

**ADDENDUM #1**

ISSUE DATE: **June 6, 2024**

RE: **GOLDA MEIR LIBRARY LUBAR CONFERENCE RENOVATION  
UNIVERSITY OF WISCONSIN – MILWAUKEE  
GPC (GENERAL PRIME CONTRACTORS) BID DOCUMENTS  
UWSA Project No. B-23-001**

BID OPENING: For GPC BIDDERS: 2:00 P.M., THURSDAY, June 27, 2024

FROM: **Hammel, Green and Abrahamson, Inc. Architects and Engineers  
333 East Erie Street  
Milwaukee, WI 53202**

TO: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Contract Documents dated **May 24, 2024** as noted below. Acknowledge receipt of this Addendum by inserting the number and issue date of this addendum in the blank space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of this text document of one (1) page; and attached Volume 1, Division 1 – GPC Bidding and Contract Requirements consisting of 209 pages; Volume 2, SPECIFICATIONS (DIVISIONS 2 THRU 28) consisting of 450 pages; and the set of DRAWINGS (BID DOCUMENTS) consisting of 27 pages.

**CHANGES TO BIDDING REQUIREMENTS:**

1. Volume 1, Division 1 – GPC Bidding and Contract Requirements. REPLACE the entire document with the Volume 1, Division 1 that is provided as a part of this Addenda. Note: an incorrect version of the document was provided by mistake, please discard in its entirety, and use the Volume 1, Division 1 – GPC Bidding and Contract Requirements that is attached as a part of this document.

**CHANGES TO SPECIFICATIONS:**

1. Volume 2, SPECIFICATIONS (DIVISIONS 2 THRU 28). REPLACE the entire document with the SPECIFICATIONS (DIVISIONS 2 THRU 28) that is provided as a part of this Addenda. Note: an incorrect version of the document was provided by mistake, please discard in its entirety, and use the Volume 2, SPECIFICATIONS (DIVISIONS 2 THRU 28) that is attached as a part of this document.

**CHANGES/ADDITIONS TO DRAWINGS:**

1. DRAWINGS (BID DOCUMENTS) REPLACE the entire document with the DRAWINGS (BID DOCUMENTS) that is provided as a part of this Addenda. Note: an incorrect version of the document was provided by mistake, please discard in its entirety, and use the DRAWINGS (BID DOCUMENTS) that is attached as a part of this document.

END OF ADDENDUM

**Hammel, Green and Abrahamson, Inc. Architects and Engineers  
333 East Erie Street  
Milwaukee, WI 53202**

For the Board of Regents of the University of Wisconsin  
On Behalf of the University of Wisconsin – Madison  
1860 Van Hise Hall, 1220 Linden Drive  
Madison, Wisconsin 53703

**GOLDA MEIR LIBRARY  
LUBAR CONFERENCE ROOM RENOVATION  
UNIVERSITY OF WISCONSIN - MILWAUKEE  
MILWAUKEE, WISCONSIN**

(Rev 04/2024)

**GPC (General Prime Contractor) BID DOCUMENTS**  
Invitation to Bid

UW- Milwaukee Project No. **GML B1970** / UWSA Project No. **B-23-001**

**May 24, 2024**

FOR  
THE BOARD OF REGENTS OF THE  
UNIVERSITY OF WISCONSIN SYSTEM  
C/O UWSA - CAPITAL PLANNING AND BUDGET, 780 REGENT STREET, SUITE 239  
MADISON, WISCONSIN 53715

Volume 1 of 2



Architect's Seal  
**Hammel, Green and Abrahamson, Inc.**  
333 East Erie Street  
Milwaukee, WI 53202  
Telephone: (414) 278-8200



Mechanical Engineer's Seal  
**Hammel, Green and Abrahamson, Inc.**  
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Electrical Engineer's Seal  
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Milwaukee, WI 53202  
Telephone: (414) 278-8200



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1 **GPC INVITATION TO BID** (Rev 04/2024)  
2 THE BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

3  
4 **GOLDA MEIR LIBRARY**  
5 **LUBAR CONFERENCE ROOM RENOVATION**  
6 **UNIVERSITY OF WISCONSIN - MILWAUKEE**  
7 **MILWAUKEE, WISCONSIN**

8  
9 UW-Milwaukee Project No. **GML B1970** / UWSA Project No. **B-23-001**

10  
11 **BID OPENING for GENERAL PRIME CONTRACTOR BIDDERS: 2:00 P.M., June 27, 2024.**

12  
13 OWNER: The Board of Regents of the University of Wisconsin System hereinafter termed the Owner.

14  
15 **NOTICE: All potential bidders must be certified by DOA prior to submitting bids on UW-Managed construction**  
16 **projects.** All bids received from contractors who are not certified will be rejected. Contractor certification applications  
17 and instructions for completing the form may be obtained from the DOA Website DFD Contractor Certification page:  
18 <https://doa.wi.gov/Pages/DoingBusiness/ContractorCertification.aspx> .

19  
20 **This project is being let using a single prime bidding and contracting process. This project does not include any**  
21 **mechanical, electrical, plumbing, or fire protection divisions of work, the Owner will bid one bid package for all**  
22 **work to general prime contractors.**

23  
24 **The University of Wisconsin System Administration (UWSA) will ONLY be accepting construction bidding**  
25 **documents as follows:**

- 26  
27 • **PDF scanned file of all required bid documents, including bid and bid bond forms with an either original**  
28 **wet signatures or digital electronic signatures emailed to UWSA Bid Submissions at**  
29 **[uwsabidsubmissions@wisconsin.edu](mailto:uwsabidsubmissions@wisconsin.edu).** If submitting documents with electronic signatures, further  
30 information and requirements are in the following bullets.
- 31 • Include Project Name, Project Number, Project Location, Category of Work being bid on, Bid Date, and the  
32 Name and Address of Bidder within email submission.
- 33 • For documents that require a seal, please darken these scans for better visibility.
- 34 • For bids including a cashier's/certified check, please scan front and back of check and include with submission.
- 35 • Bidders may submit PDFs of bonds and powers of attorney containing e-signatures, e-corporate seals, and e-  
36 notaries affixed to each document in accordance with the Surety's obligations. **Telephone numbers are**  
37 **required for all electronic signatories** for oral verification as needed. Wisconsin law permits the use of  
38 remote online notarization if it is performed **using technology providers that have been approved by the**  
39 **Department of Financial Institutions (DFI).** If a remote online notarization is used, it is the responsibility of  
40 the contractor and its Surety to ensure that the technology provider has been approved by DFI.
- 41 • Bidders may submit bid forms containing electronic signatures, but those signatures must be obtained using  
42 approved software in order to be accepted. **DocuSign software and Adobe Digital Signature software are**  
43 **approved for e-signatures** for submission of bids. Use of any other e-signature software will require additional  
44 verification and the bidder must obtain approval at least three (3) business days prior to submission of bids.  
45 Please contact [lwoznick@uwsa.edu](mailto:lwoznick@uwsa.edu). first regarding any proposed electronic signature software.

46  
47 **UWSA will NO LONGER accept bids via third party delivery (UPS, FEDEX, or DHL) or bids being dropped off in**  
48 **person.**

- 49 • Bids must be submitted to the email address listed above ([uwsabidsubmissions@wisconsin.edu](mailto:uwsabidsubmissions@wisconsin.edu)) by **1:30 p.m.**  
50 **CT** on the day that the bid submission is due. Email PDF submissions will receive a confirmation reply from  
51 UWSA. If for any reason a reply is not received after a PDF bid is emailed, please contact Lindsay Woznick at  
52 (608) 265-6462.
- 53 • **Bidders are responsible for their bid being delivered by the time specified and delivery is entirely at**  
54 **the bidder's risk.**



1 **The bid opening will be conducted via teleconference with the information listed below. All bids will be opened**  
2 **at 2:00 p.m. CT on the scheduled date. All lines will be muted upon entry of the teleconference. Upon dialing**  
3 **into the teleconference line, you will hear silence until the bid starts.**

- 4
- 5 • "Join Zoom Meeting
- 6 • <https://wisconsin-edu.zoom.us/j/96119421731?pwd=eVF6VzM0Z2ZTalhqaCtpVGnLTnkJZz09&from=addon>
- 7 • • Meeting ID: 961 1942 1731
- 8 • • One Tap Mobile:
- 9 • +13052241968,,96119421731#,,,,\*820674# US
- 10 • Dial-In: +1 312 626 6799 US (Chicago)
- 11

12 In general, the work consists of a renovation of Rooms W301, W302 and W303 in the Golda Meir Library to create a  
13 conference and study room with a display for artifacts of donor Sheldon Lubar. The renovation reconfigures the space  
14 including the entry and two existing single-user restrooms and an existing meeting room to create a conference room  
15 that will feature a UWM custom designed display of the artifacts of Sheldon Lubar. The renovation will interior  
16 mechanical, electrical, plumbing systems modifications as indicated in the documents.

17  
18 Bidding documents (drawings, specifications, and addenda) may be obtained only as electronic files (in PDF format): as  
19 a downloadable file from the University of Wisconsin System Administration's Design and Construction Opportunities  
20 website (see website address below). Bidding documents may also be seen at various Builders' Exchanges that have  
21 downloaded the documents. Additional project bidding information, including plan holders lists are available on the  
22 University of Wisconsin System public website: <https://www.wisconsin.edu/procurement/construction/>. After opening the  
23 web page, select the UW-Milwaukee Golda Meir Library project.

24  
25 **Base Bid will be received for: A single lump sum bid for All Work.**

26  
27 Bid Guarantee in the amount of 10% of the Bid must accompany each bid submitted. Contractor MUST submit hard  
28 copies of bid to UWSA within 10 working days of being notified of award.

29  
30 Contract offer and construction phase records will be processed via email.

31  
32 **A pre-bid tour will be conducted at the site June 6, 2024 beginning at 1:00PM. Participants should meet in the**  
33 **main lobby of the existing Golda Meir Library located at 2311 E Hartford Ave, Milwaukee, WI. All bidders are**  
34 **highly encouraged to attend this Pre-bid Conference / Building Tour and no separate tours will be conducted.**  
35 **The contact person is Kevin Allebach at HGA, Inc., 333 East Erie Street, Milwaukee, WI. Architect's Phone:**  
36 **414-520-6513.**

37  
38 Any other questions related to this project can be sent via email to the Procurement contact Lindsay Woznick at  
39 [lwoznick@uwsa.edu](mailto:lwoznick@uwsa.edu).

40 \*\*\*

1 **GPC INSTRUCTIONS TO BIDDERS** (Rev 04/2024)  
2 UW-Milwaukee Project No. **GML B1970** / UWSA Project No. **B-23-001**

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28 23. Work by the Owner

29  
30 **1. DEFINITIONS**

31 In this document, the following terms are defined as:

32  
33 (a) "Mechanical, electrical, or plumbing subcontractor" ("MEP Subcontractor") is a contractor that performs  
34 mechanical (Heating, Ventilating, and Air Conditioning), electrical, plumbing, or fire protection (fire suppression) work  
35 for the Project, and enters into a contract with the General Prime Contractor to perform their division of work.

36  
37 16.855(1g)(b) (b) "Qualified bidder" means a contractor that the department certifies under Wis. Stat. s.  
38 16.855(9m)(b)1.

39  
40 16.855(1g)(c) (c) "Qualified responsible bidder" means a contractor who is a Qualified bidder and who is a  
41 Responsible bidder.

42  
43 16.855(1g)(d) (d) "Responsible bidder" means a contractor that the department certifies under Wis. Stat. s.  
44 16.855(9m)(b)2.

45  
46 16.855(1g)(e) (e) "Single prime contracting" means bidding and contracting through a process in which only a  
47 general prime contractor has a contractual relationship with the owner and all mechanical, electrical, or plumbing  
48 subcontractors are identified by the department and are subcontractors to the General Prime Contractor.

49  
50 (f) "General Prime Contractor" ("GPC") is a contractor that enters into a contract with the owner to perform all work  
51 as required by the Contract Documents and enters into contracts with subcontractors including MEP Subcontractors  
52 identified by the Owner.

53  
54 (g) "Non-MEP Subcontractor" is a subcontractor to a General Prime Contractor in divisions of work other than  
55 mechanical, electrical, plumbing, and fire protection. This includes suppliers and installers to the General Prime  
56 Contractor.

1 (h) "Subcontractor" is all subcontractors on a project. This includes MEP Subcontractors, subcontractors to the  
2 MEP Subcontractors, and Non-MEP Subcontractors.

3  
4 (i) "Contractor" is all contractors working on a project regardless of contractual relationship. This includes the  
5 General Prime Contractor, MEP Subcontractors, Non-MEP Subcontractors, and all Subcontractors, regardless of tier of  
6 subcontract.

7 (j) "DFD Project Manager" shall have the same meaning as the "Owner's Representative" as defined in the A101  
8 contract, article 8.2.

## 9 10 **2. GENERAL**

11 Time for bid opening shall be the prevailing central standard or daylight saving time in force at Madison, Wisconsin, on  
12 the date set forth in the Invitation to Bid.

13  
14 All potential bidders must be certified by DOA prior to submitting bids on state construction projects over \$50,000. All  
15 bids received from contractors who are not certified will be rejected. Contractor certification applications and instructions  
16 for completing the form may be obtained from the DOA Website DFD Contractor Certification page:  
17 <https://doa.wi.gov/Pages/DoingBusiness/ContractorCertification.aspx> or upon request from DFD--email  
18 [dfdcertification@wisconsin.gov](mailto:dfdcertification@wisconsin.gov).

19  
20  
21 Before submitting a bid, the Bidder shall examine all of the Bidding and Contract Documents listed in the Table of  
22 Contents of these specifications. The successful Bidder will be required to do all work which is shown on the drawings,  
23 mentioned in the specifications or reasonably implied as necessary to complete the contract for this project.

24  
25 Failure to visit the site or failure to examine any and all Bidding and Contract Documents will in no way relieve the  
26 successful Bidder from the necessity of furnishing any materials or equipment, or performing any work, that may be  
27 required to complete the work in accordance with the Bidding and Contract Documents. Neglect of above requirements  
28 will not be accepted as reason for delay in the work or additional compensation.

29  
30 All bidders shall have established and diligently maintained a satisfactory safety program, and if eligible for Experience  
31 Modification Rating (EMR), must have a rating of 1.20 or less as established by the Wisconsin Compensation Rating  
32 Bureau (WCRB) or the National Council on Compensation Insurance (NCCI).

## 33 34 **3. DRAWINGS AND SPECIFICATIONS**

35 The drawings and specifications that form a part of these Bidding Documents are all the documents (drawings,  
36 specifications, etc) in this invitation to bid.

37  
38 Complete sets of Contract Documents for all trades will be issued to all Bidders, irrespective of the category of work to  
39 be bid on, in order that all Bidders may be familiar with the work of other trades as they affect their bid.

## 40 41 **4. INTERPRETATION**

42 No verbal explanation or instructions will be given in regard to the meaning of the drawings or specifications during the  
43 bid period. Bidders shall bring inadequacies, omissions or conflicts to the Architect/Engineer's attention at least ten (10)  
44 days before the date set for bid opening. Prompt clarification will be supplied to all bidders of record by addendum.

45  
46 Failure to so request clarification or interpretation of the drawings and specifications will not relieve the successful Bidder  
47 of responsibility. Signing of the contract will be considered as implicitly denoting that the Contractor has thorough  
48 understanding of the scope of work and comprehension of the contract documents.

49  
50 Neither the Architect/Engineer nor the Owner will be responsible for verbal instructions.

## 51 52 **5. MANDATORY PRE-BID DOA CERTIFICATION**

53 All potential bidders must become certified as qualified and responsible bidders **before** they can bid on state projects  
54 over \$50,000. The criteria for determining certification of qualified and responsible bidders are itemized in Wis. Stat. s.  
55 16.855(9m). If the Owner determines that more experience is necessary for a particular project, the Owner may include  
56 additional requirements.

1 **6. BID GUARANTEE**

2 A bid bond prepared on the Bid Bond Form bound herein, payable to the Owner in the amount not less than 10% of the  
3 maximum bid shall accompany each bid as a guarantee. A bank certified check or a cashier's check may accompany  
4 each bid as a guarantee pursuant to Wis. Stat. s. 779.14(1m)(c)2.b. and 779.14(1s). Failure to enter into the contract  
5 with the Owner (including failure to obtain certificate of insurance and separate 100% performance and 100% payment  
6 bonds) may result in forfeiture of the Bid Bond. The company issuing the Bonds must be licensed to do business in  
7 Wisconsin.  
8

9 Any bid which is not accompanied by a bid guarantee will not be accepted and will not be read at the bid opening.

10  
11 All checks tendered as bid guarantee, except those of the three lowest bidders, will be returned to their makers within  
12 three (3) days after bid opening. All such retained checks will be returned immediately upon execution of the contract  
13 between the General Prime Contractor and the Owner.  
14

15 **7. WITHDRAWAL OF BIDS**

16 Prior to the time fixed for bid opening, bids may be withdrawn by written request from the Bidder, without prejudice to the  
17 right of the Bidder to file a new bid. Withdrawn bids will be returned unopened.  
18

19 After the bid has been opened, negligence on the part of the Bidder in preparing their bid confers **no** right for withdrawal  
20 of the bid without penalty.  
21

22 If a bid contains an error, omission, or mistake, the bidder may limit liability to the amount of their bid guarantee by giving  
23 the Owner written Notice, within seventy-two (72) hours of the bid opening, of their intent not to execute the contract with  
24 the owner. If no such notice is given, the Owner reserves the right to obtain the amount of the difference in bid price  
25 between the low bidder and the next low bidder.  
26

27 **8. CONTRACT FORM**

28 These specifications include a copy of the contract the successful Bidder is required to enter into with the owner. Bidders  
29 shall read and understand the conditions contained in this contract. The successful Bidder will be offered a contract via  
30 email to the contact provided by the bidder on the Bid Form.  
31

32 **9. CONTRACT INTERESTS BY STATE PUBLIC OFFICIALS**

33 In accordance with section 19.45(6) of the Wisconsin Statutes, no state public official, member of a state public official's  
34 immediate family, nor any organization with which the state public official or a member of the official's immediate family  
35 owns or controls at least 10% of the outstanding equity, voting rights, or outstanding indebtedness may enter into any  
36 contract or lease involving a payment or payments of more than \$3,000 within a twelve (12) month period, in whole or in  
37 part derived from state funds unless the state public official has first made written disclosure of the nature and extent of  
38 such relationship or interest to the board and to the department acting for the state in regard to such contract or lease.  
39 Any contract or lease entered into in violation of this subsection may be voided by the owner in an action commenced  
40 within three (3) years of the date on which the ethics board, or the department or officer acting for the state in regard to  
41 the allocation of state funds from which such payment is derived, knew or should have known that a violation of this  
42 subsection had occurred. This subsection does not affect the application of s.946.13.  
43

44 **10. DISCLOSURE OF OWNERSHIP**

45 The Bidder shall disclose on the date of submitting a bid for this project, the name of any construction business of which  
46 the Bidder has had a 25% or greater interest as a shareholder, officer, partner, or owner at any time during the preceding  
47 three (3) years, if said construction business has been found by the Department of Workforce Development to have failed  
48 to pay the prevailing wage rate or at least 1.5 times the hourly basic rate of pay for hours worked in excess of the  
49 prevailing hours of labor to any employee at any time within the preceding three (3) years.  
50

51 The "Disclosure of Ownership" form may be obtained at no charge from the Department of Workforce Development,  
52 Equal Rights Division, P.O. Box 8928, Madison, Wisconsin 53708.  
53

54 **11. MINORITY BUSINESS ENTERPRISE AND DISABLED VETERAN-OWNED BUSINESS INVOLVEMENT**

55 "Minority Business Enterprise" (MBE) means: a business certified by the Wisconsin Supplier Diversity Program under  
56 Wis. Stat. s. 16.287(2).  
57

1 “Disabled Veteran–Owned Business” (DVB) means: a business certified by the Wisconsin Supplier Diversity Program  
2 under Wis. Stat. s. 16.283(3).  
3

4 In awarding construction contracts, the University of Wisconsin System Administration shall attempt to ensure that 5  
5 percent of the total amount expended in each fiscal year is awarded to contractors which are minority businesses. The  
6 General Prime Contractor Bidder shall make every effort to award a minimum of 15% of the work to minority business  
7 enterprises (MBE) involvement for all projects within 60 mile radius of Milwaukee and 5% for projects located elsewhere.  
8

9 In awarding construction contracts, the University of Wisconsin System Administration shall attempt to ensure that at  
10 least 1 percent of the total amount expended each fiscal year is awarded to contractors that are disabled veteran-owned  
11 businesses.  
12

13 In order to assist the department in these endeavors we strongly encourage General Prime Contractors to use MBEs  
14 and DVBs.  
15

16 General Prime Contractor Bidders shall submit a “Form A Affidavit of Compliance – Minority Business Enterprise and  
17 Disabled Veteran-Owned Business Provision” within seven days of the general prime contractor contract offer. This form  
18 should indicate the percentage of MBE/DVB participation commitment.  
19

20 For assistance in identifying DOA certified MBE and DVB companies, please contact the Department of Administration  
21 Supplier Diversity Program at: [DOABDMBD@wisconsin.gov](mailto:DOABDMBD@wisconsin.gov), or by telephone at: (608)267-9550, or visit their website  
22 at: <http://www.doa.wi.gov/Divisions/Enterprise-Operations/Supplier-Diversity-Program>.  
23

## 24 **12. SUBSTANCE ABUSE PREVENTION**

25 Mission/Purpose: The University of Wisconsin System Administration recognizes and supports drug-free workplace  
26 programs as an important element in the national strategy to reduce the devastating effects of drug and alcohol abuse  
27 in our society. the Owner requires contractors, subcontractors, suppliers and vendors to establish and enforce drug-free  
28 workplace policies and programs that conform to Sec 103.503 of the Wisconsin Statutes.  
29

30 Statement: The possession, use of, distribution or purchase of illegal drugs, or use of alcohol at work by any employee  
31 on University of Wisconsin System Administration construction job sites, is strictly prohibited.  
32

33 The terms of this Substance Abuse Program Statement shall cover all construction personnel who are working on  
34 University of Wisconsin System Administration job sites. This includes employees of all Contractors, Subcontractors,  
35 contractor suppliers, and their employees working at the job site.  
36

37 General Prime Contractor's and Subcontractor's Written Program: Each General Prime Contractor and Subcontractor  
38 shall have in place a written Substance Abuse Program conforming to Sec 103.503(3) of the Wisconsin Statutes.  
39

40 In addition, representatives of the Owner who believe that any General Prime Contractor's or Subcontractor's employee  
41 may be under the influence of alcohol or drugs shall, where deemed appropriate, contact the General Prime Contractor's  
42 or Subcontractor's appropriate management/supervision authority and request that appropriate action be taken. The  
43 General Prime Contractor's or Subcontractor's employer shall immediately remove an employee who is suspected of  
44 being under the influence of illegal drugs or alcohol shall be immediately removed from the job site.  
45

46 Procedures for testing and handling of positive drug tests shall be in compliance and consistent with State and Federal  
47 laws.  
48

49 Costs of Substance Abuse Programs and Testing: The cost associated with the development, implementation and  
50 enforcement of Substance Abuse Programs and any testing required shall be the responsibility of each individual General  
51 Prime Contractor and Subcontractor for their respective employees working on the job site. The Owner will not be  
52 responsible for any cost of substance abuse testing, rehabilitation or medical reviews related to substance abuse.  
53

54 The General Prime Contractor and Subcontractors shall indemnify and hold the Owner harmless from any damages or  
55 other costs incurred that are related to the implementation or enforcement of any substance abuse policy or program.  
56

## 57 **13. METHOD OF AWARD - RESERVATION**

1  
2 The general prime contract will be awarded based on the following, as long as the cost does not exceed the amount of  
3 project funds available:

4  
5 The lowest dollar amount is submitted by a qualified, responsible, certified bidder on a SINGLE BASE BID for  
6 all work comprising the project.

7  
8 Should a qualified, responsible, certified minority business enterprise or disabled veteran-owned business submit a bid  
9 that is no more than 5% higher than the apparent low bid, the Contract may be awarded to the minority business  
10 enterprise or disabled veteran-owned business.

11  
12 Firms wishing to be considered for the 5% bidding preference must be certified as a minority business enterprise or  
13 disabled veteran-owned business by the Wisconsin Supplier Diversity Program should indicate in the space provided on  
14 the Bid Form that preference is requested.

15  
16 The Owner reserves the right to reject any and all bids, or to waive any informality in any bid, or to accept any bid which  
17 will serve the best interests of the Owner.

18  
19 Informational Bids will not be considered in establishing low bidder.

#### 20 21 **14. SECURITY FOR SEPARATE 100% PERFORMANCE AND SEPARATE 100% PAYMENT**

22 Bidder is required to furnish separate 100 % performance and 100 % payment bonds to the benefit of the Board of  
23 Regents of the University of Wisconsin System as the sole obligee. These bonds shall be delivered to the Owner with the  
24 signed contract. The Surety Company shall be licensed to do business in Wisconsin. The Bond must be dated the same  
25 date or subsequent to the date of the Contract.

26  
27 A certified copy of power of attorney shall be provided by the Surety Company showing that the agent who signs the  
28 Bond has the power of attorney to sign for the Surety Company. This power of attorney must be signed by the Secretary  
29 or Assistant Secretary of the company and not by an attorney-in-fact. The power of attorney must bear the same or later  
30 date as the bond.

31  
32 If the Bidder is a partnership or a joint venture, a certified list providing the names of individuals constituting the  
33 partnership or joint venture must be furnished. The Contract itself may be signed by one partner of the partnership, or  
34 one partner of each firm comprising the joint venture, but the separate Performance and Payment Bonds must be signed  
35 by all of the partners.

36  
37 If the Bidder is a corporation, a current certified copy of the resolution or other official act of the directors of the corporation  
38 must be submitted showing that the person who signs the contract is authorized to sign contracts for the corporation.  
39 The corporate seal must be affixed to the resolution, contract, and separate performance and payment bonds. If the  
40 Bidder's corporation has no seal, the above documents must include a statement or notation to the effect that the  
41 corporation has no seal.

#### 42 43 **15. TAXES**

44 The Bidder shall include in the bid all taxes required by law.

45  
46 In accordance with section 71.80(16)(a), Wis. Stats., SURETY BOND; NONRESIDENT CONTRACTOR. "All  
47 nonresident persons, whether incorporated or not, engaging in construction contracting in this state as contractor or  
48 subcontractor and not otherwise regularly engaged in business in this state, shall file a surety bond with the  
49 department (Wisconsin Department of Revenue MS 5-77 Attn: Non-Resident Surety Bonds, 2135 Rimrock Rd.,  
50 Madison, WI 53713, telephone (608)266-2776) payable to the department of revenue, to guarantee the payment of  
51 income taxes, required unemployment compensation contributions, sales and use taxes and income taxes withheld  
52 from wages of employees, together with any penalties and interest thereon. The amount of the bond shall be 3% of  
53 the contract or subcontract price on all contracts of \$50,000 or more..."

54  
55 As the Board of Regents is an exempt entity, building materials purchased for this project are exempt. The University  
56 of Wisconsin System CES number: 040706. The Certificate of Exempt Status (CES) will be provided to the awarded  
57 Contractor upon request.

1  
2 **16. SUBMISSION OF BIDS**

3 All bids shall be submitted on the standard Bid Forms and only bids that are made on the Bid Forms will be considered.  
4 The entire Bid Form including the Addendum Receipt/Signature page, the Bid Bond Form, (if used), and other supporting  
5 documents (if any), shall be filled out and submitted in the manner specified hereinafter. SPECIFICATIONS SHALL NOT  
6 ACCOMPANY BID.

7  
8 No bids for any subdivision or any subclassification of this work, except as indicated, will be accepted. Any conditional  
9 bid, amendment to the Bid Form or appendant thereto, the inclusion of any correspondence, written or printed matter,  
10 unsolicited material or data, or details of any nature other than the information specifically called for, will disqualify the  
11 Bid. Telecommunication alterations to the bid will not be accepted.

12  
13 Space is provided on the Bid Form for General Prime Contractor's single bid. Appropriate insertions are as follows:  
14 numerals indicating the cost of the work, \$0 if there is no cost for the work, or the words 'No Bid' if the bidder is not  
15 intending to bid the work. Blank space(s) will be considered the same as 'No Bid'.

16  
17 **Bidders shall submit a Single Base Bid for all the work.**

18  
19  
20 Any addendum issued during the time of bidding shall become a part of the Contract Documents. Bidders shall  
21 acknowledge receipt of such addendum in the appropriate space provided on the Bid Form. Bid will be rejected if receipt  
22 of an addendum applicable to the award of contract has not been acknowledged on the Bid Form.

23  
24 The Owner is not responsible for bids not clearly labeled as required. Bids shall be signed, sealed, and delivered to the  
25 place indicated in the Invitation to Bid before the time designated in the Invitation to Bid. All bids shall be identified with  
26 the Project Name, Project Number, Project Location, Category of Work being bid on, Bid Date, and the Name and  
27 Address of Bidder.

28  
29 Bidder shall be responsible for the bid being delivered to the place designated for the bid opening before the time  
30 specified. Bids received after the time indicated in the Invitation to Bid will be rejected and returned to Bidder unopened.

31  
32 Bid will be considered invalid and will be rejected if it has not been signed by the Bidder.

33  
34 Bids will be rejected if the bidder is not certified by DOA in the division(s) of work they bid on and/or if their bid amount  
35 exceeds their certification threshold in that division of work.

36  
37 **17. BASE BID**

38 Base Bids shall be received as follows:  
39 SINGLE BASE BID FOR ALL THE WORK.

40  
41 Base Bid No. 1. All Work, as per specification Divisions 2 thru 33, applicable provisions of Division 1 and related drawings.

42  
43 **18. INFORMATIONAL BIDS**

44 None.

45  
46 **19. UNIT PRICES**

47 Unit prices requested on the Bid Form shall be given and, if included in the General Prime Contract, will be used for  
48 additions to or deductions from amount of work required under the Contract. Unit prices shall include all costs of  
49 materials, labor, insurance, taxes, overhead and profit.

50  
51 The Owner reserves the right to reject any unit prices as given in the bid if they are considered excessive or  
52 unreasonable, or to accept any or all of the unit prices that may be considered fair and reasonable. If any unit price is  
53 rejected, the work governed by such unit price, if required, shall be treated as specified in General Conditions.

54  
55 The Bidder shall refer to the Bid Form and the applicable technical section to determine the basis of unit measure and  
56 the detailed information related to each unit price item requested.

1 **20. STATED ALLOWANCES**

2 None.

3  
4 **21. GENERAL PRIME CONTRACTOR SUBCONTRACT WITH MEP SUBCONTRACTORS:**

5 **None.**

6  
7 **22. COMMENCEMENT AND COMPLETION**

8 The successful General Prime Contractor Bidder shall commence work upon an executed contract with Owner. The  
9 General Prime Contractor shall not Mobilize until the date to be specified in a written "Notice to Proceed" issued by the  
10 Owner, and to fully complete all the work for Substantial Completion 127. Completion time will be converted to a specific  
11 date at the time the "Notice to Proceed" is issued. The construction duration and below milestone dates are based on  
12 the current bidding schedule, and subject to modification if bidding does not proceed as planned. Refer also to General  
13 Conditions for additional information in regards to time for completion.

14  
15 These milestones will be incorporated into the master project schedule after the Notice to Proceed is issued. The  
16 schedule must include, but is not limited to, the following milestone categories as they apply to the project:

Start Date (Month/Year)	End Date (Month/Year)	Schedule Milestones
6/24	6/24	Notice to Proceed
7/24	7/24	Start of Construction
11/24	11/24	Substantial Completion
12/24	12/24	100% of Close-Out Activities Complete

17  
18

19 **23. WORK BY THE OWNER**

20 The following work will be accomplished by the Owner or will be let under separate contracts and will not be included  
21 under the General Prime Contract:

22

- 23 • Furniture
- 24 • ASBESTOS ABATEMENT - Removal of building materials identified as asbestos-containing materials (ACM)  
25 that will be disturbed by renovation work, including ACM thermal system insulation, ACM spray applied and  
26 trowel applied surfaces. (See General Requirements, HAZARDOUS SUBSTANCES for regulatory  
27 requirements, materials testing results, and General Prime Contractor's responsibility regarding ACM.)

28

29 Note: General Contractor is responsible for coordinating and scheduling the Abatement contractor and coordinating any  
30 shutdown requirements with campus.

31

32

\*\*\*





1 **BID FORM – GENERAL PRIME CONTRACTOR (GPC)** (Rev 04/2024)  
2 THE BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM  
3 s.16.855 Wis. Stats.

4  
5 **GOLDA MEIR LIBRARY**  
6 **LUBAR CONFERENCE ROOM RENOVATION**  
7 **UNIVERSITY OF WISCONSIN - MILWAUKEE**  
8 **MILWAUKEE, WISCONSIN**

9  
10 **UW-Milwaukee Project No. GML B1970 / UWSA Project No. B-23-001**

11  
12 **General Prime Contractor (GPC) Bid Opening: 2:00 P.M., June 27, 2024.**

13  
14  
15 To: University of Wisconsin System Administration (UWSA)

(a joint venture)

(a corporation)

(a partnership)

(an individual)

16  
17  
18  
19 We \_\_\_\_\_

(Cross out inapplicable)

20  
21  
22 Of \_\_\_\_\_

23 Street

City

State

Zip

24  
25 hereby agree to execute a contract with the Board of Regents of the University of Wisconsin System (the Owner) and a  
26 subcontract with all successful MEP Bidders identified by the Owner and listed in this bid, and to furnish satisfactory  
27 separate 100% Performance Bond and 100% Payment Bond in the amount specified no later than ten (10) days of the  
28 contract offer, and to provide all labor and material required for the construction of the project designated above, for the  
29 prices hereinafter set forth, in strict accordance with the Contract Documents prepared by **HGA Inc., 333 East Erie**  
30 **Street, Milwaukee, Wisconsin, 53202 for the Owner and dated May 24, 2024.**

31  
32 Contact Instructions:

33 (For use by Owner to offer contract to the successful bidders)

34  
35 Contact name: \_\_\_\_\_

36  
37 Title: \_\_\_\_\_

38  
39 Telephone Number: \_\_\_\_\_

40  
41 Email address: \_\_\_\_\_

42  
43  
44 **IMPORTANT: BEFORE SUBMITTING YOUR BID, PLEASE VERIFY THAT:**

451. You have been **certified by DOA as a qualified and responsible bidder** for the amount of your bid within the  
46 division(s) of work being bid.
472. You have **entered all Bid amounts in numeric characters** (Example: \$9,999);
483. You have **acknowledged receipt of all addenda**;
494. You have **signed the Bid Form**
505. You have **included a valid Bid Guarantee** for not less than 10% of the value of the bid as either:  
51 a) a Bid Bond signed by the contractor and surety and with a Power of Attorney attached, **or**  
52 b) a Cashier's Check or Bank Check pursuant to Wis stats. s. 779.14(1m)(c)2.b. and 779.14(1s). A Company or  
53 Personal Check will not be accepted.
- 54  
55

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40

**SINGLE BASE BID - GENERAL PRIME CONTRACTOR**

**ALL WORK**

BASE BID NO 1. ALL WORK required to fully complete the project in accordance with the Contract Documents,  
for the sum of (\$\_\_\_\_\_)

**Enter bid amount in numeric characters only** (Example: \$9,999). See Instructions to Bidders 'Article 16 Submission of Base Bids' for detailed instructions.

**COMMENCEMENT AND COMPLETION OF CONTRACT WORK**

The undersigned agrees, if awarded the contract, to enter into a subcontract with the MEP Bidders identified by the Owner.

**ADDENDUM RECEIPT**

We acknowledge receipt of the following Addenda:

Addendum No. \_\_\_\_\_ Date \_\_\_\_\_

Addendum No. \_\_\_\_\_ Date \_\_\_\_\_

Addendum No. \_\_\_\_\_ Date \_\_\_\_\_

Addendum No. \_\_\_\_\_ Date \_\_\_\_\_

PRIOR TO SIGNING, BIDDERS' ATTENTION IS DIRECTED TO INSTRUCTIONS TO BIDDERS TO AVOID THE POSSIBILITY OF INVALIDATING THIS BID.

BY SIGNING THIS BID FORM, THE BIDDER ATTESTS TO PERSONAL KNOWLEDGE OF THE FOLLOWING:

- |    |   |
|----|---|
| 1. | Bidder is <u>certified</u> by DOA as a qualified and responsible bidder for the amount of the bid submitted, within the division(s) of work being bid.  |
| 2. | In accordance with Wis. Stats. 16.855 (13) and (14) and ARTICLE 21 of these Bidding Documents, Bidder agrees to enter into a subcontract with the successful MEP Subcontractors identified by the Owner.  |
| 3. | Bidder has examined the drawings and specifications, carefully prepared the bid form, and has reviewed all forms in detail before submitting bid; and bidder, or the agents, officers, or employees thereof, have not, either directly or indirectly, entered into any agreement, bid rigging, bid rotation, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this bid. |
| 4. | That all work will be performed at the Bidder's own proper cost and expense, that the Bidder will furnish all necessary materials, labor, tools, machinery, apparatus, and other means of construction in the manner provided in the applicable specifications, and at the time stated in the contract.   |

\_\_\_\_\_  
(Firm Name)

\_\_\_\_\_  
(Bidder's Printed Name)

\_\_\_\_\_  
(Bidder's Title)

1  
2  
3  
4  
5  
6  
7  
8

(Seal, if bid is by a corporation)

Date: \_\_\_\_\_

By \_\_\_\_\_

(Signature of Bidder)

Place an "X" in the box if Bidder is certified as a minority business enterprise or disabled veteran-owned business by the Wisconsin Supplier Diversity Program and wishes to be considered for the 5% bidder preference.





BID BOND

KNOW ALL PEOPLE BY THESE PRESENTS, that (a \_\_\_\_\_ corporation of the State of \_\_\_\_\_) (individual), (partnership) (hereinafter referred to as , a the "Principal"), and \_\_\_\_\_ corporation of the State of \_\_\_\_\_

Name of Surety

(thereinafter referred to as the "Surety"), are held and firmly bound unto the Board of Regents of the University of Wisconsin System (hereinafter referred to as the "Owner"), in the penal sum of ten percent (10%) of the amount of the total bid or bids of the Principal herein accepted by the Owner, for the payment of which the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such that, whereas the Principal has submitted, or is about to submit, to the the Owner a certain bid, including the related combined bids attached hereto and hereby made a part hereof, to enter into either a

- Contract in writing for OR  subcontract in writing with the General Prime Contractor for

Type of Work

for the

Project

- (1) If said bid is rejected by the Owner, then this obligation shall be void.
(2) If said bid is accepted by the Owner and the Principal shall execute and deliver a Contract in the form specified by the Owner (properly completed in accordance with said bid) and shall furnish a bond for the Principal's faithful performance of said Contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void.
(3) If said bid is accepted by the Owner and the Principal shall fail to execute and deliver the Contract and the performance and payment bond noted in (2) above, all within the time specified or any extension thereof, the Principal and Surety agree jointly and severally to forfeit to the Owner the penal sum mentioned above, it being understood that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal sum of this obligation as stated. Notice will be given by the Ownerto the Principal and Surety of intent to request payment of all or any part of the penal sum, a minimum of 7 calendar days before making demand of payment. Payment of the penal sum by the Surety and its bond shall be received by UWSA within 72 hours following demand by the Owner.

The Surety, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by an extension of the time within which the Owner may accept such bid, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on the day and year set forth below.

SEAL:

\_\_\_\_\_  
Principal Date

By: \_\_\_\_\_

SEAL:

\_\_\_\_\_  
Name of Surety Date

By: \_\_\_\_\_

NOTE TO SURETY AND PRINCIPAL: The bid submitted, which this bond guarantees, may be rejected if the following instrument is not attached to this bond: Power of Attorney showing that the agent of Surety is currently authorized to execute bonds on behalf of the Surety, and in the amounts referenced above.





DESIGNATION OF CONFIDENTIAL AND PROPRIETARY INFORMATION

The attached material submitted in response to Bid/Proposal # \_\_\_\_\_ includes proprietary and confidential information which qualifies as a trade secret, as provided in s. 19.36(5), Wis. Stats., or is otherwise material that can be kept confidential under the Wisconsin Open Records Law. As such, we ask that certain pages, as indicated below, of this bid/proposal response be treated as confidential material and not be released without our written approval.

Prices always become public information when bids/proposals are opened, and therefore cannot be kept confidential.

Other information cannot be kept confidential unless it is a trade secret. Trade secret is defined in s. 134.90(1)(c), Wis. Stats. as follows: "Trade secret" means information, including a formula, pattern, compilation, program, device, method, technique or process to which all of the following apply:

- 1. The information derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.
2. The information is the subject of efforts to maintain its secrecy that are reasonable under the circumstances.

We request that the following pages not be released

Table with 3 columns: Section, Page #, Topic. Multiple empty rows for data entry.

IN THE EVENT THE DESIGNATION OF CONFIDENTIALITY OF THIS INFORMATION IS CHALLENGED, THE UNDERSIGNED HEREBY AGREES TO PROVIDE LEGAL COUNSEL OR OTHER NECESSARY ASSISTANCE TO DEFEND THE DESIGNATION OF CONFIDENTIALITY.

Failure to include this form in the bid/proposal response may mean that all information provided as part of the bid/proposal response will be open to examination and copying. The state considers other markings of confidential in the bid/proposal document to be insufficient. The undersigned agrees to hold the state harmless for any damages arising out of the release of any materials unless they are specifically identified above.

Name - Authorized Representative

Signature - Authorized Representative

Company Name

Date







## Form A — Affidavit of Compliance

### Minority Business Enterprise (MBE) / Disabled Veteran-Owned Business (DVB) Provisions

Project Title \_\_\_\_\_

Project Location \_\_\_\_\_ Project No. \_\_\_\_\_

The State of Wisconsin has an active Diversity Business Initiative. The purpose of this initiative, in the interest of fairness and equity, is to encourage increased voluntary expenditure of State construction dollars by prime contractors under subcontracts with MBE / DVB firms. **Please refer to the checklist on page 2 of this form which is provided to assist you in this effort.**

To that end, the bidder's commitment for MBE participation on this project is \_\_\_\_\_% and DVB participation is \_\_\_\_\_%.

The State of Wisconsin, Department of Administration, Division of Facilities Development reserves the right to reject and disqualify any bidder who does not include this completed form and who fails to comply with the State's bid requirements as outlined in the bid specifications.

I, the apparent low bidder, acknowledge, understand and agree to comply with my commitment for MBE/DVB participation on this contract including submission of all information required.

I attest that, to the best of my knowledge, all of the above information is true and correct.

Dated (mm/dd/ccyy) \_\_\_\_\_

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Telephone Number

State of \_\_\_\_\_

County of \_\_\_\_\_

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, I confirm that \_\_\_\_\_  
Bidder's Name

came before me and signed the document for the purposes stated.

I witness, and set my hand and official stamp or seal.

\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
County, State of \_\_\_\_\_

My Commission expires \_\_\_\_\_, 20\_\_\_\_

**“Good Faith Effort” To Obtain Minority Business Enterprise / Disabled Veteran-Owned Business Participation**

All “Yes” boxes must be checked to ensure that a “Good Faith Effort” has been made to obtain MBE participation.

- Have you searched the Supplier Diversity Program’s Database for Diverse, Certified Suppliers?\_ <https://wisdp.wi.gov/Search.aspx>  Yes  No
  
- Have you emailed (prior to bidding) diverse suppliers that you wish to consider regarding the logistics of them being considered for subcontracting opportunities and copied the Wisconsin Supplier Diversity Program ([DiverseSpend@wi.gov](mailto:DiverseSpend@wi.gov))  Yes  No
  
- Have you provided MBE/DVB firms adequate project information about plans, specifications and requirements pertaining to their work?  Yes  No
  
- Have you communicated with any MBE/DVB that performs the type of services needed for the project and was there any follow-up?  Yes  No
  
- Was MBE/DVB participation advertised (newspaper, radio, etc.) for this project? (You may be asked to submit evidence.)  Yes  No
  
- Did you contact any MBE/DVB trade associations to assist in locating MBE/DVBs or have you made contact with any MBEs/DVBs that may not yet be certified by the State? (You may be asked to verify.)  Yes  No
  
- Have you determined if there are other possible opportunities for MBE/DVB participation such as suppliers, haulers, etc. or using a group of MBEs/DVBs jointly?  Yes  No
  
- Have you considered creating a plan of action with the assistance of the Supplier Diversity Program office to ensure that future contracts can have MBE/DVB participation and meet the construction requirements and goals of the State? (These plans may include mentoring, technical support and other innovative opportunities.)  Yes  No
  
- Did you negotiate in good faith? (You may be asked to verify.)  Yes  No



REQUEST FOR SUBMITTAL APPROVAL

Project Name
Contractor Name
Subcontractor/Supplier Name

Project No.
Contractor Phone No.
Specification Section No.

- a. This Submittal is made under the provisions of the General Conditions of the Contract Documents. The Contractor makes an express warranty to the Owner, by express affirmation, that if installed into or made a part of this project, the work which forms the basis of this Submittal will conform to the design requirements of the Contract Documents.
b. It is the purpose of this Submittal to describe the goods proposed for use by the Contractor and to demonstrate conformance of that description to the Contract Documents.
c. At the time of this submission, the Contractor acknowledges awareness that the purpose of this Submittal is to obtain the Owner's authorization to use this Work for purposes of Contract Document compliance by the Contractor, and further, that the Owner, in doing so, relies upon the skill, judgment and integrity of the Contractor to insure that this submitted Work complies with requirements of the Contract Documents. Contractor hereby acknowledges that it has, through the use of its own resources, found and selected the Work submitted herewith and that the Work submitted is usable for the purpose of being fit and suitable in the final construction under this Contract Documents.
d. Notwithstanding any provision of this Contract Documents to the contrary, the Contractor hereby notifies the Owner that the following features of the Submittal MAY NOT BE IN CONFORMANCE with Contract Document requirements, but nevertheless asks approval thereof. (Contractor shall include brief, specific description of each potential nonconformity. If NONE, Contractor shall so state.)

- 1.
2.
3.
4.

Check if additional page(s) of potential nonconformity are attached.

Signed Contractor's Authorized Representative Date

Note: Contractors are required to copy and use this form as a cover sheet accompanying all submittals, as described in the General Conditions of the Contract Documents. All pages of submittals are to be consecutively numbered, with a front index page listing the total sequence of pages included.

This form can be made available in accessible formats to qualified individuals with disabilities upon request.





The use of any subcontractors for this project must have prior approval by the Owner.

**Request for Subcontractor Approval**

Contractor Name		Project Title
Street Address	PO Box	Location
City	State	ZIP + 4
Contact Person	Phone Number	Owner's Project Representative
Prime Contractor Business Certification <input type="checkbox"/> MBE* <input type="checkbox"/> DVB*		Contract Amount \$

Revised Form \_\_\_\_\_

**No Subcontractors will be used on this project**

Subcontractor Name / Phone Contact Person / Email	City, State	Type of Work/Service	Estimated Contract Amount	MBE*	DVB*
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>

\* MBE Minority Business Enterprise / DVB Disabled Veteran-Owned Business

Additional Pages Attached

Prepared By:

\_\_\_\_\_  
Signature                      Date (mm/dd/ccyy)

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title





PERFORMANCE BOND (100%)

This Surety Bond instrument is hereby executed to guarantee performance of a proposed contract between the herein named Principal and the State, dated \_\_\_\_\_, 20\_\_, a copy of which is hereto attached and made a part hereof, herein called "Contract," for the construction of

Project Title \_\_\_\_\_

Project Location \_\_\_\_\_

Project Number \_\_\_\_\_ Contract For \_\_\_\_\_ work.
All, General, HVAC, Roofing, Etc.

KNOW ALL PEOPLE BY THESE PRESENTS That \_\_\_\_\_
Name of Contractor

of \_\_\_\_\_ as contractor, herein called "Principal", and \_\_\_\_\_
City and State Name of Surety

\_\_\_\_\_ of \_\_\_\_\_ as Surety, herein called
City and State

"Surety", are held firmly bound to the Board of Regents of the University of Wisconsin System herein called "the Owner", in the amount of \$\_\_\_\_\_ for the faithful performance of the Contract as hereinafter set forth. For the payment of which, well and truly to be made, we bind ourselves, our heirs, successors, executors, and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the said bounded Principal shall promptly and faithfully perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of the Contract, in all respects, and within the time prescribed in the Contract (or as such time may be extended as provided in the Contract), and shall indemnify and save harmless the Owner, its officers, employees and agents against any direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the Contract by Principal or its subcontractors, and shall in all respects perform the Contract according to law, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

FURTHER, that no final settlement between the Owner and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

FURTHER, that no change, extension of time, alteration or addition to the work to be performed, or amount of, the Contract shall in any way affect Principal's or Surety's obligations on this bond, and Surety does hereby waive notice of any change, extension of time, alterations or additions thereunder.

PROVIDED, FURTHER, that the undersigned states that pursuant to express authority the corporate seal affixed to this instrument is the seal of this surety company, that the seal was affixed and this instrument was executed for and on behalf of this surety company; that authority has not been revoked by this surety company; that this instrument was executed as the free act and deed of this surety company; that the certificate of authority from the Commissioner of Insurance showing authority of this surety company to transact business in the State of Wisconsin has been obtained and will be provided to the Owner upon request; and further, that this surety bond was written through an agent duly licensed as such on the date thereof.



IN WITNESS WHEREOF, this instrument is executed this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_

FOR THE PRINCIPAL

By \_\_\_\_\_  
Corporate Secretary Signature  
(Seal)

\_\_\_\_\_  
President, Partner or Individual Signature

Witnessed by \_\_\_\_\_

Witnessed by \_\_\_\_\_

Two witnesses must attest above signatures.

FOR THE SURETY

By \_\_\_\_\_  
\*Corporate Secretary Signature  
(Seal)

\_\_\_\_\_  
Attorney in Fact or Authorized Officer

\_\_\_\_\_  
Street or PO Box

\_\_\_\_\_  
City, State and Zip Code

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Email Address

(This email address will be used to notify Surety of Project Start Date)

ACKNOWLEDGEMENT

STATE OF \_\_\_\_\_ )

) ss

COUNTY OF \_\_\_\_\_ )

I, \_\_\_\_\_, a Notary Public of said County and State, do hereby certify that \_\_\_\_\_

\_\_\_\_\_, Attorney-in-Fact or authorized officer of \_\_\_\_\_,  
Name of Surety

who is personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he/she signed, sealed and delivered said instrument for and on behalf of \_\_\_\_\_, for the uses and purposes therein set forth.  
Name of Surety

Given under my hand and notarial seal at my office at \_\_\_\_\_, \_\_\_\_\_, in said county,  
City State

this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, A.D.

\_\_\_\_\_  
Notary Public

My commission expires \_\_\_\_\_

This Performance Bond is

APPROVED

\_\_\_\_\_  
University of Wisconsin System

\* If signatory is a corporation, Secretary of corporation shall attest, otherwise leave blank.



PAYMENT BOND (100%)

This Surety Bond instrument is hereby executed to guarantee payment of certain amounts related to a proposed contract between the herein named Principal and the State, dated \_\_\_\_\_, 20\_\_, a copy of which is hereto attached and made a part hereof, hereinafter called "Contract," for the construction of

Project Title \_\_\_\_\_

Project Location \_\_\_\_\_

Project Number \_\_\_\_\_ Contract For \_\_\_\_\_ work.
All, General, HVAC, Roofing, Etc.

KNOW ALL PEOPLE BY THESE PRESENTS That \_\_\_\_\_
Name of Contractor

of \_\_\_\_\_ as contractor, herein called "Principal", and \_\_\_\_\_
City and State Name of Surety

\_\_\_\_\_ of \_\_\_\_\_ as Surety, herein called
City and State

"Surety", are held firmly bound to the Board of Regents of the University of Wisconsin System herein called "the Owner", in the amount of \$ \_\_\_\_\_ for the payment of all claims, costs, charges and other amounts arising in connection with, or related to, the Contract as hereinafter set forth. For the payment of which, well and truly to be made, we bind ourselves, our heirs, successors, executors, and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the said bounded Principal shall promptly make payment pursuant to Section 779.14 of the Wisconsin Statutes to all persons who supply labor and material to said project in the prosecution of the work arising in connection with, or related to, the Contract, and shall pay all other just debts, dues and demands incurred in the performance of the Contract, and shall indemnify and save harmless the Owner, its officers, employees and agents against any direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered as the result of Principal's failure to pay any amounts in connection with, or related to, the Contract, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

FURTHER, labor performed and materials furnished, used or consumed in making the public improvement or performing the public work, include, without limitation because of enumeration, fuel, lumber, building materials, machinery, vehicles, tractors, equipment, fixtures, apparatus, tools, appliances, supplies, electric energy, gasoline, motor oil, lubricating oil, greases, state imposed taxes, premiums for worker's compensation insurance and contributions for unemployment compensation.

FURTHER, that no final settlement between the Owner and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

FURTHER, that no change, extension of time, alteration or addition to the work to be performed, or amount of, the Contract shall in any way affect Principal's or Surety's obligations on this bond, and Surety does hereby waive notice of any change, extension of time, alterations or additions thereunder.

PROVIDED, FURTHER, that the undersigned states that pursuant to express authority the corporate seal affixed to this instrument is the seal of this surety company, that the seal was affixed and this instrument was executed for and on behalf of this surety company; that authority has not been revoked by this surety company; that this instrument was executed as the free act and deed of this surety company; that the certificate of authority from the Commissioner of Insurance showing authority of this surety company to transact business in the State of Wisconsin has been obtained and will be provided to the Owner upon request; and further, that this surety bond was written through an agent duly licensed as such on the date thereof.

IN WITNESS WHEREOF, this instrument is executed this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

FOR THE PRINCIPAL

By \_\_\_\_\_  
Corporate Secretary Signature

(Seal)

\_\_\_\_\_  
President, Partner or Individual Signature

Witnessed by \_\_\_\_\_

Witnessed by \_\_\_\_\_

Two witnesses must attest above signatures.

FOR THE SURETY

By \_\_\_\_\_  
\*Corporate Secretary Signature

(Seal)

\_\_\_\_\_  
Attorney in Fact or Authorized Officer

\_\_\_\_\_  
Street or PO Box

\_\_\_\_\_  
City, State and Zip Code

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Email Address

(This email address will be used to notify Surety of Project Start Date)

ACKNOWLEDGEMENT

STATE OF \_\_\_\_\_ )

) ss

COUNTY OF \_\_\_\_\_ )

I, \_\_\_\_\_, a Notary Public of said County and State, do hereby certify that \_\_\_\_\_

\_\_\_\_\_, Attorney-in-Fact or authorized officer of \_\_\_\_\_,  
Name of Surety

who is personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he/she signed, sealed and delivered said instrument for and on behalf of \_\_\_\_\_, for the uses and purposes therein set forth.  
Name of Surety

Given under my hand and notarial seal at my office at \_\_\_\_\_, \_\_\_\_\_, in said county,  
City State

this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, A.D.

\_\_\_\_\_  
Notary Public

My commission expires \_\_\_\_\_

This Payment Bond is

APPROVED

\_\_\_\_\_  
University of Wisconsin System

\* If signatory is a corporation, Secretary of corporation shall attest, otherwise leave blank.



# AIA® Document A101® – 2017

## Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

**AGREEMENT** made as of the    day of    in the year  
*(In words, indicate day, month and year.)*

**BETWEEN** the Owner:  
*(Name, legal status, address and other information)*

Board of Regents of the University of Wisconsin System  
c/o UW System Administration - CPB  
780 Regent Street, Suite 239, Madison, WI 53715

and the Contractor:  
*(Name, legal status, address and other information)*

for the following Project:  
*(Name, location and detailed description)*

project  
project number(s)

The Architect:  
*(Name, legal status, address and other information)*

The Owner and Contractor agree as follows.

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.

/

## TABLE OF ARTICLES

1	THE CONTRACT DOCUMENTS
2	THE WORK OF THIS CONTRACT
3	DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4	CONTRACT SUM
5	PAYMENTS
6	DISPUTE RESOLUTION
7	TERMINATION OR SUSPENSION
8	MISCELLANEOUS PROVISIONS
9	ENUMERATION OF CONTRACT DOCUMENTS

### EXHIBIT A INSURANCE

#### ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement and Exhibits thereto, AIA Document A201™-2017, General Conditions of the Contract for Construction, as modified and dated 11/9/2022 ("General Conditions"), any other Conditions of the Contract (Supplementary and other Conditions), Invitation to Bid the Project ("Invitation to Bid"), Bid Documents, the Contractor's bid or proposal, Drawings, Specifications, Addenda, any changes in the Work approved by the Owner and Contractor issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications, as defined in the General Conditions, issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract Documents represent the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. Notwithstanding anything herein to the contrary, any and all terms or conditions contained in the Contractor's bid, proposal or response to the Invitation to Bid that were not explicitly solicited by the Owner in the Invitation to Bid is not included as part of the Contract Documents. .

#### ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

#### ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of Mobilization for the Work shall be:

*(Check one of the following boxes.)*

- The date of this Agreement.
- A date set forth in a Notice to Proceed issued by the Owner.
- Established as follows:  
*(Insert a date or a means to determine the date of commencement of the Work.)*

*(Paragraph deleted)*

The date of commencement of the Work shall be the date of this Agreement, and Mobilization shall be set in the Notice to Proceed.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

#### § 3.3 Substantial Completion

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User Notes:

(1716809587)

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

*(Paragraph deleted)*

[ X ] By the date set forth in the Notice to Proceed.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

**Portion of Work**

**Substantial Completion Date**

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

**ARTICLE 4 CONTRACT SUM**

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor’s performance of the Contract. The Contract Sum shall be (\$ ), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Intentionally deleted.

*(Table deleted)*

*(Paragraphs deleted)*

*(Table deleted)*

*(Paragraph deleted)*

§ 4.3 Allowances, if any, included in the Contract Sum:

*(Identify each allowance.)*

**Item**

**Price**

If applicable, see Drawings and Specifications for Allowances.

§ 4.4 Unit prices, if any:

*(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)*

**Item**

**Units and Limitations**

**Price per Unit (\$0.00)**

If applicable, see Completed Bid Form for unit prices.

§ 4.5 Liquidated damages, if any:

*(Insert terms and conditions for liquidated damages, if any.)*

None.

§ 4.6 Other:

*(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)*

None.

**ARTICLE 5 PAYMENTS**

**§ 5.1 Progress Payments**

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

Init.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month.

§ 5.1.3 *Intentionally deleted.*

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with the General Conditions, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, properly stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of the General Conditions;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of the General Conditions; and
- .5 Retainage withheld pursuant to Section 5.1.7.

### § 5.1.7 Retainage

§ 5.1.7.1 For

*(Paragraphs deleted)*

retainage details, see the General Conditions.

*(Paragraphs deleted)*

### § 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of the General Conditions, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

Not applicable.

### § 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

12 % per annum or as dictated by state statute.

**ARTICLE 6 DISPUTE RESOLUTION**

**§ 6.1 Initial Decision Maker**

The Initial Decision Maker pursuant to Article 15 of the General Conditions, shall be:

**Alexandria Roe, Senior Associate Vice President  
University of Wisconsin System Administration  
780 Regent Street, CPB, Suite 239  
Madison, WI 53715**

*(Paragraphs deleted)*

**ARTICLE 7 TERMINATION OR SUSPENSION**

**§ 7.1** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of the General Conditions.

**§ 7.1.1** If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of the General Conditions, then the Owner shall pay the Contractor a termination fee as follows:

*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)*

None.

**§ 7.2** The Work may be suspended by the Owner as provided in Article 14 of the General Conditions.

**ARTICLE 8 MISCELLANEOUS PROVISIONS**

**§ 8.1** Where reference is made in this Agreement to a provision of the General Conditions or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

**§ 8.2** The Owner’s Representative:  
*(Name, address, email address, and other information)*

**§ 8.3** The Contractor’s representative:  
*(Name, address, email address, and other information)*

**§ 8.4** The Contractor’s representative shall not be changed without ten days’ prior notice to the other party.

**§ 8.5 Insurance and Bonds**

**§ 8.5.1** The Owner and the Contractor shall carry and maintain insurance as set forth in Exhibit A attached hereto.

**§ 8.5.2** The Contractor shall provide bonds as set forth in the bid documents and the General Conditions.

**§ 8.6**

Init.



*(Paragraphs deleted)*  
Intentionally deleted.

**§ 8.7** Other provisions:

None.

This Agreement entered into as of the day and year first written above. The persons signing below represent they have been duly authorized by their respective organizations to sign on behalf of their organization for this Agreement.

\_\_\_\_\_  
**OWNER** *(Signature)*

\_\_\_\_\_  
*(Printed name)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Date)*

*(Paragraphs deleted)*

\_\_\_\_\_  
**CONTRACTOR** *(Signature)*

\_\_\_\_\_  
*(Printed name)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Date)*

# Additions and Deletions Report for AIA® Document A101® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 10:50:41 CT on 05/23/2024.

## PAGE 1

Board of Regents of the University of Wisconsin System  
c/o UW System Administration - CPB  
780 Regent Street, Suite 239, Madison, WI 53715

...

project  
project number(s)  
**PAGE 2**

## **EXHIBIT A ~~INSURANCE AND BONDS~~**

...

The Contract Documents consist of this ~~Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda~~ Agreement and Exhibits thereto, AIA Document A201™-2017, General Conditions of the Contract for Construction, as modified and dated 11/9/2022 ("General Conditions"), any other Conditions of the Contract (Supplementary and other Conditions), Invitation to Bid the Project ("Invitation to Bid"), Bid Documents, the Contractor's bid or proposal, Drawings, Specifications, Addenda, any changes in the Work approved by the Owner and Contractor issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications ~~Modifications, as defined in the General Conditions, issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents Documents represent~~ the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. ~~An enumeration of the Contract Documents, other than a Modification, appears in Article 9. Notwithstanding anything herein to the contrary, any and all terms or conditions contained in the Contractor's bid, proposal or response to the Invitation to Bid that were not explicitly solicited by the Owner in the Invitation to Bid is not included as part of the Contract Documents. .~~

...

§ 3.1 The date of ~~commencement of~~ Mobilization for the Work shall be:

...

A date set forth in a ~~notice to proceed~~ Notice to Proceed issued by the Owner.

...

~~If the date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.~~ shall be the date of this Agreement, and Mobilization shall be set in the Notice to Proceed.

(Check one of the following boxes and complete the necessary information.)

[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[ - ] By the following date: X ] By the date set forth in the Notice to Proceed.

...

§ 4.2 Alternates Intentionally deleted.

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
------	-------

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
------	-------	---------------------------

...

If applicable, see Drawings and Specifications for Allowances.

...

If applicable, see Completed Bid Form for unit prices.

...

None.

...

None.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar ~~month ending on the last day of the month,~~ or as follows:

month.

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the ~~day~~ of a month, the Owner shall make payment of the amount certified to the Contractor not later than the ~~day~~ of the ~~month~~. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment. (Federal, state or local laws may require payment within a certain period of time.) Intentionally deleted.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to

substantiate its accuracy, as the Architect may require. ~~This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.~~

...

§ 5.1.6 In accordance with ~~AIA Document A201™ 2017, General Conditions of the Contract for Construction, the General Conditions,~~ and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

...

- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and ~~suitably~~ stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, ~~suitably properly~~ stored off the site at a location agreed upon in writing; and

...

- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of ~~AIA Document A201 2017; the General Conditions;~~

...

- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of ~~AIA Document A201 2017; the General Conditions;~~ and

...

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, ~~the Owner may withhold the following amount, as retainage, from the payment otherwise due:~~  
*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*

retainage details, see the General Conditions.

§ 5.1.7.1.1 The following items are not subject to retainage:

*(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)*

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

*(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)*

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

*(Insert any other conditions for release of retainage upon Substantial Completion.)*

~~§ 5.1.8~~ If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201-2017.

~~§ 5.1.9~~ Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

...

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201-2017, the General Conditions, and to satisfy other requirements, if any, which extend beyond final payment; and

...

Not applicable.

...

(Insert rate of interest agreed upon, if any.)

~~—%—12 % per annum or as dictated by state statute.~~

PAGE 5

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201-2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker. the General Conditions, shall be:

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

**Alexandria Roe, Senior Associate Vice President**  
**University of Wisconsin System Administration**  
**780 Regent Street, CPB, Suite 239**  
**Madison, WI 53715**

...

### **§ 6.2 Binding Dispute Resolution**

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201-2017, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box.)*

Arbitration pursuant to Section 15.4 of AIA Document A201-2017

Litigation in a court of competent jurisdiction

Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

**§ 7.1** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201-2017, the General Conditions.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of ~~AIA Document A201-2017, the General Conditions~~, then the Owner shall pay the Contractor a termination fee as follows:

...

None.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of ~~AIA Document A201-2017, the General Conditions~~.

...

§ 8.1 Where reference is made in this Agreement to a provision of ~~AIA Document A201-2017, the General Conditions~~ or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's ~~representative~~: Representative:

...

§ 8.4 ~~Neither the Owner's nor the~~ The Contractor's representative shall not be changed without ten days' prior notice to the other party.

...

§ 8.5.1 The Owner and the Contractor shall ~~purchase~~ carry and maintain insurance as set forth in ~~AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.~~ Exhibit A attached hereto.

§ 8.5.2 The Contractor shall provide bonds as set forth in ~~AIA Document A101™-2017 Exhibit A, and elsewhere in the Contract Documents.~~ the bid documents and the General Conditions.

§ 8.6 Notice ~~in electronic format, pursuant to Article 1 of AIA Document A201-2017, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:~~

*(If other than in accordance with AIA Document E203-2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)*

Intentionally deleted.

**PAGE 6**

None.

This Agreement entered into as of the day and year first written above. The persons signing below represent they have been duly authorized by their respective organizations to sign on behalf of their organization for this Agreement.

\_\_\_\_\_  
OWNER (Signature)

\_\_\_\_\_  
CONTRACTOR (Signature)

\_\_\_\_\_  
*(Printed name)*

\_\_\_\_\_  
*(Printed name)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Date)*

\_\_\_\_\_  
*(Date)*

**Number**

**Title**

**Date**

**ARTICLE 9 — ENUMERATION OF CONTRACT DOCUMENTS**

**§ 9.1** This Agreement is comprised of the following documents:

- ~~.1~~ AIA Document A101™ 2017, Standard Form of Agreement Between Owner and Contractor
- ~~.2~~ AIA Document A101™ 2017, Exhibit A, Insurance and Bonds
- ~~.3~~ AIA Document A201™ 2017, General Conditions of the Contract for Construction
- ~~.4~~ AIA Document E203™ 2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:  
*(Insert the date of the E203-2013 incorporated into this Agreement.)*

~~.5~~ Drawings

~~.6~~ Specifications

**Section**

**Title**

**Date**

**Pages**

~~.7~~ Addenda, if any:

**Number**

**Date**

**Pages**

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

~~.8~~ Other Exhibits:

*(Check all boxes that apply and include appropriate information identifying the exhibit where required.)*

AIA Document E204™ 2017, Sustainable Projects Exhibit, dated as indicated below:  
*(Insert the date of the E204-2017 incorporated into this Agreement.)*

The Sustainability Plan:

**Title**

**Date**

**Pages**

Supplementary and other Conditions of the Contract:

**Document**

**Title**

**Date**

**Pages**

~~.9~~ Other documents, if any, listed below:

*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)*

This Agreement entered into as of the day and year first written above.

\_\_\_\_\_  
**OWNER** *(Signature)*

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
**CONTRACTOR** *(Signature)*

\_\_\_\_\_  
*(Printed name and title)*



# **Certification of Document's Authenticity**

**AIA® Document D401™ – 2003**

I, Patrick Rebholz, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 10:50:41 CT on 05/23/2024 under Order No. 2114482720 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ – 2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, other than those additions and deletions shown in the associated Additions and Deletions Report.

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Dated)*



# AIA<sup>®</sup> Document A132™ – 2019 Exhibit A

## Insurance and Bonds

This Insurance Exhibit is part of the Agreement, between the Owner and the Contractor,

for the following **PROJECT**:  
*(Name and location or address)*

As stated in the A101.

**THE OWNER:**  
*(Name, legal status, and address)*

As stated in the A101.

**THE CONTRACTOR:**  
*(Name, legal status, and address)*

As stated in the A101.

### TABLE OF ARTICLES

- A.1 GENERAL**
- A.2 OWNER'S INSURANCE**
- A.3 CONTRACTOR'S INSURANCE**
- A.4 MUTUAL WAIVER OF SUBROGATION**
- A.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSSES**

### ARTICLE A.1 GENERAL

The Owner and Contractor shall carry and maintain insurance as set forth in this Exhibit.

### ARTICLE A.2 OWNER'S INSURANCE

#### § A.2.1 Builder's Risk Insurance

If the Contract Sum, exclusive of additions or deductions made after execution of the Agreement, is equal to or less than ten million dollars (\$10,000,000.00), then Owner shall, prior to commencement of the Work, purchase and maintain Builder's Risk insurance in the amount of, at least, the initial Contract sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis.

#### § A.2.1.1 Owner's Builder's Risk Sub-limits

If the Owner purchases Builder's risk insurance, the minimum allowable sub-limits, if any are as follows:

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A232™–2019, General Conditions of the Contract for Construction. Article 11 of A232™–2019 contains additional insurance provisions

<b>Causes of Loss</b>	<b>Sub-Limit</b>
Earthquake	Moderate Hazard Areas-\$2,500,00 Low Hazard Areas-\$5,000,000
Flood	Moderate Hazard Areas-\$2,500,00 Low Hazard Areas-\$5,000,000

If the Owner purchases Builder's risk insurance, the Coverage Sub-limits will be as follows:

<b>Coverage</b>	<b>Sub-Limit</b>
Loss of Use, Business Interruption, and Delay in Completion Insurance	\$500,000
Extra Expense Insurance	\$250,000
Soft Costs Insurance	\$100,000

**§ A.2.2 Offsite and Transit Property Insurance**

If Owner is required to purchase and maintain Builder's Risk insurance pursuant to Article A.2.1, then Owner shall also provide liability coverage for materials and/or Work stored off the Work site or in transit thereto. Owner may provide such insurance by procuring and maintaining Property Insurance, Builder's Risk, or through self-insurance. Such coverage shall not be less than \$500,000 in the aggregate for materials and/or Work stored off the Work site or in transit. Any property damage to such materials and/or Work in excess of such limit shall be Contractor's responsibility, and Contractor shall not look to Owner's Property Insurance or self-insurance coverage to cover such excess loss(es). The Owner's policy coverage is exclusive of materials or Work under the care, custody, and control of the manufacturer prior to delivery.

**§ A.2.3** Owner shall be responsible for any deductibles for all insurance required under Article A.2, provided, however, that in the event a claim arises as a result of Contractor's negligent acts or omissions or intentional misconduct, Contractor shall be responsible for paying the lesser of the deductible or \$25,000.00.

*(Paragraphs deleted)*

*(Table deleted)*

*(Paragraphs deleted)*

*(Table deleted)*

*(Paragraphs deleted)*

**§ A.2.4**

*(Paragraphs deleted)*

Except with respect to insurance that subcontractors are required to obtain and carry, Contractor shall be responsible for any deductibles for all insurance required under Article A.3, provided, however, that in the event a claim arises as a result of Owner's negligent acts or omissions or intentional misconduct, Owner shall be responsible for paying the lesser of the deductible or \$25,000.00.

*(Paragraphs deleted)*

**ARTICLE A.3 CONTRACTOR'S INSURANCE**

**§ A.3.1 General**

*(Paragraphs deleted)*

**§ A.3.1.1** The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in this Article A.3. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy. Owner shall also be an Additional Insured on Contractor's general liability, auto, umbrella liability, and contractor's pollution liability insurance policies. Furthermore, these policies shall also include a waiver of subrogation provision in favor of the owner.

**§ A.3.1.2** The Contractor shall not commence Work under this Contract until the Contractor has obtained all the insurance required hereunder. The insurance carrier(s) must be lawfully authorized to do business in the State of Wisconsin with a minimum A.M. Best rating of A-, X.

§ **A.3.1.3** Notice of Cancellation or Expiration of Contractor's Required Insurance: Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required hereunder, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage and shall not relieve the Contractor of consequences of Owner stopping work – Contractor shall bare all costs of such work stoppage.

§ **A.3.1.4** Proof of Insurance: The Contractor shall provide certificates of insurance to the Owner indicating coverage is in place at the limits set forth herein. The insurer(s) shall give the Owner thirty (30) day notice of cancellation or changes in coverage. The insurance certificate(s) shall be provided before commencement of the Work.

### § **A.3.2 Required Insurance Policies**

#### § **A.3.2.1**

*(Paragraphs deleted)*

#### **Worker's Compensation Insurance**

§ **A.3.2.1.1** The Contractor shall procure and maintain during the life of this Contract, and shall require all Subcontractors, to maintain, Worker's Compensation Insurance as required by State of Wisconsin Statutes and any applicable Federal Act coverage such as the Longshoremen's and Harbor Workers Act, the Jones Act or the Admiralty Act for all employees engaged in Work associated with the Project under this Contract.

§ **A.3.2.1.2** The Contractor shall procure and maintain during the life of this Contract, and shall require all Subcontractors, to maintain, Employer's Liability Insurance, with coverage amounts at least equal to that required in section **A.3.3.2**.

#### § **A.3.2.2 Commercial General Liability Insurance and Excess Liability-Umbrella**

##### § **A.3.2.2.1**

*(Paragraphs deleted)*

The Contractor shall procure and maintain during the life of this Contract, Commercial General Liability Insurance and Excess Liability-Umbrella coverage, with coverage amounts at least equal to that required in section A.3.2.1, including Products and Completed Operations for all claims that might occur in carrying out the Contract. Such coverage shall be of the "occurrence" type form.

##### § **A.3.2.2.2** The Contractor's Commercial General Liability

*(Paragraphs deleted)*

Insurance and Excess Liability Umbrella coverage shall apply to the provisions of indemnity obligations under Section 3.18 of the General

*(Paragraphs deleted)*

Conditions.-

§ **A.3.2.2.3** Commercial General Liability insurance carried under this Contract shall contain a provision making it primary and non-contributory to any other coverage available to the Owner.

§ **A.3.2.2.** The Contractor shall require Subcontractors to procure and maintain Commercial General Liability Insurance and Excess Liability-Umbrella coverage reasonable and commensurate of the work of the Subcontractor.

#### § **A.3.2.3 Auto Liability Insurance**

§ **A.3.2.3.1** The Contractor shall procure and maintain during the life of the Contract Commercial Automobile Liability Insurance for all owned, non-owned, and hired vehicles that are used in carrying out the Contract, with coverage amounts at least equal to that required in section A.3.3.2.

§ **A.3.2.3.2** Auto Liability carried under this Contract shall contain a provision making it primary and non-contributory to any other coverage available to the Owner.

§ A.3.2.3.3 The Contractor shall require each Subcontractor to procure and maintain Commercial Auto Liability Insurance, with coverage amounts at least equal to that required in section A.3.3.2.

§ A.3.2.4 Errors and Omissions Liability Insurance

Intentionally deleted.

§ A.3.2.5 Contractor's Pollution Insurance

The Contractor shall procure and maintain for a period not less than ten years after completion of the Project Contractor's Pollution Liability (CPL) with coverage amounts at least equal to that required in section A.3.3.2. Contractor shall annually provide evidence of CPL insurance coverage upon Owner's request.

§ A.3.2.6 Pollution Legal Liability Insurance

§ A.3.2.6.1 If the scope of services in this Contract requires the disposal of any hazardous or non-hazardous materials off the job site, the disposal site operator or abatement Contractor (or Subcontractor, as appropriate), upon request of the Owner, must furnish a certificate of insurance for Pollution Legal Liability (PLL) with coverage for:

- Bodily injury, sickness, disease, mental anguish or shock sustained by any person, including death;
- Property damage including physical injury to or destruction of tangible property including the resulting loss of use thereof, cleanup costs, and the loss of use of tangible property that has not been physically injured or destroyed;
- Defense costs including costs, charges, and expenses incurred in the investigation, adjustment or defense of claims for such compensatory damages; and
- Losses that arise from the insured facility that is accepting the waste under this Contract.

§ A.3.2.6.2 The Pollution Legal Liability policy must be written on a claims made form, and the "State of Wisconsin, its officers, employees and agents" must be included as an additional insured. Coverage amounts must be at least equal to that required in section A.3.3.2. Upon request of the Owner, Contractor must obtain a certificate of insurance for Pollution Legal Liability (PLL) from the disposal site and provide a copy thereof to Owner.

§ A.3.2.6.3 Coverage shall apply to sudden and non-sudden pollution conditions, including the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere or any watercourse or body of water, which results in bodily injury or property damage.

§ A.3.2.6.4 Cyber Risk Insurance- The Contractor shall purchase Cyber Risk Insurance for loss to the Owner due to data security and privacy breach including costs of investigating potential or actual breach of confidential or private information.

§ A.3.2.7 Builder's Risk Insurance

§ A.3.2.7.1 If the Contract Sum, exclusive of additions or deductions made after execution of the Agreement, exceeds ten million dollars (\$10,000,000.00), then Contractor shall, prior to commencement of the Work, purchase and maintain through the life of the Project Builder's Risk "all-risks" insurance in the amount of, at least, the initial Contract sum as well as subsequent modifications and labor performed and materials or equipment supplied by others thereto for the entire Work at the site on a replacement cost basis. The property insurance shall be maintained until Substantial Completion unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement.

§ A.3.2.7.2 Contractor's Builder's Risk policy shall provide coverage for direct physical loss or damage, and shall not exclude or sublimit risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, terrorism, water damage and equipment breakdown including but not limited to hot and cold testing. All limits must apply per occurrence and not be subject to annual or project term aggregates. The insurance shall also provide coverage for loss or damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Minimum allowable sub-limits, if any are as follows:

*(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

**Causes of Loss**

Earthquake  
Flood

**Sub-Limit**

The lesser of project contract value or \$75,000,000  
The lesser of project contract value or \$75,000,000

Init.

**§ A.3.2.7.3** In addition to providing coverage for direct physical loss or damage, Contractor's Builder's Risk policy shall provide coverage for loss or damage to false work and other temporary structures, materials stored off-site including with the manufacturer prior to delivery, materials in transit, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's, Construction Manager's, and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

*(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

Coverage	Sub-Limit
Loss of Use, Business Interruption, and Delay in Completion Insurance	\$1,000,000
Extra Expense Insurance	Internal determination
Civil Authority Insurance	60 days of coverage
Ingress/Egress Insurance	60 days of coverage
Soft Costs Insurance	\$7,500,000

**§ A.3.2.8 Deductibles and Self-Insured Retentions.** If the insurance required by Section §A.3.3.2. is subject to deductibles or self-insured retentions, the Contractor shall be responsible for all loss not covered because of such deductibles or retentions with the exception of coverages identified under §A.2 which will be the obligation of Owner.

**§ A.3.2.9 Occupancy or Use Prior to Substantial Completion.** The insurance required by Section §A.3 shall allow for occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion.

**§ A.3.2.10 Insurance for Existing Structures.** If the Work involves remodeling an existing structure or construction of an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the Work, "all-risks property insurance", on a replacement cost basis, protecting the existing structure against direct physical loss or damage, notwithstanding the undertaking of the Work.

*(Paragraphs deleted)*

**§ A.3.3 Minimum Coverage Limits**

**§ A.3.3.1**

*(Paragraphs deleted)*

The coverage limits provided in § A.3.3.2 are minimum required limits of coverage and may not represent the actual amounts necessary to protect the Contractor. Such minimum required limits shall not be construed in any way to limit the Contractor's liability to the Owner.

**§ A.3.3.2** The following minimum coverage limits shall apply to Contractor's insurance requirements:

TYPE	Limits
Commercial General Liability	\$1,000,000 Each Occurrence
	\$2,000,000 General Aggregate (applies per project)
	\$1,000,000 Products Aggregate
	\$1,000,000 Personal Injury
	\$50,000 Fire Damage
	\$5,000 Medical Expense Per Person
Automobile Liability	\$1,000,000 Combined Single Limit
Excess Liability Umbrella	\$5,000,000 Each Occurrence (Projects with contract values \$5M or less)
	\$10,000,000 Each Occurrence (projects with contract values \$5M-\$25M)

\$25,000,000 Each Occurrence (projects with contract values over \$25M)

**Worker's Compensation/Employers Liability Insurance**

1. State: Statutory to all states the work is being performed;
2. Federal: As Applicable;
3. All Employees, partners, individuals, any managers on project site must be included for coverage.

**TYPE**

Employers Liability  
Employers Liability Disease  
Employers Liability Disease

**Limits**

\$100,000 Each Accident  
\$100,000 Each Employee  
\$500,000 Policy Limit

**Professional Liability**

**Limits**

\$1,000,000 per Occurrence/Aggregate  
\$5,000,000 per Occurrence/Aggregate (for "unique" or "high risk" projects and/or those with contract values over \$10,000,000)

**Contractors Pollution Liability (CPL)**

**Limits**

\$1,000,000 per pollution event/aggregate (projects with contract values \$1M or less)

\$3,000,000 per pollution event/aggregate (projects with contract values \$1M-\$10M)

\$5,000,000 per pollution event/aggregate (projects with contract values over \$10M)

**Pollution Legal Liability (PLL)**

**Limits**

\$2,000,000 per loss, \$4,000,000 annual aggregate for disposal at non-hazardous treatment, storage and disposal facilities (TSDFs)

**Cyber Liability**

**Limits**

\$1,000,000

*(Paragraphs deleted)*

**ARTICLE A.4 MUTUAL WAIVER OF SUBROGATION**

§ A.4.1 The Owner and the Contractor waive all rights against each other and shall require their insurers to waive any rights of subrogation or recovery, for damages caused by fire or other perils to the extent covered by Builder's Risk insurance obtained pursuant to this Contract or other insurance applicable to the Work. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise; did not pay the insurance premium directly or indirectly; and whether or not the person or entity had an insurable interest in the person harmed or property damaged. This waiver shall be effective only to the extent any policy of insurance is not impaired thereby. This contract provision shall be incorporated into the contracts between the Contractor and Subcontractors.

§ A.4.2 Intentionally deleted.

**ARTICLE A.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSSES**

Prior to settlement of an insured loss, the insured party shall notify the other party of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The other party shall have 14 days from receipt

Init.

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User Notes:

(1819224951)

of notice to object to the proposed settlement or allocation of the proceeds. If the other party does not object, the insured party shall settle the loss and the other party shall be bound by the settlement and allocation. Upon receipt, the insured party shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the other party timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the insured party may proceed to settle the insured loss, and any dispute between the insured party and other party arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15 of the General Conditions. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

*(Paragraphs deleted)(Table deleted)*



# Additions and Deletions Report for AIA<sup>®</sup> Document A132™ – 2019 Exhibit A

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 10:32:39 CT on 11/09/2022.

## PAGE 1

This Insurance ~~and Bonds~~ Exhibit is part of the Agreement, between the Owner and the Contractor, ~~dated the~~ day of ~~in the year~~  
(In words, indicate day, month, and year.)

...

As stated in the A101.

...

As stated in the A101.

...

As stated in the A101.

...

### **A.3 ~~CONTRACTOR'S INSURANCE AND BONDS~~**

### **A.4 ~~SPECIAL TERMS AND CONDITIONS~~ MUTUAL WAIVER OF SUBROGATION**

### **A.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSSES**

...

The Owner and Contractor shall ~~purchase and maintain insurance, and provide bonds, carry and maintain insurance as~~ set forth in this Exhibit. ~~As used in this Exhibit, the term General Conditions refers to AIA Document A232™ 2019, General Conditions of the Contract for Construction.~~

...

#### **§ ~~A.2.1 General~~ Builder's Risk Insurance**

~~Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements. If the Contract Sum, exclusive of additions or deductions made after execution of the Agreement, is equal to or less than ten million dollars (\$10,000,000.00), then Owner shall, prior to commencement of the Work, purchase and maintain Builder's Risk insurance in the amount of, at least, the initial Contract sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis.~~

#### **§ A.2.1.1 Owner's Builder's Risk Sub-limits**

If the Owner purchases Builder's risk insurance, the minimum allowable sub-limits, if any are as follows:

<u>Causes of Loss</u>	<u>Sub-Limit</u>
<u>Earthquake</u>	<u>Moderate Hazard Areas-\$2,500,00</u> <u>Low Hazard Areas-\$5,000,000</u>
<u>Flood</u>	<u>Moderate Hazard Areas-\$2,500,00</u> <u>Low Hazard Areas-\$5,000,000</u>

If the Owner purchases Builder's risk insurance, the Coverage Sub-limits will be as follows:

<u>Coverage</u>	<u>Sub-Limit</u>
<u>Loss of Use, Business Interruption, and</u> <u>Delay in Completion Insurance</u>	<u>\$500,000</u>
<u>Extra Expense Insurance</u>	<u>\$250,000</u>
<u>Soft Costs Insurance</u>	<u>\$100,000</u>

### **§ A.2.2 Liability Insurance**Offsite and Transit Property Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance. If Owner is required to purchase and maintain Builder's Risk insurance pursuant to Article A.2.1, then Owner shall also provide liability coverage for materials and/or Work stored off the Work site or in transit thereto. Owner may provide such insurance by procuring and maintaining Property Insurance, Builder's Risk, or through self-insurance. Such coverage shall not be less than \$500,000 in the aggregate for materials and/or Work stored off the Work site or in transit. Any property damage to such materials and/or Work in excess of such limit shall be Contractor's responsibility, and Contractor shall not look to Owner's Property Insurance or self-insurance coverage to cover such excess loss(es). The Owner's policy coverage is exclusive of materials or Work under the care, custody, and control of the manufacturer prior to delivery.

**§ A.2.3 Required Property Insurance** Owner shall be responsible for any deductibles for all insurance required under Article A.2, provided, however, that in the event a claim arises as a result of Contractor's negligent acts or omissions or intentional misconduct, Contractor shall be responsible for paying the lesser of the deductible or \$25,000.00.

**§ A.2.3.1** Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

**§ A.2.3.1.1 Causes of Loss.** The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

*(Indicate below the cause of loss and any applicable sub-limit.)*

#### **Causes of Loss**

#### **Sub-Limit**

**§ A.2.3.1.2 Specific Required Coverages.** The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to false work and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's, Construction Manager's, and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

*(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

## Coverage

## Sub-Limit

~~§ A.2.3.1.3~~ Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

~~§ A.2.3.1.4 Deductibles and Self-Insured Retentions.~~ If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

~~§ A.2.3.2 Occupancy or Use Prior to Substantial Completion.~~ The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

### ~~§ A.2.3.3 Insurance for Existing Structures~~

~~If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.~~

### ~~§ A.2.4 Optional Extended Property Insurance.~~

~~The Owner shall purchase and maintain the insurance selected and described below.~~

~~(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)~~ Except with respect to insurance that subcontractors are required to obtain and carry, Contractor shall be responsible for any deductibles for all insurance required under Article A.3, provided, however, that in the event a claim arises as a result of Owner's negligent acts or omissions or intentional misconduct, Owner shall be responsible for paying the lesser of the deductible or \$25,000.00.

~~§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance,~~ to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

~~§ A.2.4.2 Ordinance or Law Insurance,~~ for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

~~§ A.2.4.3 Expediting Cost Insurance,~~ for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

~~§ A.2.4.4 Extra Expense Insurance,~~ to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

~~§ A.2.4.5 Civil Authority Insurance~~, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

~~§ A.2.4.6 Ingress/Egress Insurance~~, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

~~§ A.2.4.7 Soft Costs Insurance~~, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

~~§ A.2.5 Other Optional Insurance.~~

The Owner shall purchase and maintain the insurance selected below.

*(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)*

~~§ A.2.5.1 Cyber Security Insurance~~ for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information.  
*(Indicate applicable limits of coverage or other conditions in the fill point below.)*

~~§ A.2.5.2 Other Insurance~~  
*(List below any other insurance coverage to be provided by the Owner and any applicable limits.)*

Coverage

Limits

~~ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS~~

~~ARTICLE A.3 CONTRACTOR'S INSURANCE~~

~~§ A.3.1.1 Certificates of Insurance.~~ The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

~~§ A.3.1.2 Deductibles and Self-Insured Retentions.~~ The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

~~§ A.3.1.3 Additional Insured Obligations.~~ To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect and the Architect's consultants, and the Construction Manager and the Construction Manager's consultants, as additional insureds for claims caused in whole

or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, and the Construction Manager and the Construction Manager's consultants, CG 20 32 07 04.

§ A.3.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in this Article A.3. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy. Owner shall also be an Additional Insured on Contractor's general liability, auto, umbrella liability, and contractor's pollution liability insurance policies. Furthermore, these policies shall also include a waiver of subrogation provision in favor of the owner.

§ A.3.1.2 The Contractor shall not commence Work under this Contract until the Contractor has obtained all the insurance required hereunder. The insurance carrier(s) must be lawfully authorized to do business in the State of Wisconsin with a minimum A.M. Best rating of A-, X.

§ A.3.1.3 Notice of Cancellation or Expiration of Contractor's Required Insurance: Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required hereunder, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage and shall not relieve the Contractor of consequences of Owner stopping work – Contractor shall bare all costs of such work stoppage.

§ A.3.1.4 Proof of Insurance: The Contractor shall provide certificates of insurance to the Owner indicating coverage is in place at the limits set forth herein. The insurer(s) shall give the Owner thirty (30) day notice of cancellation or changes in coverage. The insurance certificate(s) shall be provided before commencement of the Work.

### § A.3.2 Contractor's Required Insurance Coverage**Required Insurance Policies**

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:  
*(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)*

### Worker's Compensation Insurance

§ A.3.2.1.1 The Contractor shall procure and maintain during the life of this Contract, and shall require all Subcontractors, to maintain, Worker's Compensation Insurance as required by State of Wisconsin Statutes and any applicable Federal Act coverage such as the Longshoremen's and Harbor Workers Act, the Jones Act or the Admiralty Act for all employees engaged in Work associated with the Project under this Contract.

§ A.3.2.1.2 The Contractor shall procure and maintain during the life of this Contract, and shall require all Subcontractors, to maintain, Employer's Liability Insurance, with coverage amounts at least equal to that required in section A.3.3.2.

### § A.3.2.2 Commercial General Liability**Commercial General Liability Insurance and Excess Liability-Umbrella**

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than (\$ ) each occurrence, (\$ ) general aggregate, and (\$ ) aggregate for products completed operations hazard, providing coverage for claims including

- ~~.1 — damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;~~
- ~~.2 — personal injury and advertising injury;~~
- ~~.3 — damages because of physical damage to or destruction of tangible property, including the loss of use of such property;~~
- ~~.4 — bodily injury or property damage arising out of completed operations; and~~
- .5 — the Contractor's indemnity obligations under Section 3.18 of the General Conditions. The Contractor shall procure and maintain during the life of this Contract, Commercial General Liability Insurance and Excess Liability-Umbrella coverage, with coverage amounts at least equal to that required in section A.3.2.1, including Products and Completed Operations for all claims that might occur in carrying out the Contract. Such coverage shall be of the "occurrence" type form.

~~§ A.3.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:~~

- ~~.1 — Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.~~
- ~~.2 — Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.~~
- ~~.3 — Claims for bodily injury other than to employees of the insured.~~
- ~~.4 — Claims for indemnity-Insurance and Excess Liability Umbrella coverage shall apply to the provisions of indemnity obligations under Section 3.18 of the General Conditions arising out of injury to employees of the insured.~~
- ~~.5 — Claims or loss excluded under a prior work endorsement or other similar exclusionary language.~~
- ~~.6 — Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.~~
- ~~.7 — Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.~~
- ~~.8 — Claims related to roofing, if the Work involves roofing.~~
- ~~.9 — Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.~~
- ~~.10 — Claims related to earth subsidence or movement, where the Work involves such hazards.~~
- ~~.11 — Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.~~  
~~Conditions.-~~

§ A.3.2.3 Commercial General Liability insurance carried under this Contract shall contain a provision making it primary and non-contributory to any other coverage available to the Owner.

§ A.3.2.2. The Contractor shall require Subcontractors to procure and maintain Commercial General Liability Insurance and Excess Liability-Umbrella coverage reasonable and commensurate of the work of the Subcontractor.

~~§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than (\$ ) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.~~

#### Auto Liability Insurance

§ A.3.2.3.1 The Contractor shall procure and maintain during the life of the Contract Commercial Automobile Liability Insurance for all owned, non-owned, and hired vehicles that are used in carrying out the Contract, with coverage amounts at least equal to that required in section A.3.3.2.

§ A.3.2.3.2 Auto Liability carried under this Contract shall contain a provision making it primary and non-contributory to any other coverage available to the Owner.

§ A.3.2.3.3 The Contractor shall require each Subcontractor to procure and maintain Commercial Auto Liability Insurance, with coverage amounts at least equal to that required in section A.3.3.2.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.  
**Errors and Omissions Liability Insurance**  
Intentionally deleted.

**§ A.3.2.5 Workers' Compensation at statutory limits.****Contractor's Pollution Insurance**

The Contractor shall procure and maintain for a period not less than ten years after completion of the Project Contractor's Pollution Liability (CPL) with coverage amounts at least equal to that required in section A.3.3.2. Contractor shall annually provide evidence of CPL insurance coverage upon Owner's request.

**§ A.3.2.6 Employers' Liability with policy limits not less than — (\$ ) each accident, — (\$ ) each employee, and — (\$ )-policy limit.**

**Pollution Legal Liability Insurance**

**§ A.3.2.6.1** If the scope of services in this Contract requires the disposal of any hazardous or non-hazardous materials off the job site, the disposal site operator or abatement Contractor (or Subcontractor, as appropriate), upon request of the Owner, must furnish a certificate of insurance for Pollution Legal Liability (PLL) with coverage for:

- Bodily injury, sickness, disease, mental anguish or shock sustained by any person, including death;
- Property damage including physical injury to or destruction of tangible property including the resulting loss of use thereof, cleanup costs, and the loss of use of tangible property that has not been physically injured or destroyed;
- Defense costs including costs, charges, and expenses incurred in the investigation, adjustment or defense of claims for such compensatory damages; and
- Losses that arise from the insured facility that is accepting the waste under this Contract.

**§ A.3.2.6.2** The Pollution Legal Liability policy must be written on a claims made form, and the "State of Wisconsin, its officers, employees and agents" must be included as an additional insured. Coverage amounts must be at least equal to that required in section A.3.3.2. Upon request of the Owner, Contractor must obtain a certificate of insurance for Pollution Legal Liability (PLL) from the disposal site and provide a copy thereof to Owner.

**§ A.3.2.6.3** Coverage shall apply to sudden and non-sudden pollution conditions, including the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere or any watercourse or body of water, which results in bodily injury or property damage.

**§ A.3.2.6.4** Cyber Risk Insurance- The Contractor shall purchase Cyber Risk Insurance for loss to the Owner due to data security and privacy breach including costs of investigating potential or actual breach of confidential or private information.

**§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks**

**Builder's Risk Insurance**

**§ A.3.2.7.1** If the Contract Sum, exclusive of additions or deductions made after execution of the Agreement, exceeds ten million dollars (\$10,000,000.00), then Contractor shall, prior to commencement of the Work, purchase and maintain through the life of the Project Builder's Risk "all-risks" insurance in the amount of, at least, the initial Contract sum as well as subsequent modifications and labor performed and materials or equipment supplied by others thereto for the entire Work at the site on a replacement cost basis. The property insurance shall be maintained until Substantial Completion unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement.

**§ A.3.2.7.2** Contractor's Builder's Risk policy shall provide coverage for direct physical loss or damage, and shall not exclude or sublimit risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, terrorism, water damage and equipment breakdown including but not limited to hot and cold testing. All limits must apply per occurrence and not be subject to annual or project term aggregates. The insurance shall also

provide coverage for loss or damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Minimum allowable sub-limits, if any are as follows:

*(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

<u>Causes of Loss</u>	<u>Sub-Limit</u>
<u>Earthquake</u>	<u>The lesser of project contract value or \$75,000,000</u>
<u>Flood</u>	<u>The lesser of project contract value or \$75,000,000</u>

**§ A.3.2.7.3** In addition to providing coverage for direct physical loss or damage, Contractor's Builder's Risk policy shall provide coverage for loss or damage to false work and other temporary structures, materials stored off-site including with the manufacturer prior to delivery, materials in transit, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's, Construction Manager's, and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

*(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

<u>Coverage</u>	<u>Sub-Limit</u>
<u>Loss of Use, Business Interruption, and Delay in Completion Insurance</u>	<u>\$1,000,000</u>
<u>Extra Expense Insurance</u>	<u>Internal determination</u>
<u>Civil Authority Insurance</u>	<u>60 days of coverage</u>
<u>Ingress/Egress Insurance</u>	<u>60 days of coverage</u>
<u>Soft Costs Insurance</u>	<u>\$7,500,000</u>

**§ A.3.2.8** If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate. **Deductibles and Self-Insured Retentions.** If the insurance required by Section §A.3.3.2. is subject to deductibles or self-insured retentions, the Contractor shall be responsible for all loss not covered because of such deductibles or retentions with the exception of coverages identified under §A.2 which will be the obligation of Owner.

**§ A.3.2.9** If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate. **Occupancy or Use Prior to Substantial Completion.** The insurance required by Section §A.3 shall allow for occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion.

**§ A.3.2.10** Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate. **Insurance for Existing Structures.** If the Work involves remodeling an existing structure or construction of an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the Work, "all-risks property insurance", on a replacement cost basis, protecting the existing structure against direct physical loss or damage, notwithstanding the undertaking of the Work.

**§ A.3.2.11** Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate.

**§ A.3.2.12** Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate.

### **§ A.3.3 Contractor's Other Insurance Coverage** Minimum Coverage Limits

**§ A.3.3.1** Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

*(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)*



The coverage limits provided in § A.3.3.2 are minimum required limits of coverage and may not represent the actual amounts necessary to protect the Contractor. Such minimum required limits shall not be construed in any way to limit the Contractor's liability to the Owner.

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1-folllowing minimum coverage limits shall apply to Contractor's insurance requirements:

<b>TYPE</b>	<b>Limits</b>
Commercial General Liability	\$1,000,000 Each Occurrence
	\$2,000,000 General Aggregate (applies per project)
	\$1,000,000 Products Aggregate
	\$1,000,000 Personal Injury
	\$50,000 Fire Damage
	\$5,000 Medical Expense Per Person
Automobile Liability	\$1,000,000 Combined Single Limit
Excess Liability Umbrella	\$5,000,000 Each Occurrence (Projects with contract values \$5M or less)
	\$10,000,000 Each Occurrence (projects with contract values \$5M-\$25M)
	\$25,000,000 Each Occurrence (projects with contract values over \$25M)

**Worker's Compensation/Employers Liability Insurance**

*(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)*

1. State: Statutory to all states the work is being performed;
2. Federal: As Applicable;
3. All Employees, partners, individuals, any managers on project site must be included for coverage.

<b>TYPE</b>	<b>Limits</b>
Employers Liability	\$100,000 Each Accident
Employers Liability Disease	\$100,000 Each Employee
Employers Liability Disease	\$500,000 Policy Limit
Professional Liability	<b>Limits</b>
	\$1,000,000 per Occurrence/Aggregate
	\$5,000,000 per Occurrence/Aggregate (for "unique" or "high risk" projects and/or those with contract values over \$10,000,000)
Contractors Pollution Liability (CPL)	<b>Limits</b>
	\$1,000,000 per pollution event/aggregate (projects with contract values \$1M or less)
	\$3,000,000 per pollution event/aggregate (projects with contract values \$1M-\$10M)
	\$5,000,000 per pollution event/aggregate (projects with contract values over \$10M)

Pollution Legal Liability (PLL)	<b>Limits</b>
	\$2,000,000 per loss, \$4,000,000 annual aggregate for disposal at non-hazardous treatment, storage and disposal facilities (TSDFs)

Cyber Liability	<b>Limits</b>
	\$1,000,000

~~[ ] § A.3.3.2.1 If there is only one Contractor performing the Work on the Project, property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:~~

~~(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)~~

~~[ ] § A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate, for Work within fifty (50) feet of railroad property.~~

~~[ ] § A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.~~

~~[ ] § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all risks" completed value form.~~

~~[ ] § A.3.3.2.5 Property insurance on an "all risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.~~

~~[ ] § A.3.3.2.6 Other Insurance  
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)~~

Coverage	Limits
----------	--------

~~§ A.3.4 Performance Bond and Payment Bond~~

~~The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:~~

~~(Specify type and penal sum of bonds.)~~

**ARTICLE A.4 MUTUAL WAIVER OF SUBROGATION**

§ A.4.1 The Owner and the Contractor waive all rights against each other and shall require their insurers to waive any rights of subrogation or recovery, for damages caused by fire or other perils to the extent covered by Builder's Risk insurance obtained pursuant to this Contract or other insurance applicable to the Work. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise; did not pay the insurance premium directly or indirectly; and whether or not the person or entity had an insurable interest in the person harmed or property damaged. This waiver shall be effective only to the extent any policy of insurance is not

impaired thereby. This contract provision shall be incorporated into the contracts between the Contractor and Subcontractors.

§ A.4.2 Intentionally deleted.

**ARTICLE A.5 ADJUSTMENT AND SETTLEMENT OF INSURED LOSSES**

Prior to settlement of an insured loss, the insured party shall notify the other party of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The other party shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the other party does not object, the insured party shall settle the loss and the other party shall be bound by the settlement and allocation. Upon receipt, the insured party shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the other party timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the insured party may proceed to settle the insured loss, and any dispute between the insured party and other party arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15 of the General Conditions. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

Type	Penal Sum (\$0.00)
Payment Bond	
Performance Bond	

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

**ARTICLE A.4 SPECIAL TERMS AND CONDITIONS**

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:





**Capital Planning & Budget**  
**UW-Managed Program**  
780 Regent Street, Suite 210  
Madison, WI 53715  
(608) 263-4409

November 9, 2022

To: All Contractors and Architects Bidding on and Contracted Directly with UWSA/BOR

Subject: Changes in the 11/9/2022 GC Contract from Previous Versions

This note summarizes the changes made to the currently used contracts, dated 11/9/2022, to the previous version dated 9/12/2022, 6/17/2022, and 6/30/21.

**B101 Summary of changes:**

1. Article 13, Changed A201 reference to the current version of the A201.

**A101 Summary of changes:**

1. Article 1, The Contract Documents. Updated to provide accurate enumeration of documents.
2. 5.2, Final Payment. Added language providing specificity regarding final payment.
3. Article 3, Clarified Work to begin on date of agreement, and only Mobilization set in the Notice to Proceed.
4. Article 6, Dispute Resolution. Revised language to make it consistent with A201 dispute resolution provisions.
5. Article 9, Enumeration of Contract Documents. Deleted this article in its entirety because it is now duplicative of language in Article 1.
6. Various minor technical modifications throughout the document.

**A201 Summary of changes:**

1. 1.1.1, The Contract Documents. Updated to provide further clarity regarding enumeration of documents.
2. 1.1.8, Initial Decision Maker. Revised to reflect that the Initial Decision Maker is the University of Wisconsin System Senior Associate Vice President.
3. 1.1.16, Owner's Representative. Changes related to Owner's Representative's authority to delegate responsibility.
4. 2.3.7, Information and Services Required of the Owner. Revisions regarding contractor responsibility to report discrepancies in information.
5. 3.1.1, The Contractor. Revisions intended to provide more concise definition of contractor.
6. 3.1.2, The Contractor. Revisions regarding contractor's standard of performance.
7. 3.2.4, Review of Contract Documents and Field Conditions by Contractor. Revisions regarding allocation of cost for construction activities involving errors in construction documents.
8. 3.3.3.9, Supervision and Construction Procedures. Deleted.
9. 3.5.1, Warranty. Revisions regarding warranty exclusivity.
10. 3.5.4, Warranty. Deleted.

11. 3.10.1, Contractor's Construction and Submittal Schedules. Revisions regarding contractor standard of performance.
12. 3.10.1.2, Change of contractor's Project Schedule publication from the Notice to Proceed, to the Contract award.
13. 5.2, Clarified the definition of "MEP" includes the separately bid sprinkler subcontractor, and references to these subcontractors.
14. 5.3.4, Subcontractor Relations. Clarifications regarding provisions contractor must include in subcontracts.
15. 7.1.2.1, deleted this previously added subsection as it duplicated language and terms clearly described elsewhere.
16. 7.1.4, Changes in the Work. Revisions regarding authorization for changes to work that increase contract sum or contract time.
17. 7.1.5, Broaden electronic signature acceptance to all contract documents.
18. 9.6.2, Progress Payments. Revisions regarding provisions contractor must include in subcontracts.
19. Article 11, Bonds. This section previously addressed insurance and bonds. All provisions regarding insurance have been moved to Exhibit A.
20. 14.1.3, Termination or Suspension of the Contract. Clarifying language on contractor remedies upon termination.
21. 14.2.1, Termination by the Owner for Cause. Clarifying language on what may trigger termination for cause.
22. 14.4.3, Termination by the Owner for Convenience. Clarifying language regarding reasonable costs incurred by reason of termination.
23. Article 15, Claims and Disputes. Various revisions clarifying and streamlining the contractor claims process.
24. Various minor technical modifications throughout the document.
25. Exhibit A, Insurance Requirements.
  - a. Moved all insurance provisions out of A201 and put them in a separate exhibit.
  - b. A.2.1; A.3.2.6, Builder's Risk Insurance. Specifies which party is responsible for carrying builder's risk insurance based on whether the Contract Sum exceeds \$10 million.
  - c. Clarifications around insurance requirements.



Board of Regents of the University of Wisconsin System  
c/o UW System Administration - CPB  
780 Regent Street, Suite 239  
Madison, WI 53715

**Corporate Resolution**

Name of Person Signing Contract

Adopted at Board of Directors meeting of \_\_\_\_\_, be it resolved that

\_\_\_\_\_

the \_\_\_\_\_, of the Corporation, be and is hereby authorized and empowered to execute contracts on behalf of the Corporation, and that this resolution shall continue in force and effect until modified or rescinded by subsequent of the Stockholders or of the Board of Directors of the Corporation.

Witnessed By:

\_\_\_\_\_

Print Name

\_\_\_\_\_

Signature

\_\_\_\_\_

Name of Office

\_\_\_\_\_

Name of Corporation

Subscribed to and sworn before me

This \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_

\_\_\_\_\_

Notary Public

My commission expires \_\_\_\_\_, 20\_\_\_\_\_







# AIA® Document A201® – 2017

## General Conditions of the Contract for Construction

for the following PROJECT:

General Conditions, dated 11/9/2022  
As stated in the A101 and B101 agreements for this project.

**THE OWNER:**

Board of Regents of the University of Wisconsin System  
c/o UW System Administration - CPB  
780 Regent Street, Suite 239, Madison, WI 53715

**THE ARCHITECT:**

*(Paragraph deleted)*  
Architect as defined in A101 and B101 agreements for this Project.

**TABLE OF ARTICLES**

- 1 GENERAL PROVISIONS
- 2 OWNER
- 3 CONTRACTOR
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- 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
- 7 CHANGES IN THE WORK
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- 9 PAYMENTS AND COMPLETION
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- 12 UNCOVERING AND CORRECTION OF WORK
- 13 MISCELLANEOUS PROVISIONS
- 14 TERMINATION OR SUSPENSION OF THE CONTRACT
- (Paragraphs deleted)*
- 15 CLAIMS AND DISPUTES

**ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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## **ARTICLE 1 GENERAL PROVISIONS**

### **§ 1.1 Basic Definitions**

#### **§ 1.1.1 The Contract Documents**

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, AIA Document A201™–2017, General Conditions of the Contract for Construction, as modified and dated 11/9/2022 ("General Conditions"), any other Conditions of the Contract (Supplementary and other Conditions), Invitation to Bid the Project ("Invitation to Bid"), the Contractor's bid or proposal, Drawings, Specifications, Addenda, any changes in the Work approved by the Owner and Contractor issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work (as defined in section 7.4) issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include instructions to bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, or portions of Addenda relating to bidding or proposal requirements. Moreover, notwithstanding anything herein to the contrary, any and all terms or conditions contained in the Contractor's bid, proposal or response to the Invitation to Bid that were not explicitly solicited by the Owner in the Invitation to Bid is not included as part of the Contract Documents.

#### **§ 1.1.2 The Contract**

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

**§ 1.1.2.1** The Owner and the Contractor hereby commit themselves to good faith negotiation, coordination, and cooperation to assure the timely completion of the Project.

#### **§ 1.1.3 The Work**

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### **§ 1.1.4 The Project**

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

#### **§ 1.1.5 The Drawings**

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location, dimensions, and character of the Work, generally including but not limited to plans, elevations, sections, details, schedules, and diagrams.

#### **§ 1.1.6 The Specifications**

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, forms, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### **§ 1.1.7 Instruments of Service**

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

#### **§ 1.1.8 Initial Decision Maker**

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in

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accordance with Section 15.2. At the Owner's sole discretion, the Initial Decision Maker may be replaced at any time, for any reason. If the Initial Decision Maker is replaced, Owner shall provide notice to Contractor.

**§ 1.1.9 Contractor**

See 3.1.1 for definition.

**§ 1.1.10 Intentionally blank**

**§ 1.1.11 Delay**

A Delay is an event that causes an increase in the duration of the Project, or that changes the sequence of the Work or individual Work activities, thereby preventing completion of the Project within the time period specified in the Contract Documents.

**§ 1.1.12 Equal**

Equal means material, equipment or methods proposed and warranted by the Contractor as being equivalent to essential attributes of the material, equipment or method specified in the Contract Documents, and approved by the Architect and Owner's Representative.

**§ 1.1.13 Notice To Proceed**

Notice to Proceed is a written notice provided by the Owner to the Contractor authorizing the Contractor to proceed with Mobilization for the Work on a date specified therein and establishing the date for Substantial Completion of the Work.

**§ 1.1.14 Owner**

The Owner is the Board of Regents of the University of Wisconsin System. The Board of Regents of the University of Wisconsin System exercises the powers and duties prescribed by Wis. Stat. § 16.855. The terms "Board," "Board of Regents," or "The Board of Regents" as used in this document also refer to the Owner.

**§ 1.1.15 Reserved**

**§ 1.1.16 Owner's Representative**

Owner's Representative is the person or persons delegated authority to act on behalf of the Owner. The Owner's Representative will be designated in writing. Owner reserves the right to change its designated Owner's Representative at any time for any reason. If the Owner's Representative is changed, notice shall be provided.

**§ 1.1.17 Project Schedule**

The Project Schedule is a graphic and written analysis of activity duration and sequencing, which is required for successful completion of the Project within the time period identified in the Contract Documents. The Project Schedule shall be in sufficient detail to permit meaningful analysis of work tasks, durations and critical path to Substantial Completion in the sole opinion of the Owner's Representative.

**§ 1.1.18 Shop Drawing**

See 3.12.1 for definition.

**§ 1.1.19 Subcontractor**

The Subcontractor means a person or firm who enters into a contract with the Contractor or a Subcontractor to perform a portion of the Work. Unless otherwise specifically provided, the term Subcontractor includes Subcontractors of all tiers, and is equivalent to Sub-subcontractor for all provisions of this Contract.

**§ 1.1.20 Submittal**

Submittals includes Shop Drawings, Product Data, Samples, etc. submitted by the Contractor to the Architect regarding some portion of the Work.

**§ 1.1.21 Substitution**

Substitution means the use of material or equipment not specified in the Contract Documents, but that the Contractor proposes and warrants as suitable for the use intended and conforms to all other physical, functional, and performance requirements of the Contract Documents.

### § 1.1.22 Surety

Surety is a person or entity licensed to do business in the State of Wisconsin, who provides separate performance bonds and payment bonds to a Contractor to indemnify the Owner against all damages suffered by failure of the Contractor to perform the Work and to pay all lawful claims of Subcontractors, Material Suppliers, and laborers.

## § 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work with the standard of quality established by the Contract Documents and within the allowable time period specified. The Contract Documents are complementary, with technical provisions set forth in the Specifications and complemented by the Drawings and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. The failure of the Contractor to account for all aspects of the Work in its bid shall not relieve the Contractor from performing the Work. To the extent any terms or conditions in any of the Contract Documents conflict with one another, the more stringent or better quality requirement, in the Owner's sole discretion, shall be controlling without any increase in the Contract Time or Contract Sum.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade, except for the provisions of the Single Prime Bid dictated by statute.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

### § 1.2.4 Conflicting Conditions

§ 1.2.4.1 The Architect shall take all reasonable steps, and care common for the profession in the area, to assure that the Contract Documents are as accurate as possible, and provide information which, in the opinion of the Architect, is necessary in preparing bids and constructing the Project. However, it is mutually understood that discrepancies or conflicts in the Contract Documents may be identified, in which case:

- .1 addenda take precedence over the Specifications;
- .2 the Specifications take precedence over the Drawings;
- .3 stated dimensions take precedence over scaled dimensions;
- .4 large-scale detail drawings take precedence over small-scale drawings; and
- .5 schedules take precedence over other data on the plans.

§ 1.2.4.2 Architect has the right for first interpretation of any ambiguity in the Contract Documents. Ambiguities in the Contract Documents will be resolved by the Owner if the Contractor and Architect cannot come to an agreement.

§ 1.2.4.3 Where the terms "A/E," "Architect/Engineer," "Architect," or "Engineer" are used in technical Sections of the Specifications, the Contractor shall understand that actions indicated to be accomplished by such named parties are actions which are solely the responsibility of the professional technical advisor and consultant to the Owner and such actions thus require final approval by the Owner.

§ 1.2.4.4 Periodically, the Architect may provide the Contractor additional instructions and drawings necessary to perform the Work. The Architect shall make a good faith effort to coordinate such instructions and drawings with the Contract Documents, preparing them so they can be reasonably interpreted as a part thereof. If such additional

instructions change the scope of Work, provisions of Article 7, Changes in the Work, shall be followed.

### **§ 1.3 Capitalization**

Terms capitalized in these General Conditions and Contract Documents include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

### **§ 1.4 Interpretation**

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### **§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service**

**§ 1.5.1** The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Drawings, Specifications, and other Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the reserved ownership rights. Any Drawings, Specifications, and other Instruments of Service for this Project shall become the property of Owner on completion and/or acceptance of the work, or upon any basis of termination of the Contract.

**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and, if necessary, the Architect's consultants.

### **§ 1.6 Notice**

**§ 1.6.1** Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission when there is reasonable evidence that the notice was read by the recipient.

**§ 1.6.2** Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

**§ 1.6.3** The Contractor's presentation to Owner's Representative, or mailing, of such notice to Owner's Representative is a condition precedent to any liability of the Owner for any actual or alleged breach of the Owner's contractual obligations hereunder. The Contractor's failure to give such written notice in the manner and time prescribed by the Contract Documents shall result in the waiver of any and all claims, demands and causes of action that the Contractor may have against the Owner arising from or in connection with the actual or alleged breach.

### **§ 1.7 Digital Data Use and Transmission**

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties may use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data. In lieu of separate agreed upon digital form protocols, or the AIA Document E203, industry accepted standards shall govern the digital communication of data, as approved by the Owner.

### **§ 1.8 Building Information Models Use and Reliance**

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees. If Building Information Model and AutoCAD protocols are not established with the preceding, protocols will default to State of Wisconsin Department of Administration protocols.

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**User Notes:**

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## ARTICLE 2 OWNER

### § 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing an Owner's Representative, who shall have express authority to bind the Owner with respect to matters requiring the Owner's approval or authorization, provided, however, that changes to the Contract Documents that modify the General Conditions, Contract cost, and/or Contract time shall only be executed by a person duly authorized with signatory authority by the Board of Regents of the University of Wisconsin System. Person(s) with signatory authority will be furnished upon request.

*(Paragraph deleted)*

§ 2.2 The Owner reserves the right to conduct a detailed audit of Contractor and Architect's documents, including, but not limited to: Change Orders and supporting documentation, Construction Change Directives and supporting documents, and any other documentation on the Project related to costs, timeline, and scope.

*(Paragraphs deleted)*

### § 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture or engineering, or an entity lawfully practicing architecture or engineering, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3.7 The Owner shall furnish surveys described in Section 2.3.4 and other information prepared by third parties for the Project to the extent the Owner deems necessary for the performance of the Contractor's services, and shall not withhold any reasonable information. The Owner makes no representations or warranties as to the accuracy and/or the completeness of the information it obtains from third parties and provides to the Contractor pursuant to this Section 2.3. In addition, the Owner may provide the Contractor access to the Owner's records, which may contain information about the site and adjacent land and improvements that was not collected specifically for the Project. The Owner makes no representations as to the relevance, accuracy or completeness of information made available to the Contractor from the Owner's records. Contractor shall notify Owner of any discrepancies or information which is lacking in the information provided by the Owner of which Contractor is aware or reasonably should be aware.

§ 2.3.8 The Contractor shall attend all pre-construction meetings, which will be scheduled by the Owner's Representative and Architect.

§ 2.3.9 The Owner's Representative or Architect will schedule progress meetings with the Contractor. At each such progress meeting, the parties will discuss the above-mentioned items, cooperate with others to assure successful completion of the Work, and help to quickly resolve problems which arise.

#### § 2.4 Owner's Right to Stop the Work

In the event that any of the Work in progress, or Work already completed by the Contractor, or Subcontractors, is determined by the Owner's Representative to be of substandard quality, defective, or otherwise in violation of requirements of the Contract Documents, or if the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails or refuses to carry out Work in accordance with the Contract Documents, the Owner may issue an order by written Notice to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4.1 The Contractor shall have ten (10) calendar days after the serving of such Notice within which to take corrective action or to make arrangements judged satisfactory by the Owner's Representative for the corrections to be made. If corrective actions or other arrangements are not judged satisfactory by the Owner's Representative, the Owner may terminate the Contract in accordance with the provisions of the General Conditions of the Contract.

§ 2.4.1.1 If, after suspension of the Work, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the suspension or termination had been issued for the convenience of the Owner under the Contract.

§ 2.4.2 The Owner's Representative may order the Contractor, in writing, to suspend or delay all or any part of the Work of the Contractor for the period of time that the Owner's Representative determines appropriate for the convenience of the Owner.

§ 2.4.2.1 If the Contractor determines that the cost of the Work is altered by such suspension, or the time for completion of such Work is altered or delayed, the Contractor shall provide Notice to the Owner's Representative of any such costs or delay;

§ 2.4.2.2 Such Notice shall be made within ten (10) calendar days of the order to stop or suspend Work;

§ 2.4.2.3 Provision of such Notice to the Owner's Representative shall be a condition precedent to any Owner liability for increased costs, delay, or time extension.

§ 2.4.3 The Owner may exercise any and all rights or remedies provided for herein, by law or in equity, either concurrently or singly in its sole discretion.

#### § 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of Notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. The Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. Correction of such deficiencies shall not prevent the Owner from recovery of other damages or penalties sustained as a result of the Contractor's default or neglect. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

#### § 2.6 Owner's Responsibility For The Site

§ 2.6.1 Prior to start of construction, the Owner shall furnish land and rights-of-way necessary for the carrying out and completion of the Work to be performed under this Contract.

§ 2.6.2 Reserved.

§ 2.6.3 Reserved.

§ 2.6.4 The Owner's Representative shall act on any Notice as soon as practicable. If the Owner's Representative determines that the conditions reported by the Contractor differ materially from those indicated in the Contract Documents, or are of an unknown and unusual nature which could not have been discovered during a reasonable site investigation by the Contractor, then to the extent established by the Contractor and approved by the Owner, the Owner shall authorize an increase or decrease in the scope, cost, and/or time required for performing any part of the Work under this Contract.

§ 2.6.5 No request by the Contractor for an equitable adjustment to the Contract shall be allowed, unless the Contractor gives proper Notice, which is a condition precedent to any liability on the part of the Owner.

§ 2.6.6 In no event shall any claim by the Contractor for equitable adjustment to the Contract for differing site conditions be allowed if presented after final payment under this Contract is made.

### ARTICLE 3 CONTRACTOR

#### § 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement that has contracted with the Owner to perform the Work as required by the Contract Documents and enters into contracts with Subcontractors including mechanical, electrical, plumbing and fire protection subcontractors identified by the Owner during the Single Prime bidding process. The Contractor is referred to throughout the Contract Documents as if singular in number. The Contractor, and all Subcontractor and Sub-subcontractors shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative, but does not include the Owner or the Architect.

§ 3.1.1.1 The Contractor represents and warrants that the scheduling, coordination, and monitoring activity for all Work will be placed under the direct control and supervision of a person experienced in construction scheduling, means and methods. If such experience and knowledge must be obtained by contracting with a separate scheduling consultant, the entire cost of such consultant shall be borne by the Contractor. Additionally, the Contractor fully agrees to cooperate in all respects with all Subcontractors and suppliers to provide all data required, and shall coordinate the activities of its own workforces and the work forces of the Subcontractors, in such manner and at such time as to not cause a delay in the Project

§ 3.1.1.2 The Contractor's bid price shall include the performance of all Work which:

- .1 in accordance with industry standards, customary practice, or by reasonable inference are details of Work that are necessary as part of the construction, operation, and coordination and interface of the Work;
- .2 would necessarily be readily apparent to one skilled in the trades; and
- .3 a component an experienced Contractor would recognize as part of its responsibility.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents and in a good and workmanlike manner in accordance with generally accepted standards of construction of projects similar to the Project.

§ 3.1.2.1 The Contractor has the full and complete responsibility for the accomplishment of all Work within the specified time indicated in the Contract Documents, except where the Contract Documents explicitly and specifically place a limited duty for completion on the Owner.

§ 3.1.2.2 The Contractor is hereby put on notice that failure to furnish data or cooperate in good faith is a material breach of Contract and may be the basis for a termination for cause under the procedures set forth in these General Conditions. In the event of such material breach the Owner's Representative, in addition to, and not in lieu of the right to termination for default, may acquire the services of a scheduling specialist to perform any such duties and charge



the cost thereof to the Contractor. In the event that the Owner's Representative is required to acquire any replacement scheduling services, the Contractor shall conform to any revised schedule resulting therefrom.

§ 3.1.2.3 In addition to the criteria set forth in these General Conditions, the full and complete performance of Contractor's obligations under this Contract is a condition precedent to the right of the Contractor to payment of any sums due. In the event of any delays by the Contractor or other breach hereof which gives rise to penalties and/or damages to the Owner, then in any such event the Owner's Representative may offset such penalties and damages against the sums due or to become due the Contractor hereunder.

§ 3.1.2.4 Any Work necessary to be performed after regular working hours, on Sundays, or legal holidays, and for which the Contractor is responsible, shall be performed without additional expense to the Owner.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, the presence and observation of the Work by the Architect, the Owner, or Owner's Representative, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.1.3.1 In the event it becomes necessary to interpret this Article 3.1, the interpretation shall strive to achieve timely, effective and efficient performance of the Work under the Contract within the allowable time identified in the Contract Documents, and at no extra cost or inconvenience to any party, if at all possible.

## § 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.1.1 The Contractor represents and warrants it has taken the steps reasonably necessary to prepare a bid which includes the costs for Work, the requirement for which would reasonably be known to a competent contractor, in overcoming normal subsurface conditions at the site where the Work is to be performed and in order to accomplish the Work described in the Contract Documents. Additionally, the Contractor certifies that it has investigated the site and satisfied itself as to the general and local conditions which affect the Work or its cost, including, but not limited to:

- .1 conditions bearing upon transportation, disposal, handling, and storage of materials;
- .2 the availability of labor, water, electric power, and roads or access;
- .3 uncertainties of weather, river stages, tides, or similar physical conditions at the site;
- .4 the conformations and conditions of the ground; and
- .5 the character of facilities and equipment as represented by the Contract Documents.

§ 3.2.1.2 The Contractor also acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from a non-exploratory, visual inspection of the site, and information included in the Contract Documents.

§ 3.2.1.3 Any failure of the Contractor to take the actions described in the Contract Documents will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the Work, or for proceeding to successfully perform the Work without additional expense to the Owner.

§ 3.2.1.4 The Owner assumes no responsibility for any erroneous conclusions or interpretations made by the Contractor based on the information made available by the Owner. The Owner expects the Contractor to have the ability to interpret provided technical information, including geotechnical information, which would be reasonably analyzed or interpreted by any contractor knowledgeable and skilled in the work required to be performed. If the Contractor does not have the ability to interpret or analyze such information, it is the responsibility of the Contractor to obtain the professional services required to perform such analysis. The Owner assumes no responsibility for any understanding reached or representation made concerning conditions which can affect the Work by any of its officers, representatives, or agents before the execution of this Contract, unless that understanding or representation is expressly stated in the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect and Owner's Representative any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect or Owner may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Owner's Representative and Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Owner may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect or Owner's Representative issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities unless the Contractor recognized such error, inconsistency, omission or difference and failed to report it to the Architect. If the Contractor performs any construction activity involving an error, inconsistency, omission or difference in the Contract Documents that Contractor knowingly recognized or should have reasonably recognized without such notice to the Architect and Owner, the costs for correction will be allocated among the responsible parties.

### § 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall (1) give timely notice to the Owner's Representative and Architect; (2) shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.3.1 The Contractor shall, except where a provision of the Contract Documents explicitly states to the contrary, have the full, complete, and absolute responsibility and obligation for ensuring that the Work performed strictly conforms to the requirements set forth in the Contract Documents. The Contractor shall maintain an adequate inspection and quality control system and shall perform such inspections as will ensure that the Work performed under this Contract conforms to the requirements of the Contract Documents.

§ 3.3.3.2 At the initial pre-construction meeting, the Contractor shall provide the Owner's Representative a full description of the Contractor's safety, quality control and inspection system and method of implementation.

§ 3.3.3.3 Prior to the start of significant on-site work by any trade, Owner's Representative, the Contractor's superintendent and the Subcontractor's foremen, shall conduct a pre-installation conference. The purpose of the meeting is to review and discuss Contract requirements applicable to the work, samples required, level of quality necessary, and find answers to any questions that may arise. Such meeting is in addition to regularly-scheduled progress meetings and will be arranged on-site by Owner's Representative.

§ 3.3.3.4 The Contractor shall maintain complete inspection records and test data to ensure that quality of the Work is in strict compliance with the terms of the Contract Documents. These records shall be available to the Architect and Owner's Representative at all reasonable times and places. The doctrine of "substantial conformity" to the quality requirements of the Contract Documents shall have no application, unless the Owner's Representative accepts the Work in accordance with the Contract.

§ 3.3.3.5 The Owner reserves the right to conduct its own quality assurance verification, and to observe, inspect, and/or conduct tests relative to Contractor and Subcontractor performance. If, when conducting its own quality assurance program, the Owner determines that the Work or a portion thereof does not comply with requirements of the Contract Documents, the Owner shall attempt to notify the Contractor of such deficiencies as soon as practicable. However, the Owner's exercise of rights under this provision does not:

- .1 relieve the Contractor of the responsibility for providing adequate inspection and quality control measures or the proper documentation of the occurrence of the events required to be tested or monitored in the performance of the Work required by the Contract Documents; and shall provide no basis for waiver or estoppel claims to be asserted against the Owner;
- .2 relieve the Contractor of responsibility for damage to or loss of the material before acceptance;
- .3 constitute or imply acceptance on the part of the Owner; or
- .4 affect the continuing rights of the Owner after acceptance of the completed Work, except as specifically stated to the contrary in the Contract Documents.

§ 3.3.3.6 The presence or absence of the Owner's Representative does not relieve the Contractor from any Contract requirement. If the Contractor desires waiver of any technical or Contract requirement or any other deviation from the strict requirements of the Contract Documents, a specific request for such waiver or deviation must be made to the Owner's Representative and Architect for consideration.

§ 3.3.3.7 The Contractor shall, without charge, replace or correct Work found not to conform to the Contract Document requirements, unless the Owner agrees to accept the non-conforming Work with an appropriate adjustment in the Contract price thereof. Such acceptance of non-conforming Work shall, whether the determination is to be made at the time of final completion or during the performance of Work, be based upon a determination by the Owner that the deviation from Contract Documents requirements does not adversely affect the integrity of completed Work.

#### § 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work within the specified time, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. No materials or supplies which are to become part of the Work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage, conditional sale contract, or other agreement by which a security interest is retained by the seller.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.2.1 It is not the intention of the Owner to limit or restrict competition by the use of any reference to a particular manufacturer, process, technique, catalog number or other identifying information. Such proprietary specifications are intended to establish a level of quality or the minimum essential requirements to which the Contractor must conform, unless more explicit restrictions are stated to apply.

§ 3.4.2.2 When the Contract Documents list performance or functional characteristics in connection with Work to be performed, these characteristics are mandatory for reasons of design. Use of any Substitution shall be subject to the prior written approval of the Architect.

§ 3.4.2.3 Material, equipment, or processes offered for use as a Substitution may be proposed by the Contractor in writing. Such proposals shall guarantee the proposed Substitution to be capable of performing the duties of the originally specified material, equipment, or process. The Architect shall respond to any such proposal as soon as practicable, but in no case later than seven (7) calendar days after receipt of such proposal.

§ 3.4.2.4 It shall be the sole responsibility of the Contractor to provide all documentation, regardless of type or quantity, to clearly establish the qualifications of items proposed as Substitutions under this Contract. If the value of the Substitution is less than the item specified in the Contract Documents, then an equitable reduction of the price of the Contract shall be made.

§ 3.4.2.5 When Substitutions are approved by the Owner's Representative and incorporated into the Project by the Contractor, all costs incurred to 1) correct deficiencies in items, 2) provide for installation or hookup, or 3) to achieve performance specified in the Contract Documents, will be borne by the Contractor.

§ 3.4.2.6 Any substitute material or equipment installed by the Contractor without approval of the Owner's Representative may be subject to immediate removal, at sole discretion of Owner's Representative, and all costs required to conform to the Contract Documents shall be borne by the Contractor.

§ 3.4.2.7 The Contractor shall assume all liability and responsibility for any changes in the Work or additional Work required to accommodate use of proposed and approved Substitutions. The Owner's approval of such Substitutions does not relieve the Contractor from the obligation to pay all additional costs resulting from their inclusion in the Work, even if additional costs or Work become apparent after execution of the change or installation of the Substitution. The Contractor's liability shall include payment of any additional costs incurred by the Owner, made necessary by, or directly connected to, such changes.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

### § 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements, including Substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect or Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The Contractor's warranty under this Section is not exclusive, and any other express warranties stated elsewhere, may also be exercised by the Owner at its option.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.5.3 The Contractor warrants to the Owner that all materials and supplies used in the Work are free from all liens, claims, or encumbrances, and good title to materials and supplies is retained by the Contractor and shall be conveyed prior to approval of final payment.

§ 3.5.4 Intentionally deleted.

§ 3.5.5 Intentionally deleted.

§ 3.5.6 Intentionally deleted.

§ 3.5.7 The Contractor shall remedy, at the Contractor's expense, any defect in the Work. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to the Owner's property, whether controlled or owned, when the damage is the result of:

- .1 the Contractor's failure to conform to Contract Document requirements; or
- .2 any defect in equipment, material, workmanship, or design furnished by the Contractor or Subcontractors regardless of tier.

§ 3.5.8 Intentionally deleted.

§ 3.5.9 The Owner's Representative shall give Notice to the Contractor within a reasonable time after discovery of any failure, defect, or damage.

§ 3.5.10 If, after the receipt of a Notice of a claim under this warranty, the Contractor fails to remedy any failure, defect, or damage within a time judged reasonable by the Owner's Representative, the Owner's Representative shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage, at the Contractor's expense.

§ 3.5.11 All warranties under this Contract or in any related to this Contract, express or implied, shall be obtained for and shall be subject to direct enforcement by the Owner. The Contractor shall provide in each subcontract, or other purchase agreement, for the assignment to the Owner of all such warranties and for the right of enforcement by the Owner. In addition, if necessary the Contractor shall:

- .1 obtain for the Owner's benefit all warranties that would be given in normal commercial practice;
- .2 require all warranties to be executed, in writing, for the benefit of the Owner, if so directed by the Owner's Representative;
- .3 enforce all warranties for the benefit of the Owner; and
- .4 obtain for the Owner's benefit all warranties given by any Subcontractor, at any tier, if such warranty is in excess of the one (1) year warranty period set forth herein.

§ 3.5.12 Unless a defect is caused by the negligence of the Contractor or Subcontractors at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Owner.

§ 3.5.13 The Contractor shall require any Subcontractor manufacturers or suppliers to execute their warranties, in writing, directly to the Owner.

### § 3.6 Taxes

The Contractor shall pay all sales, consumer, use, and other similar taxes required by law assessed to or arising out of the construction of the Project. Per 2017 Wis. Stat. § 77.54 (9m), building materials sold to a construction contractor that will become a component of a facility owned by the Board of Regents of the University of Wisconsin System are exempt from sales and use tax.

### § 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded, and shall provide evidence of such permits, licenses, and approvals at the initial pre-construction meeting or before commencement of the Work.

§ 3.7.1.1 Charges for water, sewer, and other utility connections made by municipalities will be paid by the Owner. Payment for use of such services and utilities before Substantial Completion shall be in accordance with provisions of the Contract.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work and/or relating to

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environmental quality and safety, the performance of the Work, the protection of adjacent property, and the maintenance of passageways, guard fences, or other protective facilities. Such Work shall not be subject to the ordinances or regulations (except land use zoning) of the municipality in which the construction takes place, including ordinances or regulations relating to materials used, permits, supervision of construction or installation, payment of permit fees, or other restrictions of any nature whatsoever. The Owner's Representative shall be notified by the Contractor of any notices of noncompliance or violation associated with Work required by the Contract Documents.

§ 3.7.2.1 Where Contract Documents require abatement of asbestos containing materials, prior written notice to the State of Wisconsin, Department of Natural Resources is required. The Contractor shall provide evidence of such notice prior to commencement of the Work. The Contractor shall follow all State of Wisconsin and Federal rules associated with asbestos abatement.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

#### § 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

#### § 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection, except for Subcontractors selected in the single prime bidding process.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

### **§ 3.9 Superintendent**

**§ 3.9.1** The Contractor shall employ a competent superintendent and necessary assistants who shall be in continuous attendance at the Project site during performance of the Work, or as approved by Owner's Representative. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. This person shall be delegated authority to act on behalf of the Contractor, and shall be, to the extent possible, a single point of contact and communication for the Owner's Representative, Architect, and all Subcontractors to facilitate efficient, timely, and cost effective completion of the Work. Communications between the Architect and Contractor shall be timely relayed to the Owner's Representative.

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

**§ 3.9.3** The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

### **§ 3.10 Contractor's Construction and Submittal Schedules**

**§ 3.10.1** The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Work shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the Work. Any delays in Contractor's performance of the Work relative to the schedule shall be governed by Section 8.3 hereof.

**§ 3.10.1.1** The Project Schedule shall incorporate all activities, events, and milestones required for successful Project completion within the allowable time for completion specified in the Contract Documents. The Contractor shall prepare a breakdown of all Work activities or events, whether the activities are to be performed by the Contractor's own forces, those of Subcontractors or the Owner, indicating the proposed duration and sequencing of such activities for successful completion of the Project within the allowable time specified in the Contract Documents. No single Work activity in the Project Schedule shall be for more than \$500,000 in Contract value or for a duration greater than four (4) successive weeks, as approved by the Owner's Representative. The Contractor shall also identify whether any Work activity or event is dependent on the Work of its own forces or with those of the Owner. The failure to list any activity or to perform any other duty required by or incident to that required by the Contract Documents shall not be the basis of a claim for adjustment of any provision of this Contract, or of any other type of claim whatsoever.

**§ 3.10.1.2** The Contractor shall, within fourteen (14) calendar days from the Contract award, develop and publish a Project Schedule for the first sixty (60) calendar days of the Project. The completed Project Schedule, for all Work activities through Project completion, shall be developed and published within this sixty (60) day period. Pursuant to Wis. Stat. § 16.855 (14m)(d), the Contractor must base this Project Schedule on the schedule that the mechanical, electrical or plumbing Subcontractors and Contractors bid on (in the Specifications or bid instructions), unless otherwise agreed to by the Subcontractor. The Contractor shall update the Project Schedule monthly.

**§ 3.10.1.3** If the Contractor's Work depends upon construction or operations by the Owner, the Contractor shall, prior to proceeding with that portion of the Work, promptly give Notice to the Owner's Representative of any apparent deficiencies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acknowledgment that the Owner's completed or partially completed construction is fit and proper to receive the Work, except as to defects not then reasonably discoverable.

**§ 3.10.1.4** The Contractor shall identify forthwith any critical event which will require the Owner to act or to refrain from acting, or critical time periods within which the Owner must complete activities or Work for which the Owner is

responsible under the Contract. Timely Notice of any such identified event or time period shall be given to the Owner. The giving of such Notice is a condition precedent to the creation of any duty of the Owner to take any action or to refrain from taking any action. The failure of the Contractor to give such Notice forthwith shall thereafter bar and preclude any claim by the Contractor for adjustment of any Contract provision or claim predicated on the breach of any obligation by the Owner.

§ 3.10.1.5 The bonds furnished to secure these commitments shall be applicable to each and every one of these time and scheduling commitments.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current Submittal schedule, shall submit a Submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The Submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review Submittals. If the Contractor fails to submit a Submittal schedule, or fails to provide Submittals in accordance with the approved Submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of Submittals.

§ 3.10.2.1 If the Contractor submits for approval items which do not strictly comply with the design requirements of Contract Documents, the Contractor shall provide all engineering or design information necessary for complete evaluation of the Submittal by the Architect and Owner's Representative. If it is determined by the Contractor or the Owner's Representative that the services of a professional consultant, engineer or architect are required to provide such information, the Contractor shall acquire such services at its own expense.

§ 3.10.2.2 If the Contractor believes that requirements of the Contract Documents are in conflict with the manufacturer's recommended method of installation or application of specified materials, products, or systems, the Contractor shall indicate such possible conflicts at the time of submittal.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to and approved by the Owner and Architect.

§ 3.10.3.1 The Owner shall be given the opportunity to schedule its own Work as conveniently as is consistent with the overall needs of the Project Schedule.

§ 3.10.3.2 Where any Work activity required for completion of the Project is completed in less time than required, anticipated, or otherwise allowed by the Project Schedule, the unused time, hereinafter called Float, shall belong to the Project, to be used by the Contractor as the Project needs determine, including but not limited to providing additional time for completion of any other Work activities required for completion of the Project. Float shall not be considered owned, subject to the exclusive use, or management by any of the interested participants. No claim against the Owner or the Contractor shall be made by any party for the loss of Float time.

§ 3.10.3.3 The Contractor shall be independently responsible for resolving any time related matters with Subcontractors, suppliers, or others who may furnish supplies or services on the Project. No liability shall attach to the Owner, for the failure of any party to carry out the coordination and scheduling responsibilities which they have assumed under the Contract.

### § 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required Submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

### § 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.



§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples, such as mock-ups, that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar Submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require Submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational Submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action. The following provisions shall apply to all Submittals:

- .1 the Contractor notes the conspicuous nature of this article and agrees that these provisions are material provisions and are to be enforced, in the event of controversy, in such a manner as to place upon the Contractor the full, complete, and total responsibility for the Submittal's conformance with the requirements of this Contract, and suitability or usability of preliminary submissions by the Contractor, without regard to any the Owner action or failure to act.
- .2 all Submittals and supporting information shall be delivered to a party designated by the Owner, who shall act on any such Submittal within 14 calendar days or notify the Contractor in writing, of the time required for such action if greater than the aforementioned 14 day period. Such designation shall take place at the initial Project pre-construction meeting. Review of the Submittals for conformance with requirements of the Contract Documents shall be completed by the party responsible to the Owner for Project design. A copy of all such Submittal and transmittal forms shall also be sent to the Owner's Representative.
- .3 the Contractor shall make Submittals in a timely fashion to assure completion of the entire Project within the allowable time specified in the Contract Documents. The timing of such Submittals shall be subject to the provisions of the contract.
- .4 each Submittal by the Contractor shall contain the cover page included in the Specifications. Such cover page shall be signed by a representative of the Contractor responsible for review of the Submittal to assure compliance with requirements of the Contract Documents.
- .5 the Contractor timing and phasing of Submittals shall be appropriate to the critical path Project Schedule, and to facilitate the timely review by the Architect.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar Submittals required by the Contract Documents, in accordance with the Submittal schedule approved by the Architect or, in the absence of an approved Submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors. Submittals shall be provided in response to requests for Submittals by the Owner's Representative, or whenever required by the Contract Documents.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar Submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar Submittals, until the respective Submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved Submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar Submittals, unless the Contractor has specifically notified the Architect and Owner's Representative of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar Submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar Submittals, to revisions other than those requested by the Architect on previous Submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all Drawings, calculations, Specifications, certifications, Shop Drawings, and other Submittals prepared by such professional. Shop Drawings, and other Submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on Submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

### § 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Contractor shall make commercially reasonable efforts to avoid interruptions to the Owner's operations.

### § 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

### **§ 3.15 Cleaning Up**

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so, and the Owner shall be entitled to reimbursement from the Contractor.

### **§ 3.16 Access to Work**

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

### **§ 3.17 Royalties, Patents and Copyrights**

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

### **§ 3.18 Indemnification**

**§ 3.18.1** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, its agents and employees from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

**§ 3.18.1.1** The obligations of the Contractor under this indemnification shall not extend to the liability of the Owner, the Architect and its agents or employees thereof arising out of (1) preparation or approval of maps, Drawings, opinions, reports, surveys, change orders, designs or Specifications, or (2) the giving of or the failure to give directions or instructions thereof provided such giving or failure to give is the cause of the injury or damage.

**§ 3.18.2** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

### **§ 3.19 Contractor Performance Evaluation**

**§ 3.19.1** The Contractor acknowledges that following completion of the Work, the Owner's Representative will evaluate the Contractor's performance under this Contract. Such evaluation may take place after Substantial Completion or after Final Completion of the Work, as determined by Owner's Representative. The purpose of such evaluation includes, but is not limited to, determining whether or not the Contractor responsibly performed its Contractual obligations and whether or not the best interests of the Owner were promoted thereby.

**§ 3.19.2** Owner's Representative shall provide a copy of any such performance evaluation to the Contractor, as soon as practicable after completion of such evaluation.

**§ 3.19.3** The Contractor may appeal results of the Contractor's performance evaluation completed by the Owner's Representative by submitting a request for performance review to the Owner. Any such request must include the reasons for such request, and documentation necessary to substantiate the Contractor's claim that initial performance evaluation was inappropriate or otherwise in error.

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§ 3.19.4 The Owner reserves the right to waive the results of such performance evaluation(s) if, in the opinion of the Owner, corrective action has been taken to remediate substandard performance, events beyond the control of the Contractor resulted in substandard performance, or the best interests of the Owner will be served.

§ 3.19.5 The Contractor acknowledges and agrees that such evaluation(s) may be used by the Owner pursuant to Wis. Stat. § 16.855(9m) when determining whether the Contractor is a "qualified responsible bidder" for future Project(s); provided, however, any such evaluation made more than five (5) years prior to the submission of any such subsequent bid shall not be considered in any event.

§ 3.19.6 The Contractor acknowledges and agrees that all such evaluations so prepared by Owner's Representative shall constitute "open public records" available for inspection and copying as provided for by law.

## **ARTICLE 4 ARCHITECT**

### **§ 4.1 General**

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner.

### **§ 4.2 Administration of the Contract**

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents until the date of the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

### **§ 4.2.4 Communications**

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to advise the Owner to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect shall recommend that the Owner require additional inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a

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recommendation made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's Submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such Submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's Submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will work with the Owner's Representative to conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; assist the Owner's Representative in issuing Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and recommendations of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and recommendations, the Architect will endeavor to secure faithful performance by both Owner and Contractor.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be consistent with the intent expressed in the Contract Documents and the Contractor will adhere to those decisions.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

**§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work**

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.1.1 The Contractor must offer a subcontract to the successful mechanical, electrical, plumbing, and sprinkler (MEP) Subcontractors identified by the Owner and included in the Contractor's bid. This subcontract between a Contractor and a MEP Subcontractor must include a scope of work clause identical to the scope of work clause included in the Bid Documents and the contract between the Contractor and the Owner. A Contractor and a MEP Subcontractor may not enter any agreement in connection with bids submitted that would alter or affect the scope or price of the contracts entered into. This prohibition does not apply to the Owner's Change Orders that result in changes to the plans or specifications, or to back charges allowed by the Contract.

§ 5.2.1.1.1 The Contractor shall base its Project Schedule on the schedule in the Specifications and bid instructions unless otherwise agreed to by the MEP Subcontractor.

§ 5.2.1.2 The Contractor may enter into subcontracts for work other than MEP Subcontractor work, if subcontractors are approved by Owner's Representative through the Request for Subcontractor Approval Form. However, the election to subcontract Work shall not relieve the Contractor from responsibility or liability which it has assumed under this Contract. The Contractor shall remain liable to the same extent that its liability would attach, as if the Work had been performed by the Contractor's own employees. If the Specifications require or otherwise designate only one Subcontractor or source of supply for Work required under the Contract Documents, the Contractor's failure to acquire suitable contract arrangements with such Subcontractor or source of supply shall not excuse the Contractor from full responsibility and liability for any failure or default of such source of supply.

§ 5.2.1.3 Bidders shall submit a completed Request for Subcontractor Approval Form with their bid or within seven days of the Contractor bid opening. Submission of a completed Request for Subcontractor Approval Form is an element of responsiveness. Failure to submit this completed form within the above time limits will be considered unresponsiveness and may result in contract award to the next apparent low bidder. When no Subcontractors are anticipated, the Contractor shall give notice of this fact on the Request for Subcontractor Approval Form within the time limits noted above.

§ 5.2.1.4. All Subcontractors are subject to Owner's approval. The Owner may request, or the Contractor may provide, any of the following information to substantiate the proposed Subcontractors' qualifications or ability to perform the Work. The Owner shall consider such information when reviewing the qualifications of proposed Subcontractors to determine whether such qualifications serve the best interests of the Project.

- .1 The amount of experience completing similar Work to that required by the Contract Documents;
- .2 The quality of work the proposed Subcontractor has provided on past projects;
- .3 The extent of available staffing and financial resources of the proposed Subcontractor;
- .4 The Contractor's intended method of monitoring the proposed Subcontractor's Work;
- .5 The level of supervision of the Subcontractor's Work which the Contractor will provide; and
- .6 Any other information regarding the proposed Subcontractor's ability to complete the Work.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, and met all other applicable criteria, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change,

and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution. The Contractor shall not replace any Owner-identified or approved Subcontractor or material supplier without written approval of the Owner. Any Contractor request for replacement of a Subcontractor previously approved by the Owner shall include the reason(s) for such replacement and all documentation necessary to substantiate such change.

§ 5.2.5 The Contractor shall maintain a list of all Subcontractors and suppliers performing labor or furnishing materials for the Project.

### § 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

*(Paragraphs deleted)*

§ 5.3.1 The Contractor shall be fully responsible for all acts and omissions of all Subcontractors and shall be responsible for scheduling and coordinating the Work of all Subcontractors and material suppliers.

§ 5.3.2 Nothing herein shall be construed to create any express or implied contractual relationship between Owner and any of the Contractor's Subcontractors, suppliers or vendors.

§ 5.3.3 The Contractor shall cause Article 10.2 (Safety of Persons and Property), with appropriate changes in paragraph and entity designation, to be incorporated in all Subcontracts, regardless of tier.

§ 5.3.4 The Contractor shall insert the following mandatory provisions, with appropriate changes in paragraph and entity designation, in all subcontracts with Subcontractors:

- .1 Article 9 - Payments and Completion
- .2 Article 9.6.2 and 9.6.5.1- Progress Payments
- .3 Article 13.9 - Minimum Wages

§ 5.3.5 Pursuant to Wis. Stat. §16.855 (14m)(a), any contract that the Contractor (referred to below as General Prime Contractor) enters into with a Subcontractor as defined under Wis. Stat. §16.855 (14)(e) shall include the following mandatory provisions:

**PROMPT PAYMENT** (General prime contractor) shall pay (mechanical, electrical, or plumbing subcontractor) in accordance with Wis. Stat §16.855(19)(b), for work that has been satisfactorily completed and properly invoiced by (mechanical, electrical, or plumbing subcontractor). A payment is timely if it is mailed, delivered, or transferred to (mechanical, electrical, or plumbing subcontractor) by the deadline under Wis. Stat §16.855(19)(b).

If (mechanical, electrical, or plumbing subcontractor) is not paid by the deadline in this Contract, (general prime contractor) shall pay interest on the balance due from the eighth day after the (general prime contractor) receives payment from the Board of Regents for the work for which payment is due and owing to (mechanical, electrical, or plumbing subcontractor), at the rate specified in Wis. Stat §71.82, compounded monthly.

A (mechanical, electrical, or plumbing subcontractor) that receives payment as provided under this Contract and that subcontracts with another entity shall pay those subcontractors, and be liable for interest on late payments to those subcontractors, in the same manner as the (General prime contractor) is required to pay the (mechanical, electrical, or plumbing subcontractor) under this Contract.

**INSURANCE AND BONDS** (mechanical, electrical, or plumbing subcontractor) shall not commence work under this Contract until it has obtained all necessary insurance required of (mechanical, electrical, or plumbing subcontractor) in the contract between the (general prime contractor) and the Board of Regents.

(Mechanical, electrical, or plumbing subcontractor) shall provide a separate 100 percent performance bond and a separate 100 percent payment bond to the benefit of the (general prime contractor) as the sole named obligee. Original bonds shall be given to the (general prime contractor) and a copy shall be given to the Board of Regents no later than 10 days after execution of this Contract.

**INDEMNIFICATION** To the fullest extent permitted by law, (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others whom (general prime contractor) is required to indemnify under its contract with the Board of Regents, and the employees of any of them, from and against claims, damages, fines, penalties, losses, and expenses, including but not limited to attorney fees, arising in any way out of or resulting from the performance of the work under this Contract, but only to the extent such claim, damage, fine, penalty, loss, or expense: (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of property, including but not limited to loss of use resulting therefrom and is caused by the negligence, or acts or omissions, of (mechanical, electrical, or plumbing subcontractor), its subcontractors, any of their employees, and anyone directly or indirectly employed by them or anyone for whose acts they may be liable, or (2) as related to such claims, damages, fines, penalties, losses, and expense of or against (general prime contractor), results from or arises out of the negligence of the (general prime contractor) or other fault in providing general supervision or oversight of the work of (mechanical, electrical, or plumbing subcontractor) or (3) as related to claims, damages, fines, penalties, losses, and expense against the Board of Regents arises out of the Board's status as owner of the project or project site.

In addition (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others (general prime contractor) is required to indemnify under its contract with the Board, and the employees of any of them, from any liability, including liability resulting from a violation of any applicable safe place act, that (general prime contractor) or the Owner incurs to any employee of (mechanical, electrical, or plumbing subcontractor) or any third party where the liability arises from a derivative claim from said employee, when the liability arises out of the failure of the (General prime contractor) or the Owner to properly supervise, inspect, or approve the work or work area of (mechanical, electrical, or plumbing subcontractor), but only to the extent that the liability arises out of the acts or omissions of (mechanical, electrical, or plumbing subcontractor), its employees, or anyone for whom (mechanical, electrical, or plumbing subcontractor) may be liable, or from (mechanical, electrical, or plumbing subcontractor's) breach of its contractual responsibilities or arises out of (General prime contractor's) negligence or other fault in providing general supervision or oversight of (mechanical, electrical, or plumbing subcontractor's) work or arises out of The Board of Regents' status as owner of the project or project site. In claims against (general prime contractor) or the Owner by an employee of (mechanical, electrical, or plumbing subcontractor) or its subcontractors or anyone for whose acts (mechanical, electrical, or plumbing subcontractor) may be liable, the indemnification obligation of this paragraph is not limited by a limitation on amount or type of damage, compensation, or other benefits payable by or for the (mechanical, electrical, or plumbing subcontractor) subcontractors under workers compensation act.



Except as identified above, the obligations of (mechanical, electrical, or plumbing subcontractor) under this indemnification do not extend to the liability of (general prime contractor) and its agents or employees arising out of (1) preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications; (2) the giving of or failure to give directions or instructions by the (general prime contractor) or the or their agents or employees provided the giving or failure to give is the cause of the injury or damage; or (3) the acts or omissions of other subcontractors.

**RETAINAGE** Retainage shall occur and be in amounts and on a schedule equal to that in the contract between (general prime contractor) and the Owner. Pursuant to Wis. Stat. §16.855(19)(b), Retainage between Contractor and mechanical, electrical and plumbing subcontractors is governed as follows:

As the work progresses under any subcontract as defined under Wis. Stat. § (14)(e) for construction of a project, the Contractor shall, upon request of a subcontractor, pay to the subcontractor an amount equal to the proportionate value of the subcontractor's work properly completed, less retainage. The retainage shall be an amount equal to not more than 5 percent of the subcontractor's work completed until 50 percent of the subcontractor's work has been completed. At 50 percent completion, no additional amounts may be retained, and partial payments shall be made in full to the subcontractor unless the Board certifies that the subcontractor's work is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the subcontractor's work is not satisfactory, additional amounts may be retained but the total retainage may not be more than 10 percent of the value of the work completed. Upon substantial completion of the subcontractor's work, any amount retained shall be paid to the subcontractor, less the value of any required corrective work or uncompleted work. All payments the general prime contractor makes under this paragraph shall be within 7 calendar days after the date on which the general prime contractor receives payment from the Board.

Pursuant to Wis. Stat. §16.855(14m)(b), subcontracts under sub (14)(e) must include a scope of work clause that is identical to the scope of work clause on which the subcontractor bid. The following Scope of Work language shall be included in the contracts between the Contractor and Subcontractors:

**SCOPE OF WORK** The mechanical, electrical and plumbing subcontractor scope of work is identical to the general prime contractor scope of work included in these bidding and contract documents. By submitting and signing a bid, all bidders have examined all the Bidding Documents listed in the Table of Contents of the project Specifications. The successful bidders will be required to do all work which is shown on the drawings, mentioned in the Specifications, or reasonably implied as necessary to complete the division of work bid for this project.

## **ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

### **§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts**

**§ 6.1.1** The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

**§ 6.1.2** When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

**§ 6.1.3** The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

### § 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect and Owner's Representative of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect and Owner's Representative of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

### § 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Owner's Representative will allocate the cost among those responsible.

## ARTICLE 7 CHANGES IN THE WORK

### § 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.2.2 No adjustment of any kind shall be made to this Contract if asserted by the Contractor for the first time, after the date of final payment.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.1.4 Except in cases of emergency, no changes shall be made to the Work by the Contractor without having prior approval of Owner through a Construction Change Directive or Change Order. In addition, the Contractor shall not

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be entitled to any increase in the Contract Sum or Contract Time without first receiving prior written authorization from the Owner for the same. If the parties disagree whether the work to be performed constitutes a change in Work or disagree as to any adjustments in the Contract Sum or Contract Time, Contractor shall nonetheless diligently proceed with the Work if directed by the Owner while the parties resolve their dispute. In any case, the parties reserve their rights as to the disputed amount.

§ 7.1.5 Electronic signatures are acceptable for all contract and related documents.

## § 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect or Owner's Representative and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 the change in the Work;
- .2 the amount of the adjustment, if any, in the Contract Sum; and
- .3 the extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 The inclusion of Subcontractor terms and conditions in the supporting documentation of a Change Order shall have no bearing on the contract between the Owner and Contractor, and shall not change any of the terms and conditions between the Owner and Contractor. Such supporting documentation shall not be construed as creating any expressed or implied contractual obligation of those terms and conditions between Owner and any of the Contractor's Subcontractors, suppliers or vendors.

§ 7.2.3 A Change Order may be proposed by the Architect, Contractor, or the Owner. When a Change Order is proposed, the following procedures shall apply:

- .1 if requested by Owner's Representative, the Contractor shall prepare and submit a detailed proposal, including all cost and time adjustments to which the Contractor believes it will be entitled if the change proposed is incorporated into the Contract. Owner's Representative shall be under no legal obligation to issue a Change Order for such proposal;
- .2 the parties shall attempt in good faith to reach agreement on the adjustments needed to the Contract to properly incorporate the proposed change(s) into the Work;
- .3 in some instances, it may be necessary for Owner to authorize Work or direct changes in Work for which no final and binding Change Order has been reached and for which unit prices are not applicable. In such cases the following shall apply:
  - .1 upon written request by the Owner, through a Construction Change Directive, the Contractor shall perform the proposed Work;
  - .2 the cost of such changes shall not exceed the amount in the Construction Change Directive, and be determined in accordance with Section 7.2.5;
  - .3 in the event agreement cannot be accomplished as contemplated herein, the Owner may authorize the Work to be performed by Owner or to hire others to complete the Work. Such action on the part of the Owner shall not be the basis of a claim by the Contractor for failure to allow it to perform the changed Work.

§ 7.2.4 In the event Work is required due to an emergency as described in Section 7.1.4., the Contractor must request an equitable adjustment as soon as practicable, and in no case later than ten (10) working days of the commencement of such emergency.

§ 7.2.5 Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.2 shall be limited to the following:

- .1 actual labor rate includes the base rate, taxes, insurance and fringe benefits required by agreement or custom and no Contractor markup except as allowed in Section 7.2.5.6 below. Unit labor is the labor time anticipated to be expended to install the corresponding unit of actual materials. Labor cost is the

- labor hours approved by Owner's Representative multiplied by the Owner's Representative pre-approved composite hourly labor rates;
- .2 actual material cost is the amount paid or to be paid by the Contractor for materials, supplies and equipment entering permanently into the Work, including cost of transportation and applicable taxes. This cost shall be substantiated by the vendor or supplier's verified invoices/quotes. The cost shall not exceed the usual and customary cost for such items available in the geographical area of the project;
  - .3 large tools and major equipment are those with an initial cost greater than \$1,000, whether from the Contractor or other sources. The rental rate shall not exceed the usual and customary amount for such items available in the geographical area of the project. Tool and equipment use time allowed is only for the extra Change Order work. Rental cost is the above tool and equipment time approved by Owner's Representative multiplied by the Owner's Representative pre-approved rental rates also described above;
  - .4 the cost of performance and payment bonds are the actual rate paid by the Contractor for such bonds;
  - .5 subcontractor costs are for those subcontracted specialties required to complete the Change Order work, with maximum markups as outlined hereinafter;
  - .6 the maximum allowable markup for overhead and profit, by all parties of the Contractor and Subcontractors, on Change Order proposals shall not exceed 15 percent total. The Contractor markup of change order work done by Subcontractors shall not exceed 7 ½ percent; and the total combined mark-up by Contractor and Subcontractor, on Subcontractor performed work shall not exceed 15 percent. When the value of a Change Order proposal exceeds \$30,000, a declining scale will be used to negotiate the allowable combined overhead and profit margin. Where Change Order proposals involve a credit only, a reasonable allowance for overhead and profit are properly included as part of the downward adjustment for a deductive change exceeding \$15,000. The amount of such allowance is subject to negotiation.
  - .7 all other Change Order expenses are part of the overhead and profit allowance which are not reimbursable as separate items and include the following:
    - .1 all costs associated with the processing of the Change Order are included in the overhead and profit allowance;
    - .2 all such efforts, unless specifically requested as additional Work to be documented as a Change Order proposal or portion thereof, is included in the overhead and profit allowance;
    - .3 the layout required for the installation of material and equipment, and installation design, is the responsibility of the Contractor and is included in the overhead and profit allowance;
    - .3 small tools and supplies. The cost of small hand tools with an initial cost of \$1,000 or less, along with consumable supplies and expendable items such as drill bits, saw blades, gasoline, lubricating or cutting oil, and similar items, is included in the overhead and profit allowance;
    - .4 general expenses (for example, and not limited to: parking fees) which include those items that are a specific job cost not associated with direct labor and material, is included in the overhead and profit allowance;
    - .5 the preparation of record or as-built drawings required is included in the overhead and profit allowance;
    - .6 other costs: a) All association dues, assessments, and similar items are included in the overhead and profit allowance. b) All education, training, and similar items are included in the overhead and profit allowance. c) All drafting and/or engineering, unless specifically requested as additional Work to be documented as a Change Order proposal or portion thereof, is included in the overhead and profit allowance. d) All other cost items such as, but not necessarily limited to, review, coordination, estimating, and expediting, relative to Change Order proposals, are associated with field and office supervision and are included in the overhead and profit allowance.

### § 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect or Owner's Representative and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the

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Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

**§ 7.3.2** A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

**§ 7.3.3** If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 time and material, Not To Exceed. This Not To Exceed amount will be the amount the Contractor can complete the needed change in the Work, and shall include all costs for this work including overhead and profit;
- .2 unit prices stated in the Contract Documents or subsequently agreed upon; or
- .3 cost method agreed upon by all signing parties.
- .4 Intentionally deleted.

**§ 7.3.4**

*(Paragraphs deleted)*  
Intentionally deleted.

**§ 7.3.5** Intentionally deleted.

**§ 7.3.6** Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect and Owner's Representative of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

**§ 7.3.7** A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

**§ 7.3.8** The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

**§ 7.3.9** Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

**§ 7.3.10** When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders shall be subsequently issued for all Construction Change Directives when there is agreement on time and cost changes to the Work.

**§ 7.4 Minor Changes in the Work**

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

## ARTICLE 8 TIME

### § 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect and Owner's Representative in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

### § 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work. It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the time for completion of the Work required by the Contract Documents is an essential condition of this Contract. The Contractor agrees that the Work required by the Contract Documents will be prosecuted regularly and diligently at a rate of progress that will ensure its final completion within the time specified in the Contract Documents. It is expressly understood and agreed, by the Contractor and the Owner, that the specified time period for completion of the Work described in the Contract Documents is a reasonable time for the completion of the Work, taking into consideration the average weather conditions and usual industrial conditions prevailing in the locality in which the Work is to be completed.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, Mobilize prior to the effective date of insurance required to be furnished by the Contractor and Owner, and the Mobilization date.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.2.4 Costs for acceleration of Work activities to allow completion of the Project in less time than that allowed by the Contract Documents shall be borne by the party requesting such acceleration or early completion. No claim for delay shall be valid against the Owner for compensation for delayed completion which extends completion beyond the early finish date, but which does not continue beyond the stated time for completion as set forth in the Contract.

### § 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; or (4) by other causes that the Contractor asserts, and the Owner's Representative determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Owner's Representative may determine.

§ 8.3.1.1 If any activity is delayed, or anticipated to be delayed, thereby delaying the Substantial Completion of the entire Project, the Contractor shall have the right to take action as may be necessary to recapture any delay. Such action shall include, but not be limited to:

- .1 increase in staffing;
- .2 increase in shifts, hours of Work, or number of days of Work;
- .3 use of available Float; or
- .4 changing the sequence of Work activities

Costs caused by delays or improperly timed activities shall be borne by the party responsible therefore, and Change Orders, as deemed appropriate, shall be issued in accordance with Article 7 of these General Conditions.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.2.1 When events occur which, in the opinion of the Contractor, prevent completion of the Project within the time period allowed by the Contract Documents, the Contractor shall request an extension of the specified time for completion. Such request shall include the reasons for delay, the amount of time extension being requested, and any cost(s) associated with the delay. All such requests shall be made in writing and delivered to Owner's Representative within ten (10) working days from the beginning of such delay, or within ten (10) working days from the time when the circumstance with potential for delay becomes reasonably known to the Contractor, whichever is earlier. The Owner's Representative shall act on such requests as soon as practicable and notify the Contractor of Owner's decision.

§ 8.3.2.2 If the Contractor fails to complete the Work within the time specified in the Contract and such failure is due to reasons which were not beyond the reasonable control of the Contractor or if the Contractor fails to complete the Work within the time specified in the Contract and fails to make the written request as provided for in 8.3.2, then in any such event the Contractor shall pay to the Owner actual damages.

§ 8.3.2.3 If Owner terminates the Contract, or suspends or stops Work in accordance with 2.4 due to the fault of the Contractor, the damages described in Paragraph 8.3.2.2 shall be assessed for each day (or any part thereof) such Work is stopped on the Project. If the Owner does not elect to terminate the Contract or to suspend or stop the Work, the damages shall be assessed for each day of delay in Substantial Completion.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents. The Owner may, at its discretion, waive damages due the Owner, or any portion thereof.

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. Payments to the Contractor under the Contract Documents will be made as provided for in Wis. Stat. § 16.855(19)(a), as the Work progresses on this Project. Payment requests will be processed monthly, except for special circumstances approved by Owner's Representative. The Contractor must perform all of the conditions required for payment and must have met the obligations which are necessary to qualify for any partial payments. No Contractor whose Work is deficient or whose Work fails to conform to the quality standards set forth in the Contract Documents shall be entitled to interim, progress or partial payments.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

### § 9.2 Schedule of Values

As soon as practicable after the Agreement is executed, but not later than submission of the first payment application, the Contractor shall submit to the Architect a Schedule of Values for work to be performed, as prescribed by the Contract Documents and in the detail requested by the Architect. The cost breakdown items shall reflect actual work progress stages as closely as feasible which, if approved by Architect, will become the basis for Applications for Payment.

### § 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 With each Application for Payment, the Contractor shall provide to the Architect and Owner's Representative:

- .1 At the request of the Architect or Owner's Representative, submit satisfactory evidence to establish that

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the sum set forth in any Application for Payment represents the "proportionate value" of Work completed;

- .2 The Contractor shall certify each request for payment as being a true, accurate, and complete statement of account as of the date on which the certificate was made, and that the stated sums are then earned and payable to the Contractor.
- .3 All requests for payment shall be submitted to the Architect. To expedite payment of sums due under the Contract, the Contractor, Owner's Representative and Architect shall, where possible, jointly review any such request for payment at the site, inspecting the Work if necessary to determine the validity of the request or modifications to the request which are necessary to accurately represent the value of Work completed in accordance with the Contract Documents
- .4 The Contractor shall furnish any and all accounting records requested by the Architect or Owner's Representative to validate all or any part of any request for payment. The Contractor shall maintain these accounting records for a period of three (3) years from the date the Architect authorizes final payment.
- .5 The Contractor agrees to indemnify and hold the Owner harmless from all claims growing out of lawful demands of Subcontractors, laborers, workers, mechanics, material persons, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the performance the Work required by Contract Documents.
- .6 The Contractor shall, at Owner's Representative or Architect's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived.
- .7 If separate prices are set forth in the Contract Documents for identifiable items of Work, payment for such prices shall be made at the time of completion of those items of Work. Payment under this Paragraph shall be an interim payment until the time of final payment and acceptance of the Work by Architect.
- .8 Pursuant to Wis. Stat. § 16.855(19)(a), as the Work progresses under this Contract for Construction the Architect or Owner's Representative, from time to time, shall grant to the Contractor an estimate of the amount and proportionate value of the work properly completed, which shall entitle the Contractor to receive the amount, less the retainage, from the proper fund. The retainage shall be an amount equal to not more than 5 percent of the estimate until 50 percent of the work has been completed. At 50 percent completion, no additional amounts shall be retained, and partial payments shall be made in full to the Contractor unless the Owner certifies that the job is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the work is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than 10 percent of the value of the Work completed. Upon Substantial Completion of the Work, any amount retained shall be paid to the Contractor, less the value of any required corrective Work or uncompleted Work. For the purposes of this section, estimates may include any fabricated or manufactured materials and components specified, previously paid for by Contractor and delivered to the Work or properly stored and suitable for incorporation in the Work embraced in the contract.

**§ 9.3.1.2** Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

**§ 9.3.2** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment properly stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with the requirement that it holds clear title to all property of every description which serves as the basis for the Application for Payment. Contractor warrants that title to any such property is being transferred to the Owner free and clear of all liens. If requested by the Architect or Owner's Representative, the

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Contractor shall produce satisfactory evidence of transfer of title from suppliers and Subcontractors to the Contractor, without reservation, or with adequate waiver of lien. These payments may include any fabricated or manufactured materials and components specified, previously paid for by Contractor and delivered to the site, properly stored, and suitable for incorporation into the Work embraced in the Contract. The Contractor shall identify the method of storage for such materials. Proper evidence of insurance shall be presented to protect the interest of the Owner. If payment is intended to be requested for any off-site storage items, such items shall be listed as separate lines in the request and certification for payment, cost breakdown. Architect or Owner's Representative, upon their request, shall be allowed to verify such materials and equipment no matter the location stored and located.

**§ 9.3.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work. The Contractor shall have the sole responsibility for obtaining proper insurance on, as well as the responsibility for the care and protection of materials and Work upon which payments have been made. The Contractor shall be responsible for the restoration of any damaged Work. Nothing herein shall operate as a waiver of the rights of the Owner to require fulfillment of all of the terms of the Contract.

#### **§ 9.4 Certificates for Payment**

**§ 9.4.1** The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

**§ 9.4.2** The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect.

#### **§ 9.5 Decisions to Withhold Certification**

**§ 9.5.1** The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment. In paying any unpaid bills of the Contractor relating to the Work, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the Contract by the Owner to the Contractor for its account and the Owner shall not be liable to the Contractor for any such payment.

## § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 Not more than seven (7) calendar days following the receipt of each payment from the Owner, the Contractor shall make payment to each and every person, Subcontractors, or entity who furnished goods or services for the progress of the Work on the Project, the value of which goods or services were included in the Contractor's Request for Payment and Certification for Payment, or who by law or Contract payment is due upon the receipt of the payment most recently received from the Owner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.5.1 In the event Owner receives notice from any person, Subcontractor, or other third party, that the Contractor has failed to pay such person(s) for Work performed in accordance with the Contract Documents, the Owner shall notify the Contractor and the Contractor shall, in no more than 10 calendar days, provide all documentation Owner's Representative believes necessary to determine whether such payment is due, or reasons for non-payment of disputed amounts. In the event Owner's Representative determines the claim to be valid and payment is due, or in the absence of aforementioned documentation, Owner's Representative may authorize direct payment of any unpaid bills, withholding from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such claims until satisfactory documentation is furnished that all liabilities have been fully discharged or reasons for non-payment of disputed amounts are provided by the Contractor. In no event shall these provisions be construed to impose any obligations upon the Owner to either the Contractor or the Contractor's Surety.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary

liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

**§ 9.6.7.1** Pursuant to Wis. Stat. § 16.855(19)(b) and § 16.855(14m)(a) retainage on a Subcontract shall occur and be in amounts and on a schedule equal to the retainage schedule in the contract between the Contractor and the Owner.

**§ 9.6.7.2** Nothing herein shall preclude the Contractor from deducting from any request for payment such amounts as will properly represent the value of Work which fails to meet the quality standards of the Contract Documents or which the Subcontractor fails to complete.

**§ 9.6.8** Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

### **§ 9.7 Failure of Payment**

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. In the event the Contractor elects to stop Work under this Section 9.7, upon recommencing the Work, the Contractor may seek a Change Order to assert a claim for adjustment of the Contract Time and the Contract Sum by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

### **§ 9.8 Substantial Completion**

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

**§ 9.8.2** When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**§ 9.8.3** Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection identifies any item, whether or not included on the Contractor's list, which is not sufficiently complete, in need of correction, or in need of replacement to be in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

**§ 9.8.4** When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

**§ 9.8.6** On the date of Substantial Completion, the Contractor shall assign to the Owner all warranties and guarantees

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of labor or material incorporated into the Work which are provided by third party vendors, suppliers, manufacturers, and Subcontractors.

### **§ 9.9 Partial Occupancy or Use**

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. While the Owner has such possession or use, the Contractor shall be relieved of the responsibility for loss or damage to the Work resulting from the Owner's possession or use. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor.

**§ 9.9.2** Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents. The Contractor will prepare a list of items of Work remaining to be performed or corrected on those portions of the Project that the Owner intends to take possession of or use.

### **§ 9.10 Final Completion and Final Payment**

**§ 9.10.1** Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor provides certification that all debts and claims against this Project have either been paid in full or otherwise satisfied and give final evidence of release of all liens against the Project, the Owner, and all proceeds payable hereunder. The Contractor shall certify upon such payment request that the data contained therein is current, accurate, and complete. Contractor shall permit, if requested by Owner's Representative, the final inspection to be jointly conducted by the Contractor, Architect and Owner's Representative. The Contractor shall give Notice at least 72 hours in advance of the time set for final inspection. Upon completion of the Work and before receiving final payment for the Work, as required by law, the Contractor shall file with Owner's Representative an affidavit stating that the Contractor has complied fully with Wis. Stat. § 103.49(4r) and that the Contractor has received an affidavit from each of the Contractor's agents, and Subcontractors stating that they also have complied fully with Wis. Stat. § 103.49(4r).

**§ 9.10.2.1** As a condition precedent to final payment, all corrective actions to remedy deficiencies in the Work required by Contract Documents and Work identified on the punch list must have been completed. In addition, where required by Contract Documents, all training of the Owner's staff in the proper operation and maintenance of the Work shall have been completed, Operating and Maintenance Manuals and Instructions as well as drawings marked up to reflect "as built" conditions must have been transmitted to Owner's Representative and all warranty certificates signed and presented for Owner's Representative acceptance.

**§ 9.10.2.2** When to the satisfaction of Owner's Representative and Architect the Work has been completed, and is of the quality required by the Contract Documents, Owner's Representative may authorize payment of all sums then due the Contractor. Receipt of the final payment, as provided for herein shall constitute a waiver of any and all claims against the Owner arising out of, under, or incident to the Work performed under the Contract.

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**§ 9.10.2.3** If the Contractor fails to submit a request for final payment or make satisfactory arrangements with Owner's Representative within thirty (30) calendar days of the final inspection or accepted punch list, no further payments will be made and the Contract will be closed. The last request for Certification for Payment will be considered the final payment under the terms and conditions of the Contract.

**§ 9.10.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect or Owner's Representative so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

**§ 9.10.4** The making of final payment shall constitute a waiver of Claims by the Owner except those arising from but not limited to:

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents;
- .4 audits performed by the Owner after final payment;
- .5 any warranty or guarantee required by the Contract Documents;
- .6 any other right surviving the Owner as to which the Contractor was specifically given notice before or during the final inspection and final payment process; or
- .7 rights surviving to the Owner as a matter of law.

**§ 9.10.5** Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## **ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY**

### **§ 10.1 Safety Precautions and Programs**

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor, its agents, employees, material suppliers and subcontractors will perform all Work on the project in a safe and responsible manner. In particular, Contractor shall, at its own expense, conform to the safety policies and regulations established by the Contractor and shall comply with all specific safety requirements promulgated by any government authority, including without limitation the requirements of the Occupations Safety and Health Act of 1970 and the Construction Safety Act of 1969 and all standards and regulations which have been or shall be promulgated by the parties or agencies which administer the Acts. Contractor shall comply with said requirements, standards and regulations, and require and be directly responsible for compliance therewith on the part of its said agents, employees, materials suppliers and contractors; and shall directly receive, respond to, defend, and be responsible for all citations, assessments, fines or penalties which may be incurred by reason of its failure on the part of its agents, employees, material suppliers or subcontractors to so comply.

### **§ 10.2 Safety of Persons and Property**

**§ 10.2.1** The Contractor shall strictly comply with, and bear full responsibility for, any safety procedure set forth in the Contract Documents. The Contractor shall further indemnify Owner for any cost and expense, including legal, resulting from any such failure to abide by any safety procedure set forth in the Contract Documents. At the sole discretion of Owner, the Contractor may also be subject to termination of the Contract for default. The Contractor shall take all precautions for safety of, and shall provide all protection to prevent damage, injury, or loss to:

- .1 employees on the Work and other persons who may be affected thereby (including, but not limited to the public, and the Owner's personnel and agents);
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and

- 3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss. Contractor shall have properly qualified and trained personnel on safety means and methods, and properly qualified supervision.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, all safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. For these purposes, the Contractor shall:

- 1 provide appropriate safety barricades, signs, and signal lights;
- 2 comply with any safety requirement published by any governmental authority with jurisdiction over the site, including federal, state, or local jurisdictions;
- 3 ensure that any additional measures which are reasonably necessary for the purposes stated are taken.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18. If the Owner becomes aware of any noncompliance by the Contractor or any Subcontractor with the safety conditions of this Contract or of any condition caused by the Contractor or any Subcontractor, which poses a serious or imminent danger to the health or safety of the public or to Owner personnel, for which the Contractor has been previously notified of, and the Contractor has failed to correct, the Owner has the right stop all Work until satisfactory correction action has been taken. Satisfactory correction will be at the sole discretion of the Owner.

§ 10.2.5.1 In case of an emergency which threatens loss or injury of property, or safety of life, the Contractor will be allowed to act, without previous instructions from the Owner's Representative, in a diligent manner. The Contractor shall notify Owner's Representative immediately thereafter. Any claim for compensation by the Contractor due to such extra Work shall be promptly submitted to the Owner's Representative and Architect for approval as provided for in Article 7 above.

§ 10.2.5.2 In the event of temporary suspension of Work, or during inclement weather, or whenever Owner's Representative shall direct, the Contractor shall reasonably protect all Work and materials against damage or injury from the weather. This provision shall be incorporated into the contracts between the Contractor and Subcontractors. If, in the opinion of Owner's Representative, any Work or materials have been damaged or injured by reason of failure on the part of the Contractor or Subcontractors to reasonably protect the Work, such materials shall be removed and replaced at the expense of the Contractor.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

### **§ 10.2.8 Injury or Damage to Person or Property**

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

### **§ 10.3 Hazardous Materials and Substances**

**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. The Contractor shall use the least hazardous materials, equipment, and processes to execute the Work. The Contractor shall comply with all OSHA rules and regulations. If the Contractor encounters a condition that it suspects may contain a hazardous material or substance that is not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, take all reasonable steps that, in its judgement, are necessary to prevent bodily injury or death, up to and including stopping the Work.

**§ 10.3.2** Contractor shall give notice to Owner of the condition that may contain the hazardous material or substance. Contractor shall have the right to engage a licensed laboratory/subcontractor to test the suspected hazardous material or substance. Owner will negotiate for reimbursement of reasonable testing costs if the test results do not verify the presence of a hazardous material or substance by a Change Order. Owner, by Change Order, will reimburse Contractor for reasonable testing costs if the tests results verify the presence of a hazardous material or substance.

**§ 10.3.3** When hazardous materials or substances, not addressed in the Contract Documents, are required to be removed or disturbed to complete the Work, Contractor and Owner will negotiate how to complete that new work. If Contractor agrees to perform this work, a Change Order will be negotiated potentially adjusting the Contract Sum and Contract Time. Such new work will be at the sole direction of the Owner.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site.

**§ 10.3.5** The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

### **§ 10.4 Emergencies**

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

## **ARTICLE 11 BONDS**

### **§ 11.1 Contractor's Bonds**

**§ 11.1.1** The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located. The bond may be enforced by any person or entity who is entitled to enforce the bonds as a matter of law and who is damaged as a result of breach of these commitments by the Contractor on the Project to which these provisions apply. The Owner shall not be responsible for the default of the Contractor and the remedies of any damaged party shall be limited to an action by the damaged party against the defaulting Contractor and/or its bonding company, in addition to any other coverage for the bond.

§ 11.1.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

*(Paragraphs deleted)*

## **ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

### **§ 12.1 Uncovering of Work**

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's or Owner's Representative's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, or Owner's Representative, be uncovered for examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect or Owner's Representative has not specifically requested to examine prior to its being covered, the Architect or Owner's Representative may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense with no adjustment to Contract Time.

### **§ 12.2 Correction of Work**

#### **§ 12.2.1 Before Substantial Completion**

The Contractor shall promptly correct Work rejected by the Architect or Owner's Representative or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

#### **§ 12.2.2 After Substantial Completion**

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.



§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

### § 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 Governing Law

The Contract shall be governed by the laws of the State of Wisconsin.

### § 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. The Owner may withhold its consent in its sole discretion. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.1.1 In case the Contractor assigns all or any part of any moneys due or to become due under this Contract, the instrument of assignment shall contain an article substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms, and corporations for services rendered or materials supplied for the performance of the Work called for in this Contract and subject to the terms of this Contract and claims of offset by the Owner.

§ 13.2.2 Antitrust Agreement. The Contractor and the Owner recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the Owner. Therefore, the Contractor hereby assigns to the Owner any and all claims for such overcharges as to goods and materials purchased in connection with this Contract, except as to overcharges which result from antitrust violations commencing after the price is established under this Contract and any Change Order thereto.

### § 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

### § 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect and Owner's Representative timely notice of when and where tests and inspections are to be made so that the Architect and Owner's Representative may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written

authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect and Owner's Representative of when and where tests and inspections are to be made so that the Architect and Owner's Representative may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect and Owner's Representative.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

**§ 13.5 Interest**

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate as listed in the Agreement or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

**§ 13.6 Reserved**

**§ 13.7 Reserved**

**§ 13.8 Nondiscrimination/Affirmative Action -**

§ 13.8.1 In connection with the performance of Work under this Contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of age, race, religion, color, handicap, sex, physical condition, developmental disability as defined in Wis. Stat. §51.01(5), sexual orientation, national origin, or any other basis prohibited by law. This provision shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training. Except with respect to sexual orientation, the Contractor further agrees to take affirmative action to ensure equal employment opportunities. This contract provision shall be incorporated into the contracts between the Contractor and Subcontractors.

§ 13.8.2 Contracts with a value of fifty thousand dollars (\$50,000) or more require the Contractor to submit a written affirmative action plan acceptable under Wisconsin Statutes. An exemption occurs from this requirement if the Contractor has a Work force of less than thirty (30) employees. The Contractor is responsible for obtaining affirmative action compliance from Subcontractors.

§ 13.8.3 The Contractor should establish and take appropriate initiatives to reach goals and timetables for minority and female utilization which shall be based on appropriate work force, demographic, or other relevant data which shall cover construction projects or construction contracts performed in specific geographical areas. The goals shall be applicable to the Contractor's, and Subcontractor's entire work force which is working in the area covered by the goals. The goals are established and are as follows:

County	Women Goal	Minority Goal
Adams/Juneau/Monroe/Vernon	12%	2%
Ashland/Bayfield/Douglas/Price	9%	6%
Barron/Sawyer/Washburn	13%	4%
Brown	11%	9%
Buffalo/Jackson/Pepin/Trempealeau	12%	5%
Burnett/Polk	11%	2%

Calumet/Winnebago	11%	3%
Chippewa/Rusk	12%	2%
Clark/Taylor	16%	2%
Columbia	12%	2%
Crawford/Grant/Richland	14%	2%
Dane	9%	9%
Dodge	12%	3%
Door/Kewaunee/Manitowoc	13%	3%
Dunn/Eau Claire	11%	3%
Florence/Forest/Marinette/Oconto	13%	2%
Fond du Lac	11%	4%
Green/Iowa/LaFayette	13%	1%
Green Lake/Marquette/Waushara	10%	4%
Iron/Oneida/Vilas	9%	3%
Jefferson	12%	4%
Kenosha	7%	10%
La Crosse	10%	4%
Langlade/Lincoln/Menominee/Shawano	11%	7%
Marathon	12%	4%
Milwaukee	10%	29%
Outagamie	10%	5%
Ozaukee	8%	3%
Pierce/St Croix	12%	2%
Portage	13%	3%
Rock	11%	7%
Sauk	10%	2%
Sheboygan	14%	5%
Walworth	10%	8%
Washington	9%	3%
Waukesha	7%	4%
Waupaca	11%	2%
Wood	12%	2%

Source: Combined Occupation Distribution: 2000 Census

§ 13.8.4 Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom a Contractor has a collective bargaining agreement, to refer to either minorities or women shall excuse the Contractor's required initiatives under these specifications.

§ 13.8.5 The Contractor agrees to post in conspicuous places, available for employees and applicants for employment, a notice to be provided by the Owner that sets forth the provisions of this Article 13.8.

§ 13.8.6 Failure to comply with the conditions of this Article 13.8 may result in the Contractor becoming declared an "ineligible" Contractor, termination of the Contract, or withholding of payment.

### § 13.9 Minimum Wages

§ 13.9.1 The Contractor shall post, at an appropriate conspicuous point on the site of the Project, a schedule showing all determined minimum wage rates for the various classes of laborers and mechanics to be engaged in Work on the Project under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by the laborers and mechanics so engaged.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 an act of government, such as a declaration of national emergency, that requires all Work to be stopped; or
- .3 because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents.
- .4 Intentionally deleted.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner, as its sole remedy, payment for Work properly executed, as well as reasonable and mutually agreed upon costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner's Representative and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

### § 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

The Owner may exercise any and all rights or remedies provided for herein, by law or in equity, either concurrently or singly in its sole discretion.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, three days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon secured for this project by the Contractor; and
- .2 finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment for the Work the Contractor performed until the Work is finished by another contractor in consideration of 14.2.4.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not

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expressly waived, such excess shall be paid to the Contractor, although the excess shall not exceed the unpaid Work performed by the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

### § 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

### § 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time and at its sole discretion, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; reasonable costs incurred by reason of the termination, including reasonable costs attributable to termination of subcontracts. For avoidance of doubt, "reasonable costs incurred by reason of the termination" shall not include lost profits or payments due to Subcontractors for any period of time subsequent to termination of the Contract.

§ 14.4.3.1 The Contractor shall be paid for all Work performed to the effective date of termination, and any "Reimbursable Expenses" outstanding as of the date of termination. The term "Reimbursable Expenses" shall include the cost of personal property or materials which meet requirements of the Contract Documents and have been purchased by the Contractor for incorporation into the Work but not yet incorporated therein; lease payments due to an unaffiliated third party lessor for equipment provided to the Project, where the lease term extends beyond the termination date of this Contract and the Contractor is unable to terminate said lease; and other costs approved by Owner's Representative. Reimbursable Expenses do not include lost profits or payments due to Subcontractors for any period of time subsequent to termination of the Contract. Upon payment of the Reimbursable Expenses, the Contractor shall deliver to the Owner any materials or personal property for which said payment has been made.

## ARTICLE 15 CLAIMS AND DISPUTES

### § 15.1 Claims

#### § 15.1.1 Definition

A Claim is a demand or assertion by the Contractor seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the Contractor..

#### § 15.1.2 Time Limits on Claims

The Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in

any case not more than 10 years after the date of Substantial Completion of the Work. The Contractor waives all Claims and causes of action not commenced in accordance with this Section 15.1.2.

### § 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by the Contractor shall be initiated by notice to the Owner, the Owner's Representative, and the Initial Decision Maker. Claims under this Section 15.1.3.1 shall be initiated within twenty-one (21) days after occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

*(Paragraph deleted)*

### § 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim and any subsequent judicial action or appeal, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker. The Owner and the Contractor shall act in good faith to efficiently and fairly resolve Claims and disputes arising under the Contract in order to avoid, wherever possible, formal legal proceedings.

### § 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4. The Contractor expressly waives any rights that it otherwise might have to include overhead costs for extended or unabsorbed overhead in a Claim for an increase in the Contract Sum.

§ 15.1.5.1 In the event of such interruption or suspension, the Owner and the Contractor shall negotiate in good faith in an effort to agree upon the additional construction costs and other amounts, if any, that shall be paid the Contractor because of the interruption or suspension of Work. Anything in the Contract Documents to the contrary notwithstanding, however, it is expressly understood and agreed that:

- .1 the total amount recoverable by and payable to the Contractor shall be limited to an amount equal to the sum of the additional construction costs and other amounts actually incurred by the Contractor because of the Owner's actions and omissions; plus a maximum overhead and profit allowance equal to fifteen (15) percent of the sum of additional construction costs and other amounts.
- .2 overhead costs for extended or unabsorbed overhead shall not be used as the basis for calculating or determining the amount of any additional construction costs or other amounts recoverable by or payable to the Contractor; and
- .3 by entering into this Contract with the Owner, the Contractor hereby waives any rights that it otherwise might have to pursue recovery of overhead costs for extended or unabsorbed overhead from the Owner.

### § 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

- .1 Where, under the Contract, Initial Decision Maker extends the amount of time specified for completion of the Project, the new time limit fixed by such extension shall be the essence of this Contract.
- .2 Time extensions and associated adjustments in the Contract Documents which are implemented by, or based on Change Orders, shall not include any allowance for extended and unabsorbed overhead costs.
- .3 Permitting the Work or any part of it to continue after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of

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the Owner, or any of the Owner's rights under the Contract or a waiver of any default by the Contractor.

**§ 15.1.6.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions in the locale in which the Work is being performed were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction. A determination on a Claims in accordance with Section 15.1.6.2 shall only be made by the Initial Decision Maker upon written request by the Contractor. Not all extension(s) in the allowable time for completion, when granted by Initial Decision Maker, will result in additional compensation to the Contractor.

### **§ 15.1.7 Waiver of Claims for Consequential Damages**

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

### **§ 15.2 Initial Decision**

As a condition precedent to Contractor's ability to pursue any monetary claim under Wis. Stat. §§ 16.008 and 775.01 or any form of judicial action against Owner, all Claims shall be referred to the Initial Decision Maker for initial decision in accordance with the following procedures:

- .1 First, the Contractor shall present its Claim to the Initial Decision Maker who shall have thirty (30) days after presentation of the Claim to take one or more of the following actions: (1) request additional supporting data from the Contractor, (2) reject the Claim in whole or in part, or (3) approve the Claim. Failure by the Initial Decision Maker to take such action within the time specified herein shall constitute a rejection of the Contractor's Claim.
- .2 If the Initial Decision Maker requests the Contractor to provide additional supporting data, the Contractor shall respond within the timeframe specified by the Initial Decision Maker, by (1) providing the requested supporting data, (2) advising the Initial Decision Maker that the supporting data cannot be provided within the timeframe specified, but that it will provide such supporting data by a specific date, or (3) advising the Initial Decision Maker that no supporting data will be furnished. After receipt of the response or supporting data, if any, the Initial Decision Maker shall have thirty (30) days to take one or more of the following actions: (1) request further additional supporting data from the Contractor, (2) reject the Claim in whole or in part, or (3) approve the Claim.
- .3 The Initial Decision Maker's decision shall: (1) be in writing; (2) state the reasons therefor; and (3) specify any change in the Contract Sum or Contract Time or both.

*(Paragraphs deleted)*

### **§ 15.3 Litigation**

**§ 15.3.1** Any judicial action relating to the construction, interpretation, or enforcement of the Contract Documents including without limitation, the Contractor's claims, demands, and causes of action for additional construction costs, delay damages, and other amounts owed hereunder, shall be brought and venue in the Dane County Circuit Court in Madison, Wisconsin. The Contractor hereby consents to personal jurisdiction in that venue, and waives any defenses that the Contractor otherwise might have relating thereto.

**§ 15.3.2** The Contractor hereby waives its right to a jury trial in connection with any judicial action or proceeding that may arise by and between the Owner and the Contractor concerning the construction, interpretation, or enforcement of

the Contract Documents including, without limitation, any claims, demands, or causes of action that the Contractor hereafter may assert against the Owner for additional construction costs, delay damages, and other amounts.



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# **Additions and Deletions Report for** **AIA® Document A201® – 2017**

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## **PAGE 1**

~~(Name and location or address)~~

**General Conditions, dated 11/9/2022**

**As stated in the A101 and B101 agreements for this project.**

...

~~(Name, legal status and address)~~

**Board of Regents of the University of Wisconsin System**

**c/o UW System Administration - CPB**

**780 Regent Street, Suite 239, Madison, WI 53715**

...

~~(Name, legal status and address)~~

**Architect as defined in A101 and B101 agreements for this Project.**

...

**11     ~~INSURANCE AND BONDS~~**

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The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, ~~Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda~~ AIA Document A201™–2017, General Conditions of the Contract for Construction, as modified and dated 11/9/2022 ("General Conditions"), any other Conditions of the Contract (Supplementary and other Conditions), Invitation to Bid the Project ("Invitation to Bid"), the Contractor's bid or proposal, Drawings, Specifications, Addenda, any changes in the Work approved by the Owner and Contractor issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work (as defined in section 7.4) issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include ~~the advertisement or invitation to bid, Instructions to Bidders, instructions to bidders, sample forms, other information~~ furnished by the Owner in anticipation of receiving bids or proposals, ~~the Contractor's bid or proposal, or portions of~~ Addenda relating to bidding or proposal requirements. Moreover, notwithstanding anything herein to the contrary, any and all terms or conditions contained in the Contractor's bid, proposal or response to the Invitation to Bid that were not explicitly solicited by the Owner in the Invitation to Bid is not included as part of the Contract Documents.

...

**§ 1.1.2.1** The Owner and the Contractor hereby commit themselves to good faith negotiation, coordination, and cooperation to assure the timely completion of the Project.

...

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, ~~location and dimensions~~ location, dimensions, and character of the Work, generally including but not limited to plans, elevations, sections, details, schedules, and diagrams.

...

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, forms, equipment, systems, standards and workmanship for the Work, and performance of related services.

...

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. ~~The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.~~ At the Owner's sole discretion, the Initial Decision Maker may be replaced at any time, for any reason. If the Initial Decision Maker is replaced, Owner shall provide notice to Contractor.

**§ 1.1.9 Contractor**

See 3.1.1 for definition.

**§ 1.1.10 Intentionally blank**

**§ 1.1.11 Delay**

A Delay is an event that causes an increase in the duration of the Project, or that changes the sequence of the Work or individual Work activities, thereby preventing completion of the Project within the time period specified in the Contract Documents.

#### **§ 1.1.12 Equal**

Equal means material, equipment or methods proposed and warranted by the Contractor as being equivalent to essential attributes of the material, equipment or method specified in the Contract Documents, and approved by the Architect and Owner's Representative.

#### **§ 1.1.13 Notice To Proceed**

Notice to Proceed is a written notice provided by the Owner to the Contractor authorizing the Contractor to proceed with Mobilization for the Work on a date specified therein and establishing the date for Substantial Completion of the Work.

#### **§ 1.1.14 Owner**

The Owner is the Board of Regents of the University of Wisconsin System. The Board of Regents of the University of Wisconsin System exercises the powers and duties prescribed by Wis. Stat. § 16.855. The terms "Board," "Board of Regents," or "The Board of Regents" as used in this document also refer to the Owner.

#### **§ 1.1.15 Reserved**

#### **§ 1.1.16 Owner's Representative**

Owner's Representative is the person or persons delegated authority to act on behalf of the Owner. The Owner's Representative will be designated in writing. Owner reserves the right to change its designated Owner's Representative at any time for any reason. If the Owner's Representative is changed, notice shall be provided.

#### **§ 1.1.17 Project Schedule**

The Project Schedule is a graphic and written analysis of activity duration and sequencing, which is required for successful completion of the Project within the time period identified in the Contract Documents. The Project Schedule shall be in sufficient detail to permit meaningful analysis of work tasks, durations and critical path to Substantial Completion in the sole opinion of the Owner's Representative.

#### **§ 1.1.18 Shop Drawing**

See 3.12.1 for definition.

#### **§ 1.1.19 Subcontractor**

The Subcontractor means a person or firm who enters into a contract with the Contractor or a Subcontractor to perform a portion of the Work. Unless otherwise specifically provided, the term Subcontractor includes Subcontractors of all tiers, and is equivalent to Sub-subcontractor for all provisions of this Contract.

#### **§ 1.1.20 Submittal**

Submittals includes Shop Drawings, Product Data, Samples, etc. submitted by the Contractor to the Architect regarding some portion of the Work.

#### **§ 1.1.21 Substitution**

Substitution means the use of material or equipment not specified in the Contract Documents, but that the Contractor proposes and warrants as suitable for the use intended and conforms to all other physical, functional, and performance requirements of the Contract Documents.

#### **§ 1.1.22 Surety**

Surety is a person or entity licensed to do business in the State of Wisconsin, who provides separate performance bonds and payment bonds to a Contractor to indemnify the Owner against all damages suffered by failure of the Contractor to perform the Work and to pay all lawful claims of Subcontractors, Material Suppliers, and laborers.

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**§ 1.2.1** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and with the standard of quality established by the Contract Documents and within the allowable time period specified. The Contract Documents are complementary, with technical provisions set forth in the Specifications and complemented by the Drawings and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the

extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. The failure of the Contractor to account for all aspects of the Work in its bid shall not relieve the Contractor from performing the Work. To the extent any terms or conditions in any of the Contract Documents conflict with one another, the more stringent or better quality requirement, in the Owner's sole discretion, shall be controlling without any increase in the Contract Time or Contract Sum.

**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the ~~Contract~~Contract

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any ~~trade-trade~~, except for the provisions of the Single Prime Bid dictated by statute.

...

#### **§ 1.2.4 Conflicting Conditions**

**§ 1.2.4.1** The Architect shall take all reasonable steps, and care common for the profession in the area, to assure that the Contract Documents are as accurate as possible, and provide information which, in the opinion of the Architect, is necessary in preparing bids and constructing the Project. However, it is mutually understood that discrepancies or conflicts in the Contract Documents may be identified, in which case:

- .1 addenda take precedence over the Specifications;
- .2 the Specifications take precedence over the Drawings;
- .3 stated dimensions take precedence over scaled dimensions;
- .4 large-scale detail drawings take precedence over small-scale drawings; and
- .5 schedules take precedence over other data on the plans.

**§ 1.2.4.2** Architect has the right for first interpretation of any ambiguity in the Contract Documents. Ambiguities in the Contract Documents will be resolved by the Owner if the Contractor and Architect cannot come to an agreement.

**§ 1.2.4.3** Where the terms "A/E," "Architect/Engineer," "Architect," or "Engineer" are used in technical Sections of the Specifications, the Contractor shall understand that actions indicated to be accomplished by such named parties are actions which are solely the responsibility of the professional technical advisor and consultant to the Owner and such actions thus require final approval by the Owner.

**§ 1.2.4.4** Periodically, the Architect may provide the Contractor additional instructions and drawings necessary to perform the Work. The Architect shall make a good faith effort to coordinate such instructions and drawings with the Contract Documents, preparing them so they can be reasonably interpreted as a part thereof. If such additional instructions change the scope of Work, provisions of Article 7, Changes in the Work, shall be followed.

Terms capitalized in these General Conditions and Contract Documents include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

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**§ 1.5.1** ~~The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Drawings, Specifications, and other Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in~~



connection with the Project is not to be construed as publication in derogation of the ~~Architect's or Architect's consultants' reserved rights.~~ reserved ownership rights. Any Drawings, Specifications, and other Instruments of Service for this Project shall become the property of Owner on completion and/or acceptance of the work, or upon any basis of termination of the Contract.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. ~~All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service.~~ The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, ~~and~~ and, if necessary, the Architect's consultants.

...

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission ~~if a method for electronic transmission is set forth in the Agreement,~~ when there is reasonable evidence that the notice was read by the recipient.

...

§ 1.6.3 The Contractor's presentation to Owner's Representative, or mailing, of such notice to Owner's Representative is a condition precedent to any liability of the Owner for any actual or alleged breach of the Owner's contractual obligations hereunder. The Contractor's failure to give such written notice in the manner and time prescribed by the Contract Documents shall result in the waiver of any and all claims, demands and causes of action that the Contractor may have against the Owner arising from or in connection with the actual or alleged breach.

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties ~~will~~ may use AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data. In lieu of separate agreed upon digital form protocols, or the AIA Document E203, industry accepted standards shall govern the digital communication of data, as approved by the Owner.

...

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set ~~forth in AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™-2013, Project Building Information Modeling Protocol Form,~~ shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees. If Building Information Model and AutoCAD protocols are not established with the preceding, protocols will default to State of Wisconsin Department of Administration protocols.

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§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing ~~a representative an Owner's Representative,~~ who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative. authorization, provided, however, that changes to the Contract Documents that modify the General Conditions, Contract cost, and/or Contract time shall only be executed by a person duly authorized with signatory authority by the Board of Regents of the University of Wisconsin System. Person(s) with signatory authority will be furnished upon request.

~~§ 2.1.2~~ The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

~~§ 2.2~~ Evidence of the Owner's Financial Arrangements The Owner reserves the right to conduct a detailed audit of Contractor and Architect's documents, including, but not limited to: Change Orders and supporting documentation, Construction Change Directives and supporting documents, and any other documentation on the Project related to costs, timeline, and scope.

~~§ 2.2.1~~ Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

~~§ 2.2.2~~ Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

~~§ 2.2.3~~ After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

~~§ 2.2.4~~ Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

...

~~§ 2.3.2~~ The Owner shall retain an architect lawfully licensed to practice ~~architecture, architecture or engineering,~~ or an entity lawfully practicing ~~architecture, architecture or engineering,~~ in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

...

~~§ 2.3.4~~ The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall ~~be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.~~

...

§ 2.3.7 The Owner shall furnish surveys described in Section 2.3.4 and other information prepared by third parties for the Project to the extent the Owner deems necessary for the performance of the Contractor's services, and shall not withhold any reasonable information. The Owner makes no representations or warranties as to the accuracy and/or the completeness of the information it obtains from third parties and provides to the Contractor pursuant to this Section 2.3. In addition, the Owner may provide the Contractor access to the Owner's records, which may contain information about the site and adjacent land and improvements that was not collected specifically for the Project. The Owner makes no representations as to the relevance, accuracy or completeness of information made available to the Contractor from the Owner's records. Contractor shall notify Owner of any discrepancies or information which is lacking in the information provided by the Owner of which Contractor is aware or reasonably should be aware.

§ 2.3.8 The Contractor shall attend all pre-construction meetings, which will be scheduled by the Owner's Representative and Architect.

§ 2.3.9 The Owner's Representative or Architect will schedule progress meetings with the Contractor. At each such progress meeting, the parties will discuss the above-mentioned items, cooperate with others to assure successful completion of the Work, and help to quickly resolve problems which arise.

If~~In~~ the event that any of the Work in progress, or Work already completed by the Contractor, or Subcontractors, is determined by the Owner's Representative to be of substandard quality, defective, or otherwise in violation of requirements of the Contract Documents, or if the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails or refuses to carry out Work in accordance with the Contract Documents, the Owner may issue ~~a written order~~ an order by written Notice to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4.1 The Contractor shall have ten (10) calendar days after the serving of such Notice within which to take corrective action or to make arrangements judged satisfactory by the Owner's Representative for the corrections to be made. If corrective actions or other arrangements are not judged satisfactory by the Owner's Representative, the Owner may terminate the Contract in accordance with the provisions of the General Conditions of the Contract.

§ 2.4.1.1 If, after suspension of the Work, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the suspension or termination had been issued for the convenience of the Owner under the Contract.

§ 2.4.2 The Owner's Representative may order the Contractor, in writing, to suspend or delay all or any part of the Work of the Contractor for the period of time that the Owner's Representative determines appropriate for the convenience of the Owner.

§ 2.4.2.1 If the Contractor determines that the cost of the Work is altered by such suspension, or the time for completion of such Work is altered or delayed, the Contractor shall provide Notice to the Owner's Representative of any such costs or delay;

§ 2.4.2.2 Such Notice shall be made within ten (10) calendar days of the order to stop or suspend Work;

§ 2.4.2.3 Provision of such Notice to the Owner's Representative shall be a condition precedent to any Owner liability for increased costs, delay, or time extension.

§ 2.4.3 The Owner may exercise any and all rights or remedies provided for herein, by law or in equity, either concurrently or singly in its sole discretion.

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If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of ~~notice~~ Notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. ~~Such action by the Owner and amounts charged to the Contractor are both subject~~

~~to prior approval of the Architect and the Architect~~ The Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. Correction of such deficiencies shall not prevent the Owner from recovery of other damages or penalties sustained as a result of the Contractor's default or neglect. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

## **§ 2.6 Owner's Responsibility For The Site**

**§ 2.6.1** Prior to start of construction, the Owner shall furnish land and rights-of-way necessary for the carrying out and completion of the Work to be performed under this Contract.

**§ 2.6.2** Reserved.

**§ 2.6.3** Reserved.

**§ 2.6.4** The Owner's Representative shall act on any Notice as soon as practicable. If the Owner's Representative determines that the conditions reported by the Contractor differ materially from those indicated in the Contract Documents, or are of an unknown and unusual nature which could not have been discovered during a reasonable site investigation by the Contractor, then to the extent established by the Contractor and approved by the Owner, the Owner shall authorize an increase or decrease in the scope, cost, and/or time required for performing any part of the Work under this Contract.

**§ 2.6.5** No request by the Contractor for an equitable adjustment to the Contract shall be allowed, unless the Contractor gives proper Notice, which is a condition precedent to any liability on the part of the Owner.

**§ 2.6.6** In no event shall any claim by the Contractor for equitable adjustment to the Contract for differing site conditions be allowed if presented after final payment under this Contract is made.

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**§ 3.1.1** The Contractor is the person or entity identified as such in the Agreement that has contracted with the Owner to perform the Work as required by the Contract Documents and enters into contracts with Subcontractors including mechanical, electrical, plumbing and fire protection subcontractors identified by the Owner during the Single Prime bidding process. The Contractor is referred to throughout the Contract Documents as if singular in number. ~~The Contractor-Contractor, and all Subcontractor and Sub-subcontractors~~ shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized ~~representative-representative~~, but does not include the Owner or the Architect.

**§ 3.1.1.1** The Contractor represents and warrants that the scheduling, coordination, and monitoring activity for all Work will be placed under the direct control and supervision of a person experienced in construction scheduling, means and methods. If such experience and knowledge must be obtained by contracting with a separate scheduling consultant, the entire cost of such consultant shall be borne by the Contractor. Additionally, the Contractor fully agrees to cooperate in all respects with all Subcontractors and suppliers to provide all data required, and shall coordinate the activities of its own workforces and the work forces of the Subcontractors, in such manner and at such time as to not cause a delay in the Project

**§ 3.1.1.2** The Contractor's bid price shall include the performance of all Work which:

- .1** in accordance with industry standards, customary practice, or by reasonable inference are details of Work that are necessary as part of the construction, operation, and coordination and interface of the Work;
- .2** would necessarily be readily apparent to one skilled in the trades; and
- .3** a component an experienced Contractor would recognize as part of its responsibility.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents. Documents and in a good and workmanlike manner in accordance with generally accepted standards of construction of projects similar to the Project.

§ 3.1.2.1 The Contractor has the full and complete responsibility for the accomplishment of all Work within the specified time indicated in the Contract Documents, except where the Contract Documents explicitly and specifically place a limited duty for completion on the Owner.

§ 3.1.2.2 The Contractor is hereby put on notice that failure to furnish data or cooperate in good faith is a material breach of Contract and may be the basis for a termination for cause under the procedures set forth in these General Conditions. In the event of such material breach the Owner's Representative, in addition to, and not in lieu of the right to termination for default, may acquire the services of a scheduling specialist to perform any such duties and charge the cost thereof to the Contractor. In the event that the Owner's Representative is required to acquire any replacement scheduling services, the Contractor shall conform to any revised schedule resulting therefrom.

§ 3.1.2.3 In addition to the criteria set forth in these General Conditions, the full and complete performance of Contractor's obligations under this Contract is a condition precedent to the right of the Contractor to payment of any sums due. In the event of any delays by the Contractor or other breach hereof which gives rise to penalties and/or damages to the Owner, then in any such event the Owner's Representative may offset such penalties and damages against the sums due or to become due the Contractor hereunder.

§ 3.1.2.4 Any Work necessary to be performed after regular working hours, on Sundays, or legal holidays, and for which the Contractor is responsible, shall be performed without additional expense to the Owner.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, the presence and observation of the Work by the Architect, the Owner, or Owner's Representative, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.1.3.1 In the event it becomes necessary to interpret this Article 3.1, the interpretation shall strive to achieve timely, effective and efficient performance of the Work under the Contract within the allowable time identified in the Contract Documents, and at no extra cost or inconvenience to any party, if at all possible.

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§ 3.2.1.1 The Contractor represents and warrants it has taken the steps reasonably necessary to prepare a bid which includes the costs for Work, the requirement for which would reasonably be known to a competent contractor, in overcoming normal subsurface conditions at the site where the Work is to be performed and in order to accomplish the Work described in the Contract Documents. Additionally, the Contractor certifies that it has investigated the site and satisfied itself as to the general and local conditions which affect the Work or its cost, including, but not limited to:

- .1 conditions bearing upon transportation, disposal, handling, and storage of materials;
- .2 the availability of labor, water, electric power, and roads or access;
- .3 uncertainties of weather, river stages, tides, or similar physical conditions at the site;
- .4 the conformations and conditions of the ground; and
- .5 the character of facilities and equipment as represented by the Contract Documents.

§ 3.2.1.2 The Contractor also acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from a non-exploratory, visual inspection of the site, and information included in the Contract Documents.

§ 3.2.1.3 Any failure of the Contractor to take the actions described in the Contract Documents will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the Work, or for proceeding to successfully perform the Work without additional expense to the Owner.

§ 3.2.1.4 The Owner assumes no responsibility for any erroneous conclusions or interpretations made by the Contractor based on the information made available by the Owner. The Owner expects the Contractor to have the ability to interpret provided technical information, including geotechnical information, which would be reasonably analyzed or interpreted by any contractor knowledgeable and skilled in the work required to be performed. If the

Contractor does not have the ability to interpret or analyze such information, it is the responsibility of the Contractor to obtain the professional services required to perform such analysis. The Owner assumes no responsibility for any understanding reached or representation made concerning conditions which can affect the Work by any of its officers, representatives, or agents before the execution of this Contract, unless that understanding or representation is expressly stated in the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect and Owner's Representative any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect or Owner may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Owner's Representative and Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect-Owner may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect or Owner's Representative issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, ~~subject to Section 15.1.7, Owner~~ as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public ~~authorities~~ authorities unless the Contractor recognized such error, inconsistency, omission or difference and failed to report it to the Architect. If the Contractor performs any construction activity involving an error, inconsistency, omission or difference in the Contract Documents that Contractor knowingly recognized or should have reasonably recognized without such notice to the Architect and Owner, the costs for correction will be allocated among the responsible parties.

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§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall (1) give timely notice to the Owner and Architect, and Owner's Representative and Architect; (2) shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

...

§ 3.3.3.1 The Contractor shall, except where a provision of the Contract Documents explicitly states to the contrary, have the full, complete, and absolute responsibility and obligation for ensuring that the Work performed strictly conforms to the requirements set forth in the Contract Documents. The Contractor shall maintain an adequate inspection and quality control system and shall perform such inspections as will ensure that the Work performed under this Contract conforms to the requirements of the Contract Documents.

§ 3.3.3.2 At the initial pre-construction meeting, the Contractor shall provide the Owner's Representative a full description of the Contractor's safety, quality control and inspection system and method of implementation.

§ 3.3.3.3 Prior to the start of significant on-site work by any trade, Owner's Representative, the Contractor's superintendent and the Subcontractor's foremen, shall conduct a pre-installation conference. The purpose of the meeting is to review and discuss Contract requirements applicable to the work, samples required, level of quality necessary, and find answers to any questions that may arise. Such meeting is in addition to regularly-scheduled progress meetings and will be arranged on-site by Owner's Representative.

§ 3.3.3.4 The Contractor shall maintain complete inspection records and test data to ensure that quality of the Work is in strict compliance with the terms of the Contract Documents. These records shall be available to the Architect and Owner's Representative at all reasonable times and places. The doctrine of "substantial conformity" to the quality requirements of the Contract Documents shall have no application, unless the Owner's Representative accepts the Work in accordance with the Contract.

§ 3.3.3.5 The Owner reserves the right to conduct its own quality assurance verification, and to observe, inspect, and /or conduct tests relative to Contractor and Subcontractor performance. If, when conducting its own quality assurance program, the Owner determines that the Work or a portion thereof does not comply with requirements of the Contract Documents, the Owner shall attempt to notify the Contractor of such deficiencies as soon as practicable. However, the Owner's exercise of rights under this provision does not:

- .1 relieve the Contractor of the responsibility for providing adequate inspection and quality control measures or the proper documentation of the occurrence of the events required to be tested or monitored in the performance of the Work required by the Contract Documents; and shall provide no basis for waiver or estoppel claims to be asserted against the Owner;
- .2 relieve the Contractor of responsibility for damage to or loss of the material before acceptance;
- .3 constitute or imply acceptance on the part of the Owner; or
- .4 affect the continuing rights of the Owner after acceptance of the completed Work, except as specifically stated to the contrary in the Contract Documents.

§ 3.3.3.6 The presence or absence of the Owner's Representative does not relieve the Contractor from any Contract requirement. If the Contractor desires waiver of any technical or Contract requirement or any other deviation from the strict requirements of the Contract Documents, a specific request for such waiver or deviation must be made to the Owner's Representative and Architect for consideration.

§ 3.3.3.7 The Contractor shall, without charge, replace or correct Work found not to conform to the Contract Document requirements, unless the Owner agrees to accept the non-conforming Work with an appropriate adjustment in the Contract price thereof. Such acceptance of non-conforming Work shall, whether the determination is to be made at the time of final completion or during the performance of Work, be based upon a determination by the Owner that the deviation from Contract Documents requirements does not adversely affect the integrity of completed Work.

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the ~~Work~~, Work within the specified time, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. No materials or supplies which are to become part of the Work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage, conditional sale contract, or other agreement by which a security interest is retained by the seller.

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§ 3.4.2.1 It is not the intention of the Owner to limit or restrict competition by the use of any reference to a particular manufacturer, process, technique, catalog number or other identifying information. Such proprietary specifications are

intended to establish a level of quality or the minimum essential requirements to which the Contractor must conform, unless more explicit restrictions are stated to apply.

**§ 3.4.2.2** When the Contract Documents list performance or functional characteristics in connection with Work to be performed, these characteristics are mandatory for reasons of design. Use of any Substitution shall be subject to the prior written approval of the Architect.

**§ 3.4.2.3** Material, equipment, or processes offered for use as a Substitution may be proposed by the Contractor in writing. Such proposals shall guarantee the proposed Substitution to be capable of performing the duties of the originally specified material, equipment, or process. The Architect shall respond to any such proposal as soon as practicable, but in no case later than seven (7) calendar days after receipt of such proposal.

**§ 3.4.2.4** It shall be the sole responsibility of the Contractor to provide all documentation, regardless of type or quantity, to clearly establish the qualifications of items proposed as Substitutions under this Contract. If the value of the Substitution is less than the item specified in the Contract Documents, then an equitable reduction of the price of the Contract shall be made.

**§ 3.4.2.5** When Substitutions are approved by the Owner's Representative and incorporated into the Project by the Contractor, all costs incurred to 1) correct deficiencies in items, 2) provide for installation or hookup, or 3) to achieve performance specified in the Contract Documents, will be borne by the Contractor.

**§ 3.4.2.6** Any substitute material or equipment installed by the Contractor without approval of the Owner's Representative may be subject to immediate removal, at sole discretion of Owner's Representative, and all costs required to conform to the Contract Documents shall be borne by the Contractor.

**§ 3.4.2.7** The Contractor shall assume all liability and responsibility for any changes in the Work or additional Work required to accommodate use of proposed and approved Substitutions. The Owner's approval of such Substitutions does not relieve the Contractor from the obligation to pay all additional costs resulting from their inclusion in the Work, even if additional costs or Work become apparent after execution of the change or installation of the Substitution. The Contractor's liability shall include payment of any additional costs incurred by the Owner, made necessary by, or directly connected to, such changes.

...

**§ 3.5.1** The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements, including Substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the ~~Architect~~, Architect or Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The Contractor's warranty under this Section is not exclusive, and any other express warranties stated elsewhere, may also be exercised by the Owner at its option.

...

**§ 3.5.3** The Contractor warrants to the Owner that all materials and supplies used in the Work are free from all liens, claims, or encumbrances, and good title to materials and supplies is retained by the Contractor and shall be conveyed prior to approval of final payment.

**§ 3.5.4** Intentionally deleted.

**§ 3.5.5** Intentionally deleted.



§ 3.5.6 Intentionally deleted.

§ 3.5.7 The Contractor shall remedy, at the Contractor's expense, any defect in the Work. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to the Owner's property, whether controlled or owned, when the damage is the result of:

- .1 the Contractor's failure to conform to Contract Document requirements; or
- .2 any defect in equipment, material, workmanship, or design furnished by the Contractor or Subcontractors regardless of tier.

§ 3.5.8 Intentionally deleted.

§ 3.5.9 The Owner's Representative shall give Notice to the Contractor within a reasonable time after discovery of any failure, defect, or damage.

§ 3.5.10 If, after the receipt of a Notice of a claim under this warranty, the Contractor fails to remedy any failure, defect, or damage within a time judged reasonable by the Owner's Representative, the Owner's Representative shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage, at the Contractor's expense.

§ 3.5.11 All warranties under this Contract or in any related to this Contract, express or implied, shall be obtained for and shall be subject to direct enforcement by the Owner. The Contractor shall provide in each subcontract, or other purchase agreement, for the assignment to the Owner of all such warranties and for the right of enforcement by the Owner. In addition, if necessary the Contractor shall:

- .1 obtain for the Owner's benefit all warranties that would be given in normal commercial practice;
- .2 require all warranties to be executed, in writing, for the benefit of the Owner, if so directed by the Owner's Representative;
- .3 enforce all warranties for the benefit of the Owner; and
- .4 obtain for the Owner's benefit all warranties given by any Subcontractor, at any tier, if such warranty is in excess of the one (1) year warranty period set forth herein.

§ 3.5.12 Unless a defect is caused by the negligence of the Contractor or Subcontractors at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Owner.

§ 3.5.13 The Contractor shall require any Subcontractor manufacturers or suppliers to execute their warranties, in writing, directly to the Owner.

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect, all sales, consumer, use, and other similar taxes required by law assessed to or arising out of the construction of the Project. Per 2017 Wis. Stat. § 77.54 (9m), building materials sold to a construction contractor that will become a component of a facility owned by the Board of Regents of the University of Wisconsin System are exempt from sales and use tax.

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§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations ~~concluded~~, and shall provide evidence of such permits, licenses, and approvals at the initial pre-construction meeting or before commencement of the Work.

§ 3.7.1.1 Charges for water, sewer, and other utility connections made by municipalities will be paid by the Owner. Payment for use of such services and utilities before Substantial Completion shall be in accordance with provisions of the Contract.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the ~~Work~~ Work and/or relating to environmental quality and safety, the performance of the Work, the protection of adjacent property, and the maintenance of passageways, guard fences, or other protective facilities. Such Work shall not be subject to the ordinances or regulations (except land use zoning) of the municipality in which the construction takes place, including

ordinances or regulations relating to materials used, permits, supervision of construction or installation, payment of permit fees, or other restrictions of any nature whatsoever. The Owner's Representative shall be notified by the Contractor of any notices of noncompliance or violation associated with Work required by the Contract Documents.

§ 3.7.2.1 Where Contract Documents require abatement of asbestos containing materials, prior written notice to the State of Wisconsin, Department of Natural Resources is required. The Contractor shall provide evidence of such notice prior to commencement of the Work. The Contractor shall follow all State of Wisconsin and Federal rules associated with asbestos abatement.

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§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable ~~objection~~ objection, except for Subcontractors selected in the single prime bidding process.

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§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in continuous attendance at the Project site during performance of the ~~Work~~ Work, or as approved by Owner's Representative. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. This person shall be delegated authority to act on behalf of the Contractor, and shall be, to the extent possible, a single point of contact and communication for the Owner's Representative, Architect, and all Subcontractors to facilitate efficient, timely, and cost effective completion of the Work. Communications between the Architect and Contractor shall be timely relayed to the Owner's Representative.

...

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Work shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the Work. Any delays in Contractor's performance of the Work relative to the schedule shall be governed by Section 8.3 hereof.

§ 3.10.1.1 The Project Schedule shall incorporate all activities, events, and milestones required for successful Project completion within the allowable time for completion specified in the Contract Documents. The Contractor shall prepare a breakdown of all Work activities or events, whether the activities are to be performed by the Contractor's own forces, those of Subcontractors or the Owner, indicating the proposed duration and sequencing of such activities for successful completion of the Project within the allowable time specified in the Contract Documents. No single Work activity in the Project Schedule shall be for more than \$500,000 in Contract value or for a duration greater than four (4) successive weeks, as approved by the Owner's Representative. The Contractor shall also identify whether any Work activity or event is dependent on the Work of its own forces or with those of the Owner. The failure to list any activity or to perform any other duty required by or incident to that required by the Contract Documents shall not be the basis of a claim for adjustment of any provision of this Contract, or of any other type of claim whatsoever.

§ 3.10.1.2 The Contractor shall, within fourteen (14) calendar days from the Contract award, develop and publish a Project Schedule for the first sixty (60) calendar days of the Project. The completed Project Schedule, for all Work activities through Project completion, shall be developed and published within this sixty (60) day period. Pursuant to Wis. Stat. § 16.855 (14m)(d), the Contractor must base this Project Schedule on the schedule that the mechanical, electrical or plumbing Subcontractors and Contractors bid on (in the Specifications or bid instructions), unless otherwise agreed to by the Subcontractor. The Contractor shall update the Project Schedule monthly.

§ 3.10.1.3 If the Contractor's Work depends upon construction or operations by the Owner, the Contractor shall, prior to proceeding with that portion of the Work, promptly give Notice to the Owner's Representative of any apparent deficiencies or defects in such other construction that would render it unsuitable for such proper execution and

results. Failure of the Contractor to so report shall constitute an acknowledgment that the Owner's completed or partially completed construction is fit and proper to receive the Work, except as to defects not then reasonably discoverable.

§ 3.10.1.4 The Contractor shall identify forthwith any critical event which will require the Owner to act or to refrain from acting, or critical time periods within which the Owner must complete activities or Work for which the Owner is responsible under the Contract. Timely Notice of any such identified event or time period shall be given to the Owner. The giving of such Notice is a condition precedent to the creation of any duty of the Owner to take any action or to refrain from taking any action. The failure of the Contractor to give such Notice forthwith shall thereafter bar and preclude any claim by the Contractor for adjustment of any Contract provision or claim predicated on the breach of any obligation by the Owner.

§ 3.10.1.5 The bonds furnished to secure these commitments shall be applicable to each and every one of these time and scheduling commitments.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current ~~submittal~~-Submittal schedule, shall submit a ~~submittal~~-Submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The ~~submittal~~-Submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review ~~submittals~~-Submittals. If the Contractor fails to submit a ~~submittal~~-Submittal schedule, or fails to provide ~~submittals~~ Submittals in accordance with the approved ~~submittal~~-Submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of ~~submittals~~-Submittals.

§ 3.10.2.1 If the Contractor submits for approval items which do not strictly comply with the design requirements of Contract Documents, the Contractor shall provide all engineering or design information necessary for complete evaluation of the Submittal by the Architect and Owner's Representative. If it is determined by the Contractor or the Owner's Representative that the services of a professional consultant, engineer or architect are required to provide such information, the Contractor shall acquire such services at its own expense.

§ 3.10.2.2 If the Contractor believes that requirements of the Contract Documents are in conflict with the manufacturer's recommended method of installation or application of specified materials, products, or systems, the Contractor shall indicate such possible conflicts at the time of submittal.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to and approved by the Owner and Architect.

§ 3.10.3.1 The Owner shall be given the opportunity to schedule its own Work as conveniently as is consistent with the overall needs of the Project Schedule.

§ 3.10.3.2 Where any Work activity required for completion of the Project is completed in less time than required, anticipated, or otherwise allowed by the Project Schedule, the unused time, hereinafter called Float, shall belong to the Project, to be used by the Contractor as the Project needs determine, including but not limited to providing additional time for completion of any other Work activities required for completion of the Project. Float shall not be considered owned, subject to the exclusive use, or management by any of the interested participants. No claim against the Owner or the Contractor shall be made by any party for the loss of Float time.

§ 3.10.3.3 The Contractor shall be independently responsible for resolving any time related matters with Subcontractors, suppliers, or others who may furnish supplies or services on the Project. No liability shall attach to the Owner, for the failure of any party to carry out the coordination and scheduling responsibilities which they have assumed under the Contract.

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The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required ~~submittals~~-Submittals. These shall be in electronic form or paper copy, available to the Architect and

Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

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§ 3.12.3 Samples are physical ~~examples~~ examples, such as mock-ups, that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar ~~submittals~~ Submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require ~~submittals~~ Submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational ~~submittals~~ Submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action. The following provisions shall apply to all Submittals:

- .1 the Contractor notes the conspicuous nature of this article and agrees that these provisions are material provisions and are to be enforced, in the event of controversy, in such a manner as to place upon the Contractor the full, complete, and total responsibility for the Submittal's conformance with the requirements of this Contract, and suitability or usability of preliminary submissions by the Contractor, without regard to any the Owner action or failure to act.
- .2 all Submittals and supporting information shall be delivered to a party designated by the Owner, who shall act on any such Submittal within 14 calendar days or notify the Contractor in writing, of the time required for such action if greater than the aforementioned 14 day period. Such designation shall take place at the initial Project pre-construction meeting. Review of the Submittals for conformance with requirements of the Contract Documents shall be completed by the party responsible to the Owner for Project design. A copy of all such Submittal and transmittal forms shall also be sent to the Owner's Representative.
- .3 the Contractor shall make Submittals in a timely fashion to assure completion of the entire Project within the allowable time specified in the Contract Documents. The timing of such Submittals shall be subject to the provisions of the contract.
- .4 each Submittal by the Contractor shall contain the cover page included in the Specifications. Such cover page shall be signed by a representative of the Contractor responsible for review of the Submittal to assure compliance with requirements of the Contract Documents.
- .5 the Contractor timing and phasing of Submittals shall be appropriate to the critical path Project Schedule, and to facilitate the timely review by the Architect.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar ~~submittals~~ Submittals required by the Contract Documents, in accordance with the ~~submittal~~ Submittal schedule approved by the Architect or, in the absence of an approved ~~submittal~~ Submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors. Submittals shall be provided in response to requests for Submittals by the Owner's Representative, or whenever required by the Contract Documents.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar ~~submittals~~ Submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such ~~submittals~~ Submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar ~~submittals~~ Submittals, until the respective ~~submittal~~ Submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved ~~submittals-Submittals~~ except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar ~~submittals-Submittals~~, unless the Contractor has specifically notified the Architect and Owner's Representative of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar ~~submittals-Submittals~~, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar ~~submittals-Submittals~~, to revisions other than those requested by the Architect on previous ~~submittals-Submittals~~. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

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§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all ~~drawings, calculations, specifications-Drawings, calculations, Specifications~~, certifications, Shop Drawings, and other ~~submittals-Submittals~~ prepared by such professional. Shop Drawings, and other ~~submittals-Submittals~~ related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on ~~submittals-Submittals~~ only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

...

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Contractor shall make commercially reasonable efforts to avoid interruptions to the Owner's operations.

...

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably ~~withhold-withhold~~ from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

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§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do ~~so-so~~, and the Owner shall be entitled to reimbursement from the Contractor.

...

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account ~~thereof, thereof~~ but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings,

Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

...

**§ 3.18.1** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, ~~Architect's consultants, and agents and employees of any of them~~ its agents and employees from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

**§ 3.18.1.1** The obligations of the Contractor under this indemnification shall not extend to the liability of the Owner, the Architect and its agents or employees thereof arising out of (1) preparation or approval of maps, Drawings, opinions, reports, surveys, change orders, designs or Specifications, or (2) the giving of or the failure to give directions or instructions thereof provided such giving or failure to give is the cause of the injury or damage.

...

### **§ 3.19 Contractor Performance Evaluation**

**§ 3.19.1** The Contractor acknowledges that following completion of the Work, the Owner's Representative will evaluate the Contractor's performance under this Contract. Such evaluation may take place after Substantial Completion or after Final Completion of the Work, as determined by Owner's Representative. The purpose of such evaluation includes, but is not limited to, determining whether or not the Contractor responsibly performed its Contractual obligations and whether or not the best interests of the Owner were promoted thereby.

**§ 3.19.2** Owner's Representative shall provide a copy of any such performance evaluation to the Contractor, as soon as practicable after completion of such evaluation.

**§ 3.19.3** The Contractor may appeal results of the Contractor's performance evaluation completed by the Owner's Representative by submitting a request for performance review to the Owner. Any such request must include the reasons for such request, and documentation necessary to substantiate the Contractor's claim that initial performance evaluation was inappropriate or otherwise in error.

**§ 3.19.4** The Owner reserves the right to waive the results of such performance evaluation(s) if, in the opinion of the Owner, corrective action has been taken to remediate substandard performance, events beyond the control of the Contractor resulted in substandard performance, or the best interests of the Owner will be served.

**§ 3.19.5** The Contractor acknowledges and agrees that such evaluation(s) may be used by the Owner pursuant to Wis. Stat. § 16.855(9m) when determining whether the Contractor is a "qualified responsible bidder" for future Project(s); provided, however, any such evaluation made more than five (5) years prior to the submission of any such subsequent bid shall not be considered in any event.

**§ 3.19.6** The Contractor acknowledges and agrees that all such evaluations so prepared by Owner's Representative shall constitute "open public records" available for inspection and copying as provided for by law.

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**§ 4.1.2** Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the ~~Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.~~ Owner.

...

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents ~~and will be an Owner's representative during construction until the date the Architect issues~~ until the date of the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

...

§ 4.2.6 The Architect has authority to ~~advise the Owner to reject~~ Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect ~~will have authority to require~~ shall recommend that the Owner require additional inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a ~~decision recommendation~~ made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's ~~submittals~~ Submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such ~~submittals~~ Submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's ~~submittals~~ Submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

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§ 4.2.9 The Architect will work with the Owner's Representative to conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue assist the Owner's Representative in issuing Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more ~~Project~~ representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

...

§ 4.2.12 Interpretations and ~~decisions recommendations~~ of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and ~~decisions recommendations~~, the Architect will endeavor to secure faithful performance by both Owner and Contractor, ~~will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith Contractor.~~

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be ~~final if~~ consistent with the intent expressed in the Contract ~~Documents Documents~~ and the Contractor will adhere to those decisions.

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§ 5.2.1.1 The Contractor must offer a subcontract to the successful mechanical, electrical, plumbing, and sprinkler (MEP) Subcontractors identified by the Owner and included in the Contractor's bid. This subcontract between a Contractor and a MEP Subcontractor must include a scope of work clause identical to the scope of work clause included in the Bid Documents and the contract between the Contractor and the Owner. A Contractor and a MEP

Subcontractor may not enter any agreement in connection with bids submitted that would alter or affect the scope or price of the contracts entered into. This prohibition does not apply to the Owner's Change Orders that result in changes to the plans or specifications, or to back charges allowed by the Contract.

§ 5.2.1.1.1 The Contractor shall base its Project Schedule on the schedule in the Specifications and bid instructions unless otherwise agreed to by the MEP Subcontractor.

§ 5.2.1.2 The Contractor may enter into subcontracts for work other than MEP Subcontractor work, if subcontractors are approved by Owner's Representative through the Request for Subcontractor Approval Form. However, the election to subcontract Work shall not relieve the Contractor from responsibility or liability which it has assumed under this Contract. The Contractor shall remain liable to the same extent that its liability would attach, as if the Work had been performed by the Contractor's own employees. If the Specifications require or otherwise designate only one Subcontractor or source of supply for Work required under the Contract Documents, the Contractor's failure to acquire suitable contract arrangements with such Subcontractor or source of supply shall not excuse the Contractor from full responsibility and liability for any failure or default of such source of supply.

§ 5.2.1.3 Bidders shall submit a completed Request for Subcontractor Approval Form with their bid or within seven days of the Contractor bid opening. Submission of a completed Request for Subcontractor Approval Form is an element of responsiveness. Failure to submit this completed form within the above time limits will be considered unresponsiveness and may result in contract award to the next apparent low bidder. When no Subcontractors are anticipated, the Contractor shall give notice of this fact on the Request for Subcontractor Approval Form within the time limits noted above.

§ 5.2.1.4. All Subcontractors are subject to Owner's approval. The Owner may request, or the Contractor may provide, any of the following information to substantiate the proposed Subcontractors' qualifications or ability to perform the Work. The Owner shall consider such information when reviewing the qualifications of proposed subcontractors to determine whether such qualifications serve the best interests of the Project.

- .1 The amount of experience completing similar Work to that required by the Contract Documents;
- .2 The quality of work the proposed Subcontractor has provided on past projects;
- .3 The extent of available staffing and financial resources of the proposed Subcontractor;
- .4 The Contractor's intended method of monitoring the proposed Subcontractor's Work;
- .5 The level of supervision of the Subcontractor's Work which the Contractor will provide; and
- .6 Any other information regarding the proposed Subcontractor's ability to complete the Work.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, and met all other applicable criteria, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution. The Contractor shall not replace any Owner-identified or approved Subcontractor or material supplier without written approval of the Owner. Any Contractor request for replacement of a Subcontractor previously approved by the Owner shall include the reason(s) for such replacement and all documentation necessary to substantiate such change.

§ 5.2.5 The Contractor shall maintain a list of all Subcontractors and suppliers performing labor or furnishing materials for the Project.

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**§ 5.4 Contingent Assignment of Subcontracts**

- § 5.4.1** Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that
- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
  - .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

**§ 5.4.2** Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

**§ 5.4.3** Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

**§ 5.3.1** The Contractor shall be fully responsible for all acts and omissions of all Subcontractors and shall be responsible for scheduling and coordinating the Work of all Subcontractors and material suppliers.

**§ 5.3.2** Nothing herein shall be construed to create any express or implied contractual relationship between Owner and any of the Contractor's Subcontractors, suppliers or vendors.

**§ 5.3.3** The Contractor shall cause Article 10.2 (Safety of Persons and Property), with appropriate changes in paragraph and entity designation, to be incorporated in all Subcontracts, regardless of tier.

**§ 5.3.4** The Contractor shall insert the following mandatory provisions, with appropriate changes in paragraph and entity designation, in all subcontracts with Subcontractors:

- .1 Article 9 - Payments and Completion
- .2 Article 9.6.2 and 9.6.5.1- Progress Payments
- .3 Article 13.9 - Minimum Wages

**§ 5.3.5** Pursuant to Wis. Stat. §16.855 (14m)(a), any contract that the Contractor (referred to below as General Prime Contractor) enters into with a Subcontractor as defined under Wis. Stat. §16.855 (14)(c) shall include the following mandatory provisions:

**PROMPT PAYMENT** (General prime contractor) shall pay (mechanical, electrical, or plumbing subcontractor) in accordance with Wis. Stat §16.855(19)(b), for work that has been satisfactorily completed and properly invoiced by (mechanical, electrical, or plumbing subcontractor). A payment is timely if it is mailed, delivered, or transferred to (mechanical, electrical, or plumbing subcontractor) by the deadline under Wis. Stat §16.855(19)(b).

If (mechanical, electrical, or plumbing subcontractor) is not paid by the deadline in this Contract, (general prime contractor) shall pay interest on the balance due from the eighth day after the (general prime contractor) receives payment from the Board of Regents for the work for which payment is due and owing to (mechanical, electrical, or plumbing subcontractor), at the rate specified in Wis. Stat §71.82, compounded monthly.

A (mechanical, electrical, or plumbing subcontractor) that receives payment as provided under this Contract and that subcontracts with another entity shall pay those subcontractors, and be liable for interest on late payments to those subcontractors, in the same manner as the (General prime contractor) is required to pay the (mechanical, electrical, or plumbing subcontractor) under this Contract.

**INSURANCE AND BONDS** (mechanical, electrical, or plumbing subcontractor) shall not commence work under

this Contract until it has obtained all necessary insurance required of (mechanical, electrical, or plumbing subcontractor) in the contract between the (general prime contractor) and the Board of Regents.

(Mechanical, electrical, or plumbing subcontractor) shall provide a separate 100 percent performance bond and a separate 100 percent payment bond to the benefit of the (general prime contractor) as the sole named obligee. Original bonds shall be given to the (general prime contractor) and a copy shall be given to the Board of Regents no later than 10 days after execution of this Contract.

**INDEMNIFICATION** To the fullest extent permitted by law, (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others whom (general prime contractor) is required to indemnify under its contract with the Board of Regents, and the employees of any of them, from and against claims, damages, fines, penalties, losses, and expenses, including but not limited to attorney fees, arising in any way out of or resulting from the performance of the work under this Contract, but only to the extent such claim, damage, fine, penalty, loss, or expense: (1) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of property, including but not limited to loss of use resulting therefrom and is caused by the negligence, or acts or omissions, of (mechanical, electrical, or plumbing subcontractor), its subcontractors, any of their employees, and anyone directly or indirectly employed by them or anyone for whose acts they may be liable, or (2) as related to such claims, damages, fines, penalties, losses, and expense of or against (general prime contractor), results from or arises out of the negligence of the (general prime contractor) or other fault in providing general supervision or oversight of the work of (mechanical, electrical, or plumbing subcontractor) or (3) as related to claims, damages, fines, penalties, losses, and expense against the Board of Regents arises out of the Board's status as owner of the project or project site.

In addition (mechanical, electrical, or plumbing subcontractor) shall defend, indemnify, and hold harmless (general prime contractor) and its officers, directors, agents, and any others (general prime contractor) is required to indemnify under its contract with the Board, and the employees of any of them, from any liability, including liability resulting from a violation of any applicable safe place act, that (general prime contractor) or the Owner incurs to any employee of (mechanical, electrical, or plumbing subcontractor) or any third party where the liability arises from a derivative claim from said employee, when the liability arises out of the failure of the (General prime contractor) or the Owner to properly supervise, inspect, or approve the work or work area of (mechanical, electrical, or plumbing subcontractor), but only to the extent that the liability arises out of the acts or omissions of (mechanical, electrical, or plumbing subcontractor), its employees, or anyone for whom (mechanical, electrical, or plumbing subcontractor) may be liable, or from (mechanical, electrical, or plumbing subcontractor's) breach of its contractual responsibilities or arises out of (General prime contractor's) negligence or other fault in providing general supervision or oversight of (mechanical, electrical, or plumbing subcontractor's) work or arises out of The Board of Regents' status as owner of the project or project site. In claims against (general prime contractor) or the Owner by an employee of (mechanical, electrical, or plumbing subcontractor) or its subcontractors or anyone for whose acts (mechanical, electrical, or plumbing subcontractor) may be liable, the indemnification obligation of this paragraph is not limited by a limitation on amount or type of damage, compensation, or other benefits payable by or for the (mechanical, electrical, or plumbing subcontractor) subcontractors under workers compensation act.

Except as identified above, the obligations of (mechanical, electrical, or plumbing subcontractor) under this indemnification do not extend to the liability of (general prime contractor) and its agents or employees arising out of (1) preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications; (2) the giving of or failure to give directions or instructions by the (general prime contractor) or the or their agents or employees provided the giving or failure to give is the cause of the injury or damage; or (3) the acts or omissions of other subcontractors.

**RETAINAGE** Retainage shall occur and be in amounts and on a schedule equal to that in the contract between (general prime contractor) and the Owner. Pursuant to Wis. Stat. §16.855(19)(b), Retainage between Contractor and mechanical, electrical and plumbing subcontractors is governed as follows:

As the work progresses under any subcontract as defined under Wis. Stat. § (14)(e) for construction of a project,

the Contractor shall, upon request of a subcontractor, pay to the subcontractor an amount equal to the proportionate value of the subcontractor's work properly completed, less retainage. The retainage shall be an amount equal to not more than 5 percent of the subcontractor's work completed until 50 percent of the subcontractor's work has been completed. At 50 percent completion, no additional amounts may be retained, and partial payments shall be made in full to the subcontractor unless the Board certifies that the subcontractor's work is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the subcontractor's work is not satisfactory, additional amounts may be retained but the total retainage may not be more than 10 percent of the value of the work completed. Upon substantial completion of the subcontractor's work, any amount retained shall be paid to the subcontractor, less the value of any required corrective work or uncompleted work. All payments the general prime contractor makes under this paragraph shall be within 7 calendar days after the date on which the general prime contractor receives payment from the Board.

Pursuant to Wis. Stat. §16.855(14m)(b), subcontracts under sub (14)(e) must include a scope of work clause that is identical to the scope of work clause on which the subcontractor bid. The following Scope of Work language shall be included in the contracts between the Contractor and Subcontractors:

**SCOPE OF WORK** The mechanical, electrical and plumbing subcontractor scope of work is identical to the general prime contractor scope of work included in these bidding and contract documents. By submitting and signing a bid, all bidders have examined all the Bidding Documents listed in the Table of Contents of the project Specifications. The successful bidders will be required to do all work which is shown on the drawings, mentioned in the Specifications, or reasonably implied as necessary to complete the division of work bid for this project.

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**§ 6.2.2** If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect and Owner's Representative of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect and Owner's Representative of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

...

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect-Owner's Representative will allocate the cost among those responsible.

...

**§ 7.1.2.2** No adjustment of any kind shall be made to this Contract if asserted by the Contractor for the first time, after the date of final payment.

**§ 7.1.4** Except in cases of emergency, no changes shall be made to the Work by the Contractor without having prior approval of Owner through a Construction Change Directive or Change Order. In addition, the Contractor shall not be entitled to any increase in the Contract Sum or Contract Time without first receiving prior written authorization from the Owner for the same. If the parties disagree whether the work to be performed constitutes a change in Work or disagree as to any adjustments in the Contract Sum or Contract Time, Contractor shall nonetheless diligently proceed with the Work if directed by the Owner while the parties resolve their dispute. In any case, the parties reserve

their rights as to the disputed amount.

§ 7.1.5 Electronic signatures are acceptable for all contract and related documents.

§ 7.2.1 A Change Order is a written instrument prepared by the Architect or Owner's Representative and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 The inclusion of Subcontractor terms and conditions in the supporting documentation of a Change Order shall have no bearing on the contract between the Owner and Contractor, and shall not change any of the terms and conditions between the Owner and Contractor. Such supporting documentation shall not be construed as creating any expressed or implied contractual obligation of those terms and conditions between Owner and any of the Contractor's Subcontractors, suppliers or vendors.

§ 7.2.3 A Change Order may be proposed by the Architect, Contractor, or the Owner. When a Change Order is proposed, the following procedures shall apply:

- .1 if requested by Owner's Representative, the Contractor shall prepare and submit a detailed proposal, including all cost and time adjustments to which the Contractor believes it will be entitled if the change proposed is incorporated into the Contract. Owner's Representative shall be under no legal obligation to issue a Change Order for such proposal;
- .2 the parties shall attempt in good faith to reach agreement on the adjustments needed to the Contract to properly incorporate the proposed change(s) into the Work;
- .3 in some instances, it may be necessary for Owner to authorize Work or direct changes in Work for which no final and binding Change Order has been reached and for which unit prices are not applicable. In such cases the following shall apply:
  - .1 upon written request by the Owner, through a Construction Change Directive, the Contractor shall perform the proposed Work;
  - .2 the cost of such changes shall not exceed the amount in the Construction Change Directive, and be determined in accordance with Section 7.2.5;
  - .3 in the event agreement cannot be accomplished as contemplated herein, the Owner may authorize the Work to be performed by Owner or to hire others to complete the Work. Such action on the part of the Owner shall not be the basis of a claim by the Contractor for failure to allow it to perform the changed Work.

§ 7.2.4 In the event Work is required due to an emergency as described in Section 7.1.4., the Contractor must request an equitable adjustment as soon as practicable, and in no case later than ten (10) working days of the commencement of such emergency.

§ 7.2.5 Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.2 shall be limited to the following:

- .1 actual labor rate includes the base rate, taxes, insurance and fringe benefits required by agreement or custom and no Contractor markup except as allowed in Section 7.2.5.6 below. Unit labor is the labor time anticipated to be expended to install the corresponding unit of actual materials. Labor cost is the labor hours approved by Owner's Representative multiplied by the Owner's Representative pre-approved composite hourly labor rates;
- .2 actual material cost is the amount paid or to be paid by the Contractor for materials, supplies and equipment entering permanently into the Work, including cost of transportation and applicable taxes.

This cost shall be substantiated by the vendor or supplier's verified invoices/quotes. The cost shall not exceed the usual and customary cost for such items available in the geographical area of the project;

- .3 large tools and major equipment are those with an initial cost greater than \$1,000, whether from the Contractor or other sources. The rental rate shall not exceed the usual and customary amount for such items available in the geographical area of the project. Tool and equipment use time allowed is only for the extra Change Order work. Rental cost is the above tool and equipment time approved by Owner's Representative multiplied by the Owner's Representative pre-approved rental rates also described above;
- .4 the cost of performance and payment bonds are the actual rate paid by the Contractor for such bonds;
- .5 subcontractor costs are for those subcontracted specialties required to complete the Change Order work, with maximum markups as outlined hereinafter;
- .6 the maximum allowable markup for overhead and profit, by all parties of the Contractor and Subcontractors, on Change Order proposals shall not exceed 15 percent total. The Contractor markup of change order work done by Subcontractors shall not exceed 7 ½ percent; and the total combined mark-up by Contractor and Subcontractor, on Subcontractor performed work shall not exceed 15 percent. When the value of a Change Order proposal exceeds \$30,000, a declining scale will be used to negotiate the allowable combined overhead and profit margin. Where Change Order proposals involve a credit only, a reasonable allowance for overhead and profit are properly included as part of the downward adjustment for a deductive change exceeding \$15,000. The amount of such allowance is subject to negotiation.
- .7 all other Change Order expenses are part of the overhead and profit allowance which are not reimbursable as separate items and include the following:
  - .1 all costs associated with the processing of the Change Order are included in the overhead and profit allowance;
  - .2 all such efforts, unless specifically requested as additional Work to be documented as a Change Order proposal or portion thereof, is included in the overhead and profit allowance;
  - .3 the layout required for the installation of material and equipment, and installation design, is the responsibility of the Contractor and is included in the overhead and profit allowance;
  - .3 small tools and supplies. The cost of small hand tools with an initial cost of \$1,000 or less, along with consumable supplies and expendable items such as drill bits, saw blades, gasoline, lubricating or cutting oil, and similar items, is included in the overhead and profit allowance;
  - .4 general expenses (for example, and not limited to: parking fees) which include those items that are a specific job cost not associated with direct labor and material, is included in the overhead and profit allowance;
  - .5 the preparation of record or as-built drawings required is included in the overhead and profit allowance;
  - .6 other costs: a) All association dues, assessments, and similar items are included in the overhead and profit allowance. b) All education, training, and similar items are included in the overhead and profit allowance. c) All drafting and/or engineering, unless specifically requested as additional Work to be documented as a Change Order proposal or portion thereof, is included in the overhead and profit allowance. d) All other cost items such as, but not necessarily limited to, review, coordination, estimating, and expediting, relative to Change Order proposals, are associated with field and office supervision and are included in the overhead and profit allowance.

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**§ 7.3.1** A Construction Change Directive is a written order prepared by the Architect or Owner's Representative and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

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- .1 ~~Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation; time and material, Not To Exceed. This Not To Exceed amount will be the amount the Contractor can complete the needed change in the Work, and shall include all costs for this work including overhead and profit;~~
- .2 ~~Unit-unit prices stated in the Contract Documents or subsequently agreed upon; or~~
- .3 ~~Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or cost method agreed upon by all signing parties.~~
- .4 ~~As provided in Section 7.3.4. Intentionally deleted.~~

**§ 7.3.4** ~~If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:~~

- .1 ~~Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;~~
- .2 ~~Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;~~
- .3 ~~Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;~~
- .4 ~~Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and~~
- .5 ~~Costs of supervision and field office personnel directly attributable to the change. Intentionally deleted.~~

**§ 7.3.5** ~~If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15. Intentionally deleted.~~

**§ 7.3.6** Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect and Owner's Representative of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

...

**§ 7.3.10** When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. ~~Change Orders may be issued for all or any part of a Construction Change Directive, shall be subsequently issued for all Construction Change Directives when there is agreement on time and cost changes to the Work.~~

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**§ 8.1.3** The date of Substantial Completion is the date certified by the Architect and Owner's Representative in accordance with Section 9.8.

...

**§ 8.2.1** Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work. It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the time for completion of the Work required by the Contract Documents is an essential condition of this Contract. The Contractor agrees that the Work required by the Contract Documents will be prosecuted regularly and diligently at a rate of progress that will ensure its final completion within the time specified in the Contract Documents. It is expressly understood and agreed, by the Contractor and the Owner, that the specified time period for completion of the Work described in the Contract Documents is a reasonable time for the completion of the Work, taking into consideration the average weather conditions and usual industrial conditions prevailing in the locality in which the Work is to be completed.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, ~~commence the Work~~ Mobilize prior to the effective date of insurance required to be furnished by the Contractor ~~and Owner and Owner, and the Mobilization date.~~

...

§ 8.2.4 Costs for acceleration of Work activities to allow completion of the Project in less time than that allowed by the Contract Documents shall be borne by the party requesting such acceleration or early completion. No claim for delay shall be valid against the Owner for compensation for delayed completion which extends completion beyond the early finish date, but which does not continue beyond the stated time for completion as set forth in the Contract.

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; ~~(4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) or (4)~~ by other causes that the Contractor asserts, and the ~~Architect~~ Owner's Representative determines, justify delay, then the Contract Time shall be extended for such reasonable time as the ~~Architect may determine.~~ Owner's Representative may determine.

§ 8.3.1.1 If any activity is delayed, or anticipated to be delayed, thereby delaying the Substantial Completion of the entire Project, the Contractor shall have the right to take action as may be necessary to recapture any delay. Such action shall include, but not be limited to:

- .1 increase in staffing;
- .2 increase in shifts, hours of Work, or number of days of Work;
- .3 use of available Float; or
- .4 changing the sequence of Work activities

Costs caused by delays or improperly timed activities shall be borne by the party responsible therefore, and Change Orders, as deemed appropriate, shall be issued in accordance with Article 7 of these General Conditions.

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§ 8.3.2.1 When events occur which, in the opinion of the Contractor, prevent completion of the Project within the time period allowed by the Contract Documents, the Contractor shall request an extension of the specified time for completion. Such request shall include the reasons for delay, the amount of time extension being requested, and any cost(s) associated with the delay. All such requests shall be made in writing and delivered to Owner's Representative within ten (10) working days from the beginning of such delay, or within ten (10) working days from the time when the circumstance with potential for delay becomes reasonably known to the Contractor, whichever is earlier. The Owner's Representative shall act on such requests as soon as practicable and notify the Contractor of Owner's decision.

§ 8.3.2.2 If the Contractor fails to complete the Work within the time specified in the Contract and such failure is due to reasons which were not beyond the reasonable control of the Contractor or if the Contractor fails to complete the Work within the time specified in the Contract and fails to make the written request as provided for in 8.3.2, then in any such event the Contractor shall pay to the Owner actual damages.

§ 8.3.2.3 If Owner terminates the Contract, or suspends or stops Work in accordance with 2.4 due to the fault of the Contractor, the damages described in Paragraph 8.3.2.2 shall be assessed for each day (or any part thereof) such Work is stopped on the Project. If the Owner does not elect to terminate the Contract or to suspend or stop the Work, the damages shall be assessed for each day of delay in Substantial Completion.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents. The Owner may, at its discretion, waive damages due the Owner, or any portion thereof.

...

**§ 9.1.1** The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. Payments to the Contractor under the Contract Documents will be made as provided for in Wis. Stat. § 16.855(19)(a), as the Work progresses on this Project. Payment requests will be processed monthly, except for special circumstances approved by Owner's Representative. The Contractor must perform all of the conditions required for payment and must have met the obligations which are necessary to qualify for any partial payments. No Contractor whose Work is deficient or whose Work fails to conform to the quality standards set forth in the Contract Documents shall be entitled to interim, progress or partial payments.

...

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications. As soon as practicable after the Agreement is executed, but not later than submission of the first payment application, the Contractor shall submit to the Architect a Schedule of Values for work to be performed, as prescribed by the Contract Documents and in the detail requested by the Architect. The cost breakdown items shall reflect actual work progress stages as closely as feasible which, if approved by Architect, will become the basis for Applications for Payment.

...

**§ 9.3.1.1** As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders. With each Application for Payment, the Contractor shall provide to the Architect and Owner's Representative:

- .1 At the request of the Architect or Owner's Representative, submit satisfactory evidence to establish that the sum set forth in any Application for Payment represents the "proportionate value" of Work completed;
- .2 The Contractor shall certify each request for payment as being a true, accurate, and complete statement of account as of the date on which the certificate was made, and that the stated sums are then earned and payable to the Contractor.
- .3 All requests for payment shall be submitted to the Architect. To expedite payment of sums due under the Contract, the Contractor, Owner's Representative and Architect shall, where possible, jointly review any such request for payment at the site, inspecting the Work if necessary to determine the validity of the request or modifications to the request which are necessary to accurately represent the value of Work completed in accordance with the Contract Documents
- .4 The Contractor shall furnish any and all accounting records requested by the Architect or Owner's Representative to validate all or any part of any request for payment. The Contractor shall maintain these accounting records for a period of three (3) years from the date the Architect authorizes final payment.
- .5 The Contractor agrees to indemnify and hold the Owner harmless from all claims growing out of lawful demands of Subcontractors, laborers, workers, mechanics, material persons, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the performance the Work required by Contract Documents.
- .6 The Contractor shall, at Owner's Representative or Architect's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived.
- .7 If separate prices are set forth in the Contract Documents for identifiable items of Work, payment for



such prices shall be made at the time of completion of those items of Work. Payment under this Paragraph shall be an interim payment until the time of final payment and acceptance of the Work by Architect.

- .8 Pursuant to Wis. Stat. § 16.855(19)(a), as the Work progresses under this Contract for Construction the Architect or Owner's Representative, from time to time, shall grant to the Contractor an estimate of the amount and proportionate value of the work properly completed, which shall entitle the Contractor to receive the amount, less the retainage, from the proper fund. The retainage shall be an amount equal to not more than 5 percent of the estimate until 50 percent of the work has been completed. At 50 percent completion, no additional amounts shall be retained, and partial payments shall be made in full to the Contractor unless the Owner certifies that the job is not proceeding satisfactorily. At 50 percent completion or any time thereafter when the progress of the work is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than 10 percent of the value of the Work completed. Upon Substantial Completion of the Work, any amount retained shall be paid to the Contractor, less the value of any required corrective Work or uncompleted Work. For the purposes of this section, estimates may include any fabricated or manufactured materials and components specified, previously paid for by Contractor and delivered to the Work or properly stored and suitable for incorporation in the Work embraced in the contract.

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§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably properly stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site. the requirement that it holds clear title to all property of every description which serves as the basis for the Application for Payment. Contractor warrants that title to any such property is being transferred to the Owner free and clear of all liens. If requested by the Architect or Owner's Representative, the Contractor shall produce satisfactory evidence of transfer of title from suppliers and Subcontractors to the Contractor, without reservation, or with adequate waiver of lien. These payments may include any fabricated or manufactured materials and components specified, previously paid for by Contractor and delivered to the site, properly stored, and suitable for incorporation into the Work embraced in the Contract. The Contractor shall identify the method of storage for such materials. Proper evidence of insurance shall be presented to protect the interest of the Owner. If payment is intended to be requested for any off-site storage items, such items shall be listed as separate lines in the request and certification for payment, cost breakdown. Architect or Owner's Representative, upon their request, shall be allowed to verify such materials and equipment no matter the location stored and located.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work. The Contractor shall have the sole responsibility for obtaining proper insurance on, as well as the responsibility for the care and protection of materials and Work upon which payments have been made. The Contractor shall be responsible for the restoration of any damaged Work. Nothing herein shall operate as a waiver of the rights of the Owner to require fulfillment of all of the terms of the Contract.

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§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the that the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect.

However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

...

.7 ~~repeated~~ failure to carry out the Work in accordance with the Contract Documents.

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**§ 9.5.4** If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment. In paying any unpaid bills of the Contractor relating to the Work, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the Contract by the Owner to the Contractor for its account and the Owner shall not be liable to the Contractor for any such payment.

...

**§ 9.6.2** The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. Not more than seven (7) calendar days following the receipt of each payment from the Owner, the Contractor shall make payment to each and every person, Subcontractors, or entity who furnished goods or services for the progress of the Work on the Project, the value of which goods or services were included in the Contractor's Request for Payment and Certification for Payment, or who by law or Contract payment is due upon the receipt of the payment most recently received from the Owner.

...

**§ 9.6.5.1** In the event Owner receives notice from any person, Subcontractor, or other third party, that the Contractor has failed to pay such person(s) for Work performed in accordance with the Contract Documents, the Owner shall notify the Contractor and the Contractor shall, in no more than 10 calendar days, provide all documentation Owner's Representative believes necessary to determine whether such payment is due, or reasons for non-payment of disputed amounts. In the event Owner's Representative determines the claim to be valid and payment is due, or in the absence of aforementioned documentation, Owner's Representative may authorize direct payment of any unpaid bills, withholding from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such claims until satisfactory documentation is furnished that all liabilities have been fully discharged or reasons for non-payment of disputed amounts are provided by the Contractor. In no event shall these provisions be construed to impose any obligations upon the Owner to either the Contractor or the Contractor's Surety.

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**§ 9.6.7.1** Pursuant to Wis. Stat. § 16.855(19)(b) and § 16.855(14m)(a) retainage on a Subcontract shall occur and be in amounts and on a schedule equal to the retainage schedule in the contract between the Contractor and the Owner.

**§ 9.6.7.2** Nothing herein shall preclude the Contractor from deducting from any request for payment such amounts as will properly represent the value of Work which fails to meet the quality standards of the Contract Documents or which the Subcontractor fails to complete.

...

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, ~~the amount certified by the Architect or awarded by binding dispute resolution,~~ then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. ~~The Contract Time shall be extended appropriately and the Contract Sum shall be increased.~~ In the event the Contractor elects to stop Work under this Section 9.7, upon recommencing the Work, the Contractor may seek a Change Order to assert a claim for adjustment of the Contract Time and the Contract Sum by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

...

**§ 9.8.3** Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection ~~discloses-identifies~~ any item, whether or not included on the Contractor's list, which is not sufficiently ~~complete-complete, in need of correction, or in need of replacement to be~~ in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

...

**§ 9.8.6** On the date of Substantial Completion, the Contractor shall assign to the Owner all warranties and guarantees of labor or material incorporated into the Work which are provided by third party vendors, suppliers, manufacturers, and Subcontractors.

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. While the Owner has such possession or use, the Contractor shall be relieved of the responsibility for loss or damage to the Work resulting from the Owner's possession or use. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor ~~or, if no agreement is reached, by decision of the Architect-Contractor.~~

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**§ 9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents. The Contractor will prepare a list of items of Work remaining to be performed or corrected on those portions of the Project that the Owner intends to take possession of or use.

...

**§ 9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor ~~submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or~~

encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees; provides certification that all debts and claims against this Project have either been paid in full or otherwise satisfied and give final evidence of release of all liens against the Project, the Owner, and all proceeds payable hereunder. The Contractor shall certify upon such payment request that the data contained therein is current, accurate, and complete. Contractor shall permit, if requested by Owner's Representative, the final inspection to be jointly conducted by the Contractor, Architect and Owner's Representative. The Contractor shall give Notice at least 72 hours in advance of the time set for final inspection. Upon completion of the Work and before receiving final payment for the Work, as required by law, the Contractor shall file with Owner's Representative an affidavit stating that the Contractor has complied fully with Wis. Stat. § 103.49(4r) and that the Contractor has received an affidavit from each of the Contractor's agents, and Subcontractors stating that they also have complied fully with Wis. Stat. § 103.49(4r).

§ 9.10.2.1 As a condition precedent to final payment, all corrective actions to remedy deficiencies in the Work required by Contract Documents and Work identified on the punch list must have been completed. In addition, where required by Contract Documents, all training of the Owner's staff in the proper operation and maintenance of the Work shall have been completed, Operating and Maintenance Manuals and Instructions as well as drawings marked up to reflect "as built" conditions must have been transmitted to Owner's Representative and all warranty certificates signed and presented for Owner's Representative acceptance.

§ 9.10.2.2 When to the satisfaction of Owner's Representative and Architect the Work has been completed, and is of the quality required by the Contract Documents, Owner's Representative may authorize payment of all sums then due the Contractor. Receipt of the final payment, as provided for herein shall constitute a waiver of any and all claims against the Owner arising out of, under, or incident to the Work performed under the Contract.

§ 9.10.2.3 If the Contractor fails to submit a request for final payment or make satisfactory arrangements with Owner's Representative within thirty (30) calendar days of the final inspection or accepted punch list, no further payments will be made and the Contract will be closed. The last request for Certification for Payment will be considered the final payment under the terms and conditions of the Contract.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect or Owner's Representative so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from but not limited to:

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- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment. Owner after final payment;
- .5 any warranty or guarantee required by the Contract Documents;
- .6 any other right surviving the Owner as to which the Contractor was specifically given notice before or during the final inspection and final payment process; or
- .7 rights surviving to the Owner as a matter of law.

...

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor, its agents, employees, material suppliers and subcontractors will perform all Work on the project in a safe and responsible manner. In particular, Contractor shall, at its own expense, conform to the safety policies and regulations established by the Contractor and shall comply with all specific safety requirements promulgated by any government authority, including without limitation the requirements of the Occupations Safety and Health Act of 1970 and the Construction Safety Act of 1969 and all standards and regulations which have been or shall be promulgated by the parties or agencies which administer the Acts. Contractor shall comply with said requirements, standards and regulations, and require and be directly responsible for compliance therewith on the part of its said agents, employees, materials suppliers and contractors; and shall directly receive, respond to, defend, and be responsible for all citations, assessments, fines or penalties which may be incurred by reason of its failure on the part of its agents, employees, material suppliers or subcontractors to so comply.

...

**§ 10.2.1** The Contractor shall ~~take reasonable~~ strictly comply with, and bear full responsibility for, any safety procedure set forth in the Contract Documents. The Contractor shall further indemnify Owner for any cost and expense, including legal, resulting from any such failure to abide by any safety procedure set forth in the Contract Documents. At the sole discretion of Owner, the Contractor may also be subject to termination of the Contract for default. The Contractor shall take all precautions for safety of, and shall provide ~~reasonable~~ all protection to prevent damage, injury, or loss to:

- .1 employees on the Work and other persons who may be affected ~~thereby;~~ thereby (including, but not limited to the public, and the Owner's personnel and agents);

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**§ 10.2.2** The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss. Contractor shall have properly qualified and trained personnel on safety means and methods, and properly qualified supervision.

**§ 10.2.3** The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, ~~reasonable~~ all safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. For these purposes, the Contractor shall:

- .1 provide appropriate safety barricades, signs, and signal lights;
- .2 comply with any safety requirement published by any governmental authority with jurisdiction over the site, including federal, state, or local jurisdictions;
- .3 ensure that any additional measures which are reasonably necessary for the purposes stated are taken.

...

**§ 10.2.5** The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18. If the Owner becomes aware of any noncompliance by the Contractor or any Subcontractor with the safety conditions of this Contract or of any condition caused by the Contractor or any Subcontractor, which poses a serious or imminent danger to the health or safety of the public or to Owner personnel, for which the Contractor has been previously notified of, and the Contractor has failed to correct, the Owner has the right stop all Work until satisfactory correction action has been taken. Satisfactory correction will be at the sole discretion of the Owner.

**§ 10.2.5.1** In case of an emergency which threatens loss or injury of property, or safety of life, the Contractor will be

allowed to act, without previous instructions from the Owner's Representative, in a diligent manner. The Contractor shall notify Owner's Representative immediately thereafter. Any claim for compensation by the Contractor due to such extra Work shall be promptly submitted to the Owner's Representative and Architect for approval as provided for in Article 7 above.

**§ 10.2.5.2** In the event of temporary suspension of Work, or during inclement weather, or whenever Owner's Representative shall direct, the Contractor shall reasonably protect all Work and materials against damage or injury from the weather. This provision shall be incorporated into the contracts between the Contractor and Subcontractors. If, in the opinion of Owner's Representative, any Work or materials have been damaged or injured by reason of failure on the part of the Contractor or Subcontractors to reasonably protect the Work, such materials shall be removed and replaced at the expense of the Contractor.

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**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. The Contractor shall use the least hazardous materials, equipment, and processes to execute the Work. The Contractor shall comply with all OSHA rules and regulations. If the Contractor encounters a condition that it suspects may contain a hazardous material or substance that is not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition. take all reasonable steps that, in its judgement, are necessary to prevent bodily injury or death, up to and including stopping the Work.

**§ 10.3.2** ~~Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up. Contractor shall give notice to Owner of the condition that may contain the hazardous material or substance. Contractor shall have the right to engage a licensed laboratory/subcontractor to test the suspected hazardous material or substance. Owner will negotiate for reimbursement of reasonable testing costs if the test results do not verify the presence of a hazardous material or substance by a Change Order. Owner, by Change Order, will reimburse Contractor for reasonable testing costs if the tests results verify the presence of a hazardous material or substance.~~

**§ 10.3.3** ~~To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity. When hazardous materials or substances, not addressed in the Contract Documents, are required to be removed or disturbed to complete the Work, Contractor and Owner will negotiate how to complete that new work. If Contractor agrees to perform this work, a Change Order will be negotiated potentially adjusting the Contract Sum and Contract Time. Such new work will be at the sole direction of the Owner.~~

**§ 10.3.4** ~~The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances. site.~~

...

**ARTICLE 11 — INSURANCE AND BONDS**

**ARTICLE 11 BONDS**

**§ 11.1 Contractor's Insurance and Bonds**

...

**§ 11.1.1** The Contractor shall ~~purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the~~ provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance bonds from a company or companies lawfully authorized to issue insurance surety bonds in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents. The bond may be enforced by any person or entity who is entitled to enforce the bonds as a matter of law and who is damaged as a result of breach of these commitments by the Contractor on the Project to which these provisions apply. The Owner shall not be responsible for the default of the Contractor and the remedies of any damaged party shall be limited to an action by the damaged party against the defaulting Contractor and/or its bonding company, in addition to any other coverage for the bond.

**§ 11.1.2** The Contractor shall ~~provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.~~ Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

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**§ 11.1.3** ~~Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.~~

**§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.** ~~Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.~~

**§ 11.2 Owner's Insurance**

**§ 11.2.1** The Owner shall ~~purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.~~

**§ 11.2.2 Failure to Purchase Required Property Insurance.** ~~If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and~~

Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

**§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

### **§ 11.3 Waivers of Subrogation**

**§ 11.3.1** The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

**§ 11.3.2** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

### **§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance**

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

### **§ 11.5 Adjustment and Settlement of Insured Loss**

**§ 11.5.1** A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

**§ 11.5.2** Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no



~~other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.~~

...

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's or Owner's Representative's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, or Owner's Representative, be uncovered for ~~the Architect's~~ examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect or Owner's Representative has not specifically requested to examine prior to its being covered, the Architect or Owner's Representative may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's ~~expense~~ expense with no adjustment to Contract Time.

...

The Contractor shall promptly correct Work rejected by the Architect or Owner's Representative or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

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~~The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.laws of the State of Wisconsin.~~

...

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. ~~Except as provided in Section 13.2.2, neither~~ Neither party to the Contract shall assign the Contract as a whole without written consent of the other. The Owner may withhold its consent in its sole discretion. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.1.1 In case the Contractor assigns all or any part of any moneys due or to become due under this Contract, the instrument of assignment shall contain an article substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms, and corporations for services rendered or materials supplied for the performance of the Work called for in this Contract and subject to the terms of this Contract and claims of offset by the Owner.

~~§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.~~ Antitrust Agreement. The Contractor and the Owner recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the Owner. Therefore, the Contractor hereby assigns to the Owner any and all claims for such overcharges as to goods and materials purchased in connection with this Contract, except as to overcharges which result from antitrust violations commencing after the price is established under this Contract and any Change Order thereto.

...

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect and Owner's Representative timely notice of when and where tests and inspections are to be made so that the Architect and Owner's Representative may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect and Owner's Representative of when and where tests and inspections are to be made so that the Architect and Owner's Representative may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

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§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the ~~Architect.~~ Architect and Owner's Representative.

...

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate ~~the parties agree upon in writing as listed in the Agreement~~ or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.6 Reserved

§ 13.7 Reserved

§ 13.8 Nondiscrimination/Affirmative Action -

§ 13.8.1 In connection with the performance of Work under this Contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of age, race, religion, color, handicap, sex, physical condition, developmental disability as defined in Wis. Stat. §51.01(5), sexual orientation, national origin, or any other basis prohibited by law. This provision shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training. Except with respect to sexual orientation, the Contractor further agrees to take affirmative action to ensure equal employment opportunities. This contract provision shall be incorporated into the contracts between the Contractor and Subcontractors.

§ 13.8.2 Contracts with a value of fifty thousand dollars (\$50,000) or more require the Contractor to submit a written affirmative action plan acceptable under Wisconsin Statutes. An exemption occurs from this requirement if the Contractor has a Work force of less than thirty (50) employees. The Contractor is responsible for obtaining affirmative action compliance from Subcontractors.

**§ 13.8.3** The Contractor should establish and take appropriate initiatives to reach goals and timetables for minority and female utilization which shall be based on appropriate work force, demographic, or other relevant data which shall cover construction projects or construction contracts performed in specific geographical areas. The goals shall be applicable to the Contractor's, and Subcontractor's entire work force which is working in the area covered by the goals. The goals are established and are as follows:

<u>County</u>	<u>Women Goal</u>	<u>Minority Goal</u>
<u>Adams/Juneau/Monroe/Vernon</u>	12%	2%
<u>Ashland/Bayfield/Douglas/Price</u>	9%	6%
<u>Barron/Sawyer/Washburn</u>	13%	4%
<u>Brown</u>	11%	9%
<u>Buffalo/Jackson/Pepin/Trempealeau</u>	12%	5%
<u>Burnett/Polk</u>	11%	2%
<u>Calumet/Winnebago</u>	11%	3%
<u>Chippewa/Rusk</u>	12%	2%
<u>Clark/Taylor</u>	16%	2%
<u>Columbia</u>	12%	2%
<u>Crawford/Grant/Richland</u>	14%	2%
<u>Dane</u>	9%	9%
<u>Dodge</u>	12%	3%
<u>Door/Kewaunee/Manitowoc</u>	13%	3%
<u>Dunn/Eau Claire</u>	11%	3%
<u>Florence/Forest/Marinette/Oconto</u>	13%	2%
<u>Fond du Lac</u>	11%	4%
<u>Green/Iowa/LaFayette</u>	13%	1%
<u>Green Lake/Marquette/Waushara</u>	10%	4%
<u>Iron/Oneida/Vilas</u>	9%	3%
<u>Jefferson</u>	12%	4%
<u>Kenosha</u>	7%	10%
<u>La Crosse</u>	10%	4%
<u>Langlade/Lincoln/Menominee/Shawano</u>	11%	7%
<u>Marathon</u>	12%	4%
<u>Milwaukee</u>	10%	29%
<u>Outagamie</u>	10%	5%
<u>Ozaukee</u>	8%	3%
<u>Pierce/St Croix</u>	12%	2%
<u>Portage</u>	13%	3%
<u>Rock</u>	11%	7%
<u>Sauk</u>	10%	2%
<u>Sheboygan</u>	14%	5%
<u>Walworth</u>	10%	8%
<u>Washington</u>	9%	3%
<u>Waukesha</u>	7%	4%
<u>Waupaca</u>	11%	2%
<u>Wood</u>	12%	2%

Source: Combined Occupation Distribution: 2000 Census

**§ 13.8.4** Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom a Contractor has a collective bargaining agreement, to refer to either minorities or women shall excuse the Contractor's required initiatives under these specifications.

**§ 13.8.5** The Contractor agrees to post in conspicuous places, available for employees and applicants for

employment, a notice to be provided by the Owner that sets forth the provisions of this Article 13.8.

**§ 13.8.6** Failure to comply with the conditions of this Article 13.8 may result in the Contractor becoming declared an "ineligible" Contractor, termination of the Contract, or withholding of payment.

**§ 13.9 Minimum Wages**

**§ 13.9.1** The Contractor shall post, at an appropriate conspicuous point on the site of the Project, a schedule showing all determined minimum wage rates for the various classes of laborers and mechanics to be engaged in Work on the Project under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by the laborers and mechanics so engaged.

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- .1 ~~Issuance~~ issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 ~~An~~ an act of government, such as a declaration of national emergency, that requires all Work to be stopped; or
- .3 ~~Because~~ because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or Documents.
- .4 ~~The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.~~ Intentionally deleted.

...

**§ 14.1.3** If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the ~~Owner~~ Owner, as its sole remedy, payment for Work properly executed, as well as reasonable overhead and profit on Work not executed, and mutually agreed upon costs incurred by reason of such termination.

**§ 14.1.4** If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the ~~Owner~~ Owner's Representative and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

...

- .1 ~~repeatedly~~ refuses or fails to supply enough properly skilled workers or proper materials;

...

- .3 ~~repeatedly~~ disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

The Owner may exercise any and all rights or remedies provided for herein, by law or in equity, either concurrently or singly in its sole discretion.

**§ 14.2.2** When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven ~~three~~ days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 ~~Exclude~~ exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon ~~owned~~ secured for this project by the Contractor; and
- .2 ~~Accept assignment of subcontracts pursuant to Section 5.4; and~~

~~3~~ — ~~Finish~~ finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment ~~until the Work is finished~~, for the Work the Contractor performed until the Work is finished by another contractor in consideration of 14.2.4.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor, although the excess shall not exceed the unpaid Work performed by the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

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§ 14.4.1 The Owner may, at any ~~time~~, time and at its sole discretion, terminate the Contract for the Owner's convenience and without cause.

...

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; reasonable costs incurred by reason of the termination, including ~~costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement~~ reasonable costs attributable to termination of subcontracts. For avoidance of doubt, "reasonable costs incurred by reason of the termination" shall not include lost profits or payments due to Subcontractors for any period of time subsequent to termination of the Contract.

§ 14.4.3.1 The Contractor shall be paid for all Work performed to the effective date of termination, and any "Reimbursable Expenses" outstanding as of the date of termination. The term "Reimbursable Expenses" shall include the cost of personal property or materials which meet requirements of the Contract Documents and have been purchased by the Contractor for incorporation into the Work but not yet incorporated therein; lease payments due to an unaffiliated third party lessor for equipment provided to the Project, where the lease term extends beyond the termination date of this Contract and the Contractor is unable to terminate said lease; and other costs approved by Owner's Representative . Reimbursable Expenses do not include lost profits or payments due to Subcontractors for any period of time subsequent to termination of the Contract. Upon payment of the Reimbursable Expenses, the Contractor shall deliver to the Owner any materials or personal property for which said payment has been made.

...

A Claim is a demand or assertion by ~~one of the parties~~ the Contractor seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. ~~This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.~~ Contractor.

...

~~The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive~~ Contractor waives all Claims and causes of action not commenced in accordance with this Section 15.1.2.

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~~§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, the Contractor shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party the Owner, the Owner's Representative, and the Initial Decision Maker. Claims under this Section 15.1.3.1 shall be initiated within 21 twenty-one (21) days after occurrence of the event giving rise to such Claim or within 21 twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.~~

...

~~§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.~~

~~§ 15.1.4.1 Pending final resolution of a Claim, Claim and any subsequent judicial action or appeal, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.~~

~~§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker. The Owner and the Contractor shall act in good faith to efficiently and fairly resolve Claims and disputes arising under the Contract in order to avoid, wherever possible, formal legal proceedings.~~

...

~~If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4. The Contractor expressly waives any rights that it otherwise might have to include overhead costs for extended or unabsorbed overhead in a Claim for an increase in the Contract Sum.~~

~~§ 15.1.5.1 In the event of such interruption or suspension, the Owner and the Contractor shall negotiate in good faith in an effort to agree upon the additional construction costs and other amounts, if any, that shall be paid the Contractor because of the interruption or suspension of Work. Anything in the Contract Documents to the contrary notwithstanding, however, it is expressly understood and agreed that:~~

- ~~.1 the total amount recoverable by and payable to the Contractor shall be limited to an amount equal to the sum of the additional construction costs and other amounts actually incurred by the Contractor because of the Owner's actions and omissions; plus a maximum overhead and profit allowance equal to fifteen (15) percent of the sum of additional construction costs and other amounts.~~
- ~~.2 overhead costs for extended or unabsorbed overhead shall not be used as the basis for calculating or determining the amount of any additional construction costs or other amounts recoverable by or payable to the Contractor; and~~
- ~~.3 by entering into this Contract with the Owner, the Contractor hereby waives any rights that it otherwise might have to pursue recovery of overhead costs for extended or unabsorbed overhead from the Owner.~~

...

~~.1 Where, under the Contract, Initial Decision Maker extends the amount of time specified for completion of the Project, the new time limit fixed by such extension shall be the essence of this Contract.~~

~~.2 Time extensions and associated adjustments in the Contract Documents which are implemented by, or~~

based on Change Orders, shall not include any allowance for extended and unabsorbed overhead costs.

- .3 Permitting the Work or any part of it to continue after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the Owner, or any of the Owner's rights under the Contract or a waiver of any default by the Contractor.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions in the locale in which the Work is being performed were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction. A determination on a Claims in accordance with Section 15.1.6.2 shall only be made by the Initial Decision Maker upon written request by the Contractor. Not all extension(s) in the allowable time for completion, when granted by Initial Decision Maker, will result in additional compensation to the Contractor.

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As a condition precedent to Contractor's ability to pursue any monetary claim under Wis. Stat. §§ 16.008 and 775.01 or any form of judicial action against Owner, all Claims shall be referred to the Initial Decision Maker for initial decision in accordance with the following procedures:

- .1 First, the Contractor shall present its Claim to the Initial Decision Maker who shall have thirty (30) days after presentation of the Claim to take one or more of the following actions: (1) request additional supporting data from the Contractor, (2) reject the Claim in whole or in part, or (3) approve the Claim. Failure by the Initial Decision Maker to take such action within the time specified herein shall constitute a rejection of the Contractor's Claim.
- .2 If the Initial Decision Maker requests the Contractor to provide additional supporting data, the Contractor shall respond within the timeframe specified by the Initial Decision Maker, by (1) providing the requested supporting data, (2) advising the Initial Decision Maker that the supporting data cannot be provided within the timeframe specified, but that it will provide such supporting data by a specific date, or (3) advising the Initial Decision Maker that no supporting data will be furnished. After receipt of the response or supporting data, if any, the Initial Decision Maker shall have thirty (30) days to take one or more of the following actions: (1) request further additional supporting data from the Contractor, (2) reject the Claim in whole or in part, or (3) approve the Claim.
- .3 The Initial Decision Maker's decision shall: (1) be in writing; (2) state the reasons therefor; and (3) specify any change in the Contract Sum or Contract Time or both.

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

~~§ 15.2.4~~ If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

~~§ 15.2.5~~ The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

~~§ 15.2.6~~ Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

~~§ 15.2.6.1~~ Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

~~§ 15.2.7~~ In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

~~§ 15.2.8~~ If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### ~~§ 15.3 Mediation Litigation~~

~~§ 15.3.1~~ Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution. Any judicial action relating to the construction, interpretation, or enforcement of the Contract Documents including without limitation, the Contractor's claims, demands, and causes of action for additional construction costs, delay damages, and other amounts owed hereunder, shall be brought and venue in the Dane County Circuit Court in Madison, Wisconsin. The Contractor hereby consents to personal jurisdiction in that venue, and waives any defenses that the Contractor otherwise might have relating thereto.

~~§ 15.3.2~~ The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

Contractor hereby waives its right to a jury trial in connection with any judicial action or proceeding that may arise by and between the Owner and the Contractor concerning the construction, interpretation, or enforcement of the Contract Documents including, without limitation, any claims, demands, or causes of action that the Contractor hereafter may assert against the Owner for additional construction costs, delay damages, and other amounts. ~~§ 15.3.3~~ Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.



~~§ 15.3.4~~ The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

#### **§ 15.4 Arbitration**

~~§ 15.4.1~~ If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

~~§ 15.4.1.1~~ A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

~~§ 15.4.2~~ The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

~~§ 15.4.3~~ The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

#### **§ 15.4.4 Consolidation or Joinder**

~~§ 15.4.4.1~~ Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

~~§ 15.4.4.2~~ Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

~~§ 15.4.4.3~~ The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

# Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, Patrick Rebholz, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 10:50:25 CT on 05/23/2024 under Order No. 2114482720 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction, other than those additions and deletions shown in the associated Additions and Deletions Report.

\_\_\_\_\_  
(Signed)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Dated)

1 **SUPPLEMENTARY GENERAL CONDITIONS** (Rev 04/2019)  
2 UWM Project No. **GML B1970** / UWSA Project No. **B-23-001**

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5  
6 1. Definitions

7  
8 1. DEFINITIONS

9 Architect/Engineer (A/E) for this project: **Hammel, Green and Abrahamson, Inc., 333 East Erie Street, Milwaukee,**  
10 **Wisconsin, 53201, Telephone: (414) 278-8200**

11  
12



1 **DIVISION 1 - GENERAL REQUIREMENTS** (Rev 11/2022)  
2 UWM Project No. **GML B1970** / UWSA Project No. **B-23-001**

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45  
46 **1. DEFINITIONS**

47 In this document, the following terms are defined as:

48  
49 (a) "Mechanical, electrical, or plumbing subcontractor" ("MEP Subcontractor") is a contractor that performs  
50 mechanical (Heating, Ventilating, and Air Conditioning), electrical, plumbing, or fire protection (fire suppression) work  
51 for the Project, and enters into a contract with the General Prime Contractor to perform their division of work.

52  
53 (b) "Qualified bidder" means a contractor that DOA certifies under Wis. Stat. s. 16.855(9m)(b)1.

1  
2 (c) "Qualified responsible bidder" means a contractor who is a Qualified bidder and who is a Responsible bidder.

3  
4 (d) "Responsible bidder" means a contractor that DOA certifies under Wis. Stat. s. 16.855(9m)(b)2.

5  
6 (e) "Single prime contracting" means bidding and contracting through a process in which only a general prime  
7 contractor has a contractual relationship with the the Owner and all mechanical, electrical, or plumbing subcontractors  
8 are identified by the Owner and are subcontractors to the General Prime Contractor.

9  
10 (f) "General Prime Contractor" is a contractor that enters into a contract with the Owner to perform all work as  
11 required by the Contract Documents and enters into contracts with subcontractors including MEP Subcontractors  
12 identified by the Owner.

13  
14 (g) "Non-MEP Subcontractor" is a subcontractor to a General Prime Contractor in divisions of work other than  
15 mechanical, electrical, plumbing, and fire protection. This includes suppliers and installers to the General Prime  
16 Contractor.

17  
18 (h) "Subcontractor" is all subcontractors on a project. This includes MEP Subcontractors, subcontractors to the  
19 MEP Subcontractors, and Non-MEP Subcontractors.

20  
21 (i) "Contractor" is all contractors working on a project regardless of contractual relationship. This includes the  
22 General Prime Contractor, MEP Subcontractors, Non-MEP Subcontractors, and all Subcontractors, regardless of tier of  
23 subcontract.

24  
25 (j) "Asbestos Abatement Contractor" means any individual, firm, corporation, or other non-governmental  
26 organization performing all Asbestos Abatement Work required by the Contract Documents.

## 27 28 **2. GENERAL**

29 All articles in these General Requirements are applicable to all Divisions and Sections of the Work included herein. The  
30 Conditions of the Contract, General and Supplementary General Conditions, and these General Requirements shall  
31 apply with equal force and effect to the General Prime Contractor and all Subcontractors engaged in this work.

32  
33 Contractor or the Contractor's authorized representative must be present to accept delivery of all equipment and material  
34 shipments. The Owner will not knowingly accept, unload or store anything delivered to the site for the Contractor's use.  
35 Inadvertent acceptance of delivered items by any representative or employee of the Owner shall not constitute  
36 acceptance or responsibility for any of the materials or equipment. It is the Contractor's responsibility to assume liability  
37 for equipment or material delivered to the job site.

## 38 39 **3. SPECIAL SITE CONDITIONS**

40 Confine all operations, equipment, apparatus and storage of materials, to the immediate area of work to the greatest  
41 possible extent. Contractor shall ascertain, observe and comply with all rules and regulations in effect on the project  
42 site, including but not limited to parking and traffic regulations, use of walks, security restrictions and hours of allowable  
43 ingress and egress. Any special traffic control during construction involving lane closures shall be in accordance with  
44 the federal standard, Manual of Uniform Traffic Control Devices.

45  
46 The Contractor shall take all measures necessary to become acquainted with the location of underground service,  
47 utilities, structures, etc., which may be encountered or be affected by the Contractor's work, and shall be responsible for  
48 damage caused by neglect to provide proper precautions or protection. As a minimum to become acquainted with such  
49 underground appurtenances, the Contractor shall: 1) Observe existing conditions visible at the site immediately prior to  
50 commencement of work; 2) Review available site plans incorporated in the contract documents and/or provided by the  
51 Owner; 3) Final check with the Owner for additions to or changes from conditions indicated on site plans for the facility;  
52 and 4) Obtain input from the "one-call system", the organization composed of all suppliers of utilities/services to or from  
53 the site.

1 Information pertaining to existing conditions that are described in the specifications or appear on the drawings, is based  
2 on available records. While such data has been collected with reasonable care, there is no expressed or implied  
3 guarantee that conditions so indicated are entirely representative of those actually existing. This information is provided  
4 to inform the Contractor of known, existing conditions so that due diligence is taken by the Contractor to avoid damage.  
5 Where site observation or documents indicate existing underground utilities/services in close proximity (within four feet  
6 horizontally and/or four feet vertically) to necessary new construction work, the Contractor shall be responsible to test,  
7 probe or otherwise determine exact locations so as to prevent damage to such utilities/services.  
8

9 Existing pipes, electrical work, and all other utilities encountered, which may interfere with new work, shall be re-routed,  
10 capped, cut off, or replaced by the contractor having jurisdiction, in accordance with the Bidding and Contract Documents.  
11

12 **Any noisy and disruptive activities will need to be coordinated with the Owner and occur before 9am or after**  
13 **4pm, Monday through Friday or between 6am and 6pm on Saturday or Sunday.**  
14

15 Limit use of premises to work in the areas indicated. Do not disturb portions of the site beyond areas in which work is  
16 indicated. General, confine construction operations to areas defined within Project Limits, unless specifically noted or  
17 otherwise and/or approved by Owner. Confine storage of materials and support facilities to designated staging areas.  
18

19 Parking at or near the project site is restricted. Contractor's truck or working vehicles will be permitted to drive on  
20 premises only for the purpose of loading and unloading materials and equipment for this project and only if keys are  
21 removed and all doors locked when not in use.  
22

23 **Owner will designate an area in a building which can be used by workers for eating lunch and for toilet needs. Toilets**  
24 **used by workers shall be kept clean and sanitary at all times.**  
25

26 All buildings at this site will be occupied during the construction.  
27

28 To ensure the safety of persons at the University, the following safety measures should be observed:

29 Contractor shall instruct their workers not to leave any openings in barricades, or to leave tools, equipment, or  
30 materials lying around in any area where persons may traverse. Surfaces of barricades, enclosures, etc., must  
31 be smooth with no protruding nails or other sharp projections or edges on side toward existing occupied areas,  
32 corridors, connecting links, etc.  
33

34 Outdoor lanes for emergency exit from existing buildings which may lie within or adjacent to new construction area must  
35 be kept clear of obstructions at all times.  
36

37 The Owner reserves the right to occupy and place and install equipment in completed areas of construction. Such  
38 placement of equipment and partial occupancy shall not constitute acceptance of the Work. The Owner will prepare a  
39 Certificate of Substantial Completion for each specific portion of the work to be occupied before occupancy. Before  
40 partial occupancy, mechanical and electrical systems shall be fully operational and required documents and inspections  
41 shall be successfully completed. On final completion, the Owner will operate, and maintain mechanical and electrical  
42 systems serving occupied portions of the building. On Substantial Completion, the Owner will assume responsibility for  
43 maintenance and custodial service for occupied portions of the building.  
44

#### 45 **4. INSPECTION OF SURFACES**

46 Contractor shall obtain complete data at the site and inspect surfaces that are to receive the Work before proceeding  
47 with fabricating, assembling, fitting or erecting any work under this contract.  
48

49 Contractor shall notify the Owner in writing in case of discrepancies between existing work and drawings, and of any  
50 defects in such surfaces that are to receive the Contractor's work. The Owner will evaluate the notice and direct what  
51 remedial action will be taken.

1 Starting of work implies acceptance of existing work or the work of others. Removal and replacement of work applied to  
2 defective surfaces, in order to correct defects, shall be done at the expense of the Contractor who applied work to  
3 defective surfaces.  
4

#### 5. HAZARDOUS SUBSTANCES - ASBESTOS, LEAD AND POLYCHLORINATED BIPHENYLS (PCB'S)

6 Airborne asbestos fibers, lead, and PCB compounds, if encountered, have been determined to be hazardous to one's  
7 health. Compliance with all possible applicable regulations is the Contractor's responsibility. Contractor shall not provide  
8 or install any product that contains any amount of asbestos or PCB. See General Requirements, CLEANING AND  
9 WASTE DISPOSAL for disposal of hazardous waste, if encountered.  
10

#### ASBESTOS

11 Contractor's attention is directed to WAC NR 447, WAC DHS 159 and the Occupational Safety and Health Act (OSHA)  
12 in general, part 1926.1101--ASBESTOS in particular. Contractor is responsible for compliance with all applicable  
13 regulations when the work includes fastening to or coring through Asbestos Containing Materials (ACM) and disturbance  
14 of asbestos containing caulking and adhesives. The Contractor is responsible for removal and disposal of Category I  
15 non-friable ACM that will be disturbed by the work.. Unless otherwise indicated, all caulking, sealants, glazing  
16 compounds, gaskets, asphalt roofing materials, damp proofing and miscellaneous adhesives are assumed to contain  
17 asbestos and are considered to be Category I non-friable ACM as defined in NR 447. Waste material containing Category  
18 I non-friable ACM, is regulated as Construction and Demolition (C&D) waste and may be disposed of at a Department  
19 of Natural Resources (DNR) approved C & D waste landfill. If Contractor's work methods cause non-friable ACM to  
20 become friable, the Contractor is responsible for the disposal of the friable asbestos waste at a landfill specifically  
21 approved by DNR to accept friable asbestos. A copy of the signed waste manifest for the disposal of all friable asbestos  
22 waste shall be provided to DFD prior to request for final payment.  
23  
24

25 The regulations referenced above require removal of friable ACM and Category II non-friable ACM prior to demolition of  
26 a building. Category I non-friable ACM does not need to be removed from a building prior to demolition if the waste  
27 generated from the demolition is taken to a DNR approved C & D waste landfill. If the contractor chooses to recycle  
28 building materials from a building to be demolished, the contractor is responsible for removal and disposal of all Category  
29 I non-friable ACM in accordance with applicable regulations prior to demolition. If the contractor's demolition methods  
30 will cause non-friable ACM to become friable, the contractor is responsible for removal and disposal of all Category I  
31 non-friable ACM in accordance with applicable regulations prior to demolition.  
32 See Section 02 82 13 for identification of ACMS and non-ACMs  
33

#### Lead Based Paint

34 Paint and glazed finishes on tile and masonry units is assumed to contain lead. The Contractor is responsible for  
35 compliance with Occupational Safety and Health Act (OSHA) in general and particularly to 29 CFR 1910 (LEAD  
36 STANDARD) and to CFR 1926 (LEAD EXPOSURE IN THE CONSTRUCTION INDUSTRY). Dispose of refuse containing  
37 lead based paint or contaminated with lead by the demolition process in conformance with State of Wisconsin Hazardous  
38 Waste Regulations set forth by the Department of Natural Resources and in conformance with OSHA and EPA  
39 recommended worker safety requirements.  
40  
41

#### PCB'S

42 Contractor's attention is directed to Wisconsin Administrative Code, Chapter NR 157 relative to PCB's. Refer to Division  
43 26, Electrical within these specifications for work involving PCB's.  
44  
45

#### 6. SOIL TEST BORINGS

46 Not applicable to this project.  
47  
48

#### 7. MUTUAL RESPONSIBILITY

49 Contractor(s) shall coordinate the work with adjacent work and shall cooperate with all other contractors to facilitate the  
50 general progress of the work. Each contractors shall afford all other contractors every reasonable opportunity for the  
51 installation of their work and for the storage of their material. In no case will the Contractor(s) be permitted to exclude  
52



1 from the premises or work, any other Contractor or employees thereof, or interfere with any other Contractor in the  
2 executing or installation of their work.  
3

4 Contractor(s) shall arrange the work and dispose of materials so as not to interfere with the work or storage of materials  
5 of others and each shall join their work to that of others in accordance with the intent of the drawings and specifications.  
6 All Contractors shall work in cooperation with the General Prime Contractor and with each other, and fit their work into  
7 the structure as job conditions may demand. All final decisions as to the right-of-way and run of pipe, ducts, etc., shall  
8 be made by the Owner at prearranged meetings with responsible representatives of the Contractors involved.  
9

10 For projects involving an Asbestos Abatement Contractor, General Prime Contractors should note the coordination  
11 requirements in Section 5.  
12

### 13 **8. PROJECT MEETINGS**

14 Project meetings will be held at the time designated by the Owner. Contractor, when requested, shall attend these  
15 meetings. If the principal of the firm does not attend meetings, a responsible representative of the Contractor who can  
16 bind the Contractor to a decision at the meetings shall attend.  
17

18 The Architect/Engineer or a representative thereof will write a report covering all items discussed and decisions reached  
19 and copy of such report distributed to all parties involved.  
20

### 21 **9. SLEEVES AND OPENINGS**

22 Each Contractor requiring sleeved openings shall furnish all sleeves required for their penetrations whether or not they  
23 responsible for providing the respective openings. Contractors furnishing sleeves to others for installation shall do this  
24 in a timely manner so as not to impede the project schedule.  
25

26 Openings shown on the structural and/or architectural drawings shall be the responsibility of the General Prime  
27 Contractor. Sleeves furnished by other contractors for openings shown on the structural and/or architectural drawings  
28 shall be installed by the General Prime Contractor.  
29

30 Openings that are required and are not shown on the structural and/or architectural drawings shall be the responsibility  
31 of the contractor requiring the openings. The contractor requiring the opening shall install sleeves for these openings  
32 or cut openings as needed (including floor openings within chases).  
33

34 Individuals skilled in such work shall accomplish installation of sleeves and openings.

35 Each Contractor shall be responsible for coordinating locations of their sleeves with work of other contractors.  
36

37 Each Contractor who requires sleeves and/or openings shall submit through the Contractor, to the Owner for review and  
38 approval, layout drawings of all such required sleeves and/or openings. Sleeve and opening layout drawings shall be  
39 received by the Owner a minimum of two weeks prior to installation of the sleeves and openings. Sleeve and opening  
40 sizes and locations shall be dimensioned from column lines and floor elevations or from a point of reference approved  
41 by the Owner.  
42

### 43 **10. CUTTING AND PATCHING**

44 Cutting and patching required to access work in existing walls, in chases, above inaccessible ceilings, below floors, etc.,  
45 shall be by the Contractor who requires the access, unless shown on the bid documents otherwise or noted otherwise.  
46

47 The Contractor shall do all cutting, or fitting of the work as required to make its several parts fit together, or to receive  
48 the work of others, as shown or reasonably implied by the drawings or specifications, or as may be directed by the  
49 Owner. Holes cut in exterior walls and/or roofs shall be waterproofed.  
50

51 The Contractor who cuts shall also be responsible for patching. Where cutting and patching is required, the Contractor  
52 shall hire individuals skilled in such work to do cutting and patching.  
53

1 The Contractor who removes or relocates building components which leaves a remaining opening shall be responsible  
2 for patching the opening.

3  
4 Patching includes repairing openings to match adjacent construction and painting the surface to match existing. Painting  
5 means covering the entire wall where patching is to be done to nearest break point or corner unless indicated to be done  
6 by other contractors.

7  
8 Contractor shall not endanger any work by cutting, digging or otherwise and shall not cut or alter the work of others  
9 without their consent.

10  
11 Do not pierce beams or columns without permission of the Owner and then only as directed in writing. If any ductwork,  
12 piping, conduit, etc. is required through walls or floors where no sleeve has been provided, use a core drill or saw cut to  
13 prevent damage and structural weakening.

14  
15 Wherever any material, finish, or equipment, is damaged, the skilled contractor shall accomplish the repair or  
16 replacement, in that particular work and the cost shall be charged to the party responsible for the damage.

### 17 18 **11. MANUFACTURER'S DIRECTIONS**

19 Contractors shall apply, install, connect, erect, use, clean and condition manufactured articles, materials, and equipment  
20 as recommended by the manufacturer, unless specified to the contrary. The manufacturer's latest recommendations at  
21 the time of bidding shall be used.

### 22 23 **12. LAYOUT**

24 The General Prime Contractor shall immediately upon entering the site for purpose of beginning work, locate general  
25 reference points and take such action as is necessary to prevent their destruction. Each Contractor shall lay out its work  
26 and be responsible for all lines, elevations and measurements of the building and other work executed under its Contract.  
27 Each Contractor must exercise proper precaution to verify dimensions on the drawings before laying out work and will  
28 be held responsible for any error resulting from failure to exercise such precaution.

29  
30 Using datum furnished by the Owner, the lot lines and present levels have been established as shown on the drawings.  
31 Other grades, lines, levels and benchmarks, shall be established and maintained by each Contractor, who shall be  
32 responsible for them.

33  
34 As work progresses, the General Prime Contractor shall lay out on forms and floor, the locations of all partitions, walls  
35 and fix column centerlines as a guide to all contractors.

36  
37 The General Prime Contractor shall make provision to preserve property line stakes, benchmarks, or datum point. If any  
38 are lost, displaced or disturbed through neglect of any Contractor, Contractor's agents or employees, the Contractor  
39 responsible shall pay the cost of restoration.

40  
41 Each Contractor shall verify grades, lines, levels, locations and dimensions as shown on drawings and report any errors  
42 or inconsistencies to the Owner before commencing work. Starting of work by each Contractor shall imply acceptance  
43 of existing conditions.

### 44 45 **13. SUPERVISION**

46 The General Prime Contractor shall take complete charge of the work under this contract and coordinate the work of all  
47 contractors on the project.

### 48 49 **14. FIELD OFFICES**

50 Not required.

### 51 52 **15. STAIRS AND SCAFFOLDS**

53 The General Prime Contractor shall:

1 Furnish and maintain equipment such as temporary stairs, fixed ladders, ramps, chutes, runways and the like as required  
2 for proper execution of work by all contractors, and shall remove them on completion of the work.  
3

4 Erect permanent stair framing as soon as possible. Provide stairs with temporary treads, handrails, and shaft protection.  
5

6 Contractors requiring scaffolds shall make arrangements with the General Prime Contractor, or shall provide their own  
7 and remove them on completion of the work. Each Contractor shall underlay its interior scaffolds with planking to prevent  
8 uprights from resting directly on the floor construction.  
9

#### 10 **16. HOISTS, ELEVATORS OR CRANES**

11 Each separate contractor shall provide and pay for its own hoist/crane or other apparatus necessary for unloading/setting  
12 or moving their equipment and materials. Installation and removal of equipment for this activity must be accounted for  
13 in the Project Schedule.  
14

15 Equipment and operations for this activity shall comply with applicable Department of Safety and Professional Services  
16 and OSHA requirements. No material hoist may be used to transport personnel unless it meets Department of Safety  
17 and Professional Services and OSHA requirements for that purpose.  
18

19 Contractors shall provide any protection required, temporary or long term, to prevent damage to work in place or in  
20 progress. When hoisting activity results in such damage, the responsible contractor shall pay for cleaning, repair or  
21 replacement of material or equipment as determined by the Owner.  
22

23 Equipment, that imposes loads of any kind on work in place, shall not be erected without agreement from the Owner.  
24

25 At their own discretion, two or more contractors may agree to use common hoisting facilities. Under such arrangements,  
26 the allocation of costs, access and scheduling and all other details of the agreement are the responsibility of the  
27 contractors involved.  
28

29 Existing elevators may be used on a limited basis with the Owner's permission and agreement. Costs of warranty  
30 extensions and additional service work required will be paid by the using contractor. Appropriate protection must be  
31 provided by the using contractor and that contractor shall be responsible for any structural, mechanical or finish damage  
32 to the elevator and its parts and to adjoining building finishes and components.  
33

#### 34 **17. SIGNS**

35 No project sign required.  
36

37 No individual advertising signs, plaques or credits, temporary or permanent, will be permitted on the building or premises,  
38 except the name of the Contractor on Contractor's office or material shed.  
39

#### 40 **18. FENCE**

41 Construction Staging Areas/Materials Storage Areas: the Owner will assign required Construction Site Staging Areas  
42 and Material Storage Areas as required on this project. The General Prime Contractor shall provide an eight-foot (8'-0")  
43 high, temporary chain-link construction fence around the site construction staging/material storage areas as required to  
44 secure the staging area(s) and construction materials stored on site. Contractor shall construct of standard studded T-  
45 Posts of sufficient length for line posts and spaced not to exceed 8'-0" apart. Corner posts and gate posts are to be  
46 galvanized steel pipe of not less than 2 1/2" o.d. and shall be properly braced. Note: Plastic fencing or wooden snow  
47 fence is not acceptable. Provide gates, properly constructed and braced, complete with hinges, hasps, and padlocks in  
48 number and location required for proper control, delivery and distribution of material and equipment. Gate posts shall  
49 be adequately back tied and anchored to insure a rigid installation. All protective fencing shall be maintained in an  
50 upright, orderly fashion throughout the construction schedule.  
51

#### 52 **19. ROADWAY**

53 Not applicable to this project.

1  
2 **20. TOILETS**

3 The General Prime Contractor shall arrange with Owner to use existing toilet facilities at building site. Toilets used by  
4 workers shall be kept clean and sanitary at all times.  
5

6 **21. TELEPHONES**

7 It is expected that each contractor have access to their own cell phone for their own use. No additional telephone service  
8 will be provided.  
9

10 **22. WATER SUPPLY**

11 The General Prime Contractor shall arrange with the Owner to use nearby existing water service.  
12

13 Toilets and slop sinks used by workers shall be kept clean and sanitary at all times.  
14

15 The General Prime Contractor shall supply water required for construction and other purposes from the existing  
16 building plumbing system.  
17

18 The General Prime Contractor shall prevent waste of water and shall maintain valves, connections, and hoses in  
19 perfect condition, at all times. Contractors shall provide their own hose or piping from hose bibs.  
20

21 **23. TEMPORARY ELECTRICAL WORK**

22 Duplex receptacles (120 volts) are available in each of the existing areas where work is performed for use of small hand  
23 tools when available.  
24

25 If a Contractor contemplates the use of equipment that requires a different voltage or greater capacity than that specified,  
26 then that Contractor must arrange with utility for this additional service and pay for installation of the service and the  
27 necessary additional switches and wiring required.  
28

29 The Electrical Contractor shall provide, at no cost to others, all lamps, wiring, switches, sockets and similar equipment  
30 required for temporary system until substantial completion. Upon completion of the project, the Electrical Contractor  
31 shall remove the temporary system.  
32

33 The temporary lighting system shall be sufficient to enable all contractors to safely complete their work and to enable the  
34 Owner to check all work as it is being done. Illumination shall be 5 foot-candles minimum in all areas and, in addition,  
35 shall meet or exceed the requirements of 29 CFR 1926.56 Illumination (OSHA regulations).  
36

37 In accordance with the latest issue of the National Electrical Code, all temporary electrical circuits for construction  
38 purposes shall be equipped with combination ground fault interrupter and circuit breakers meeting the requirements of  
39 UL for Class A, Group 1 devices. The ground fault interrupter portion shall be solid state type, insulated and isolated  
40 from the breaker mechanism. A test button shall be provided for checking the device. The breaker mechanism shall  
41 provide overload and short circuit protection and shall be operated by a toggle switch with overcenter switching  
42 mechanism so that contact cannot be held closed.  
43

44 All contractors shall furnish their extension cords and lamps other than those furnished for general lighting.  
45

46 All contractors and other separate Contractors shall be allowed to use the service provided for general lighting and  
47 fractional horsepower hand tools at no cost.  
48

49 The General Prime Contractor shall be compensated by those requiring three phase and single-phase energy used for  
50 equipment other than fractional horsepower hand tools. Arrangements shall be made with the General Prime Contractor  
51 before construction equipment is used.  
52

1 **24. COLD WEATHER PROTECTION**

2 All heating and protective covering, required to protect the work from injury due to freezing and moisture during the  
3 construction period and prior to enclosure of the building, shall be classed as COLD WEATHER PROTECTION. Such  
4 protection shall be provided and paid for by the General Prime Contractor.

5  
6 Heat required to protect materials from injury due to freezing during the construction period and prior to enclosure, shall  
7 be provided by means of portable heating units intended for this purpose.

8  
9 All heating units must be approved types. Proper ventilation must be provided. The use of temporary units whose  
10 product of combustion will damage fresh concrete, mortar or other building materials, will not be allowed. Use of coke  
11 or oil salamanders is prohibited.

12  
13 If electrical power is required for oil or gas portable heating units, it may be taken from the available temporary power  
14 source and paid for by the General Prime Contractor.

15  
16 Heating units and the area surrounding the units shall be kept in a clean and safe condition.

17  
18 **25. ENCLOSURE**

19 The General Prime Contractor should provide approved translucent material for temporary enclosure of exterior wall  
20 openings if they have not received final louvers. Plain or reinforced polyethylene film or other suitable translucent material  
21 will be acceptable, provided it is installed in or on a well fitting rigid wood frame and kept in good repair. This means of  
22 temporary enclosure shall be used for other minor openings in walls.

23  
24 At the end of day's work, securely close temporary enclosures. Padlock work area doors. The General Prime Contractor  
25 shall supervise the effectiveness of enclosures.

26  
27 **26. TEMPORARY HEAT**

28 All heating required after enclosure of the building up to substantial completion shall be classified as TEMPORARY  
29 HEAT. Enclosure is defined in the preceding Article.

30  
31 It shall be the responsibility of the General Prime Contractor to see that every precaution is used to prevent unnecessary  
32 escape of heat.

33  
34 For installations that are not connected to central plant steam or central plant hot water, the General Prime Contractor  
35 shall pay the fuel costs for temporary heat for both permanent heating systems used for temporary heat and/or temporary  
36 heating systems used for temporary heat.

37  
38 The General Prime Contractor shall pay for all electrical energy consumed for temporary heat.

39  
40 The Mechanical Contractor shall provide one of the following systems or a combination thereof, for furnishing temporary  
41 heat:

42  
43 Permanent heating system may be used for temporary heating. If permanent system is used, the Mechanical Contractor  
44 shall install in their permanent location heating coils or connectors as approved by the Owner, with controls to maintain  
45 temperatures required. Temporary filters shall be used in the permanent system. Provide bases, shields, etc., around  
46 heating elements to prevent too rapid drying of adjacent concrete, masonry or plaster. Relocation of some of the  
47 permanent heating system equipment may be required during construction to prevent interference with new construction.  
48 Temporary units may be installed in such areas during the time permanent equipment is not operating due to relocation.

49  
50 The distribution piping of the permanent heating system may be utilized for supply and return to unit heaters on each  
51 floor in lieu of temporary piping, provided approved connections, controls and protection of such piping is maintained.

52

1 If the permanent air system is used during temporary heating period, temporary filters shall be provided in the system  
2 and they shall have efficiency equal to the permanent filters. The return air ductwork shall be protected from construction  
3 dirt by temporary filters placed over return openings.  
4

5 If the Mechanical Contractor does not have one of the above systems in operation by the time the building is enclosed,  
6 then the Mechanical Contractor shall provide, maintain and supervise the operation of temporary portable units with  
7 necessary automatic controls to provide required temperatures. Current required may be taken from the temporary  
8 electrical service. See "Temporary Electrical Installation". Cost of fuel to operate portable units shall be paid by the  
9 General Prime Contractor.  
10

11 All electrical wiring required for temporary heating units shall be furnished and installed by Mechanical Contractor, from  
12 temporary wiring service. Electrical wiring to permanent equipment used for temporary heating that has been mounted  
13 in its permanent location shall be wired by contractors skilled in that work.  
14

15 The use of open salamanders as portable heating units will not be approved. All portable temporary heating units shall  
16 be properly ventilated to prevent combustion gases from remaining in the heating area.  
17

18 The Mechanical Contractor must ascertain if heating equipment will operate on the temporary electrical service available.  
19 If service is insufficient to operate equipment, Mechanical Contractor shall make other arrangements.  
20

21 The Mechanical Contractor shall be responsible for the proper adjustment and maintenance of the system, and shall  
22 supervise and be responsible for the operation of the system used for temporary heating until the Owner occupies the  
23 building. Supervision shall include periodic checking of operation as required.  
24

25 A minimum temperature of 45 degrees and a maximum temperature of 60 degrees for the building shall be maintained  
26 by the Mechanical Contractor, except for a period of at least ten days prior to the placing of interior woodwork and  
27 throughout the placing of this and other finish, varnishing, painting, etc., and until substantial completion to provide  
28 sufficient heat to insure a temperature in the spaces involved of not less than 70 degrees nor more than 80 degrees.  
29

30 The temporary heating system shall be removed by the Mechanical Contractor after the permanent heating system has  
31 been installed and operating. Surfaces and structure shall be patched as required. Temporary heating equipment shall  
32 be relocated by the Mechanical Contractor as required during construction to prevent interference with new construction.  
33

34 At completion of construction work or when temporary heat is no longer required, Mechanical Contractor must repair any  
35 damage done to permanent equipment during temporary heating period and also perform the necessary cleaning of all  
36 ducts and equipment. The Mechanical Contractor shall provide permanent filters to the complete satisfaction of the  
37 Owner.  
38

### 39 **27. FIRE PROTECTION**

40 The General Prime Contractor shall provide and maintain in working order during the entire construction period, a  
41 minimum of three (3) fire extinguishers on each floor level, including basement of the building, and one (1) in temporary  
42 office. Extinguishers shall be non-freeze type such as A-B-C rated dry chemical, of not less than 10-pound capacity  
43 each. In addition, any Subcontractor who maintains an enclosed shed on the site shall provide and maintain, in an  
44 accessible location, one or more similar nonfreezing type fire extinguisher in each enclosed shed.  
45

### 46 **28. WATCHPERSONS**

47 Watchpersons will not be furnished by the Owner. The Contractor shall provide such precautionary measures, to include  
48 the furnishing of watchpersons if deemed necessary, to protect persons and property from damage or loss where the  
49 Contractor's work is involved.  
50

1 **29. STORAGE OF MATERIALS**

2 Contractor shall confine equipment, apparatus, storage of materials and operations to limits indicated on the drawings  
3 or by specific direction of the Owner and shall not bring material onto the site until they are needed for the progress of  
4 the work.

5  
6 The storage of materials on the grounds and within the building shall be in strict accordance with the instructions of the  
7 Owner. Storage of materials within the building shall at no time exceed the design carrying capacity of the structural  
8 system.

9  
10 All materials affected by moisture shall be stored on platforms and protected from the weather.

11  
12 All materials shall be stored in a manner that prevents release of hazardous material to the environment.

13  
14 All hazardous materials, including motor fuels, shall be properly handled and contained to prevent spills or other releases.  
15 The General Prime Contractor shall develop and maintain a contingency plan to provide emergency response,  
16 containment, and cleanup of spills of hazardous materials resulting from contract activities. All spills and releases shall  
17 be reported to the Owner as soon as possible.

18  
19 During the construction of this building, materials, construction sheds, and earth stockpiles shall be located so as not to  
20 interfere with the installation of the utilities nor cause damage to existing lines.

21  
22 The Contractor shall allot space to others for storage of their materials, and erection of their sheds.

23  
24 *Should it be necessary at any time to move material sheds or storage platforms, the Contractor shall move same at the  
25 Contractor's expense, when directed by Owner.*

26  
27 Repairing of areas used for placing of sheds, offices, and for storage of materials shall be done by the Contractor.

28  
29 **30. PROTECTION OF FINISHED CONSTRUCTION**

30 Contractor shall assume the responsibility for the protection of all finished construction under the Contract and shall  
31 repair and restore any and all damage of finished work to its original state.

32  
33 Wheeling of any loads over any type of floor, either with or without plank protection, will be permitted only in rubber tired  
34 wheelbarrows, buggies, trucks or dollies.

35  
36 Where structural concrete is also the finished surface, care must be taken to avoid marking or damaging those surfaces.

37  
38 **31. PROTECTION IN GENERAL**

39 All structures and equipment shall be constructed, installed and operated with guards, controls and other devices in  
40 place.

41  
42 *Temporary pumps required for pumping water from building excavation or from building proper shall be provided by the  
43 General Prime Contractor, including temporary connections. Plumbing Contractor shall install permanent sump basins  
44 and piping where and when required. Permanent sump pumps shall not be installed until building is substantially  
45 complete and when approved by Owner. The General Prime Contractor shall remove temporary pumps and connections  
46 when approved by Owner.*

47  
48 The General Prime Contractor shall:

49 Provide, erect and maintain all required planking, barricades, guard rails, temporary walkways, etc., of sufficient size and  
50 strength necessary for protection of stored material and equipment; paved surfaces, walks, curbs, gutters and drives;  
51 streets adjacent to or within project area; adjoining property and all project work to prevent accidents to the public and  
52 the workmen at the job site.

1 Notify adjacent property owners if their property interferes with the work so that arrangements for proper protection can  
2 be made.

3

4 Provide and maintain proper shoring and bracing to prevent earth from caving or washing into the building excavation.  
5 Provide temporary protection around openings through floors and roofs, including elevator openings, stairwells, and edge  
6 of slabs.

7

8 Provide and maintain proper shoring and bracing for existing underground utilities, sewers, etc., encountered during  
9 excavation work, to protect them from collapse or other type of damage until such time as they are to be removed,  
10 incorporated into the new work, or can be properly backfilled upon completion of new work.

11

12 Provide protection against rain, snow, wind, ice, storms, or heat to maintain all work, materials, apparatus, and fixtures,  
13 incorporated in the work or stored on the site, free from injury or damage. At the end of the day's work, cover all new  
14 work likely to be damaged. Remove snow and ice as necessary for safety and proper execution of the work.

15

16 Protect the building and foundations from damage at all times from rain, ground water and back-up from drains or sewers.  
17 Provide all equipment and enclosures as necessary to provide this protection.

18

19 Damaged property shall be repaired or replaced in order to return it to its original condition. Damaged lawns shall be  
20 replaced with sod.

21

22 Protect materials, work and equipment, not normally covered by above protection, until construction proceeds to a point  
23 where the general building protection of the area where located, dispenses with the necessity therefore. Protect work  
24 outside of the building lines such as trenches and open excavations, as specified above.

25

26 Take all necessary precautions to protect the Owner's property as well as adjacent property, including trees, shrubs,  
27 buildings, sanitary and storm sewers, water piping, gas piping, electric conduit or cable, etc., from any and all damage  
28 which may result due to work on this project.

29

30 Repair work outside of property line in accordance with the requirements of the authority having jurisdiction.

31

32 Repair any work, damaged by failure to provide proper and adequate protection, to its original state to the satisfaction of  
33 the Owner or remove and replace with new work at the Contractor's expense.

34

35 Protect trees indicated on the drawings to remain and trees in locations that would not interfere with new construction,  
36 from all damage. Do not injure trunks, branches, or roots of trees that are to remain. Do cutting and trimming only as  
37 approved and as directed by Owner.

38

39 The value of trees destroyed or damaged will be charged against the account of the Contractor responsible for the  
40 damage in an amount equal to the expense of replacing the trees with those of similar kind and size.

41

## 42 **32. CLEANING AND WASTE DISPOSAL**

43 Contractor shall be responsible for all cleaning required within the technical sections of the specifications governing work  
44 under the Contractor's jurisdiction as well as for keeping all work areas, passageways, ramps, stairs and all other areas  
45 of the premises free of accumulation of surplus materials, rubbish, debris and scrap which may be caused by the  
46 Contractor's operations or that of the Subcontractors.

47

48 Remove rubbish, debris and scrap promptly upon its accumulation and in no event later than the end of each week.

49

50 Combustible waste shall be removed immediately or stored in fire resistive containers until disposed of in an approved  
51 manner.

52



1 No burning of rubbish or debris will be allowed at the site. Rubbish, debris and scrap shall not be thrown through any  
2 window or other opening, or dropped from any great height; it shall be conducted to the ground, to waiting truck(s) or  
3 removable container(s) by means of approved chutes or other means of controlled conveyance.

4  
5 Form and scrap lumber shall have all nails withdrawn or bent over; shall be neatly stacked, placed in trash bins, or  
6 removed from the premises.

7  
8 Spillages of oil, grease or other liquids which could cause a slippery or otherwise hazardous situation or stain a finished  
9 surface, shall be cleaned up immediately.

10  
11 Dust, dirt and other foreign matter shall be removed completely from all internal surfaces of all mechanical and electrical  
12 units, cabinets, ducts, pipes, etc.

13  
14 Dirt, soil, fingerprints, stains and the like, shall be completely removed from all exposed finished surfaces.

15  
16 General Prime Contractor shall wash all glass immediately prior to the occupancy of this project. Work shall include the  
17 removal of labels, paint splattering, glazing compound and sealant. Surfaces shall include mirrors and both sides of all  
18 glass in windows, borrowed lights, partitions, doors and side lights.

19  
20 Broken, scratched or otherwise damaged glass shall be replaced by the General Prime Contractor.

21  
22 In addition to the above, the General Prime Contractor shall be responsible for the general "broom" cleaning of the  
23 premises and for expediting all of the cleaning, washing, waxing and polishing required within the technical sections of  
24 the specifications governing work under this Contract. The General Prime Contractor shall also perform "final" cleaning  
25 of all exposed surfaces to remove all foreign matter, spots, soil, construction dust, etc., so as to put the project in a  
26 complete and finished condition ready for acceptance and use intended.

27  
28 If rubbish and debris is not removed, or if surfaces are not cleaned as specified above, the Owner reserves the right to  
29 have said work done by others and the related cost(s) will be deducted from monies due the Contractor.

### 30 31 **33. OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS**

32 Contractor shall provide the Owner with two (2) sets of the O&M data for each device, piece of equipment and assembly  
33 furnished and/or installed under this contract. Format shall be paper, indexed and labeled and bound in three-ring  
34 binders. When duplicate electronic data is available, include electronic media in 3-hole vinyl holders in binders.

35  
36 The O&M manuals shall include the following:

- 37 • Table of Contents
- 38 • Contact information (including emergency contact number) for installing contractor, original vendor  
39 manufacturer and service provider
- 40 • Copy of approved submittals
- 41 • As-built control drawings and sequences of operations
- 42 • Catalog data or literature with correct model number checked
- 43 • Manufacturer's installation and operation instructions including start-up, break-in, shutdown, seasonal,  
44 emergency and special operation procedures
- 45 • Manufacturer's maintenance instructions including procedures and instructions for problem corrections,  
46 preventive maintenance, testing, alignment, adjustment and repair
- 47 • Complete parts list in an exploded view diagram of the equipment
- 48 • Construction Verification Checklists
- 49 • Inspection and testing reports
- 50 • Maintenance records indicating maintenance performed by contractor prior to substantial completion
- 51 • Equipment warranties including terms and conditions and date of inception (substantial completion) and date  
52 of expiration
- 53 • List of special tools or testing equipment required for the operation, testing or maintenance of the equipment

1 • For items assembled by the Contractor for special functions, write operating and maintenance instructions  
2 Contractor shall submit to A/E for review, make revisions noted by A/E and provide final O&M data for A/E's review 30  
3 business days prior to training. Any revisions or changes to the systems and/or equipment post delivery of the final O &  
4 M data submittal must be submitted to A/E as an addendum within 30 days of the revision or change.

#### 5 6 **34. TESTS AND ADJUSTMENTS**

7 The complete installation consisting of the several parts and systems and all equipment installed according to the  
8 requirements of the Contract Documents, shall be ready in all respects for use by the Owner and shall be subjected to a  
9 test at full operating conditions and pressures for normal conditions of use.

10  
11 Contractor shall make all necessary adjustments and replacements affecting the work which is necessary to fulfill Owner  
12 requirements and to comply with the directions and recommendations of the manufacturer of the several pieces of  
13 equipment, and to comply with all codes and regulations which may apply to the entire installation. Contractor shall also  
14 make all required adjustments to comply with all provisions of the drawings and specifications.

#### 15 16 **35. LOOSE AND DETACHABLE PARTS**

17 Contractor shall retain all loose and small detachable parts of apparatus and equipment furnished under this Contract,  
18 until completion of the work and shall turn them over to Owner designated to receive them. Contractor shall obtain from  
19 the Owner an itemized receipt thereof

#### 20 21 **36. EROSION CONTROL AND STORM WATER MANAGEMENT**

22 In accordance with state law, where applicable, and what the University of Wisconsin System Administration believes to  
23 be good soil conservation practices and pollution prevention, the General Prime Contractor shall be governed by the  
24 following:

25  
26 The General Prime Contractor hereby covenants to maintain all project grounds, public streets and associated areas,  
27 including fill areas in a manner consistent with state laws and the general policy to conserve soil and soil resources, and  
28 to control and prevent soil erosion and to control and prevent siltation into waters of the state. This clause is to be  
29 liberally construed to further the above stated objectives. The following shall include, but not limit areas in which control  
30 is to be executed:

31  
32 Erosion Control Plan: Implement the erosion control plan developed for the project and maintain erosion control practices  
33 throughout the construction period. Modifications to the erosion control plan, addressing phases of construction shall be  
34 the responsibility of the General Prime Contractor. Erosion control practices that are compromised as the result of  
35 construction activity shall be returned to their functioning state by the end of the current work day. Where applicable,  
36 erosion control practices shall comply with Chapters NR 151 and 216, Wis. Adm. Code.

37  
38 Minimum Stripping: Limit stripping of sod and vegetation and limit land disturbance to an area and a time period that will  
39 expose bare soil to least possibility of erosion that construction requirements will allow.

40  
41 Stockpiling: Materials, including soil, shall be stored and protected in a manner that will prevent runoff of material from  
42 the stockpiles into streets, drainage facilities, storm sewer systems, or waters of the state in the event of rain.

43  
44 Soil Erosion and Erodible Materials: Take positive measures to prevent soil erosion from the construction area and areas  
45 disturbed by construction activities by employing such means as seed and mulch, mulches, intercepting embankments  
46 and berms, sedimentation basins, ditch checks, riprap, erosion mats, silt fence, approved polyacrylamides, inlet  
47 protection, or other temporary erosion control devices or methods.

48  
49 Record Keeping: Maintain a copy of the current erosion control plan on site. Maintain maintenance records and  
50 inspection logs on-site for erosion control and storm water management practices. Contractor shall provide Owner with  
51 a weekly maintenance and inspection report.

1 Street Maintenance: Control the tracking of soil onto street and paved surfaces to a minimum. Any such tracking shall  
2 be removed no less than on a daily basis.

3  
4 Storm Water Management: Practices installed for post-construction storm water management shall be protected during  
5 construction activity, and in the event that their intended function becomes compromised during construction activity,  
6 shall be restored and/or repaired according to Chapters NR 151 and 216, Wis. Adm. Code, for post-construction storm  
7 water management.

8  
9 Erosion control and storm water management practices shall be installed and maintained in accordance with the WDNR  
10 approved technical standards available at the following website:

11 <http://dnr.wi.gov/org/water/wm/nps/stormwater/techstds.htm>

12  
13 Responsibility and authority for maintaining records for NR 216 is the responsibility of the General Prime Contractor.

### 14 15 **37. AIR QUALITY MANAGEMENT**

16 In accordance with the Department of Administration's air quality management practice on Ozone Action Days, all  
17 contractors shall reduce or limit emissions and particulate matter that adversely affect air quality.

18  
19 The General Prime Contractor shall establish the action plan, in cooperation with other contractor(s), concerning  
20 implementation of air quality management on Ozone Action Days. This plan shall include suspending work or modifying  
21 operations for all activities related to ozone, volatile organic compounds (VOC) and nitrogen oxide emissions. These  
22 work activities include but are not limited to the following:

23 Limit equipment and vehicle refueling to after 6 pm.

24 Limit use of gasoline-powered vehicle and equipment.

25 Limit excessive idling of diesel-powered vehicle and equipment.

26 Limit large scale painting with VOC.

27 Limit large scale asphalt roofing and paving.

28 Limit and/or control all dust creating activities.

29  
30 For information on air quality readings on Ozone Action Days refer to:

31 1-866-324-5924; or

32 <http://www.dnr.state.wi.us/org/aw/air/wisards/state.htm>

### 33 34 **38. CONSTRUCTION WASTE MANAGEMENT**

35 See Section 01 74 19 – Construction Waste Management.

### 36 37 **39. GUARANTEE DOCUMENTS**

38 Upon Substantial Completion of project, the Contractor shall submit such written guarantees and bonds to the Owner.

### 39 40 **40. RECORD DOCUMENTS**

41 On a suitable set of Contract Documents, the contractor is to maintain a daily record of changes and deviations from the  
42 contract. All buried or concealed piping, conduit, or similar items shall be located by dimensions and elevations on the  
43 record drawings.

44  
45 The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary mark-ups will be  
46 permitted.

47  
48 Once during the month the Contractor shall present at the project, the job copy showing variations and changes to date  
49 to the Architect/Engineer and the Owner for their review.

50  
51 At substantial completion of the project, the Contractor shall transmit the marked up as-built documents to the  
52 Architect/Engineer and copy the Owner on the transmittal of the documents. The A/E will incorporate the contractor  
53 marked up as-built drawings into the record drawings.

54 \*\*\*



1 **SECTION 01 33 00**  
2 **ELECTRONIC SUBMITTAL PROCEDURES**  
3 **BASED ON DFD MASTER SPECIFICATION DATED 2/29/2024**  
4

5 **PART 1 - GENERAL**  
6

7 **SCOPE**

8 This section includes requirements for the submittal log and administrative and procedural requirements for elec-  
9 tronically submitting Fabrication Drawings, Product Data, Samples and other submittals. Included are the follow-  
10 ing topics:  
11

12 **PART 1 – GENERAL**

- 13 Scope
- 14 Reference
- 15 Related Work
- 16 Definitions
- 17 Administrative Requirements

18 **PART 2 – PRODUCTS**

- 19 Submittal Management System

20 **PART 3 – EXECUTION**

- 21 Submittal Management System
  - 22 Contractor's Review
  - 23 Architect/Engineer's Action
  - 24 Closeout Documentation
- 25

26 **REFERENCE**

27 Applicable provisions of Division 01 govern work under this section.  
28

29 **RELATED WORK**

30 **SUBMITTALS NOT COVERED BY THIS SECTION INCLUDE:**

31  
32 General Conditions of the General Prime Contractor Contract articles:

33 “Equals and Substitutions” regarding substitution requests.

34 “Payment to General Prime Contractor” regarding Applications for Payment and the schedule of values.

35 “Scheduling and Coordination of Work” regarding schedules and reports, including Contractor's construction  
36 schedule.

37 “Final Completion and Final Payment” regarding project closeout and final pay submittals.

38 “Quality Control and Inspection” and “Reports, Records and Data” regarding scheduling and reporting of tests and  
39 inspections.  
40

41 Division 01 General Requirements articles:

42 "Operation and Maintenance Manuals and Instructions" regarding operation and maintenance manuals.

43 "Record Documents" regarding record Drawings, record Specifications, and record Product Data.  
44

45 Other:

46 “01 74 19 Construction Waste Management” regarding construction waste management submittal requirements.  
47

48 **DEFINITIONS**

49 Submittals: All written and graphic information and physical samples demonstrating compliance with Contract  
50 Documents that require Architect/Engineer's review including but not limited to the following: design data, pre-  
51 engineered systems certification, product data, product schedule, samples, fabrication drawings, tests and  
52 certifications submittals. The terms “Submittals” and “Shop Drawings” may be used interchangeably.  
53

1 **ADMINISTRATIVE REQUIREMENTS**

2 Coordination: Provide adequate submittal processing time to allow completion of the entire project within the time  
3 specified in the Contract Documents. Coordinate preparation and processing of submittals with Project Schedule,  
4 including:

- 5 1. Review by Architect/Engineer, revision by contractor, if returned by Architect/Engineer, and review of  
6 resubmittal.
- 7 2. Ordering, manufacturing, fabrication, delivery, installation, and related activities, including required  
8 construction sequencing per the construction schedule.  
9

10 Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

- 11 1. Assemble each submittal into a single, separate, PDF file.
- 12 2. Include Request for Submittal Approval form DOA-4523 as first page of file. Identify features of the  
13 submittal which may not be in conformance with contract document requirements.
- 14 3. For large submittals, include bookmarks within file to navigate through file.
- 15 4. Name file with submittal number or other unique identifier, using Specification Section Number-Submittal  
16 Name-Submittal Sequence Number (e.g. 081100-Doors-6).
- 17 5. Resubmittals: Make resubmittals in same form and number of copies as initial submittal. Resubmittals  
18 shall include the letter "R" and a number inciting the resubmittal number (081100-Doors-6-R1).  
19  
20

21 **PART 2 - PRODUCTS**

22  
23 **SUBMITTAL MANAGEMENT SYSTEM**

24 Vendors: Aconex, CMiC, eBuilder, Newforma, Primavera, Procore, Prolog, Submittal Exchange  
25

26 Provide an electronic tracking and management system capable of storing and displaying a Submittal Log and all  
27 project Submittals. The Submittal Log and all Submittal information must be printable and continuously accessible  
28 via the Internet by the General Prime Contractor, Subcontractors, Suppliers, Architect/Engineer and UW with  
29 password controlled accessibility and permissions. Provide uploading and editing capabilities for the General Prime  
30 Contractor, Subcontractors and Architect/Engineer and viewing capabilities for UW.  
31

32 Provide online training and live technical support for system users.  
33

34 The Submittal Log must automatically enter the date submittals are uploaded or edited, the name of the person  
35 taking action and issue E-Mail notifications to the parties who must next act on the submittal. The Submittal Log  
36 must identify submittal due dates and those submittals that are on the critical path of the construction schedule and  
37 highlight any submittal that is beyond its schedule requirement.  
38

39 SUBMITTAL LOG: The Submittal Log must include each anticipated submittal, sortable by initial submittal date  
40 and by division of work. It must also include the following information for each submittal, arranged in tabular form  
41 in the following sequence.

- 42 1. ***Project name***
- 43 2. ***UW Project number***
- 44 3. ***Contractor Name***
- 45 4. ***Specification Section Number***
- 46 5. ***Specification Section Title***
- 47 6. ***Submittal Description***
- 48 7. ***Responsible Contractor or Subcontractor***
- 49 8. ***Date of Initial Submittal Required to Meet Project Schedule***
- 50 9. ***Date of Final Release or Architect/Engineer Approval Required to Meet Project Schedule***
- 51 10. ***Date Initial Submittal Received by Architect/Engineer***
- 52 11. ***Date of Initial Response from Architect/Engineer***
- 53 12. ***Architect/Engineer Action on Initial Submittal***
- 54 13. ***Date Resubmittal Received by Architect/Engineer (if Applicable)***
- 55 14. ***Date of Resubmittal Response from Architect/Engineer (if Applicable)***
- 56 15. ***Architect/Engineer Action on Resubmittal (if Applicable)***

1           **16. Remarks**

2  
3   SUBMITTALS:

4   Provide Submittals for the following Submittal Types.

5  
6   Product Data: Provide Product Data information in a single submittal for each element of construction and type of  
7   product or equipment. Include the following information, as applicable:

- 8           1. *Manufacturer's catalog cuts.*
- 9           2. *Manufacturer's product specifications.*
- 10          3. *Standard color charts.*
- 11          4. *Dimensions.*
- 12          5. *Materials of construction.*
- 13          6. *Statement of compliance with specified referenced standards.*
- 14          7. *Testing by recognized testing agency.*
- 15          8. *Application of testing agency labels and seals.*
- 16          9. *Notation of coordination requirements.*
- 17          10. *Availability and delivery time information.*
- 18          11. *Wiring diagrams showing factory-installed wiring.*
- 19          12. *Capacities and operational characteristics.*
- 20          13. *Performance and operating criteria, ratings and curves.*
- 21          14. *Operational range diagrams.*
- 22          15. *Clearances required to other construction, if not indicated on accompanying Fabrication Drawings.*

23  
24   Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of  
25   products required for the Work and their intended location. Include the following information in tabular form:

- 26   1. Type of product, including a unique identifier for each product indicated in the Contract Documents, or as  
27   assigned by Contractor, if none is indicated.
- 28   2. Manufacturer and product name, and model number if applicable.
- 29   3. Number and name of room or space.
- 30   4. Location within room or space.

31  
32   Fabrication Drawings: Project-specific Fabrication Drawings, drawn accurately to scale. Do not base Drawings on  
33   reproductions of the Contract Documents or standard printed data. Fully illustrate requirements of the Contract  
34   Documents, including the following information, as applicable:

- 35           1. *Identification of products.*
- 36           2. *Schedules.*
- 37           3. *Dimensions.*
- 38           4. *Materials of construction.*
- 39           5. *Compliance with specified standards.*
- 40           6. *Notation of coordination requirements.*
- 41           7. *Notation of dimensions established by field measurement.*
- 42           8. *Relationship and attachment to adjoining construction clearly indicated.*
- 43           9. *Seal and signature of design professional if specified.*

44  
45   Except for templates, patterns, and similar full-size drawings, submit Fabrication Drawings on sheets at least 8-1/2  
46   by 11 inches, but no larger than 30 by 42 inches .

47  
48   Samples: Samples include, but are not limited to, the following: partial sections of manufactured or fabricated  
49   components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing  
50   color, texture, and pattern; color charts, color range sets; and components used for independent testing and  
51   inspection. The electronic Submittal Management System is not intended for transmitting samples.

52  
53   Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, kind,  
54   textures, and patterns available for a check of these characteristics with other elements and for comparison to actual  
55   component as delivered and installed.

1 Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and  
2 finished in manner specified, and physically identical with material or product proposed for use, and that show full  
3 range of color and texture variations expected.

4  
5 Where variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a  
6 Sample, submit at least three sets of paired units that show approximate limits of variations

7  
8 Attach label on unexposed side of Samples that includes the following:

- 9 **1. Generic description of Sample.**
- 10 **2. Product name and name of manufacturer.**
- 11 **3. Sample source.**
- 12 **4. Number and title of applicable Specification Section.**
- 13 **5. Specification paragraph number and generic name of each item.**

14  
15 Transmit Samples that contain multiple, related components such as accessories together in one submittal package.  
16 Provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample  
17 characteristics, and identification information for record.

18  
19 Tests and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing  
20 certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign  
21 documents on behalf of that entity; provide notarized statement on original paper copy certificates and  
22 certifications, where indicated.

23  
24 Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and  
25 design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other  
26 performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and  
27 version of software, if any, used for calculations. Include page numbers.

28  
29 Pre-engineered Systems Certification: Submit electronic files of certificate, signed and sealed by the responsible  
30 design professional, for each product and system specifically assigned to Contractor to be designed or certified by a  
31 design professional.

- 32 1. Indicate that products and systems comply with performance and design criteria in the Contract  
33 Documents. Include list of codes, loads, and other factors used in performing these services.

### 34 35 **PART 3 - EXECUTION**

#### 36 37 **ELECTRONIC SUBMITTAL MANAGEMENT SYSTEM**

38 Establish the electronic submittal management system upon contract award and maintain the system for the duration  
39 of the General Prime Contractor's contract. Develop a list of project users and user permissions and update  
40 throughout the project when needed. Provide users with passwords, directions for accessing, uploading, editing and  
41 technical support resources.

42  
43 **SUBMITTAL LOG:** Establish and maintain the project submittal log in the Submittals Management System.

44  
45 Provide a printed submittal log at the Pre-Construction Meeting. List all known submittals: be particularly mindful  
46 of submittals required to maintain orderly progress of the Work and the Project Schedule over the first 60 calendar  
47 days of the project or that are need early submission and response due to long lead time for manufacture, fabrication  
48 or delivery.

49  
50 Complete submittal entries in the submittal log within 60 calendar days of project Notice to Proceed, including  
51 listing submittals for all work activities through project completion.

52  
53 Update the submittal log weekly to reflect changes in submittal status, submission & reply dates or other  
54 information. Provide a printed submittal log for review along with project schedule at construction progress  
55 meetings. Maintain electronic access to the submittal log at the construction site at all times.



1  
2 SUBMITTALS: Reference Division 01, General Conditions of the General Prime Contractor Contract, Submittals,  
3 for submittal requirements in addition to the following.  
4  
5 Prepare and submit submittals required by individual Specification Sections and Part 2 above.  
6 Group submittals for related parts of the Work together so processing will not be delayed due to need for concurrent  
7 review for coordination. Architect/Engineer reserves the right to withhold action on a submittal requiring  
8 coordination with other submittals until related submittals are received  
9  
10 Enter and maintain submittals in the electronic Submittals Management System, except those not able to be digitally  
11 transmitted, such as samples or documents required to be original.  
12  
13 On an attached separate sheet prepared on Contractor's letterhead, record relevant information, requests for data, and  
14 revisions other than those requested by Architect/Engineer on previous submittals.  
15  
16 Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received  
17 prior approval from the Architect/Engineer.  
18  
19 Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal  
20 without review.  
21  
22 The General Prime Contractor is responsible for review and approval of subcontractor and supplier submittals prior  
23 to forwarding to Architect/Engineer. Architect/Engineer will not review submittals received from sources other than  
24 the General Prime Contractor.  
25  
26 Maintain a current set of submittals and access to electronic access at the construction site at all times.  
27  
28 Product Data: Collect information into a single submittal for each element of construction and type of product or  
29 equipment. Submit before or concurrent with Samples. If information must be specially prepared for submittal  
30 because standard published data are not suitable for use, submit as Fabrication Drawings, not as Product Data.  
31  
32 Samples: Submit Samples per Part 2 above. Provide corresponding electronic submittal of Sample transmittal,  
33 digital image file illustrating Sample characteristics, and identification information for record.  
34  
35 Maintain sets of approved Samples at Project Site, available for quality-control comparisons throughout the course  
36 of construction activity. Sample sets may be used to determine final acceptance of construction associated with each  
37 set.  
38  
39 Samples may be incorporated into the Work if so indicated in individual Specification Sections. Such Samples must  
40 be in an undamaged condition at time of use. Samples not incorporated into the Work, are otherwise designated as  
41 Owner's property.  
42  
43 Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and  
44 other similar characteristics are to be demonstrated.  
45  
46 Performance Design: Where performance design services or certifications by a design professional are required,  
47 provide components, products, assemblies and systems complying with specific performance and design criteria  
48 indicated. Include design professional certifications, signature and seal; calculations, the list of codes and standards  
49 the design complies with and other factors used in performing these services.  
50  
51 Tests and Reports: Submit test and inspection reports where required with date of test or inspection, name of firm  
52 and individual performing the test or inspection.  
53  
54 RESUBMITTALS: Contractor shall contact Architect/Engineer directly to resolve issues prior to making a  
55 resubmittal.  
56

1 **CONTRACTOR'S REVIEW**  
2 Review each submittal and check for coordination with other Work of the Contract and for compliance with the  
3 Contract Documents. Make corrections necessary for coordination and compliance prior to submitting.

4  
5 Stamp each submittal with a dated and signed approval stamp before submitting to Architect/Engineer.

6  
7 **ARCHITECT/ENGINEER'S ACTION**

8 Architect/Engineer will review each submittal, make marks and/or provide written comments to indicate corrections  
9 or revisions required, and return it. Architect/Engineer will stamp each submittal with an action stamp and will  
10 mark stamp appropriately to indicate action.

11  
12 **CLOSEOUT DOCUMENTATION**

13 Prior to project closeout, submit a complete set of project submittals and the submittal log in PDF format on CD,  
14 DVD, USB flash drive or downloadable link to the UW Project Representative.

15  
16 **END OF SECTION**

**SECTION 01 74 19**  
**CONSTRUCTION WASTE MANAGEMENT**  
BASED ON DFD MASTER SPECIFICATION DATED 3/12/14

1 **SCOPE**

2 This Section addresses and specifies salvaging, reusing, recycling and disposing of all project Construction  
3 Waste.

4  
5 **PART 1 - GENERAL**

6       Related Work  
7       Definitions  
8       Diversion Goal  
9       Submittals  
10       Construction Waste Management Plan

11  
12 **PART 2 - PRODUCTS** Not Applicable

13  
14 **PART 3 - EXECUTION**

15       Construction Waste Management Plan Implementation  
16  
17

18 **PART 1 - GENERAL**

19  
20 **RELATED WORK**

21 Other Applicable provisions of Division 01 shall govern all work under this Section.  
22       Section 02 41 13 Demolition  
23

24 **DEFINITIONS**

25 Clean: Untreated and unpainted; not contaminated with oils, solvents, sealant (caulk), or the like.

26 Construction Waste: An umbrella term for construction, demolition and remodeling solid waste, typically including  
27 extra building materials, rubble & material that has reached the end of its useful life for its intended use,  
28 packaging, trash & debris incidental to the project construction. Construction Waste includes salvageable,  
29 returnable, recyclable, and reusable material.  
30

31 Diversion Goal: Percentage of Construction Waste material (by weight or by volume) which is intended to be  
32 reused, recycled, returned or otherwise salvaged and thus diverted from landfill.  
33

34 Hazardous Waste: Waste that is ignitable, corrosive, toxic and/or reactive and poses substantial or potential  
35 threats to public health or the environment. Hazardous Waste is not recyclable and not included when calculating  
36 Diversion Goal or percentage and shall be disposed of according to the General Requirements.  
37

38 Landfill Tipping Fees: Monies paid for burying non-recyclable Waste in the landfills.  
39

40 Recycle: To sort, clean, treat & reconstitute or remanufacture Construction Waste materials for reuse in the same  
41 form or some altered form. Recycling does not include burning, incinerating, or thermally destroying waste.  
42

43 Return: To give back reusable items or unused products to vendors for credit.  
44

45 Reuse: To reuse a Construction Waste material on the project site.  
46

47 Scrap Revenue: Monies received by the hauler for recyclable materials.  
48

49 Trash: Non-hazardous products or materials unable to be reused, returned, recycled, or salvaged.

50 WasteCap ReTRAC: Online submittal and reporting tool for Construction waste management. Contractors bear  
51 no cost for using TRACE. Information about ReTRAC may be obtained at <https://www.re-trac.com>.  
52  
53

1 **DIVERSION GOAL**

2 Divert **75 %** by weight or volume of total waste generated through Substantial Completion.

3  
4 **SUBMITTALS**

5 The General Prime Contractor shall develop and compile the following Construction Waste Management (CWM)  
6 project information in cooperation with all Contractors and subcontractors:

7  
8 **CWM Plan:** Required prior to commencing demolition, construction or waste removal activities  
9 and no later than 15 days after Notice to Proceed.

10  
11 **CWM Final Report:** At Substantial Completion, the General Prime Contractor shall submit a  
12 Final Report summarizing total waste and trash quantities and rates for all Contractors over  
13 the course of the project.

14  
15 CWM Plan and Report information above shall be available from the General Prime Contractor upon request.

16  
17 **CONSTRUCTION WASTE MANAGEMENT (CWM) PLAN**

18 The CWM Plan shall include, but is not limited, to the following:

19 **Schedule** - Include milestones and key reporting dates of construction waste management.

20  
21 **Trash Materials List** - Include estimated quantities and types of materials expected to be  
22 discarded as trash.

23  
24 **Diverted Materials List** - Include estimated quantities and types of Construction Waste  
25 materials anticipated to be salvaged, reused, returned or recycled. Identify applicable markets  
26 for reuse and/or recycling. At a minimum, include scrap metal and all other materials required  
27 by statute or regulation to be recycled (e.g., cardboard, cans, bottles, office paper, fluorescent  
28 tubes, refrigerants, mercury, etc.). Other recyclable materials may include, but are not limited  
29 to:

30  
31 Aluminum Cans, Straps, and Sheet: Recycle as metal.

32  
33 Brick: Can be reused whole, or crushed for use as landscape cover, sub-base material or fill.

34  
35 Building Components and Fixtures: Windows, doors, cabinets, hardware, plumbing and electrical fixtures  
36 may be salvaged. Porcelain plumbing fixtures may be crushed for fill.

37  
38 Carpet and Carpet Pad: Carpet may be able to be reused or recycled if sufficient quantities are  
39 generated. Store clean, dry carpet and pad in a closed container or trailer.

40  
41 Ceiling Panels: Ceiling panels may be able to be recycled if sufficient quantities are generated. Sort by  
42 size, palletize, and shrink-wrap for shipment to and recycling by a ceiling tile manufacturer.

43  
44 Concrete, Precast Concrete: Can/may be able to crushed and graded for use as riprap, aggregate,  
45 sub-base material, or fill. Remove steel reinforcement and other metals and recycle with other metals.  
46 Neutralize alkalinity of concrete fill if planting above.

47  
48 Concrete Block: Can be reused whole, or crushed for use as sub-base material or fill, used as concrete  
49 aggregate.

50  
51 Corrugated Cardboard and Paper: Separate for recycling into new paper products. Painted, waxed or  
52 muddy cardboard or paper is unsuitable for recycling and should be discarded.

53  
54 Dimensional Lumber, Oriented Strand Board, Plywood, Crates, and Pallets: Large pieces can be reused.  
55 Wood unsuitable for reuse may be used to manufacture particleboard and other composite wood products,  
56 chipped or shredded for use as animal bedding, landscape use, groundcover, mulch, compost, pulp, or

1 process fuel. Painted or treated wood may not be recycled. Some recyclers have equipment to remove  
 2 nails.  
 3  
 4 Doors and Hardware: May be reused. Brace open end of door frames and leave door hardware attached  
 5 to doors, except for removing door closers.  
 6  
 7 Glass Containers: Recycle as glass.  
 8  
 9 Gypsum Board: Clean Standard, Type X, and Plaster Base (standard blue board) drywall, free of tape,  
 10 joint compound, paint, nails, screws, or other contaminants may be processed and spread as a soil  
 11 amendment. (Gypsum wallboard WR (green), Sheathing (brown/black), Mold Resistant Panels or  
 12 Specialty Type X cannot be used due to additives unsuitable in soil amendments.)  
 13  
 14 Lighting Fixtures: Separate lamps by type and protect from breakage.  
 15  
 16 Metals, Ferrous and Nonferrous: Separate for recycling: banding, castings, ceiling grid, copper and other  
 17 metal pipe, conduit and accessories, ductwork, extruded metals, rebar and metal stud cut-offs, roofing and  
 18 sheet metals, miscellaneous steel shapes, miscellaneous metal parts, structural steel.  
 19  
 20 Piping: If separated for reuse, reduce piping to straight lengths and store with joints, accessories and  
 21 other components by type and size.  
 22  
 23 Vinyl: Siding, window extrusions, floor tiles, and sheet flooring may be able to be separated for recycling  
 24 into new vinyl products.  
 25  
 26 • **Separation and Materials Handling Services and Equipment:** Description of how Construction Waste  
 27 materials will be separated, cleaned (if necessary), protected from contamination and diverted, and the  
 28 entity who will perform those services.  
 29  
 30 • **Documentation Procedures:** Method to collect data and document materials leaving the project site as  
 31 Trash or diverted for recycling for incorporation into the CWM Progress Reports.  
 32  
 33 • **Educational and Motivational Procedures:** Means and methods the General Prime Contractor will  
 34 employ to ensure full participation of all project construction personnel in CWM Plan activities. These  
 35 might include periodic meetings, demonstrations, incentive/reward programs, etc.  
 36  
 37  
 38 **PART 2 – PRODUCTS (Not Applicable)**  
 39  
 40  
 41 **PART 3 – EXECUTION**  
 42  
 43 **CONSTRUCTION WASTE MANAGEMENT IMPLEMENTATION**  
 44 The General Prime Contractor is responsible for implementing the Construction Waste management requirements  
 45 specified herein and shall designate a Waste Manager to coordinate and monitor the waste management activities  
 46 of all Contractors and subcontractors, including coordination of separation, handling, recycling, salvage, reuse,  
 47 and return methods used by all project construction personnel.  
 48  
 49 Contractors and subcontractors who do their own recycling shall report all applicable Construction Waste  
 50 recycling and Trash amounts to the General Prime Contractor as needed to support the development of the CWM  
 51 Plan and Progress and Final Reports.  
 52  
 53 The General Prime Contractor shall also provide:  
 54 • **Education and Instruction:** General Prime Contractor shall provide on-site instruction as described in  
 55 the CWM Plan to engage all construction personnel in separation, handling, recycling, salvage, reuse, and  
 56 return methods throughout the project.

1  
2  
3  
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- **Separation Facilities:** General Prime Contractor shall lay out and identify a specific area on the site and shall provide sorting bins for separating materials for recycling, salvage, reuse, and returns. The General Prime Contractor shall clearly identify the recycling area and sorting bins with durable signs and shall keep it neat and clean to avoid contamination of materials.

Acceptable sorting methods are:

- Sorting recyclable materials at the Project site and transporting them to recycling markets directly from the Project site.
- Employing haulers who make use of a materials-recovery facility or a transfer station where recyclable materials are sorted from the waste and recycled before disposing of the remainder. If using a hauler or recycling facility to sort out recyclables, verify that the hauler sorts out all construction waste loads and is not limited to those that are not acceptable at the landfill. Verify that the hauler or recycling facility recycles at least three types of materials.

**END OF SECTION**

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**SECTION 01 91 01**  
**COMMISSIONING PROCESS**  
**BASED ON DFD MASTER SPECIFICATION DATED 03/01/14**

**PART 1 - GENERAL**

**SCOPE**

This section includes specifications for the implementation, tracking and verification of the commissioning process. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Commissioned Systems
- Reference
- Definitions
- Submittals

**PART 2 - PRODUCTS**

- Equipment

**PART 3 - EXECUTION**

- Meetings
- Scheduling
- Issues List
- CxP Site Visits
- Construction Verification
- Functional Performance Testing
- Operation and Maintenance Data
- Agency Training

**COMMISSIONED SYSTEMS**

- Division 22 - Plumbing
- Division 23 - HVAC
- Division 26 - Electrical
- Division 27 - Communications
- Division 28 - Electronic Safety and Security

**REFERENCE**

Applicable provisions of Division 01 govern work under this section. Note in particular:

- General Conditions, Article 15 – Quality Control & Inspection
- General Requirements, Article 33 – Operating and Maintenance Manuals and Instructions

**DEFINITIONS**

**Commissioning (Cx):** The process of ensuring that systems are designed, installed, functionally tested and performing in conformity with the Owner's Project Requirements and that the building operator has received complete equipment and systems documentation and training.

**Commissioning Provider (CxP):** The entity identified by the DFD Project Manager to lead, monitor, coordinate and report on project commissioning activities. The commissioning provider may be the project A/E (most common), an independent third party or DFD.

**Construction Verification:** A quality control verification process performed by the installer as building assemblies, components, equipment and systems are being installed which documents that the materials, installation procedures, interfaces with other trades, start-up, testing and operation are correct, complete, in compliance with contract documents and manufacturer's recommendations and are ready for functional performance testing.

1 Functional Performance Tests (FPT): Contractor testing of installed building assemblies, components,  
2 equipment, systems and interfaces which confirms correct performance through all operating modes and  
3 compliance with contract documents and manufacturer's recommendations.

4  
5 **SUBMITTALS**

6 Reference the General Conditions of the Contract for submittal requirements.  
7

8 **PART 2 – PRODUCTS**  
9

10 **EQUIPMENT**

11 Provide equipment required to perform startup, checkout and testing. Equipment to be calibrated within the  
12 past year and in accordance with the manufacturer's recommendations.  
13

14 **PART 3 – EXECUTION**  
15

16 **MEETINGS**

17 Each contractor is required to attend meetings related to commissioning (pre-construction, construction  
18 progress, etc.) and have personnel requested by CxP in attendance to facilitate quality control and  
19 coordinate commissioning efforts.  
20

21 The CxP will present an overview of the project's commissioning process at the pre-construction meeting.  
22 The commissioning team members will be identified and their responsibilities reviewed.  
23

24 At subsequent meetings, contractors are to provide a review of project progress, a report on the status of  
25 issues, commissioning tasks and scheduling for future commissioning tasks.  
26

27 **SCHEDULING**

28 Reference General Conditions Article 13 for Contractor responsibilities for scheduling. Each contractor  
29 shall provide the Contractor a detailed schedule and regular updates of commissioning tasks for  
30 incorporation into the project schedule.  
31

32 **ISSUES LIST**

33 Each contractor is responsible for completing action items in a timely manner that are noted in the Issues  
34 List as their responsibility. Timely response and successful completion are a requirement to avoid  
35 withholding of payment.  
36

37 **CxP SITE VISITS**

38 Commissioning is a team effort requiring the cooperation of all parties. Contractors are to proactively carry  
39 out their commissioning responsibilities and are to assist the CxP during site visits in performing  
40 commissioning tasks. This includes providing access to and demonstrating the installation, operation, and  
41 testing of commissioned systems; responding to CxP requests for information; carrying out proactive and  
42 corrective actions; and accurate reporting on system status and conditions.  
43

44 **CONSTRUCTION VERIFICATION**  
45

46 The construction verification checklists are a formalized means to provide individual workers the criteria  
47 for a successful installation, adherence to the construction documents and to easily track construction  
48 progress.  
49

50 Each assembly, component, equipment, system and interface to be commissioned shall be verified by the  
51 installer at the site while work is underway and documented on the construction verification checklists. The  
52 contractor is responsible for successfully completing installations, documenting this on the construction  
53 verification checklist forms and correcting all deficiencies.  
54

55 Contractor shall periodically review the construction verification schedule with the CxP allowing advance  
56 notice of activities of 5 business days so that the CxP may witness as deemed necessary. If CxP identifies



1 more than a 10% discrepancy rate during confirmation of construction verification, the contractor shall  
2 correct all deficiencies and revalidate all items covered by that checklist and resubmit new checklists. The  
3 cost of reconfirmation of construction verification due to equipment or construction deficiencies is the  
4 responsibility of the contractor and subject to deductive change order at DFD's discretion. Correction of  
5 deficiencies and revalidation are the responsibility of the contractor and are not subject to time extensions  
6 or delay claims.  
7

8 Complete the construction verification checklists in each Division's Commissioning Section for this project  
9 and submit to the CxP for review and comment. Contractor should make multiple copies of the blank test  
10 forms as needed for duplicate items. The "Checklist Tracking ID" on the form is only applicable where a  
11 checklist tracking ID system is being used by the CxP.  
12

### 13 **FUNCTIONAL PERFORMANCE TESTING**

14

15 Complete the functional performance test procedures included on the functional performance test forms in  
16 each Division's Commissioning Section on this project. Coordinate with DFD, A/E and CxP so they may  
17 witness and document test results. If the forms include a "SAMPLE" water mark then the AE will edit the  
18 forms prior to the start of testing. If forms do not include a "SAMPLE" water mark, then they are the  
19 forms that will be used for the testing.  
20

21 Contractors are responsible for completion and coordination of their work with all trades prior to testing,  
22 preplanning testing procedures, performing preliminary functional performance testing using test forms,  
23 insuring necessary staff and resources are on hand and expediting testing. This includes completion of  
24 testing and balancing by the HVAC contractor required for successful functional performance testing.  
25 Failure to complete or coordinate work, preplan or have staff and resources available to carry out testing  
26 will result in retesting. Submit completed preliminary functional performance test forms to CxP for review  
27 prior to scheduling testing for witnessing.  
28

29 Contractor shall coordinate functional performance testing with DFD, the A/E, CxP and Agency and notify  
30 them 5 business days prior to testing so that they may witness and document the test results. All contractors  
31 involved with specific assemblies, components, equipment, systems and interfaces shall have qualified  
32 installers and technicians present at the same time working together to perform testing and demonstrate  
33 correct performance through all operating and failure modes and compliance with contract documents and  
34 manufacturer's recommendations.  
35

36 CxP shall establish sampling protocol and at the time of testing select sample test locations for identical  
37 pieces of equipment. Where simulation of conditions or altering of setpoints or values is required to achieve  
38 an operating or failure mode for testing, the contractor must receive CxP approval.  
39

40 With DFD's oversight, the CxP is responsible for witnessing functional performance testing and recording  
41 the results and deficiencies. Correct minor deficiencies during testing. Deficiencies that cannot be corrected  
42 during testing will be documented and subject to retest. Retesting will continue until no deficiencies  
43 remain.  
44

45 Retesting is required when testing cannot be successfully completed. Deficiencies requiring retesting  
46 include:

- 47 • Incomplete work and/or coordination with others
  - 48 • Inadequate preparation of systems for testing
  - 49 • Inadequate preplanning
  - 50 • Inadequate staff, equipment, tools or resources for testing
  - 51 • Material, equipment or construction deficiencies
  - 52 • Incomplete or failed test due to reasons under the Contractor's responsibility
- 53

1 The cost of retesting is the responsibility of the contractor and subject to deductive change order at DFD's  
2 discretion. Correction of deficiencies and retesting are the responsibility of the contractor and are not  
3 subject to time extensions or delay claims.

4

5 **OPERATION AND MAINTENANCE (O&M) DATA**

6 Reference Division 01 General Requirements.

7

8 **AGENCY TRAINING**

9 Provide agency training using final O&M data. Training sessions to include classroom and site  
10 presentations as appropriate. Demonstrate operation of systems and equipment. Review setpoints and  
11 operating parameters. Demonstrate preventive and routine maintenance procedures as well as common  
12 repairs. Videotape training sessions providing reasonable video/audio quality and provide final record in  
13 labeled DVD format to agency along with a sign off sheet demonstrating receipt by the agency.

14

15

**END OF SECTION**

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MILWAUKEE, WISCONSIN**

(Rev 4/2024)

**TECHNICAL SPECIFICATIONS BID DOCUMENTS**  
Invitation to Bid

UW- Milwaukee Project No. **GML B1970** / UWSA Project No. **B-23-001**

**May 24, 2024**

FOR  
THE BOARD OF REGENTS OF THE  
UNIVERSITY OF WISCONSIN SYSTEM  
C/O UWSA - CAPITAL PLANNING AND BUDGET, 780 REGENT STREET, SUITE 239  
MADISON, WISCONSIN 53715

Volume 2 of 2



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**SECTION 02 05 00**  
**COMMON WORK RESULTS FOR EXISTING CONDITIONS**  
**BASED ON DFD MASTER SPECIFICATION DATED 10/01/2012**

**PART 1 - GENERAL**

**SCOPE**

This section provides information common to two or more technical site work specification sections or items that are of a general nature, and not included in other sections. This section applies to ALL site work, as applicable. Included are the following topics:

**PART 1 - GENERAL**

Scope  
Related Work  
Referenced Organizations  
Referenced Documents  
Quality Assurance  
Safety  
Permits  
Construction Limits  
Submittals  
Off Site Storage  
Codes  
Certificates and Inspections

**PART 2 - MATERIALS**

Barricades, Signs, and Warning Devices

**PART 3 - EXECUTION**

Maintenance of Site and Building Access/Egress  
Continuity of Existing Traffic/Parking and Traffic Control  
Protection and Continuity of Existing Utilities  
Protection of Existing Work and Facilities

**RELATED WORK**

Applicable provisions of Division 1 govern work under this Section.

**REFERENCED ORGANIZATIONS**

Applicable provisions of Division 1 shall govern all work under this section.

Abbreviations of organizations referenced in these specifications are as follows:

41 AASHTO American Association of State Highway and Transportation Officials  
42 ACPA American Concrete Pipe Association  
43 ANSI American National Standards Institute  
44 ASCE American Society of Civil Engineers  
45 ASME American Society of Mechanical Engineers  
46 ASTM American Society for Testing and Materials  
47 AWWA American Water Works Association  
48 AWS American Welding Society  
49 FHA Federal Highway Administration  
50 EPA Environmental Protection Agency  
51 NEC National Electric Code  
52 NEMA National Electrical Manufacturers Association  
53 NFPA National Fire Protection Association  
54 NSF National Sanitation Foundation  
55 OSHA Occupational Safety and Health Administration

1	STI	Steel Tank Institute
2	UL	Underwriters Laboratories Inc.
3	WDNR	State of Wisconsin Department of Natural Resources
4	WISDOT	State of Wisconsin Department of Transportation

## 6 REFERENCED DOCUMENTS

7 Where reference is made to the "SSHSC", it shall mean the pertinent sections of the State of Wisconsin,  
8 Department of Transportation, Standard Specifications for Highway and Structure Construction, current  
9 edition, and all supplemental and interim supplemental specifications. Where reference is made to the  
10 "SSSWC", it shall mean pertinent sections of the Standard Specifications for Sewer and Water Construction  
11 in Wisconsin, current edition. Where reference is made to the "BMPH", it shall mean the Wisconsin  
12 Construction Site Best Management Practice Handbook, current edition as published by the WDNR. Method  
13 of measurement and basis of payment sections in referenced documents shall not apply.

## 15 QUALITY ASSURANCE

16 Provide materials and products as required by individual specification sections. Refer to Section GC -  
17 General Conditions of the Contract regarding substitutions.

18  
19 Provide quality assurance testing and reporting as required by individual specification sections.

## 21 SAFETY

22 Contractor is solely responsible for worksite safety.

23  
24 Perform all work in accordance with applicable OSHA, state and local safety standards.

## 26 PERMITS

27 Unless otherwise noted in the Contract Documents, Contractor shall be responsible for obtaining and  
28 paying for all permits necessary to complete the work.

## 30 CONSTRUCTION LIMITS

31 Construction Limits are indicated on the drawings. In the absence of such a designation on the drawings,  
32 confine work to the minimum area reasonably necessary to undertake the work as determined by the UW  
33 Construction Representative. In no case shall construction activities extend beyond state property lines or  
34 construction easements.

35  
36 The Contractor shall restore all disturbed areas in accordance with the drawings and specifications. If plans  
37 and specifications do not address restoration of specific areas, these areas will be restored to pre-construction  
38 conditions as approved by the UW Construction Representative.

## 41 SUBMITTALS

42 Refer also to Section GC - General Conditions of the Contract and Division 1.

43  
44 Submit manufacturer's shop drawings, product data, samples, substitutions and operation and maintenance  
45 (O&M) data for approval as required by individual specification sections.

46  
47 Unless otherwise noted, provide 6 copies of each submittal. Submit to project architect/engineer (A/E)  
48 unless otherwise directed by the UW Construction Representative at the Pre-Construction Meeting.

## 50 OFF SITE STORAGE

51 Refer to Division 1.

1 In general, the payments for materials stored off site will only be considered in instances where there is  
2 limited space available for storage on the site. Prior approval by the UW Construction Representative,  
3 together with the execution of a Storage Agreement will be required.

4  
5 **CODES**

6 Comply with the requirements of all applicable, local, state and federal codes.

7  
8 **CERTIFICATIONS AND INSPECTIONS**

9 Refer to Section GC - General Conditions.

10  
11 Obtain and pay for all required sampling, testing, inspections, and certifications except those expressly  
12 listed as provided by the A/E or other third party in the Contract Documents. Deliver originals of  
13 certificates and documents to the UW Construction Representative w/I 3 days; provide copies to the A/E.  
14 Include copies of the certifications and documents in the O&M Manual.

15  
16  
17  
18 **PART 2 - MATERIALS**

19  
20 **BARRICADES, SIGNS, AND WARNING DEVICES**

21 Traffic barricades, traffic signs, and warning devices shall meet the requirements of applicable OSHA  
22 standards and the FHA Manual of Uniform Traffic Control Devices (MUTCD).

23  
24 **PART 3 - EXECUTION**

25  
26  
27 **MAINTENANCE OF SITE AND BUILDING ACCESS/EGRESS**

28 Unless otherwise shown or directed, maintain existing access and egress to the facility throughout  
29 construction. Maintain ANSI A117 compliant access for disabled persons, delivery access, emergency  
30 vehicle access, and emergency egress. Do not interrupt access and egress without prior written approval  
31 from the UW Construction Representative.

32  
33 **CONTINUITY OF EXISTING TRAFFIC/PARKING AND TRAFFIC CONTROL**

34 Refer also to Section GR - General Requirements.

35  
36 Do not interrupt or change existing traffic, delivery, or parking without prior written approval from the UW  
37 Construction Representative. When interruption is required, coordinate schedule with the Owner agency to  
38 minimize disruptions. When working in public right-of-way, obtain all necessary approvals and permits  
39 from applicable municipalities and WISDOT.

40  
41 When Contractor's activities impede or obstruct traffic flow, Contractor shall provide traffic control  
42 devices, signs and flaggers in accordance with other Contract Documents and the current version of the  
43 MUTCD, or as shown on the Drawings.

44  
45 **PROTECTION AND CONTINUITY OF EXISTING UTILITIES**

46 Verify the locations of any water, drainage, gas, sewer, electric, drainage, gas, sewer, electric,  
47 telephone/communication, fuel, steam lines or other utilities and site features which may be encountered in  
48 any excavations or other sitework. All lines shall be properly underpinned and supported to avoid disruption  
49 of service.

50  
51 Do not interrupt or change existing utilities without prior written approval from the UW Construction  
52 Representative, affected utilities and users. Notify all users impacted by outages a minimum of 48 hours in  
53 advance of outage. Notification shall be provided in writing and describe the nature and duration of outages  
54 and provide the name and number of Contractor's foreman or other contact.

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Any service connections encountered which are to be removed shall be cut off at the limits of the excavation and capped in accordance with the requirements of applicable codes and any specifications governing such removals.

**PROTECTION OF EXISTING WORK AND FACILITIES**

Verify the locations of, and protect, any signs, paved surfaces, buildings, structures, landscaping, streetlights, utilities, and all other such facilities that may be encountered or interfered with during the progress of the work. Take measures necessary to safeguard all existing work and facilities that are outside the limits of the work or items that are within the construction limits but are intended to remain. Report any damage to existing facilities to the UW Construction Representative immediately. Correct and pay for all damages.

**END OF SECTION**

**SECTION 02 41 30**  
**INTERIOR SELECTIVE DEMOLITION**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Demolition and removal of selected portions of building or structure.
  - 1. Demolition and removal of selected site elements.
  - 2. Salvage of existing items to be reused or recycled.
  - 3. Repair procedures for selective demolition operations.

**1.2 INFORMATIONAL SUBMITTALS**

- A. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure building manager's and other tenants on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Use of elevator and stairs.
  - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

**1.3 QUALITY ASSURANCE**

- A. Skilled Mechanics: Accomplish all work of cutting, removal, demolition, relocation, patching and other restoration by using only mechanics skilled in the trade. If necessary, sublet the work to skilled contractors or subcontractors.

**1.4 FIELD CONDITIONS**

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition such that Owner's operations will not be disrupted.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

**PART 2 - PRODUCTS**  
**NOT USED**

1 PART 3 - EXECUTION

2 3.1 SELECTIVE DEMOLITION

- 3 A. General: Demolish and remove existing construction only to the extent required by new construction and  
4 as indicated. Use methods required to complete the Work within limitations of governing regulations.
- 5 1. Regulatory Requirements: Comply with governing EPA notification regulations before beginning  
6 selective demolition. Comply with hauling and disposal regulations of authorities having  
7 jurisdiction.
- 8 2. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.
- 9 3. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished.  
10 A report on the presence of hazardous materials is on file for review and use. Examine report to  
11 become aware of locations where hazardous materials are present.
- 12 a. Do not disturb hazardous materials or items suspected of containing hazardous materials.
- 13 4. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged  
14 during selective demolition, by methods and with materials so as not to void existing warranties.
- 15 B. Pre-Demolition Conference: Conduct conference at Project site.
- 16 1. Inspect and discuss condition of construction to be selectively demolished.
- 17 2. Review structural load limitations of existing structure.
- 18 3. Review and finalize selective demolition schedule and verify availability of materials, demolition  
19 personnel, equipment, and facilities needed to make progress and avoid delays.
- 20 4. Review requirements of work performed by other trades that rely on substrates exposed by selective  
21 demolition operations.
- 22 5. Review areas where existing construction is to remain and requires protection.
- 23 C. Examination: Survey existing conditions and correlate with requirements indicated to determine extent of  
24 selective demolition required.
- 25 1. Review record documents of existing construction provided by Owner. Owner does not guarantee  
26 that existing conditions are same as those indicated in record documents.
- 27 2. Survey existing conditions and correlate with requirements indicated to determine extent of selective  
28 demolition required.
- 29 3. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with  
30 selective demolition.
- 31 4. Engage a professional engineer to perform an engineering survey of condition of building to  
32 determine whether removing any element might result in structural deficiency or unplanned collapse  
33 of any portion of structure or adjacent structures during selective building demolition operations.
- 34 a. Perform surveys as the Work progresses to detect hazards resulting from selective demolition  
35 activities.
- 36 D. Preparation:
- 37 1. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury  
38 to people and damage to adjacent buildings and facilities to remain.
- 39 2. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to  
40 preserve stability and prevent movement, settlement, or collapse of construction and finishes to  
41 remain, and to prevent unexpected or uncontrolled movement or collapse of construction being  
42 demolished.
- 43 3. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect,  
44 and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be  
45 selectively demolished.
- 46 E. Removed and Salvaged Items:
- 47 1. Clean salvaged items.

- 1 2. Pack or crate items after cleaning. Identify contents of containers.
- 2 3. Store items in a secure area until delivery to Owner.
- 3 4. Transport items to Owner's storage area designated by Owner.
- 4 5. Protect items from damage during transport and storage.
  
- 5 F. Removed and Reinstalled Items:
  - 6 1. Clean and repair items to functional condition adequate for intended reuse.
  - 7 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  - 8 3. Protect items from damage during transport and storage.
  - 9 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and  
10 equipment. Provide connections, supports, and miscellaneous materials necessary to make item  
11 functional for use indicated.
  
- 12 G. Existing to Remain:
  - 13 1. Existing Items to Remain: Protect construction indicated to remain against damage and soiling  
14 during selective demolition. When permitted by Architect, items may be removed to a suitable,  
15 protected storage location during selective demolition and cleaned and reinstalled in their original  
16 locations after selective demolition operations are complete.
  - 17 2. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect  
18 them against damage.
  
- 19 H. Unused Anchorages: Remove anchorages associated with removed items. Dismantle anchorages associated  
20 with dismantled items. Patch holes created by anchorage removal or dismantling according to the  
21 requirements for new work.
  
- 22 I. Brick Removal: At locations indicated, carefully demolish or remove masonry work without damaging  
23 surrounding existing construction to be left in place.
  - 24 1. Maintain adjoining construction to be left in place in an undamaged condition.
  - 25 2. Notify Architect of detrimental conditions including:
    - 26 a. Voids, cracks and damaged existing masonry backup units.
    - 27 b. Rotted wood, rusted metal, and other deteriorated items.
  
- 28 J. Disposal: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise  
29 indicated to remain Owner's property, remove demolished materials from Project site and legally dispose  
30 of them in an EPA-approved landfill.
  
- 31 K. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective  
32 demolition operations. Return adjacent areas to condition existing before selective demolition operations  
33 began.

34 **END OF SECTION**

35





1  
2  
3 **SECTION 02 82 13**  
4 **ASBESTOS ABATEMENT**  
5 **BASED ON DFDM MASTER SPECIFICATION DATED 7/15/05 (Rev5/2/2019)**

6 **PART 1 - GENERAL**

7  
8  
9 **SCOPE**

10 Perform all operations in connection with asbestos abatement, encapsulation, removal and related  
11 work as shown on drawings and/or specified herein.

12 **PART 1 - GENERAL**

13 Related work  
14 Description of Work  
15 References  
16 Qualifications  
17 Definitions  
18 Submittals and Notices  
19 Site Security  
20 Emergency Planning  
21 Preconstruction Meeting  
22 Delivery, Storage and Handling

23 **PART 2- PRODUCTS**

24 Materials  
25 Equipment

26 **PART 3 - EXECUTION**

27 General Compliance Measures  
28 Preparations of Regulated Area  
29 Decontamination Enclosure System  
30 Temporary Isolation Partitions  
31 Maintenance of Enclosure System  
32 Workplace Entry and Exit Procedures  
33 Waste Container Pass-Out Procedure  
34 Water Collection and disposal  
35 Wet Removal Procedure  
36 Ceiling System Removal  
37 Pipe Tunnel or Crawl Space Removal Work  
38 Flooring Removal  
39 Small Scale - Short Duration Removal Procedure  
40 Encapsulation Procedures  
41 Enclosure Procedure  
42 Air Monitoring  
43 Cleanup Procedure  
44 Disposal Procedures  
45 Reestablishment of Regulated Area

46  
47  
48 **RELATED WORK**

49 Applicable provisions of Division 1 govern work under this Section.

50  
51 None

52  
53 **DESCRIPTION OF WORK;**

54  
55 Golda Meir Library is a four (4) story academic building with a basement. The original building  
56 was constructed in 1967 with subsequent additions (additions 1 & 2). This project renovates Room  
57 W301, W302 and W303 to create a conference and study room with a display of the artifacts of  
58 Sheldon Lubar. The majority of the project is in the original building. A very small portion is in  
59 addition 2.  
60

1 The work will also involve the following impacts to the mechanical, electrical, and plumbing  
2 (MEP) systems in the spaces beneath the project areas:

3  
4 • Plumbing: Some work within (including above plaster ceilings) and below Room  
5 W301, W302 & W303 to either demolish or extend the existing services.

6  
7 • HVAC: Some work within (including above plaster ceilings) and below Room  
8 W301, W302 & W303 to either demolish or extend the existing services.

9  
10 All existing sealants/caulks, miscellaneous adhesives and glazing compounds are assumed to  
11 contain asbestos. Unless otherwise noted, the removal or disturbance of these materials as required  
12 for the project shall be conducted in accordance with DHS 159, "Certification and Training Course  
13 Requirements for Asbestos Activities".

14  
15 Roofing materials are assumed to contain asbestos. Unless otherwise noted, the removal or  
16 disturbance of these materials as required for the project shall be conducted in accordance with  
17 DHS 159, "Certification and Training Course Requirements for Asbestos Activities".

18  
19  
20 Removal;

21  
22 The asbestos abatement contractor (AAC) shall remove and dispose of up to four hundred  
23 fifty (450) square feet of asbestos containing textured plaster from the ceiling in Room  
24 W301. Additional abatement of the textured plaster from the ceiling may need to be  
25 removed in Corridor W300A in support of the project (i.e. if it is necessary to construct a  
26 hard construction barrier in Corridor W300A)

27  
28 The AAC shall also remove and dispose of up to seventy-five (75) ACM fittings hidden in  
29 walls or above ceilings associated with Rooms W301, W302, W303, W201 & W203 as  
30 part of this renovation. This would include at least the partial demolition of the ceilings  
31 and walls in Rooms W301, W302 & W303 to locate and abate these materials.

32  
33 The AAC shall remove and dispose of up fifteen (15) square feet of 6" ceramic base with  
34 grey/white mortar set from Rooms W302 & W303.

35  
36 Additional information regarding the asbestos abatement and the AAC scope of work are  
37 found in Sheets H 102 & H103.

38  
39 Encapsulation;

40  
41 None

42  
43 Enclosure;

44  
45 None

46  
47 The following materials associated with the Golda Meir Library are confirmed as non-ACMs (those  
48 materials in **BOLD** are in the project areas):

49  
50

Material Code	Material Description
• <b>MTZOWN (both)</b>	<b>White/Brown Terrazo</b>
• <b>SPI (both)</b>	<b>Plaster (Both Skim and Base Coats)</b>

51  
52

1	•	<b>INOSF1 (original)</b>	<b>Partition Wall</b>
2	•	<b>INOSF2 (original)</b>	<b>4" Grey Vinyl Base + Adhesive</b>
3	•	<b>INOSF3 (original)</b>	<b>Carpet Adhesive</b>
4	•	<b>INOSF4 (original)</b>	<b>2" x 2" Ceramic Floor Tile/grout/mortar - Tan</b>
5	•	MCM (both)	Carpet Mastic
6	•	MDC (both)	Brown Door Caulk
7	•	MDC2 (original)	White Door Caulk
8	•	MDC2 (addition)	Grey Door Caulk
9	•	MDJC (both)	Duct Joint Caulk
10	•	MDWC (both)	Drywall w/Joint Compound
11	•	MEC (original)	Brown Exposed Caulk
12	•	MEC (addition)	Exposed Caulk
13	•	MEC2 (addition)	Beige Exterior Exposed Caulk
14	•	MEC4 (addition)	Grey Exterior Exposed Caulk
15	•	MPCR (original)	Red Pipe Caulk
16	•	MPG2 (original)	Black, Sticky Exterior Windowpane Glazing
17	•	MRF (addition)	Roof Flashing
18	•	MRM (addition)	Roof Field (Built-Up)
19	•	MSCT1 (addition)	1' x 1' Suspended Ceiling Tiles with Pinholes
20	•	MSCT1 (original)	2'x4' Drywall Ceiling Tile
21	•	MSCT2 (both)	2'x4' Susp. Ceil. Tile w/Pinholes, Fissures, 4" SQ
22	•	MSCT3 (original)	1'x1' Suspended Ceiling Tile w/Pinholes & Fissures
23	•	MSCT3 (addition)	2'x4' Suspended Ceiling Tile w/Pinholes & Fissures
24	•	MSCT4 (original)	2'x4' Suspended Ceiling Tile w/Pinholes & Fissures
25	•	MTP (original)	Transite Panel
26	•	MTZON (both)	Brown Terrazo
27	•	MV4K (original)	4" Black Vinyl Wallbase & Assoc. Mastic
28	•	MV4N (both)	4" Brown Vinyl Wallbase & Assoc. Mastic
29	•	MV6N (addition)	6" Brown Vinyl Wallbase & Assoc. Mastic
30	•	MVFN (original)	Brown Vinyl Flooring & Associated Mastic
31	•	MVFNE (both)	Brown/Beige Vinyl Flooring & Associated Mastic
32	•	MVFR (original)	Red Vinyl Flooring & Associated Mastic
33	•	MWC (original)	Brown Window Caulk
34	•	MWC (addition)	Wall Caulk
35	•	MWC2 (original)	White Window Caulk
36	•	MWC2 (addition)	Brown Exterior Window Caulk
37	•	MWC3 (original)	Brown Exterior Window Caulk
38	•	SSF (addition)	White Sprayed on Fireproofing
39	•	SSF2 (addition)	Grey Sprayed on Fireproofing

The following materials associated with the Golda Meir Library are assumed or confirmed ACMs (those materials in **BOLD** are in the project areas):

Material Code	Material Description
• <b>SP2 (both)</b>	<b>Textured Plaster</b>
• <b>TF5-20F (both)</b>	<b>1"-20+" O.D. Fittings On Fiberglass</b>
• <b>TM5-20 (both)</b>	<b>1"-20" O.D. Magnesia Pipe</b>
• <b>INOSF5 (original)</b>	<b>Mortar Associated with Ceramic Base</b>
• MCDCW (addition)	White Cloth Duct Connector
• MCTG (addition)	Ceramic Tile Grout (assumed)
• MCTM (addition)	Ceramic Tile Mastic (assumed)
• MDC3 (original)	Brown Exterior Door Caulk
• MF12W (both)	12"x12" White Floor Tile & Assoc. Mastic
• MF12Y (original)	12"x12" Gray Floor Tile & Assoc. Mastic
• MF12WY (addition)	12"x12" White/Gray Floor Tile & Assoc. Mastic
• MFB (addition)	Fiberboard with Suspect Layer
• MFD (both)	Fire Door
• MPG (both)	Black Sticky Windowpane Glazing
• MPG (addition)	Windowpane Glazing
• MRB (original)	Roof: Built-Up
• MRF (original)	Roof Flashing
• MSLK (original)	Black Sink Lining
• MSLP (both)	Pink Sink Lining

- 1 • MSLY (original) Gray Sink Lining
- 2 • MWC4 (original) Gray Exterior Window Caulk
- 3 • MVFW (addition) White Vinyl Flooring & Associated Mastic
- 4 • MVFY (addition) Gray Vinyl Flooring & Associated Mastic
- 5 • TDP (original) Duct Patch
- 6 • TTIE (ordinal) Tank Insulation Caps

7  
8  
9 **Special Precautions:**

10  
11 Coordinate with the Owner’s Project Representative for the shutdown and isolation of all  
12 electrical circuits and air movement systems within the regulated area from that of the rest  
13 of the facility to prevent any inconvenience to building occupants and contamination  
14 outside of the regulated area. Refer to Article entitled: "Preparation of Regulated Area,"  
15 of this section relative to shutdown of mechanical and electrical systems.

16  
17 Equipment that must remain in operation while abatement work is in progress consists of  
18 the following:

19  
20 None

21 **Special Circumstances:**

22  
23 None

24 **Restoration:** Contractor is responsible for restoring all existing finish surfaces to their original  
25 state, which were damaged as a result of abatement activities.

26  
27  
28 **REFERENCES**

29 **General Reference:**

30  
31 All work under this contract shall be done in strict accordance with all applicable General  
32 and State regulations, standards and codes governing asbestos abatement and any other  
33 trade work done in conjunction with the abatement.

34  
35 The most recent edition of any relevant regulation in force at the time of bid opening shall  
36 be in effect. Where conflict among the laws, rules, and regulations or with these  
37 specifications exists the most stringent requirements shall be utilized.

38  
39 The Contractor shall make available, in the clean change area of the worker  
40 decontamination system, copies of this specification and all standards, regulations, and  
41 codes listed hereinafter.

42  
43 **Specific Reference:**

44  
45 Occupational Safety and Health Administration (OSHA):

46  
47 Title 29 Code of Federal Regulations, Section 1910.134(d) -

48  
49 Title 29 Code of Federal Regulations, Section 1926.1101- Construction Industry,  
50 including the mandatory appendices;

51  
52 Appendix A - OSHA Reference Method.

53  
54 Appendix C - Qualitative and Quantitative Fit Testing Procedures.

55  
56 Appendix D - Medical Questionnaires.

1 Appendix E - Interpretation and Classification of Chest Roentgenograms.

2  
3 Nonmandatory appendices:

4  
5 Appendix B - Detailed Procedures for Asbestos, Tremolite, Anthrophyllite,  
6 and Actinolite Sampling and Analysis.

7  
8 Appendix F - Work Practices and Engineering Controls for Major Asbestos  
9 Removal, Renovation, and Demolition Operations.

10  
11 Appendix G - Work Practices and Engineering Controls for Small Scale, Short  
12 Duration Asbestos Renovation and Maintenance Activities.

13  
14 Appendix H - Substance Technical Information for Asbestos.

15  
16 Appendix I - Medical Surveillance Guidelines for Asbestos, Tremolite,  
17 Anthrophyllite, and Actinolite.

18  
19 Title 29 Code of Federal Regulations, Section 1926.59 - Hazard Communication  
20 Standard. Requires employers to inform their workers of the hazards of any  
21 chemicals used on the project and to train their employees in proper safeguards.

22  
23 Environmental Protection Agency (EPA): Title 40 Code of Federal Regulations (CFR)  
24 Part 763 Subpart G - Asbestos Abatement Projects; worker Protection (effective March 27,  
25 1987).

26  
27 Environmental Protection Agency (EPA) Title 40 Code of Federal Regulations (CFR) Part  
28 61 - National Emission Standards for Hazardous Air Pollutants; Asbestos NESHAP  
29 Revision; Final Rule effective November 20, 1990.

30  
31 Department of Health Services (DHS) State of Wisconsin Administrative Rule, Chapter  
32 DHS 159, Asbestos Certification and Training.

33  
34 Department of Natural Resources (DNR) State of Wisconsin Administrative Rule, Chapter  
35 NR 447, Control of Asbestos Emissions.

36  
37 Compressed Gas Association, Inc., New York, Pamphlet G-7, "Compressed Air for Human  
38 Respiration", and Specification G-7.1 "Commodity Specification for Air".

39  
40 Department of Natural Resources (DNR) State of Wisconsin Administrative Rule Chapter  
41 NR 506, Landfill Operations Criteria for Disposal of Asbestos Containing Material.

42  
43 **QUALIFICATIONS**

44 The prospective Contractor who is proposed to actually perform the asbestos abatement work, shall  
45 submit to the Architect/Engineer the data hereinafter requested within ten (10) days after Bid  
46 Opening. The proposed asbestos abatement Contractor will be awarded a Contract, only if data  
47 submitted is determined to be favorable in all instances, by the Architect/Engineer, and the  
48 prospective Contractor further meets the qualifications requirements specified in the Instructions  
49 to Bidders.

50  
51 The proposed asbestos abatement Contractor shall, if requested:

52  
53 Demonstrate prior experience on asbestos abatement projects of similar nature and scope  
54 of that being bid, through the submission of letters of reference from building owners  
55 including the name, address, and telephone numbers of the contact persons who are  
56 specifically familiar with the referenced projects. At least three previous users of this  
57 service shall be submitted. Include descriptions of projects and records of all air  
58 monitoring data that was generated during the projects.

1  
2 Submit a description of all major Asbestos Abatement Equipment owned by the  
3 prospective Contractor which is available for use on this project such as:

4  
5 Respiratory protection equipment.

6  
7 HEPA vacuum equipment.

8  
9 Negative air pressure equipment.

10  
11 Spray equipment for amended water.

12  
13 Equipment used for shower facilities in decontamination enclosure system.

14  
15 Submit a list of names, work responsibilities and evidence of certification for all employees  
16 that will be assigned to this project:

17  
18 At least one firm principal, the firm's "competent person" and any other personnel  
19 performing supervisory duties must be certified by the Wisconsin Department of  
20 Health Services as having successfully completed a comprehensive 5-day course  
21 for Asbestos Abatement Contractors and Supervisors in conformance with  
22 Wisconsin Administrative Code DHS 159.

23  
24 Contractor's employees who perform asbestos abatement activities must be  
25 certified by the Wisconsin Department of Health Services as having successfully  
26 completed a comprehensive 4-day course for Asbestos Abatement Workers in  
27 conformance with Wisconsin Administrative Code DHS 159.

28  
29 **DEFINITIONS**

30 ACGIH: American Conference of Governmental Industrial Hygienists

31  
32 AIHA: American Industrial Hygiene Association

33  
34 Air Monitoring: The process of measuring the fiber content of a known volume of air collected  
35 during a specific period of time shall conform with Appendix A to OSHA 29 CFR 1926.1101. The  
36 procedure normally utilized for asbestos follows the NIOSH Standard Analytical Method 7400 for  
37 Asbestos in Air. For clearance air monitoring, electron microscopy methods may be utilized for  
38 lower detectability limit and specific fiber identification.

39  
40 Air Sampling Professional: The Professional contracted or employed by UWS to supervise and  
41 conduct air monitoring and analysis schemes. This individual shall not be affiliated in any way  
42 other than through this contact with the Contractor performing the abatement work.

43  
44 ANSI: American National Standards Institute

45  
46 Asbestos: Means the asbestiform varieties of chrysotile (serpentine); crocidolite (riebeckite);  
47 amosite (cummingtonite-grunerite); tremolite; anthrophyllite, and actinolite.

48  
49 Asbestos Containing Material (ACM): Material composed of asbestos of any type and in an amount  
50 greater than 1%, either alone or mixed with other fibrous or nonfibrous materials.

51  
52 Asbestos Containing Waste Material: Asbestos containing material or asbestos contaminated  
53 objects requiring disposal.

54  
55 ASTM: American Society for Testing and Materials

1 Authorized Visitor: The Building Owner (and designated representatives) and any representative  
2 of a regulatory agency having jurisdiction over the project.  
3

4 Certified Industrial Hygienist (CIH): An industrial hygienist certified in Comprehensive Practice  
5 by the American Board of Industrial Hygiene.  
6

7 Competent Person: Means an employee of the asbestos abatement contractor who is capable of  
8 identifying existing asbestos hazards in the workplace and who has the authority to take prompt  
9 corrective measures to eliminate them pursuant to OSHA 1926.1101(b).  
10

11 Decontamination Enclosure: A decontamination system consisting of a clean room, a shower room,  
12 and an equipment room separated from each other and from the regulated area by airlocks. This  
13 system is used for all workers to enter and exit the regulated area and may also serve as equipment  
14 and waste pass out on small jobs.  
15

16 Department of Natural Resources (DNR): A Wisconsin state agency that is responsible for  
17 enforcement of Chapter NR 447.  
18

19 Encapsulation: The application of a bridging or penetrating liquid material to asbestos containing  
20 materials to control the release of asbestos fibers into the air. The bridging liquid material creates  
21 a membrane over the surface and the penetrating liquid material seeps through the surface and binds  
22 all components together.  
23

24 Enclosure: The construction of an airtight, impermeable, permanent barrier around asbestos  
25 containing material to control the release of asbestos fibers into the air.  
26

27 EPA: U. S. Environmental Protection Agency  
28

29 Glovebag Technique: A method with limited applications for removing small amounts of friable  
30 asbestos-containing material from ducts, short piping runs, valves, joints, elbows, and other  
31 nonplanar surfaces in a noncontained (plasticized) regulated area. The glovebag is constructed and  
32 installed in such a manner that it surrounds the object or material to be removed and contains all  
33 asbestos fibers released during the process.  
34

35 HEPA Filter: A high efficiency particulate air filter capable of removing particles 0.3 microns in  
36 diameter with 99.97% efficiency.  
37

38 HEPA Vacuum: A vacuum system equipped with HEPA filtration.  
39

40 NESHAPS: National Emission Standards for Hazardous Air Pollutants  
41

42 NIOSH National Institute for Occupational Safety and Health  
43

44 OSHA: Occupational Safety and Health Administration  
45

46 Permissible Exposure Limits (PEL): No personnel associated with asbestos abatement work shall  
47 be exposed to an airborne concentration of asbestos in excess of the following limits, as determined  
48 by the method prescribed in Appendix A to OSHA 29 CFR 1926.1101, or by an equivalent method:  
49

50 P.E.L. is 0.1 fiber per cubic centimeter of air as an eight (8) - hour time-weighted average.  
51

52 Excursion Limit (EL) is 1.0 fiber per cubic centimeter of air as averaged over a sampling  
53 period of thirty (30) minutes.  
54

55 Regulated Area: An area identified by specific boundaries where airborne concentrations of  
56 asbestos exceed, or can reasonably be expected to exceed the P.E.L. and/or Excursion Limit. The  
57 regulated area may take the form of:  
58

59 A temporary negative-pressure enclosure, or  
60

1 An area specifically identified and segregated in any manner that minimizes the number of  
2 employees exposed to asbestos.

3  
4 Surfactant: A chemical wetting agent added to water to improve penetration.

5  
6 Visible Emissions: Any emissions containing particulate asbestos material that is visually  
7 detectable without the aid of instruments. This does not include condensed uncombined water  
8 vapor.

9  
10 Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and  
11 objects by using cloths, mops, or other cleaning utensils which have been dampened with water  
12 and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.

13  
14 **SUBMITTALS AND NOTICES**

15  
16 The Contractor shall submit a completed Asbestos/Lead Abatement Certification (Form #DOA-  
17 4509) no later than the end of the seventh calendar day after the bid opening date.

18  
19 Prior to Commencement of Work, Contractor shall:

20  
21 File a "Notification of Demolition and/or Renovation Form 4500-113" with the parties  
22 named hereinafter, when required, at least 10 working days prior to commencement of  
23 demolition or renovation project involving any asbestos-containing material.

24  
25 Air Management Asbestos Coordinator  
26 Department of Natural Resources  
27 P.O. Box 7921  
28 Madison WI 53707-7921  
29

30 File an "Asbestos Project Notification Form 00041" with the parties named hereinafter,  
31 when required, at least 2 working days prior to commencement of renovation project  
32 involving any asbestos-containing material.

33  
34 Department of Health Services  
35 Asbestos/Lead Section, Room 137  
36 P.O. Box 2659  
37 Madison, WI 53701-2659

38 Submit the following documentation attached to completed form DOA-4523 prior to commencing  
39 work:

40  
41 Manufacturer's information and MSDS or SDS for the mastic remover that the Contractor  
42 intends to use for floor tile mastic removal. Mastic remover shall be low odor and shall  
43 not contain known carcinogens.

44  
45 A copy of the asbestos training certification card issued by Wisconsin Department of  
46 Health and Family Services pursuant to DHS 159 for all Contractor employees that will be  
47 working on the project.

48  
49 Submit the following documentation at completion of the work:

50  
51 Copies of all completed "Transportation and Disposal Manifest" forms for all asbestos  
52 waste materials removed from the regulated area during the abatement process.

53  
54 Project Log per DHS 159.21(2)

55  
56 Occupant Protection Plan per DHS 159.21(3).  
57



1 During Abatement Activities, Contractor shall submit to the Owner's Project Representative, if  
2 requested:

3  
4 Shop drawings for layout and construction of decontamination enclosure systems and  
5 barriers for isolation of the regulated area as detailed in this specification and required by  
6 applicable regulations. If work is to be phased, a phasing schedule shall also be submitted.

7  
8 Weekly (or as required) job progress reports detailing abatement activities. Include review  
9 of major problems and action taken, injury reports, equipment breakdown.

10  
11 Logs documenting filter changes on respirators, HEPA vacuums, negative pressure  
12 ventilation units, local exhaust ventilation systems, and other engineering controls.

13  
14 Results of bulk material analysis and air sampling data collected during the course of the  
15 abatement including OSHA compliance air monitoring results.

16  
17 Results of materials testing conducted during the abatement for purposes of utilization  
18 during abatement activities (e. g., testing of encapsulant for depth of penetration, testing of  
19 materials for adherence to encapsulated surfaces).

20  
21 Contractor shall post at the entrance to the regulated area a list containing the names,  
22 addresses, and telephone numbers of the Contractor, Fire Department and any other  
23 personnel who may be required to be contracted during abatement activities.

#### 24 25 **SITE SECURITY**

26 Contractor shall be responsible for the security of the regulated area(s) during abatement operations  
27 in order to protect work efforts and equipment.

28  
29 The regulated area shall be restricted to only authorized, trained, and protected personnel. These  
30 may include the Contractor's employees, employees of subcontractors, state representatives, and  
31 any other designated individuals. A list of authorized personnel shall be established prior to job  
32 start and posted in the clean room of the decontamination facility.

33  
34 Contractor shall immediately decontaminate (if required) and evict any unauthorized individual  
35 entering the regulated area and notify the Construction Representative of action taken and identity  
36 of the unauthorized individual.

37  
38 A log book shall be maintained in the clean room area of the decontamination system. Anyone  
39 who enters the regulated area must record name, affiliation, time in, and time out for each entry.

40  
41 Access to the regulated area shall be through a single decontamination system located where shown  
42 on approved Shop Drawings. All other means of access (doors, windows, hallways, etc.) shall be  
43 blocked or locked so as to prevent entry to or exit from the regulated area. The only exceptions to  
44 this rule are the waste pass-out air lock which shall be sealed except during the removal of  
45 containerized asbestos waste from the regulated area, and emergency exits in case of fire or  
46 accident. Emergency exits shall not be locked from the inside; however, they shall be sealed with  
47 polyethylene sheeting and tape until needed.

#### 48 49 **EMERGENCY PLANNING**

50 Written emergency plan shall be submitted through the Owner's Project Representative and  
51 approved by the Architect/Engineer prior to the initiation of abatement activities.

52  
53 Emergency procedures shall be in written form and prominently posted in the clean change area  
54 and equipment room of the worker decontamination area. Everyone prior to entering the regulated  
55 area must read and sign these procedures to acknowledge receipt and understanding of work site  
56 layout, location of emergency exits and emergency procedures.

57

1 Emergency planning shall include notification of police, fire and emergency medical personnel of  
2 planned abatement activities, work schedule and layout of regulated area, particularly barriers that  
3 may affect response capabilities.

4  
5 Emergency planning shall include considerations of fire, explosion, toxic atmospheres, electrical  
6 hazards, slips, trips and falls, confined spaces and heat related injury. Written procedures shall be  
7 developed and employee training in procedures shall be provided.

8  
9 Employees shall be trained in evacuation procedures in the event of workplace emergencies under  
10 the following conditions:

11  
12 For non-life-threatening situations, employees injured or otherwise incapacitated shall  
13 decontaminate following normal procedures with assistance from fellow workers, if  
14 necessary, before exiting the workplace to obtain proper medical treatment.

15  
16 For life-threatening injury or illness, worker decontamination shall take least priority.  
17 After measures to stabilize the injured worker, remove the worker from the workplace and  
18 secure proper medical treatment.

19  
20 Telephone numbers of all emergency response personnel shall be prominently posted in the clean  
21 change area and equipment room, along with the location of the nearest telephone.

## 22 23 **PRECONSTRUCTION MEETING**

24 The Contractor shall attend a preconstruction meeting to be conducted at a time and place  
25 designated by the Owner's Project Representative. All parties having an active role in asbestos  
26 abatement shall be in attendance.

27  
28 The Contractor, Contractor's competent person and other supervisory personnel who shall provide  
29 on-site direction of the abatement activities must attend.

30  
31 At this meeting the Contractor shall provide all documentation as required by Article entitled:  
32 "Submittals and Notices," herein. In addition, the Contractor shall be prepared to provide detailed  
33 information concerning:

- 34  
35
- 36 • Preparation of regulated area.
  - 37 • Personal protective equipment including respiratory protection and protective clothing.
  - 38 • Employees who will participate in the project, including delineation of experience, training, certification, and assigned responsibilities during the project.
  - 39 • Decontamination procedures for personnel, regulated area and equipment.
  - 40 • Abatement methods and procedures to be utilized.
  - 41 • Required air monitoring procedures.
  - 42 • Procedures for handling and disposing of waste materials.
  - 43 • Procedures for final decontamination and cleanup.
  - 44 • A sequence of work and performance schedule.
  - 45 • Procedures for dealing with heat stress.
  - 46 • Emergency procedures.
  - 47 • Methods of adhering plastic sheeting to the surfaces to be covered.
- 48  
49

## 50 **DELIVERY, STORAGE AND HANDLING**

51 Deliver all materials in the original packages, containers or bundles bearing the name of the  
52 manufacturer and the brand name.

53

1 Damaged, deteriorating or previously used materials shall not be used and shall be removed from  
2 the work site and disposed of properly.

## 3 4 5 **PART 2 - PRODUCTS**

### 6 7 **MATERIALS**

8 Polyethylene sheeting for walls and stationary objects shall be a minimum of four (4) mil thick.  
9 For floors and all other uses, sheeting of at least six (6) mil thickness shall be used in widths selected  
10 to minimize the frequency of joints.

11  
12 Polyethylene sheeting utilized for decontamination enclosure shall be opaque white or black in  
13 color.

14  
15 Flame retardant polyethylene sheeting shall be utilized.

16  
17 Hardboard or plywood, minimum 1/4 inch thick, shall be furnished to protect finished floor  
18 surfaces, such as carpet or hardwood floors, to prevent damage from scaffolds or falling objects.  
19 Such protection shall also be provided for polyethylene sheeting under the scaffold area if the  
20 material being removed has sharp projections which could readily puncture the enclosure material.

21  
22 Disposal bags shall be of six (6) mil polyethylene, preprinted with labels as required by OSHA  
23 Requirement 29 CFR 1926.1101 (k) (8).

24  
25 Disposal drums for transporting disposal bags shall be metal or fiberboard with locking ring tops.

26  
27 Stick-on labels as per EPA, OSHA or DNR requirements shall be present on disposal containers.

28  
29 Surfactant (Wetting Agent):

30  
31 For use with materials containing asbestos identified as "Amosite", shall be a 50/50 mixture  
32 of polyoxyethylene ether and polyoxyethylene ester, mixed in a proportion of one (1) fluid  
33 ounce to five (5) gallons of water or as specified by manufacturer.

34  
35 For all materials containing asbestos identified as "chrysotile", "crocidolite", or types other  
36 than Amosite, shall consist of soapy water mixed in a proportion of two (2) fluid ounces of  
37 liquid soap to five (5) gallons of water.

38  
39 Asbestos Removal Encapsulant (substitute for surfactant): In lieu of using a wetting agent in water  
40 to control airborne fibers, an asbestos removal encapsulant may be used.

41  
42 Encapsulating Material:

43  
44 Bridging type encapsulant (for sealing masonry and concrete walls, barrier surfaces during  
45 cleanup phase and asbestos containing surfaces to remain in place) shall be capable of  
46 being applied with airless spray equipment, able to withstand light impact or abrasion  
47 without releasing fibers, water insoluble when cured, and must retain sufficient integrity  
48 after six (6) years to allow recoating.

49  
50 Penetrating type encapsulant (for sealing scratch coat plaster, wood grounds and wood  
51 blocking which have been in contact with asbestos containing material and also exposed  
52 ends of pipe insulation) shall not be noxious or toxic to applicator or subsequent occupants,  
53 shall have high flame retardance and low toxic fume and smoke emission ratings, and shall  
54 have some permeability to water vapor to prevent condensation accumulation.

### 55 56 **EQUIPMENT**

57 Negative Pressure Ventilation Units:

58  
59 A sufficient quantity of negative pressure ventilation units equipped with HEPA filtration  
60 and operated in accordance with ANSI Z9.2-79 (local exhaust ventilation requirements)

1 and EPA guidance document EPA 560/5-83-002 Guidance for Controlling Friable  
2 Asbestos-Containing Material in Buildings Appendix F: Recommended Specifications  
3 and Operating Procedures for the Use of Negative Pressure Systems for Asbestos  
4 Abatement shall be utilized so as to provide one workplace air change every 15 minutes.

5  
6 To calculate total air flow requirement:

7  
8 
$$\text{Total Ft}^3/\text{Min.} = \frac{\text{Volume of Regulated area (in Ft}^3\text{)}}{15 \text{ Min.}}$$
  
9

10  
11 To calculate the number of units needed for the abatement:

12  
13 
$$\text{Number of Units Needed} = \frac{\text{Total Ft}^3/\text{Min.}}{0.75 \text{ (Capacity of Unit in Ft}^3/\text{Min.)}}$$
  
14  
15

16 The air filtering equipment shall be capable of filtering asbestos fibers at 0.3 um at 99.9  
17 percent efficiency. Prefilters, which protect the final filter by removing the larger particles,  
18 are required to prolong the operating life of the HEPA filter. Two stages of prefiltration  
19 are required. The first-stage prefilter shall be a low efficiency type (e.g., for particles 10  
20 um and larger). The second-stage (or intermediate) filter shall have a medium efficiency  
21 (e.g., effective for particles down to 5 um). Prefilters and intermediate filters shall be  
22 installed either on or in the intake grid of the unit and held in place with special housings  
23 or clamps.

24  
25 Exhaust air from the regulated area shall maintain a negative pressure of 0.02 inches of  
26 water (head). The ventilation shall operate on a 24 hours basis throughout the abatement  
27 process until final clearance has been approved.

28  
29 **Air Purifying Respirators:**

30  
31 Respirator bodies shall be of half face or full face type with removable cartridges. Single  
32 use, disposable or quarter face respirators shall not be used. Full face respirators shall be  
33 equipped with a nose cup or other anti fogging devices as would be appropriate for use in  
34 air temperatures less than 32 degrees F.

35  
36 Filter cartridges shall, at a minimum, be HEPA type filters certified by NIOSH under 30  
37 CFR Part 11 or with filters certified for particulates under 42 CFR Part 84.

38  
39 Full body disposable protective clothing, including head, body and foot coverings consisting of  
40 material impenetrable by asbestos fibers (Tyvek<sup>R</sup> or equivalent) shall be provided to all workers  
41 and authorized visitors in sizes adequate to accommodate movement without tearing.

42  
43 Additional safety equipment, such as hard hats, eye protection, safety shoes, disposable PVC  
44 gloves, as necessary, shall be provided to all workers and authorized visitors. Safety Equipment  
45 shall meet latest ANSI Standards.

46  
47 Nonskid footwear shall be provided to all abatement workers. Disposable clothing shall be  
48 adequately sealed to the footwear to prevent body contamination.

49  
50 Provide sufficient supply of disposable mops, rags and sponges for work area decontamination.

51  
52 Provide scaffolds, ladders, lifts and hand tools such as scrapers, wire cutters, brushes, utility knives,  
53 wire saws, as the work requires.

54  
55 Sprayers with pumps capable of providing 14-15 pounds per square inch (psi) at the nozzle tip at a  
56 flow rate of 2 gallons per minute for spraying amended water.

57  
58 Rubber dust pans and rubber squeegees shall be provided for cleanup.

- 1  
2 Brushes utilized for removing loose asbestos containing material shall have nylon or fiber bristles,  
3 not metal.  
4  
5 A sufficient supply of HEPA filtered vacuum systems shall be available during cleanup.  
6  
7 Airless spray equipment with an adjustable low pressure nozzle shall be provided for spraying  
8 encapsulants. Nozzle tip size and pressure adjustment shall conform to encapsulant manufacturers  
9 written recommendations.  
10  
11 Heavy duty power cables for temporary electrical service and a portable electric generator for  
12 maintaining negative pressure in the work area shall be present in case of power failure.  
13  
14 Warning Signs and Labels: As required by OSHA Regulation 29 CFR 1926.1101(k).  
15  
16 Other equipment the Contractor deems necessary for asbestos abatement work shall be submitted  
17 to the Architect/Engineer for approval prior to its use.  
18

### 19 **PART 3 - EXECUTION**

#### 20 **GENERAL COMPLIANCE MEASURES**

21 **Mandatory Protection Conditions:** Contractor's employees shall wear appropriate respiratory  
22 protection and protective clothing under the following conditions:  
23

24  
25 During installation or implementation of engineering work practices and control measures.  
26

27 During maintenance and repair activities for which control measures, hereinafter described,  
28 are not feasible.  
29

30 Whenever the control measures are not yet sufficient to reduce exposure below the  
31 Permissible Exposure Limits (TWA and/or Excursion Limits).  
32

33 Whenever emergency conditions exist.  
34

35 **Control Measures:** The Contractor shall use one or any combination of the following control  
36 methods to achieve compliance with the "Permissible Exposure Limits" defined hereinbefore:  
37

38 Local exhaust ventilation equipped with HEPA filter dust collection systems.  
39

40 General dilution ventilation equipped with HEPA filtration systems on both exhaust and  
41 return air.  
42

43 Vacuum cleaners equipped with HEPA filters.  
44

45 Enclosure or isolation of processes producing airborne asbestos fibers and dust.  
46

47 Use of wet methods, wetting agents or removal encapsulants to control employee exposures  
48 during their performance of asbestos abatement activities. Where wet methods would  
49 result in equipment damage or a safety hazard, dry removal is allowed with written  
50 approval from WDNR pursuant to NR447.08(3)(b).  
51

52 Prompt disposal of wastes contaminated with asbestos in leak-tight containers.  
53

1 Supplement to Control Measures: Whenever the control measures described above are not  
2 sufficient to reduce the employee exposure to or below the "Permissible Exposure Limits" (TWA  
3 and/or Excursion Limit), the Contractor shall continue to use the control measures to maintain the  
4 employee exposure to the lowest levels attainable and supplement them with the use of appropriate  
5 respiratory protection and protective clothing.

6  
7 Negative-Pressure Enclosure: A negative-pressure enclosure shall be employed whenever feasible,  
8 prior to commencing removal, demolition and renovation operations involving asbestos containing  
9 materials.

10  
11 Types of Respiratory Protection: The following Table represents the minimum respiratory  
12 protection required for given airborne concentrations of asbestos:  
13

<u>Airborne Concentration of Asbestos, Tremolite, Anthophyllite, Actinolite, or a Combination of These Minerals</u>	<u>Required Respirator</u>
Not in excess of 1 f/cc (10 X PEL)	1. Half-mask air purifying respirator equipped with high-efficiency filters.
Not in excess of 5 f/cc (50 X PEL)	1. Full faceplate air purifying respirator equipped with high-efficiency filters.
Not in excess of 10 f/cc (100 X PEL)	1. Any powered air purifying respirator equipped with high efficiency filters.  2. Any supplied air respirator operated in continuous flow mode.
Not in excess of 100 f/cc (1000 X PEL)	1. Full face piece supplied air respirator operated in pressure demand mode.
Greater than 100 f/cc (1,000 X PEL) or unknown concentration	1. Full face piece supplied air respirator operated in pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus.

14 NOTE: Respirators assigned for higher environmental concentrations may be used at lower  
15 concentrations.

16  
17 A high-efficiency filter means a filter that is at least 99.97 percent efficient against mono-  
18 dispersed particles of 0.3 micrometers in diameter or larger.

19  
20 Employee Rotation: The Contractor shall not use employee rotation as a means of compliance with  
21 Permissible Exposure Limits (TWA and/or Excursion Limit).

22  
23 Supervision: The Contractor shall have a project supervisor on site at all times that only supervises  
24 the project and is responsible to assure contract and regulatory compliance.

25  
26 **PREPARATION OF REGULATED AREA**

27 Post the following warning signs at all approaches to a regulated area per OSHA 1926.110(k)(7).  
28 Signs shall be posted at a distance sufficiently far enough away from the regulated area to permit  
29 any person to read the sign and take the necessary protective measures before entering the area  
30 marked by the signs.

31  
32 **DANGER**

1  
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51

## ASBESTOS

### CANCER AND LUNG DISEASE HAZARD

#### AUTHORIZED PERSONNEL ONLY

Post the Occupant Protection Plan at the entrance to the regulated area per DHS 159.21(3).

Post at the entrance to the regulated area a list containing the names, addresses and telephone numbers of the Contractor, Fire Department and any other personnel who may be required to be contacted during abatement activities.

Maintain Project Log per DHS 159.21(2).

Shutdown and lock out all heating, cooling and air conditioning system (HVAC) components that are in, supply or pass through the regulated area. Appropriate equipment and control measures shall be utilized to prevent contamination of building spaces. Seal all intake and exhaust vents in the work area with tape and two layers of 6 mil polyethylene. Also seal any seams in system components that pass through the regulated area.

All electrical circuits to the area in which asbestos abatement work is to take place must be disconnected. The regulated area and other uncontaminated areas that were dependent on the disconnected electrical circuits shall be serviced by a temporary electrical service provided by owner. In accordance with the latest issue of the National Electrical Code, temporary electrical service shall be equipped with combination ground fault interrupter and circuit breakers meeting the requirements of UL for Class A, Group 1 devices. The ground fault interrupter portion shall be solid state type, insulated and isolated from the breaker mechanism. A test mechanism shall provide overload and short circuit protection and shall be operated by a toggle switch with over-center switching mechanism so that contact cannot be held closed.

Preclean all movable objects within the regulated area using a HEPA filtered vacuum or wet cleaning methods as appropriate. After cleaning, these objects shall be removed from the regulated area and carefully stored in an uncontaminated location.

Preclean all fixed objects in the regulated area using HEPA filtered vacuums or wet cleaning techniques as appropriate, if contamination is visibly covering them. Careful attention must be paid to machinery and behind grills or gratings where access may be difficult but contamination significant. Also pay particular attention to wall, floor and ceiling penetrations behind fixed items. After precleaning, enclose fixed objects in four (4) mil polyethylene sheeting and seal securely in place with tape.

Preclean all surfaces in the regulated area using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Do not use any methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos containing materials during the precleaning phase.

Seal off all windows, doorways, elevator openings, corridors, tunnels, entrances, drains, ducts, grills, grates, diffusers, skylights and any other openings between the regulated area and uncontaminated areas outside of the regulated area (including the outside of the building, tunnels and crawl spaces) with four (4) mil polyethylene sheeting and tape.

Wall Covering:

1  
2 Where surfacing materials are being removed from overhead, walls shall be covered with two (2)  
3 layers of four (4) mil polyethylene sheeting, starting at top of wall and extending down and across  
4 the floor area until it meets in the center of the floor. Here the covering sheets shall be taped  
5 together to form a monolithic covering which completely encases the regulated area.

6  
7 Polyethylene sheets shall be sized to minimize seams. Seams shall be staggered and separated by  
8 a distance of at least six (6) feet.

9  
10 Wall sheeting shall be secured adequately to prevent it from falling away from the walls. This may  
11 require additional support/attachment when negative pressure ventilation systems are utilized.

12  
13 Floor Covering:

14  
15 The floor area, which has previously been covered with sheeting extended from the walls, shall be  
16 covered with one additional layer of six (6) mil (minimum) sheeting. Provide additional protection  
17 such as plywood, canvas, or extra plastic sheeting for floors requiring special protection such as  
18 carpeting, hardwood flooring and tile floors which may be damaged by water leakage, ladder feet  
19 or scaffold wheels. Additional layers of sheeting may be utilized as drop cloths to aid in cleanup  
20 of bulk materials.

21  
22 Polyethylene sheets shall be sized to minimize seams. If the floor area necessitates seams, those  
23 on successive layers of sheeting shall be staggered to reduce the potential for water to penetrate to  
24 the flooring material. A distance of at least six (6) feet between seams is sufficient. Do not locate  
25 any parallel seams at wall/floor joints.

26  
27 Floor sheeting shall extend at least 24" up the side walls of the work area.

28  
29 **DECONTAMINATION ENCLOSURE SYSTEM**

30 A decontamination enclosure system shall be provided at each location where workers will enter  
31 or exit a regulated area.

32  
33 Plans for construction, including materials and layout, shall be submitted as shop drawings and  
34 approved by the Architect/Engineer prior to work initiation. Decontamination enclosure systems  
35 constructed at the work site shall utilize six (6) mil opaque black or white polyethylene sheeting or  
36 other acceptable materials for privacy. Detailed descriptions of portable, prefabricated units, if  
37 used, must be submitted for the Architect/Engineer's approval. Plans must include floor plan with  
38 dimensions, materials, size, thickness, plumbing and electrical utilities.

39  
40 The decontamination enclosure system shall consist of at least a clean room, a shower room, and  
41 an equipment room, each separated from each other and from the regulated area by air locks.

42  
43 Entry to and exit from all airlocks and decontamination enclosure system chambers shall be through  
44 curtained doorways consisting of two sheets of overlapping six (6) mil polyethylene sheeting. The  
45 curtain doorway sheets shall be secured at the top and one side opposite each other. All curtains  
46 shall have weights attached to the bottom to ensure that they hang straight and maintain a seal over  
47 the doorway when not in use. Doorway designs, providing equivalent protection and acceptable to  
48 the Architect/Engineer may be utilized.

49  
50 Access between any two rooms in the decontamination enclosure system shall be through an airlock  
51 with at least three (3) feet separating each curtained doorway. Pathways into (from clean to  
52 contaminated) and out from (contaminated to clean) the regulated area shall be clearly designated.



1 The clean room shall be sized to adequately accommodate the work crew. Clean, disposable  
2 clothing, replacement filters for respirators, disposable towels and other necessary items shall be  
3 provided in adequate supply in the clean room. A location for postings shall also be provided in  
4 this area. Whenever possible, a lockable door shall be used to permit access into the clean room  
5 from outside the regulated area.

6  
7 The shower room shall contain one or more shower heads as necessary to adequately accommodate  
8 workers. Each shower head shall be supplied with hot and cold water adjustable at the tap. The  
9 shower enclosure shall be constructed to insure against leakage of any kind. An adequate supply  
10 of soap and disposable towels shall be supplied by the Contractor and available at all times. Shower  
11 water shall be drained, collected and filtered as specified in the Article entitled: "Water Collection  
12 and Disposal," herein.

13  
14 The equipment room shall be used for storage of equipment and tools at the end of a shift after  
15 workers have been decontaminated using a HEPA filtered vacuum and/or wet cleaning techniques  
16 as appropriate. Replacement filters (in sealed containers until used) for HEPA vacuums and  
17 negative pressure ventilation equipment, extra tools, containers or surfactant and other materials  
18 and equipment that may be required during the abatement, may also be stored here as needed. A  
19 walk-off pan (a small children's swimming pool or equivalent filled with water) shall be located in  
20 the regulated area just outside the equipment room for workers to clean off foot coverings after  
21 leaving the regulated area and prevent excessive contamination of the worker decontamination  
22 enclosure system. A drum lined with a labeled six (6) mil polyethylene bag for collection of  
23 disposable clothing shall be located in this room. Contaminated rubber boots or other reusable  
24 footwear shall be stored in this area for reuse the following workday.

#### 25 26 Waste Container Pass-Out Airlock:

27  
28 The waste container pass-out airlock shall be constructed at some location away from the worker  
29 decontamination enclosure system. Wherever possible, this shall be located where there is direct  
30 access from the regulated area to the outside of the building.

31  
32 This airlock system shall consist of an airlock, a container staging area, and another airlock with  
33 access to outside the regulated area.

34  
35 The waste container pass-out airlock shall be constructed in similar fashion to the worker  
36 decontamination enclosure system using similar materials and airlock and curtain doorway designs.

37  
38 This airlock system shall not be used to enter or exit the regulated area. The airlock system shall  
39 be tightly sealed when not in use.

40  
41 Emergency exits shall be established and clearly marked with duct tape arrows or other effective  
42 designations to permit easy location from anywhere within the regulated area. They shall be  
43 secured to prevent access from uncontaminated areas, but still permit emergency exiting. These  
44 exits shall be properly sealed with polyethylene sheeting which can be cut to permit egress if  
45 needed. These exits may be through the decontamination enclosure, the waste pass-out airlock, or  
46 other alternative exits satisfactory to fire officials.

#### 47 48 **TEMPORARY ISOLATION PARTITIONS**

49 Large rooms or open areas that require temporary air tight barriers to separate a contaminated  
50 regulated area from an uncontaminated area shall be provided with temporary partitions,  
51 constructed in the following manner:

52  
53 Walls shall be constructed of wood or metal framing to support barriers in all openings larger than  
54 4' x 8'.

1  
2 A sheathing material (plywood, drywall) of at least 3/8" thickness shall be applied to work side of  
3 barrier.

4  
5 Cover the work side of partition with a double layer of four (4) mil polyethylene sheeting with  
6 staggered joints and seal in place.

7  
8 Provide at least one (12" x 12") window in the barrier system, where feasible, for the purpose of  
9 viewing into the regulated area. The window shall consist of heavy gauge plastic or clear safety  
10 glass. Panes shall be framed into the barrier system and completely sealed to prevent any leakage  
11 of air through the unit.

### 12 13 **MAINTENANCE OF ENCLOSURE SYSTEM**

14 Following completion of the construction of all polyethylene barriers and decontamination system  
15 enclosures, initiate negative pressure system and allow overnight settling to ensure that barriers  
16 will remain intact and secured to walls and fixtures before beginning actual abatement activities.

17  
18 All polyethylene barriers and decontamination enclosure systems shall be inspected at least twice  
19 daily by the Contractor's competent person prior to the start of each day's abatement activities and  
20 following the completion of the day's abatement activities. Document inspections and observations  
21 in the daily project log.

22  
23 Damage and defects in the enclosure system are to be repaired immediately upon discovery.

24  
25 Use smoke tubes to test the effectiveness of the barrier system when directed by Owners Project  
26 Representative.

27  
28 Anytime during the abatement activities, if visible construction related dust or debris is observed  
29 outside of the regulated area or if damage occurs to barriers, work shall immediately stop, repairs  
30 shall be made to barriers, and debris/residue cleaned up using appropriate HEPA vacuuming and  
31 wet mopping procedures.

32  
33 Openings made in the enclosure system to accommodate negative air pressure system shall be made  
34 airtight with tape and caulking as needed. If more than one unit is installed, they should be turned  
35 on one at a time, checking the integrity of wall barriers for secure attachment and need for additional  
36 reinforcement. Insure that adequate power supply is available to satisfy the requirements of the  
37 ventilating and exhaust units. Negative pressure units shall be exhausted to the outside of the  
38 building. They shall not be exhausted into occupied areas of the building. Careful installation and  
39 daily inspections shall be done to ensure that the ducting does not release fibers into  
40 uncontaminated building areas.

41  
42 Use of enclosure system shall not commence until the following has been accomplished:

43  
44 Enclosure systems have been constructed, inspected, and tested.

45  
46 Negative pressure systems are functioning adequately.

47  
48 All preabatement submissions, notifications, postings and permits have been provided and  
49 approved by the Architect/Engineer, or Construction Representative, as applicable.

50  
51 All equipment for abatement, cleanup and disposal are on hand.

52  
53 All worker training is completed.

54

1 Contractor has received written notice to commence abatement work from the UWS, based on  
2 recommendation of the Owners Project Representative.

3  
4 **WORKPLACE ENTRY AND EXIT PROCEDURES**

5 All workers and authorized personnel shall enter the regulated area through the decontamination  
6 enclosure system.

7  
8 All personnel who enter the regulated area must sign the registration log, located in the clean room,  
9 both upon entry and exiting the area.

10  
11 All personnel shall proceed first to the clean room, remove all street clothes, and appropriately don  
12 respiratory protection (as approved for the job conditions) and disposable coveralls, head covering  
13 and foot covering. Hard hats, eye protection and gloves shall also be utilized if required. Clean  
14 respirators and protective clothing shall be provided and utilized by each person for each separate  
15 entry into the regulated area.

16  
17 Personnel wearing designated personal protective equipment shall proceed from the clean room  
18 through the decontamination enclosure system to the regulated area.

19  
20 Before leaving the regulated area all personnel shall remove gross contamination from the outside  
21 of respirators and protective clothing by brushing or wet wiping procedures. (Small HEPA  
22 vacuums with brush attachments may be utilized for this purpose.) Each person shall clean bottoms  
23 of protective footwear in the walk-off pan just prior to entering the equipment room.

24  
25 Personnel shall proceed to equipment room where they remove all protective equipment except  
26 respirators. Deposit disposable clothing into appropriately labeled containers for disposal.

27  
28 Reusable, contaminated footwear shall be stored in the equipment room when not in use in the  
29 regulated area. Upon completion of abatement it shall be disposed of as asbestos contaminated  
30 waste. Rubber boots may be decontaminated at the completion of the abatement for reuse.

31  
32 Still wearing respirators, personnel shall proceed to the shower area, clean the outside of the  
33 respirators and the exposed face area under running water prior to removal of respirator and shower  
34 and shampoo to remove residual asbestos contamination. Various types of respirators will require  
35 slight modification of these procedures. An airline respirator with HEPA filtered disconnect  
36 protection may be disconnected in the equipment room and worn into the shower. A powered air  
37 purifying respirator face piece will have to be disconnected from the filter/power pack assembly  
38 which is not waterproof, upon entering the shower. Cartridges must be in place for each new entry  
39 into the regulated area.

40  
41 After showering and drying off, proceed to the clean room and don street clothing, even though  
42 there will be later reentry into the regulated area or street clothes, if it is the end of the work shift.

43  
44 Workers shall NOT eat, drink, smoke, chew gum or tobacco in the regulated area. To eat, drink or  
45 smoke, workers shall follow the procedure described above, then dress in street clothes before  
46 entering the nonregulated areas of the building.

47  
48 These procedures shall be posted in the clean room and equipment room.

49  
50 **WASTE CONTAINER PASS-OUT PROCEDURE**

51 Asbestos contaminated waste that has been containerized shall be transported out of the regulated  
52 area through the waste container pass-out airlock (or through the decontamination enclosure if a  
53 separate airlock has not been constructed).

1 The inside team wearing protective clothing and respirators appropriate for the contaminated  
2 regulated area shall clean the entire surface, including bottoms, of properly labeled bags, using  
3 HEPA vacuums and wet wiping techniques and transport them into the waste container pass-out  
4 airlock where they will be placed into another properly labeled bag. No worker from the inside  
5 team shall further exit the regulated area through this airlock.

6  
7 Workers from outside the regulated area wearing appropriately assigned respirators, shall enter the  
8 airlock from outside the regulated area. No worker from the outside team shall further enter the  
9 regulated area through this airlock.

10  
11 The exit from this airlock shall be secured to prevent unauthorized entry.

### 12 13 **WATER COLLECTION AND DISPOSAL**

14 All water resulting from precleaning operation, excess from floor of regulated area and the final  
15 cleaning operation shall be collected and placed in sealed containers for disposal as contaminated  
16 material.

17  
18 Water from the decontamination shower shall be collected in a holding tank and filtered to remove  
19 particles of 0.5 microns or larger size before draining water into sanitary sewer system. The  
20 drainage and filtering system shall consist of the following:

21  
22 A centrifugal pump capable of pumping at least 25 gallons/minute.

23  
24 Two filter cartridge housings, one serving as a prefilter, utilizing at least 6 cylindrical 100 micron  
25 filters (reusable type) and the other serving as final filter with 6 cylindrical 0.5 micron filters.

26  
27 Maintain two sets (6 cylinders per set) of 100 micron filters, to allow one set to be cleaned while  
28 the other set is in use.

29  
30 A common garden hose may be connected to final filter housing to drain water to sanitary sewer  
31 system.

### 32 33 **WET REMOVAL PROCEDURE**

34 Wet all asbestos containing material with an amended water solution, or removal encapsulant, using  
35 equipment capable of providing a fine spray mist, in order to reduce airborne fiber concentrations  
36 when the material is disturbed. Saturate the material to the substrate. Keep all removed material  
37 wet to prevent fiber release until it can be containerized for disposal. If regulated area temperatures  
38 are below 32°F and amended water is subject to freezing, modify as specified for surfactant in  
39 Article entitled: "Materials," herein. Maintain a high humidity in the regulated area by misting or  
40 spraying to assist in fiber settling and reduce airborne concentrations.

41  
42 Saturated asbestos containing material shall be removed in manageable sections. Removed  
43 material should be containerized before moving to a new location for continuance of work.  
44 Surrounding areas shall be periodically sprayed and maintained in a wet condition until visible  
45 material is cleaned up.

46  
47 Material removed from building structures or components shall not be dropped or thrown to the  
48 floor. Material should be removed as intact sections or components whenever possible and  
49 carefully lowered to the floor. If this cannot be done for materials greater than 50 feet above the  
50 floor, a dust-tight chute shall be constructed to transport the material to containers on the floor or  
51 the material may be containerized at elevated levels (e.g. on scaffolds) and carefully lowered to the  
52 ground by mechanical means. For materials between 15 and 50 feet above the ground they may be  
53 containerized at elevated levels or dropped onto inclined chutes or scaffolding for subsequent  
54 collection and containerization.

1  
2 Bags shall be considered full when half their capacity have been filled. They should be securely  
3 sealed to prevent accidental opening and leakage by tying tops of bags in an overhand knot or by  
4 taping in gooseneck fashion. Do not seal bags with wire or cord.  
5

6 Large components removed intact may be wrapped in two (2) layers of six (6) mil polyethylene  
7 sheeting secured with tape for transport to the approved disposal site.  
8

9 Asbestos containing waste with sharp edged components (e.g., nails, screws, metal lath, tin  
10 sheeting) shall be placed into drums for disposal in lieu of polyethylene bags. Drums shall be  
11 marked to differentiate contents from those drums containing bagged material.  
12

13 After completion of all stripping work, surfaces from which asbestos containing materials have  
14 been removed, such as plaster base coat or metal deck, etc., shall be wet brushed and sponged to  
15 remove all visible residue.  
16

### 17 **CEILING SYSTEM REMOVAL**

18 Remove, clean and enclose in polyethylene the ceiling mounted objects such as lights and other  
19 items that may interfere with the abatement process and were not previously cleaned and sealed  
20 off. Utilize localized spraying of amended water, or HEPA vacuums, to reduce fiber dispersal  
21 during the removal of these fixtures.  
22

23 Remove ceiling (tiles) (panels) within the regulated area carefully. If panels are to be reused,  
24 vacuum them with a HEPA filtered vacuum cleaner and carefully damp sponge and wrap cleaned  
25 (tiles) (panels) in four (4) mil polyethylene sheeting and seal with tape. Store as designated by  
26 Owner's Project Representative (preferably outside of the regulated area). If (tiles) (panels) are to  
27 be discarded it is not necessary to clean them, but wrap in a similar fashion and stage for disposal  
28 in the waste container pass-out airlock.  
29

30 Where suspended ceiling T-grid components must be removed to perform the abatement, HEPA  
31 vacuum and wet sponge each piece after removal from hangers. Wrap clean grid pieces in four (4)  
32 mil polyethylene sheeting and seal with tape. Store as designated by Owner's Project  
33 Representative or in waste staging area if designated for disposal.  
34

35 When removal of ceiling grid suspension system is not necessary for accessibility to the asbestos  
36 containing materials, leave the system in place and clean properly following completion of  
37 abatement, as specified in the Article of this section entitled: "Cleanup Procedure."  
38

39 Remove plaster/drywall ceilings including lath, furring channel system, wire mesh, ties, clips,  
40 screws, nails and other accessory items as necessary and dispose of them as asbestos contaminated  
41 waste material. As work progresses, spray ceiling materials and debris with amended water to keep  
42 wet until containerized for disposal.  
43

### 44 **PIPE TUNNEL OR CRAWL SPACE REMOVAL WORK**

45 A decontamination enclosure shall be provided at the entrance to the pipe tunnel or crawl space.  
46 All requirements for regulated area entry and exit procedures and waste container pass-out  
47 procedures, as hereinbefore specified, shall apply to this work.  
48

49 All openings within the pipe tunnel or crawl space shall be sealed with four (4) mil polyethylene  
50 and tape. The existing surfaces within the space will not be required to be covered with  
51 polyethylene sheeting.  
52

53 A negative pressure system shall be required to maintain the security of the workspace and the  
54 integrated decontamination enclosure.

1  
2 All loose and fallen asbestos-containing material shall be very carefully cleaned up with an  
3 industrial vacuum equipped with HEPA filter.

4  
5 After asbestos abatement work has been completed in the crawl space or pipe tunnel, all ceiling,  
6 wall and floor surfaces shall be cleaned with the HEPA equipped vacuum. All cleaned surfaces  
7 shall be sealed with an approved encapsulant.

#### 8 9 **FLOORING REMOVAL**

10 Where flooring removal is specified with the use of solvents to remove flooring adhesive, the  
11 substrate shall have no adhesive residue or debris remaining. Contractor shall wash the substrate  
12 with soap and water to remove all solvent. Contractor shall be responsible for the cost of repair or  
13 replacement of any building components damaged by excessive use of solvents.

14  
15 Where flooring removal is specified without the use of solvents to remove flooring adhesive, the  
16 contractor shall diligently remove adhesive by scraping process so that all trowel marks are  
17 removed and a uniform substrate, smooth to the touch, is attained. Contractor shall coordinate with  
18 the flooring installer to ensure that the remaining substrate is suitable for replacement flooring  
19 installation.

#### 20 21 **SMALL SCALE - SHORT DURATION REMOVAL PROCEDURE**

22 **Glovebag Method:**

23  
24 All workers who are permitted to use the glovebag technique must be trained, experienced and  
25 skilled in this method.

26  
27 All tools and materials that will be required during the removal procedure shall be placed into the  
28 tool pouch.

29  
30 Glovebag shall be installed so that it completely encompasses the surface where removal work will  
31 take place. The side seams of the glovebag shall be cut the appropriate length to accommodate a  
32 size that will fit over the removal area. The bag shall be placed in position, the edges of the bag  
33 shall be folded together and sealed with tape. All openings in the bag shall be sealed with duct tape  
34 (or equivalent material). The bottom seam of the bag must also be sealed with tape to prevent  
35 leakage.

36  
37 Workers performing asbestos removal with glovebag shall wear (at a minimum) half mask dual-  
38 cartridge HEPA-equipped respirator, and full protective clothing to protect against the possibility  
39 of accidental leakage.

40  
41 All material removed within the glovebag shall be thoroughly wetted with wetting agent, or  
42 removal encapsulant, applied with airless sprayer through the side port provided in the bag. After  
43 asbestos containing material has been removed, the exposed base surface must be thoroughly  
44 cleaned and wet wiped until all traces of asbestos-containing material is removed.

45  
46 Create constant negative pressure by running a HEPA vacuum hose into bag.

47  
48 Any exposed edges of asbestos-containing that will remain after bag is removed shall be  
49 encapsulated with a bridging encapsulant to seal the material from releasing fibers to the  
50 atmosphere. Provide neatly beveled and coated terminations, where insulation terminates, suitable  
51 for a butt joint with new insulation.

52  
53 In all glovebag removal settings, all doors, windows and other openings to the functional space  
54 must be sealed with a minimum of four (4) mil polyethylene sheeting. The HVAC system must be

1 shut down. Once the area is completely sealed off, negative air pressure must be introduced to the  
2 entire functional space.

3  
4 In glovebag settings which involve small scale short duration removal the immediate area shall be  
5 prepared using the following techniques: polyethylene drop cloths (minimum 6 mil) on floor and  
6 walls in a 12 foot perimeter of the removal area with a negative air machine present and running in  
7 the immediate area. Glovebag must be placed under variable negative pressure during removal  
8 stages. A centralized three stage decontamination system must be established in the building for  
9 this method of glovebag removal.

#### 10 11 Mini-Enclosure Method:

12  
13 A mini-enclosure may be built around an area which is too large for glovebag method, but is of  
14 small-scale and short duration work and would not warrant large enclosure.

15  
16 The mini-enclosure can be small enough to restrict the space to use by one worker. A small change  
17 room shall be contiguous to the mini-enclosure. The change room shall be a minimum of 3' x 3'

18  
19 The mini-enclosure shall be constructed by affixing plastic sheeting to existing walls and covering  
20 the floor with plastic sheeting, which shall extend up walls at least 24 inches and sealed with tape.  
21 If existing walls are not available, frame shall be constructed and two (2) layers of six (6) mil  
22 polyethylene sheeting applied to the interior side of frame to allow clean "take-down" at  
23 completion. Sheeting shall be sealed with tape.

24  
25 The change room shall be constructed of framing to which shall be applied two (2) layers of six (6)  
26 mil polyethylene sheeting to interior side of frame and sealed with tape. The change room shall be  
27 provided with double six (6) mil polyethylene curtains at the exit and the entrance to the mini work  
28 enclosure. Both curtains in each opening shall be secured at the top and one side opposite from the  
29 other.

30  
31 A hose from a HEPA vacuum shall be extended through the wall of the mini-enclosure and the  
32 opening around the hose shall be sealed with tape. The HEPA vacuum shall run continuously  
33 during the time asbestos abatement work is taking place.

34  
35 All abatement work shall be conducted using the wet removal method and all debris from such  
36 work shall be bagged and disposed of as contaminated material. Upon completion, the interior  
37 surfaces of the regulated area shall be cleaned and sprayed with an encapsulant.

38  
39 Worker using the mini-enclosure method shall wear two (2) Tyvek<sup>R</sup> or equivalent disposable work  
40 suits and the appropriate HEPA filtered dual cartridge respiratory protection. Upon completion of  
41 the work and before leaving the change area, worker shall remove outer work suit and then proceed  
42 to a shower that is not contiguous with the work area.

43  
44 The polyethylene enclosure, comprising the regulated area and the change room, shall be collapsed  
45 inwardly, bagged and disposed of as contaminated material.

#### 46 47 **ENCAPSULATION PROCEDURES**

48 Clean and isolate the regulated area as specified in Article entitled: "Preparation of Regulated  
49 Area", hereinbefore.

50  
51 Repair damaged and missing areas of existing materials with nonasbestos-containing substitutes.  
52 Material must adhere adequately to existing surfaces and provide an adequate base for application  
53 of encapsulating agents. Filler material shall be applied in accordance with manufacturer's  
54 recommended specifications.

1  
2 Spray apply using airless equipment with low nozzle pressure to all surfaces where asbestos is  
3 removed or surfaces containing asbestos that are to remain in place. Spray must completely  
4 encapsulate any remaining asbestos, permanently locking it in place.  
5

6 Apply a minimum of one (1) coat with coverage in strict accordance with manufacturer's  
7 recommendations. Surfaces must be dry and free of dirt, oil and dust.  
8

#### 9 **ENCLOSURE PROCEDURE**

10 Clean and isolate the regulated area as specified in Article entitled: "Preparation of Regulated  
11 Area" hereinbefore.  
12

13 Spray areas that will be disturbed during the installation of hangers or other support/framing  
14 materials for the enclosure with water containing the specified surfactant. Keep these areas damp  
15 to reduce airborne fiber concentrations.  
16

17 Remove loose or hanging asbestos containing materials.  
18

19 After installation of hangers and other fixing devices and before installation of enclosure, repair  
20 damaged areas of fireproofing/thermal insulation materials as required using a nonasbestos-  
21 containing replacement material. Prepare surfaces and apply replacement material in accordance  
22 with manufacturer's recommendations.  
23

#### 24 **AIR MONITORING**

25 Daily Personal Air Monitoring (OSHA Compliance):  
26

27       Daily determination of employee exposure shall be made by collecting one or more  
28 breathing zone samples that are representative of the 8-hour TWA, full-shift exposure for  
29 each employee in each regulated area; and one or more breathing zone air samples that are  
30 representative of 30-minute exposures associated with operations that are most likely to  
31 produce exposures above the excursion limit for employees in each regulated area.  
32

33       OSHA P.E.L. As required by 29CFR 1926.1101(c). Within the breathing zone of each  
34 worker category (i.e., wetter, receiver, bagger) 25% of the crew or one per job category.  
35

36 All samples collected shall be analyzed by a laboratory accredited by the American Industrial  
37 Hygiene Association or in accordance with 1926.1101 – Appendix A.  
38

39 The Owners Project Representative has the authority to stop the abatement work under the  
40 provisions of the General Conditions of this contract at anytime the Representative determines  
41 either personally or through the services of an air sampling professional that conditions are not in  
42 compliance with the specifications and applicable regulations. The stoppage of work shall continue  
43 until conditions have been corrected and corrective steps have been taken to the satisfaction of the  
44 Construction Representative. Standby time required to resolve violations shall be at the  
45 Contractor's expense.  
46

#### 47 **CLEANUP PROCEDURE**

48 Remove and containerize all visible accumulations of asbestos containing material and asbestos  
49 contaminated debris utilizing rubber dust pans and rubber squeegees to move material around. Do  
50 not use metal shovels to pick up or move accumulated waste. Special care shall be taken to  
51 minimize damage to floor sheeting.  
52

53 Wet clean all surfaces in the regulated area using rags, mops and sponges as appropriate. (Note:  
54 Some HEPA vacuums might not be wet-dry vacuums.)



1  
2 Prior to removing the inner layer of plastic sheeting, the sheeting shall be sprayed with an  
3 encapsulant, so that any residue remaining will be adhered to the plastic sheeting.

4  
5 Remove the cleaned inner layer of plastic sheeting from walls and floors. Windows, doors, HVAC  
6 system vents and all other openings shall remain sealed. The negative pressure ventilation units  
7 shall remain in continuous operation. Decontamination enclosure systems shall remain in place  
8 and be utilized.

9  
10 Remove all containerized waste from the regulated area and waste container pass-out airlock.

11  
12 The DFDM's Project Representative, DNR Representative and the Contractor shall inspect the  
13 regulated area for visible residue. If any accumulation of residue is observed, it will be assumed to  
14 be asbestos and the cleaning cycle shall be repeated.

15  
16 After cleaning the regulated area the Contractor may either spray the remaining barrier material  
17 with encapsulant, or wait at least 24 hours to allow fibers to settle and HEPA vacuum and wet clean  
18 all objects and surfaces in the regulated area again.

19  
20 Decontaminate all tools and equipment and remove at the appropriate time in the cleaning  
21 sequence.

## 22 23 **DISPOSAL PROCEDURES**

24 As the work progresses to prevent exceeding available storage capacity onsite, sealed and labelled  
25 containers of asbestos-containing waste shall be removed and transported directly to the  
26 prearranged disposal location, which must be an authorized site in accordance with regulatory  
27 requirements of NESHAP and Wisconsin Administrative Rule NR 447.13 and NR 506.10. Use of  
28 intermediate storage locations is not an accepted disposal procedure. Mark vehicles used to  
29 transport asbestos-containing waste in accordance with NR 447.12(4)(a)1 to 3. Comply with US  
30 DOT Hazardous Material regulations, 49 CFR 171-180.

31  
32 The Contractor shall provide documentation in the form of a transportation and disposal manifest  
33 that will provide a chain-of-custody record of all asbestos-containing waste from project site to the  
34 disposal site. All asbestos-containing waste generated must be accounted for by these records and  
35 copies of all such records shall be delivered to the Construction Representative.

### 36 37 **Transportation to the Landfill:**

38  
39 Contractor shall provide an enclosed lockable waste container, consisting of a truck, trailer  
40 or dumpster, for storage and transportation of waste. The waste container shall be locked  
41 while unattended and during transportation of waste. Once bags have been removed from  
42 the regulated area, they shall be loaded directly into the waste container for transportation.

43  
44 The waste container shall be free of debris and lined with six (6) mil polyethylene sheeting  
45 to prevent contamination from leaking or spilled containers. Floor sheeting shall be  
46 installed first and extend up the side walls. Wall sheeting shall be overlapped and taped  
47 into place.

48  
49 Drums shall be placed on level surfaces in the waste container and packed tightly together  
50 to prevent shifting and tipping. Large components shall be secured to prevent shifting and  
51 bags placed on top. Do not throw containers into waste container.

52

1 Personnel loading asbestos containing waste shall be protected by disposable clothing  
2 including head, body and foot protection and at a minimum, half-face piece, air-purifying,  
3 dual cartridge respirators equipped with HEPA filters.

4  
5 Any debris or residue observed on containers or surfaces outside of the regulated area  
6 resulting from cleanup or disposal activities shall be immediately cleaned up using HEPA  
7 filtered vacuum equipment and/or wet methods.

8  
9 Disposal at the Landfill:

10  
11 Upon reaching the landfill, trucks are to approach the dump location as closely as possible  
12 for unloading of the asbestos containing waste.

13  
14 Bags, drums and components shall be inspected as they are off-loaded at the disposal site.  
15 Damaged containers shall be very carefully taped shut and repacked into drums or bags as  
16 applicable.

17  
18 Waste containers shall be placed on the ground at the disposal site, not pushed or thrown  
19 out of trucks (weight of wet material could rupture bags).

20  
21 Personnel off-loading containers at the disposal site shall wear protective equipment  
22 consisting of disposable head, body and foot protection and, at a minimum, half-face piece,  
23 air-purifying, dual cartridge respirators equipped with HEPA filters.

24  
25 Following the removal of all containerized waste, the truck cargo area shall be  
26 decontaminated using HEPA vacuums and wet methods to meet the no visible residue  
27 criteria. Polyethylene sheeting shall be removed and discarded along with contaminated  
28 cleaning materials and protective clothing in bags or drums at the disposal site.

29  
30 **REESTABLISHMENT OF REGULATED AREA**

31 Reestablishment of the regulated area shall occur only after completion of cleanup procedures and  
32 documentation has been performed to the satisfaction of the Owner's Representative.

33  
34 Resecure mounted objects removed from their former positions during area preparation activities.

35  
36 Resecure and relocate objects that were removed to temporary locations back to their original  
37 positions.

38  
39 Reestablish HVAC, mechanical and electrical systems in proper working order. Remove  
40 potentially contaminated HVAC system filters and dispose of as asbestos contaminated waste.  
41 Decontaminate filter assembly using HEPA vacuums and wet cleaning techniques.

42  
43 END OF SECTION  
44  
45

1 **SECTION 04 03 22**  
2 **HISTORIC BRICK UNIT MASONRY REPAIR**

3 PART 1 - GENERAL

4 1.1 SUMMARY

- 5 A. Section includes historic treatment work consisting of repairing historic clay brick masonry as follows:  
6 1. Infilling in and patching existing unit masonry.

7 1.2 DELIVERY, STORAGE, AND HANDLING

- 8 A. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use  
9 cementitious materials that have become damp.
- 10 B. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have  
11 been damaged or have been opened for more than two days.

12 PART 2 - PRODUCTS

13 2.1 MASONRY MATERIALS

- 14 A. Salvaged Brick: Obtain salvaged brick from location indicated on Drawings. Clean off residual mortar.

15 2.2 MORTAR MATERIALS

- 16 A. Portland Cement: ASTM C150, Type I or Type II; white or gray as where required for color matching of  
17 mortar.
- 18 B. Hydrated Lime: ASTM C207, Type S.
- 19 C. Mortar Sand: ASTM C144 unless otherwise indicated.  
20 1. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several  
21 sands if necessary to achieve suitable match.  
22 2. Colored Mortar: Natural sand or ground marble, granite, or other sound stone of color necessary to  
23 produce required mortar color.
- 24 D. Mortar Pigments: ASTM C979M, compounded for use in mortar mixes, and having a record of  
25 satisfactory performance in masonry mortars.
- 26 E. Water: ASTM C270, potable.

1 2.3 ACCESSORY MATERIALS

- 2 A. Anchors and Ties, General: Provide ties and anchors specifically designed to be used together; sized to  
3 extend at least halfway, but not less than 1-1/2 inches, through masonry unit and with at least 5/8-inch  
4 mortar cover on outside face; and made of materials that comply with the following, unless otherwise  
5 indicated:
- 6 1. Steel Sheet: ASTM A 1008, Commercial Steel; 0.074-inch minimum thickness; with  
7 ASTM A 153, Class B coating applied after fabrication.
  - 8 2. Steel Wire: ASTM A 82; 0.187-inch minimum diameter; with ASTM A 153, hot-dip galvanized  
9 Class B-2 coating applied after fabrication.
- 10 B. Setting Buttons and Shims: Resilient plastic, nonstaining to masonry, sized to suit joint thicknesses and  
11 bed depths of bricks, less the required depth of pointing materials unless removed before pointing.

12 2.4 MORTAR MIXES

- 13 A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or  
14 equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical  
15 batch mixer.
- 16 B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified  
17 proportions without Architect's approval.
- 18 1. Mortar Pigments: Where mortar pigments are indicated, do not add pigment exceeding 10 percent  
19 by weight of the cementitious or binder materials, except for carbon black which is limited to 2  
20 percent, unless otherwise demonstrated by a satisfactory history of performance.
- 21 C. Do not use admixtures in mortar unless otherwise indicated.
- 22 D. Mixes: Mix mortar materials in the following proportions:
- 23 1. Rebuilding (Setting) Mortar by Type: ASTM C270, Proportion Specification, Type N with  
24 cementitious material limited to portland cement and lime.
  - 25 2. Colored Mortar: Add mortar pigments to produce exposed, setting (rebuilding) mortar of colors  
26 required.

27 PART 3 - EXECUTION

28 3.1 PROTECTION

- 29 A. Prevent mortar from staining face of surrounding masonry and other surfaces.

30 3.2 BRICK REMOVAL AND REPLACEMENT

- 31 A. At locations indicated, remove entire units from joint to joint, without damaging surrounding masonry, in  
32 a manner that permits replacement with full-size units.
- 33 B. Support and protect remaining masonry that surrounds removal area.
- 34 C. Remove in an undamaged condition as many whole bricks as possible.
- 35 1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and  
36 water.

- 1 2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
- 2 3. Store brick for reuse. Store off ground, on skids, and protected from weather.
- 3 4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.
  
- 4 D. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation  
5 for brick replacement.
  
- 6 E. Use only salvaged brick in good condition. Do not use broken units unless they can be cut to usable size.
  
- 7 F. Lay replacement brick with mortar and with completely filled bed, head, and collar joints. Butter ends  
8 with sufficient mortar to fill head joints and shove into place.
  - 9 1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
  - 10 2. When mortar is hard enough to support units, remove shims and other devices interfering with  
11 pointing of joints.
  - 12 3. Replacement brick should be anchored to back up approximately 16-inches on center vertically  
13 and horizontally.
  
- 14 G. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours,  
15 including weekends and holidays.
  - 16 1. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable.  
17 Completely remove such mortar and repoint.

18 3.3 FINAL CLEANING

- 19 A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign  
20 matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low-pressure spray.
  - 21 1. Do not use metal scrapers or brushes.
  - 22 2. Do not use acidic or alkaline cleaners.
  
- 23 B. Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.

24 3.4 MASONRY-WASTE DISPOSAL

- 25 A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property.
  
- 26 B. Masonry Waste: Remove masonry waste and legally dispose of off Owner's property.

27 **END OF SECTION 04 03 22**



1 **SECTION 055000**  
2 **METAL FABRICATIONS**

3 **PART 1 - GENERAL**

4 1.1 **SUMMARY**

- 5 A. Section Includes: Loose lintels.

6 1.2 **ACTION SUBMITTALS**

- 7 A. Shop Drawings: Indicate dimensions, description of materials and finishes.

8 **PART 2 - PRODUCTS**

9 2.1 **MATERIALS**

- 10 A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components  
11 exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade  
12 names, or blemishes.

- 13 B. Steel Plates, Shapes and Bars: ASTM A36.

14 2.2 **FRAMING, SUPPORTS AND PLATES**

- 15 A. (MET FAB-1) Loose Steel Lintels: Fabricate loose steel lintels from steel angles and shapes of size  
16 indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in  
17 single lengths for each opening unless otherwise indicated.  
18 1. Finish: Shop-prime for field-applied paint.

19 2.3 **FINISHING**

- 20 A. Comply with NAAMMS "Metal Finishes Manual for Architectural and Metal Products" for  
21 recommendations for applying and designating finishes.  
22 1. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary  
23 protective covering before shipment.

- 24 B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum  
25 requirements indicated below for SSPC surface-preparation specifications and environmental exposure  
26 conditions of installed products:  
27 1. Interior (SSPC Zone 1A): SSPC SP 3, "Power Tool Cleaning."

- 28 C. Shop-Applied Primer and Field-Applied Paint (PT): Coordinate with Section 09 90 00 - Painting.

1 PART 3 - EXECUTION

2 3.1 EXAMINATION

3 A. Examine areas and conditions under which miscellaneous metal items are to be installed. Do not proceed  
4 with work until unsatisfactory conditions have been corrected.

5 3.2 INSTALLATION

6 A. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal items to in-  
7 place construction; including threaded fasteners for concrete and masonry inserts, toggle bolts, through-  
8 bolts, lag bolts, wood screws and other connectors as required.

9 B. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint  
10 exposed areas with same material as used for shop painting. Apply by brush or spray to provide minimum  
11 dry film thickness of 2 mils.

12 C. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal  
13 fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces  
14 level, plumb, true, and free of rack; and measured from established lines and levels.

15 D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are  
16 required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and  
17 masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

18 **END OF SECTION**



1 **SECTION 06 10 00**  
2 **ROUGH CARPENTRY**

3 PART 1 - GENERAL

4 1.1 SUMMARY

- 5 A. Section Includes: Concealed carpentry work not specified in other Sections and not used as exposed work,  
6 including:
- 7 1. Miscellaneous concealed wood blocking and nailers.
  - 8 2. Wood sheathing.
  - 9 3. Anchors nails, bolts, and screws.

10 1.2 COORDINATION

- 11 A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit, show location  
12 of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.
- 13 1. Coordinate work directly with other subcontractors as necessary to insure proper fitting, joining or  
14 to clearances of other work. Obtain templates as required to insure proper fitting.

15 1.3 DELIVERY, STORAGE AND HANDLING

- 16 A. Inspect wood materials for conformance to specified grades, species, and treatment at time of delivery to  
17 Project site.
- 18 1. Reject and return unsatisfactory wood materials.
- 19 B. Provide facilities for handling and storage of materials to prevent damage to edges, ends and surfaces.
- 20 C. Keep carpentry materials dry.

21 PART 2 - PRODUCTS

22 2.1 WOOD PRODUCTS, GENERAL

- 23 A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated,  
24 provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC  
25 Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect  
26 and grade lumber under the rules indicated.
- 27 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 28 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content  
29 specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  - 30 3. Provide dressed lumber, S4S, unless otherwise indicated.
- 31 B. Maximum Moisture Content of Lumber: 15 percent maximum, unless otherwise indicated.

- 1 C. Plywood Standard: Comply with U. S. Product Standard PS 1-74/ANSI A199.1; and Grades and  
 2 Specifications, Performance-Rated Panels and Specifications by APA – The Engineered Wood Association  
 3 local code standard. Each construction and industrial panel shall bear APA trademark and appropriate  
 4 identification.
- 5 D. Not Allowed: Products containing following materials will not be permitted:  
 6 1. Urea Formaldehyde.  
 7 2. Chromium in wood pressure treatment products.  
 8 3. Arsenic.

9 2.2 LUMBER

- 10 A. (WD BLKG-1) Miscellaneous Lumber: Lumber for support or attachment of other construction, including  
 11 rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping  
 12 and similar members.  
 13 1. Grade: No. 3 or standard grade.  
 14 2. Moisture content of 19 percent maximum for lumber items not specified to have wood preservative  
 15 treatment.

16 2.3 WOOD SHEATHING

- 17 A. Specified sheathing thicknesses are minimums. Provide sheathing in other thicknesses as shown on  
 18 Drawings.
- 19 B. (WD SHTG-1) Concealed Sheathing: APA, C-D touch-sanded plugged, Exposure 1, square edge, fire-  
 20 resistive treated, Douglas Fir.  
 21 1. Thickness: 1/2-inch.
- 22 C. (WD SHTG-8) Exposed Sheathing: APA Douglas Fir, with medium density overlay (MDO) for painted  
 23 finish, 3/8 inch, square edge.

24 2.4 FIRE-RETARDANT TREATMENT AND TREATED MATERIALS

- 25 A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of  
 26 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive  
 27 combustion when the test is extended an additional 20 minutes, and with the flame front not extending more  
 28 than 10.5 feet beyond the centerline of the burners at any time during the test.  
 29 1. Complete fabrication prior to treatment to minimize cutting and jointing after treatment.  
 30 2. Coat surfaces cut after treatment with heavy brush coat of same fire-retardant chemical.  
 31 3. After treatment: Material shall be dried to an average moisture content of 15 percent or less for  
 32 plywood and 19 percent or less for other lumber.  
 33 4. Do not use twisted, warped, bowed or otherwise damaged or defective pieces.
- 34 B. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.  
 35 Each piece to bear:  
 36 1. UL FR-S rating (flame spread and smoke developed less than 25),  
 37 2. Complying with extended 30-minute tunnel test, ASTM E84 or UL 723  
 38 3. Meet interior Type A requirements in AWPA Standard C-20 for lumber and C-27 for plywood.  
 39 4. And shall be registered for use as a wood preservative by the U.S. Environmental Protection  
 40 Agency.

- 1 2.5 ROUGH HARDWARE, FASTENERS AND ANCHORAGE DEVICES
- 2 A. General: Provide rough hardware required, including nails, screws, bolts, lag screws, cinch anchors, toggle  
3 bolts, shot anchors and similar items . Provide proper size and type for use intended and for materials to be  
4 fastened.
- 5 1. Install adequate hardware to insure substantial and positive anchorage.
- 6 B. Nails: Conform to materials standards established under FS FF-N-105.
- 7 1. Refer to IBC Nailing Schedule for quality and size.
- 8 C. Adhesive: As recommended by manufacturer of product to be applied for surface material to give  
9 permanent adhesion, with material remaining flat to back surface. Comply with local code standards.
- 10 1. Comply with APA AFG-01 for adhesive for use with type of construction panel indicated.
- 11 2. Interior: Water-resistant casein and other adhesives suited for particular use.

12 PART 3 - EXECUTION

13 3.1 BLOCKING AND BACKING

- 14 A. Install plumb, level, true and square to dimensions shown and required. Allow for finishes and proper  
15 clearances where necessary.
- 16 B. Provide sound bearing, square cuts, and full bearing surfaces. Set crown up for horizontal members. Shim  
17 and block where required.
- 18 C. Eliminate crooked, twisted, cupped or bowed framing where required.
- 19 D. Anchorage: Adequately anchor, fasten and support members to form secure, substantial and accurate  
20 anchorage and to hold required dimensions and prevent twist.
- 21 1. Use bolts and screws to eliminate loosening up of joints, sagging or similar movement.
- 22 E. Secure WD SHTG-2 to substrate with adhesive. Exposed fasteners are not acceptable.

23 **END OF SECTION**  
24





1 PART 2 - PRODUCTS

2 2.1 ARCHITECTURAL WOODWORK, GENERAL

- 3 A. Quality Standards: Provide custom-fabricated architectural woodwork, casework, millwork and other  
4 assemblies that are fabricated and installed in accordance with the *North American Architectural Woodwork*  
5 *Standards, Adopted and Published jointly by Architectural Woodwork Institute, Architectural Woodwork*  
6 *Manufacturer's Association of Canada and Woodwork Institute - Current Edition* (NAAWS).  
7 1. Comply with requirements of specified NAAWS Grade except where more stringent requirements  
8 are indicated in the Contract Documents.

9 2.2 WOOD MATERIALS, GENERAL

- 10 A. General: Provide specified wood materials and other materials recommended by woodwork fabricator, and  
11 in compliance with specified NAAWS Grade.  
12 1. Wood Moisture Content: 5 to 10 percent.  
13 2. Provide wood products made with binder containing no urea formaldehyde,  
14 3. Dimensions: As indicated on Drawings.
- 15 B. Miscellaneous Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by  
16 ALSC's Board of Review.
- 17 C. Dimension Lumber Items: Standard, Stud, or No. 3 grade lumber .

18 2.3 LAMINATE-FACED FABRICATIONS

- 19 A. Minimum Quality Standard: Unless otherwise indicated, comply with the *North American Architectural*  
20 *Woodwork Standards* (NAAWS) for grades of architectural plastic-laminate cabinets indicated for  
21 construction, finishes, installation, and other requirements.  
22 1. Contract Documents contain selections chosen from options in the quality standard and additional  
23 requirements beyond those of the quality standard. Comply with those selections and requirements in  
24 addition to the quality standard.
- 25 B. Plastic-Laminate-Faced Cabinets:  
26 1. Minimum Quality Standard: NAAWS Custom Grade.  
27 2. (PLAM-1) Basis of Design: Wilsonart River Cherry.  
28 3. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required  
29 by woodwork quality standard.

30 2.4 SOLID SURFACE FABRICATIONS

- 31 A. Solid Surface Countertops and Fabrications: Comply with NAAWS Premium Grade for architectural  
32 countertops on base cabinets, wall-mounted countertops and shelves, and other assemblies as shown on  
33 Drawings.  
34 1. Dimensions and Configurations: As shown on Drawings.  
35 2. Countertops: Fabricate tops in one piece with shop-applied eased edges unless otherwise indicated.  
36 a. Backsplash: Standard single length solid surface pieces; longest length possible to minimize  
37 joints. Where indicated provide countertop with coved backsplash.  
38 b. Inside Corners: Fabricate countertops with square inside corners.  
39 c. Sinks: Install integral sink bowls in countertops in the shop.

- 1 B. (SSF-1) Cast Polymer: Homogeneous non-porous high density product; core structure is composed of  
2 paper, impregnated with thermosetting resins; outer surface is metal structure substrate treated with acrylic  
3 resins applied as multilayer coating, cured via an electron beam process. Comply with Manufacturer's  
4 written instructions for adhesives, sealers, fabrication, and finishing.
- 5 1. Basis of Design: HI-Macs; Color: Ghost white ST907.
  - 6 2. Integral Sinks: Install integral sink bowls in countertops in the shop.
    - 7 a. Basis of Design: Architect will select a single basin bowl from manufacturer's standards.
- 8 C. Adhesives and Sealants for Solid Surfacing: Comply with manufacturer's written instructions for adhesives,  
9 sealers, fabrication, and sealing. Do not use adhesives that contain urea formaldehyde.
- 10 1. Sealant: Silicone sealant as recommended by panel manufacturer for application to substrate.
  - 11 2. VOC Limits for Installation Adhesives and Glues, and for Primers and Sealers: Use installation  
12 adhesives with VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D  
13 (EPA Method 24).

14 2.5 INSTALLATION ACCESSORIES

- 15 A. Installation Accessories: Provide assembly hardware as shown on Drawings, or as recommended by  
16 Fabricator and approved by Architect.
- 17 B. Mechanical Fasteners and Anchors: Use material, type, size and finish required for each substrate for  
18 secure anchorage and as recommended by architectural woodwork fabricator and installer.
- 19 1. Provide concealed anchors unless otherwise indicated.
  - 20 2. Provide metal expansion sleeves or expansion bolts for post-installed anchors.

21 2.6 FABRICATION

- 22 A. General: Fabricate Work of this Section using materials, methods and quality control procedures in  
23 accordance with NAAWS, and in accordance with reviewed Shop Drawings.
- 24 1. Complete fabrication in shop, including assembly, finishing, and hardware application, to maximum  
25 extent possible before shipment to Project site.
  - 26 2. Join and assemble work to provide durable, strong, rigid units that will not warp or rack, including  
27 during shipping and installation.
- 28 B. Shop cut openings, to maximum extent possible, to receive plumbing fixtures and similar items. Locate  
29 openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped  
30 openings. Sand edges of cutouts to remove splinters and burrs.

31 PART 3 - EXECUTION

32 3.1 EXAMINATION AND PREPARATION

- 33 A. Examination and Acceptance of Conditions: Before proceeding with installation, take field measurements,  
34 examine substrates and verify temperature and relative humidity and other conditions.
- 35 1. Verify that mechanical and electrical items affecting this section are properly placed and complete.
  - 36 2. Proceed with installation only after unsatisfactory conditions have been corrected and after building  
37 temperature and relative humidity are within specified range. Proceeding with the Work indicates  
38 acceptance of surfaces and site conditions.

- 1 B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck  
2 measurements before installing each product.  
3 1. Where portions of the Work are indicated to fit to other construction, verify dimensions of other  
4 construction by field measurements before fabrication.  
5 2. Coordinate fabrication schedule with construction progress to avoid delaying the Work.  
6 3. Verify space requirements and dimensions of items shown diagrammatically on Drawings.

7 3.2 INSTALLATION

- 8 A. General: Install architectural woodwork in accordance with *North American Architectural Woodwork*  
9 *Standards* (NAAWS) and in accordance with reviewed shop drawings and manufacturer instructions.  
10 B. Anchorage: Adequately anchor, fasten and support members to form secure, substantial and accurate work  
11 and to hold required dimensions and prevent twist.  
12 C. Solid Surfacing: Install solid surfacing in accordance with reviewed shop drawings and manufacturer's  
13 instructions.

14 3.3 INSTALLED WORK

- 15 A. Damaged or Non-Compliant Woodwork: Remove and replace materials that are damaged or do not comply  
16 with requirements.  
17 B. Cleaning: Clean and provide maintenance on completed construction as frequently as necessary through  
18 the remainder of the construction period.  
19 C. Protection: Provide final protection and maintain conditions that ensure installed Work is without damage  
20 or deterioration at time of Substantial Completion.

21 **END OF SECTION**



1 **SECTION 07 92 00**  
2 **JOINT SEALANTS**

3 PART 1 - GENERAL

4 1.1 SUMMARY

- 5 A. Section Includes: Interior sealants (SLNT).

6 1.2 ACTION SUBMITTALS

- 7 A. Product Data: For each joint-sealant product.

- 8 B. Color Samples:

- 9 1. Samples for Initial Selection: Manufacturer's color charts consisting of actual strips of cured  
10 sealants showing the full range of colors available for each product exposed to view.

11 1.3 DELIVERY, STORAGE, AND HANDLING

- 12 A. Deliver materials to project site in original unopened containers or bundles with labels informing about  
13 manufacturer, product name and designation, color, expiration period for use, pot life, curing time and  
14 mixing instructions for multi component materials.

- 15 B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes,  
16 contaminants, or other causes.

17 1.4 PROJECT CONDITIONS

- 18 A. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than  
19 allowed by joint sealer manufacturer for application indicated.

- 20 B. Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of  
21 interfering with their adhesion are removed from joint substrates.

- 22 C. Compatibility and Adhesion Testing: Ascertain sealant compatibility and adhesion with adjacent materials  
23 using laboratory testing procedures.

24 PART 2 - PRODUCTS

25 2.1 SEALANT, GENERAL

- 26 A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one  
27 another and with joint substrates under conditions of service and application, as demonstrated by joint-  
28 sealant manufacturer, based on testing and field experience.

- 29 B. Sealant Colors: In accordance with approved sealant color schedule.

1 1. Colors as selected by Architect from manufacturer's standard colors. Acceptance of sealant will  
2 depend on range of standard colors available for selection.

3 2.2 SILICONE SEALANT

4 A. Silicone Sealant, Mildew-Resistant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as  
5 applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing  
6 interior nonporous substrates that are subject to in-service exposures of high humidity and extreme  
7 temperatures.

8 1. Products and Manufacturers:

- 9 a. Dow Corning Corporation; Dow Corning 786.
- 10 b. GE Silicones; a division of GE Specialty Materials; Sanitary 1700.
- 11 c. Laticrete International, Inc.; Latacil Tile & Stone Sealant.
- 12 d. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
- 13 e. Tremco Incorporated; Tremsil 200 White.

14 2. Applications: Interior joints as follows:

- 15 a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
- 16 b. Tile control and expansion joints where indicated.
- 17 c. Joints subject to water and high moisture areas.

18 2.3 ACRYLIC SEALANT

19 A. Acrylic Sealants: General purpose, paintable acrylic-emulsion sealant. Caulk with approximately 12-1/2  
20 percent elongation complying with ASTM C834.

21 1. Products and Manufacturers:

- 22 a. Tremco Incorporated: Acrylic Latex 834.
- 23 b. Pecora Corporation: AC-20.

24 2. Location/Use:

- 25 a. Joints in vertical surfaces and in horizontal surfaces not subject to traffic.
- 26 b. Vertical joints on exposed surfaces of interior partitions.
- 27 c. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
- 28 d. Other joints as indicated.

29 B. Acoustic Joint Sealant: Refer to Section 09 29 00 for acoustic sealant in gypsum board assemblies.

30 2.4 JOINT SEALANT BACKING

31 A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates,  
32 sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer  
33 based on field experience and laboratory testing.

34 2.5 PREPARATORY MATERIALS

35 A. Joint Primer: Non-staining type recommended by sealant manufacturer to suit application.

36 B. Joint Cleaner: Non-corrosive type recommended by sealant manufacturer; compatible with joint forming  
37 materials.

38 C. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to  
39 joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

- 1 D. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant  
2 backing materials, free of oily residues or other substances capable of staining or harming joint substrates  
3 and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to  
4 joint substrates.

5 PART 3 - EXECUTION

6 3.1 EXAMINATION

- 7 A. Examine joint surfaces, backing, and anchorage of units forming sealant rabbet, and conditions under which  
8 sealant work is to be performed. Do not proceed with sealant work until unsatisfactory conditions have  
9 been corrected.

10 3.2 JOINT SURFACE PREPARATION

- 11 A. Preparation: Clean out joints immediately before installing joint sealants to comply with joint-sealant  
12 manufacturer's written instructions.
- 13 B. Clean joint surfaces immediately before installation of sealant. Remove dirt, insecure coatings, moisture  
14 and other substances which would interfere with bond of sealant.
- 15 C. Examine joint dimensions and size materials to achieve required width/depth ratios. Use joint filler to  
16 achieve required joint depths, to allow sealants to perform properly.

17 3.3 SEALANT APPLICATION

- 18 A. Installation:
- 19 1. Comply with joint-sealant manufacturer's written installation instructions for products and  
20 applications indicated, unless more stringent requirements apply.
- 21 2. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint  
22 sealants as applicable to materials, applications, and conditions indicated.
- 23 3. Install sealant backings of kind indicated to support sealants during application and at position  
24 required to produce cross-sectional shapes and depths of installed sealants relative to joint widths  
25 that allow optimum sealant movement capability.
- 26 4. Install sealants using proven techniques that comply with the following and at the same time  
27 backings are installed:
- 28 5. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing  
29 begins, tool sealants according to requirements specified in subparagraphs below to form smooth,  
30 uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and  
31 adhesion of sealant with sides of joint.
- 32 B. Apply sealant in accordance with manufacturer's printed instructions. Perform work in accordance with  
33 ASTM C804.
- 34 C. Prime or seal joint surfaces. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.
- 35 D. Install sealant backer rod for liquid elastomeric sealant, except where recommended to be omitted by  
36 sealant manufacturer for application shown.

- 1 E. Install bond breaker tape wherever required by manufacturer's recommendations to ensure that elastomeric  
2 sealant will perform properly.
- 3 F. Employ only proven installation techniques, which will ensure that sealant will be deposited in uniform,  
4 continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on  
5 opposite sides.
- 6 G. Install sealant to depth as shown or, if not shown, as recommended by sealant manufacturer but within  
7 following general limitations, measured at center (thin) section of bead:
- 8 H. Remove excess and spillage of sealant promptly as work progresses. Clean adjoining surfaces by whatever  
9 means may be necessary to eliminate evidence of spillage, without damage to adjoining surfaces or finishes.

10 3.4 PROTECTION AND CLEANING

- 11 A. Protect joint sealers during and after curing period from contact with contaminating operations or other  
12 causes so that they are without deterioration or damage at time of Substantial Completion.
  - 13 1. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or  
14 deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer  
15 installations with repaired areas indistinguishable from original work.
- 16 B. Clean off excess sealant or sealant smears adjacent to joints as work progresses by methods and with  
17 cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

18 **END OF SECTION**

1 **SECTION 08 11 13**  
2 **HOLLOW METAL DOORS & FRAMES**

3 PART 1 - GENERAL

4 1.1 SUMMARY

- 5 A. Section Includes:  
6 1. Pressed steel hollow metal frames.  
7 2. Factory prime paint finish.

8 1.2 COORDINATION

- 9 A. Anchorages: Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings,  
10 templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and  
11 items with integral anchors. Deliver such items to Project site in time for installation.
- 12 B. Preparation for Hardware: Reinforced and machine hollow metal work for hardware specified in Sections  
13 087100.

14 1.3 ACTION SUBMITTALS

- 15 A. Product Data: For each type of product. Include construction details, material descriptions, core  
16 descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.
- 17 B. Shop Drawings: Include the following:  
18 1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.  
19 2. Locations of reinforcement and preparations for hardware.  
20 3. Details of each different wall opening condition.  
21 4. Details of anchorages, joints, field splices, and connections.  
22 5. Details of conduit and preparations for power, signal, and control systems.

23 1.4 DELIVERY, STORAGE, AND HANDLING

- 24 A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-  
25 site storage. Do not use nonvented plastic.
- 26 B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs  
27 and mullions.
- 28 C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum **4-inch-**  
29 **high** wood blocking. Provide minimum **1/4-inch** space between each stacked door to permit air circulation.
- 30 D. Handle hollow metal with care to prevent damage to hollow metal and to factory-applied primer and  
31 galvanized coatings.

1 PART 2 - PRODUCTS

2 2.1 MANUFACTURERS

- 3 A. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.
- 4 B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 5 1. Ceco Door Products; an Assa Abloy Group company.
- 6 2. Curries Company; an Assa Abloy Group company.
- 7 3. Republic Doors and Frames.
- 8 4. Steelcraft; an Ingersoll-Rand company.

9 2.2 MATERIALS AND COMPONENTS

- 10 A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled  
11 content not less than 25 percent.
- 12 B. Steel Sheets:
- 13 1. Cold-Rolled Steel Sheet: ASTM A1008, Commercial Steel (CS), Type B; suitable for exposed  
14 applications.
- 15 2. Hot-Rolled Steel Sheet: ASTM A1011, Commercial Steel (CS), Type B; free of scale, pitting, or  
16 surface defects; pickled and oiled.
- 17 C. Fastenings: Provide fastenings, anchors and clips as required to secure hollow metal work in place. Provide  
18 Jackson head screws, or flatter. Dimple metal work to receive screw heads. Set stops and other non-  
19 structural fastenings with #8 FHSMS.
- 20 D. Steel Reinforcing: ASTM A36.

21 2.3 FABRICATION, GENERAL

- 22 A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to  
23 required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble  
24 units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot  
25 be permanently factory assembled before shipment.
- 26 B. Construct doors and frames to comply with the standards indicated for materials, fabrication, hardware  
27 locations, hardware reinforcement, tolerances, and clearances, and as specified.
- 28 1. Refer to Openings Schedule on Drawings for openings and locations.
- 29 C. Interior Frames: Provide Extra-Heavy-Duty Frames, ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4,  
30 Level A; 0.053 inch (18 ga.) minimum steel thickness, typical.

31 2.4 HOLLOW METAL FRAMES

- 32 A. General: Provide frames as full profile welded unless otherwise indicated. Where necessary, alternate  
33 details will be considered provided design intent is maintained. Consider and provide for erection methods.
- 34 B. Jamb Anchors:

- 1 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.  
2 2. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- diameter bolts  
3 with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement  
4 plate, welded to frame at each anchor location.
- 5 C. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:  
6 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
- 7 D. Fasteners:  
8 1. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153.  
9 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated,  
10 fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching  
11 hollow-metal frames of type indicated.

12 2.5 FINISHES

- 13 A. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with  
14 ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and  
15 field-applied coatings despite prolonged exposure.

16 PART 3 - EXECUTION

17 3.1 EXAMINATION

- 18 A. Examine supporting structure and conditions under which hollow metal is to be installed. Do not proceed  
19 with installation until unsatisfactory conditions have been corrected.

20 3.2 INSTALLATION

- 21 A. Install hollow metal in accordance with reviewed shop drawings and manufacturer's printed instructions.  
22 Securely fasten and anchor work in place without twists, warps, bulges or other unsatisfactory or defacing  
23 workmanship. Set hollow metal plumb, level, square to proper elevations, true to line and eye. Set clips and  
24 other anchors with Ramset "shot" anchors or drill in anchors as approved.
- 25 B. Placing Frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent  
26 anchors are set. After wall construction is complete, remove temporary braces and spreaders leaving  
27 surfaces smooth and undamaged.
- 28 1. At acoustic rated metal stud and gypsum board partitions, install insulation within frames.  
29 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure  
30 with post-installed expansion anchors.
- 31 3. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural  
32 supports or substrates above frame unless frame is anchored to masonry or to other structural support  
33 at each jamb. Bend top of struts to provide flush contact for securing to supporting construction.  
34 Provide adjustable wedged or bolted anchorage to frame jamb members.
- 35 4. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and  
36 plumb to the following tolerances:  
37 a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from  
38 jamb perpendicular to frame head.  
39 b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane  
40 of wall.

- 1 c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines,  
2 and perpendicular to plane of wall.  
3 d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

4 3.3 INSTALLED WORK

- 5 A. Touchup: Sand and clean rusted or abraded surfaces and apply compatible touchup finish:  
6 1. Primer: Apply air-drying, rust-inhibitive primer.  
7 2. Metallic-Coated Surface: Repair with galvanizing repair paint according to manufacturer's written  
8 instructions.  
9 3. Painting: As specified in Section 09 90 00 - Painting.
- 10 B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and  
11 frames.
- 12 C. Final Adjustments: Check and readjust operating hardware items immediately before final inspection.  
13 Leave work in complete and proper operating condition. Remove and replace defective work, including  
14 hollow-metal work that is warped, bowed, or otherwise unacceptable.

15 **END OF SECTION**  
16



1 **SECTION 08 41 10**  
2 **ALUMINUM STOREFRONTS & ENTRANCES**

3 PART 1 - GENERAL

4 1.1 SUMMARY

5 A. Section Includes:

- 6 1. Non-thermally-broken interior aluminum storefront framing systems and entrances.  
7 2. Non-thermally-broken interior aluminum stile and rail doors.  
8 3. Installation accessories.

9 1.2 ACTION SUBMITTALS

10 A. Product Data: Include construction details, material descriptions, glazing and fabrication methods,  
11 dimensions of individual components and profiles, hardware, and finishes for aluminum windows.

12 B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational  
13 clearances, and details of installation, including anchor, flashing, and sealant installation.

14 C. Samples: For each exposed product and for each color specified, **2 by 4 inches** in size.

15 1.3 CLOSEOUT SUBMITTALS

16 A. Maintenance Data: For weather stripping, operable panels, and operating hardware to include in  
17 maintenance manuals.

18 1.4 PROJECT CONDITIONS

19 A. Field Measurements: Verify aluminum storefront, window and door openings by field measurements  
20 before fabrication and indicate measurements on Shop Drawings.

21 1.5 WARRANTY

22 A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace  
23 aluminum windows and doors that fail in materials or workmanship within specified warranty period.

- 24 1. Warranty Period: Three years from date of Substantial Completion.

25 PART 2 - PRODUCTS

26 2.1 PRODUCTS AND MANUFACTURERS

27 A. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including  
28 framing, doors, and accessories, from single manufacturer.

- 1 B. Subject to requirements, provide Basis of Design or equivalent as approved by Architect, by one of the  
2 following Manufacturers:  
3 1. EFCO Corporation  
4 2. Kawneer Company  
5 3. Tubelite Incorporated,  
6 4. Oldcastle/VistaWall.  
7 5. YKK AP America Inc..

8 2.2 GLAZED ALUMINUM FRAMING SYSTEMS

- 9 A. (AFS-2) Interior Storefront Framing Systems: Non-thermally-broken storefront framing.  
10 1. Basis of Design: Kawneer; Trifab VersaGlaze 450.  
11 a. Mullion Profile: 1-3/4 inches by 4-1/2 inches.  
12 2. Glazing Set: Center.

13 2.3 ENTRANCES

- 14 A. (AL DR-1) Entrance Doors: Framing system manufacturer's non-thermally-broken extruded aluminum  
15 tubular stile and rail doors for swing operation; with square profile, snap-on, extruded-aluminum stops and  
16 preformed glazing gaskets; Mechanically-fastened corners with reinforcing brackets that are deeply  
17 penetrated and fillet welded or that incorporate concealed tie rods.  
18 1. Interior, Non-Thermally-Broken Basis of Design:  
19 a. Kawneer; 350 Standard Entrances.  
20 1) Door Thickness: 1-3/4 inches.  
21 2) Stile and Top Rail Width: 3-1/2 inches.  
22 3) Bottom Rail Height: 12 inches unless otherwise indicated on Drawings.  
23 4) Tube Wall Thickness: 0.125 inch, minimum.  
24 B. Door Hardware: In accordance with Section 08 71 00 - Door Hardware.

25 2.4 COMPONENTS & MATERIALS

- 26 A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.  
27 1. Sheet and Plate: **ASTM B 209**.  
28 2. Extruded Bars, Rods, Shapes, and Tubes: **ASTM B 221**.  
29 3. Extruded Structural Pipe and Tubes: ASTM B 429.  
30 4. Structural Profiles: ASTM B 308.  
31 B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-  
32 PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface  
33 preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to  
34 applicable SSPC standard.  
35 1. Structural Shapes, Plates, and Bars: ASTM A 36.  
36 2. Cold-Rolled Sheet and Strip: ASTM A 611.  
37 3. Hot-Rolled Sheet and Strip: ASTM A 570.  
38 C. Fasteners:  
39 1. Concealed Fasteners: ASTM A449, SAE Grade 5 carbon steel with cadmium and yellow chromate  
40 finish, type and size recommended by storefront manufacturer.  
41 D. Accessories

- 1 1. Setting Blocks: Black EPDM 85±5 durometer, Shore-A per ASTM D 2000.
- 2 2. Gaskets: Glazing gaskets shall be extruded EPDM rubber.
- 3 3. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel
- 4 material and aluminum material to prevent galvanic action.

5 E. Glass and Glazing: Refer to Section 08 80 00 – Glazing.

## 6 2.5 FABRICATION

### 7 A. Fabrication, General:

- 8 1. Conceal fasteners wherever possible.
- 9 2. Reinforce work as necessary for performance requirements, and for support to structure.
- 10 3. Separate dissimilar metals and aluminum in contact with concrete utilizing protective coating or
- 11 preformed separators, which will prevent contact and corrosion.
- 12 4. Comply with Section 08 80 00 for glazing requirements.
- 13 5. Welding: Comply with recommendations of the American Welding Society.
  - 14 a. Use recommended electrodes and methods to avoid distortion and discoloration.
  - 15 b. Weld in concealed locations to greatest extent possible to minimize distortion or
  - 16 discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by
  - 17 descaling or grinding.
  - 18 c. Grind exposed welds smooth and flush with adjacent surfaces; restore mechanical finish.

19 B. Prefabrication: To greatest extent possible, complete fabrication, assembly, finishing and other work before

20 shipment to project site. Disassemble components only as necessary for shipment and installation.

- 21 1. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
- 22 2. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal
- 23 work in manner which prevents damage to exposed finish surfaces.
  - 24 a. For hardware, perform these operations prior to application of finishes.

### 25 C. Coordination of Fabrication:

- 26 1. Check actual frame or door openings required in construction work by accurate field measurements
- 27 before fabrication.
- 28 2. Fabricate units to withstand loads that will be applied when system is in place.

### 29 D. Framing:

- 30 1. Sealant Back Stop Containment: At perimeter, provide not less than 1-1/2 inch continuous flush
- 31 metal to permit sealant back-stop containment.
- 32 2. Provide inside-outside matched resilient flush-glazed system with provisions for glass replacement.
- 33 3. Provide members of size, shape and profile indicated.
- 34 4. Fabricate frame assemblies with joints straight and tight fitting.
- 35 5. Reinforce internally with structural members as necessary to support design loads.
- 36 6. Maintain accurate relation of planes and angles, with hairline fit of contacting members.

### 37 E. Entrances:

- 38 1. Door Frames: Fabricate tubular and channel frame assemblies, as indicated, with either welded or
- 39 mechanical joints in accordance with manufacturer's standards, reinforced as necessary to support
- 40 required loads Reinforce as required to support loads imposed by door operation and for installing
- 41 entrance door hardware.
  - 42 a. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three
  - 43 silencers on strike jamb of single-door frames and two silencers on head of frames for pairs
  - 44 of doors.

- 1           2.     Stile-and-Rail Doors: Provide tubular frame members, fabricated with mechanical joints using
- 2                     heavy inserted reinforcing plates and concealed tie-rods or j-bolts, or fabricate with structurally
- 3                     welded joints, at manufacturer's option. Reinforce doors as required for installing entrance door
- 4                     hardware.
- 5           3.     Glazing: Fabricate doors to facilitate replacement of glass or panels, without disassembly of door
- 6                     stiles and rails. Provide snap-on extruded aluminum glazing stops, with exterior stops anchored for
- 7                     non-removal.
- 8           4.     Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent
- 9                     possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

10        F.     (SMF-1) Flashings: Form from sheet aluminum with same finish as extruded sections. Apply finish after  
11                     fabrication. Material thickness as required to suit condition without deflection or "oil-canning".

12    2.6     FINISHES

13        A.     General: Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and  
14                     designating finishes.

- 15                1.     Form or extrude aluminum shapes before finishing.
- 16                2.     Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary  
17                     protective covering before shipping.

18        B.     Color-Anodized Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

- 19                1.     Color: Champagne to match existing.

20        C.     Other Finishes:

- 21                1.     Concealed Steel Items: Galvanized in accordance with ANSI/ASTM A653 to 2.0 oz/sq ft primed  
22                     with iron oxide paint.
- 23                2.     Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with  
24                     cementitious or dissimilar materials.
- 25                3.     Primer: FS TT-P-31; for shop application and field touch-up.
- 26                4.     Touch-Up Primer for Galvanized Surfaces: FS TT-P-641; TT-P-645.

27    PART 3 - EXECUTION

28    3.1     EXAMINATION AND PREPARATION

29        A.     Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for  
30                     compliance with requirements for installation tolerances and other conditions affecting performance of  
31                     work. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

- 32                1.     Proceed with installation only after unsatisfactory conditions have been corrected.

33        B.     Field Measurement: Wherever possible, take field measurements prior to preparation of shop drawings and  
34                     fabrication, to ensure proper fitting of work.

35    3.2     INSTALLATION

36        A.     Comply with manufacturer's instructions and recommendations for installation of aluminum entrances and  
37                     storefronts, windows, doors, hardware, accessories, and other components.

38        B.     Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels.





**SECTION 087100  
DOOR HARDWARE**

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PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
  - 1. Commercial door hardware for the following:
    - a. Swinging doors.
  - 2. Cylinders for doors and locking devices specified in other Sections.
  - 3. Electrified door hardware.

1.2 GENERAL REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- C. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- D. Existing Conditions: Where hardware components are reused or where modifications to existing hardware is required, field verify existing conditions and coordinate installation resulting in proper door operation and ensure fire-rating recertification if required.
- E. Coordination Meeting: When requested by Architect and/or Owner, the Contractor will schedule a meeting prior to the installation of electrified hardware to review and coordinate functions and connections. Participants to include representatives and-suppliers of all applicable electrified hardware components. Advise Architect/Owner of scheduled date, time, place, and attendees.

1.4 PREINSTALLATION MEETINGS

- A. Pre-Installation Conference: Prior to the installation of hardware, manufacturers' representatives must arrange and conduct a jobsite meeting to instruct Installers on the proper installation. A letter of compliance must be sent to the Architect and Owner.
- B. Refer to Keying article for keying conference requirements.

1 1.5 ACTION SUBMITTALS

2 A. Hardware Schedule: Submit hardware schedule per Section 01 33 00 in vertical format as illustrated by the  
3 Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute.  
4 Schedules, which do not comply, will be returned for correction before review. Hardware schedule shall  
5 clearly indicate architect's hardware group and manufacturer of each item proposed. The schedule shall be  
6 reviewed prior to submission by a certified Architectural Hardware Consultant, who shall affix his or her  
7 seal attesting to the completeness and correctness of the schedule.

- 8 1. Provide illustrations from manufacturers' catalogs and data in brochure form.
- 9 2. Check specified hardware for suitability and adaptability to details and surrounding conditions.  
10 Indicate unsuitable or incompatible items and proposed substitutions in the hardware schedule  
11 submittal.
- 12 3. When requested, provide listing of manufacturers' template numbers for each item of hardware in  
13 the hardware schedule submittal.
- 14 4. Furnish associated Contractors and Subcontractors with copies of final approved hardware schedule.  
15 Submit necessary templates and schedules as soon as possible to hollow metal, wood, aluminum,  
16 and other door and frame fabricators in accordance with schedule they require for fabrication.
- 17 5. Samples; if requested by Architect, provide for each exposed product in each finish specified, in  
18 manufacturer's standard size  
19 a. Tag Samples with full product description to coordinate Samples with door hardware  
20 schedule.
- 21 6. List of related door devices specified in other Sections for each door and frame.

22 B. Closer Mounting: Indicate mounting description for each closer included in the submittal's hardware  
23 groups.

24 C. Existing Hardware Conditions: Refer to Part 1 - Coordination.  
25 1. Advise Hardware Supplier and Architect of any existing conditions which would prevent utilization  
26 of specified hardware.

27 D. Provide keying schedule, prepared by or under the supervision of Installer's Architectural Hardware  
28 Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and  
29 index each key set to unique door designations that are coordinated with the Contract Documents. Keying  
30 schedule to be coordinated with and approved by Owner.

31 E. Electrified Hardware Coordination:  
32 1. List all hardware specified in groups and identify items not in your scope as -inches by Others-  
33 inches or other means of identification.  
34 2. Provide operational descriptions for each electrified hardware group including operation for exit,  
35 entry, and fire alarm conditions.  
36 a. Refer to operational descriptions in electrified hardware groups. Part 3 - Hardware Groups.  
37 3. Wiring Diagrams: When requested after final approval of the hardware schedule submittal, provide  
38 wiring diagrams for each opening that requires electrified hardware.  
39 a. Exception: groups where only magnetic hold-opens or door position switches are specified.  
40 b. Approved diagrams to be sent with hardware delivery to the jobsite.

41 F. Installation Instructions: Provide manufacturer's written installation and adjustment instructions for finish  
42 hardware. Send installation instructions to site with hardware.

43 1.6 INFORMATIONAL SUBMITTALS

44 A. Contract Closeout Submittals: Comply with Section 01 78 00 including specific requirements indicated.  
45 1. Operating and maintenance manuals containing the following:



- 1 a. Complete information in care, maintenance, and adjustment, and data on repair and  
2 replacement parts, and information on preservation of finishes.
- 3 b. Catalog pages for each product.
- 4 c. Name, address, and phone number of local representative for each manufacturer.
- 5 d. Parts list for each product.
- 6 2. Copy of final approved hardware schedule, edited to reflect As installed.
- 7 3. Copy of final keying schedule.
- 8 4. As installed Wiring Diagrams for each opening connected to power, both low voltage and 110 volts.
- 9 5. One complete set of special tools required for maintenance and adjustment of hardware, including  
10 changing of cylinders.

11 1.7 QUALITY ASSURANCE

- 12 A. Manufacturer: Obtain each type of hardware, i.e. latch and locksets, hinges, closers from single  
13 manufacturer, although several may be indicated as offering products complying with requirements.
- 14 B. Supplier: Recognized architectural finish hardware supplier, with warehousing facilities, who has been  
15 providing hardware for period of not less than 3 years. The supplier shall be, or employ, a certified  
16 Architectural Hardware Consultant AHC, who is registered in the continuing education program as  
17 administered by the Door and Hardware Institute. The hardware schedule shall be prepared and signed by  
18 a certified AHC.
- 19 C. Installer: Firm with three years experience in installation of similar hardware to that required for this  
20 project, including specific requirements indicated.
- 21 D. Regulatory Label Requirements: Provide nationally recognized testing agency label or stamp on hardware  
22 for labeled openings. Where UL requirements conflict with drawings or specifications, hardware  
23 conforming to UL requirements shall be provided. Conflicts and proposed substitutions shall be clearly  
24 indicated in hardware schedule.
- 25 E. All electric locking system units that control egress shall be listed in accordance with UL 294.
- 26 F. Accessibility Requirements: Doors to stairs, other than exit stairs, loading platforms, boiler rooms, stages  
27 and doors serving other hazardous locations shall have knurled or other similar approved marking of door  
28 lever handles or cross bars, if required by local building codes.
- 29 G. Pre-Installation Conference: Prior to the installation of hardware, manufacturers' representatives for  
30 locksets, closers, and exit devices shall arrange and conduct a jobsite meeting to instruct the installing  
31 contractor's personnel on the proper installation of their respective products. A letter of compliance,  
32 indicating when this meeting is held and who is in attendance, shall be sent to the Architect and Owner.  
33 Refer to Keying article for keying conference requirements.

34 1.8 DELIVERY, STORAGE AND HANDLING

- 35 A. Deliver hardware to jobsite in manufacturer's original packaging, marked to correspond with the approved  
36 hardware schedule. Do not deliver hardware until suitable locked storage space is available. Check  
37 hardware against reviewed hardware schedule. Store hardware to protect against loss, theft, or damage.
- 38 B. Deliver hardware required to be installed during fabrication of hollow metal, aluminum, wood, or stainless-  
39 steel doors prepaid to the respective manufacturer.

- 1 1.9 WARRANTY
- 2 A. Guarantee workmanship and material provided against defective manufacture. Repair or replace defective  
3 workmanship and material appearing within period of one year after Substantial Completion.
- 4 B. Provide a minimum ten-year factory warranty on door closer body against defects in material and  
5 workmanship from date of occupancy of Project.
- 6 C. Replace shortages and incorrect items with correct material at no additional cost to Owner.
- 7 D. At completion of project, qualified factory representative shall inspect closer installations. After this  
8 inspection, letter shall be sent to Architect reporting on conditions, verifying that closers have been properly  
9 installed and adjusted.

10 1.10 ATTIC STOCK

- 11 A. Coordinate with Owner for products and quantities desired for attic stock.

12 PART 2 - PRODUCTS

13 2.1 GENERAL

- 14 A. Confirm acceptable manufacturers and models of all hardware products with Owner. Specified products  
15 are listed only to establish function and a level of quality.
- 16 B. Specified manufacturers and models are based on the best information available at the time of this printing  
17 to establish function and level of quality but are subject to change as additional information becomes  
18 available. Changes will be advised in future documentation.
- 19 C. Acceptable manufacturers and models of particular products will be determined by hardware  
20 distributor/supplier who has been contracted and directed by the Owner. Specified products are listed only  
21 to establish function and a level of quality.

22 2.2 BUTTS AND HINGES

- 23 A. Acceptable Manufacturers:
- 24 1. Bommer
- 25 2. Hager listed below for design intent only
- 26 3. Ives
- 27 4. McKinney
- 28 5. PBB
- 29 6. Stanley/Best
- 30 B. Types per Application:
- 31 1. Interior doors with closers: BB1279/BB1168
- 32 2. Interior doors over 36 inches wide: BB1168
- 33 3. Interior doors 36 inches or less without closer: BB1279
- 34 4. Provide NRP, non-removable pins, at out-swinging doors that are lockable or locked and at other  
35 doors when specifically indicated.

- 1 C. Size:  
2 1. 1-3/4 inch Doors 4-1/2 inch by 4-1/2 inch  
3 D. Quantity:  
4 1. 2 – hinges per leaf for openings through 60 inches in height.  
5 2. 1 – additional hinge per leaf for each additional 30 inches in height or fraction thereof.  
6 3. 1 – additional hinge per leaf for openings 40 inches wide and wider.  
7 a. For mineral core doors Refer to Part 2 - Continuous Stainless-Steel Hinges  
8 E. Drill 5/32 inch hole and use No. 12, 1-1/4 inch steel threaded to the head wood screws for hinges on wood  
9 doors.

10 2.3 ELECTRIC POWER TRANSFERS

- 11 A. Acceptable Manufacturers:  
12 1. ABH: PT Series  
13 2. Pemko: EL-CEPT  
14 3. Securitron EPT/EPTL  
15 4. Von Duprin EPT-2/EPT-10  
16 B. Provide electric power transfer devices as specified in hardware groups or as required by electrified  
17 hardware voltage requirements.  
18 C. When specifically indicated, provide surface-mounted armored power transfer loops with length to  
19 accommodate door opening conditions.  
20 D. UL 10C fire tested and listed for labeled doors up to and including Class A.

21 2.4 CONTINUOUS GEARED HINGES

- 22 A. Acceptable Manufacturers:  
23 1. ABH A110HD, A240HD  
24 2. Hager/Roton: 780-112HD, 780-224HD  
25 3. Ives: 112HD, 224HD  
26 4. McKinney: MCK-12HD, MCK-25HD  
27 5. Pemko: FM\_SLFHD, FM\_HD  
28 6. Select: SL-11HD, SL-24HD  
29 7. Stanley/Best: 661HD, 662HD  
30 B. Provide model of continuous hinges as appropriate for the type, inset, and thickness of door where specified.  
31 Coordinate hinge types with the door supplier.  
32 C. Specialty hinges for special mounting conditions, example: swing-clear, wide-throw, etc. are indicated in  
33 assigned hardware groups for particular openings.

34 2.5 BOLT LOCKS

- 35 A. Acceptable Manufacturers:  
36 1. ABH  
37 2. Burns  
38 3. Door Controls International

- 1           4.     Hager
- 2           5.     Ives listed below for design intent only
- 3           6.     Rockwood
- 4           7.     Trimco
  
- 5         B.     Automatic Flushbolt: FP31/FP41 Series
  
- 6         C.     Dust Proof Strike: Ives DP2
  
- 7         D.     Provide flush bolts meeting the requirements of ANSI A156.3, Grade 1, Type 25, conforms to positive  
8           pressure standards of UL10C and UBC 7-2 -1997, and is UL listed at fire rated openings.
  
- 9         E.     Provide flush bolts for inactive door of pairs as indicated in the hardware groups, as required for metal or  
10           wood doors, and per the following conditions, unless indicated otherwise:
  - 11           1.     At all exterior openings and locking interior openings, provide top and bottom bolt configuration  
12           for inactive door of pair, unless indicated otherwise.
  - 13           2.     At non-locking interior openings, provide top bolt only.
  - 14           3.     At fire-rated openings utilizing top bolt only configurations, provide appropriate auxiliary fire latch,  
15           as required by the door manufacturer to attain the specified fire-rating/label.
  - 16           4.     Include appropriate strike to receive bolt/pin when projected.
  - 17           5.     Where bottom bolts are utilized, provide dustproof strike, as required for sill conditions.
  - 18           6.     Locate centerline of top bolt not more than 78 inches above finished floor – provide rod extensions  
19           as necessary.
  - 20           7.     Only provide manual flushbolts or surface bolts when specifically indicated in the assigned  
21           hardware group.

22    2.6     LOCKSETS – MORTISE

- 23         A.     Acceptable Manufacturer and Series: Lever design: **MATCH LEVER TO EXISTING DOORS ON**  
24           **FLOOR**
  - 25           1.     Corbin ML2000 Series – citation - bronze
  - 26           2.
  
- 27         B.     Provide mortise locks, unless indicated otherwise, with functions specified in Hardware Groups and with  
28           following provisions:
  - 29           1.     Cylinders: Provide cylinders, as required, to accomplish specified lock function. Refer to Part 2 –  
30           KEYING.
  - 31           2.     Locksets shall meet the requirements of ANSI/BHMA A156.13-1994, Operational Grade 1, and  
32           Security Grade 1.
  - 33           3.     Backsets: 2-3/4 inches.
  - 34           4.     Strikes: Provide wrought boxes and strikes with proper lip length to protect trim but not to project  
35           more than 1/8 inch beyond trim, frame or inactive leaf. Where required, provide open back strike  
36           and protected to allow practical and secure operation.
  - 37           5.     Where electrified locksets are specified, provide wiring harness and connections from electric lock  
38           to electric power transfer.
  - 39           6.     Provide escutcheons to match existing conditions, where applicable.

40    2.7     LOCKSETS – HEAVY-DUTY CYLINDRICAL

- 41         A.     Acceptable Manufacturer and Series. **MATCH LEVER TO EXISTING DOORS ON FLOOR**
- 42         B.

1. Best: 9K
  2. Sargent: 10-Line
  3. Schlage: ND
- C. Provide heavy-duty cylindrical locks unless indicated otherwise with functions specified in Hardware Groups and with the following provisions:
1. Cylinders: Provide cylinders, as required, to accomplish specified lock function. Refer to Part 2 – KEYING.
  2. Backsets: 2-3/4 inches.
  3. Strikes: Provide wrought boxes and strikes with proper lip length to protect trim but not to project more than 1/8 inch beyond trim, frame or inactive leaf. Where required, provide open back strike and protected to allow practical and secure operation.
  4. Where electrified locksets are specified, provide wiring harness and connections from electric lock to electric power transfer.
  5. Where required by codes, doors which open onto stairways, mechanical rooms, or other spaces where caution is required, shall have levers with tactile markings to alert a visually impaired person of such conditions.

2.8 KEYING

- A. **All locks, cylinders, and keying will be provided by UWM lock shop.**
- B. Contractor shall provide construction masterkeying and keys for the construction period.
- C. Authorized local distribution/service shall be available for purchase of additional keys and cylinders to allow for system revisions, expansion, and service, as required.
- D. Keying Conference: Conduct conference.
1. Conference participants shall include Installer's Architectural Hardware Supplier/Consultant, Architect and Owner's security consultant.
  2. Incorporate conference decisions into keying schedule after reviewing door hardware keying system including, but not limited to, the following:
    - a. Flow of traffic and degree of security required.
    - b. Preliminary key system schematic diagram.
    - c. Requirements for key control system.
    - d. Requirements for access control.
    - e. Address for delivery of keys.
- E. If requested, submit proposed keying schedule to Architect and meet with Owner and Architect to review schedule.
- F. Provide construction masterkeying. Permanent cylinders/cores shall be installed/activated upon completion of the project.
- G. Provide 6 masterkeys for each masterkey set. Provide 3 change keys for each lock. Stamp keys Do Not Duplicate. When interchangeable core cylinders are specified, provide 2 control keys for core removal.
- H. All keys shall be delivered to the designated Owner's representative via method determined and agreed upon by the Owner at the keying meeting.

- 1 2.9 DOOR TRIM
- 2 A. Acceptable Manufacturers and Types:
- 3 1. Burns
- 4 2. Hiawatha listed below for design intent only
- 5 3. Rockwood
- 6 4. Trimco.
- 7 B. Door Protection Plates and Edge Guards: Minimum of 0.050 inch thick, stainless-steel, beveled 4 edges.
- 8 1. Kick Plates:
- 9 a. At single doors provide width 1-1/2 inches less than door width on push side.
- 10 b. At pairs of doors provide width 1 inch less than door width on both doors.
- 11 c. Height: 10 inches unless otherwise detailed in Architectural drawings or indicated in
- 12 hardware groups.
- 13 2. When door protection plates and edge guards are specified for fire-rated openings, they must be
- 14 installed in accordance with the listing of the door. Field-installed products must be labeled and
- 15 installed in accordance with manufacturers' listings.
- 16 3. Do not provide protection plates, or edge guards for impact-resistant doors. Refer to Door Panel
- 17 type in Opening Schedule or MAT-ID list.

18 2.10 COORDINATORS

- 19 A. Acceptable Manufacturers:
- 20 1. Door Controls International
- 21 2. Hager
- 22 3. Ives.
- 23 4. Trimco, listed below for design intent only
- 24 5. Ives
- 25 B. Provide stop-mounted coordinator for labeled pairs of doors equipped with automatic flush bolts and those
- 26 with vertical rod/mortise lock fire exit device combinations with astragals, unless indicated otherwise.
- 27 1. Trimco 3094 series, or approved equivalent
- 28 C. Provide filler bars for total opening width, closer mounting brackets, carry bars, and special preparation for
- 29 top latches where applicable.

30 2.11 DOOR CLOSERS

- 31 A. Acceptable Manufacturers and Types of Exposed Closers:
- 32 1. Heavy-Duty - cast aluminum bodies:
- 33 a. LCN 4050
- 34 b. Norton 7500/PR7500
- 35 c. SARGENT 351/351 P-10
- 36 d. Stanley D-4550
- 37 B. Provide heavy-duty drop plates, brackets, or adapters for arms as required to suit details.
- 38 C. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors,
- 39 unless indicated otherwise.
- 40 D. Provide back-check for closers.

1 E. Provide closers for doors as noted in Hardware Groups and, in addition, provide closers for labeled doors  
2 whether or not specifically noted in group.

3 F. Provide closers meeting the requirements of UBC 7-2 and UL 10C positive pressure tests.

4 G. No through bolting of closers will be accepted.

5 2.12 AUTOMATIC OPERATORS

6 A. Acceptable low-energy standard-duty manufacturers/models:

7 1. Besam: SW100

8 2. LCN Senior-Swing

9 3. Horton: 4000LE Series

10 4. Stanley: Magic-Force-LE

11 5. Best/Stanley: D-4990. Provide low energy automatic swing door operators complying with ANSI  
12 A156.19 and as indicated in the hardware groups. Provide complete with drop plates, brackets, or  
13 adapters for arms as required to suit details. Must function as compliant manual closer if power  
14 fails.

15 C. Provide a terminal strip in an enclosed box near or above door that indicates connections for security and  
16 fire alarm equipment and for electrified hardware items associated with proper door operation, as indicated  
17 by hardware group operational description.

18 D. Provide wall-mounted actuator switches by the same manufacturer as the operator. Actuators shall be  
19 weather-resistant type at exterior applications.

20 E. Provide connections and integration with other specified electronic hardware to achieve the operational  
21 description, as specified.

22 F. Provide fire-alarm connection, or smoke detectors, as required by local codes, to de-activate operator to  
23 close door during fire-alarm event.

24 G. Install automatic operators in compliance with manufacturer's installation procedures. Adjust automatic  
25 operators for smooth and quiet operation.

26 2.13 STOPS AND HOLDERS

27 A. Acceptable Manufacturers:

28 1. Burns

29 2. Hager

30 3. Ives listed below for design intent only

31 4. Trimco

32 B. Wall Bumper: WS406/407CVX; WS406/407CCV

33 C. Wall Mounted Stops: WS11/WS11X

34 D. Provide wall bumper for each door leaf except where wall mounted stops are specified in the Hardware  
35 Groups, or where opening conditions require the use of an overhead stop. Refer to Part 2 – Overhead Stops

36 1. Provide an overhead stop for doors in which the door face or operating trim on the leading/latch  
37 edge does not open against wall or opens against equipment or furniture.

- 1 E. Provide base mounted stops at toilet rooms, unless alternate stop is specified: WS11/WS11X.
- 2 F. Floor or base stops must be used only where specified or absolutely unavoidable.

3 2.14 DOOR POSITION SWITCHES

- 4 A. Acceptable Manufacturers and Types:
  - 5 1. Ademco ADI 800-233-6261: 944SP-WH 3/4-in recessed white
  - 6 2. Detex: MS-2049F
  - 7 3. SARGENT: 3287
  - 8 4. Sentrol: 1078
- 9 B. Provide model to accommodate door and frame materials and mounting conditions.
- 10 C. Coordinate door and frame preparations with door and frame suppliers.
- 11 D. Switches shall be installed in frame head approximately 4-inches from latching edge of door, unless detailed
- 12 otherwise.

13 2.15 FASTENERS

- 14 A. Including, but not limited to; wood or machine screws, special screws, bolts, special bolts, nuts, expansion
- 15 shields, anchors, and other accessory items of proper type, material, and finish required for complete
- 16 operational installation of hardware.
- 17 B. Use phillips head for exposed screws. Do not use aluminum screws to attach hardware.
- 18 C. Provide self-tapping, TEC, screws for attachment of sweeps and stop-applied weatherstripping.

19 2.16 TYPICAL FINISHES AND MATERIALS

- 20 A. Finishes, unless otherwise specified: Satin Brass **OR MATCH EXISTING FINISH OF DOORS**
- 21 **NEARBY ON FLOOR**
  - 22 1. Hinges: Interior Doors: US4/BHMA 633 Dull Brass, clear coated on Steel.
  - 23 2. Continuous Hinges: Gold Anodized, or custom painted, if indicated.
  - 24 3. Flush Bolts: US4/BHMA 606 Dull Brass, clear coated on Brass.
  - 25 4. .
  - 26 5. Locks and Latches: US4/BHMA 606 Dull Brass, clear coated on Brass.
  - 27 6. Door Trim: US4/BHMA 606 Dull Brass, clear coated on Brass.
  - 28 7. Coordinators: USP/BHMA 600 Primed on Steel.
  - 29 8. Protection Plates and Edge Guards: US4/BHMA 606 Dull Brass, clear coated on Brass.
  - 30 9. Closers - Surface mounted, Sprayed Lacquer to Match.
  - 31 10. Wall Stops: US4/BHMA 606 Dull Brass, clear coated on Brass.
  - 32 11. Floor Stops: US4/BHMA 606 Dull Brass, clear coated on Brass.
  - 33 12. Miscellaneous Hardware: US4/BHMA 606 Dull Brass, clear coated on Brass.



1 PART 3 - EXECUTION

2 3.1 EXAMINATION

- 3 A. Examine doors, frames, and related items for conditions that would prevent the proper application of finish  
4 hardware. Do not proceed until defects are corrected.

5 3.2 INSTALLATION

- 6 A. Install finish hardware in accordance with reviewed hardware schedule and manufacturer's printed  
7 instructions. Prefit hardware before finish is applied, remove and reinstall after finish is completed. Install  
8 hardware so that parts operate smoothly, close tightly and do not rattle.

- 9 B. Installation of hardware shall comply with the current NFPA 80 and NFPA 101 requirements or as amended  
10 by state and local building codes.

- 11 C. Set units level, plumb and true to line and location. Adjust and reinforce attachment to substrate as  
12 necessary for proper installation and operation.

- 13 D. Screws for hinges and lock fronts in wood doors shall have pilot holes pre-drilled to avoid splitting doors.  
14 Do not over-drill pilot holes or over-torque installation of screws.

- 15 E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and  
16 anchors in accordance with industry standards.

17 3.3 FIELD QUALITY CONTROL

- 18 A. After installation has been completed, provide services of qualified hardware consultant to check Project  
19 to determine proper application of finish hardware according to schedule. Also check operation and  
20 adjustment of hardware items.

- 21 B. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

22 3.4 ADJUSTING AND CLEANING

- 23 A. At final completion, hardware shall be left clean and free from disfigurement. Make final adjustment to  
24 door closers and other items of hardware. Where hardware is found defective repair or replace or otherwise  
25 correct as directed.

- 26 B. Adjust door closers to meet opening force requirements of Uniform Federal Accessibility Standards.  
27 1. Force Requirements:  
28 a. Interior hinged doors and gates: 5 pounds maximum.  
29 b. Sliding or folding doors: 5 pounds maximum.

- 30 C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or  
31 occupancy of space or area, return to work during week prior to acceptance or occupancy, and make final  
32 check and adjustment of hardware items in such space or area. Clean operating items as necessary to restore  
33 proper function and finish of hardware and doors.

1 D. Instruct Owner's personnel in proper adjustment and maintenance of door hardware and hardware finishes.

2 E. Clean adjacent surfaces soiled by hardware installation.

3 3.5 PROTECTION

4 A. Provide for proper protection of hardware items until the Owner accepts Project as complete.

5 3.6 HARDWARE GROUPS

6 A. Provide all required door hardware for each specified opening to comply with requirements of this section  
7 in its entirety. Included are desired/intended functions, acceptable manufacturers and models, systems  
8 coordination, etc. for a complete installed opening.

9 B. Refer to the openings schedule for hardware group and modifiers assigned to each door opening. Ignore  
10 hardware groups and modifiers not assigned on the openings schedule.

11 C. All electrified hardware groups listed below, assigned to doors in the project, provide free egress at all  
12 times, complying with code requirements for door operations, sensor release of electrically locked egress  
13 doors and door hardware release of electrically locked egress doors.

14 **GROUP 31.92 – Existing single door/frame/hardware assembly with closer, replace existing lock/latch**  
15 **with Privacy (mortise) function with occupancy indicator**

16 Existing hardware (hinges, closer, stop, etc.) to remain, except as noted below.

17 1 each Mortise Lockset Privacy function with OCC/VAC indicator

18 Function: Latchbolt is retracted by lever on either side, unless inside thumb turn lever locks outside lever.

19 Operating inside lever or closing door unlocks outside lever. Outside indicator indicates occupancy when  
20 door is locked. Outside emergency release unlocks outside lever.

21 Patch/refinish door & frame, as required, for “like new” appearance.

1  
2 **GROUP 510.24 – Aluminum active/inactive pair with automatic flushbolts, coordinator, and closers –**  
3 **narrow backset electric lever lock (fail-secure entry with inside lever signal switch) via electronic**  
4 **access control system/devices**  
5 2 each Continuous Hinges  
6 1 each Electric Power Transfer Device  
7 1 each Latchset (narrow backset) Accurate No.8525 (confirm backset req'd)  
8 1 set Electrified Lever Trim SECURITECH - GG (fail-secure outside, request-to-exit inside)  
9 Function: Latchbolt is retracted by lever inside, key outside, and lever outside when unlocked electronically.  
10 Power off locks outside lever. (fail-secure entry) Rotating inside lever connects/contacts signal switch.  
11 1 each Cylinder  
12 1 each Coordinator  
13 1 set Flushbolts (automatic)  
14 2 each Closers w/stop arms  
15 2 each Stops, as required by opening conditions  
16 2 each Door Position Switches/Contacts  
17 Astragal provided by Door Manufacturer/Supplier (unless indicated otherwise).  
18 Electronic access control system/devices, power supply (for electric lock), and monitoring/alarms are  
19 provided by Security Contractor. Refer to security documents for locations and types of controls.  
20 Connection by Electrical.  
21 **Operational Description:** Manual exit (from overlook to floor) is possible at all times by rotating inside  
22 (pull-side) lever to retract latchbolt, though monitor signal will be sent. Entry to overlook (from floor to  
23 overlook) is controlled via electronic access control system (card reader, etc.) which locks and unlocks  
24 outside (push-side) lever for predetermined periods of time. When locked, presenting authorization  
25 temporarily unlocks outside (push-side) lever to allow entry. Manual entry is possible by outside (push-side)  
26 key at all times, but monitoring/alarm system will be alerted when door is opened.

27 **END OF SECTION**



**SECTION 088000  
GLAZING**

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**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Monolithic glass.
  - 2. Glazing accessories.

**1.2 DEFINITIONS**

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.

**1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- B. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the inspecting and testing agency, Insulating Glass Certification Council.
- C. Integrated Mockup: Coordinate with Section 01 43 00 - Mockups and provide materials and installation for integrated mockup on site.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1 PART 2 - PRODUCTS

2 2.1 PERFORMANCE REQUIREMENTS

- 3 A. General: Provide glazing systems capable of withstanding normal lateral and impact loads (where  
4 applicable) without failure, including loss or glass breakage attributable to the following: defective  
5 manufacture, fabrication, and installation; or other defects in construction.
- 6 B. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201,  
7 Category II.
- 8 1. Safety Glazing Labeling: Where safety glazing is indicated and/or required, permanently mark  
9 glazing with certification label of the SGCC or another certification agency acceptable to authorities  
10 having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety  
11 glazing standard with which glass complies.

12 2.2 GLASS PRODUCTS

- 13 A. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened). Provide heat-strengthened as  
14 required for wind pressure or thermal stress.
- 15 B. Fully-Tempered Float Glass: ASTM C1048, Kind FT (fully tempered). Provide as required to comply with  
16 safety code requirements and as indicated with "T" in the Material Identification Abbreviation. Provide  
17 safety glazing labeling, as applicable.
- 18 C. Clear Float Glass: ASTM C1036, Type I (transparent glass, flat), Class 1 (clear), Quality Q3 (glazing  
19 select).

20 2.3 GLAZING SCHEDULE

- 21 A. Glazing type locations as indicated on Drawings. Provide full-tempered glass where specified and where  
22 indicated with 'T' at the end of the material designation.
- 23 B. (GL-1) Clear Float Glass, Fully-Tempered: 1/4-inch (6 mm) minimum thickness.
- 24 C. (GL-2) Clear Float Glass, Fully-Tempered: 1/2-inch (12 mm) minimum thickness.

25 2.4 GLAZING ACCESSORIES

- 26 A. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants  
27 suitable for applications indicated and for conditions existing at time of installation.
- 28 B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class  
29 50, for Use NT, G, A, and O; SWRI validation.
- 30 1. Basis of Design: Dow Corning Corporation, 795 Silicone Building Sealant
- 31 C. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape;  
32 nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as  
33 recommended in writing by tape and glass manufacturers for application indicated; and complying with  
34 ASTM C 1281 and AAMA 800 for products indicated below:

- 1           1.     AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- 2           D.     Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both  
3           surfaces; and complying with AAMA 800 for the following types:
- 4           1.     AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.  
5           2.     AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead  
6           of liquid sealant.
- 7           E.     Setting Blocks: Neoprene, 80 to 90 shore "A" durometer hardness, chemically compatible with glazing  
8           sealant or compound, length as recommended by glass manufacturer.
- 9           F.     Spacers and Shims: Neoprene, 40 to 50 shore "A" durometer hardness, chemically compatible with glazing  
10          sealant or compound, length as recommended by glass manufacturer.

11   PART 3 - EXECUTION

12   3.1     EXAMINATION

- 13   A.     Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify  
14   conditions detrimental to proper or timely completion.
- 15          1.     Verify glazing channels are free of burrs, irregularities, and debris.  
16          2.     Verify glass is free of edge damage or face imperfections.  
17          3.     Inspect door and frames to determine that frames, sash, and stops are set true and straight. Sash  
18          rabbets and stops shall be clean and dry at time of glazing.  
19          4.     Do not proceed until unsatisfactory conditions have been corrected.
- 20   B.     Beginning of installation means acceptance of substrate.

21   3.2     PREPARATION

- 22   A.     Provide glass manufacturer's recommended edge clearances when sizing glass.
- 23   B.     Remove protective coatings from surfaces to be glazed.
- 24   C.     Clean glass and glazing surfaces to remove dust, oil, and contaminants, and wipe dry.
- 25   D.     Verify measurements of sash and openings at Project.
- 26          1.     Dimensions shown or indicated are given only as a guide for estimating purposes, and actual size  
27          shall be determined by measurement of the actual openings. Accurately cut glass to fit openings  
28          with proper clearances and setting block height.
- 29   E.     Coordinate with and check Shop Drawings furnished by other suppliers of Work affecting this Section to  
30   avoid field installation problems.
- 31   F.     Before glazing metal sash, remove oil, lacquer, or other material to which the compound will not readily  
32   adhere or which will tend to delaminate from metal and cause a leak through the glazing seal.

- 1 3.3 INSTALLATION
- 2 A. Comply with glass fabricators recommendations.
- 3 B. Except where curtain wall, window, entrance or glass manufacturer recommends otherwise, comply with  
4 Flat Glass Marketing Association (FGMA) Sealant Manual and FGMA Glazing Manual.
- 5 C. Glaze insulated units as recommended by glass and frame manufacturers.
- 6 D. Set glass using neoprene setting blocks and spacers to insure proper edge clearance and uniform beads of  
7 compound. Clearances shall conform to FGMA Glazing Manual requirements. Center glass in glazing  
8 rabbets.
- 9 E. Check openings to confirm proper clearance at perimeters and between glass and stops.
- 10 1. Clean surfaces of rabbet (including stops) and surface of glass which will come into contact with  
11 sealant. Use solvents and methods which insure clean, dry surfaces without film or foreign material  
12 when sealant is placed.
- 13 F. Remove and replace glazing beads carefully to avoid marking or defacing any portion of frame, sash, or  
14 fastenings.
- 15 1. Set glass in full bed of glazing tape or sealant. Clean glazing material after stops are installed. Clean  
16 excess compound, etc. from glass after setting in conformance with glass manufacturer's  
17 recommendations.
- 18 2. If recommended prime surfaces prior to glazing.
- 19 G. Set glass with reams (waves) running horizontally. Set glass with factory attached labels in place.
- 20 H. Setting Blocks: Place setting blocks at locations recommended by glass manufacturer, generally between  
21 1/4 points and 6 inches from corner, except at glazed doors.
- 22 1. At glazed doors, provide one block at sill, located 3 inches up from edge of glass at hinge side; one  
23 block at hinge side jamb, located 3 inches up from lower edge of glass; one block at head, located 3  
24 inches from edge of glass at latch side of door; and, one block at jamb at lock side of door, located  
25 3 inches down from edge of glass at top corner.
- 26 2. Use blocks of length required to properly support glass. Offset approximately 1 inch from shims.
- 27 I. Glass Installation in Aluminum Frames:
- 28 1. Glaze aluminum frames using preformed EPDM elastomeric glazing extrusion separately or in  
29 combination with sealant and pre-shimmed glazing tape in compliance with aluminum frame  
30 supplier's recommendations.
- 31 2. Set glass on setting blocks as recommended by manufacturer.
- 32 3. Apply tape and/or sealant to produce uniform sight line even with frame.
- 33 4. Set glass in gaskets with corners sealed.
- 34 J. Glazing Sealant: Along entire bottom edge of light, and up at least 6 inches at each jamb, gun in continuous  
35 full bed of sealant to fill voids.
- 36 1. Fill entire space, full width of pane, full depth of glass, with sufficient sealant to form heel along  
37 inside face and edge of glass.
- 38 2. At other edges (top and sides) gun in continuous heel bead of sealant along edges of glass perimeter  
39 to set stop against and into, acting as fill between glass and stop.
- 40 3. Immediately after setting glass, at entire perimeter of glass, gun in sealant between stop and glass  
41 so space above spacer is completely filled, without voids.
- 42 4. Place sealant flush with daylight edge of stops, with slight watershed at exterior. Provide straight,  
43 smooth surface meeting at opening corners with sharp intersection.
- 44 5. Leave no sealant on exposed surfaces of stops and glass.



- 1 3.4 CLEANING
- 2 A. Remove surplus materials.
- 3 B. Final cleaning of glass by Contractor.

4 **END OF SECTION**





- 1 D. Furring and Bracing Members: Provide members with protective galvanized coating, in depths as  
2 indicated.  
3 1. (MET FURG-1) Hat-Shaped, Rigid Furring Channels: ASTM C645; with minimum base-metal  
4 thickness of 0.033 inch  
5 2. (MET FURG-3) Cold-Rolled Steel Channels: Channel bridging, furring channels, carrying  
6 channels, steel channel stiffeners and braces; with minimum base-metal thickness of 0.054 inch.
- 7 E. Galvanized Flat Strap and Backing Plate at Interior Stud Walls: Steel sheet for blocking and bracing in  
8 length and width indicated.  
9 1. Minimum Base-Metal Thicknesses:  
10 a. Typical: 0.054 inch.  
11 b. For Heavy Equipment and Grab Bar Locations: 0.068 inch.  
12 2. Where Wood Backing and Blocking is Indicated: Refer to Section 06 10 00 for wood requirements.  
13 Provide fire-resistant treatment.

14 2.3 SUSPENSION SYSTEMS

- 15 A. General: Comply with ASTM C754 for conditions indicated.
- 16 B. Metal Studs and Furring Channels: As specified above.
- 17 C. Tie Wire: ASTM A641, Class 1 zinc coating, soft temper, 0.0625 inch diameter wire, or double strand of  
18 0.0475 inch diameter wire.
- 19 D. Hanger Attachment to Anchors in Concrete: Fabricated from corrosion-resistant materials with holes or  
20 loops for attaching hanger wires and capable of sustaining, without failure, a load equal to 5 times that  
21 imposed by construction as determined by testing according to ASTM E488 by a qualified independent  
22 testing agency.  
23 1. Postinstalled, chemical anchor.  
24 2. Postinstalled, expansion anchor.
- 25 E. Wire Hangers: ASTM A641, Class 1 zinc coating, soft temper, 0.162 inch diameter.
- 26 F. Manufactured Suspension Grid System for Ceilings and Soffits: ASTM C 645, direct-hung system  
27 composed of main beams and cross-furring members that interlock.  
28 1. Products and Manufacturers:  
29 a. Drywall Grid Systems by Armstrong World Industries, Inc..  
30 b. Drywall Grid Systems by Chicago Metallic Corporation.  
31 c. Drywall Suspension System by USG Corporation.

32 2.4 AUXILIARY MATERIALS

- 33 A. Fasteners: Galvanized steel fasteners of type, size, corrosion resistance, holding power, and other properties  
34 required to fasten steel members to substrates; and of length suitable for adequate penetration of substrate
- 35 B. Acoustic Sealant: In accordance with Section 09 29 00 - Gypsum Board.

1 PART 3 - EXECUTION

2 3.1 EXAMINATION

- 3 A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in  
4 anchors, and structural framing, for compliance with requirements and other conditions affecting  
5 performance of the Work.
- 6 B. Proceed with installation only after unsatisfactory conditions have been corrected.

7 3.2 INSTALLATION, GENERAL

- 8 A. Installation Standards: ASTM C 754.  
9 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing  
10 installation.
- 11 B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars,  
12 toilet accessories, furnishings, or similar construction. Install bracing at terminations in assemblies.
- 13 C. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame  
14 both sides of joints independently.
- 15 D. Installation Tolerance: Install each steel framing and furring member so fastening surfaces vary not more  
16 than 1/8 inch from plane formed by faces of adjacent framing.

17 3.3 FRAMING INSTALLATION

- 18 A. Framing Installation, General:  
19 1. Partition Heights: Extend partition stud system through suspended ceilings to structural support  
20 above, except where indicated to terminate at ceiling.  
21 a. Provide additional bracing for partitions extending above ceiling where indicated.  
22 b. Continue framing around ducts penetrating partitions above ceiling.  
23 2. Coordinate erection of studs with installation of service utilities. Align stud web openings.  
24 Coordinate installation of bucks, anchors, blocking, electrical and mechanical work which is to be  
25 placed in or behind partition framing. Allow such items to be installed after framing is complete.  
26 3. Isolate stud system from transfer of structural loading to system, both horizontally and vertically.  
27 Provide slip or cushioned joints to attain lateral support and avoid axial loading.  
28 4. Reinforce stud partitions and provide additional metal studs as indicated and required for installation  
29 of wall cabinets, wall mounted equipment, wall mounted mechanical and electrical fixtures,  
30 accessories, shelves and shelf standards. Provide thick steel plate to span minimum of 3 studs for  
31 installation of mirrors, toilet accessories or grab bars.  
32 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated on  
33 Drawings. Do not fasten or bridge inner and outer tracks at nested track construction. Verify that  
34 tracks are free of all bridging elements.
- 35 B. Runners and Tracks: Secure runner tracks to floor and ceiling construction, and to structure above ceilings  
36 as recommended by manufacturer, with fastener spacing not to exceed 24 inches o.c.  
37 1. Runner Tracks: Provide continuous track sized to match studs. Align runner tracks accurately to  
38 partition layout at both floor and ceiling. Provide fasteners at corners and ends of runner tracks.  
39 2. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce  
40 joints at tops of framing systems that prevent axial loading of finished assemblies.

- 1 3. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly  
2 indicated.  
3 4. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner  
4 track section (for cripple studs) at head and secure to jamb studs.
- 5 C. Metal Studs: Install studs vertically at 16 inches o.c., unless otherwise indicated, and not more than 2 inches  
6 from abutting construction, each side of openings, and at corners.  
7 1. Install metal studs in floor and ceiling runner tracks. Secure studs to runners. Anchor light gauge  
8 screw-type partition studs to runner tracks by screwing opposite flanges top and bottom, except  
9 screw end studs to both tracks at both flanges.  
10 2. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior  
11 walls, install isolation strip between studs and exterior wall.  
12 3. Provide additional studs at exterior corners and 2 inches from inside corners, terminations of  
13 partitions, and both sides of control joints.  
14 4. Where partitions abut other construction, provide vertical runner track securely attached to  
15 construction.  
16 5. Use full length studs between runner tracks.  
17 6. Stud Splicing: Not permitted.
- 18 D. Door Openings:  
19 1. Frame door openings with vertical studs attached to each jamb of door frame.  
20 2. Provide additional studs 2 inches from jamb studs.  
21 3. Frame head of door with horizontal section of runner track attached to jamb studs and provide  
22 vertical studs cut to fit between head and ceiling tracks and attach to tracks.  
23 4. Provide 3/4 inch cold-rolled steel channel stiffener at 6 inches above door head extending at least 2  
24 stud spaces beyond jamb studs, and attach to studs.  
25 5. Fit runners under and above openings, secure intermediate studs at spacing of wall studs. Brace stud  
26 framing system and make rigid.
- 27 E. Other Framed Openings: Frame openings other than door openings the same as required for door openings,  
28 unless otherwise indicated. Install framing below sills of openings to match framing required above door  
29 heads.

### 30 3.4 SUSPENSION SYSTEM INSTALLATION

- 31 A. Suspended Assemblies, General: ASTM C 754.  
32 1. Install ceiling framing independent of walls, columns, and above ceiling work.  
33 2. Do not bridge building expansion joints with support system.  
34 3. Installation Tolerances: Install steel framing components for suspended ceilings so members for  
35 panel attachment are level to within 1/8 inch in 12 feet measured lengthwise on each member  
36 transversely between parallel members.
- 37 B. Hangers: Install hangers plumb and free from contact with insulation or other objects within ceiling plenum  
38 that are not part of supporting structural or suspension system. Splay hangers only where required to miss  
39 obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective  
40 means.  
41 1. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye  
42 screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner  
43 that will not cause hangers to deteriorate or otherwise fail.  
44 a. Space hanger wires 48 inches o.c. along carrying channels and within 6 inches of ends of  
45 channel run. Anchor hanger wires to supporting structure. Do not attach hangers to metal  
46 deck tabs.  
47 2. Coordinate location of hangers with other work.

- 1                   a.       Do not connect or suspend steel framing from ducts, pipes, or conduit.
  
- 2       C.       Carrying Channels: Position channels at proper height and level, and secure with hanger wires.
- 3           1.       Space main carrying channels at maximum 48 inches on center, not more than 6 inches from
- 4                   perimeter walls.
- 5           2.       Lap splices minimum 12 inches and secure together 2 inches from each end of splice. Provide
- 6                   clearance between channels and abutting walls or partitions.
  
- 7       D.       Furring Channels: Comply with Gypsum Association GA-203.
- 8           1.       Place furring channels perpendicular to carrying channels at 16 inches on center not more than 6
- 9                   inches from perimeter walls.
- 10          2.       Lap splices minimum 8 inches and secure together one inch from each end of splice.
- 11          3.       Provide clearance between furring and abutting walls or partitions. Secure furring to carrying
- 12                   channels with clips.
- 13          4.       Frame both sides of joints with furring and other supports.
  
- 14       E.       Lateral Bracing: Laterally brace entire suspension system where required. Reinforce openings in ceiling
- 15                   suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing.
- 16                   Extend bracing minimum 24 inches past each end of openings.
  
- 17       F.       Manufactured Suspension Grid Systems: Install in accordance with Manufacturer's instructions.
- 18           1.       Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces.
- 19           2.       Install main beams and cross tees at the on center spacing required for ceiling loading, and location
- 20                   of in-ceiling services.
- 21           3.       Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall
- 22                   track.
- 23           4.       Provide additional bracing as required by code.

24                   **END OF SECTION**





1 **SECTION 09 29 00**  
2 **GYPSUM BOARD**

3 PART 1 - GENERAL

4 1.1 SUMMARY

- 5 A. Section Includes:  
6 1. Interior gypsum board.  
7 2. Acoustic insulation and sealant.  
8 3. Gypsum assembly accessories.

9 1.2 DEFINITIONS

- 10 A. Gypsum Board Terminology: Refer to ASTM C11 for definitions of terms for gypsum board assemblies  
11 not defined in this Section or in other referenced standards.

12 1.3 ACTION SUBMITTALS

- 13 A. Product Data: For each type of product.

14 1.4 DELIVERY, STORAGE, AND HANDLING

- 15 A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct  
16 sunlight, construction traffic, and other potential causes of damage.  
17 1. Stack panels flat and supported on risers on a flat platform to prevent sagging.

18 1.5 PROJECT CONDITIONS

- 19 A. Environmental Limitations: Comply with ASTM C 840 requirements and recommendations of gypsum  
20 board manufacturer, for environmental conditions before, during and after application of gypsum board.
- 21 B. Damaged Materials: Do not install panels that are wet, moisture damaged, and mold damaged.  
22 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration,  
23 sagging, or irregular shape.  
24 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface  
25 contamination and discoloration.

26 PART 2 - PRODUCTS

27 2.1 PERFORMANCE REQUIREMENTS

- 28 A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those  
29 tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an  
30 independent testing agency.

1 1. STC-Rated Assemblies: Indicated by design designations from GA-600, "Fire Resistance Design  
2 Manual."

3 2.2 GYPSUM PANEL PRODUCTS

4 A. Manufacturers:

- 5 1. United States Gypsum.
- 6 2. National Gypsum Company.
- 7 3. Georgia-Pacific.
- 8 4. CertainTeed Corporation.

9 B. Gypsum Board Products, General: In accordance with ASTM C 1396, and other specified requirements,  
10 and as follows:

- 11 1. Provide products that do not contain asbestos.
- 12 2. Provide products in accordance with recommendations of GA 216 - Application and Finishing of  
13 Gypsum Panel Products.
- 14 3. Provide products in maximum lengths and widths available to minimize joints and to correspond  
15 with support system indicated.

16 C. (GYP BD-1) Fire-Rated Board: Type X, 5/8 inch thick.

17 D. (GYP BD-2) Moisture- and Mold-Resistant Board, Type X: With moisture- and mold-resistant paper  
18 surfaces and core. Provide mold and water-resistant gypsum board as required by local building code and  
19 as indicated

- 20 1. Thickness: 5/8 inch.
- 21 2. Mold Resistance: ASTM D 3273, score of 10.
- 22 3. Basis of Design: Sheetrock Mold Tough Firecode by United States Gypsum (USG).

23 2.3 JOINT TREATMENT MATERIALS

24 A. General: Comply with ASTM C 475.

25 B. Joint Tape:

- 26 1. Interior Gypsum Wallboard: Paper.
- 27 2. Tile Backing Panels: As recommended by panel manufacturer.

28 C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with  
29 other compounds applied on previous or for successive coats.

- 30 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-  
31 type taping compound.
- 32 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges,  
33 use setting-type taping compound.
  - 34 a. Use setting-type compound for installing paper-faced metal trim accessories.
- 35 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
- 36 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
- 37 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound, or high-  
38 build interior coating product designed for application by airless sprayer and to be used instead of  
39 skim coat compound to produce Level 5 finish.

- 1 2.4 ACCESSORIES
- 2 A. General: Provide auxiliary materials and accessories that comply with referenced installation standards and  
3 manufacturer's written instructions.
- 4 B. Trim Accessories: ASTM C 1047; galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-  
5 faced galvanized steel sheet; in the following shapes as required:
- 6 1. Cornerbead.  
7 2. Bullnose bead.  
8 3. LC-Bead: J-shaped; exposed long flange receives joint compound.  
9 4. L-Bead: L-shaped; exposed long flange receives joint compound.  
10 5. U-Bead: J-shaped; exposed short flange does not receive joint compound.  
11 6. Expansion (control) joint.
- 12 C. Fasteners and Anchorages: GA 216, type and size as recommended by board manufacturer.
- 13 D. Fasteners: Use self-tapping or appropriate threaded fastener, compatible with all materials fasteners will  
14 contact with and not causing galvanic corrosion.
- 15 E. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
- 16 F. Joint Sealant (Non-Acoustic): As specified in Section 07 92 00 - Joint Sealants.

17 2.5 ACOUSTICAL INSULATION

- 18 A. Acoustic Insulation, General:
- 19 1. Insulation is required to be formaldehyde-free or GreenGuard Indoor Air Quality Certified.  
20 2. Flamespread: Maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per  
21 ASTM E 84; passing ASTM E 136 for combustion characteristics.
- 22 B. (INSUL-40) Glass-Fiber Acoustic Insulation: ASTM C 665, Type I; unfaced fiberglass batts or blankets,  
23 free of formaldehyde and GreenGuard Indoor Air Quality Certified.
- 24 1. Basis of Design:  
25 a. CertainTeed; NoiseReducer (FF)  
26 b. Johns Manville: Formaldehyde-Free and Unfaced Sound Control Batt.

27 2.6 ACOUSTICAL SEALANT

- 28 A. (SLNT) Provide acoustical joint-sealant products that effectively reduce airborne sound transmission  
29 through perimeter joints and openings in building construction, as demonstrated by testing representative  
30 assemblies according to ASTM E 90.
- 31 1. Provide permanently resilient, non-hardening, non-bleeding silicone or polyurethane caulking  
32 material. Use polyurethanes for joints that will be painted and silicone or polyurethane for unpainted  
33 joints. Do not use latex, siliconized latex, or siliconized acrylic sealants for acoustic purposes, unless  
34 the product is specifically listed below.
- 35 2. Product Requirements:  
36 a. Elongation: 100 percent, minimum.  
37 b. Shore "A" Hardness: 45, maximum.  
38 c. Movement Capability: 30% or higher.  
39 d. Class: 35 or higher per ASTM C920.

- 1 B. Acoustical Sealant for Exposed Joints: Manufacturer's standard nonsag, non-hardening, non-skinning,  
2 paintable, nonstaining latex acoustical sealant complying with ASTM C 834.
- 3 C. Acoustical Sealant for Concealed Joints: Manufacturer's standard nonsag, nondrying, nonhardening,  
4 nonskinning, nonstaining, gunnable, synthetic-rubber acoustical sealant.

5 PART 3 - EXECUTION

6 3.1 GYPSUM BOARD INSTALLATION

- 7 A. Install and finish gypsum board and accessories in accordance with manufacturer's printed instructions and  
8 comply with recommendations of GA 216 and ASTM C840, including appendixes.
- 9 B. Minimize butt joints by using gypsum board of maximum length possible. If cut butt joints are unavoidable,  
10 locate end butt joints as far from center of walls or ceilings as possible and stagger not less than 12 inches  
11 in alternate courses of board.
- 12 C. Do not install imperfect, damaged, damp or wet gypsum board.
- 13 D. Abut boards together for light contact at edges or ends with not more than 1/16 inch open space between  
14 boards. Do not force into place.
- 15 E. Locate edges and joints over supports or back-blocking except in horizontal applications. Position gypsum  
16 board so that both tapered edge joints and cut edges abut. Do not place tapered edges against cut edges or  
17 ends. Stagger vertical joints over different studs on opposite sides of partition/walls.  
18 1. Hold gypsum board 1/4 inch above floor at each type of partition.
- 19 F. Isolate gypsum surfaces with control joints or other stress relief where:  
20 1. Partition or furring abuts structural element (except floor) or dissimilar wall or ceiling.  
21 2. Ceiling abuts structural element, dissimilar wall or partition or other vertical penetration.  
22 3. Construction changes within plane of partition or ceiling.  
23 4. Wings of "L", "U" and "T" shaped ceiling areas are joined.  
24 5. Expansion joints occur in exterior wall if expansion joints are not used.  
25 6. Where control joint is near a door opening, locate and align control joint with edge of door frame.  
26 a. Ceiling height door frames may be used as control joints.  
27 b. Where door frames are less than ceiling height, extend control joints to ceiling from both  
28 corners  
29 7. Review location of joints with Architect.
- 30 G. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings,  
31 etc.), except in chases braced internally.  
32 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage  
33 may be accomplished with scraps of not less than 8 sq. ft.in area.  
34 2. Fit gypsum panels around ducts, pipes, and conduits.  
35 3. Where partitions intersect open concrete coffers, concrete joists, and other structural members  
36 projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by  
37 coffers, joists, and other structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- 38 H. Provide perimeter isolation where non-load-bearing partitions abut structural decks or ceilings, or vertical  
39 structural elements. Allow not less than 1/4 inch, or more than 1/2 inch gap between gypsum and structure.  
40 Finish edges of face layer with casing bead. Seal space between casing bead and structure with continuous  
41 acoustical sealant bead. Do not attach board directly to tracks.

- 1 I. Cutting, Fitting and Trimming: Accurately measure and precut gypsum drywall units prior to installation.  
2 Make cuts from face side by scoring and snapping away from face side or by sawing. Completely cut paper  
3 on back face; do not break paper by tearing. Maintain close tolerances for accurate fit at joints between  
4 sheets and at framed openings, and allow for covering of edges of cut-outs with plates and escutcheons.  
5 Cut edges smooth as required for neat and accurate fit.
- 6 J. Begin fastening from center portion of sheet and work toward edges and ends. Ensure contact of drywall  
7 with supports by applying pressure on surface adjacent to fastener being driven. Do not locate fasteners  
8 closer than 3/8 inch from edges or ends of sheets. Drive with shank approximately perpendicular to drywall  
9 surface.
- 10 K. Drive screws with power screwdriver recommended by drywall manufacturer. Do not hammer drive  
11 screws. Set screw heads slightly below surface of drywall, but do not break or strip paper face around screw.  
12 Stagger screws on edges and ends of adjacent sheets.
- 13 3.2 ACOUSTICALLY RATED PARTITIONS
- 14 A. Where acoustically rated partitions are shown, provide complete air tight, acoustical rated assembly  
15 meeting or exceeding requirements of Sound Transmission Class (STC) ratings per manufacturer's  
16 requirements and GA 600 for sound control requirements.
- 17 B. Stagger joints between layers of gypsum board and install gypsum board to be continuous between adjacent  
18 rooms.
- 19 C. Fit gypsum board tightly around structural elements.
- 20 D. Install continuous acoustical sealant at:  
21 1. Entire perimeter of wall on each side of top, bottom and side of walls.  
22 2. Intersection at change of plane and change of material.  
23 3. Gaps between service outlets and gypsum board  
24 4. Each penetration.  
25 5. Structural elements.  
26 6. All penetrations of partition, wall, and floor construction by ductwork, conduit, piping, or structure.  
27 7. All termination of partitions enclosing Noise Critical Spaces to abutting construction (e.g. partitions,  
28 structure, etc.)  
29 8. Both sides of door frames to abutting construction where doors are scheduled to have acoustical  
30 seals.  
31 9. Both sides of window frames to adjacent construction.  
32 10. Perimeter of and penetrations through sound isolating ceilings, roof systems, and floor systems.
- 33 E. Seal entire back of service boxes.
- 34 F. Seal gaps around penetrations as follows:  
35 1. One inch or less gap filled tightly with batt insulation and apply sealant.  
36 2. One inch or greater gap fill with acoustical insulation and moldable putty.
- 37 G. Acoustical Sealant Installation: Provide acoustical sealant at the following locations:  
38 1. At penetrations of partition, wall, and floor construction by ductwork, conduit, piping, or structure.  
39 2. At both sides of door frames to abutting construction where doors are scheduled to have acoustical  
40 seals.  
41 3. At perimeter of and penetrations through sound isolating ceilings, roof systems, and floor systems.  
42 4. Provide backer rod at all acoustical sealant joints..

1 3.3 ACCESSORIES INSTALLATION

- 2 A. Acoustical Insulation: Install blankets in accordance with manufacturer's printed instructions, with tight  
3 joints in blanket units. Use tape, adhesive or staples to hold blankets in place.  
4 1. Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around  
5 electrical and mechanical items within or behind partitions and tight to items passing through  
6 partitions.
- 7 B. Drywall Sealant: Seal perimeter of sound-rated partitions by filling open space between drywall and floor  
8 or ceiling construction with continuous bead of sealant. Fill open spaces between drywall and fixtures,  
9 cabinets and other flush or penetrating items with continuous bead of sealant. Seal sides and back of  
10 electrical boxes to completely close up openings and joints. Seal perimeter of wallboard shaft wall where  
11 it abuts other work.  
12 1. Apply joint sealant in accordance with Section 07 92 00 - Joint Sealants.

13 3.4 FINISHING

- 14 A. Finish exposed drywall surfaces with joints, corners and exposed edges reinforced or trimmed and with  
15 joints, fastener heads, trim accessory flanges and surface defects filled with joint compound in accordance  
16 with drywall manufacturer's recommendations for smooth, flush surface. Form true, level or plumb lines,  
17 without joints, fastener heads, flanges of trim accessories or defects visible after application of field-applied  
18 decoration. Exposed metal trim (not filled) will not be acceptable.
- 19 B. Use joint tape to reinforce joints formed by tapered edges or butt ends of drywall units and at interior  
20 corners and angles. Set tape in joint compound and apply skim coat over tape in one application. Do not  
21 use topping or finishing compounds for setting of tapes.
- 22 C. Apply joint compound to joint. Apply joint compound to fill holes left from removal of screws at  
23 intermediate studs. Finish gypsum drywall thereafter, including sanding of final coat, in accordance with  
24 ASTM C840.
- 25 D. Where open spaces of more than 1/16 inch width occur between abutting drywall units, except at control  
26 joints, prefill joints with joint compound and allow prefill to dry before application of joint tape.
- 27 E. Finish Levels of Joints in Interior Gypsum Board Work:  
28 1. Level 0: No taping, finishing, or accessories required.  
29 a. Use above suspended ceilings and within other concealed spaces, unless assembly is fire  
30 rated, sound rated, sound or smoke controlled, or unless space serves as air plenum.  
31 2. Level 1: At joints and interior angles embed tape in joint compound. Leave surface free of excess  
32 joint compound. Tool marks and ridges are acceptable.  
33 3. Level 2: At joints and interior angles embed tape in joint compound with one separate coat of joint  
34 compound applied over joints, angles, fastener heads, and accessories.  
35 a. Use for mold and water resistant gypsum board indicated for use as a substrate for ceramic  
36 tile.  
37 b. Use for gypsum board indicated for use as a substrate for wood paneling or acoustical panels.  
38 c. Use above suspended ceilings and within other concealed spaces if gypsum board assembly  
39 is fire rated, sound rated, sound or smoke controlled, or space serves as air plenum.  
40 4. Level 3: At joints and interior angles embed tape in joint compound with 2 separate coats of joint  
41 compound applied over joints, angles, fastener heads, and accessories. Apply joint compound  
42 smooth and free of tool marks and ridges.  
43 5. Level 4: At joints and interior angles embed tape in joint compound with 3 separate coats of joint  
44 compound applied over joints, angles, fastener heads, and accessories. Apply joint compound  
45 smooth and free of tool marks and ridges.

1 a. Use for all locations, except those indicated for other finish levels.

2 3.5 FIELD QUALITY CONTROL

- 3 A. Above-Ceiling Observation: Before Contractor installs gypsum board ceilings, Architect will conduct an  
4 above-ceiling observation and report deficiencies in the Work observed. Do not proceed with installation  
5 of gypsum board to ceiling support framing until deficiencies have been corrected.
- 6 1. Notify Architect seven days in advance of date and time when Project, or part of Project, will be  
7 ready for above-ceiling observation.
  - 8 2. Before notifying Architect, verify installation of mechanical, electrical and other facility services  
9 work and Installation of ceiling support framing in areas to receive gypsum board ceilings.

10 3.6 INSTALLED WORK

- 11 A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall  
12 surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- 13 B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other  
14 causes during remainder of the construction period.
- 15 C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
- 16 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration,  
17 sagging, or irregular shape.
  - 18 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface  
19 contamination and discoloration.

20 **END OF SECTION**





1 **SECTION 09 30 00**  
2 **TILING**

3 **PART 1 - GENERAL**

4 1.1 **SUMMARY**

- 5 A. Section Includes:  
6 1. Ceramic tile.  
7 2. Setting Materials.  
8 3. Tiling Accessories.  
9 4. Installation Procedures.

10 1.2 **ACTION SUBMITTALS**

- 11 A. Product Data: For each product specified.  
12 B. Samples: For color selection and appearance acceptance.  
13 1. Full-size units of each type and size of tile and for each color and finish.  
14 2. Grout color samples.  
15 3. Full-size units of each type of ceramic tile accessory.

16 1.3 **CLOSEOUT SUBMITTALS**

- 17 A. Furnish extra materials that match and are from same production runs as products installed and that are  
18 packaged with protective covering for storage and identified with labels describing contents.  
19 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for  
20 each type, composition, color, pattern, and size indicated.

21 1.4 **QUALITY ASSURANCE**

- 22 A. Installer Qualifications: Engage installer who has minimum 5 years' experience and who has completed  
23 tile installations similar in material, design, and extent to that indicated for this Project and with record of  
24 successful in-service performance.

25 1.5 **PROJECT CONDITIONS**

- 26 A. Provide sufficient heat and ventilation in areas where work of this section is being performed, so as to allow  
27 ceramic tile to properly set. Take precautionary measures necessary to ensure that excessive temperature  
28 changes do not occur.  
29 B. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient  
30 temperature and humidity conditions are maintained at the levels indicated in referenced standards and  
31 manufacturer's written instructions.

1 1.6 WARRANTY

2 A. Mortar and Grout Warranty: Provide 20-year materials and installation.

3 PART 2 - PRODUCTS

4 2.1 TILE MATERIALS

5 A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer, and  
6 from same production run and of consistent quality in appearance and physical properties for each  
7 contiguous area.

8 B. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and  
9 other characteristics indicated.

10 1. Factory-Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as  
11 standard with manufacturer unless otherwise indicated.

12 C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so  
13 tile units taken from one package show same range in colors as those taken from other packages and match  
14 approved Samples.

15 D. Acceptable Manufacturers: Subject to compliance with the requirements provide the basis of design product  
16 or equivalent as approved by the Architect from one of the following:

- 17 1. Crossville, Inc.  
18 2. Daltile  
19 3. Anitolia Capital Corp.

20 E. (CT) Basis of Design Ceramic Tiles:

- 21 1. (CTF-1) Ceramic Floor Tile: Daltile  
22 a. Pattern: Dignitary  
23 b. Color: DR11 Governor Black  
24 c. Size:24"x24"  
25 d. Thickness: 5/16"; Finish: Matte  
26 e. Installation: Stack Bond  
27 2. (CTW-1) Ceramic Floor Tile: Daltile  
28 a. Pattern: Dignitary  
29 b. Color: DR11 Governor Black  
30 c. Size:24"x24"  
31 d. Thickness: 5/16"; Finish: Matte  
32 e. Installation: Stack Bond  
33 3. (CTB-1) Ceramic Floor Tile: Daltile  
34 a. Pattern: Dignitary;  
35 b. Shape: Bullnose Base P43F9;  
36 c. Color: DR11 Governor Black;  
37 d. Size:3"x24";  
38 e. Thickness: 5/16";  
39 f. Finish: Matte

1 2.2 SETTING MATERIALS

- 2 A. Tile-Setting System Manufacturer: Provide complete tile-setting system consisting of materials by a single  
3 Manufacturer. Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from  
4 one manufacturer and each aggregate from one source or producer. Provide tile setting system by one of  
5 the following:
- 6 1. Custom Building Products.
  - 7 2. LATICRETE International Inc..
  - 8 3. MAPEI Corporation.
- 9 B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI  
10 standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods  
11 specified in tile installation schedules, and other requirements specified.
- 12 C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:
- 13 1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which  
14 only water must be added at Project site.
  - 15 2. Prepackaged dry-mortar mix combined with styrene-butadiene-rubber liquid-latex additive.
    - 16 a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in  
17 addition to the other requirements in ANSI A118.4.
  - 18 3. Flexible Latex-Cement Mortar: Add flexible latex additive to dry mortar mix as recommended by  
19 porcelain tile manufacturer.
- 20 D. Mortar for Large Format Floor Tile: Polymer modified portland cement mortar, designed for large format  
21 tile for thin-bed or medium-bed applications, complying with ANSI A118.4 and ANSI A118.11, and "Extra  
22 Heavy" rating using ASTM C-627 Robinson Floor Test.
- 23 1. Basis of Design:
    - 24 a. Laticrete International, Sure-Set.
    - 25 b. Mapei, comparable product.
    - 26 c. ProLite Tile and Stone Mortar by Custom Building Products.
- 27 E. Polymer-Modified Cement Grout: ANSI A118.7. Provide Either ethylene vinyl acetate, in dry,  
28 redispersible form, prepackaged with other dry ingredients; or acrylic resin or styrene-butadiene rubber in  
29 liquid-latex form for addition to prepackaged dry-grout mix. Color as indicated.
- 30 1. Color: As selected by Architect from manufacturer's full range to match tile.

31 2.3 ACCESSORIES

- 32 A. (CT TRIM) Ceramic Tile Trim and Transition Strips: Basis of Design as follows:
- 33 1. (CT TRIM-1): Schluter Jolly, finish: anodized aluminum.
- 34 B. Sealant: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following  
35 requirements and with the applicable requirements in Section 07 92 00 - Joint Sealants.
- 36 1. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59,  
37 Subpart D (EPA Method 24).
  - 38 2. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
  - 39 3. Provide sanded elastomeric joints to match sanded grout joints.
- 40 C. Sealant and Backer Rod: As specified in Section 07 92 00 - Joint Sealants.

1 2.4 MIXING MORTARS AND GROUT

- 2 A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written  
3 instructions.
- 4 B. Add materials, water, and additives in accurate proportions.
- 5 C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other  
6 procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for  
7 installations indicated.

8 PART 3 - EXECUTION

9 3.1 EXAMINATION

- 10 A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance  
11 with requirements for installation tolerances and other conditions affecting performance of installed tile.
  - 12 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with  
13 tile-setting materials including curing compounds and other substances that contain soap, wax, oil,  
14 or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations  
15 indicated.
- 16 B. Proceed with installation only after unsatisfactory conditions have been corrected.

17 3.2 PREPARATION

- 18 A. Prepare surfaces to receive tile as recommended by mortar or adhesive manufacturer; and in compliance  
19 with TCA's "Handbook for Ceramic Tile Installation".
  - 20 1. Roughen surfaces that are glossy or which have loose surface material by sanding or scarifying.
  - 21 2. Remove surface material that is not compatible with adhesive.
  - 22 3. Use primer when recommended by adhesive manufacturer.
  - 23 4. Clean thoroughly to remove oil, dirt and dust.

24 3.3 TILE INSTALLATION

- 25 A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in  
26 tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of  
27 Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and  
28 apply to types of setting and grouting materials used.
  - 29 1. Achieve 100 percent bond in tile work. Back butter units 12 inch by 12 inch and larger.
- 30 B. Extend tile work into recesses and under equipment and fixtures, to form complete covering without  
31 interruptions. Terminate work neatly at obstructions, edges and corners without disruption of pattern or  
32 joint alignment.
- 33 C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible  
34 surfaces. Grind cut edges of tile abutting trim, finish or built-in items for straight, aligned joints.
  - 35 1. Fit tile closely to electrical outlets, piping and fixtures so that plates, collars or covers overlap tile.
- 36 D. Perimeter: Provide for expansion at perimeter with non-grouted and non-sealed perimeter expansion joint.

- 1 E. Grout Jointing Pattern: Unless otherwise shown, lay ceramic tile in grid pattern. Align joints when adjoining  
2 tiles on floor, base, walls and trim are same size. Layout tile work and center tile fields both directions in  
3 each space or on each wall area.
  - 4 1. Adjust to minimize tile cutting. Provide uniform joint width.
  - 5 2. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
    - 6 a. Ceramic Mosaic Tile: 1/8 inch.
- 7 F. Grout Sealer: Apply grout sealer as recommended by sealer and grout material manufacturers.
- 8 G. Tile Accessories: Install at locations indicated, in accordance with Manufacturer's recommendations.

9 3.4 **INSTALLED WORK**

- 10 A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of  
11 foreign matter.
  - 12 1. Remove grout residue from tile as soon as possible.
  - 13 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions  
14 but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout  
15 manufacturers and only after determining that cleaners are safe to use by testing on samples of tile  
16 and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of  
17 cleaning. Flush surfaces with clean water before and after cleaning.
  - 18 3. Remove temporary protective coating by method recommended by coating manufacturer and that  
19 is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- 20 B. Protection: Protect installed tile work with heavy covering during construction period to prevent damage  
21 and wear.
  - 22 1. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
    - 23 a. Setting materials for large format tile require longer curing time.
  - 24 2. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile  
25 surfaces.

26 **END OF SECTION**





- 1 B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture  
2 content.
- 3 C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

4 PART 2 - PRODUCTS

5 2.1 PRODUCTS AND MANUFACTURERS

6 A. Source Limitations for Ceiling Units and Suspension Systems: Obtain each acoustical ceiling panel and  
7 suspension system from one source with resources to provide products of consistent quality in appearance  
8 and physical properties without delaying Work.

9 B. Products and Manufacturers: Provide specified Basis of Design or approved equivalent products by one of  
10 the following:

- 11 1. Armstrong World Industries, Inc.;
- 12 2. USG Interiors, Inc.;
- 13 3. Ecophon CertainTeed, Inc.;
- 14 4. Chicago Metallic Corporation.

15 C. (ACT) Acoustical Ceiling Systems, Basis of Design Assemblies:

16 1. (ACT-1) Toilet Room ACT:

- 17 a. Panels: Armstrong Ceiling Solutions; Ultima Tegular Fine Texture No. 1912.
  - 18 1) Size: 24" x 24" x 3/4" thick
  - 19 2) Edge: square; tegular
  - 20 3) Color: white
  - 21 4) Acoustics:
    - 22 (a) NRC: 0.75
    - 23 (b) CAC: 35

24 b. Suspension System: 9/16" Prelude XL suspension grid, white.

25 2. (ACT-2) Conference Room ACT:

- 26 a. Panels: Armstrong Ceiling Solutions Calla High CAC Tegular Fine Texture No. 2824
  - 27 1) Size: 24" x 24" x 1" thick
  - 28 2) Edge: square; tegular
  - 29 3) Color: white
  - 30 4) Acoustics:
    - 31 (a) NRC: 0.85
    - 32 (b) CAC: 35

33 b. Suspension System: 9/16" Prelude XL suspension grid, white.

34 2.2 ACOUSTICAL CEILING PANELS

35 A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply  
36 with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance,  
37 unless otherwise indicated.

- 38 1. Recycled Content: Provide acoustical panels with recycled content such that postconsumer recycled  
39 content plus one-half of pre-consumer recycled content constitutes a minimum of 40 percent by  
40 weight.
- 41 2. Surface-Burning Characteristics: Provide acoustical panels with surface-burning characteristics  
42 complying with ASTM E 1264 for Class A materials with flame spread of 0-25, as determined by  
43 testing identical products per ASTM E 84.



1 2.3 SUSPENSION SYSTEMS

- 2 A. Metal Suspension System: Provide manufacturer's standard direct-hung metal suspension systems of types,  
3 structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.  
4 1. Double-Web, Exposed Steel Suspension System: Main and cross runners roll formed from cold-  
5 rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to  
6 ASTM A 653, not less than G30coating designation, with prefinished metal caps on flanges.  
7 a. Structural Classification: Heavy-duty system.  
8 b. Face Design: Flat, flush.  
9 c. Cap Material: Steel cold-rolled sheet.  
10 d. Face Width: As indicated.  
11 2. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a  
12 yield stress load of at least time three design load, but not less than 12 gauge.
- 13 B. Accessories: Provide stabilizer bars, furring clips, splices, edge moldings and hold down clips as required  
14 to complete and complement suspended ceiling grid system.  
15 1. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct  
16 Hung unless otherwise indicated.  
17 2. Edge Moldings and Trim: Provide Roll-formed sheet metal type in profile indicated or, if not  
18 indicated, manufacturer's standard moldings for edges and penetrations, [formed from sheet metal  
19 of same material, finish, and color as that used for exposed flanges of suspension system runners,  
20 and complying with seismic design requirements.  
21 3. Touch-up Paint: Manufacturer's touch-up paint for field cut tegular or other reveal edge tiles.
- 22 C. Carrying Channels and Hangers: Primed steel, size and type to suit application and to rigidly secure  
23 complete acoustic unit ceiling system, with maximum deflection of 1/360.
- 24 D. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and  
25 Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's  
26 standard factory-applied finish for type of system indicated.

27 2.4 METAL EDGE MOLDINGS AND TRIM

- 28 A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated,  
29 manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements;  
30 formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-  
31 system runners.  
32 1. (ACTR-1) Basis of Design: Axiom by Armstrong, 4" high, color to match suspension system.  
33 2. Provide manufacturer's edge moldings that fit acoustical panel edge details and suspension systems  
34 indicated and that match width and configuration of exposed runners unless otherwise indicated.

35 PART 3 - EXECUTION

36 3.1 EXAMINATION

- 37 A. Examine substrates and structural framing to which ceiling system attaches or abuts, with Installer present,  
38 for compliance with requirements specified in this and other sections that affect installation and anchorage  
39 of ceiling system. Do not proceed with installation until unsatisfactory conditions have been corrected.

1 3.2 PREPARATION

- 2 A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite  
3 edges of each ceiling. Avoid use of less-than-half-width units at borders, and comply with reflected ceiling  
4 plans.

5 3.3 SUSPENSION GRID INSTALLATION

- 6 A. General: Install acoustical panel ceilings to comply with ASTM C636, per manufacturer's written  
7 instructions and CISCA's "Ceiling Systems Handbook."

- 8 B. Suspend ceiling hangers from building's structural members and as follows:

- 9 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum  
10 that are not part of supporting structure or of ceiling suspension system.  
11 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by  
12 bracing, countersplaying, or other equally effective means.  
13 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that  
14 interfere with location of hangers at spacings required to support standard suspension system  
15 members, install supplemental suspension members and hangers in form of trapezes or equivalent  
16 devices. Size supplemental suspension members and hangers to support ceiling loads within  
17 performance limits established by referenced standards and publications.  
18 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three  
19 tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices  
20 that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age,  
21 corrosion, or elevated temperatures.  
22 5. Space hangers not more than 48 inches o.c. along each member supported directly from hangers,  
23 unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.

- 24 C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary  
25 to conceal edges of acoustical panels.

- 26 1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3  
27 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter  
28 corners accurately and connect securely.  
29 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

- 30 D. Install suspension system runners so they are square and securely interlocked with one another. Remove  
31 and replace dented, bent, or kinked members.

- 32 E. Tolerances: Erect ceiling system level within 1/8 inch in 12'-0" in any direction.

33 3.4 ACOUSTICAL PANEL INSTALLATION

- 34 A. Fit acoustic lay-in panels in place, free from damaged edges or other defects detrimental to appearance and  
35 function. Lay directional patterned tile one way with pattern parallel to shortest room axis.

- 36 1. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.  
37 2. Field recess units with tegular or reveal edge at border or ceiling edge.  
38 3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces  
39 using coating recommended in writing for this purpose by acoustical panel manufacturer.

- 40 B. Install lay-in panels level, in uniform plane and free from twist, warp and dents with straight joints, edges  
41 in alignment, and edges and corners flush.

- 1 3.5 INSTALLED WORK
- 2 A. Adjusting: Adjust sags or twists that develop in ceiling systems and replace part which is damaged or faulty.
- 3 B. Cleaning: Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension
- 4 members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage.
- 5 C. Replace: Remove and replace work that cannot be successfully cleaned and repaired to permanently
- 6 eliminate evidence of damage.

7 **END OF SECTION**



**SECTION 09 65 13  
RESILIENT WALL BASE**

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PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Rubber wall base.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

1.3 FIELD CONDITIONS

A. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC-RUBBER BASE

A. Products and Manufacturers: Subject to compliance with specified requirements, provide Basis of Design or equivalent product, approved by Architect from one of the following:

- 1. Armstrong.
- 2. Johnsonite.
- 3. Roppe.

B. (RB-1) Rubber Wall Base: ASTM F 1861, Type TP (rubber, thermoplastic), PVC-free, Group I (solid, homogeneous).

- 1. Basis of Design: Johnsonite Millwork Monument.
- 2. Thickness: 0.25 inch.
- 3. Height: 4 inches, unless noted otherwise.
- 4. Lengths: Manufacturer's standard length.
- 5. Outside Corners: Preformed.
- 6. Inside Corners: Preformed.
- 7. Style and Location:
  - a. Style A, Straight: Provide in areas with carpet.
  - b. Style B, Cove: Provide in areas with hard surface flooring.

2.2 INSTALLATION MATERIALS

A. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

1 PART 3 - EXECUTION

2 3.1 INSTALLATION

3 A. Examination: Proceed with installation only after unsatisfactory conditions have been corrected.  
4 Installation of resilient products indicates acceptance of surfaces and conditions.

5 B. Installation: Comply with manufacturer's written instructions and with the following requirements:

6 1. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient  
7 products.

8 2. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent  
9 pieces aligned.

10 3. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous  
11 contact with horizontal and vertical substrates.

12 4. Cope inside corners and miter outside corners

13 3.2 INSTALLED WORK

14 A. Cleaning: Comply with manufacturer's written instructions for cleaning and protecting resilient products.  
15 Remove adhesive and other blemishes from exposed surfaces.

16 B. Protection: Protect resilient products from mars, marks, indentations, and other damage from construction  
17 operations and placement of equipment and fixtures during remainder of construction period.

18 **END OF SECTION**

1 **SECTION 09 68 00**  
2 **CARPETING**

3 PART 1 - GENERAL

4 1.1 SUMMARY

- 5 A. Section Includes:  
6 1. Carpet tiles.  
7 2. Installation accessories.

8 1.2 ACTION SUBMITTALS

- 9 A. Product Data: Carpet Manufacturer's written product data, for each carpet product specified, including the  
10 following:  
11 1. Physical characteristics and durability.  
12 2. Installation recommendations for each type of substrate.  
13 3. Recommended installation adhesive, primer and other accessories for complete installation.
- 14 B. Samples: For each of the following products and for each color and texture required. Label each Sample  
15 with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and  
16 in schedules.  
17 1. Carpet Tile: Full-size Sample.  
18 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- long Samples.

19 1.3 CLOSEOUT SUBMITTALS

- 20 A. Maintenance Data: For carpet to include in maintenance manuals. Include the following:  
21 1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and  
22 manufacturer's recommended maintenance schedule.  
23 2. Precautions for cleaning materials and methods that could be detrimental to finishes and  
24 performances. Including cleaning and stain-removal products and procedures.
- 25 B. Extra Materials: Furnish extra materials described below that match products installed, are packaged with  
26 protective covering for storage, and are identified with labels clearly describing contents.  
27 1. Carpet Tiles: Before installation begins, furnish quantity of full-size units equal to 5 percent of  
28 amount installed.  
29 2. Carpet: Full-width rolls equal to [5] percent of amount installed for each type indicated, but not less  
30 than 10 sq. yd.

31 1.4 DELIVERY, STORAGE AND HANDLING

- 32 A. Comply with the Carpet and Rug Institute's CRI 104, Section 5: "Storage Handling."
- 33 B. Deliver materials to Project site in original wrappings and containers, labeled with identification of  
34 manufacturer, brand name, and lot number.

1 C. Store materials on-site in original undamaged packages, inside well-ventilated area protected from weather,  
2 moisture, soilage, extreme temperatures, and humidity. Lay flat, with continuous blocking off ground.

3 1.5 PROJECT CONDITIONS

4 A. Comply with CRI 104, Section 6: "Site Conditions."

5 PART 2 - PRODUCTS

6 2.1 CARPETING

7 A. Single-Source Responsibility: Obtain each type of carpet from one source and by single manufacturer.

8 B. Acceptable Manufacturers: Subject to compliance with the requirements provide the basis of design product  
9 or equivalent as approved by the Architect from one of the following:

- 10 1. Interfac, Inc.
- 11 2. Milliken Contract Carpets.
- 12 3. Shaw Industries Group, Inc.

13 C. (CPT-1) Basis of Design Carpet Tile: Interface

- 14 1. Pattern: Ice Breaker;
- 15 2. Style: 1473002500;
- 16 3. Color: 105784 Warm Rock

17 2.2 INSTALLATION ACCESSORIES

18 A. Trowel-Applied Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation  
19 provided or recommended by carpet manufacturer.

20 B. Concrete-Slab Primer: Non-staining type as recommended by carpet manufacturer.

21 C. Adhesive: Water-resistant, mildew-resistant, nonstaining type recommended and approved by flooring  
22 manufacturer to suit products and subfloor conditions indicated and to comply with flammability  
23 requirements for installed carpet as recommended by carpet manufacturer.

24 D. Metal Edge/Transition Strips: Extruded aluminum with finish, profile and width selected by Architect, of  
25 height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

26 PART 3 - EXECUTION

27 3.1 EXAMINATION

28 A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for  
29 maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet  
30 performance.



- 1 3.2 PREPARATION
- 2 A. General: Comply with CRI's "CRI Carpet Installation Standard" and with carpet manufacturer's written  
3 installation instructions for preparing substrates.
- 4 B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill  
5 cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch  
6 wide or wider, and protrusions more than 1/32 inch, unless more stringent requirements are required by  
7 manufacturer's written instructions.
- 8 C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are  
9 incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use  
10 mechanical methods recommended in writing by adhesive and carpet manufacturers.

11 3.3 INSTALLATION

- 12 A. Comply with CRI's "CRI Carpet Installation Standard" and written installation instructions by carpet and  
13 adhesive manufacturers.
- 14 1. Installation Method: Glue-down method as recommended in writing by carpet manufacturer  
15 2. Maintain dye-lot integrity. Do not mix dye lots in same area.  
16 3. Install pattern parallel to walls and borders.
- 17 B. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including  
18 cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet  
19 manufacturer.
- 20 C. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges,  
21 alcoves, and similar openings.

22 3.4 INSTALLED WORK

- 23 A. Cleaning: Perform the following operations immediately after installing carpet:
- 24 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by  
25 carpet manufacturer.  
26 2. Remove yarns that protrude from carpet surface.  
27 3. Vacuum carpet using commercial machine with face-beater element.
- 28 B. Protection: Protect installed carpet to comply with CRI's "CRI Carpet Installation Standard."

29 **END OF SECTION**



1 **SECTION 099000**  
2 **PAINTING**

3 **PART 1 - GENERAL**

4 1.1 **SUMMARY**

- 5 A. Section Includes:  
6 1. Painting and finishing of new and existing materials  
7 2. Preparation of surfaces for painting and finishing.  
8 3. Repainting and refinishing of existing surfaces as indicated. Preparation of existing surfaces for  
9 repainting and refinishing.

10 1.2 **ACTION SUBMITTALS**

- 11 A. Product Data: For each paint system specified, all coats, including primers.  
12 B. Samples: Submit three 4 inch by 6 inch samples of each specified finish to be reviewed for color and sheen.  
13 Architect reserves right to select color or finish from any manufacturer, herein specified, as necessary to  
14 achieve desired color or finish.

15 1.3 **CLOSEOUT SUBMITTALS**

- 16 A. Maintenance Materials (Attic Stock): Furnish extra paint materials from the same production run as the  
17 materials applied and in the quantities described below. Package with protective covering for storage and  
18 identify with labels describing contents. Deliver extra materials to Owner.  
19 1. Quantity: Furnish Owner with extra paint materials in quantities indicated below:  
20 a. Interior, Paint: 1 gal.of each color applied.

21 1.4 **QUALITY ASSURANCE**

- 22 A. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of total  
23 systems for various substrates. On request, furnish information on characteristics of finish materials to  
24 ensure use of compatible primers.

25 1.5 **DELIVERY, STORAGE AND HANDLING**

- 26 A. Deliver paint materials in sealed original labeled containers, bearing manufacturer's name, type of paint,  
27 brand name, color designation and instructions for mixing or reducing.  
28 B. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45 degrees F  
29 in well ventilated area. Restrict storage to paint materials and related equipment.  
30 C. Take precautionary measures to prevent fire hazards and spontaneous combustion. Comply with health and  
31 fire regulations.

1 1.6 PROJECT CONDITIONS

- 2 A. Environmental Requirements: Comply with manufacturer's recommendations as to environmental  
3 conditions under which painting and finishing can be applied. Do not apply finish in areas where dust is  
4 being generated.
- 5 B. Measure moisture content of surfaces using electronic moisture meter. Do not apply finishes unless  
6 moisture contents of surfaces are below following maximums:  
7 1. Gypsum Wallboard: 12 percent.
- 8 C. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 45  
9 degrees F for 24 hours before, during and 48 hours after application of finishes.
- 10 D. Provide minimum 25 foot candles of lighting on surfaces to be finished.

11 PART 2 - PRODUCTS

12 2.1 PRODUCT REQUIREMENTS

- 13 A. Manufacturers:  
14 1. Sherwin-Williams Company  
15 2. Benjamin Moore & Co.  
16 3. ICI Paints  
17 4. PPG Industries
- 18 B. Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another  
19 and with the substrates indicated under conditions of service and application, as demonstrated by  
20 manufacturer based on testing and field experience.
- 21 C. Single-Source Responsibility: Provide primers and undercoat coating produced by same manufacturer as  
22 finish coats. No Exceptions.
- 23 D. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified  
24 that are factory formulated and recommended by manufacturer for application indicated. Paint-material  
25 containers not displaying manufacturer's product identification will not be acceptable.
- 26 E. Painting and Finishing Schedules: Refer to Painting and Finishing Schedules in Part 3 of this Section.  
27 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or  
28 materials is not intended to imply that products named are required to be used to the exclusion of  
29 equivalent products of other manufacturers. Furnish manufacturer's material data and certificates  
30 of performance for proposed substitutions.  
31 2. Sheen: When one of following terms is used to denote specific sheen for coating listed, following  
32 index shall apply:  
33 a. Flat: Less than 15 units based on 85 degrees of sheen.  
34 b. Eggshell: 5 to 20 units based on 60 degrees of sheen.  
35 c. Satin/Low Lustre: 15 to 35 units based on 60 degrees of sheen.  
36 d. Semi-gloss: 30 to 65 units based on 60 degrees of sheen.  
37 e. Gloss: Above 65 units based on 60 degrees of sheen.
- 38 F. PT Paint Colors: Provide specified color in paint type as scheduled in this Section  
39 1. (PT-1): Sherwin Williams; Origami White SW7636.

- 1           2.     (PT-2): Color to match existing door frames within surrounding brick walls as approved by  
2           Architect.  
3           3.     Mixing and Tinting: Deliver paints ready-mixed to job site. Job mixing and job tinting is not  
4           acceptable.
- 5           G.     (PTE) Epoxy Paint Colors: Provide specified color in paint color that matches corresponding PT-#.

6     PART 3 - EXECUTION

7     3.1     EXAMINATION

- 8           A.     Examine surfaces to receive paint finishes for conditions that would adversely affect execution, permanence  
9           or quality of work and which cannot be put into acceptable condition through preparatory work. Do not  
10          proceed with surface preparation or coating application until conditions are suitable.

11    3.2     PREPARATION OF SURFACES

- 12          A.     Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as  
13          specified, for each particular substrate condition.

- 14           1.     Remove mildew, by scrubbing with solution of detergent, bleach and warm water. Rinse with clean  
15           water and allow surface to dry completely.  
16           2.     Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect  
17           in writing of anticipated problems in using specified coating systems with substrate primed by  
18           others.

- 19          B.     Remove hardware, hardware accessories, plates, lighting fixtures, and similar items in-place and not to be  
20          finish painted, or provide surface-applied protection prior to surface preparation and painting operations.  
21          Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of  
22          painting of each space or area, reinstall removed items by workmen skilled in trades involved.

- 23          C.     Clean surfaces to be painted before applying paint or surface treatment. Remove oil and grease with clean  
24          cloths and cleaning solvents prior to mechanical cleaning. Program cleaning and painting so that dust and  
25          other contaminants from cleaning process will not fall in wet, newly painted surfaces.

- 26           1.     Remove dirt, grease and oil from canvas and cotton insulated coverings.

- 27          D.     Gypsum Wallboard: Remove contamination from gypsum wallboard surfaces and prime to show defects,  
28          if any. Paint after defects have been remedied.

- 29          E.     Ferrous Metals: Clean non-galvanized, ferrous surfaces that have not been shop-coated of oil, grease, dirt,  
30          loose mill scale and other foreign substances by solvent or mechanical cleaning, complying with Steel  
31          Structures Painting Council (SSPC)-SP3.

- 32           1.     Touch-up shop-applied prime coats which have damaged or bare areas. Wire-brush, solvent-clean,  
33           and touch-up with same primer as shop coat.

- 34           2.     Clean unprimed steel surfaces by washing with solvent. Apply treatment of phosphoric acid  
35           solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate  
36           defects, if any. Paint after defects have been remedied.

- 37           3.     Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to  
38           make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime  
39           steel including shop primed steels.

1 F. Existing Surfaces to be Repainted or Refinished: Wash surfaces to remove grease, oil, soil or other matter  
2 which will interfere with proper bond of new materials. Scrape and wire brush loose or flaking paint. Fill  
3 cracks, voids or other defects.

4 3.3 MATERIALS PREPARATION

5 A. Mix and prepare painting materials and transparent finish materials in accordance with manufacturer's  
6 directions.

7 B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing,  
8 and application of paint in clean condition, free of foreign materials and residue.

9 C. Stir materials before application to produce mixture of uniform density, and as required during application  
10 of materials. Do not stir any film that may form on surface into material. Remove film and, if necessary,  
11 strain material before using.

12 3.4 APPLICATION

13 A. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according  
14 to manufacturer's written instructions.

15 1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for  
16 surface or item being painted.

17 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by  
18 manufacturer for material and texture required.

19 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer  
20 for material and texture required.

21 4. Apply each coat at proper consistency.

22 5. Each coat of paint shall be slightly darker than preceding coat unless otherwise approved by  
23 Architect.

24 6. Provide finish coats which are compatible with prime paints used.

25 B. Do not apply succeeding coats until previous coat has completely dried. Sand between each enamel or  
26 varnish coat application with fine sandpaper, or rub surfaces with pumice stone where required to produce  
27 even, smooth surface in accordance with coating manufacturer's directions.

28 1. Allow each coat of finish to dry before following coat is applied, unless directed otherwise by  
29 manufacturer.

30 C. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint, until  
31 paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including  
32 edges, corners, crevices, welds, and exposed fasteners receive film thickness equivalent to that of flat  
33 surfaces.

34 D. Finish doors on tops, bottoms, and side edges same as exterior faces, unless otherwise indicated.

35 E. Film Thickness: Apply materials in accordance to paint manufacturer's recommendations and spreading  
36 rates to provide total dry film thickness as recommended.

37 1. Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry  
38 film thickness indicated

39 2. Use precision instruments designed for measuring and evaluation wet and dry films of paints and  
40 coatings.

41 3. Results measuring less than recommended thickness will require additional material application.

- 1           4.     Use of poor hiding colors may require application of additional coats in order to achieve proper  
2           coverage and hiding.
- 3           F.     Apply first-coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting  
4           as soon as practicable after preparation and before subsequent surface deterioration.
- 5           G.     Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has  
6           dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application  
7           of another coat of paint does not cause lifting or loss of adhesion of undercoat.
- 8           H.     Prime Coats: Recoat primed and sealed walls and ceilings where there is evidence of suction spots or  
9           unsealed areas in first coat, to assure finish coat with no burn-through or other defects due to insufficient  
10          sealing.
- 11          I.     Painting and Repainting of Existing Surfaces: Where repainting of existing surfaces is required, repaint  
12          wall and ceiling surfaces in their entirety, patch or spot painting is not acceptable.
- 13          J.     Paint surfaces behind movable equipment or furniture same as similar exposed surfaces. Paint surfaces  
14          behind permanently-fixed equipment or furniture with prime coat only.
- 15          K.     Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint  
16          work not complying with requirements.

17    3.5     CLEANING

- 18          A.     As work proceeds and upon completion, promptly remove paint where spilled, splashed or spattered. Touch  
19          up and restore damaged or defaced painted areas.
- 20          B.     During progress of work keep premises free from unnecessary accumulation of tools, equipment, surplus  
21          materials and debris. Remove at end of each workday.
- 22          C.     Upon completion of work clean window glass and other paint-spattered surfaces and leave premises neat  
23          and clean, to satisfaction of Architect.

24    3.6     PROTECTION

- 25          A.     Adequately cover or otherwise protect finished work of other trades and other surfaces from paint and  
26          damage. Repair damage as result of inadequate or unsuitable protection as acceptable to Architect.
- 27              1.     Furnish sufficient drop cloths, shields and protective equipment to prevent spray or droppings from  
28              fouling surfaces not being painted and in particular, surfaces within storage and preparation area.
- 29          B.     Place cotton waste, cloths and material which may constitute fire hazard in closed metal containers and  
30          remove daily from site.
- 31          C.     Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items  
32          shall be carefully stored, cleaned and replaced on completion of work in each area. Do not use solvent to  
33          clean hardware that may remove permanent lacquer finish.
- 34          D.     Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective  
35          wrappings provided by others for protection of their work after completion of painting operations.

1 3.7 INTERIOR PAINTING AND FINISHING SCHEDULE

2 A. Interior Ferrous and Non-Ferrous Metal Surfaces:

- 3 1. Surfaces Included: Hollow Metal  
4 2. Waterborne Low VOC, Low-Odor System: Zero-VOC, Low-Odor Acrylic over Waterborne Metal  
5 Primer:  
6 a. VOC Content:<50g/L  
7 b. Primer: Acrylic Concrete & Masonry Primer  
8 1) 1 coat S-W Pro Industrial Pro-Cryl Universal Acrylic Primer, B66-1300 Series  
9 c. Finish: Water-based, 100 percent acrylic.  
10 1) 2 coats S-W Pro Industrial Acrylic Semi-Gloss, B66-650 Series.

11 B. Gypsum Wallboard, Gypsum Plaster and Gypsum Veneer Plaster Surfaces:

- 12 1. Surfaces Included:  
13 a. Gypsum wallboard, including over skim coat of joint compound.  
14 2. Sheens, General: Unless noted otherwise on Room Finish Schedule.  
15 a. Walls: Eggshell  
16 b. Ceilings and Soffits: Flat  
17 3. Zero VOC Vinyl Acrylic System:  
18 a. VOC Content: 0g/L  
19 b. Primer: Water-based vinyl acrylic primer and sealer.  
20 1) S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600  
21 c. Finish: Water-based acrylic, not less than 35 percent solids, ammonia free.  
22 1) 2 coats S-W ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series.  
23 2) 2 coats S-W ProMar 200 Zero VOC Interior Latex Eg-Shel, B20-2600 Series.  
24 4. Water Based Polyamine Epoxy System:  
25 a. VOC Content: <50g/L  
26 b. Primer:  
27 1) 1 coat S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600  
28 2) 2 coats S-W Pro Industrial Water Based Epoxy Eg-Shel, B73-300 Series.

29 3.8 SPECIAL SURFACES

30 A. Black Enamel Finish:

- 31 1. Surfaces Included: Duct throats for visible distance but not less than approximately 24 inches behind  
32 supply or return air grilles, registers, louvers.  
33 2. Water-Based Systems, Low-VOC: Acrylic Latex Finish.  
34 a. Finish: 1 coat S-W ProMar 400 Latex Flat Black, B30W400 Series.

35 3.9 REPAINTING OF EXISTING SURFACES

36 A. Existing Surfaces:

- 37 1. Surfaces Included:  
38 a. Existing surfaces where indicated to be repainted.  
39 2. Low-VOC Latex System:  
40 a. Primer/Finish: 2 coats paint similar to type listed above.

41 **END OF SECTION**



1 **SECTION 10 12 00**  
2 **DISPLAY CASE DOORS**

3 PART 1 - GENERAL

4 1.1 SUMMARY

- 5 A. Section Includes: Display Case Glass Doors (DC-1).

6 1.2 ACTION SUBMITTALS

- 7 A. Product Data: Submit Manufacturer's product data for Display Case Door Systems including:  
8 1. Manufacturer's standard details and fabrication method.

- 9 B. Shop drawings for each Display Case Door System are required, including:  
10 1. Layout and installation details.  
11 2. Elevations at 1/4-inch scale.  
12 3. Anchorage and reinforcement.  
13 4. Glazing details.

- 14 C. Samples: Submit pairs of samples of each specified metal color and finish on 9-inch long sections of  
15 extrusions or formed shapes.

16 1.3 CLOSEOUT SUBMITTALS

- 17 A. Data on finishing, hardware and accessories.  
18 B. Recommendations for maintenance and cleaning of finished surfaces.

19 1.4 QUALITY ASSURANCE

- 20 A. Installer qualifications: Engage an experienced installer who has completed installations of Display  
21 Case Door Systems similar in design and extent to those required for the project and whose work has  
22 resulted in construction with a record of success in service performance.
- 23 B. Manufacturer's qualifications: Provide Display Case Doors produced by a firm experienced in  
24 manufacturing Display Case Door Systems that are similar to those indicated for this project and that have  
25 a record of success in service performance.
- 26 C. Single Source Responsibility: Obtain Display Case Door Systems from a single manufacturer.
- 27 D. Design Intent: The drawings indicate the size, profile and dimensional requirements of the Display  
28 Case Door System required and are based on the specific types and models indicated. Display Case Doors  
29 by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and  
30 do not change the design concept as judged by the Architect.

1 1.5 DELIVERY, STORAGE, AND HANDLING

- 2 A. Deliver all Display Case Door Systems and related components in the manufacturer's original  
3 protective packaging. Do not deliver door units until the work is ready for their installation.  
4 1. Inspect components for damage upon delivery. Unless minor defects in metal components can  
5 be made to meet the Architect's specifications and satisfaction, damaged parts should be removed  
6 and replaced.

7 1.6 PROJECT CONDITIONS

- 8 A. Field Measurements: Check opening by accurate field measurement before fabrication. Show recorder  
9 measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay  
10 of the work and possible damage to the finished product.  
11 1. Where necessary, proceed with fabrication without measurement and coordinate  
12 fabrication tolerances to ensure proper fit.

13 PART 2 - PRODUCTS

14 2.1 ACCEPTABLE MANUFACTURERS

- 15 A. Basis of Design: Subject to compliance with requirements provide CRL Slender Profile Door system by  
16 C.R. Laurence Co., Inc. or comparable product from Blumcraft or Dorma.

17 2.2 COMPONENTS

- 18 A. Glass: ½-inch tempered safety glass (GL-2T) as specified in Section 08 80 00 "Glazing."  
19 B. Rail Configuration: Full Width at top and bottom of doors as indicated on drawings.  
20 1. 1-inch square brushed stainless steel.  
21 C. Center Pivots: CRL9040WBP at top; INT402 at bottom.  
22 D. Lock: #7150 lever type cam lock in bottom rail.  
23 E. Accessories: Provide all necessary materials and accessories for a complete installation.  
24 F. Overhead door stop: Roller Catch/Stop to be #593 with strike plate in top rail.  
25 G. Anchors and Fasteners: Manufacturer's standard concealed anchors and fasteners. Do not use exposed  
26 fasteners.

27 2.3 FABRICATION

- 28 A. General: Fabricate Display Case Door components to designs and sizes indicated. Sizes of doors and profile  
29 requirements of hardware are indicated on the drawings.  
30 1. Do not permit cutting, drilling or other alterations to glass after tempering.  
31 2. Fabricate work to accommodate required hardware, anchors, reinforcement, and accessory items.

- 1 B. Prefabrication: Complete fabrication, assembly, finishing, hardware application and other work to the  
2 greatest extent possible before shipment to the project site. Disassemble components only as necessary  
3 for shipment and installation.
- 4 C. Continuity: Maintain accurate relation of planes and angles with hairline fit of contracting members.

5 PART 3 - EXECUTION

6 3.1 EXAMINATION

- 7 A. Examine substrates and supports with the installer, present for compliance with requirements indicated,  
8 installation tolerances and other conditions that affect the installation of Display Case Door Systems.  
9 Correct unsatisfactory conditions before proceeding with the installation.  
10 1. Do not proceed with installation until unsatisfactory conditions are corrected.

11 3.2 INSTALLATION

- 12 A. Install Display Case Door Systems and associated components in accordance with manufacturer's printed  
13 instructions and recommendations.  
14 1. Verify units level, plumb and true line.  
15 2. Lubricate hardware and other moving parts as required.

16 3.3 INSTALLED WORK

- 17 A. Adjustment:  
18 1. Adjust doors and hardware to provide an acceptable fit at meeting points and at weatherstripping  
19 for smooth operation and dust tight closure.  
20 2. Hardware: Adjust operating hardware to ensure proper operation.
- 21 B. Cleaning:  
22 1. Clean door and frame surfaces after installation, exercising care to avoid damage to the finish.  
23 2. Clean glass surfaces after installation, complying with requirements contained in the "Glass and  
24 Glazing" section for cleaning and maintenance. Remove excess glazing sealant compounds, dirt or  
25 other substances.
- 26 C. Protection: Institute protective measures required throughout the remainder of the construction period to  
27 ensure that the Display Case Door Systems do not incur any damage or deterioration.

28 **END OF SECTION**



1 **SECTION 10 28 13**  
2 **TOILET & BUILDING ACCESSORIES**

3 PART 1 - GENERAL

4 1.1 SUMMARY

- 5 A. Section Includes:  
6 1. Washroom accessories.  
7 2. Installation of Owner-furnished accessories (OFCl).

8 1.2 COORDINATION

- 9 A. Coordinate accessory locations with other work to prevent interference with clearances required for access  
10 by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of  
11 accessories.  
12 B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the  
13 Work.

14 1.3 ACTION SUBMITTALS

- 15 A. Product Data: For each type of product indicated.

16 1.4 CLOSEOUT SUBMITTALS

- 17 A. Maintenance Data: For toilet accessories to include in maintenance manuals.

18 1.5 DELIVERY, STORAGE AND HANDLING

- 19 A. Do not deliver accessories to site until rooms in which they are to be installed are ready to receive them.  
20 B. Pack accessories individually in manner to protect accessory and its finish.

21 1.6 WARRANTY

- 22 A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner  
23 may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent  
24 with, other warranties made by Contractor under requirements of the Contract Documents.  
25 B. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors  
26 that develop visible silver spoilage defects and that fail in materials or workmanship within specified  
27 warranty period.  
28 1. Warranty Period: 15 years from date of Substantial Completion.

1 PART 2 - PRODUCTS

2 2.1 PRODUCT REQUIREMENTS

- 3 A. Product Options: Accessory requirements, including those for materials, finishes, dimensions, capacities,  
4 and performance, are established by specified Basis of Design products.
- 5 1. Products of other manufacturers listed in Part 2 with equal characteristics, as judged solely by  
6 Architect, may be provided.
- 7 2. Do not modify aesthetic effects, as judged solely by Architect, except with Architect's approval.  
8 Where modifications are proposed, submit comprehensive explanatory data to Architect for review.
- 9 B. Names and labels are not permitted on exposed faces of accessories. On interior surface not exposed to  
10 view or on back surface of each accessory, provide printed, waterproof label or stamped nameplate  
11 indicating manufacturer's name and product model number.
- 12 C. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single  
13 source from single manufacturer.
- 14 D. Products and Manufacturers: Subject to compliance with specified requirements, provide Basis of Design  
15 products as indicated in Product Schedule, or approved equivalent products by one of the following  
16 manufacturers:
- 17 1. Bobrick Washroom Equipment Inc.  
18 2. American Specialties Inc.  
19 3. Bradley Corporation

20 2.2 WASHROOM ACCESSORIES

- 21 A. (GB-1) Grab Bars: In accordance with requirements of ADA guidelines, capable of withstanding load of  
22 250 lbf applied in any direction and at any point on the grab bar, fastener, mounting device or supporting  
23 device; in accordance with ASTM F 446.
- 24 1. Basis of Design: Bobrick B-6806 Series.  
25 2. Material and Finish: Type 304 stainless steel pipe, 18 ga., 1-1/2" outer diameter, with satin finish  
26 on ends and slip-resistant texture in grip area.  
27 3. Mounting: Flanges with concealed fasteners and gasketed stainless steel escutcheon.  
28 4. Configurations: As indicated on Drawings. Refer to grab bar schedule in Drawings.
- 29 B. (CH-1) Single Hook: Stainless steel, satin finish.  
30 1. Basis of Design: Bobrick B-76717.
- 31 C. (MIR-1) Framed Mirror No Shelf:  
32 1. Basis of Design: Bobrick B-290 Series.  
33 2. Size: 24-inches wide by 36-inches tall unless otherwise indicated on the Drawings
- 34 D. (PTC-1) Paper Towel Dispensers: Owner furnished contractor installed.
- 35 E. (SDISP-1) Soap Dispenser: Owner furnished contractor installed.
- 36 F. (SND-1) Sanitary Napkin Disposal: Surface-mounted, stainless steel.  
37 1. Basis of Design: Bobrick B-254
- 38 G. (TPH-1) Toilet Tissue (Roll) Dispenser: Owner furnished contractor installed.

- 1 H. (US-1) Stainless Steel Shelf: surface-mounted.  
2 1. Basis of Design: Bobrick B-295: 5” deep x length shown on Drawings.

3 2.3 MATERIALS

- 4 A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch minimum nominal  
5 thickness, unless otherwise indicated..
- 6 B. Steel Sheet: ASTM A 1008, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal  
7 thickness.
- 8 C. Steel Sheet: ASTM A 366, cold rolled, commercial quality, 0.0359-inch minimum nominal thickness;  
9 surface preparation and metal pretreatment as required for applied finish.
- 10 D. Galvanized Steel Sheet: ASTM A 653, G60.
- 11 E. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- 12 F. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering,  
13 electroplated copper coating, and protective organic coating complying with FS DD-M-411.  
14 1. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- 15 G. Fasteners and Mounting Devices: Provide concealed fasteners where possible.  
16 1. Where fasteners remain exposed to view, provide tamper-resistant and theft-resistant fasteners, of  
17 material and finish to match accessory unit.  
18 2. Screws, bolts, and other devices of same material as unit and tamper-and-theft resistant where  
19 exposed, and of galvanized steel where concealed.  
20 3. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication
- 21 H. Fasteners, Screws, and Bolts: Hot dip galvanized.
- 22 I. Expansion Shields: Fiber, lead or rubber as recommended by accessory manufacturer for component and  
23 substrate. Provide exposed fasteners with finish to match accessories.
- 24 J. Adhesive: Epoxy type contact cement

25 2.4 FABRICATION

- 26 A. General:  
27 1. Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels  
28 with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-  
29 resistant backing plates.  
30 2. Shop assemble components and package complete with anchors and fittings.  
31 3. Keys: Provide universal keys for internal access to accessories for servicing and resupplying.
- 32 B. General: Names or labels are not permitted on exposed faces of accessories. On interior surface not  
33 exposed to view or on back surface of each accessory, provide printed, waterproof label or stamped  
34 nameplate indicating manufacturer's name and product model number.
- 35 C. Surface-Mounted Toilet Accessories: Unless otherwise indicated, fabricate units with tight seams and  
36 joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge.  
37 Provide concealed anchorage where possible.

- 1 D. Framed Glass-Mirror Units: Fabricate frames for glass-mirror units to accommodate glass edge protection  
2 material. Provide mirror backing and support system that permits rigid, tamper-resistant glass installation  
3 and prevents moisture accumulation.
- 4 E. Provide galvanized steel backing sheet, not less than 0.034 inch and full mirror size, with non-absorptive  
5 filler material. Corrugated cardboard is not an acceptable filler material.
- 6 F. Mirror-Unit Hangers: Provide mirror-unit mounting system that permits rigid, tamper- and theft-resistant  
7 installation, as follows:  
8 1. One-piece, galvanized steel, wall-hanger device with spring-action locking mechanism to hold  
9 mirror unit in position with no exposed screws or bolts.
- 10 G. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide  
11 minimum of six keys to Owner's representative.

12 PART 3 - EXECUTION

13 3.1 PREPARATION

- 14 A. Deliver inserts and rough-in frames to jobsite at appropriate time for building-in. Provide templates and  
15 rough-in measurements as required.
- 16 B. Before starting work notify Architect in writing of conflicts detrimental to installation or operation of units.
- 17 C. Verify exact location of accessories with Architect. Verify blocking is in place prior to gypsum board  
18 installation.
- 19 D. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure  
20 proper operation and servicing of accessory units.

21 3.2 INSTALLATION

- 22 A. Install fixtures, accessories, and items in accordance with manufacturer's printed instructions.
- 23 B. Install true, plumb and level, securely and rigidly anchored to substrate and sealed to protect structural  
24 elements of wall from moisture.
- 25 C. Use tamper proof (security) type fasteners.

26 3.3 INSTALLED WORK

- 27 A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace  
28 damaged or defective items.
- 29 B. Clean and polish exposed surfaces in accordance with manufacturer's recommendations after removing  
30 labels and protective coatings.

31 **END OF SECTION**



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**SECTION 22 05 00**  
**COMMON WORK RESULTS FOR PLUMBING**  
**BASED ON DFD MASTER SPECIFICATION DATED 11/01/2019**

**PART 1 - GENERAL**

**SCOPE**

This section includes information common to two or more technical plumbing specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference
- Reference Standards
- Lead Free Requirements
- Quality Assurance
- Continuity of Existing Services
- Protection of Finished Surfaces
- Sleeves and Openings
- Sealing and Fire Stopping
- Submittals
- Codes
- Certificates and Inspections
- Operating and Maintenance Data
- Record Drawings

**PART 2 - PRODUCTS**

- Access Panels and Doors
- Identification
- Sealing and Fire Stopping

**PART 3 - EXECUTION**

- Demolition
- Concrete Work
- Cutting and Patching
- Building Access
- Equipment Access
- Coordination
- Identification
- Sleeves and Openings
- Sealing and Fire Stopping

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 07 84 00 – Fire Stopping

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

This section applies to all Division 22 00 00 sections of plumbing.

**REFERENCE STANDARDS**

Abbreviations of standards organizations referenced in this and other sections are as follows:

- 1
- 2 ABMA American Boiler Manufacturers Association
- 3 ACPA American Concrete Pipe Association
- 4 AGA American Gas Association
- 5 AMCA Air Movement and Control Association
- 6 ANSI American National Standards Institute
- 7 ARI Air Conditioning and Refrigeration Institute
- 8 ASME American Society of Mechanical Engineers
- 9 ASPE American society of Plumbing Engineers
- 10 ASSE American Society of Sanitary Engineering
- 11 ASTM American Society for Testing and Materials
- 12 AWWA American Water Works Association
- 13 AWS American Welding Society
- 14 CISPI Cast Iron Soil Pipe Institute
- 15 CGA Compressed Gas Association
- 16 CS Commercial Standards, Products Standards Sections, Office of Eng. Standards Service, NBS
- 17 DSPS State of Wisconsin Dept. of Safety and Professional Services, State Plumbing Code
- 18 EPA Environmental Protection Agency
- 19 FS Federal Specifications, Superintendent of Documents, U.S. Government Printing Office
- 20 GAMA Gas Appliance Manufacturers Association
- 21 IAPMO International Association of Plumbing & Mechanical Officials
- 22 IEEE Institute of Electrical and Electronics Engineers
- 23 ISA Instrument Society of America
- 24 MCA Mechanical Contractors Association
- 25 MICA Midwest Insulation Contractors Association
- 26 MSS Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.
- 27 NBS National Bureau of Standards
- 28 NEC National Electric Code
- 29 NEMA National Electrical Manufacturers Association
- 30 NFPA National Fire Protection Association
- 31 NSF National Sanitation Foundation
- 32 PDI Plumbing and Drainage Institute
- 33 SMACNA Sheet Metal and Air Conditioning Contractors' National Association. Inc.
- 34 STI Steel Tank Institute
- 35 UL Underwriters Laboratories Inc.

36

37 Standards referenced in this section:

- 38 ACI 614 Recommended Practice for Measuring, Mixing and Placing of Concrete
- 39 ASTM D1557 Standard Test Method for Moisture-Density Relations of Soils
- 40 ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops
- 41 ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- 42 D.O.T. Standard Specifications for Road and Bridge Construction, State of Wisconsin, Dept. of  
43 Transportation
- 44 UL1479 Fire Tests of Through-Penetration Firestops
- 45 UL723 Surface Burning Characteristics of Building Materials

46

47 **LEAD FREE REQUIREMENTS**

48 All materials that contact potable water shall be lead free. Lead free refers to the wetted surface of pipe,  
49 fittings and fixtures in potable water systems that have a weighted average lead content  $\leq 0.25\%$   
50 per the Federal Safe Drinking Water Act as amended January 4th 2011 Section 1417.

51

52 This requirement applies to all the subsequent Plumbing Specification Sections and Plumbing Drawings and  
53 supersedes any part or model number that may conflict with this requirement.

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**QUALITY ASSURANCE**

Substitution of Materials: Refer to Section GC - General Conditions of the Contract, Equals and Substitutions.

All products and materials used are to be new, undamaged, clean and in good condition. Existing products and materials are not to be reused unless specifically indicated.

Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system and for obtaining the intended performance from the system into which these items are placed.

**CONTINUITY OF EXISTING SERVICES**

Do not interrupt or change existing services without prior written approval from the Owner's Project Representative. When interruption is required, coordinate scheduling of down-time with the Owner to minimize disruption to his activities. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during normal working hours.

**PROTECTION OF FINISHED SURFACES**

Refer to Division 1, General Requirements, Protection of Finished Surfaces.

**SLEEVES AND OPENINGS**

Refer to Division 1, General Requirements, Sleeves and Openings.

**SEALING AND FIRE STOPPING**

Sealing and firestopping of sleeves/openings between piping, etc. and the sleeve or structural opening shall be the responsibility of the contractor whose work penetrates the opening. The contractor responsible shall hire individuals skilled in such work to do the sealing and fireproofing. Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with section 07 84 00 Fire Stopping.

**CODES**

Comply with requirements of Wisconsin Administrative Code.

**CERTIFICATES AND INSPECTIONS**

Refer also to Division 1, General Conditions, Permits, Regulations, Utilities and Taxes.

Obtain and pay for all required State installation inspections except those provided by the Architect/Engineer. Deliver the originals of inspection certificates and test records to the Owner's Project Representative. Include copies of the certificates and test records in the Operating and Maintenance Instructions.

**SUBMITTALS**

Refer to Division 1, General Conditions, Submittals.

Shop drawing submittals are to be bound, labeled, contain the project manual cover page and a material index list page showing item designation, manufacturer and additional items supplied with the installation. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents. Include wiring diagrams of electrically powered equipment.

The specific items that will be required for submittals shall be coordinated with the UWM Project Representative, the A/E, and the General Prime Contractor for inclusion in the project submittal log.

1  
2 Submit sufficient quantities of data sheets and shop drawings to allow the following distribution:

- 3 • Operating and Maintenance Manuals 2 copies
- 4 • Division of Facilities Development 1 copy
- 5 • Architect/Engineer 1 copy

6  
7 **OPERATION AND MAINTENANCE DATA**

8 All operations and maintenance data shall comply with the submission and content requirements specified  
9 under section GENERAL REQUIREMENTS.

10  
11 In addition to the general content specified under GENERAL REQUIREMENTS supply the following  
12 additional documentation:

- 13 1. Records of tests performed a to certify compliance with system requirements
- 14 2. Manufacturer's wiring diagrams for electrically powered equipment
- 15 3. Certificates of inspection by regulatory agencies
- 16 4. Valve schedules
- 17 5. Lubrication instructions, including list/frequency of lubrication
- 18 6. Parts lists for fixtures, equipment, valves and specialties.
- 19 7. Manufacturers installation, operation and maintenance recommendations for fixtures, equipment,  
20 valves and specialties.
- 21 8. Additional information as indicated in the technical specification sections

22  
23 **RECORD DRAWINGS**

24 Refer to Division 1, General Requirements, Record Drawings.

25  
26 **PART 2 - PRODUCTS**

27  
28 **ACCESS PANELS AND DOORS**

29  
30 **LAY-IN CEILINGS:**

31 Removable lay-in ceiling tiles in 2 X 2 foot or 2 X 4 foot configuration provided under Section 09500 are  
32 sufficient; no additional access provisions are required unless specifically indicated.

33  
34 **CONCEALED SPLINE CEILINGS:**

35 Removable sections of ceiling tile held in position with metal slats or tabs compatible with the ceiling system  
36 used will be provided under Section 09500.

37  
38 **METAL PAN CEILINGS:**

39 Removable sections of ceiling tile held in position by a pressure fit will be provided under Section 09500.

40  
41 **MASONRY WALLS, GYPSUM BOARD AND PLASTER WALLS AND CEILINGS:**

42 16 gauge frame with not less than a 20 gauge hinged door panel, prime coated steel for general applications,  
43 stainless steel for use in toilets, showers, and similar wet areas, concealed hinges, screwdriver operated cam  
44 latch for general applications, key lock for use in public or secured areas, UL listed for use in fire rated  
45 partitions if required by the application. Use the largest size access opening possible, consistent with the  
46 space and the item needing service; minimum size is 12" by 12".

47  
48 **IDENTIFICATION**

49 **STENCILS:**

50 Not less than 1 inch high letters/numbers for marking pipe and equipment.

51  
52 **ENGRAVED NAME PLATES:**

53 White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, screw mounting,  
54 Setonply Style 2060 by Seton Name Plate Company or Emedolite Style EIP by EMED Co., or equal by W.  
55 H. Brady.

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**ADHESIVE LABELS:**

Pressure-sensitive, adhesive backed, vinyl pipe markers with applicable labeling, 3/4" min. size for lettering and surrounding tape on both ends. With flow arrows on piping. Conforming to ANSI, ANSI and NFPA standards. Seton Opti-Code, MSI, Brady or approved equal. Clean piping before application.

**SNAP-AROUND PIPE MARKERS:**

One-piece, preformed, vinyl construction, snap-around or strap-around pipe markers with applicable labeling and flow direction arrows, 3/4" min. size for lettering. Provide nylon ties on each end of pipe markers. Equal to Seton Setmark.

**VALVE TAGS:**

Round brass tags with 1/2 inch numbers, 1/4 inch system identification abbreviation, 1-1/4 inch minimum diameter, with brass jack chains, brass "S" hooks or one piece nylon ties around the valve stem, available from EMED Co., Seton Name Plate Company, or W. H. Brady.

**UNDERGROUND WARNING TAPE:**

Detectable underground warning tape, 5.0 mil overall thickness, 6" width, .0035" thick aluminum foil core with polyethylene jacket bonded to both sides. Color code tape and print caution along with name of buried service in bold letters on face of tape. Thor Enterprises Magnatec or equal by Carlton, MSI Marking Services, Seton.

**UNDERGROUND TRACER WIRE:**

All underground non-metallic sewers/mains and water services/mains shall be provided with tracer wire installations. Tracer wire installations shall conform with Section 182.0715(2r) of Wisconsin Statutes and prevailing DSPS Chapter 384 requirements. Tracer wire shall be continuous solid copper or steel plastic coated with split bolt or compression-type connectors.

**SEALING AND FIRE STOPPING**

**FIRE AND/OR SMOKE RATED PENETRATIONS:**

Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with section 07 84 00 "Fire Stopping".

**NON-RATED PENETRATIONS:**

In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated pipe and the cored opening or a water-stop type wall sleeve. The operating bolts of the mechanical type seal shall be accessible from the interior of the building.

At pipe penetrations of non-rated interior partitions, floors and exterior walls, use urethane caulk in annular space between pipe insulation and sleeve. For non-rated drywall, plaster or wood partitions where sleeve is not required use urethane caulk in annular space between pipe insulation and wall material

**PART 3 - EXECUTION**

**DEMOLITION**

Perform all demolition as indicated on the drawings to accomplish new work. Where demolition work is to be performed adjacent to existing work that remains in an occupied area, construct temporary dust partition to minimize the amount of contamination of the occupied space. Where pipe is removed and not reconnected with new work, cap ends of existing services as if they were new work. Coordinate work with the Owner to minimize disruption to the existing building occupants.

1  
2 All pipe, fixtures, equipment, wiring and associated conduit, insulation and similar items demolished,  
3 abandoned, or deactivated are to be removed from the site by the Contractor except as specifically noted  
4 otherwise. All designated equipment is to be turned over to the user agency for their use at a place and time  
5 so designated. Maintain the condition of material and/or equipment that is indicated to be reused equal to  
6 that existing before work began.

7  
8 **CONCRETE WORK**

9 Cast-in-place concrete within the building will be performed by the Division 3 Contractor unless otherwise  
10 noted. Provide all layout drawings, anchor bolts, metal shapes, and/or templates required to be cast into  
11 concrete or used to form concrete for support or installation of plumbing piping, fixtures, specialties and  
12 equipment. Coordinate locations of equipment, pipe penetrations in wet areas, etc. with the Division 3  
13 Contractor.

14  
15 Plumbing related cast-in-place concrete on the exterior of the building to be provided by this Contractor in  
16 conformance with requirements of Division 3. This includes piping thrust restraints, pipe supports, hydrant  
17 supports, manholes, catch basins, grease traps, septic tanks, distribution boxes, valve pits, meter pits, cleanout  
18 cover pads, yard hydrant pads, etc.

19  
20 **CUTTING AND PATCHING**

21 Refer to Division 1, General Requirements, Cutting and Patching.

22  
23 **BUILDING ACCESS**

24 Arrange for the necessary openings in the building to allow for admittance or removal of all apparatus. When  
25 the building access was not previously arranged and must be provided by this contractor, restore any opening  
26 to its original condition after the apparatus has been brought into the building.

27  
28 **EQUIPMENT ACCESS**

29 Install all piping, conduit and accessories to permit access to equipment for maintenance and service.  
30 Coordinate the exact location of wall and ceiling access panels and doors with the General Prime Contractor,  
31 making sure that access is available for all equipment and specialties. Access doors in general construction  
32 are to be furnished by the Plumbing Contractor and installed by the General Prime Contractor.

33  
34  
35 Provide color coded thumb tacks or screws, depending on the surface, for use in accessible ceilings which do  
36 not require access panels.

37  
38 **COORDINATION**

39 Coordinate all work with other contractors prior to installation. Any work that is not coordinated and that  
40 interferes with other contractor's work shall be removed or relocated at the installing contractor's expense.

41  
42 Verify that all devices are compatible for the type of construction and surfaces on which they will be used.

43  
44 **IDENTIFICATION**

45 Identify equipment in mechanical equipment rooms by stenciling equipment number and service with one  
46 coat of black enamel against a light background or white enamel against a dark background. Use a primer  
47 where necessary for proper paint adhesion.

48  
49 Where stenciling is not appropriate for equipment identification, engraved name plates may be used.

50  
51 Identify interior piping not less than once every 30 feet, not less than once in each room, adjacent to each  
52 access door or panel, and on both side of the partition where accessible piping passes through walls or floors.  
53 Place flow directional arrows at each pipe identification location. Use one coat of black enamel against a  
54 light background or white enamel against a dark background.

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Identify all exterior buried piping for entire length with underground warning tape except for sewer piping which is routed in straight lines between manholes or cleanouts. Place tape 6"-12" below finished grade along entire length of pipe. Extend tape to surface at building entrances, meters, hydrants and valves. Where existing underground warning tape is broken during excavation, replace with new tape identifying appropriate service and securely spliced to ends of existing tape.

Identify valves with brass tags bearing a system identification and a valve sequence number. Identify medical gas and vacuum valves with brass tags and wall or cabinet mounted color coded engraved nameplate with the following "(Type of Gas) Shutoff Valve for (Location or Zone)". Valve tags are not required at a terminal device unless the valves are greater than ten feet from the device, located in another room or not visible from device. Provide a typewritten valve schedule and pipe identification schedule indicating the valve number and the equipment or areas supplied by each valve and the symbols used for pipe identification; locate schedules in mechanical room and in each Operating and Maintenance manual. Schedule in mechanical room to be framed under clear plastic.

**SLEEVES AND OPENINGS**

Pipe penetrations in existing concrete floors: Core drill openings.

**SEALING AND FIRE STOPPING**

**FIRE AND/OR SMOKE RATED PENETRATIONS:**

Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with section 07 84 00 Fire Stopping.

**NON-RATED PARTITIONS:**

At all interior partitions and exterior walls, pipe penetrations are required to be sealed. Apply sealant to both sides of the penetration in such a manner that the annular space between the pipe sleeve or cored opening and the pipe or insulation is completely blocked.

END OF SECTION





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**SECTION 22 05 14**  
**PLUMBING SPECIALTIES**  
**BASED ON DFD MASTER SPECIFICATION DATED 10/1/12**

**PART 1 - GENERAL**

**SCOPE**

This section includes specifications for floor drains, roof drains, cleanouts, backflow preventers, water hammer arrestors and other miscellaneous plumbing specialties.

**PART 1 - GENERAL**

- Scope
- Related Documents
- Reference
- Reference Standards
- Quality Assurance
- Shop Drawings
- Operation and Maintenance Data

**PART 2 - PRODUCTS**

- Cleanouts
- Water Hammer Arrestors

**PART 3 - EXECUTION**

- Installation
- Construction Verification Items
- Agency Training

**RELATED DOCUMENTS**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 22 08 00 – Commissioning of Plumbing
- Section 22 11 00 - Facility Water Distribution
- Section 22 13 00 - Facility Sanitary Sewerage
- Section 22 05 23 - General-Duty Valves for Plumbing Piping

**REFERENCE**

Applicable provisions of Division 1 shall govern work under this section.

**REFERENCE STANDARDS**

- ANSI A112.26.1/PDI WH-201 - Water Hammer Arrestors.
- ASSE 1010 - Water Hammer Arrestors.

**QUALITY ASSURANCE**

Substitution of Materials: Refer to Section GC - General Conditions of the Contract, Equals and Substitutions..

Plumbing products requiring approval by the State of Wisconsin Dept. of Safety and Professional Services must be approved or have pending approval at the time of shop drawing submission.

**SHOP DRAWINGS**

Include data concerning dimensions, capacities, materials of construction, ratings, certifications, weights, manufacturer's installation requirements, manufacturer's performance limitations, and appropriate identification.

**OPERATION AND MAINTENANCE DATA**

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

**PART 2 - PRODUCTS**

**CLEANOUTS**

1 Manufacturer: Josam, Smith, Wade, Watts, Zurn.

2  
3 INTERIOR HORIZONTAL LINES: Cast iron hub with tapped ferrule and tapered threaded ABS or PVC  
4 closure plug, or no-hub coupling and blind plug.

5  
6 **WATER HAMMER ARRESTORS**

7 Manufacturer: PPP Industries, Sioux Chief, Wade, Watts.

8  
9 ANSI A112.26.1, ASSE 1010; sized in accordance with PDI WH-201, precharged piston type constructed  
10 of hard drawn Type K copper, threaded brass adapter, brass piston with o-ring seals, FDA approved  
11 silicone lubricant, suitable for operation in temperature range 35 to 150 degrees F, maximum 250 psig  
12 working pressure, 1500 psig surge pressure. Watts series 15.

13  
14  
15 **PART 3 - EXECUTION**

16  
17 **INSTALLATION**

18 Coordinate location and setting of plumbing specialties with adjacent construction. Install in accordance with  
19 manufacturers recommendations.

20 Install water hammer arrestors where indicated and at quick closing valve installations.

21  
22  
23  
24  
25 **CONSTRUCTION VERIFICATION ITEMS**

26 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
27 Section 22 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
28 or 01 91 02.

29  
30 **AGENCY TRAINING**

31 All training provided for agency shall comply with the format, general content requirements and submission  
32 guidelines specified under Section 01 91 01 or 01 91 02.

33  
34 **END OF SECTION**  
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**SECTION 22 05 23**  
**GENERAL DUTY VALVES FOR PLUMBING PIPING**  
**BASED ON DFD MASTER SPECIFICATION DATED 01/31/2024**

**PART 1 - GENERAL**

**SCOPE**

This section includes valve specifications for all Plumbing systems except where indicated under Related Work. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference
- Lead Free Requirements
- Quality Assurance
- Submittals
- Operation and Maintenance Data
- Design Criteria

**PART 2 - PRODUCTS**

- Water System Valves
  - Ball Valves
  - Swing Check Valves
  - Balance Valves

**PART 3 - EXECUTION**

- General
- Shut-off Valves
- Balancing Valves
- Swing Check Valves

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 22 05 00 Common Work Results for Plumbing
- Section 22 05 14 - Plumbing Specialties

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**LEAD FREE REQUIREMENTS**

All materials that contact potable water shall be lead free. Lead free refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content  $\leq 0.25\%$  per the Federal Safe Drinking Water Act as amended January 4th 2011 Section 1417.

**QUALITY ASSURANCE**

Substitution of Materials: Refer to Section GC - General Conditions of the Contract, Equals and Substitutions.

**SUBMITTALS**

Schedule of all valves indicating type of service, dimensions, materials of construction, and pressure/temperature ratings for all valves to be used on the project. Temperature ratings specified are for continuous operation.

1 **OPERATION AND MAINTENANCE DATA**

2 All operations and maintenance data shall comply with the submission and content requirements specified  
3 under section GENERAL REQUIREMENTS.

4  
5 **DESIGN CRITERIA**

6  
7 Where valve types (ball, butterfly, etc.) are specified for individual plumbing services (i.e. domestic water,  
8 gas, etc.), each valve type shall be of the same manufacturer unless prior written approval is obtained from  
9 the Owner.

10  
11 Valves to be line size unless specifically noted otherwise.

12  
13 **PART 2 - PRODUCTS**

14  
15 **WATER SYSTEM VALVES**

16 All water system valves to be rated at not less than 125 water working pressure at 240 degrees F unless noted  
17 otherwise.

18  
19 **BALL VALVES:**

20 3" and smaller: Two piece bronze body; sweat, threaded or ASTM F1960 joint connection ends, full port  
21 stainless steel ball and stem; glass filled teflon seat; teflon packing and threaded packing nut; blowout-proof  
22 stem; 600 psig WOG. Provide valve stem extensions for valves installed in all piping with insulation. Nibco  
23 585-70-66 LF or equal by Apollo, Milwaukee, Watts.

24  
25 **SWING CHECK VALVES:**

26 3" and smaller: Bronze body, sweat or threaded ends, Y-pattern, regrindable bronze seat, renewable bronze  
27 disc, Class 125, suitable for installation in a horizontal or vertical line with flow upward. Hammond UP904,  
28 Milwaukee UP509, Nibco S413-Y-LF, Watts LFCV, Apollo equal.

29  
30 **BALANCE VALVES:**

31 2" and smaller: Brass body, 304 stainless steel ball, sweat or threaded ends, glass filled teflon seat, brass  
32 readout valves with EPT checks, with adjustable memory stop position indicator and extended handle stem,  
33 suitable for 300 psig water working pressure at 200 degrees F. B&G Xylem Circuit Setter Plus CB1SLF/CB-  
34 1LF, or equal by Nibco, Red and White Valve or Watts.

35  
36  
37 **PART 3 - EXECUTION**

38  
39 **GENERAL**

40 Properly align piping before installation of valves. Install and test valves in strict accordance with valve  
41 manufacturer's installation recommendations. Do not support weight of piping system on valve ends.

42  
43 Mount valves in locations which allow access for operation, servicing and replacement.

44  
45 Provide valve handle extensions for all valves installed in insulated piping.

46  
47 Install all valves with the stem in the upright or horizontal position. If possible, install butterfly valves with  
48 the stem in the horizontal position. Valves installed with the stems down will not be accepted.

49  
50 Prior to flushing of piping systems, place all valves in the full-open position.

51  
52 **SHUT-OFF VALVES**

53 Install shut-off valves at each piece of equipment and plumbing fixture, at each branch take-off from mains  
54 for isolation or repair and elsewhere as indicated.

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**BALANCING VALVES**

Install where indicated on the drawings and details for balancing of flow in pumped hot water recirculation piping systems.

Upon project completion, adjust each valve and set position stop. Balance system to minimum flow in return piping branches needed to maintain even supply water temperature throughout building.

**SWING CHECK VALVES**

Install swing check valves in recirculation branch lines and elsewhere as indicated. Provide weighted swing check valves at sanitary sump pump discharges.

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**SECTION 22 05 29**  
**HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT**  
**BASED ON DFD MASTER SPECIFICATION DATED 3/17/2023**

**PART 1 - GENERAL**

**SCOPE**

This section includes specifications for supports of all plumbing equipment and materials as well as piping system anchors. Included are the following topics:

**PART 1 - GENERAL**

Scope

Related Work

Reference

Reference Standards

Quality Assurance

Description

Shop Drawings

Design Criteria

**PART 2 - PRODUCTS**

Manufacturers

Structural Supports

Pipe Hangers and Supports

Beam Clamps

Riser Clamps

Concrete Inserts

**PART 3 - EXECUTION**

Installation

Hanger and Support Spacing

Riser Clamps

Concrete Inserts

**RELATED WORK**

Section 01 91 01 – Commissioning Process

Section 22 07 00 - Plumbing Insulation for insulation protection at support devices.

**REFERENCE**

Applicable provisions of Division 1 shall govern work under this section.

**REFERENCE STANDARDS**

MSS SP-58

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**QUALITY ASSURANCE**

Substitution of Materials: Refer to Section GC - General Conditions of the Contract, Equals and Substitutions.

**DESCRIPTION**

Provide all supporting devices as required for the installation of mechanical equipment and materials. All support and installation procedures are to conform to the latest requirements of the ANSI Code for building piping.

Do not hang any mechanical item directly from a metal deck or run piping so its rests on the bottom chord of any truss or joist.

1  
2 Fasteners depending on soft lead for holding power or requiring powder actuation will not be accepted.

3  
4 Support apparatus and material under all conditions of operation, variations in installed and operating  
5 weight of equipment and piping, to prevent excess stress, and allow for proper expansion and contraction.

6  
7 Protect insulation at all hanger points; see Related Work above.

#### 8 9 **SHOP DRAWINGS**

10 Schedule of all hanger and support devices indicating attachment methods and type of device for each pipe  
11 size and type of service.

12  
13 All submittals are to comply with submission and content requirements specified with in section [17 00 00].

#### 14 15 **DESIGN CRITERIA**

16 Materials and application of pipe hangers and supports shall be in accordance with MSS Standard Practice  
17 SP-58 unless noted otherwise.

## 18 19 **PART 2 - PRODUCTS**

#### 20 21 **MANUFACTURERS**

22 Anvil, B-Line, FNW, G-Strut, Pate, Piping Technology, Roof Products & Systems or approved equal.

#### 23 24 **STRUCTURAL SUPPORTS**

25 Provide all supporting steel required for the installation of mechanical equipment and materials, including  
26 angles, channels, beams, etc. to suspended or floor supported tanks and equipment. All of this steel may  
27 not be specifically indicated on the drawings.

#### 28 29 **PIPE HANGERS AND SUPPORTS**

30 **HANGERS FOR PIPE SIZES 1/2" THROUGH 2":**

31 Carbon steel, adjustable swivel ring. B-Line B3170NF, Anvil 69 or 70.

32 Carbon steel, adjustable clevis, standard. B-Line B3100, Anvil 260.

33  
34 **HANGERS FOR PIPE SIZES 2" AND LARGER:**

35 Carbon steel, adjustable clevis, standard. B-Line B3100, Anvil 260.

36  
37 **MULTIPLE OR TRAPEZE HANGERS:**

38 Steel channels with welded spacers and hanger rods.

39  
40 **WALL SUPPORT:**

41 Carbon steel welded bracket with hanger. B-Line 3068 Series, Anvil 194 Series.

42  
43 Perforated, epoxy painted finish, 16-12 gauge, min., steel channels securely anchored to wall structure,  
44 with interlocking, split-type, bolt secured, galvanized pipe/tubing clamps. B-Line type S channel with B-  
45 2000 series clamps, Anvil type PS 200 H with PS 1200 clamps. When copper piping is being supported,  
46 provide flexible elastomeric/thermoplastic isolation cushion material to completely encircle the piping and  
47 avoid contact with the channel or clamp, equal to B-Line B1999 Vibra Cushion or provide manufacturers  
48 clamp and cushion assemblies, B-Line BVT series, Anvil PS 1400 series.

49  
50 **VERTICAL SUPPORT:**

51 Carbon steel riser clamp. B-Line B3373, Anvil 261 for above floor use.

52  
53 **FLOOR SUPPORT:**

54 Carbon steel pipe saddle, stand and bolted floor flange. B-Line B3088T/B3093.



1  
 2 **COPPER PIPE SUPPORTS:**  
 3 All supports, fasteners, clamps, etc. directly connected to copper piping shall be copper plated or  
 4 polyvinylchloride coated. Where steel channels are used, provide isolation collar between  
 5 supports/clamps/fasteners and copper piping.  
 6  
 7 **GLASS PIPE SUPPORTS:**  
 8 All supports, clamps, etc. directly connected to glass piping shall be fully lined with 1/4" neoprene padding.  
 9

10 **PIPE HANGER RODS**

11 **STEEL HANGER RODS:**  
 12 Threaded both ends, threaded one end, or continuous threaded, complete with adjusting and lock nuts.  
 13  
 14 Size rods for individual hangers and trapeze support as indicated in the following schedule.  
 15

16 Total weight of equipment, including valves, fittings, pipe, pipe content, and insulation, are not to exceed  
 17 the limits indicated.

18	Maximum Load (Lbs.)	Rod Diameter
19	<u>(650°F Maximum Temp.)</u>	<u>(inches)</u>
20	610	3/8
21	1130	1/2
22	1810	5/8
23	2710	3/4
24	3770	7/8
25	4960	1
26	8000	1-1/4

27  
 28 **BEAM CLAMPS**

29 MSS SP-58 Types 19 & 23 malleable black iron clamp for attachment to beam flange to 0.62 inches thick  
 30 with a retaining ring and threaded rod of 3/8, 1/2, and 5/8 inch diameter. Furnish with a hardened steel cup  
 31 point set screw. B-Line B3036L/B3034, Anvil 86/92.  
 32  
 33 MSS SP-58 Type 28 or Type 29 forged steel jaw type clamp with a tie rod to lock clamp in place, suitable  
 34 for rod sizes to 1-1/2 inch diameter. B-Line B3054, Anvil 228.  
 35

36 **CONCRETE INSERTS**

37  
 38 **DRILLED FASTENERS:**  
 39 Carbon steel drop-in type expansion anchors, vibration resistant, with ASTM B633 zinc plating. Use drill  
 40 bit of same manufacturer as anchor. Hilti, Rawl, Redhead.  
 41

42 **PART 3 - EXECUTION**

43  
 44 **INSTALLATION**

45 Size, apply and install supports and anchors in compliance with manufacturers recommendations.  
 46  
 47 Install supports to provide for free expansion of the piping system. Support all piping from the structure  
 48 using concrete inserts, beam clamps, ceiling plates, wall brackets, or floor stands. Fasten ceiling plates and  
 49 wall brackets securely to the structure and test to demonstrate the adequacy of the fastening.  
 50  
 51 Coordinate hanger and support installation to properly group piping of all trades.  
 52  
 53 Trim steel hanger rods to within one inch of the final lock nut position. Hanger and support cutoff burrs  
 54 shall be removed and sharp edges ground smooth.

1  
2 Where piping can be conveniently grouped to allow the use of trapeze type supports, use standard structural  
3 shapes or continuous insert channels for the supporting steel. Where continuous insert channels are used,  
4 pipe supporting devices made specifically for use with the channels may be substituted for the specified  
5 supporting devices provided that similar types are used and all data is submitted for prior approval.  
6

7 Size and install hangers and supports, except for riser clamps, for installation on the exterior of piping  
8 insulation. Where a vapor barrier is not required, hangers may be installed either on the exterior of pipe  
9 insulation or directly on piping.  
10

11 Perform welding in accordance with standards of the American Welding Society.  
12

### 13 **HANGER AND SUPPORT SPACING**

14 Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.  
15

16 Place a hanger within 12 inches of each horizontal elbow, valve, strainer, or similar piping specialty item.  
17

18 Use hangers with 1-1/2 inch minimum vertical adjustment.  
19

20 Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze  
21 hangers.  
22

23 Support riser piping independently of connected horizontal piping.  
24

25 Adjust hangers to obtain the slope specified in the piping section of these specifications.  
26

27 Space hangers for pipe as follows:

<u>Pipe Material</u>	<u>Pipe Size</u>	<u>Max. Horiz. Spacing</u>	<u>Max. Vert. Spacing</u>
28 Cast Iron	2" and larger	5'-0"	15'-0"
29 Copper	1/2" through 3/4"	5'-0"	10'-0"
30 Copper	1" through 1-1/4"	6'-0"	10'-0"
31 Copper	1-1/2" through 2-1/2"	8'-0"	10'-0"
32 Copper	3"	10'-0"	10'-0"
33 Copper	4" and larger	12'-0"	10'-0"
34 Ductile Iron	All	10'-0"	20'-0"
35 Glass	Per Pipe Mfr.	8'-0"	12'-0"
36 Steel	1/2" through 1-1/4"	7'-0"	15'-0"
37 Steel	1-1/2" through 6"	10'-0"	15'-0"
38 Steel	8" through 12"	14'-0"	20'-0"
39 Steel	14" and over	20'-0"	20'-0"
40 Plastic	Drain and Vent	4'-0"	10'-0"
41 PEXa*	Tubing* 1/2" through 3/4"	6'-0"	4'-0"
42 PEXa*	Tubing* 1" through 1-1/2"	8'-0"	4'-0"
43 Plastic	Pure Water 1-1/2"		
44 or less		Continuous	5'-0"

45  
46  
47 \*PEXa Tubing shall have PEXa continuous pipe support with stainless steel strapping around insulated  
48 pipe. PEXa tubing without continuous channel (at fittings) shall be supported no less than every 32".  
49

### 50 **RISER CLAMPS**

51 Support vertical piping with clamps secured to the piping and resting on the building structure or secured to  
52 the building structure below at each floor.  
53

END OF SECTION

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**SECTION 22 07 00**  
**PLUMBING INSULATION**  
**BASED ON DFD MASTER SPECIFICATION DATED 10/1/12**

**PART 1 - GENERAL**

**SCOPE**

This section includes insulation specifications for plumbing piping and equipment. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference Standards
- Quality Assurance
- Description
- Definitions
- Shop Drawings
- Operation and Maintenance Data

**PART 2 - PRODUCTS**

- Materials
- Insulation & Jackets
- Accessories

**PART 3 - EXECUTION**

- Installation
- Piping, Valve and Fitting Insulation
- Equipment Insulation
- Construction Verification Items

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 22 08 00 – Commissioning of Plumbing
- Section 22 05 00 - Common Work Results for Plumbing
- Section 22 11 00 - Facility Water Distribution
- Section 22 13 00 - Facility Sanitary Sewerage
- Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**REFERENCE STANDARDS**

- ASTM B209 Aluminum and Aluminum Alloy Sheet and Plate
- ASTM C165 Test Method for Compressive Properties of Thermal Insulations
- ASTM C177 Heat Flux and Thermal Transmission Properties
- ASTM C195 Mineral Fiber Thermal Insulation Cement
- ASTM C240 Cellular Glass Insulation Block
- ASTM C302 Density of Preformed Pipe Insulation
- ASTM C303 Density of Preformed Block Insulation
- ASTM C449 Mineral Fiber Hydraulic Setting Thermal Insulation Cement
- ASTM C518 Heat Flux and Thermal Transmission Properties
- ASTM C533 Calcium Silicate Block and Pipe Thermal Insulation
- ASTM C534 Preformed Flexible Elastomeric Thermal Insulation
- ASTM C547 Mineral Fiber Preformed Pipe Insulation
- ASTM C552 Cellular Glass Block and Pipe Thermal Insulation
- ASTM C553 Mineral Fiber Blanket and Felt Insulation

1	ASTM C578	Preformed, Block Type Cellular Polystyrene Thermal Insulation
2	ASTM C591	Preformed Rigid Cellular Polyurethane Thermal Insulation
3	ASTM C610	Expanded Perlite Block and Thermal Pipe Insulation
4	ASTM C612	Mineral Fiber Block and Board Thermal Insulation
5	ASTM C921	Properties of Jacketing Materials for Thermal Insulation
6	ASTM C1136	Flexible Low Permeance Vapor Retarders for Thermal Insulation
7	ASTM E84	Surface Burning Characteristics of Building Materials
8	MICA	National Commercial & Industrial Insulation Standards
9	NFPA 225	Surface Burning Characteristics of Building Materials
10	UL 723	Surface Burning Characteristics of Building Materials

11

12 **QUALITY ASSURANCE**

13 Substitution of Materials: Refer to Section GC - General Conditions of the Contract, Equals and  
14 Substitutions.

15

16 Label all insulating products delivered to the construction site with the manufacturer's name and description  
17 of materials.

18

19 **DESCRIPTION**

20 Furnish and install all insulating materials and accessories as specified or as required for a complete  
21 installation. The following types of insulation are specified in this section:

- 22 • Pipe Insulation
- 23 • Equipment Insulation

24

25 Install all insulation in accordance with the latest edition of MICA (Midwest Insulation Contractors  
26 Association) Standard and manufacturer's installation instructions. Exceptions to these standards will only  
27 be accepted where specifically modified in these specifications, or where prior written approval has been  
28 obtained from the UWM Project Representative.

29

30 **DEFINITIONS**

31 Concealed: shafts, furred spaces, space above finished ceilings, utility tunnels and crawl spaces. All other  
32 areas, including walk-through tunnels, shall be considered as exposed.

33

34 **SHOP DRAWINGS**

35 Submit a schedule of all insulating materials to be used on the project, including adhesives, fastening  
36 methods, fitting materials along with material safety data sheets and intended use of each material. Include  
37 manufacturer's technical data sheets indicating density, thermal characteristics, jacket type, and  
38 manufacturer's installation instructions.

39

40 **OPERATION AND MAINTENANCE DATA**

41 All operations and maintenance data shall comply with the submission and content requirements specified  
42 under section GENERAL REQUIREMENTS.

43

44

**PART 2 - PRODUCTS**

45

46 **MATERIALS**

47 Materials or accessories containing asbestos will not be accepted.

48

49 Use composite insulation systems (insulation, jackets, sealants, mastics, and adhesives) that have a flame  
50 spread rating of 25 or less and smoke developed rating of 50 or less, with the following exceptions:

51

52       Insulation which is not located in an air plenum may have a flame spread rating not over 25 and a  
53       smoke developed rating no higher than 150.

54

1 **INSULATION AND JACKETS**

2 Manufacturers: Armstrong, Certainteed Manson, Childers, Dow, Extol, Halstead, H.B. Fuller, Imcoa, Knauf,  
3 Owens-Corning, Pittsburgh Corning, Rubatex, Johns-Mansville, or approved equal.

4  
5 Insulating materials shall be fire retardant, moisture and mildew resistant, and vermin proof. Insulation shall  
6 be suitable to receive jackets, adhesives and coatings as indicated.

7  
8 **RIGID FIBERGLASS INSULATION:**

9 Minimum nominal density of 3 lbs. per cu. ft., and thermal conductivity of not more than 0.23 at 75 degrees  
10 F, minimum compressive strength of 25 PSF at 10% deformation, rated for service to 450 degrees F.

11  
12 White kraft reinforced foil vapor barrier all service jacket, factory applied to insulation with a self-sealing  
13 pressure sensitive adhesive lap, maximum permeance of .02 perms and minimum beach puncture resistance  
14 of 50 units.

15  
16 **PVC FITTING COVERS AND JACKETS:**

17 White PVC film, gloss finish one side, semi-gloss other side, FS LP-535D, Composition A, Type II, Grade  
18 GU. Ultraviolet inhibited indoor/outdoor grade to be used where exposed to high humidity, ultraviolet  
19 radiation, in kitchens or food processing areas or installed outdoors. Jacket thickness to be .02 inch (20 mil).

20  
21 **INSULATION INSERTS AND PIPE SHIELDS**

22 Manufacturers: B-Line, Pipe Shields, Value Engineered Products

23  
24 Construct inserts with calcium silicate, minimum 140 psi compressive strength. Piping 12" and larger,  
25 supplement with high density 600 psi structural calcium silicate insert. Provide galvanized steel shield. Insert  
26 and shield to be minimum 180 degree coverage on bottom of supported piping and full 360 degree coverage  
27 on clamped piping. On roller mounted piping and piping designed to slide on support, provide additional load  
28 distribution steel plate.

29  
30 Where contractor proposes shop/site fabricated inserts and shields, submit schedule of materials, thicknesses,  
31 gauges and lengths for each pipe size to demonstrate equivalency to pre-engineered pre-manufactured  
32 product described above. On low temperature systems, extruded polystyrene may be substituted for calcium  
33 silicate provided insert and shield length and gauge are increased to compensate for lower insulation  
34 compressive strength.

35  
36 Precompressed 20# density molded fiberglass blocks, Hamfab or equal, of same thickness as adjacent  
37 insulation may be substituted for calcium silicate inserts with one 1"x 6" block for piping through 2-1/2" and  
38 three 1" x 6" blocks for piping through 4". Submit shield schedule to demonstrate equivalency to pre-  
39 engineered/pre-manufactured product described above.

40  
41 Wood blocks will not be accepted.

42  
43 **ACCESSORIES**

44 All products shall be compatible with surfaces and materials on which they are applied, and be suitable for  
45 use at operating temperatures of the systems to which they are applied.

46  
47 Adhesives, sealants, and protective finishes shall be as recommended by insulation manufacturer for  
48 applications specified.

49  
50 Insulation bands to be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness to be  
51 .015 inch for aluminum and .010 inch for stainless steel.

52  
53 Tack fasteners to be stainless steel ring grooved shank tacks.

54

1 Staples to be clinch style.  
2  
3 Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.  
4  
5 Finishing cement to be ASTM C449.  
6  
7 Fibrous glass or canvas fabric reinforcing shall have a minimum untreated weight of 6 oz./sq. yd.  
8  
9 Bedding compounds to be non-shrinking and permanently flexible.  
10  
11 Vapor barrier coatings to be non-flammable, fire resistant, polymeric resin.  
12  
13 Fungicidal water base coating (Foster 40-20 or equal) to be compatible with vapor barrier coating.  
14  
15

### 16 **PART 3 - EXECUTION**

#### 17 **INSTALLATION**

18 Install insulation, jackets and accessories in accordance with manufacturers instructions and under ambient  
19 temperatures and conditions recommended by manufacturer. Surfaces to be insulated must be clean and dry.  
20  
21

22 Do not insulate systems or equipment which are specified to be pressure tested or inspected, until testing,  
23 inspection and any necessary repairs have been successfully completed.  
24

25 Install insulation with smooth and even surfaces. Poorly fitted joints or use of filler in voids will not be  
26 accepted. Cover and seal exposed fiberglass insulation when insulation is terminated, no raw fiberglass  
27 insulation is allowed. Provide neat and coated terminations at all nameplates, uninsulated fittings, or at other  
28 locations where insulation terminates. Install with longitudinal joints facing wall or ceiling.  
29

30 Install fabric reinforcing without wrinkles. Overlap seams a minimum of 2 inches.  
31

32 Use full-length material (as delivered from manufacturer) wherever possible. Scrap piecing of insulation or  
33 pieces cut undersize and stretched to fit will not be accepted.  
34

35 Insulation shall be continuous through sleeves and openings. Vapor barriers shall be maintained continuous  
36 through all penetrations.  
37

38 Provide a complete vapor barrier for insulation on the following systems:

- 39 • Cold water (potable and non-potable)
  - 40 • Storm Water
  - 41 • Equipment piping with a surface temperature below 65 degrees F
- 42

#### 43 **PIPING, VALVE, AND FITTING INSULATION**

##### 44 **GENERAL:**

45 Install insulation with butt joints and longitudinal seams closed tightly. Provide minimum 2" lap on jacket  
46 seams and 2" tape on butt joints, firmly cemented with lap adhesive. Additionally secure with staples along  
47 seams and butt joints. Coat staples with vapor barrier mastic on systems requiring vapor barrier.  
48

49 Water supply piping insulation shall be continuous throughout the building and installed adjacent to and  
50 within building walls to a point directly behind the fixture that is being supplied.  
51

52 Install insulation continuous through pipe hangers and supports with hangers and supports on the exterior of  
53 insulation. Where a vapor barrier is not required, hangers and supports may be attached directly to piping  
54 with insulation completely covering hanger or support and jacket sealed at support rod penetration. Where

1 riser clamps are required to be attached directly to piping requiring vapor barrier, extend insulation and vapor  
2 barrier jacketing/coating around riser clamp.

3  
4 **INSULATION INSERTS AND PIPE SHIELDS:**

5 Provide insulation inserts and pipe shields at all hanger and support locations. Inserts may be omitted on 3/4"  
6 and smaller copper piping provided 12" long 22 gauge pipe shields are used.

7  
8 **FITTINGS AND VALVES:**

9 Fittings, valves, unions, flanges, couplings and specialties may be insulated with factory molded or built up  
10 insulation of the same thickness as adjoining insulation. Cover insulation with fabric reinforcing and mastic  
11 or where temperatures do not exceed 150 degrees, PVC fitting covers. Secure PVC fitting covers with tack  
12 fasteners and 1-1/2" band of mastic over ends, throat, seams or penetrations. On systems requiring vapor  
13 barrier, use vapor barrier mastic.

14  
15 **PROTECTIVE JACKETS:**

16  
17 Provide a protective metal jacket for the following insulated piping: \_\_\_\_\_  
18 Lap seams a minimum of 2 inches. Secure with metal bands for end to end joints, and rivets or sheet metal  
19 screws for longitudinal joints. Rivets, screws, and bands to be constructed of the same material as the  
20 jacket. Locate seams on bottom for exterior applications.

21  
22 **PIPE INSULATION SCHEDULE:**

23 Provide insulation on new and existing remodeled piping as indicated in the following schedule:

24  
25

Service	Insulation Types	Insulation Thickness by Pipe Size				
		<1-1/4"	1-1/2" to 2"	2-1/2" to 4"	5" to 6"	8" and larger
Hot Water Supply	Rigid Fiberglass	1"	1.5"	1.5"	1.5"	1.5"
Hot Water Circulating	Rigid Fiberglass	1"	1.5"	1.5"		
Cold Water	Rigid Fiberglass	0.5"	1"	1"	1"	1"
All Horizontal Storm Piping and 4'-0" of vertical Piping thereafter, & Roof Drain bodies	Rigid Fiberglass	0.5"	0.5"	0.5"	0.5"	0.5"
Clearwater Waste	Rigid Fiberglass	0.5"	0.5"	0.5"	0.5"	0.5"

33  
34  
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38  
39  
40

41 The following piping and fittings are not to be insulated:

- 42 • Chrome plated exposed supplies and stops (except where specifically noted).
  - 43 • Water hammer arrestors.
  - 44 • Piping unions and flanges for systems not requiring a vapor barrier.
- 45

46 **CONSTRUCTION VERIFICATION ITEMS**

47 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
48 Section 22 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
49 or 01 91 02.

50  
51

END OF SECTION





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**SECTION 22 08 00**  
**COMMISSIONING OF PLUMBING**  
**BASED ON DFD MASTER SPECIFICATION DATED 12/1/16**

**PART 1 - GENERAL**

**SCOPE**

This section includes commissioning forms for construction verification and functional performance testing. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference
- Submittals

**PART 2 - PRODUCTS**

(Not Used)

**PART 3 – EXECUTION**

- Commissioning Forms
- CV-22 07 00 Plumbing Insulation
- CV-22 11 00 Facility Water Distribution
- CV-22 13 00 Facility Sanitary Sewerage
- CV-22 14 00 Facility Storm Drainage
- CV-22 42 00 Commercial Plumbing Fixtures
- CV-22 42 00 Electric Water Coolers

**RELATED WORK**

Section 01 91 01– Commissioning Process

**REFERENCE**

Applicable provisions of Division 1 shall govern work under this section.

**SUBMITTALS**

Reference the General Conditions of the Contract for submittal requirements.

Reference Section 01 91 01 or 01 91 02 Commissioning Process for Construction Verification Checklist and Functional Performance Test submittal requirements.

**PART 2 – PRODUCTS**

(Not Used)

**PART 3 – EXECUTION**

**COMMISSIONING FORMS**

Commissioning forms are to be filled in as work progresses by the individuals responsible for installation and shall be completed for each installation phase.

Provide a description of the work completed since the last entry, the percentage of the total work completed for the system for that area and the step of installation or finalization.

Circle Yes or No for each commissioning form item. If the information requested for an item does not apply to the given stage of installation for the system, list it as “N/A”. Explain all discrepancies, negative responses or N/A responses in the negative responses section.

Once the work is 100% complete and the responses to each item are complete and resolved for a given commissioning forms group, mark as complete, initial and date in the spaces provided.

- 1
- 2 Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress
- 3 meetings.
- 4
- 5

Construction Verification Checklist  
22 05 14 – Plumbing Specialties

Construction Verification Checklist  
22 07 00 – Plumbing Insulation

**CV-22 07 00 – Plumbing Insulation**

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

**PIPING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____				DATE: _____						

**Question Details**

- 1) Piping clean, dry, pressure tested and approved prior to application of insulation.
- 2) Type and thickness of insulation complies with listed specification requirements for given system and pipe size.
- 3) Insulation installed with smooth and even surfaces, without the use of filler in voids.
- 4) Butt joints and longitudinal seams closed tightly with a minimum of 2” lap on jacket seams and 2” tape on butt joints.
- 5) Staples along seams and butt joints provided with vapor barrier mastic provided for staples on systems requiring vapor barrier.
- 6) Full-length material used as possible, with no scrap piecing or stretching of insulation utilized.
- 7) Insulation continuous through sleeves and openings with vapor barriers continuous through all penetrations.
- 8) Complete vapor barrier provided for all cold water, storm water and piping systems with surface temperatures below 65°F.
- 9) Exposed fiberglass insulation covered and sealed at all permanent terminations and at end of work day.
- 10) Piping and direction of flow is labeled per specification requirements.

Construction Verification Checklist  
22 07 00 – Plumbing Insulation

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 07 00 – Plumbing Insulation

**B) VALVE, FITTING & EQUIPMENT INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)					
				1)	2)	3)	4)	5)	6)
				YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____		DATE: _____			

**Question Details**

- 1) Fittings, valves, unions, flanges, couplings and specialties insulated with factory molded or built up insulation of the same thickness as adjoining insulation.
- 2) Insulated fittings, valves, unions, flanges, couplings and specialties covered with fabric reinforcing and mastic or where temperatures do not exceed 150°F, PVC fitting covers.
- 3) PVC fitting covers secured with tack fasteners and 1-1/2" band of mastic over ends, throat, seams or penetrations or for systems requiring vapor barrier, vapor barrier mastic.
- 4) Equipment access manholes, fittings, nameplates or ASME stamps left uninsulated with insulation beveled and sealed at these locations.
- 5) Equipment insulation installed with smooth and even surfaces per specifications requirements.
- 6) No insulation provided at chrome plated exposed supplies and stops (except where specifically noted), water hammer arrestors, and piping unions and flanges for piping systems not requiring a vapor barrier.

Construction Verification Checklist  
22 07 00 – Plumbing Insulation

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

## V-22 11 00 – Facility Water Distribution

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

### A) PRE-INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)		
				1)	2)	3)
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____	DATE: _____	

### Question Details

- 1) All piping, valves, etc. are clean and free of damage prior to installation.
- 2) Temporary protective coating is provided on cast iron and steel valves during storage.
- 3) Temporary end caps are provided on piping and fittings until installation.



Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**B) GENERAL PIPING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				<b>INITIALS:</b> _____				<b>DATE:</b> _____						

**Question Details**

- 1) Piping is free to expand and contract without noise or damage to hangers, joints, or the building.
- 2) Piping is installed in a manner to ensure that insulation will not contact adjacent surfaces.
- 3) Piping is installed with sufficient pitch and arranged in a manner to ensure drainage of entire system.
- 4) Changes in pipe sizes are made with the proper size reducing fittings, reducing elbow or reducing tees, and no bushings are utilized.
- 5) Connections between dissimilar pipe materials are made with dielectric fittings.
- 6) Pipe hanger spacing complies with specification requirements.
- 7) All equipment requiring maintenance is accessible (valves, strainers, etc.).
- 8) Piping allows access to equipment that is part of this system or another system.
- 9) Water piping not installed within exterior walls.
- 10) Open pipe ends capped at completion of work day.

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**C) UNDERGROUND PIPING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)						
				1)	2)	3)	4)	5)	6)	7)
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____			DATE: _____			

**Question Details**

- 1) Exterior water piping installed below predicted frost level in accordance with SPS Table 382.30-6, but in no case less than 6' bury depth to top of pipe.
- 2) Minimum of 8' horizontal distance maintained between 2-1/2" and larger water piping and sanitary sewer piping.
- 3) Minimum of 30" horizontal and 12" vertical distance, water on top, maintained between 2" and smaller water piping and sanitary sewer piping.
- 4) Where water piping crosses a sanitary sewer, minimum 18" vertical clearance add waterproof PVC water pipe sleeve (reference sanitary sewer materials) sealed at both ends for distance of 10' from sewer in both directions provided.
- 5) Thrust restraints provided for 3" and larger exterior water piping joints, hydrants, caps, plugs, fittings and bends of 22-1/2 degrees or more.
- 6) Excavation and backfill meet specification requirements.
- 7) Underground warning tape installed 6"-12" below finished grade above all exterior below ground piping.
- 8) Pipe and fittings encased in a polyethylene wrap per specification.

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**D) VALVE & FITTING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)						
				1)	2)	3)	4)	5)	6)	7)
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____			DATE: _____			

**Question Details**

- 1) All valves are in a horizontal or upright vertical position (not inverted) with handles in an accessible position.
- 2) Valve handle extensions are provided where needed per the specification.
- 3) Drainage valves provided at all low points and downstream of riser isolation valves.
- 4) Isolation valves provided at all equipment connections, main branches and sub-branches, “T” connections, and as necessary for repairing the system as specified in contract documents.
- 5) Riser shutoff valve and a capped hose thread drain valve at the bottom of each riser provided.
- 6) All strainers in piping system have ball valves installed at the tapped screen retainer.
- 7) Yard and wall hydrants installed with discharge above minimum grade clearance requirements noted in specifications.

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**E) TESTING CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)								
				1)	2)	3)	4)	5)	6)	7)	8)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				<b>INITIALS:</b> _____				<b>DATE:</b> _____				

**Question Details**

- 1) Piping tested utilizing water at specified pressure and duration as per specification.
- 2) All leaks identified during testing have been repaired and test re-done until satisfactory conditions are accomplished.
- 3) Test conducted with all piping of tested system or section visible during testing.
- 4) Proceeding system chlorination, all outlets flushed for a minimum of 1 minute with clean water until water runs clear.
- 5) Following initial flush system filled with water and chlorine at 50 PPM and allowed to stand for 24 hours, or system filled and with a water solution containing at least 200 PPM of chlorine and allowed to stand for 3 hours.
- 6) Following specification prescribed stand times for chlorine treatment system flushed until chlorine levels are at source water levels.
- 7) 24 hours after final flushing, water samples of the number and location specified by the Engineer taken for lab testing and results show the absence of coliform bacteria.



Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 11 00 – Facility Water Distribution

**F) FINALIZATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)			
				1)	2)	3)	4)
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____		DATE: _____	

**Question Details**

- 1) All exposed piping which passes through a wall, ceiling or floor is provided with escutcheon plates.
- 2) Piping labels and direction of flow is provided per specification requirements.
- 3) All penetrations through fire rated wall assemblies have been sealed per specification requirements.
- 4) All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.

**Negative Responses**

Group/Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 13 00 – Facility Sanitary Sewerage

## CV-22 13 00 – Facility Sanitary Sewerage

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

### A) PRE-INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)		
				1)	2)	3)
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				<b>INITIALS:</b> _____		<b>DATE:</b> _____

### Question Details

- 1) All piping meets ASTM standards and specifications.
- 2) All piping, etc. is clean and free of damage prior to installation.
- 3) Temporary protective covering is provided on pipe and fittings during storage.

Construction Verification Checklist  
22 13 00 – Facility Sanitary Sewerage

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

Construction Verification Checklist  
22 13 00 – Facility Sanitary Sewerage

**B) GENERAL PIPING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials											
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				<b>INITIALS:</b>				<b>DATE:</b>						

**Question Details**

- 1) Piping is free to expand and contract without noise or damage to hangers, joints, or the building.
- 2) Piping is installed with sufficient pitch and arranged in a manner to ensure drainage of entire system.
- 3) Interior piping pitched to drain at minimum slope of 1/4" per foot where possible and in no case less than 1/8" per foot for piping 3" and larger.
- 4) Changes in pipe sizes are made with the proper size reducing fittings, reducing elbow or reducing tees, and no bushings are utilized.
- 5) Pipe hanger spacing complies with specification requirements.
- 6) All equipment requiring maintenance is accessible (valves, strainers, etc.).
- 7) Drains and cleanouts level and plumb to finished floor, roof or finished wall.
- 8) Minimum clearance of 18" provided for all cleanouts and backwater valves.
- 9) Open pipe ends capped at completion of work day.

Construction Verification Checklist  
22 13 00 – Facility Sanitary Sewerage

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

Construction Verification Checklist  
22 13 00 – Facility Sanitary Sewerage

**C) UNDERGROUND PIPING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)					
				1)	2)	3)	4)	5)	6)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____		DATE: _____			

**Question Details**

- 1) Exterior piping installed below predicted frost level, but in no case less than 5' bury depth to top of pipe.
- 2) Minimum of 8' horizontal distance maintained between 2-1/2" and larger water piping and sanitary sewer piping.
- 3) Minimum of 30" horizontal and 12" vertical distance, water on top, maintained between 2" and smaller water piping and sanitary sewer piping.
- 4) Where water piping crosses a sanitary sewer, minimum 18" vertical clearance and waterproof PVC water pipe sleeve (reference sanitary sewer materials) sealed at both ends for distance of 10' from sewer in both directions provided.
- 5) Excavation and backfill procedures meet specification requirements.
- 6) Piping bedding and backfill materials meet specification requirements.
- 7) Underground warning tape installed 6"-12" below finished grade above all exterior below ground piping.
- 8) Non-metallic piping has tracer wire installed per Wisconsin Administrative Plumbing Codes.

Construction Verification Checklist  
22 13 00 – Facility Sanitary Sewerage

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		



Construction Verification Checklist  
22 13 00 – Facility Sanitary Sewerage

**D) TESTING & FINALIZATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)								
				1)	2)	3)	4)	5)	6)	7)	8)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____				DATE: _____				

**Question Details**

- 1) Piping tested utilizing water at specified pressure and duration as per specification for given piping system type.
- 2) All leaks identified during testing have been repaired and test re-done until satisfactory conditions are accomplished.
- 3) Test conducted with all piping of tested system or section visible during testing.
- 4) Entire testing procedure witnessed by UWM Representative per the specifications.
- 5) Piping inlets (floor drains, hub drains, mop basins, fixtures, etc.) flushed with high flow of water at completion of project to demonstrate full flow capacity.
- 6) Blockages removed and necessary repairs made where flow is found to be impeded during flushing test.
- 7) Piping identification and direction of flow is provided per specification requirements.
- 8) All penetrations through fire rated wall assemblies have been sealed per specification requirements.
- 9) All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.

Construction Verification Checklist  
22 13 00 – Facility Sanitary Sewerage

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

Construction Verification Checklist  
 22 14 00 – Facility Storm Drainage

**CV-22 14 00 – Facility Storm Drainage**

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

**A) PRE-INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)		
				1)	2)	3)
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:	_____	DATE: _____

**Question Details**

- 1) Piping materials meet specified ASTM standards and the specifications.
- 2) All piping, etc. is clean and free of damage prior to installation.
- 3) Temporary protective covering is provided on pipe and fittings during storage.

Construction Verification Checklist  
22 14 00 – Facility Storm Drainage

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 14 00 – Facility Storm Drainage

**B) GENERAL PIPING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				<b>INITIALS:</b> _____				<b>DATE:</b> _____						

**Question Details**

- 1) Piping is free to expand and contract without noise or damage to hangers, joints, or the building.
- 2) Piping is installed in a manner to ensure that insulation will not contact adjacent surfaces.
- 3) Piping is installed with sufficient pitch and arranged in a manner to ensure drainage of entire system.
- 4) Changes in pipe sizes are made with the proper size reducing fittings, reducing elbow or reducing tees, and no bushings are utilized.
- 5) Connections between dissimilar pipe materials are made with approved fittings.
- 6) Pipe hanger spacing complies with specification requirements.
- 7) All equipment requiring maintenance is accessible.
- 8) Piping allows access to equipment that is part of this system or another system.
- 9) Minimum clearance of 18” provided for all cleanouts.
- 10) Open pipe ends capped at completion of work day.

Construction Verification Checklist  
22 14 00 – Facility Storm Drainage

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

Construction Verification Checklist  
22 14 00 – Facility Storm Drainage

**C) UNDERGROUND PIPING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)				
				1)	2)	3)	4)	5)
				YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____		DATE: _____		

**Question Details**

- 1) Exterior piping installed below predicted frost level, but in no case less than 5' bury depth to top of pipe.
- 2) Excavation and backfill procedures meet specification requirements.
- 3) Bedding and backfill material meet specifications.
- 4) Tracer wire is installed on non-metallic piping.
- 5) Underground warning tape installed 6"-12" below finished grade above all exterior below ground piping.

**Negative Responses**

Group/Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
22 14 00 – Facility Storm Drainage

**D) TESTING & FINALIZATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)						
				1)	2)	3)	4)	5)	6)	7)
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____			DATE: _____			

**Question Details**

- 1) Piping tested utilizing water at specified pressure and duration as per specification for given piping system type.
- 2) All leaks identified during testing have been repaired and test re-done until satisfactory conditions are accomplished.
- 3) Test conducted with all piping of tested system or section visible during testing.
- 4) All testing procedures witnessed by UWM representative.
- 5) Piping identification and direction of flow is provided per specification requirements.
- 6) All penetrations through fire rated wall assemblies have been sealed per specification requirements.
- 7) All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.



Construction Verification Checklist  
22 14 00 – Facility Storm Drainage

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
CV-22 30 00 – Plumbing Equipment

Construction Verification Checklist  
22 42 00 – Commercial Plumbing Fixtures

## CV-22 42 00 – Commercial Plumbing Fixtures

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

### A) INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)								
				1)	2)	3)	4)	5)	6)	7)	8)	9)
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____				DATE: _____				

### Question Details

- 1) Fixture traps and service stops easily accessible for service.
- 2) Fixture and carriers secured per manufacturer requirements and level and plumb to finished surface.
- 3) Pipe penetrations covered with escutcheons.
- 4) Openings between walls, floors and fixtures sealed with mildew-resistant silicone sealant same color as fixture.
- 5) Fixtures tested and fully operational.
- 6) Fixture valves adjusted for intended water flow rate to fixtures to eliminate splashing, noise or overflow
- 7) Self-closing lavatory faucets adjusted to 15 second cycle.
- 8) Shower valve temperature limit stops set to 110 degree maximum outlet temperature.
- 9) Fixtures and trim cleaned using manufacturer's recommended cleaning methods and materials.

Construction Verification Checklist  
22 42 00 – Commercial Plumbing Fixtures

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

Construction Verification Checklist  
22 42 00 – Commercial Plumbing Fixtures

## CV-22 42 00 – Electric Water Coolers

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

Group/Item	Group/Task Description	Submitted	Delivered
<i>A</i>	<i>MODEL VERIFICATION</i>		
1	Manufacturer		
2	Model		
3	Serial Number		
4	Refrigerant Type		
5	Flow (gph)		
6	Voltage / Phase / Frequency (V / - / Hz)	/ /	/ /
<input type="checkbox"/> CHECKLIST GROUP COMPLETE		INITIALS: _____	DATE: _____

Group/Item	Group/Task Description	Response	
<i>B</i>	<i>PHYSICAL CHECKS</i>		
1	Unit is free from physical damage.	YES	NO
2	The water openings are sealed with plastic plugs.	YES	NO
3	All components present.	YES	NO
4	Installation and startup manual provided.	YES	NO
5	Unit tags affixed.	YES	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE		INITIALS: _____	DATE: _____

Group/Item	Group/Task Description	Response	
<i>C</i>	<i>INSTALLATION</i>		
1	Unit secured as required by manufacturer and specifications.	YES	NO
2	Adequate clearance around unit for service.	YES	NO
3	All components accessible for maintenance.	YES	NO
4	Unit installed at the proper height.	YES	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE		INITIALS: _____	DATE: _____

Group/Item	Group/Task Description	Response	
<i>D</i>	<i>WATER PIPING</i>		
1	All piping components have been installed (in the correct order) as required by contract document or manufacturer.	YES	NO
2	Piping arranged for ease of unit removal.	YES	NO
3	Unions provided at water connections to unit.	YES	NO
4	Piping supported as required by specifications.	YES	NO
5	Piping is clean.	YES	NO
6	Piping and valves properly checked and free of leaks.	YES	NO
7	All valves are easily accessible.	YES	NO
8	Valve tags attached.	YES	NO
9	Piping insulation is complete and installed as per specifications.	YES	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE		INITIALS: _____	DATE: _____

Group/Item	Group/Task Description	Response	
<i>E</i>	<i>ELECTRICAL</i>		
1	Local disconnect installed in accessible and visible location.	YES	NO
2	All electrical connections are tight.	YES	NO
3	All electrical components are grounded.		
<input type="checkbox"/> CHECKLIST GROUP COMPLETE		INITIALS: _____	DATE: _____

Group/Item	Group/Task Description	Response	
<i>F</i>	<i>MECHANICAL STARTUP</i>		
1	Unit starts and runs without any unusual noise or vibration.	YES	NO
2	Stream and temperature adjustments made per manufacturer recommendations.	YES	NO
3	Unit interior and exterior clean and finish blemishes repaired.	YES	NO

Construction Verification Checklist  
22 42 00 – Commercial Plumbing Fixtures

<b>Group/Item</b>	<b>Group/Task Description</b>	<b>Response</b>	
<input type="checkbox"/> CHECKLIST GROUP COMPLETE	<b>INITIALS:</b> _____	<b>DATE:</b>	_____

**Negative Responses**

Group/Item	Date Found	Found By	Reason for Negative Response	Resolved	Date Resolved	Resolution
				YES / NO		
				YES / NO		
				YES / NO		
				YES / NO		
				YES / NO		

Functional Performance Test  
22 30 00 – Plumbing Equipment

UWM Project No. GML B1970 / UWSA Project No. B-23-001

22 08 00-39





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**SECTION 22 11 00**  
**FACILITY WATER DISTRIBUTION**  
**BASED ON DFD MASTER SPECIFICATION DATED 10/10/17**

**PART 1 - GENERAL**

**SCOPE**

This section contains specifications for plumbing pipe and pipe fittings for this project. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Reference
- Reference Standards
- Shop Drawings
- Quality Assurance
- Delivery, Storage, and Handling
- Design Criteria
- Welder Qualifications

**PART 2 - PRODUCTS**

- Domestic Water
- Dielectric Unions and Flanges
- Unions and Flanges
- Mechanical Grooved Pipe Connections

**PART 3 - EXECUTION**

- General
- Preparation
- Erection
- Copper Pipe Joints
- Welded Pipe Joints
- Threaded Pipe Joints
- Solvent Welded Pipe Joints
- Mechanical Hubless Pipe Connections
- Mechanical Joint Pipe Connections
- Push-On Gasketed Pipe Connections
- Mechanical Grooved Pipe Connections
- Mechanically Formed Tee Fittings
- Domestic Water
- Flushing and Disinfection of Potable Water Systems
- Underground Pipe Wrap
- Dielectric Unions and Flanges
- Unions and Flanges
- Piping System Leak Tests
- Construction Verification Items

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 22 08 00 – Commissioning of Plumbing
- 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment
- 22 05 14 - Plumbing Specialties

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

1	<b>REFERENCE STANDARDS</b>
2	ANSI A21.4
3	ANSI A21.11
4	ANSI A21.51
5	ANSI B16.3 Malleable Iron Threaded Fittings
6	ANSI B16.4 Cast Iron Threaded Fittings
7	ANSI B16.5 Pipe Flanges and Flanged Fittings
8	ANSI B16.22 Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
9	ANSI B16.29 Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV
10	ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
11	ASTM A105 Forgings, Carbon Steel, for Piping Components
12	ASTM A126 Gray Cast Iron Castings for Valves, Flanges, and Pipe Fittings
13	ASTM A234 Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated
14	Temperatures
15	ASTM B32 Solder Metal
16	ASTM B88 Seamless Copper Water Tube
17	ASTM B280 Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
18	ASTM B813 Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube
19	ASTM D1785 Poly Vinyl Chloride (PVC) Plastic Pipe
20	ASTM D2241 Poly Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
21	ASTM D2464 Threaded Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
22	ASTM D2466 Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
23	ASTM D2513 Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
24	ASTM D2564 Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings
25	ASTM D2657 Heat Fusion Joining of Polyolefin Pipe and Fittings
26	ASTM D2774 Recommended Practice for Underground Installation of Thermoplastic Pressure Piping
27	ASTM D2855 Making Solvent Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings
28	ASTM D3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
29	ASTM D3222 Unmodified Poly Vinylidene Fluoride (PVDF) Molding Extrusion and Coating Materials
30	ASTM D4101 Propylene Plastic Injection and Extrusion Materials
31	ASTM F437 Threaded Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80
32	ASTM F438 Socket Type Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 40
33	ASTM F441 Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe, Schedules 40 and 80
34	ASTM F493 Solvent Cements for Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe and Fittings
35	ASTM F656 Primers for Use in Solvent Cement Joints of Poly Vinyl Chloride (PVC) Plastic Pipe and
36	Fittings
37	ASTM F876 Standard Specification for Crosslinked Polyethylene (PEX) Tubing
38	ASTM F877 Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water
39	Distribution Systems
40	ASTM F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings
41	AWWA C904 Standard for Crosslinked Polyethylene (PEX) Pressure Pipe, 1/2-inch Through 3-inch, for
42	Water Service
43	AWS A5.8 Brazing Filler Metal
44	AWWA C104 Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
45	AWWA C105 Polyethylene Encasement for Ductile Iron Piping for Water
46	AWWA C110 Ductile Iron and Gray Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids
47	AWWA C111 Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
48	AWWA C151 Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or
49	Other Liquids
50	AWWA C153 Ductile Iron Compact Fittings, 3 In. Through 48 In., for Water and Other Liquids
51	AWWA C600 Installation of Ductile Iron Water Mains and Their Appurtenances
52	AWWA C651 Disinfecting Water Mains
53	AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution

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**SHOP DRAWINGS**

Schedule from the contractor indicating the ASTM, AWWA or CISPI specification number of the pipe being proposed along with its type and grade if known at the time of submittal, and sufficient information to indicate the type and rating of fittings for each service.

Statement from manufacturer on his letterhead that pipe furnished meets the ASTM, AWWA or CISPI specification contained in this section.

**QUALITY ASSURANCE**

Substitution of Materials: Refer to Section GC – General Conditions of the Contract, Equals and Substitutions.

Order all copper, cast iron, steel, PVC and polyethylene pipe with each length marked with the name or trademark of the manufacturer and type of pipe; with each shipping unit marked with the purchase order number, metal or alloy designation, temper, size, and name of supplier.

Any installed material not meeting the specification requirements must be replaced with material that meets these specifications without additional cost to the State.

**DELIVERY, STORAGE, AND HANDLING**

Promptly inspect shipments to ensure that the material is undamaged and complies with specifications.

Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging.

Offsite storage agreements will not relieve the contractor from using proper storage techniques.

Storage and protection methods must allow inspection to verify products.

**DESIGN CRITERIA**

Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, and AWWA specifications as listed in this specification.

Construct all piping for the highest pressures and temperatures in the respective system.

Non-metallic piping will be acceptable only for the services indicated. It will not be acceptable in ventilation plenum spaces, including plenum ceilings unless approved for this use.

Where weld fittings are used, use only long radius elbows having a centerline radius of 1.5 pipe diameters.

Where ASTM A53 type F pipe is specified, grade A Type E or S, or grade B Type E or S may be substituted at Contractor's option. Where the grade or type is not specified, Contractor may choose from those commercially available.

Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn) temper copper tubing may be substituted at Contractor's option.

**WELDER QUALIFICATIONS**

1 Welding procedures, welders, and welding operators for all building service piping to be in accordance  
2 with certified welding procedures of the National Certified Pipe Welding Bureau and Section 927.5 of  
3 ASME B31.9 Building Services Piping or AWS 10.9 Qualification of Welding Procedures and Welders for  
4 Piping and Tubing. Before any metallic welding is performed, Contractor to submit his Standard Welding  
5 Procedure Specification together with the Procedure Qualification Record as required by Section 927.6 of  
6 ASME B31.9 Building Services Piping.

7  
8 Before any polyethylene fusion welding is performed, Contractor to submit certification that the welders to  
9 be used on this project have successfully demonstrated proper welding procedures in accordance with the  
10 Code of Federal Regulations, Title 49, Part 192, Section 192.285.

11  
12 The Architect or Engineer reserves the right to test the work of any welder employed on the project, at the  
13 State's expense. If the work of the welder is found to be unsatisfactory, the welder shall be prevented from  
14 doing further welding on the project and all defective welds replaced.

## 15 16 17 **PART 2 - PRODUCTS**

### 18 19 **DOMESTIC WATER**

#### 20 **ABOVE GROUND:**

21 Type L copper water tube, H (drawn) temper, ASTM B88; wrought copper pressure fittings, ANSI B16.22;  
22 lead free (<.2%) solder, ASTM B32; flux, ASTM B813; copper phosphorous brazing alloy, AWS A5.8  
23 BCuP. Copper mechanical grooved fittings and couplings on roll grooved pipe may be used in lieu of  
24 soldered fittings. Mechanically formed brazed tee connections may be used in lieu of specified tee fittings  
25 for branch takeoffs up to one-half (1/2) the diameter of the main.

## 26 27 28 **PART 3 - EXECUTION**

### 29 30 **GENERAL**

31 Install pipe and fittings in accordance with reference standards, manufacturers recommendations and  
32 recognized industry practices.

### 33 34 **PREPARATION**

35 Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior  
36 of each section of pipe and fitting prior to assembly.

### 37 38 **ERECTION**

39 Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a  
40 window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute  
41 piping as required to clear such interferences. Coordinate locations of plumbing piping with piping,  
42 ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult  
43 drawings for exact location of pipe spaces, ceiling heights, door and window openings, or other  
44 architectural details before installing piping.

45  
46 Where copper, steel, or plastic piping is embedded in masonry or concrete, provide protective sleeve  
47 covering of elastomeric pipe insulation.

48  
49 Install underground warning tape 6"-12" below finished grade above all exterior below ground piping.  
50 Where existing underground warning tape is encountered, repair and replace.

51  
52 Maintain piping in clean condition internally during construction.

1 Provide clearance for installation of insulation, access to valves and piping specialties.  
2  
3 Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and  
4 contract without damage to itself, equipment, or building.  
5  
6 Do not route piping through transformer vaults or above transformers, panelboards, or switchboards,  
7 including the required service space for this equipment, unless the piping is serving this equipment  
8  
9 Install all valves and piping specialties, including items furnished by others, as specified and/or detailed.  
10 Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures and  
11 systems installed by others where same requires the piping services indicated in this section.  
12

13 **COPPER PIPE JOINTS**

14 Remove all slivers and burrs remaining from the cutting operation by reaming and filing both pipe surfaces.  
15 Clean fitting and tube with metal brush, emery cloth or sandpaper. Remove residue from the cleaning  
16 operation, apply flux and assemble joint to socket stop. Apply flame to fitting until solder melts when  
17 placed at joint. Remove flame and feed solder into joint until full penetration of cup and ring of solder  
18 appears. Wipe excess solder and flux from joint.  
19

20 **DOMESTIC WATER**

21 Maintain piping system in clean condition during installation. Remove dirt and debris from assembly of  
22 piping as work progresses. Cap open pipe ends where left unattended or subject to contamination.  
23

24 Install interior water piping with drain valves where indicated and at low points of system to allow  
25 complete drainage. Install shutoff valves where indicated and at the base of risers to allow isolation of  
26 portions of system for repair. Do not install water piping within exterior walls.  
27

28

29

30 **FLUSHING AND DISINFECTION OF POTABLE WATER SYSTEMS**

31 Prior to use, isolate and fill system with potable water. Allow to stand 24 hours. Flush each outlet  
32 proceeding from the service entrance to the furthest outlet for minimum of 1 minute and until water appears  
33 clear. Fill system with a solution of water and chlorine containing at least 10 parts per million of chlorine  
34 and allow to stand for 24 hours. Flush system with potable water until chlorine concentration is no higher  
35 than source water level.  
36

37 Wait 24 hours after final flushing. Take samples of water for lab testing. The number and location of  
38 samples shall be representative of the system size and configuration and are subject to approval by  
39 Engineer. Test shall show the absence of coliform bacteria. If test fails, repeat disinfection and testing  
40 procedures until no coliform bacteria are detected. Submit test report indicating date and time of test along  
41 with test results.  
42

43 Piping that is pressure tested shall be drained completely dry. The piping system is not to be left full of  
44 stagnant water. The piping system, water heaters and water softeners shall not be filled until within 10 days  
45 of occupancy to guard against microbial growth.  
46

47 **PIPING SYSTEM LEAK TESTS**

48 Isolate or remove components from system which are not rated for test pressure. Test piping in sections or  
49 entire system as required by sequence of construction. Do not insulate or conceal pipe until it has been  
50 successfully tested.  
51

1 If required for the additional pressure load under test, provide temporary restraints at fittings or expansion  
 2 joints. Backfill underground water mains prior to testing with the exception of thrust restrained valves  
 3 which may be exposed to isolate potential leaks.  
 4  
 5 For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents  
 6 or loosening of flanges/unions. Measure and record test pressure at the high point in the system.  
 7  
 8 Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking  
 9 will not be acceptable.  
 10  
 11 All pressure tests are to be documented and provided to the UWM project manager.  
 12

<u>System</u>	<u>Test Medium</u>	<u>Initial Test Pressure</u>	<u>Duration</u>	<u>Final Test Pressure</u>	<u>Duration</u>
Above Ground Domestic Water	Water	N/A		100 psig	8 hr

16  
 17 **CONSTRUCTION VERIFICATION ITEMS**  
 18 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
 19 Section 22 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
 20 or 01 91 02.  
 21

22 **END OF SECTION**  
 23  
 24  
 25

1 **PIPING SYSTEM TEST REPORT**

2  
3 **State of Wisconsin**  
4 **Department of Administration**  
5 **Division of Facilities Development**

**Date Submitted:** \_\_\_\_\_

6  
7 **Project Name:** \_\_\_\_\_

8  
9 **Location:** \_\_\_\_\_ **DFD Project No:** \_\_\_\_\_

10  
11 **Contractor:** \_\_\_\_\_

12  
13  Plumbing  Fire Sprinkler

14 **Test Medium:**  Air  Water  Other \_\_\_\_\_

15  
16 **Test performed per specification section No.** \_\_\_\_\_

17  
18 **Specified Test Duration** \_\_\_\_\_ **Hours** **Specified Test Pressure** \_\_\_\_\_ **PSIG**

19  
20 **System Identification:** \_\_\_\_\_

21 **Describe Location:** \_\_\_\_\_

22 \_\_\_\_\_

23	
24 <b>Test Date:</b> _____	
25 <b>Start Test Time:</b> _____	<b>Initial Pressure:</b> _____ <b>PSIG</b>
26	
27 <b>Stop Test Time:</b> _____	<b>Final Pressure:</b> _____ <b>PSIG</b>
28	

29 **Tested By:** \_\_\_\_\_ **Witnessed By:** \_\_\_\_\_

30 **Title:** \_\_\_\_\_ **Title:** \_\_\_\_\_

31 **Signed:** \_\_\_\_\_ **Signed:** \_\_\_\_\_

32 **Date:** \_\_\_\_\_ **Date:** \_\_\_\_\_

33 **Comments:** \_\_\_\_\_

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**SECTION 22 13 00**  
**FACILITY SANITARY SEWERAGE**  
**BASED ON DFD MASTER SPECIFICATION DATED 4/6/18**

**PART 1 - GENERAL**

**SCOPE**

This section contains specifications for plumbing pipe and pipe fittings for this project. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Reference
- Reference Standards
- Shop Drawings
- Quality Assurance
- Delivery, Storage, and Handling
- Design Criteria
- Welder Qualifications

**PART 2 - PRODUCTS**

- Sanitary Waste and Vent

**PART 3 - EXECUTION**

- General
- Preparation
- Erection
- Copper Pipe Joints
- Threaded Pipe Joints
- Solvent Welded Pipe Joints
- Mechanical Hubless Pipe Connections
- Mechanical Joint Pipe Connections
- Push-On Gasketed Pipe Connections
- Mechanical Grooved Pipe Connections
- Mechanically Formed Tee Fittings
- Sanitary Waste and Vent
- Piping System Leak Tests
- Construction Verification Items

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 22 08 00 – Commissioning of Plumbing
- 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment
- 22 05 14 - Plumbing Specialties

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**REFERENCE STANDARDS**

- ANSI A21.4
- ANSI A21.11
- ANSI A21.51
- ANSI B16.3      Malleable Iron Threaded Fittings
- ANSI B16.4      Cast Iron Threaded Fittings
- ANSI B16.5      Pipe Flanges and Flanged Fittings

1	ANSI B16.22	Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
2	ANSI B16.29	Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV
3	ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
4	ASTM A74	Cast Iron Soil Pipe and Fittings
5	ASTM A105	Forgings, Carbon Steel, for Piping Components
6	ASTM A126	Gray Cast Iron Castings for Valves, Flanges, and Pipe Fittings
7	ASTM A234	Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated
8		Temperatures
9	ASTM A861	High Silicon Iron Pipe and Fittings
10	ASTM A888	Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent
11		Piping Applications
12	ASTM B32	Solder Metal
13	ASTM B306	Copper Drainage Tube (DWV)
14	ASTM B813	Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube
15	ASTM C76	Reinforced Concrete Culvert, Storm Drain and Sanitary Pipe
16	ASTM C564	Standard Specifications for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
17	ASTM C1540	Standard Specifications for Heavy Duty Shielded Couplings Joining Hubless Cast Iron
18		Soil Pipe and Fittings
19	ASTM D1785	Poly Vinyl Chloride (PVC) Plastic Pipe
20	ASTM D2241	Poly Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
21	ASTM D2466	Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
22	ASTM D2564	Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings
23	ASTM D2665	Poly Vinyl Chloride (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
24	ASTM D2729	Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
25	ASTM D2774	Recommended Practice for Underground Installation of Thermoplastic Pressure Piping
26	ASTM D2855	Making Solvent Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings
27	ASTM D3034	Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
28	ASTM D3139	Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
29	ASTM D3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
30	ASTM D3222	Unmodified Poly Vinylidene Fluoride (PVDF) Molding Extrusion and Coating Materials
31	ASTM D3311	Drain, Waste and Vent (DWV) Plastic Fitting Patterns
32	ASTM F2618	CPVC Pipe and Fittings for Chemical Waste Drainage Systems
33	AWS A5.8	Brazing Filler Metal
34	CISPI 301	Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent
35		Piping Applications
36	CISPI 310	Couplings For Use In Connection With Hubless Cast Iron Soil Pipe And Fittings For
37		Sanitary And Storm Drain, Waste And Vent Piping Applications
38		

39 **SHOP DRAWINGS**

40 Schedule from the contractor indicating the ASTM, or CISPI specification number of the pipe being  
41 proposed along with its type and grade if known at the time of submittal, and sufficient information to  
42 indicate the type and rating of fittings for each service.

44 Statement from manufacturer on his letterhead that pipe furnished meets the ASTM, or CISPI specification  
45 contained in this section.

47 **QUALITY ASSURANCE**

49 Substitution of Materials: Refer to Section GC – General Conditions of the Contract, Equals and  
50 Substitutions.

51

1 Order all copper, cast iron, steel, PVC and polyethylene pipe with each length marked with the name or  
2 trademark of the manufacturer and type of pipe; with each shipping unit marked with the purchase order  
3 number, metal or alloy designation, temper, size, and name of supplier.  
4

5 Any installed material not meeting the specification requirements must be replaced with material that meets  
6 these specifications without additional cost to the State.  
7

8 **DELIVERY, STORAGE, AND HANDLING**

9 Promptly inspect shipments to ensure that the material is undamaged and complies with specifications.  
10

11 Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid  
12 condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not  
13 damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect  
14 fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging.  
15

16 Offsite storage agreements will not relieve the contractor from using proper storage techniques.  
17

18 Storage and protection methods must allow inspection to verify products.  
19

20 **DESIGN CRITERIA**

21 Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, or CISPI  
22 specifications as listed in this specification.  
23

24 Construct all piping for the highest pressures and temperatures in the respective system.  
25

26 Piping that is not in accordance with ASTM E-84/UL723 for flame spread of <25 and smoke development  
27 of <50 shall not be utilized in ventilation plenum spaces, including plenum ceilings.  
28

29 Where weld fittings or mechanical grooved fittings are used, use only long radius elbows having a  
30 centerline radius of 1.5 pipe diameters.  
31

32 Where ASTM A53 type F pipe is specified, grade A type E or S, or grade B type E or S may be substituted  
33 at Contractor's option. Where the grade or type is not specified, Contractor may choose from those  
34 commercially available.  
35

36 Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn)  
37 temper copper tubing may be substituted at Contractor's option.  
38

39 **WELDER QUALIFICATIONS**

40 Welding procedures, welders, and welding operators for all building service piping to be in accordance  
41 with certified welding procedures of the National Certified Pipe Welding Bureau and Section 927.5 of  
42 ASME B31.9 Building Services Piping or AWS 10.9 Qualification of Welding Procedures and Welders for  
43 Piping and Tubing. Before any metallic welding is performed, Contractor to submit his Standard Welding  
44 Procedure Specification together with the Procedure Qualification Record as required by Section 927.6 of  
45 ASME B31.9 Building Services Piping.  
46

47 Before any polyethylene fusion welding is performed, Contractor to submit certification that the welders to  
48 be used on this project have successfully demonstrated proper welding procedures in accordance with the  
49 Code of Federal Regulations, Title 49, Part 192, Section 192.285.  
50

1 The Architect or Engineer reserves the right to test the work of any welder employed on the project, at the  
2 State's expense. If the work of the welder is found to be unsatisfactory, the welder shall be prevented from  
3 doing further welding on the project and all defective welds replaced.  
4  
5

## 6 **PART 2 - PRODUCTS**

7

### 8 **SANITARY WASTE AND VENT**

#### 9 **INTERIOR ABOVE GROUND:**

10 Hubless cast iron soil pipe and fittings, ASTM A888; with no-hub couplings, CISPI 301, CISPI 310,  
11 ASTM A74. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Pipe Institute  
12 or receive prior approval of the Engineer. Cast iron piping and fittings shall be of A B & I Foundry,  
13 Charlotte Pipe and Foundry, or Tyler Pipe manufacturers.  
14  
15  
16

## 17 **PART 3 - EXECUTION**

18

### 19 **GENERAL**

20 Install pipe and fittings in accordance with reference standards, manufacturers recommendations and  
21 recognized industry practices.  
22

### 23 **PREPARATION**

24 Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior  
25 of each section of pipe and fitting prior to assembly.  
26

### 27 **ERECTION**

28 Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a  
29 window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute  
30 piping as required to clear such interferences. Coordinate locations of plumbing piping with piping,  
31 ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult  
32 drawings for exact location of pipe spaces, ceiling heights, door and window openings, or other  
33 architectural details before installing piping.  
34

35 Where copper or steel piping is embedded in masonry or concrete, provide protective sleeve covering of  
36 elastomeric pipe insulation.  
37

38 Maintain piping in clean condition internally during construction.  
39

40 Provide clearance for installation of insulation, access to valves and piping specialties.  
41

42 Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and  
43 contract without damage to itself, equipment, or building.  
44

45 Do not route piping through transformer vaults or above transformers, panelboards, or switchboards,  
46 including the required service space for this equipment, unless the piping is serving this equipment  
47

48 Install all valves and piping specialties, including items furnished by others, as specified and/or detailed.  
49 Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures and  
50 systems installed by others where same requires the piping services indicated in this section.  
51  
52

1 **MECHANICAL HUBLESS PIPE CONNECTIONS**  
 2 Place the gasket on the end of one pipe or fitting and the clamp assembly on the end of the other pipe or  
 3 fitting. Firmly seat the pipe or fitting ends against the integrally molded shoulder inside the neoprene  
 4 gasket. Slide the clamp assembly into position over the gasket. Tighten fasteners to manufacturers  
 5 recommended torque.

6  
 7 **SANITARY WASTE AND VENT**  
 8 Flush piping inlets (floor drains, hub drains, mop basins, fixtures, etc.) with high flow of water at  
 9 completion of project to demonstrate full flow capacity. Remove blockages and make necessary repairs  
 10 where flow is found to be impeded.

11  
 12 **PIPING SYSTEM LEAK TESTS**  
 13 Isolate or remove components from system which are not rated for test pressure. Perform final testing for  
 14 medical and lab gas with all system components in place. Test piping in sections or entire system as  
 15 required by sequence of construction. Do not insulate or conceal pipe until it has been successfully tested.

16  
 17 If required for the additional pressure load under test, provide temporary restraints at fittings or expansion  
 18 joints. Backfill underground water mains prior to testing with the exception of thrust restrained valves  
 19 which may be exposed to isolate potential leaks.

20  
 21 For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents  
 22 or loosening of flanges/unions. Measure and record test pressure at the high point in the system.

23  
 24 For air or nitrogen tests, gradually increase the pressure to not more than one half of the test pressure; then  
 25 increase the pressure in steps of approximately one-tenth of the test pressure until the required test pressure  
 26 is reached. Examine all joints and connections with a soap bubble solution or equivalent method. System  
 27 will not be approved until it can be demonstrated that there is no measurable loss of test pressure during the  
 28 test period.

29  
 30 Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking  
 31 will not be acceptable.

32  
 33 All pressure tests are to be documented.

34  
 35

System	Test Medium	Initial Test		Final Test	
		Pressure	Duration	Pressure	Duration
Sanitary Waste and Vent	Water	N/A		10' water	2 hr

36  
 37  
 38

39 **CONSTRUCTION VERIFICATION ITEMS**  
 40 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
 41 Section 22 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
 42 or 01 91 02.

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 END OF SECTION



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**SECTION 22 14 00**  
**FACILITY STORM DRAINAGE**  
**BASED ON DFD MASTER SPECIFICATION DATED 4/6/18**

**PART 1 - GENERAL**

**SCOPE**

This section contains specifications for plumbing pipe and pipe fittings for this project. Included are the following topics:

PART 1 - GENERAL

- Scope
- Reference
- Reference Standards
- Shop Drawings
- Quality Assurance
- Delivery, Storage, and Handling
- Design Criteria
- Welder Qualifications

PART 2 - PRODUCTS

- Storm and Clear Water Waste

PART 3 - EXECUTION

- General
- Preparation
- Erection
- Solvent Welded Pipe Joints
- Mechanical Hubless Pipe Connections
- Piping System Leak Tests
- Construction Verification Items

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 22 08 00 – Commissioning of Plumbing
- 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment
- 22 05 14 - Plumbing Specialties

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**REFERENCE STANDARDS**

- ANSI A21.4
- ANSI A21.11
- ANSI A21.51
- ANSI B16.3 Malleable Iron Threaded Fittings
- ANSI B16.4 Cast Iron Threaded Fittings
- ANSI B16.5 Pipe Flanges and Flanged Fittings
- ANSI B16.22 Wrought Copper and Wrought Copper Alloy Solder Joint Pressure Fittings
- ANSI B16.29 Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV
- ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless
- ASTM A74 Cast Iron Soil Pipe and Fittings
- ASTM A105 Forgings, Carbon Steel, for Piping Components
- ASTM A126 Gray Cast Iron Castings for Valves, Flanges, and Pipe Fittings

1	ASTM A234	Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated
2		Temperatures
3	ASTM A861	High Silicon Iron Pipe and Fittings
4	ASTM A888	Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent
5		Piping Applications
6	ASTM B32	Solder Metal
7	ASTM B88	Seamless Copper Water Tube
8	ASTM B306	Copper Drainage Tube (DWV)
9	ASTM B813	Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube
10	ASTM C76	Reinforced Concrete Culvert, Storm Drain and Sanitary Pipe
11	ASTM C443	Joints for Circular Concrete Pipe Sewer and Culvert Pipe Using Rubber Gaskets
12	ASTM C564	Rubber Gaskets for Cast Iron Soil Pipe and Fittings
13	ASTM C1540	Heavy Duty Shielded Couplings for Joining Hubless Cast Iron Soil Pipe and Fittings
14	ASTM D1785	Poly Vinyl Chloride (PVC) Plastic Pipe
15	ASTM D2321	Underground Installation of Flexible Thermoplastic Sewer Pipe
16	ASTM D2241	Poly Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
17	ASTM D2464	Threaded Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
18	ASTM D2466	Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
19	ASTM D2513	Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
20	ASTM D2564	Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings
21	ASTM D2657	Heat Fusion Joining of Polyolefin Pipe and Fittings
22	ASTM D2665	Poly Vinyl Chloride (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
23	ASTM D2729	Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
24	ASTM D2774	Recommended Practice for Underground Installation of Thermoplastic Pressure Piping
25	ASTM D2855	Making Solvent Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings
26	ASTM D3034	Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
27	ASTM D3139	Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
28	ASTM D3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
29	ASTM D3311	Drain, Waste and Vent (DWV) Plastic Fitting Patterns
30	ASTM F2618	CPVC Pipe and Fittings for Chemical Waste Drainage Systems
31	ASTM D4101	Propylene Plastic Injection and Extrusion Materials
32	ASTM F405	Corrugated Polyethylene (PE) Tubing and Fittings
33	ASTM F437	Threaded Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80
34	ASTM F438	Socket Type Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 40
35	ASTM F441	Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe, Schedules 40 and 80
36	ASTM F656	Primers for Use in Solvent Cement Joints of Poly Vinyl Chloride (PVC) Plastic Pipe and
37		Fittings
38	CISPI 301	Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and
39		Vent Piping Applications
40	CISPI 310	Couplings For Use In Connection With Hubless Cast Iron Soil Pipe And Fittings For
41		Sanitary And Storm Drain, Waste And Vent Piping Applications
42		

43 **SHOP DRAWINGS**

44 Schedule from the contractor indicating the ASTM, AWWA or CISPI specification number of the pipe  
 45 being proposed along with its type and grade if known at the time of submittal, and sufficient information  
 46 to indicate the type and rating of fittings for each service.

47  
 48 Statement from manufacturer on his letterhead that pipe furnished meets the ASTM, AWWA or CISPI  
 49 specification contained in this section.

51 **QUALITY ASSURANCE**

52



1 Substitution of Materials: Refer to Section GC – General Conditions of the Contract, Equals and  
2 Substitutions.

3  
4 Order all copper, cast iron, steel, PVC and polyethylene pipe with each length marked with the name or  
5 trademark of the manufacturer and type of pipe; with each shipping unit marked with the purchase order  
6 number, metal or alloy designation, temper, size, and name of supplier.

7  
8 Any installed material not meeting the specification requirements must be replaced with material that meets  
9 these specifications without additional cost to the State.

10  
11 **DELIVERY, STORAGE, AND HANDLING**

12 Promptly inspect shipments to ensure that the material is undamaged and complies with specifications.

13  
14 Cover pipe to prevent corrosion or deterioration while allowing sufficient ventilation to avoid  
15 condensation. Do not store materials directly on grade. Protect pipe, tube, and fitting ends so they are not  
16 damaged. Where end caps are provided or specified, take precautions so the caps remain in place. Protect  
17 fittings, flanges, and unions by storage inside or by durable, waterproof, above ground packaging.

18  
19 Offsite storage agreements will not relieve the contractor from using proper storage techniques.

20  
21 Storage and protection methods must allow inspection to verify products.

22  
23 **DESIGN CRITERIA**

24 Use only new material, free of defects, rust and scale, and meeting the latest revision of ASTM, AWWA or  
25 CISPI specifications as listed in this specification.

26  
27 Construct all piping for the highest pressures and temperatures in the respective system.

28  
29 Piping that is not in accordance with ASTM E-84/UL723 for flame spread of <25 and smoke development  
30 of <50 shall not be utilized in ventilation plenum spaces, including plenum ceilings.

31  
32 Where weld fittings or mechanical grooved fittings are used, use only long radius elbows having a  
33 centerline radius of 1.5 pipe diameters.

34  
35 Where ASTM A53 type F pipe is specified, grade A type E or S, or grade B type E or S may be substituted  
36 at Contractor's option. Where the grade or type is not specified, Contractor may choose from those  
37 commercially available.

38  
39 Where ASTM B88, type L H (drawn) temper copper tubing is specified, ASTM B88, type K H (drawn)  
40 temper copper tubing may be substituted at Contractor's option.

41  
42 **WELDER QUALIFICATIONS**

43 Welding procedures, welders, and welding operators for all building service piping to be in accordance  
44 with certified welding procedures of the National Certified Pipe Welding Bureau and Section 927.5 of  
45 ASME B31.9 Building Services Piping or AWS 10.9 Qualification of Welding Procedures and Welders for  
46 Piping and Tubing. Before any metallic welding is performed, Contractor to submit his Standard Welding  
47 Procedure Specification together with the Procedure Qualification Record as required by Section 927.6 of  
48 ASME B31.9 Building Services Piping.

49  
50 Before any polyethylene fusion welding is performed, Contractor to submit certification that the welders to  
51 be used on this project have successfully demonstrated proper welding procedures in accordance with the  
52 Code of Federal Regulations, Title 49, Part 192, Section 192.285.

53

1 The Architect or Engineer reserves the right to test the work of any welder employed on the project, at the  
2 State's expense. If the work of the welder is found to be unsatisfactory, the welder shall be prevented from  
3 doing further welding on the project and all defective welds replaced.  
4

## 6 **PART 2 - PRODUCTS**

### 8 **STORM AND CLEARWATER WASTE and VENT**

#### 9 **INTERIOR ABOVE GROUND:**

10 Hubless cast iron soil pipe and fittings, ASTM A888; with no-hub couplings, CISPI 301, CISPI 310,  
11 ASTM A74. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Pipe Institute.  
12 Cast iron piping and fittings shall be of A B & I Foundry, Charlotte Pipe and Foundry, or Tyler Pipe  
13 manufacturers.  
14

## 16 **PART 3 - EXECUTION**

### 18 **GENERAL**

19 Install pipe and fittings in accordance with reference standards, manufacturers recommendations and  
20 recognized industry practices.  
21

### 22 **PREPARATION**

23 Cut pipe ends square. Ream ends of piping to remove burrs. Clean scale and dirt from interior and exterior  
24 of each section of pipe and fitting prior to assembly.  
25

### 26 **ERECTION**

27 Install all piping parallel to building walls and ceilings and at heights which do not obstruct any portion of a  
28 window, doorway, stairway, or passageway. Where interferences develop in the field, offset or reroute  
29 piping as required to clear such interferences. Coordinate locations of plumbing piping with piping,  
30 ductwork, conduit and equipment of other trades to allow sufficient clearances. In all cases, consult  
31 drawings for exact location of pipe spaces, ceiling heights, door and window openings, or other  
32 architectural details before installing piping.  
33

34 Where copper or steel piping is embedded in masonry or concrete, provide protective sleeve covering of  
35 elastomeric pipe insulation.  
36

37 Install underground warning tape 6"-12" below finished grade above all exterior below ground piping.  
38 Where existing underground warning tape is encountered, repair and replace.  
39

40 Maintain piping in clean condition internally during construction.  
41

42 Provide clearance for installation of insulation, access to valves and piping specialties.  
43

44 Provide anchors, expansion joints, swing joints and/or expansion loops so that piping may expand and  
45 contract without damage to itself, equipment, or building.  
46

47 Do not route piping through transformer vaults or above transformers, panelboards, or switchboards,  
48 including the required service space for this equipment, unless the piping is serving this equipment  
49

50 Install all valves and piping specialties, including items furnished by others, as specified and/or detailed.  
51 Provide access to valves and specialties for maintenance. Make connections to all equipment, fixtures and  
52 systems installed by others where same requires the piping services indicated in this section.  
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**MECHANICAL HUBLESS PIPE CONNECTIONS**

Place the gasket on the end of one pipe or fitting and the clamp assembly on the end of the other pipe or fitting. Firmly seat the pipe or fitting ends against the integrally molded shoulder inside the neoprene gasket. Slide the clamp assembly into position over the gasket. Tighten fasteners to manufacturers recommended torque.

**PIPING SYSTEM LEAK TESTS**

Isolate or remove components from system which are not rated for test pressure. Perform final testing for medical and lab gas with all system components in place. Test piping in sections or entire system as required by sequence of construction. Do not insulate or conceal pipe until it has been successfully tested.

If required for the additional pressure load under test, provide temporary restraints at fittings or expansion joints. Backfill underground water mains prior to testing with the exception of thrust restrained valves which may be exposed to isolate potential leaks.

For hydrostatic tests, use clean water and remove all air from the piping being tested by means of air vents or loosening of flanges/unions. Measure and record test pressure at the high point in the system.

For air or nitrogen tests, gradually increase the pressure to not more than one half of the test pressure; then increase the pressure in steps of approximately one-tenth of the test pressure until the required test pressure is reached. Examine all joints and connections with a soap bubble solution or equivalent method. System will not be approved until it can be demonstrated that there is no measurable loss of test pressure during the test period.

Inspect system for leaks. Where leaks occur, repair the area with new materials and repeat the test; caulking will not be acceptable.

All pressure tests are to be documented.

System	Test Medium	Initial Test		Final Test	
		Pressure	Duration	Pressure	Duration
Clearwater Waste and Vent	Water	N/A		10' water	2 hr
Storm and Clearwater Waste	Water	N/A		10' water	2 hr

**CONSTRUCTION VERIFICATION ITEMS**

Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 22 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01 or 01 91 02.

END OF SECTION



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**SECTION 22 42 00**  
**COMMERCIAL PLUMBING FIXTURES**  
**BASED ON DFD MASTER SPECIFICATION DATED 10/1/12**

**PART 1 - GENERAL**

**SCOPE**

This section includes specifications for plumbing fixtures, faucets and trim.

**PART 1 - GENERAL**

- Scope
- Related Work
- Quality Assurance
- Shop Drawings
- Operation and Maintenance Data
- Design Criteria
- Energy Efficiency Requirements

**PART 2 - PRODUCTS**

- Plumbing Fixtures

**PART 3 - EXECUTION**

- Installation
- Construction Verification Items

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 22 08 00 – Commissioning of Plumbing
- Section 22 11 00 - Facility Water Distribution
- Section 22 13 00 - Facility Sanitary Sewerage
- Section 22 14 00 - Facility Storm Drainage
- Section 22 05 29 – Hangers and Supports for Plumbing Piping and Equipment
- Section 22 05 14 - Plumbing Specialties

**REFERENCE**

Applicable provisions of Division 1 shall govern work under this section.

**QUALITY ASSURANCE**

Substitution of Materials: Refer to Section GC - General Conditions of the Contract, Equals and Substitutions.

Plumbing products requiring approval by the State of Wisconsin Dept. of Safety and Professional Services must be approved or have pending approval at the time of shop drawing submission.

**SHOP DRAWINGS**

Include data concerning sizes, utility sizes, rough in-dimensions, capacities, materials of construction, ratings, weights, trim, finishes, manufacturer's installation requirements, manufacturer's performance limitations, and appropriate identification.

**OPERATION AND MAINTENANCE DATA**

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

**DESIGN CRITERIA**

- ANSI A112.6.1M-88 - Supports for Off-the Floor Plumbing Fixtures for Public Use.
- ANSI A112.18.1-94 - Finished and Rough Brass Plumbing Fixture Fittings.

- 1 ANSI A112.19.1-90 - Enameled Cast Iron Plumbing Fixtures.
- 2 ANSI A112.19.2M-82 - Vitreous China Plumbing Fixtures.
- 3 ANSI A112.19.5-79(R1990) - Trim for Water Closet Bowls, Tanks and Urinals.
- 4 ANSI Z124.1-87 - Plastic Bathtub Units.
- 5 ANSI Z124.2-87 - Plastic Shower Receptors and Shower Stalls.
- 6 ARI-1010-94 - Drinking Fountains and Self-Contained Mechanically Refrigerated Drinking Water Coolers.
- 7 ASSE 1011-93 - Hose Connection Vacuum Breakers.
- 8 ASSE 1014-90 - Handheld Showers.
- 9 ASSE 1035-93 - Laboratory Faucet Backflow Preventers.

10  
11

12 **ENERGY EFFICIENCY REQUIREMENTS**

13 Plumbing fixtures must meet the following maximum water usage requirements which are based upon  
14 Federal Energy Management Program (FEMP) performance requirements.

- 15 a. Lavatory Faucets, flow of 2 gpm or less and .25 gallon per cycle or less (based on inlet pressure of 60  
16 p.s.i.)
- 17 b. Showerheads, flow of 2.2 gpm or less (based on inlet pressure of 80 p.s.i.)
- 18 c. Urinal Flush Valves, 1.0 gallon per flush or less.
- 19 d. Water Closet Flush Valves, 1.6 gallon per flush or less.

20  
21

22 **PART 2 - PRODUCTS**

23  
24

24 **PLUMBING FIXTURES**

25 Manufacturers: Fixture descriptions establish fixture type, quality, materials, features and size. Products of  
26 the following manufacturers determined to be equal by the Architect/Engineer will be accepted.

27  
28

- 28 • Water Closets - American Standard, Kohler, Zurn.
- 29 • Water Closet Seats - Bemis, Beneke, Centoco, Olsonite Sperzel.
- 30 • Urinals – American Standard, Kohler, Zurn.
- 31 • Lavatories – American Standard, Kohler, Zurn.
- 32 • Faucets - Chicago Faucet, Kohler, Speakman, Symmons, Zurn.
- 33 • Drains - Chicago Faucet, Engineered Brass Co., Kohler, McGuire.
- 34 • Stops and Supplies - Chicago Faucet Co., McGuire. (Heavy Duty Type Only)
- 35 • Flush Valves - Coyne & Delany, Sloan Royal, Zurn AV.
- 36 • Traps - Kohler, McGuire, Dearborn, Engineered Brass Co. (17 gauge Min.)
- 37 • Carriers and Supports - Josam, Smith, Wade, Watts Drainage, Zurn.
- 38 • Washfountains - Acorn, Bradley.
- 39 • Sinks - American Standard, Elkay, Just, Kohler.
- 40 • Laundry Trays - Fiat, Mustee, Stern-Williams.
- 41 • Service Sinks - American Standard, Crane, Kohler.
- 42 • Mop Basins - Fiat, Mustee, Stern-Williams.
- 43 • Showers - Leonard, Powers, Speakman, Symmons.
- 44 • Multiple Showers - Acorn, Bradley, Willoughby.
- 45 • Bathtubs - American Standard, Crane, Kohler.
- 46 • Molded Tub and Shower Units – Aker, Aqua Glass, Fiat, Kohler, Lasco.
- 47 • Drinking Fountains - Elkay, Halsey Taylor, Haws, Filtrine, Oasis, Sunroc.
- 48 • Drinking Fountains (China) - American Standard, Crane, Kohler, Sunroc.
- 49 • Electric Water Coolers - Elkay, Halsey Taylor, Haws, Filtrine, Oasis, Sunroc.
- 50 • Security Fixtures - Acorn, Bradley, Metcraft, Willoughby.
- 51 • Emergency Eyewash Fountains and Showers - Bradley, Chicago Faucet Co., Guardian, Haws,  
52 Speakman.

53  
54

54 **WATER CLOSETS**

1 WC-1 - Wall hung back outlet white vitreous china siphon jet water closet with elongated bowl, barrier free  
2 adjusted for 16-1/2" bowl height. 1-1/2" top spud, 2-1/4" passageway and 1.6 gallon flush. Handle of the  
3 flush valve to be ADA compliant for activation force and located to the wide side of the stall. Flush valve  
4 handle 13" above rim.

- 5 • Fixture: Kohler Kingston K-4330.
- 6 • Flush Valve: Sloan Royal 113-1.5-YK.
- 7 • Seat: Bemis 1655-SS/C white solid plastic open front.
- 8 • Carrier: Smith commercial grade adjusted for 15" bowl height.

## 11 LAVATORIES

13 Lavatory faucets must meet maximum water usage requirements of 2 gpm flow or less and .25 gallon per  
14 cycle or less (based on inlet pressure of 60 p.s.i.)

16 L-1 - Self-rimming counter mount white vitreous china lavatory with 4" on center faucet openings.

- 17 • Fixture: Integral bowl provided by others.
- 18 • Faucet: Chicago Faucet No. 802-336CP. Self-closing.
- 19 • Drain: Kohler K-13885 perforated strainer and 1-1/4" tailpiece.
- 20 • Trap: 1-1/4"x1-1/2" 17 ga. cast brass trap and tubular wall bend. With C.O. plug.
- 21 • Supplies & Stops: Chicago Faucet No. 1017CP.

## 23 ELECTRIC WATER COOLERS

24 EWC-1 - Wall mounted bi-level electric water cooler with stainless steel basin and integrated bottle filling  
25 station, self-closing front and side mounted push bars, wall hanger and 1-1/4" tailpiece, rated for 8.0 GPH at  
26 80 degree inlet water, 90 degree ambient and 50 degree leaving water, 120/60/1.

- 27 • Fixture: Elkay LZSTL8WSLK
- 28 • Trap: 1-1/4"x1-1/4" 17 ga. cast brass trap.
- 29 • Stop/Supply: Chicago Faucet Co. 1013-CP or 1/2" ball valve with 3/8" riser (concealed).

# 32 PART 3 - EXECUTION

## 34 INSTALLATION

35 Install plumbing fixtures in accordance with manufacturers instructions. Set level and plumb. Secure in place  
36 to counters, floors and walls providing solid bearing and secure mounting. Bolt fixture carriers to floor and  
37 wall. Secure rough-in fixture piping to prevent movement of exposed piping.

39 Install each fixture with trap easily removable for servicing and cleaning. Install fixture stops in readily  
40 accessible location for servicing.

42 Install barrier free fixtures in compliance with IBC 1108 and 3408, COMM 52, 69 and Federal ADA  
43 Accessibility Guidelines. Install barrier free lavatory traps parallel and adjacent to wall and supplies and stops  
44 elevated to 27" above floor to avoid contact by wheelchair users.

46 Provide unions at water connections to drinking fountains and electric water coolers.

48 Each fixture shall have a stop valve installation to control the fixture. Stop valves shall be heavy duty type  
49 with brass stems and screwed or sweat inlet connections. Compression type inlets are not acceptable.

51 Cover pipe penetrations with escutcheons. Exposed traps, stops, piping and escutcheons to be chrome plated  
52 brass, same items in concealed locations may be of rough brass finish.

1 Set floor mounted water closets, floor mounted service sinks; counter mounted lavs and sinks; lav and sink  
2 faucets and drains with full setting bed of flexible non-staining plumber's putty. Cover exposed water closet  
3 bolts with bolt covers.

4  
5 Seal openings between walls, floors and fixtures with mildew-resistant silicone sealant same color as fixture.  
6

7 Test fixtures to demonstrate proper operation. Replace malfunctioning units or components. Adjust valves  
8 for intended water flow rate to fixtures without splashing, noise or overflow. Adjust self-closing lavatory  
9 faucets to 15 second cycle. Adjust shower valve temperature limit stops to 110 degree maximum outlet  
10 temperature.

11  
12 Protect fixtures during construction. At completion clean plumbing fixtures and trim using manufacturer's  
13 recommended cleaning methods and materials.

14  
15 **CONSTRUCTION VERIFICATION ITEMS**  
16 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
17 Section 22 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
18 or 01 91 02.

19  
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END OF SECTION



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**SECTION 23 05 00**  
**COMMON WORK RESULTS FOR HVAC**  
**BASED ON DFD MASTER SPECIFICATION DATED 3/28/2022**

**PART 1 - GENERAL**

**SCOPE**

This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Continuity of Existing Services
- Protection of Finished Surfaces
- Sleeves and Openings
- Sealing and Fire Stopping

- Submittals
- Off Site Storage
- Certificates and Inspections
- Operating and Maintenance Data
- Record Drawings

**PART 2 - PRODUCTS**

- Access Panels and Doors
- Identification
- Sealing and Fire Stopping

**PART 3 - EXECUTION**

- Demolition
- Cutting and Patching
- Building Access
- Equipment Access
- Coordination
- Identification
- Lubrication
- Sleeves and Openings
- Sealing and Fire Stopping
- Agency Training

**RELATED WORK**

Section 01 91 01 or 01 91 02 – Commissioning Process  
Section 07 84 00 - Fire Stopping  
Section 23 33 00 - Air Duct Accessories.

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**REFERENCE STANDARDS**

Abbreviations of standards organizations referenced in other sections are as follows:

AABC	Associated Air Balance Council
ABMA	American Boiler Manufacturers Association
ADC	Air Diffusion Council
AGA	American Gas Association
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute

1	ARI	Air-Conditioning and Refrigeration Institute
2	ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
3	ASME	American Society of Mechanical Engineers
4	ASTM	American Society for Testing and Materials
5	AWWA	American Water Works Association
6	AWS	American Welding Society
7	CGA	Compressed Gas Association
8	CTI	Cooling Tower Institute
9	EPA	Environmental Protection Agency
10	GAMA	Gas Appliance Manufacturers Association
11	IEEE	Institute of Electrical and Electronics Engineers
12	ISA	Instrument Society of America
13	MCA	Mechanical Contractors Association
14	MICA	Midwest Insulation Contractors Association
15	MSS	Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.
16	NBS	National Bureau of Standards
17	NEBB	National Environmental Balancing Bureau
18	NEC	National Electric Code
19	NEMA	National Electrical Manufacturers Association
20	NFPA	National Fire Protection Association
21	SMACNA	Sheet Metal and Air Conditioning Contractors' National Association. Inc.
22	UL	Underwriters Laboratories Inc.
23	ASTM E814	Standard Test Method for Fire Tests of Through-Penetration Fire Stops
24	ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
25	UL1479	Fire Tests of Through-Penetration Firestops
26	UL723	Surface Burning Characteristics of Building Materials

27  
28 **QUALITY ASSURANCE**

29 Refer to Division 1, General Conditions, Equals and Substitutions.

30  
31 Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings,  
32 or engineering parameters from those indicated on the contract documents, the contractor is responsible for  
33 all costs involved in integrating the equipment or accessories into the system and for obtaining the  
34 performance from the system into which these items are placed. This may include changes found necessary  
35 during the testing, adjusting, and balancing phase of the project.

36  
37 **CONTINUITY OF EXISTING SERVICES**

38 Do not interrupt or change existing services without prior written approval from the UW Project  
39 Representative. When interruption is required, coordinate the down-time with the user agency to minimize  
40 disruption to their activities. Unless specifically stated, all work involved in interrupting or changing  
41 existing services is to be done during normal working hours.

42  
43  
44 **PROTECTION OF FINISHED SURFACES**

45 Refer to Division 1, General Requirements, Protection of Finished Surfaces.

46  
47 Furnish one can of touch-up paint for each different color factory finish which is to be the final finished  
48 surface of the product. Deliver touch-up paint with other "loose and detachable parts" as covered in the  
49 General Requirements.

50  
51 **SLEEVES AND OPENINGS**

52 Refer to Division 1, General Requirements, Sleeves and Openings.

53  
54 **SEALING AND FIRE STOPPING**

55 Sealing and fire stopping of sleeves/openings between ductwork, piping, etc. and the sleeve, structural or  
56 partition opening shall be the responsibility of the contractor whose work penetrates the opening. Provide  
57 all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with  
58 section 07 84 00 Fire Stopping.

59  
60 **SUBMITTALS**

61 Refer to Division 1, General Conditions, Submittals.

62  
63 Submit for all equipment and systems as indicated in the respective specification sections, marking each  
64 submittal with that specification section number. Mark general catalog sheets and drawings to indicate

1 specific items being submitted and proper identification of equipment by name and/or number, as indicated  
2 in the contract documents.

3  
4 Before submitting electrically powered equipment, verify that the electrical power and control requirements  
5 for the equipment are in agreement with the motor starter schedule on the electrical drawings. Include a  
6 statement on the shop drawing transmittal to the architect/engineer that the equipment submitted and the  
7 motor starter schedules are in agreement or indicate any discrepancies. See related comments in Section  
8 23 05 13 in Part 1 under Electrical Coordination.  
9

10 Include wiring diagrams of electrically powered equipment.

11 Submit sufficient quantities of shop drawings to allow the following distribution:

- 12 • Operating and Maintenance Manuals 2 copies
- 13 • Testing, Adjusting and Balancing Contractor 1 copy
- 14 • Division of Facilities Development 1 copy
- 15 • A/E 1 copy

### 16 **OFF SITE STORAGE**

17 Prior approval by UW and the A/E will be needed. The contractor shall submit Storage Agreement Form  
18 AD-BDC-74 to UW for consideration of off site materials storage.  
19

20 Generally, ductwork, metal for making ductwork, duct lining, sleeves, pipe/pipe fittings and similar  
21 rough-in material will not be accepted for off site storage. For material that can be stored off site, no  
22 material will be accepted for off site storage unless shop drawings for that material have been approved.  
23

### 24 **CERTIFICATES AND INSPECTIONS**

25 Refer also to Division 1, General Conditions, Permits, Regulations, Utilities and Taxes.  
26

27 Obtain and pay for all required State installation inspections except those provided by the  
28 Architect/Engineer in accordance with code. Deliver originals of these certificates to the Division Project  
29 Representative. Include copies of the certificates in the Operating and Maintenance Instructions.  
30

### 31 **OPERATION AND MAINTENANCE DATA**

32 All operations and maintenance data shall comply with the submission and content requirements specified  
33 under section GENERAL REQUIREMENTS.  
34

35 In addition to the general content specified under GENERAL REQUIREMENTS supply the following  
36 additional documentation:

- 37 1. Records of tests performed to certify compliance with system requirements
- 38 2. Certificates of inspection by regulatory agencies
- 39 3. Copies of all approved shop drawings.
- 40 4. Manufacturer's wiring diagrams for electrically powered equipment
- 41 5. Temperature control record drawings and control sequences
- 42 6. Parts lists for manufactured equipment
- 43 7. Warranties
- 44 8. Additional information as indicated in the technical specification sections

### 45 **RECORD DRAWINGS**

46 Refer to Division 1, General Requirements, Record Drawings.  
47

48 In addition to the data indicated in the General Requirements, maintain temperature control record  
49 drawings on originals prepared by the installing contractor/subcontractor. Include copies of these record  
50 drawings with the Operating and Maintenance manuals.  
51

## 52 **PART 2 - PRODUCTS**

### 53 **ACCESS PANELS AND DOORS**

1  
2  
3 **LAY-IN CEILINGS:**

4 Removable lay-in ceiling tiles in 2 X 2 foot or 2 X 4 foot configuration provided under Section 09500 are  
5 sufficient; no additional access provisions are required unless specifically indicated.  
6

7 **CONCEALED SPLINE CEILINGS:**

8 Removable sections of ceiling tile held in position with metal slats or tabs compatible with the ceiling  
9 system used will be provided under Section 09500.  
10

11 **METAL PAN CEILINGS:**

12 Removable sections of ceiling tile held in position by a pressure fit will be provided under Section 09500.  
13

14 **PLASTER WALLS AND CEILINGS:**

15 16 gauge frame with not less than a 20 gauge hinged door panel, prime coated steel for general  
16 applications, stainless steel for use in toilets, showers, and similar wet areas, concealed hinges, screwdriver  
17 operated cam latch for general applications, key lock for use in public areas, UL listed for use in fire rated  
18 partitions if required by the application. Use the largest size access opening possible, consistent with the  
19 space and the equipment needing service; minimum size is 12" by 12".  
20

21 **IDENTIFICATION**

22 **STENCILS:**

23 Not less than 1 inch high letters/numbers for marking pipe and equipment.  
24  
25

26 **SNAP-ON PIPE MARKERS:**

27 Cylindrical self-coiling plastic sheet that snaps over piping insulation and is held tightly in place without  
28 the use of adhesive, tape or straps. Not less than 1 inch high letters/numbers and flow direction arrows for  
29 piping marking. W. H. Brady, Seton, Marking Services, or equal.  
30

31 **ENGRAVED NAME PLATES:**

32 White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, screw mounting,  
33 Setonply Style 2060 by Seton Name Plate Company or Emedolite- Style EIP by EMED Co., or equal by  
34 Marking Services, or W. H. Brady.  
35

36 **CEILING and ACCESS DOOR LABELS:**

37 Clear polyester tape 3/4" width with black printing W. H. Brady or equal.  
38  
39

40 **SEALING AND FIRE STOPPING**

41 **FIRE AND/OR SMOKE RATED PENETRATIONS:**

42 Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance  
43 with section 07 84 00 "Fire Stopping".  
44  
45

46 **NON-RATED PENETRATIONS:**

47 **Pipe Penetrations Through Below Grade Walls:**

48 In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking  
49 synthetic rubber links shaped to continuously fill the annular space between the uninsulated pipe and the  
50 cored opening or a water-stop type wall sleeve.  
51

52 **Pipe Penetrations:**

53 At pipe penetrations of non-rated interior walls, floors and exterior walls above grade, use urethane caulk in  
54 annular space between pipe insulation and sleeve. For non-rated drywall, plaster or wood walls where  
55 sleeve is not required use urethane caulk in annular space between pipe insulation and wall material.  
56

57 **Duct Penetrations:**

58 Annular space between duct (with or without insulation) and the non-rated walls or floor opening shall not  
59 be larger than 2". Where existing openings have an annular space larger than 2", the space shall be patched  
60 to match existing construction to within 2" around the duct.  
61

62 Where shown or specified, pack annular space with fiberglass batt insulation or mineral wool insulation.  
63 Provide 4" sheet metal escutcheon around duct on both sides of partition or floor to cover annular space.  
64

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2  
3 **PART 3 - EXECUTION**  
4

5 **DEMOLITION**

6 Perform all demolition as indicated on the drawings to accomplish new work. Where demolition work is to  
7 be performed adjacent to existing work that remains in an occupied area, construct temporary dust partition  
8 to minimize the amount of contamination of the occupied space. Where pipe or duct is removed and not  
9 reconnected with new work, cap ends of existing services as if they were new work. Coordinate work with  
10 the user agency to minimize disruption to the existing building occupants.

11  
12 All pipe, wiring and associated conduit, insulation, ductwork, and similar items demolished, abandoned, or  
13 deactivated are to be removed from the site by the Contractor. All piping and ductwork specialties are to  
14 be removed from the site by the Contractor unless they are dismantled and removed or stored by the user  
15 agency. All designated equipment is to be turned over to the user agency for their use at a place and time  
16 so designated. Maintain the condition of material and/or equipment that is indicated to be reused equal to  
17 that existing before work began.

18  
19 Where existing control devices, piping, or wiring are discontinued from use, remove, and turn over to  
20 owner. If owner does not want them remove from premises. Remove any previously abandoned control  
21 devices in a similar manner. In addition to the hardware removal, the software points and user view will  
22 need to be revised to reflect the removal of devices in the project scope.

23  
24 **CUTTING AND PATCHING**

25 Refer to Division 1, General Requirements, Cutting and Patching.

26  
27 **BUILDING ACCESS**

28 Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the  
29 building access was not previously arranged and must be provided by this contractor, restore any opening  
30 to its original condition after the apparatus has been brought into the building.

31  
32 **EQUIPMENT ACCESS**

33 Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance and  
34 service. Coordinate the exact location of wall and ceiling access panels and doors with the General  
35 Contractor, making sure that access is available for all equipment and specialties. Access doors in general  
36 construction are to be furnished by the Mechanical Contractor and installed by the General Contractor.

37  
38  
39 For equipment that is accessed above acoustical lay in ceilings or access doors, label the ceiling tile grid at  
40 the ceiling tile that is to be removed for access to the equipment or the access door. The label shall be pre-  
41 printed using clear polyester tape with black bold 28 size font for ceilings under 12 feet. For ceilings over  
42 12 feet high, use bold 40 size font. For accessible ceilings, use an arrow to point at ceiling tile to be  
43 removed for access. Label shall match equipment tag designation used on mechanical plans..

44  
45 **COORDINATION**

46 Verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not  
47 limited to, diffusers, register, grilles, and recessed or semi-recessed heating and/or cooling terminal units  
48 installed in/on architectural surfaces.

49  
50 Coordinate all work with other contractors prior to installation. Any installed work that is not coordinated  
51 and that interferes with other contractor's work shall be removed or relocated at the installing contractor's  
52 expense.

53  
54 Cooperate with the test and balance agency in ensuring Section 23 05 93 specification compliance. Verify  
55 system completion to the test and balance agency (flushing, pressure testing, chemical treatment, filling of  
56 liquid systems, proper pressurization and air venting of hydronic systems, clean filters, clean strainers, duct  
57 and pipe systems cleaned, controls adjusted and calibrated, controls cycled through their sequences, etc.),  
58 ready for testing, adjusting and balancing work. Install dampers, shutoff and balancing valves, flow  
59 measuring devices, gauges, temperature controls, etc., required for functional and balanced systems.  
60 Demonstrate the starting, interlocking and control features of each system so the test and balance agency  
61 can perform its work.

62  
63  
64 **IDENTIFICATION**

1 Identify equipment in mechanical equipment rooms by stenciling equipment number and service with one  
2 coat of black enamel against a light background or white enamel against a dark background. Use a primer  
3 where necessary for proper paint adhesion. Do not label equipment such as cabinet heaters and ceiling fans  
4 in occupied spaces.  
5

6 Where stenciling is not appropriate for equipment identification, engraved name plates may be used.  
7

8 Identify piping not less than once every 30 feet, not less than once in each room, adjacent to each access  
9 door or panel, and on both side of the partition where exposed piping passes through walls, floors or roofs.  
10 Place flow directional arrows at each pipe identification location. Use one coat of black enamel against a  
11 light background or white enamel against a dark background for stenciling, or provide snap-on pipe  
12 markers as specified in Part 2 – Products.  
13

14 Identify valves with brass tags bearing a system identification and a valve sequence number. Valve tags  
15 are not required at a terminal device unless the valves are greater than ten feet from the device or located in  
16 another room not visible from the terminal unit. Provide a typewritten valve schedule indicating the valve  
17 number and the equipment or areas supplied by each valve; locate schedules in each mechanical room and  
18 in each Operating and Maintenance manual. Schedules in mechanical rooms to be framed under clear  
19 plastic.  
20

21 Use engraved name plates to identify control equipment.  
22

23 Label fire, smoke and combination fire smoke dampers on the exterior surface of ductwork directly  
24 adjacent to access doors using a minimum of 0.5 inch height lettering reading, “SMOKE DAMPER” or  
25 “FIRE DAMPER”. Smoke and combination fire smoke dampers shall also include a second line listing the  
26 individual damper tag. The tags must be coordinated with the mechanical schedules. Utilize stencils or  
27 manufactured labels. All other forms of identification are unacceptable. All labels shall be clearly visible  
28 from the ceiling access point. For dampers that are accessed above acoustical lay in ceilings, label the  
29 ceiling tile grid at the ceiling tile that is to be removed for access to the damper and use an arrow to point at  
30 the tile to be removed for access. The label shall be pre-printed using clear polyester tape with black bold  
31 28 size font for ceilings under 12 feet. For ceilings over 12 feet high, use bold 40 size font. Ceiling tile  
32 label shall match damper tag designation used on mechanical plans.  
33  
34

### 35 **LUBRICATION**

36 Lubricate all bearings with lubricant as recommended by the manufacturer before the equipment is  
37 operated for any reason. Once the equipment has been run, maintain lubrication in accordance with the  
38 manufacturer's instructions until the work is accepted by UW. Maintain a log of all lubricants used and  
39 frequency of lubrication; include this information in the Operating and Maintenance Manuals at the  
40 completion of the project.  
41

### 42 **SLEEVES AND OPENINGS**

#### 43 **DUCT SLEEVES:**

44 Duct sleeves are not required in non-rated partitions or floors.  
45  
46

### 47 **SEALING AND FIRE STOPPING**

#### 48 **FIRE AND/OR SMOKE RATED PENETRATIONS**

49 Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance  
50 with section 07 84 00 Fire Stopping.  
51

#### 52 **NON-RATED PENETRATIONS:**

53  
54 At all interior walls and exterior walls, pipe penetrations are required to be sealed. Apply sealant to both  
55 sides of the penetration in such a manner that the annular space between the pipe sleeve or cored opening  
56 and the pipe or insulation is completely blocked.  
57

58 Duct penetrations through non-rated partitions shall require sheet metal escutcheons with fiberglass or  
59 mineral wool insulation fill for spaces that include laboratories, clean rooms, animal rooms, kitchens, cart  
60 wash rooms, janitor closets, toilet rooms, mechanical rooms, conference rooms, private consultation rooms,  
61 where ducts are exposed and where noted on drawings elsewhere.  
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**AGENCY TRAINING**

All training provided for agency shall comply with the format, general content requirements and submission guidelines specified under Section 01 91 01 or 01 91 02.

END OF SECTION





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**SECTION 23 05 93**  
**TESTING, ADJUSTING, AND BALANCING FOR HVAC**  
**BASED ON DFD MASTER SPECIFICATION DATED 4/3/2023**

**PART 1 - GENERAL**

**SCOPE**

This section includes air and water testing, adjusting and balancing for the entire project. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference
- Reference Standards
- Description
- Pre-Installation Meeting and Scheduling
- Pre-Balance Conference
- Submittals

**PART 2 - PRODUCTS**

- Instrumentation

**PART 3 - EXECUTION**

- Pre-Construction Testing of Existing Systems
- Preliminary Procedures
- Performing Testing, Adjusting and Balancing
- Deficiencies

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 23 05 00 Common Work Results for HVAC
- Section 23 07 00 HVAC Insulation
- Section 23 08 00 Commissioning of HVAC

**REFERENCE**

Applicable provisions of the General Conditions, Supplementary General Conditions and General Requirements in Division 1 govern work under this section.

**REFERENCE STANDARDS**

- AABC National Standards for Total System Balance, Sixth Edition, 2002.
- ASHRAE ASHRAE Handbook, 2007 HVAC Applications, Chapter 37, Testing Adjusting and Balancing.
- NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems, Seventh Edition, 2005.
- TABB Tab Procedural Guide, First Edition, 2003.

**DESCRIPTION**

The Contractor will separately contract with an independent test and balance agency to perform all testing, adjusting, and balancing of air and hydronic systems required for this project. Work related to the testing, adjusting, and balancing that must be performed by the installing mechanical contractor is specified in other section of these specifications.

The contractor will perform pre-construction testing on existing systems as described in part 3 of this document. See mechanical sheets for systems requiring testing.

Provide total mechanical systems testing, adjusting and balancing. Requirements include the balance of air and water distribution, adjustment of new and existing systems and equipment to provide design requirements indicated on the drawings, electrical measurement and verification of performance of all mechanical equipment, all in accordance with standards published by AABC, NEBB, or TABB.

Test, adjust and balance all air and hydronic systems so that each room, piece of equipment or terminal device meets the design requirements indicated on the drawings and in the specifications.

1 Accomplish testing, adjusting and balancing work in a timely manner that allows partial occupancy of major  
2 buildings, occupancy of one building when the project involves many buildings, and completion of the entire  
3 project in the time stated in the Instruction to Bidders and in accordance with the completion schedule  
4 established for this project.

5  
6 Verify that provisions are being made to accomplish the specified testing, adjusting and balancing work. If  
7 problems are found, handle as specified in Part 3 under Deficiencies.

## 8 9 **QUALITY ASSURANCE**

### 10 11 **Qualifications**

12 An independent Firm specializing in the Testing and Balancing of HVAC systems for a minimum of 3 years.  
13 A Firm not engaged in the commerce of furnishing or providing equipment or material generally related to  
14 HVAC work other than that specifically related to installing Testing and Balancing components necessary  
15 for work in this section such as, but not limited to sheaves, pulleys, and balancing dampers.

16  
17 A certified member of AABC or certified by NEBB or TABB in the specific area of work performed.  
18 Maintain certification for the entire duration of the project. If certification of firm or any staff performing  
19 work is terminated or expires during the duration of the project, contact UW immediately.

20  
21 Technicians on this project must have satisfactorily completed work on a minimum of (3) three projects of  
22 at least 50% in size, and of similar complexity. Size is defined as the quantity of each specific individual item  
23 requiring testing and balancing such as, but not limited to, equipment, devices, terminal devices, and grilles  
24 and diffusers.

25  
26 Submit Qualifications of firm and project staff to UW upon requested.

### 27 28 **PRE-INSTALLATION MEETING AND SCHEDULING**

29 The test and balance agency is required to attend a pre-installation meeting with all other project contractors  
30 before the construction process is started. The test and balance agency shall give the Mechanical Contractor  
31 a detailed schedule of testing and balancing tasks for incorporation into the project schedule.

### 32 33 **PRE-BALANCE CONFERENCE**

34 90 days prior to beginning testing, adjusting and balancing, schedule and conduct a conference with the  
35 Architect/Engineer, UW's Project Representative and the mechanical system and temperature control system  
36 installing Contractors. Provide AE and Commissioning Provider (CxP) with a complete copy of the TAB  
37 plan for the project. The objective is final coordination and verification of system operation and readiness  
38 for testing, adjusting and balancing procedures and scheduling procedures with the above mentioned parties.  
39 Indicate work required to be completed prior to testing, adjusting, and balancing and identify the party  
40 responsible for completion of that work.

### 41 42 **SUBMITTALS**

43 Refer to division 1, General Conditions, Submittals. See also Related Work in this section.

44  
45 Submit testing, adjusting and balancing reports bearing the seal and signature of the NEBB, AABC or TABB  
46 Certified Test and Balance Supervisor. The reports certify that the systems have been tested, adjusted and  
47 balanced in accordance with the referenced standards; are an accurate representation of how the systems have  
48 been installed and are operating; and are an accurate record of all final quantities measured to establish normal  
49 operating values of the systems.

50  
51 Format: Cover page identifying project name, project number and descriptive title of contents. Divide the  
52 contents of the report into the below listed divisions:

- 53  
54
- 55 • General Information
  - 56 • Summary
  - 57 • Air Systems
  - 58 • Hydronic Systems
  - 59 • Special Systems

60 Contents: Provide the following minimum information, forms and data:

61  
62 General Information: Inside cover sheet identifying Test and Balance Agency, Contractor, Architect,  
63 Engineer, Project Name and Project Number. Include addresses, contact names and telephone numbers. Also  
64 include a certification sheet containing the seal and signature of the Test and Balance Supervisor.

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Summary: Provide summary sheet describing mechanical system deficiencies. Describe objectionable noise or drafts found during testing, adjusting and balancing. Provide recommendations for correcting unsatisfactory performances and indicate whether modifications required are within the scope of the contract, are design related or installation related. List instrumentation used during testing, adjusting and balancing procedures.

The remainder of the report to contain the appropriate standard NEBB, AABC, or TABB forms for each respective item and system. Fill out forms completely. Where information cannot be obtained or is not applicable indicate same.

**PART 2 - PRODUCTS**

**INSTRUMENTATION**

Provide all required instrumentation to obtain proper measurements. Application of instruments and accuracy of instruments and measurements to be in accordance with the requirements of NEBB, AABC, or TABB Standards and instrument manufacturer's specifications.

All instruments used for measurements shall be accurate, and calibration histories for each instrument to be available for examination by DD upon request. Calibration and maintenance of all instruments to be in accordance with the requirements of NEBB, AABC, or TABB Standards

**PART 3 - EXECUTION**

**PRE-CONSTRUCTION TESTING OF EXISTING SYSTEMS**

Pre-construction testing and balancing will be required for supply and exhaust air systems as indicated on the drawings. Provide both airflow and static pressure measurements for the existing system and verify information in schedules is accurate. Communicate results with architect prior to construction. All testing and balancing to be performed as described in this section.

**DAILY REPORTS**

Submit to UW's Project Representative daily work activity reports for each day on which testing and balancing work is performed. Reports shall include description of day's activities and description of any system deficiencies.

**PRELIMINARY PROCEDURES**

Review preconstruction meeting report, applicable construction bulletins, applicable change orders and approved shop drawings of equipment, outlets/inlets and temperature controls.

Check filters for cleanliness, dampers and valves for correct positioning, equipment for proper rotation and belt tension, temperature controls for completion of installation and hydronic systems for proper charge and purging of air.

Notify UW's Project Representative on a daily basis during balancing. Identify deficiencies preventing completion of testing, adjusting and balancing procedures. Do not proceed until systems are fully operational with all components necessary for complete testing, adjusting and balancing. Installing Contractors are required to provide personnel to check and verify system completion, readiness for balancing and assist Balancing Agency in providing specified system performance.

**PERFORMING TESTING, ADJUSTING AND BALANCING**

Perform testing, adjusting and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards except as may be modified below.

Unless specifically instructed in writing, all work in this specification section is to be performed during the normal workday.

1  
2 In areas containing ceilings, remove ceiling tile to accomplish balancing work; replace tile when work is  
3 complete and provide new tile for any tile that are damaged by this procedure. If the ceiling construction is  
4 such that access panels are required for the work of this section and the panels have not been provided, inform  
5 the owner's project representative.  
6

7  
8 Cut insulation, ductwork and piping for installation of test probes to the minimum extent necessary for  
9 adequate performance of procedures. Patch using materials identical to those removed, maintaining vapor  
10 barrier integrity and pressure rating of systems.  
11

12 In air systems employing filters, blank off sufficient filter area to simulate a pressure drop that is midway  
13 between that of a clean filter and that of a dirty filter.  
14

15 Measure and record system measurements at the fan and/or pump to determine total flow. Adjust equipment  
16 as required to yield specified total flow at terminals. Proceed taking measurements in mains and branches as  
17 required for final terminal balancing. Perform terminal balancing to specified flows balancing branch  
18 dampers, deflectors, extractors and valves prior to adjustment of terminals.  
19

20 Measure and record static air pressure conditions across fans, coils and filters. Indicate in report if cooling  
21 coil measurements were made on a wet or dry coil and if filter measurements were made on a clean or dirty  
22 filter. Spot check static air pressure conditions directly ahead of terminal units.  
23

24 Adjust outside air, return air and relief air dampers for design conditions at both the minimum and maximum  
25 settings and record both sets of data. Balance modulating dampers at extreme conditions and record both  
26 sets of data. Balance variable air volume systems at maximum air flow rate, full cooling, and minimum flow  
27 rate, full heating; record all data.  
28

29 Adjust register, grille and diffuser vanes and accessories to achieve proper air distribution patterns and  
30 uniform space temperatures free from objectionable noise and drafts within the capabilities of the installed  
31 system.  
32

33 Provide fan and motor drive sheave adjustments necessary to obtain design performance. Provide drive  
34 changes specifically noted on drawings, if any. If work of this section indicates that any drive or motor is  
35 inadequate for the application, advise the owner's project representative by giving the representative properly  
36 sized motor/drive information (in accordance with manufacturers original service factor and installed motor  
37 horsepower requirements); Confirm any change will keep the duct/piping system within its design limitations  
38 with respect to speed of the device and pressure classification of the distribution system. Required  
39 motor/drive changes not specifically noted on drawings or in specifications will be considered an extra cost  
40 and will require an itemized cost breakdown submitted to owner's project representative. Prior authorization  
41 is needed before this work is started.  
42

43 Areas or rooms designed to maintain positive, negative or balanced air pressures with respect to adjacent  
44 spaces, as indicated by the design air quantities, require special attention. Adjust fan drives, distribution  
45 dampers, terminals and controls to maintain indicated pressure relationship.  
46

47 Final air system measurements to be within the following range of specified cfm:

48 Fans	0% to +10%
49 Supply grilles, registers, diffusers	0% to +10%
50 Return/exhaust grilles, registers	0% to -10%
51 Room pressurization air	-5% to +5%

52  
53 Final water system measurements must be within the following range of specified gpm:

54 Heating flow rates	0% to -10%
55 Cooling flow rates	-5% to +5%

56  
57 Contact the temperature control Contractor for assistance in operation and adjustment of controls during  
58 testing, adjusting and balancing procedures. Cycle controls and verify proper operation and setpoints.  
59 Include in report description of temperature control operation and any deficiencies found.  
60

61 Permanently mark equipment settings, including damper and valve positions, control settings, and similar  
62 devices allowing settings to be restored. Set and lock memory stops.  
63

1 Leave systems in proper working order, replacing belt guards, closing access doors and electrical boxes, and  
2 restoring temperature controls to normal operating settings.  
3  
4 Coordinate and assist CxP with all verification activities defined within section (01 91 01, 02) including  
5 providing all required sampling data necessary for the commissioning process.  
6  
7 Verify and record, in the T&B Report, “K” factors for all VAV air terminal devices and air flow stations.  
8  
9 Verify and record, in the T&B Report, values of damper positions and fan speeds for all characterization  
10 curves required in the 23 09 93 control sequences.  
11  
12 **VAV SUPPLY AND EXHAUST DUCT SYSTEM STATIC PRESSURE SET POINT**  
13 For VAV supply and exhaust systems with VAV air terminal devices, determine the minimum required duct  
14 static pressure at the DDC static pressure sensor location(s) needed to insure that all VAV air terminals are  
15 operating at their design airflows with the most demanding VAV terminal wide open. Provide these static  
16 pressure numbers to the DDC temperature controls contractor and record them in the T&B report for each  
17 system.  
18  
19 **DEFICIENCIES**  
20 Division 23 00 00 contractor to correct any installation deficiencies found by the test and balance agency that  
21 were specified and/or shown on the Contract Documents to be performed as part of that division of work.  
22 Test and balance agency will notify the UW's Project Representative of these items and instructions will be  
23 issued to the Division 23 00 00 contractor for correction of the deficient work. All corrective work to be done  
24 at no cost to the State of Wisconsin. Retest mechanical systems, equipment, and devices once corrective work  
25 is complete as specified.  
26  
27 **FUNCTIONAL PERFORMANCE TESTING**  
28 Contractor is responsible for utilizing the functional performance test forms supplied under specification  
29 Section 23 08 00 Commissioning of HVAC in accordance with the procedures defined for functional  
30 performance testing in Section 01 91 01 or 01 91 02. Notify the A/E and commissioning provider 5 business  
31 days prior to performing functional performance testing so that they may witness.  
32  
33 **END OF SECTION**



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**SECTION 23 07 00**  
**HVAC INSULATION**  
**BASED ON DFD MASTER SPECIFICATION DATED 11/18/2022**

**PART 1 - GENERAL**

**SCOPE**

This section includes insulation specifications for heating, ventilating and air conditioning piping, ductwork and equipment. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Description
- Definitions
- Shop Drawings
- Operation and Maintenance Data
- Environmental Requirements

**PART 2 - PRODUCTS**

- Materials
- Insulation Types
- Adhesives, Mastics, Sealants, and Reinforcing Materials
- Jackets
- Accessories

**PART 3 - EXECUTION**

- Examination
- Installation
- Protective Jacket Installation
- Duct Insulation
- Ductwork Protective Coverings
- Duct Insulation Schedule
- Construction Verification Items

**RELATED WORK**

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 23 05 00 - Common Work Results for HVAC
- Section 23 08 00 - Commissioning of HVAC
- Section 23 31 00 - HVAC Ducts and Casings

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**REFERENCE STANDARDS**

- ASTM B209 Aluminum and Aluminum Alloy Sheet and Plate
- ASTM C165 Test Method for Compressive Properties of Thermal Insulations
- ASTM C177 Heat Flux and Thermal Transmission Properties
- ASTM C195 Mineral Fiber Thermal Insulation Cement
- ASTM C240 Cellular Glass Insulation Block
- ASTM C302 Density of Preformed Pipe Insulation
- ASTM C272 Water Absorption of Core Materials for Sandwich Constructions
- ASTM C303 Density of Preformed Block Insulation
- ASTM C355 Test Methods for Test for Water Vapor Transmission of Thick Materials
- ASTM C449 Mineral Fiber Hydraulic Setting Thermal Insulation Cement
- ASTM C518 Heat Flux and Thermal Transmission Properties
- ASTM C533 Calcium Silicate Block and Pipe Thermal Insulation
- ASTM C534 Preformed Flexible Elastomeric Thermal Insulation
- ASTM C547 Mineral Fiber Preformed Pipe Insulation
- ASTM C552 Cellular Glass Block and Pipe Thermal Insulation
- ASTM C553 Mineral Fiber Blanket and Felt Insulation
- ASTM C578 Preformed, Block Type Cellular Polystyrene Thermal Insulation
- ASTM C591 Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation

1	ASTM C610	Expanded Perlite Block and Thermal Pipe Insulation
2	ASTM C612	Mineral Fiber Block and Board Thermal Insulation
3	ASTM C921	Properties of Jacketing Materials for Thermal Insulation
4	ASTM C1136	Flexible Low Permeance Vapor Retarders for Thermal Insulation
5	ASTM C1728	Standard for Aerogel Insulation
6	ASTM D412	Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
7	ASTM D1000	Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications
8		
9	ASTM D1621	Standard Test Method for Compressive Properties Of Rigid Cellular Plastics
10	ASTM D1622	Standard Test Method for Apparent Density of Rigid Cellular Plastics
11	ASTM D1940	Method of Test for Porosity of Rigid Cellular Plastics
12	ASTM D2126	Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
13	ASTM D2240	Standard Test Method for Rubber Property—Durometer Hardness
14	ASTM D5590	Test Method for Determining the Resistance of Coatings to Fungal Defacement
15	ASTM E84	Surface Burning Characteristics of Building Materials
16	ASTM E814	Standard Test Method for Fire Tests of Penetration Firestop Systems
17	ASTM E2336	Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems
18	MICA	National Commercial & Industrial Insulation Standards
19	NFPA 225	Surface Burning Characteristics of Building Materials
20	UL 723	Surface Burning Characteristics of Building Materials

21 **QUALITY ASSURANCE**

22 Refer to division 1, General Conditions, Equals and Substitutions

23 Label all insulating products delivered to the construction site with the manufacturer's name and description of materials.

24  
25 Insulation systems shall be applied by experienced contractors. Within the past five (5) years, the contractor shall be able to document the successful completion of a minimum of three (3) projects of at least 50% of the size and similar scope of the work specified in this section.

31  
32  
33 **DESCRIPTION**

34 Furnish and install all insulating materials and accessories as specified or as required for a complete installation. The following types of insulation are specified in this section:

- 35 • Duct Insulation

36  
37 Install all insulation in accordance with the latest edition of MICA (Midwest Insulation Contractors Association) Standard and manufacturer's installation instructions. Exceptions to these standards will only be accepted where specifically modified in these specifications, or where prior written approval has been obtained from the UW Project Representative.

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43 **DEFINITIONS**

44 Concealed: shafts, furred spaces, space above finished ceilings, utility tunnels and crawl spaces. All other areas, including walk-through tunnels, shall be considered as exposed.

45  
46  
47  
48 **SHOP DRAWINGS**

49 Refer to division 1, General Conditions, Submittals.

50  
51 Submit a schedule of all insulating materials to be used on the project, including adhesives, fastening methods, fitting materials along with material safety data sheets and intended use of each material. Include manufacturer's technical data sheets indicating density, thermal characteristics, jacket type, and manufacturer's installation instructions. Include copies of the MICA plates that are applicable to this project.

52  
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54  
55 **OPERATION AND MAINTENANCE DATA**

56 All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

57  
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61  
62 **ENVIRONMENTAL REQUIREMENTS**

63 Do not store insulation materials on grade or where they are at risk of becoming wet. Do not install insulation products that have been exposed to water.



1  
2 Protect installed insulation work with plastic sheeting to prevent water damage.  
3

## 4 **PART 2 - PRODUCTS**

### 5 **MATERIALS**

6 Manufacturers: Armacell, CertainTeed, Manson, Childers, Dow, Extol, Fibrex, Halstead, Foster, Imcoa,  
7 ITW, Johns Manville, Knauf Insulation, Owens-Corning, Pittsburgh Corning, VentureTape or approved  
8 equal.  
9

10 Materials or accessories containing asbestos will not be accepted.  
11

12 Use composite insulation systems (insulation, jackets, sealants, mastics, and adhesives) that have a flame  
13 spread rating of 25 or less and smoke developed rating of 50 or less, with the following exceptions:  
14

15 Pipe insulation which is not located in an air plenum may have a flame spread rating not over 25 and a smoke  
16 developed rating no higher than 450 when tested in accordance with UL 723 and ASTM E84.  
17

### 18 **INSULATION TYPES**

19 Insulating materials shall be fire retardant, moisture and mildew resistant, and vermin proof. Insulation shall  
20 be suitable to receive jackets, adhesives and coatings as indicated.  
21

#### 22 **FLEXIBLE FIBERGLASS INSULATION:**

23 Minimum nominal density of 0.75 lbs. per cu. ft., and thermal conductivity of not more than 0.30 at 75  
24 degrees F mean temperature, rated for maximum service temperature of 250 degrees F.  
25

#### 26 **RIGID FIBERGLASS INSULATION:**

27 Minimum nominal density of 3 lbs. per cu. ft., and thermal conductivity of not more than 0.23 at 75 degrees  
28 F mean temperature, 0.25 at 125 degrees F, 0.27 at 150 degrees F, 0.29 at 200 degrees F, 0.32 at 250 degrees  
29 F, minimum compressive strength of 25 PSF at 10% deformation, rated for maximum service temperature of  
30 450 degrees F.  
31

#### 32 **SEMI-RIGID FIBERGLASS INSULATION:**

33 Minimum nominal density of 3 lbs. per cu. ft., thermal conductivity of not more than 0.28 at 75 degrees F  
34 mean temperature, minimum compressive strength of 25 PSF at 10% deformation, rated for service  
35 temperature range of 0 degrees F to 450 degrees F. Insulation fibers perpendicular to jacket and scored for  
36 wrapping cylindrical surfaces.  
37

### 38 **ADHESIVES, MASTIC, SEALANTS, AND REINFORCING MATERIALS**

39 Products shall be compatible with surfaces and materials on which they are applied and shall be suitable for  
40 use at operating temperatures of systems to which they are applied.  
41

#### 42 **FIBERGLASS INSULATION ADHESIVE:**

43 Must comply with ASTM C916, Type II: Foster 85-60, Childers CP-127, Duro Dyne SSG.  
44

#### 45 **LAGGING ADHESIVE / COATINGS:**

46 For all indoor applications used in conjunction with canvas/glass cloth: the coating must be anti-fungal and  
47 shall meet ASTM D 5590 with 0 growth rating (AF): Foster 30-36 AF Seal Fas, Childers CP-137 AF Chil-  
48 Seal.  
49

50 Anti-fungal adhesive/coating to be used in the following locations;  
51

- 52 • Exterior locations

#### 53 **REINFORCING MESH:**

54 Use Foster 42-24 Mast A Fab, Childers Chil Glas #10 or Pittsburgh Corning PC 79.  
55

#### 56 **INSULATION JOINT SEALANT:**

57 Joint sealants to be non-shrinking and permanently flexible.  
58

59 Used on all below ambient piping to prevent moisture ingress.  
60

61 For Cellular Glass, Polyisocyanurate, Phenolic use Foster 95-44 Elastolar, Childers CP-70 Chil-Byl,  
62 Pittsburgh Corning CW Sealant.  
63

64 For Polystyrene use Foster 30-45N, Childers CP-70.

1 For Elastomeric use Armaflex 520 or equal.

## 3 **JACKETS**

### 4 **ALL SERVICE JACKETS (ASJ):**

5 Heavy duty, fire retardant material with polymer coated white kraft reinforced foil vapor retarder jacket,  
6 factory applied to insulation with a self-sealing pressure sensitive adhesive lap, maximum permeance of .02  
7 perms and minimum beach puncture resistance of 50 units.

### 9 **FOIL SCRIM KRAFT ALL SERVICE JACKETS (FSK):**

10 Glass fiber reinforced foil kraft laminate, factory applied to insulation. Maximum permeance of .02 perms  
11 and minimum beach puncture resistance of 25 units.

## 14 **ACCESSORIES**

15 All products shall be compatible with surfaces and materials on which they are applied and be suitable for  
16 use at operating temperatures of the systems to which they are applied.

18 Adhesives, sealants, and protective finishes shall be as recommended by insulation manufacturer for  
19 applications specified.

21 Insulation bands to be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness to be  
22 0.015 inch for aluminum and 0.010 inch for stainless steel.

24 Tack fasteners to be stainless steel ring grooved shank tacks.

26 Staples to be clinch style.

28 Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.

30 Finishing cement to be ASTM C449.

32 Fibrous glass or canvas fabric reinforcing used with lagging adhesive shall have a minimum untreated weight  
33 of 6 oz./sq. yd.

35 Fungicidal water base duct liner coating (Foster 40-20 or equal) to be compatible with vapor retarding  
36 coating. This product must be EPA registered to be used inside HVAC ducts. Coating must comply with  
37 ASTM D 5590 with 0 growth rating.

## 39 **PART 3 - EXECUTION**

### 41 **EXAMINATION**

42 Verify that all piping, equipment, and ductwork are tested and approved prior to installing insulation. Do not  
43 insulate systems until testing and inspection procedures are completed.

45 Verify that all surfaces are clean, dry and without foreign material before applying insulation materials.

### 47 **INSTALLATION**

48 All materials shall be installed by skilled labor regularly engaged in this type of work. All materials shall be  
49 installed in strict accordance with manufacturer's recommendations, building codes, and industry standards.  
50 Do not install products when the ambient temperature or conditions are not consistent with the manufacturer's  
51 recommendations. Surfaces to be insulated must be clean and dry.

53 Locate insulation and cover seams in the least visible location. All surface finishes shall be extended in such  
54 a manner as to protect all raw edges, ends and surfaces of insulation.

56 Install insulation with smooth and even surfaces. Poorly fitted joints or use of filler in voids will not be  
57 accepted. Provide neatly beveled and coated terminations at all nameplates, uninsulated fittings, or at other  
58 locations where insulation terminates.

60 Install fabric reinforcing without wrinkles. Overlap seams a minimum of 2 inches.

62 Use full length material (as delivered from manufacturer) wherever possible. Scrap piecing of insulation or  
63 pieces cut undersize and stretched to fit will not be accepted.

1 All pipe and duct insulation shall be continuous through walls, ceiling or floor openings and through sleeves  
2 except where firestop or firesafing materials are required. Vapor retarding jacket shall be maintained  
3 continuous through all penetrations.  
4

5 Provide a continuous unbroken moisture vapor retarding jacket on insulation applied to systems noted below.  
6 Attachments to cold surfaces shall be insulated and vapor sealed to prevent condensation.  
7

8 Provide a complete vapor retarding jacket for insulation on the following systems:

- 9 • Insulated Duct
- 10 • Equipment, ductwork or piping with a surface temperature below 65 degrees F

11  
12 **PROTECTIVE JACKET INSTALLATION**

13 ALL SERVICE JACKETS (ASJ) and FOIL SCRIM KRAFT JACKETS (FSK):

14 Install according to manufacturer's recommendations using factory supplied lap seals and butt strip seals. In  
15 addition to factory adhesive, secure lap seals and tape with clinch type staples.  
16

17  
18 **DUCT INSULATION**

19 GENERAL:

20 Secure flexible blanket duct insulation on sides and bottom of ductwork over 24" wide with weld pins. Space  
21 fasteners 18" on center or less as required to prevent sagging. Compress insulation no more than 25%.  
22

23 Secure rigid board insulation to ductwork with weld pins. Apply insulation with joints firmly butted together  
24 and placed as close as possible to the equipment surface. Pins shall be located a maximum of 3" from each  
25 edge and spaced no greater than 12" on center.  
26

27 Install weld pins without damage to the interior galvanized surface of the duct. Clip pins back to washer and  
28 cover penetrations with tape of same material as jacket. Firmly butt seams and joints and cover with 4" tape  
29 of same material as jacket. Seal tape with plastic applicator and secure with staples. All joints, seams, edges  
30 and penetrations to be fully vapor sealed with vapor retarding mastic.  
31

32 Stop and point insulation around access doors and damper operators to allow operation without disturbing  
33 insulation or jacket material.  
34

35 External supply duct insulation is not required where ductwork contains continuous 1" acoustical liner.  
36 Provide 4" overlap of external insulation over ends of acoustically lined sections.  
37

38 Where insulated ductwork is supported by trapeze hangers, the insulation shall be installed continuous  
39 through the hangers. Drop the supporting channels required to facilitate the installation of the insulation.  
40 Where rigid board or flexible insulation is specified, install high density inserts to prevent the weight of the  
41 ductwork from crushing the insulation.  
42

43 Where insulated low temperature (below 45°F) ductwork is supported by steel metal straps or wire ropes that  
44 are secured directly to the duct, the straps or ropes shall be completely covered with insulation and sealed to  
45 provide a complete vapor retarding barrier.  
46

47 Where insulated duct risers are supported by steel channels secured directly to the duct, extend the insulation  
48 and vapor retarding jacketing to encapsulate the support channels.  
49

50  
51 **DUCT INSULATION SCHEDULE:**

52 Provide duct insulation on new and existing remodeled ductwork in the following schedule:  
53  
54

SERVICE	INSULATION TYPE	JACKET	THICKNESS
Exposed supply ducts*	Rigid Fiberglass	FSK	2"
Concealed supply ducts	Flexible Fiberglass	FSK	1.5"

55  
56 \* Exposed supply branch ducts located in the space they are serving do not require insulation.  
57 Exposed supply main ducts running through spaces they serve shall be insulated as exposed  
58 supply ducts scheduled above.

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**CONSTRUCTION VERIFICATION ITEMS**

Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 23 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01 or 01 91 02.

END OF SECTION

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**SECTION 23 08 00**  
**COMMISSIONING OF HVAC**  
**BASED ON DFD MASTER SPECIFICATION DATED 01/17/17**

**PART 1 - GENERAL**

**SCOPE**

This section includes commissioning forms for construction verification and functional performance testing. Included are the following topics:

PART 1 - GENERAL

Scope  
Related Work  
Reference  
Submittals

PART 2 - PRODUCTS

(Not Used)

PART 3 – EXECUTION

Commissioning Forms

CV-23 07 00	HVAC Ductwork Insulation
CV-23 09 14	Control Wiring and Devices
CV-23 31 00	Ductwork and Casings
CV-23 37 13	Diffuser, Grilles and Registers

Functional Performance Test Forms

FPT-23 05 93 Testing Adjusting and Balancing

**RELATED WORK**

Section 01 91 01 or 01 91 02 – Commissioning Process

**REFERENCE**

Applicable provisions of Division 1 shall govern work under this section.

**SUBMITTALS**

Reference the General Conditions of the Contract for submittal requirements.

Reference Section 01 91 01 or 01 91 02 Commissioning Process for Construction Verification Checklist and Functional Performance Test submittal requirements.

**PART 2 – PRODUCTS**

(Not Used)

**PART 3 – EXECUTION**

**COMMISSIONING FORMS**

Commissioning forms are to be filled in as work progresses by the individuals responsible for installation and shall be completed for each installation phase.

Provide a description of the work completed since the last entry, the percentage of the total work completed for the system for that area and the step of installation or finalization.

Circle Yes or No for each commissioning form item. If the information requested for an item does not apply to the given stage of installation for the system, list it as “N/A”. Explain all discrepancies, negative responses or N/A responses in the negative responses section.

Once the work is 100% complete and the responses to each item are complete and resolved for a given commissioning forms group, mark as complete, initial and date in the spaces provided.

Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress meetings.

Construction Verification Checklist  
23 07 00 – HVAC Ductwork Insulation

## CV-23 07 00 – HVAC Ductwork Insulation

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

**A) DUCTWORK INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:			DATE:							

**Question Details**

- 1) Ductwork clean, dry, pressure tested and approved prior to application of insulation.
- 2) Type and thickness of insulation complies with listed specification requirements for given system.
- 3) Insulation installed with smooth and even surfaces.
- 4) Insulation is secured per specification requirements for given insulation type and ductwork width.
- 5) Insulation seams and joints firmly butted together and covered with 4" tape of same material as jacket.
- 6) Insulation and vapor barrier continuous through non-rated sleeves.
- 7) Insulation is butted tightly against the fire stop with butt joints taped in rated construction.
- 8) Insulation stopped and pointed around access doors and damper operators to allow operation without disturbing insulation or jacket material.
- 9) Complete vapor barrier provided for all insulated ductwork.
- 10) Exposed fiberglass insulation covered and sealed at all permanent terminations and at end of work day.

Construction Verification Checklist  
 23 07 00 – HVAC Ductwork Insulation

**Negative Responses**

Group/Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 07 00 – HVAC Ductwork Insulation

**B) DEVICE & EQUIPMENT INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)			
				1)	2)	3)	
				YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	
				YES NO	YES NO	YES NO	
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:		DATE:	

**Question Details**

- 1) Insulated easily removable galvanized steel metal boxes or insulated easily removable elastomeric insulation sections provided for equipment, devices, labels and access panels per specifications.
- 2) Air handling unit casings, chambers, or plenums (filters, mixing chambers, sound attenuators, etc.) insulated in accordance with requirements of adjacent duct insulation.
- 3) All control devices are mounted over ductwork insulation.

**Negative Responses**

Group/Item	Date Found	Found By	Location	Reason for Negative Response	Resolved YES / NO	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		



Construction Verification Checklist  
23 09 14 – Control Wiring and Devices

## CV-23 09 14 – Control Wiring and Devices

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

### A) WIRING INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)								
				1)	2)	3)	4)	5)	6)	7)	8)	9)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:				DATE:				

#### Question Details

- 1) All cabling identified at both ends according to Section 23 09 14.
- 2) A minimum of 5' of cable provided in DDC panel for all electronic input/output devices, sensors, relays and interlocking wiring to allow for termination by the DDC Contractor.
- 3) All high voltage and low voltage wiring (includes low voltage cable) installed in metal conduit, Electrical Non-metallic Tubing (ENT), or Electrical Metallic Tubing (EMT), as scheduled per specifications.
- 4) All conduit installed and supported in accordance with electrical sections (Division 26) of this specification and the National Electrical Code.
- 5) Bushings installed at all conduit terminations.
- 6) Conduit is a minimum of 1/2 " for low voltage control wiring and pipe fill does not exceed 40%.
- 7) Control panels serving equipment fed by emergency power also served by emergency power.
- 8) "Hand/off/auto" selector switches installed on systems where automatic interlock controls are specified and "hand/off/auto" selector switches are not supplied with the equipment controlled.
- 9) All equipment requiring maintenance is accessible (valves, junction boxes, etc.).

Construction Verification Checklist  
23 09 14 – Control Wiring and Devices

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

Construction Verification Checklist  
23 09 14 – Control Wiring and Devices

**B) CONTROL DEVICES INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:				DATE:						

**Question Details**

- 1) Thermometers installed at each point of temperature transmission (sensors) and control, except reheat coils, unless the drawings indicate a thermometer is to be installed.
- 2) Room thermostats and sensors installed at the location and height indicated on the drawings and aligned with light switches and humidistats.
- 3) Any room thermostats or sensors mounted on an exterior wall mounted on a thermally insulated sub-base.
- 4) Where thermostats or sensors are mounted on exterior walls or in any location where air transfer will affect the measured temperature or humidity the conduit and any other opening that will effect the measurement are sealed.
- 5) Guards provided on thermostats in entrance hallways, other public areas, or in locations where thermostat is subject to physical damage.
- 6) For horizontal steam or hot water coils, low limit thermostat elements distributed (serpentine) horizontally across the coil to cover every square foot of coil.
- 7) For integral face and bypass coils the low limit thermostat elements are installed on the leaving face of the heating coil inside the damper enclosure.
- 8) Straightening vanes installed upstream of air flow measuring stations where required per manufacturers recommendations.
- 9) Where flow meters are located more than five feet above the floor or where they cannot be read due to equipment location, provide remote mounting of the flow meter display and programming controls four to five feet above finished floor.
- 10) For VFD installations, a separate current switch provided in parallel with the VFD motor status relay when a bypass starter is provided on the VFD to prove motor status in the bypass mode.
- 11) All control devices and boxes mounted on insulated ductwork are mounted over the insulation.

Construction Verification Checklist  
23 09 14 – Control Wiring and Devices

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 09 14 – Control Wiring and Devices

**C) FINALIZATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)								
				1)	2)	3)	4)	5)	6)	7)	8)	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:				DATE:				

**Question Details**

- 1) All penetrations through fire rated wall assemblies have been sealed per specification requirements.
- 2) All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.
- 3) All wiring is properly labeled with control ID number of circuit within 1/2" of device and terminal connection.
- 4) All control devices with the exception of dampers, valves, and terminal unit devices labeled with permanent printed labels that correspond to control drawings.
- 5) Temperature control wiring and tubing junction and pullboxes identified utilizing spray painted green covers.
- 6) Pressure and/or differential set points of pressure sensors re-adjusted after final balancing is completed.
- 7) Threshold settings for current switch adjusted to indicate belt or coupling loss after final balancing.
- 8) As-built control drawings of all systems served by each local panel provided in a location adjacent to or inside of panel cover. Provide a protective cover or envelope for drawings.

Construction Verification Checklist  
23 09 14 – Control Wiring and Devices

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

## CV-23 31 00 – Ductwork and Casings

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

### A) GENERAL DUCTWORK INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:			DATE:							

#### Question Details

- 1) Ductwork is clean and free of damage prior to installation.
- 2) Ductwork is installed in accordance with SMACNA HVAC Duct Construction Standards, Metal and Flexible, 2nd Edition, 1995.
- 3) Where two different metal ducts meet, the joint is installed in such a manner that metal ducts do not contact each other by using proper seal or compound.
- 4) No reductions to duct to less than six inches in any dimension and/or aspect ratio greater than 8:1 are present.
- 5) Duct is pitched toward outside air intakes and drain to outside of building. Solder or seal seams to form watertight joints.
- 6) All equipment and systems requiring maintenance are accessible (valves, junction boxes, etc.).
- 7) All seams, joins and penetrations sealed in accordance with SMACNA seal class "A" standards, except transfer ductwork with pressure classification below 2".
- 8) All duct openings sealed to maintain duct system cleanliness.
- 9) Ductwork supported in accordance with SMACNA HVAC Duct Construction Standards, except secure wire method is not utilized.
- 10) Sheet metal thickness complies with the requirements of Section 23 21 00.

UWM Project No. GML B1970 / UWSA Project No. B-23-001

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		



Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**B) SUPPLY DUCTWORK INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)		
				1)	2)	3)
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:		DATE:

**Question Details**

- 1) Duct is pitched toward outside air intakes and drain to outside of building. Solder or seal seams to form watertight joints.
- 2) All seams, joins and penetrations sealed in accordance with SMACNA seal class "A", except transfer ductwork with pressure classification below 2".
- 3) Manual balancing damper installed in each branch duct and for each diffuser or grille.

**Negative Responses**

Group/Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**C) KITCHEN, DUST COLLECTION & GENERAL EXHAUST DUCTWORK INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)						
				1)	2)	3)	4)	5)	6)	7)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:			DATE:			

**Question Details**

- 1) Bracing and reinforcement provided to the outside of the kitchen ductwork to prevent breathing, rattling, vibration or sagging of duct.
- 2) Ductwork supports provided at intervals no greater than 5' for kitchen ductwork, and no fasteners or hangers penetrate duct.
- 3) Horizontal kitchen ductwork is pitched back to hood at 1 inch per foot.
- 4) Grease tight access doors of the same material and thickness as the duct and as large as possible, up to 24 inches in any dimension provided on duct sides of all kitchen ductwork at each change in direction, not less than every 10 lineal feet of duct, including risers, and not less than 1-1/2 inches from the bottom of the duct.
- 5) Exhaust ductwork is pitched to drain back to equipment or exhaust grille.
- 6) Water tight drain pan provided at all low points or at locations where moisture may collect, with drain pan piped to nearest floor drain.
- 7) Access doors and clean out doors provided on duct sides of dust collection exhaust ductwork at each change in direction, at junctions with vertical ducts, at devices requiring periodic inspection and maintenance, and not less than every 10 lineal feet of duct, including risers.

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**D) FUME & PERCHLORIC ACID EXHAUST DUCTWORK INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)								
				1)	2)	3)	4)	5)	6)	7)	8)	9)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:				DATE:				

**Question Details**

- 1) For all rectangular duct and round duct 36 inch diameter and larger, PCD sealant provided at the corrosive side of the gasket.
- 2) For round duct less than 36-inch diameter, slip coupling connection sealed with PCD sealant provided.
- 3) Duct sealer applied on male end connectors before and after insertion to cover the entire joint.
- 4) 316 stainless steel fasteners provided at all couplings, with maximum screw spacing of 12 inches o. c. and a minimum of 3 equally spaced screws per joint.
- 5) Fasteners not located at bottom of duct.
- 6) Any damage to the PVC coating repaired with a PVC aerosol spray or similar PVC product as soon as installation of the piece with a damaged coating is completed.
- 7) Interior and exterior joints and seams ground and polished smooth for perchloric duct.
- 8) Duct pitched to drain back to hood or other drain point detailed on the drawings.
- 9) Perchloric acid exhaust ducts labeled with 4 inch high red stenciled "Perchloric Acid Exhaust" legend every ten feet.

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**E) DUCT ACCESSORIES INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:			DATE:						

**Question Details**

- 1) Turning vanes installed in all rectangular, mitered elbows in accordance with SMACNA standards and/or manufacturer's recommendations.
- 2) Fire dampers installed in sleeves with retaining angles on both sides of rated partition, with ductwork connections meeting manufacturer requirements.
- 3) Where it is necessary to set dampers out from the rated wall, install a sleeve extension encased in two hour rated fire proofing insulation. Install an access door at each fire damper, located to permit resetting the damper or replacing the fusible link.
- 4) Access doors provided in size, location and quantity specified under contract documents, including before and after all duct mounted coils.
- 5) Pressure relief doors provided on VAV systems to protect ductwork damage in the case of equipment or controls malfunction.
- 6) Flexible duct connections provided for all connections to rotating or vibrating equipment, including air handling units (unless unit is internally isolated), fans, or other motorized equipment.
- 7) Flexible duct connections in corrosive environments or fume exhaust systems, provided with a double layer of the Teflon coated fabric.
- 8) Manual volume dampers are constructed with continuous shafts according to SMACNA Duct Construction Standards Fig. 2-12 and Fig. 2-13.
- 9) Manual volume damper blades are two gauges thicker than the surrounding duct according to SMACNA Duct Construction Standards Fig. 2-12 and Fig. 2-13.
- 10) Manual volume damper handles are extended beyond the surface of external duct insulation according to Section 23 33 00.

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**F) FLEXIBLE DUCTWORK INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)						
				1)	2)	3)	4)	5)	6)	7)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:			DATE:			

**Question Details**

- 1) Flexible ductwork is clean and free from damage prior to installation.
- 2) Flexible duct used for final connections of air inlets and outlets at diffuser, register, and grille locations only.
- 3) Where flexible duct is used, it is installed with the minimum length required to make the final connections, but no greater than 5 feet in length, and no more than one (1) 90° bend.
- 4) Inner jacket of flexible duct secured in place with stainless steel metal band clamp.
- 5) Insulation vapor barrier jacket secured in place with steel or nylon draw band.
- 6) Flexible ductwork does not penetrate walls.
- 7) Individual sections of flexible ductwork are of one piece construction.



Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**G) FINALIZATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:							DATE:		

**Question Details**

- 1) All penetrations through fire rated wall assemblies have been sealed per specification requirements.
- 2) All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.
- 3) Each fire damper manually tested for proper operation and any defective dampers repaired or replaced. Access doors labeled “FIRE DAMPER” according to IMC requirements.
- 4) Fire/smoke damper linkages coordinated with operators so dampers are closed when the air system is not operating.
- 5) All dirt and foreign matter removed from the entire duct system and diffusers, registers, grilles and the inside of air-handling units cleaned before operating fans.
- 6) Duct systems with cleaned with high power vacuum machines where systems have been used for temporary heat, air-conditioning, or ventilation purposes during construction.
- 7) All ductwork leakage tested in accordance with test methods described in Section 5 of SMACNA HVAC Air Duct Leakage Test Manual, with test pressure equal to the duct pressure class.
- 8) Leakage rate does not exceed more than 5% of the system air quantity for low pressure ductwork, determined in accordance with Appendix C of the SMACNA HVAC Air Duct Leakage Test Manual.
- 9) Leakage rate does not exceed more that 1% of the system air quantity for high pressure ductwork, determined in accordance with Appendix C of the SMACNA HVAC Air Duct Leakage Test Manual.
- 10) Ductwork randomly tested for structural integrity and deflection limits do not exceed those listed in accordance with Chapter 7 of SMACNA HVAC Duct Construction Standards, 3.0 Performance Requirements.

Construction Verification Checklist  
23 31 00 – Ductwork and Casings

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

Construction Verification Checklist  
23 37 13 – Diffuser, Grilles and Registers

## CV-23 37 13 – Diffuser, Grilles and Registers

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

### A) GENERAL DUCTWORK INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)	9)	
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:			DATE:						

#### Question Details

- 1) Diffusers, grilles and registers installed as shown in contract documents.
- 2) Where it is not possible to maintain minimum 2 duct diameter straight duct into diffuser, equalizing grids are furnished.
- 3) Connections between ductwork drops and diffusers, grilles and registers sealed airtight.
- 4) Unused portions of linear slot diffusers and linear bar diffusers and grilles are blanked off.
- 5) Where diffusers, registers and grilles cannot be installed to avoid seeing inside duct, inside of duct is painted with flat black paint to reduce visibility.
- 6) In clean rooms and animal holding rooms, space between diffusers, registers and grilles and ceiling or wall to be air and watertight using clear, non-hardening, microbiological resistant silicone sealant compatible with ceiling or wall surfaces.
- 7) All diffusers, grilles and registers temporary sealed at end of work day to maintain duct system cleanliness.
- 8) All mars and blemishes are repaired.
- 9) Throw pattern and direction adjusted per contract document requirements.

Construction Verification Checklist  
23 37 13 – Diffuser, Grilles and Registers

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

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**FUNCTIONAL PERFORMANCE TEST FORMS**

*Edit the individual functional performance test forms and provide additional test forms as needed to reflect the functional performance test requirements of assemblies, components, equipment and systems to be commissioned on this project. Include test forms with final review documents; no submission is required at preliminary review.*

*Edit to provide test forms unique to the specific test requirements of the project and remove the "SAMPLE" watermark. Edited or unedited test forms may be used in the bidding documents. Unedited test forms must be edited by the A/E at the time of shop drawing submittal and accompany the submittals when returned to the contractor prior to functional performance testing. Incorporate changes to the contract documents into the test forms prior to testing. This option is preferred for medium and large projects where there are many functional performance tests to be done.*



Functional Performance Test

23 05 93 Testing Adjusting and Balancing Verification Test

FPT-23 05 93 – Testing, Adjusting and Balancing Verification Test

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

Test Duration

Date: \_\_\_\_\_ Start Time: \_\_\_\_\_ End Time \_\_\_\_\_

Estimated Duration: \_\_\_\_\_

Cx Provider(s): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Objectives

This test is performed to verify the accuracy of the testing, adjusting and balancing completed for the facility.

Instrumentation

AABC or NEBB specified equipment with specified accuracies.

Sampling Methodology

1. Major equipment air flow (i.e. AHU’s, fans, etc.): Sample air flow performance of 100 % of all major equipment shown in the construction documents for all sample points indicated.
2. Major equipment water flow (i.e. AHU’s, Chillers, Boilers, pumps, etc.): Sample water flow performance of 100 % of all major equipment shown in the construction documents for all sample points indicated.
3. Terminal devices air flow (i.e. terminal units, fan coil units, grilles, etc.): Sample air flow performance of 10% of all terminal units shown in the construction documents, with at least one sample for each terminal type for all sample points indicated.
4. Terminal and balancing devices water flow (i.e. Fan Coils, Terminal Units, Balancing valves, etc.): Sample water flow performance of 10% of all terminal units and all balance valves shown in the construction documents, with at least one sample for each terminal or valve type for all sample points indicated.
5. Critical terminal devices for Labs and Vivariums (VAV boxes, air valves, etc.): Sample air flow performance of (50%)(100 %) of all Critical terminal devices shown in the construction documents for all sample points indicated.

Note: Fume hoods will be tested by the Contractor furnishing the fume hood when they conduct the ASHRAE 110 test and calibrate the fume hood monitor.

Procedure

For each of the sample points listed under the results section, re-test the point in accordance with the procedures detailed within specification section 23 05 93. Verify procedures utilized concur with these documents and record findings in the results section below. In addition, for each point tested record the measured value and verify the result is within 10% of the original value recorded and within the specified tolerances of the design setting for the point.

Sample 100% of Terminal devices if 20% of devices sampled fall outside of either specified tolerance range of the completed Testing, Adjusting and Balancing Verification Test Results Table found in form FPT – 23 05 93, located in section 01 91 01 or 01 91 02.

Sample 100% Lab and Vivarium devices if 20% of devices sampled fall outside of either specified tolerance range of the completed Testing, Adjusting and Balancing Verification Test Results Table found in form FPT – 23 05 93, located in section 01 91 01 or 01 91 02.





# Functional Performance Test

## 23 05 93 Testing Adjusting and Balancing Verification Test

**Conclusion**

Acceptable Criteria: All points listed are within listed tolerances of design and original recordings and were recorded in accordance with TAB plan and/or NEBB standards.

**Comments:****Observations:**

Final Status:  Accepted  Not Accepted

**Relevant Trend Data**

Static Pressure Setpoint (VFD fans ONLY), Hydronic Loop Differential Setpoint (VFD pumps ONLY).

**Witnesses**

<b>Name</b>	<b>Signature</b>
_____	_____
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_____	_____
_____	_____

Functional Performance Test

23 09 23 BAS Communication/Calibration Functional Performance Test

FPT-23 09 23 - BAS Communication/Calibration

Equipment Identification/Tag: \_\_\_\_\_
Location: \_\_\_\_\_

Test Duration

Date: \_\_\_\_\_ Start Time: \_\_\_\_\_ End Time \_\_\_\_\_

Estimated Duration: \_\_\_\_\_

Cx Provider(s): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Applicable Equipment: \_\_\_\_\_

\_\_\_\_\_

Objectives

This test is performed to investigate the functionality of communication within BAS system, associated sensors, actuators and relays and the calibration of these devices.

Instrumentation

Table with 3 columns: Instrument, Accuracy, Measurement. All cells contain N/A.

Stated Sequence

To be defined by A/E and commissioning provider at completion of construction documents.

Sampling Set

A minimum of 20% of total points monitored or controlled by BAS system is to be sampled. However, areas specified as critical in nature or associated with critical or major components (i.e. chiller, AHU, etc.) are to be sampled at a rate of 50% of total points associated with given area or equipment.

Procedure

- 1. For each of the points listed under the results section related to monitoring run status of equipment or responsible for actuation or control of equipment, manually override the equipment to start or actuate. Verify equipment is started and status concurs with BAS head end.
2. For each of the points listed under the results section related to monitoring temperature, pressure, humidity, etc. record the readings registered at the BAS head end and measure the conditions present at the sensor. Verify BAS and measured readings agree within scheduled tolerances listed under the results section.
3. For each of the points listed under the results section related to alarms and safeties, verify proper communication of alarm conditions for each point by manually overriding the alarm point by one of the following methods:
a. Disconnect relay contacts.
b. Force alarm condition by running a diagnostic protocol on the local control panel.
c. Force alarm condition by presenting a simulated alarm condition (i.e. shutting off gas to each boiler to produce a flame failure).

Results

Status & Actuation Points:

Table with 3 columns: Point Name, Communication Verified (checkbox YES, checkbox NO), Notes.

Temperature, Pressure, Humidity Sensors:

Table with 5 columns: Point Name, BAS Value, Measured Value, Tolerance, Accepted (checkbox YES, checkbox NO).

# Functional Performance Test

23 09 23 BAS Communication/Calibration Functional Performance Test

## Alarms and Safeties

Point Name	Communication Verified	Notes
	<input type="checkbox"/> YES <input type="checkbox"/> NO	

## Conclusion

Acceptable Criteria: All points listed have proper communication with BAS head end and are calibrated to meet tolerances specified.

Comments:

Observations:

Final Status:  Accepted  Not Accepted

## Relevant Trend Data

N/A

## Witnesses

Name	Signature
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Functional Performance Test

23 09 24 BAS Communication/Calibration Functional Performance Test

**FPT-23 09 24 - BAS Communication/Calibration**

**Equipment Identification/Tag:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Test Duration**

Date: \_\_\_\_\_ Start Time: \_\_\_\_\_ End Time \_\_\_\_\_

Estimated Duration: \_\_\_\_\_

Cx Provider(s): \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Applicable Equipment: \_\_\_\_\_  
 \_\_\_\_\_

**Objectives**

This test is performed to investigate the functionality of communication within BAS system, associated sensors, actuators and relays and the calibration of these devices.

**Instrumentation**

Instrument	Accuracy	Measurement
N/A	N/A	N/A

**Stated Sequence**

*To be defined by A/E and commissioning provider at completion of construction documents.*

**Sampling Set**

A minimum of 20% of total points monitored or controlled by BAS system is to be sampled. However, areas specified as critical in nature or associated with critical or major components (i.e. chiller, AHU, etc.) are to be sampled at a rate of 50% of total points associated with given area or equipment.

**Procedure**

1. For each of the points listed under the results section related to monitoring run status of equipment or responsible for actuation or control of equipment, manually override the equipment to start or actuate. Verify equipment is started and status concurs with BAS head end.
2. For each of the points listed under the results section related to monitoring temperature, pressure, humidity, etc. record the readings registered at the BAS head end and measure the conditions present at the sensor. Verify BAS and measured readings agree within scheduled tolerances listed under the results section.
3. For each of the points listed under the results section related to alarms and safeties, verify proper communication of alarm conditions for each point by manually overriding the alarm point by one of the following methods:
  - a. Disconnect relay contacts.
  - b. Force alarm condition by running a diagnostic protocol on the local control panel.
  - c. Force alarm condition by presenting a simulated alarm condition (i.e. shutting off gas to each boiler to produce a flame failure).

**Results**

**Status & Actuation Points:**

Point Name	Communication Verified	Notes
	<input type="checkbox"/> YES <input type="checkbox"/> NO	

**Temperature, Pressure, Humidity Sensors:**

Point Name	BAS Value	Measured Value	Tolerance	Accepted
				<input type="checkbox"/> YES <input type="checkbox"/> NO

**Alarms and Safeties**

Point Name	Communication Verified	Notes
	<input type="checkbox"/> YES <input type="checkbox"/> NO	

# Functional Performance Test

23 09 24 BAS Communication/Calibration Functional Performance Test

**Conclusion**

Acceptable Criteria: All points listed have proper communication with BAS head end and are calibrated to meet tolerances specified.

Comments:

Observations:

Final Status:  Accepted  Not Accepted

**Relevant Trend Data**

N/A

**Witnesses**

<u>Name</u>	<u>Signature</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Functional Performance Test

23 09 25 BAS Communication/Calibration Functional Performance Test

FPT-23 09 25 - BAS Communication/Calibration

Equipment Identification/Tag: \_\_\_\_\_
Location: \_\_\_\_\_

Test Duration

Date: \_\_\_\_\_ Start Time: \_\_\_\_\_ End Time \_\_\_\_\_

Estimated Duration: \_\_\_\_\_

Cx Provider(s): \_\_\_\_\_
\_\_\_\_\_
\_\_\_\_\_

Applicable Equipment: \_\_\_\_\_
\_\_\_\_\_

Objectives

This test is performed to investigate the functionality of communication within BAS system, associated sensors, actuators and relays and the calibration of these devices.

Instrumentation

Table with 3 columns: Instrument, Accuracy, Measurement. All cells contain N/A.

Stated Sequence

To be defined by A/E and commissioning provider at completion of construction documents.

Sampling Set

A minimum of 20% of total points monitored or controlled by BAS system is to be sampled. However, areas specified as critical in nature or associated with critical or major components (i.e. chiller, AHU, etc.) are to be sampled at a rate of 50% of total points associated with given area or equipment.

Procedure

- 1. For each of the points listed under the results section related to monitoring run status of equipment or responsible for actuation or control of equipment, manually override the equipment to start or actuate. Verify equipment is started and status concurs with BAS head end.
2. For each of the points listed under the results section related to monitoring temperature, pressure, humidity, etc. record the readings registered at the BAS head end and measure the conditions present at the sensor. Verify BAS and measured readings agree within scheduled tolerances listed under the results section.
3. For each of the points listed under the results section related to alarms and safeties, verify proper communication of alarm conditions for each point by manually overriding the alarm point by one of the following methods:
a. Disconnect relay contacts.
b. Force alarm condition by running a diagnostic protocol on the local control panel.
c. Force alarm condition by presenting a simulated alarm condition (i.e. shutting off gas to each boiler to produce a flame failure).

Results

Status & Actuation Points:

Table with 3 columns: Point Name, Communication Verified (checkbox YES, checkbox NO), Notes.

Temperature, Pressure, Humidity Sensors:

Table with 5 columns: Point Name, BAS Value, Measured Value, Tolerance, Accepted (checkbox YES, checkbox NO).

Alarms and Safeties

Table with 3 columns: Point Name, Communication Verified (checkbox YES, checkbox NO), Notes.

# Functional Performance Test

23 09 25 BAS Communication/Calibration Functional Performance Test

**Conclusion**

Acceptable Criteria: All points listed have proper communication with BAS head end and are calibrated to meet tolerances specified.

Comments:

Observations:

Final Status:  Accepted  Not Accepted

**Relevant Trend Data**

N/A

**Witnesses**

<u>Name</u>	<u>Signature</u>
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**SECTION 23 31 00**  
**HVAC DUCTS and CASINGS**  
**BASED ON DFD MASTER SPECIFICATION DATED 06/19/2020**

**PART 1 - GENERAL**

**SCOPE**

This section includes specifications for all duct systems used on this project. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Shop Drawings
- Design Criteria
- Delivery, Storage And Handling

**PART 2 - PRODUCTS**

- General
- Ductwork Pressure Class
- Ductwork System Class
- Materials
- Low Pressure Ductwork (Maximum 2 inch pressure class)
- Duct Sealant
- Gaskets

**PART 3 - EXECUTION**

- Installation
- Ductwork Support
- Low Pressure Duct (Maximum 2 inch pressure class)
- Cleaning
- Leakage Test
- Structural Test
- Construction Verification

**APPENDIX**

- Duct Leakage Test Report
- Duct Structural Test Report

**RELATED WORK**

- Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC
- Section 23 08 00 – Commissioning of HVAC
- Section 23 33 00 – Air Duct Accessories

**REFERENCE**

Applicable provisions of Division 1 govern work under this Section.

**REFERENCE STANDARDS**

ANSI SS-EN 485-2	Aluminum and Aluminum Alloys-Sheet, Strip and Plate-Part 2: Mechanical Properties
ASTM B209	Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM A90	Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles
ASTM A167	Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A623	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
ASTM A527	Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality
ASTM 924	Standard Specification for General Requirements for Sheet Steel, Metallic-coated by the Hot-dip Method
ASTM C 1071	Specification for Fibrous Glass Duct Lining Insulation
ASTM C 411	Test Method for Hot Surface Performance of High Temperature Thermal Insulation

1	ASTM E 84	Test Method for Surface Burning Characteristics of Building Materials
2	ASTM C 1338	Test Method for Determining Fungal Resistance of Insulation Materials and
3		Facings
4	ASTM G 21	Standard Practice for Determining Resistance of Synthetic Polymeric Materials
5		to Fungi
6	ASTM C 916	Standard Specification for Adhesives for Duct Thermal Insulation
7	NFPA 90A	Standard for the Installation of Air Conditioning and Ventilating Systems
8	UL 181	Standard for Safety for Factory Made Air Ducts and Air Connectors.
9	NAIMA	Fibrous Glass Duct Liner Standard

10  
11 **QUALITY ASSURANCE**

12 Refer to division 1, General Conditions, Equals and Substitutions.

13  
14 **SHOP DRAWINGS**

15 Refer to division 1, General Conditions, Submittals.

16  
17 Include manufacturer's data and/or Contractor data for the following:

- 18 • Fabrication and installation drawings.
- 19 • Schedule of duct systems including material of construction, gauge, pressure class, system class,
- 20 method of reinforcement, joint construction, fitting construction, and support methods, all with
- 21 details as appropriate.
- 22 • Duct sealant and gasket material.
- 23 • Duct liner including data on thermal conductivity, air friction correction factor, and limitation on
- 24 temperature and velocity.

25  
26 **DESIGN CRITERIA**

27 Construct all ductwork to be free from vibration, chatter, objectionable pulsations and leakage under specified

28 operating conditions.

29  
30 Use material, weight, thickness, gauge, construction and installation methods as outlined in the following

31 SMACNA publications, unless noted otherwise:

- 32 • HVAC Duct Construction Standards, Metal and Flexible, 3rd Edition, 2005
- 33 • HVAC Air Duct Leakage Test Manual, 2<sup>nd</sup> Edition, 2012
- 34 • HVAC Systems - Duct Design, 4th Edition, 2006
- 35 • Rectangular Industrial Duct Construction Standard, 2nd Edition, 2004
- 36 • Round Industrial Duct Construction Standards, 2<sup>nd</sup> Edition, 1999
- 37 • Thermoplastic Duct (PVC) Construction Manual, 2<sup>nd</sup> Edition, 1995

38  
39 Use products which conform to NFPA 90A, possessing a flame spread rating of not over 25 and a smoke

40 developed rating no higher than 50.

41  
42 **DELIVERY, STORAGE AND HANDLING**

43 Promptly inspect shipments to ensure that Ductwork is undamaged and complies with the specification.

44  
45 Protect Ductwork against damage.

46  
47 Protect Ductwork by storing inside or by durable, waterproof, above ground packaging. Do not store material

48 on grade. Protect Ductwork from dirt, dust, construction debris and foreign material. Where end

49 caps/packaging are provided, take precautions so caps/packaging remain in place and free from damage.

50  
51 Offsite storage agreements do not relieve the contractor from using proper storage techniques.

52  
53 Storage and protection methods must allow inspection to verify products.

54  
55 **PART 2 - PRODUCTS**

56  
57 **GENERAL**

58 All sheet metal used for construction of duct shall be 24 gauge or heavier except for round and spiral ductwork

59 and spiral duct take-offs 12" and below may be 26 gauge where allowed in SMACNA HVAC Duct

60 Construction Standards, Metal and Flexible, 3rd Edition, 2005.

61

62 Duct sizes indicated on plans are net inside dimensions; where duct liner is specified, dimensions are net,

63 inside of liner.

1  
2 **DUCTWORK PRESSURE CLASS**

3 Minimum acceptable duct pressure class, for all ductwork except transfer ductwork, is 2 inch W.G. positive  
4 or negative, depending on the application. Transfer ductwork minimum acceptable duct pressure class is 1  
5 inch W.G. positive or negative, depending on the application.

6  
7 **MATERIALS**

8 Galvanized Steel Sheet:

9 Use ASTM A 653 galvanized steel sheet of lock forming quality. Galvanized coating to be 1.25 ounces per  
10 square foot, both sides of sheet, G90 in accordance with ASTM A90. Provide "Paint Grip" finish or  
11 galvanneal sheet metal for ductwork that will be painted.

12  
13 All couplings shall be slip-joint construction with a minimum 2 inches insertion length. Seal all couplings  
14 with sealants as specified.

15  
16 **LOW PRESSURE DUCTWORK (Maximum 2 inch pressure class)**

17 Fabricate and install ductwork in sizes indicated on the drawings and in accordance with SMACNA  
18 recommendations, except as modified below.

19  
20 Construct so that all interior surfaces are smooth. Use slip and drive or flanged and bolted construction when  
21 fabricating rectangular ductwork. Use spiral lock seam construction when fabricating round spiral ductwork.  
22 Sheet metal screws may be used on duct hangers, transverse joints and other SMACNA approved locations  
23 if the screw does not extend more than 1/2 inch into the duct.

24  
25 Use elbows and tees with a center line radius to width or diameter ratio of 1.5 wherever space permits. When  
26 a shorter radius must be used due to limited space, install single wall sheet metal splitter vanes in accordance  
27 with SMACNA publications, Type RE 3. Where space will not allow and the C value of the radius elbow,  
28 as given in SMACNA publications, exceeds 0.31, use rectangular elbows with turning vanes as specified in  
29 Section 23 33 00. Square throat-radius heel elbows will not be acceptable. Straight taps or bullhead tees are  
30 not acceptable.

31  
32 Where rectangular elbows are used, provide turning vanes in accordance with Section 23 33 00.

33  
34 Provide expanded take-offs or 45 degree entry fittings for branch duct connections with branch ductwork  
35 airflow velocities greater than 700 fpm. Square edge 90-degree take-off fittings or straight taps will not be  
36 accepted.

37  
38 Button punch snaplock construction will not be accepted on aluminum ductwork.

39  
40 Round ducts may be substituted for rectangular ducts if sized in accordance with ASHRAE table of  
41 equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by  
42 written permission of the Architect/Engineer.

43  
44 Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream  
45 of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.

46  
47 **DUCT SEALANT**

48 Manufacturer: 3M 800, 3M 900, H.B. Fuller/Foster, Hardcast, Hardcast Peal & Seal, Lockformer cold  
49 sealant, Mon-Eco Industries, United Sheet Metal, or approved equal. Silicone sealants are not allowed in  
50 any type of ductwork installation.

51  
52 Install sealants in strict accordance with manufacturer's recommendations, paying special attention to  
53 temperature limitations. Allow sealant to fully cure before pressure testing of ductwork, or before startup of  
54 air handling systems.

55  
56 **GASKETS**

57 2 Inch Pressure Class And Lower:

58 Soft neoprene or butyl gaskets in combination with duct sealant for flanged joints.

59  
60  
61 **PART 3 - EXECUTION**

62  
63 **INSTALLATION**

1 Verify dimensions at the site, making field measurements and drawings necessary for fabrication and  
2 erection. Check plans showing work of other trades and consult with Architect in the event of any  
3 interference.

4  
5 Make allowances for beams, pipes or other obstructions in building construction and for work of other  
6 contractors. Transform, divide or offset ducts as required, in accordance with SMACNA HVAC Duct  
7 Construction Standards, Figure 4-7, except do not reduce duct to less than six inches in any dimension and  
8 do not exceed an 8:1 aspect ratio. Where it is necessary to take pipes or similar obstructions through ducts,  
9 construct easement as indicated in SMACNA HVAC Duct Construction Standards, Figure 4-8, Fig. E. In  
10 all cases, seal to prevent air leakage. Pipes or similar obstructions may not pass through high pressure or  
11 fume exhaust ductwork.

12  
13 Test openings for test and balance work will be provided under Section 23 05 93.

14  
15 Provide frames constructed of angles or channels for coils, filters, dampers or other devices installed in duct  
16 systems, and make all connections to such equipment including equipment furnished by others. Secure  
17 frames with gaskets and screws or nut, bolts and washers.

18  
19 Install duct to pitch toward outside air intakes and drain to outside of building. Solder or seal seams to form  
20 watertight joints.

21  
22 Where two different metal ducts meet, the joint shall be installed in such a manner that metal ducts do not  
23 contact each other by using proper seal or compound.

24  
25 Install all motor operated dampers and connect to or install all equipment furnished by others. Blank off all  
26 unused portions of louvers, as indicated on the drawings, with 1-1/2 inch board insulation with galvanized  
27 sheet metal backing on both sides.

28  
29 Do not install ductwork through dedicated electrical rooms or spaces unless the ductwork is serving this room  
30 or space.

31  
32 Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

33  
34 Provide adequate access to ductwork for cleaning purposes.

35  
36 Provide temporary capping of ductwork openings to prevent entry of dirt, dust and foreign material.

37  
38 Protect diffusers, registers and grilles with plastic wrap or some other approved form of protection to  
39 maintain dirt and dust free and to prevent entry of dirt, dust and foreign material into the Ductwork.

40  
41 During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent  
42 construction dust from entering ductwork system.

#### 43 44 **DUCTWORK SUPPORT**

45 Support ductwork in accordance with SMACNA HVAC Duct Construction Standards, Figure 5-5, except  
46 supporting ductwork with secure wire method is not allowed.

47  
48 Stainless steel air-craft cable hanging systems are allowed on round ductwork under 12 inches diameter if  
49 installed utilizing two fasteners with two cable loops. Support with 3/32 inch, 7 x 7, stainless steel air-craft  
50 cable, with matching serrated spring loaded wedge mechanism fasteners rated for actual load. Comply with  
51 the manufacturer's installation instructions.

#### 52 53 54 **LOW PRESSURE DUCT (Maximum 2 inch pressure class)**

55 Seal all ducts, except for transfer ducts, in accordance with SMACNA seal class "A"; all seams, joints, and  
56 penetrations shall be sealed.

57  
58 Install a manual balancing damper in each branch duct and for each diffuser or grille. The use of splitter  
59 dampers, extractors, or grille face dampers will not be accepted for balancing dampers.

60  
61 Hangers must be wrapped around bottom edge of duct and securely fastened to duct with sheet metal screws  
62 or pop rivets. Trapeze hangers may be used at contractor's option.

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**CLEANING**

Remove all dirt and foreign matter from the entire duct system and clean diffusers, registers, grilles and the inside of air-handling units before operating fans.

Clean duct systems with high power vacuum machines where systems have been used for temporary heat, air-conditioning, or ventilation purposes during construction. Protect equipment that may be harmed by excessive dirt with filters, or bypass during cleaning.

**LEAKAGE TEST**

Test all ductwork in accordance with test methods described in Section 4 of SMACNA HVAC Air Duct Leakage Test Manual. Do not insulate ductwork until it has been successfully tested. Test pressure shall be equal to the duct pressure class.

If excessive air leakage is found locate leaks, repair the duct in the area of the leak, seal the duct, and retest.

Leakage rate shall not exceed more than 5% of the system air quantity for low pressure ductwork, determined in accordance with Appendix C of the SMACNA HVAC Air Duct Leakage Test Manual.

Leakage rate shall not exceed more than 1% of the system air quantity for high pressure ductwork, determined in accordance with Appendix C of the SMACNA HVAC Air Duct Leakage Test Manual.

Leakage test for ductwork downstream of air terminal devices may be omitted but will not relieve the contractor from duct sealing requirements.

Submit a signed report to the Division's Construction Representative, indicating test apparatus used, results of the leakage test, and any remedial work required to bring duct systems into compliance with specified leakage rates.

**STRUCTURAL TEST**

Random test all ductwork per UW direction. Do not insulate ductwork until it has been successfully tested. Test pressure shall be equal to the duct pressure class.

Deflection limits shall not exceed those listed in accordance with Chapter 11 of SMACNA HVAC Duct Construction Standards, 3.0 Performance Requirements.

Submit a signed report to the Division's Construction Representative, indicating test apparatus used, results of the structural test, and any remedial work required.

**CONSTRUCTION VERIFICATION**

Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 23 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01 or 01 91 02.

**APPENDIX**

**DUCT LEAKAGE TEST REPORT**

<b>State of Wisconsin</b> <b>Department of Administration</b> <b>Division of Facilities Development</b>	<b>UW Project Number:</b> _____  <b>Date Submitted:</b> _____
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<b>Project</b>	<b>Name:</b> _____		
	<b>Location:</b> _____		
	<b>Contractor:</b> _____		
<b>System</b>	<b>Fan No:</b> _____	<b>Leakage Class (CL):</b> _____	
<b>Data</b>	<b>Fan Design CFM:</b> _____	<b>Duct Pressure Class (PC):</b> _____	
		<b>Test Pressure (Pr):</b> _____	
<b>Test</b>			
<b>Equipment</b>	<b>Manufacturer:</b> _____	<b>Model No:</b> _____	<b>Serial No:</b> _____

For large systems, use the reverse side for a simple sketch of the entire duct system. Then use letter designations to indicate the various duct sections being tested at one time. Also use the reverse side for test comments.

Note that due to normal construction sequencing it is usually necessary to test risers separately prior to enclosing chases.

Design Data					Field Test Data							
Duct Section	Duct Shape	Duct Surface (F <sup>2</sup> )	Allowable Leakage		Diameter		Pressure (in. wc.)		Date	Performed By	Observed By	Actual CFM
			Leakage Factor (P <sup>0.65</sup> CL)	CFM for Section	Tube (D <sub>1</sub> )	Orifice (D <sub>2</sub> )	In Duct (P)	Across Orifice (P <sub>drop</sub> )				
<b>TOTAL</b>												

## DUCT STRUCTURAL TEST REPORT

<b>State of Wisconsin</b> <b>Department of Administration</b> <b>Division of Facilities Development</b>	<b>UW Project Number:</b> _____  <b>Date Submitted:</b> _____
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<b>Project</b>	<b>Name:</b> _____ <b>Location:</b> _____ <b>Contractor:</b> _____
<b>System Data</b>	<b>Fan No:</b> _____
<b>Description of Test Method:</b>	
_____ _____ _____	
<b>Test Equipment</b>	<b>Manufacturer:</b> _____ <b>Model No:</b> _____ <b>Serial No:</b> _____

Indicate the various duct sections being tested at one time. Also use the reverse side for test comments.

Design Data							Field Test Data							
Duct Test Location	Ductwork Shape		Duct Pressure Class	Allowable Ductwork Wall Deflection		Allowable Joint/Reinforcement Deflection		Pressure (in. wc.) In Duct	Measured Ductwork Wall Deflection		Measured Joint/Reinforcement Deflection		Per-formed By/ Date	Wit-nessed By/ Date
	H	W		H	W	H	W		H	W	H	W		

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**SECTION 23 33 00**  
**AIR DUCT ACCESSORIES**  
**BASED ON DFD MASTER SPECIFICATION DATED 02/17/2022**

**PART 1 - GENERAL**

**SCOPE**

This section includes accessories used in the installation of duct systems. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference
- Reference Standards
- Quality Assurance
- Shop Drawings
- Operation and Maintenance Data

**PART 2 - PRODUCTS**

- Manual Volume Dampers
- Flexible Duct
- Duct Flexible Connections

**PART 3 - EXECUTION**

- Manual Volume Dampers
- Flexible Duct
- Duct Flexible Connections
- Construction Verification

**RELATED WORK**

Section 23 08 00 – Commissioning of HVAC  
Section 23 31 00 – HVAC Ducts and Casings

**REFERENCE**

Applicable provisions of Division 1 govern work under this Section.

**REFERENCE STANDARDS**

NFPA 90A	Standard for Installation of Air Conditioning and Ventilating Systems
SMACNA	HVAC Duct Construction Standards - Metal and Flexible, 3rd Edition, 2005
UL 214	
UL 555 (6 <sup>th</sup> edition)	Standard for Fire Dampers and Ceiling Dampers
UL 555S (4 <sup>th</sup> edition)	Leakage Rated Dampers for Use in Smoke Control Systems

**QUALITY ASSURANCE**

Refer to division 1, General Conditions, Equals and Substitutions

**SHOP DRAWINGS**

Refer to division 1, General Conditions, Submittals.

Submit for all accessories and include dimensions, capacities, ratings, installation instructions, and appropriate identification.

Include certified test data on dynamic insertion loss, self-noise power levels, and aerodynamic performance of sound attenuators.

Submit manufacturer's color charts where finish color is specified to be selected by the Architect/Engineer.

**OPERATION AND MAINTENANCE DATA**

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

**PART 2 - PRODUCTS**

1 **MANUAL VOLUME DAMPERS**

2 Manufacturers: Ruskin, Vent Products, Air Balance, or approved equal.

3  
4 Dampers must be constructed in accordance with SMACNA Fig. 7-4, Fig. 7-5, and notes relating to these  
5 figures, except as modified below.

6  
7 Reinforce all blades to prevent vibration, flutter, or other noise. Construct dampers in multiple sections with  
8 mullions where width is over 48 inches. Use rivets or tack welds to secure individual components; sheet  
9 metal screws will not be accepted. Provide operators with locking devices and damper position indicators  
10 for each damper; use an elevated platform on insulated ducts. Provide end bearings or bushings for all volume  
11 damper rods penetrating ductwork constructed to a 3" w.c. pressure class or above.

12  
13  
14 **FLEXIBLE DUCT**

15 Manufacturers: Anco Products, Clevaflex, Thermaflex, Flexmaster or approved equal.

16  
17 Factory fabricated, UL 181 listed as a class 1 duct, and having a flame spread of 25 or less and a smoke  
18 developed rating of 50 or under in accordance with NFPA 90A.

19  
20 Suitable for pressures and temperatures involved but not less than a 180°F service temperature and ±2 inch  
21 pressure class, depending on the application.

22  
23 Duct to be composed of polyester film, aluminum laminate or woven and coated fiberglass fabric bonded  
24 permanently to corrosion resistant coated steel wire helix. Two-ply, laminated, and corrugated aluminum  
25 construction may also be used.

26  
27 Where duct is specified to be insulated, provide a minimum 1 inch fiberglass insulation blanket with  
28 maximum thermal conductance of 0.23 K (75 degrees F.) and vapor barrier jacket of polyethylene or  
29 metalized reinforced film laminate. Maximum perm rating of vapor barrier jacket to be 0.1 perm.

30  
31  
32 **DUCT FLEXIBLE CONNECTIONS**

33 Material to be fire retardant, be UL 214 listed, and meet the requirements of NFPA 90A.

34  
35 Connections to be a minimum of 3 inches wide, crimped into metal edging strip, and air tight. Connections  
36 to have adequate flexibility and width to allow for thermal expansion/contraction, vibration of connected  
37 equipment, and other movement.

38  
39 General Applications:

40 Use coated glass fiber fabric for all applications. Material for inside applications other than corrosive  
41 environments, fume exhaust, or kitchen exhaust to be double coated with neoprene, air and water tight,  
42 suitable for temperatures between -10°F and 200°F, and have a nominal weight of 30 ounces per square yard.

43  
44 **PART 3 - EXECUTION**

45  
46 **MANUAL VOLUME DAMPERS**

47 Install manual volume dampers in each branch duct and for each grille, register, or diffuser as far away from  
48 the outlet as possible while still maintaining accessibility to the damper. Install so there is no flutter or  
49 vibration of the damper blade(s).

50  
51  
52 **FLEXIBLE DUCT**

53 Flexible duct may only be used for final connections of air inlets and outlets at diffuser, register, and grille  
54 locations. Where flexible duct is used, it shall be the minimum length required to make the final connections,  
55 but no greater than 5 feet in length, and have no more than one (1) 90 degree bend.

56  
57 Secure inner jacket of flexible duct in place with stainless steel metal band clamp. Secure insulation vapor  
58 barrier jacket in place with steel or nylon draw band. Sheetmetal screws and/or duct tape will not be accepted.

59  
60 Flexible duct used to compensate for misalignment of main duct or branch duct will not be accepted.

61  
62 Individual sections of flexible ductwork shall be of one piece construction. Splicing of short sections will  
63 not be accepted.

1 Flexible ductwork used as transfer duct shall be sized for a maximum velocity of 300 fpm.

2

3 Penetration of any partition, wall, or floor with flexible duct will not be accepted.

4

5

6 **DUCT FLEXIBLE CONNECTIONS**

7 Install at all duct connections to rotating or vibrating equipment, including air handling units (unless unit is  
8 internally isolated), fans, or other motorized equipment in accordance with SMACNA Figure 7-8. Install  
9 thrust restraints to prevent excess strain on duct flexible connections at fan inlets and outlets; see Related  
10 Work.

11

12 For applications in corrosive environments or fume exhaust systems, use a double layer of the Teflon<sub>2</sub> coated  
13 fabric when making the connector.

14

15

16 **CONSTRUCTION VERIFICATION**

17 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
18 Section 23 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
19 or 01 91 02.

20

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END OF SECTION



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**SECTION 23 37 13**  
**DIFFUSERS, REGISTERS & GRILLES**  
**BASED ON DFD MASTER SPECIFICATION DATED 7/11/2023**

**PART 1 - GENERAL**

**SCOPE**

This section includes specifications for air terminal equipment. Included are the following topics:

**PART 1 - GENERAL**

Scope  
Related Work  
Reference  
Reference Standards  
Quality Assurance  
Submittals  
Design Criteria

**PART 2 - PRODUCTS**

Manufacturers  
Linear Slot Diffusers  
Linear Bar Diffusers and Grilles  
Plenum Slot Diffusers - 180 Degree Adjustable  
Plenum Slot Diffusers - with Gasketed Blade  
Sidewall Registers and Grilles  
Eggcrate Grille

**PART 3 - EXECUTION**

Installation  
Construction Verification Items

**RELATED WORK**

Section 01 91 01 or 01 91 02 - Commissioning Process  
Section 23 08 00 - Commissioning of HVAC  
Section 23 31 00 - HVAC Ducts and Casings  
Section 23 33 00 - Air Duct Accessories  
Section 23 05 93 - Testing, Adjusting and Balancing for HVAC

**REFERENCE**

Applicable provisions of Division 1 govern work under this section.

**REFERENCE STANDARDS**

NFPA 90A - Installation of Air Conditioning and Ventilation Systems.  
UL 181 - Factory-Made Air Ducts and Connectors.  
ARI-ADC Standard 880.

**QUALITY ASSURANCE**

Refer to division 1, General Conditions, Equals and Substitutions.

**SUBMITTALS**

Refer to division 1, General Conditions, Submittals.

Furnish submittal information including, but not limited to, the following:

- Manufacturer's name and model number
- Identification as referenced in the documents
- Capacities/ratings
- Materials of construction
- Sound ratings
- Dimensions
- Finish
- Color selection charts where applicable
- Manufacturer's installation instructions
- All other appropriate data

1 **DESIGN CRITERIA**

2 All performance data shall be based on tests conducted in accordance with Air Diffusion Council (ADC) Test  
3 Code 1062 GRD 84.

4  
5 **PART 2 - PRODUCTS**

6  
7 **MANUFACTURERS**

8 Acceptable manufacturers for specific products are listed under each item.

9  
10 **LINEAR SLOT DIFFUSERS**

11 Carnes CH, Nailor 5000, Price SDS, Shoemaker LSD, Titus ML.

12  
13 Extruded aluminum with frame type appropriate to installation with diffuser elements being removable from  
14 frame. Both air pattern and flow rate adjustment with air pattern having full 180-degree adjustment. Single  
15 slot diffuser vanes segmented on 2 or 3-foot centers.

16  
17  
18 Diffuser lengths and slot sizes as shown on drawings and/or as scheduled.

19  
20 White, baked enamel finish or powder coat finish, unless otherwise indicated. Flat black diffuser vanes and  
21 frame interior.

22  
23 Provide diffusers with uninsulated galvanized steel plenum. Plenums constructed for specific diffuser frame  
24 and border type. Provide round or oval inlet collar designed to fit standard flexible duct sizes.

25  
26  
27 **LINEAR BAR DIFFUSERS AND GRILLES**

28 Carnes CC, CT and CW, Greenheck XG-2000, Metal Aire 2000, Nailor 4900, Price LBP, Shoemaker LF, LS  
29 and LC, Titus CT.

30  
31 Extruded aluminum with frame type appropriate to side wall, sill or ceiling installation as indicated.

32  
33 Diffuser and grille lengths, blade spacing, and blank off strips as shown on drawings and/or as scheduled.

34  
35 Where frame and border types allow, provide supply air diffusers with straightening or equalizing vanes.  
36 Fixed blades at 0 or 15-degree deflection as scheduled. Bar support maximum 9" spacing.

37  
38 White, anodized aluminum finish unless otherwise indicated.

39  
40 Provide alignment strips/wires for end-to-end joining of sections for a continuous appearance when  
41 scheduled lengths exceed standard manufacturer lengths.

42  
43 **PLENUM SLOT DIFFUSER - 180 Degree Adjustable**

44 Carnes DA, Greenheck XG-6600, Krueger PTBA, Metal Aire 6600, Nailor 5800, Price TBD3, Raymon-  
45 Donco SAT and XC, Shoemaker LSD, Titus TBD-30.

46  
47 Steel, furnished with T-bars compatible with ceiling components. Vane air pattern and flow rate adjustment  
48 with air pattern having full 180-degree adjustment.

49  
50 Provide 24-gauge galvanized steel [uninsulated] [insulated] plenum. Provide round or oval inlet collar  
51 designed to fit standard flexible duct sizes.

52  
53  
54 Double metal thickness slot face.

55  
56 White, baked enamel finish or powder coat finish, unless otherwise indicated. Flat black diffuser vanes and  
57 frame interior.

58  
59 **PLENUM SLOT DIFFUSER - with Gasketed Blade**

60 Carnes DA, Greenheck XG-PHP, Krueger PTBS, Metal Aire PHP, Nailor 5700, Price TBD4, Raymon-  
61 Donco BA and BS, Shoemaker LSD, Titus TBD-80.

1 Steel, furnished with T-bars compatible with ceiling components. Extruded aluminum pattern with a gasket  
2 on top edge to form a seal against the plenum wall or slot divider. Pattern control field adjustable from vertical  
3 to horizontal discharge.  
4

5 Provide 24-gauge galvanized steel [uninsulated] [insulated] plenum. Provide round or oval inlet collar  
6 designed to fit standard flexible duct sizes.  
7

8  
9 Double metal thickness slot face.

10  
11 White, baked enamel finish or powder coat finish, unless otherwise indicated. Flat black diffuser vanes and  
12 frame interior.  
13

#### 14 **SIDEWALL REGISTERS AND GRILLES**

15 Carnes R, Greenheck XG-4000, Krueger 880, Metal Aire 4000, Nailor 51DH, Price 520 (supply) and 530  
16 (return/exhaust), Shoemaker 900, Titus 300 (supply) and 350 (return/exhaust).  
17

18 [Aluminum] [Steel] unless otherwise indicated, with frame type appropriate to installation.  
19

20  
21 Register and grille sizes as shown on drawings and/or as scheduled.  
22

23 White, baked enamel finish or powder coat finish, unless otherwise indicated.  
24

25 Screw holes on surface counter sunk to accept recessed type screws.  
26

27  
28  
29  
30  
31 Fixed blade (0 or 45 degree) core return and exhaust registers and grilles.  
32

#### 33 **EGGCRATE GRILLE**

34 Carnes RAE and RAT, Greenheck XG-CC, Krueger EGC, Metal Aire CC, Nailor 51EC, Price 80, Shoemaker  
35 600, Titus 50.  
36

37 Aluminum construction with frame type appropriate to installation.  
38

39 Grille face 1/2" x 1/2" or 1" x 1" grid pattern 1" deep with a minimum of 85% free area.  
40

41 Grille sizes and finishes as shown on drawings and/or as scheduled.  
42

43 White, baked enamel finish or powder coat finish, unless otherwise indicated.  
44

45 Screw holes on surface counter sunk to accept recessed type screws.  
46  
47  
48  
49

### 50 **PART 3 - EXECUTION**

#### 51 **INSTALLATION**

52 Install grilles, registers and diffusers as shown on drawings and according to manufacturer's instructions.  
53

54  
55 Furnish diffusers with equalizing grids where it is not possible to maintain minimum 2 duct diameter straight  
56 duct into diffuser. Equalizing grids shall consist of individually adjustable vanes designed for equalizing  
57 airflow into diffuser neck and providing directional control of airflow.  
58

59 Unless otherwise indicated, size ductwork drops to diffusers or grilles to match unit collar size.  
60

61 Seal connections between ductwork drops and diffusers/grilles airtight.  
62

63 Blank off unused portion of linear slot diffusers and linear bar diffusers and grilles.  
64

1 Where diffusers, registers and grilles cannot be installed to avoid seeing inside duct, paint inside of duct with  
2 flat black paint to reduce visibility.

3  
4 In clean rooms and animal holding rooms, caulk space between diffuser or grille and ceiling or wall to be air  
5 and watertight. User clear, non-hardening silicone sealant compatible with ceiling or wall surfaces. Sealant  
6 shall be resistant to microbiological growth.

7  
8 **CONSTRUCTION VERIFICATION**

9 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
10 Section 23 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
11 or 01 91 02.

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13 END OF SECTION  
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**SECTION 26 05 00**  
**COMMON WORK RESULTS FOR ELECTRICAL**

**PART 1 - GENERAL**

The electrical work included in all other divisions is the responsibility of the contractor performing the division 26 work unless noted otherwise.

**PROJECT OVERVIEW**

This is a remodeling project that consists of the reconfiguration of existing lab spaces to be used as the new kinesiology department. Reconfiguration includes adding new or rewiring existing lights and receptacles, This project also includes replacement of existing electrical panels serving kinesiology department.

**SCOPE**

The work under this section includes basic electrical requirements, which are applicable to all Division 26 sections. This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

**PART 1 - GENERAL**

- Project Overview
- Scope
- Related Work
- Reference Standards
- Regulatory Requirements
- Quality Assurance
- Continuity of Existing Services and Systems
- Protection of Finished Surfaces
- Approved Electrical Testing Laboratories
- Sleeves and Openings
- Sealing and Fire Stopping
- State and/or User Agency Furnished Equipment
- Work by State and/or User Agency
- Provisions for Future Work
- Intent
- Omissions
- Submittals
- Project/Site Conditions
- Work Sequence and Scheduling
- Work by Other Trades
- Offsite Storage
- Salvage Materials
- Certificates and Inspections
- Operating and Maintenance Data
- Record Drawings

**PART 2 - PRODUCTS**

- Access Panels and Doors
- Identification
- Sealing and Fire Stopping

**PART 3 - EXECUTION**

- Cutting and Patching
- Building Access
- Equipment Access
- Coordination
- Sleeves and Openings

1 Sealing and Fire Stopping  
2 Housekeeping and Clean Up  
3 Agency Training  
4

5 **RELATED WORK**

6 Applicable provisions of Division 1 govern work under this Section.  
7

8 Section 01 91 01 or 01 91 02 – Commissioning Process

9 Section 07 84 00 – Fire Stopping  
10

11 **REFERENCE STANDARDS**

12 Abbreviations of standards organizations referenced in this and other sections are as follows:  
13

14 ANSI American National Standards Institute

15 ASTM American Society for Testing and Materials

16 EPA Environmental Protection Agency

17 ETL Electrical Testing Laboratories, Inc.

18 IEEE Institute of Electrical and Electronics Engineers

19 IES Illuminating Engineering Society

20 ISA Instrument Society of America

21 NBS National Bureau of Standards

22 NEC National Electric Code

23 NEMA National Electrical Manufacturers Association

24 NESC National Electrical Safety Code

25 NFPA National Fire Protection Association

26 UL Underwriters Laboratories Inc.

27 DSPS Wisconsin Department of Safety and Professional Services  
28

29 **REGULATORY REQUIREMENTS**

30 All work and materials are to conform in every detail to applicable rules and requirements of the Wisconsin  
31 State Electrical Code (SPS 316), the National Electrical Code (NFPA 70), other applicable National Fire  
32 Protection Association codes, the National Electrical Safety Code, and present manufacturing standards  
33 (including NEMA).  
34

35 All Division 26 work shall be done under the direction of a currently licensed State of Wisconsin Master  
36 Electrician.  
37

38 All Division 26 work shall comply with SPS 101.862 and SPS 305.40 for electrical wiring integral with pre-  
39 manufactured structures.  
40

41 **QUALITY ASSURANCE**

42 Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or  
43 engineering parameters from those indicated on the contract documents, the contractor is responsible for all  
44 costs involved in integrating the equipment or accessories into the system and the assigned space, and for  
45 obtaining the performance from the system into which these items are placed.  
46

47 Manufacturer references used herein are intended to establish a level of quality and performance requirements  
48 unless more explicit restrictions are stated to apply.  
49

50 All materials, except medium voltage equipment and components, shall be listed by and shall bear the label  
51 of an approved electrical testing laboratory. If none of the approved electrical testing laboratories has  
52 published standards for a particular item, then other national independent testing standards, if available,  
53 applicable, and approved by UW-Milwaukee, shall apply and such items shall bear those labels. Where one  
54 of the approved electrical testing laboratories has an applicable system listing and label, the entire system,  
55 except for medium voltage equipment and components, shall be so labeled.  
56

1 **CONTINUITY OF EXISTING SERVICES AND SYSTEMS**

2 No outages shall be permitted on existing systems except at the time and during the interval specified by the  
3 user agency and by the UW Project Representative. The institution may require written approval. Any  
4 outage must be scheduled when the interruption causes the least interference with normal institutional  
5 schedules and business routines. No extra costs will be paid to the Contractor for such outages which must  
6 occur outside of regular weekly working hours.

7  
8 This Contractor shall restore any circuit interrupted as a result of this work to proper operation as soon as  
9 possible. Note that institutional operations are on a seven-day week schedule.

10  
11 **PROTECTION OF FINISHED SURFACES**

12 Furnish one can of touch-up paint for each different color factory finish furnished by the Contractor. Deliver  
13 touch-up paint with other "loose and detachable parts" as covered in the General Requirements.

14  
15 **APPROVED ELECTRICAL TESTING LABORATORIES**

16 The following laboratories are approved for providing electrical product safety testing and listing services as  
17 required in these specifications:

18  
19 Underwriters Laboratories Inc.  
20 Electrical Testing Laboratories, Inc.

21  
22 **SLEEVES AND OPENINGS**

23 Refer to Division 1, General Requirements, Sleeves and Openings.

24  
25 **SEALING AND FIRE STOPPING**

26 Sealing and fire stopping of sleeves/openings between conduits, cable trays, wireways, troughs, cablebus,  
27 busduct, etc. and the sleeve, structural or partition opening shall be the responsibility of the contractor whose  
28 work penetrates the opening. Provide all fire stopping of fire rated penetrations and sealing of smoke rated  
29 penetrations in compliance with Section 07 84 00 Fire Stopping.

30  
31 **WORK BY STATE AND/OR USER AGENCY**

32  
33 PCB equipment (other than light fixture ballasts) removal and disposal, if required, will be by the UW-  
34 Milwaukee under separate contract.

35  
36 Electrical testing not described in these contract documents will be by UW-Milwaukee under separate  
37 contract.

38  
39 **INTENT**

40 The Contractor shall furnish and install all the necessary materials, apparatus, and devices to complete the  
41 electrical equipment and systems installation herein specified, except such parts as are specifically exempted  
42 herein.

43  
44 If an item is either called for in the specifications or shown on the plans, it shall be considered sufficient for  
45 the inclusion of said item in this contract. If a conflict exists within the Specifications or exists within the  
46 Drawings, the Contractor shall furnish the item, system, or workmanship, which is the highest quality, largest,  
47 or most closely fits the UW-Milwaukee's intent (as determined by the UW-Milwaukee Project Manager).  
48 Refer to the General Conditions of the Contract for further clarification.

49  
50 It must be understood that the details and drawings are diagrammatic. The Contractor shall verify all  
51 dimensions at the site and be responsible for their accuracy.

52  
53 All sizes as given are minimum except as noted.  
54

1 Materials and labor shall be new (unless noted or stated otherwise), first class, and workmanlike, and shall  
2 be subject at all times to the UW-Milwaukee's and/or A/E's inspections, tests and approval from the  
3 commencement until the acceptance of the completed work.

4  
5 Whenever a particular manufacturer's product is named, it is intended to establish a level of quality and  
6 performance requirements unless more explicit restrictions are stated to apply.

7  
8 **OMISSIONS**

9 No later than ten (10) days before bid opening, the Contractor shall call the attention of the UW to any  
10 materials or apparatus the Contractor believes to be inadequate and to any necessary items of work omitted.

11  
12 **SUBMITTALS**

13 Submit for all equipment and systems as indicated in the respective specification sections, marking each  
14 submittal with that specification section number. Mark general catalog sheets and drawings to indicate  
15 specific items being submitted and proper identification of equipment by name and/or number, as indicated  
16 in the contract documents. Failure to do this may result in the submittal(s) being returned to the Contractor  
17 for correction and resubmission. Failing to follow these instructions does not relieve the Contractor from the  
18 requirement of meeting the project schedule.

19  
20 On request from UW-Milwaukee, the successful bidder shall furnish additional drawings, illustrations,  
21 catalog data, performance characteristics, etc.

22  
23 Submittals shall be grouped to include complete submittals of related systems, products, and accessories in  
24 a single submittal. Mark dimensions and values in units to match those specified. Include wiring diagrams  
25 of electrically powered equipment.

26  
27 The submittals must be approved before fabrication is authorized.

28  
29 Submit sufficient quantities of submittals to allow the following distribution:

30

31	Operating and Maintenance Manuals	2 copies
32	User agency	1 copy
33	A/E	1 copy
34	UW-Milwaukee Field Office	1 copy

35

36 **PROJECT/SITE CONDITIONS**

37  
38 Install Work in locations shown on drawings, unless prevented by project conditions.

39  
40 Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to  
41 work specified in other sections. Obtain permission of UW before proceeding.

42  
43 Tools, materials and equipment shall be confined to areas designated by the UW and user agency.

44  
45 **WORK SEQUENCE AND SCHEDULING**

46 Install work in phases to accommodate user agency's occupancy requirements. During the construction  
47 period coordinate electrical schedule and operations with UW's Construction Representative.

48  
49 **WORK BY OTHER TRADES**

50 Every attempt has been made to indicate in this trade's specifications and drawings all work required of this  
51 Contractor. However, there may be additional specific paragraphs in other trade specifications and addenda,  
52 and additional notes on drawings for other trades which pertain to this trade's work, and thus those additional  
53 requirements are hereby made a part of these specifications and drawings.

1 Electrical details on drawings for equipment to be provided by others are based on preliminary design data  
2 only. This Contractor shall lay out the electrical work and shall be responsible for its correctness to match  
3 equipment actually provided by others.

#### 4 5 **OFFSITE STORAGE**

6 Prior approval by UW-Milwaukee and the A/E will be needed. The contractor shall submit Storage  
7 Agreement Form DOA-4528 to UW for consideration of off-site materials storage. In general, building wire,  
8 conduit, fittings and similar rough-in material will not be accepted for off-site storage. No material will be  
9 accepted for off-site storage unless shop drawings for the material have been approved.

#### 10 11 **SALVAGE MATERIALS**

12 No materials removed from this project shall be reused unless specifically noted otherwise. All materials  
13 removed shall become the property of and shall be disposed of by the Contractor.

#### 14 15 **CERTIFICATES AND INSPECTIONS**

16  
17 Obtain and pay for all required installation inspections, except those provided by UW-Milwaukee, in  
18 accordance with the Wisconsin Administrative Code. Deliver originals of these certificates to UW-  
19 Milwaukee's Project Representative.

20  
21 The Electrical Contractor is responsible for coordination of UW electrical inspections. Prior to the start of  
22 significant on-site electrical work, the contractor shall schedule a pre-installation meeting with the Electrical  
23 Inspector to discuss the inspection requirements and review the contract requirements (also see Article 15 of  
24 the General Conditions). The Electrical Contractor shall be present when the Electrical Inspector conducts  
25 the electrical inspections.

#### 26 27 **OPERATION AND MAINTENANCE DATA**

28 All operations and maintenance data shall comply with the submission and content requirements specified  
29 under section GENERAL REQUIREMENTS.

30  
31 In addition to the general content specified under GENERAL REQUIREMENTS supply the following  
32 additional documentation:

33  
34       Manufacturer's wiring diagrams for electrically powered equipment.

#### 35 36 **RECORD DRAWINGS**

37 The Contractor shall maintain at least one copy each of the specifications and drawings on the job site at all  
38 times.

39  
40 UW-Milwaukee will provide the Contractor with a suitable set of contract drawings on which daily records  
41 of changes and deviations from contract shall be recorded. Dimensions and elevations on the record drawings  
42 shall locate all buried or concealed piping, conduit, or similar items.

43  
44 The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary  
45 mark-ups will be permitted.

46  
47 At completion of the project, the Contractor shall submit the marked-up record drawings to the  
48 Architect/Engineer prior to final payment.

### 49 50 **PART 2 - PRODUCTS**

#### 51 52 **ACCESS PANELS AND DOORS**

53  
54 Lay-in Ceilings:

55 Removable lay-in ceiling tiles in 2 x 2 foot or 2 x 4 foot configuration provided under other divisions are  
56 sufficient; no additional access provisions are required unless specifically indicated.

1  
2 Concealed Spline Ceilings:  
3 Removable sections of ceiling tile held in position with metal slats or tabs compatible with the ceiling system  
4 used will be provided under other divisions.

5  
6 Metal Pan Ceilings:  
7 Removable sections of ceiling tile held in position by pressure fit will be provided under other divisions.

8  
9 Plaster Walls and Ceilings, Concealed Cavities:  
10 16 gauge frame with not less than a 20 gauge hinged door panel, prime coated steel for general applications,  
11 stainless steel for use in toilets, showers and similar wet areas, concealed hinges, screwdriver operated cam  
12 latch for general application, key lock for use in public areas, UL listed for use in fire rated partitions if  
13 required by the application. Use the largest size access opening possible, consistent with the space and the  
14 equipment needing service; minimum size 20" x 30".

15  
16 **IDENTIFICATION**

17 See Electrical section 26 05 53 – Identification for Electrical Systems.

18  
19 **SEALING AND FIRE STOPPING**

20 **FIRE AND/OR SMOKE RATED PENETRATIONS:**

21 Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with  
22 section 07 84 00 "Fire Stopping".

23  
24 **NON-RATED PENETRATIONS:**

25  
26 **Conduit and Cable Tray Penetrations Above Grade:**

27 At through-wall conduit and cable tray penetrations of non-rated interior and exterior walls, and floors, use  
28 urethane caulk in annular space between conduit and sleeve, or the core drilled opening.

29  
30  
31 **PART 3 - EXECUTION**

32  
33 **CUTTING AND PATCHING**

34 Refer to Division 1, General Requirements, Cutting and Patching.

35  
36 **BUILDING ACCESS**

37 Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the  
38 building access was not previously arranged and must be provided by this contractor, restore any opening to  
39 its original condition after the apparatus has been brought into the building.

40  
41 **EQUIPMENT ACCESS**

42 Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance.  
43 Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making  
44 sure that access is available for all equipment and specialties. Where access is required in plaster or drywall  
45 walls or ceilings, furnish the access doors to the General Contractor and reimburse the General Contractor  
46 for installation of those access doors.

47  
48 **COORDINATION**

49 The Contractor shall cooperate with other trades and UW-Milwaukee in locating work in a proper manner.  
50 Should it be necessary to raise or lower or move longitudinally any part of the electrical work to better fit the  
51 general installation, such work shall be done at no extra cost to UW-Milwaukee, provided such decision is  
52 reached prior to actual installation. The Contractor shall check location of electrical outlets with respect to  
53 other installations before installing.

1 The Contractor shall verify that all devices are compatible for the surfaces on which they will be used. This  
2 includes, but is not limited to light fixtures, panelboards, devices, etc. and recessed or semi-recessed heating  
3 units installed in/on architectural surfaces.

4  
5 Coordinate all work with other contractors prior to installation. Any installed work that is not coordinated  
6 and that interferes with other contractor's work shall be removed or relocated at the installing contractor's  
7 expense.

#### 8 9 **SLEEVES AND OPENINGS**

10 Conduit penetrations in existing concrete floors: Core drill openings.

11  
12 Conduit penetrations through existing floors located in food service areas that do not require a T rating: Core  
13 drill sleeve opening large enough to insert schedule 40 sleeve, extend sleeve 2 inches above the floor and  
14 grout area around sleeve with hydraulic setting, non-shrink grout.

15  
16 Where penetrating conduit weight is supported by floor, provide manufactured product or structural bearing  
17 collar designed to carry load.

18  
19 Floor or roof core drilling to be x-rayed prior to coring to allow for the determination and avoidance of  
20 potential obstructions. Contractor to coordinate required ceiling access beneath the work area with Owner  
21 and assumes replacement or repair of damaged or modified building components such as ceiling tile, drywall  
22 patching, insulation, piping or other existing components as a result of access to plenum spaces.

#### 23 24 **SEALING AND FIRE STOPPING**

##### 25 **FIRE AND/OR SMOKE RATED PENETRATIONS:**

26 Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with  
27 section 07 84 00 Fire Stopping.

##### 28 29 **NON-RATED PENETRATIONS:**

30  
31 At all interior and exterior walls, through-wall conduit penetrations are required to be sealed. Apply sealant  
32 to both sides of the penetration in such a manner that the annular space between the sleeve or cored opening  
33 and the conduit is completely blocked.

##### 34 35 **PENETRATIONS SUBJECT TO WATER INTRUSION:**

36 For penetrations (both rated and non-rated) in floors subject to water intrusion or in rooms housing electrical  
37 equipment (but not within walls) provide one of the following:

- 38 • Conduit penetration where steel pipe sleeve is used extend steel sleeve 2" above the floor.
- 39 • Conduit penetration where cast in place fire stopping device/sleeve is used, extend device/sleeve 2"  
40 above the floor (provided it meets the device's UL listing).
- 41 • Conduit penetration where there is no steel sleeve or cast in place fire stopping device/sleeve,  
42 provide 2"x 2" x 1/8" galvanized steel angles fastened to floor surrounding the penetration or group  
43 of penetrations to prevent water from getting to penetration. Provide urethane caulk between angles  
44 and floor and fasten angles to floor minimum 8" on center. Seal corners water tight with urethane  
45 caulk.

46  
47 Floors subject to water intrusion or rooms housing electrical equipment include the following locations:

- 48 • Food Service/Kitchen Areas
- 49 • Laundries
- 50 • Restrooms
- 51 • Locker/Shower Rooms
- 52 • Janitor Rooms w/ Sinks
- 53 • Wet Laboratories
- 54 • Mechanical/Plumbing Equipment Rooms
- 55 • Data/Telecommunications Rooms

- Electrical Equipment Rooms

Provide waterproof caulk sealant top coating on fire stopping system (or other approved means to protect the fire stopping system from water) in areas subject to wash down such as Food Service and Dish Washing Areas.

**HOUSEKEEPING AND CLEAN UP**

The Contractor shall clean up and remove from the premises, on a daily basis, all debris and rubbish resulting from its work and shall repair all damage to new and existing equipment resulting from its work. When job is complete, this Contractor shall remove all tools, excess material and equipment, etc., from the site.

**AGENCY TRAINING**

All training provided for agency shall comply with the format, general content requirements and submission guidelines specified under Section 01 91 01 or 01 91 02.

Contractor to provide factory authorized representative and/or field personnel knowledgeable with the operations, maintenance and troubleshooting of the system and/or components defined within this section for a minimum period of 2 hours.

END OF SECTION



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**SECTION 26 05 02**  
**ELECTRICAL DEMOLITION FOR REMODELING**

**PART 1 - GENERAL**

**SCOPE**

The work under this section includes removal of existing walls and ceilings. Included are the following topics:

**PART 1 - GENERAL**

Scope

Related Work

**PART 2 - PRODUCTS**

Materials and Equipment

**PART 3 - EXECUTION**

Examination

Preparation

Demolition and Extension of the Existing Electrical Work

PCB Ballast Handling

Lamp and PCB Ballast Disposal

**RELATED WORK**

Applicable provisions of Division 1 govern work under this Section.

**PART 2 - PRODUCTS**

**MATERIALS AND EQUIPMENT**

Materials and equipment for patching and extending work as specified in the individual Sections.

**PART 3 - EXECUTION**

**EXAMINATION**

Verify field measurements and circuiting arrangements as shown on Drawings.

Verify that abandoned wiring and equipment serve only abandoned facilities.

Verify whether or not PCB ballasts exist in light fixtures which will be disposed of. If PCB light fixture ballasts exist, then follow requirements in **PCB BALLAST HANDLING** and **LAMP AND PCB BALLAST DISPOSAL** below.

Demolition Drawings are based on casual field observation and/or existing record documents. Report discrepancies to the User Agency, Architect/Engineer and UW Field Representative before disturbing existing installation.

Beginning of demolition means installer accepts existing conditions.

**PREPARATION**

Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

Coordinate utility service outages with the User Agency, UW Field Representative, and Architect/Engineer. Also, if applicable, coordinate utility service outages with the local Utility Company.

1 Provide temporary wiring and connections to maintain existing systems in service during construction. When  
2 work must be performed on energized equipment or circuits, use personnel experienced in such operations  
3 and follow the safe working practice requirements of NFPA 70E.  
4

#### 5 **DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK**

6  
7 Remove, relocate, and extend existing installations as necessary, to accommodate new construction and to  
8 meet all requirements of these specifications. Extend existing installations using materials and methods  
9 compatible with existing electrical installations, or as specified.

10  
11 Remove abandoned wiring to source of supply.

12  
13 Remove exposed abandoned conduit and abandoned conduit above accessible ceiling finishes, unless noted  
14 otherwise on drawings. Cut conduit flush with walls and floors, and patch surfaces. If certain conduits and  
15 boxes are abandoned but not scheduled for removal, they shall be shown on the "As Built Drawings".

16  
17 Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit and wiring  
18 servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not  
19 removed.

20  
21 Disconnect and remove abandoned panelboards and distribution equipment.

22  
23 Disconnect and remove electrical devices and equipment serving utilization equipment that has been  
24 removed.

25  
26 Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

27  
28 Provide revised typed circuit directory in panelboards that have circuits removed.

29  
30 Repair adjacent construction and finishes damaged during demolition and extension work.

31  
32 Maintain access to existing electrical installations which remain active. Modify installation or provide access  
33 panel as appropriate.

34  
35 Provide supplemental support for conduits that are routed through demolition area, and are to remain.  
36 Supplemental support shall be added so that the conduit meets the support requirements of electrical  
37 specification section 26 05 33.

#### 38 **PCB BALLAST HANDLING**

39 Generally, all high power factor fluorescent light ballasts manufactured before 1978 and some HID ballasts  
40 contain polychlorinated biphenyl (PCB) compounds in their capacitors. The Contractor shall inspect all  
41 ballasts in all light fixtures and take the actions described below.  
42

43  
44 The disposal of all ballasts labeled as "NON-PCBs" or "NO PCBs" shall become the responsibility  
45 of the Contractor. If the PCB content is not stated on the ballast label, the ballast shall be handled  
46 as a PCB ballast.

47  
48 All PCB ballasts shall be removed from the light fixtures and shall have the wires clipped off.  
49 However, before removal, all PCB ballasts shall be carefully inspected for leaks. If a ballast appears  
50 to be leaking (evidenced by potting compound leaking out or by an oily film on the ballast surface)  
51 the ballast must be handled per EPA and DNR PCB regulations. Basically, this means the ballast is  
52 to be carefully removed from the fixture and placed in an approved drum. See paragraph below for  
53 the drum specifications. The person removing the ballast from the fixture shall wear protective  
54 gloves, eye protection, and protective clothing as necessary.  
55

1 If the fixture has also been contaminated, it must be cleaned to less than 10 micrograms/100 square  
2 centimeters contamination before disposal. This cleaning must be done by an approved PCB  
3 contractor and is not considered a part of this contract. Contact UW for contractor approval before  
4 commencing with the cleanup.  
5

6 The PCB ballasts shall then be placed in US DOT approved drums (barrels). The contractor may  
7 furnish their own drums or obtain them from Lamp Recyclers Incorporated (800-558-1166). The  
8 quantity and size of the drums will be determined by the contractor at the time of construction,  
9 30 and 55 gallon drums are typically available.  
10

11 These PCB drums shall be placed in storage with the cover that came with the barrels, in a location  
12 within a building, as designated by the Building Manager or UW Field Representative. The drums  
13 are not to be placed outside where they are exposed to weather.  
14

15 THESE PCB BALLASTS ARE NOT TO BE REMOVED FROM THE WORK SITE BY THE  
16 CONTRACTOR. To do so would be a violation of DNR and DOT hazardous waste regulations and  
17 may result in a fine to the Contractor.  
18

19 The Contractor shall label and mark the PCB storage drums with EPA approved PCB labels and the  
20 storage area with signs, marks and lines to meet the regulations of Wisconsin Code NR 157 –  
21 Management of PCBs and Products Containing PCBs.  
22

23 The Contractor shall also provide approved PCB absorbent materials to be stored immediately  
24 adjacent to the drum storage area. Do not place loose absorbent material in the drums.  
25

26 The Contractor shall provide to the UW Field Representative, in written form, a total count of these  
27 ballasts (or their total weight by drum) and where they are stored.  
28

29 See Lamp and PCB Ballast Disposal instructions below.  
30

### 31 **LAMP AND PCB BALLAST DISPOSAL**

32 All lamps (fluorescent, incandescent, and HID) contain mercury and/or lead (in the base) as well as other  
33 heavy metals and compounds which are regulated by the EPA and DNR during the disposal process. As a  
34 result, regulations have been issued covering the handling and disposal of all lamps. Lamps which have been  
35 removed from service for disposal shall be handled as follows by the Contractor:  
36

37 The Contractor shall very carefully remove all lamps (fluorescent, incandescent, and HID) from  
38 light fixtures before removal of the fixture from its mounted position. This is to reduce the  
39 likelihood that the lamp(s) will be broken. The Contractor will be charged the cost difference  
40 between disposal of broken and unbroken lamps, for all lamps broken in excess of 1% of the total  
41 lamps removed in the project.  
42

43 The contractor shall contact Lamp Recyclers Incorporated (800-558-1166) to coordinate the storage  
44 and pickup of disposed lamps and PCB ballasts. The contractor may furnish their own containers  
45 or obtain them from Lamp Recyclers Incorporated. Removed lamps and PCB ballasts shall be  
46 placed in containers by the contractor, marked with the number and type of lamp and PCB ballast,  
47 and placed in storage at a location on the user agency's property. The contractor shall label the area  
48 as "Hazardous Material Storage". The contractor shall make arrangements for pickup of the lamps  
49 and PCB ballasts with Lamp Recyclers Incorporated, shall provide a count of all stored lamps and  
50 PCB ballasts, and shall fill out any required forms.  
51

52 When making disposal arrangements with Lamp Recyclers Incorporated, the contractor shall make  
53 sure to notify them of the UW project number, UW project name and UW Project Manager, for  
54 invoicing purposes. Invoicing from Lamp Recyclers Incorporated shall be sent to the UW Project  
55 Manager for direct charge payment from the project (lamp and PCB ballast disposal costs to be paid  
56 by UW), and shall indicate the proper UW project number, name, and PM.

1  
2  
3  
4  
5

The contractor shall coordinate the lamp and PCB ballast disposal with the UW Field Representative.

END OF SECTION

1  
2 **SECTION 26 05 04**  
3 **CLEANING, INSPECTION, AND TESTING OF ELECTRICAL EQUIPMENT**

4  
5 **PART 1 - GENERAL**

6  
7 **SCOPE**

8 The work under this section includes the required cleaning, inspection, adjustment, maintenance and testing  
9 of electrical equipment, as specified herein. This applies only to new electrical and existing electrical  
10 equipment being furnished, modified, worked on or serviced by this contractor for this project. Included are  
11 the following topics:

12  
13 **PART 1 - GENERAL**

14 Scope

15 Related Work

16 **PART 2 - PRODUCTS**

17 Not Used

18 **PART 3 - EXECUTION**

19 General Inspection and Cleaning of All Electrical Equipment

20 Grounding Systems

21 Panelboards

22 Motor Starters and Motor Control Centers

23 Cables

24 Light Fixtures

25 Occupancy Sensors

26 Battery Pack Emergency Lighting

27  
28 **RELATED WORK**

29 Applicable provisions of Division 1 govern work under this Section.

30  
31 Section 01 91 01 or 01 91 02 – Commissioning Process

32  
33  
34 **PART 2 - PRODUCTS**

35  
36 Not Used.

37 **PART 3 - EXECUTION**

38  
39  
40 **GENERAL INSPECTION AND CLEANING OF ALL ELECTRICAL EQUIPMENT**

41 Inspect for physical damage and abnormal mechanical and electrical conditions.

42  
43 Any item found to be out of tolerance, or in any other way defective as a result of the required inspection or  
44 testing, shall be reported to UW. Procedure for repair and/or replacement will be outlined. After appropriate  
45 corrective action is completed the item shall be re-tested.

46  
47 Compare equipment nameplate information with the latest single line diagram and report any discrepancies.

48  
49 Verify proper auxiliary device operation and indicators.

50  
51 Check tightness of accessible bolted electrical joints. Use torque wrench method.

52  
53 Make a close examination of equipment and remove any shipping brackets, insulation, packing, etc. that may  
54 not have been removed during original installation.  
55

1 Make a close examination of equipment and remove any dirt or other forms of debris that may have collected  
2 in existing equipment or in new equipment during installation.

3  
4 Clean All Equipment:

5 Vacuum inside of panelboards, switchboards, switchgear, transformer core and coils, bus ducts,  
6 MCC's, fire alarm panels, communication/data panels, security panels, etc.

7 Loosen attached particles and vacuum them away.

8 Wipe all insulators with a clean, dry, lint free rag.

9 Clean insulator grooves.

10 Re-vacuum inside surfaces as directed by the UW Construction Representative or Inspector

11  
12 Inspect equipment anchorage.

13  
14 Inspect equipment and bus alignment.

15  
16 Check all heater elements for operation and control.

17  
18 Lubricate nonelectrical equipment per manufacturer's recommendations.

19  
20 **GROUNDING SYSTEMS**

21 Inspect the ground system for adequate termination at all devices.

22  
23 **PANELBOARDS**

24 Torque all the connections per the manufacturers spec. Verify phase wires, color coding, separate neutral  
25 and mechanical bonding. Verify circuit breaker operation. Verify the directory.

26  
27 Vacuum clean the panelboard enclosure.

28  
29 **MOTOR STARTERS AND MOTOR CONTROL CENTERS**

30 Verify the control circuits. Confirm the fusing and the grounding of the control transformers. Torque all of  
31 the connections. Confirm the overload elements and the circuit breakers (fuse) for proper sizing. Verify all  
32 grounding. Operate and test each motor starter for proper operation.

33  
34 **CABLES**

35 600 Volt cable:

36 Visually inspect cables, lugs, connectors and all other components for physical damage and proper  
37 connections.

38 Check all cable connectors for tightness (with a torque wrench) and clearances. Torque test  
39 conductor terminations to manufacturer's recommendations.

40 Perform a 1000 Vdc megger test on all secondary cables from the substation transformers to the  
41 secondary switchboards and on all switchboard feeders.

42  
43 Medium Voltage cable:

44 Inspect exposed sections for physical damage.

45 Inspect for visual jacket and insulation condition.

46 Visible cable bends shall be checked against ICEA or manufacturer's minimum allowable bending  
47 radii -- 12 times the diameter for tape shielded cables.

48 Inspect for proper shield grounding, cable support and termination.

49 Inspect for proper fireproofing in common cable areas.

50 Verify cable is supplied and connected in accordance with single line diagram.

51 There shall be NO tests performed on existing cable without specific direction from UW.

52 Above 600 volt testing will be performed under a separate contract.

53  
54 **LIGHT FIXTURES**

55 Check the bonding and proper lamping. Verify that recessed fixtures are installed with hold down clips.

56 Confirm operation of the fixture with the proper switch or sensor.

1  
2  
3  
4  
5  
6  
7  
8  
9

**OCCUPANCY SENSORS**

Confirm operation of the sensor per the manufacturer's specification.

**BATTERY PACK EMERGENCY LIGHTING**

Verify the operation per the manufacturers spec and run all of the diagnostic steps. Confirm proper grounding and location.

END OF SECTION







1 Conductor sizes are based on copper.

2  
3 Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as  
4 required for project conditions.

5  
6 Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and  
7 lengths required.

## 8 9 **PART 2 - PRODUCTS**

### 10 11 **GENERAL**

12 All wire shall be new, delivered to the site in unbroken cartons and shall be less than one year old out of  
13 manufacturer's stock.

14  
15 All conductors shall be copper. Aluminum conductors size #1/0 and larger may be substituted for copper  
16 and used for phase and neutral conductors for transformer feeders, switchboard feeders, and panelboard  
17 feeders. All ground conductors shall be copper.

18  
19 Aluminum conductors shall not be used for serving individual motors, chillers, VFD's and motor  
20 controllers.

21  
22 The following requirements shall be met when aluminum conductors are used:

23  
24  
25 Aluminum alloy conductors shall be compact stranded conductors of a recognized Aluminum  
26 Association 8000 Series aluminum alloy conductor material (AA-8000 series alloy).

27  
28 It is the responsibility of the contractor to increase the size of the conduit, wire gutter, or  
29 enclosure, if necessary, to accommodate the aluminum conductors and meet allowable code  
30 requirements.

31  
32 It is the responsibility of the contractor to increase the size of the aluminum conductor and  
33 associated termination lugs to match the ampacity of the copper conductor circuit shown on the  
34 Drawings.

35  
36 The contractor shall submit a feeder schedule to the Engineer for all conductor substitutions  
37 indicating the aluminum conductor wire size and the conduit size. The contractor shall not begin  
38 the installation until written approval is granted by the Engineer.

39  
40 All aluminum conductors shall terminate on a mechanical screw-type connector or mechanical  
41 compression-type connector. Connector shall be dual rated (AL7CU or AL9CU) and Listed by  
42 UL for use with aluminum and copper conductors, and sized to accept aluminum conductors of the  
43 required ampacity. When using compression-type connectors, the lugs shall be marked with wire  
44 size, die index, number and location of crimps and shall be suitably color-coded. Using a suitable  
45 stripping tool, remove insulation from the required length of the conductor. Wire brush the  
46 conductor and apply a Listed joint compound. Tighten or crimp the connection per the connector  
47 manufacturer's recommendation. Wipe off any excess joint compound.

48  
49 When terminating aluminum conductors to aluminum bus, prepare a mechanical screw-type or  
50 compression-type connection. Bolts shall be anodized alloy and conform to current ANSI and  
51 ASTM chemical and mechanical property limits. Nuts shall be aluminum alloy and conform to  
52 current ANSI standards. Washers shall be flat aluminum alloy, Type A plain, standard wide series  
53 conforming to current ANSI standards. Lubricate and tighten the hardware per manufacturer's  
54 recommendations.

1 When terminating aluminum conductors to copper bus, prepare a mechanical screw-type or  
2 compression-type connection. Bolts shall be plated or galvanized medium carbon steel; heat  
3 treated, quenched and tempered equal to current ASTM standard or SAE grade 5. Nuts shall  
4 conform to current ANSI standards. Washers shall be steel, Type A plain, standard wide series  
5 conforming to current ANSI standards. Belleville conical spring washers shall be of hardened  
6 steel, cadmium plated or silicone bronze. Lubricate and tighten the hardware per manufacturer's  
7 recommendations.

8  
9 The final tightening torque shall be recorded for all aluminum conductor mechanical screw-type  
10 connections and provided in report form, in the completed O&M manuals.

11  
12 The contractor shall perform an infrared survey of all aluminum conductor connections after the  
13 installation is complete and in normal service. Infrared surveys shall be performed during periods  
14 of maximum possible loading with at least 30% of rated load of the equipment being inspected.  
15 All connections with elevated temperatures shall be corrected by the contractor. The infrared  
16 survey results shall be provided in report form, in the completed O&M manuals.

17  
18 **No copper-to-aluminum transitions permitted when splicing onto existing copper feeders.**

19  
20 Insulation shall have a 600 volt rating.

21  
22 All conductors shall be stranded.

23  
24 Stranded conductors may only be terminated with UL OR ETL Listed type terminations or  
25 methods: e.g. stranded conductors may not be wrapped around a terminal screw but must be  
26 terminated with a crimp type device or must be terminated in an approved back wired method.

## 27 28 **BUILDING WIRE**

29 Description: Single conductor insulated wire 90 degree C.

30  
31 Insulation: Type THHN/THWN-2, XHHW-2 insulation.

## 32 33 **VARIABLE FREQUENCY DRIVE (VFD) WIRE**

34 All power wiring from the VFD output to the motor shall be type XHHW-2 insulation, single conductor  
35 wire.

## 36 37 **EMERGENCY CIRCUITS (2-HOUR RATED)**

38 Description: Power cable assembly for fire pump circuits and emergency circuits requiring a minimum  
39 2-hour rating.

40  
41 Insulation: Type MI mineral insulated cable installed as a listed electrical circuit protective system with a  
42 minimum 2-hour fire-resistive cable rating per Factory Mutual testing. UL 2196 and ULC-S139-00  
43 approved.

44  
45 Install and support cabling system per manufacturer's requirements.

## 46 47 **WIRING CONNECTORS**

48 Split Bolt Connectors: Not acceptable.

49  
50 Solderless Pressure Connectors: High copper alloy terminal. May be used only for cable termination to  
51 equipment terminals. Not approved for splicing.

52  
53 Twist Type Wire Connectors: Solderless twist type spring connector (wire-nut) with insulating cover for  
54 copper wire splices and taps. Use for conductor sizes 10 AWG and smaller. The manufacturer's wire fill  
55 capacity must be followed. Use Silicone filled twist type spring connectors in all wet location areas.

56

1 All wire connectors used in underground or exterior pull boxes or hand holes shall be gel filled twist  
2 connectors or a connector designed for damp and wet locations. Gel filled twist type connectors can be  
3 used for copper conductor sizes 6 AWG and smaller for site lighting applications. The manufacturer's wire  
4 fill capacity must be followed.

5  
6 Mechanical Connectors: Bolted type tin-plated; high conductivity copper alloy; spacer between conductors;  
7 beveled cable entrances.

8  
9 Compression (crimp) Connectors: Long barrel; seamless, tin-plated electrolytic copper tubing; internally  
10 beveled barrel ends. Connector shall be clearly marked with the wire size and type and proper number and  
11 location of crimps. Connector must be installed with a crimper tool listed for use with the manufacturer and  
12 type of compression connector.

13  
14 Insulation Piercing Connectors: Molded insulated body, copper teeth, wrench tightened, UL 486B Listed.  
15 May be used only for connection of a tap conductor in run and tap type applications when main conductor  
16 is 8 AWG and larger.

### 17 **PART 3 - EXECUTION**

#### 18 **GENERAL WIRING METHODS**

19  
20 All wire and cable shall be installed in conduit.

21  
22 Do not use wire smaller than 12 AWG for power and lighting circuits.

23  
24 All phase, neutral and ground conductors shall be sized to prevent excessive voltage drop at rated circuit  
25 ampacity. As a minimum use 10 AWG conductors for 20 ampere, 120 volt branch circuit home runs longer  
26 than 100 feet (30 m), and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet (61 m).

27  
28 Ground conductor size shall be increased per NEC 250.122(B) when phase and phase/neutral conductors  
29 are increased in size.

30  
31 Make conductor lengths for parallel conductors equal.

32  
33 Splice only in junction or outlet boxes.

34  
35 Identify ALL low voltage wire, 600V and lower, per section 26 05 53.

36  
37 Neatly train and lace wiring inside boxes, equipment, and panelboards.

#### 38 **WIRING INSTALLATION IN RACEWAYS**

39  
40 Pull all conductors into a raceway at the same time. Use Listed water or silicone based wire pulling  
41 lubricant for pulling 4 AWG and larger wires and for other conditions when necessary. Wax based  
42 lubricants are not allowed. Pulling lubricant is not required for low friction type products where the cable  
43 manufacturer recommends that cables be pulled without lube.

44  
45 Completely and thoroughly swab raceway system before installing conductors.

46  
47 Place all conductors of a given circuit (this includes phase wires, neutral (if any), and ground conductor) in  
48 the same raceway. If parallel phase and/or neutral wires are used, then place an equal number of phase and  
49 neutral conductors in same raceway or cable.

50  
51 VFD Installations: Install VFD input wiring and output wiring in separate conduit systems. Do not mix  
52 VFD input power and output power, or control wiring in a common raceway.

53  
54 In high ambient spaces, mechanical rooms, utility rooms and exterior exposed conduit, 90 degree C,  
55 XHHW-2 conductors shall be utilized.

1  
2 **WIRING CONNECTIONS AND TERMINATIONS**

3 Splice only in accessible junction boxes.

4  
5 Wire splices and taps shall be made firm, and adequate to carry the full current rating of the respective wire  
6 without soldering and without perceptible temperature rise.

7  
8 All splices shall be so made that they have an electrical resistance not in excess of two feet (600 mm) of the  
9 conductor.

10  
11 Use solderless twist type spring connectors (wire nuts) with insulating covers for wire splices and taps,  
12 10 AWG and smaller.

13  
14 Use mechanical or compression connectors for wire splices and taps, 8 AWG and larger. Tape uninsulated  
15 conductors and connectors with electrical tape to 150 percent of the insulation value of the wiring.

16  
17 Thoroughly clean wires before installing lugs and connectors.

18  
19 At all splices and terminations, leave tails long enough to cut splice out and completely re-splice.

20  
21 **FIELD QUALITY CONTROL**

22 Field inspection and testing will be performed under provisions of Section 26 05 04.

23  
24 Additional testing as follows shall be performed if aluminum conductors are used:

25  
26 Feeders terminated with aluminum conductors shall be tested with a thermal imager and recorded.

27  
28 Conductors shall be closely checked for loose or poor connections, and for signs of overheating or  
29 corrosion.

30  
31 Test procedures shall meet NETA guidelines.

32  
33 Test results and report shall be provided to the engineer and included in O&M manual under AL  
34 conductors/ tests.

35  
36 Contractor shall correct all deficiencies reported in the test report.

37  
38 **WIRE COLOR**

39 General:

40 Solid colored insulation is required for all THHN/THWN-2 wire. For other wire types use colored  
41 wire or identify wire with colored tape at all terminals, splices and boxes. Wire shall be colored as  
42 indicated below.

43  
44 In existing facilities, use existing color scheme. If there is no color scheme follow the new  
45 facilities scheme listed below.

46  
47 In new facilities, use black and red for single phase circuits at 120/240 volts, use Phase A black,  
48 Phase B red and Phase C blue for circuits at 120/208 volts single or three phase, and use Phase A  
49 brown, Phase B orange and Phase C yellow for circuits at 277/480 volts single or three phase.  
50 Note: This includes fixture whips except for Listed whips mounted by the fixture manufacturer on  
51 the fixture and Listed as a System.

52  
53 Switch legs shall be the same color as their associated circuit, except for the second switch leg  
54 used for dual-level switching. The second switch leg shall be the next phase color, e.g. if the first  
55 switch leg is brown (277/480V phase A), the second switch leg shall be orange (277/480V phase  
56 B).

1  
2 Traveler conductors run between 3 and 4 way switches shall be colored pink or purple.

3  
4 Neutral Conductors: White for 120/208V and 120/240V systems, Gray for 277/480V systems. Where there  
5 are two or more neutrals in one conduit, each shall be individually identified with a different stripe.

6  
7 Branch Circuit Conductors: Three or four wire home runs shall have each phase uniquely color coded.

8  
9 Feeder Circuit Conductors: Each phase shall be uniquely color coded.

10  
11 Ground Conductors: Green colored insulation for THHN/THWN-2 wire. For other wire types use green  
12 colored wire or identify wire with green tape at both ends and at all access points, such as panelboards,  
13 motor starters, disconnects and junction boxes. When isolated grounds are required, contractor shall  
14 provide green with yellow tracer.

15  
16 **BRANCH CIRCUITS**

17 The use of single-phase, multi-wire branch circuits with a common neutral is not permitted. All single-  
18 phase branch circuits shall be furnished and installed with an individual accompanying neutral, sized the  
19 same as the phase conductors.

20  
21 **EMERGENCY CIRCUITS**

22 All Emergency, Legally Required Standby and Optional Standby system wiring shall be installed in  
23 separate raceways after their associated transfer switches. The wiring shall be separate from each other and  
24 from all normal system wiring.

25  
26 All emergency wiring serving NEC 700 loads, requiring minimum 2 hour fire rating shall comply with  
27 NEC 700.10(D)(1).

28  
29 **CONSTRUCTION VERIFICATION**

30 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
31 Section 26 08 00 in accordance with the procedures defined for construction verification in Section 01 91  
32 01 or 01 91 02.

33  
34 END OF SECTION



- Equipment Rated more than 1000 KVA: 3 ohms building service entrance.
- Communications Busbars: 5 ohms maximum.

**Testing of grounding system resistance is to be witnessed by the UW Electrical Inspector or Construction Representative.**

Provide test report of grounding system overall resistance and resistance of each electrode in final O&M manuals and noted on record documents.

**SUBMITTALS**

Product Data: Provide data for grounding electrodes and connections.

Provide samples of ground labels.

Test Reports: Indicate overall resistance to ground and resistance of each electrode.

Manufacturer's Instructions: Include instructions for preparation, installation and examination of exothermic connectors.

**PROJECT RECORD DOCUMENTS**

Record locations of all electrical and telecommunications grounding electrodes, busbars and grounding conductors as installed including recorded ground resistance test results.

**REGULATORY REQUIREMENTS**

Conform to requirements of NFPA 70.

Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

**PART 2 - PRODUCTS**

**ROD ELECTRODE**

Material: Copper-clad steel.

Diameter: 3/4 inch (19 mm) minimum.

Length: 10 feet (3.5 m) minimum. Rod shall be driven at least 9' 6" deep.

**MECHANICAL CONNECTORS**

The mechanical connector bodies shall be manufactured from high strength, high conductivity cast copper alloy material. Bolts, nuts, washers and lock washers shall be made of Silicon Bronze and supplied as a part of the connector body and shall be of the two bolt type.

Split bolt connector types are NOT allowed. Exception: the use of split bolts is acceptable for grounding of wire-basket type cable tray, and for cable shields/straps of medium voltage cable.

The connectors shall meet or exceed UL 467 and be clearly marked with the catalog number, conductor size and manufacturer.

**COMPRESSION CONNECTORS**

The compression connectors shall be manufactured from pure wrought copper. The conductivity of this material shall be no less than 99% by IACS standards.

Each connector shall be factory filled with an oxide-inhibiting compound.



1 The connectors shall meet or exceed the performance requirements of IEEE 837, latest revision.  
2  
3 The connectors shall be clearly marked with the manufacturer, catalog number, conductor size and the  
4 required compression tool settings.  
5  
6 The installation of the connectors shall be made with a compression tool and die system, as recommended  
7 by the manufacturer of the connectors, and shall be irreversible.  
8  
9 Pre-crimping of the ground rod is required for all irreversible compression connections to a ground rod.  
10  
11 Terminal lug for communication system grounding shall be compression type and conform to the  
12 following:

13  
14 Material: Tin Plated Copper (aluminum not permitted).  
15 Wire Size: to match conductor  
16 Number of Stud Holes: 2  
17 Stud Hole Size: 3/8"  
18 Bolt Hole Spacing: per TIA-607-C  
19 Tongue Angle: Straight  
20

## 21 **EXOTHERMIC CONNECTIONS**

22 As manufactured by Erico Cadweld, Harger Ultraweld or similar.  
23

## 24 **CONDUCTORS**

25 Material: Stranded copper (aluminum not permitted).  
26

27 Grounding Electrode Conductor: Bare seven-strand conductors. Size as shown on drawings, specifications  
28 or as required by NFPA 70, whichever is larger.  
29

30 Feeder and Branch Circuit Equipment Ground: Size as shown on drawings, specifications or as required by  
31 NFPA 70, whichever is larger. Differentiate between the normal ground and the isolated ground when both  
32 are used at the same facility.  
33

34 Branch Circuit Equipment Ground shall be proportionately increased in size when routed with phase  
35 conductors increased in size.  
36

37 Conductors for Telecommunications shall be as follows:

38 Telecommunications Bonding Conductor (TMGB to Service Ground): No. 3/0 minimum or as  
39 shown on drawings.

40 Telecommunications Bonding Backbone (TBB; TMGB to TGB): No. 3/0 minimum or as shown  
41 on drawings.

42 Telecommunications Grounding Equalizer (GE): No. 3/0 minimum or as shown on drawings.

43 Bonding Conductors shall be insulated with a Green Jacket or jacket marked with Green Tape or  
44 labeled per NEC Guidelines.  
45

## 46 **BUS/BUSBAR**

47 Material: Copper (aluminum not permitted).  
48

49 Size:

50 All Power systems: 1/4" X 2", length as needed (24" minimum).

51 Telecommunications Main Ground Busbar (TMGB): 1/4" x 4" x 20" long (minimum).

52 Telecommunications Grounding Busbar (TGB): 1/4" x 2" x 12" long (minimum).  
53

54 Busbars:

55 Be pre-drilled to accommodate two-hole lugs.

56 3/8" stud hole size; hole spacing per TIA-607-C.

1 Incorporate insulators and stand-off brackets that electrically isolate busbar from mounting  
2 surface.

3  
4 Provide main ground busbar located adjacent to main electrical service equipment to terminate all ground  
5 conductors. Refer to UW grounding detail 26 05 26-1.  
6

### 7 8 **PART 3 - EXECUTION** 9

#### 10 **EXAMINATION**

11 Verify that final backfill and compaction has been completed before driving rod electrodes.  
12

#### 13 **GENERAL**

14 Install Products in accordance with manufacturer's instructions.  
15

16 Mechanical connections shall be accessible for inspection and checking. No insulation shall be installed  
17 over mechanical ground connections.  
18

19 Ground connection surfaces shall be cleaned and all connections shall be made so that it is impossible to  
20 move them.  
21

22 Attach grounds permanently before permanent building service is energized.  
23

24 Terminate each grounding conductor on its own terminal lug. Sharing a single lug by multiple conductors  
25 is not allowed.  
26

27 All grounding electrode conductors and individual grounding conductors shall be installed in PVC conduit,  
28 in exposed locations.  
29

30 Each grounding electrode conductor shall be labeled at each terminated end as to system served and  
31 location of second termination.  
32

#### 33 **LESS THAN 600 VOLT ELECTRICAL SYSTEM GROUNDING** 34 35

36 Supplementary Grounding Electrode: Use effectively grounded metal frame of the building.  
37

38 Provide code sized copper grounding electrode conductor from electrical room ground bus to secondary  
39 switchboard ground bus, each separately derived system neutral, secondary service system neutral to street  
40 side of water meter, building steel, ground rod, and any concrete encased electrodes. Provide bonding  
41 jumper around water meter. Provide physical protection as required.  
42

43 Equipment Grounding Conductor: Provide separate, insulated equipment grounding conductor within each  
44 raceway. Terminate each end on suitable lug, bus, enclosure or bushing. Provide a ground wire from each  
45 device to the respective enclosure.  
46

47 Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of  
48 electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle  
49 ground connectors, and plumbing systems.  
50

#### 51 **COMMUNICATION SYSTEM GROUNDING** 52

53 Grounding and Bonding System for Communications shall be an isolated grounding system with a single  
54 ground point. That ground point is to be the common grounding electrode system at the building electrical  
55 service entrance (main ground bar located in electrical room).  
56

1 The system shall be compliant with ANSI J-STD-607-B with the exception that the ground cable shall not  
2 be bonded to building steel except at the electrical service entrance.

3  
4 Provide Grounding Busbar for Telecommunications at each Telecommunications Room, the Main  
5 Equipment Room and at the electrical service entrance per project drawings. Coordinate Busbar location(s)  
6 and conductor routing per drawings with Division 27 contractor.

7  
8 Provide Telecommunications Bonding Conductor from Telecommunications Main Grounding Busbar  
9 (TMGB) at the Communications Entrance Facility to building common grounding electrode system.  
10 Attach grounding conductor to building steel as allowed only at the main electrical service entrance.  
11 Provide physical protection as required.

12  
13 Provide Telecommunications Bonding Backbone (TBB) conductor from the TMGB to  
14 Telecommunications Grounding Busbar (TGB) at each Telecommunication Room, Telecommunications  
15 Equipment Room and Telecommunications Enclosure.

16 TBB shall be continuous and not connected through Telecommunications Grounding Busbars  
17 (TGBs).

18 Bond TGBs to TBB via tap off of TBB. Gauge of conductor to be same as TBB.

19 Leave 10 feet slack in conductor from TBB to TGB at TGB location(s).

20 Do not bond TBB or TGB to building steel at TGB location(s).

21  
22 Provide Grounding Equalizer(s) (GE) per project drawings. Connect GE conductor directly to TGBs being  
23 interconnected.

24  
25 **FIELD QUALITY CONTROL**

26 Inspect grounding and bonding system conductors and connections for tightness and proper installation.

27  
28 Testing of grounding system resistance is to be witnessed by the UW Electrical Inspector or Construction  
29 Representative. Provide test report of grounding system resistance in final O&M manuals and noted on  
30 record drawings.

31  
32 Provide resistance test at each electrical and telecommunications Busbar to ground.

33  
34 **IDENTIFICATION AND LABELING**

35 Label Grounds at point of termination.

36  
37 Label for TBB connection at TMGB and TGB(s) shall be plastic and include the following:

38  
39  
40 IF THIS CONNECTOR OR CABLE IS  
41 LOOSE OR MUST BE REMOVED,  
42 PLEASE CALL THE BUILDING  
43 TELECOMMUNICATIONS  
44 MANAGER.  
45

46 **CONSTRUCTION VERIFICATION**

47 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
48 Section 26 08 00 in accordance with the procedures defined for construction verification in Section 01 91  
49 01 or 01 91 02.

50  
51 Record locations of all electrical and telecommunications grounding electrodes, busbars and grounding  
52 conductors as installed including recorded ground resistance test results.

53  
54 **WARRANTY**

55 See Division 1, General Conditions, and General Requirements.

56





1 All hot-dip galvanized after fabrication products must be returned to point of manufacture after coating for  
2 inspection and removal of all sharp burrs.

#### 3 4 **Stainless Steel**

5 All strut, fittings and hardware shall be made of AISI Type 304 or Type 316 stainless steel as indicated.

#### 6 7 **CONDUIT SUPPORTS**

8 Conduit clamps, straps, supports, etc., shall be steel or malleable iron.

9  
10 One-hole straps shall be heavy duty type. All straps shall have steel or malleable backing plates when rigid  
11 steel conduit is installed on the interior or exterior surface of any exterior building wall.

12  
13 Above suspended ceilings, bar joist conduit hangers: Spring Steel Clips with Snap-Close Clamps (Conduit  
14 Supports): Conduit clamps shall pivot a full 360 degrees and shall snap close around the conduit. Push-in  
15 type conduit clamps are not allowed. Spring clips shall require a hammer to install onto supporting surface.

16  
17 Stud wall applications: Spring Steel Clips with Push-in or Snap-Close Conduit Clamps (Conduit Supports):  
18 Conduit clamps shall pivot a full 360 degrees. Spring clips shall require a fastener to install onto stud.

19  
20 Box/conduit hanger with rod/wire clip (a.k.a. antlers): One assembly provides support for electrical box and  
21 conduit from drop wire or rod. Conduit clamps shall snap close around the conduit.

22  
23 Spring Steel Clip products shall be provided with corrosion resistance and be warranted against failure  
24 from corrosion for a period of ten (10) years from date of manufacture.

#### 25 26 **NYLON ANCHORS**

27 Nylon anchors may only be used in limited applications with the pre-approval of the UW Electrical  
28 Inspector. See Part 3 – Execution for examples of applications of where nylon anchors may be allowed.

29  
30 Nylon wall plugs shall be designed for 2-way expansion, providing rapid fixing with high pull-out values.  
31 Nylon wall plugs shall be molded with protruding side fins which restrict rotation and prevent fall out from  
32 overhead holes. Examples of these include Mungo types MN or MU, or Fischer type S nylon plugs.

33  
34 Nylon one-piece self-drilling anchors designed for use in hollow gypsum wallboard for light duty loads.  
35 Anchors shall be engineered nylon or Zamac alloy. Examples of these are the Zip-It ® or Zip-It Jr. ® self-  
36 drilling anchors.

37  
38 Manufacturer's names and catalog numbers are used for quality and performance only. Anchors  
39 manufactured by others shall be equally acceptable provided they meet or exceed in performance and  
40 quality as specified.

#### 41 42 **THREADED ROD**

43 Minimum sized threaded rod for supports shall be 3/8" for trapezes and single conduits 1-1/4" and larger,  
44 and 1/4" for single conduits 1" and smaller.

#### 45 46 **HARDWARE**

47 Corrosion resistant, or as noted for each product above.

### 48 49 **PART 3 - EXECUTION**

#### 50 51 **INSTALLATION**

52 Fasten hanger rods, conduit clamps, and outlet-, junction-, and pull-boxes to building structure using pre-  
53 cast insert system, preset inserts, beam clamps, or expansion anchors.

54  
55 Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls;  
56 expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchors on

1 concrete surfaces; sheet metal screws in sheet metal studs and wood screws in wood construction. If nail-in  
2 anchors are used, they must be removable type anchors.  
3  
4 Powder-actuated fasteners are not permitted.  
5  
6 Do not fasten supports to piping, ductwork, mechanical equipment, cable tray or conduit. Do not fasten to  
7 suspended ceiling grid system.  
8  
9 Do not drill structural steel members unless approved by UW.  
10  
11 In wet locations, mechanical rooms, and electrical rooms, install free-standing electrical equipment on  
12 3.5 inch (89 mm) concrete pads.  
13  
14 Install surface-mounted cabinets and panelboards with a minimum of four anchors. At all cabinet and  
15 panelboard locations on concrete or concrete block walls, and at ALL locations below grade, provide steel  
16 channel supports to stand cabinet one inch (25 mm) off wall (7/8" Uni-strut or 3/4" painted fire-retardant  
17 plywood is acceptable). In above-grade equipment rooms that have drywall walls, the cabinets and  
18 panelboards may be mounted to the drywall if backing is provided in the stud walls behind the equipment.  
19  
20 Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboards in stud  
21 walls.  
22  
23 Furnish and install all supports as required to fasten all electrical components required for the project,  
24 including free standing supports required for those items remotely mounted from the building structure,  
25 catwalks, walkways etc.  
26  
27 Fabricate supports from galvanized structural steel or steel channel, rigidly welded or bolted to present a  
28 neat appearance. Use hexagon head bolts with spring lock washers under all nuts.  
29  
30 **Support Channel**  
31 Use one of the following types of support channel as appropriate for the installed environment:  
32 • Indoor: Epoxy Painted Steel, Hot-dipped Galvanized Steel, or as noted on the drawings.  
33  
34 • Exterior and wet locations: Hot-dipped Galvanized Steel or Stainless Steel, as appropriate for the  
35 environment or as noted on the drawings. Type 316 stainless steel shall be used for Food Service  
36 type environments. Epoxy painted support channel shall not be used for exterior installations.  
37  
38 • Manholes, steam pits, steam tunnels, or corrosive environments: Stainless Steel Type 316.  
39  
40 • Field cuts: File and de-bur cut ends of support channel and paint to prevent rusting. For epoxy-  
41 painted support channel, paint cut ends to match the original color. For hot-dipped galvanized  
42 support channel, spray cut ends with cold galvanized paint.  
43  
44 **Support Wires**  
45 Support wires that are installed in addition to the ceiling grid support wires to provide secure support for  
46 raceways, cables assemblies, boxes, cabinets, and fittings shall be secured at both ends (e.g. the ceiling  
47 structure at the top and the ceiling grid at the bottom) per NEC 300.11(A).  
48  
49 Compressed-air power-actuated fasteners may ONLY be used for the installation of separate ceiling wires  
50 required for support of conduits and aircraft cable hung light fixtures.  
51  
52 Support wires shall be identified per specification section 26 05 53.  
53  
54  
55 **Spring Steel Clip Conduit Supports**

1 Above suspended ceilings: Spring steel clips with snap-close clamps may be used to support conduit from  
2 bar joist (steel truss) systems above suspended ceilings.

3  
4 Stud wall applications: Spring steel clips with push-in or snap-close conduit clamps may be used to support  
5 conduit in interior metal stud wall applications. Use screw fasteners to install conduit clamp onto stud.

6  
7 Box/conduit hanger with rod/wire clip (a.k.a. antlers): These may only be used in limited applications with  
8 the pre-approval of the UW Electrical Inspector.

9  
10 **Nylon anchor applications**

11 Nylon anchors may only be used in limited light duty applications with the pre-approval of the UW  
12 Electrical Inspector.

13  
14 Nylon anchors shall be designed for the construction material in which they are intended to be installed and  
15 shall be designed for the weight in which the anchors are intended to support.

16  
17 Nylon wall plug applications may include attaching 4" square boxes or conduit straps to plaster-covered  
18 clay tile, drywall, or hollow concrete block. Screws used with nylon wall plugs shall be #10 minimum and  
19 shall be longer than the anchor.

20  
21 Nylon one-piece self-drilling anchor applications may include attaching 4" square boxes or conduit straps  
22 to hollow gypsum wallboard for light duty loads. Use No. 8 screws with one-piece self-drilling anchors  
23 designed for 3/8" to 1" thick wallboard. Use No. 6 screws with anchors designed for 3/8" to 5/8"  
24 wallboard.

25  
26  
END OF SECTION



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**SECTION 26 05 33**  
**RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**SCOPE**

This section describes the products and execution requirements relating to furnishing and installing raceways and boxes and related systems as part of a raceway system for electrical, communications, and other low-voltage systems for the project. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- References
- Submittals

**PART 2 - PRODUCTS**

- General
  - Rigid Metal Conduit (RMC) and Fittings
  - Intermediate Metal Conduit (IMC) and Fittings
  - Electrical Metallic Tubing (EMT) and Fittings
  - Flexible Metal Conduit (FMC) and Fittings
  - Liquidtight Flexible Metal Conduit (LFMC) and Fittings
  - Conduit Supports
  - Surface Metal Raceway
  - Surface Nonmetal Raceway
  - Multi-Outlet Assembly
  - Auxiliary Gutters (Wireways)
  - Conduit Water Sealant
  - Pull and Junction Boxes
  - Outlet Boxes
  - Outlet Box Extenders
  - Floor Boxes
  - Poke-Through Assemblies
  - Boxes for Audio-Video Equipment
  - Boxes for Fire Alarm Audio-Visual Notification Appliances

**PART 3 - EXECUTION**

- Conduit Sizing, Arrangement, and Support
- Conduit Installation
- Conduit Installation Schedule
- Surface Metal Raceway and Multi-Outlet Assembly Installation
- Nonmetallic Surface Raceway Installation
- Auxiliary Gutters (Wireways) Installation
- Coordination of Box Locations
- Pull and Junction Box Installation
- Outlet Box Installation
- Floor Box Installation
- Audio-Video System Box and Conduit Installation
- Construction Verification Items

**RELATED WORK**

Applicable provisions of Division 1 govern work under this section.

- Section 01 91 01 or 01 91 02 – Commissioning Process
- Section 26 08 00 – Commissioning of Electrical
- Section 26 05 26 – Grounding and Bonding for Electrical Systems

- 1 Section 26 05 29 – Hangers and Supports for Electrical Systems
- 2 Section 26 27 02 – Equipment Wiring Systems
- 3 Section 26 27 26 – Wiring Devices
- 4 Section 27 10 00 – Structured Cabling
- 5 Section 27 41 00 – Audio-Video Systems
- 6 Section 28 31 00 – Fire Detection and Alarm

7

8 **REFERENCES**

- 9 Wisconsin Administrative Code SPS 316 - Electrical
- 10 ANSI/TIA-569-C-Telecommunications Pathways and Spaces

11

12 **SUBMITTALS**

13 Surface Raceway System - submit product data and catalog sheets for all components.

14

15 Boxes - provide product data showing configurations, finishes, dimensions, and manufacturer's instructions.

16

17 Conduits in Concrete Slabs Above Grade - provide proposed conduit routing and sizing to Structural Engineer  
18 prior to approval of installation to verify structural integrity and fire rating of concrete slab.

19

20

21

**PART 2 - PRODUCTS**

22

23 **GENERAL**

24 All steel fittings and conduit bodies shall be galvanized.

25

26 All conduit transitional fittings shall be listed for installed application.

27

28 No cast metal or split-gland type fittings permitted.

29

30 Mogul-type condulets larger than 2 inch (50 mm) not permitted except as approved or detailed.

31

32 All conduit covers must be fastened to the conduit body with screws and be of the same manufacture.

33

34 C-condulets shall not be used in lieu of pull boxes.

35

36 All boxes shall be of sufficient size to provide free space for all conductors enclosed in the box and shall  
37 comply with NEC requirements.

38

39 **RIGID METAL CONDUIT (RMC) AND FITTINGS**

40 Conduit: Heavy wall threaded, galvanized steel, schedule 40.

41

42 Fittings and Conduit Bodies: Use all steel threaded fittings and conduit bodies.

43

44 Expansion Fittings/Expansion Joints: Expansion Fittings shall be Internal Grounding type and shall not rely  
45 on external bonding jumpers to maintain grounding continuity between raceway components.

46

47 **INTERMEDIATE METAL CONDUIT (IMC) AND FITTINGS**

48 Conduit: Galvanized Steel, threaded.

49

50 Fittings and Conduit Bodies: Use all Steel threaded fittings and conduit bodies.

51

52 Expansion Fittings/Expansion Joints: Expansion Fittings shall be Internal Grounding type and shall not rely  
53 on external bonding jumpers to maintain grounding continuity between raceway components.

54

55 **ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS**

56 Conduit: Steel, Unthreaded thin wall galvanized tubing.

1  
2 Fittings: All steel, compression or set screw type. No push-on or indenter types permitted.  
3 Conduit Bodies: All steel conduit bodies.  
4  
5 **FLEXIBLE METAL CONDUIT (FMC) AND FITTINGS**  
6 Conduit: steel, galvanized, spiral strip.  
7  
8 Fittings and Conduit Bodies: All steel, galvanized or malleable iron (except as allowed in Section 26 51 13).  
9  
10 **LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC) AND FITTINGS**  
11 Conduit: flexible, steel, galvanized, spiral strip with an outer Liquidtight, nonmetallic, sunlight-resistant  
12 jacket.  
13  
14 Fittings and Conduit Bodies: ANSI/NEMA FB 1, compression type. There shall be a metallic cover/insert on  
15 the end of the conduit inside the connector housing to seal the cut conduit end.  
16  
17 **CONDUIT SUPPORTS**  
18 See section 26 05 29.  
19  
20 **SURFACE METAL RACEWAY**  
21 Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway.  
22  
23 Size: As shown on Drawing.  
24  
25 Finish: White (Contractor allowed to paint white if original finish is not white).  
26  
27 Fittings: Couplings, elbows, and connectors designed for use with raceway system.  
28  
29 Boxes and Extension Rings: Designed for use with raceway systems.  
30  
31 Allowed manufacturers:  
32 Legrand  
33 Hubbell  
34  
35 **SURFACE NONMETAL RACEWAY**  
36 Description: Nonmetallic channel with fitted cover, suitable for use as surface raceway.  
37  
38 Size: As shown on Drawing.  
39  
40 Color: White.  
41  
42 Fittings: Couplings, elbows, and connectors designed for use with raceway system.  
43  
44 Boxes and Extension Rings: Designed for use with raceway systems.  
45  
46 Allowed manufacturers:  
47 Legrand  
48 Hubbell  
49 Panduit  
50  
51 Coordinate with Section 12 35 53 – Laboratory Casework.  
52  
53 **MULTI-OUTLET ASSEMBLY**  
54 Description: Sheet metal channel with fitted cover, suitable for use as a multi-outlet assembly.  
55  
56 Size: As indicated on Drawing.

1  
2 Receptacles: Provide covers and accessories to accept convenience receptacles specified in Section 26 27 26.

3  
4 Finish: White

5  
6 Fittings: Couplings, elbows, outlet and device boxes, and connectors designed for use with multi-outlet  
7 system.

8  
9 **AUXILIARY GUTTERS (WIREWAYS)**

10 Description: General purpose type wireway without knockouts.

11  
12 Size: As indicated on Drawings; length as indicated on Drawings.

13  
14 Cover: Hinged cover.

15  
16 Connector: Slip-in construction.

17  
18 Fittings: Lay-in type with removable top, bottom, and side; captive screws.

19  
20 Finish: Rust inhibiting primer coat with gray enamel finish.

21  
22 **CONDUIT WATER SEALANT**

23 Description: Conduit sealant used to prevent water from entering buildings via conduits.

24  
25 Sealant shall seal conduits against water and gas intrusion, such as Polywater® FST™-250 Foam Duct  
26 Sealant, Raychem RDSS Rayplate Duct Sealing System, or approved alternate. Sealant shall be re-enterable,  
27 shall be compatible with the conduit and conductor types being used, and shall comply with NEC 225.27,  
28 230.8, and 300.5(G).

29  
30 Manufacturer names and catalog numbers are used to develop quality and performance requirements only.  
31 Products manufactured by others may be acceptable provided they meet or exceed the specifications.

32  
33 **PULL AND JUNCTION BOXES**

34 Interior Sheet Metal Boxes: code gauge galvanized steel, screw covers, flanged and spot-welded joints and  
35 corners.

36  
37 Interior Sheet Metal Boxes larger than 12 inches (300 mm) in any dimension shall have a hinged cover or a  
38 chain installed between box and cover. Boxes 9 square-feet or larger shall have hinged covers and a single  
39 cover shall not exceed 10 square-feet.

40  
41 Interior Sheet Metal Boxes connected to an exterior underground raceway, shall have a drain fitting located  
42 in the bottom.

43  
44 Box extensions and adjacent boxes within 48 inches of each other are not allowed for the purpose of creating  
45 more wire capacity.

46  
47 Junction boxes 6 inch-by-6 inch or larger size shall be without stamped knock-outs.

48  
49 Wireways shall not be used in lieu of junction boxes.

50  
51 **OUTLET BOXES**

52 Sheet Metal Outlet Boxes: galvanized steel, with stamped knockouts.

53  
54 Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 3/8 inch  
55 male fixture studs where required.

1 Concrete Ceiling Boxes: Concrete type.  
2  
3 Cast Boxes: Cast ferroalloy or aluminum, deep type, gasketed cover, threaded hubs.  
4  
5 **OUTLET BOX EXTENDERS**  
6 Outlet Box Extenders: Non-Metallic, adjustable depth.  
7  
8 Outlet Box Extenders may only be used in limited applications with the pre-approval of the UW Electrical  
9 Inspector. See Part 3 – Execution for examples of applications of where Outlet Box Extenders may be  
10 allowed.  
11  
12 **FLOOR BOXES**  
13 Floor Boxes for Installation in Cast-In-Place Concrete Floors: As indicated on drawings. Provide boxes with  
14 sufficient capacity to house the devices indicated on the plans.  
15  
16 Type: Flush or Concealed service as indicated on drawings.  
17  
18 Floor Box Cover: As indicated on drawings. Floor plates shall meet and exceed UL scrub water exclusion  
19 requirements for concrete, tile, carpet, and wood covered floors.  
20  
21 Device Plate: Stainless steel or as available from manufacturer.  
22  
23 Configuration: As indicated on drawings.  
24  
25 **POKE-THROUGH ASSEMBLIES**  
26 Description: Assembly comprising of service fitting, poke-through component, fire stops and smoke barriers,  
27 and junction box for conduit termination.  
28  
29 Fire Rating: Two-hour rated, or rated to match existing floor.  
30  
31 Type: As indicated on drawings.  
32  
33 Floor Plate: As indicated on drawings. Floor plates shall meet and exceed UL scrub water exclusion  
34 requirements for concrete, tile, carpet, and wood covered floors.  
35  
36 Device Plate: Stainless steel or as available from manufacturer.  
37  
38 Configuration: As indicated on drawings.  
39  
40 **BOXES FOR AUDIO-VIDEO EQUIPMENT**  
41 Provide floor, wall, and/or ceiling boxes for Audio-Video (AV) Equipment as indicated on the Electrical  
42 and/or Audio-Video drawings.  
43  
44 **FLAT SCREEN MONITOR BOXES**  
45 Provide a recessed wall box for mounting behind flat screen monitors, allowing the screens to sit flush against  
46 the wall. These boxes shall provide a neat and secure environment for the audio, video, control and power  
47 connections.  
48  
49 The recessed wall box shall install easily between any two standard studs in the wall. Connections and cable  
50 entry can be on the top or the bottom depending on installation preference.  
51  
52 The recessed wall box shall be provided with one low-voltage conduit entry box and Nationally Recognized  
53 Testing Laboratory (NRTL) listed single gang box for AC power.  
54  
55 The recessed wall box cover shall be provided in white or black and shall be suitable for painting. The cover  
56 shall have a cable exit slot for the display connections and the excess cable can easily be hidden inside of the

1 box making the entire installation as clean as possible. The cover screws onto the front of the box once all  
2 connections are in place.

3  
4 The recessed wall box shall be designed for new or existing construction. Brackets shall be included for  
5 mounting to studs in new construction as well as surface mount clips for mounting to sheet rock or plywood  
6 in existing construction.

### 7 8 **BOXES FOR FIRE ALARM AUDIO-VISUAL NOTIFICATION APPLIANCES**

9 Recessed boxes for Fire Alarm audio, visual, and audio-visual notification appliances shall be galvanized  
10 steel sheet metal with stamped knockouts. Boxes shall be painted red.

11  
12 For surface mounting, use manufacturer supplied back boxes and trim plates, painted red or off white to  
13 match device color, and shall contain no visible conduit knock-outs. Mark each device with its circuit  
14 number.

## 15 16 **PART 3 - EXECUTION**

### 17 18 **CONDUIT SIZING, ARRANGEMENT, AND SUPPORT**

19 EMT is permitted to be used in sizes 4 inch (100 mm) and smaller for power and low-voltage systems. See  
20 CONDUIT INSTALLATION SCHEDULE below for other limitations for EMT and other types of conduit.

21  
22 Size power conductor raceways for conductor type installed. Conduit size shall be 1/2 inch (16 mm) minimum  
23 except **all homerun conduits shall be 3/4 inch (21 mm)**, or as specified elsewhere. **Caution: Per the NEC,**  
24 **the allowable conductor ampacity is reduced when more than three current-carrying conductors are**  
25 **installed in a raceway. Contractor must take the NEC ampacity adjustment factors into account when**  
26 **sizing the raceway and wiring system.**

27  
28 Size communications and other low-voltage systems raceways as follows:

29  
30 Communications, including Outlet Box: 1 inch minimum. Conduit used for single device locations  
31 (e.g. Wireless Access Point, Video Surveillance Camera, and Wall mounted telephone) may be  
32 3/4 inch minimum.

33  
34 Control, security, signal, video, and other low-voltage applications: 3/4 inch minimum.

35  
36 Fire Alarm: 1/2 inch minimum.

37  
38 Floor Box and Poke-Through Assemblies:

39 Power: 3/4 inch minimum or as indicated on drawings.

40 Low-voltage: 1 inch minimum or as indicated on drawings.

41  
42 Provide one raceway from each communications outlet box to above accessible ceiling.

43  
44 Arrange conduit to maintain 6'-8" clear headroom and present a neat appearance.

45  
46 Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent  
47 piping.

48  
49 Maintain minimum 6 inch (150 mm) clearance between conduit and piping. Maintain 12 inch (300 mm)  
50 clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.

51  
52 Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using  
53 galvanized pipe straps, conduit racks (lay-in adjustable hangers), clevis hangers, or bolted split stamped  
54 galvanized hangers.

1 Group conduit in parallel runs where practical and use conduit rack (lay-in adjustable hangers) constructed  
2 of steel channel with conduit straps or clamps. Provide space for 25 percent additional conduit.  
3  
4 Do not fasten conduit with wire or perforated pipe straps. Before conductors are pulled, remove all wire used  
5 for temporary conduit support during construction.  
6  
7 Support and fasten metal conduit at a maximum of 8 feet (2.4 m) on center.  
8  
9 Supports shall be independent of the installations of other trades, e.g. ceiling support wires, HVAC pipes,  
10 other conduits, etc., unless so approved or detailed.  
11  
12 Conceal all conduits except where noted on the drawings or approved by the Architect/Engineer. Contractor  
13 shall verify with Architect/Engineer all surface conduit installations except in mechanical rooms.  
14  
15 Changes in direction shall be made with symmetrical bends, cast steel boxes, stamped metal boxes or cast  
16 steel conduit bodies.  
17  
18 For indoor conduits, no continuous conduit run shall exceed 100 feet (30 meters) without a junction box.  
19  
20 All conduits installed in exposed areas shall be installed with a box offset before entering box.  
21  
22 **CONDUIT INSTALLATION**  
23 Cut conduit square; de-burr cut ends.  
24  
25 Conduit shall not be fastened to the corrugated metal roof deck.  
26  
27 Bring conduit to the shoulder of fittings and couplings and fasten securely.  
28  
29 Use conduit hubs for fastening conduit to cast boxes. Use sealing locknuts or conduit hubs for fastening  
30 conduit to sheet metal boxes in damp or wet locations.  
31  
32 Threads to be coated with approved electrically conductive corrosion compound per NEC 300.6. Coating to  
33 be listed for installed environment, i.e. food service.  
34  
35 Terminate all conduit (except for terminations into conduit bodies) using conduit hubs, or connectors with  
36 one locknut, or utilize double locknuts (one each side of box wall).  
37  
38 Provide bushings for the ends of all conduit not terminated in box walls. Refer to Section 26 05 26 –  
39 Grounding and Bonding for Electrical Systems for grounding bushing requirements.  
40  
41 Provide insulated bushings where raceways contain 4 AWG or larger conductors.  
42  
43 Communication and Low Voltage systems conduits shall terminate in horizontal plane.  
44  
45 Install no more than the equivalent of:  
46  
47 Three 90 degree bends between boxes for electrical systems.  
48  
49 Two 90 degree bends between boxes for communications and other low voltage systems.  
50 Note: Offsets shall be considered 90 degrees.  
51  
52 No single bend may exceed 90 degrees.  
53  
54 Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch (50 mm) size  
55 unless sweep elbows are required.  
56

1 Bend conduit according to manufacturer's recommendations. Torches or open flame shall not be used to aid  
2 in bending of PVC conduit.

3  
4 Use suitable conduit caps or other approved seals to protect installed conduit against entrance of dirt and  
5 moisture.

6  
7 Provide 1/8 inch (3 mm) nylon pull string in empty conduit, except sleeves and nipples.

8  
9 Install listed expansion-deflection fitting or other approved means shall be used where a raceway crosses a  
10 structural joint for expansion, contraction or deflection, used in buildings, bridges, parking garages or other  
11 structures.

12  
13 Avoid moisture traps where possible. Where moisture traps are unavoidable, provide junction boxes with  
14 drain fittings at conduit low points.

15  
16 Where conduit passes between areas of differing temperatures such as into or out of cool rooms, freezers,  
17 unheated and heated spaces, buildings, etc., provide conduit or box with duct seal or other means to prevent  
18 the passage of moisture and water vapor through the conduit.

19  
20 Route conduit through roof openings for piping and ductwork where possible.

21  
22 Where communication cabling is to be installed in conduit to the wiring hub (e.g. Telecom Room), multiple  
23 conduits may be consolidated into fewer, larger conduits. Capacity of shared conduits shall equal the capacity  
24 of the individual conduits unless otherwise noted.

25  
26 Use NRTL listed metallic grounding clamps when terminating conduit to cable tray.

27  
28 Ground and bond conduit under provisions of Section 26 05 26.

29  
30 Conduit is not permitted in any slab topping of two inches (50 mm) or less.

### 31 32 33 **CONDUIT INSTALLATION SCHEDULE**

34  
35 Conduit other than that specified below for specific applications shall not be used.

- 36  
37 • Concealed in Concrete Block Walls: Electrical metallic tubing, PVC conduit. Electrical  
38 Nonmetallic Tubing (ENT).
- 39  
40 • Emerging from Within Concrete Slab: Rigid Metal conduit.
- 41  
42 • Wet Interior Locations: Exposed: Rigid metal conduit.
- 43  
44 • Concealed Dry Interior Locations: Rigid metal conduit, Intermediate metal conduit, Electrical  
45 metallic tubing, PVC conduit (Ground conductor).
- 46  
47 • Interior Building Grounding Electrode Conductor: Schedule 80 PVC.
- 48  
49 • Exposed Dry Interior Locations: Rigid metal conduit, Intermediate metal conduit, Electrical  
50 metallic tubing.
- 51  
52 • Motor and equipment connections: Liquidtight flexible metal conduit (LFMC) in all locations  
53 except in Mechanical equipment plenum spaces where Flexible Metal Conduit (FMC) shall be  
54 utilized. Minimum length shall be one foot (300 mm); maximum length shall be three feet (900



1 mm). Conduit must be installed perpendicular to direction of equipment vibration to allow  
2 conduit to freely flex.

3  
4 • Exposed Dry Interior Locations for HVAC control devices with Conduit Connections:  
5 Electrical metallic tubing, Flexible Metal Conduit (FMC). For FMC installations, Minimum  
6 length shall be one foot (300 mm), Maximum length shall be three feet (900 mm). Minimum  
7 size FMC of 3/8".

8  
9 • Exposed Dry Interior Locations for HVAC control devices without Conduit Connections:  
10 Where HVAC equipment control panels or devices do not provide for the direct connection of  
11 conduits, exposed Class 2 wiring may be extended to complete the final connections in dry  
12 locations, provided it does not exceed 18 inches in length.

13  
14 • Light fixtures: Refer to specification section 26 51 13.

15  
16 • Plenum Spaces: Installation shall comply with requirements of NEC 300.22.

17  
18 **SURFACE METAL RACEWAY AND MULTI-OUTLET ASSEMBLY INSTALLATION**

19 Use flat-head screws to fasten channel to surfaces every twenty-four (24) inches. Mount plumb and level.

20  
21 Use suitable insulating bushings and inserts at connections to outlets and corner fittings.

22  
23 Maintain grounding continuity between raceway components to provide a continuous grounding path under  
24 provisions of Section 26 05 26.

25  
26 Fastener Option: Use clips and straps suitable for the purpose.

27  
28 **NONMETALLIC SURFACE RACEWAY INSTALLATION**

29 Use flat headed screws with appropriate anchors to fasten channel to surfaces secured every twenty-four (24)  
30 inches. Mount plumb and level. All surface mounted devices shall be fastened to the wall utilizing flat head  
31 screws along with appropriate anchors. No device shall be adhered to the wall surface using two-faced tape  
32 or any means other than as described above.

33  
34 Use suitable insulating bushings and inserts at connections to outlets and corner fittings.

35  
36 In areas where the walls cannot be fished, the station cable serving these outlets shall be covered with  
37 raceways. No exposed wire shall be permitted within offices, laboratories, and conference rooms or like  
38 facilities.

39  
40 Non-metallic raceway shall have a screw applied base. Both the base and cover shall be manufactured of  
41 rigid PVC materials.

42  
43 The raceway shall originate from a surface mounted box mounted adjacent to and at the same height as  
44 existing electrical boxes in the room, be attached to the wall and terminate above the ceiling.

45  
46 All fittings including, but not limited to, extension boxes, elbows, tees, fixture bodies shall match the color  
47 of the raceway.

48  
49 The raceway and all systems devices shall be UL listed and exhibit nonflammable self-extinguishing  
50 characteristics, tested to specifications of UL94V-0.

51  
52 In raceway for communications and other low voltage systems, the inside bend radius minimum shall be as  
53 follows:

- 54 • Internal diameter of 2 in or less- 6 times the internal diameter.  
55 • Internal diameter of more than 2 in- 10 times the internal diameter.

1  
2 Conduit bends shall contain no kinks or other discontinuities.

3  
4 **AUXILIARY GUTTERS (WIREWAYS) INSTALLATION**

5 Bolt auxiliary gutter to wall using two-piece hangers or steel channels fastened to the wall or in  
6 self-supporting structure.

7  
8 Gasket each joint in oil-tight gutter.

9  
10 Mount rain-tight gutter in horizontal position only.

11  
12 Maintain grounding continuity between raceway components to provide a continuous grounding path under  
13 provisions of Section 26 05 26.

14  
15 **COORDINATION OF BOX LOCATIONS**

16 Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment  
17 connections, and code compliance.

18  
19 Electrical box locations shown on Contract Drawings are approximate unless dimensioned. Verify location  
20 of floor boxes and outlets in offices and work areas prior to rough-in.

21  
22 No outlet, junction, or pull boxes shall be located where it will be obstructed by other equipment, piping,  
23 lockers, benches, counters, etc.

24  
25 Conduit and boxes shall not be fastened to the metal roof deck. If conduit and boxes are required to be located  
26 and installed on roof decks, the conduit and boxes are required to be spaced minimum 1-5/8 inch off the  
27 lowest part of the metal roof decking material, per NEC 300.4 (E).

28  
29 It shall be the Contractor's responsibility to study drawings pertaining to other trades, to discuss location of  
30 outlets with workmen installing other piping and equipment and to fit all electrical outlets to job conditions.

31  
32 In case of any question or argument over the location of an outlet, the Contractor shall refer the matter to the  
33 Architect/Engineer and install outlet as instructed by the Architect/Engineer.

34  
35 The proper location of each outlet is considered a part of this contract and no additional compensation will  
36 be paid to the Contractor for moving outlets which were improperly located.

37  
38 Locate and install boxes to allow access to them. Where installation is inaccessible, coordinate locations and  
39 provide 18 inch (450 mm) by 24 inch (600 mm) access doors. Boxes must be installed within 12" from edge  
40 of the access door.

41  
42 Locate and install to maintain headroom and to present a neat appearance.

43  
44 Install boxes to preserve fire resistance rating of partitions and other elements, using approved materials and  
45 methods.

46  
47 Boxes installed in the building envelop shall be sealed with caulking materials or closed with gasketing  
48 systems compatible with the construction materials and locations per IEC 502.4.3.

49  
50 **PULL AND JUNCTION BOX INSTALLATION**

51 Pull boxes and junction boxes shall be minimum 4 inches square (100 mm) by 2-1/8 inches (54 mm) deep  
52 for use with 1 inch (25 mm) conduit and smaller. On conduit systems using 1-1/4 inch (31.75 mm) conduit,  
53 minimum junction box size shall be 4-11/16 inches square by 2-1/8 inches deep.

54  
55 Where used with raceway(s) containing conductors of 4 AWG or larger, pull box shall be sized as required  
56 unless otherwise noted on the drawings.

1  
2 Where used with raceway(s) containing conductors on systems over 600V, size pull box per NEC 314 Part  
3 IV unless otherwise noted as larger on the drawings.

4  
5         Size pull boxes for communications per ANSI/TIA-568-C

6  
7 Locate pull boxes and junction boxes above accessible ceilings, in unfinished areas or furnish and install UW  
8 approved access panels in non-accessible ceilings where boxes are installed. All boxes are to be readily-  
9 accessible.

10  
11 Provide Pull and Junction boxes for communications and other low voltage applications (a) in any section of  
12 conduit longer than 100 feet, (b) where there are bends totaling more than 180 degrees between pull points  
13 or pull boxes and (c) wherever there is a reverse bend in run. Locate boxes on straight section of raceway  
14 (e.g. do not use boxes in place of raceway bends).

15  
16 Support pull and junction boxes independent of conduit.

### 17 18 **OUTLET BOX INSTALLATION**

19 Do not install boxes back-to-back in walls. Provide minimum 6 inch (150 mm) separation, except provide  
20 minimum 24 inch (600 mm) separation in acoustic-rated walls.

#### 21 22 **Power:**

23         Recessed (1/4 inch maximum) outlet boxes in masonry, concrete, tile construction, or drywall shall  
24 be minimum 4 inch square, with device rings. Device covers shall be square-cut except rounded  
25 corner plaster rings are allowed in drywall applications. Angle cut plaster rings are not permitted.  
26 Coordinate masonry cutting to achieve neat openings for boxes. A single gang box can be used in  
27 drywall and masonry, for a single device location, when a single conduit enters box.

28  
29         Shallow 4 inch square by 1 1/2 inch deep boxes can be used as device boxes for power provided the  
30 box and plaster ring is sized for installed device and conductors.

#### 31 32 **Low Voltage:**

33  
34         Recessed (1/4 inch maximum) outlet boxes in masonry, concrete, tile construction or drywall shall  
35 be minimum 4 11/16 inch square by 2 1/8 inch deep with single gang device ring (unless noted  
36 otherwise on drawings). Device covers shall be square-cut except rounded corner plaster rings are  
37 allowed in drywall applications. Angle cut plaster rings are not permitted. Coordinate masonry  
38 cutting to achieve neat openings for boxes.

39  
40         Provide one conduit from each communications outlet box. Conduit runs between outlet boxes for  
41 communications are not allowed. Terminate conduit above accessible ceiling.

42  
43 Provide knockout closures for unused openings.

44  
45 Support boxes independently of conduit except for cast boxes that are connected to two rigid metal conduits,  
46 both supported within 12 inches (300 mm) of box.

47  
48 Use multiple-gang boxes where more than one device are mounted together; do not use sectional boxes.  
49 Sectional boxes may only be used with the pre-approval of the UW Electrical Inspector for remodeling  
50 applications where it is impractical to install multi-gang boxes. Provide non-metallic barriers to separate  
51 wiring of different voltage systems.

52  
53 Install boxes in walls without damaging wall insulation.

54  
55 Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.

56

1 Ceiling outlets shall be 4 inch square, minimum 2-1/8 inch (54 mm) deep except that concrete boxes and  
2 plates will be approved where applicable. Position outlets to locate luminaires as shown on reflected ceiling  
3 plans.

4  
5 In inaccessible ceiling areas, position outlets and junction boxes within 6 inches (150 mm) of recessed  
6 luminaire, to be accessible through luminaire ceiling opening.

7  
8 Provide recessed outlet boxes in finished areas; secure boxes to interior wall and partition studs, accurately  
9 positioning to allow for surface finish thickness. Use stamped steel stud bridges for flush outlets in hollow  
10 stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.

11 Align wall-mounted outlet boxes for switches, thermostats, and similar devices.

12  
13 Provide cast ferroalloy or aluminum outlet boxes in exterior and wet locations.

14  
15 Surface wall outlets shall be 4 inch (100 mm) square with raised covers for one and two gang requirements.  
16 For three gang or larger requirements, use gang boxes with non-overlapping covers.

17  
18  
19 Outlet Box Extender applications:

20 **Outlet Box Extenders may only be used in limited applications with the pre-approval of the**  
21 **UW Electrical Inspector.**

22  
23 Provide box extenders for boxes that are set too far back in the wall due to un-anticipated wall  
24 finishes. **Outlet Box Extenders will NOT be allowed for installations where the EC has not**  
25 **accommodated for wall finishes that were expected prior to installation.** Place the box extender  
26 over the existing box face to make the box face flush with the wall finish.

## 27 28 **FLOOR BOX INSTALLATION**

29 Set boxes level and flush with finish flooring material.

30  
31 Floor boxes for communications shall each be served by conduit(s) dedicated to that box. Conduit runs  
32 between floor boxes for communications are not allowed. Conduit shall be part of path that allows for cable  
33 to be terminated at wiring hub (e.g. Telecom Room) on same floor on which floor box appears unless noted  
34 otherwise.

## 35 36 **AUDIO-VIDEO SYSTEM BOX AND CONDUIT INSTALLATION**

37 Conduit requirements for AV systems cabling may differ from those of other trades. It is important that the  
38 electrical contractor become familiar with these specialized requirements. AV systems cabling must be  
39 enclosed within continuously grounded ferrous metallic conduit or raceway. PVC conduit is not acceptable.  
40 Conduit and raceway is to be furnished and installed by electrical contractor. Conduits containing different  
41 wiring classes must maintain minimum separations to minimize interferences from electrical noise. Conduits  
42 sizes and quantities shown on bid documents are minimums. Separate conduit runs specified in bid  
43 documents may not be combined for any purpose.

44  
45 The following tables define the required minimum separations between the group divisions and other power  
46 services.

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Group	Description	Level	Bandwidth
A	Microphone level AV circuits	Below -30 dB $\mu$	20 Hz to 20 kHz
B	Line level AV circuits, Communication Circuits (Intercom)	-30 dB $\mu$ to +24 dB $\mu$	20 Hz to 20 kHz
C	Speaker level AV circuits, including low- and high-impedance types (70V)	Greater than +24 dB $\mu$	20 Hz to 20 kHz
D	Control Circuits Data Circuits	0-28 volt into <50k ohm 2 volt peak-peak into 100 ohm	0 Hz to 100 MHz
E	Video	1 volt peak-peak into 75 ohm	0 Hz to 10 MHz
F	Fiber Optic Circuits	N/A	N/A

Wire Class	A	B	C	D	E	F
A	Adjacent	6 inches	12 inches	12 inches	12 inches	Adjacent
B	--	Adjacent	12 inches	6 inches	6 inches	Adjacent
C	--	--	Adjacent	6 inches	6 inches	Adjacent
D	--	--	--	Adjacent	Adjacent	Adjacent
E	--	--	--	Adjacent	Adjacent	Adjacent
F	--	--	--	--	--	Adjacent
Power Conduit <60A	24 inches	24 inches	24 inches	24 inches	24 inches	Adjacent
Power Conduit 60 - 120A	48 inches	48 inches	48 inches	48 inches	48 inches	Adjacent
Power Conduit >120A	64 inches	64 inches	64 inches	64 inches	64 inches	Adjacent

- Ninety-degree crossings in close proximity are acceptable between groups A through F.
- The sizing of the conduit is to be based on the NEC requirements.
- The minimum conduit size allowed for AV cables is 3/4 inch.
- For conduit runs of 50 to 100 feet the installed number shall be reduced by 15% or the next larger size of conduit shall be used.
- If more than two 90 degree bends are to be used in a conduit run or if the run exceeds 100 feet, a pull box shall be inserted.

Conduit runs entering or exiting the audio equipment racks shall be electrically isolated from the racks. PVC or other non-conductive fittings shall be used to isolate the conduit from the audio equipment racks.

Provide AV boxes as shown on the Electrical and/or Audio-Video drawings. Install boxes at heights and locations as indicated on the drawings. Coordinate all box installations with the AV equipment provider.

Flat screen monitor boxes shall be installed so that all cabling is concealed behind the monitor. Coordinate box location with flat screen mounting brackets so that the box cover and cables are not blocked by the brackets.

**CONSTRUCTION VERIFICATION**

Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 26 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01 or 01 91 02.

END OF SECTION



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**SECTION 26 05 53**  
**IDENTIFICATION FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**SCOPE**

The work under this section includes the products and execution requirements relating to the installation of labels, nameplates, and directories for electrical boxes, wiring devices, and equipment, along with the labeling of power and control wiring. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Submittals

**PART 2 - PRODUCTS**

- Materials

**PART 3 - EXECUTION**

- General
- Box Identification
- Communication Conduit Labeling
- Power, Control and Signal Wire Identification
- Wiring Device Identification
- Support Wire Identification
- Nameplate Engraving for Electrical Equipment
- Panelboard Directories

**RELATED WORK**

Applicable provisions of Division 1 shall govern work under this section.

- Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables
- Section 26 05 23 – Control-Voltage Electrical Power Cables
- Section 01 91 01 or 01 91 02 – Commissioning Process

**SUBMITTALS**

Include schedule for nameplates.

Prior to installation, the contractor shall provide samples of all label types planned for the project. These samples shall include examples of the lettering to be used. Samples shall be mounted on 8 -1/2” x 11” sheets, explaining their purposed use.

**PART 2 - PRODUCTS**

**MATERIALS**

Labels: All labels shall be permanent, and machine generated. NO HANDWRITTEN OR NON-PERMANENT LABELS ARE ALLOWED.

Wire Labels: All wiring labels shall be white/transparent vinyl or vinyl-cloth, self-laminating, wraparound type. Flag type labels are not allowed. The labels shall be of adequate size to accommodate the circumference of the cable being labeled and properly self-laminate over the full extent of the printed area of the label.

Tape (wiring phase identification only): Scotch #35 tape, JVCC E-Tape, or Duck Brand 667 Pro Series in appropriate colors for system voltage and phase. Embossed tape shall not be permitted for any application.

1 Nameplates: Engraved multi-layer laminated plastic. Normal system shall use nameplates with black letters  
2 on white background, Emergency system (NEC 700) shall use white letters on red background, Legally  
3 Required Standby system (NEC 701) shall use white letters on blue background, and Optional Standby  
4 system (NEC 702) shall use black letters on yellow background.

5  
6 Nameplates: Engraved multi-layer laminated plastic. Normal system shall use nameplates with black letters  
7 on white background, Life Safety system (NEC 517) shall use white letters on red background, Critical  
8 system (NEC 517) shall use white letters on orange background, Equipment system (NEC 517) shall use  
9 white letters on blue background, and Optional Equipment system (NEC 517) shall use black letters on yellow  
10 background.

11 See Box Identification and Wiring Device Identification sections for allowed usage of permanent marker.

### 14 **PART 3 - EXECUTION**

#### 17 **GENERAL**

18 Clean all surfaces before attaching labels with the label manufacturer's recommended cleaning agent. Install  
19 all labels firmly as recommended by the label manufacturer. Labels shall be installed plumb and neatly on  
20 all equipment.

21  
22 Install nameplates parallel to equipment lines. Secure nameplates to equipment fronts using screws, rivets  
23 or manufacturer approved adhesive or cement.

24  
25 Provide all warning labels to electrical equipment as required per NEC 110.16 and 110.21. Provide available  
26 fault current labeling to service equipment as required per NEC 110.24.

27  
28 Provide a sign at the service-entrance equipment indicating type and location of on-site emergency power  
29 sources and on-site legally required standby power sources, per NEC 700.7 and NEC 701.7.

30  
31 Fire pump disconnecting means shall be marked as "Fire Pump Disconnecting Means", per NEC  
32 695.4(B)(3)(c).

33  
34 Provide a sign at each service disconnect indicating "Service Disconnect", per NEC 230.70(B).

35  
36 Provide permanent marking of exposed Emergency (NEC 700) cable or raceway systems, where boxes or  
37 enclosures are not encountered, per NEC 700.10(A)(2).

#### 39 **BOX IDENTIFICATION**

40 All junction and pull boxes shall be identified by color, based on the following color scheme:

42 <b>System</b>	42 <b>Color(s)</b>
43 Secondary Power – 480Y/277V	Brown
44 Secondary Power – 208Y/120V, 240/120V	White
46 Emergency (NEC 700) – 480Y/277V	Brown/Red
47 Emergency (NEC 700) – 208Y/120V	White/Red
48 Life Safety (NEC 517) – 480Y/277V	Brown/Red
49 Life Safety (NEC 517) – 208Y/120V	White/Red
51 Critical (NEC 517) – 480Y/277V	Brown/Orange
52 Critical (NEC 517) – 208Y/120V	White/Orange
54 Legally Required Standby (NEC 701) – 480Y/277V	Brown/Blue
55 Legally Required Standby (NEC 701) – 208Y/120V	White/Blue



1	Equipment (NEC 517) – 480Y/277V	Brown/Blue
2	Equipment (NEC 517) – 208Y/120V	White/Blue
3		
4	Optional Standby (NEC 702) – 480Y/277V	Brown/Yellow
5	Optional Standby (NEC 702) – 208Y/120V	Black/Yellow
6	Optional Equipment (NEC 517) – 480Y/277V	Brown/Yellow
7	Optional Equipment (NEC 517) – 208Y/120V	Black/Yellow
8		
9	Fire Alarm (see below)	Red
10	Temperature Control	Green
11	Door Access Control	Orange
12	Sound and Intercom Systems	Gray
13	Video Surveillance System	Yellow
14	Communications	Blue

15  
16 The means of junction and pull box identification shall be as follows:

- 17
- 18 1. Boxes 8” Square or Smaller – Concealed (Above Accessible Ceilings).
    - 19 • Color identified utilizing fully painted covers. If box contains power wiring, the box shall be
    - 20 further identified with circuit numbers and source panel designation, using machine-generated
    - 21 adhesive label or neatly hand-written permanent marker.
  - 22 2. Boxes 8” Square or Smaller – Exposed.
    - 23 • Color identified utilizing fully painted covers. If box contains power wiring, the box shall be
    - 24 further identified with circuit numbers and source panel designation, using machine-generated
    - 25 adhesive label or engraved nameplate.
  - 26 3. Boxes Larger than 8” Square – Concealed (Above Accessible Ceilings).
    - 27 • Color identified utilizing 4” x 4” minimum-sized painted patch, or color-correct machine-
    - 28 generated adhesive label. If box contains power wiring, the box shall be further identified with
    - 29 circuit numbers and source panel designation using machine-generated adhesive label or neatly
    - 30 hand-written permanent marker. Letter height shall be 1/2” minimum.
  - 31 4. Boxes Larger than 8” Square – Exposed.
    - 32 • Color identified utilizing 4” x 4” minimum-sized painted patch, or color-correct engraved
    - 33 nameplate. If box contains power wiring, the box shall be further identified with circuit
    - 34 numbers and source panel designation using machine-generated adhesive label or engraved
    - 35 nameplate. Letter height shall be 1/2” minimum.

36  
37 All fire alarm boxes (covers and outer sides) shall be painted red and labeled “Fire Alarm” or “FA”. When  
38 red conduit is used for the alarm system installation, there is no need to paint the box sides – paint the covers  
39 only. Non-factory device boxes shall also be painted red.

40  
41 Other system boxes shall be further identified as shown on drawing details or approved shop drawings.

42  
43 **COMMUNICATIONS CONDUIT LABELING**

44 Provide label on all conduits installed between Telecommunication Equipment Rooms. Both ends of the  
45 conduits shall be labeled. All labels shall be mechanical, no hand-written labels.

46  
47 The label shall indicate the location of the far end of the conduit run and a unique conduit number.  
48 (i.e. TR-1A-01 or Room #216 – 01). Refer to agency standards where applicable.

49  
50 **POWER, CONTROL AND SIGNALING WIRE IDENTIFICATION**

51 Provide wire labels on each conductor in panelboard gutters, all boxes, and at load connection. Identify with  
52 branch circuit or feeder number for power and lighting circuits, and with wire number as indicated on  
53 schematic and interconnection diagrams or equipment manufacturer's shop drawings for control and signaling  
54 wires.

55

1 All wiring shall be labeled within 2 to 4 inches of terminations. Each end of a wire or cable shall be labeled  
2 as soon as it is terminated, including wiring used for temporary purposes.  
3

4 **WIRING DEVICE IDENTIFICATION**

5 Wall switches, receptacles, occupancy sensors, photocells, poke-through fittings, access floor boxes, and  
6 time clocks shall be identified with circuit numbers and panelboard source (ex. Panel ABC-3). In exposed  
7 areas, identifications should be made inside of device covers, unless directed otherwise. Use machine-  
8 generated adhesive labels, or neatly hand-written permanent marker.  
9

10 **SUPPORT WIRE IDENTIFICATION**

11 Support wires that are installed in addition to the ceiling grid support wires to provide secure support for  
12 raceways, cables assemblies, boxes, cabinets, and fittings shall be distinguishable from the ceiling grid  
13 support wires per NEC 300.11(A). This identification shall be either approximately 6 inches of fluorescent  
14 orange paint, or orange tape flags 3/4 inches high-by-2 inches wide (minimum) within 12 inches of the bottom  
15 of the support wires.  
16

17 **ELECTRICAL EQUIPMENT IDENTIFICATION**

18 Provide nameplates of minimum letter height as scheduled below.  
19

20 All Panelboards (Distribution, Branch, Sub-feed, and Feed-Through), Switchboards and Motor Control  
21 Centers: 1 inch (25 mm); identify equipment designation (same designation used by the main distribution  
22 center). 1/2 inch (13 mm); identify voltage rating, source and room location of the source. Panelboards  
23 serving NEC 700, 701 or 702 loads shall identify which branch they serve. Both panels in a double tub  
24 application shall be labeled.  
25

26 Circuit Breakers, Switches, and Motor Starters in Distribution Panelboards, Switchboards and Motor Control  
27 Centers: 1/2 inch (13 mm); identify circuit number and load served, including location.  
28

29 Individual Disconnect Switches, Enclosed Circuit Breakers, and Motor Starters: 1/2 inch (13 mm); identify  
30 voltage, source and load served.  
31

32 Transformers: 1 inch (25 mm); identify equipment designation. 1/2 inch (13 mm); identify primary and  
33 secondary voltages, primary source and location, and secondary load and location.  
34

35 **PANELBOARD DIRECTORIES**

36 Typed directories for panelboards shall be covered with clear plastic and shall have a metal frame. Room  
37 number on directories shall be Owner's numbers, not Plan numbers unless Owner so specifies.  
38

39  
END OF SECTION



1 IEEE 1584 – Guide for Performing Arc Flash Calculations

2  
3 **DATA COLLECTION FOR THE STUDY**

4 The contractor shall provide the required data for preparation of the studies. The engineer performing the  
5 system studies shall furnish the contractor with a listing of the required data immediately after award of the  
6 contract.

7  
8 The contractor shall expedite collection of the data to assure completion of the studies as required for final  
9 approval of the distribution equipment shop drawings and/or prior to release of the equipment for  
10 manufacture.

11  
12 **SUBMITTALS**

13 **THIRD PARTY QUALIFICATIONS**

14 Submit qualifications of individual(s) who will perform the work to the A/E for approval prior to  
15 commencement of the studies.

16  
17 **PRELIMINARY REPORT**

18 Submit a draft of the studies to the A/E for review prior to delivery of the final study to the Owner. Make  
19 all additions or changes as required by the reviewer.

20  
21 **FINAL STUDY REPORT**

22 Provide studies in conjunction with equipment submittals to verify equipment ratings required.

23  
24 The results of the power system studies shall be summarized in a final report and provided in the following  
25 formats. Provide (2) bound hard copies of the final report. Provide (2) electronic copies (on CD) of the final  
26 report and one-line diagrams in PDF format. Provide (2) electronic copies (on CD) of the final report in MS  
27 Word format and the one-line diagrams in CAD format.

28  
29 Also provide (2) electronic copies (on CD) of all files generated by the SKM or EasyPower software for all  
30 scenarios evaluated in the studies. The files shall permit the studies to be opened, reviewed or updated by  
31 any user of the analysis software used for the studies.

32  
33 The report shall typically include the following sections:

34  
35 I. Overview

36 II. Short Circuit Study

37 SC-1 Purpose

38 SC-2 Explanation of Data

39 SC-3 Assumptions

40 SC-4 Analysis of Results

41 SC-5 Recommendations

42 SC-6 Fault Analysis Input Report from Software Program

43 SC-7 Fault Contribution Report

44 III. Protective Device Coordination Study

45 PDC-1 Purpose

46 PDC-2 Explanation of Data

47 PDC-3 Assumptions

48 PDC-4 Analysis of Results

49 PDC-5 Recommendations (Including NEC 700-27 Requirement)

50 PDC-6 Results from Software Program

51 PDC-7 Example Drawings

52 IV. Arc Flash Study

53 ARC-1 Purpose

54 ARC-2 Explanation of Data

55 ARC-3 Assumptions

56 ARC-4 Analysis of Results

1	ARC-5	Recommendations
2	ARC-6	Arc Flash Evaluation Report from Software Program
3	V.	Prioritized Recommendations and Conclusions
4	VI.	Appendices
5	APP-1	One-line Diagrams from Software Program
6	APP-2	AutoCAD One-line Diagrams
7	APP-3	Protective Device Summaries from Software Program
8	APP-4	Reference Data
9	APP-5	Sample Work Permit Form
10	APP-6	Copy of Warning Labels, including study date

11  
12 The above sections shall include the following items in detail:

- 14 • Obtain available fault current from the local utility company.
- 15 • Short circuit studies shall evaluate the available fault current at each bus (each change of impedance), including all three-phase motors.
- 17 • Coordination study recommendations for relay settings, breaker settings, and motor protection settings.
- 18 • Recommendations for improving the coordination and/or load distribution, as well as ground fault requirements.
- 20 • Worst case Arc Flash values (highest incident energy) for project specific scenarios (low short circuit and high short circuit for each possible power supply source).
- 22 • Arc flash values for two maintenance cases, which define the arc flash values available at the equipment that would be available if the instantaneous trip of the upstream circuit breaker is set at a minimum value. This is recommended if someone has to work on live equipment.
- 25 • IEEE standard one-line diagram with equipment evaluation and circuit breaker settings that clearly define the system data and are easy to interpret. The diagrams should include the bus names and references used in the studies.
- 28 • Recommendations to reduce the arc flash incident energy in all areas that are subject to 8 calories per square centimeter or greater of available incident energy.
- 30 • Condition of Maintenance information for any existing equipment included in the study.
- 31 • Prioritized report summarizing all recommendations from this study. This shall include observed NEC code violations and their corrective action.
- 33 • The contractor shall provide a one-line diagram that meets IEEE/ANSI standard 141, mounted on 34 24" x 36" (minimum) Styrofoam backboard. This one-line diagram shall be mounted in each electrical 35 room.

36  
37 **PART 2 – PRODUCTS**

38  
39 Not used.

40 **PART 3 – EXECUTION**

41  
42  
43 **SHORT CIRCUIT AND COORDINATION STUDY**

44 The short circuit, coordination, and arc flash hazard studies shall be performed using SKM Dapper, Captor and PowerTool for Windows software or EasyPower product suite Windows based software packages. In 45 the short circuit study, provide calculation methods and assumptions, the base per unit quantities selected, 46 one-line diagrams, source impedance data including power company system characteristics, typical 47 calculations, and recommendations. Calculate short circuit interrupting and momentary (when applicable) 48 duties for an assumed 3-phase bolted fault at each supply switchgear lineup, unit substation primary and 49 secondary terminals, low voltage switchgear lineup, switchboard, motor control center, distribution 50 panelboard, pertinent branch circuit panelboard, and other significant locations throughout the system. 51 Provide a ground fault current study for the same system areas, including the associated zero sequence 52 impedance data. Include in tabulations fault impedance, X to R ratios, asymmetry factors, motor 53 contribution, short circuit KVA, and symmetrical and asymmetrical fault currents.

54  
55

1 In the protective device coordination study, provide time-current curves graphically indicating the  
2 coordination proposed for the system, centered on conventional, full-size, log-log forms. Include with each  
3 curve sheet a complete title and one-line diagram with legend identifying the specific portion of the system  
4 covered by that particular curve sheet. Include a detailed description of each protective device identifying  
5 its type, function, manufacturer, and time-current characteristics. Tabulate recommended device tap, time  
6 dial, pickup, instantaneous, and time delay settings.

7  
8 Include on the curve sheets power company relay and fuse characteristics, system medium-voltage  
9 equipment relay and fuse characteristics, low-voltage equipment circuit breaker trip device characteristics,  
10 pertinent transformer characteristics, pertinent transformer characteristics, pertinent motor and generator  
11 characteristics, and characteristics of other system load protective devices. Include at least all devices down  
12 to largest branch circuit and largest feeder circuit breaker in each motor control center, and main breaker in  
13 branch panelboards.

14  
15 Include all adjustable settings for ground fault protective devices. Include manufacturing tolerance and  
16 damage bands in plotted fuse characteristics. Show transformer full load and 150, 400, or 600 percent  
17 currents, transformer magnetizing inrush, ANSI transformer withstand parameters, and significant  
18 symmetrical and asymmetrical fault currents. Terminate device characteristic curves at a point reflecting  
19 the maximum symmetrical or asymmetrical fault current to which the device is exposed.

20  
21 Select each primary protective device required for a delta-wye connected transformer so that its  
22 characteristic or operating band is within the transformer characteristics, including a point equal to  
23 58 percent of the ANSI withstand point to provide secondary line-to-ground fault protection. Where the  
24 primary device characteristic is not within the transformer characteristics, show a transformer damage  
25 curve. Separate transformer primary protective device characteristic curves from associated secondary  
26 device characteristics by a 16 percent current margin to provide proper coordination and protection in the  
27 event of secondary line-to-line faults. Separate medium-voltage relay characteristic curves from curves for  
28 other devices by at least a 0.4-second time margin.

29  
30 Include complete fault calculations as specified herein for each proposed and ultimate source combination.  
31 Note that source combinations may include present and future supply circuits, large motors, or generators  
32 as noted on drawing one-lines.

33  
34 Utilize equipment load data for the study obtained by the Contractor from contract documents, including  
35 contract addendums issued prior to bid openings.

36  
37 Include fault contribution of all motors in the study. Notify the Engineer in writing of circuit protective  
38 devices not properly rated for fault conditions.

39  
40 Provide settings for the chiller motor starters or obtain from the mechanical contractor, include in the study  
41 package, and comment.

42  
43 When an emergency generator is provided, include phase and ground coordination of the generator  
44 protective devices, to meet NEC 700.27 requirements. Show the generator decrement curve and damage  
45 curve along with the operating characteristic of the protective devices. Obtain the information from the  
46 generator manufacturer and include the generator actual impedance value, time constants and current boost  
47 data in the study. Do not use typical values for the generator.

48  
49 Evaluate proper operation of the ground relays in 4-wire distributions with more than one main service  
50 circuit breaker, or when generators are provided, and discuss the neutral grounds and ground fault current  
51 flows during a neutral to ground fault.

52  
53 For motor control circuits, show the MCC full-load current plus symmetrical and asymmetrical of the  
54 largest motor starting current to ensure protective devices will not trip major or group operation.

55  
56 **FIELD SETTINGS**

1 The Contractor shall perform field adjustments of the protective devices as required to place the equipment  
2 in final operating condition. The settings shall be in accordance with the approved short circuit study,  
3 protective device coordination study and arc flash risk assessment.

4  
5 Necessary field settings and adjustments of devices and minor modifications to equipment to accomplish  
6 conformance with the approved short circuit and protective device coordination study shall be carried out  
7 by the Contractor at no additional cost to the owner.

8  
9 **ARC FLASH RISK ASSESSMENT**

10 As part of the short circuit and coordination study, arc flash risk assessment shall be included. The study  
11 shall include the following:

- 12  
13 1. Determine and document all possible utility and generator/emergency sources that are capable of  
14 being connected to each piece of electrical gear. Calculations shall be based on highest possible  
15 source connection.
- 16  
17 2. Calculations to conform to National Fire Protection Association (NFPA) 70E recognized means of  
18 calculation standards. All incident energy units shall be calculated in calories per square  
19 centimeter.
- 20  
21 3. Provide recommended boundary zones and personal protective equipment (PPE) based on the  
22 calculated incident energy and requirements of NFPA 70E for each piece of electrical gear.

23  
24 Electrical Contractor shall provide warning labels as required by OSHA based upon the results of the arc  
25 flash risk assessment. At a minimum, the labeling shall contain the following information: nominal system  
26 voltage, arc flash boundary, limited approach boundary, restricted approach boundary, available incident  
27 energy and the corresponding working distance or the arc flash PPE category, minimum arc rating of  
28 clothing, and study date. Label shall also include the name or logo and the phone number of the company  
29 performing the study.

30  
31 Arc flash warning labels shall be affixed to all electrical equipment that is likely to require examination,  
32 adjustment, servicing or maintenance while energized. This includes, but is not limited to, medium-voltage  
33 switchgear, transformers, switchboards, panel boards, three-phase disconnect switches, transfer switches,  
34 motor control centers, motor controllers, and three-phase motor disconnect switches.

35  
36 END OF SECTION







1 Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress.

2  
3

## CV-26 51 13 – Interior Light Fixtures, Lamps and Ballasts

4  
5  
6  
7

**Equipment Identification/Tag:** \_\_\_\_\_

**Location:** \_\_\_\_\_

### 8 **A) INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:		_____				DATE:		_____		

### 9 **Question Details**

- 10 1) Fixtures, ballasts, and lamps are free from damage.
- 11 2) Identical ballasts provided for each fixture type.
- 12 3) All fixtures and exit signs installed in locations specified in contract documents.
- 13 4) Fixtures do not impede access to other systems or equipment for maintenance.
- 14 5) Suspended fixtures and exit signs are hung independent of any other fixture, system, or equipment, are level, and are suspended with appropriate materials and methods defined within the contract documents.
- 15 6) Fixtures larger than 2’x4’ or greater than 50 lbs. are supported independently from ceiling framing.
- 16

- 1        7) All recessed fixtures are installed flush to ceiling or wall finish.
- 2        8) All recessed fixtures are installed to permit removal and access to lamps from below.
- 3        9) All wall mounted fixtures and exit signs are mounted at heights specified in contract documents.
- 4        10) All fixtures are supported and installed in accordance with manufacturer and specification requirements.

5        **Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

6

1 **B) WIRING INSTALLATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)					
				1)	2)	3)	4)	5)	
				YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:		_____			DATE: _____

2 **Question Details**

- 3 1) Fixture and accessories grounded and bonded to branch circuit grounding conductor.  
 4 2) Maximum of 6' of flexible conduit provided for lay-in, recessed fixtures.  
 5 3) All electrical connections are tight.  
 6 4) All conductors are labeled per specification requirements.

7 **Negative Responses**

Group/Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

8

1 **C) STARTUP & TESTING CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)			
				1)	2)	3)	4)
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____		DATE: _____	

2 **Question Details**

- 3 1) Emergency indicating button/lamp visible and verified to be operational (if applicable).  
 4 2) Associated emergency ballast tested and operation verified (if applicable).  
 5 3) Occupancy sensor and associated fixture(s) tested and operation verified (if applicable).  
 6 4) Lighting control schedules programmed and operation verified for all associated fixtures (if applicable).

7 **Negative Responses**

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

8

1 **D) FINALIZATION CHECKS**

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)											
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)		
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS:			_____			DATE:			_____		

2 **Question Details**

- 3 1) Protective covering removed.
- 4 2) Lens, trim ring and other architectural accessories installed.
- 5 3) Recessed fixtures are flush to finished surface with no visible gaps.
- 6 4) Code-required hardware is installed to secure recessed grid-supported fixtures in place.
- 7 5) Recessed fixtures in fire rated assemblies have been sealed per manufacturer and specification requirements to maintain assembly rating.
- 8 6) Number and type of lamps specified for each fixture installed and operational.
- 9 7) Fluorescent lamps installed in fixtures with dimming ballasts have been burned in at 100% rated output for a minimum of 100 hours.
- 10 8) Fixture adjusted and aimed for specific task or effect per contract documents and/or Architect's directions.
- 11 9) All damages to fixture finish repaired.
- 12 10) Fixtures and lens are clean.

1 **Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

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END OF SECTION





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**SECTION 26 09 43**  
**DISTRIBUTED DIGITAL LIGHTING CONTROLS**

**PART 1 - GENERAL**

**SCOPE**

Provide Distributed Digital Lighting Controls (controls) as indicated on the drawings and as specified herein. The controls shall consist of a series of standalone digital load controllers and intelligent low-voltage devices dedicated to the room/space they are serving. All local devices shall be connected together via an In-Room Network, enabling digital communication between devices. Digital Lighting Control Panels, where indicated on the drawings, may also be used for lighting control as part of the overall lighting control scheme.

The controls shall provide time-based, sensor-based (e.g. occupancy/vacancy and daylight sensors), and/or manual control as indicated in the lighting sequences of operation on the drawings. The controls shall turn lighting loads ON/OFF, and shall dim the lighting where indicated.

Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Reference Standards
- Design/Performance Requirements
- Quality Assurance
- Submittals
- Operation and Maintenance Data
- Extra Materials

**PART 2 - PRODUCTS**

- System Requirements
- Digital Load Controllers (Room Controllers)
- Digital Motion Sensors
- Digital Daylight Sensors
- Digital Manual Controls
- Digital LED Luminaires
- Digital Auxiliary Input/Output (I/O) Interface Modules
- Digital Lighting Control Panels (Relay and Dimming Panels)
- Configuration Tools
- Network Cables
- [Network Interfaces]

**PART 3 - EXECUTION**

- Delivery, Storage, and Handling
- Project Conditions
- Sensor Layouts
- Auxiliary Contacts for HVAC Interlock
- Installation
- Free-Air Cable Installation
- Field Quality Control
- Sequence of Operation
- Post Start-up Tuning
- Warranty
- Product Support and Service
- Construction Verification Items
- Agency Training

**RELATED WORK**

1 Applicable provisions of Division 1 govern work under this Section.

2  
3 Section 01 91 01 or 01 91 02 – Commissioning Process

4 Section 26 08 00 – Commissioning of Electrical

5 Section 26 51 13 – Interior Lighting Fixtures, Lamps, and Ballasts

6  
7 **REFERENCE STANDARDS**

8 NFPA 70 National Electrical Code; National Fire Protection Association

9 NEMA National Electrical Manufacturers Association

10 FCC Federal Communications Commission – Emission Standards

11 UL Underwriters Laboratories, Inc. Listings

12 UL 2043 Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products Installed in Air-  
13 Handling Spaces

14 UL 20 General-Use Snap Switches

15 UL 508 Standard for Industrial Control Equipment

16 UL 916 Standard for Energy Management Equipment

17 UL 924 Standard for Emergency Lighting and Power Equipment

18  
19 **DESIGN/PERFORMANCE REQUIREMENTS**

20 Distributed Digital Lighting Controls shall accommodate the square-footage coverage requirements for each  
21 area controlled utilizing digital load controllers, digital occupancy/vacancy sensors, digital daylighting  
22 sensors, digital switches, digital lighting control panels, and accessories that suit the required lighting and  
23 electrical system parameters.

24  
25 System shall conform to requirements of NFPA 70.

26  
27 System shall comply with FCC emission standards specified in part 15, sub-part J for commercial and  
28 residential application.

29  
30 System shall be listed under UL sections 916 and/or 508.

31  
32 **QUALITY ASSURANCE**

33 Installer Qualifications: Company certified by the manufacturer and specializing in installation of Distributed  
34 Digital Lighting Control products with minimum three years documented experience.

35  
36 **SUBMITTALS**

37 **Shop Drawings:**

38 Shop drawings shall include the following:

- 39 • Product Datasheets (general device descriptions, dimensions, electrical specifications, wiring  
40 details, nomenclature)
- 41 • All manufacturers shall submit to the specifying engineer a line-by-line compliance comparison  
42 between each specifications requirement and the system being proposed. Any ambiguities in the  
43 drawings or specifications shall be brought to the attention of the specifying engineer for  
44 clarification.
- 45 • Riser Diagrams – typical per room type (detailed drawings showing interconnectivity of devices)
- 46 • Other Diagrams – as needed for special operation or interaction with other system(s)
- 47 • Example Contractor Startup/Commissioning Worksheet – must be completed prior to factory start-  
48 up
- 49 • Hardware and Software Operation Manuals
- 50 • Other operational descriptions as needed

51  
52 Occupancy Sensor Shop Drawings

- 53 • Symbols on drawings are diagrammatic and represent design intent only. Provide manufacturer-  
54 recommended layout drawings showing quantity and location of sensors, and associated wiring  
55 diagrams.

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**Closeout Submittals:**

- Project Record Documents: Record actual installed locations **and settings for each** lighting control device and show interconnecting wiring.
  
- Operation and Maintenance Manual:
  - Include approved Shop Drawings and Product Data.
  - Include Sequence of Operation, identifying operation for each room or space.
  - Include manufacturer's maintenance information.
  - Operation and Maintenance Data: Include detailed information on device programming and setup.
  - Include startup and test reports.

**OPERATION AND MAINTENANCE DATA**

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

**EXTRA MATERIALS**

Provide the following spare materials:

- One (1) ON/OFF Load Controller with three relays
- One (1) ON/OFF/Dimming Load Controller with three relays
- One (1) of each type of motion sensor used
- One (1) two-button digital wall switch
- One (1) four-button digital wall switch

**PART 2 - PRODUCTS**

**SYSTEM REQUIREMENTS**

Lighting control zones shall consist of one or more intelligent lighting control components (digital load controllers), be capable of stand-alone operation, and be capable of being connected to a higher-level network backbone.

Network Characteristics

- In-Room Network:
  - The In-Room network shall be a free topology lighting control network using physical wiring connections and communication protocol designed to control a room/space/small area of a building.
  - Digital room devices connect to the In-Room network, which provides both communications and power to room devices.

Individual lighting zones must continue to provide a user defined default level of lighting control in the event of a system communication failure with the Global Network or the management software becoming unavailable.

All switching and dimming for a specific lighting zone shall take place within the devices located in the zone itself (i.e. not in remotely located devices such as panels) to facilitate system robustness and minimize wiring requirements. Specific applications that require centralized or remote switching shall be capable of being accommodated.

System shall be capable of using a web-based software management program that enables remote system control, status monitoring, and creation of lighting control schedules and profiles.

**DIGITAL LOAD CONTROLLERS (Room Controllers)**

**General**

1 Digital load controllers shall be simple to install and shall not have dip switches or potentiometers, or require  
2 special configuration.

3  
4 The controllers shall include the following features:

- 5 • Standard junction box mounting.
- 6 • Low voltage connection using standard RJ-45 connectors and CAT5e cable. Other wiring  
7 topologies are acceptable if controls accomplish all requirements specified in these documents.
- 8 • Each connected load shall be capable of any of the following behaviors: Manual ON, Automatic  
9 ON, Automatic ON to 50 percent, or Automatic ON to Preset level or last level set.
- 10 • UL 2043 plenum rated.
- 11 • Manual override and LED indication for each load.
- 12 • Power supply to power the digital load controller itself and the peripheral sensors and controls  
13 connected to the In-Room Network.
- 14 • Dual voltage (120/277 VAC, 60 Hz), rated for 20A total load, derating to 16A required for some  
15 dimmed loads (forward phase dimming).
- 16 • Zero cross circuitry for each load.
- 17 • All digital parameter data programmed into an individual room controller or plug load controller  
18 shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an  
19 expected life of no less than 10 years.

#### 20 21 **ON/OFF Load Controllers**

22 Controllers shall include the following:

- 23 • Multiple relay configurations per unit.

#### 24 25 **ON/OFF/Dimming Load Controllers**

26 Controllers shall include the following:

- 27 • Multiple relay configurations per unit.
- 28 • Each dimming output channel shall have an independently configurable minimum and maximum  
29 calibration trim level to set the dimming range to match the true dynamic range of the connected  
30 LED driver.
- 31 • One dimming output per relay.
  - 32 ○ 0-10V Dimming: Where indicated, one 0-10 volt analog output per relay for control of  
33 compatible LED drivers. The 0-10 volt output shall automatically close upon loss of  
34 power to the Controller to assure full light output from the controlled lighting.
  - 35 ○ Line Voltage, Forward Phase Dimming: Where indicated, one forward phase control line  
36 voltage dimming output per relay for control of compatible LED drivers, forward phase  
37 compatible ELV, and incandescent loads.
- 38 • Each load shall have an independently configurable preset ON level for Normal Hours and After  
39 Hours events to allow different dimmed levels to be established at the start of both Normal Hours  
40 and After Hours events.

#### 41 42 **DIGITAL MOTION SENSORS**

##### 43 **General**

44 Sensors shall be available in wall, ceiling, corner-mounted, or wall-switch configurations.

45  
46 Sensors shall use either passive infrared (PIR) sensing, or if dual technology, passive infrared and passive  
47 acoustic or passive infrared and ultrasonic sensing for detecting room occupancy.

48  
49 Sensors shall be able to function together with other sensors in order to provide expanded coverage areas.

##### 50 51 **Features**

52 Sensors shall be provided with the following features:

- 53 • Sensitivity Adjustment, Time Delay, Detection Technology, and Walk-Through Mode.
- 54 • Dual-Technology Sensors shall have independent configurable trigger modes to choose proper  
55 technology according to space use to eliminate false-triggers.

- 1       • Each sensor may be programmed to control specific loads within an In-Room network.  
2       • Each sensor shall allow remote programming through a handheld commissioning tool via a two-  
3 way infrared (IR) transceiver or by configuration through a local network device.  
4

5       **Digital Wall Switch Motion Sensors**

6       Digital wall switch motion sensors shall be provided with the following features:

- 7       • Shall not allow current to pass to the load when sensor is in the unoccupied (Off) condition.  
8       • One- or two-button switches for one or two switch-legs.  
9       • Optional daylight sensor feature for daylighting override.  
10

11  
12       **DIGITAL MANUAL CONTROLS**

13       **Wall Switches**

14       Low voltage dimming and momentary pushbutton switches in 1, 2, 3, 4, 5, and 8 Button configurations.  
15

16       Wall switches shall include the following features:

- 17       • Buttons may be programmed as Load or Scene Buttons.  
18       • Buttons may be programmed as ON/OFF, ON only, or OFF only.  
19       • Switch buttons may be bound to any load on a room controller and are not load type dependent.  
20

21       **Dimmer Switches**

- 22       • Raise/lower dimming adjustment controls.  
23       • Dimmer switches shall include multiple LEDs to indicate load levels.  
24       • Dimmer switches shall be able to be ganged with multi-button switches under the same wallplate.  
25       • Three-way and 4-way switch locations are supported for ON/OFF or Dimming control.  
26

27       **Digital Scene Switches**

- 28       • Scene switches allow for Preset Scene recall and dimming override control.  
29

30       **Touch Panel Controls**

31       Touch Panel Controls are allowed, but not required. Touch Panel Controls are used for adjusting lighting and  
32 to set up and control preset lighting scenes in the associated room/space.  
33

34       Touch panel controls shall be provided with the following features:

- 35       • Full-color multi-touch capacitive touchscreen for controlling lighting and system components  
36       • Control up to 16 dynamic lighting zones/scenes per touch screen or acting as up to 16  
37       ON/OFF/DIM control switches  
38       • Lighting zones/scenes can be comprised of lighting intensity, color, color temperature, and  
39       luminaire position  
40       • Modify color and color temperature using a digital color palette and UV rating scale  
41       • Proximity screen sensor for auto “wake-up”  
42       • Auto dimming and user adjustable backlight  
43       • Device shall enable configuration of all switches, dimmers, and lighting preset scenes via password  
44       protected setup screens. User programmable screen lock limiting access to all feature controls and  
45       programming  
46       • Full alpha-numeric scene and zone naming  
47       • Configurable interface to reflect project requirements  
48       • Lighting zones/scenes support control of forward/reverse phase dimming, 0-10V, RGB, tunable  
49       white, and moving fixtures  
50       • Integral astronomical time clock enables lighting scenes  
51       • Partition status control and visualization  
52       • Direct DMX control  
53       • Digital motion sensor control  
54       • Digital daylight harvesting response

- Shall have the ability to control connected load through time schedules.
- RS-232/contact closure capable for 3rd party integration
- Local wireless Bluetooth connectivity with mobile app
- Device shall have a micro-USB style connector for local computer connectivity.
- Remote-mounted power supply

## **DIGITAL LED LUMINAIRES**

Digital LED Luminaires are luminaires with embedded controls (a.k.a. “enabled” luminaires). Luminaires with embedded controls are not allowed.

## **DIGITAL AUXILIARY INPUT/OUTPUT (I/O) INTERFACE MODULES**

### **General**

- Operate on Class 2 power supplied by In-Room network.
- Status LEDs indicate if input is energized.
- UL 2043 plenum rated where required.

### **Switched Contact Closure Interface**

- Utilized for automatic control via input from other sources such as switches, relay-based system, BAS, etc.
- Includes 24VDC output and input terminals for momentary or maintained third party contact closure inputs.
- Utilize input module for an Auto ON and Sweep OFF function input from other sources for the controlled area. During normal hours of operation, all local low-voltage devices are fully operational. During after hours, a timer shall be applied to all low-voltage switches or dimmers so that the room will automatically sweep off every two hours following switch activation. Provide a blink warning to alert occupants of impending OFF.
- Specific I/O devices shall have a dimming control output that can control 0-10 VDC dimmable ballasts or LED drivers by sinking up to 20 mA of current.
- Specific I/O devices shall have an input that reads a 0-10 VDC signal from an external device.
- Specific I/O devices shall have a switch input that can interface with either a maintained or momentary switch and run a switch event (e.g. toggle the lighting load) or run a local/remote control profile.
- Specific I/O devices shall sense state of low-voltage outdoor photocells.
- Specific I/O devices shall sense momentary and maintained contact closures, and either toggle a connected load after a momentary contact or ramp the load high/low during a maintained contact (stopping when the contact releases).

### **Serial Data Interface**

- Utilized for control from A/V system to send ON/OFF/Preset commands to In-Room Network.
- Includes 24VDC output and 10 pin RS232 connection.
- Coordinate programming with the Distributed Digital Lighting Control System manufacturer’s technician and the A/V system technician for successful interface between both systems.

## **DIGITAL LIGHTING CONTROL PANELS (RELAY and DIMMING PANELS)**

### **General**

It is the intent of this paragraph to provide a Digital Lighting Control Panel as part of an integrated lighting control system. Contractor is responsible for confirming that the panels and associated peripheral devices such as sensors and manual controls interoperate as a single system.

Digital Lighting Control Panels shall be incorporated into the lighting control system Global Network where used.

Provide lighting control panels in the locations and capacities as indicated on the plans and schedules. Each panel shall be of modular construction and consist of the following components:

- The panel cover shall have a hinged and lockable door with restricted access to line voltage section

- 1 of the panel.
- 2 • The interior construction shall provide total isolation of line voltage (Class 1) wiring from low
  - 3 voltage (Class 2) wiring within the assembled panel.
  - 4 • Direct wired switch inputs associated with each relay shall support two-wire, momentary or
  - 5 maintained contact switches.
  - 6 • Digital inputs shall support digital switches, digital I/O modules capable of receiving 0-5V or 0-
  - 7 10V analog photocell inputs, digital I/O modules capable of receiving momentary or maintained
  - 8 contact closure inputs, digital photocell modules, and digital occupancy sensors.
  - 9 • Power supply shall be a multi-voltage transformer assembly with rated power to supply all
  - 10 electronics, occupancy sensors, switches, pilot lights, and photocells associated with the lighting
  - 11 control panel as necessary to meet the project requirements.

12

13 **Relays**

14 Relays shall provide the following ratings and features:

- 15 • Panel shall provide one 0-10VDC dimming output paired with each relay.
- 16 • Each relay shall contain an LED status light and an override pushbutton. True relay state shall be
- 17 indicated by the on-board LED and shall be available to external control devices and systems via
- 18 BACnet. Isolated low voltage contacts provide for true relay status feedback and pilot light
- 19 indication.
- 20 • Relays shall be individually replaceable in a modular plug-in design.
- 21 • Relays shall be single-phase normally-closed latching type relays capable of switching 120/277
- 22 VAC or two-phase relays capable of switching 208/240/480 VAC loads.
- 23 • Relays shall be rated to switch up to a 30A ballast load at 277 VAC.
- 24 • Tested to 300,000 mechanical on/off cycles.
- 25 • Relay operation shall be automatically sequenced to reduce impact on the electrical distribution
- 26 system when large loads are controlled simultaneously.

27

28 **Digital Network Clock**

- 29 • Each panel shall include a digital clock capable to issue system wide automation commands.
- 30 • The clock module shall provide astronomic capabilities, time delays, blink warning, daylight
- 31 savings, and holiday functions and shall include battery backup for the clock function and for
- 32 program retention. The clock capability of each panel shall employ non-volatile memory and shall
- 33 retain user programming and time for a minimum of 10 years.
- 34 • The clock capability of each panel shall operate on a basis of ON/OFF or Normal Hours/After
- 35 Hours to automation groups that implement pre-configured control scenarios. Scenarios shall
- 36 include:
  - 37 ○ Scheduled ON / OFF
  - 38 ○ Manual ON / Scheduled OFF
  - 39 ○ Astro ON / OFF (or Photo ON / OFF)
  - 40 ○ Astro and Schedule ON / OFF (or Photo and Schedule ON / OFF)
- 41 • Schedules programmed into the clock of any one panel shall be capable of executing local
- 42 schedules or Dark/Light (photocell or Astro) events for that panel in the event that global network
- 43 communication is lost.

44

45 **CONFIGURATION TOOLS**

46 A configuration tool facilitates optional customization of In-Room networks.

- 47 • Provide two Configuration Tools for the project.
- 48 • Provide free, downloadable PC software for direct programming of In-Room Networks.

49

50 Features and functionality of the wireless configuration tool shall include but not be limited to:

- 51 • Optional customization of In-Room networks using two-way wireless communications or USB
- 52 interface.
- 53 • Must be able to read and modify parameters for room controllers, occupancy sensors, wall
- 54 switches, daylighting sensors, network bridges and relay panels, and identify room devices by type
- 55 and serial number.

- Adjust or fine-tune daylighting settings established during auto-configuration, and input light level data to complete configuration of open loop daylighting controls.

## **NETWORK CABLES**

### **In-Room Networks**

This specification is based on CAT5e data cables for In-Room Networks. Other wiring topologies are acceptable if controls accomplish all requirements specified in these documents.

Use manufacturer's factory-tested Cat 5e cable with pre-terminated RJ-45 connectors for In-Room Networks. If manufacturer's cables are not used, each field-terminated cable shall be tested prior to installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.

UL 2043 plenum rated where required.

### **BAS Integration**

Provide capabilities for integration with a Building Automation System (BAS) via BACnet protocol. At a minimum, the following points shall be available to the BAS via BACnet IP connection to the Global Management Controller: Room occupancy state; Room schedule mode; Room switch lock control; Individual occupancy sensor state; Load ON/OFF state; Load dimming level; Panel relay state; and Global Management Controller Group schedule state.

### **Management Software**

Every device parameter (e.g. sensor time delay and photocell setpoint) shall be available and configurable remotely from the software.

Software shall require all users to log in with a User Name and Password.

Software shall provide at least three permission levels for users.

All sensitive stored information and privileged communication by the software shall be encrypted.

All device firmware and system software updates must be available for automatic download and installation via the internet.

Software shall be capable of managing systems interconnected via a WAN (wide area network).]

## **PART 3 - EXECUTION**

### **DELIVERY, STORAGE, AND HANDLING**

Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

### **PROJECT CONDITIONS**

Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer. Do not install products under environmental conditions outside manufacturer's absolute limits.

Do not install equipment until following conditions can be maintained in spaces to receive equipment:

Ambient temperature: 32 to 104 degrees F (0 to 40 degrees C).

Relative humidity: Maximum 90 percent, non-condensing.

### **SENSOR LAYOUTS**

Confirm quantity and provide appropriate coverage by sensors on a per-space requirement. Symbols on drawings are diagrammatic and represent design intent only.

Occupancy sensors shall be installed at locations indicated on the manufacturer's submittal layout drawings. Sensors shall be located to prevent false triggering of the lights to ON when no occupant is present.



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**AUXILIARY CONTACTS for HVAC INTERLOCK**

Provide auxiliary dry contacts for HVAC/BAS interlock via Digital Auxiliary Input/Output (I/O) Interface Modules when required. Refer to the “Occ Sensor Interlock” column in the Air Terminal Schedule on the HVAC drawings.

The occupancy sensors, room controllers, and auxiliary contacts shall be configured such that the sensors still detect occupancy and control the auxiliary contacts regardless of whether the lights are ON or OFF (e.g. the occupant has turned the lights OFF because there is enough daylight, but the occupant is still occupying the space, so the occupancy sensor senses the occupant and closes the auxiliary contacts for Air Terminal control).

The HVAC/BAS wiring to the auxiliary contacts shall be by the Division 23 contractor.

**INSTALLATION**

Install system in accordance with the approved system shop drawings and manufacturer's instructions.

Install all room/space devices using manufacturer's factory-tested Cat 5e cable with pre-terminated RJ-45 connectors.

If pre-terminated cable is not used for room/space wiring, each field-terminated cable shall be tested following installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.

Install all room-to-room digital devices using manufacturer-supplied network wire. Network wire substitution is not permitted and may result in loss of product warranty.

Low-voltage wiring topology must comply with manufacturer's specifications.

Document final wiring locations, routing, and topology on as-built drawings.

All line-voltage connections shall be tagged to indicate circuit and switched legs.

Test all devices to ensure proper communication.

Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings.

Adjust time delay so that controlled area remains lighted while occupied.

Provide written or computer-generated documentation on the configuration of the system including room-by-room description including:

- Sensor parameters, time delays, sensitivities, and daylighting setpoints.
- Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
- Load Parameters (e.g. blink warning, etc.)

Tighten all panel Class I conductors at circuit breakers and at loads to torque ratings as marked on enclosure UL label.

All Class II cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class I conductors shall enter a low-voltage area.

Run separate neutrals for any phase dimmed branch load circuit. Different types of dimmed loads shall have separate neutrals.

Verify all loads to be free from short circuits prior to connection to room controllers.

Control-voltage cables shall be installed in conduit. However, they may be installed free-air (without conduit)

1 above accessible ceilings if the cable meets NEC requirements for the application, unless specified to be in  
2 conduit in other sections of the specifications. See requirements for free-air cable installation below.

3  
4 Control cables for controlling HVAC and lighting equipment connected to emergency power shall be routed  
5 in raceways separate from each other.

### 6 7 **FREE-AIR CABLE INSTALLATION**

8 Cabling shall be neatly run at right angles and be kept clear of other trades work.

9  
10 Cabling shall be supported at a maximum of 4-foot intervals utilizing “J-Hook” or “Bridal Ring” supports  
11 anchored to ceiling concrete, piping supports or structural steel beams. If cable sag at mid-span exceeds 12-  
12 inches, another support shall be provided. Cable supports shall be installed to maintain cable bend to larger  
13 than the minimum bend radius.

14  
15 Cabling shall not be attached to or supported by existing cabling, plumbing or steam piping, ductwork,  
16 suspended ceiling supports or electrical or communications conduit. Do not place cable directly on the ceiling  
17 grid or attach cable in any manner to the ceiling grid wires.

18  
19 To reduce or eliminate Electro-Magnetic Interference (EMI), the following minimum separation distances  
20 for ‘Free-Air’ cabling installations shall be adhered to:

- 21  
22 • Twelve (12) inches from power lines of less than 5kV.  
23 • Thirty-nine (39) inches from power lines of 5kV or greater.  
24 • Five (5) inches from lighting fixtures.  
25 • Thirty-nine (39) inches from transformers and motors.

26  
27 A coil of 4 feet in each cable shall be placed in the ceiling at each ‘free-air’ wired device. These  
28 coils shall be secured (wire tied) at the last cable support before the cable reaches the device and shall be  
29 coiled from 100% to 200% of the cable recommended minimum bend radius.

30  
31 All cable shall be free of tension at both ends. Nylon strain relief connectors shall be provided at  
32 each device and junction box where cables enter. In cases where the cable must bear some stress, Kellum  
33 type grips may be used to spread the strain over a longer length of cable.

34  
35 Cable manufacturers minimum bend radius shall be observed in all instances. Care should be taken  
36 in the use of cable ties to secure and anchor the station cabling. Ties should not be over tightened as to  
37 compress the cable jacket. No sharp burrs should remain where excess length of the cable tie has been cut.

38  
39 All exposed vertical cable extensions to devices located below the finished ceiling shall be in  
40 conduit.

41  
42 Use suitable cable fittings and connectors.

43  
44 When permitted in exposed ceiling areas as designated on the plan drawings, Free-Air wiring runs shall avoid  
45 areas of high traffic (i.e. aisle way), shall be run as close as possible to outlining walls and shall be a minimum  
46 of ten (10) feet above finished floor. Provide protection for exposed cables where subject to damage.

### 47 48 **FIELD QUALITY CONTROL**

49 Electrician/Low Voltage Technician: Any low voltage wiring made onsite by electrical or low voltage  
50 contractor must be verified end to end with industry standard test equipment capable of printing or producing  
51 a digital file of the testing results.

52  
53 Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components,  
54 assemblies, and equipment installations, including connections, and to assist in testing. Notify Manufacturer  
55 in writing a minimum of three (3) weeks prior to system start-up and testing.

1 Tests and Inspections: Manufacturer's service representative or electrical/low-voltage contractor installing  
2 low voltage cabling that is not pre-terminated from the manufacturer shall perform the following inspections  
3 and prepare reports:  
4

5 Tests and Inspections: Manufacturer's service representative shall perform the following inspections and  
6 prepare reports:

- 7 • Verify end-to-end testing of all low voltage wiring that is not pre-terminated from the  
8 manufacturer. Provide detailed results via paper or digital format downloadable from testing  
9 equipment.
- 10 • Verify Class I and II wiring connections by validating system performance.
- 11 • Set IP addresses and other network settings of system front-end hardware per facility's IT.  
12 instructions.
- 13 • Verify/complete task programming for all switches, dimmers, time clocks, and sensors.
- 14 • Verify that the control of each space complies with the Lighting Sequence of Operation.
- 15 • Correct any system issues and retest.

16  
17 Provide a report in table format with drawings, or using a software file that can be opened in the  
18 manufacturer's system software including each room or space that has lighting control installed. Indicate the  
19 following:

- 20 • Date of test or inspection.
- 21 • Loads per space.
- 22 • Fixture Address identification.
- 23 • Quantity and Type of each device installed.
- 24 • Reports providing each device's settings.

## 25 26 27 **SEQUENCE of OPERATION**

28 See plans for Sequence of Operation descriptions.  
29

## 30 **POST START-UP TUNING**

31 Adjust sensor time delays and sensitivities to meet the Owner's requirements 30 days from initial occupancy.  
32 Provide a detailed report to the Architect/Owner of post start-up activity.  
33

## 34 **WARRANTY**

35 Manufacturer shall provide a 5-year limited warranty on products within this installation, except where  
36 otherwise noted, and consisting of a one-for-one device replacement.  
37

## 38 **PRODUCT SUPPORT AND SERVICE**

39 Factory telephone support shall be available at no cost to the Owner following acceptance. Factory assistance  
40 shall consist of assistance in solving application issues pertaining to the control equipment.  
41

## 42 **CONSTRUCTION VERIFICATION ITEMS**

43 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
44 Section 26 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
45 or 01 91 02.  
46

## 47 **AGENCY TRAINING**

48 All training provided for agency shall comply with the format, general content requirements and submission  
49 guidelines specified under Section 01 91 01 or 01 91 02.  
50

51 The Contractor, through their supplier, shall provide training on the system operation for the owner as part  
52 of this contract. The training shall consist of one(1) two-hour session.  
53  
54

55 **END OF SECTION**





1 **General:** Heavy duty use toggle switch, rated 20 amperes and 120/277 volts AC. Switches shall be UL20  
2 Listed and meet Federal Specification WS-896. All switches shall be heavy duty Specification Grade.

3  
4 Handle: White, made of nylon or high impact resistant material.

5  
6 All switches on emergency circuits shall have a red handle with matching red cover plate.

7  
8 **Wall Switches for Lighting Circuits and Motor Loads Under 1/2 HP:** All switches shall be back and  
9 side wired, screw clamp type, suitable for solid or stranded wire up to #10 AWG, with separate green  
10 ground screw. Switches shall be as follows:

11       Hubbell 1221\*,  
12       Leviton 1221-S\*,  
13       Pass & Seymour CSB20AC1-\*,  
14       or approved equal. (\* indicates color selection).

15  
16 **Modular Wall Switches for Lighting Circuits and Motor Loads Under 1/2 HP:** Switches shall be as  
17 follows:

18       Hubbell SNAP1221\*NA,  
19       Leviton M1221-\*,  
20       Pass & Seymour PT20AC1-\*,  
21       or approved equal. (\* indicates color selection).

## 22 23 **RECEPTACLES**

24 **General Requirements:** NEMA Type 5-20R, white, nylon or high impact resistant face. Receptacles shall  
25 be UL498 Listed and meet Federal Specification WC-596. All duplex receptacles shall be heavy duty  
26 Specification Grade, 20 amp rated.

27  
28 Generally, all receptacles shall be duplex convenience type unless otherwise noted.

29  
30 All receptacles on emergency circuits shall have a red face with matching red cover plate.

31  
32 All receptacles designated as isolated ground shall have an isolated ground triangle imprint on the face of  
33 the receptacle.

34  
35 All receptacles installed in bathrooms, kitchens, and within 6 feet of the outside edge of sinks shall be  
36 GFCI type.

37  
38 All receptacles installed in outdoor locations, garages, rooftops, and in other damp or wet locations shall be  
39 GFCI type with a weather-resistant (WR) rating.

40  
41 **Convenience and Straight-blade Receptacles:** All receptacles shall be back and side wired, screw clamp  
42 type, suitable for solid or stranded wire up to #10 AWG, with a separate green ground screw. Receptacles  
43 shall be as follows:

44       Hubbell 5362\*,  
45       Leviton 5362-\*,  
46       Pass & Seymour PS5362\*,  
47       or approved equal. (\* indicates color selection).

48  
49 **GFCI Receptacles:** Duplex convenience receptacle with integral ground fault current interrupter meeting  
50 the requirements of UL standard 943 Class A, including self-test functionality and reverse line-load misfire  
51 function repeatability. GFCI receptacles shall be as follows:

52       Hubbell GFR5362SG\*,  
53       Leviton GFNT2-\*,  
54       Pass & Seymour 2097\*,  
55       or approved equal. (\* indicates color selection).

1 **GFCI Receptacles with a weather-resistant (WR) rating:** Weather-Resistant duplex convenience  
2 receptacle with integral ground fault current interrupter meeting the requirements of UL standard 943  
3 Class-A, including self-test functionality and reverse line-load misfire function repeatability. WR GFCI  
4 receptacles shall be as follows:

5       Hubbell GFR5362SG\*,  
6       Leviton GFWR2-\*,  
7       Pass & Seymour 2097TRWR\*,  
8       or approved equal. (\* indicates color selection).  
9

10 **USB Charger and Duplex Tamper-Resistant Receptacles:** Do not use combination duplex receptacles  
11 with USB chargers. Use duplex receptacles as required for the application and as specified herein. Use  
12 separate 4-port USB charging devices.  
13

14 **USB Charging Devices:** Single-gang 4-port USB charging station. USB ports shall meet UL94 for 5V  
15 flammability rating, and shall comply with battery charging specification USB BC1.2. USB ports shall be  
16 compatible with USB 1.1/2.0/3.0 devices, including Apple products. USB ports shall be rated 5VDC, 4.2A  
17 minimum. Devices shall be as follows:

18       Hubbell USB4\*,  
19       Leviton USB4P-\*,  
20       Pass & Seymour TM8USB4\*CC6,  
21       or approved equal. (\* indicates color selection).  
22

23 **Locking-Blade Receptacles:** As indicated on drawings.  
24

25 **Specific-use Receptacle Configuration:** As indicated on drawings.  
26

27 **Modular Convenience and Straight-blade Receptacles:** Receptacles shall be as follows:

28       Hubbell SNAP5362\*A,  
29       Leviton M5362-\*,  
30       Pass & Seymour PT5362\*,  
31       or approved equal. (\* indicates color selection).  
32

33 **Modular GFCI Receptacles:** Duplex convenience receptacle with integral ground fault current interrupter  
34 meeting the requirements of UL standard 943 Class A, including self-test functionality and reverse line-  
35 load misfire function repeatability. GFCI receptacles shall be as follows:

36       Hubbell GFRST83SNAP\*,  
37       Leviton MGFN2-\*,  
38       Pass & Seymour PT2097\*,  
39       or approved equal. (\* indicates color selection).  
40

41 **Modular GFCI Receptacles with a weather-resistant (WR) rating:** Use back and side wired devices in  
42 lieu of modular weather-resistant rated GFCI receptacles.  
43

#### 44 **EMERGENCY LIGHTING CONTROL UNITS**

45 **General Requirements:** Emergency Lighting Control Units (ELCUs) shall automatically illuminate  
46 connected emergency lighting upon utility power interruption, regardless of room switch position or  
47 occupancy sensor state.  
48

49 The ELCU shall be UL 924 listed.  
50

51 Warranty shall be 5 year replacement warranty.  
52

53 Local room switch or lighting control shall turn both normal and emergency luminaires ON at the same  
54 time (no dedicated emergency room switch required).  
55

56 The ELCU shall have a minimum load rating of 20 Amps at 120V or 277V, 1800W Tungsten at 120V,

1 1500W Tungsten at 277V, 1 HP, or general use 20 Amp circuits.

2  
3 The ELCU shall accept 120V or 277V, 60Hz Input & Output (voltage tolerance +/- 15%).

4  
5 The ELCU shall include emergency power and normal power indicator LEDs, and a manual test switch.

6  
7 The ELCU shall accept separate phases on the constant hot and switched hot inputs.

8  
9 The ELCU shall include high voltage input surge protection up to 50,000V.

10  
11 Load contacts shall be able to withstand 10 direct shorts while connected to a 20 Amp breaker without  
12 permanent damage.

13  
14 The ELCU shall not generate any objectionable electrical or mechanical noise.

15  
16 The ELCU shall have UL 94-VO or UL 94-5VA flame rating and be approved for installation above the  
17 suspended ceiling.

18  
19 **Dimming Applications:** The ELCU shall automatically illuminate connected emergency lighting to full  
20 brightness upon utility power interruption, regardless of dimmer or switch position or occupancy sensor  
21 state.

22  
23 The ELCU shall be compatible with 2-wire, 3-wire, 0-10V, and DALI dimming systems and ballasts.

24  
25 The same local room switch, dimmer, or lighting control shall dim both normal and emergency luminaires  
26 at the same level during normal operation.

## 27 28 **WALL DIMMERS**

29 General:

- 30 1. Compatible with the voltage of the circuit being controlled: 120V or 277V;
- 31 2. Compatible with the load being dimmed;
- 32 3. Linear full-range slide control;
- 33 4. Separate ON/OFF switch: single-pole, 3-way, or multiple-location operation as indicated on the  
34 drawings;
- 35 5. No derating required in multi-gang applications;
- 36 6. Polycarbonate construction;
- 37 7. Color to match receptacles and/or standard toggle switches.

38  
39 Line-voltage LED Dimmer:

- 40 1. Forward or reverse phase dimming control as required for the application;

41  
42 0-10 V Dimmers:

- 43 1. Ratings: 30 mA sink current;
- 44 2. Adjustable dial allows users to trim the low-end dimming range;

## 45 46 **DEVICE PLATES AND BOX COVERS**

47 **Decorative Cover Plate:** White, smooth thermoplastic nylon. Note requirement for red plates on  
48 emergency outlets and switches.

49  
50 **Weatherproof Cover:** All receptacles installed in wet locations shall have an enclosure that is  
51 weatherproof whether or not the attachment plug is inserted. Covers shall be gasketed metal with hinged  
52 "in-use" device covers, powder coat painted. Non-metallic covers are not allowed. Covers shall be latching  
53 type and shall be lockable. Covers shall be identified as "extra-duty" type per NEC 406.9(B)(1).

54  
55 **Damp Location Cover:** All receptacles installed outdoors in a location protected from the weather or in  
56 other damp locations shall have an enclosure that is weatherproof when the receptacle is covered



1 (attachment plug not inserted and receptacle covers closed). Covers shall be gasketed metal with hinged  
2 device covers, powder coat painted. Non-metallic covers are not allowed.

3  
4 **Surface Cover Plate:** Raised galvanized steel.

5  
6  
7 **PART 3 - EXECUTION**

8  
9 **INSTALLATION**

10 See plans for device mounting heights.

11  
12 Install wall switches with OFF position down.

13  
14 Wall dimmers: de-rate ganged dimmers as instructed by manufacturer; do not use common neutral.

15  
16 Install convenience receptacles with grounding pole on bottom.

17  
18 Install box for information outlet at the same height as adjacent convenience receptacles. Locate boxes for  
19 information outlet as close as practical to duplex power outlet, approximately 2-inches apart.

20  
21 Install box for telephone jack for wall telephone at 46-inches to center above finished floor.

22  
23 Install specific-use receptacles at heights shown on Contract Drawings.

24 Install decorative plates on switch, receptacle, and blank outlets in finished areas.

25  
26 Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible  
27 ceilings, and on surface-mounted outlets.

28  
29 Install devices and wall plates flush and level.

30  
31 Receptacles shall have a bonding conductor from grounding terminal to the metal conduit system. Self-  
32 grounding receptacles using mounting screws as bonding means are not approved.

33  
34 **FIELD QUALITY CONTROL**

35 Inspect each wiring device for defects.

36  
37 Operate each wall switch and sensor with circuit energized, and verify proper operation.

38  
39 Verify operation of each ELCU by turning off the normal power circuit breaker at the panelboard.

40  
41 Verify that each receptacle device is energized.

42  
43 Test each receptacle device for proper polarity.

44  
45 Test each GFCI receptacle device for proper operation.

46  
47 The user agency and UW personnel reserve the right to be present at all tests.

48  
49 **ELCU WIRING**

50 For lights on emergency power *without* an emergency lighting control unit (ELCU), use the *emergency*  
51 circuit to energize the Digital Load Controller. Route the emergency circuit through the Load Controller's  
52 relay to the light fixtures. Route any non-emergency circuits controlled by the same Load Controller  
53 through separate auxiliary relays (Digital Auxiliary I/O Interface Modules).

54  
55 For lights on emergency power *with* an ELCU, route the *normal* power through the Load Controller relay  
56 to the ELCU, then to the normal power lighting fixtures. Connect the emergency circuit to the ELCU's

1 emergency power terminals, then to the emergency lighting fixtures. The ELCU will control the emergency  
2 lighting along with the normal lighting controls, but will turn the emergency lights ON in a power outage,  
3 regardless of the position of the Load Controller relays (ON or OFF).

4

5 **ADJUSTING**

6 Adjust devices and wall plates to be flush and level.

7

8 Mark all conductors with the panel and circuit number serving the device with a machine generated label,  
9 at the device, and on the back of the device cover.

10

11

END OF SECTION

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**SECTION 26 27 28**  
**DISCONNECT SWITCHES**

**PART 1 - GENERAL**

**SCOPE**

The work under this section includes disconnect switches, fuses and enclosures. Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- References
- Submittals
- Operation and Maintenance Data
- General

**PART 2 - PRODUCTS**

- Disconnect Switches
- Fuses

**PART 3 - EXECUTION**

- Installation
- Construction Verification Items

**RELATED WORK**

Applicable provisions of Division 1 govern work under this Section.

Section 26 08 00 - Commissioning of Electrical  
Section 01 91 01 or 01 91 02 – Commissioning Process

**REFERENCES**

NECA (National Electrical Contractors Association) "Standard of Installation"  
NEMA ICS 2 – Industrial Control Devices, Controllers, and Assemblies  
NEMA KS 1 – Enclosed Switches  
UL 50 – Enclosures for Electrical Equipment  
UL 98 – Enclosed and Dead-front Switches

**SUBMITTALS**

Include outline drawings with dimensions, and equipment ratings for voltage, ampacity, horsepower, and short circuit.

**OPERATION AND MAINTENANCE DATA**

All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

**GENERAL**

Provide disconnect switches for loads required by code. Review HVAC and Plumbing specifications to determine what equipment is furnished with disconnect switches. Install disconnect switches whether furnished under this contract or not. It is the Electrical Contractors responsibility to determine the need for a disconnect switch for each load. The contractors shall include in their bid the code required disconnect switches whether indicated on the drawings or not.

**PART 2 - PRODUCTS**

**DISCONNECT SWITCHES**

Fusible Switch Assemblies: NEMA Type Heavy Duty; quick-make, quick-break, load interrupter, enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: designed to accommodate Class R, Class J or Class CC (motors) cartridge type fuses.

1 Nonfusible Switch Assemblies: NEMA Type Heavy Duty; quick-make, quick-break, load interrupter,  
2 enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch  
3 in ON position. Handle lockable in OFF position.  
4

5 Enclosure:

6 Indoor: NEMA 1 code gauge steel with rust inhibiting primer and baked enamel finish.  
7

8 Outdoors: NEMA 3R code gauge zinc coated steel with baked enamel finish. or NEMA 4X, 304  
9 stainless steel with brushed finish, when indicated on drawings.  
10

11 Corrosive Areas, Kitchen/Food service areas, Therapeutic/Pool spaces and Interior Damp/Wet locations:  
12 NEMA 4X, 304 stainless steel with brushed finish.

13 Provide manufacturer's equipment ground kit in all disconnect switches.  
14

15 In applications where the switch serves as the service entrance disconnect, provide service ground kit, label  
16 as service disconnect and provide UL listing for service disconnect.  
17

### 18 FUSES

19 Fuses 600 Amperes and Less: Dual element, time delay, 250 or 600 volt, UL Class J. Interrupting Rating:  
20 200,000 rms amperes.  
21

22 Fuses 601 Amperes and Larger: Low Peak, time delay, 600 volt, UL Class L. Interrupting Rating: 200,000  
23 rms amperes.  
24

25 Fuses 30 Amperes and less: Time-Delay, 600 volt, UL Class CC. Interrupting rating: 200,000 rms amperes.  
26

27 Provide three (3) spares of each size and type fuse.  
28

29 Provide cabinet/enclosure for spare fuses sized to accommodate all required spare fuses for entire facility.  
30 Cabinet shall have hinged and latched cover. Label cabinet "Spare Fuses". Locate cabinet in main electrical  
31 room.  
32

## 33 PART 3 - EXECUTION

### 34 INSTALLATION

35 Install disconnect switches where indicated on Drawings or required by NEC.  
36

37 Provide identification as specified in Section 26 05 53.  
38

39 Provide label on inside of disconnect cover identifying the type and size of fuse to be utilized.  
40

41 VFD installations; Provide aux contact to de energize VFD when operating local disconnect.  
42

43 Generator installations; Provide monitoring micro switches for audio/ visual alarm indication at generator  
44 control panel and remote annunciator panels for disconnects serving the emergency side of each automatic  
45 transfer switches.  
46

### 47 CONSTRUCTION VERIFICATION

48 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
49 Section 26 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01  
50 or 01 91 02.  
51

52  
53 END OF SECTION



1 Luminaire:

- 2 • Manufacturer and catalog number,
- 3 • Type (identification) as indicated on the plans and schedule,
- 4 • Delivered lumens,
- 5 • Input watts,
- 6 • Efficacy,
- 7 • Color rendering index.

8  
9 Driver:

- 10 • Manufacturer and catalog number,
- 11 • Type (Non-Dimming, Step-dimming, Continuous dimming, etc.),
- 12 • Power Factor, Crest Factor, THD, etc.

13  
14 **OPERATION AND MAINTENANCE DATA**

15 All operations and maintenance data shall comply with the submission and content requirements specified  
16 under section GENERAL REQUIREMENTS.

17  
18 **EXTRA MATERIALS**

19 Provide one (1) of each type of LED module, light bar, or array (if applicable). If the LED's are integrated  
20 into the luminaire and are not separate components, provide one (1) of each of these types of luminaires.

21  
22 Provide one (1) LED driver or ballast of each type.

23  
24 **DEFINITIONS**

25 Driver: The power supply used to power LED luminaires, modules, or arrays.

26  
27 L70, L70, or L70%: The reported life of an LED component or system to reach 70% lumen maintenance, or  
28 70% of the LED's original light output. This test is being developed by the IES and is currently  
29 described by TM-21-11.

30  
31 LED's: Broadly defined as complete luminaire with light emitting diode (LED) packages, modules, light  
32 bars or arrays, complete with driver.

33  
34 LED luminaire failure: Negligible light output from more than 10 percent of the LED's constitutes  
35 luminaire failure.

36  
37 **PART 2 - PRODUCTS**

38  
39 **INTERIOR LUMINAIRES AND ACCESSORIES**

40 See the Luminaire Schedule on the drawings for type of luminaires and catalog numbers. Catalog numbers  
41 are shown on the drawings for quality and performance requirements only. Luminaires manufactured by  
42 others are equally acceptable provided they meet or exceed the performance of the indicated luminaires,  
43 and meet the intent of the design.

44  
45 Luminaire shall be listed by a NRTL (Nationally Recognized Testing Laboratory: e.g. UL, ETL, etc.).

46  
47 Provide luminaires with quick-connect disconnecting means, similar to Thomas & Betts Sta-Kon.

48  
49 **LED LUMINAIRES**

- 50 • LED Luminaires shall meet all DesignLights Consortium® (DesignLights.org) Product  
51 Qualification Criteria. This does not require that the luminaire be listed on the DesignLights  
52 Consortium's® Qualified Products List, but they must meet the Product Qualification Criteria.  
53 The technical requirements that the luminaire shall meet for each Application Category are:
  - 54 ○ Minimum Light Output.
  - 55 ○ Zonal Lumen Requirements.

- 1           ○ Minimum Luminaire Efficacy.
- 2           ○ Minimum CRI.
- 3           ○ L70 Lumen Maintenance.
- 4           ○ Minimum Luminaire Warranty of 5 years (not pro-rated) to include LED driver and all
- 5           LED components.

6

7           *Additional Requirements:*

- 8           • Color Temperature of 3000K-4100K for interior luminaires as listed in the Luminaire Schedule on
- 9           the plans. The color temperature of exterior LED luminaires should not exceed 4100K (nominal).
- 10          • Color Consistency: LED manufacturer shall use a maximum 3-step MacAdam Ellipse binning
- 11          process to achieve consistent luminaire-to-luminaire color for interior luminaires. Exterior
- 12          luminaires shall use a maximum 5-step MacAdam Ellipse binning process.
- 13          • Glare Control: Exterior luminaires shall meet DesignLights Consortium's® criteria for Zonal
- 14          Lumen Distribution requirements or Backlight-Uplight-Glare (BUG) standards for exterior
- 15          luminaires.
- 16          • Luminaire shall be mercury-free, lead-free, and RoHS compliant.
- 17          • Luminaire shall comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.
- 18          • Light output of the LED system shall be measured using the absolute photometry method
- 19          following IES LM-79 and IES LM-80 requirements and guidelines.
- 20          • Luminaire shall maintain 70% lumen output (L70) for a minimum of 50,000 hours.
- 21          • Lumen output shall not depreciate more than 20% after 10,000 hours of use.
- 22          • Luminaire and driver shall be furnished from a single manufacturer to ensure compatibility.
- 23          • Luminaire Color Rendering Index (CRI) shall be a minimum of 80 for interior luminaires, and a
- 24          minimum of 70 for exterior luminaires.
- 25          • LED luminaire shall be thermally designed as to not exceed the maximum junction temperature of
- 26          the LED for the ambient temperature of the location the luminaire is to be installed. Rated case
- 27          temperature shall be suitable for operation in the ambient temperatures typically found for the
- 28          intended installation. Exterior luminaires to operate in ambient temperatures of -20°F to
- 29          122°F (-29°C to 50°C).
- 30          • Luminaire shall operate normally for input voltage fluctuations of plus or minus 10 percent.
- 31          • Luminaire shall have a maximum Total Harmonic Distortion (THD) of ≤20% at full input power
- 32          and across specified voltage range.
- 33          • All connections to luminaires shall be reverse polarity protected and provide high voltage
- 34          protection in the event connections are reversed or shorted during the installation process.
- 35          • All luminaires shall be provided with knockouts for conduit connections.
- 36          • The LED luminaire shall carry a limited 5-year warranty minimum for LED light engine(s)/board
- 37          array, and driver(s).
- 38          • Provide all of the following data on submittals:
  - 39           ○ Delivered lumens
  - 40           ○ Input watts
  - 41           ○ Efficacy
  - 42           ○ Color rendering index.

43

44   LED Luminaires used for Emergency Egress Lighting:

- 45          • The failure of one LED shall not affect the operation of the remaining LEDs.

46

47   Emergency LED Luminaire Compatibility with Inverters:

- 48          • Emergency Inverters shall be sine-wave type, or have written confirmation from the luminaire
- 49          manufacturer that the luminaire will function with a square-wave inverter.

50

51   **LED DRIVERS**

52   General:

- 53          • Provide driver type (non-dimmed, step-dimmed, continuous-dimming, etc.) as indicated on the
- 54          luminaire schedule on the drawings.
- 55          • Minimum Warranty of 5 years (not pro-rated) to include LED driver and all LED components.

- 1 • Driver shall have a rated life of 50,000 hours, minimum.
- 2 • Driver and LEDs shall be furnished from a single manufacturer to ensure compatibility.
- 3 • Driver shall have a minimum power factor (pf) of 0.9 and a maximum crest factor (cf) of 1.5 at
- 4 full input power and across specified voltage range.
- 5 • Driver shall operate normally for input voltage fluctuations of plus or minus 10 percent.
- 6 • Driver shall have a maximum Total Harmonic Distortion (THD) of  $\leq 20\%$  at full input power and
- 7 across specified voltage range.
- 8 • Wiring connections to LED drivers shall utilize polarized quick-disconnects for field maintenance.
- 9 • Fuse Protections: All luminaires shall have built-in fuse protection. All power supply outputs shall
- 10 be either fuse protected or be Polymeric Positive Temperature Coefficient (PTC)-protected as per
- 11 Class 2 UL listing.
- 12 • Provide all of the following data on submittals:
- 13     o Input watts
- 14     o Power Factor (pf)
- 15     o Crest Factor (cf) at full input power
- 16     o Total Harmonic Distortion (THD).

#### 18 Dimming Drivers:

- 19 • LED driver shall be compatible with dimming controls where dimming is indicated on the plans.
- 20 Dimmable drivers shall use Dimming Constant Current (DCC), Constant Voltage, or Pulse Width
- 21 Modulation (PWM) operation.
- 22
- 23 • Step-Dimming Drivers: Easily switched from 0% to 50% to 100% output power. Both switch-leg
- 24 inputs shall control 50% of the luminaire's light output equally.
- 25 • Continuous Dimming Drivers: LED luminaires shall dim to (10%, 1%, or 0.1%) as specified in the
- 26 Luminaire Schedule on the plans without visible flicker or "popcorn effect". "Popcorn effect" is
- 27 defined as the luminaire being on a pre-set dimmed level (less than 100%), and going to 100%
- 28 prior to returning to the pre-set level when power is returned to the luminaire. Continuous
- 29 Dimming Drivers shall use 0-10V control.
- 30

### 31 **PART 3 - EXECUTION**

#### 32 **INSTALLATION**

33 Verify ceiling types with Architectural plans or with existing ceilings. Verify specified luminaires are

34 compatible with specified ceiling type(s) prior to ordering luminaires.

35 Install in accordance with manufacturer's instructions.

36 Install suspended luminaires using aircraft cable, or pendants supported from swivel hangers. Heavy duty

37 chain supports may be used where indicated on the luminaire schedule. Provide aircraft cable, pendants, or

38 chain lengths required to suspend luminaire at indicated height. All aircraft cables or pendant supported

39 luminaires shall have an independent support to structure at all cable or pendant support locations. When

40 chain is used, tie-wrap the luminaire wiring method to the chain.

41 Support luminaires larger than 2 x 4 foot (600 x 1200 mm) size independent of ceiling framing.

42 Provide independent support for all luminaires over 50 lbs.

43 Locate ceiling luminaires as indicated on reflected ceiling plan.

44 Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with

45 each other. Secure to prohibit movement.



1 The Contractor shall install luminaire supports as required. Luminaire installations with luminaires  
2 supported only by insecure boxes will be rejected. It shall be the Contractor's responsibility to support all  
3 luminaires adequately, providing extra steel work for the support of luminaires if required. Any  
4 components necessary for mounting luminaires shall be provided by the Contractor. No plastic,  
5 composition or wood type anchors shall be used.  
6  
7 Exposed Grid Ceilings: Support surface mounted luminaires on grid ceiling directly from building  
8 structure.  
9  
10 Install recessed luminaires to permit removal from below.  
11  
12 Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for  
13 fire rating.  
14  
15 Install code required hardware to secure recessed grid-supported luminaires in place.  
16  
17 Install wall mounted luminaires and exit signs at height as scheduled. Use pendants supported from swivel  
18 hangers in exposed ceiling/structure locations where necessary to mount exit signs at the specified height.  
19  
20 Install accessories furnished with each luminaire.  
21  
22 Make wiring connections to branch circuit using building wire with insulation suitable for temperature  
23 conditions within luminaire.  
24  
25 Bond luminaires and metal accessories to branch circuit equipment grounding conductor.  
26  
27 Install specified lamps in each luminaire and exit sign.  
28  
29 Dimmed luminaire circuits shall have separate neutrals.  
30  
31 Dimmed LED luminaires shall have a positive OFF, which requires turning off the circuit to the luminaire  
32 so that the luminaires don't "glow" at the lowest dimmed setting. This shall be accomplished using a  
33 switch, relay, or some other means acceptable to UW.  
34  
35 All lamps shall be delivered to the job in sealed cartons and protected from dirt and dust during storage on  
36 the project. Lamps shall be taken directly from the cartons and installed in the luminaire with special care  
37 so that they do not become dusty and are not soiled in the operation.  
38  
39 Lamps installed in luminaires using dimming ballasts shall be burned in at 100% rated output by the  
40 contractor for a minimum of 100 hours as recommended by the ballast manufacturer.  
41  
42 All new lamps shall be operational at the Substantial Completion of the project.  
43  
44 **ADJUSTING AND CLEANING**  
45 Align luminaires and clean lenses and diffusers at completion of Work. Clean paint splatters, dirt, and  
46 debris from installed luminaires.  
47  
48 Aim and adjust luminaires as indicated on Drawings or as directed by the A/E.  
49  
50 Touch up luminaire finish at completion of work.  
51  
52 **INTERFACE WITH OTHER PRODUCTS**  
53 Interface with air handling accessories furnished and installed under Division 23.  
54  
55 Provide controls as indicated on the plans. Refer to section 26 27 26 - Wiring Devices. Controls shall be  
56 compatible with the luminaires/ballasts/drivers being installed.

1  
2 **ZERO-TO-10V DIMMING CONTROL WIRING INSTALLATION**

3 Zero-to-10V dimming control conductors are classified by the NEC as Class 2 conductors and shall be kept  
4 separate from line-voltage conductors per NEC 725.136(A). Matching the insulation rating of Conductors  
5 of Different Systems does not apply to Class 2 conductors per NEC 300.3(C)(1), Informational Note No.1.

6  
7 Wall box dimmers will typically have two conduits: One conduit for line-voltage power, and one conduit or  
8 conduit stub for the 0-10V control wiring.

9  
10 At each luminaire, separate openings (either manufactured knock-outs or punched openings) shall be used  
11 for the line-voltage power and the 0-10V wiring. The EC shall use a cable connector at the opening for the  
12 0-10V wiring. Zero-to-10V conductors entering and within a luminaire enclosure shall maintain a  
13 minimum separation of 6 mm (0.25 in.) per NEC 725.136(D).

14 Exposed 0-10V cables shall be installed in separate conduits from line-voltage conductors.

15 The 0-10V cables may be routed in free air where concealed above accessible ceilings. Cables routed in  
16 free air shall observe the following installation requirements:

17 The 0-10V cables may be tie-wrapped to the outside of the luminaire power raceway where allowed by  
18 NEC 300.11(B)(2). Tie-wraps shall be UL listed for UV resistance. Care should be taken in the use of  
19 cable ties to secure and anchor the cabling. Ties shall not be over tightened as to compress the cable  
20 jacket. No sharp burrs shall remain where excess length of the cable tie has been cut.

21 Cabling shall be neatly run at right angles and be kept clear of other trades work.

22 Cabling shall be secured within twelve (12) inches of direction change or termination.

23  
24 Cabling shall be supported at a maximum of 5-foot intervals utilizing “J-Hook” or “Bridle Ring”  
25 supports anchored to ceiling concrete, piping supports or structural steel beams. If cable sag at mid-  
26 span exceeds 12-inches, another support shall be provided. Cable supports shall be installed to  
27 maintain cable bend to larger than the minimum bend radius.

28 Cabling shall not be attached to or supported by existing cabling, plumbing or steam piping, ductwork,  
29 suspended ceiling supports or electrical or communications conduit. Do not place cable directly on the  
30 ceiling grid or attach cable in any manner to the ceiling grid wires.

31 All cables shall be free of tension at both ends. Nylon strain relief connectors shall be provided at each  
32 device and junction box where cables enter. In cases where the cable must bear some stress, Kellum  
33 type grips may be used to spread the strain over a longer length of cable.

34 Cable manufacturer’s minimum bend radius shall be observed in all instances.

35 Use suitable cable fittings and connectors.

36  
37  
38  
39  
40  
41  
42  
43  
44 **FIELD QUALITY CONTROL**

45 Operate each luminaire after installation and connection. Inspect for proper connection and operation.

46  
47 **LUMINAIRE CONNECTIONS**

48 **METAL-CLAD (MC) CABLE**

49 Metal-Clad (MC) type cable that combines power and Class 2 circuits into a single cable may be used for  
50 the luminaire wiring where 0-10V dimming control wiring is required. Examples of such products are  
51 Encore Wire® MC-LED™ or Southwire® MC-PCS Duo™. Manufacturer's names and catalog numbers  
52 are used for quality and performance only. MC Cables manufactured by others shall be equally acceptable  
53 provided they meet or exceed in performance and quality as specified.

54 Recessed, including Master-Satellite connections:  
55  
56

- 1 • Use a luminaire fixture whip from a J-box for recessed lay-in luminaires. Luminaire fixture whips  
2 shall be aluminum or steel AC Cable (Armored Cable) or Flexible Metal Conduit (FMC). Metal  
3 Clad (MC) cable that combines power and Class 2 circuits (for 0-10V dimming control) into a  
4 single cable may be used as a whip for luminaires that are dimmed.
- 5 • Cable/Conduit whips shall be 3/8" (10 mm) minimum diameter, six feet (1.8 m) maximum length.
- 6 • Flexible whips or pre-wired systems between master and satellite luminaires may be supported by  
7 the ceiling grid wires.
- 8 • The flexible connectors shall be steel, galvanized, clamp type with locknut, snap-in type with  
9 locknut, or snap-in connector type, including those used on the master-satellite units.

10

11 Chain or Cable Hung (unfinished spaces):

- 12 • Use manufacturer's SO cord or a luminaire fixture whip from a J-box. Luminaire fixture whips  
13 shall be aluminum or steel AC Cable (Armored Cable) or Flexible Metal Conduit (FMC). Metal  
14 Clad (MC) cable that combines power and Class 2 circuits (for 0-10V dimming control) into a  
15 single cable may be used as a whip for luminaires that are dimmed.
- 16 • Conduit whips shall be 3/8" (10 mm) minimum diameter. Conduit whip or SO cord shall be cut to  
17 length (six feet (1.8 m) maximum) and shall allow movement of the chain/cable/luminaire, but  
18 shall not be long enough to "loop" and shall present a neat and workmanlike appearance.
- 19 • Luminaire field wired flexible cord installations shall be connected per NEC 410.62.
- 20 • The flexible connectors shall be steel, galvanized, clamp type with locknut, snap-in type with  
21 locknut, or snap-in connector type, including those used on the master-satellite units.
- 22 • Conduit whip slack shall be tie-wrapped to the chain supports. Tie-wraps shall be UL listed for  
23 UV resistance.

24

25 Cable Hung (finished spaces):

- 26 • Use manufacturer's SO cord from luminaire to a J-box.
- 27 • SO cord shall be cut to length (six feet (1.8 m) maximum) and shall allow movement of the  
28 cable/luminaire, but shall not be long enough to "loop" and shall present a neat and workmanlike  
29 appearance.
- 30 • SO cord slack may be tie-wrapped to the cable supports. Tie-wraps shall be UL listed for UV  
31 resistance.
- 32 • Luminaire field wired flexible cord installations shall be connected per NEC 410.62.

33

34 Surface Mounted (unfinished spaces):

- 35 • Provide direct conduit and box connection.

36

37 Surface Mounted (finished spaces):

- 38 • Provide direct conduit and box connection. Use surface metal raceway where indicated on  
39 drawings. Conceal box and conduit where appropriate. Flexible metal conduit shall not be used  
40 where the conduit is exposed.

41

42 **CONSTRUCTION VERIFICATION**

43 Contractor is responsible for utilizing the construction verification checklists supplied under specification  
44 Section 26 08 00 in accordance with the procedures defined for construction verification in Section 01 91  
45 01 or 01 91 02.

46

47 **AGENCY TRAINING**

48 All training provided for agency shall comply with the format, general content requirements and  
49 submission guidelines specified under Section 01 91 01 or 01 91 02.

50

51

END OF SECTION



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**SECTION 27 05 53**  
**IDENTIFICATION FOR COMMUNICATIONS SYSTEMS**  
**BASED ON DFD MASTER SPECIFICATION DATED 03/01/23**

**PART 1 - GENERAL**

Applicable provisions of Division 0 and 1 shall govern work of this Section.

**CONTENTS**

**PART 1 - GENERAL**

Scope

Related Work

References

Submittals

**PART 2 - PRODUCTS**

General

Cable and Termination Hardware

SYSTEMS

Miscellaneous

**PART 3 - EXECUTION**

General

Equipment Room and Fittings

Pathways

Horizontal Cable and Termination Hardware

Backbone Cable – Copper and Fiber Optic

Termination Blocks

Fiber Optic Patch Panels

Audio-Video

Abandoned Cable

**SCOPE**

This Section describes the general, product and execution requirements relating labeling of all communications cabling, terminations and related sub-systems for the Project.

Unless specifically included in this Section, requirements for labeling of pathway items – Junction and Pull Boxes, Communication Conduit, Surface Raceway, and Cable Tray – are covered in the respective Division 26 sections covering those items.

Provide all labeling as detailed in this and related Sections.

**RELATED WORK**

Section 26 05 53 - Identification for Electrical Systems; re: labeling of conduit, boxes, etc.

Section 26 05 26 - Grounding and Bonding for Electrical Systems; re: component labeling

Section 27 10 00 - Structured Cabling

**REFERENCES**

ANSI/TIA-606-B - Administration Standard for Telecommunications Infrastructure

**SUBMITTALS**

Prior to labeling of cabling, connectivity, hardware, etc., provide samples of all label types planned for the Project.

Samples shall include the intended lettering type(s) and sizes to be used.

Mount samples on 8 1/2" x 11" sheets and mark to indicate their proposed use. Submit scanned image(s) of the mounted samples.

1  
2  
3 **PART 2 - PRODUCTS**  
4

5 **GENERAL**

6 All labels shall be permanent, and machine generated. NO HANDWRITTEN OR NON-PERMANENT  
7 LABELS ARE ALLOWED unless specifically exempted by the language of this Section.  
8

9 Labels and markings shall be physically and chemically resistant to damage that would affect readability.

10 Embossed tape will not be permitted for any application.

11 Labels shall match hardware layout and design and shall be as large as possible while fitting properly.

12 Refer to Part 3 for labeling formats and content.

13 Use of installing company logo on any labeling is not permitted.

14 *Exception: Where included for warranty and/or maintenance purposes, such labeling is acceptable.*  
15

16 **CABLE AND TERMINATION HARDWARE**

17 **Cable Labels**

18 Labels shall be Wrap-around, adhesive type or – for Inter-Building Backbone Cables only – plastic label that  
19 is secured to the cable.

20 Flag type labels are not allowed.

21 Wrap-around Labels shall be:

- 22 • White Vinyl or other appropriate substrate and incorporate a clear lamination that, when label is  
23 wrapped around cable, covers printed part of label.
- 24 • Of adequate size to accommodate circumference of cable(s) being marked and properly self-  
25 laminate over full extent of printed area of label. Labels on larger cables (e.g., Copper Backbone)  
26 may be wrapped with clear non-removable tape.

27 **Equipment Outlet**

28 Equipment Outlet labels that are placed in recessed label holders shall be white paper on which outlet  
29 information is added.

30 **Modular Patch Panel**

31 Paper Inserts integral to patch panel, Adhesive labels or factory-screened numbering.  
32

33 **SYSTEMS**

34 Refer to applicable specification section for system-specific labeling requirements.  
35

36 **MISCELLANEOUS**

37 Where an Equipment Outlet or plug-terminated cable is concealed above a suspended ceiling (e.g., for a  
38 Wireless Access Point or Security camera), provide a marking on the ceiling to identify such a location.  
39 Coordinate with agency to determine preferred identification method.  
40

41 **PART 3 - EXECUTION**  
42

43 **GENERAL**

44 Clean surfaces before attaching labels with the label manufacturer's recommended cleaning agent.  
45

46 Install labels firmly as recommended by the label manufacturer.

47 Install labels square and neatly on all equipment.  
48

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Position labels as to be visible and not obscured by termination hardware or other cabling.

Lettering shall be 10-point or larger unless noted otherwise.

**EQUIPMENT ROOM AND FITTINGS**

**General**

Identifier for communications equipment rooms to be used in labeling shall be as follows:

Telecommunications Room (TR) 2W

Telecommunication Room identifiers shall be unique in each building.

**HORIZONTAL CABLE AND TERMINATION HARDWARE**

**General**

Label all Equipment Outlets, Patch Panels, Termination Blocks, and Cables.

This is inclusive of each voice, data, video, or fiber optic outlet, or any configuration thereof, as identified on the Drawings.

Label each component using a unique code identifying the link.

**Equipment Outlet**

Equipment Outlet identification shall be based on and result in a logical numbering sequence in each Work Area. Labeling plans that result in random EO numbering are not acceptable.

Label Equipment Outlets on the faceplate and, if applicable, on the base or frame of the EO which is permanently attached to its mounting.

Where outlet faceplates incorporate recessed label holders, labels shall be positioned beneath clear plastic covers that are part of the faceplate assembly. Where no such label holders are present (e.g., on existing to remain outlets or wall-mounted telephone-only outlets) protect the faceplate labels with a clear over-laminate.

Labels shall be White background with Black lettering. Lettering size shall be as large as practicable (up to 16-point) to fit properly on the outlet label. No lettering shall be smaller than 12-point.

The format of the Equipment Outlet identifier shall be as follows:

HC-###X

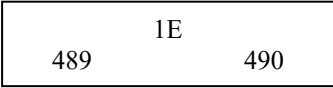
where: HC = Telecommunication Room Designation "2W" for this project.

### = Sequential position of the Jack on the Equipment Rack mounted Patch Panels within the Telecommunication Room.

X = Special application identifier; S = Security, C = Camera, W = Wireless Access Point (WAP)

For example: "2W-489" represents a cable terminated in position 489 of the equipment rack mounted Patch Panels located within Telecommunication Room "2W".

Faceplate labels can use common HC identifiers on each label strip. For example, two links that terminate in the room designated as "2W" on positions "489" and "491" of the Equipment Rack mounted Patch Panel(s) and sharing common label strip may be represented by:



1 **Horizontal Cable**  
2 Code used to label Horizontal Cables shall be same as identified for Equipment Outlet above.

3  
4 Label each Horizontal Cable at the Horizontal Cross-connect (e.g., Modular Patch Panel or Termination  
5 Block) and at the Equipment Outlet. If applicable, label cables at an intermediate interconnect such as a  
6 Consolidation Point in a Zone Cabling installation.

7  
8 At an Equipment Outlet or Modular Patch Panel, position labels within 4-inches of each cable end.

9  
10 Cable ID shall repeat around the perimeter of the cable (3-times minimum) to allow the ID to be  
11 visible from all angles.

12  
13 At a Termination Block, position label so that it is not obscured by the designation strip (labeling) on  
14 the block.

15  
16 **Modular Patch Panels**

17 Patch Panel labeling format shall be same as identified for Equipment Outlet above. Connectors shall be  
18 positioned in sequence of Outlet ID starting at the top left and counting from Left-to-Right then Top-to-  
19 Bottom.

20  
21 **ABANDONED CABLE**

22 Not applicable to this Project. Remove all cabling back to the point of termination. No labeling required.

23  
24 END OF SECTION



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**SECTION 27 08 00**  
**COMMISSIONING OF COMMUNICATIONS**  
**BASED ON DFD MASTER SPECIFICATION DATED 03/01/23**

**PART 1 - GENERAL**

**SCOPE**

This section includes commissioning forms for construction verification and functional performance testing. Included are the following topics:

PART 1 - GENERAL

- Scope
- Related Work
- Reference
- Submittals

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

Commissioning When No Forms Are Available

Commissioning Forms:

- CV-27 05 53 Identification for Communications Systems
- CV-27 10 00 Structured Cabling

**RELATED WORK**

Section 01 91 01 or 01 91 02 – Commissioning Process

Section 27 08 41 – AV Systems Commissioning

**REFERENCE**

Applicable provisions of Division 1 shall govern work under this section.

**SUBMITTALS**

Reference the General Conditions of the Contract for submittal requirements.

Reference Section 01 91 01 Commissioning Process for Construction Verification Checklist and Functional Performance Test submittal requirements.

**PART 2 – PRODUCTS**

(Not Used)

**PART 3 – EXECUTION**

**COMMISSIONING FORMS**

Commissioning forms are to be filled in as work progresses by the individuals responsible for installation and shall be completed for each installation phase.

Provide a description of the work completed since the last entry, the percentage of the total work completed for the system for that area and the step of installation or finalization.

Circle Yes or No for each commissioning form item. If the information requested for an item does not apply to the given stage of installation for the system, list it as “N/A”. Explain all discrepancies, negative responses or N/A responses in the negative responses section.

Once the work is 100% complete and the responses to each item are complete and resolved for a given commissioning forms group, mark as complete, initial and date in the spaces provided.

- 1 Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress
- 2 meetings.
- 3

Construction Verification Checklist  
27 05 53 – Identification for Communications Systems

## CV-27 05 53 – Identification for Communication Systems

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

### A) LABELING

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____				DATE: _____						

### Question Details

- 1) Equipment Outlet faceplates labeled as specified.
- 2) Cabling at Equipment Outlet labeled as specified.
- 3) Modular Patch Panels for Horizontal Copper Cable labeled as specified.
- 4) Termination Blocks for Horizontal Copper Cable labeled using correct color-coded (BLUE) Designation Strips
- 5) Termination Blocks for Backbone Copper Cable (including Building Entrance Terminal) labeled using correct color-coded (WHITE, GRAY or BROWN) Designation

Construction Verification Checklist  
27 05 53 – Identification for Communications Systems

Strips

- 6) Fiber Optic Patch Panels for backbone fiber optic cabling labeled as specified.
- 7) Copper Cabling at Modular Patch Panels and Termination Blocks at Main Equipment Room and Telecom Room(s) labeled in accordance with specification requirements.
- 8) Fiber Optic Cabling at Patch Panels at Main Equipment Room and Telecom Room(s) labeled in accordance with specification requirements.
- 9) Innerduct for backbone fiber optic cabling (if applicable) labeled as specified.
- 10) Backboard, Equipment Racks and Cabinets, and Enclosures labeled as specified.

**Negative Responses**

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

## CV-27 10 00 – Structured Cabling

Equipment Identification/Tag: \_\_\_\_\_

Location: \_\_\_\_\_

### A) HORIZONTAL CABLING IN CONDUIT - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)			
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				<b>INITIALS:</b> _____				<b>DATE:</b> _____						

### Question Details

- 1) Exposed cabling has been visually inspected for physical damage and any damaged cabling has been replaced. Cabling jacket and insulation are in good condition.
- 2) Cable color(s) matches specification requirements for given cable type.
- 3) Cable listing (e.g., General Purpose, Riser, Plenum) as specified and appropriate for installation environments.
- 4) Conduits swabbed to remove foreign material prior to pulling cables.
- 5) Cables pulled though conduit at the same time, with pulling lubricant used as required to ease pulling tensions.
- 6) Cabling is splice free.
- 7) Bend radii conforms to manufacturer recommendations for each cable type.
- 8) Appropriate slack provided in length required by specifications for given cabling type and termination point.

**Negative Responses**

<b>Group/Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

## B) UNENCLOSED HORIZONTAL CABLING - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)										
				1)	2)	3)	4)	5)	6)	7)	8)			
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
				YES	YES	YES	YES	YES	YES	YES	YES	YES		
				NO	NO	NO	NO	NO	NO	NO	NO	NO		
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____				DATE: _____						

### Question Details

- 1) Exposed cabling has been visually inspected for physical damage and any damaged cabling has been replaced. Cabling jacket and insulation are in good condition.
- 2) Cable color(s) matches specification requirements for given cable type.
- 3) Cable listing (e.g., General Purpose, Riser, Plenum) as specified and appropriate for installation environments.
- 4) Cabling supported via “J-hook” or “bridle-type” supports at spacing defined within specifications. (Bridle-type supports configured with bend-radius control.)  
Supports are independent of piping, ductwork, equipment, cable tray or other conduit.
- 5) Minimum separations provided for cabling per specifications to minimize EMI.
- 6) Cabling is splice free.
- 7) Bend radii conform to manufacturer recommendations for each cable type.
- 8) Cable slack provided in length required for given cabling type and location and is secured using Hook-and-Loop Ties.

## Negative Responses

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		



### C) EQUIPMENT OUTLET - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)	9)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____				DATE: _____					

#### Question Details

- 1) Equipment Outlet faceplate material and color are as specified.
- 2) Outlets installed at locations and heights specified in contract documents for given outlet type.  
Outlets mounted at same height for given outlet type throughout facility.
- 3) Outlets are level.
- 4) Outlets are flush to finished surface.
- 5) Connector types and colors are as specified.
- 6) Connector positions and faceplate layout are as specified. Faceplate layout for a given configuration is same throughout installation.
- 7) Unused connector positions fitted with a blank insert color-matched to the faceplate color.
- 8) Connectors fitted with Dust Covers as specified and as applicable.
- 9) Outlets secured using tamper-resistant fasteners (where applicable).

**Negative Responses**

<b>Group/ Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

## D) HORIZONTAL

## F) CABLING AND PATHWAYS (GENERAL) - INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)			
				YES	YES	YES	YES	YES	YES	YES			
				NO	NO	NO	NO	NO	NO	NO			
				YES	YES	YES	YES	YES	YES	YES			
				NO	NO	NO	NO	NO	NO	NO			
				YES	YES	YES	YES	YES	YES	YES			
				NO	NO	NO	NO	NO	NO	NO			
				YES	YES	YES	YES	YES	YES	YES			
				NO	NO	NO	NO	NO	NO	NO			
				YES	YES	YES	YES	YES	YES	YES			
				NO	NO	NO	NO	NO	NO	NO			
				YES	YES	YES	YES	YES	YES	YES			
				NO	NO	NO	NO	NO	NO	NO			
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____			DATE: _____						

### Question Details

- 1) Cable bend radii conform to manufacturer recommendations for given wire type and gauge.
- 2) Penetrations through floor and rated walls are Firestopped as specified using an Assembly rated for the wall or floor penetrated.
- 3) Penetrations through non-rated walls are sealed as specified for given penetration type.
- 4) Communications Cabling pulled in separate conduits from normal power, emergency power, security and control systems.
- 5) Conduit junction boxes are painted and tagged in accordance with specification requirements.
- 6) Pull cord provided in each conduit. Includes occupied and vacant conduit.
- 7) Cross-connects and Patching are complete and documented as specified.

**Negative Responses**

<b>Group/Item</b>	<b>Date Found</b>	<b>Found By</b>	<b>Location</b>	<b>Reason for Negative Response</b>	<b>Resolved</b>	<b>Date Resolved</b>	<b>Resolution</b>
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		
					<b>YES / NO</b>		

## G) TESTING, DOCUMENTATION, WARRANTY AND TRAINING CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below)									
				1)	2)	3)	4)	5)	6)	7)	8)	9)	
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
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				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
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				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
				YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
<input type="checkbox"/> CHECKLIST GROUP COMPLETE				INITIALS: _____				DATE: _____					

### Question Details

- 1) Maximum Horizontal Copper Cable (Voice/Data) length is less than 295' for all cables installed.
- 2) Copper Horizontal Twisted-pair Cabling Tested as specified.
- 3) Test Results are documents as specified and submitted for review.
- 4) Documentation as required for Extended Warranties has been submitted to manufacturer.
- 5) Training covering the installed system to Agency Staff, and/or contract maintenance personnel is complete.

### Negative Responses

Group/Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		



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**SECTION 27 10 00**  
**STRUCTURED CABLING**  
**BASED ON DFD MASTER SPECIFICATION DATED 03/01/23**

**PART 1 - GENERAL**

**SCOPE**

This section describes the products and execution requirements relating to furnishing and installation of Communications Cabling and Termination Components and related sub-systems as part of a Structured Cabling System for the project. The specified cabling may support “voice”, “data”, audiovisual and networked security applications as noted.

Work may also include removal and recycling of unused, un-documented and otherwise "abandoned" cables. Refer to project drawings and Part 3 of this Section under "Salvage Materials".

Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- References
- Design Intent
- Quality Assurance
- Submittals
- Schedule

**PART 2 - PRODUCTS**

- Horizontal Permanent Link
- Horizontal Twisted-Pair Cable
- Equipment Outlet
- Modular Patch Panel
- Horizontal Jumper Management
- Spares and Miscellaneous Materials

**PART 3 - EXECUTION**

- General
- Equipment Rack Layout
- Salvage Materials
- Cleaning and Inspection
- Cable Installation
- Equipment Outlet
- Cable Termination
- Cross-connect Wiring and Patching
- Identification and Labeling
- Testing and Acceptance
- Documentation
- Training
- Warranty

**RELATED WORK**

Applicable provisions of Division 1 govern work under this Section.

- Section 01 91 01 – Commissioning Process
- Section 26 05 00 – Common Work Results for Electrical
- Section 26 05 04 – Cleaning, Inspection and Testing of Electrical Equipment
- Section 26 05 26 – Grounding and Bonding for Electrical Systems
- Section 26 05 29 – Hangers and Supports for Electrical Systems
- Section 26 05 33 – Raceway and Boxes for Electrical Systems
- Section 26 05 53 – Identification for Electrical Systems
- Section 27 05 53 – Identification for Communications Systems
- Section 27 08 00 – Commissioning of Communications

1 **REFERENCES**

2 All work and materials shall conform in every detail to the rules and requirements of the National Fire  
3 Protection Association, the Wisconsin Electrical Code and present manufacturing standards.

4 All materials shall be listed by UL and shall bear the UL label. If UL has no published standards for a  
5 particular item, then other national independent testing standards shall apply and such items shall bear those  
6 labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.

7  
8 Other applicable standards (plus applicable update bulletins and errata) are as follows:

9 General

- 10 • ANSI/IEEE C2 - National Electrical Safety Code  
11 • SPS Chapter 316 – Wisconsin Dept. of Safety and Professional Services Electrical Code

12 Structured Cabling and Infrastructure

- 13 • TIA-568.0-D, -568.1-D, -568-C.2, -569-C, -598-C, -606-B and TIA standards referenced therein.  
14 568.3-D Fiber Optic  
15 • ANSI/TIA-862-B – Structured Cabling Infrastructure Standard for Intelligent Building Systems  
16 • ANSI/TIA-1152 – Requirements for Field Test Instruments and Measurements for Balanced Twisted-  
17 Pair (Cabling)  
18 • IEEE/ANSI 142-1982 - Recommended Practice for Grounding of Industrial and Commercial Power  
19 Systems.  
20 • ICEA publication S-80-576-2002  
21 • ANSI/TIA-526-14-C and -526-7  
22 • IEC 61300-3-35 - Fibre Optic Interconnecting Devices and Passive Components – Basic Test and  
23 Measurement Procedures  
24 • TIA-607-C - Commercial Building Grounding (Earthing) and Bonding Requirements for  
25 Telecommunications  
26

27 **DESIGN INTENT**

28 **General**

29 The Structured Cabling System is based on a hierarchy of cables and termination locations.

30  
31 All cables and related termination, support and grounding hardware, bonding, shall be furnished, installed,  
32 wired, tested, labeled, and documented by the Contractor, as detailed in the following sections.

33  
34 Provide all labor and materials necessary to construct the system as described herein. This includes - but is  
35 not limited to - furnishing and installing cable, cable supports, innerduct, racking and termination  
36 components, termination, testing, labeling, and documentation.

37  
38 Refer to Part 2 – PRODUCTS, Part 3 - EXECUTION and the project drawings for applicable cable and  
39 connectivity types and installation requirements.  
40

41 **Horizontal Cabling**

42 Horizontal Cabling System links the termination in the work area (Equipment Outlet (EO) or modular plug  
43 at a communications or security device) to the Horizontal Cross-connect serving the location (e.g.,  
44 Telecommunications Room (TR) or Equipment Room (ER)). This cabling and the related connectors (both  
45 ends) is referred to as the “Permanent Link” in this section.

46  
47 Security devices may include Card Access Credential Readers and/or Controllers.  
48

49 **QUALITY ASSURANCE**

50 **Manufactured Items**

51 The manufacturer(s) of cabling and connectivity components shall be a company specializing in and having  
52 a minimum of five years documented experience in producing products similar to those specified in this and  
53 related sections.  
54



1 **Contractor Qualifications**

2 The contractor shall have been in this line of business for a minimum of five (5) years and have successfully  
3 completed one or more projects of scope 50% or more of the magnitude specified by these documents.

4  
5 Contractor shall have necessary certifications to provide for Guarantees as specified herein.

6  
7 Contractor shall be an active participant in Installers Program operated by Manufacturer of Cabling or  
8 Termination Components used. Contractor shall be a participant in this program at time of Bidding and  
9 remain so throughout project.

10  
11 Contractor shall have on the project team at a minimum one (1) certified Installer trained by the  
12 manufacturer(s) of the cabling, hardware and accessories installed under this project.

13  
14 At least (1) member of each test team shall be factory trained/certified in use of the test equipment. The  
15 project foreman shall have been factory trained in the use of the test equipment.

16  
17 **SUBMITTALS**

18 **General**

19 Under the provisions of Division 1, prior to the start of work, submit:

- 20  
21 • Shop Drawings  
22  
23 • Contractor Qualifications  
24  
25 • Schedule of Values (part of GPC or STC submittal)  
26

27 Group Submittals to include complete documentation of related systems, products and accessories in a single  
28 submittal.

29  
30 Submittals shall be electronic format (ADOBE Portable Document format “.pdf”) copies of manufacturer  
31 datasheets.

32  
33 Identify each proposed product with a mark or reproducible highlight.

34  
35 Where multiple options for a particular product may apply (color, construction, features, etc.), identify  
36 the applicable option(s).

37  
38 Where applicable, mark dimensions in units to match those specified.

39  
40 The Engineer shall review the Submittals and through annotation and/or a cover sheet, provide comment.

41  
42 Work shall not proceed without the Engineer’s review of the submitted items.

43  
44 Additional submittals (Test Plan, Test Results, Documentation, Record Documents, etc.) required during and  
45 in follow-up to construction are detailed in Part 3.

46  
47 **Shop Drawing Submittal**

48 Submit documents including:

- 49  
50 • Manufacturer’s Product data for all products proposed indicating construction, materials, ratings, and  
51 all other parameters identified in Part 2 (Products) below. Structured Cabling submittal shall include  
52 Test Data confirming Horizontal Cabling Channel Performance.  
53  
54 • Manufacturer’s installation instructions.  
55

1 **Contractor Qualifications**

2 Provide certification documents confirming contractor status as an active participant in Installers Program  
3 operated by Manufacturer of Cabling or Termination Components used.

4  
5 Upon request, furnish project experience as identified under “Quality Assurance / Contractor Qualifications”  
6 above.

7 For each project listed provide:

- 8 • Name and location of installation.
- 9 • Date of initial operation of system by owner. (Minimum period of operation for referenced project  
10 shall be 12 months.)
- 11 • Owner's representative to contact and their telephone number.

12  
13 **Schedule of Values Submittal**

14 As part of the General Prime Contractor (GPC) or Single Trade Contractor (STC) submittal, include in the  
15 breakdown of the proposed values for work to be performed:

- 16 • Materials (Cable, Connectivity, Equipment Racks, etc.)
- 17 • Installation (by building if applicable)
- 18 • Testing
- 19 • Documentation
- 20 • Training
- 21 • Additional categories as appropriate

22  
23 **SCHEDULE**

24 Interim testing and documentation may be required to support systems (e.g., Elevator, Mechanical,  
25 Security) that preceded building occupancy. Confer with agency and UW prior to construction for  
26 additional direction.

27  
28 **PART 2 - PRODUCTS**

29  
30 **HORIZONTAL PERMANENT LINK**

31 **General**

32 The Horizontal Cable System is based on the installation of 4-pair, copper twisted-pair cables from the  
33 Equipment Outlet to the Horizontal Cross-connect (wiring hub). The combined cable and termination  
34 hardware is referred to as the “Permanent Link”.

35  
36 Unshielded Twisted-Pair (UTP) is the default choice for the horizontal cable unless noted otherwise.

37  
38 Where a shielded cable is called for, the cable shall incorporate an overall foil shield under the cable jacket  
39 and no shielding around individual pairs.

40  
41 This cable is referred to herein as “F/UTP - Foiled Unshielded Twisted Pair”. “ScTP - Screened Twisted-  
42 pair” is also sometimes used in industry publications to describe the cable type.

43  
44 Cable and Termination Components (Jack, Patch Panel / Wiring Blocks) are specified to function as a  
45 System. The compatibility of the Cable to be installed with the proposed termination components shall be  
46 recognized and documented by the Termination Component Manufacturer.

47  
48 All Horizontal Link Cable shall be of the same manufacturer throughout the project.

49  
50 All Horizontal Link connectivity components shall be of the same manufacturer throughout the project.

51 *Exception:* Where identified for 4-pair cable termination at a security device (e.g., camera, card access  
52 controller) or wireless access point, Modular Plug may be from a manufacturer other than that providing  
53 other Horizontal Link connectivity.

1 **Application**

2 There shall be no distinction between Horizontal Cables designated for “DATA” and “VOICE” (Telephone  
3 and/or other analog) applications.  
4

5 Horizontal Cables for network-type Security devices (e.g., IP Video Surveillance Camera), if applicable, are  
6 considered “Data” cables for the purpose of this specification.  
7

8 **Performance**

9 Where Cable, Component and Permanent Link performance is specified to “Exceed Category 6”,  
10 performance shall be defined as follows:  
11

- 12 • Manufacturer’s published literature shall document performance margins over worst-case ANSI/TIA-  
13 568-C.2 Category 6 Channel requirements for Power Sum Attenuation-to-Crosstalk Ratio (PSACR).  
14 Channel – as tested – shall include 4-connections (minimum). Data shall be verified by an  
15 independent source (e.g., ETL, Intertek).  
16

17 Performance Margins shall be greater than zero (0) at all frequencies up to and including 250-MHz.  
18

19 *Exceptions:*

- 20 1. Where a Modular Plug is identified for 4-pair cable termination at a device, the above requirement  
21 for performance margins does not apply. Performance of the link shall meet the requirements of the  
22 standard (e.g., Category 6).  
23

24 Where Cable, Component and Permanent Link performance is specified to “Meet Category 6A”,  
25 performance shall be defined as follows:  
26

- 27 • Meet or exceed ANSI/TIA Category 6A criteria.  
28

29 Performance Margins exceeding those defined by the referenced standard are not required. PSACR shall  
30 remain positive at all frequencies up to 500-MHz.  
31

32 Cable and connecting components that comprise the “Permanent Link” shall meet or exceed the requirements  
33 for “DTE Power via the MDI” to provide at least 25.5 W at the Powered Device as defined by the IEEE  
34 802.3at-2009 “Power over Ethernet Plus (PoE+)” standard.  
35

36 **Project Requirements**

37 Cable shall be listed as being suitable for use in environment defined.  
38

39 **Cable Rating:**

- 40 • Indoor: CMR or approved substitutes as defined by the NEC. CATV equivalents apply for coaxial  
41 cable where specified.  
42

43 Cable and connectivity type, performance and features for included applications are as follows:

- 44 • Workstation Link (to Equipment Outlet)  
45 Performance Meet Category 6A  
46 Cable type 4-pair w/ Discontinuous Foil over UTP  
47 Cable Jacket Color Blue  
48 Modular Jack Pinning and Color  
49 T568A; Color White  
50
- 51 • Wireless Access Point (WAP) Location  
52 Performance Meet Category 6A  
53 Cable type 4-pair w/ Discontinuous Foil over UTP  
54 Cable Jacket Color Blue  
55 Terminate in 8P8C Modular Plug (Siemon Z-Plug or equivalent).  
56 Modular Jack/Plug Pinning and Color

1 T568A; Color White

- 2
- 3 • Audiovisual Link (Point to Point)
- 4 Performance Meet Category 6A
- 5 Cable type 4-pair w/ Discontinuous Foil over UTP
- 6 Cable Jacket Color Blue
- 7 Modular Jack Pinning and Color
- 8 T568A; Color Blue
- 9

## 10 **HORIZONTAL TWISTED-PAIR CABLE**

### 11 **General**

12 All Cables and Termination hardware shall be technically compliant with and installed in accordance with  
13 the referenced ANSI/TIA documents and perform as required to provide the margins stated herein.

14 All cables shall be suitable for installation in the environment defined.

15 Cables shall be Underwriters Laboratory (UL) listed, comply with Article 800 (Communications Circuits) of  
16 the National Electrical Code and shall meet the specifications of NEMA (low loss), UL 444, and ICEA.

17 Construction:

18 Horizontal Cables shall be constructed of individually twisted pairs with 24-AWG (Category 5e) or 23-AWG  
19 (Category 6 and 6A) - as applicable - insulated solid copper conductors.

20 Pairs shall be identified by a banded color code in which conductor insulation is marked with a dominant  
21 color and banded with a contrasting color as follows:

- 22 Pair 1: White-Blue / Blue (or Blue/White)
- 23 Pair 2: White-Orange / Orange (or Orange/White)
- 24 Pair 3: White-Green / Green (or Green/White)
- 25 Pair 4: White-Brown / Brown (or Brown/White)
- 26

### 27 **Indoor Applications**

28 Cable performance shall be as required to meet the Permanent Link and Channel performance as specified in  
29 the above Article “HORIZONTAL PERMANENT LINK”.

30 Cable Rating shall be as identified in the above article “HORIZONTAL PERMANENT LINK”.

31 Cable Jacket color(s) shall be as identified in the above article “HORIZONTAL PERMANENT LINK”.

32 Cable shall be packaged in a way that minimizes tangling and kinking of the cable during installation.  
33 Examples are open reels or packages that incorporate a rotating reel.

### 34 **Horizontal Cable Termination**

35 Refer to Part 2 articles “EQUIPMENT OUTLET”, “MODULAR PATCH PANEL” and “TERMINATION  
36 BLOCKS”.

37 Termination hardware performance shall be as required to meet the criteria defined in “HORIZONTAL  
38 CABLING / Performance” above.

## 39 **EQUIPMENT OUTLET**

### 40 **General**

41 Horizontal cables shall each be terminated at their designated workstation location in the connector types  
42 described in the sub-sections below. Included are Modular Jacks, [Fiber Optic Connectors][and Coaxial  
43 Connector assemblies]. These connector assemblies shall snap into a mounting frame. The combined  
44 assembly is referred to as the Equipment Outlet (EO).

1 EO mounting configurations shall be as follows:  
2  
3 Flush in new or where existing boxes are in place.  
4  
5 Mounted on Modular Furniture (base panel) - Modular Furniture Type shall be defined prior to  
6 construction.  
7  
8 Mounted in a Floor Box or Poke-Through Assembly.  
9  
10 The Equipment Outlet Frame-wall- and furniture-mount assemblies-shall accommodate:  
11  
12 A minimum of four (4) Modular Jacks when installed on a wall-mounted assembly.  
13  
14 A minimum of two (2) Modular Jacks when installed on modular furniture. Design shall accommodate  
15 bend radius of installed cables.  
16  
17 The outlet frame shall incorporate a mechanism for adjusting the surface plate to a plumb position.  
18  
19 Refer to the project drawings for configuration requirements for mounting in a Floor Box or Poke-Through  
20 Assembly.  
21  
22 Connector mounting in the faceplate/frame shall be as follows.  
23  
24 Wall-mount: Flush  
25  
26 Furniture-Mount: Flush  
27  
28 Floor Box or Poke-Through Assembly: Flush  
29  
30 The same orientation and positioning of Jacks and Connectors shall be utilized throughout the installation.  
31 Prior to installation, submit the proposed configuration for each EO type for review by the Engineer.  
32  
33 Wall Mount Outlet Faceplates shall incorporate recessed designation strips at the top and bottom of the frame  
34 for identifying labels. Designation strips shall be fitted with clear plastic covers.  
35  
36 Unused jack positions shall be fitted with a removable blank inserted into the opening.  
37  
38 Faceplate of the EO shall be constructed of High Impact Plastic.  
39  
40 Faceplate Color shall (1) match other utilities in the building or (2) when installed in Surface Raceway (if  
41 applicable), match the color of the Raceway.  
42  
43 Modular Jack design shall include a Dust Cover which remains with the jack assembly when the jack is in  
44 use. No damage to the Jack pinning shall result from insertion or removal of these covers. Dust covers,  
45 which result in deformation of the jack pinning, shall not be accepted.  
46  
47 **Outlet for Wall-mounted Telephone Sets**  
48 Outlets intended for wall-mounted telephone sets shall be installed where identified ("W") on the Project  
49 Drawing(s). The Wall Plate shall be of Stainless-Steel construction, accommodate one (1) modular jack as  
50 previously defined, mounted on a standard single gang outlet box or bracket and include mating lugs for wall  
51 phone mounting.  
52  
53 **4-pair Copper Connector (Modular Jack)**  
54 Connector type for 4-pair, copper twisted-pair cabling shall be an 8-pin, 8-conductor (8P8C) Modular Jack.  
55

1 The interface between the jack and the 4-pair cable shall be an insulation-displacement type contact.  
2 Termination components shall be designed to maintain the cable's pair twists as closely as possible to the  
3 point of mechanical termination to meet performance requirements.

4  
5 Modular Jacks shall be UL verified and listed.

6  
7 Modular Jack spring wire contacts shall have a minimum of 50 micro-inches of gold plating.

8  
9 Modular Jack performance shall be as required to meet the specified Permanent Link and Channel  
10 performance as specified in the above Article "HORIZONTAL PERMANENT LINK".

11  
12 Connector type used for 4-pair F/UTP cabling-if applicable-shall match the requirements described above  
13 plus:

- 14 • Be of all metal construction or incorporate an overall metal shield.
- 15 • Provide an integral mechanism for achieving shield continuity between the connector and cable.

16  
17 Modular Jack pinning and Color(s) shall be as identified in the above article "HORIZONTAL PERMANENT  
18 LINK".

#### 19 20 **Modular Plug**

21 Where identified for 4-pair cable termination at a communications or security device, Modular Plug shall:

22  
23 Support termination of solid copper conductors of the AWG specific to the cable type specified.

24  
25 Meet the performance limits for the cable type specified as identified in the above article  
26 "HORIZONTAL PERMANENT LINK".

27  
28 Incorporate an overall shield when used to termination F/UTP cable type.

29  
30 Incorporate gold plated contacts.

31  
32 Provide for cable retention means other than the crimped conductors.

33  
34 Be a snag-less design.

35  
36 Retain conductors by means other than crimp on cable.

37  
38 Incorporate strain-relief. A boot is optional.

#### 39 40 **MODULAR PATCH PANEL**

41 Patch Panels shall incorporate Modular Jacks meeting the specifications for the Equipment Outlet detailed in  
42 the above article "EQUIPMENT OUTLET".

43  
44 Jack colors should match those used at the Equipment Outlet.

45  
46 Modular Patch Panel shall be rack-mounted.

47  
48 Rack-mounted panel shall be Flat.

49  
50 Modular Patch Panel configuration shall not exceed 48 ports (2 rows of 24 ports each) in a 2 RU panel.

51  
52 Panel designs which feature removable modular jack assemblies may be partially populated. (See PART 3).

53  
54 Modular Patch Panel cable termination shall:

- 55 • Have the ability to seat and cut 8 conductors (4 pairs) at a time and shall have the ability of terminating  
56 22- through 26-gauge plastic insulated, solid and stranded copper conductors.

- 1 • Be designed to maintain the cable's pair twists as closely as possible to the point of mechanical
- 2 termination.
- 3 • Include color coded designation strips or other markings to identify conductor position.
- 4
- 5 Modular Patch Panels shall incorporate cable support and/or strain relief mechanisms to secure cables at the
- 6 termination block and to ensure that all manufacturers minimum bend radius specifications are adhered to.
- 7
- 8 Modular Patch Panel performance shall be as required to meet the specified Permanent Link and Channel
- 9 performance.
- 10
- 11 Panels on which F/UTP cable is terminated shall incorporate:
- 12 • Ground clip(s) or spade(s) to achieve continuity between the connector shield and cable shield.
- 13 • Ground lugs (2).
- 14

15 **HORIZONTAL JUMPER MANAGEMENT**

16 Equipment Rack shall be equipped with Horizontal Jumper Management Hardware as to allow an orderly

17 routing of twisted pair, optical fiber and coaxial jumpers from the patch panels to the customer provided

18 network equipment.

19

20 Horizontal Jumper management hardware shall be:

- 21
- 22 • A 2 RU (3.5”), plastic or painted steel panel.
- 23
- 24 • Configured with plastic “fingers” or a minimum of five (5) Jumper distribution rings (1.75" x 3.75"
- 25 minimum dimension).
- 26
- 27 • Configured with a cover.
- 28

29 **SPARES AND MISCELLANEOUS MATERIALS**

30 Deliver per Division 1 - General Requirements, “Loose and Detachable Parts”.

31

32 **Spares**

33 Provide:

- 34 • Modular Jacks matching the type(s) provided—consider performance and color(s).
- 35
- 36 • Equipment Outlet Faceplate of the type(s) provided.
- 37
- 38 • 1000-foot box matching the Horizontal Cable type(s) provided. Consider performance and color(s).
- 39 Box shall be new and unopened.
- 40

41 Base spare jack and faceplate quantity on the scope of the initial installation:

42 <u>Installed Jacks</u>	<u>Spare Jacks</u>	<u>Spare Faceplates</u>
43 Initial 100	(10)	(3)
44 200 – 500	(10) additional	(3) additional
45 Each additional 500	(10) additional	(3) additional

46

47 **PART 3 - EXECUTION**

48

49 **GENERAL**

50 Refer to Project Drawings which indicate Equipment Outlet locations, major cable routes and termination

51 location(s) within each building. Coordinate duct allocation with the Agency.

52

53 Furnish and install all cables, connectors, hardware and equipment as shown on drawings and as specified

54 above.

55

1 It is the contractor's responsibility to survey the site and include all necessary costs to perform the installation  
2 as specified.  
3

4 Identifying and report to the UW Construction Representative any existing damage to walls, flooring, tiles  
5 and furnishings in the work area prior to start of work. All damage to interior spaces caused by the installation  
6 of cable, raceway or other hardware must be repaired by the Contractor. Repairs must match preexisting  
7 color and finish of walls, floors and ceilings. Any contractor-damaged ceiling tiles are to be replaced by the  
8 contractor to match color, size, style and texture.  
9

10 Where unacceptable conditions are found, bring this to the attention of the UW Construction Representative  
11 immediately. A written resolution will follow to determine the appropriate action to be taken.  
12

13 Project Design Intent is for cable fill in conduit for communications to not exceed 40% based on the  
14 maximum number of cables anticipated (initial requirement plus 25% growth) and a nominal assumed cable  
15 outside dimension of 0.25 inches". Identify to the UW Construction Rep. shared pathways that do not provide  
16 this capacity.  
17

18 Beginning installation means contractor accepts existing conditions.  
19

20 Should it be found by the Engineer that the materials or any portion thereof furnished and installed under this  
21 contract fail to comply with the specifications and drawings with the respect or regard to the quality, value  
22 of materials, appliances or labor used in the work, it shall be rejected and replaced by the Contractor and all  
23 work disturbed by changes necessitated in consequence of said defects or imperfections shall be made good  
24 at the Contractor's expense.  
25

26 Furnish, install, test and document all cables, termination components and support hardware unless noted  
27 otherwise.  
28

### 29 **EQUIPMENT RACK LAYOUT**

30 Position termination hardware between 18- and 72-inches above the finished floor unless otherwise  
31 directed on drawings.  
32

33 Position Fiber Optic Termination Hardware above other hardware.  
34

35 Layout equipment with Horizontal Management positioned at the top of the rack and adjacent to  
36 termination hardware as specified.  
37

### 38 **SALVAGE MATERIALS**

39 Remove and recycle unused, undocumented and otherwise "abandoned" cables prior to the completion of the  
40 project.  
41

42 The Agency shall be responsible for identifying and labeling all abandoned cable within the boundary of this  
43 project.  
44

45 "Abandoned Cable" is defined per NEC 2011 Articles: 640, 645, 725, 760, 770, 800, 820 and 830.  
46 Further definition is contained in NFPA-75, NFPA-76 and NFPA-90A.  
47

48 Disconnect abandoned Equipment Outlets and remove devices.  
49

50 Remove cabling and communications devices in walls, floors, and ceilings scheduled for removal.  
51

52 Provide blank cover for abandoned Equipment Outlet boxes that are not removed.  
53

54 Schedule work with Owner/Agency and other contractors.  
55



1 Except where noted on the project drawings, materials removed shall become the property of and shall be  
2 disposed/recycled by the Contractor.

3

4 Maintain materials and equipment to be turned over to the UW/agency and/or reused in condition equal  
5 to that existing before work began. Repair or replace materials or equipment damaged by the Contractor  
6 at no additional cost to the State.

7

#### 8 **CLEANING AND INSPECTION**

9 Refer to specification Section 26 05 04 – Cleaning, Inspection and Testing of Electrical Equipment.

10

#### 11 **CABLE INSTALLATION**

12

##### 12 **General**

13

13 Install all cables in continuous lengths from endpoint to endpoint. No splices shall be allowed unless noted  
14 otherwise.

15

16

16 Cable shall be suitable for and meeting the Listing requirements of the installation environment through  
17 which it passes.

18

19

19 Furnish all required installation tools to facilitate cable pulling without damage to the cable jacket. Such  
20 equipment is to include, but not limited to, sheaves, winches, cable reels, cable reel jacks, duct entrance  
21 tunnels, pulling tension gauge and similar devices. All equipment shall be of substantial construction to allow  
22 steady progress once pulling has begun. Makeshift devices, which may move or wear in a manner to pose a  
23 hazard to the cable, shall not be used.

24

25

25 Pull all cable by hand unless installation conditions require mechanical assistance. Where mechanical  
26 assistance is used, care shall be taken to ensure that the maximum tensile load for the cable as defined by the  
27 manufacturer is not exceeded. This may be in the form of continuous monitoring of pulling tension, use of  
28 a “break-away” or other approved method.

29

30

30 Where recommended by the cable manufacturer, use a swivel between the pull-line and pulling grip to  
31 prevent the pull-line from imparting a twist to the cable.

32

33

33 Complete all work using qualified personnel utilizing state-of-the-art equipment and techniques. During  
34 pulling operation an adequate number of workers shall be present to allow cable observation at all points of  
35 duct entry and exit, as well as to feed cable and operate pulling machinery.

36

37

37 Pull cable in accordance with cable manufacturer’s recommendations and ANSI/IEEE C2 standards.  
38 Manufacturer’s recommendations shall be a part of the cable submittal. Recommended pulling tensions and  
39 pulling bending radius shall not be exceeded.

40

41

41 Install cable unenclosed, in a secured metal raceway, in cable tray or in modular furniture as designated on  
42 the plan drawings. All cable shall be free of tension at both ends.

43

44

44 Avoid abrasion and other damage to cables during installation.

45

46

46 Pulling Lubricant may be used to ease pulling tensions. Lubricant shall be of a type that is non-injurious to  
47 the cable jacket and other materials used. Lubricant shall not harden or become adhesive with age.

48

49

49 All cable shall be free of tension at both ends. In cases where the cable must bear some stress, Mesh-type  
50 (e.g., “Kellem”) grips may be used to spread the strain over a longer length of cable.

51

52

52 Manufacturer’s minimum bend radius specifications shall be observed in all instances.

53

54

54 Within the equipment room in which cabling is terminated, use only Hook and Loop (e.g., “Velcro”) ties  
55 from room entry to the point of termination. This is to facilitate the addition of future cables.

56

1 A pull cord (nylon; 1/8" minimum) shall be co-installed with all cable installed in any conduit.

2  
3 **Protection of cable and devices from foreign materials:**

4 Coordinate with other trades and provide adequate physical protection during construction to prevent foreign  
5 material application or contact with cables and devices.

6  
7 Foreign material is defined as any material that would negatively impact the validity of the  
8 manufacturer's performance warranty. This includes, but is not limited, to overspray of paint (accidental  
9 or otherwise), drywall compound, or any other surface chemical, liquid or compound that could come in  
10 contact with the cable, cable jacket or cable termination components.

11 Overspray of paint on any cable, cable jacket, termination component or device will not be accepted.

12 Use of any cleaning agents to remove overspray shall be per the cable manufacturer's written consent.

13  
14  
15  
16 Replace any component or assembly affected by a foreign material. This shall be at no additional cost to the  
17 project.

18  
19 Should the manufacturer and/or warrantor of the structured cabling system desire to physically inspect the  
20 installed condition and certify the validity of the structured cabling system (via a signed and dated statement  
21 by an authorized representative of the structured cabling manufacturer), the Owner may, at their sole  
22 discretion, agree to accept said warranty in lieu of having the affected cables replaced.

23  
24 In the case of plenum cabling, in addition to the statement from the manufacturer, submit a letter from  
25 the local Authority Having Jurisdiction stating that they consider the plenum rating of the cable to be  
26 intact and acceptable.

27  
28 **Horizontal Cable Installation**

29 Refer to the project Drawings which identify the location of the Horizontal Cross-connect and Equipment  
30 Outlet (EO) locations.

31  
32 Route Horizontal Cabling on each Floor to the Telecommunications Room (TR) on that floor or to the  
33 designated TR if on another floor.

34  
35 The maximum Horizontal Cable length shall not exceed 295-feet (90-meters). This length is measured from  
36 the termination in the wiring closet to the equipment outlet and must include any slack required for the  
37 installation and termination.

38  
39 Route horizontal cabling in a fashion as to avoid unnecessarily long runs. Identify and report to the  
40 engineer prior to installation any area that cannot be reached within the above constraints.

41  
42 Where installed unenclosed:

43  
44 Route cable at right angles and clear of other trades work.

45  
46 Support cables utilizing "J-Hook", "Bridle Ring" or similar supports anchored to ceiling concrete, or  
47 structural steel beams. Cable support devices shall be designed to maintain cables bend to larger than  
48 the minimum bend radius. J-Hooks shall incorporate a metal wire or other type closure to retain the  
49 cables. Bridle Rings shall be equipped with "saddles" to maintain the required bend radius.

50  
51 Space supports at a maximum 4-foot interval unless limited by building construction. Cable "sag" at  
52 mid-span shall not exceed 6-inches. Place additional supports as required to clear other trades work.

53  
54 Do not attach cables to or support cables using existing plumbing or steam piping, ductwork, raceways  
55 or cabling.

1 Route cable to allow removal of ceiling tiles. Do not place cable directly on the ceiling grid or attach  
2 cable in any manner to the ceiling grid wires.  
3

4 Limit cable bundles (e.g., those secured with cable ties) to (24) or fewer cables in each bundle.  
5

6 Cable routing shall not limit maintenance access to mechanical systems, piping (e.g., valves, takeoffs for  
7 future work), controls and other systems.  
8

9 Take care in the use of cable ties to secure and anchor the horizontal cabling. Do not overtighten ties as to  
10 compress the cable jacket. No sharp burrs should remain where excess length of the cable tie has been cut.  
11

12 Protect cable sheaths from damage from sharp edges. Where a cable passes over a sharp edge, provide a  
13 bushing or grommet to protect the cable.  
14

15 At Equipment Outlet locations, provide slack in each horizontal cable under 250-feet in length to allow for  
16 change in the office layout without re-cabling. These "service loops" shall be secured at the last cable support  
17 (e.g., J-Hook, Bridle Ring, etc.) before the cable leaves the ceiling. Minimum coil diameter shall be 8-inches.  
18 Secure coils with Hook & Loop cable ties.  
19

20 Slack cable length shall—unless noted otherwise on the project drawings—be as follows:  
21

22 • Where cables enter a fishable wall, conduit, surface raceway or box: 4-feet.  
23

24 • Location where cables are installed into movable partition walls or modular furniture via a service  
25 pole: 15-feet.  
26

27 • At Wireless Access Point (WAP) locations: 20-feet.  
28

29 At all Telecommunication Rooms (TR), provide approximately 10-feet of slack in each horizontal cable to  
30 allow for changes in the telecommunication room layout without re-cabling.  
31

32 This slack shall not be required where a horizontal cable length in excess of 295-feet would result.  
33

34 Secure cable slack to the cable runway above the equipment racks.  
35

36 Cable bends shall be 200% of the cable recommended minimum bend radius or greater.  
37

38 Minimum separation distances between communications wires and cables, and any electric light, power,  
39 Class 1, non-powered fire alarm, or medium power network-powered broadband communications circuit  
40 shall comply with NEC Article 800.  
41

42 In addition, to reduce or eliminate EMI, the following minimum separation distances shall be adhered to:  
43

44 Thirty-nine (39) inches from transformers and motors.  
45

46 Cabling installed unenclosed or in cable tray shall be separated from fluorescent lamps and associated  
47 fixtures by a minimum of 5 inches (125 mm).  
48

49 Zero pathway separation distance is permitted when electrically conductive communications cables,  
50 power conductors or both are enclosed in metallic pathways that meet the following conditions:  
51

- 52 ▪ Metallic pathway(s) completely enclose the power conductors and are continuous;
- 53 ▪ Metallic pathway(s) are properly bonded and grounded per ANSI/TIA-607-B; and
- 54 ▪ Walls of the pathway(s) have a minimum thickness 1 mm (0.04 in) nominal if made of steel (1/2”  
55 EMT minimum)

1 No separation is required between power and communications cables crossing at right angles. The cables  
2 shall not, however, be supported by the power cabling.

3  
4 Sleeve all openings and fire-stop per prevailing code and building construction ratings upon completion of  
5 cable installation.

### 6 7 **Grounding**

8 Where a cable incorporates metal armor, strength elements, shielding or other metallic elements (not  
9 including conductors), Bond those elements to an approved ground using a #6 AWG solid copper conductor.  
10 Cable grounding hardware and method shall be per manufacturer's recommendations.

11  
12 The grounding shall be as close as practicable to the point of entrance.

### 13 14 **EQUIPMENT OUTLET**

#### 15 **General**

16 Mount outlets flush in wall-, ceiling- and/or ceiling mounted boxes, in floor boxes and/or poke-through  
17 assemblies, on Surface Raceway and in modular furniture. Refer to project drawings for applicable outlet  
18 types.

19  
20 Mount level.

21  
22 Unless noted otherwise on drawings, default mounting height (from finished floor to center line of outlet) in  
23 new installation shall be as follows:

24  
25       Standard Equipment Outlet                   18-inches

26  
27       Outlet for Wall-Mounted Telephone       per ADA

28  
29 Assemble and terminate connectors per manufacturer's recommendations.

30  
31       In shielded installations, assemble to ensure continuity between connector shield and cable shield.

32  
33 Fit all Connectors (e.g., modular jacks and coaxial type) with a dust cover. If the modular jack design requires  
34 an integral dust cover, ensure that the covers are securely seated.

#### 35 36 **Wireless Access Point (WAP) Locations**

37 Unless noted otherwise on drawings, mount Equipment Outlet intended for use with a Wireless Access Point  
38 (WAP) as follows:

39  
40       Drop Ceilings - Cut ceiling tiles and deliver cabling into 4-11/16" square, deep outlet box mounted on a  
41 grid box hanger (a.k.a. "tile bridge").

42  
43       Exposed Ceilings (surface mount) - cabling piped to a 4-11/16" square, deep outlet box. Unless mounted  
44 to structure, support outlet box using threaded rod or other means. Mount so assembly is horizontal.

45  
46       Reduce 2-gang or larger openings to 1-gang using "mud ring".

47  
48 Equipment Outlet locations for Wireless Access Points as shown on drawings are approximate. Coordinate  
49 final locations with Agency.

### 50 51 **CABLE TERMINATION**

#### 52 **General**

53 At the Telecommunications Rooms, position all Data and Voice Cables on termination hardware in sequence  
54 of the Outlet I.D. starting with the lowest number.

1 Termination Hardware (Blocks and Patch Panels) Positioning and Layout must be reviewed and approved  
2 by the Engineer prior to construction. The review does not exempt the Contractor from meeting any of the  
3 requirements stated in this document.

4  
5 At each Equipment Outlet (or communications or security device where cable is terminated in a Modular  
6 Plug), terminate cabling per manufacturer's recommendations and as identified in the above article  
7 "HORIZONTAL PERMANENT LINK".

8  
9 Where F/UTP cabling is installed, maintain continuity of the shield from Modular Patch Panel to EO or  
10 Modular Plug.

11  
12 **Cable Termination - Modular Patch Panels**

13 Install Modular Patch Panel(s) in a fashion as to allow future horizontal cabling to be terminated on the panel  
14 without disruption to existing connections.

15  
16 Size Modular Patch Panels to accommodate a minimum of 20% growth in the quantity of equipment outlets  
17 relative to the initial installation.

18  
19 Panel designs which feature removable modular jack assemblies may be partially populated.

20  
21 Cables designated for various systems (e.g., Network, WiFi, Security) shall be terminated on shared patch  
22 panels.

23  
24 At Equipment Outlet and Modular Patch Panel, ensure that the twists in each horizontal cable pair are  
25 preserved per manufacturer's recommendations, typically to within 0.5-inch of the termination. Remove the  
26 cable jacket only to the extent required to make the termination.

27  
28 Bond F/UTP cable shield and drain wire to connecting hardware per manufacturer's instructions. Bond  
29 connecting hardware to the Telecommunications grounding system.

30  
31 Provide horizontal cable management hardware above and below each Modular Patch Panel.

32 *Exception:* Where angled patch panels are specified, provide horizontal management above and below  
33 patching area. In large installations, add management in the middle of the patching area. Refer to  
34 project drawings.

35  
36 **IDENTIFICATION AND LABELING**

37 Refer to Section 27 05 53 "Identification for Communications Systems" for Identification and Labeling  
38 guidelines for this Project.

39  
40 Label all Backbone and Horizontal Cable, Outlet Faceplates, and Termination components (e.g., Voice  
41 Termination Blocks & Modular Patch Panel).

42  
43 Prior to installation, provide samples of all label types planned for the project. These samples shall include  
44 examples of the lettering to be used.

45  
46 **TESTING AND ACCEPTANCE**

47 **General**

48 Prior to testing, provide a Test Plan for each cable type including equipment (makes/models) to be used, set-  
49 up, pass/fail limits and results format. A sketch of each test set-up (hand-drawn is OK) and results report  
50 examples are encouraged.

51  
52 The Test Plan shall consider the requirements identified below plus any manufacturer-required test,  
53 test method or reporting format needed to support the specified warranties.

54

1 Test results format should include proposed filenames and be organized by Cable Type, Subsystem  
2 (Horizontal or Backbone), Building and Equipment Room. Prefix filenames with the UWSA project  
3 number.

4  
5 Content of native format records should be organized to allow for interim records to be combined  
6 into the composite results package required at project closeout.

7  
8 Failure to provide the above information shall be grounds for the Engineer and/or UW to reject any and all  
9 Documentation of Results on related testing and to require a repeat of the affected test(s).

10  
11 Visually inspect all cabling and termination points to ensure that they are complete and conform to the wiring  
12 pattern defined herein. Provide to the Engineer with a written certification that this inspection has been made.

13  
14 Conduct acceptance testing according to a schedule coordinated with the Agency and UW.

15  
16 Agency and UW representatives may be in attendance to witness the test procedures. Provide a  
17 minimum of one (1) week advance notice to allow for such participation.

18  
19 Provide Test Plan as part of this notice or sooner.

20  
21 Supply all equipment and personnel necessary to conduct the acceptance tests.

22  
23 Test equipment and measurement methods shall comply with the standards referenced in PART 1.

24  
25 All equipment used in testing shall be maintained and calibrated per manufacturer's guidelines. Provide  
26 documentation of equipment calibration.

27  
28 Set Test Unit Limits to match specified performance requirements. For example, for Category 6 Horizontal  
29 Cabling, limits should be set to "Category 6 Permanent Link". Test limit for fiber optic cable should be set  
30 to consider cable length, connectors and, if applicable, splices as detailed in PART 2 and below.

31  
32 Perform tests related to connected equipment by others only with the permission and presence of the agency  
33 and/or responsible contractor.

34  
35 The Engineer or UW may request that a random field re-test—not to exceed 10% of the installed cabling—be  
36 conducted on the cable system to verify documented findings. Tests shall be a repeat of those defined above.  
37 If findings contradict the documentation submitted by the Contractor, additional testing can be requested to  
38 the extent determined necessary by the Engineer, including a 100% re-test. Any and all re-tests shall be at  
39 no additional cost to the project.

40  
41 All cabling shall be 100% fault free. Should it be determined by the Engineer that the materials or any portion  
42 thereof furnished and installed under this contract fail to comply with the specifications and drawings with  
43 regard to quality, performance, value of materials, appliances or labor used in the work, it shall be rejected  
44 and replaced by the Contractor and all work disturbed by changes in consequence of said defects or  
45 imperfections made good at the Contractor expense.

46  
47 Where the installation includes use of existing or agency-provided cabling and/or connectivity components,  
48 links that fail to meet the specified limits (e.g., Category 6) shall be evaluated by the contractor to determine  
49 the likely cause of the failure. Contractor shall propose a plan for corrective action to the UW Construction  
50 Representative and Engineer for approval prior to any rework and/or cable or component replacement. Such  
51 corrective actions and related re-tests will be considered additions to contractor scope.

1     **Documentation**  
2     See Article DOCUMENTATION for required content and formats.  
3  
4     **Horizontal 4-pair Copper Cabling**  
5     General  
6     Test from the Equipment Outlet to the Modular Patch Panel (or Wiring Block) at the TR on which the cables  
7     are terminated.  
8  
9     Cables shall be installed and dressed at the patch panel and secured in the outlet box at the Equipment Outlet  
10    location with the faceplate in place.  
11  
12    The cabling must pass all the specified requirements. Conditional passing test results that are within the  
13    measurements accuracy of the test equipment (e.g., “\*PASS”) are not acceptable.  
14  
15    When the EO is located on/in the wall behind modular furniture, a patch cord may be inserted into the EO to  
16    allow the furniture to be returned to its normal location. Cable testing, in this case, will be done with the  
17    patch cord. If the cable test fails only due to the length of the patch cord, the UW will accept the cable as  
18    passing. Provide list of such locations in Test Results documentation.  
19  
20    Horizontal cables shall be free of shorts within the pairs, and be verified for continuity, pair validity and  
21    polarity, and Wire Map (Conductor Position on the Modular Jack).  
22  
23    Correct any defective, split or mis-positioned pairs.  
24  
25    Additional testing of Cabling Systems rated at TIA Category 5e and higher shall be performed to confirm  
26    proper functioning and performance.  
27  
28    Performance Testing  
29    Test Performance per ANSI/TIA-568-C.2 Permanent Link test configuration and procedures.  
30  
31    Test using a test instrument designed for use with the installed cable type(s) and specified standards. The  
32    instrument shall verify “PASS” on each cable and record the results of all tests, comparing measured values  
33    with standards-based limits.  
34  
35    Test Transmission Performance of Horizontal Cabling to include the following:  
36  
37        Length  
38        Attenuation (Insertion Loss)  
39        Pair-to-Pair NEXT Loss  
40        PSNEXT Loss  
41        Attenuation-to-Crosstalk Ratio (ACR)  
42        Power-sum ACR (PSACR)  
43        Propagation Delay  
44        Delay Skew  
45        Return Loss  
46        DC Loop Resistance  
47        ANSI/TIA-1152 Optional++ Tests including:  
48            Transverse Conversion Loss (TCL)  
49            Equal Level Transverse Conversion Transfer Loss (ELTCTL)  
50            DC Resistance Imbalance (in-pair & pair-to-pair)  
51  
52    The maximum length of horizontal cable Permanent Link shall not exceed 90 meters (295 feet).  
53  
54    Program test unit to match Net Propagation Velocity (NPV) of the installed cable type.  
55

1 In the event results of the tests are not satisfactory, make changes as necessary and repeat the test or tests  
2 which disclosed faulty or defective material, equipment or installation method.

### 3 4 Special Considerations

5 Where Cabling is terminated in a Modular Plug at the device location (e.g., Video Surveillance Camera or  
6 Wireless Access Point), test per standards for a Modular Plug Terminated Link (MPTL)..

7  
8 Where the horizontal cabling includes an interconnect (e.g., where a zone cable is extended from a  
9 Consolidation Point to the work area Equipment Outlet (EO)), testing of the Permanent Link shall be from  
10 the Horizontal Cross-connect at the Telecom Room to the EO and include the interconnect.

11  
12 Where a Surge Protector is in place as part of the Horizontal Permanent Link, performance testing shall  
13 include the Surge Protector as part of the link.

14  
15 Where F/UTP cabling is installed, testing shall include Shield Continuity.

## 16 **DOCUMENTATION**

### 17 **General**

18 Provide project documentation as detailed in the sub-sections below.

19  
20  
21 Submit all documentation in electronic form.

22  
23 In addition, provide (1) paper copies of Record Drawings.

24  
25 Where documentation provided in electronic form requires unique software (e.g., NATIVE formats) other  
26 than Adobe Acrobat Reader for viewing test results, provide one (1) copy of such software. The software  
27 shall run on MICROSOFT *Windows operating system*. Software shall include license if applicable.

28  
29 Organize documentation by Building, Telecom Room and cable type.

30  
31 Name file(s) and records to include building, route or other cable identifiers that match labeling formats used.  
32 Prefix file name with the UWSA project number.

33  
34 Provide test results and describe the conduct of the tests including the date of the tests, the equipment used,  
35 and the procedures followed. At the request of the Engineer, provide copies of the original test results.

36  
37 Where interim documentation has been submitted, submit a composite results package containing all  
38 records at project closeout.

39  
40 Where the installation includes re-use of existing cabling and/or components, documentation shall include a  
41 summary of such materials including manufacturer/part and where used.

### 42 43 **Test Data - Copper Media**

44 Test results shall include a record of test frequencies, cable type, conductor pair and cable I.D. (see 27 05 53),  
45 measurement direction, test equipment type, model and serial number, calibration date, test date, reference  
46 setup, and crew member name(s).

47  
48 Submit Test Results for each Horizontal Link and each Backbone Cable in electronic form as follows:

49  
50 In the native format of the test instrument (e.g., flw for Fluke, .sdf for Agilent or Ideal, etc.).

51  
52 Summarized in a fashion that includes a graphical display of key test parameters. The Summary shall  
53 be in Adobe Acrobat (.pdf) format and include all records. Individual .pdf documentation of individual  
54 records (e.g., for each horizontal cable) are not required.

55  
56 Summary should display Margins (Headroom) for each cable.



1  
2 Individual records for Horizontal Cabling shall identify Outlet ID using a consistent format for all records to  
3 allow for sorting.  
4  
5 **Record Drawings**  
6 Provide Record Drawings which denote as-built information.  
7  
8 Include cable routes and outlet locations.  
9  
10 Identify Telecommunications and other low-voltage Outlet locations by their sequential number as  
11 defined elsewhere in these documents. Numbering, icons and drawing conventions used shall be  
12 consistent throughout all documentation provided.  
13  
14 The UW will provide floor plans in electronic (*AutoCAD* .dwg) format on which as-built construction  
15 information can be added. Modify these documents to denote as-built information as defined above and  
16 return to the Engineer for acceptance. Coordinate the schedule for creation of these drawings, including  
17 interim and final sets, during construction to accommodate scheduled occupancy.  
18  
19 Refer to DFD “CAD Standards Manual” for file format, naming and other applicable guidelines.  
20  
21 Identify each drawing submitted by the Contractor as part of the Project Documentation as a “Record  
22 Drawing” (RD) and include a) the contractor name and/or logo, and b) the date of the drawing.  
23  
24 Retain all fonts, color, layer, Model Space/Paper Space conventions established in the base drawings by  
25 the Contractor in preparation of the As-built drawings.  
26  
27 Prior to generation of the drawings, provide a sample file to the Engineer for review and approval.  
28  
29 All documentation, including hard copy and electronic forms shall become the property of the State.  
30  
31 **Construction Verification**  
32 Provide applicable construction Verification Checklists included in specification Section 27 08 00 and in  
33 accordance with the procedures defined for in specification Section 01 91 01 or 01 91 02.  
34  
35 **TRAINING**  
36 Provide training covering the installed system to Agency Staff, and/or contract maintenance personnel.  
37  
38 Training to include:  
39 • Overview of System Topology and General Concepts  
40 • Overview of Products Used  
41 • Overview of Labeling Formats  
42 • Overview of Test Results and their meaning  
43 • Overview of Documentation (Record Documents, O&M Manuals)  
44  
45 Other project team members (e.g., UW Project Manager, Engineer, others) may, at their discretion, participate  
46 in the session as a presenter.  
47  
48 Coordinate with UW Construction Representative, Agency Staff, and Engineer to schedule session(s).  
49 Provide adequate notification to accommodate participant schedules.  
50  
51 Training shall be held at Project Site and shall be conducted during normal working hours.  
52 For purposes of bidding, assume (1) Training Session(s). Coordinate training with Agency to  
53 accommodate staff schedules.  
54  
55 Number of Students per session shall be 6 or less.  
56

1 Provide electronic copies of training material plus plus paper copies for each student plus (2)  
2 additional copies.

3  
4 Owner reserves the right to record session(s) for use as future refresher materials for Agency technical staff.

5  
6 **WARRANTY**

7 See Division 1, GENERAL CONDITIONS, and GENERAL REQUIREMENTS - Guarantee Documents for  
8 general requirements.

9  
10 Where all materials are contractor-provided, minimum Warranty Period for Structured Cable System sub-  
11 systems shall be as follows:

12  
13 Horizontal Copper Permanent Link – 15 years. Warranty shall be direct from manufacturer(s) of cabling  
14 and connecting components to Owner.

15 Exception: Where cabling is terminated in a modular plug, such links shall be covered by a 2-year system  
16 warranty. Cabling and Connecting Components shall carry a 15-year manufacturer’s component  
17 warranty.

18  
19 Warranties shall include all labor, material, and travel time.

20  
21 Where the project includes re-use of existing cabling and/or components or installation of agency-furnished  
22 materials, contractor warranty shall be per Division 1 and cover contractor-provided materials. Cable and  
23 connecting component warranties shall be as indicated above.

24  
25 Provide Warranty Certification of the Horizontal Copper Permanent Link from the manufacturer(s) of cabling  
26 and connecting components as part of system documentation.

27  
28 Submit documents to manufacturer as required for Extended Warranties.

29  
30 END OF SECTION

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**SECTION 28 10 00**  
**ACCESS CONTROL SYSTEM**  
**BASED ON DFD MASTER SPECIFICATION DATED 03/01/23**

**PART 1 - GENERAL**

**SCOPE**

This specification section describes the products and execution requirements relating to the furnishing, installation, testing, and commissioning of a complete Access Control System and placing it into satisfactory operation.

This system is an extension of the existing Schneider Electric Andover Access Control System.

In general, work consists of installation of new access control equipment, hardware and devices and all associated cabling as part of this project.

CLASS 1 NOTICE:

Notice is hereby given in accordance with Section 16.855(10), Wisconsin Statutes, that the Division believes it is in the best interests of the State to contract the following work from only one source, without the usual statutory procedures:

- Schneider Andover Continuum

Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Related Work
- Quality Assurance
- References
- Inspections and Permits
- Submittals

**PRODUCTS**

**PART 2 -**

- General
- Credential Readers
- Miscellaneous Field Devices
- Cabling

**PART 3 - EXECUTION**

- General
- Coordination
- Continuity of Existing Services and Systems
- Installation
- Identification and Labeling
- Acceptance Testing
- Documentation
- Warranty

Major features of the Access Control System and responsibilities to furnish and/or install equipment, install cabling, and terminate cabling are as follows:

Division 08 contractor-furnished, Division 08 contractor-installed

- ADA Door Operators
- ADA Door Operator Pushbuttons
- Electric Latches and Strikes
- Push-bars with integrated request-to-exit switches
- Power-transfer Door Hinges
- Door-Position Switches

1  
2 Division 28 contractor-furnished, Division 28 contractor installed

- 3 - Cabling:  
4 ADA door operators to ADA door operator pushbuttons  
5 Field Device to Controller (incl. signal and power)  
6 Network Cabling (Controller to Network Switch)  
7 Cable Termination at Field Devices  
8 Cable Termination at Controller  
9 - Credential Readers  
10 - Door lock Power Supplies  
11 - Request-to-Exit Devices (PIR)  
12 - Door Release Pushbuttons

13  
14 Agency-furnished, Agency-installed or Existing

- 15 - Badging System  
16 - Central Equipment Hardware  
17 - Central Equipment Software / Credential Database  
18 - Database Updates (door assignments, scheduling other programming)

19  
20 All raceways and pull boxes, conduit and cables supports, grounding hardware, and bonding as required for  
21 a full and functioning system shall be installed and documented by this Division 28 Contractor, as detailed  
22 in this and related section(s).

23  
24 **RELATED WORK**

25 Applicable provisions of Division 1 govern work under this Section.

- 26  
27 Section 01 91 01 or 01 91 02 – Commissioning Process  
28 Section 08 71 00 – Door Hardware  
29 Section 26 05 26 – Grounding and Bonding for Electrical Systems  
30 Section 26 05 29 – Hangers and Supports for Electrical Systems  
31 Section 26 05 33 – Raceway and Boxes for Electrical Systems  
32 Section 26 05 36 – Cable Tray for Electrical Systems  
33 Section 26 05 53 – Identification for Electrical Systems  
34 Section 27 05 53 – Identification for Communications Systems  
35 Section 27 10 00 – Structured Cabling

36  
37 **QUALITY ASSURANCE**

38 **Bidder Qualifications**

39 The intent of these quality assurance requirements is to ensure that the installing contractor has the  
40 capabilities to engineer, install, and commission the devices as specified under this section.

41  
42 Installing contractor must be a firm specializing and experienced in Access Control system installation for  
43 no less than 3 years.

44  
45 Installing contractor must be a branch office or an authorized representative of the manufacturer of the  
46 specified Access Control System” as required to support the warranty stated herein. Such authorization must  
47 have been in effect for a period of not less than three years at the time of Bidding and remain so throughout  
48 project.

49  
50 Installation of equipment and cabling shall be done by qualified staff in the direct employ or directly  
51 subcontracted and under the supervision of the manufacturer or Authorized Representative.

52  
53 **REFERENCES**

54 All work and materials are to conform to applicable rules and requirements of the Wisconsin State Electrical  
55 Code (SPS 316), the National Electrical Code (NFPA 70), other applicable National Fire Protection

1 Association codes, the National Electrical Safety Code, Federal Communications Commission (FCC) rules,  
2 and present manufacturing standards (including NEMA).

3  
4 All materials shall be listed by UL and shall bear the UL label. If UL has no published standards for a  
5 particular item, then other national independent testing standards shall apply, and such items shall bear those  
6 labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.

7  
8 Other applicable standards are as follows:  
9 FCC Part 15 as applicable to the equipment type(s) included  
10 UL 294 Standard for Access Control System Units

## 11 **INSPECTIONS AND PERMITS**

12 Refer also to Division 1, General Conditions, Permits, Regulations, Utilities and Taxes.

13  
14 Obtain and pay for all required state or local installation inspections and permits except those provided by  
15 the Architect/Engineer. Deliver originals of required certificates UW Construction Representative. Include  
16 copies of the certificates and reports in the Operating and Maintenance Manuals.

## 17 **SUBMITTALS**

### 18 **General**

19 Under the provisions of Division 1, prior to the start of work, submit:

- 20 • Bidder Qualifications
- 21 • Shop Drawings

22  
23 Group Submittals to include complete documentation of related systems, products, and accessories in a single  
24 submittal.

25 Submittals shall be electronic format (ADOBE Portable Document format “.pdf”) thereof.

### 26 **Bidder Qualifications**

27 Furnish documentation of contractor capabilities as identified under “Quality Assurance / Bidder  
28 Qualifications” above.

29  
30 Where installing contractor is an authorized representative of the Card Access System manufacturer, submit  
31 written confirmation of such authorization from the manufacturer. Indicate in letter of authorization that  
32 installing contractor has successfully completed all necessary training required for engineering, installation,  
33 and commissioning of equipment. Letter should indicate the start date of such authorization.

### 34 **Shop Drawings**

- 35 • Product data for all equipment, hardware cabling and miscellaneous components proposed.
- 36 • Schematic drawings - specific to project - of all circuits from the field devices to the required  
37 connection points. The diagrams shall show schematic wiring of equipment and all connections to be  
38 made to devices. Terminal connections in the equipment shall be numbered to correspond to the  
39 diagrams for use in making connections. Wiring diagrams shall be coordinated so that terminal  
40 numbering, circuit designation and equipment or device designations are the same on all drawings. All  
41 drawings must be submitted and approved by the Engineer before installation starts, but such approval  
42 will not waive specification requirements unless specifically stated.

43 Mark submittal package with specification section number. Do not mix sections in a single submittal.

44 Work shall not proceed without Engineer approval of the submitted items.

45 No substituted materials shall be installed except by written approval from the Engineer.

### 46 **Test Plan**

47 Submit Test Plan during construction. See Part 3.

48

1 **Work Permit**

2 None required.

3  
4 **Mock-ups**

5 Upon request, provide a mock-up of Control Panel enclosure. Include applicable hardware, cabling, interface  
6 types (barrier strip, modular jack, etc.).

7  
8  
9 **PART 2 - PRODUCTS**

10  
11 **GENERAL**

12 All contractor-furnished items shall be compatible with the existing system as identified above.

13  
14 New system devices installed as part of this project will integrate into the existing campus-wide system. No  
15 substitutions will be allowed unless otherwise noted.

16  
17 Licensing where applicable will be provided by the owner.

18  
19 **CREDENTIAL READERS**

20 **Proximity Card Reader**

21  
22 Frequency: 125 kHz and 13.56 MHz.

23  
24 Output format: Wiegand and Open Supervised Device Protocol (OSDP)

25  
26 Read Range: up to 8.0 inches (Wall-mount); up to 6.0 inches (Mullion-mount). Dependent upon installation  
27 conditions and credential type.

28  
29 Power: 5-16 VDC

30  
31 Polycarbonate housing, IP55 rated for indoor and outdoor use, operating temperature of -22 to 150 degrees  
32 Fahrenheit.

33  
34 Reader provides visual – typically a change in color of LED from red to green – and an audible indication of  
35 acceptance or denial of credentials when card is presented to the reader.

36  
37 Wall-mount: HID multiCLASS SE RP40. Mounts in 1-gang electrical box.

38  
39 Mullion-mount: HID multiCLASS SE RP10 or multiCLASS SE RP15.

40  
41 Proximity Card Readers manufactured by others shall be considered equals provided they meet or exceed  
42 in performance and quality as specified.

43  
44 Color: Architect to select standard color option. Confirm during shop drawing review.

45  
46 **MISCELLANEOUS FIELD DEVICES**

47 **Request-to-Exit (REX)**

48 Refer to drawings and schedules for applicable REX type(s).

49  
50 Integral to Door Hardware type: By Division 08 Contractor.

51  
52 Motion-Sensor type:

- 53
- 54 • Passive infrared (PIR) sensing with an adjustable 8 ft. x 10 ft. coverage area.
  - 55 • Designed for wall mounting above a door.
  - 56 • Listed as an access control device under the UL 294 standard.
  - 57 • Configured with a minimum of two from “C” relay contacts with an adjustable latch time.
  - Programmable for fail-safe or fail-secure modes. Configured with an activation LED.

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**Door Release Pushbuttons**

Code required exit pushbuttons shall be wired to directly remove power to the lock at the door location and not through the electronic card key control panel.

Time delay to relock shall be adjusted for 30 second

SCHLAGE Cat. No. 631-AL-EX or approved equal.

**CABLING**

**General**

All cables shall be suitable for installation in the environment defined.

Any cabling installed unenclosed shall meet a CMP rating (or approved substitutes as defined by the referenced NEC).

Cables shall be Underwriters Laboratory (UL) listed and comply with Article 800 (Communications Circuits) of the National Electrical Code.

Use consistent wire colors throughout the project for field device and other connections.

**Field Device to Controller**

Per manufacturer’s recommendations.

**Horizontal (Telecom) Cabling**

Refer to specification Section 27 10 00 – Structured Cabling for cable and termination requirements for horizontal links designated for Access Control System locations.

**PART 3 - EXECUTION**

**GENERAL**

The complete installation shall be done in a neat, workmanlike manner in accordance with Division 26 of these documents and manufacturer's recommendations.

Review the project drawings to identify rough-in, cabling and device requirements all controlled and monitored doors.

**COORDINATION**

Coordinate with the Division 08 contractor regarding the doorframes and hardware equipment which is associated with the Access Control System. Verify rough-in and installation requirements for all door frame mounted and/or door mounted control and monitoring equipment.

Prior to start of construction, confirm installation requirements with the Agency. The coordination shall include, but not be limited to, hardware, cabling and wiring requirements including types, sizes, color-coding schemes, labeling, wire way requirements, termination responsibilities, and cable identification requirements.

Prior to the start of system installation, schedule and facilitate a pre-installation meeting with the pertinent hardware, lock, exit device, and door closer manufacturers’ representative(s), UW Milwaukee Police Department representative, and related trades to coordinate materials, techniques, and to sequence complex hardware items and system installation. Proper installation and adjustment of hardware is to be reviewed. Convene at least one week prior to commencement of access control installation. Provide written documentation of the meeting including date, attendee/participant list and minutes. Distribute to A/E, Agency and UW within seven (7) days of the meeting date.

1 Coordinate with Division 26 installer to confirm required cabling pathways, device rough-ins, and line-voltage power requirements.

2  
3  
4 Coordinate hardware placement, cabling, and interface requirements relating to elevator cab-mounted credential readers (if applicable) with the elevator contractor.

5  
6  
7 Prior to system start-up, provide support to agency for updates to central equipment and software as required to add the new components to the overall system. Consider field device locations, controller addresses and other information, network links, etc. as applicable.

#### 10 11 **CONTINUITY OF EXISTING SERVICES AND SYSTEMS**

12 No outages shall be permitted on existing systems except at the time and during the interval specified by Agency and site representatives. Obtain written approval for any outages.

13  
14  
15 Schedule any outage when the interruption causes the least interference with normal site schedules and business routines. No extra costs will be paid to the Contractor for such outages which must occur outside of regular weekly working hours.

16  
17  
18  
19 Refer to General Requirements.

20  
21 Restore any service interrupted as a result of this work to proper operation as soon as possible.

#### 22 23 **INSTALLATION**

##### 24 **General**

25 Receive, store and install Access Control System equipment and cabling as specified.

26  
27 Comply with the manufacturer's instructions and recommendations for installation of all products.

28  
29 Provide all system wiring between all components in accordance with manufacturer's guidelines. Each cable for each device shall be home run. No splices are allowed unless otherwise noted.

30  
31  
32 Intermediate termination points within a wire run would be considered a splice. If intermediate termination points are allowed, with prior approval of the Agency and the Engineer, provide pull boxes and terminal strips permanently labeled with the numbering scheme per Agency's requirements.

33  
34  
35  
36 Mount all credential readers where shown on plans. Placement shall be in accordance with Americans with Disabilities Act (ADA) requirements.

37  
38  
39 Locate all request-to-exit motion detectors directly above the door frame, centered on the door opening (as applicable). Adjust sensitivity to permit operation on motion of persons within 2'-0" of door. Avoid false activation by persons passing by where possible.

40  
41  
42  
43 Provide wiring to request-to-exit devices located in electrified door hardware.

##### 44 45 **Controller Installation - General**

46 Install, wire, and power per manufacturer's recommendations.

##### 47 48 **Cable Installation - General**

49 Route Cable for field devices in raceway unless otherwise noted.

50  
51 Route system cabling to equipment per the Access Control System installation diagrams. Provide all interconnecting cabling from the head-end, between controllers, and between peripheral devices.

52  
53  
54 Route cabling/conduit on secure side of door.



1 Where cables are to be installed unenclosed (without raceway) the cable shall meet NEC requirements for  
2 the application and installation environment. See Cable Installation - Unenclosed below.  
3  
4 Route in conduit, all exposed vertical cable extensions to devices located below the finished ceiling.  
5  
6 Install and terminate cable as required at each door location.  
7  
8 Observe cable manufacturers minimum bend radius in all instances. Take care in the use of cable ties to  
9 secure and anchor the station cabling. Do not overtighten cable ties as to compress the cable jacket. No  
10 sharp burrs should remain where excess length of the cable tie has been cut.  
11  
12 All cable shall be free of tension at both ends. Provide strain relief connectors at each device and junction  
13 box where cables enter.  
14  
15 Use suitable cable fittings and connectors.  
16  
17 **Cable Installation – Unenclosed**  
18 Where unenclosed cable installation is permitted and as designated on the plan drawings, route cabling to  
19 avoid areas of high traffic (i.e., aisle way) and as close as possible to outlining walls. Cable route shall be a  
20 minimum of ten (10) feet above finished floor. Provide protection for exposed cables where subject to  
21 damage.  
22  
23 Route cabling neatly at right angles and be kept clear of other trades work.  
24  
25 Support cabling at a maximum of 4-foot intervals utilizing “J-Hook” or “Bridle Ring” supports anchored to  
26 structure. Cable sag at mid-span shall not exceed 6-inches. Install supports to maintain cable bend to larger  
27 than the minimum bend radius.  
28  
29 Do not attach-to or support cabling from existing cabling, plumbing or steam piping, ductwork, suspended  
30 ceiling supports, or electrical or communications conduit. Do not place cable directly on the ceiling grid or  
31 attach cable in any manner to the ceiling grid wires.  
32  
33 Provide 4-foot slack in each cable in accessible ceiling at each device location. Secure cable slack—coiled  
34 from 100% to 200% of the cable recommended minimum bend radius— (wire tied) at the last cable support  
35 before the cable reaches the device and shall be.  
36  
37 **Field Device Installation**  
38 Field devices are shown on the drawing locations diagrammatically and shall not be used for dimensioning  
39 of final location. The exact location of door control devices shall be determined by the Division 28 contractor  
40 and verified with the General and Division 08 contractors.  
41  
42 Multiple devices (i.e., intercoms, card readers, etc.) at door locations shall be mounted adjacent to each other.  
43  
44 Mount Credential Readers at 42" AFF to center unless noted otherwise on drawings.  
45  
46 Card reader stations shall not be mounted back-to-back on a common wall. Maintain separation to eliminate  
47 one card reader reading through the wall to a card reader on the opposite side.  
48  
49 When mounting credential readers on a new surface-mounted box, match box dimensions to the dimensions  
50 of the credential reader. (Example: For mounting HID ProxPro II 5455 or reader of similar dimension, a  
51 Wiremold V5752 2-gang alarm device box, or equivalent, is appropriate.)  
52  
53 Coordinate with Division 26 all 120-volt connections to access control panels, and at remote and local door  
54 power supply locations as indicated on the drawings.  
55

1 **Door Control Interface Wiring**

2 Obtain from the Division 08 contractor all necessary cut sheets, wiring diagrams, and manufacturer’s  
3 installation instructions.

4  
5 Install door control wiring at each door location according to manufacturer’s wiring instructions and as  
6 provided by the hardware supplier, including standard locations and all special function controls for  
7 interlocking doors and fire release door locations.

8  
9 **Emergency Door Release**

10 There are two types of emergency door release events:

11 • **Condition 1 – Emergency Fire Alarm**

12 Doors that receive their lock power from centralized power supplies adjacent to the access control panels:  
13 This door type, which, when scheduled to be unlocked in a Condition 1 - Emergency Fire Alarm  
14 condition, shall unlock from a fire alarm interface control module at the centralized power supply. When  
15 activated, the fire alarm interface control module removes power to the power supply that feeds the  
16 locks.

17  
18 Doors that are associated with crash bars and rim mounted electric locks: The electrical in-rush current  
19 of these devices makes it necessary to control these locks from a local power supply provided with the  
20 device. This door type, which, when scheduled to be unlocked in a Condition 1 - Emergency Fire Alarm  
21 condition, shall unlock from a fire alarm interface control module located at the door’s local power  
22 supply.

23  
24 • **Condition 2 – Emergency Response**

25 Doors that receive their lock power from centralized power supplies adjacent to the access control panels:  
26 This door type, which, when scheduled to be unlocked in a Condition 2 - Emergency Response condition,  
27 shall unlock from the key switch control located per the drawings at the fire alarm control panel located  
28 in the lobby. When activated, the key switch removes power to the power supply that feeds the locks.

29  
30 Doors that are associated with crash bars and rim mounted electric locks: The electrical in-rush current  
31 of these devices makes it necessary to control these locks from a local power supply provided with the  
32 device. This door type, which, when scheduled to be unlocked in a Condition 2 - Emergency Response  
33 condition, shall unlock from the same key switch control as noted above. When activated, the key switch  
34 removes power to the power supply that feeds the locks.

35  
36 **Network**

37 Where identified in PART 1, provide network electronics as required for links between Control Panels and  
38 to Central Equipment. Configure (IP address & other settings.) per agency direction. Otherwise, confirm  
39 network requirements to agency.

40  
41 **IDENTIFICATION AND LABELING**

42 Label all installed electronic access control cabling and equipment.

43  
44 Prior to installation, the provide samples of all label types planned for the project. These samples shall include  
45 examples of the lettering to be used.

46  
47 Label cables with the architectural door number for the opening served, the room number the opening is  
48 located in, the type of door device they serve (“reader”, “REX”, “lock”, etc.), a unique numerical  
49 identification number for the control panel it originates in, and the room number the control panel is located  
50 in, on both ends of the cable. Example: “DOOR 1234A / RM 1234 / READER / CP 1 / RM B123”.

51  
52 All system wiring shall be color coded as required by Agency. Maintain color coding and labeling throughout  
53 the system at all accessible locations to the cabling.

1     **ACCEPTANCE TESTING**  
2     **General**  
3     Conduct acceptance testing according to a schedule coordinated with the Agency and UW.  
4  
5     Prior to testing, provide a summary of the proposed test plan. Test plan shall include – at minimum –  
6     proposed schedule, list of tests to be performed, equipment to be used, set-up, expected results and  
7     documentation format.  
8  
9     Testing shall not proceed without approval by the Engineer.  
10  
11    Schedule shall allow time for correction of defects and remedial work.  
12  
13    Representatives of the Owner may be in attendance to witness the test procedures. Provide a minimum of  
14    one (1) week advance notice to allow for such participation.  
15  
16    Supply all equipment and personnel necessary to conduct the acceptance tests.  
17  
18    Perform tests related to connected equipment of others only with the permission and presence of Contractor  
19    responsible for that equipment.  
20  
21    Assist the User Agency in the final system checkout and commissioning of the Access Control System.  
22  
23    Document all tests. Refer to the Article “DOCUMENTATION” below which details requirements.  
24  
25    **Cable Testing**  
26    Visually inspect all cabling and termination points to ensure that they are complete and conform to the wiring  
27    pattern defined herein. Provide the Engineer with written certification that this inspection has been made.  
28  
29    Test all cables to verify continuity in both door-open and door-closed conditions.  
30  
31    Test all cables for open circuits, ground faults or line-to-line short circuits.  
32  
33    **System Testing**  
34    At minimum, verify the following are properly wired and labeled:  
35    • Field Devices and Control Panels.  
36    • Associated equipment such as Power Supplies.  
37  
38    Prior to the commencement of the Acceptance Tests, verify the installation and configuration of software  
39    related to the operation and control of the Access Control System.  
40  
41    Assist User Agency in testing overall functionality of the Access Control System. The tests shall include  
42    verification of the following:  
43    • The functional operation of each controlled access door and circuit.  
44    • Demonstrate normal and abnormal modes of operation and required responses to each.  
45  
46    **DOCUMENTATION**  
47    **General**  
48    Upon completion of the installation, provide documentation of controlled door locations, door-to-controller  
49    port mapping, addresses, and other information as required to support agency updates to system database and  
50    maintenance.  
51  
52    Provide additional system documentation as detailed in the sub-sections below.  
53    Provide approved test results and documentation in Operating and Maintenance Manuals.  
54  
55    At the request of any of the parties listed above, provide copies of the original test results.  
56

1 Provide chart listing test results for each controlled door.  
2  
3 Inform owner of any maintenance agreement(s) which applies to provided software, along with cost of future  
4 updates or extensions.  
5  
6 All documentation, including hard copy and electronic forms shall become the property of the State.  
7

8 **Operation and Maintenance Manuals**

9 Submit quantities required by Division 1 and Section 26 05 00.

10  
11 Provide documents in electronic format (Adobe Acrobat .pdf) and (when requested) hard copy.  
12

13 At minimum, O&M Manuals shall include:

- 14 • Drawings annotated to show as-installed field device locations, cable routes, and major equipment  
15 locations.
- 16 • Cabling Schematics
- 17 • Approved Submittals
- 18 • Test plan and test report sheets

19  
20 **WARRANTY**

21 This Contractor shall guarantee the following for a period of two (2) years from date of substantial completion  
22 of this work:

- 23 • All provided materials and equipment.
- 24 • Installation of all equipment, hardware, cabling, and related components.

25  
26 Warranties shall include labor, materials, and travel time.  
27

28 See Division 1, GENERAL CONDITIONS, and GENERAL REQUIREMENTS - Guarantee Documents and  
29 the individual technical sections for further requirements.  
30

31 If while fulfilling requirements of this warranty, the Contractor disturbs other work, the Contractor shall  
32 arrange for such disturbed work to be restored to its original condition by the responsible Contractor. This  
33 shall be at no cost to the State.  
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**SECTION 28 31 00**  
**FIRE DETECTION AND ALARM**

Included are the following topics:

**PART 1 - GENERAL**

- Scope
- Description of Work
- Related Work
- Regulatory Requirements
- Manufacturer Provided Services
- Quality Assurance
- Qualifications
- Submittals
- Plan Review for Fire Alarm Systems
- Project Record Drawings
- Operation and Maintenance Data
- Product Delivery, Storage and Handling
- Spare Parts
- Supervision
- Power Requirements

**PART 2 - PRODUCTS**

- Conventional Initiating Devices
- Audio Visual Notification Appliances

**PART 3 - EXECUTION**

- General
- Raceways
- Conductors
- Device Mounting
- Identifications
- Testing
- Warranty

**PART 1 - GENERAL**

**SCOPE**

The work covered by this section of the specifications includes the furnishing of all labor, equipment, materials, and performance of all operations associated with the installation of the Fire Alarm System as shown on the drawings and as herein specified.

**DESCRIPTION OF WORK**

The fire alarm scope consists of adding new devices that are compatible with the existing system. Contractor shall field verify existing system prior to the start of construction.

The Fire Alarm System shall be configured as a local protective signaling system, as defined in NFPA-72, and shall use/incorporate the following features, as a minimum:

- The latest intelligent analog, addressable technology (detectors/sensors and modular panel equipment) currently available from the manufacturer.

The existing building FACP is to be field verified prior to the start of construction.

UL and NFPA listed for use with and be manufactured by the same manufacturer of the fire alarm system being provided in the building(s) in this project.”

- Network Connections, Data, Audio, and Signaling Line Circuits, which functionally link together multiple panels or Transponders shall be wired in an NFPA Style 6 (Class A) arrangement.

- Initiating Device Circuits (IDCs) shall be limited to short runs from Monitor Modules to the connected device, unless specifically stated otherwise herein, and shall be configured as NFPA Style B (Class B), with individual zone supervision.

1  
2 Notification Appliance Circuits (NACs) shall be configured as NFPA Style Y (Class “B”). Audible  
3 NACs serving Speakers shall be installed using shielded cable, such that the speakers do not generate  
4 unwanted noises, due to crosstalk with other circuits.

5  
6 Data Circuits to Annunciators shall be configured as NFPA Style 4 (Class “B”). All annunciators shall  
7 be fully supervised.  
8

#### 9 **RELATED WORK**

10 The work covered by this section of the specifications shall be coordinated with the related work as specified  
11 elsewhere under the following project sections:  
12

13 Section 01 74 19 – Construction Waste Management  
14 Section 01 91 01 or 01 91 02 – Commissioning Process  
15 Section 07 84 00 – Fire Stopping  
16 Section 26 05 00 – Common Work Results for Electrical  
17 Section 26 05 02 – Electrical Demolition  
18 Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cable  
19 Section 26 05 26 – Grounding and Bonding for Electrical Systems  
20 Section 26 05 29 – Hangers and Supports for Electrical Systems  
21 Section 26 05 33 – Raceway and Boxes for Electrical Systems  
22 Section 26 05 36 – Cable Trays for Electrical Systems  
23 Section 26 05 53 – Identifications for Electrical Systems  
24 Section 26 27 26 – Wiring Devices  
25 Section 27 10 00 – Structured Cabling  
26

#### 27 **REGULATORY REQUIREMENTS**

28 The complete installation shall conform to the applicable sections of the latest edition of the following Codes  
29 and Standards:  
30

#### 31 NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):

32 NFPA 70 National Electrical Code (NEC) generally, and Article 760 in particular  
33 NFPA 72 National Fire Alarm Code  
34 NFPA 101 Life Safety Code  
35 IBC International Building Code  
36 IFC International Fire Code  
37 IMC International Mechanical Code  
38

#### 39 STATE OF WISCONSIN – DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES (DSPS)

40 SPS 361.30 Plan Review and Approval  
41

#### 42 NATIONAL ELECTRICAL MANUFACTURER’S ASSOCIATION (NEMA)

#### 43 UNDERWRITERS’ LABORATORIES, INC. (UL)

44  
45 UL 38 Manual Signaling Boxes for Fire Alarm Systems  
46 UL 217 Smoke Alarms  
47 UL 268 Smoke Detectors for Fire Alarm Systems  
48 UL 464 Audible Signaling Devices for Fire Alarm and Signaling Systems, Including  
49 Accessories  
50 UL 497B Protectors for Data Communications and Fire-Alarm Circuits  
51 UL 521 Heat Detectors for Fire Protective Signaling Systems  
52 UL 864 Control Units and Accessories for Fire Alarm Systems  
53 UL 1480 Speakers for Fire Alarm and Signaling Systems, Including Accessories  
54 UL 1481 Power Supplies for Fire-Protective Signaling Systems  
55 UL 1971 Signaling Devices for the Hearing Impaired  
56 UL 2572 Mass Notification Systems  
57

#### 58 US ARMY CORPS of ENGINEERING

59 UFGS 28 31 76 Interior Fire Alarm and Mass Notification System, Addressable  
60

#### 61 **MANUFACTURER PROVIDED SERVICES**

62 A manufacturer-trained service technician shall provide the following installation supervision. This Techni-  
63 cian shall be certified by the equipment manufacturer and shall have a minimum of two (2) years of service  
64 experience in the fire alarm industry.

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The technician's name shall appear on equipment submittals and a letter of certification from the fire alarm manufacturer shall be sent to the project engineer. The manufacturer's service technician shall be responsible for the following items:

Pre-installation visit to the job site to review equipment submittals and verify method by which the system should be wired.

Periodic job site visits to verify installation and wiring of system, and to perform any partial system programming – required to permit portions of the existing system to be removed.

Upon completion of wiring, final connections shall be made under the supervision of this technician, and final checkout and certification of the system.

At the time of final checkout, technician shall give operational instructions to the Owner and/or his representative on the system.

All job site visits shall be dated and documented in writing and signed by the Electrical Contractor. Any discrepancy shall be noted on this document and a copy kept in the system job folder that shall be available to the Project Engineer any time during the project.

**QUALITY ASSURANCE**

Unless specifically stated otherwise, each and all items of the fire alarm system shall be listed as a product of a SINGLE fire alarm system manufacturer under the appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear the UL label.

Notification Appliances may be products of a single, different manufacturer – provided that the Primary Equipment Provider or Manufacturer provides written documentation of compatibility and agrees to assume any and all responsibility for compatibility with the Control Equipment.

In addition to previously listed UL standards, all control equipment shall be listed under the following UL Standards:

UOJZ UL category UOJZ as a single control unit. Partial listing shall NOT be acceptable.

**QUALIFICATIONS**

All equipment shall be supplied by a firm, which specializes in fire alarm and smoke detection systems with a minimum of five (5) years-documented experience. The company shall be an authorized distributor of the proposed equipment.

All work shall be performed by a licensed contractor, who is regularly engaged in the installation and servicing of fire alarm systems. Proof of five (5) years documented experience and of factory authorization to furnish and install the equipment proposed shall be furnished prior to contract award, if required by Division of Facilities Development.

Contractor shall be located within three (3) hours of travel time or less from the site of this project.

**SUBMITTALS**

Under the provisions of Section 26 05 00 and Division 1, submit the following for approval prior to ordering any equipment in accordance with requirements of Division 1, General Conditions. Submit a total of ten (10) sets.

Copies of CAD Files (AutoCAD, latest version) for the Fire Alarm floor plans will be made available to the successful bidder for preparation of the required shop drawings and as-builts.

**REQUIRED SUBMITTAL MATERIALS**

The following items, and any additional items required per Section 26 05 00, shall be included within the submittal package:

Although they may be submitted under separate cover, Submittal Brochures / Booklets / Binders and Shop Drawings shall be submitted together and shall be treated as a complete set.

**COVER SHEET**

The submittals shall contain a cover sheet, which shall include the following information:

Submittal Date

1 Specification Section(s)  
2 Electrical Contractor (Contact Name, name, address, and telephone number)  
3 Project Name, Project City, Project State, and Project Address.  
4

#### 5 TABS AND TABLE OF CONTENTS

6 The Table of Contents shall appear immediately behind the Cover Sheet and shall contain a complete  
7 listing of all tabs contained within the binder / booklet.  
8

9 Tabbed index sheets shall be inserted into each of the binders, such that each binder is clearly sub-  
10 divided into sections. Tabbed sections shall be provided, at minimum, for the following:  
11

12 One section for each building – All submittal data, which applies to any particular building,  
13 shall be located within the tabbed section for the corresponding building. All submittal data  
14 within each “building” section shall appear in the same order.  
15

16 One section for manufacturer’s data sheets – divided into sub-sections for the following:  
17

18 Panel Equipment (Panels, Panel Components / Modules, Printers, Annunciators, etc.)  
19 Addressable Field Devices (Initiating and Control / Monitoring / Isolation)  
20 Non-Addressable Field Devices (Initiating Devices, relays, etc.)  
21 Notification Appliances  
22 Fire-Fighter Communications Equipment if applicable  
23

#### 24 EQUIPMENT LIST

25 A complete equipment list of all components, including the following: Quantity, Manufacturer, Part  
26 Number, and Description. If the supplier uses different part numbers from those of the actual  
27 manufacturer, the actual manufacturer and part numbers as they appear – marked on the shipping box /  
28 packages, shall also be identified on this list.  
29

30 Each Equipment List shall include a complete listing of the modules, components, and software  
31 included for each modular FIRE Alarm Control Panel, Network Panel, Transponder, Outboard Gear  
32 Panel or Annunciator. Such items shall be listed in a manner that clearly indicates that such items  
33 are parts of / components of a larger unit. Simply stating a single part number and description for  
34 such panels shall be unacceptable.  
35

36 A separate list shall be included for each section, with items grouped by system.  
37

38 For projects involving multiple systems, separate equipment lists shall be provided - one for each  
39 system.  
40

41 Spare Parts shall also be listed separately and shall be identified clearly as “Spare Equipment”.  
42

#### 43 PRODUCT DATA

44 Manufacturer's product data sheets, and equipment description of all system components. These data  
45 sheets shall be highlighted or suitably marked, so that included items and options are indicated. On data  
46 sheets that include multiple products, products that are not used shall be crossed out.  
47

48 Product Data Sheets shall be organized, in order, corresponding to the first occurrence of the  
49 corresponding item on the equipment list.  
50

#### 51 SEQUENCE OF OPERATION

52 The existing Sequence of Operation shall remain.  
53

#### 54 BATTERY CALCULATIONS

55 These calculations shall clearly illustrate both the Standby and Alarm loads, due to the various field  
56 devices and panel components / modules. It is generally recommended to submit such calculations in a  
57 “spreadsheet” format. These calculations shall include any reserve / additional capacity, as required  
58 elsewhere within these specifications. Final results shall indicate both the minimum battery capacity  
59 required and the capacity actually provided.  
60

61 ADDRESSABLE DEVICE / DESCRIPTOR LIST - Prior to programming the system, submit a chart or  
62 printout, listing every system address provided for purposes of alarm initiation, status monitoring,  
63 supervised signaling, and auxiliary controls. This printout shall include the corresponding device type  
64 and field programmable “custom labels”, as they will be displayed on the New System – at the FACP



1 and Local Annunciator. The addresses listed within this document shall directly correspond to the  
2 addresses marked on the submitted floor plan drawings. This list will be modified as needed by the  
3 Owner and returned to the contractor for final programming into the system.  
4

#### 5 NAC WIRE DROP CALCULATIONS

6 Calculations shall be provided for all Notification Appliance Circuits (NAC) in the building. It is  
7 recommended that this calculation should follow a "spreadsheet" format, and should clearly indicate the  
8 following:  
9

- 10 The name of the circuit
- 11 Point of origin of the circuit
- 12 Complete list of all devices served by the circuit, including location and type of each device.
- 13 Alarm Current Draw for each device, at the applied voltage.
- 14 Applied Voltage (Based on anticipated battery voltage after specified stand-by & alarm operation).
- 15 Acceptable Operating Voltage for each type of device on circuit.
- 16 Calculated Voltage at each device on circuit.

17  
18 These calculations should mathematically prove that all Notification Appliances on the circuit will  
19 receive acceptable power for proper operation, under "worst-case-scenario" conditions.  
20

#### 21 SHOP DRAWINGS

22 All submitted drawings shall be created using AutoCAD, and shall be coordinated so that terminal  
23 numbering, circuit designation and equipment or device designations are the same on all drawings. All  
24 drawings must be submitted and approved by the engineer before ordering or fabrication starts, but such  
25 approval will not waive any specification requirements unless specifically stated. UW shall provide  
26 copies of the floor plan drawings, in AutoCAD, to the successful bidder.  
27

28 Each and every sheet of the Shop Drawings shall be clearly and prominently identified as "SHOP  
29 DRAWINGS – PREPARED BY "NAME OF CONTRACTOR". The name and company logo for the  
30 Electrical Contractor should be added to the title block in each sheet, and a revision date shall be inserted  
31 on each sheet.  
32

33 The submitted Shop Drawings shall include the following types of drawings:  
34

#### 35 PROJECT-SPECIFIC DRAWINGS

36 Project-Specific Drawings. These drawings shall include the following:  
37

#### 38 SYSTEM RISER DRAWING

39 A separate riser drawing shall be furnished for each system. Each System Riser shall illustrate  
40 all fire alarm circuits, which serve the facility, and shall incorporate the following information,  
41 in a clear, concise format:  
42

- 43 Point of origin of each circuit (usually a Panel, or a Module within a panel)
- 44 Circuit type and labeling
- 45 Area served by each circuit
- 46 Wire / cable type and size
- 47 Locations of Panelboards where primary system power is obtained
- 48 The following information for each Field Device:
  - 49 Device Type
  - 50 Circuit(s) to which device is connected
  - 51 Locations of any End-Of-Line Resistor (EOLR)
  - 52 (And the circuit terminated by any such EOLR)

#### 54 BLOCK DIAGRAMS

55 Showing layout and operation of the entire system.  
56

#### 57 FLOOR PLANS

58 These drawings shall consist of edited versions of the Contract Documents, which shall include  
59 the following information:  
60

- 61 Device Addresses - The addresses shown on these drawings shall directly correspond to  
62 the chart or printout, as specified previously, which spells out specific information about  
63 each device, including the field programmable "custom label".  
64

1 TYPICAL DEVICE / MODULE WIRING DETAILS

2 Component and module wiring diagrams – intended to illustrate terminations and wiring  
3 connections to each typical Field Device (Detectors, Notification Appliances, etc.), and each  
4 typical panel component / module utilized within the system. This set of drawings shall only  
5 include diagrams for modules and components which are actually used in the provided  
6 system(s).

7  
8 These drawings shall incorporate clear labeling / nomenclature, which shall clearly indicate the  
9 corresponding field device or module, to which it corresponds.

10  
11 OMISSION OF ANY OF THE ABOVE MATERIALS FROM THE SUBMITTALS SHALL RESULT IN  
12 AN IMMEDIATE REJECTION OF THE SUBMITTALS FOR THIS PROJECT. If the Contractor has any  
13 questions concerning the preparation of these materials, please contact the Engineer.

14  
15 **PLAN REVIEW FOR FIRE ALARM SYSTEMS**

16 In accordance with Wis. Admin. Code § SPS 361.30, the State of Wisconsin has adopted the component  
17 review of all Fire Protection Systems for buildings that require plan submittal effective January 1, 2012.  
18 Exceptions to required review will only be as follows:

19  
20 <https://dsps.wi.gov/Documents/Programs/FireSuppressAlarm/FireAlarmSubmittalGuidelines.pdf>

21  
22 Projects involving the alteration or addition of 20 or fewer devices to an existing fire alarm system  
23 do not need to be submitted. A “device” includes both detection devices and notification  
24 appliances. This includes, but is not limited to, all the following: fire alarm control panels, power  
25 supply panels, annunciators, horns, strobes, combination horn/strobes, speakers, combination  
26 speaker/strobes, smoke detectors, heat detectors, pull stations, and door holders. Relay modules or  
27 monitoring modules are not considered alarm devices.

28  
29 **Note:** Replacement fire alarm control panels must be listed for use with all the existing devices  
30 installed on the fire alarm system.

31  
32 For the purpose of plan review requirements, detection or monitoring systems which are not  
33 connected to the building fire alarm system (e.g., smoke detection in an unoccupied storage  
34 facility with off-site monitoring, sprinkler system monitoring or elevator recall operations in a  
35 building without a fire alarm system), are not required to be submitted for review.

36  
37 Projects where only single- and multiple-station smoke alarms are required.

38  
39 Hospitals, Nursing Homes, CBRF and Hospice buildings (reviewed by DHS).

40  
41 DSPS retains jurisdiction for plan review and inspection for all State-owned buildings with the exception of  
42 the City of Madison. City of Madison will conduct inspections of State-owned buildings in the City of  
43 Madison jurisdiction. Submit copy of DSPS approval letter with City of Madison Fire Department Work  
44 permit if applicable.

45  
46 <https://www.cityofmadison.com/fire/documents/2019%20MASTER%20PLAN%20REVIEW%20PERMIT%20APPLICATION.pdf>

47  
48  
49 Per SPS 302.10, plan review fees shall be **doubled** for projects where the installation, erection,  
50 or construction was initiated without the required DSPS approval.

51  
52 **CONTRACTOR’S RESPONSIBILITY**

53 The Electrical Contractor shall determine if DSPS plan review or permitting is required for the project in  
54 accordance with Wis. Admin. Code and DSPS requirements. The Electrical Contractor or delegated sub-  
55 contractor is also responsible for preparing and submitting required documentation and fees for DSPS Fire  
56 Alarm plan review and permitting (if applicable).

- 1 a) Department of Safety and Professional Services approval is required prior to the start of fire alarm  
2 system construction. The contractor shall prepare and submit the required documents in a timely  
3 fashion to meet this requirement. If the contractor starts fire alarm system construction before  
4 approval is given by the Department of Safety and Professional Services, the contractor is  
5 responsible for all additional fees required by the Department of Safety and Professional Services.  
6 b) Initially, prepare one set of the Department of Safety and Professional Services fire alarm  
7 submittals and send it to the A/E for approval before proceeding with actual submittal to DSPS.  
8 c) Contractor shall follow UW's AutoCAD standards when preparing fire alarm shop drawings,  
9 using information consistent with the project's construction drawings.  
10 d) After obtaining A/E approval to proceed with the Department of Safety and Professional Services  
11 fire alarm submittal, prepare four (4) sets of the fire alarm shop drawings as approved by the A/E  
12 that will be sent to the Department of Safety and Professional Services by the contractor. These  
13 shop drawings shall be stamped, signed and dated by a Wisconsin registered architect,  
14 professional engineer or electrical designer taking responsibility for the shop drawings. Signing  
15 and sealing shall comply with SPS 361.31(1). Note that each shop drawing copy must be  
16 stamped, signed and dated unless there is a drawing index sheet, in which case only the four index  
17 sheets need to be stamped, signed and dated. Where the submitter is both the designer and  
18 installer of the fire alarm system, a signature only will suffice [Ch. 443.14(6), Stats.]. It shall be  
19 an original signature and date.  
20 e) Prepare one bound booklet of the fire alarm system device cut sheets and all calculations  
21 (indicating device power calculations, voltage drop calculations and battery calculations). These  
22 booklets do not need to be stamped, signed or dated.  
23 f) Prepare a letter of transmittal listing all items being sent to the Department of Safety and  
24 Professional Services. Copy the A/E on the letter of transmittal only.  
25 g) Complete the Application for Review, Buildings, HVAC, Fire and Components – SBD-118 form.  
26 h) Calculate the SDB-118 submittal fee; write a check for the appropriate amount, payable to Safety  
27 and Professional Services.  
28 i) Schedule a plan review date with Department of Safety and Professional Services, Division of  
29 Safety and Buildings by visiting these websites and completing the online request form.  
30

### 31 **PROJECT RECORD DRAWINGS**

32 Installing Electrical Contractor shall submit to the Architect/Engineer for approval the as-built drawings for  
33 the entire work done under this project prior to final payment.  
34

35 Work shall be done on AutoCAD using the contract drawings provided to the Contractor by UW in the form  
36 of AutoCAD files. A hard copy of same shall also be submitted.  
37

38 These drawings shall show:

39 Locations and addresses of Initiation Devices, Notification Appliances, isolation devices, status-  
40 monitoring devices, supervised signaling devices, and auxiliary control devices. All these devices  
41 shall be shown as connected to system wiring.

42 Circuit and Address information for each field device listed above.

43 Conduit layout.

44 Number/size/type of conductors in each conduit run

45 Riser diagrams

46 Location of end-of-line devices  
47

48 Riser diagrams shall be specific for this project, and shall include location of emergency 120VAC panel,  
49 panel designation and circuit number used to feed each fire alarm panel. Also, indicate if panel is backed up  
50 by an emergency generator.  
51

52 Riser diagrams shall include locations (room or area number) of notification, initiating, end-of-line devices  
53 and addresses for all addressable field devices.  
54

55 Also see requirements in Division 1, General Conditions.  
56

### 57 **OPERATION AND MAINTENANCE DATA**

58 All operations and maintenance data shall comply with the submission and content requirements specified  
59 under section GENERAL REQUIREMENTS.  
60

1 In addition to the general content specified under GENERAL REQUIREMENTS supply the following  
2 additional documentation:

- 3 1. A material guide, which shall contain the replacement part numbers and description of all  
4 components used. If this information is included in an instruction section for any of the equipment,  
5 it will not be necessary to duplicate the list. In either case, the parts list shall be associated with its  
6 respective chassis, modules or kit wherein it is found. A total listing of parts without such grouping  
7 will not be acceptable.
- 8 2. Catalog data or literature
- 9 3. Manufacturer's operating instructions.
- 10 4. Manufacturer's maintenance instructions
- 11 5. Installation instructions
- 12 6. Name, address and telephone number of sources for parts (i.e., keys, guards, etc.) not supplied by  
13 the Fire Alarm Manufacturer
- 14 7. Copies of all approved shop drawings
- 15 8. An updated copy of the submitted sequence of operation, revised to reflect any implemented  
16 changes.

### 17 **PRODUCT DELIVERY, STORAGE AND HANDLING**

18 Receive equipment at job site. Verify applicable components and quantity delivered.

19  
20  
21 Handle equipment to prevent internal components' damage and breakage, as well as denting and scoring of  
22 enclosure finish.

23  
24 Do not install damaged equipment.

25  
26 Store equipment in a clean, dry space and protect from dirt, fumes, water, and construction debris and  
27 physical damage. Make arrangements with the Owner at the pre-construction meeting for storage of  
28 equipment on the premises.

### 29 **SPARE PARTS**

30 Contractor shall provide the following spare parts in quantities shown:

31  
32  
33 Quantity:    Type of Device  
34 (2)            Heat detectors

### 35 **SUPERVISION**

36 The system shall report a TROUBLE condition when any supervised circuit becomes disarranged,  
37 disconnected, or is manually disabled or overridden. Each supervised circuit shall be independently protected  
38 for short-circuit conditions and shall be arranged so that faults on any one circuit do not prevent the proper  
39 operation of any other circuit in the system.  
40

41  
42 The following devices/circuits shall be supervised, as a minimum:

- 43 ALL communication links.
- 44 ALL Signaling Line Circuits
- 45 ALL Initiating Device Circuits.
- 46 All sprinkler flow and tamper switches.
- 47 ALL Notification Appliance Circuits.
- 48 Auxiliary manual control circuits.
- 49 Manual control switches for off normal position
- 50 Remote Control Relays / Control Modules.
- 51 Primary, AC Incoming power to the system.
- 52 The system's batteries.
- 53 System Expansion Modules
- 54 Auxiliary module LED's.

55  
56 The system shall have provisions for disabling and enabling all circuits individually for maintenance or  
57 testing purposes.

58  
59 Each independently supervised circuit shall include a discrete LCD readout, to indicate disarrangement  
60 conditions per circuit.

### 61 **POWER REQUIREMENTS**

62

1 Primary 120 VAC power, to all Fire Alarm equipment shall consist of dedicated branch circuits. These  
2 circuits shall be of a 3-conductor type, including a suitably sized green ground wire – SHARED NEUTRALS  
3 AND CONDUIT GROUNDS SHALL BE UNACCEPTABLE.  
4

5 All fire alarm power supplies, as well as any other supplemental power supplies, shall be installed in  
6 compliance with NFPA-70 – National Electrical Code (Latest Edition).  
7

8 Where the new control panel is to remain at same location as the existing panel, the contractor may re-use  
9 the existing branch circuit, if it meets the previously stated requirements stated above.  
10

11 All batteries used in conjunction with the fire alarm system shall be installed in accordance with NFPA-70 –  
12 National Electrical Code (Latest Edition).  
13

14 If these batteries are not located within or immediately adjacent to the fire alarm equipment, the location of  
15 such batteries shall be clearly indicated within the fire alarm equipment served by them, and the batteries and  
16 their enclosure shall be clearly marked as “FIRE ALARM”  
17

18 All external circuits requiring system-operating power shall be 24VDC and shall be individually supervised  
19 and fused at the control panel.  
20

## 21 **PART 2 - PRODUCTS**

### 22 **MULTIPLEX/INTELLIGENT INITIATING DEVICES**

23  
24 All devices shall be supervised for trouble conditions. The system control panel shall be capable of  
25 displaying the type of trouble condition (open, short, device missing/failed). Failure of a device shall not  
26 hinder the operation of other system devices.  
27

### 28 **DEVICE IDENTIFICATION**

29 Each intelligent device must be uniquely identified by an address code entered on each device at time of  
30 installation. The use of jumpers to set address shall not be acceptable.  
31

32 Device addressing schemes which use permanently imbedded electronically-identifiable “serial number”  
33 which is similar to the address imbedded within Personal Computer Network Interface Cards shall be  
34 acceptable.  
35

36 Fire Alarm Systems utilizing hand-held or briefcase-style programming tools, which are used to  
37 electronically assign addresses and/or programming parameters to devices shall be acceptable. However,  
38 one such programmer tool shall be provided to the Owner at no additional cost.  
39

40 The address along with the loop number and end-of-line device if present shall be indicated, and be visible  
41 from the ground, on the device in the field using machine generated marking. Contractor shall provide a  
42 sample of such labeling scheme before using it.  
43

44 End-of Line devices shall also be identified by means of permanent, machine generated label, affixed to the  
45 device.  
46

47 Device identification schemes that do not use uniquely set addresses but rely on electrical position along the  
48 communication channel are unacceptable. These systems cannot accommodate tapping and the addition of  
49 an intelligent device between existing devices requires re-programming all existing devices beyond added  
50 device.  
51

52 The system must verify that proper type device is in place and matches the desired software configuration.  
53

### 54 **INTELLIGENT DETECTORS - GENERAL**

55 Smoke and heat detectors must be approved by the State Engineer prior to installation.  
56

57 Each detector shall incorporate the following features:  
58

59 LED(s), which shall flash to indicate communication with the Fire Alarm System, and which also  
60 illuminate in a steady manner when the detector is in an alarm status

61 A means to allow field function testing of the detector

62 A low-profile design / shape

63 An insect screen

64 Voltage and RF transient suppression techniques, in order to minimize false alarms

1  
2 Smoke detectors shall communicate the actual smoke chamber values to the system control panel.

3  
4 Smoke detectors shall be listed for sensitivity testing from the control panel. Sensitivity test results shall be  
5 logged and downloaded to a printer.

6  
7 The detectors shall be plug-in units, which mount to a common base, and shall be UL 268 approved.

8  
9 Each detector shall be compatible with the fire alarm panel and shall obtain its operating power from the  
10 SLC, to which it is connected. (Where relay or sounder-equipped bases are used, it shall be acceptable to  
11 require a separate 24 VDC or NAC connection.) Each detector shall be reset by actuating the control panel  
12 reset switch.

13  
14 If field conditions so require the smoke detection devices shall not be installed until the construction is  
15 completed.

16  
17  
18 Acceptable manufacturers include:

19 Siemens  
20 Edwards  
21 Kidde  
22 Johnson Controls

23  
24 The manufacturer must allow for interfacing with the existing system.

25  
26  
27 **INTELLIGENT DETECTOR BASES**

28 Bases shall be suitable for either smoke or heat detector mounting.

29  
30 Either the base or the head shall contain electronic circuits that communicate the detector's status (normal,  
31 alarm, sensitivity status, trouble, etc.) to the control panel over two wires. The same two wires shall also  
32 provide power to the base and detector. Contacts between the base and head shall be of the bifurcated type  
33 using spring-type, self-wiping contacts.

34  
35 The base shall be lockable. The locking feature must be field-removable when not required.

36  
37 Upon removal of the detector's head, a trouble signal shall be transmitted to the control panel.

38  
39 The detector base shall be sealed against rear airflow entry.

40  
41 Each detector's base or head shall contain LED(s), which shall flash when the detector is being scanned by  
42 the control panel. The LED(s) shall turn on steady when the detector is in an alarm condition.

43  
44 **MULTI-CRITERIA DETECTORS**

45 The Intelligent multi-criteria detector shall have advanced software to continuously sample the air in an  
46 environment and adjust its detection parameters and alarm threshold accordingly. It shall do this  
47 automatically, without user intervention.

48  
49 Detector shall incorporate either thermal and photoelectric technologies or thermal, photoelectric and  
50 carbon monoxide technologies.

51  
52 Detector shall have on-board microprocessor and advanced software that focuses on rejecting nuisance  
53 alarms.

54  
55  
56 Carbon monoxide alarm signals shall be displayed as SUPERVISORY signals on the fire alarm system  
57 displays.

58  
59 **SMOKE/HEAT DETECTOR GUARDS**

60 Smoke/heat detector guard shall be of two-piece construction perforated metal for ease of installation and  
61 maintenance of equipment once installed and shall have the following properties:

62 Constructed of 16-gauge perforated steel with 3/16" diameter on 1/4" staggered centers  
63 Welded on all sides with reinforcement for a solid unit construction

1 Painted with white epoxy coating  
2 Dimensions I.D. 7 1/2" x 7 1/2" x 4" deep  
3 Shall have provisions for electrical conduit  
4 Shall have tamper-proof screws  
5  
6  
7

8 **INTERFACE MODULES - GENERAL**

9 If external power to Addressable Interface Modules is required, such power shall be 24VDC, and shall be  
10 derived from a supervised fire alarm power supply.

11  
12 Addressable Interface Modules may be provided in either a Class B or Class A supervision version.

13  
14 In the Class B version, the wiring shall be supervised by an end-of-line device.

15  
16 In the Class A version, the wiring shall be looped back through a separate conduit/route and connected to the  
17 module to allow continual operation of the controlled devices even if the wiring sustains a single break.

18  
19 The interface modules shall be supervised and uniquely identified by the control panel. Device identification  
20 shall be transmitted to the control panel for processing according to the program instructions.

21  
22 **INTERFACE MODULES - SUPERVISED CONTROL**

23 Supervised Control Modules shall be utilized where needed, for control of Notification Appliances.

24  
25 For Notification Appliances, speakers, and other device control with Class B or Class A wiring supervision,  
26 the interface module shall provide a double-pole/double-throw relay output, with supervision.

27  
28 These interface modules shall communicate the supervised wiring status (normal, trouble) to the fire alarm  
29 control panel and shall receive from the fire alarm control panel a command to transfer the relay.

30  
31 **INTERFACE MODULES - SUPERVISED MONITORING**

32 Addressable Monitor Modules shall be suited for monitoring of water-flow, valve tamper, fire Suppression  
33 Control Panels, and other non-intelligent detectors and systems.

34  
35 Addressable Monitor Modules shall be provided in any needed configuration, and may be used to interface  
36 any of the following initiation devices to a Signaling Line Circuit, as follows:

37 Conventional 2-wire smoke detectors, including providing suitable power to the IDC.

38  
39 Normally Open, dry contact type devices - with class B or class A wiring supervision:

40 These interface modules shall communicate the Initiating Device Circuit status (normal,  
41 alarm, trouble) to the control panel.

42  
43 **INTERFACE MODULES - NON-SUPERVISED CONTROL**

44 This interface module shall provide double-pole/double-throw relay switching for loads up to  
45 120VAC. It shall contain easily replaceable 2-amp fuses, one on each common leg of the relay.

46  
47 **FAULT ISOLATOR MODULE (FIM)**

48 The system shall employ Fault Isolator Modules (FIM) on the Signaling Line Circuits. These FIM units shall  
49 be utilized in order to isolate portions of SLCs, in the event of short circuit conditions. The SLC segment  
50 protected by each FIM shall be separated from the SLC in a manner such that a single short-circuit condition  
51 may not affect more than 25 Addressable Field Devices / Detectors, which are served by the isolated SLC  
52 segment.

53  
54 The FIM shall be located as close as practical to the point where the isolated SLC sub-circuit branches and  
55 shall also be located at an accessible location.

56  
57 **CONVENTIONAL INITIATING DEVICES**

58 **NON-ADDRESSABLE HEAT DETECTORS**

59 Non-Addressable Heat Detectors shall of the fixed temp type and only to be used at locations where the  
60 ambient conditions are unsuitable for Analog Addressable units, or where the required operation (set point /  
61 response index, etc.) cannot be achieved with Analog Addressable units. Where used, these devices shall be  
62 UL listed for their intended purpose. These heat detectors do not have to be made by the same manufacturer  
63 supplying the other fire alarm equipment for the project.  
64

1 Acceptable manufacturers include:

2 Siemens  
3 Edwards  
4 Kidde  
5 Johnson Controls

6  
7 The manufacturer must allow for interfacing with the existing system.  
8  
9

### 10 **PART 3 - EXECUTION**

#### 11 **GENERAL**

12 The complete installation shall be done in a neat, workmanlike manner in accordance with the applicable  
13 requirements of NFPA 70 - Article 760 and the manufacturer's recommendations.  
14

15  
16 Smoke detectors shall not be mounted until the construction is completed unless they are covered with plastic  
17 bags or fitted covers immediately after installation to maintain cleanliness. Remove plastic bags or fitted  
18 covers from smoke detectors after final construction cleaning is complete.  
19

20 Clean All Equipment:

21 Vacuum inside of fire alarm panels, NAC panels, etc.  
22 Loosen attached particles and vacuum them away.  
23 Wipe all surfaces with a clean, dry, lint free rag.  
24 Re-vacuum inside surfaces as directed by the UW Construction Representative or Inspector.  
25

#### 26 **RACEWAYS**

27 NOTE: ALL FIRE ALARM SYSTEM WIRING SHALL BE INSTALLED WITHIN METALLIC  
28 CONDUIT.  
29

30 All wiring shall be in a conduit system separate from other building wiring. See Section 26 05 33 – Raceway  
31 and Boxes for Electrical Systems for specifications.  
32

33 All wiring shall be in minimum ½" steel raceway.

34  
35 40% fill factor shall be applied to all conduit sizes.  
36

37 The contractor shall size conduit and boxes by circular mil size of each cable in each conduit or box. The  
38 circular mil sizing can be found on the manufacture's spec sheet, then use the NEC codebook to make  
39 calculation to follow NEC Chapter 9 Tables and Annex C for box and conduit fill.  
40

41 The contractor is encouraged to use red conduit for fire alarm systems.  
42

43 There shall be no sharp edges with installed materials.  
44

45 Use only identified conduit entries or request approval for other penetrations in cabinets; (certain areas  
46 require clear space for interior components / batteries). Cabinet shall be grounded to either a cold water pipe  
47 or grounding rod.  
48

49 Existing conduit and surface metal raceway that is ½" in size or larger may be reused if found to have  
50 adequate space provided that it only serves the fire Alarm system and doesn't contain any AC wiring. All  
51 existing conduit that is reused MUST be brought up to the current State of Wisconsin Electrical Code and  
52 Approved for usage by the Engineer prior to work being done.  
53

#### 54 **CONDUCTORS**

55 All wire and cable associated with this system shall be as required by the equipment manufacturer. The  
56 following information is intended for estimating purposes only. However, the minimum wire gauges and  
57 colors specified shall be strictly adhered to. All cable shall be installed as per NEC Article 760.  
58

59 All cables and wires #14 AWG and larger shall be stranded.  
60

61 Fire alarm wiring shall be held in place at the device box, by means of a two-screw connector, (do not use  
62 squeeze or crimp type connectors).  
63



1 All wiring shall be completely supervised. In the event of a primary power failure, disconnected standby  
2 battery, disarrangement of any components, any open circuits or grounds in the system, an audible and visual  
3 trouble signal shall be activated until the system is restored to normal.  
4  
5 All conductors shall be color-coded. Coding shall be consistent throughout the facility. Green wire shall be  
6 used only for equipment ground.  
7  
8 Fire alarm risers, notification appliance circuits and interconnections to remote panels (per NFPA 72) shall  
9 have a minimum 2Hr fire alarm rating. All notification appliance circuits shall be protected from the fire  
10 alarm panel of origination to the signaling zone they serve.  
11  
12 Where fire alarm circuits enter or leave a building, additional transient 75 to 90-volt gas tube protection shall  
13 be provided for each conductor.  
14  
15 Cable for Intelligent detector Loops shall be 18 to 12 AWG twisted pair with a shield jacket or per  
16 manufacturers recommendations installed in 1/2" conduit. Shield continuity must be maintained and  
17 connected to earth ground only at the control panel.  
18  
19 SLC wiring must not be in the same conduit with AC power wiring or other high current circuits. T-taps or  
20 branch circuit connections are allowed for all class B SLCs.  
21  
22 Cable for RS-232C devices (CRT, PRINTER) shall be dual pair twisted- shielded.  
23  
24 Cable for RS-485 devices (Remote Annunciators) shall be twisted-shielded pair (Belden 9841 or equivalent)  
25 for the data signal. Power wiring shall be 12 AWG.  
26  
27 All splices or connections shall be made within approved junction boxes and with approved fittings. Boxes  
28 shall be red and labeled "FIRE ALARM SYSTEM" or "FA" by decal or other approved markings.  
29  
30 Speaker and strobe circuits shall have separate conductors and shall operate independently of each other.  
31  
32 Speaker wiring shall be #18 AWG twisted-shielded cable or per manufacturers recommendations.  
33  
34 Strobe wiring shall be #14 AWG minimum.  
35  
36 Tray cable is not acceptable for use as fire alarm system wiring installed in conduit.  
37  
38 **DEVICE MOUNTING**  
39 Unless otherwise noted on the drawings, plans, specifications or by the Architect or Engineer; the  
40 recommended mounting heights, and requirements are as follows:  
41  
42 **HEAT AND SMOKE DETECTORS**  
43 The location of detectors shown on the plans is schematic only. The detectors must be located according to  
44 code requirements.  
45  
46 Surface mounted detectors shall be installed using back boxes equal to the base's size. Standard octagon and  
47 square boxes are not acceptable.  
48  
49 Detectors should be located on the highest part of a smooth ceiling so that the edge of the detector is no closer  
50 than 4 inches from a sidewall. Ceilings with beams, joists or soffits that exceed 8 inches in depth require  
51 special planning and closer spacing.  
52  
53 If it is necessary to mount a detector upon a sidewall, the top of the detector (the sensing chamber portion of  
54 the device) shall be located no closer than 4 inches from the ceiling and no further away than 12 inches.  
55  
56 Smoke detectors should be installed to favor the air flow towards return openings and not located closer than  
57 3 feet from air supply diffusers which could dilute smoke before it reaches the detector. No detectors shall  
58 be installed in direct airflow.  
59  
60 Duct smoke detector installation to be by this contractor and should be installed in the locations shown on  
61 the mechanical and electrical plans. Ensure that the duct smoke detectors are in serviceable  
62 locations. Consult with the mechanical designer for alternate locations if these are shown in non-  
63 serviceable locations. When locations on mechanical plans are not available, install in locations called for  
64 that provide accessibility for service. For duct smoke detectors that are associated with shaft smoke

1 dampers, ensure the sampling tubes protruding into the duct are located within five feet of the smoke  
2 damper and there are no air inlets or outlets between the sampling tubes and the damper. Do not install  
3 within four feet of a fan discharge.  
4

5 Heat and smoke detectors should be located near the center of the open area which they are protecting, thus  
6 providing coverage generally for 15-foot radius for heat and smoke detectors. Questionable locations shall  
7 be verified with Architect or Engineer before installation takes place.  
8

9 Heat and smoke detectors, both Intelligent and non-addressable, shall be installed in accordance with their  
10 UL Listed Spacing. The quantity of Heat and smoke detectors depicted on the drawings is based on the 900  
11 square foot per detector rule. If detectors with significantly different spacing requirements are selected by  
12 the Fire Alarm equipment provider/contractor, then additional detectors, if required, shall be provided at no  
13 additional cost to the project.  
14

#### 15 **IDENTIFICATION**

16 Attach the label containing the address and SLC designation to:

17 Each addressable detector. Label shall be visible and readable from the floor, 3/16" minimum  
18 character size (1/4" is recommended).

19 Each manual pull station. Label shall be placed on the top part.

20 Each Addressable Module. Label shall be attached to the faceplate.  
21

22 Label shall consist of black writing on white or clear background.  
23

24 All fire alarm boxes shall be painted red and labeled "Fire Alarm" or "FA". When red conduit is used for the  
25 fire alarm system installation, there is no need to paint the boxes. Non-factory device boxes shall also be  
26 painted red.  
27

28 All circuits must be labeled with the name of circuit and the area being served by the circuit.  
29

30 Wire/cable splices in junction boxes shall be labeled indicating where the wire/cable is coming from and  
31 where it is going.  
32

33 All conductors terminated in control panels, annunciator panels and extension panels shall be labeled.  
34

35 All audio-visual devices shall be labeled by each circuit and the order of the device on that circuit such as  
36 "Circuit No. 2, strobe No. 05 of 10".  
37

38 All labels shall be permanent, and be machine generated. NO HANDWRITTEN OR NON-PERMANENT  
39 LABELS SHALL BE ALLOWED. Submit a sample for approval before using any labeling schemes.  
40

41 Label size shall be appropriate for the conductor or cable size(s) and design. All labels to be used shall be  
42 self-laminating, white/transparent vinyl and be wrapped around the cable (sheath). Flag type labels are not  
43 allowed. The labels shall be of adequate size to accommodate the circumference of the cable being labeled  
44 and properly self-laminate over the full extent of the printed area of the label.  
45

46 Adhesive type labels not permitted except for phase and wire identification.  
47

#### 48 **TESTING**

49 Before proceeding with any testing, all persons, facilities and building occupants who receive alarms or  
50 trouble signals shall be notified by the contractor to prevent unnecessary response or building occupant  
51 distress. At the conclusion of testing, those previously notified shall be notified that testing has been  
52 concluded.  
53

54 The manufacturer's authorized representative shall provide on-site supervision of installation of the complete  
55 fire alarm system installation, perform a complete functional test of the system, and submit a written report  
56 to the Contractor attesting to the proper operation of the completed system prior to final inspection.  
57

58 Contractor shall pre-test every device in the system before the system is considered ready for final inspection.  
59

60 The completed and pre-tested fire alarm system shall be fully tested in accordance with NFPA-72 by the  
61 Contractor in the presence of the Engineer, UW representative, Owner's representative, the local Fire  
62 Marshal, and Authorized Commercial Building Inspector.  
63

1 The Engineer or his authorized representative may suspend or discontinue the tests at any time performance  
2 is considered unsatisfactory. Resumption of testing will cover untested elements and any replaced elements.  
3 The contractor shall furnish all test personnel, test instruments and equipment of the accuracy necessary to  
4 perform the test. Arrangements for testing must be made with the UW representative and the Engineer at  
5 least two weeks before the proposed testing date.  
6

7 Upon the completion of a successful test, and prior to the final request for payment the Contractor shall:

- 8 Certify the system to the Owner in writing.
- 9 Complete the NFPA 72 record of completion form.
- 10 Provide as-built and O&M manuals.
- 11 Provide a signed statement that the Owner had received the specified system operation and maintenance  
12 training and indicated spare parts.

13  
14 ***FINAL PAYMENT WILL NOT BE PROCESSED UNLESS THESE DOCUMENTS ARE COMPLETE***  
15 ***AND ON-HAND.***  
16

#### 17 **WARRANTY**

18 The Contractor shall warrant the completed fire alarm system wiring and equipment to be free from inherent  
19 mechanical and electrical defects for a period of two (2) years from the date of substantial completion of the  
20 project.

21  
22 At the end of the project, the Contractor shall post the warranty period along with the company's name and  
23 telephone number inside the fire alarm panel.  
24

25 Any occupied facility shall not be without a UL and an NFPA approved and fully operational fire alarm  
26 system for a period longer than two (2) hours. Emergency response shall be provided within two (2) hours  
27 of the notification, to the contractor, of the failure of the system to perform operationally per UL and NFPA  
28 standards. Non-emergency service calls shall be responded to within twenty-four (24) hours of the  
29 notification to the contractor.  
30

31 Emergency situations may include, but not limited to:

- 32 System can't be acknowledged or reset
- 33 System is non-responsive to commands
- 34 System in non-responsive to actuated alarm devices
- 35 Malfunction of notification/initiating circuit(s)
- 36 System going into alarm/trouble without indicating the source
- 37 System is dead (no power), etc.

38  
39 Repairs and/or replacement arising from emergency situations shall be completed within twenty-four (24)  
40 hours of the time of notification. Other than emergency, actual repairs and /or replacement shall be provided  
41 within seventy-two (72) hours of the time of notification during normal working hours, Monday through  
42 Friday, excluding holidays. If the repairs involve parts that are not shelve items and require lead time, the  
43 contractor shall inform the Owner within twenty-four (24) hours from the time of notification of the exact  
44 time when the repairs will be completed.  
45

46 If repair and/or replacement cannot be made within the prescribed time, then other means and methods of  
47 protection shall be provided to ensure the safety of the building's occupants during which time the system is  
48 not in compliance with the standards. This may involve up to and include hiring Owner approved qualified  
49 personnel to stand a fire watch, all at the contractor's expense.  
50

51 Warranty service for the equipment shall be provided by the system supplier's factory trained representative.  
52 Further, Warranty shall include all parts, labor, and necessary travel.  
53

#### 54 **SPECIAL CONSIDERATIONS**

55 Contractor shall refer to Division 1, General Requirements, "SPECIAL SITE CONDITIONS".  
56

57  
58 The contractor must maintain the existing fire alarm system operational during the construction period.  
59 During periods of construction where dust or dirt may contaminate the existing detectors, the contractor shall  
60 cover the detectors to avoid nuisance alarms and trouble-calls.  
61

62 Individual zones and/or devices of the existing fire alarm system can be bypassed by the contractor during  
63 construction under the following requirements:  
64

1 The Superintendent of Buildings and Grounds is notified of which zones and/or devices are inoperative  
2 and for how long in writing, hand delivered.

3  
4 The contractor covers all manual-pull stations that are not active and post temporary fire alarm  
5 notification procedures next to each inactive manual-pull station.

6  
7 Ensure the fire alarm system is fully operational before leaving the job site.

8  
9  
10  
11

END OF SECTION

# UW-MILWAUKEE GOLDA MEIR LIBRARY LUBAR CONFERENCE ROOM RENOVATION

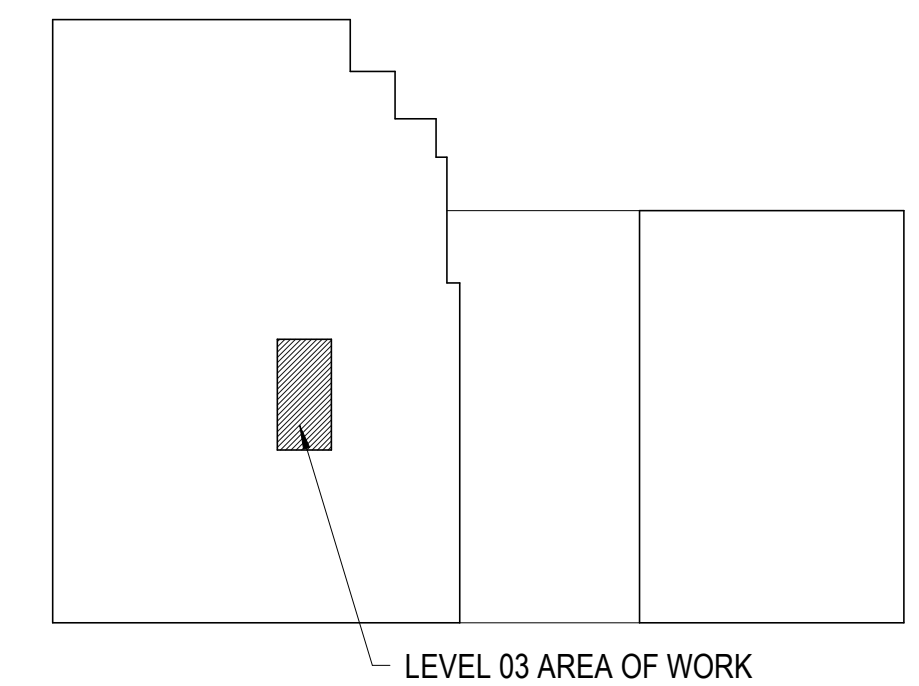
2311 E HARTFORD AVE.  
MILWAUKEE, WI 53211



## HGA

333 EAST ERIE STREET  
MILWAUKEE, WISCONSIN 53202  
TELEPHONE: 414.278.8200

KEY PLAN:



HGA COMMISSION NUMBER: 4200-026-00

**MAY 24, 2024**

MAP: 2311 E HARTFORD AVE. MILWAUKEE, WI 53211

## BID SET

### UWSA: B-23-001

### GML B1970

NOTE: RENDERING NOT FOR CONSTRUCTION USE

#### PROJECT INFORMATION

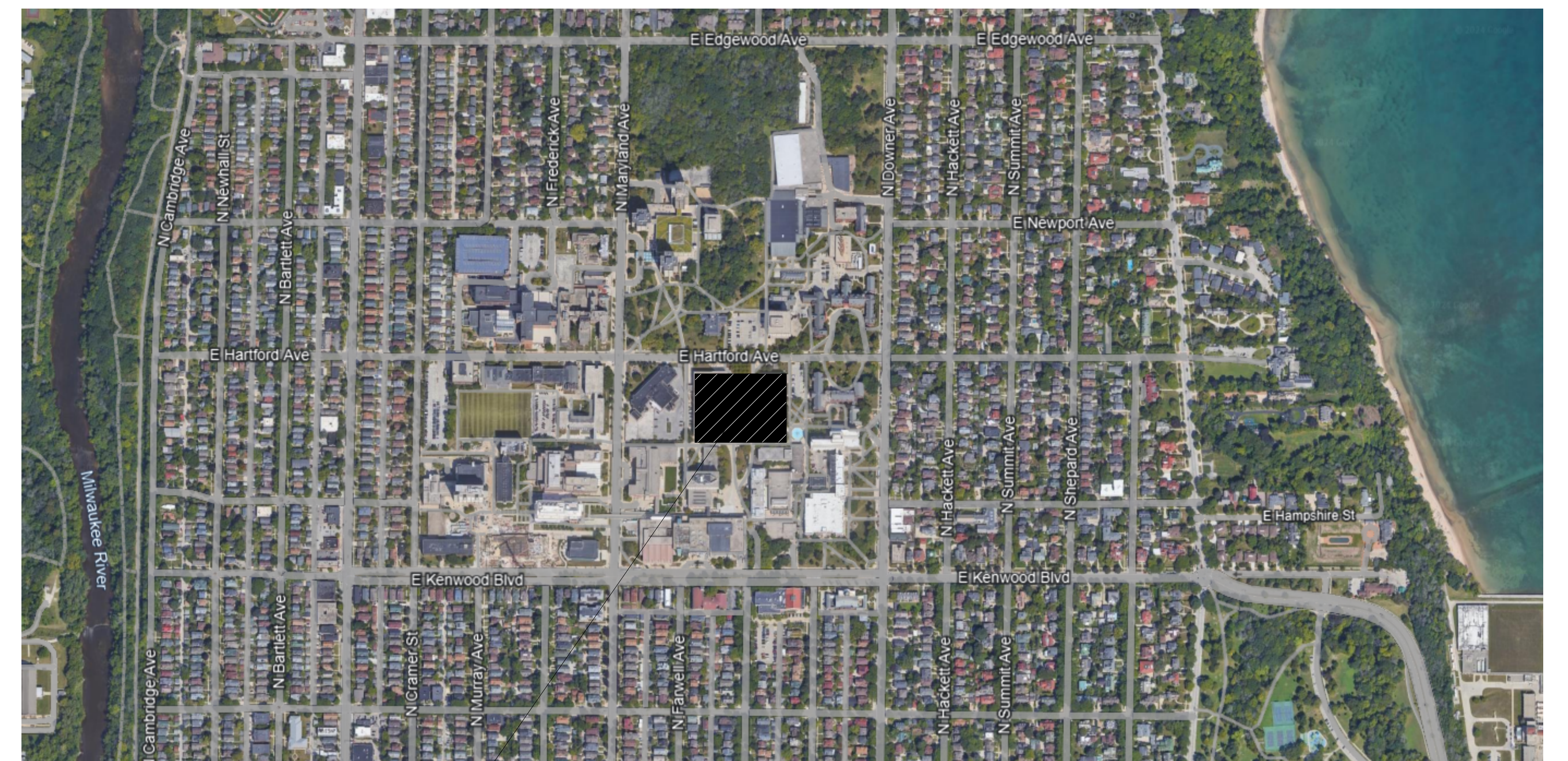
<b>PROJECT NAME:</b> UW-MILWAUKEE - GOLDA MEIR LIBRARY - LUBAR CONFERENCE ROOM	
<b>PROJECT DESCRIPTION:</b> LEVEL 2 ALTERATION CONFERENCE ROOM RENOVATION AND TOILET ROOM RELOCATION	
<b>OCCUPANCY:</b> A-3, LIBRARY	
<b>PROPOSED USE:</b> LIBRARY	
<b>PROJECT ADDRESS:</b> 2311 E HARTFORD AVE. MILWAUKEE, WI 53211	
<b>REQUIRED FIRE SEPARATION:</b>	<b>TYPE OF CONSTRUCTION:</b> IA
<b>HEIGHT OF BUILDING:</b> 55' GROUND LEVEL TO 4TH FLOOR ROOF	
<b>PROJECT FLOOR AREA:</b> 800 SF	

#### CONTACT INFORMATION

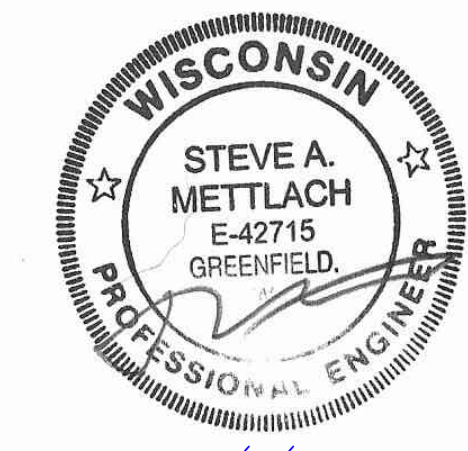
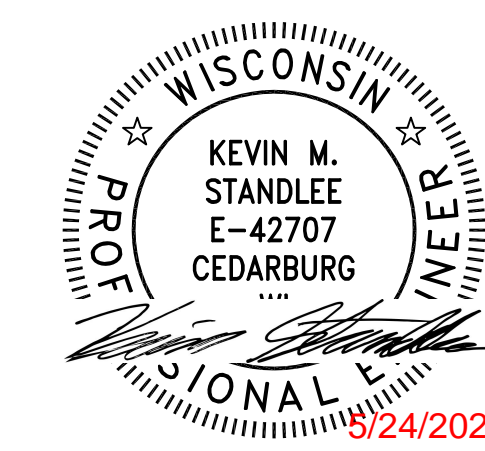
<b>ARCHITECT:</b> HAMMEL, GREEN AND ABRAHAMSON	<b>PHONE:</b> (414) 278-3442
<b>CONTACT:</b> KEVIN ALLEBACH	<b>EMAIL:</b> KALLEGACH@HGA.COM

#### DRAWING INDEX

REV #	NUMBER	SHEET NAME
<b>1-GENERAL</b>		
G000		COVERSHEET
G033		LIFE SAFETY PLAN LEVEL 03
<b>8-ARCHITECTURAL</b>		
A010		GENERAL NOTES AND SYMBOLS
A030		CONSTRUCTION LOGISTICS PLAN
A103		DEMOLITION PLAN - LEVEL 03
A202		CEILING PLAN - LEVEL 02
A203		FLOOR PLAN - LEVEL 03
A263		FLOOR FINISH PLAN - LEVEL 03
A600		TYPICAL MOUNTING HEIGHTS
A620		INTERIOR ELEVATIONS AND DETAILS
A660		TYPICAL INTERIOR PARTITION TYPES
A661		TYPICAL PARTITION DETAILS
A664		INTERIOR METAL STUD FRAMING DETAILS
A700		DOOR SCHEDULE
<b>12-PLUMBING</b>		
P001		PLUMBING GENERAL NOTES AND SYMBOLS
P202		PLUMBING FLOOR PLAN - LEVEL 2
P203		PLUMBING FLOOR PLAN - LEVEL 3
<b>14-MECHANICAL</b>		
M001		MECHANICAL ABBREVIATIONS, SYMBOLS, AND DETAILS
M203		HVAC FLOOR PLAN - LEVEL 3
<b>16-ELECTRICAL</b>		
E000		ELECTRICAL GENERAL NOTES AND SYMBOLS
E103		DEMOLITION PLAN - LEVEL 03
E203		LIGHTING PLAN - LEVEL 03
E303		ELECTRICAL PLANS
E600		ELECTRICAL DETAILS
E601		ELECTRICAL DETAILS
<b>16-ABATEMENT</b>		
H102		ASBESTOS ABATEMENT PLAN - LEVEL 02 (FOR REFERENCE ONLY)
H103		ASBESTOS ABATEMENT PLAN - LEVEL 03 (FOR REFERENCE ONLY)
Grand total: 27		



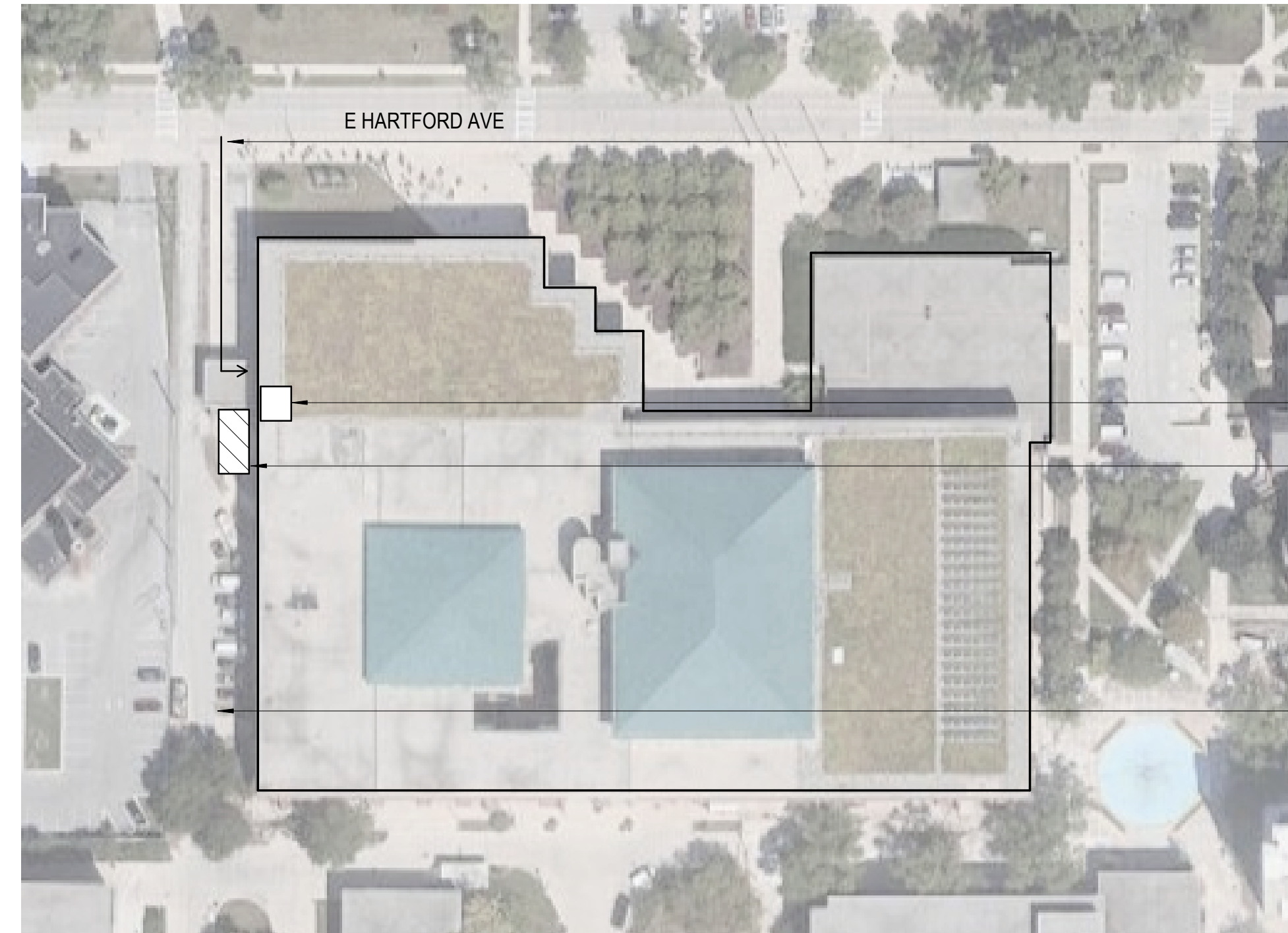
PROJECT LOCATION:



G000







CONSTRUCTION DELIVERIES

FREIGHT ELEVATOR

DUMPSTER LOCATION,  
CONTRACTOR TO PROTECT  
SIDEWALK AND REPAIR ANY  
DAMGES

DRIVEWAY FREQUENTLY  
USED AS STUDENT  
WALKWAY; USE CAUTION

SEE SPECIFICATIONS FOR CONSTRUCTION  
SCHEDULE AND MILESTONES

SEE SPEC

UW-MILWAUKEE 2024 SUMMER ACADEMIC CALENDAR

Summer Session Calendar 2024	
Graduation	May 19
Steam/Heat Shutdown	May 20-24
First Day of Summer Instruction	May 28
Last day of Summer Instruction	August 17
First Day of Fall Instruction	September 3

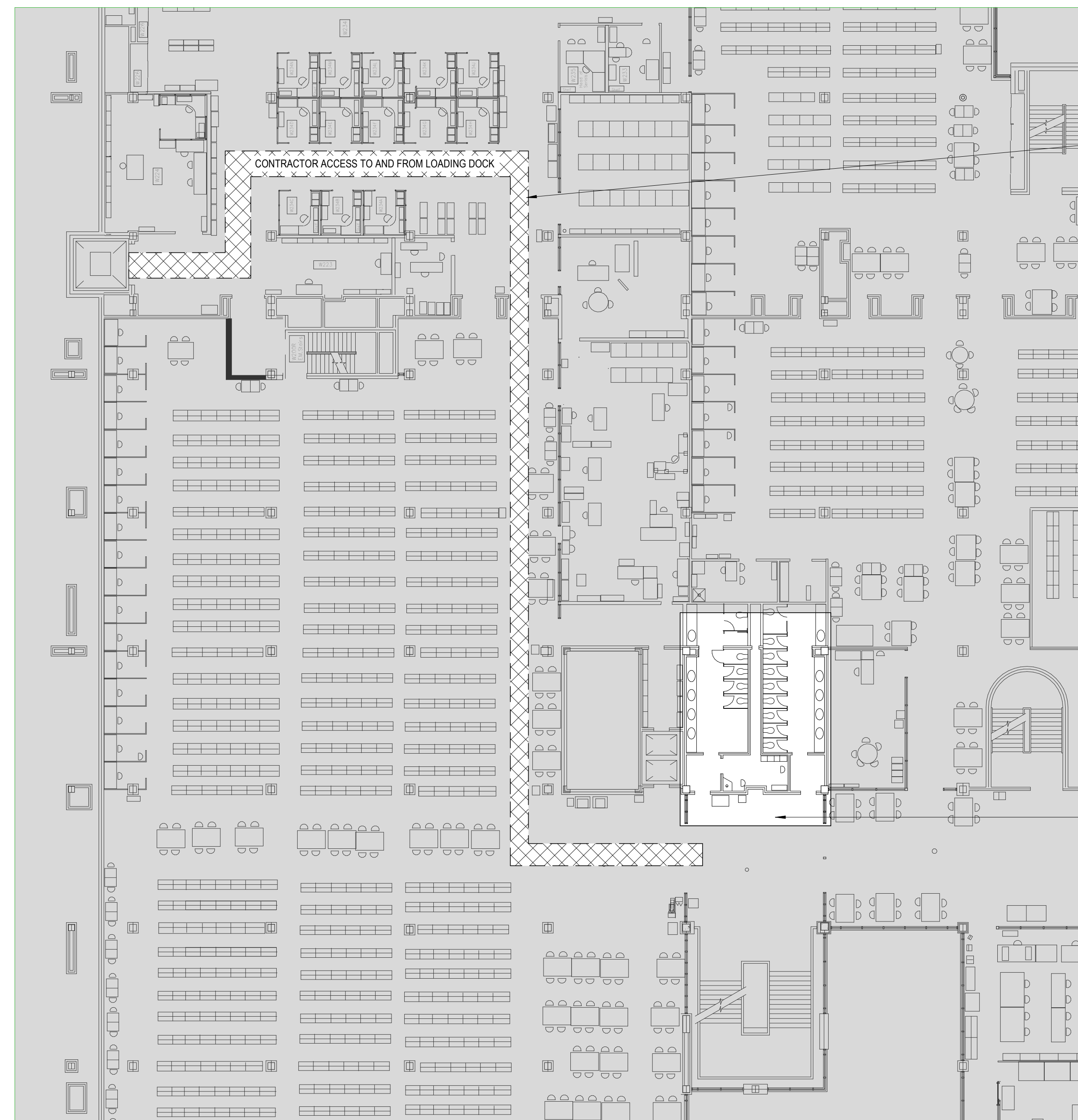
GENERAL NOTES:

- BUILDING WILL REMAIN OCCUPIED THROUGHOUT THE CONSTRUCTION DURATION.
- ALL CONTRACTORS TO WEAR HARD HATS, EYE PROTECTION & SAFETY VESTS AT ALL TIMES WHILE ON SITE.
- CONTRACTORS, TO THE EXTENT POSSIBLE, TO COORDINATE THEIR TASKS SO THAT NOISIEST ACTIVITIES OCCUR BETWEEN THE HOURS OF 6:30AM -9AM.
- CONTRACTORS ACCESS TO THE BUILDING IS LIMITED TO WORK AREAS, STAGING AREAS AND DIRECT TRAVEL TO AND FROM WORK AREAS.
- NO WORK (OTHER THAN NON-NOISE GENERATED ACTIVITES, I.E. PAINTING, GROUTING, CLEANING) ON STUDY DAYS AND EXAM DAYS (SEE CALENDAR).
- CONSTRUCTION DELIVERIES SHALL HAPPEN IN THE MORNING DURING OFF-PEAK HOURS (6AM -10AM).
- CONTRACTOR TO MAXIMIZE WORK EFFORTS DURING STUDENT BREAKS / RECESSES. REFER TO ACADEMIC CALENDAR FOR OPPORTUNITIES FOR UNRESTRICTED CONSTRUCTION ACTIVITIES. CONTRACTOR TO COORDINATE WITH OWNER.
- THERE IS NO CONTRACTOR PARKING PROVIDED; CONTRACTORS ARE RESPONSIBLE FOR THEIR PARKING. CITY PARKING STRUCTURES ARE AVAILABLE NEARBY. CONTRACTORS MAY BE ABLE TO PURCHASE PARKING FROM TRANSPORTATION SERVICES.
- CONTRACTORS ARE RESPONSIBLE FOR PROVIDING DUST/DEBRIS CONTROL MEASURES TO ASSURE THE DUST/DEBRIS IS NOT TRACKED THROUGH CORRIDORS/OTHER AREAS OF THE BUILDING. CONTRACTORS ARE RESPONSIBLE FOR CLEANING UP ANY VISIBLE DUST/DEBRIS OUTSIDE OF THEIR WORK AREAS ON A DAILY BASIS.
- CONTRACTOR CONVERSATIONS WITH STUDENTS IS TO BE MINIMIZED.
- THE DESIGNATED WORK AREA IS THE ONLY AREA IN THE BUILDING THAT IS AVAILABLE AS A STAGING AREA OR AREA FOR MATERIAL LAY DOWN.
- CONTRACTOR IS TO PROVIDE A FULL TEMPORARY ENCLOSURE TO SEPARATE THE WORK AREA FROM THE CORRIDOR.
- NO CONTRACTOR PARKING; UNIVERSITY LOTS MUST BE OPEN AND AVAILABLE FOR UEM AT ALL TIMES. CONTRACTOR TO PROVIDE THEIR OWN PARKING ARRANGEMENT AND/OR UTILIZE CITY REGULATED STREET PARKING SERVICES.

1 SITE LOGISTICS  
1/2" = 1'-0"

INDICATES EXISTING SPACE THAT IS EXCLUDED FROM THE SCOPE OF THIS PROJECT REFER TO DRAWINGS AND DETAILS FOR MORE INFORMATION

CONTRACTOR PATH TO WORK AREA

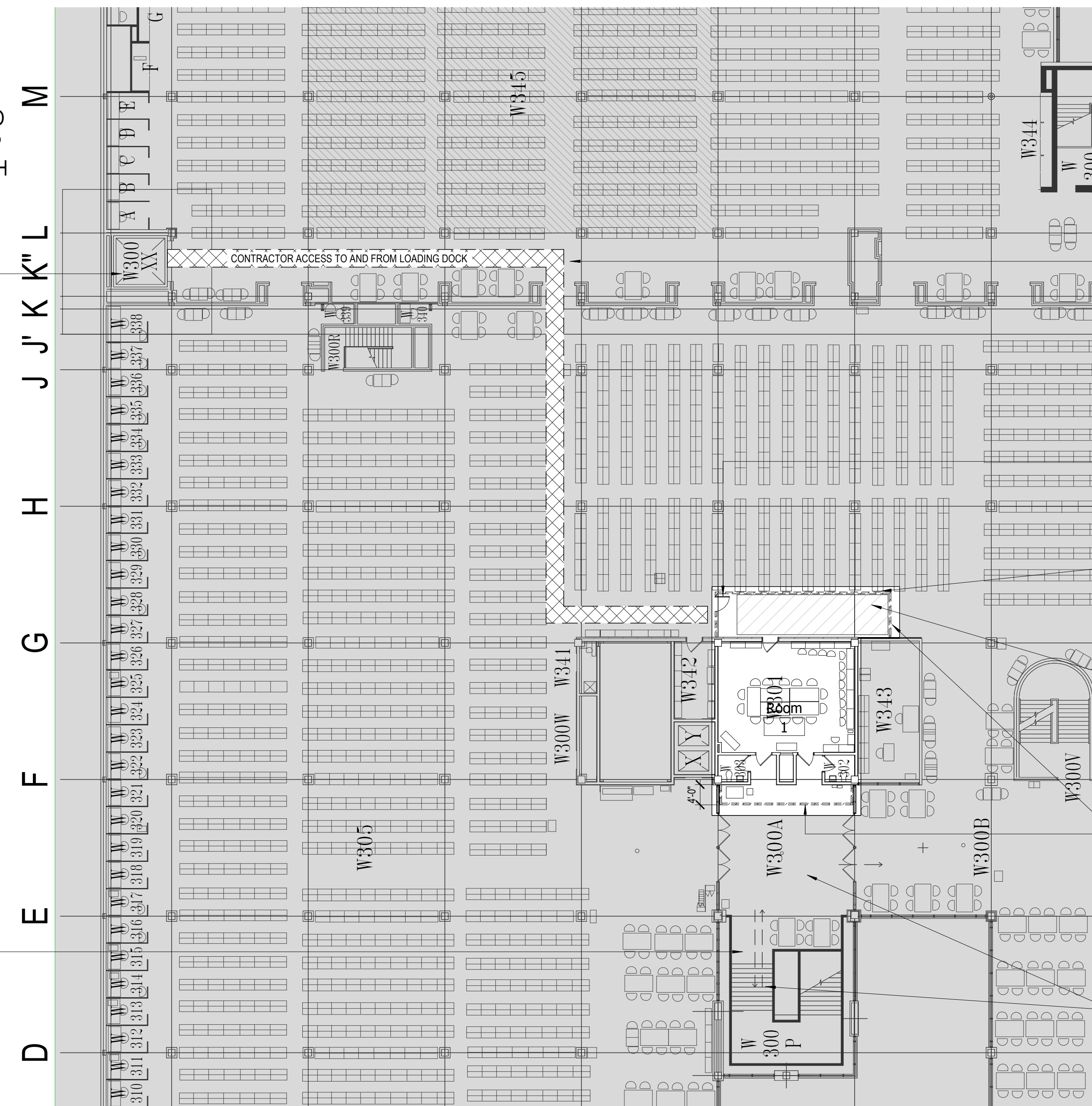


CONTRACTOR TO LAY DOWN  
HARD SURFACE MATERIAL TO  
PROTECT CARPET. CLEAN UP  
ANY DEBRIS ALONG THE PATH  
DAILY

FREIGHT ELEVATOR LIVE  
LOAD CAPACITY IS 5,000 LBS

NO TEMPORARY  
BARRIER ON THIS FLOOR.  
COORDINATE WITH UWM  
WHEN TO SHUT DOWN  
BATHROOMS FOR  
NECESSARY WORK.

CONTRACTOR IS  
RESPONSIBLE FOR  
CLEANING ANY DUST OR  
DEBRIS AROUND THE WORK  
AREA AND STAIRS DAILY.



CONTRACTOR TO LAY DOWN  
HARD SURFACE MATERIAL TO  
PROTECT CARPET. CLEAN UP  
ANY DEBRIS ALONG THE PATH  
DAILY

CONSTRUCTION DOOR INTO  
LAYDOWN AND WORK AREA

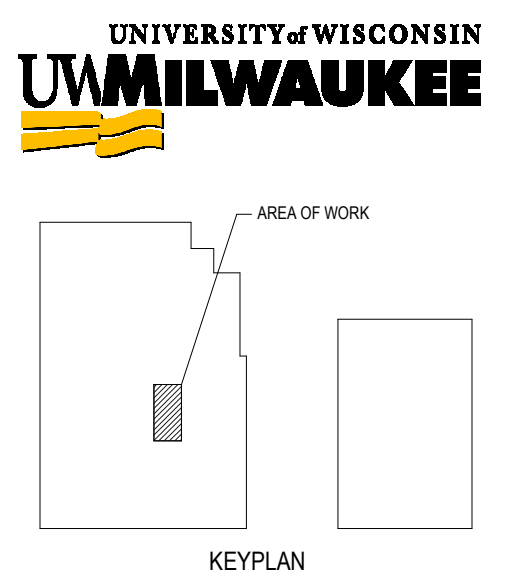
ALIGN TEMPORARY BARRIER  
WITH THE EDGE OF THE  
STACKS. TEMPORARY BARRIER  
CAN NOT DISTURB THE CEILING.

STAGING / MATERIAL LAYDOWN  
AREA

TEMPORARY CONSTRUCTION  
PARTITION CONSISTING OF 3/8"  
METAL STUDS, SOUND BATT  
INSULATION, AND 5/8" GYPSUM  
BOARD. TEMPORARY BARRIER  
CAN NOT DISTURB THE CEILING.

MAINTAIN A CLEAR ENTRANCE /  
EGRESS PATH FOR  
OCCUPANTS. MAINTAIN A SAFE  
UNOBSTRUCTED ACCESS TO  
ADJACENT SPACES. THESE  
AREAS WILL REMAIN OCCUPIED  
THROUGHOUT CONSTRUCTION

UW-MILWAUKEE  
GOLDA MEIR LIBRARY  
LUBAR CONFERENCE  
ROOM RENOVATION  
UWSA: B-23-001  
GML B1970  
2311 E HARTFORD  
AVE.  
MILWAUKEE, WI 53211



NO	DESCRIPTION	DATE

ISSUANCE HISTORY - THIS SHEET

HGA NO: 4200-026-00

CONSTRUCTION  
LOGISTICS PLAN

DATE: MAY 24, 2024

BID SET



















































