

Project Manual  
TECHNICAL SPECIFICATIONS

# Rennebohm Park Shelter Restroom Renovation

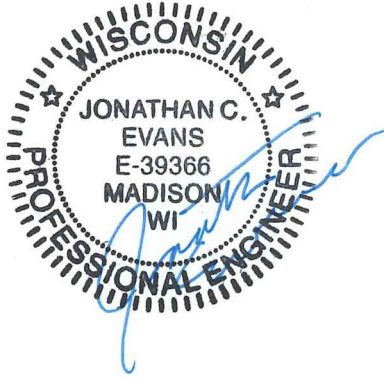
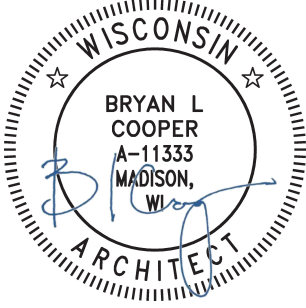
115 N. Eau Claire Avenue  
Madison, WI 53705

**1/19/2024**

Munis #14525  
Contract # 9485



<p><b>PUBLIC IMPROVEMENT PROJECT APPROVED:</b> RES 80758  FILE ID 9485  DATE December 5, 2023  BY THE COMMON COUNCIL OF MADISON, WI</p>	<p><b>PUBLIC IMPROVEMENT DESIGN APPROVED BY:</b>  _____ CITY ENGINEER <i>[Signature]</i>  _____ DATE 01/23/2024</p>
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10  
11 **PART 1 – GENERAL**

12  
13 **1.1. SUMMARY**

- 14 A. Each project has varying requirements for permits, inspections, and fees based on the scope, size, and location of  
15 the project.  
16 B. The City of Madison (Owner) is subject to all permits, inspections and associated fees for construction,  
17 demolition, utility connection, storm water management, and other similar requirements that may be required  
18 to complete the scope of work associated with these contract documents.  
19 C. The General Contractor (GC) shall be responsible for obtaining all permits, inspections and paying for all  
20 associated fees unless specifically identified within this specification.  
21

22 **1.2. REFERENCES**

- 23 A. The following references are not intended to be all inclusive. It shall be the GC’s responsibility to determine all  
24 requirements based on the scope of work in the contract documents.  
25 B. City of Madison Ordinances: Review all ordinances that may require a permit or fee that may be connected with  
26 a required permit. Contact the following City Agencies to determine the exact requirements during bidding  
27 1. Building Inspection  
28 2. Zoning  
29 3. Engineering  
30 4. Water Utility  
31 5. Traffic Engineering  
32 6. Others as may be specified by the contract documents.  
33 B. State Statutes  
34 C. Other Regulatory Regulations  
35 D. Other Agencies or companies that may have related requirements  
36 1. Madison Metropolitan Sewerage District  
37 2. Local gas and electric utility companies  
38 3. Other utility companies  
39

40 **1.3. GENERAL CONTRACTORS REQUIREMENTS**

- 41 A. The GC shall be responsible for all of the following:  
42 1. Execute application for all required permits as may be required by the scope of work described within the  
43 contract documents.  
44 2. Scheduling all required inspections that may be conditions of any required permits.  
45 3. Paying for other permits not explicitly stated as excluded in this section.  
46 B. The GC is not responsible for paying for the City Building, City HVAC, City Electrical, City Plumbing, Madison Fire  
47 Department Sprinkler and Madison Fire Department Fire Alarm permits.  
48 C. The GC shall provide high quality scanned images of all required permits and inspections and upload them to the  
49 Contract Documents-Regulatory Documents Library on the Project Management Web Site.  
50

51 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

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53 **PART 3 – EXECUTION – THIS SECTION NOT USED**

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57 **END OF SECTION**  
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**SECTION 00 43 25  
SUBSTITUTION REQUEST FORM (DURING BIDDING)**

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13

14 **PART 1 – GENERAL**

15  
16 **1.1. SUMMARY**

- 17 A. The City of Madison uses a specific list of preferred products for various specification items to establish  
18 standards of quality, utility, and appearance required.  
19 B. The City of Madison will not allow substitutions for specified Products except as follows:  
20 1. The Product is no longer produced or the product manufacturer is no longer in business.  
21 2. The manufacturer has significantly changed performance data, product dimensions, or other such design  
22 criteria for the specified Product(s).  
23 3. Products specified by naming one or more Products or manufacturer’s and “or approved equal” or  
24 “approved equivalent.”  
25 C. The procedures in this specification shall apply to all proposals by Contractors, Suppliers, Vendors, and  
26 Manufacturers when the conditions in item 1.1.B. above have been met during the bidding phase.  
27

28 **1.2. RELATED SPECIFICATIONS**

- 29 A. 01 25 13 Product Substitution Procedures  
30

31 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

32  
33 **PART 3 - EXECUTION**

34  
35 **3.1. REQUESTING A SUBSTITUTION DURING BIDDING**

- 36 A. In the event that a substitution is requested during the bidding phase the Contractor, Supplier, Vendor, or  
37 Manufacturer shall do all of the following:  
38 1. Submit a Substitution Request Form for each different product. Use a printed/scanned copy of the form  
39 at the end of this specification as a cover sheet.  
40 2. Support your request with complete data, drawings, specifications, performance data and samples as  
41 appropriate. A complete submission shall include the following:  
42 a. Substitution Request Form as a cover sheet  
43 b. Comparison of qualities of the proposed substitutions with that specified.  
44 c. Changes required in other elements of the Work because of the substitution.  
45 d. Effect on the construction schedule.  
46 e. Cost data comparing the proposed substitution with the Product specified.  
47 f. Any required license fees or royalties.  
48 g. Availability of maintenance service and source of replacement materials.  
49 3. Submit the Substitution Request Form and all required supporting documentation to the City Project  
50 Manager and Project Architect.  
51 a. Submissions to be done as complete PDF files for each product, appropriately titled  
52 b. Email submissions to the Project Architect and City Project Manager at the email addresses  
53 provided on the last page of Section D of the contract documents.  
54 i. The subject line shall include the contract number and “Request for Substitution”.  
55 Example: Contract 1234 – Request for Substitution  
56 4. Submissions must be received by the substitution request deadline specified in Section A of the Contract  
57 Documents.  
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**3.2. SUBMISSION REVIEW**

- A. The Project Architect, City Project Manager, members of the design team, and the Owners staff shall review all submissions for substitutions during the bidding phase.

**3.3. SUBSTITUTION APPROVAL**

- A. All requests for substitutions that have been approved shall be published by Addenda to the bid documents.

**NOTE SEE NEXT PAGE FOR SAMPLE SUBSTITUTION REQUEST FORM.**

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**3.4. SUBSTITUTION REQUEST FORM**

**For Pre-bid Substitution Requests all text boxes on this form are required information for a complete request.**

	<h1>Substitution Request</h1>
<b>Today's Date:</b>	<input type="text"/>
<b>Project Title:</b>	<input type="text"/>
<b>Project Number:</b>	<input type="text"/>
<b>Contract Number:</b>	<input type="text"/>
<p><i>By completing and submitting this form for review the General Contractor affirms that all of the following statements are correct:</i></p> <ol style="list-style-type: none"><li><i>The General Contractor affirms that this request is in compliance with the requirements described in <b>Specification 01 25 13 Product Substitution Procedures</b>.</i></li><li><i>The function, appearance, and quality of the proposed substitution are equal or superior to the specified item.</i></li><li><i>The proposed substitution does not affect dimensions shown on the drawings.</i></li><li><i>The proposed substitution will have no adverse affects on other trades, the construction schedule, or any specified warranty requirements.</i></li><li><i>Maintenance and service parts will be locally available for the proposed substitution. (GC shall provide supporting documentation in the attachments section below.)</i></li><li><i>The General Contractor shall be responsible for any and all costs associated with this substitution request if approved. This includes but is not to limited to fees for building design, engineering design fees, detailing fees, plan review fees, construction costs, and inspection fees.</i></li></ol>	
<b><u>GC Substitution Request:</u></b>	
<b>General Title:</b>	<input type="text"/>
<b>Related Specification:</b>	<input type="text"/> <input type="text"/> <input type="text"/>
<b>Reason for Substitution:</b>	<input type="text"/>
<b>Proposed Substitution:</b> <small>(include Name, Model, etc.)</small>	<input type="text"/>
<b>Submitted By:</b>	<input type="text"/>
<b>Company:</b>	<input type="text"/>
<b>Phone:</b>	<input type="text"/>
<b>Email:</b>	<input type="text"/>

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**SECTION 00 43 43  
WAGE RATES FORM**

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6 1.2. RELATED SPECIFICATIONS ..... 1  
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10 3.2. GENERAL CONTRACTORS RESPONSIBILITIES ..... 1  
11

12 **PART 1 – GENERAL**

13  
14 **1.1. SUMMARY**

- 15 A. The Reimbursable Hourly Worksheet is a contractor provided document that indicates the basic rate of pay,  
16 fringe benefits, and each companies cost of required insurance for all Trades and Classifications that will be  
17 performing productive labor during the execution of this contract.  
18 1. Rates shall be similar to recognized rates published by the Bureau of Labor Statistics, Associated General  
19 Contractors (AGC), Associated Builders and Contractors (ABC), appropriate union contracts, and other  
20 similar organizations or documents.  
21 B. The Reimbursable Labor Rate Worksheet shall provide the basis for labor rates being used on Change Order  
22 Request forms.  
23

24 **1.2. RELATED SPECIFICATIONS**

- 25 A. Section 01 26 57 Change Order Request  
26 B. Section 01 29 76 Progress Payment Procedures  
27 C. Section 01 31 23 Project Management Web Site (PMWS)  
28 D. Section 01 32 19 Submittals Schedule  
29

30 **PART 2 – PRODUCTS – NOT USED**

31  
32 **PART 3 - EXECUTION**

33  
34 **3.1. GENERAL REQUIREMENTS**

- 35 A. Prior to the Pre-Construction Meeting the City Project Manager (CPM) or the City Construction Manager (CCM)  
36 shall provide the GC a copy of the *Reimbursable Labor Rate Worksheet.xls*.  
37 1. See the last page of this specification for an example of the worksheet.  
38 B. The GC shall provide all subcontractors that will be performing productive labor during the execution of this  
39 contract with additional copies of the worksheet as needed.  
40 C. All contractors shall be required to fill out and submit completed worksheets for all Trades and Classifications of  
41 labor that will be performing productive labor during the execution of this contract.  
42

43 **3.2. GENERAL CONTRACTORS RESPONSIBILITIES**

- 44 A. The GC shall consolidate all Trades and Classifications into one master Excel Workbook of all trades.  
45 B. The GC shall provide the combined workbook as required by Section 1.6 of Specification 01 32 19 Submittals  
46 Schedule for review and approval by the Owners Representatives.  
47 1. Submittal shall be an Exported PDF of the completed Excel Workbook.  
48 a. As an Exported PDF the individual worksheets will be bookmarked and the document will be word  
49 searchable for easy reference.  
50 C. The GC shall only use the rates posted in the approved submittal throughout the execution of this contract.  
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### Reimbursable Hourly Rate Worksheet

*(see bottom of page for instructions)*

Project Name: \_\_\_\_\_  
 Project Location: \_\_\_\_\_  
 Project Number: \_\_\_\_\_  
 Contractor: \_\_\_\_\_  
 Rates are based on the following documentaton: \_\_\_\_\_

Enter TRADE Here:

**Carpenter**

<u>Classification:</u>		<u>Foreman</u>	<u>Journeyman</u>	<u>Laborer</u>	<u>Apprt 1</u>	<u>Other</u>	<u>Other</u>	<u>Other</u>
<b>Base Rate (BR)</b>		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Vacation		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Health Insurance		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Pension		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Apprenticeship		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<i>Sub-total</i>		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>BR Sub-total</b>		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Work. Comp	% of BR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Gen Liability	% of BR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
WI Unemploy.	% of BR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fed Unemploy	% of BR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
FICA	% of BR	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<i>Sub-total</i>		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>TOTAL COST</b>		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Enter YOUR percentage of base rate in the column below.

% of BR	
0	- Work. Comp
0	- Gen Liability
0	- WI Unemploy.
0.6	- Fed Unemploy
7.65	- FICA

**Form Instructions:**

1. Provide a work sheet for ALL Trade Classifications that will be performing on site productive labor during the execution of this project.
2. Responsible contractor to complete only boxes that are shaded, all non-shaded boxes are formula driven.
3. Contractor shall provide the name of the source used for these rates. (union contract, Bureau of Labor and Statistics, AGC, ABC, etc.) and be prepared to provide copies if so requested.

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**END OF SECTION**

**SECTION 00 62 76.13  
SALES TAX FORM**

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4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATION SECTIONS ..... 1  
7 1.2. TAX EXEMPT FORM ..... 1  
8 PART 2 – PRODUCTS – THIS SECTION NOT USED ..... 1  
9 PART 3 – EXECUTION – THIS SECTION NOT USED ..... 1

10  
11 **PART 1 – GENERAL**

12  
13 **1.1. SUMMARY**

- 14 A. The City of Madison is a qualifying tax exempt entity in the State of Wisconsin.  
15 B. The Contractor shall refer to *Section 102.9 – Bidders Understanding of the City of Madison FACILITIES*  
16 *MANAGEMENT SPECIFICATIONS for Public Works Construction* for more information on Tax Exempt Status.  
17 C. This project constructs or remodels facilities owned by the City of Madison in Madison, Wisconsin.

18  
19 **1.2. RELATED SPECIFICATION SECTIONS**

- 20 A. Parts of this specification will reference articles within “The City of Madison FACILITIES MANAGEMENT  
21 SPECIFICATIONS for Public Works Construction”.  
22 1. Use the following link to access the FACILITIES MANAGEMENT SPECIFICATIONS web page:  
23 <http://www.cityofmadison.com/business/pw/specs.cfm>  
24 a. Click on the “Part” chapter identified in the specification text. For example if the specification  
25 says “Refer to City of Madison FACILITIES MANAGEMENT SPECIFICATION 210.2” click the link for  
26 Part II, the Part II PDF will open.  
27 b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you  
28 to the referenced text.

29  
30 **1.3. TAX EXEMPT FORM**

- 31 A. The Contractor can access Wisconsin Sales and Use Tax Exemption Certificates (form S-211, Wisconsin  
32 Department of Revenue) from the City of Madison Finance website.  
33 1. City of Madison tax exempt information and signature by Purchasing Supervisor is already completed.  
34 2. Website: <http://www.cityofmadison.com/employeeenet/finance/purchasing>  
35 a. Under the title *Purchasing Forms*, scroll down to the form link titled *Sales Tax Exempt Form S-211*.

36  
37 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

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39 **PART 3 – EXECUTION – THIS SECTION NOT USED**

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44 **END OF SECTION**  
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**SECTION 01 25 13  
PRODUCT SUBSTITUTION PROCEDURES**

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4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATIONS ..... 1  
7 PART 2 – PRODUCTS..... 1  
8 2.1. SUBSTITUTION REQUEST FORM..... 1  
9 PART 3 - EXECUTION ..... 1  
10 3.1. REQUESTING A SUBSTITUTION DURING BIDDING..... 1  
11 3.2. REQUESTING A SUBSTITUTION AFTER AWARD OF CONTRACT ..... 1  
12 3.3. UNAUTHORIZED SUBSTITUTIONS..... 2  
13

14 **PART 1 – GENERAL**

15  
16 **1.1. SUMMARY**

- 17 A. The City of Madison uses a specific list of preferred products for various specification items to establish  
18 standards of quality, utility, and appearance required.  
19 B. The City of Madison will not allow substitutions for specified Products except as follows:  
20 1. The Product is no longer produced or the product manufacturer is no longer in business.  
21 2. The manufacturer has significantly changed performance data, product dimensions, or other such design  
22 criteria for the specified Product(s).  
23 3. Products specified by naming one or more Products or manufacturer’s and “or approved equal” or  
24 “approved equivalent.”  
25 C. The City of Madison will not allow substitutions for specified Products as follows:  
26 1. For Products specified by naming only one Product and manufacturer, no substitute product will be  
27 considered.  
28 2. For Products specified by naming several Products or manufacturers select any one of the products or  
29 manufacturers named, which complies with the specifications. No substitute product will be considered.  
30 D. Request for substitutions from any party other than the General Contractor (GC) will not be accepted.  
31

32 **1.2. RELATED SPECIFICATIONS**

- 33 A. Section 00 43 25 Substitution Request Form (During Bidding)  
34 B. Section 01 26 13 Request for Information (RFI)  
35 C. Section 01 31 23 Project Management Web Site (PMWS)  
36 D. Section 01 33 23 Submittals  
37

38 **PART 2 – PRODUCTS**

39  
40 **2.1. SUBSTITUTION REQUEST FORM**

- 41 A. During bidding all contractors (General and Sub-contractors) and suppliers of materials or products shall  
42 reference Specification Section 00 43 25 and provide a pdf copy of the Substitution Request form located at the  
43 end of that section with all required attachments directly to the Project Architect.  
44 B. After bidding only the GC shall submit a request and shall use the form located at the end of this specification  
45 and submit the request on the Project Management Web Site.  
46

47 **PART 3 - EXECUTION**

48  
49 **3.1. REQUESTING A SUBSTITUTION DURING BIDDING**

- 50 A. In the event that a substitution is requested during the bidding phase the Contractor or Supplier shall meet the  
51 substitution request deadline listed in the bidding documents. No substitution request will be considered during  
52 the bidding period after the stated substitution request deadline.  
53 B. See specification 00 43 25 Substitution Request Form (During Bidding).  
54

55 **3.2. REQUESTING A SUBSTITUTION AFTER AWARD OF CONTRACT**

- 56 A. A substitution request will only be considered after award of contract if it meets the qualifying provisions as  
57 described in 1.1.B.1 and .2 above.  
58 B. The GC shall submit a substitution request using the digital form on the Project Management Web Site.

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1. Consulting Staff, Owner and Owners Representatives will review the request and provide the appropriate approvals and feed back to the GC.

**3.3. UNAUTHORIZED SUBSTITUTIONS**

- A. Any Contractor who substitutes products without proper authorization by the Owner and Architect will be required to immediately remove and replace the product and all costs required to conform to the Contract Documents shall be borne by the General Prime Contractor.

**NOTE SEE NEXT PAGE FOR SAMPLE SUBSTITUTION REQUEST FORM.**

1

**For Pre-bid Substitution Requests all text boxes on this form are required information for a complete request.**

		<h1>Substitution Request</h1>	
Today's Date:	<input type="text"/>		
Project Title:	<input type="text"/>		
Project Number:	<input type="text"/>	Contract Number:	<input type="text"/>
<p><i>By completing and submitting this form for review the General Contractor affirms that all of the following statements are correct:</i></p> <ol style="list-style-type: none"><li>1 The General Contractor affirms that this request is in compliance with the requirements described in <i>Specification 01 25 13 Product Substitution Procedures.</i></li><li>2 The function, appearance, and quality of the proposed substitution are equal or superior to the specified item.</li><li>3 The proposed substitution does not affect dimensions shown on the drawings.</li><li>4 The proposed substitution will have no adverse affects on other trades, the construction schedule, or any specified warranty requirements.</li><li>5 Maintenance and service parts will be locally available for the proposed substitution. (GC shall provide supporting documentation in the attachments section below.)</li><li>6 The General Contractor shall be responsible for any and all costs associated with this substitution request if approved. This includes but is not to limited to fees for building design, engineering design fees, detailing fees, plan review fees, construction costs, and inspection fees.</li></ol>			
<b>GC Substitution Request:</b>			
General Title:	<input type="text"/>		
Related Specification:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Reason for Substitution:	<input type="text"/>		
Proposed Substitution: (include Name, Model, etc.)	<input type="text"/>		
Submitted By:	<input type="text"/>	Phone:	<input type="text"/>
Company:	<input type="text"/>	Email:	<input type="text"/>

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3  
4  
5  
6  
7

END OF SECTION

**SECTION 01 26 13  
REQUEST FOR INFORMATION (RFI)**

1  
2  
3  
4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATIONS ..... 1  
7 1.3. PERFORMANCE REQUIREMENTS..... 1  
8 1.4. QUALITY ASSURANCE ..... 1  
9 PART 2 – PRODUCTS..... 1  
10 2.1. REQUEST FOR INFORMATION FORM ..... 1  
11 PART 3 - EXECUTION ..... 1  
12 3.1. CONTRACTOR INITIATED RFI ..... 1  
13 3.3. RFI RESPONSES..... 2  
14 3.4. COMMENCEMENT OF WORK RELATED TO AN RFI ..... 2  
15

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 19 A. Contractors shall use the RFI form/process to request additional information or clarification regarding the  
20 construction documents.  
21 B. All RFI documentation will be processed through the through the Project Management Web Site (PMWS).  
22

**1.2. RELATED SPECIFICATIONS**

- 23 A. Section 01 26 46 Construction Bulletin (CB)  
24 B. Section 01 26 57 Change Order Request (COR)  
25 C. Section 01 26 63 Change Order (CO)  
26 D. Section 01 31 23 Project Management Web Site (PMWS)  
27 E. Section 01 91 00 Commissioning  
28  
29

**1.3. PERFORMANCE REQUIREMENTS**

- 30 A. RFI issues initiated by any contractor shall be done through the General Contractor (GC).  
31 1. RFIs submitted by any Sub-contractor under the GCs control shall be returned with no response.  
32 B. Submit a new RFI for each issue. Only multiple questions that are of a similar nature may be combined into one  
33 RFI shall be allowed and responded to.  
34  
35

**1.4. QUALITY ASSURANCE**

- 36 A. The GC shall be responsible for all of the following:  
37 1. Ensure that any request for additional information is valid and the information being requested is not  
38 addressed in the construction documents.  
39 2. Ensure that all requests are clearly stated and the RFI form is completely filled out.  
40 3. Ensure that all Work associated an RFI response is carried out as intended.  
41 B. The Project Architect /Project Engineer (A/E PROJ MGR) shall be responsible for the following:  
42 1. Ensure that all responses to contractor initiated RFIs are properly responded to in a timely fashion.  
43 a. The CPM, Owner, consulting staff, and other City staff shall be responsible for the initial review of  
44 the RFI. The A/E PROJ MGR shall be responsible for codifying all consultant and Owner/City staff  
45 comments into a unified RFI response.  
46  
47

**PART 2 – PRODUCTS**

**2.1. REQUEST FOR INFORMATION FORM**

- 48 A. The RFI form is located on the Project Management Web Site.  
49

**PART 3 - EXECUTION**

**3.1. CONTRACTOR INITIATED RFI**

- 50 A. Immediately on discovery of the need for additional information or interpretation of the Contract Documents  
51 any contractor may initiate an RFI for additional information or clarification through the GC.  
52 B. The GC shall use the Project Management Web Site and completely fill out the form.  
53  
54  
55  
56  
57  
58



- 1                   1.     Thoroughly explain the issue at hand, provide backup information (photographs, sketches, drawings,  
2                   data, etc.) as necessary, and clearly state the question or problem that requires a resolution. Combine  
3                   like or related issues but do not include multiple issues on one form.  
4                   a.     Example. If a duct interferes with other critical piping and electrical work include all issues into  
5                   one RFI.  
6                   b.     Example. If you have a question regarding the chiller and another regarding toilet partitions  
7                   create separate RFIs.  
8

9     **3.3. RFI RESPONSES**

- 10            A.     Responses to simple RFI issues shall be completed within five (5) working days of the RFI form being submitted.  
11            B.     Responses to more complex issues may require additional time or may require a Construction Bulletin to be  
12            published. The initial RFI shall be responded to within five (5) working days stating that the RFI is being  
13            reviewed and provide an estimated date for the response.  
14            C.     The following GC generated RFIs will be returned without action:  
15                1.     Requests for approval of submittals  
16                2.     Requests for approval of substitutions  
17                3.     Requests for approval of Contractor's means and methods.  
18                4.     Requests for coordination information already indicated in the Contract Documents.  
19                5.     Requests for adjustments in the Contract Time or the Contract Sum.  
20                6.     Requests for interpretation of A/E's actions on submittals.  
21                7.     Incomplete RFI or inaccurately prepared RFI.  
22

23     **3.4. COMMENCEMENT OF WORK RELATED TO AN RFI**

- 24            A.     The GC shall only proceed with the Work of an RFI when additional information is not required.  
25            B.     The GC shall not proceed with any Work associated with an RFI while it is under review.  
26            C.     The GC shall not proceed with any Work associated with an RFI that clearly states a CB will be issued in response  
27            to the RFI.  
28            D.     The GC will be required to immediately remove and replace unauthorized Work and all costs required to  
29            conform to the Contract Documents shall be borne by the GC.  
30  
31  
32

33                                                           **END OF SECTION**

**SECTION 01 26 46  
CONSTRUCTION BULLETIN (CB)**

1  
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4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATIONS ..... 1  
7 1.3. PERFORMANCE REQUIREMENTS..... 1  
8 1.4. QUALITY ASSURANCE ..... 2  
9 PART 2 – PRODUCTS..... 2  
10 2.1. CONSTRUCTION BULLETIN FORM ..... 2  
11 PART 3 - EXECUTION ..... 2  
12 3.1. WRITING THE CONSTRUCTION BULLETIN ..... 2  
13 3.2. EXECUTING THE CONSTRUCTION BULLETIN..... 2  
14

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 18 A. Construction Bulletins (CB) are formal published construction documents that modify the original contract bid  
19 documents after construction has commenced. CBs may be published for many reasons, including but not  
20 limited to the following:  
21 1. Clarification of existing construction documents including specifications, plans, and details  
22 2. Change in product or equipment  
23 3. A response to a Request for Information  
24 4. Change in scope of the contract as either an add or a deduct of work  
25 B. CBs provide a higher degree of detail in response to a Request for Information (RFI) through directives, revised  
26 plans/details, and specifications as necessary.  
27 C. The CB may change the original contract documents through additions or deletions to the Work.  
28 D. Where the directives of a CB are significant enough to warrant a Change Order Request (COR) the GC shall use all  
29 information provided in the CB to assemble all required back-up documentation for additions and deletions of  
30 materials, labor and other related contract costs for the COR.  
31 E. All CB documentation will be processed through the Project Management Web Site (PMWS).  
32

**1.2. RELATED SPECIFICATIONS**

- 34 A. Section 01 26 13 Request for Information (RFI)  
35 B. Section 01 26 57 Change Order Request (COR)  
36 C. Section 01 26 63 Change Order (CO)  
37 D. Section 01 31 23 Project Management Web Site (PMWS)  
38 E. Section 01 91 00 Commissioning  
39

**1.3. PERFORMANCE REQUIREMENTS**

- 41 A. Project Architect /Project Engineer (A/E PROJ MGR): The A/E PROJ MGR shall be the only person authorized to  
42 publish a CB as needed for any reason indicated in section 1.1.A above. The A/E PROJ MGR shall consult as  
43 necessary with any of the following while drafting the CB and shall confirm final direction with the CPM prior to  
44 issuing a CB:  
45 1. City Project manager (CPM)  
46 2. Owner  
47 3. Members of the consulting staff  
48 4. Members of city staff  
49 5. The General Contractor  
50 6. Sub-contractors  
51 7. Commissioning Agent (CxA)  
52 B. General Contractor: The GC shall be responsible for the following as needed:  
53 1. Executing the directives of the CB when they believes that no changes in labor, materials, equipment, or  
54 contract duration will be required for additions or deletions.  
55 2. Submit a COR when they believes that a change in labor, materials, equipment or contract duration will  
56 be required for additions or deletions.  
57

1 **1.4. QUALITY ASSURANCE**

- 2 A. The A/E PROJ MGR shall be responsible for ensuring the final CB sufficiently provides direction, details,  
3 specifications and other information as necessary for the GC to perform the intended Work.  
4 B. The A/E PROJ MGR shall be responsible for ensuring the final CB is published as expeditiously as practical based  
5 on the complexity of the CB being written. CBs that may affect the GC critical path shall be given priority.  
6

7 **PART 2 – PRODUCTS**

8  
9 **2.1. CONSTRUCTION BULLETIN FORM**

- 10 A. The CB form is located on the Project Management Web Site.  
11

12 **PART 3 - EXECUTION**

13  
14 **3.1. WRITING THE CONSTRUCTION BULLETIN**

- 15 A. The A/E PROJ MGR shall draft a CB as needed using the Construction Bulletin form on the Project Management  
16 Web Site.  
17 1. The A/E PROJ MGR and/or consulting staff as necessary shall provide specifications, model numbers and  
18 performance data, details and other such information necessary to clearly state the intentions of the CB.  
19 2. The consulting staff, CPM, Owner, CxA and other City Staff shall review the draft and recommend  
20 changes as needed.  
21 3. The A/E PROJ MGR shall amend the draft as necessary into a final CB for review.  
22 4. Full plan sheets and entire specification sections referred to within a CB, shall be reissued with the CB.  
23 B. Once the final CB has been approved the A/E PROJ MGR shall “Submit” the CB through the Project Management  
24 Web Site to the City Project Manager.  
25 C. The City Project Manager will close and distribute the CB.  
26

27 **3.2. EXECUTING THE CONSTRUCTION BULLETIN**

- 28 A. The GC shall acknowledge receipt of the CB on the Project Management Web Site as instructed in the Tutorial  
29 Manual provided to the awarded contractor.  
30 B. The GC shall notify all Sub-contractors of the CB and publish the CB to all field sets of drawings and specifications  
31 as appropriate.  
32 C. The GC shall execute the directives of the CB or submit COR documentation as necessary during the execution  
33 and implementation of the CB.  
34 1. See Specification 01 26 57 Change Order Request (COR)  
35  
36  
37

38 **END OF SECTION**  
39

**SECTION 01 26 57**  
**CHANGE ORDER REQUESTS (COR)**

1  
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5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATION SECTIONS ..... 2  
7 1.3. DEFINITIONS AND STANDARDS ..... 2  
8 1.4. CONTRACT EXTENSION ..... 3  
9 1.5. OVERHEAD AND PROFIT MARKUP ..... 3  
10 1.6. PERFORMANCE REQUIREMENTS ..... 3  
11 1.7. QUALITY ASSURANCE ..... 4  
12 PART 2 – PRODUCTS ..... 4  
13 2.1. CHANGE ORDER REQUEST FORM ..... 4  
14 PART 3 - EXECUTION ..... 4  
15 3.1. ESTABLISHING A CHANGE ORDER REQUEST ..... 4  
16 3.2. SUBMIT A CHANGE ORDER REQUEST FORM ..... 4  
17 3.3. CHANGE ORDER REQUEST REVIEW, APPROVAL, AND PROCESSING ..... 4  
18 3.4. EMERGENCY CHANGE ORDER REQUEST ..... 5  
19

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 20  
21  
22  
23 A. Except in cases of emergency, no changes in the Work required by the Contract Documents may be made  
24 by the General Contractor (GC) without having prior approval of the City Engineer or their representative.  
25 B. The City may at any time, without invalidating the Contract and without Notice to Sureties, order changes in  
26 the Work by written Change Order (CO). Such changes may include additions and/or deletions.  
27 C. Where the City desires to make changes in the Work through use of written Change Order Request (COR), the  
28 following procedures apply:  
29 1. If requested by the City, the GC shall prepare and submit a detailed proposal, including all cost and time  
30 adjustments to which the GC believes it will be entitled if the change proposed is incorporated into the  
31 Contract. The City shall be under no legal obligation to issue a Change Order for such proposal.  
32 2. The parties shall attempt in good faith to reach agreement on the adjustments needed to the Contract to  
33 properly incorporate the proposed change(s) into the Work. In the event that the parties agree on such  
34 adjustments, the City may issue a Change Order and incorporate such changes and agreed to  
35 adjustments, if any.  
36 3. In some instances, it may be necessary for the City to authorize Work or direct changes in Work for which  
37 no final and binding agreement has been reached and for which unit prices are not applicable. In such  
38 cases the following shall apply.  
39 a. Upon written request by the City, the GC shall perform proposed Work  
40 b. The cost of such change may be determined in accordance with this specification.  
41 c. In the event agreement cannot be accomplished as contemplated herein, the City may authorize  
42 the Work to be performed by City forces or to hire others to complete the Work. Such action on  
43 the part of the City shall not be the basis of a claim by the GC for failure to allow it to perform the  
44 changed Work.  
45 D. Where changes in the Work are made by the City through use of a force account basis, the GC shall as soon as  
46 practicable, and in no case later than ten (10) working days from the receipt of such order, unless another time  
47 period has been agreed to by both parties, give the City written Notice, stating:  
48 1. The date, circumstances and source of the extra work; and,  
49 2. The cost of performing extra work described by such Order, if any; and,  
50 3. Effect of the order on the required completion date of the Project, if any.  
51 E. The giving of each Notice by the GC as prescribed by this specification, shall be a requirement to liability of the  
52 City for payment of any additional costs incurred by the GC in implementing changes in the Work. Under this  
53 specification, no order or statement of the City shall be treated as a Change Order, or shall entitle the GC to an  
54 equitable adjustment of the terms of this Contract or damages for costs incurred by the GC on any activity for  
55 which the Notice was not given.  
56 F. In the event Work is required due to an emergency as described in this specification the GC must request an  
57 equitable adjustment as soon as practicable, and in no case later than ten (10) working days of the  
58 commencement of such emergency.

- 1 G. All GC requests for equitable adjustment shall be submitted to the CPM per the specifications below. Such
- 2 requests shall set forth with specificity the amount of and reason(s) for the proposed adjustment and shall be
- 3 accompanied by supporting information and documents.
- 4 H. No adjustment of any kind shall be made to this Contract, if asserted by the GC for the first time, after the date
- 5 of final payment.
- 6 I. This specification shall be used by the GC when preparing documentation for any COR to ensure each has been
- 7 properly and completely filled out as required by the City of Madison.
- 8 J. All COR documentation will be processed through the Project Management Web Site (PMWS).
- 9

10 **1.2. RELATED SPECIFICATION SECTIONS**

- 11 A. Section 01 26 13 Request for Information (RFI)
- 12 B. Section 01 26 46 Construction Bulletins (CB)
- 13 C. Section 01 26 63 Change Order (CO)
- 14 D. Section 01 31 23 Project Management Web Site (PMWS)
- 15 E. Section 01 91 00 Commissioning
- 16 F. Parts of this specification will reference articles within “The City of Madison FACILITIES MANAGEMENT
- 17 SPECIFICATIONS for Public Works Construction”.
- 18 1. Use the following link to access the FACILITIES MANAGEMENT SPECIFICATIONS web page:
- 19 <http://www.cityofmadison.com/business/pw/specs.cfm>
- 20 a. Click on the “Part” chapter identified in the specification text. For example if the specification
- 21 says “Refer to City of Madison FACILITIES MANAGEMENT SPECIFICATION 210.2” click the link for
- 22 Part II, the Part II PDF will open.
- 23 b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you
- 24 to the referenced text.
- 25

26 **1.3. DEFINITIONS AND STANDARDS**

- 27 A. LABOR: The amount of time and cost associated with the performance of human effort for a defined scope of
- 28 Work. Labor is further defined as follows:
- 29 1. Labor rate is the total hourly rate which includes the basic rate of pay, fringe benefits plus each
- 30 company’s cost of required insurance, also referred to as a reimbursable labor rate.
- 31 2. Unit labor is the labor hours anticipated to install the corresponding unit of material.
- 32 3. Labor cost is the labor hours multiplied by the hourly labor rates.
- 33 B. MATERIAL: Actual material cost is the amount paid, or to be paid, by the GC for materials, supplies and
- 34 equipment entering permanently into the Work, including cost of transportation and applicable taxes. The cost
- 35 shall not exceed the usual and customary cost for such items available in the geographical area of the project
- 36 C. LARGE TOOLS AND MAJOR EQUIPMENT: Large tools and major equipment are those with an initial cost greater
- 37 than \$1,500, whether from the GC or other sources.
- 38 1. Tool and equipment use and time allowed is only for extra work associated with change orders.
- 39 a. Rental Rate is the machine cost associated with operating a piece of equipment for a defined
- 40 length of time (hour, day, week, or month) and shall not exceed the usual and customary amount
- 41 for such items available in the geographical area of the project.
- 42 b. Rental cost is the rental rate multiplied by the anticipated duration the equipment shall be
- 43 required.
- 44 2. The GC shall provide a breakdown of all rental rates to indicate what items and costs are associated with
- 45 the rate. Examples of items to include in the breakdown would be fuel consumption, lubrication,
- 46 maintenance and other similar expenses but not including profit and overhead.
- 47 3. When large tools and equipment needed for Change Order work are not already at the job site, the
- 48 actual cost to get the item there is also reimbursable.
- 49 D. BOND COST: The cost shall be calculated at 1% of the total proposed change order.
- 50 E. SUB-CONTRACTOR COSTS: Sub-contractor costs are for those labor, material, and equipment costs required by
- 51 subcontracted specialties to complete the Change Order work.
- 52 F. OVERHEAD AND PROFIT Markup: The allowable markup percentage to a COR by the GC and Sub-contractors for
- 53 overhead and profit. All of the following are expenses associated with overhead and profit and shall not be
- 54 reimbursable as individual items on any COR:
- 55 1. CHANGE ORDER PREPARATION: All costs associated with the preparing and processing of the change
- 56 order.
- 57 2. DESIGN, ESTIMATING, AND SUPERVISION: All such efforts, unless specifically requested by Owner as
- 58 additional Work to be documented as a COR or portion thereof.

- 1 3. INSTALLATION LAYOUT: The layout required for the installation of material and equipment, and the
- 2 installation design, is the responsibility of the GC.
- 3 4. SMALL TOOLS AND SUPPLIES: The cost of small hand tools with an initial cost of \$1,500 or less, along
- 4 with consumable supplies and expendable items such as drill bits, saw blades, gasoline, lubricating or
- 5 cutting oil, and similar items.
- 6 5. GENERAL EXPENSE: The general expense, which is those items that are a specific job cost not associated
- 7 with direct labor and material such as job trailers, foreman truck, and similar items.
- 8 6. RECORD DRAWINGS: The preparation of record or as-built drawings.
- 9 7. OTHER COSTS: Any miscellaneous cost not directly assessable to the execution of the Change Order
- 10 including but not limited to the following:
- 11 a. All association dues, assessments, and similar items.
- 12 b. All education, training, and similar items.
- 13 c. All drafting and/or engineering, unless specifically requested by Owner as additional Work to be
- 14 documented as a Change Order proposal or portion thereof.
- 15 d. All other items including but not limited to review, coordination, estimating and expediting, field
- 16 and office supervision, administrative work, etc.
- 17 G. Contract Extension: The necessary amount of time to be added to the contract deadlines for the completion of a
- 18 change order.
- 19

20 **1.4. CONTRACT EXTENSION**

- 21 A. The GC shall not assume that every COR will require a Contract Extension. If the GC feels a contract extension is
- 22 warranted, they shall provide sufficient scheduling information that shows how the COR being requested
- 23 impacts the critical path of the project.
- 24 B. The City of Madison strongly encourages the GC to explore alternative methods and practices prior to submitting
- 25 a COR with a request for contract extension.
- 26

27 **1.5. OVERHEAD AND PROFIT MARKUP**

- 28 A. Pursuant to the City of Madison FACILITIES MANAGEMENT SPECIFICATIONS for Public Works Construction,
- 29 Section 104.7, Extra Work, the following maximum allowable markups shall be strictly enforced on all change
- 30 orders associated with the execution of this contract.
- 31 1. The total maximum overhead and profit shall not exceed fifteen percent (15%) of the total costs.
- 32 2. The total maximum overhead and profit shall be distributed as follows:
- 33 a. For work performed and materials provided solely by the General Contractor, fifteen percent
- 34 (15%) of the total costs.
- 35 b. For work performed and materials provided solely by Sub-contractors and supervised by the
- 36 General Contractor:
- 37 i. Supervision of the GC, five percent (5%) of the total Sub-contractor cost.
- 38 ii. Sub-contractors work and materials ten percent (10%) of the total Sub-contractor cost.
- 39

40 **1.6. PERFORMANCE REQUIREMENTS**

- 41 A. The GC shall become thoroughly familiar with this specification as it will identify procedures and expenses that
- 42 are or are not allowed under the Change Order and Change Order Request process.
- 43 B. The GC shall be responsible for all of the following:
- 44 1. Carefully reviewing the CB that is associated with the COR.
- 45 2. Collecting required supporting documentation from all contractors that quantify the need for a COR.
- 46 a. Labor hours and wage rates
- 47 b. Material costs
- 48 c. Equipment costs
- 49 C. The following shall apply to establishing prices for labor, materials, and equipment costs:
- 50 1. Where Work to be completed has previously been established by individual bid items in the contract bid
- 51 proposal the GC shall use the unit bid prices previously established.
- 52 2. Where Work to be completed was bid as a Lump Sum without individual bid items the GC shall provide a
- 53 breakdown of all labor, materials, equipment including unit rates and quantities required.
- 54 D. The completion date is determined by Owner. The schedule, however, is the responsibility of the GC. Time
- 55 extensions for extra Work will be considered when a schedule analysis of the critical path shows that the Change
- 56 Order Request places the Work beyond the completion date stated in the Contract.

1  
2 **1.7. QUALITY ASSURANCE**

- 3 A. The GC shall be responsible for ensuring that all COR supporting documentation meets the following  
4 requirements prior to completing the COR form on the Project Management Web Site:  
5 1. Sufficiently indicates labor, material, and other expenses related to completing the intent of the CB.  
6 2. No costs exceed the usual and customary amount for such items available in the geographical area of the  
7 project, and no costs exceed those established under the contract.  
8 B. The Project Architect /Project Engineer A/E PROJ MGR, Commissioning Agent (CxA), City Project Manager (CPM),  
9 other members of the consulting staff, and city staff shall review all COR requests to ensure that the intent of the  
10 CB will be met under the proposal of the COR or request additional information as necessary.  
11

12 **PART 2 – PRODUCTS**

13  
14 **2.1. CHANGE ORDER REQUEST FORM**

- 15 A. The COR form is located on the Project Management Web Site.  
16

17 **PART 3 - EXECUTION**

18  
19 **3.1. ESTABLISHING A CHANGE ORDER REQUEST**

- 20 A. Upon receipt of a Construction Bulletin (CB) where the GC believes a significant change in contract scope  
21 warrants the submittal of a COR the GC shall do all of the following within ten (10) working days after receipt of  
22 the CB:  
23 1. Review the CB with all necessary trades and sub-contractors required by the change in scope.  
24 a. Additions or deletions to the contract scope shall be as directed within the CB.  
25 b. Additions or deletions of labor and materials shall be determined by the GC based on the  
26 directives of the CB.  
27 2. Assemble all required back-up documentation for additions and deletions of materials, labor and other  
28 related contract costs as previously outlined in this specification.  
29 3. Submit a COR request form on the Project Management Web Site.  
30 B. Submitting a COR does not obligate the GC to complete the work associated with the COR nor does it obligate  
31 the Owner to approve the COR as a change to the contract.  
32

33 **3.2. SUBMIT A CHANGE ORDER REQUEST FORM**

- 34 A. This specification shall provide a subject overview only. In depth instructions shall be provided to the awarded  
35 Contractor in a PDF Instructional Manual.  
36 B. The GC shall select the appropriate link on the Project Management Web Site.  
37 C. The software will open a new COR form and the GC shall provide all of the following information:  
38 1. DO NOT perform any calculations on this worksheet, only provide the raw data as requested below. All  
39 calculations, totals, and markups shall be computed as described within this specification.  
40 2. Provide a summary description of the COR request, and justification for any requested time extension to  
41 the contract, indicate the number of calendar days being requested for the extension and add any  
42 attachments to the form as needed.  
43 3. Provide all GC self-performance data including all of the following:  
44 a. Materials description, quantities, and unit costs.  
45 b. Labor hours and rates for all Foremen, Journeymen, and Apprentices by trade.  
46 c. Equipment descriptions, quantities, unit costs and rates.  
47 4. Provide all Sub-contractor data including all of the following:  
48 a. Materials description, quantities, and unit costs.  
49 b. Labor hours and rates for all Foremen, Journeymen, and Apprentices by trade.  
50 c. Equipment descriptions, quantities, unit costs and rates.  
51 5. Ensure all calculations performed by the form have been completed correctly. Contact the CPM directly  
52 if you suspect an error before hitting the save button.  
53 D. When all data has been entered submit the COR form. This will kick off the COR Review and Approval process.  
54

55 **3.3. CHANGE ORDER REQUEST REVIEW, APPROVAL, AND PROCESSING**

- 56 A. The A/E PROJ MGR and CPM shall review all CORs submitted by the GC.

- 1 1. Additional consulting staff and city staff having knowledge of the components of the COR shall review
- 2 and advise the A/E PROJ MGR and CPM as to the accuracy of the items, quantities, and associated costs
- 3 of the COR as directed by the CB.
- 4 2. The CPM shall review the COR with the Owner.
- 5 B. If required the A/E PROJ MGR and CPM, shall in good faith, further negotiate the COR with the GC as necessary.
- 6 All amendments to any COR shall be documented within the Project Management Web Site software.
- 7 C. After final review of the COR the CPM and Owner may accept the COR.
- 8 D. The CPM shall prepare the COR in the form of an official Board of Public Works Change Order for final review and
- 9 approval as outlined in Section 01 26 63 Change Order (CO).
- 10 E. The GC shall not act upon any accepted COR until it has received final approval through the Public Works process
- 11 as an official CO to the Work unless instructed to do so by the CPM. Proceeding without the final approval of a
- 12 fully authorized Change Order is at the GC's own risk.
- 13

14 **3.4. EMERGENCY CHANGE ORDER REQUEST**

- 15 A. In the event Work is required due to an emergency as described in the Contract Documents, the GC must
- 16 request an equitable adjustment as soon as practicable, and in no case later than ten (10) working days of the
- 17 commencement of such emergency.
- 18 B. The GC shall provide full documentation of all labor, materials and equipment used during the period of
- 19 emergency as part of the COR submittal.
- 20
- 21
- 22

23 **END OF SECTION**

24



**SECTION 01 26 63  
CHANGE ORDER (CO)**

1  
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5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATION SECTIONS ..... 1  
7 1.3. BOARD OF PUBLIC WORKS PROCEDURE ..... 1  
8 PART 2 – PRODUCTS..... 2  
9 2.1. CHANGE ORDER FORM..... 2  
10 PART 3 - EXECUTION ..... 2  
11 3.1. PREPARATION OF THE CHANGE ORDER ..... 2  
12 3.2. EXECUTION OF THE CHANGE ORDER ..... 2  
13

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 17 A. Except in cases of emergency, no changes in the Work required by the Contract Documents may be made  
18 by the General Contractor (GC) without having prior approval of the City Project Manager (CPM).  
19 B. The City may at any time, without invalidating the Contract and without Notice to Sureties, order changes in  
20 the Work by written Change Order. Such changes may include additions and/or deletions.  
21 C. The Change Order (CO) is a Board of Public Works (BPW) form that is reviewed and approved by a specific  
22 process.  
23 D. The CO form is typically made up of multiple Change Order Requests (CORs) and/or Bid Items as appropriate  
24 depending on the type of project and how the contract was bid.  
25 E. All CO documentation shall be processed through the Project Management Web Site (PMWS).  
26

**1.2. RELATED SPECIFICATION SECTIONS**

- 27 A. Section 01 26 13 Request for Information (RFI)  
28 B. Section 01 26 46 Construction Bulletin (CB)  
29 C. Section 01 26 63 Change Order Request (COR)  
30 D. Section 01 31 23 Project Management Web Site (PMWS)  
31 E. Section 01 91 00 Commissioning  
32  
33

**1.3. BOARD OF PUBLIC WORKS PROCEDURE**

- 34 A. The Board of Public Works has a very explicit procedure for the review and approval of all change orders  
35 associated with any Public Works Contract as follows:  
36 1. The Supervisory Chain of the CPM shall review and approve any CO under \$20,000 provided it does not  
37 include either of the following:  
38 a. The CO does not request a time extension to the contract.  
39 b. The CO does not cause the contract contingency sum to be exceeded.  
40 2. The Board of Public Works shall review and approve any CO that requires any of the following:  
41 a. Any CO over \$20,000.  
42 b. Any CO requesting a time extension to the contract regardless of the monetary value of the CO.  
43 c. Any CO that that causes the contract contingency sum to be exceeded.  
44 B. The Board of Public Works generally meets every other week and only once in August and December. The GC is  
45 cautioned that, under normal scheduling, a CO requiring a BPW review will take a minimum of two (2) weeks to  
46 achieve final approval.  
47 1. The City shall not be responsible for additional delays to the Work caused by the scheduling constraints  
48 of the Board of Public Works.  
49 C. **SPECIAL NOTE:** The GC is cautioned to never proceed unless told to do so by the CPM. Only in rare instances  
50 may the CPM give a written notice to proceed on a COR without an approved CO. Proceeding without the  
51 written notice of the CPM or an approved CO is at the GC’s own risk.  
52  
53

1 **PART 2 – PRODUCTS**

2  
3 **2.1. CHANGE ORDER FORM**

- 4 A. The CO form is located on the Project Management Web Site. The CPM shall click the link in the left margin of  
5 the project web site opening a new form. Project information is pre-loaded, the CPM only needs to enter  
6 information and make attachments as needed to complete the form.  
7

8 **PART 3 - EXECUTION**

9  
10 **3.1. PREPARATION OF THE CHANGE ORDER**

- 11 A. The CPM shall prepare the required CO forms in the Project Management Web Site as follows:  
12 1. Provide information for all contract information.  
13 2. Provide a general description of the items described within the change order.  
14 3. Provide detailed information for each Item on the CO form. At the option of the CPM, they may include  
15 multiple Change Order Requests each as their own item.  
16 4. Provide required pricing and accounting information as needed for the item.  
17 5. Insert attachments of contractor/architect provided information that clarifies and quantifies the CO.  
18 Attachments may include but not be limited to material lists, estimated labor, revised details or  
19 specifications, and other documents that may be related to the requested change.  
20 6. Save the final version of the completed CO.  
21

22 **3.2. EXECUTION OF THE CHANGE ORDER**

- 23 A. Upon saving the CO as described in section 3.1 above, the software associated with the Project Management  
24 Web Site shall notify the GC that the CO has been drafted and is ready for review. The GC shall do the following:  
25 1. Open the CO form using the link provided in the email notification and review all items on the form.  
26 2. The GC shall notify the CPM immediately of any errors or discrepancies on the form and shall not sign or  
27 save it.  
28 a. The CPM shall make any corrections as needed, re-save the form, and notify the GC.  
29 3. If/when the GC concurs with the CO form as drafted the GC shall digitally sign the form and click SAVE.  
30 B. After the GC digitally signs/saves the CO it shall be routed through the Project Management Web Site for  
31 additional review and/or approvals. The CPM shall do the following:  
32 1. Monitor the review process to ensure the software is working properly at each review step.  
33 2. Ensure that proper BPW procedures are executed as needed by the CO approval process.  
34 a. Schedule the CO on the next available BPW agenda if required.  
35 i. Attend the BPW meeting to speak on the CO to board members and answer questions.  
36 ii. The GC and/or the Project Architect /Project Engineer (A/E PROJ MGR) may be required to  
37 attend the BPW meeting to address specific information as it relates to the Work and/or  
38 materials associated with the CO.  
39 3. Monitor final approval and distribution of the CO.  
40 4. Notify the GC that the CO has been completed.  
41 5. Ensure that the CO is posted to the next Public Works payment schedule.  
42 6. Verify that the GC's next Progress Payment-Schedule of Values show the CO as part of the contract sum.  
43 C. Upon final approval of the CO the GC may proceed with executing the Work associated with the CO.  
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**END OF SECTION**

**SECTION 01 29 73  
SCHEDULE OF VALUES**

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4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATIONS ..... 1  
7 1.3. RELATED DOCUMENTS ..... 1  
8 1.4. BASIS OF VALUES ..... 1  
9 PART 2 – PRODUCTS – THIS SECTION NOT USED ..... 2  
10 PART 3 - EXECUTION ..... 2  
11 3.1. APPLICATION FOR PAYMENT ..... 2  
12 3.2. PROJECT MANAGEMENT WEBSITE SOV SPREADSHEET ..... 2  
13 3.3. INITIAL SCHEDULE OF VALUES SUBMITTAL ..... 2  
14 3.4. SOV FOR PROGRESS PAYMENT REQUESTS ..... 2  
15

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 19 A. The Schedule of Values (SOV) is a Contractor provided statement that allocates portions of the total contract  
20 sum to various portions of the contracted work and shall be the basis for reviewing the Contractors Progress  
21 Payment Requests.  
22 B.  
23 C. The General Contractor shall be responsible for filling out and updating the SOV in the Project Management  
24 website with each Progress Payment Request.  
25

**1.2. RELATED SPECIFICATIONS**

- 26 A. Section 01 26 63 Change Order (CO)  
27 B. Section 01 29 76 Progress Payment Procedures  
28 C. Section 01 31 23 Project Management Web Site (PMWS)  
29 D. Section 01 32 26 Construction Progress Reporting  
30 E. Section 01 33 23 Submittals  
31 F. Parts of this specification will reference articles within “The City of Madison FACILITIES MANAGEMENT  
32 SPECIFICATIONS for Public Works Construction”.  
33 1. Use the following link to access the FACILITIES MANAGEMENT SPECIFICATIONS web page:  
34 <http://www.cityofmadison.com/business/pw/specs.cfm>  
35 a. Click on the “Part” chapter identified in the specification text. For example, if the specification  
36 says “Refer to City of Madison FACILITIES MANAGEMENT SPECIFICATION 210.2” click the link for  
37 Part II, the Part II PDF will open.  
38 b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you  
39 to the referenced text.  
40  
41

**1.3. RELATED DOCUMENTS**

- 42 A. The following documents shall be used as the basis for initiating and maintaining the SOV worksheets throughout  
43 the execution of this contract.  
44 1. Drawing documents and specifications (including general provisions) as provided with the bid set  
45 documents and any published addendums.  
46 2. Documents associated with revisions or clarifications to number 1 above after awarding of the contract,  
47 including but not limited to:  
48 a. Construction Bulletins  
49 b. Request for Information  
50 c. Approved Change Orders  
51 3. The latest daily/weekly Construction Progress Report  
52 4. Other specifications as identified in Section 1.2 above  
53  
54

**1.4. BASIS OF VALUES**

- 55 A. The Contractor shall provide a breakdown of the Contract Sum in sufficient detail to assist the Architect and City  
56 Project Manager in evaluating Progress Payment Requests. The breakdown detail may require a labor and  
57 material breakdown for each division of work or trade or as directed by the CPM.  
58

- 1 B. The total sum of all items shall equal the Contract Sum.  
2

3 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

4  
5 **PART 3 - EXECUTION**

6  
7 **3.1. APPLICATION FOR PAYMENT**

- 8 A. The Contractor shall use the Project Management website or Payment with each Progress Payment Request.  
9 B. Completely fill out the Pay Application per the tutorial provided for the PMWS  
10 1. Fill out to reflect the current status of the contract through the payment date being requested.  
11 2. The City of Madison calculates retainage on Public Works Contracts as follows:  
12 a. In general, across the duration of the contract, 2.5% of the total contract sum, including change  
13 orders, is withheld for retainage as referenced from the City of Madison FACILITIES  
14 MANAGEMENT SPECIFICATION 110.2:  
15 i. Beginning with Progress Payment 1, 5% retainage will be withheld until such time that 50%  
16 of the total contract sum has been paid out.  
17 ii. No additional retainage will be withheld after 50% of the total contract sum has been paid,  
18 unless additional change orders have been approved after the 50% milestone has been  
19 reached. Per City of Madison FACILITIES MANAGEMENT SPECIFICATION 110.2, additional  
20 retainage up to 10%, may be held in the event there are holds placed by Affirmative Action  
21 or liquidated damages by BPW.  
22 iii. Retainage for additional change orders after the 50% milestone will be withheld at the rate  
23 of 2.5% of the total cost of the change order.  
24 iv. Retainage is based on the change orders posted to the City's contract worksheet at the  
25 time the progress payment is processed.  
26 C. Only change orders that have been finalized and posted to the City of Madison's Application for Partial Payment  
27 worksheet may be itemized into the SOV documents.  
28 D. The Contractor shall sign and date the application.  
29

30 **3.2. PROJECT MANAGEMENT WEBSITE SOV SPREADSHEET**

- 31 A. The Contractor shall use the PMWS spreadsheet provided by the City to itemize their SOV for this contract.  
32 Provide additional sheets as necessary.  
33 B. Provide information by any method that allocates portions of the total contract sum to various portions of the  
34 contracted work. Possible methods include combinations of the following:  
35 1. By division of work  
36 2. By contractor, sub-contractor, sub sub-contractor  
37 3. By specialty item or group  
38 4. Other methods of breakdown as may be requested by the City Project Manager or City Construction  
39 Manager at the pre-construction meeting.  
40 C. Provide total cost of the item/description of work including proportionate shares of profit and overhead related  
41 to the item.  
42

43 **3.3. INITIAL SCHEDULE OF VALUES SUBMITTAL**

- 44 A. The Contractor shall upload their initial SOV to the Project Management Web Site, no later than five (5) working  
45 days after the Pre-construction Meeting.  
46 1. The level of detail shall be as described in section 3.2 above.  
47 B. The Project Architect /Project Engineer (A/E PROJ MGR) and the City Project Manager (CPM) shall review the  
48 SOV as any other submittal and may require modifications to reflect additional detail as necessary.  
49 C. The Contractor shall resubmit the SOV as necessary until such time as the A/E PROJ MGR and CPM have  
50 sufficient detail for assessing and approving future Progress Payment Applications.  
51 D. Progress Payment Application 1 will not be processed until such time as the Contractor has met this requirement  
52 regardless of the amount of work completed per the application.  
53

54 **3.4. SOV FOR PROGRESS PAYMENT REQUESTS**

- 55 A. The Contractor shall update the initial SOV with each Progress Payment Application as follows:  
56 1. Initial items and values as part of Section 3.3 above will not be adjusted once the original Schedule of  
57 Values submittal has been approved.

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2. Change orders shall be added as additional items and values at the bottom of the SOV as they become approved and posted to the City's contract worksheet. The value for each change order shall be the value indicated on the SOV and shall stand alone. Values shall not be split out or combined with other existing items with similar work descriptions on the original SOV.
  3. Fill out columns to properly reflect the work completed and materials received since the last Progress Payment Application.
  4. Only materials delivered and stored on the project site may be reflected on SOV progress updates.
- B. Provide an updated project schedule with each Progress Payment application.
- C. See Specification 01 29 76 Progress Payment Procedures for additional information on submitting Progress Payment Applications.

**END OF SECTION**

**SECTION 01 29 76**  
**PROGRESS PAYMENT PROCEDURES**

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7 1.3. RELATED DOCUMENTS ..... 1  
8 1.4. PROGRESS PAYMENT MILESTONES ..... 1  
9 1.5. PROGRESS PAYMENT SUBMITTAL ..... 4  
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12 3.1. GENERAL CONTRACTOR PROCEDURE ..... 4  
13 3.3. CITY PROJECT MANAGER PROCEDURE ..... 4  
14

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 18 A. The General Contractor (GC) shall review this and all related specifications prior to submitting progress payment  
19 requests.  
20 B. Progress payment requests (Partial Payment-PP) for this contract shall be applied for by the GC in the Project  
21 Management Web Site (PMWS)  
22 C. The City Project Manager (CPM) shall review and amend or approve the PP on the Project Management Web  
23 Site.  
24 D. After approval of the PP by the CPM, they shall forward the PP to the appropriate agencies for BPW contractual  
25 review and payment processing.  
26

**1.2. RELATED SPECIFICATIONS**

- 27  
28 A. Section 01 26 63 Change Order (CO)  
29 B. Section 01 29 73 Schedule of Values  
30 C. Section 01 31 19 Progress Meetings  
31 D. Section 01 31 23 Project Management Web Site (PMWS)  
32 E. Section 01 32 16 Construction Progress Schedules  
33 F. Section 01 32 26 Construction Progress Reporting  
34 G. Section 01 33 23 Submittals  
35 H. Section 01 45 16 Field Quality Control Procedures  
36 I. Section 01 77 00 Closeout Procedures  
37 J. Section 01 78 13 Completion and Correction List  
38 K. Section 01 78 23 Operation and Maintenance Data  
39 L. Section 01 78 36 Warranties  
40 M. Section 01 78 39 As-Built Drawings  
41 N. Section 01 78 43 Spare Parts and Extra Materials  
42 O. Section 01 79 00 Demonstration and Training  
43

**1.3. RELATED DOCUMENTS**

- 44  
45 A. The following documents shall be used when evaluating PP requests.  
46 1. Daily and weekly construction progress reports filed since the last payment request.  
47 2. Contractors Schedule of Values as updated from the last payment request. See Specification 01 29 73.  
48 3. Any document that may be required to be submitted for review and approval, as noted by the  
49 specifications listed in Section 1.2 above, or the Progress Payment Milestone Schedule in Section 1.4  
50 below, to achieve a required bench mark of contract progression or contract requirement.  
51

**1.4. PROGRESS PAYMENT MILESTONES**

- 52  
53 A. City Engineering-Facility Management has developed the Project Payment Milestone Schedule (Section 1.4  
54 below) to assist the GC in providing required construction specific documentation and general contractual  
55 documentation in a timely manner.  
56 B. The Progress Payment Milestone Schedule is not an all inclusive list. Multiple agencies review progress payment  
57 requests and contract closeout requests. Missing, incomplete, or incorrect documentation for any agency may

- 1 be a cause for not processing progress payments. It shall be the sole responsibility of the Contractor for  
 2 providing documentation as required or requested to the appropriate agencies.  
 3 C. The milestone schedule is based on the contract total sum and shall be valid for most contracts. Milestone  
 4 submittals will be required with whatever progress payment hits the percentage of contract total indicated in  
 5 the schedule.  
 6 D. The CPM shall review the milestone schedule with each progress payment request and at their option may elect  
 7 to hold processing the progress payment until such time as the contractor has met the requirements for  
 8 providing construction specific documentation.  
 9 E. It shall be the General Contractors responsibility to comply with all BPW Contract Administration requirements  
 10 and related deadlines as outlined in the Award Letter, Award Checklist, and Start Work Letter.  
 11

<b>Progress Payment (PP) Milestone Schedule</b>		
<b>Milestone Description</b>	<b>Due Before</b>	<b>Remarks</b>
BPW Contract Administration Documentation <ul style="list-style-type: none"> <li>• Workforce profiles</li> <li>• Best Value Contracting Documentation</li> <li>• Sub-contractors prequalification approval &amp; Affirmative Action plans</li> <li>• Other as may be required</li> </ul>	PP-1, or start work as applicable	<ul style="list-style-type: none"> <li>• For GC and Sub-contractors before PP-1 regardless of scheduling</li> <li>• Sub-contractors (if applicable), due 10 days before they may start work</li> <li>• Sub-contractors (if applicable), due 10 days before they may start work</li> </ul>
Required Construction Submittals/Administrative Documents <ul style="list-style-type: none"> <li>• Contractors Project Directory</li> <li>• Schedule of Values</li> <li>• Submittals Schedule</li> <li>• Waste Management Plan</li> <li>• Closeout Requirement Checklist</li> <li>• Warranty Checklist</li> </ul>	PP-1	References <ul style="list-style-type: none"> <li>• Specification 01 31 23</li> <li>• Specification 01 29 73</li> <li>• Specification 01 32 19</li> <li>• Specification 01 74 19</li> <li>• Specification 01 77 00</li> <li>• Specification 01 78 36</li> </ul>
Construction Progress Milestones <ul style="list-style-type: none"> <li>• Early submittals, per submittal schedule</li> <li>• Detailed Contract Schedules</li> </ul>	PP-1	See specifications for specific requirements <ul style="list-style-type: none"> <li>• Specification 01 32 19, Examples: concrete mix, structural steel, products with long lead times</li> <li>• See Specification 01 32 16</li> </ul>
General Construction Progress Requirements are all up to date <ul style="list-style-type: none"> <li>• Progress Schedules</li> <li>• Submittals/Re-submittals (ongoing)</li> <li>• Schedule of Values</li> <li>• Progress Reporting</li> <li>• LEED Documentation</li> <li>• Waste Management documentation</li> <li>• QMOs are being addressed and closed</li> <li>• Progress Cleaning</li> <li>• As-Built Drawings</li> </ul>	Each future PP	Verified with each Progress Payment Request <ul style="list-style-type: none"> <li>• Specification 01 32 16</li> <li>• Specification 01 33 23</li> <li>• Specification 01 29 73</li> <li>• Specification 01 32 26</li> <li>• All specifications with LEED documentation requirements</li> <li>• Specification 01 74 19</li> <li>• Specification 01 45 16</li> <li>• Specification 01 74 13</li> <li>• Specification 01 78 39</li> </ul>
<b>* All of the above are being updated on the Project Management Web Site as required</b>		
BPW Contract Administration Documentation <ul style="list-style-type: none"> <li>• Weekly payroll reports</li> <li>• Best Value Contracting Reports</li> </ul>	25% CT or PP 2	See 1.4.E above. <i>This progress payment will be with held by BPW for any missing contractual documentation.</i>

<b>Progress Payment (PP) Milestone Schedule</b>		
<b>Milestone Description</b>	<b>Due Before</b>	<b>Remarks</b>
<ul style="list-style-type: none"> <li>SBE Reports</li> </ul>		
Construction Progress Milestones <ul style="list-style-type: none"> <li>Construction/Contract Closeout Meeting #1</li> <li>Submittals/Re-submittals complete</li> </ul>	50% CT	<ul style="list-style-type: none"> <li>Specification 01 31 19</li> <li>Specification 01 33 23</li> </ul>
Operation and Maintenance (O & M) drafts	60% CT	<ul style="list-style-type: none"> <li>Specification 01 78 23</li> </ul>
Construction/Contract Closeout Meeting #2 <ul style="list-style-type: none"> <li>Construction closeout checklist</li> </ul>	70% CT	<ul style="list-style-type: none"> <li>Specification 01 31 19</li> <li>Specification 01 77 00</li> </ul>
BPW Contract Administration Documentation <ul style="list-style-type: none"> <li>Request Finalization Review from BPW</li> </ul>	80% CT	This is a recommendation to the GC and is not a requirement of this PP. <ul style="list-style-type: none"> <li>Specification 01 77 00</li> </ul>
Construction Progress Milestones <ul style="list-style-type: none"> <li>Operation and Maintenance (O &amp; M) finals, accepted</li> <li>All major QMO issues resolved</li> <li>As-Built Drawings, Division Trades ready for GC review</li> </ul>	80% CT	<ul style="list-style-type: none"> <li>Specification 01 78 23</li> <li>Specification 01 45 16; Items that could prevent occupancy</li> <li>Specification 01 78 39</li> </ul>
All of the following shall be completed for this PP: <ul style="list-style-type: none"> <li>Regulatory Inspections completed</li> <li>All QMO reports closed</li> <li>Demonstration and Training completed</li> <li>Attic Stock completed</li> <li>Final Cleaning</li> </ul>	90% CT	Contractor to determine the proper order of completion: <ul style="list-style-type: none"> <li>Governing ordinances and statutes</li> <li>Specification 01 45 16</li> <li>Specification 01 79 00</li> <li>Specification 01 78 43</li> <li>Specification 01 74 13</li> </ul>
Construction Closeout Procedures: <ul style="list-style-type: none"> <li>Letter of Substantial Compliance sent to BI and DHS as needed</li> <li>Certificate of Occupancy issued</li> <li>As-Built Drawings, finals, accepted</li> <li>City Letter of Substantial Completion</li> <li>Warranty letters dated and issued</li> </ul>	100% CT	<ul style="list-style-type: none"> <li>Specification 01 77 00</li> <li>Generated/Signed by the Architect</li> <li>Building Inspection</li> <li>Specification 01 78 39</li> <li>Signed by the City Engineer</li> <li>Specification 01 78 36</li> </ul>
<b>* Completion of this begins the one year warranty.</b>		
BPW Contract Administration Documentation Contract Closeout Procedures <ul style="list-style-type: none"> <li>Construction Closeout has been completed</li> <li>Contractor requests final payment of retainage upon receiving City Letter of Substantial Completion</li> <li>All BPW contractual requirements are verified</li> </ul>	Final	<ul style="list-style-type: none"> <li>Specification 01 77 00</li> <li>Contractor must provide any missing BPW Contractual Documentation</li> </ul>
<b>* Completion of this closes the contract but not the warranty period/bond.</b>		



<b>Progress Payment (PP) Milestone Schedule</b>		
<b>Milestone Description</b>	<b>Due Before</b>	<b>Remarks</b>
<b>NOTE: CT = Contract Total less held retainage</b>		

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**1.5. PROGRESS PAYMENT SUBMITTAL**

- A. Each progress payment submittal shall be completed in the Project Management Website. See guide on the Project Management Website for the procedure.
- B. Submit all required construction progress documentation to the appropriate Project Management Web Site component as described in guides.
- C. In general the following shall apply to all PP requests:
  - 1. Materials or products:
    - a. On order, being shipped, etc. may not be invoiced.
    - b. Received and stored on the project site may be invoiced.
    - c. Being manufactured off site at any location may not be invoiced (example: cabinetry, ductwork, etc.)
    - d. Completed products stored off site locally waiting for delivery to the project site may be invoiced with prior approval by the CPM. All of the following conditions must be met to be allowed:
      - i. Items must be visually inspected by CPM to verify product is complete.
      - ii. Item must be stored inside a compatible structure and the structure and contents must be insured.
      - iii. Contractor is responsible for condition until installation is completed.
  - 2. All labor and equipment, including rental time for the current progress period may be invoiced.
  - 3. Only completed installations may be invoiced to 100% based on the Schedule of Values.
- D. **DO NOT** submit BPW Contract Administration Documentation for review with Progress Payment Requests, submit them directly to the correct agency and in the correct format as instructed from information in your BPW Contract Award Packet instructions.

**PART 2 - PRODUCTS - THIS SECTION NOT USED**

**PART 3 - EXECUTION**

**3.1. GENERAL CONTRACTOR PROCEDURE**

- A. The GC shall use the Project Management Website for each PP request.
  - 1. The GC shall subtotal the work completed to date for all of the original Schedule of Value items.
  - 2. Ensure that any newly posted change orders have been entered.
  - 3. The GC shall submit the PP request in the Project Management Website. The username and date will be automatically recorded.
  - 4. The GC shall provide the dates from and to for the PP being requested.
  - 5. The GC shall provide the list of all contractors/sub-contractors that were actively working during the dates indicated above. The guide details the appropriate location for this list.
    - a. All contractors/sub-contractors named must be in compliance with all City requirements (Pre-qualified, Affirmative Action Plan on file, etc). The PP will be held and not processed by the City of Madison until all contractors/sub-contractors are in compliance.
    - b. Do not list the names of suppliers or manufacturers, doing so will slow down processing and require a re-submittal of the paperwork.
  - 6. The GC shall attach a copy of the current Project Schedule.

**3.3. CITY PROJECT MANAGER PROCEDURE**

- A. The CPM shall review all documents submitted by the GC to ensure the schedule of values accurately reflects the work completed to date.
- B. The CPM may elect to hold processing of any progress payment pending submittal of required progress payment milestones.
- C. When verified, the CPM shall send the PP and required documentation to the appropriate City agencies for further processing of the payment request.
- D. The PP processing will be completed and available for view within the PMWS.

**END OF SECTION**

**SECTION 01 31 13  
PROJECT COORDINATION**

1  
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4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATIONS ..... 1  
7 1.3. GENERAL REQUIREMENTS ..... 1  
8 1.4. GENERAL CONTRACTOR PERFORMANCE REQUIREMENTS ..... 2  
9 1.5. SUB-CONTRACTOR PERFORMANCE REQUIREMENTS ..... 2  
10 PART 2 – PRODUCTS – THIS SECTION NOT USED ..... 3  
11 PART 3 – EXECUTION – THIS SECTION NOT USED ..... 3  
12

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 16 A. Project Coordination covers many areas within the execution of the Contract Documents and the requirements  
17 of proper coordination are the applicable to all contractors executing the Work of this contract.  
18 B. This specification provides general information regarding project coordination for the General Contractor and all  
19 Sub-contractors. All contractors shall be familiar with project coordination requirements and responsibilities  
20 that may be defined in other specification within these Contract Documents.  
21 C. The General Contractor shall at all times be responsible for the project, project site, and execution of the  
22 Contract Documents.  
23

**1.2. RELATED SPECIFICATIONS**

- 24 A. Section 01 29 76 Progress Payment Procedures  
25 B. Section 01 31 19 Progress Meetings  
26 C. Section 01 31 23 Project Management Web Site  
27 D. Section 01 32 16 Construction Progress Schedules  
28 E. Section 01 32 19 Submittals Schedule  
29 F. Section 01 33 23 Submittals  
30 G. Section 01 43 39 Mockups  
31 H. Section 01 45 16 Field Quality Control Procedures  
32 I. Section 01 60 00 Product Requirements  
33 J. Section 01 77 00 Closeout Procedures, including all specifications referenced therein  
34 K. Section 01 91 00 Commissioning  
35  
36

**1.3. GENERAL REQUIREMENTS**

- 37 A. The following general requirements shall applicable to all contractors:  
38 1. Cooperate with the Owner, all authorized Owner Representatives, Project Architect and all consultants of  
39 the Owner.  
40 2. Materials, products, and equipment shall be new, as specified and to industry standards except where  
41 otherwise noted.  
42 3. Labor and workmanship shall be of a high quality and to industry standards.  
43 B. Existing conditions:  
44 1. Verify all existing conditions noted in the contract documents with actual filed locations. Verify  
45 dimensions, sizes and locations, of structural, equipment, mechanical and utility components.  
46 2. Report any inconsistencies, errors, omissions, or code violations in writing to the General Contractor (GC)  
47 immediately.  
48 3. Annotate any inconsistencies, errors, omissions on the GC As-Built record drawings immediately for  
49 future reference.  
50 C. Contract Documents:  
51 1. The Contract Documents are intended to include everything necessary to perform the work. Every item  
52 required may not be specifically mentioned, shown, or detailed.  
53 a. Except where specifically stated all systems and equipment shall be complete, installed, and fully  
54 operable.  
55 b. If a conflict exists within the contract documents the contractor shall furnish the item, system, or  
56 workmanship of the highest quality, largest, largest quantity, or most closely fits the intent of the  
57 contract documents.  
58

- 1 c. Manufacturers recommended installation details shall be verified and used prior to installation of
- 2 products and equipment so as to not void warranties.
- 3 D. Errors and Omissions
- 4 1. No Contractor shall take any advantage of any apparent error or omission in the construction documents.
- 5 2. The City of Madison shall be permitted to make such corrections and interpretations as may be deemed
- 6 necessary for the fulfillment of the intent of the construction documents.
- 7 E. Owners Representatives
- 8 1. All contractors shall be familiar with various Owner Representatives having Quality Management
- 9 responsibilities for the duration of this project including but not limited to the following:
- 10 a. Project Architect, responsible for all decisions affecting the code compliance and design intent of
- 11 the construction documents.
- 12 b. Consulting Architects and Engineers, responsible for providing consulting services to the Project
- 13 Architect, Owner, and City Project Manager, also responsible for Quality Management of the
- 14 construction documents.
- 15 c. Owner, the designated representative of the City Agency that will occupy the project upon
- 16 completion.
- 17 d. City Project Manager, responsible for all day to day decisions regarding the execution and
- 18 performance of this Public Works Contract.
- 19 e. Consulting City Staff, responsible for providing consulting services to the Project Architect, Owner,
- 20 and City Project Manager, also responsible for Quality Management of the construction
- 21 documents.
- 22 f. Commissioning Agent (CxA), responsible for ensuring that the project is meeting the Owner's
- 23 Project Requirements and related quality assurance procedures.
- 24 2. Owner Representatives shall be attending progress meetings, pre-installation meetings, performing or
- 25 being present for final testing and acceptance and quality management reporting during the execution of
- 26 the contract documents as outlined in other specifications.
- 27

28 **1.4. GENERAL CONTRACTOR PERFORMANCE REQUIREMENTS**

- 29 A. Assume the responsibility for all Work specified in the Contract Documents except where specifically identified
- 30 to be performed by the Owner or other contractor separately hired by the Owner.
- 31 1. Coordinate all work by Owner, equipment provided Owner, or contractor hired by the Owner into the
- 32 project schedule.
- 33 B. Provide all construction management responsibilities as specified in other Division 1 specifications including but
- 34 not limited to:
- 35 1. Scheduling of work
- 36 2. Coordination of work between other Trades and Sub-contractors
- 37 3. Construction administration and management
- 38 4. Site layout, cleanliness, and protection of completed work/stored materials
- 39 5. Waste Management
- 40 6. Quality Assurance and Quality Control
- 41 C. Use Diggers Hotline and private utility locating companies to accurately locate all public and private utilities on
- 42 the property as needed. The GC is responsible for any repair or replacement to any public or private utility
- 43 damaged during the execution of the Work
- 44 D. Report any inconsistencies, errors, omissions, or code violations in writing to the Project Architect immediately.
- 45 Failure to report inconsistencies prior to beginning work shall indicate that the GC accepted all existing
- 46 conditions.
- 47 E. The GC shall be responsible for assigning work and related responsibilities where the Contract Documents may
- 48 not clearly state who is responsible for providing the work, material, or product.
- 49 F. Provide construction management oversight of all items described in Section 1.5 below.
- 50 G. Coordinate and assist CxA as outlined within 01 91 00 and as directed by Owner.
- 51

52 **1.5. SUB-CONTRACTOR PERFORMANCE REQUIREMENTS**

- 53 A. Be familiar with all of the contract documents as they pertain to your Work, adjacent work and the overall
- 54 progress of the project.
- 55 1. All Sub-contractors shall be familiar with all Division 1 specifications as they may apply to progress,
- 56 progress payments, quality control construction management, and closeout of the contract.
- 57 B. Coordinate your Work with all adjacent work and existing conditions.

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1. Perform your work in proper sequence according to the GC's project schedule and in relation to the work of other trades.
  2. Notify other sub-contractors and trades whose work may be connected to, combined with, or influenced by your work and allow them reasonable time and access to complete their work.
  3. Join your work to the work of others in accordance with the intent of the Contract Documents.
  4. Order materials and schedule deliveries to facilitate the general progress of the Work.
- C. Cooperate with all other trades to facilitate the general progress of the work. This shall include providing every reasonable opportunity for the installation of work by others and the storage of their materials and equipment.
1. In no case shall any contractor exclude from the premises or work any Sub-contractor or their employees.
  2. In no case shall any contractor interfere with the execution or installation of Work by any other Sub-contractor or their employees.
- D. Arrange your work, equipment, and materials and dispose of your construction waste so as to not interfere with the work or storage of materials of others.
- E. Coordinate all work as indicated during pre-installation meetings with Owner Representatives, the GC and other trades. Any work improperly coordinated shall be relocated as designated by the Owner Representative at no additional cost to the City.
- F. Coordinate and assist CxA as outlined within 01 91 00 and as directed by Owner.

**PART 2 – PRODUCTS – THIS SECTION NOT USED**

**PART 3 – EXECUTION – THIS SECTION NOT USED**

**END OF SECTION**

**SECTION 01 31 19  
PROJECT MEETINGS**

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4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATIONS ..... 1  
7 1.3. PROJECT MEETING TYPES ..... 1  
8 1.4. GENERAL REQUIREMENTS ..... 1  
9 PART 2 – PRODUCTS – NOT USED IN THIS SECTION ..... 1  
10 PART 3 - EXECUTION ..... 1  
11 3.1. PRECONSTRUCTION MEETING ..... 1  
12 3.2. PROJECT MANAGEMENT WEB SITE – TUTORIAL MEETING ..... 2  
13 3.3. CONSTRUCTION PROGRESS MEETINGS ..... 2  
14 3.4. PRE-INSTALLATION MEETINGS ..... 3  
15 3.6 PRE-CONTRACT CLOSEOUT MEETINGS ..... 3  
16 3.7 OTHER SPECIAL MEETINGS ..... 3  
17

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 21 A. The purpose of this specification is to identify various project related meetings and the responsible parties for  
22 scheduling, agendas, minutes, and required attendance.  
23 B. This specification is not intended to be inclusive of all meeting types or a complete list of required meetings.  
24 C. This specification is not intended to cover planning and execution meetings between the General Contractor  
25 (GC) and their sub-contractors.

**1.2. RELATED SPECIFICATIONS**

- 28 A. 01 31 23 Project Management Web Site  
29 B. 01 32 16 Construction Progress Schedules  
30 C. 01 43 39 Mockups  
31 D. 01 91 00 Commissioning  
32

**1.3. PROJECT MEETING TYPES**

- 34 A. The following project meeting types may be used but not limited to the following  
35 1. Preconstruction Meeting  
36 2. Project Management Web Site – Tutorial Meeting  
37 3. Construction Progress Meetings  
38 4. Pre-installation Meetings (including mock-up review meetings)  
39 5. Weekly Trade Meetings  
40 6. Special Meetings  
41 7. Commissioning Meetings  
42

**1.4. GENERAL REQUIREMENTS**

- 44 A. Representatives of Contractors, Subcontractors, and suppliers attending meetings shall be qualified and  
45 authorized to act on behalf of the entity each represents.  
46

**PART 2 – PRODUCTS – NOT USED IN THIS SECTION**

**PART 3 - EXECUTION**

**3.1. PRECONSTRUCTION MEETING**

- 52 A. After execution of the Contract the City Project Manager (CPM) shall schedule and conduct the Preconstruction  
53 Meeting at the Owner’s facilities. The CPM shall coordinate the meeting agenda with the Project Architect and  
54 the GC Project Manager.  
55 B. The CPM shall be responsible for the final agenda.  
56 C. The CPM and Project Architect shall take notes on the meeting and post completed meeting minutes.  
57 D. Attendance shall be required by all of the following:  
58 1. Owner Representative(s)

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2. Architect and applicable sub consultant(s)
  3. General Contractor and applicable subcontractors and suppliers
  4. City Quality Management Staff
  5. Commissioning Agent
  6. Others, as may be invited for particular agenda items.
- E. Topics of the Preconstruction Meeting shall include but not be limited to the following:
1. Staff and contractor introductions
  2. Completion Date
  3. BPW Administrative requirements and due outs
    - a. Small Business Enterprise (SBE) (if applicable)
    - b. Certified payroll forms
    - c. Workforce profiles
    - d. Best Value Contracting (BVC)
  4. General Facility Management Division 1 Specifications, including:
    - a. Section 01 29 76 Progress Payment Procedures
    - b. Section 01 31 23 Project Management Web Site (overview)
    - c. Section 01 45 16 Field Quality Control Procedures
    - d. Section 01 77 00 Closeout Procedures
    - e. Section 01 91 00 Commissioning
  5. Project Meeting scheduling
    - a. Section 01 31 19 Project Meetings
  6. Construction Schedule
  7. Commissioning Process

**3.2. PROJECT MANAGEMENT WEB SITE – TUTORIAL MEETING**

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- A. The CPM shall schedule and conduct a virtual tutorial presentation of the PMWS prior to the beginning of construction.
  - B. The CPM shall be responsible for the final agenda, there will be no minutes.
  - C. The required attendance list in 3.1.D. above shall apply except for City Staff in items 1 and 4 who are already familiar with the PMWS system.

**3.3. CONSTRUCTION PROGRESS MEETINGS**

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- A. In general, all of the following shall apply:
    1. Representatives of Contractors, Subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
    2. The attendance shall be from the required attendance list in 3.1.D. above.
  - B. The General Contractor Project Manager (GCPM) shall:
    1. Schedule and conduct all construction progress meetings biweekly or more frequently as required.
    2. Prepare agenda for meetings including, but not limited to the following:
      - a. Safety
      - b. Current Schedule, including review of the critical path and 6-week look ahead schedule
      - c. Status of project related documentation (Submittals, RFIs, CBs, etc.)
      - d. Quality Observation Log and status of correction of deficient items
      - e. Project questions and issues from meeting attendees
      - f. BPW Administration Check
      - g. Other as needed
      - h. Status of CORs and COs to be reviewed outside the standard progress meeting time.
    3. Make physical arrangements for meetings.
    4. GCPM to post meeting agendas to the appropriate libraries on the Project Management Web Site (PMWS) no less than two (2) working days prior to the scheduled meeting. Notify all required attendees, applicable parties to the contract, and others affected of the posted meeting agenda.
    5. Preside at meetings.
    6. Route a meeting attendance roster for attendees to sign-in on.
    7. GCPM to record the minutes of the meeting; include significant proceedings and decisions. Post meeting minutes to the PMWS no more than two (2) working days after the completed meeting. Meeting minutes shall include a scanned copy of the attendance sign-in sheet. Notify all required meeting attendees, applicable parties to the contract, and others affected by decisions made at the meetings.
    8. The above requirements do not apply to GC/sub-contractor meetings.

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**3.4. PRE-INSTALLATION MEETINGS**

- A. The GCPM shall schedule and conduct all pre-installation meetings, including mockup reviews, before each construction activity that requires coordination with other trades.
- B. The GCPM shall be responsible for the final agenda and meeting minutes.
- C. The GCPM will work with all concerned parties to resolve issues as needed and submit RFI's if necessary.
- D. Required attendance shall be from the list in 3.1.D. above and shall be personnel having a stake in the outcome of the installation or knowledge of the system being installed.
- E. In the event the Contractor installs equipment or materials without a pre-installation meeting the Contractor shall be solely responsible for removing, replacing, repositioning materials and equipment as instructed by the Project Architect or City Project Manager at no additional cost to the City.

**3.6 PRE-CONTRACT CLOSEOUT MEETINGS**

- A. Two (2) Pre-contract Closeout Meetings shall be held to review the closeout procedures, requirements, and contract deliverables.
  - 1. Pre-contract Closeout Meeting #1 shall be scheduled prior to the 50% Progress Payment Request is being requested. This meeting shall discuss items such as closing out QMO reports, providing O&M drafts and finals, payroll and Affirmative Action documentation, and other contract deliverables.
  - 2. Pre-contract Closeout Meeting #2 shall be scheduled prior to the 80% Progress Payment Request is being requested. This meeting shall discuss, but not be limited to, the status of scheduling final regulatory inspections, cleaning up outstanding QMO's, demonstration and training, attic stock; and finalization review of payroll and other related documents.
- B. The GCPM shall schedule, coordinate, and make physical arrangements for both meetings.
- C. All of the following shall be required to attend both meetings:
  - 1. The GCPM and the GC Field superintendent
  - 2. All Subcontractor Project Managers regardless of the current status of their work.
    - a. The GCPM may excuse a Subcontractor PM if they are confident that all contractual requirements for closeout by the subcontractor have been completed and/or delivered to the GCPM. The list of attendees shall be reviewed and agreed upon with CPM ahead of the meeting.
    - b. At the option of these project managers the field supervisors may also attend.
  - 3. The Project Architect and at least one design consultant from each discipline represented by the plans and specifications to address open QMOs, final tests, reports, etc.
  - 4. The Owner
  - 5. The CPM
  - 6. Quality Management staff as needed to address open QMOs, final tests, reports, etc.
  - 7. The Commissioning Agent
- D. The CPM shall publish an agenda and chair the meeting.

**3.7 OTHER SPECIAL MEETINGS**

- A. The Contractor shall schedule special meetings per the requirements of the LEED Specification, the Project Quality Management Plan, the Commissioning Plan and as indicated by other specifications.
- B. Special meetings include but are not limited to the following:
  - 1. Waste Management Conference
  - 2. Equipment start up meetings
  - 3. Testing and balancing meetings
  - 4. Commissioning meetings
  - 5. Other meetings as necessitated by the contract documents

**END OF SECTION**

**SECTION 01 31 23  
 PROJECT MANAGEMENT WEB SITE**

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 3 PART 1 – GENERAL ..... 1  
 4 1.1. GENERAL DESCRIPTION ..... 1  
 5 1.2. AUTODESK CONSTRUCTION CLOUD PROCEDURE OVERVIEW ..... 1  
 6 1.3. RELATED SPECIFICATIONS ..... 1  
 7 PART 2 - PRODUCTS ..... 2  
 8 2.1. AUTODESK CONSTRUCTION CLOUD SYSTEM RELATED PRODUCTS ..... 2  
 9 PART 3 - EXECUTION ..... 2  
 10 3.1. POST BID-OPENING ..... 2  
 11 3.2. POST PRE-CONSTRUCTION MEETING ..... 2  
 12

**PART 1 – GENERAL**

**1.1. GENERAL DESCRIPTION**

- A. The City of Madison (CoM) has established a cloud-based Project Management Tool (PMT) using an Autodesk product called Autodesk Construction Cloud (ACC).
- B. The software is used throughout the design, construction and warranty process of major remodels and new construction projects.
- C. Initially deployed in mid-2023, the PMT software will be deployed on all projects. The PMT software is cloud-based software and therefore will receive regular updates and enhancements.

**1.2. AUTODESK CONSTRUCTION CLOUD PROCEDURE OVERVIEW**

- A. The CoM PMT is 3 main modules. The [Autodesk Docs \(https://help.autodesk.com/view/DOCS/ENU/\)](https://help.autodesk.com/view/DOCS/ENU/) module is a document management file system that is the foundation of ACC. The [Build https://help.autodesk.com/view/BUILD/ENU/](https://help.autodesk.com/view/BUILD/ENU/) module has many sections that assist in performing day to day functions of design/construction management while reducing the use of different software platforms, surface mail, email and email attachments. Finally, the [Cost management \(https://help.autodesk.com/view/BUILD/ENU/?guid=Cost\\_Overview\)](https://help.autodesk.com/view/BUILD/ENU/?guid=Cost_Overview) module is used to manage project finances.
  - 1. Files within Autodesk Docs can store a wide variety [file formats \(https://help.autodesk.com/view/DOCS/ENU/?guid=Supported\\_Files\\_Docs\)](https://help.autodesk.com/view/DOCS/ENU/?guid=Supported_Files_Docs) including but not limited to Word, Excel, PDF, photographs (all popular formats), etc.
  - 2. The Issues section within the Build module is used for Punch Lists, Quality Control and Warranty issues.
  - 3. File Folder and module section access are controlled by Permission Groups and Permission Level
- B. A tutorial document on the web based PMT will be provided to the General Contractor (GC) who is awarded the contract. Additional training will be provided as needed for the GC and Sub-Contractors (SC) by the CoM.
- C. The PMT has predefined work flows that channel automated alerts as documents are uploaded, reviewed, and completed. These workflows are designed for inbound information from the contractor as well as outbound information from the Architectural/Engineer consultant and the Owner.
- D. The GC will be required to receive email notifications, access the internet to review related documentation and be able to upload/download documentation to the various project modules or folders.
- E. The SC's will be required (at a minimum) to receive email notifications and access the internet to review related documentation. Prior to setting up the final PMT the GC and CPM shall meet to review all ACC workflows, the GC will determine to what level over the minimum requirements the SC's will be involved.
- F. At final project closeout with the GC, the CoM will provide the Project Architect/Project Engineer (A/E PROJ MGR) and the GC, an exported version of the complete project in ACC.

**1.3. RELATED SPECIFICATIONS**

- A. The following specification sections are directly related to the CoM PMT system.
  - 1. 01 25 13 Product Substitution Procedures
  - 2. 01 26 13 Request for Information (RFI)
  - 3. 01 26 46 Construction Bulletins (CB)
  - 4. 01 26 57 Change Order Request (COR)
  - 5. 01 26 63 Change Order (CO)
  - 6. 01 29 76 Progress Payment Procedures
  - 7. 01 31 19 Project Meetings
  - 8. 01 32 16 Construction Progress Schedules
  - 9. 01 32 26 Construction Progress Reporting



- 1                    10.    01 32 33        Photographic Documentation
- 2                    11.    01 33 23        Submittals
- 3                    12.    01 45 16        Field Quality Control Procedures (Owner)
- 4

5                    **PART 2 - PRODUCTS**

6

7                    **2.1.    AUTODESK CONSTRUCTION CLOUD SYSTEM RELATED PRODUCTS**

- 8                    A.       Autodesk Construction Cloud is an Autodesk based software that requires no additional software installation,  
9                    hardware or other special requirements/applications for the users. There are no costs associated with the use of  
10                    this system.
- 11                    B.       Please consult Autodesk's web site for the [latest system requirements](https://help.autodesk.com/view/BUILD/ENU/?guid=System_Requirements_ACC)  
12                    ([https://help.autodesk.com/view/BUILD/ENU/?guid=System\\_Requirements\\_ACC](https://help.autodesk.com/view/BUILD/ENU/?guid=System_Requirements_ACC))

13

14                    **PART 3 - EXECUTION**

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16                    **3.1.    POST BID-OPENING**

- 17                    A.       After bids have been opened, a successful bidder has been determined, and bid acceptance procedures have  
18                    been initiated the City Project Manager (CPM) will contact the GC to provide the following information.
  - 19                    1.       [Autodesk Construction Cloud Help \(https://help.autodesk.com/view/BUILD/ENU/\)](https://help.autodesk.com/view/BUILD/ENU/) and [Learning Center](https://learnacc.autodesk.com/)  
20                    (<https://learnacc.autodesk.com/>) are kept up to date with latest ACC features.
  - 21                    2.       For more customized workflows, Project Management Software Tutorials have been developed. These  
22                    tutorials are in a PDF printable format with screen shots and associated instructions on how to access and  
23                    use the PMT.
  - 24                    3.       A blank Project Directory in an Excel spread sheet format. The contractor shall provide the following  
25                    information for GC and SC staffs as indicated on the spreadsheet. This will generally be the Project  
26                    Manager for the GC as well as the Sub-contractors and the GC Site Supervisor.
    - 27                    a.       Last Name, First Name
    - 28                    b.       Company Name
    - 29                    c.       Email address (valid, work related)
  - 30                    4.       Phone Contact number and professional name must be entered by each user themselves via  
31                    <https://profile.autodesk.com/>
  - 32                    5.       The GC shall provide the above information for all SC's where the GC is not self-performing the work.
  - 33                    6.       The GC may provide project foreperson information for work being self-performed if he/she so desires.

34

35                    **3.2.    POST PRE-CONSTRUCTION MEETING**

- 36                    A.       The GC/PM will return the completed Project Directory spread sheet to the CPM no later than the Pre-  
37                    construction meeting.
- 38                    B.       The City Project Admin is responsible for uploading all project directory data into ACC, adding users to project  
39                    and licenses to users for all non-city staff (GC/SC staffs).
- 40                    C.       All GC/SC staff will be notified through an automated email from Autodesk directing them to create an Autodesk  
41                    account if they do not already have one. It is the responsibility of each GC/SC to follow the instructions to setup  
42                    their own account
- 43                    D.       Once the GC/PM has received his/her project invitation, uploading of contract related documents can begin. This  
44                    would include but not be limited to project schedules, submittals, RFI's, and other documents as needed.
- 45                    E.       All workflows, review of documentation, and general archiving of construction related documentation will be  
46                    conducted on the PMWS. These documents will generally not be emailed.
- 47                    F.       The following documents related to the execution of the contract will not be part of the PMT:
  - 48                    1.       All documentation related to executing the contract, such as:
    - 49                    a.       Sub Contractors list
    - 50                    b.       Affirmative Action documentation
    - 51                    c.       Bonding documentation
    - 52                    d.       Documentation associated with payroll verification
    - 53                    e.       Final documentation associated with closing out the contract
  - 54                    2.       Any documentation required/generated by ordinance, code or statute, such as;
    - 55                    a.       Erosion Control inspections
    - 56                    b.       Building Inspection Department inspections

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58                    **END OF SECTION**

**SECTION 01 32 16  
CONSTRUCTION PROGRESS SCHEDULES**

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4 PART 1 – GENERAL ..... 1  
5 1.1. SCOPE ..... 1  
6 1.2. RELATED SPECIFICATIONS ..... 1  
7 PART 2 – PRODUCTS – THIS SECTION NOT USED ..... 1  
8 PART 3 - EXECUTION ..... 1  
9 3.1. OVERALL PROJECT SCHEDULE (OPS) ..... 1  
10 3.2. 6 WEEK LOOK-OUT SCHEDULES (LOS) ..... 1  
11 3.3. PROJECT MANAGEMENT WEB SITE (PMWS) ..... 2  
12

**PART 1 – GENERAL**

**1.1. SCOPE**

- 16 A. This specification is to identify various project related schedules associated with indicating construction progress  
17 and outlook. The following schedules are the responsibility of the General Contractor (GC).  
18 1. Overall Project Schedule  
19 2. 6 Week Look-out Schedule  
20 B. This specification is not intended to include internal schedules generated by the contractors during their  
21 planning and execution of the contract.  
22

**1.2. RELATED SPECIFICATIONS**

- 23 A. Section 01 29 76 Progress Payment Procedures  
24 B. Section 01 31 23 Project Management Web Site  
25 C. Section 01 31 19 Progress Meetings  
26 D. Section 01 74 13 Progress Cleaning  
27 E. Section 01 77 00 Closeout Procedures  
28 F. Section 01 78 23 Operation and Maintenance Data  
29 G. Section 01 78 36 Warranties  
30 H. Section 01 78 39 As-Built Drawings  
31 I. Section 01 78 43 Spare Parts and Extra Materials  
32 J. Section 01 79 00 Demonstration and Training  
33 K. Section 01 91 00 Commissioning  
34 L. Other specification within the construction documents that may indicate the need for scheduling any event with  
35 Owner, Project Architect, Owner Representatives, including any owner provided equipment.  
36  
37

**PART 2 – PRODUCTS – THIS SECTION NOT USED**

**PART 3 - EXECUTION**

**3.1. OVERALL PROJECT SCHEDULE (OPS)**

- 43 A. The GC shall prepare an OPS that covers the duration of the contract from the pre-construction meeting through  
44 the end of construction to final contract closeout.  
45 1. The GC shall review Specification 01 77 00 Closeout Procedures to become familiar with definitions,  
46 differences, and requirements for closing out the construction and contract including the association with  
47 progress payments.  
48 B. The GC shall provide copies and lead a discussion on the OPS during the pre-construction meeting.  
49 C. The OPS shall indicate start and end dates of each task associated with the project.  
50 D. The OPS shall clearly indicate the critical path of the project.  
51 E. The GC shall update the OPS as often as necessary during the duration of the project. Updates will be briefed as  
52 needed during bi-weekly progress meetings.  
53

**3.2. 6 WEEK LOOK-OUT SCHEDULES (LOS)**

- 54 A. The GC shall prepare the initial LOS to include detail of daily tasks for the first six (6) weeks of construction in  
55 depth for the Pre-construction meeting. The LOS shall be compatible and complimentary to the OPS.  
56 B. The GC shall provide copies and lead a discussion on the LOS during the pre-construction meeting.  
57

- 1 C. The LOS shall indicate start and end dates of each major task, associated related sub-tasks, and required parallel
- 2 or pre-requisite tasks required to complete the major task on time.
- 3 D. The LOS shall also include identifying and scheduling such events as:
- 4 1. Pre-installation meetings and mock-up review meetings.
- 5 2. Quality management reviews of installations before they are covered.
- 6 3. Owner provided equipment as designated by the contract documents.
- 7 4. Work by others as designated by the contract documents.
- 8 5. Critical submittal dates.
- 9 E. The GC shall update the LOS prior to each bi-weekly progress meeting to indicate the next 6 weeks of scheduled
- 10 work. Updates will be briefed during each bi-weekly progress meeting.
- 11

12 **3.3. PROJECT MANAGEMENT WEB SITE (PMWS)**

- 13 A. The GC shall upload all project schedules and updates to the PMWS in an original PDF version of the scheduling
- 14 document. Scans will not be permitted.
- 15
- 16

17 **END OF SECTION**

18

**SECTION 01 32 19  
 SUBMITTALS SCHEDULE**

1  
 2  
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 4 PART 1 – GENERAL ..... 1  
 5 1.1. SUMMARY ..... 1  
 6 1.2. RELATED SPECIFICATIONS ..... 1  
 7 1.3. RELATED DOCUMENTS ..... 1  
 8 1.4. SUBMITTAL DEFINITIONS ..... 1  
 9 1.5. SUBMITTAL REQUIREMENTS ..... 2  
 10 1.6. ADMINISTRATIVE SUBMITTALS ..... 2  
 11 PART 2 – PRODUCTS – THIS SECTION NOT USED ..... 2  
 12 PART 3 - EXECUTION ..... 2  
 13 3.1. OVERALL RESPONSIBILITIES OF ALL CONTRACTORS ..... 2  
 14 3.2. GENERAL CONTRACTORS RESPONSIBILITIES ..... 2  
 15 3.3. STAFF REVIEW RESPONSIBILITIES ..... 2  
 16

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 20 A. The General Contractor shall submit a complete and comprehensive list of all submittals anticipated during the  
 21 execution of this contract.  
 22 B. The GC shall include the Administrative submittals identified in item 1.5 below and shall be required to up load  
 23 them to the Project Management Web Site.  
 24 C. The initial Submittals Schedule shall be based on the original contract documents used at the time of bidding and  
 25 any posted addenda through awarding of the contract.  
 26 D. The Submittal Schedule may be appended during the execution of the contract based on amendments to the  
 27 contract in the form of Change Orders, Construction Bulletins, and other related documents that add, or change  
 28 the scope of the work.  
 29

**1.2. RELATED SPECIFICATIONS**

- 30 A. Section 01 29 76 Progress Payment Procedures  
 31 B. Section 01 31 23 Project Management Web Site (PMWS)  
 32 C. Section 01 33 23 Submittals  
 33 D. Section 01 91 00 Commissioning  
 34  
 35

**1.3. RELATED DOCUMENTS**

- 36 A. The following documents shall be used as the basis for initiating the original Submittals Schedule.  
 37 1. Drawing documents and specifications (including general provisions) as provided with the bid set  
 38 documents and any published addenda.  
 39 B. The following documents shall be used to amend the submittals schedule as needed during the execution of this  
 40 contract.  
 41 1. Documents associated with revisions or clarifications to number A.1 above after awarding of the  
 42 contract, including but not limited to:  
 43 a. Construction Bulletins  
 44 b. Approved Change Orders  
 45  
 46

**1.4. SUBMITTAL DEFINITIONS**

- 47 A. Administrative Submittal: Any submittal that may be required by a Division 1 Specification and as noted in  
 48 Section 1.5 below.  
 49 B. Critical Path Submittal: Any early submittal that needs a priority review due to early construction use or long  
 50 lead times where a delay could affect the critical path of the construction schedule  
 51 C. Submittal: Any material, product, equipment, or general requirement as outlined in this and other specifications  
 52 that require a favorable review or acceptance prior to proceeding with procuring the item or proceeding with  
 53 the Work.  
 54  
 55

1 **1.5. SUBMITTAL REQUIREMENTS**

- 2 A. The GC and all Sub-contractors shall review the construction documents including the specifications of their  
3 individual Division or Trade to compile a complete list of all materials, products, or equipment that will require a  
4 positively reviewed submittal to be completed prior to procurement and installation.  
5 1. Submittals shall include but not be limited to any of the following that may apply:  
6 a. Shop Drawings  
7 b. Product Data  
8 c. Assembly Drawings  
9 d. Engineered Drawings  
10 e. Product Samples  
11 B. The following items will require an approved submittal, verify with specifications for specific needs and  
12 requirements:  
13 1. Contractor certifications for specialized work such as asbestos removal, well drilling, controls, AV, etc.

14  
15 **1.6. ADMINISTRATIVE SUBMITTALS**

- 16 A. The GC shall upload the following submittals within 15 working days of receipt of the City of Madison Start Work  
17 Letter. All Administrative Submittals shall be approved prior to requesting Progress Payment Number 1.  
18 1. Contractors Project Directory, see specification 01 31 23, discuss requirements with CPM  
19 2. Schedule of Values, see Specification 01 29 73  
20 3. Submittals Schedule, see Specification 01 32 19  
21 4. Waste Management Plan, see Specification 01 74 19  
22 5. Closeout Requirement Checklist, see Specification 01 77 00  
23 6. Warranty Checklist, see Specification 01 78 36  
24

25 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

26  
27 **PART 3 - EXECUTION**

28  
29 **3.1. OVERALL RESPONSIBILITIES OF ALL CONTRACTORS**

- 30 A. All contractors shall be responsible for reviewing the drawings and specifications within their Divisions of Work  
31 to provide a complete and comprehensive list of submittals to the General Contractor.  
32 B. Each list shall indicate the title of the submittal, the associated specification of the submittal, whether the  
33 submittal can be considered an early/middle/late submittal, the anticipated date the submittal will be provided  
34 and the anticipated date the submittal needs to be approved.  
35 C. Contractors shall be aware that the goals for submittal review by the Architect staff and City staff will be as  
36 follows:  
37 1. For items on the Critical Path as identified by the GC, five (5) working days  
38 2. For most other submittals ten (10) working days  
39 3. Additional time may be needed for complex submittals or if re-submittals are required.  
40 D. The City will provide a spreadsheet to provide the format of the Submittal Schedule as part of the first  
41 administrative submittals.

42 **3.2. GENERAL CONTRACTORS RESPONSIBILITIES**

- 43 A. The General Contractor shall be responsible for all of the following:  
44 1. Consolidating all submittal lists from individual contractors into one master list.  
45 2. Reviewing all submitted lists for completeness, timing with the overall contract, etc. The GC shall meet  
46 with individual contractors to make changes as necessary.  
47 3. Upload the completed Submittals Schedule to the Submittal Library on the Project Management Web Site  
48 for review as SD 003.0. See Specification 01 33 23 Submittals for more information on this procedure.  
49 4. Resubmit the schedule as needed after initial reviews have been completed.  
50 B. The GC shall work with other contractors to amend the Submittals Schedule throughout the execution of the  
51 project based on changes and modifications as needed.  
52 C. The GC and Project Architect shall be responsible for reviewing and briefing the submittal schedule and  
53 submittals status at each bi-weekly construction meeting.  
54

55 **3.3. STAFF REVIEW RESPONSIBILITIES**

- 56 A. The Project Architect, consulting staff, Commissioning Agent (CxA), Owner, and city staff will review the  
57 Submittal Schedule for completeness per the plans and specifications within their divisions of work. The  
58 reviewing staff may provide comments as needed. Some examples might include the following:

- 1                    1.     Submittal not required
- 2                    2.     Provide photos of samples with digital submittal
- 3                    3.     Insure one submittal for complete system
- 4                    4.     Append the schedule to include...
- 5                    5.     See Specification <xyz> for additional requirements
- 6                    B.     The Project Architect and City Project Manager will finalize review comments regarding the Submittal Schedule.
- 7                            Re-submittal of the submittal schedule may be required.
- 8
- 9

**END OF SECTION**

**SECTION 01 32 26  
CONSTRUCTION PROGRESS REPORTING**

1  
2  
3  
4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATION SECTIONS ..... 1  
7 1.3. PERFORMANCE AND QUALITY ASSURANCE REQUIREMENTS ..... 1  
8 PART 2 – PRODUCTS - THIS SECTION NOT USED ..... 1  
9 PART 3 - EXECUTION ..... 1  
10 3.0 DAILY SIGN-IN SHEET ..... 1  
11 3.1. CONTRACTOR JOURNAL ..... 1  
12 3.2. CONSTRUCTION PROGRESS MEETINGS ..... 2  
13

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 17 A. Daily records of project activities, resources used, weather conditions, and other information related to the  
18 ongoing progress of the project are extremely important at all levels of Construction Management.  
19 B. Daily records provide the base for weekly progress reports and updating progress schedules.

**1.2. RELATED SPECIFICATION SECTIONS**

- 22 A. Section 01 31 19 Project Meetings  
23 B. Section 01 31 23 Project Management Web Site  
24 C. Section 01 32 23 Photographic Documentation

**1.3. PERFORMANCE AND QUALITY ASSURANCE REQUIREMENTS**

- 27 A. The General Contractor (GC) shall be responsible for all Construction Progress Reporting as outlined in this and  
28 other specifications as noted.  
29 B. The GC shall maintain daily progress journals in a format of their choosing provided it is legible and contains the  
30 information as outlined in Section 3.1 below.  
31 C. The journal shall be located in the job trailer and shall be reviewable by the Project Architect or City Project  
32 Manager if so requested.

**PART 2 – PRODUCTS - THIS SECTION NOT USED**

**PART 3 - EXECUTION**

**3.0 DAILY SIGN-IN SHEET**

- 39 A. The GC shall provide and maintain a daily sign-in sheet and require all workers and visitors to sign in/out each  
40 work day. These daily sign-in sheet reports shall include name/company/time-in/time-out. These reports  
41 can be submitted daily or at the end of each week to the City Project Manager or as directed by City Staff.

**3.1. CONTRACTOR JOURNAL**

- 44 A. The GC shall maintain a journal of daily progress on which Work is performed by any employee or entity for  
45 which the GC is responsible. Such reports shall include all relevant data concerning the progress of Work  
46 activities the GC and Subcontractors are responsible for and the effect of that activity on the time of  
47 performance of the Contract.  
48 1. Some projects may not require weekly journals be kept instead of daily journals. This is at the sole  
49 discretion of the City Project Manager. A daily journal will generally be required when the contract has a  
50 significant amount of site work. A weekly journal will generally be used when a contract is interior work  
51 only.  
52 B. Journal entries shall be made in the Project Management Web Site. The form consists of the following areas:  
53 1. Weather; include temperature, humidity, precipitation, wind and other related information such as  
54 significant storm events, times, and details.  
55 2. Work completed by trade  
56 3. Delays encountered  
57 4. Deliveries received or delayed  
58 5. Hot issues that need to be addressed

- 1
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  - 11
- 6. Safety issues
  - 7. Photograph progress and upload to the Photo Library on the Project Management Web Site.
  - 8. Other including inspections, testing, etc.
  - 9. Space for attaching documents
- C. Contractor Daily/Weekly Report Forms shall be completed and signed by the GC's Job Superintendent or other on-site representative authorized by the GC confirming each such report is current, accurate and complete.
  - D. If applicable the GC shall include schedules of quantities and costs, progress schedules, wage rates, reports, estimates, invoices, records and other data as requested by the CPM concerning Work performed or to be performed under this Contract if the CPM determines such information is needed to substantiate Change Order proposals, claims, or to resolve disputes.

12 **3.2. CONSTRUCTION PROGRESS MEETINGS**

- A. The GC shall provide a verbal summary of the previous two (2) weeks progress reports at each bi-weekly construction progress meeting.

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16  
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**END OF SECTION**



**SECTION 01 32 33**  
**PHOTOGRAPHIC DOCUMENTATION**

1  
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3  
4 PART 1 – GENERAL ..... 1  
5 1.1. SCOPE ..... 1  
6 1.2. RELATED SPECIFICATION SECTIONS ..... 1  
7 1.3. SUBMITTALS ..... 1  
8 PART 2 – PRODUCTS ..... 1  
9 2.1. DIGITAL CAMERA ..... 1  
10 2.1. TIME LAPSE CONSTRUCTION CAMERA (TLCC) ..... 1  
11 PART 3 – EXECUTION ..... 2  
12 3.1. REQUIREMENTS FOR DIGITAL PHOTOGRAPHS ..... 2  
13 3.2. REQUIREMENTS FOR TIME LAPSE PHOTOGRAPHS ..... 2  
14

**PART 1 – GENERAL**

**1.1. SCOPE**

- A. The General Contractor (GC) shall be required to take weekly digital photographs of interior and exterior construction progress and upload the photos directly to the Project Management Web Site (PMWS).
- B. The GC shall be required to provide digital time-lapse photo service of the project exterior construction progress.

**1.2. RELATED SPECIFICATION SECTIONS**

- A. Section 01 29 76 Progress Payment Procedures
- B. Section 01 31 23 Project Management Web Site (PMWS)
- C. Section 01 32 19 Submittals Schedule
- D. Section 01 32 33 Submittals
- E. Section 01 77 00 Closeout Procedures

**1.3. SUBMITTALS**

- A. The GC shall provide general information on the type of camera being used for interior and exterior digital photographs.
  - 1. Information may be written on Contractor’s transmittal sheet.
    - a. Include camera name/type, aspect ratio setting, and average file size
    - b. Provide sample project pictures as part of PDF submittal.
- B. The GC shall provide sufficient information on the type of time lapse system being used that meets the requirements identified in section 2.2 below.

**PART 2 – PRODUCTS**

**2.1. DIGITAL CAMERA**

- A. All digital photographs shall be taken with a good quality digital camera, cell phone, tablet, and other such digital device.
- B. Digital photographs shall be formatted to achieve a good, clear, and detailed image where the final file size is between 600 KB and 3.0 MB (3000KB).

**2.1. TIME LAPSE CONSTRUCTION CAMERA (TLCC)**

- A. The TLCC shall be a high quality weather proof camera owned and operated, or leased, by the GC for the duration of this contract with the following minimum capabilities:
  - 1. Pan-Tilt-Zoom (PTZ) capable.
  - 2. Wireless internet or built in cellular technology capable.
    - a. The use of memory cards will not be permitted.
  - 3. Widescreen, high resolution (5-30 MP rating).
  - 4. Powered by 120V AC.
    - a. The use of battery packs will not be permitted.
  - 5. Web/cloud hosted access to archived photos and video.
  - 6. Provides complete time lapse video capability.
  - 7. 24/7 service and support for equipment, software, and hosting services.
- B. Approved equipment/services include but are not limited to the following:



**SECTION 01 33 23  
SUBMITTALS**

1  
2  
3  
4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED REFERENCES ..... 1  
7 1.3. SUBMITTAL REQUIREMENTS ..... 2  
8 PART 2 – PRODUCTS – THIS SECTION NOT USED ..... 2  
9 PART 3 - EXECUTION ..... 2  
10 3.1. GENERAL CONTRACTOR’S PROCEDURES ..... 2  
11 3.2. SUBMITTAL REVIEW ..... 3  
12 3.3. PROJECT ARCHITECT’S REVIEW ..... 3  
13

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 17 A. The General Contractor (GC) shall be responsible for providing submittals for review of all contractors and sub-  
18 contractors as designated in the construction documents. Submittals shall include but not be limited to all of the  
19 following:
- 20 1. Equipment specified and pre-approved in the specification; to ensure quality, construction, and  
21 performance specifications have not changed since final design.
  - 22 2. Equipment specified by performance in the specification; to ensure that the intended quality,  
23 construction, and performance specified is met by the selected material or product.
  - 24 3. Shop, piece, erection, and other such drawings as indicated in the specifications to ensure all structural,  
25 dimensional, and assembly requirements are being met.
  - 26 4. Submittals indicating installation sequencing
  - 27 5. Submittals indicating control sequencing
  - 28 6. Contractor licensing, certification, and other such regulatory documentation when required by a  
29 specification.
  - 30 7. Other submittals as may be required by individual specifications.
- 31 B. The submittal process shall not be used to determine alternates to specified products or equipment. All  
32 considerations shall be reviewed during the bidding process and acceptable alternates shall be acknowledged by  
33 addendum prior to the closing of bidding. See bidding instructions for the information on submitting alternates  
34 for consideration.
- 35 D. In the event that a manufacturer has significantly changed a product (discontinued a model, changed dimension  
36 or performance data changed available colors, etc.) since bid opening the GC shall submit a Request for  
37 Information (RFI) to the Project Architect requesting other approved alternates prior to uploading a digital  
38 submittal.
- 39 E. Contractors and sub-contractors shall be responsible for knowing the submittal requirements of ALL sections  
40 within their scope of work under the contract. The Owner reserves the right to request documentation on any  
41 materials, equipment, or product being installed where a submittal is not on file. If the material, equipment, or  
42 product installed is determined not to meet the intent of the specification the contractor/sub-contractor shall be  
43 required to remove and replace the items involved. The GC shall be solely responsible for all costs associated  
44 with the removal and replacement.
- 45 F. Doors, Frames + Hardware Submittals - After submission of all door/frame/hardware submittals (and related low  
46 voltage door hardware submittals) Contractor will organize a meeting(s) with Owner, Architect, General  
47 Contractor, Electrician, Door/Frame/Hardware Supplier(s)/Installer(s), Low-Voltage Supplier/Installer, and others  
48 as applicable to comprehensively review and explain each door opening’s submitted hardware package  
49 operation. Prior to this meeting the low voltage contractor shall have completed a review with the Madison Fire  
50 Department for all access control doors and be prepared to explain any conflicts or concerns with all parties. No  
51 procurement of door hardware (and related low voltage components) shall be procured until this meeting is  
52 completed; and until related submittals are returned to by the Owner/Architect team.

**1.2. RELATED REFERENCES**

- 53 A. Section 01 29 76 Progress Payment Procedures  
54 B. Section 01 31 23 Project Management Web Site (PMWS)  
55 C. Section 01 32 19 Submittals Schedule  
56 D. Section 01 32 26 Construction Progress Reporting  
57 E. Section 01 91 00 Commissioning  
58

- 1 F. All Technical Specifications, contract documents, construction drawings, and any published addendums during  
2 the bidding process.  
3 G. All contract documents generated during the execution of the contract including but not limited to Requests for  
4 Information (RFI) and Construction Bulletins (CB).  
5

6 **1.3. SUBMITTAL REQUIREMENTS**

- 7 A. A completed submittal shall meet the following requirements:  
8 1. Digital submittal shall be original PDF of manufacturer's data sheets or high quality color scan of the  
9 same.  
10 a. Submittals shall not include sales fliers or other similar documents that typically do not provide  
11 complete manufacturers data.  
12 2. Documents within the PDF submittal shall be printable to a sized sheet no less than 8-1/2 by 11 inches  
13 and no larger than 24 by 36 inches.  
14 3. At the beginning of each submittal the contractor shall identify the plan reference (WC-1, EF-3, etc.) in  
15 RED block letters that the submittal is for.  
16 4. Where multiple model numbers appear in a table the contractor shall identify the specific model being  
17 submitted by using a RED square, box, or other designation to distinguish the correct model from others  
18 on the page.  
19 B. A complete submittal will include all information associated with the product or equipment as presented in  
20 plans, equipment tables, and specifications. Information shall include but not be limited to the following:  
21 1. Dimensional data  
22 2. Performance data  
23 3. Resource requirements, power, water, waste, etc.  
24 4. Clearance and maintenance requirements  
25 5. Finish information, colors, textures, etc.  
26 6. Warranty information  
27 C. Where a submittal includes material samples (carpet, tile, paint draw downs, etc.) the contractor shall do the  
28 following:  
29 1. The Contractor shall submit the sample(s) as indicated in the specification.  
30 2. The Contractor shall include a quality photograph(s) of the product with the digital submittal.  
31 Photographs shall meet the following requirements:  
32 a. Formatted to be between 500Kb and 1.0 Mb in file size  
33 b. Have no glare or flash reflection on the sample  
34 c. Sample fills the frame of the photo and shows detail as needed. Include multiple photos from  
35 other angles as needed.  
36 d. Scanned copies of products or photos are not acceptable.  
37 D. Uploaded submittals should be relative and related to a specific written specification.  
38 1. Do not upload submittals under a broad category or division (I.E. HVAC 23 00 00). Always upload by the  
39 specific specification that identifies a required product or performance to be met.  
40 2. Group related items together if the specification is written that way. (I.E. all of the plumbing fixtures and  
41 trim relative to one specific specification should be submitted together).  
42 3. Submittals shall be grouped and adhere to the divisions in the submittal schedule. Submittals that do not  
43 conform to the submittal schedule and/or specification divisions will be rejected for re-submittal.  
44

45 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

46  
47 **PART 3 - EXECUTION**

48  
49 **3.1. GENERAL CONTRACTOR'S PROCEDURES**

- 50 A. All required submittals will be uploaded to the Project Management Web Site (PMWS) by the GC.  
51 1. Fill in required information on the form that will be used for routing the review and comments.  
52 2. Attach all documentation as described in Section 1.3 above.  
53 a. Submit samples under separate cover to the Project Architect when necessary.  
54 B. Uploading the submittal indicates that the GC has reviewed and approved the submittal against the contract  
55 document requirements.  
56 C. The GC shall discuss submittal status at all progress meetings and shall monitor submittal review/approval/re-  
57 submittal so as to not incur delays in the project schedule.  
58 D. A completed upload of the submittal to the PMWS initiates the review process workflow.

1 E. The GC and sub-contractors shall provide re-submittals as required.  
2

3 **3.2. SUBMITTAL REVIEW**

- 4 A. Upon completion of the submittal upload by the GC the PMWS automatically notifies the appropriate  
5 Architect/Engineer and Owner Representative, including CxA, by Division/Specification number that there is a  
6 submittal for review.  
7 B. The submittal shall be reviewed internally by the required Architect/Engineer and Owner Representative and  
8 CxA in a timely fashion and provide commentary on missing items, incorrect information, or incomplete shop  
9 drawings, etc as needed.  
10 C. When the internal review is completed the PMWS will notify the Project Architect the submittal is ready for final  
11 review.  
12

13 **3.3. PROJECT ARCHITECT'S REVIEW**

- 14 A. Upon completion of the internal review the Project Architect shall review all internal review comments, confer  
15 with the CPM and CxA as needed and determine the appropriate disposition status for the submittal (approved  
16 or resubmit).  
17 B. The Project Architect shall summarize final internal review comments onto the submittal cover sheet, provide a  
18 final disposition of the submittal and update the review status of the submittal to "Complete..." (with or w/o  
19 comments) or "Rejected".  
20 C. A completed Final Review status will be completed by the City Project or City Construction Manager and initiates  
21 the PMWS to notify the GC and appropriate sub-contractor(s) that the review of the submittal has been  
22 completed.  
23  
24

25 **END OF SECTION**  
26  
27

**SECTION 01 43 39  
MOCKUPS**

1  
2  
3  
4 PART 1 – GENERAL ..... 1  
5 1.1. SUMMARY ..... 1  
6 1.2. RELATED SPECIFICATIONS ..... 1  
7 1.3. RELATED DOCUMENTS ..... 1  
8 1.4. PERFORMANCE REQUIREMENTS ..... 1  
9 1.5. QUALITY ASSURANCE ..... 1  
10 PART 2 - PRODUCTS ..... 2  
11 2.1. MATERIALS ..... 2  
12 PART 3 - EXECUTION ..... 2  
13 3.1. REVIEW THE PLANS AND SPECIFICATIONS ..... 2  
14 3.2. MOCKUP CONSTRUCTION ..... 2  
15 3.3. MOCKUP REVIEW ..... 2  
16 3.4. FINAL SUBMITTAL ..... 3  
17

**PART 1 – GENERAL**

**1.1. SUMMARY**

A. Definition

1. Mockups are field samples constructed, applied, or assembled at the project site for review by the Owner, Owners Representative, Architect and Consultants.
2. Mockups are three dimensional, true scale models that illustrate materials and methods, equipment, workmanship, or location; based on plans, details, and assemblies.

B. Approved mockups establish the standard of quality by which the final work will be judged.

C. Approved mockups shall be properly documented and entered into the Submittal Library on the Project Management Web Site like any other required submittal. See section 3.4 below for more information.

**1.2. RELATED SPECIFICATIONS**

- |    |                  |                                 |
|----|------------------|---------------------------------|
| A. | Section 01 26 13 | Request for Information (RFI)   |
| B. | Section 01 26 46 | Change Bulletin (CB)            |
| C. | Section 01 26 63 | Change Order (CO)               |
| D. | Section 01 31 19 | Project Meetings                |
| E. | Section 01 32 16 | Construction Progress Schedules |
| F. | Section 01 33 23 | Submittals                      |
| G. | Section 01 45 00 | Quality Control                 |

**1.3. RELATED DOCUMENTS**

- A. The following documents shall be used for preparing mockups.
1. All plans, specifications, and details including those derived as revisions (RFI, CB, CO).
  2. Construction Progress Schedules. Mockups shall be done and completed in a timely fashion for review and approval so as to not impact the Contractors project schedule.
  3. Any Manufacturers installation/assembly instructions.

**1.4. PERFORMANCE REQUIREMENTS**

- A. All Contractors shall be responsible for providing and constructing mockups as specified in their Division of Work in the plans and specifications.
- B. Materials to be used shall be as specified in the construction documents, full sized and properly assembled.
- C. Completed mockups shall be of sufficient size to provide visible detail of all components as needed for the sample.

**1.5. QUALITY ASSURANCE**

- A. The General Contractor (GC) shall be responsible for coordinating all of the following as needed:
1. Designating the location for the mockup construction
  2. Coordinating the work of all contractors and materials required to complete the mockup
  3. Ensuring that the mockup meets the intent of the construction documents before scheduling the mockup review meeting.

1  
2 **PART 2 - PRODUCTS**

3  
4 **2.1. MATERIALS**

- 5 A. The materials used in mockups shall be only those materials indicated in the plans, specifications, and favorably  
6 reviewed submittals.  
7 B. Mockups shall be made of full scale materials as delivered to the project site.  
8 C. All materials associated with a particular detail, construction method, manufacturer's installation instructions  
9 shall be properly represented and visible in the mockup. This includes but is not limited to finished mortar joints,  
10 sealants, backer rods, tie bars, rebar, etc.  
11

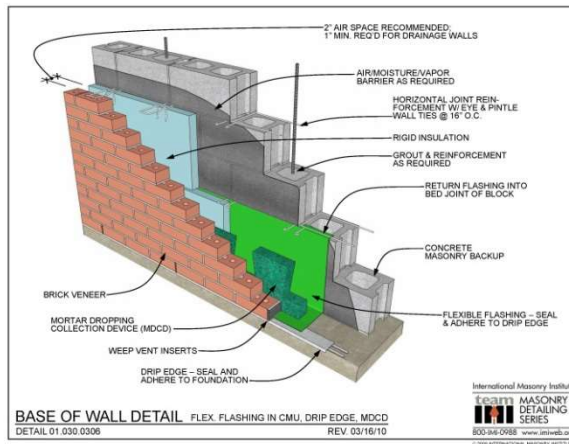
12 **PART 3 - EXECUTION**

13  
14 **3.1. REVIEW THE PLANS AND SPECIFICATIONS**

- 15 A. The GC shall review the plans and specifications with all required contractors prior to constructing the mockup.  
16 1. Mockups that will be built and remain in place, if favorably reviewed, will be installed in an area easily  
17 accessible for review.  
18 2. Mockups that will not be built in place or will not remain will be constructed in a space on the project site  
19 protected from weather, construction traffic, and other such disturbances until such time as the  
20 associated work has been completed.  
21 3. Insure all products being represented in the mockup meet the plans, specifications, and any published  
22 changes.  
23

24 **3.2. MOCKUP CONSTRUCTION**

- 25 A. Mockups shall be of sufficient size to show various material adjacencies, connectivity, patterns, and other such  
26 related features.  
27 B. Mockups shall be constructed in a layered fashion so that all products being used can be seen and evaluated.  
28 C. The construction detail below is an example of a properly layered mockup.  
29



- 30  
31 D. REQUIRED MOCK UPS INCLUDE:  
32 1. New 6" CMU wall and all exterior layers similar to image above.  
33

34 **3.3. MOCKUP REVIEW**

- 35 A. The General Contractor and all associated Sub-contractors (Contracting Team) shall meet with the Owner,  
36 Owners Representative, Architect and Consultants (Design Team) as necessary to review the mock-up.  
37 Contractors shall be prepared to answer questions on materials and methods as necessary.  
38 B. The Contracting and Design Teams shall review the mockup in detail for materials, methods, and workmanship  
39 with respect to the intent of the contract documents. Improvements or adjustments shall be discussed as  
40 needed.  
41 C. If the mockup is incomplete or does not show sufficient detail of products and workmanship the General  
42 Contractor shall resubmit a new mockup.

- 1 D. Re-submittal of mockups to meet the intent of the contract documents shall be the responsibility of the General  
2 Contractor. No Change Orders will be processed for additional time or materials associated with re-submitting a  
3 mockup for approval.  
4 1. In the event that a submitted mockup meets the criteria of the contract documents but does not meet  
5 the expectations of the design team and alternative methods or materials are discussed the following  
6 procedure shall be used:  
7 a. Project Architect shall publish a Construction Bulletin (CB) to detail the required/recommended  
8 changes.  
9 b. The GC shall prepare and submit a new mockup.

10

11 **3.4. FINAL SUBMITTAL**

- 12 A. The field approved mockup shall be submitted by the General Contractor as any other submittal for project  
13 documentation purposes. The mockup submittal shall consist of the following:  
14 1. Digitally photograph the field approved mockup. Take as many detailed photos as necessary to capture  
15 the complexity of the mockup.  
16 2. Provide a written summary of the approved mockup. Include all recommended adjustments, level of  
17 expected workmanship, and other such detail as discussed during the mockup review.  
18 3. Submit the mockup to the Project Management Web Site. See Specification 01 33 23 Submittals for  
19 additional information.  
20

21

22

23

24

**END OF SECTION**



**SECTION 01 43 39  
MOCKUPS**

1  
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14 3.2. MOCKUP CONSTRUCTION ..... 2  
15 3.3. MOCKUP REVIEW ..... 2  
16 3.4. FINAL SUBMITTAL ..... 3  
17

**PART 1 – GENERAL**

**1.1. SUMMARY**

A. Definition

1. Mockups are field samples constructed, applied, or assembled at the project site for review by the Owner, Owners Representative, Architect and Consultants.
2. Mockups are three dimensional, true scale models that illustrate materials and methods, equipment, workmanship, or location; based on plans, details, and assemblies.

B. Approved mockups establish the standard of quality by which the final work will be judged.

C. Approved mockups shall be properly documented and entered into the Submittal Library on the Project Management Web Site like any other required submittal. See section 3.4 below for more information.

**1.2. RELATED SPECIFICATIONS**

- |    |                  |                                 |
|----|------------------|---------------------------------|
| A. | Section 01 26 13 | Request for Information (RFI)   |
| B. | Section 01 26 46 | Change Bulletin (CB)            |
| C. | Section 01 26 63 | Change Order (CO)               |
| D. | Section 01 31 19 | Project Meetings                |
| E. | Section 01 32 16 | Construction Progress Schedules |
| F. | Section 01 33 23 | Submittals                      |
| G. | Section 01 45 00 | Quality Control                 |

**1.3. RELATED DOCUMENTS**

- A. The following documents shall be used for preparing mockups.
1. All plans, specifications, and details including those derived as revisions (RFI, CB, CO).
  2. Construction Progress Schedules. Mockups shall be done and completed in a timely fashion for review and approval so as to not impact the Contractors project schedule.
  3. Any Manufacturers installation/assembly instructions.

**1.4. PERFORMANCE REQUIREMENTS**

- A. All Contractors shall be responsible for providing and constructing mockups as specified in their Division of Work in the plans and specifications.
- B. Materials to be used shall be as specified in the construction documents, full sized and properly assembled.
- C. Completed mockups shall be of sufficient size to provide visible detail of all components as needed for the sample.

**1.5. QUALITY ASSURANCE**

- A. The General Contractor (GC) shall be responsible for coordinating all of the following as needed:
1. Designating the location for the mockup construction
  2. Coordinating the work of all contractors and materials required to complete the mockup
  3. Ensuring that the mockup meets the intent of the construction documents before scheduling the mockup review meeting.

1  
2 **PART 2 - PRODUCTS**

3  
4 **2.1. MATERIALS**

- 5 A. The materials used in mockups shall be only those materials indicated in the plans, specifications, and favorably  
6 reviewed submittals.  
7 B. Mockups shall be made of full scale materials as delivered to the project site.  
8 C. All materials associated with a particular detail, construction method, manufacturer's installation instructions  
9 shall be properly represented and visible in the mockup. This includes but is not limited to finished mortar joints,  
10 sealants, backer rods, tie bars, rebar, etc.  
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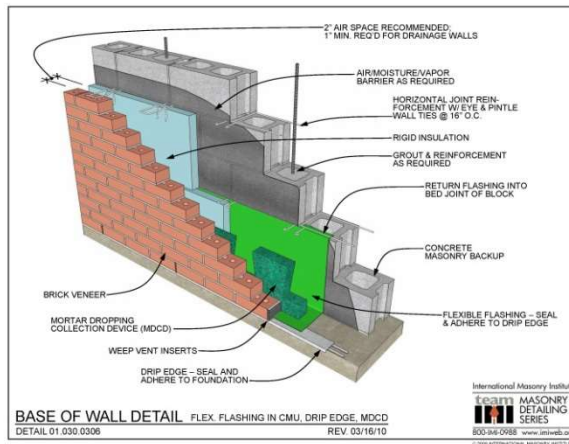
12 **PART 3 - EXECUTION**

13  
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19 protected from weather, construction traffic, and other such disturbances until such time as the  
20 associated work has been completed.  
21 3. Insure all products being represented in the mockup meet the plans, specifications, and any published  
22 changes.  
23

24 **3.2. MOCKUP CONSTRUCTION**

- 25 A. Mockups shall be of sufficient size to show various material adjacencies, connectivity, patterns, and other such  
26 related features.  
27 B. Mockups shall be constructed in a layered fashion so that all products being used can be seen and evaluated.  
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29



- 30  
31 D. REQUIRED MOCK UPS INCLUDE:  
32 1. New 6" CMU wall and all exterior layers similar to image above.  
33

34 **3.3. MOCKUP REVIEW**

- 35 A. The General Contractor and all associated Sub-contractors (Contracting Team) shall meet with the Owner,  
36 Owners Representative, Architect and Consultants (Design Team) as necessary to review the mock-up.  
37 Contractors shall be prepared to answer questions on materials and methods as necessary.  
38 B. The Contracting and Design Teams shall review the mockup in detail for materials, methods, and workmanship  
39 with respect to the intent of the contract documents. Improvements or adjustments shall be discussed as  
40 needed.  
41 C. If the mockup is incomplete or does not show sufficient detail of products and workmanship the General  
42 Contractor shall resubmit a new mockup.

- 1           D.     Re-submittal of mockups to meet the intent of the contract documents shall be the responsibility of the General  
2 Contractor. No Change Orders will be processed for additional time or materials associated with re-submitting a  
3 mockup for approval.  
4           1.     In the event that a submitted mockup meets the criteria of the contract documents but does not meet  
5 the expectations of the design team and alternative methods or materials are discussed the following  
6 procedure shall be used:  
7           a.     Project Architect shall publish a Construction Bulletin (CB) to detail the required/recommended  
8 changes.  
9           b.     The GC shall prepare and submit a new mockup.

10

11 **3.4. FINAL SUBMITTAL**

- 12           A.     The field approved mockup shall be submitted by the General Contractor as any other submittal for project  
13 documentation purposes. The mockup submittal shall consist of the following:  
14           1.     Digitally photograph the field approved mockup. Take as many detailed photos as necessary to capture  
15 the complexity of the mockup.  
16           2.     Provide a written summary of the approved mockup. Include all recommended adjustments, level of  
17 expected workmanship, and other such detail as discussed during the mockup review.  
18           3.     Submit the mockup to the Project Management Web Site. See Specification 01 33 23 Submittals for  
19 additional information.  
20

21

22

23

24

**END OF SECTION**

**SECTION 01 45 29**  
**TESTING LABORATORY SERVICES**

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14

**PART 1 – GENERAL**

**1.1. REQUIREMENTS INCLUDED**

- 17  
18 A. The Contractor shall employ and pay for the services of an independent testing laboratory to perform specified  
19 services and testing.  
20 B. Testing Laboratory inspection, sampling and testing is required for:  
21 1. Section 03 30 00: Cast-In-Place Concrete  
22 2. Section 05 12 00: Structural Steel Framing  
23 3. Section 05 40 00: Cold-Formed Steel Framing  
24 4. Section 31 20 00: Earthwork  
25

**1.2. RELATED REQUIREMENTS**

- 26  
27 A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or  
28 approvals of public authorities.  
29 B. Related Requirements Specified in Other Sections:  
30 1. Division 22 and 23: Testing of Mechanical Systems  
31 2. Division 26: Testing of Electrical Systems  
32

**1.3. QUALIFICATION OF LABORATORY**

- 33  
34 A. Meet “Recommended Requirements of Independent Laboratory Qualification” published by American Council of  
35 Independent Laboratories.  
36 B. Meet basic requirements of ASTM E 329, “Standards of Recommended Practice for Inspection and Testing  
37 Agencies for Concrete and Steel as Used in Construction.”  
38 C. Authorized to operate in State in which the Project is located.  
39

**1.4. LABORATORY DUTIES**

- 40  
41 A. Cooperate with Owner, A/E and Contractor; provide qualified personnel after due notice.  
42 B. Perform specified inspections, sampling and testing of materials and methods of construction:  
43 1. Comply with specified standards.  
44 2. Ascertain compliance of materials with requirements of Contract Documents.  
45 C. Promptly notify the Owner, A/E and Contractor of observed irregularities or deficiencies of work or products.  
46 D. Promptly submit written report of each test and inspection; one copy each to A/E, Consulting Engineer, Owner  
47 and Contractor. Each report shall include:  
48 1. Date issued.  
49 2. Project Title and number.  
50 3. Testing laboratory name, address and telephone number.  
51 4. Name and signature of laboratory inspector.  
52 5. Date and time of sampling or inspection.  
53 6. Record of temperature and weather conditions.  
54 7. Date of test.  
55 8. Identification of product and specification section.  
56 9. Location of sample or test in the Project.  
57 10. Type of inspection or test.  
58 11. Results of tests and compliance with Contract Documents.

- 1                    12. Interpretation of test results, when requested by A/E or the Contractor.  
2                    E. Perform additional tests as required by Owner, A/E or the Contractor.  
3  
4                    **1.5. LIMITATIONS OF AUTHORITY OF TESTING LABORATORY**  
5                    A. Laboratory is not authorized to:  
6                        1. Release, revoke, alter, or enlarge on requirements of Contract Documents.  
7                        2. Approve or accept any portions of the Work other than those portions of the Work scheduled for testing.  
8                        3. Perform any duties of the Contractor.  
9  
10                    **1.6. CONTRACTOR'S RESPONSIBILITIES**  
11                    A. Cooperate with laboratory personnel, provide access to Work and to manufacturer's operations.  
12                    B. Secure and deliver to the laboratory, adequate quantities of representative samples of materials proposed to be  
13                        used and which require testing. Submit concrete mix designs to A/E for approval prior to pouring concrete.  
14                    C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes  
15                        that require control by the testing laboratory.  
16                    D. Furnish copies of Product test reports as required.  
17                    E. Furnish incidental labor and facilities:  
18                        1. To provide access to Work to be tested.  
19                        2. To obtain and handle samples at the Project site or at the source of the product to be tested.  
20                        3. To facilitate inspections and tests.  
21                        4. For storage and curing of test samples.  
22                    F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and  
23                        scheduling of tests.  
24                    G. Make arrangements with laboratory and pay for additional samples and tests required for Contractor's  
25                        convenience.  
26                    H. Employ and pay for the services of a separate, equally qualified independent testing laboratory to perform  
27                        additional inspections, sampling and testing required when initial tests indicate work does not comply with  
28                        Contract Documents.  
29                    I. Temporarily halt the progress of the Work when tested materials do not comply with Contract Documents and  
30                        promptly notify the Owner or their designated representative and A/E.  
31                    J. Remove and replace at no cost to the Owner, all defective materials discovered upon testing not to comply with  
32                        Contract Documents, including cost for retesting and re-inspecting replaced Work that failed to comply with the  
33                        Contract Documents.  
34  
35                    **1.7. SPECIFIC TEST, INSPECTIONS, AND METHODS REQUIRED**  
36                    A. **Section 03 30 00: Cast-In-Place Concrete**  
37                        1. Secure sample of aggregates Contractor proposes to use and test for compliance with Specifications.  
38                        2. Certify compliance with Specifications of cement proposed for use by the Contractor.  
39                        3. Review and approve the Contractor's proposed concrete mix proportions for the required concrete  
40                        strengths using materials Contractor proposed to use on the project. Incorporate specified admixtures  
41                        and not less than amounts of cement specified.  
42                        4. Perform appropriate laboratory tests, including compression tests of cylinders and slump test to  
43                        substantiate mix designs.  
44                        5. Inspect and test materials during concrete work to substantiate compliance with Specifications and mix  
45                        requirements.  
46                        a. Testing:  
47                            i. Sample and test concrete in accordance with ASTM C 31, ASTM C 143, ASTM C 172, and  
48                            ASTM C 231.  
49                            ii. Perform slump tests in accord with ASTM C 143 from same concrete batch used for test  
50                            cylinders and record results and comments on compression test reports.  
51                            iii. Perform compression tests in accordance with ASTM C39.  
52                            iv. When air-entrained concrete is used, a minimum of one (1) air content test shall be  
53                            performed in accordance with ASTM C 231 for each set of test cylinders taken.  
54                            v. Identify all test cylinders with symbols to indicate location on the job where concrete test  
55                            was made. Record on project record drawings.  
56                            vi. Strength tests shall be made for: each day's pour; each class of concrete; each change of  
57                            supplies or sources; and for each 100 cubic yards of concrete or fraction thereof.





**SECTION 01 50 00**  
**TEMPORARY FACILITIES AND CONTROLS**

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 9 1.5. TELECOMMUNICATIONS SERVICES AND WI-FI ..... 2  
 10 1.6. TEMPORARY SANITARY FACILITIES ..... 2  
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 12 1.8. FENCING ..... 3  
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 27

**PART 1 – GENERAL**

**1.1. SUMMARY**

- A. This Section includes general procedural requirements for temporary facilities and controls including, but not limited to the following:
1. Temporary Utilities
  2. Telecommunications Services
  3. Temporary Sanitary Facilities
  4. Barriers
  5. Fencing
  6. Exterior Enclosures
  7. Security
  8. Vehicular Access and Parking
  6. Waste Removal
  7. Project Identification
  8. Field Offices

**1.2. RELATED SPECIFICATION SECTIONS**

- A. Section 01 31 19 Progress Meetings
- B. Section 01 31 23 Project Management Web Site
- C. Section 01 74 19 Construction Waste Management and Disposal

**1.3. QUALITY ASSURANCE**

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
1. Building Code requirements
  2. Health and safety regulations
  3. Utility company regulations
  4. Police, Fire Department and Rescue Squad rules
  5. Environmental protection regulations
  6. Joint Commission - Hospital Accreditation Standards



- 1 B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition
- 2 Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA
- 3 Electrical Design Library "Temporary Electrical Facilities".
- 4 C. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service.
- 5 Install service in compliance with NFPA 70 "National Electric Code".
- 6

7 **1.4. TEMPORARY UTILITIES**

- 8 A. Contractor will provide the following:
  - 9 1. Electrical power and metering, consisting of existing facilities.
  - 10 2. Water supply, consisting of existing facilities.
- 11 B. General:
  - 12 1. Existing facilities may be used.
  - 13 2. New permanent facilities may be used.
- 14 C. Water Service: water is available from existing building services.
  - 15 1. Use trigger-operated nozzles for water hoses, to avoid waste of water.
  - 16 2. Contractor shall provide a continuous water supply from mid-December 2024 through the end of
  - 17 February 2025 for rink filling and maintenance.
- 18 D. Temporary Electric Power Service: Electrical Contractor shall extend temporary power from existing building
- 19 services.
- 20 E. Temporary Lighting: Electrical Contractor shall provide temporary lighting with local switching
  - 21 1. Install and operate temporary lighting, minimum of 30 fc, to fulfill security and protection requirements,
  - 22 without operating the entire system, and will provide adequate illumination for all areas of work,
  - 23 including construction operations and traffic conditions.
- 24 F. Temporary Heat: General Contractor shall provide temporary heat required by construction activities, for curing
- 25 or drying of completed installations or protection of installed construction from adverse effects of low
- 26 temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed
- 27 installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition
- 28 required and minimize consumption of energy.
  - 29 1. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-
  - 30 contained LP gas or fuel oil heaters with individual space thermostatic control.
    - 31 a. Use of gasoline-burning space heaters, open flame, or salamander type heating units is
    - 32 prohibited.
- 33

34 **1.5. TELECOMMUNICATIONS SERVICES AND WI-FI**

- 35 A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization through
- 36 construction closeout.
- 37 B. Telecommunications services shall include:
  - 38 1. Windows-based personal computer dedicated to project telecommunications.
  - 39 2. Shared access to the internet via WIFI or similar wireless connection.
    - 40 a. Access must be capable to support minimum of 10 wireless devices.
  - 41 3. Email Account/address dedicated for GC Project Manager of GC Supervisor on site.
- 42

43 **1.6. TEMPORARY SANITARY FACILITIES**

- 44 A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- 45 B. Temporary toilets: Comply with regulations and health codes for the type, number, location, operation, and
- 46 maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
  - 47 1. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide
  - 48 covered waste containers for used material.
  - 49 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
- 50 C. Maintain daily in clean and sanitary condition
- 51 D. Water: Provide potable water approved by local health authorities
- 52

53 **1.7. BARRIERS**

- 54 A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be
- 55 hazardous to workers or the public and to protect existing facilities and adjacent properties from damage from
- 56 construction operations and demolition.
- 57

- 1 **1.8. FENCING**  
2 A. Construction: Refer to Plan Documents and Specification Section 01 76 00: Fencing Materials and Barricades  
3  
4 **1.9. EXTERIOR ENCLOSURES**  
5 A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions  
6 and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures  
7 identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors  
8 with self-closing hardware and locks.  
9  
10 **1.10. SECURITY**  
11 A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized  
12 entry, vandalism, or theft.  
13  
14 **1.11. VEHICULAR ACCESS AND PARKING**  
15 A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for  
16 emergency vehicles.  
17 B. Coordinate access and haul routes with governing authorities and Owner.  
18 C. Provide and maintain access to fire hydrants, free of obstructions.  
19 D. Existing paved area within the Lands for Work may be used for construction parking until project completion.  
20 Adjacent street parking is also available. Under no circumstances shall vehicles be parked on unpaved areas or  
21 outside of the Lands for Work.  
22  
23 **1.12. WASTE REMOVAL**  
24 A. See Section 01 74 19 - Waste Management, for additional requirements.  
25 B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.  
26 C. Provide containers with lids. Remove trash from site periodically.  
27 D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible  
28 containers; locate containers holding flammable material outside the structure unless otherwise approved by the  
29 authorities having jurisdiction.  
30 E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.  
31  
32 **1.13. PROJECT IDENTIFICATION**  
33 A. Provide project identification sign of design and construction indicated in Section 01 58 13.  
34 B. Erect on site at location determined by Owner .  
35 C. No other signs are allowed without Owner permission except those required by law.  
36  
37 **1.14. FIELD OFFICES**  
38 A. Office: Weather tight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy  
39 furniture, drawing rack and drawing display table.  
40 B. Field Office shall be located within the Lands for Work, but does not need to be a separate trailer.  
41 C. Provide space for Project Meetings with table and chairs to accommodate a minimum of 6 persons.  
42 D. Provide a computer identified in Section 1.4 Telecommunications Services (above), for use during progress  
43 meetings in connection with reviewing construction progress information posted to the Project Management  
44 Web Site (Specification 01 31 23).  
45

46 **PART 2 - PRODUCTS**  
47

- 48 **2.1. TEMPORARY PARTITIONS**  
49 A. Provide dustproof partitions to limit dust and dirt migration and to separate occupied areas from fumes and  
50 noise.  
51 1. Non-fire rated partitions, standard  
52 a. Wood stud framing, 6-mil polyethylene  
53  
54 **2.2. EQUIPMENT**  
55 A. Temporary Lifts and Hoists: Contractors requiring temporary lifts and hoists shall provide facilities for hoisting  
56 materials and employees.  
57 B. Electrical Outlets: Electrical Contractor shall provide properly configured NEMA polarized outlets to prevent  
58 insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault  
circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

- 1 C. Electrical Power Cords: Contractors requiring power cords shall provide grounded extension cords; use "hard-
- 2 service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate
- 3 lengths of electric cords, if single lengths will not reach areas where construction activities are in progress. Do
- 4 not exceed safe length-voltage ratio.
- 5 D. Lamps and Light Fixtures: Electrical Contractor shall provide general service incandescent lamps of wattage
- 6 required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to
- 7 breakage. Provide exterior fixtures where exposed to moisture.
- 8 E. Heating Units: General Contractor shall provide temporary heating units that have been tested and labeled by
- 9 UL, FM or another recognized trade association related to the type of fuel being consumed.
- 10 F. First Aid Supplies: General Contractor shall provide first aid supplies complying with governing regulations.
- 11 G. Fire Extinguishers: General Contractor shall provide hand-carried, portable UL-rated, fire extinguishers of NFPA
- 12 recommended classes for the exposures, extinguishing agent and size required by location and class of fire
- 13 exposure.
- 14

### 15 **PART 3 - EXECUTION**

#### 16 **3.1. TEMPORARY FIRE PROTECTION**

- 17 A. Until fire protection needs are supplied by permanent facilities, General Contractor shall install and maintain
- 18 temporary fire protection facilities of the types needed to protect against reasonably predictable and
- 19 controllable fire losses.
- 20 B. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding
- 21 Construction, Alterations and Demolition Operations".
- 22 C. Locate fire extinguishers where convenient and effective for their intended purpose.
- 23 D. Store combustible materials in containers in fire-safe locations.
- 24 E. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways
- 25 and other access routes for fighting fires.
- 26 F. Prohibit smoking on the premises.
- 27 G. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition
- 28 according to requirements of authorities having jurisdiction.
- 29 H. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site
- 30 I. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods
- 31 and procedures. Post warnings and information.
- 32
- 33

#### 34 **3.2. COLLECTION AND DISPOSAL OF WASTE**

- 35 A. Collect waste from construction areas and elsewhere daily
- 36 B. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce
- 37 requirements strictly.
- 38 C. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to
- 39 rise above 80 deg F.
- 40 D. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing
- 41 properly. Dispose of material in a lawful manner.
- 42

#### 43 **3.3. ENVIRONMENTAL PROTECTION**

- 44 A. Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply
- 45 with environmental regulations, and minimize the possibility that air, waterways and subsoil might be
- 46 contaminated or polluted, or that other undesirable effects might result.
- 47 B. Avoid use of tools and equipment which produce harmful noise.
- 48 C. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms
- 49 near the site.
- 50

#### 51 **3.4. REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS**

- 52 A. Remove temporary utilities, equipment, facilities, and materials prior to Substantial Completion inspection.
- 53 B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.
- 54 C. Clean and repair damage caused by installation or use of temporary work.
- 55 D. Restore existing facilities used during construction to original condition.
- 56 E. Restore new permanent facilities used during construction to specified condition.
- 57
- 58

1  
2

**END OF SECTION**

**SECTION 01 58 13  
TEMPORARY PROJECT SIGNAGE**

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5 1.1. SECTION INCLUDES ..... 1  
6 1.2. QUALITY ASSURANCE ..... 1  
7 1.3. SUBMITTALS ..... 1  
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9 2.1. SIGN MATERIALS ..... 1  
10 2.2. PROJECT IDENTIFICATION SIGN ..... 1  
11 PART 3 - EXECUTION ..... 1  
12 3.1. INSTALLATION ..... 1  
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14

**PART 1 – GENERAL**

**1.1. SECTION INCLUDES**

- A. Project identification sign.

**1.2. QUALITY ASSURANCE**

- A. Design sign and structure to withstand 50 miles/hr wind velocity.  
B. Sign Painter: Experienced as a professional sign painter for minimum three years.  
C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

**1.3. SUBMITTALS**

- A. See Section 01 30 00 – Administrative Requirements for submittal procedures.  
B. Shop Drawing: Show content, layout, lettering, color, structure, sizes.

**PART 2 - PRODUCTS**

**2.1. SIGN MATERIALS**

- A. Structure and Framing: New, wood, structurally adequate.  
B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4" thick, standard large sizes to minimize joints.  
C. Rough Hardware: Galvanized

**2.2. PROJECT IDENTIFICATION SIGN**

- A. One painted sign, 32 sq ft area, bottom 6 feet above ground.  
B. Content:  
1. Project title, City of Madison, Parks Division logo and name of Owner as indicated on Contract Documents.  
2. Name of Prime Contractor.

**PART 3 - EXECUTION**

**3.1. INSTALLATION**

- A. Install project identification sign within 30 days after date fixed by Notice to Proceed.  
B. Erect at designated location.  
C. Install sign surface plumb and level, with butt joints. Anchor securely.

**3.2. REMOVAL**

- A. Remove sign, framing supports, and foundations at completion of Project and restore the area.

**END OF SECTION**

**SECTION 01 60 00  
PRODUCT REQUIREMENTS**

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10 3.1. GENERAL CONTRACTOR REQUIREMENTS ..... 2  
11 3.2. BULK MATERIAL ..... 3  
12 3.3. DRY PACKAGED MATERIAL ..... 3  
13 3.4. STRUCTURAL AND FRAMING MATERIAL ..... 3  
14 3.5. EQUIPMENT ..... 3  
15 3.6. FINISH PRODUCTS ..... 3  
16 3.7. DUCTWORK, PIPING, AND CONDUIT ..... 3  
17 3.8. OWNER PROVIDED, CONTRACTOR INSTALLED EQUIPMENT ..... 4  
18

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 22 A. The purpose of this specification is to provide general guidelines and responsibilities related to the receiving,  
23 handling, and storage of all materials and products from arrival on the job site through installation.  
24 1. Immediate inspection of delivered goods means a timely replacement if damaged.  
25 2. Proper storage helps prevent damage and loss by weather, vandalism, theft, and job site accidents.  
26 3. Proper storage helps with job site performance and safety.  
27 2. Proper handling helps prevent damage and job site accidents.  
28 B. Each Contractor shall be directly responsible for the receiving, handling, and storage of all materials and  
29 products associated with the Work of their Division or Trade.  
30 C. Each Contractor responsible for Work associated with Owner provided materials or products shall be responsible  
31 for the receiving, handling and storage of the material/product as outlined in Section 3.8 below..  
32

**1.2. RELATED SPECIFICATIONS**

- 34 A. Parts of this specification will reference articles within “The City of Madison FACILITIES MANAGEMENT  
35 SPECIFICATIONS for Public Works Construction”.  
36 1. Use the following link to access the FACILITIES MANAGEMENT SPECIFICATIONS web page:  
37 <http://www.cityofmadison.com/business/pw/specs.cfm>  
38 a. Click on the “Part” chapter identified in the specification text. For example if the specification  
39 says “Refer to City of Madison FACILITIES MANAGEMENT SPECIFICATION 210.2” click the link for  
40 Part II, the Part II PDF will open.  
41 b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you  
42 to the referenced text.  
43 c. City Standard Detail Drawings (SDD) may be located from the index in Part VIII.  
44 B. Section 01 57 21 Indoor Air Quality  
45 C. Section 01 74 13 Progress Cleaning  
46 D. Section 01 76 00 Protecting Installed Construction  
47 E. Other Divisions and Specifications that may address more specifically the requirements for the storage and  
48 handling of materials and products associated Work of other Divisions or Trades.  
49

**1.3. QUALITY ASSURANCE**

- 51 A. The GC shall be responsible for ensuring that these minimum storage and handling requirements are met by all  
52 contractors on the project site including but not limited to the following:  
53 1. Receiving deliveries of materials, products, and equipment.  
54 a. Inspect all deliveries upon arrival for damage, completeness, and compliance with the  
55 construction documents.  
56 i. Deliveries shall remain in original packaging or crates, shipping manifest shall be kept with  
57 the delivery and the packaging shall have visible identification of the items within the  
58 packaging.



- 1                   1.       When openings are required in completed Work (new or existing) the GC shall be responsible for  
2                   providing an appropriate opening and for restoring the opening to the original or better condition upon  
3                   completion. Restoration shall be weather tight and complete.  
4           C.       Repeated moving and handling of items being stored shall not be allowed. The GC shall be responsible for any  
5                   damage and replacement because of mishandling or excessive handling.  
6  
7   **3.2.   BULK MATERIAL**  
8    A.       Bulk material such as sand, gravel, top soil and other types of fill shall be stored away from the construction area  
9                   and shall be stock piled as follows:  
10           1.       All bulk material shall be piled safely and efficiently in as small an area as practical. Only store the  
11                   amount of material necessary for upcoming operations so as not to interfere with other construction  
12                   activities and access to Work by the Owner and Architect.  
13           2.       All stock piles shall have silt fence/sock properly installed around the perimeter to prevent erosion and  
14                   loss of material. Refer to City of Madison FACILITIES MANAGEMENT SPECIFICATION Section 210.1(f) and  
15                   other related specification or details.  
16           3.       Fine grained material shall be protected with tarps to prevent blowing. Tarps shall be weighted or staked  
17                   to stay in place.  
18    B.       Bulk material such as brick, concrete block, stone, and other palletized materials shall be stored on original  
19                   shipping pallets until ready for use.  
20  
21   **3.3.   DRY PACKAGED MATERIAL**  
22    A.       Dry packaged material such as cement, mortar, etc shall be stored on pallets, on slightly elevated ground or clear  
23                   stone pad to keep water away from the base of the material being stored. Protect from moisture.  
24  
25   **3.4.   STRUCTURAL AND FRAMING MATERIAL**  
26    A.       All structural and framing material shall be stored in an organized manner arranged by type, size and dimension.  
27                   Materials shall be stored on pallets or timbers as necessary and shall not be allowed to lie directly on the ground.  
28    B.       Long and heavy items shall be supported at several points to prevent bending and warping.  
29  
30   **3.5.   EQUIPMENT**  
31    A.       Equipment delivered to the site shall be stored away from all construction activities until the item can either be  
32                   moved inside or properly installed.  
33    B.       Equipment shall be stored on slightly elevated ground or clear stone pad to keep water away from the base of  
34                   the equipment.  
35  
36   **3.6.   FINISH PRODUCTS**  
37    A.       Finish products such as flooring, tile, counters, lockers, toilets, partitions, lighting, and other similar items should  
38                   not be delivered and stored until the structure has been enclosed, is weather tight, temperature controlled and  
39                   the contractor is ready for such items to be installed.  
40           1.       Storage of finished products outside for any length of time shall not be allowed.  
41    B.       Products that cannot be stored inside the structure shall be stored in secured containers or job trailers until such  
42                   time as they are ready to be installed.  
43    C.       Products with a high potential for breakage such as glass, mirrors, tiles, toilet fixtures, etc. shall be stored with  
44                   additional protection as necessary such as but not limited to the following:  
45           1.       Store in original shipping containers until ready for installation.  
46           2.       Do not store in high traffic areas.  
47           3.       Shield with other materials such as cardboard, plywood, or similar products.  
48  
49   **3.7.   DUCTWORK, PIPING, AND CONDUIT**  
50    A.       All piping and conduit shall be stored horizontally unless otherwise specified by the manufacturer or Division and  
51                   Trade Specifications.  
52           1.       Do not store directly on grade.  
53           2.       Cover metal pipes and tubes to prevent rust and corrosion, allow ventilation to prevent condensation.  
54           3.       Whenever possible use pipe stands for storing pipe and conduit to prevent tripping and rolling hazards.  
55    B.       All ductwork shall be stored horizontally or vertically as necessary unless otherwise specified by the  
56                   manufacturer or Division and Trade Specifications.  
57           1.       During storage, both ends of each duct shall be protected with plastic sheathing to prevent dust and dirt  
58                   from getting inside the duct. Sheathing shall be sufficiently taped to the duct.





**SECTION 01 71 23  
FIELD ENGINEERING**

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6 1.2. RELATED REQUIREMENTS ..... 1  
7 1.3. PROCEDURES ..... 1  
8 1.4. PROJECT SURVEY REQUIREMENTS ..... 1  
9 1.5. RECORDS ..... 1  
10 PART 2 – PRODUCTS – THIS SECTION NOT USED ..... 1  
11 PART 3 – EXECUTION – THIS SECTION NOT USED ..... 1  
12

**PART 1 – GENERAL**

**1.1. REQUIREMENTS INCLUDED**

- A. The Contractor shall provide and pay for field engineering services required for the Project:
1. Land surveying services required to execute the Work, to include building addition location and layout, and location and layout of pavements and all proposed site improvements.
  2. Verification of existing building dimensions, elevations, and relationship to proposed additions.
  3. Professional Engineering services to execute Contractor’s construction methods.
  4. Registered Professional Engineer in the State of Wisconsin to determine the load capacity of the existing structure for use of Contractors temporary facilities, equipment, lifts, machinery, material storage, etc.

**1.2. RELATED REQUIREMENTS**

- A. Conditions of the Contract

**1.3. PROCEDURES**

- A. A property survey has been prepared for the Owner and has been bound with Contract Drawings. Surveys shall describe physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. If information is incomplete, notify Owner to furnish additional information. Verify easement locations, front, side, and rear yard restrictions, if any; and property line locations. Verify control points, and establish bench marks. Locate and layout roads, walks, parking areas and all civil structures and all proposed site improvements.
- B. Verify locations of underground services, utilities, structures, etc. which may be encountered or affected by the Work.

**1.4. PROJECT SURVEY REQUIREMENTS**

- A. Using datum, the lot lines and present levels have been established as indicated on the Drawings. Other grades, lines, levels and benchmarks, shall be established and maintained by the Contractor, who shall be responsible for them. As work progresses, the Contractor shall layout on forms and floor, the locations of all partitions, walls and fix column centerlines as a guide to all trades. The Contractor shall make provision to preserve property line stakes, benchmarks, or datum point. If any are lost, displaced or disturbed through neglect of any Contractor, Contractor’s agents or employee, the Contractor responsible shall pay the cost of restoration.
- B. Establish lines and levels, locate and layout, by instrumentation and similar appropriate means, additions, column locations, floor levels, stakes for walks, etc.
- C. Provide data to all Subcontractors for their use as applicable.
- D. From time to time, verify layouts by same methods.

**1.5. RECORDS**

- A. Maintain a complete, accurate log of all control and survey work as it progresses.

**PART 2 – PRODUCTS – THIS SECTION NOT USED**

**PART 3 – EXECUTION – THIS SECTION NOT USED**

**END OF SECTION**

**SECTION 01 73 29  
CUTTING AND PATCHING**

1  
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7 1.3. DEFINITIONS ..... 1  
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11 2.1. GENERAL ..... 2  
12 PART 3 - EXECUTION ..... 2  
13 3.1. EXAMINATION ..... 2  
14 3.2. PREPARATION ..... 2  
15 3.3. PERFORMANCE ..... 2  
16 3.4. CLEANUP AND RESTORATION ..... 3  
17

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 21 A. This Section includes general procedural requirements for cutting and patching including, but not limited to the  
22 following:  
23 1. Examination  
24 2. Preparation  
25 3. Performance  
26 4. Cleanup and Restoration  
27

**1.2. RELATED SPECIFICATION SECTIONS**

- 29 A. Divisions 02 through 32 Sections for specific requirements and limitations applicable to cutting and patching  
30 individual parts of the Work.  
31 B. Division 07 Section "Penetration Fire Stopping" for patching fire-rated construction.  
32

**1.3. DEFINITIONS**

- 34 A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.  
35 B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other  
36 Work.  
37 C. Level Alpha  
38

**1.4. QUALITY ASSURANCE**

- 40 A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying  
41 capacity or load-deflection ratio.  
42 B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results  
43 in reducing their capacity to perform as intended or that may result in increased maintenance or decreased  
44 operational life or safety.  
45 C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that  
46 could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that  
47 may result in increased maintenance or decreased operational life or safety. Some miscellaneous elements  
48 include the following:  
49 1. Water, moisture, or vapor barriers  
50 2. Membranes and flashings  
51 3. Exterior curtain-wall construction  
52 4. Equipment supports  
53 5. Piping, ductwork, vessels, and equipment  
54 6. Noise and vibration control elements and systems  
55 D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and  
56 patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that  
57 would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has  
58 been cut and patched in a visually unsatisfactory manner.

1 **1.5. WARRANTY**

- 2 A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting  
3 and patching operations, by methods and with materials so as not to void existing warranties.  
4 B. All cutting and patching work performed under this contract shall be warranted like new work as defined by the  
5 Specification governing the work.  
6

7 **PART 2 - MATERIALS**

8  
9 **2.1. GENERAL**

- 10 A. Comply with requirements specified within other sections of the Specifications.  
11 B. In-Place Materials: Use materials identical to existing in-place materials. For exposed surfaces use materials that  
12 visually match in-place adjacent surfaces to the fullest extent possible.  
13 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the  
14 visual and functional performance of in-place materials.  
15

16 **PART 3 - EXECUTION**

17  
18 **3.1. EXAMINATION**

- 19 A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.  
20 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including  
21 compatibility with in-place finishes or primers.  
22 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.  
23

24 **3.2. PREPARATION**

- 25 A. Temporary Support: Provide temporary support of Work to be cut.  
26 B. Protection: Protect in-place construction and existing conditions during cutting and patching to prevent damage.  
27 Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting  
28 and patching operations. If the failure to protect, or the lack of protection, of in-place construction and/or  
29 existing conditions results in damage, the contractor shall be responsible for repair to previous condition.  
30 C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.  
31 D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be  
32 removed, relocated, or abandoned, bypass such services/systems before cutting to eliminate interruption to  
33 occupied areas.  
34

35 **3.3. PERFORMANCE**

- 36 A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the  
37 earliest feasible time, and complete without delay.  
38 1. Cut in-place construction to provide for installation of other components or performance of other  
39 construction, and subsequently patch as required to restore surfaces to their original condition.  
40 B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations,  
41 including excavation, using methods least likely to damage elements retained or adjoining construction. If  
42 possible, review proposed procedures with original Installer; comply with original Installer's written  
43 recommendations.  
44 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and  
45 chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance  
46 of adjacent surfaces. Temporarily cover openings when not in use.  
47 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.  
48 3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.  
49 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by  
50 cutting and patching operations.  
51 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap,  
52 valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other  
53 foreign matter after cutting.  
54 6. Proceed with patching after construction operations requiring cutting are complete.  
55 C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following  
56 performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and  
57 comply with installation requirements specified in other Sections.

1 D. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of  
2 installation.  
3

4 **3.4. CLEANUP AND RESTORATION**

- 5 A. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a  
6 manner that will eliminate evidence of patching and refinishing.
- 7 1. Clean piping, conduit, and similar features before applying paint or other finishing materials.
  - 8 2. Restore damaged pipe covering to its original condition.
  - 9 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another,  
10 patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish,  
11 color, texture, and appearance. Remove in-place floor and wall coverings and replace with new  
12 materials, if necessary, to achieve uniform color and appearance.
  - 13 4. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch  
14 and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats  
15 until patch blends with adjacent surfaces.
  - 16 5. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide an even-plane surface of  
17 uniform appearance.
  - 18 6. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight  
19 condition.
  - 20 7. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint,  
21 mortar, oils, putty, and similar materials.
  - 22 8. Any smoke and fire caulking that has been disturbed must be replaced by the Contractor as required by  
23 code.  
24

25  
26  
27 **END OF SECTION**  
28

**SECTION 01 74 13  
PROGRESS CLEANING**

1  
2  
3  
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7 1.3. QUALITY ASSURANCE ..... 1  
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9 2.1. CLEANING MATERIALS AND EQUIPMENT..... 1  
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11 3.1. SAFETY CLEANING ..... 1  
12 3.2. PROJECT SITE CLEANING ..... 2  
13 3.3. PROGRESS CLEANING ..... 2  
14 3.4. FINAL CLEANING..... 3  
15 3.5. CALL BACK WORK ..... 4  
16

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 20 A. Throughout the execution of this contract all contractors shall be responsible for maintaining the project site in a  
21 standard of cleanliness as described in this specification.  
22 B. All contractors shall also comply with the requirements for cleaning as described in other specifications.  
23 C. Work included in this specification shall include but not be limited to:  
24 1. Safety Cleaning  
25 2. Project Site Cleaning  
26 3. Progress Cleaning  
27 4. Final Cleaning  
28

**1.2. RELATED SPECIFICAITONS**

- 30 A. Section 01 35 00 Special Procedures  
31 B. Section 01 60 00 Product Requirements  
32 C. Section 01 74 19 Construction Waste Management and Disposal  
33 D. Section 01 76 00 Protecting Installed Construction  
34

**1.3. QUALITY ASSURANCE**

- 36 A. The General Contractor (GC) shall conduct daily inspections, more often if necessary, of the entire project site to  
37 ensure the requirements of cleanliness are being met as described within these specifications.  
38 B. All contractors shall comply with other regulatory requirements as they apply to waste recycling, reuse, hauling,  
39 and disposal requirements of any governmental authority having jurisdiction.  
40 C. The Owner reserves the right to have work done by others in the event any contractor fails to perform cleaning  
41 as described within these specifications. The cost of any Owner provided cleaning shall be charged to the  
42 contractor through a deduct change order.  
43

**PART 2 - PRODUCTS**

**2.1. CLEANING MATERIALS AND EQUIPMENT**

- 47 A. The Contractor shall provide all required personnel, equipment, and materials necessary to maintain the  
48 required level of cleanliness as described in this specification.  
49 B. Use only cleaning materials and equipment that are compatible with the surface being cleaned, as  
50 recommended by the manufacturer, or as approved by the A/E.  
51 C. Use only cleaning materials, equipment, and methods as recommended in the manufacturers care and use guide  
52 of the material, finish or equipment being cleaned.  
53

**PART 3 - EXECUTION**

**3.1. SAFETY CLEANING**

- 57 A. All Contractors shall be responsible for safety cleaning as required by OSHA and other regulatory requirements  
58 as applicable.

- 1 B. Safety Cleaning shall include but not be limited to the following:
  - 2 1. All work areas, passageways, ramps, and stairs shall be kept free of debris, scrap materials, pallets, and
  - 3 other large items that would obstruct exiting routes. Small items such as tools, electrical cords, etc are
  - 4 picked up when not in use.
  - 5 2. Form and scrap lumber shall have nails/screws removed or bent over. Lumber shall be neatly stacked in
  - 6 an area designated by the GC.
  - 7 3. Spills of oil, grease, and other such liquids shall be cleaned immediately or sprinkled with sand/oil-dry
  - 8 first, then cleaned.
  - 9 4. Oily, flammable, or hazardous items shall be stored in appropriate covered containers and storage
  - 10 devices unless actively being used.
  - 11 5. Oily, or flammable rags, and other such waste shall only be disposed of in authorized covered containers.
  - 12 6. Disposal by burning shall not be allowed at any time.

13  
14 **3.2. PROJECT SITE CLEANING**

- 15 A. This section applies to the general cleanliness of the project site as a whole for the duration of the execution of
- 16 this contract.
- 17 B. Exterior Project Site Areas
  - 18 1. The GC and other Contractors as appropriate shall ensure the following levels of cleanliness are applied
  - 19 to the exterior project site areas.
    - 20 a. The overall appearance of the project site is neat and orderly. Defined areas for material storage,
    - 21 material waste, job trailers, and the project area are clean and well maintained.
    - 22 b. The construction fence is maintained, erect with no gaps, and properly posted per all regulatory
    - 23 requirements.
    - 24 c. All erosion control measures are properly maintained, cleaned, and repaired as necessary.
    - 25 d. All loose materials (construction or waste) are properly tied or weighted down to resist blowing.
    - 26 e. All construction materials are properly covered with fully functional tarps or plastic wrap,
    - 27 protected from the weather, coverings are tied, strapped, or weighted down to resist blowing.
    - 28 f. Dust control is applied as necessary or as required by any regulatory requirement.
- 29 C. Interior Project Site Areas
  - 30 1. All Contractors shall ensure the following levels of cleanliness are applied to the interior project site
  - 31 areas.
    - 32 a. The overall appearance of the project site is neat and orderly. Defined areas for material storage,
    - 33 material waste, and project area are clean and well maintained.
    - 34 b. Stored materials are kept in original shipping containers whenever possible. Stored materials not
    - 35 in shipping containers are properly stored and protected according to other applicable
    - 36 specifications.
    - 37 c. All scraps and debris shall be properly disposed of as often as necessary to keep work areas,
    - 38 passageways, stairs, and ramps free of debris and clear for emergency exiting.
    - 39 d. Boxes, pallets, and other such shipping containers, are broken down, stored in a consolidated area
    - 40 or, disposed of as often as is necessary.
    - 41 e. Hand tools, supplies, materials, electrical cords not being used are picked up and stored in gang
    - 42 boxes, not left as walking hazards in work areas, passageways, etc.
- 43 D. Job Trailer
  - 44 1. The interior of the job trailer shall be kept clean and available as a work space at all times. The GC shall
  - 45 ensure that the following is provided for within the job trailer:
    - 46 a. Meeting space including tables and chairs.
    - 47 b. Sufficient space for all contractors to access the official construction documents, provide updates,
    - 48 etc.

49  
50 **3.3. PROGRESS CLEANING**

- 51 A. This sub-section shall apply to all Progress Cleaning prior to the installation of finishes, fixtures, and trim (IE
- 52 rough-in).
  - 53 1. For the purposes of this section “clean” shall be defined as a level of cleanliness free of dust and other
  - 54 material capable of being removed by use of reasonable effort using a good quality janitor broom and
  - 55 shop-vac.
  - 56 2. Daily cleanings shall be conducted by all contractors at the end of the work day as follows:
    - 57 a. Debris in excavated areas shall be removed prior to backfill and compaction.
    - 58 b. Debris in wall cavities, chase spaces, etc shall be removed prior to enclosing the spaces.

- 1 c. Large items shall be properly stored, returned to designated areas, or disposed of as necessary.
- 2 d. Loose materials shall be properly secured.
- 3 e. Flammable or hazardous materials are properly stored or disposed of.
- 4 3. Weekly cleaning shall be conducted by all contractors as designated by the GC. Weekly cleanings shall
- 5 include all the above for a daily cleaning and other necessary cleaning as designated by the GC.
- 6 B. This sub-section shall apply to Progress Cleaning in preparation for the installation of finishes, fixtures, and trim.
- 7 a. Surfaces receiving finishes shall be thoroughly cleaned prior to contractors applying finish
- 8 materials. The GC shall be responsible for inspecting the area and surfaces being cleaned for
- 9 finish prior to the sub-contractor applying the finish. This shall include but not be limited to the
- 10 following:
- 11 i. Wall surfaces shall be wiped clean of dirt and oily residues, vacuumed free of dust, and
- 12 shall be free of surface imperfections prior to painting or installing wall coverings.
- 13 ii. Metal surfaces shall be wiped clean of dirt and oily residues, and be free of surface
- 14 imperfections prior to painting.
- 15 iii. Flooring shall be broom swept of large and loose items then vacuumed clean of dust and
- 16 small particles, and damp mopped clean and dried prior to installing any flooring finish.
- 17 Additional cleaning may be required depending on the preparation requirements
- 18 recommended by the flooring material manufacturer.
- 19 C. This sub-section shall apply to Progress Cleaning after the installation of finishes, fixtures, and trim.
- 20 1. For the purposes of this section "clean" shall be defined as a level of cleanliness free of dust and other
- 21 material capable of damaging or visually disfiguring finished work, finishes, fixtures, and trim.
- 22 2. Progress Cleaning at this point in the contract shall be conducted immediately as follows:
- 23 a. Dust, dirt, etc shall be swept and vacuumed off of finish flooring and trim.
- 24 b. Liquid spills shall be cleaned up according to the spill type. This shall include drips and spills
- 25 caused by paint, stain, sealants, and other such items.
- 26 3. The Contractor(s) at no additional cost to the Owner shall be responsible for replacing any finished work,
- 27 finishes, fixtures, and trim damaged or disfigured because of inadequate or improper cleaning.
- 28

### 3.4. FINAL CLEANING

- 30 A. As noted in Specification 01 29 76 Progress Payment Procedures, Progress Payment Milestone Schedule, Final
- 31 Cleaning shall not be conducted prior to requesting the 90% contract total progress payment and all of the
- 32 following shall be complete:
- 33 1. All final regulatory inspections including but not limited to Building Inspection Department and Madison
- 34 Fire Department inspections have been successfully completed.
- 35 2. All Quality Management Observation (QMO) reports have been closed out.
- 36 3. All Demonstration and Training has been completed.
- 37 4. All Attic Stock has been consolidated and located to its designated area
- 38 5. All protection for installed construction shall be removed prior to final cleaning by the contractor
- 39 responsible for providing the protections. This shall include the removal of any adhesive residues left
- 40 behind from tapes. Contractors shall only use manufacturer authorized cleaning materials for removing
- 41 adhesives, etc.
- 42 B. For the purposes of this section "clean" shall be defined as a level of cleanliness generally provided by skilled
- 43 cleaners using commercial quality building maintenance equipment and materials.
- 44 C. The GC shall be responsible for ensuring that all requirements under this section are being met.
- 45 D. General Requirements
- 46 1. Employ experienced personnel or professional cleaners for final cleaning as necessary for the areas or
- 47 equipment being cleaned.
- 48 2. Cleaning equipment used shall be commercial grade equipment commonly used by professional cleaners.
- 49 3. Cleaning equipment and materials shall be cleaned, rinsed, or replaced to ensure a uniform level of
- 50 cleanliness is being maintained during the final cleaning. This shall include but not be limited to the
- 51 following:
- 52 a. Vacuum cleaner bags and/or filters are changed and/or cleaned as often as necessary.
- 53 b. Dust & wipe down rags are washed, rinsed, or replaced before starting each room.
- 54 c. Mopping equipment
- 55 i. Mop water for washing shall have cleaning solution added to the amount and temperature
- 56 per manufacturer's recommendations. Mop washing water shall be replaced often to
- 57 maintain the levels of the cleaning solution and temperature required.
- 58 ii. Mop water for rinsing shall remain clean, clear, and be replaced as often as necessary.





**SECTION 01 74 19  
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

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**PART 1 – GENERAL**

**1.1. SUMMARY**

- 24 A. This specification includes administrative and procedural requirements for the recycling, re-use, salvaging, and  
25 disposal of non-hazardous construction and demolition waste.  
26 B. The General Contractor (GC) shall be fully responsible for complying with all applicable ordinances and other  
27 such regulatory requirements during the execution of this contract.  
28

**1.2. RELATED SPECIFICAITONS**

- 30 A. 01 29 76 Progress Payment Procedures  
31 B. 01 31 23 Project Management Web site  
32 C. 01 32 19 Submittals Schedule  
33 D. 01 33 23 Submittals  
34 E. 01 77 00 Closeout Procedures  
35 F. Other Divisions and Specifications that may address the proper disposal of construction or demolition waste as it  
36 pertains to work being conducted under that particular specification.  
37

**1.3. CITY ORDINANCES**

- 39 A. There are two (2) Madison General Ordinances (MGO) that the City of Madison has regarding construction and  
40 demolition waste.  
41 1. MGO 10.185, Recycling and Reuse of Construction and Demolition Debris, describes the requirements  
42 associated with this ordinance including definitions, documentation requirements, and penalties.  
43 2. MGO 28.185, Approval of Demolition (Razing, Wrecking) and Removal, describes the requirements  
44 associated with applying for and receiving a demolition permit.  
45 B. All City of Madison, Board of Public Works, contracts being conducted by City Engineering, Facility Management,  
46 for construction, remodeling, or demolition shall comply with the above ordinances regardless of project type or  
47 size.  
48

**1.4. DEFINITIONS**

- 50 A. Clean: Untreated and unpainted material, free of contamination caused by oils, solvents, caulks, and other  
51 chemicals.  
52 B. Construction and Demolition Debris: Materials resulting from the construction, remodeling, repair, and  
53 demolition of utilities, structures, buildings, and roads.  
54 C. Disposal: Off-site removal of construction and demolition debris and the subsequent sale, recycling, reuse, or  
55 deposit in authorized landfill or incinerator.  
56 D. Hazardous: Exhibiting the characteristics of hazardous substance, i.e. ignitability, corrosiveness, toxicity, or  
57 reactivity and including but not limited to asbestos containing materials, lead, mercury and PCBs.  
58 E. Non-hazardous: Exhibiting none of the characteristics of a hazardous substance.

- 1 F. Nontoxic: Not immediately poisonous to humans or poisonous after a long period of exposure.
- 2 G. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured
- 3 into a new product.
- 4 H. Recycle: Any process by which construction or demolition debris is diverted from final disposal as solid waste at
- 5 a permitted landfill and instead is collected, separated, and/or processed into raw materials for new, reused, or
- 6 reconstituted products; or for the recovery of materials for energy production processes.
- 7 I. Recycler: Any recycling facility, transfer station, or other waste handling facility which accepts construction and
- 8 demolition debris for recycling, or for other transferring to a recycling facility.
- 9 J. Recycling: The process of sorting, cleaning, treating, or reconstituting solid waste and other discarded materials
- 10 for the purpose of preparing the material to be recyclable. Recycling does not include burning, incinerating or
- 11 thermally destroying waste.
- 12 K. Return: To give back reusable items or unused products to vendors for credit.
- 13 L. Reuse: Shall mean any of the following:
- 14 1. The on-site use of reprocessed construction and demolitions debris.
- 15 2. The off-site redistribution of a material, for use in the same manner or similar manner at another
- 16 location.
- 17 3. The use of non-toxic, clean wood as an alternative fuel source.
- 18 M. Salvage: To remove a waste material from the project site for resale or reuse by the Owner or others.
- 19 N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- 20 O. Trash: Any product or material unable to be re-used, returned, recycled, or salvaged.
- 21 P. Waste: Extra materials or products that have reached the end of its useful life or its intended use. Waste
- 22 includes salvageable, returnable, recyclable and re-useable construction and demolition materials, and trash.
- 23

#### 24 1.5. PERFORMANCE REQUIREMENTS

- 25 A. The GC shall develop a Waste Management Plan that results in end-of-project rates for salvage/recycling/reuse
- 26 of 95 percent (minimum) by weight of the total waste generated by the Work. Percentages may be adjusted on
- 27 a project by project basis depending on selected LEED goals associated with the project.
- 28 B. The GC shall salvage or recycle 100 percent of all uncontaminated packaging materials including but not limited
- 29 to the following:
- 30 1. Paper
- 31 2. Cardboard
- 32 3. Beverage containers
- 33 4. Boxes
- 34 5. Plastic Sheet and film
- 35 6. Polystyrene packaging
- 36 7. Wood crates and pallets
- 37 8. Plastic pails and buckets
- 38 C. Promote a resourceful use of supplies and materials through proper planning and handling. Generate the least
- 39 amount of waste possible by minimizing errors, poor planning, breakage, mishandling, contamination or other
- 40 similar factors.
- 41 D. Use all reasonable means to divert construction waste from landfills and incinerators through recycling, reuse, or
- 42 salvage as appropriate.
- 43

#### 44 1.6. SUBMITTALS AND DELIVERABLES

- 45 A. The GC shall provide their completed Waste Management Plan to the Project Management Web Site as a
- 46 submittal for review by the Project Architect and City Project Manager.
- 47 1. See item 1.8 below for Waste Management Plan submittal requirements.
- 48 2. The Waste Management Plan shall be completed, submitted, and approved as a pre-requisite for
- 49 Progress Payment number 1.
- 50 3. Copies of all documentation required by this specification shall be submitted to the appropriate Project
- 51 Management Web Site Library. Documentation shall be reviewed by the City Project Manager during all
- 52 Progress Payment reviews for compliance and accuracy.
- 53 B. The Waste Management Coordinator shall provide copies of items 1 through 5 below to the appropriate Project
- 54 Management Web Site Library and shall update the Waste Management Summary Log to reflect the records
- 55 being submitted.
- 56 1. Records of Donations: Indicate receipt and acceptance of itemized salvageable waste donated to
- 57 individuals or organizations. Indicate if the organization is tax exempt.



- 1 i. Sizes of containers to be used.
- 2 ii. Labels to be used on the containers to identify the type of waste allowed in the container.
- 3 iii. Designated locations on the project site for waste material containers.
- 4 B. If project requires demolition incorporate the ordinance required (MGO 28.185) Recycling and Reuse Plan into
- 5 the Waste Management Plan.
- 6 C. Provide all of the following for the Waste Management Coordinator:
- 7 1. Name, employer, employer address, phone number, and email address of the designated coordinator.
- 8 a. The GC shall also provide this information with the required Project Directory Submittal at the
- 9 beginning of the project.
- 10 D. If at the option of the GC, they choose to contract with a Waste Management Disposal Company that allows
- 11 comingled and unsorted waste materials, the GC shall include with their Waste Management Plan the following:
- 12 1. Name, address, phone number, state permitting information, and other pertinent information about the
- 13 disposal company.
- 14 2. Documentation from the disposal company indicating company policies and procedures regarding
- 15 comingled and unsorted waste materials to include:
- 16 a. GC responsibilities on the project site.
- 17 b. Disposal company procedures for receiving, sorting, recycling, and disposing of comingled and
- 18 unsorted waste material.
- 19

20 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

21

22 **PART 3 - EXECUTION**

23

24 **3.1. PLAN IMPLEMENTATION**

- 25 A. Implement the approved waste management plan. Provide adequate containers, storage space, signage,
- 26 transportation and other items required to implement the plan during the execution of this contract.
- 27 B. The GC and Waste Management Coordinator shall be responsible for monitoring and reporting the status of the
- 28 Waste Management Plan and shall monitor the waste management practices on site as frequently as needed.
- 29 C. Train all workers, sub-contractors, and suppliers on proper waste management procedures as appropriate for
- 30 the work being conducted on the project site.
- 31 1. Distribute the waste management plan to everyone concerned within seven (7) days of submittal
- 32 approval.
- 33 2. Distribute the waste management plan to new workers, sub-contractors, and suppliers when they first
- 34 appear on the project site.
- 35 3. Conduct additional training as needed during the execution of the contract to keep a positive focus on
- 36 the waste management plan.
- 37 D. Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways,
- 38 and other adjacent and used facilities.
- 39 1. Designate and label specific areas on the project site necessary for separating materials to be salvaged,
- 40 recycled, reused, donated, and sold.
- 41 2. Comply with any specification or regulatory requirements pertaining to dust, dirt, environmental
- 42 protection, and noise control.
- 43

44 **3.2. HAZARDOUS AND TOXIC WASTE**

- 45 A. The Owner shall be responsible under separate contract for the removal of any asbestos related materials. All
- 46 other materials shall be removed by the GC.
- 47 B. All hazardous and toxic waste shall be separated, stored, and disposed of according to all applicable regulations.
- 48 C. All hazardous and toxic materials on site shall have a Material Safety and Data Sheet (MSDS) available that
- 49 indicates storage requirements, emergency information, and disposal requirements as necessary.
- 50

51 **3.3. GENERAL GUIDELINES FOR ALL WASTES**

- 52 A. Recycle all paper and beverage containers used by workers, sub-contractors, suppliers and visitors to the project
- 53 site.
- 54 B. All revenues, savings, rebates, tax credits, and other such incentives received from recycling, reusing, or
- 55 salvaging waste materials shall accrue to the GC unless specified otherwise in the contract documents.
- 56 C. Separate recyclable, reusable, and salvageable waste from other waste materials, trash, and debris except where
- 57 Waste Management Disposal Company allows comingled waste materials, see section 1.8.D above.

- 1                    1.     Separate by type in appropriate containers or designated areas according to the approved waste
- 2                            management plan away from the construction area. Do not store within the drip lines of existing trees.
- 3                    2.     Inspect containers and bins frequently for contamination and inappropriately sorted materials. Remove
- 4                            contaminated materials and resort as necessary.
- 5                    3.     Stockpile bulk materials such as sand, topsoil, stone, etc., on site away from the construction area and
- 6                            without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water, and
- 7                            cover to prevent windblown dust. Do not store within the drip lines of existing trees.
- 8                    4.     Whenever possible store items off the ground and/or protect them from the weather.
- 9

10     **3.4.    GUIDELINES FOR RECYCLABLE, RE-USABLE, AND SALVAGEABLE WASTE**

- 11                    A.     The following guidelines is not a complete or all inclusive list and shall be adjusted as needed by the methods
- 12                            and procedures identified in the Waste Management Plan.
- 13                    B.     Asphalt Paving: Break-up into transportable pieces or grind, transport to an authorized recycling facility.
- 14                    C.     Carpet and Pad: Separate carpet and pad scraps, containerize and transport to an authorized recycling facility.
- 15                    D.     Ceiling System Components: Suspended ceiling system components shall be sorted by material type as follows:
- 16                            1.     Broken, cut, or damaged tiles shall be containerized, transport to an authorized recycling facility.
- 17                            2.     Damaged, or cut tracks, trim and other metal grid system components shall be sorted with other metals
- 18                            of similar types, palletize, transport to an authorized recycling facility.
- 19                    E.     Clean Fill: When allowed by Division 31 Specifications; concrete, masonry, stone, asphalt pavement, sand and
- 20                            other such materials may be used as clean fill on this project site. The GC shall verify with the Project Architect,
- 21                            Structural Engineer, or Civil Engineer as necessary prior to using any materials as clean fill. Materials shall be
- 22                            processed, placed, and compacted as specified. If not being re-used on site, transport to an authorized recycling
- 23                            facility.
- 24                    F.     Clean Wood Materials: Including but not limited framing cutoffs, wood sheathing or paneling materials,
- 25                            structural or engineered wood products, and pallets or crates. Clean Wood shall be free of paints, stains, oils,
- 26                            preservatives and other such contaminants.
- 27                            1.     Useable pieces shall be sorted by type and dimension, bundled and transported off site by the GC or
- 28                            returned to the supplier.
- 29                            2.     Non-useable pieces shall be palletized or containerized, transport to an authorized recycling facility.
- 30                            3.     Clean, uncontaminated sawdust and wood shavings shall be bagged, transport to an authorized recycling
- 31                            facility.
- 32                    G.     Concrete: Break-up into transportable pieces, remove all reinforcing and other metals, transport to an
- 33                            authorized recycling facility.
- 34                    H.     Glass Products: Shall be sorted by types, do not include light fixture lamps and bulbs. Products broken in
- 35                            shipment shall be returned to the supplier. Broken or cracked items still in frames shall be taped to prevent
- 36                            further breakage and injury to workers. Transport to an authorized recycling facility.
- 37                    I.     Gypsum Board: Stack large clean pieces on wooden pallets or container, store in a dry location, transport to an
- 38                            authorized recycling facility.
- 39                    J.     Light Fixture Lamps and Bulbs: Fluorescent tubes shall be containerized, transport to an authorized recycling
- 40                            facility.
- 41                    K.     Masonry and CMU: Remove all metal reinforcing, anchors, and ties, clean undamaged pieces and neatly stack on
- 42                            pallets, transport damaged pieces to an authorized recycling facility.
- 43                    L.     Metals: Sort metals by type as follows, this does not include piping:
- 44                            1.     Architectural metals including but not limited to siding, soffit, and roofing panels shall be sorted by
- 45                            material, palletize or bundle as needed and transport to an authorized recycling facility.
- 46                            2.     Structural steel, sort by size and type; palletize and transport to an authorized recycling facility.
- 47                            3.     Miscellaneous metals such as aluminum, brass, bronze, etc shall be sorted by type, containerized or
- 48                            palletized as necessary, transport to an authorized recycling facility.
- 49                    M.     Packaging and shipping materials
- 50                            1.     Cardboard boxes and containers: Breakdown all cardboard boxes and containers into flat sheets. Bundle
- 51                            and store in a dry location until transported for recycling.
- 52                            2.     Pallets:
- 53                                    a.     Whenever possible require deliveries using pallets to remove them from the project site.
- 54                                    b.     Neatly stack pallets in preparation for reusing them or providing them to other companies for
- 55                                    salvage or re-use.
- 56                                    c.     Break down pallets into component wood pieces that comply with the requirements for recycling
- 57                                    clean wood materials. Neatly stack or palletize pieces in preparation for transportation.



**SECTION 01 76 00**  
**PROTECTING INSTALLED CONSTRUCTION**

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**PART 1 – GENERAL**

**1.1. SUMMARY**

- 25 A. The purpose of this specification is to provide clear responsibilities, guide lines, and requirements related to  
26 providing protection to already installed construction.  
27 B. Already installed construction shall include but not be limited to the following:  
28 1. Any existing site feature such as pavement, curbs, drainage features, utilities, landscaping features (trees,  
29 shrubbery, plantings, flagpoles, etc) and other such exterior items not associated with the building  
30 whether on or adjacent to the project site.  
31 2. Any existing structure on or adjacent to the project site.  
32 3. Any existing interior work that may be adjacent to the new work including all paths of ingress/egress to  
33 areas associated with accessing the Work.  
34 4. Any existing feature of any kind within the public right-of-way that may be on the project site property,  
35 adjacent to the project site or across the street from the project site.  
36 C. All contractors shall be familiar with the specifications of their Division of Work for specific requirements on  
37 protection of the Work.  
38 D. The requirements noted within this specification do not relieve any contractor of the responsibility for  
39 compliance with any code, statute, ordinance, or other such regulatory requirement having jurisdictional  
40 authority over these contract documents.

**1.2. QUALITY ASSURANCE**

- 43 A. It shall be the responsibility of every contractor and worker assigned to the project to be diligent in protecting all  
44 existing work, and newly installed construction.  
45 B. It shall be the General Contractors' (GC) responsibility under the contract to provide all reasonable protection  
46 methods, materials, or precautionary measures required to protect new or existing construction as described in  
47 within this specification to the project as a whole.  
48 1. The GC shall be responsible to ensure any damaged new or existing construction is repaired or replaced  
49 at no additional cost to the Contract.  
50 2. The GC at their discretion may direct other contractors to provide and maintain protection of completed  
51 work associated with their Division of Work. I.E.: The carpet installer may be required by the GC to  
52 provide carpet protection along traveled paths, ingress/egress, etc after installation.  
53 C. It shall be the responsibility of the GC to ensure that all materials being used to protect installed construction are  
54 compatible with, and/or adjacent to, the materials being protected. This shall include but not be limited to the  
55 material used as covering, tapes used to fasten protective materials, etc.



1  
2 **1.3. RELATED SPECIFICATIONS**

- 3 A. Parts of this specification will reference articles within “The City of Madison FACILITIES MANAGEMENT  
4 SPECIFICATIONS for Public Works Construction”.
- 5 1. Use the following link to access the FACILITIES MANAGEMENT SPECIFICATIONS web page:  
6 <http://www.cityofmadison.com/business/pw/specs.cfm>
- 7 a. Click on the “Part” chapter identified in the specification text. For example if the specification  
8 says “Refer to City of Madison FACILITIES MANAGEMENT SPECIFICATION 210.2” click the link for  
9 Part II, the Part II PDF will open.
- 10 b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you  
11 to the referenced text.
- 12 c. City Standard Detail Drawings (SDD) may be located from the index in Part VIII.
- 13 B. Section 01 60 00 Product Requirements
- 14 C. Section 01 74 13 Progress Cleaning

15  
16 **PART 2 - PRODUCTS**

17  
18 **2.1. FENCING MATERIALS AND BARRICADES**

- 19 A. Except where noted in other areas of the construction documents, the responsible contractor shall provide a six  
20 foot galvanized chain link fence including full height mesh screen at the project lines as shown Lands for Work  
21 plan. For temporary barricade situations, the responsible contractor may provide one of the following that  
22 sufficiently provide a sturdy physical barrier and/or visual barrier as necessary for the intended application.
- 23 1. Standard orange construction barrels each with a standard rubber base ring and reflective tape  
24 a. Provide flashing amber lights as needed to increase night time visibility
- 25 2. Steel “T” style fence posts
- 26 3. 4’0” high standard orange construction fence
- 27 4. Traffic barricades
- 28 5. Jersey barriers
- 29 6. Other types of fencing or barricades typically used in the construction industry
- 30 B. The contractor responsible for providing the fencing materials and barricades shall also be responsible for  
31 maintaining them. This shall include but not limited to fixing damaged fencing, standing up barrels that have  
32 been knocked over, realigning barrels, and ensuring flashing lights are fully operational at all times.
- 33 C. The following fencing and barricade designations, and their use descriptions shall be used throughout this  
34 specification to provide uniformity in describing protection requirements.
- 35 1. Type A, Jersey Barriers, to be used as permanent blocking devices to deny access to alternate project site  
36 entrances or exits.
- 37 2. Type B, Traffic Barricades, to be used as temporary blocking devices to deny access to alternate project  
38 site entrances or exits.
- 39 3. Type C, Construction Barrels without construction fencing shall be used for lane closures, temporary  
40 blocking devices to deny access and the protection of single locations (I.E. identify the location of an  
41 access structure) that do not require fencing.
- 42 4. Type D, Construction Barrels with construction fencing where it becomes necessary to surround an object  
43 with a complete visual barricade and it is impractical or unacceptable to install fence posts. The surround  
44 shall be constructed in such a manner as to provide a buffer zone around and access to the item being  
45 protected.
- 46 5. Type E, Steel “T” Fence Posts shall be used at the project lines, as indicated on the Civil Drawings, with six  
47 foot galvanized chain link fencing to surround an object with a complete visual barricade and it is  
48 practical to install fence posts. The surround shall be constructed in such a manner as to provide a buffer  
49 zone around and access to the item being protected. All posts shall be driven installed. Surface mounted  
50 posts to only be used for temporary barricades.
- 51 6. Type X, Other fencing or barricade types that may be designated and detailed within the construction  
52 documents shall use additional alpha numeric designations.

53  
54 **2.2. EROSION CONTROL PROTECTION**

- 55 A. Refer to City of Madison FACILITIES MANAGEMENT SPECIFICATION 210.2 for authorized materials associated  
56 with erosion control materials.
- 57

1 **2.3. INTERIOR FINISH PROTECTION MATERIALS**

- 2 A. Except where noted in other areas of the construction documents or this specification the responsible  
3 contractor:  
4 1. Shall not provide the cheapest or least effective method as an effort to meet any protection requirement.  
5 2. Shall provide materials of sufficient quality, and durability to provide adequate protection based on the  
6 seasonal conditions and the anticipated duration at the time the protection will be needed.  
7 3. Shall provide sufficient quantity of protection material to protect the construction as needed.  
8 B. Prior to installing protective measures the responsible contractor shall propose to the GC, Project Architect  
9 (PA)/Project Engineer (PE) and City Project Manager (CPM) the proposed plan for protection, materials to be  
10 used and samples as necessary.  
11 1. The PA/PE and CPM reserve the right to disapprove any proposed method and/or material and/or make  
12 alternate proposals.  
13

14 **PART 3 - EXECUTION**

15  
16 **3.1. GENERAL EXECUTION REQUIREMENTS**

- 17 A. The GC shall be responsible for ensuring all of the following procedures and requirements are implemented as  
18 needed for the duration of the Work performed under this contract.  
19 B. The GC shall also be responsible for the following:  
20 1. Reporting any incident of damage to existing property, right-of-way, or utility to the CPM immediately  
21 upon rendering the incident safe, and notifying emergency response teams, and emergency utility crews  
22 as needed.  
23 2. Conduct a site walk through prior to leaving at the end of each day to assess:  
24 a. Protection measures are properly in place, provide correction actions as necessary.  
25 b. Note damage to existing completed work and schedule repair/replacement as needed.  
26 3. Ensure all contractors and workers are being diligent in protecting existing work, and newly installed  
27 construction.  
28

29 **3.2. PROTECT ADJACENT PROPERTIES**

- 30 A. Whenever possible through the design process the City of Madison shall have previously provided notice to  
31 adjacent property owners that work will be occurring on or near their property. The City of Madison shall also  
32 have obtained any permanent or temporary easements that may be necessary to complete any Work on  
33 adjacent properties.  
34 B. It shall be the responsibility of the GC to do the following for all Work under this contract being performed on or  
35 adjacent to the property line:  
36 1. Contact the adjacent property owner and provide them with information on the work to be done,  
37 equipment to be used, and estimated duration of the work. Information to be updated and  
38 communicated to property owner(s) as construction progresses and site conditions change.  
39 a. If any adjacent property is a rented or leased space the GC shall also make contact and provide  
40 the same information to the tenants.  
41 b. Determine from the owner and/or tenants if there are any concerns for children, pets, special  
42 plantings, or other concerns.  
43 2. Discuss the following with all contractors performing work on or near the property line.  
44 a. Work to be completed and timeline.  
45 b. Concerns of adjacent property owners/tenants from item 1 above.  
46 c. Which protective measures will be necessary to protect adjacent properties and address the  
47 concerns of adjacent property owners/tenants.  
48 3. Ensure all protective measures are placed and maintained during the execution of Work on or adjacent to  
49 the property line. Interact with the adjacent property owners/tenants as needed.  
50 C. Any contractor doing work on or adjacent to the property line shall install and maintain any protective measure  
51 identified in the contract documents, this specification, or as directed by the GC.  
52 D. The GC shall be responsible for restoring any damage to structure and property located on or adjacent to the  
53 property line.  
54 1. Restoration shall include but not be limited to repair or replacement using like materials and finishes to  
55 its original condition or better.  
56 2. Restoration of landscaping materials shall include watering of any seed, sod, or other planting of any kind  
57 for a reasonable period of time to encourage germination and root development.  
58 E. The GC shall keep the CPM informed directly to any issues pertaining to adjacent property owners and tenants.

1  
2 **3.3. PROTECT LANDSCAPING FEATURES**

- 3 A. Except where specifically stated in other areas of the construction documents the following minimal protection  
4 requirements shall apply under this section.  
5 1. Whenever possible do not install new landscape features until exterior building construction has been  
6 completed, equipment such as scaffolding and lifts are no longer needed and have been removed, and  
7 heavy equipment operation is no longer required.  
8 2. Whenever possible remove and temporarily store all existing landscape features such as benches, waste  
9 receptacles, signage, and other such features that will be within the area of Work that can be removed.  
10 3. Landscape features that cannot be removed such as flag poles, light poles, light bollards, etc. shall be  
11 protected with Type D fencing for areas on pavement or Type E fencing for areas on soil.  
12 4. Planting beds shall be protected using Type E fencing around the exposed perimeter of the planting bed  
13 as needed.  
14 5. The City of Madison FACILITIES MANAGEMENT SPECIFICATION 107.13 shall apply to all tree protection in  
15 and around the project site at all times.  
16

17 **3.4. PROTECT UTILITIES**

- 18 A. The contractor shall be responsible for notifying all utilities to determine emergency response procedures and  
19 protection requirements prior to installing any construction protection.  
20 1. This includes requesting utility marking through Diggers Hotline.  
21 a. Call 811 or 1-800-242-8511 to request a public utility locate  
22 b. For emergency locate call (262) 432-7910 or (877) 500-9592  
23 2. Contact the Owner and CPM for any available private utility information on the property that may be  
24 available prior to calling a private utility locating company.  
25 B. Except where specifically stated in other areas of the construction documents the following minimal protection  
26 requirements shall apply under this section.  
27 1. Hydrants, lamp posts, electrical transformers, and other utility pedestals shall be protected with Type D  
28 fencing for areas on pavement or Type E fencing for areas on soil. Fence posts shall be located so as to  
29 not be directly over the utility main.  
30 2. Storm sewer structures in pavement shall have proper inlet protection according to City of Madison  
31 FACILITIES MANAGEMENT SPECIFICATION 210.1(g) and Type C Construction Barrels when necessary.  
32 3. Storm sewer structures in turf and other landscaped areas shall have proper inlet protection according to  
33 City of Madison FACILITIES MANAGEMENT SPECIFICATION 210.1(g) and Type E fencing for areas on soil.  
34 4. Stormwater management features such as greenways, retention/detention ponds, bio-filtration ponds  
35 and other such features shall be properly protected according to the appropriate erosion control  
36 measure specified on the Erosion Control Plan. See multiple sections of City of Madison FACILITIES  
37 MANAGEMENT SPECIFICATION 210.1  
38 a. For the protection of hard to see items such as structures, castings, inlets, etc. in grassy areas  
39 provide Type E fencing for areas on soil.  
40 c. For the protection of storm water management features having special soils and plants such as  
41 bio-filtration ponds provide Type E fencing for areas on soil.  
42 5. Other structures and covers including but not limited to cleanouts, wiring hand holes, valve boxes, access  
43 structures, grease trap structures, etc shall be protected as follows:  
44 a. Provide Type E fencing for areas on soil.  
45 b. When paving operations are complete provide a construction barrel or cone near structures as  
46 necessary depending on required heavy construction traffic.  
47

48 **3.5. PROTECT PUBLIC RIGHT OF WAY**

- 49 A. Except where specifically stated in other areas of the construction documents the following minimal protection  
50 requirements shall apply under this section.  
51 1. All public right-of-way (area from behind the sidewalk to the centerline of the street) shall remain open  
52 and accessible except during periods of active work. At such times the public right of way shall be  
53 properly closed and signed as referenced in City of Madison FACILITIES MANAGEMENT SPECIFICATION  
54 107.9.  
55 2. Bus stops and bus stop structures shall remain accessible at all times.  
56 3. Traffic signage and traffic signals, traffic control boxes shall be protected with Type D fencing for areas on  
57 pavement or Type E fencing for areas on soil.

- 1                   a.     Protection at traffic signage/signals shall not obstruct the viewing of the sign/signal for its
- 2                             intended purpose at any time.
- 3        B.     When additional protection for traffic control is required, the use of barricades, guardrails, lane closures and
- 4             other such procedures will be detailed within the construction documents.
- 5        C.     When additional protection for overhead sidewalk cover is required the contract documents shall indicate the
- 6             specific location and structural requirements of the protective structure.
- 7

8        **3.6.    PROTECT STORED MATERIALS**

- 9        A.     All contractors shall refer to Specification 01 60 00 Product Requirements for all storage and protection
- 10            requirements of building materials and products delivered to the site.
- 11

12       **3.7.    PROTECT WORK - EXTERIOR**

- 13        A.     Provide all temporary services that may be required to protect the installed material from heat, cold, humidity,
- 14             etc, while materials such as concrete, mortar, sealants, paints, etc, are drying and/or curing.
- 15        B.     Open trenches, pits, and other such excavations shall be properly covered, lined, or shored as needed during
- 16             periods of inclement weather to prevent the caving of soils onto existing work in progress. Refer to the
- 17             appropriate specifications and/or regulatory requirements governing this type of work as necessary.
- 18        C.     Provide adequate protection at all openings with heavy duty tarps, plastic sheathing, or wood framing and
- 19             sheathing as needed to protect interior work in progress from inclement weather as needed.
- 20        D.     Protect exterior finishes of all kinds with heavy duty tarps or plastic sheathing as needed while landscaping is
- 21             being installed through full germination of seeded areas or installation of filter fabric and mulches to keep dust,
- 22             dirt, and mud off of finished exterior surfaces.
- 23        E.     Designate specific curb mounting points and provide wood blocking where small vehicles, skid loaders and other
- 24             such equipment may need access to areas being landscaped.
- 25        F.     Provide plywood turning pads for skid loaders to turn on to prevent tire marking on new pavement.
- 26        G.     Do not permit the parking of vehicles with any kind of fluid leaks to park on new pavement.
- 27        H.     The contractor shall be responsible for cleaning, repairing, or replacing any completed work or work in progress
- 28             under this specification as deemed necessary by the CPM without additional cost to the contract.
- 29

30       **3.8.    PROTECT WORK - INTERIOR**

- 31        A.     The GC shall do all of the following:
  - 32            1.     Provide all temporary services that may be required to protect the installed material from heat, cold,
  - 33                    humidity, etc, while materials such as concrete, mortar, sealants, paints, etc, are drying and/or curing.
  - 34            2.     Provide adequate visual and/or physical protection as needed to protect newly completed interior work
  - 35                    such as paint, flooring material, sealants, grouts, etc that may be drying and/or curing.
  - 36            3.     Provide adequate space and materials for cleaning boots, tool boxes, supplies, and other items coming
  - 37                    into the project site once finish work has begun.
  - 38            4.     Clean dirtied areas and repair/replace damaged areas immediately.
- 39        B.     The contractors responsible for interior work shall be responsible for protecting their work and finishes from dirt,
- 40             mud, snow, spills, splatters, and physical damage after installation as follows:
  - 41            1.     Protect vinyl composite, rubber composite, painted/stained concrete, and tiled flooring as follows:
    - 42                    a.     Define foot traffic areas and protect with Ramboard Temporary Floor Protection products as a
    - 43                            minimum basis of design or other protection product(s) compatible with installed flooring product
    - 44                            if Ramboard is not compatible. Products to be used shall be new.
      - 45                            i.     Tape all edges, seams, etc with a good quality tape that does not leave sticky residue. Do
      - 46                                    not allow any debris or other material between the installed flooring and the protection
      - 47                                    material.
      - 48                            ii.    Repair tears immediately, replace worn areas with like material as necessary.
  - 49            2.     Protect carpeted areas as follows:
    - 50                    a.     Define foot traffic areas and protect with a minimum of 6mil, clear, polyethylene sheeting 3 feet
    - 51                            wide. Products to be used shall be new.
      - 52                            i.     Tape all edges, seams, etc with a good quality tape that does not leave sticky residue. Do
      - 53                                    not allow any debris or other material between the installed flooring and the protection
      - 54                                    material.
      - 55                            ii.    Repair tears immediately, replace worn areas with like materials as necessary.
  - 56            3.     Protect all finished walls in high traffic areas with Ramboard Temporary Wall protection products or
  - 57                    approved equal.

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- i. Tape all edges, seams, etc with a good quality tape that does not leave sticky residue. Do not allow any debris or other material between the installed flooring and the protection material.
  - ii. Repair tears immediately, replace worn areas with like materials as necessary.
3. Protect counter tops, cabinets, and other finished surfaces with large sheets of thick cardboard or Ramboard products. Do not allow toolboxes, finish materials, parts and other such items to be placed on finished materials.
- C. All protection shall stay in place until the CPM, PA/PE, and GC mutually deem the project is ready for Final Cleaning. The contractors responsible for protecting the work shall be responsible for removing the protection and removing any adhesive residue at that time. Contractors shall only use manufacturer authorized cleaning materials for removing adhesives, etc.
- D. Contractors doing work in un-protected areas of finished work shall be required to provide drop cloths and other protection as noted within this specification for the duration of their work.
1. Finished areas shall be sufficiently covered to accommodate all equipment, and materials being used to complete the work being done.
  2. Finished areas shall be sufficiently covered to prevent splatters, over spray, etc when doing touch-up work.
  3. Contractors who do not provide sufficient protection under this sub-section shall be responsible for any costs associated with cleaning, repairing or replacing already finished construction at no additional cost to the contract.

**END OF SECTION**

**SECTION 01 77 00  
 CLOSEOUT PROCEDURES**

1  
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 17

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 21 A. The purpose of this specification is to clearly define and quantify the requirements associated with closing a City  
 22 of Madison Public Works Contract for facility related work.  
 23 B. All contracts have two distinct but related paths. Each path needs to be properly closed independently in order  
 24 to close the contract as a whole.  
 25 1. Construction closeout is related to closing out all of the Work associated with the construction  
 26 documents.  
 27 a. It shall be the responsibility of all contractors to be fully aware of the required Work and closeout  
 28 requirements involved in their individual trades.  
 29 2. Contract closeout is related to closing out all of the administrative aspects of the contract in general.  
 30 a. It shall be the responsibility of all contractors to be fully aware of the administrative requirements  
 31 required by the contract and to provide the supporting documentation required.  
 32 3. Construction Closeout must be completed before Contract Closeout can begin.  
 33 C. This specification will provide general knowledge associated with the following areas:  
 34 1. Construction Closeout Requirements  
 35 2. Construction Closeout Procedure  
 36 3. Contract Closeout Requirements  
 37 4. Contract Closeout Procedure  
 38 5. Final Payment and Certificate of Completion  
 39

**1.2. RELATED SPECIFICATIONS**

- 41 A. Contractors shall review all references to other specifications including specifications relating to the execution of  
 42 the Work associated with their Division or Trade.  
 43 B. Section 01 29 76 Progress Payment Procedures  
 44 C. Section 01 31 23 Project Management Web Site (PMWS)  
 45 D. Section 01 32 26 Construction Progress Reporting  
 46 E. Section 01 45 16 Field Quality Control Procedures  
 47 F. Section 01 74 13 Progress Cleaning  
 48 G. Section 01 45 16 Construction Waste Management and Disposal  
 49 H. Section 01 76 00 Protecting Installed Construction  
 50 I. Section 01 78 13 Completion and Correction List  
 51 J. Section 01 78 23 Operation and Maintenance Data  
 52 K. Section 01 78 36 Warranties  
 53 L. Section 01 78 39 As-Built Drawings  
 54 M. Section 01 78 43 Spare Parts and Extra Materials  
 55 N. Section 01 79 00 Demonstration and Training  
 56 O. Section 01 91 00 Commissioning  
 57 P. Other requirements as noted in the contract documents signed by the General Contractor  
 58

1 **1.3. DEFINITIONS**

- 2 A. **Substantial Compliance:** A letter provided to the City of Madison Building Inspection and signed by the Project  
3 Architect indicating that all Work has been completed to a level that would allow Owner Occupancy and that all  
4 construction is in compliance with the construction documents. A copy of this letter is also provided to the  
5 State of Wisconsin Department of Health and Safety as necessary to clear plan review requirements. This letter  
6 does not represent construction closeout.
- 7 B. **Certificate of Occupancy:** The Regulatory letter from the City of Madison Building Inspection Department  
8 indicating that all regulatory requirements and inspections have been completed and the building may now be  
9 occupied for its intended use. This letter does not represent construction closeout.
- 10 C. **Certificate of Substantial Completion:** A letter provided by the Department of Public Works, signed by the City  
11 Engineer indicating that Construction activities are substantially complete. This letter does represent  
12 construction closeout and the date of this letter begins the date of the Warranty Period.
- 13 D. **Construction Closeout:** The point in the contract where all contractual requirements associated the execution of  
14 the Work as described in the plans, specifications, and other documents have been successfully met and the  
15 items described in 1.3.A, .B, and .C above have been completed.
- 16 E. **Final Progress Payment:** The progress payment associated with achieving Construction closeout as described in  
17 1.3.D above. At this point the contractor may request all monies associated with the contract be paid with the  
18 exception of held retainage.
- 19 F. **Contract Closeout:** The point in the contract where all contractual requirements associated with the City of  
20 Madison, Board of Public Works contract has been successfully met.
- 21 G. **Final Payment:** The final contract payment submittal that may be approved by the City of Madison after all  
22 contractual requirements of the Public Works Contract have been met and any remaining monies (retainage)  
23 due to the contractor may be released for the Final Payment.
- 24

25 **1.4. QUALITY ASSURANCE – CONSTRUCTION CLOSEOUT**

- 26 A. All contractors shall be responsible for properly executing the construction closeout requirements associated  
27 with their Work as described in the specifications governing their Work.
- 28 B. The GC shall be responsible for all of the following:
- 29 1. Ensuring that all contractors have met the construction closeout requirements associated with their  
30 Work.
- 31 2. Coordinate the collection of all construction closeout deliverables from all contractors, provide the  
32 deliverables to the Project Architect and City Project Manager for review as necessary, and ensure all  
33 contractors correct deficiencies of deliverables and resubmit as needed for final acceptance.
- 34 3. Ensure all closeout requirements identified in the Construction Closeout Checklist below have been  
35 completed as intended by the construction documents.
- 36

37 **1.5. QUALITY ASSURANCE – CONTRACT CLOSEOUT**

- 38 A. The City of Madison, Department of Civil Rights (DCR) monitors contract compliance for construction and  
39 procurement contracts to ensure that local, state and federal regulations are followed by contractors working on  
40 City of Madison Public Works (PW) projects. DCR will monitor all PW projects from contract award through the  
41 final payment at the close of the project. Contractors will be required to submit reporting paperwork  
42 throughout the PW project process.
- 43 1. Contractors are encouraged to visit the web site identified below for additional information, checklists,  
44 forms, and other information provided by DCR as it relates to Contract Compliance.  
45 <http://www.cityofmadison.com/Business/PW/contractCompliance.cfm>
- 46 2. Questions regarding the process should be directed to parties and offices as identified on the various  
47 forms, documents, and instructions or contact:  
48 City of Madison, Department of Civil Rights  
49 210 Martin Luther King Jr. Blvd., Room 523  
50 Madison, WI 53703  
51 (608) 266-4910
- 52 B. All Sub-Contractors have submitted the applicable required documents described in item 1.5.D below to the  
53 General Contractor (GC) for Contract Closeout.
- 54 C. The GC has submitted the required applicable documents described in item 1.5.D below for all contractors to the  
55 appropriate City of Madison Agency per instructions associated with each submittal.
- 56 D. The documents required for submittal to the City of Madison for Contract Closeout may include any/all of the  
57 items listed below depending on contract type. It is the sole responsibility of all contractors to know and submit  
58 the required and complete documentation in a timely fashion.

- 1 1. Weekly Payroll Reports
- 2 2. Employee Utilization Reports
- 3 3. Documentation required for Small Business Enterprise (SBE) goals
- 4 4. Other documents as maybe required or requested through the Finalization Review Process

6 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

8 **PART 3 - EXECUTION**

10 **3.1. CONSTRUCTION CLOSEOUT CHECKLIST**

- 11 A. All contractors shall be responsible for reviewing the drawings and specifications within their Divisions of Work  
 12 to provide a complete and comprehensive list of all Construction Closeout Requirements to the GC.
- 13 1. The checklist shall include all items identified within the construction documents that require any of the  
 14 following (and examples) prior to moving into Contract Closeout Procedures:
    - 15 a. Documents indicating a specified level of performance has been achieved, such as:
      - 16 i. Test reports of all types
      - 17 ii. Startup reports
    - 18 b. Required documentation, such as:
      - 19 i. As-builts and record drawings
      - 20 ii. Operation and maintenance data
    - 21 c. Physical items to be turned over to the owner, such as:
      - 22 i. Attic stock
      - 23 ii. Keys
    - 24 d. Required maintenance completed, such as:
      - 25 i. Ducts cleaned
      - 26 ii. Filters replaced
    - 27 e. Commissioning and LEED related items and submittals
    - 28 f. Owner and Maintenance Training
  - 29 B. Each list shall indicate the title of the closeout requirement, the associated specification of the requirement, the  
 30 required result or deliverable, the responsible contractor(s), and a column to verify the item has been turned in  
 31 and completed.
  - 32 C. The GC shall be responsible for all of the following:
    - 33 1. Consolidating all the closeout lists into one master Construction Closeout Checklist.  
 34 a. The checklist shall be in a tabular data format similar to the sample below
    - 35 2. Upload the completed checklist to the Project Management Web Site for review.
    - 36 3. Resubmit the checklist as needed after initial reviews have been completed.
  - 37 D. The GC shall work with all contractors to amend the Construction Closeout Checklist throughout the execution of  
 38 the project based on changes and modifications as necessary.

<u>Title</u>	<u>Specification</u>	<u>Description</u>	<u>Responsibility</u>	<u>Completed</u>
Quality Management Observation Reports	01 45 16	All QMO reports have been properly responded to, reviewed and closed by the CPM.	All, GC	
As-Built Drawings	01 78 39	As-Built drawings have been reviewed and accepted per the specification	All, GC	
Testing and Balancing of HVAC	23 09 23	Provide final TnB reports indicating design performance has been achieved	HVAC	

40 **3.2. CONSTRUCTION CLOSEOUT REQUIREMENTS**

- 41 A. The timely submittal or completion of closeout requirements shall go hand in hand with the Progress Payment  
 42 Milestone Schedule that can be found in Specification 01 29 76 Progress Payments. No payments shall be made  
 43 until all requirements for that payment have been met.
- 44 1. The GC and all major Subcontractors, Project Architect /Project EngineerA/E PROJ MGR, and CPM, shall  
 45 review all requirements for Construction/Contract Closeout during two (2) special meetings.  
 46 a. The first meeting shall be held at the 50% Contract Total Payment milestone. This meeting shall  
 47 discuss the requirements associated with various construction/contract closeout documentation  
 48 and events when they are due with respect to progress payments.  
 49



- 1                                    b.     The second meeting shall be held at the 70% Contract Total Payment milestone. This meeting  
2                                                   shall review the contractors progress regarding the closeout checklist, begin making plans for  
3                                                   upcoming deadlines such as scheduling training, where to put attic stock, and when they are due  
4                                                   with respect to progress payments.  
5                                    2.     The GC, A/E PROJ MGR, and CPM, shall utilize the Construction Closeout checklist to ensure that all  
6                                                   construction closeout requirements have been met.

7  
8     **3.3. CONSTRUCTION CLOSEOUT PROCEDURE**

- 9     A.     Upon successful completion and final acceptance of all Construction Closeout Requirements the GC may submit  
10                                                   to the CPM and A/E PROJ MGR the request for Final Progress Payment (100% contract total, less retainage).  
11     B.     The A/E PROJ MGR will confirm with the design consultants, CPM, and other City of Madison staff that all  
12                                                   requirements of the Work have been completed and will do the following:  
13                                                   1.     Approve the final progress payment application  
14                                                   2.     Provide the required signed payment documents to the CPM  
15                                                   3.     Provide the required Letter of Substantial Compliance to the following as required:  
16                                                   a.     State Safety and Building Division  
17                                                   b.     Local Building Inspection office  
18                                                   c.     GC  
19                                                   d.     CPM  
20     C.     The CPM shall draft the City Letter of Substantial Completion for signature by the City Engineer. This letter shall  
21                                                   state any of the following that may still be tied to the contract and/or warranty:  
22                                                   1.     Indicate that the date of the letter shall also be the beginning of the Warranty period.  
23                                                   2.     Indicate any allowed due outs, reasons for them, and anticipated dates of finalization.  
24                                                   a.     QMO issues such as off season testing of equipment  
25                                                   b.     Off season training of equipment  
26     D.     The GC and all subcontractors shall finalize all warranty letters associated with their Work using the date noted  
27                                                   on the City Letter of Substantial Completion, and provide the CPM with all warranties as described in  
28                                                   Specification 01 78 36 Warranties. Upon receipt and final approval of the Warranties the CPM may initiate final  
29                                                   processing of the Final Progress Payment (100% contract total, less retainage).  
30

31     **3.4. CONTRACT CLOSEOUT REQUIREMENTS**

- 32     A.     The GC and all sub-contractors shall follow all requirements associated with documenting contract compliance  
33                                                   and provide documentation as required or requested by DCR or PW staff. All contractors are encouraged to stay  
34                                                   current with submissions of the following documentation:  
35                                                   1.     Weekly Payroll Reports no later than the Progress Payment equal to 50% of the contract total.  
36                                                   2.     Employee Utilization Reports  
37                                                   3.     Agent or Subcontractor Affidavit of Compliance with Prevailing Wage Rate Determination  
38                                                   4.     Prime Contractor Affidavit of Compliance with Prevailing Wage Rate Determination  
39                                                   5.     Documentation required for Small Business Enterprise (SBE) goals  
40                                                   6.     Other documents as maybe required or requested through the Finalization Review Process  
41     B.     Near the Progress Payment equal to 80% of the contract total the GC shall request in writing a Finalization  
42                                                   Review. At that time DCR or PW staff shall prepare a report of all contract documentation submitted to date. A  
43                                                   list of missing items or outstanding issues will be emailed to the GC. No additional follow-up will be generated  
44                                                   by DCR or PW Staff.  
45

46     **3.5. CONTRACT CLOSEOUT PROCEDURE**

- 47     A.     The Contract Closeout Procedure will not begin until the Construction Closeout Procedure has been completed.  
48     B.     When the GC feels they have successfully met all of the Contract Closeout Requirements associated with Section  
49                                                   3.3 above the GC may submit to the request for Final Payment to the CPM.  
50     C.     The CPM shall sign and submit the Final Payment request for processing.  
51     D.     DCR and PW staff shall do a complete review of all documentation associated with item 3.3.A above.  
52     E.     The GC shall be notified directly by DCR or PW Staff of any documentation that may still be missing, have  
53                                                   incomplete information, or other outstanding issues. It shall be the responsibility of the GC to continue follow-  
54                                                   up with DCR and PW staff until all documentation has been successfully submitted and accepted.  
55     F.     When all required documentation associated with Contract Closeout has been successfully submitted and  
56                                                   accepted by DCR and PW Staff the City of Madison shall process the Final Payment of any remaining monies  
57                                                   including retainage.  
58

**END OF SECTION**

**SECTION 01 78 13  
COMPLETION AND CORRECTION LIST**

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PART 1 – GENERAL ..... 1  
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PART 3 – EXECUTION – THIS SECTION NOT USED ..... 1

**PART 1 – GENERAL**

**1.1. SUMMARY**

- A. The City of Madison has developed a multi-faceted Quality Management Program that begins with contract signing and runs through contract closeout to ensure the best quality materials, workmanship, and product are delivered for the contracted Work.
  - 1. The Project Management Web Site is a Construction Management tool that provides contractors, consultants, and staff a single on-line location for the daily operations and progression of the Work.
  - 2. The Quality Management Observation (QMO) is an ongoing observation of the construction process as it progresses. The City of Madison does not use a "Punch List" or "Corrections List" as it is typically known throughout the construction industry. The QMO process acts as an "in progress punch list". Work identified as not in compliance with the contract documents by the Owner, Owner Representatives, Owner Consultants, etc. shall be resolved immediately at the Contractor's expense. Unresolved issues will be subject to withholding of progress payment(s) until completed.
  - 3. Very stringent expectations are tied to Construction Closeout and Contract Closeout procedures. Specific milestones throughout the project need to be met and the milestones are tied to the Progress Payment Schedule.
- B. All contractors shall be required to review the specifications identified in Section 1.2 below, and other related specifications identified therein to become familiar with the terminology and expectations of this City of Madison Public Works contract.

**1.2. RELATED SPECIFICATIONS**

- A. Section 01 29 76 Progress Payment Procedures
- B. Section 01 31 23 Project Management Web Site (PMWS)
- C. Section 01 45 16 Field Quality Control Procedures
- D. Section 01 77 00 Closeout Procedures

**PART 2 – PRODUCTS – THIS SECTION NOT USED**

**PART 3 – EXECUTION – THIS SECTION NOT USED**

**END OF SECTION**

**SECTION 01 78 23**  
**OPERATION AND MAINTENANCE DATA**

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14 3.3. O&M DATA FINAL SUBMITTAL ..... 3  
15 3.4. CONSTRUCTION CLOSEOUT ..... 3  
16

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 19  
20 A. The purpose of this specification is to provide clear responsibilities and guide lines related to providing well  
21 documented and complete Operation and Maintenance (O&M) Data related to general facility use, equipment,  
22 systems, finishes, and materials to City of Madison Staff (Owner, Owner Representatives, Maintenance, and  
23 Custodial Personnel) as needed.  
24 B. Operation and Maintenance Data shall apply to both of the following categories except where specific  
25 requirements are noted under their separate titles as follows:  
26 1. Operation and Maintenance Data: Generally shall mean the owner manual that provides information on  
27 start-up, shut-down, operation, troubleshooting, maintenance, parts, and other such documentation as it  
28 pertains to all equipment and systems installed under the Work.  
29 2. Use and Care instructions: Where applicable use and care instructions shall also be considered O&M for  
30 such things as flooring, tile, partitions, and other such finishes and trim related items, installed under the  
31 Work.  
32

**1.2. RELATED SPECIFICATIONS**

- 33  
34 A. Section 01 29 76 Progress Payment Procedures  
35 B. Section 01 31 23 Project Management Web Site  
36 C. Section 01 77 00 Closeout Procedures  
37 D. Section 01 78 13 Completion and Correction List  
38 E. Section 01 78 19 Maintenance Contracts  
39 F. Section 01 78 36 Warranties  
40 G. Section 01 79 00 Demonstration and Training  
41 H. Section 01 91 00 Commissioning  
42 I. Other Divisions and Specifications that may address more specifically the requirements for O&M Data.  
43

**1.3. QUALITY ASSURANCE**

- 44  
45 A. All O&M Data shall meet the requirements identified in Section 1.4 below.  
46 B. All contractors shall provide O&M Data for each piece of equipment, system, or finish installed during the  
47 installation of the Work. O&M Data shall be provided to the General Contractor (GC) for verification and  
48 submittal.  
49 C. The GC shall be responsible for receiving all required O&M Data files from all contractors for verifying that all  
50 files submitted meet the requirements in Section 1.4 below.  
51

**1.4. O&M DATA REQUIREMENTS**

- 52  
53 A. O&M Data shall be provided in digital PDF format as follows:  
54 1. PDF files shall be complete first generation consumer useable editions of PDF documents as provided by  
55 any of the following:  
56 a. Product manufacturer  
57 b. Supplier of product  
58 c. Product manufacturer internet site

- 1 2. Acceptable PDF files shall have the following functionality:
- 2 a. Word searchable
- 3 b. Key areas are bookmarked
- 4 c. Table of Contents and/or Index linked to content is preferred whenever possible.
- 5 3. Scanned printed material, with word searchable capabilities, saved as a PDF, is not acceptable and will be
- 6 rejected without further review.
- 7 B. O&M Data shall include but not be limited to the following manufacturers' published information as appropriate
- 8 for the equipment, system, material, or finish:
- 9 1. Installation instructions
- 10 2. Parts lists, assembly diagrams, explosion diagrams
- 11 3. Wiring diagrams
- 12 4. Start-up, shut-down, troubleshooting and other related operation procedures
- 13 5. Lubrication, testing, parts replacement, and other such maintenance procedures
- 14 6. General use, care, and cleaning instructions
- 15 7. Special precautions and safety requirements
- 16 8. A list of certified equipment vendors, service companies, parts suppliers including company name,
- 17 address, and phone number
- 18 9. A list of the recommended spare parts to have on hand at all times
- 19 10. A list by type of all recommended lubes, oils, packing material, and other maintenance supplies
- 20 11. Copies of final test reports, balance reports, and other related documentation
- 21 12. Warranty information for equipment and systems
- 22

### 23 1.5. O&M DATA SUBMITTALS

- 24 A. O&M Data shall be prepared as identified in this specification and shall be submitted for review as per the
- 25 schedule identified in Specification Section 01 29 76, Progress Payment Procedures.
- 26 B. O&M Data Draft submittals will be reviewed for content, procedure, and compliance only. A general critique
- 27 with recommendations for improvement will be made but re-submittals will not be required.
- 28 C. O&M Data Final submittals will be reviewed for content, procedure, and compliance. Re-submittals will be
- 29 required until such time as each submittal is accepted.
- 30

31 *NOTE: Acceptance of O&M Data Final submittals is required to be complete prior to scheduling and conducting owner*

32 *related training and construction closeout.*

33

## 34 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

## 35 **PART 3 - EXECUTION**

### 36 3.1. O&M DATA PREPARATION - GENERAL

- 39 A. All contractors shall prepare O&M Data for draft and final submission as follows:
- 40 1. Obtain digital PDF files for each piece of equipment, system, material or finish as described in Sections
- 41 1.4.A.1 and 1.4.A.2 above.
- 42 2. Verify that all information as described in Section 1.4.B above is included with the PDF file. Obtain
- 43 missing information as necessary for a complete submittal.
- 44 B. Rename each individual PDF file as follows.
- 45 1. Do not use special characters such as #, %, &, /, etc. These characters are reserved by the Project
- 46 Management Web Site software the City of Madison uses; however the under-score (or under-bar) ' \_ ' is
- 47 an allowed character.
- 48 2. Use the following format and examples for renaming your file:
- 49 a. Format: ***Equipment name\_What\_Project name\_Contract number\_Year***
- 50 i. *Equipment Name* represents the name of any equipment, system, material or finish as
- 51 designated in the Contract Documents.
- 52 ii. *What* represents what the file is about
- 53 iii. *Project Name* represents the title of the project or contract. A shortened version of the
- 54 title may be identified by the City Project Manager to be used by all contractors.
- 55 iv. *Contract number* is the specific identification number the Work was bid under and appears
- 56 on the plan set title sheet and in each sheet title block
- 57 v. *Year* represents the year the contract will be closed out
- 58 b. Examples of file names

- 1 i. AHU 2\_Operation Manual\_Fire Admin\_1234\_2015
- 2 ii. CPT 2\_Use and Care\_MPD West\_9876\_2011
- 3 C. All contractors shall submit the completed digital PDF files to the GC in sufficient time for the GC to meet the
- 4 O&M Data submission deadlines as described in Specification Section 01 29 76, Progress Payment Procedures.
- 5 D. O&M Data shall be submitted and reviewed as described in sections 3.2 and 3.3 below.

**3.2. O&M DATA DRAFT SUBMITTAL**

- 8 A. All contractors shall prepare and submit the following for an O&M Data Draft review submittal:
  - 9 1. Prepare three (3) complete O&M Data file samples as described in section 3.1 above.
  - 10 2. Review all specifications within their Division of Work and prepare a complete O&M Data checklist listing
  - 11 all equipment, systems, materials, or finishes. Checklist shall be in tabular form similar to the example
  - 12 below and shall indicate the title (and plan identifier when applicable) of the O&M Data, the associated
  - 13 specification, and a column to verify the item has been turned in and completed.
- 14 B. The GC shall be required to review all contractors’ samples and checklists for compliance with this specification
- 15 and shall return any to the originating contractor that are insufficient for re-submittal.
  - 16 1. When acceptable to the GC, they shall upload each O&M Data draft submittal file to the O&M Draft
  - 17 library on the Project Management Web Site.
- 18 C. The Project Architect, City Project Manager, CxA, Consulting Staffs and Owner Representatives shall review the
- 19 O&M Data draft submittals and checklist within fifteen 15 working days as follows:
  - 20 1. Provide general critique comments by Division on O&M Data samples submitted. Critique is intended to
  - 21 provide all contractors with information on strengths and weaknesses of their submittals.
    - 22 a. Re-submittal of the O&M Data samples will not be required.
  - 23 2. Review in detail the O&M Data Checklist for completeness. Provide comments as needed.
    - 24 a. Re-submittal of the O&M Checklist will be required until accepted.

<u>Title</u>	<u>Specification</u>	<u>Completed</u>
Overhead Door Operator	08 36 00	
Air Handling Unit (AHU-3)	23 00 00	
Water Heater (WH-1)	22 30 00	

**3.3. O&M DATA FINAL SUBMITTAL**

- 28 A. All contractors shall prepare and submit the following for an O&M Data Final review submittal:
  - 29 1. Prepare complete O&M Data files as described in Section 3.1 above according to their approved checklist
  - 30 as described in Section 3.2 above.
  - 31 2. Submit completed checklist and all final O&M Data files to the GC for final submittal review.
- 32 B. The GC shall be required to spot check all contractors’ submittals for completeness against their checklists and
- 33 for compliance with this specification and shall return any to the originating contractor that are insufficient for
- 34 re-submittal.
  - 35 1. When acceptable to the GC, they shall upload each O&M Data final submittal file to the O&M Final library
  - 36 on the Project Management Web Site.
- 37 C. The Project Architect, City Project Manager, CxA, Consulting Staffs and Owner Representatives shall review the
- 38 O&M Data final submittals and checklist within fifteen (15) working days as follows:
  - 39 1. Review the files submitted against the checklist and request any missing files through the GC.
  - 40 2. Review in detail all of the O&M Data files for completeness.
    - 41 a. Submittals shall be accepted or rejected as individual PDF files.
    - 42 b. Contractors shall re-submit entire O&M submittal if any portion is rejected or incomplete.

**3.4. CONSTRUCTION CLOSEOUT**

- 45 A. All contractors shall review Specification 01 77 00, Closeout Procedures and Specification 01 79 00
- 46 Demonstration and Training.
  - 47 1. Acceptance of all final O&M Data submittals is required prior to scheduling Demonstration and Training
  - 48 Sessions.
  - 49 2. Completion of all Demonstration and Training Sessions is required to receive the Substantial Compliance
  - 50 for Occupancy Certificate, and to begin Construction Closeout procedures.

**END OF SECTION**

**SECTION 01 78 36**  
**WARRANTIES**

1  
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6 1.2. RELATED SPECIFICATIONS ..... 1  
7 1.3. DEFINITIONS ..... 1  
8 1.4. GENERAL CONTRACTORS RESPONSIBILITIES ..... 2  
9 PART 2 – PRODUCTS - THIS SECTION NOT USED ..... 3  
10 PART 3 - EXECUTION ..... 3  
11 3.1. WARRANTY CHECKLIST ..... 3  
12 3.2. LETTERS OF WARRANTY ..... 3  
13 3.3. STANDARD PRODUCT WARRANTY ..... 4  
14 3.4. FINAL WARRANTY SUBMITTAL ..... 4  
15 3.5. WARRANTY NOTIFICATION, RESPONSE, EXECUTION AND FOLLOW-UP ..... 4  
16

**PART 1 – GENERAL**

**1.1. SUMMARY**

- 20 A. The purpose of this specification is to provide clear responsibilities and guide lines related to providing all  
21 Warranties and Guarantees related to the Work, workmanship, materials, equipment, and other such items  
22 required by the Construction Documents.  
23 B. Manufacturers’ disclaimers and limitations on product warranties do not relieve any contractor of the warranty  
24 on the Work that includes the product.  
25 C. Manufacturers’ disclaimers and limitations on product warranties do not relieve suppliers, manufacturers and  
26 any contractor required to provide special warranties under the contract documents.  
27

**1.2. RELATED SPECIFICATIONS**

- 29 A. Section 01 29 76 Progress Payment Procedures  
30 B. Section 01 31 23 Project Management Web Site  
31 C. Section 01 77 00 Closeout Procedures  
32 D. Section 01 78 23 Operation and Maintenance Data  
33 E. Section 01 91 00 Commissioning  
34 F. Other Divisions and Specifications that may address more specifically the requirements for Warranties related to  
35 the installation of all items and equipment installed under the execution of the Work.  
36

**1.3. DEFINITIONS**

- 38 A. See specification 01 77 00 for the definitions of the following terms that may also be used in this specification:  
39 1. Substantial Compliance  
40 2. Certificate of Occupancy  
41 3. Certificate of Substantial Completion  
42 4. Construction Closeout  
43 5. Contract Closeout  
44 B. Emergency Repair: The Owner or Owner Representative reserves the right to make emergency repairs as  
45 required to keep equipment or materials in operation or to prevent damage to property and injury to persons  
46 without voiding the contractors warranty or bond or relieving the contractor of their responsibilities during the  
47 warranty period.  
48 C. Installer: The company or contractor hired to install a finished product that was manufactured and supplied  
49 specifically for the Work within this contract. The Installer may or may not be the same company that supplied  
50 the product. See the definition for supplier.  
51 D. Supplier: Any company that makes a specific finished product for the Work from information within the Contract  
52 Documents. Examples of suppliers would include custom cabinets, steel stairs and railings, etc. A supplier would  
53 not be a company that distributes items manufactured by others such as an electrical or plumbing supplier.  
54 E. Warranty: A written guarantee from the manufacturer to the owner on the integrity of a product and its  
55 installation, and the manufacturers’ responsibility to repair or replace the defective product or components  
56 within a specified time from the date of ownership. Warranty may also be used interchangeably with  
57 Guarantee. The following warranty types may be part of any specification within the Work associated with the  
58 Construction Documents:

- 1 1. Expressed Warranty: A warranty that provides specific repair or replacement for covered components of
- 2 a product over a specified length of time.
- 3 2. Implied Warranty: A warranty that is not stated explicitly by a seller or manufacturer that the product is
- 4 merchantable and fit for the intended purpose.
- 5 3. Standard Product Warranty: Preprinted written warranties published by individual manufacturers for
- 6 particular products and are specifically endorsed by the manufacturer to the Owner. Standard warranties
- 7 may be for any amount of time but shall not be for anything less than one (1) year from the warranty
- 8 date.
- 9 4. Special Warranty: A written warranty required by the Contract Documents either to extend the time
- 10 limit provided under a standard warranty or to provide greater rights to the Owner.
- 11 F. Warranty Date: The effective date that begins all warranty periods required for products, installations, and
- 12 work-manship associated with the execution of the Work for this contract. The Warranty Date shall be set by
- 13 the CPM.
- 14 G. Related Damages and Losses: When correcting failed or damaged Warranted Work, remove and reinstall (or
- 15 replace if necessary) the construction that has been damaged as a result of the failure or the construction that
- 16 must be removed and replaced to obtain access for the correction of Warranted Work.
- 17 H. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected reinstate the
- 18 warranty by a new written endorsement. The reinstated warranty shall be equal to the original warranty with an
- 19 equitable adjustment for depreciation unless specifically noted otherwise in a specification.
- 20 I. Replacement Cost: All costs that may be associated with Work being replaced under warranty including but not
- 21 limited to the following:
  - 22 1. Related damages and losses
  - 23 2. Labor, material and equipment
  - 24 3. Permits and inspection fees
  - 25 4. This shall be regardless of any benefit the Owner may have had from the Work through any portion of its
  - 26 anticipated useful service life.
- 27 J. Replacement Work: All materials, products, required labor, and equipment necessary to replace failed or
- 28 damaged warranted to an acceptable condition that complies with the requirements of the original Construction
- 29 Documents.
- 30 K. Owners Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not
- 31 limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods
- 32 shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations,
- 33 rights, and remedies.
  - 34 1. Rejection of Warranties: The Owner reserves the right to reject any warranty and to limit the selection of
  - 35 products with warranties not in conflict with the requirements of the contract documents.
  - 36 2. Where the Contract Documents require a Special Warranty or similar commitment on the Work or
  - 37 product, the Owner reserves the right to refuse acceptance of the Work until the Contractor presents
  - 38 evidence the entities required to countersign such required commitments have done so.

#### 1.4. GENERAL CONTRACTORS RESPONSIBILITIES

- 41 A. The General Contractor (GC) shall be responsible to remedy, at their expense, any defect in the Work and any
- 42 damage to City owned or controlled real or personal property when the damage is a result of:
  - 43 1. The GC's failure to conform to Contract Document requirements.
    - 44 a. Any substitutions not properly approved and authorized may be considered defective.
    - 45 2. Any defect in workmanship, materials, equipment, or design furnished by the GC or Sub-contractors.
  - 46 B. All warranties as described in this specification and these Contract Documents shall take effect on the date
  - 47 established by the CPM, as noted in Section 1.3F above.
    - 48 1. All warranties shall remain in effect for one (1) year thereafter unless specifically stated otherwise in the
    - 49 Contract Documents or where standard manufacturer warranties are greater.
  - 50 C. The GC's warranty with respect to Work repaired or replaced, including restored or replaced Work due to
  - 51 damage, will run for one (1) year from the date of Owner Acceptance of said repair or replacement.
    - 52 1. This shall be regardless of any benefit the Owner may have had from the Work through any portion of its
    - 53 anticipated useful service life.
  - 54 D. Warranty Response
    - 55 1. See Section 3.5 of this specification.

**PART 2 – PRODUCTS - THIS SECTION NOT USED**

**PART 3 - EXECUTION**

**3.1. WARRANTY CHECKLIST**

- A. All contractors shall be responsible for reviewing the drawings and specifications within their Divisions of Work to provide a complete and comprehensive list of all Warranty Requirements to the GC.
- B. Each list shall indicate the title (and plan identifier when applicable) of the warranted item, the associated specification of the warranted item, the terms of the warranty (years), and a column to verify the item has been turned in and completed.
- C. The GC shall be responsible for all of the following:
  - 1. Consolidating all the warranty lists into one master Warranty Checklist.
    - a. The checklist shall be in a tabular data format similar to the sample below.
  - 2. Upload the completed checklist to the Submittal Library on the Project Management Web Site for review. See Specification 01 33 23 Submittals for more information on this procedure.
  - 3. Resubmit the schedule as needed after initial reviews have been completed.
- D. The GC shall work with all contractors to amend the Warranty Checklist throughout the execution of the project based on changes and modifications as necessary.

<u>Title</u>	<u>Specification</u>	<u>Terms</u>	<u>Completed</u>
Overhead Door Operator	08 36 00	MFR 2yr	
Exterior Bench and Trash Receptacles	12 93 00	MFR 3 year warranty on finish	
Kitchen Sink (SK-1)	22 42 00	MFR 5 year	
Disposal (D-1)	22 42 00	MFR 7 year parts and in-home service	
Toilet (WC-1)	22 42 00	MFR 1 year limited	

**3.2. LETTERS OF WARRANTY**

- A. All letters of warranty shall be in a typed letter format and provide the following information:
  - 1. The letter shall be on official company stationary including company name, address, and phone number.
  - 2. Indicate project name, contract number, and contract address the warranty is for on the reference line.
  - 3. Provide a description of the warranty(ies) being provided.
    - a. Include Division, Trade, or Specification information as necessary.
    - b. Only combine warranties of related Divisional Work together. Create new letters for additional Divisions as necessary.
  - 4. Indicate the effective Warranty Date. As noted in Section 1.3.F above, the Warranty Date shall be the date the Certificate of Substantial Completion was signed by the City Engineer.
  - 5. Contractor Letters of Warranty shall only be signed by a principal officer of the company.
  - 6. After signing the letter provide the GC with a high quality color scanned image in PDF format and the original signed letter.
- B. The GC shall be responsible for the Final Warranty submittal as identified in Section 3.4 below.
- C. The GC shall obtain letters of warranty from all of the following:
  - 1. The General Contractor shall provide warranty letters for all Work that was self performed under the contract documents, identify all trades or Divisions of Work.
  - 2. All Sub-contractors shall provide warranty letters for Work performed under the contract documents; identify all trades or Divisions of Work.
  - 3. Suppliers, as required by other specifications within the Construction Documents where the manufacture of a specific product unique to the Work of this contract was required.
    - a. The terms and conditions of the Supplier Letter of Warranty shall be as defined by the specifications associated with the Work but shall not be less than the industry standard of repair, or replace defective materials and workmanship within one (1) year of the warranty date.
    - b. When the supplier is also the installer a single written letter may be submitted identifying both the warranty for the manufacture of the product and the warranty for the installation of the product.
  - 4. Installers as required by other specifications within the Construction Documents where the installation of a specific product unique to the Work of this contract was required.
    - 1. The terms and conditions of the Installer Letter of Warranty shall be as defined by the specifications associated with the Work but shall not be less than the industry standard of repair,



- 1 or replace defective materials and workmanship associated with the installation of the product  
2 within one (1) year of the warranty date.  
3 5. Special Letters of Warranty shall be required from any contractor, supplier, installer or manufacturer who  
4 agrees to provide warranty services required by any Division Specification in excess of their Standard  
5 Product Warranty.  
6

7 **3.3. STANDARD PRODUCT WARRANTY**

- 8 A. All contractors shall be responsible for collecting and providing copies of all standard product warranties for  
9 commercially available products purchased and installed under this contract.  
10 B. Only one copy of the manufacturers' standard warranty needs to be submitted as representative for all  
11 quantities of the same model number used throughout the Work.  
12 C. Provide the manufacturers certificate, letter, or other standard documentation for each Standard Product  
13 Warranty submitted as follows:  
14 1. Whenever possible a PDF version of the document shall be used.  
15 a. If a PDF version is used all additional information shall be completed using simple PDF editing  
16 tools such as text boxes, highlight, etc.  
17 b. If a PDF version is not available and an original document is furnished the additional information  
18 shall be neatly hand written and highlighted on the document in such a fashion so that it does not  
19 obscure any part of the written warranty.  
20 2. Provide the following additional information on each warranty document:  
21 a. Contract warranty date.  
22 b. Provide the manufacturer name and model number of the product if not specified within the  
23 warranty.  
24 i. Where the manufacturer name and model number is specified within the warranty it shall  
25 be highlighted for visibility.  
26 c. Provide the plan identifier (LAV-1, WC-2, etc) when applicable.  
27 D. Each completed warranty shall be saved as a digital PDF. The file shall be named using the specification number  
28 and item description. I.E. 22 42 00 Toilet (WC-1).pdf  
29 a. Where an original certificate was furnished provide a high quality colored scan of the completed  
30 document with the additional information. Save the scanned image in PDF format and use the  
31 same naming convention as indicated above.  
32 E. Provide all PDF files and any original documents to the GC for final consolidation to be provided to the Owner.  
33

34 **3.4. FINAL WARRANTY SUBMITTAL**

- 35 A. The GC shall receive all required warranties (digital PDF and any original documents) from all contractors,  
36 suppliers, installers and manufacturers.  
37 B. The GC shall inventory all received warranties with the Warranty Submittal List to ensure all required warranties  
38 have been received and all warranty periods are correct according to the specifications.  
39 C. Provide with each Operation and Maintenance Manual a complete copy of any associated warranty.  
40 D. Scan all warranties into a single organized electronic PDF file as follows:  
41 1. Organize the PDF file into an orderly sequence based on the table of contents of the Specifications.  
42 2. Provide a typed Table of Contents for the entire file at the front of the document.  
43 3. Provide bookmarks and links to each individual PDF to enable quick navigation through the PDF  
44 document.  
45 E. Upload the warranty submittal to the appropriate document library on the Project Management Web Site for  
46 review by the Project Architect (PA)/Project Engineer (PE) and CPM.  
47 F. Correct any deficiencies or omissions and resubmit as necessary.  
48

49 **3.5. WARRANTY NOTIFICATION, RESPONSE, EXECUTION AND FOLLOW-UP**

- 50 A. Warranty Notification:  
51 1. The City of Madison, Project Management Web Site, uses an email notification system for all warranty  
52 related issues. The GC will be required to provide, and keep current during the warranty period, a  
53 minimum of two (2) email addresses and phone numbers of current employees to receive email  
54 notifications and provide response regarding Work associated with these construction documents.  
55 a. In the event a Warranty Issue is deemed by the City of Madison to be an emergency, the GC shall  
56 first receive a phone call with a follow-up email from the Project Management Web Site.  
57 b. The Contract Closeout-Warranty Issue Library on the Project Management Web Site uses a form  
58 for each warranty issue that is logged into the system.

- 1                                    i.     The GC shall open each warranty issue form, review the issue description and any attached  
2                                    documentation or photos.
- 3                                    ii.    The GC shall also notify any other sub-contractor, supplier, or installer that may be  
4                                    required to review the warranty issue.
- 5        B.     Warranty Response:
- 6            1.     The GC shall upon notification by the City of Madison provide warranty response as follows:
- 7                    a.     Critical Systems or equipment: Where damage to equipment and other building components, or  
8                    injury to personnel is probable provide immediate emergency shut-down information and an on-  
9                    site response team as soon as possible but in no case shall on-site response exceed 24 hours.
- 10                   b.     For non-critical responses where damage or injury is unlikely provide on-site response no later  
11                   than the next business day.
- 12                   c.     Where Technical Assistance support is part of the written warranty provide all assistance  
13                   necessary via phone, text, or internet systems as indicated by the warranty. If issues cannot be  
14                   resolved provide on-site response no later than the next business day.
- 15                   d.     If the request cannot be supported in sufficient time as outlined above the Owner (or Owner  
16                   Representative) reserves the right to contact other contractors or service companies having  
17                   similar capability to expedite the repair or replacement and shall invoice all associated costs to  
18                   the Owner back to the GC.
- 19        C.     Warranty Execution:
- 20            1.     The GC shall provide all repairs or replacements as necessary to restore broken or damaged Work to the  
21                   original level of acceptance as intended by the Contract Documents.
- 22                   a.     Provide all materials, equipment, products, and labor necessary to complete the repair or  
23                   replacement associated with the Warranty Issue.
- 24                   b.     Provide all cleaning services as may be required before, during, and after the repair or  
25                   replacement as per Specification 01 74 13 Progress Cleaning.
- 26                   c.     Provide any protection necessary for existing construction as per Specification 01 76 00 Protecting  
27                   Installed Construction
- 28                   d.     Provide new letters of warranty when required.
- 29        D.     Warranty Follow-up:
- 30            1.     Logged Warranty Issues:
- 31                   a.     The GC shall provide complete documented responses of all logged Warranty Issues. Responses  
32                   shall provide a description of work completed, by who, inclusive dates, and photos of completed  
33                   or repaired work.
- 34                                    i.     Provide call back response if work is not acceptable.
- 35                   b.     The City Project Manager shall review the submitted response documentation and do a field  
36                   inspection if necessary.
- 37                                    i.     If work is not acceptable, contact GC to review details and expectations of the repair as  
38                                    needed.
- 39                                    ii.    If work is acceptable close the Warranty Issue.
- 40            2.     Quarterly Warranty Reviews:
- 41                   a.     The GC shall be responsible for scheduling quarterly on-site review with all of the following:
- 42                                    i.     City Project Manager, and other City staff as needed
- 43                                    ii.    Owner and Owner Tenant Representative
- 44                                    iii.   Commissioning Agent (CxA)
- 45                                    iv.   Plumbing, Heating, Electrical Sub-contractors
- 46                                    v.     Other Sub-contractors that may be responsible for open Warranty issues
- 47                   b.     Quarterly reviews shall be scheduled at 3 months, 6 months, and 11 months after the effective  
48                   date of the warranty. The review meetings shall:
- 49                                    i.     Review the status of all open Warranty Issues, determine course of action and estimated  
50                                    date of completion.
- 51                                    ii.    In the appropriate quarter, provide shut-down, start-up, testing, and training of off-season  
52                                    equipment as required by the contract documents.
- 53                                    iii.   The 11th month review shall review all open Warranty Issues, final plan for resolution, and  
54                                    all Warranty Issues where a new letter of warranty may have been issued.
- 55  
56  
57  
58

**END OF SECTION**

**SECTION 01 78 39  
AS-BUILT DRAWINGS**

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**PART 1 – GENERAL**

**1.1. SUMMARY**

- 22 A. This specification is intended to provide clear guidelines and identify the responsibilities of all contractors as they  
23 pertain to City of Madison contract procedures regarding the accurate recording of the Work associated with the  
24 execution of this contract. This shall include but not be limited to work that will be hidden, concealed, or buried.  
25 B. Each contractor shall be responsible for maintaining an accurate record of all installations, locations, and  
26 changes to the contract documents during the execution of this contract as it may relate to their specific division  
27 or trade.  
28 C. The General Contractor (GC) shall be responsible for ensuring all contractors provide as-built record information  
29 to the Master As-Built Document Set as described in this specification.  
30

**1.2. RELATED SPECIFCAITONS**

- 32 A. 00 31 21 Survey Information  
33 B. 01 26 13 Request for Information  
34 C. 01 31 23 Construction Bulletin  
35 D. 01 32 33 Photographic Documentation  
36 E. 01 26 63 Change Orders  
37 F. 01 29 76 Progress Payment Procedures  
38 G. 01 31 23 Project Management Web Site  
39 H. 01 33 23 Submittals  
40 I. 01 77 00 Closeout Procedures  
41 J. 01 91 00 Commissioning  
42 K. Other Divisions and Specifications that may address more specifically the requirements for field recording the  
43 installation of all items associated with the execution of this contract by Division or Trade.  
44

**1.3. RELATED DOCUMENTS**

- 46 A. Other related documents shall include but not be limited to the following:  
47 1. Bidding documents including drawings, specifications, and addenda.  
48 2. Required regulatory documents of conditional approval.  
49 3. Field orders, verbal or written by inspectors having regulatory jurisdiction.  
50 4. Shop drawings and installation drawings.  
51

**1.4. PERFORMANCE REQUIREMENTS**

- 53 A. The GC shall be responsible for maintaining the “Master As-Built Document Set” in the job trailer at all times  
54 during the execution of this contract. This document set shall include all of the following:  
55 1. Master As-Built Plan Set  
56 2. Master As-Built Specification Set  
57 3. Other Document Sets

- 1 B. The GC shall designate one person of the GC staff to be responsible for maintaining the Master As-Built  
2 Document Set at the job trailer. This shall include, posting updates, revisions, deletions and the monitoring of all  
3 contractors posting as-built information as described in this specification.  
4 C. All contractors shall use this specification as a general guideline regarding the requirements for documenting  
5 their completed Work. Contractors shall explicitly follow additional specification requirements within their own  
6 Division of Trade as it may apply to this specification.  
7

#### 8 **1.5. QUALITY ASSURANCE**

- 9 A. The GC shall be responsible for all of the following:  
10 a. Spot checking all sub-contractors field documents to insure daily information is being recorded as  
11 work progresses.  
12 b. Discuss as-built recording to the plan set at weekly job meetings with all sub-contractors on site.  
13 c. Schedule time with sub-contractors in the job trailer for recording as-built information to the plan  
14 set.  
15 d. Insure that all sub-contractors are providing clear and accurate information to the plan set in a  
16 neat and organized manner.  
17 e. Insure sub-contractors who have completed work have finalized recording all as-built information  
18 to the plan set before releasing them from the project site.  
19 B. The Project Architect, the City Project Manager, Commissioning Agent and other design team staff will perform  
20 random checks of the Master As-Built Document Set during the execution of this contract to ensure as-built  
21 information is being recorded in a timely fashion as the Work progresses. An updated and current Master As-  
22 Built Document Set is a stipulation for approval of the progress payment.  
23

### 24 **PART 2 – PRODUCTS**

#### 25 **2.1. OFFICE SUPPLIES**

- 26 A. The GC shall provide a sufficient supply of office products in the job trailer at all times for all contractors to use in  
27 recording as-built information into the plan set. This shall include but not be limited to the following:  
28 a. Red ink pens, medium point. Pens that bleed through paper, markers, and felt tips will not be  
29 accepted.  
30 b. The use of highlighters is acceptable. Assign colors to various trades for consistency in recording  
31 information.  
32 c. Straight edges of various lengths for drawing dimension, extension and other lines.  
33 d. Civil and Architectural scales  
34 e. Clear transparent, non-yellowing, single sided tape.  
35 f. Correction tape or correction fluid for correcting small errors.  
36  
37

### 38 **PART 3 - EXECUTION**

#### 39 **3.1. FIELD DOCUMENT AS-BUILTS**

- 40 A. The GC and all Sub-contractors shall be responsible for keeping their own field set of as-built documents  
41 including plans, specifications and published changes.  
42 B. Field sets shall be kept dry and in good condition at all times.  
43 C. No Work shall be buried, covered, or hidden, by any additional Work, regardless of Contractor or Trade, until  
44 locations of all materials and equipment has been properly documented as described below.  
45 D. All contractors shall be required to record the following as-built information:  
46 a. Notes on the daily installation of materials and equipment.  
47 b. Sketches, corrections, and markups indicating final location, positioning, and arrangement of  
48 materials and equipment such as pipes, conduits, valves, cleanouts, pull boxes and other such  
49 items. Note all final locations on plan sheets, indicate dimension off identifiable building features.  
50 Riser diagrams need only be corrected for significant changes in locations, routing or  
51 configuration.  
52 i. The use of photographs in lieu of hand drawn sketches is acceptable.  
53 ii. Photos shall be taken according to Specification 01 32 33 Photographic Documentation  
54 iii. Print photo and markup with dimensions or notes as necessary.  
55 c. Identify by the use of existing plan symbology and notes the size, type, quantity, and use as  
56 applicable of materials such as pipes, valves, conduits, etc.  
57

- 1                               d.     Note whether horizontal runs are below slab or above ceiling, include dimensions above or below  
2                                       finished floor elevation.  
3       E.     All contractors shall be responsible for transferring the information from their field set of documents to the  
4             Master As-Built Plan Set kept in the GC job trailer. See Section 3.3.D. below for the proper procedure.  
5       F.     All contractors shall update the GC Master Plan Set as often as necessary, but not less than once per work week.  
6

7       **3.2.   SITE SURVEY AS-BUILT**

- 8       A.     The Land Surveyor Sub-Contractor shall provide digital as-built information including but not be limited to the  
9             following:  
10            a.     For underground buried utility laterals and services of all types locate all of the following that may  
11                    apply:  
12                    i.     Connection points at all mains  
13                    ii.    Storm discharge points to open air  
14                    iii.   All corners and bends regardless of angle, large radius sweeps shall have multiple point  
15                    locations sufficient to define the sweep.  
16                    iv.   All vertical drops  
17                    v.    All wells  
18                    vi.   Private buried utilities such as buried electrical cables, irrigation systems, etc.  
19                    v.    Other information that may need to be located in the future by the owner prior to digging  
20            b.     Record all surface features including but not limited to the following:  
21                    i.     Building corners, pavement edges, and other permanent structural features.  
22                    ii.    All surface covers for inlets, catch basins, cleanouts, access structures, curb stops and  
23                    other such devices.  
24                    iii.   Other permanent surface features such as hydrants, lamp posts, and other permanent site  
25                    amenities.  
26            c.     The following data shall be recorded while locating items in sub-sections 3.2.a and 3.2.b above:  
27                    i.     Flow lines at both ends of pipes  
28                    ii.    Pipe sizes and material types  
29                    iii.   Rim elevations for all covers  
30                    iv.   Sump elevations and invert elevations of all structures  
31                    v.    Spot elevations for all pads, driveways, walks, stoops, and floors  
32       B.     The Surveyor shall provide the final digital as-built on a media and in a format specified in Specification 00 31 21  
33             Survey Information to the GC for turn in to the Project Architect and the Civil Engineer.  
34       C.     The Surveyor shall provide two printed as-built site plans to the GC for inclusion in the Master As-Built Plan Set  
35             as follows:  
36             1.     One sheet to show all features (but not contour information) with text neatly organized for each item  
37                    identified.  
38             2.     One sheet showing contours, contour labels, and features from item 1 above, but with no additional text.  
39

40       **3.3.   MASTER AS-BUILT DOCUMENT SET**

- 41       A.     The GC shall be responsible for maintaining the Master As-Built Document Set in the job trailer at all times.  
42             1.     The Master As-Built Plan Set (Plan Set) shall begin with one complete bid set of drawings and any  
43                    additional sheets that were supplied by published addenda during the bidding process. The cover sheet  
44                    shall be titled as the "Master As-Built Plan Set" in large bold red letters approximately 2" in height and  
45                    shall not be used for any other purpose.  
46                    a.     The Plan Set shall be kept dry, legible, and in good condition at all times.  
47                    b.     The Plan Set shall be kept up to date with new revisions within two (2) working days of  
48                    supplemental drawings being issued. Revisions shall be posted as follows:  
49                    i.     Insert new, revised sheets into the plan set. Void old sheets but do not remove them from  
50                    the plan set. Indicate date received and what document (RFI, CB, CO, etc) caused the  
51                    change.  
52                    ii.    Insert new, revised individual details into the plan set. Void old details, tape new details  
53                    over the old details with a "tape hinge" to allow them to be viewed. Indicate date  
54                    received and what document (RFI, CB, CO, etc) caused the change.  
55                    iii.   Add new details in appropriate white space on relevant sheets. If no space is available use  
56                    the back side of the previous sheet or insert a new sheet. Indicate date received and what  
57                    document (RFI, CB, CO, etc) caused the change.

- 1 c. The Plan Set shall be available at anytime for easy reference during progress meetings and for  
2 emergency location information of new work already completed.
- 3 2. The Master As-Built Specification Set (Spec Set) shall begin with one complete bid set of specifications  
4 and any additional specifications that were supplied by published addenda during the bidding process.  
5 The Spec Set shall be provided in three "D" ring type binders of sufficient thickness to accommodate the  
6 specification set. Multiple binders are allowed as necessary. Label the front cover and binding edge with  
7 "Master As-Built Specifications" in bold red letters. Provide other information as necessary to distinguish  
8 the contents of multi-volume sets.
  - 9 a. The Spec Set shall be kept dry, legible, and in good condition at all times.
  - 10 b. The Spec Set shall be kept up to date with new revisions within two (2) working days of  
11 supplemental drawings being issued.
  - 12 c. The Spec Set shall be available at anytime for easy reference during progress meetings.
- 13 3. Other Document Sets may be kept at the GCs option in three "D" ring type binders of sufficient thickness  
14 to accommodate the documentation. Other documentation sets may include but not be limited to RFIs,  
15 CBs, COs, etc.
- 16 C. The Land Surveyor Sub-Contractor shall be required to use digital surveying for all exterior site surveying, and  
17 provide deliverable digital as-builts as specified in Specification 00 31 21 Survey Information. As soon as practical  
18 the surveyor shall provide the GC with a preliminary copy of installed buried utilities for inclusion with the plan  
19 set in the job trailer. The surveyor shall provide final digital as builts as per section 3.2 above.
- 20 D. All contractors shall be responsible for updating the Plan Set from their field sets at least once per work week.  
21 Updates shall include but not be limited to the following procedures:
  - 22 a. All updates shall be done only in red ink. Place a "cloud" around small areas of correction to call  
23 attention to the change.
  - 24 b. Whenever possible place general work notes, field sketches, supplemental details, photos, and  
25 other such information on the reverse side of the preceding sheet. Installation notes including  
26 dates shall be kept neatly organized in chronological order as necessary.
  - 27 c. Accurately locate items on the plan set as follows:
    - 28 i. For items that are located as dimensioned provide a check mark or circle indicating the  
29 dimension was verified.
    - 30 ii. For items that are within 5 feet of the location indicated on the plans leave as shown and:
      - 31 • Provide correct dimensions to existing dimension strings or,
      - 32 • Accurately locate with new dimension strings
    - 33 iii. For items that are more than 5 feet from the location indicated on the plans
      - 34 • Accurately draw the items in the new location as installed and,
      - 35 • Accurately locate with new dimension strings and,
      - 36 • Note that the existing location is void.
  - 37 d. Include dimensioned locations for items that will be buried, concealed, or hidden in the ground,  
38 under floors, in walls or above ceilings.
    - 39 i. Dimensions shall be pulled from identifiable building features, not from centers of columns  
40 or other buried features.
    - 41 ii. When necessary pull more dimensions as needed from opposing directions to properly  
42 locate single items.

### 3.4. AS-BUILT REVIEW AND ACCEPTANCE

- 45 A. The GC shall provide the Master As-Built Plan Set to the Project Architect (PA)/Project Engineer (PE), the City  
46 Project Manager (CPM), the Commissioning Agent (CxA) and other design team staff for content review prior to  
47 the Progress Payment Milestone indicated in Specification 01 29 76 Progress Payment Procedures. The  
48 submitted plan set shall include the digital survey information produced under Section 3.2 above.
  - 49 1. If the plan set is not approved:
    - 50 a. The PA/PE and CPM shall only be required to generalize deficiencies by trade there shall be no  
51 requirement or expectation to generate a "punch list" of required corrections.
    - 52 b. The GC and Sub-contractors as necessary shall be responsible for inspecting the installation and  
53 correcting the drawings as needed.
    - 54 c. The GC shall re-submit the plan set for review.
  - 55 2. If the plan set is approved the PA/PE shall take possession of the plan set to be used in providing the  
56 owner with digital CAD record drawings. Upon completion of transferring the information to CAD the  
57 PA/PE shall provide the Owner with CAD record drawings, record PDFs, and the Master As-Built Plan Set.

- 1 **3.5. CHANGES AFTER ACCEPTANCE**  
2 A. No Contractor shall be responsible for making changes to the As-Built record documents after acceptance by the  
3 PA/PE and CPM except when necessitated by changes resulting from any Work made by the Contractor as part  
4 of their guarantee.  
5

6  
7 **END OF SECTION**  
8  
9

**SECTION 01 78 43  
SPARE PARTS AND EXTRA MATERIALS**

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**PART 1 – GENERAL**

**1.1. SUMMARY**

- 21 A. This specification is intended to provide clear guidelines and identify the responsibilities of all contractors as they  
22 pertain to City of Madison contract procedures regarding spare parts, special tools, special materials, and extra  
23 materials.  
24 B. Each contractor shall be responsible for knowing the specific requirements of their Division Specifications as they  
25 may relate to the general information provided in this specification.  
26 C. The General Contractor (GC) shall be responsible for ensuring all contractors provide spare parts and extra  
27 materials as described in this specification.  
28

**1.2. RELATED SPECIFICAITONS**

- 30 A. 01 29 76 Progress Payment Procedures  
31 B. 01 31 23 Project Management Web Site  
32 C. 01 77 00 Closeout Procedures  
33 D. Other Divisions and Specifications that may address more specifically how to proceed with spare parts, special  
34 tools, special materials, and extra materials.  
35

**1.3. DEFINITIONS**

- 37 A. Spare Parts: Any component of a product or assembly that comes pre-packaged or was specially ordered for the  
38 explicit use of the product or assembly. This shall include but not be limited to fastening devices, mounting  
39 brackets, replacement parts, wheels, pulleys, wiring, alternate assembly pieces, etc.  
40 B. Special Tools: Any tool of any kind that was pre-packaged or specially ordered, and is required to be used for the  
41 installation or maintenance of an installed product or assembly as part of this contract.  
42 C. Special Materials: Any oil, lubricant, glue, touch-up paint, or other such material that comes pre-packaged or  
43 was specially ordered and is required to be used for the installation or maintenance of an installed product or  
44 assembly as part of this contract.  
45 D. Extra Materials (Attic Stock): Any surplus materials in new and useable condition that was installed a part of this  
46 contract. Attic Stock shall include but not be limited to the following: ceiling tiles, paint, stain, floor coverings,  
47 ceramic tiles, light bulbs/lamps, filters, strainers, etc. Attic Stock shall include partially opened bulk items and  
48 additional unopened quantities as directed by other specifications.  
49

**1.4. PERFORMANCE REQUIREMENTS**

- 51 A. All contractors shall be responsible for consolidating spare parts, special tools, special materials, and attic stock  
52 as it pertains to the specific Work within their Division or Trade.  
53 B. All contractors shall use this specification as a general guideline regarding the requirements for turning spare  
54 parts, special tools, special materials, and attic stock over to the owner. Contractors shall explicitly follow  
55 specification requirements within their own Division of Trade.  
56

**1.5. QUALITY ASSURANCE**

- 58 A. The General Contractor (GC) shall be responsible for all of the following:



1. Coordinate the location for and the delivery of all spare parts, special tools, special materials, and attic stock being provided by all contractors under this contract to one centralized location as designated by the Owner.
2. Verify that all items being delivered are:
  - a. Clean, new, and in a usable condition.
  - b. Properly sealed, protected, and labeled
  - c. Properly documented

**PART 2 – PRODUCTS – THIS SECTION NOT USED**

**PART 3 - EXECUTION**

**3.1. PACKAGING**

- A. Whenever possible all surplus items should remain in their original packaging such as parts envelopes.
- B. Package small parts in re-sealable plastic bags (Ziploc) or envelopes with clasp fasteners. Do not use envelopes that seal with glue or tape envelopes closed. Do not leave packaging unsealed.
- C. Package like parts together for products or assemblies. I.E. keep all spare parts for flushometers together.
- D. Many small packages may be grouped together into a larger container by trade.
- E. Do not use unrelated boxes or containers for packaging spare items. I.E. do not use a light fixture box for spare breakers, or flushometers parts.

**3.2. LABELING**

- A. Whenever possible the original labeling indicating part numbers and other pertinent information shall remain on the original packaging.
- B. If original labeling is not available the contractor shall label all parts and packages using tape or labels and permanent black markers. Tape or labels being used shall absorb the permanent marker without bleeding or allowing ink to be smeared or rubbed off.
- C. Labels shall include the name of the product or equipment the item belongs to, part number and/or name, and any other information that would assist maintenance personnel in identifying the piece and related product.
- D. Labels shall include plan or specification designations (WC-1, LAV-3, DF-2, CPT-1, etc) that identify the particular product or finish material it represents.
- E. Labels for parts stored in clear re-sealable plastic bags may be placed inside the bag. Label shall face out and be able to be read from one side. Multiple bags shall be numbered individually for identification.
- F. Label the outside of large containers with the trade name (Plumbing, Electrical, etc).

**3.3. INVENTORY**

- A. All contractors shall provide the GC with complete inventories of all spare parts, special tools, special materials, and attic stock that they are providing at the end of the contract. The inventories shall be organized as follows:
  1. The cover sheet shall indicate the Contractors name, address, phone number, identify that the document is the "Spare Parts and Extra Materials Inventory", and identify the Division or Trade the inventory is for.
  2. Provide an inventory in a tabular format of all items being provided under this and other specifications. The minimum information to be provided for each item on the inventory shall be as follows:
    - a. Bag or container number, all items of one bag or container shall be grouped together on the inventory
    - b. Item description
    - c. Item size (if applicable)
    - d. Total quantity provided
    - e. Identify if item is a spare part, tool, special material, or attic stock
- B. The GC shall consolidate inventories from all sub-contractors into one tabular data sheet organized by Division or Trade of Work.
  1. Upon completing the consolidated list the GC shall upload the completed inventory to the Contract Closeout-Attic Stock Library on the Project Management Web Site.
  2. The GC shall notify the Project Architect and City Project Manager that the scans have been uploaded.
  3. Consulting Staff and Owner Staff shall review the inventories prior to Final Review to verify that minimum required quantities have been met. Deficiencies shall be noted and returned back to the GC for corrective action.

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**3.4. STORAGE**

- A. Prior to the 80% Progress Payment milestone the GC shall coordinate with the City Project Manager and Maintenance Personnel where spare parts, special tools, special materials, and attic stock shall be stored.
- B. The GC shall instruct all contractors as to the location and proper storage procedures.
- C. The GC shall be responsible for ensuring the storage area is kept neat and orderly as follows:
  - 1. Like items are stored together by material, product, or trade as necessary.
  - 2. Liquids are stored in sealable containers and the lids have been properly installed to prevent drying out, spillage, etc.
  - 3. All labels are clearly visible and provide the required information.
- D. Large items shall be stored so as not to damage other items. Do not stack heavy items or items with distinct shapes/outlines on softer items that may get crushed or imprinted.

**3.5. CLOSEOUT PROCEDURE**

- A. Prior to the 90% Progress Payment milestone the GC shall review all attic stock already stored by the contractors to ensure the following:
  - 1. Materials are stored in the proper location(s).
  - 2. All boxes, containers and items are properly labeled according to the submitted/approved inventory.
  - 3. Quantities are correct according to the submitted/approved inventory.
- B. The GC shall ensure that all deficiencies are corrected prior to conducting Demonstration and Training Sessions.
- C. The GC shall review with Maintenance Staff all inventories and labeling during the scheduled Demonstration and Training Sessions.
- D. Any discrepancies associated with Attic Stock shall be resolved and verified prior to the CPM releasing the 90% CT progress payment.

**END OF SECTION**

**SECTION 01 79 00  
DEMONSTRATION AND TRAINING**

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**PART 1 – GENERAL**

**1.1. SUMMARY**

- 19  
20 A. The purpose of this specification is to provide clear responsibilities and guidelines related to providing  
21 Demonstration and Training (D&T) Sessions related to general facility use, equipment, systems, finishes, and  
22 materials to City of Madison Staff (Owner, Owner Representatives, Maintenance, and Custodial Personnel) as  
23 needed.  
24 B. All D&T shall be coordinated through the General Contractor (GC), Project Architect (PA)/Project Engineer (PE)  
25 and City Project Manager (CPM), and will be based on or customized to the needs of City of Madison Staff being  
26 trained. New equipment and systems may have complete D&T sessions as described in this specification while  
27 equipment or systems staff is familiar with may have sessions more focused on maintenance only.  
28

**1.2. RELATED SPECIFICATIONS**

- 29  
30 A. Section 01 29 76 Progress Payment Procedures  
31 B. Section 01 78 13 Completion and Correction List  
32 C. Section 01 78 19 Maintenance Contracts  
33 D. Section 01 78 23 Operation and Maintenance Data  
34 E. Section 01 78 36 Warranties  
35 F. Section 01 78 39 As-Built Drawings  
36 G. Section 01 78 43 Spare Parts and Extra Materials  
37 H. Section 01 91 00 Commissioning  
38 I. Other Divisions and Specifications that may address more specifically the requirements for D&T sessions related  
39 to the installation of all items and equipment installed under the execution of the Work.  
40

**1.3. QUALITY ASSURANCE**

- 41  
42 A. All contractors shall have the responsibility of preparing for and conducting D&T sessions as determined by this  
43 and other Division or Trade related specifications, Owner Operation and Maintenance Manuals, and other such  
44 documentation related to the Work.  
45 B. The GC shall have responsibility for:  
46 1. Ensuring that all contractors required to conduct a D&T session have successfully completed all of the  
47 following:  
48 a. Turned in all required documentation for review and documentation has been approved/accepted  
49 prior to scheduling D&T sessions.  
50 b. Other required documentation as needed is available and ready for use during the D&T session.  
51 c. All systems have been started, tested, and running as per appropriate specification and/or  
52 manufacturers recommendations prior to scheduling D&T sessions.  
53 d. All contractors are sufficiently prepared for their D&T session  
54 e. Documents the D&T session including date, time, contractor and company name, attendees and  
55 other information regarding the session  
56 2. Organizing the coordination and scheduling of all D&T sessions between all contractors and the  
57 appropriate representatives of the Owner. These representatives may include any of the following  
58 depending on the Work of the Contract:

- 1 a. Owner – end users
- 2 b. Facility Maintenance personnel
- 3 i. Facility general operation procedures including custodial services
- 4 ii. Electrical
- 5 iii. Mechanical
- 6 iv. Plumbing
- 7 v. Site
- 8 c. Information Technology (IT) Department
- 9 d. Traffic Engineering – Radio Shop
- 10 e. Architects, Engineers and Facility Management staff as project completion overview
- 11

12 **PART 2 – PRODUCTS – THIS SECTION NOT USED**

13  
14 **PART 3 - EXECUTION**

15  
16 **3.1. GENERAL REQUIREMENTS**

- 17 A. The GC shall develop a specific D&T plan to be scheduled and conducted as described below but no sooner than
- 18 the meeting discussed in 3.2.A.2 below.
- 19 C. The GC shall not schedule D&T sessions to preclude required personnel from attending multiple sessions.
- 20

21 **3.2. COORDINATING AND SCHEDULING THE TRAINING**

- 22 A. The GC, PA/PE, CxA and CPM, shall review all Training and Demonstration requirements during two (2) special
- 23 meetings.
- 24 1. The first meeting shall be held at the 50% Contract Total Payment. During this meeting the following
- 25 shall be discussed:
- 26 a. Preliminary schedule of training dates to be completed prior to beginning construction closeout.
- 27 b. List of documentation and items that need to be completed and available before and during the
- 28 training session.
- 29 c. Who (Owner, Maintenance, etc) will be attending what training session(s).
- 30 2. The second meeting shall be held at the 80% Contract Total Payment. This meeting shall review due outs
- 31 that have not yet been completed for the 90% Contract Total Payment and the requirements necessary
- 32 for Construction Closeout. All Demonstration and Training sessions shall be completed prior to receiving
- 33 the 90% progress payment and beginning Construction Closeout Procedures (see Specification 01 77 00).
- 34 a. This does not include any requirement associated with off season equipment preparation and/or
- 35 demonstration and Training Sessions.
- 36 B. All of the Construction Work shall be operationally ready prior to conducting training as follows:
- 37 1. All contractors shall have their As-Built Drawing Records available for reviewing locations of system
- 38 components during training.
- 39 2. All final and approved Operations and Maintenance Data shall be completed no less than two (2) full
- 40 weeks prior to the scheduled training.
- 41 3. All systems shall have been started, functionally tested, balanced, and fully operational, and all piping
- 42 and equipment labeling complete at least two (2) days prior to the scheduled training.
- 43 a. Seasonal equipment shall not be trained out of season. Contractors having seasonal equipment
- 44 shall work with the GC and CPM for coordinating additional training sessions as appropriate for
- 45 seasonal equipment.
- 46 C. Correction list items that prevent a piece of equipment or system from being fully operational for training shall
- 47 be corrected prior to conducting the training.
- 48

49 **3.3. TRAINING OBJECTIVES**

- 50 A. For each piece of equipment or system installed train on the following objectives/topics as applicable:
- 51 1. System design, concept, and capabilities
- 52 2. Review of related contractor as-built drawings
- 53 3. Facility walkthrough to identify key components of the system
- 54 4. System operation and programming including weekly, monthly, annual test procedures
- 55 5. System maintenance requirements
- 56 6. System troubleshooting procedures
- 57 7. Testing, inspection, and reporting requirements associated with any regulatory requirements
- 58 8. Identification of any correction list items still outstanding

- 1 9. Review of system documentation including the following:
- 2 a. Operation and maintenance data
- 3 b. Warranties
- 4 c. Valve charts, tags, and pipe identification markers
- 5 B. For each piece of specialty equipment train on the following objectives/topics as applicable:
- 6 1. Manufacturers operations instructions
- 7 2. Manufacturers use and care instructions
- 8 3. Manufacturers maintenance and troubleshooting instructions
- 9 4. System operation and programming including weekly, monthly, annual test procedures
- 10 5. Identification of any correction list items still outstanding
- 11 6. Review of system documentation including the following:
- 12 a. Operation and maintenance data
- 13 b. Warranties
- 14 C. End User Orientation
- 15 1. Facility walkthrough
- 16 2. Security and emergency features
- 17 3. General facility operation procedures
- 18 D. Facility General Use and Custodial Services – if requested
- 19 1. Facility walkthrough
- 20 2. Security and emergency features
- 21 3. General facility operation procedures
- 22 4. Care and maintenance of specialty items, finishes, etc as requested
- 23 5. Attic stock inventory and material designations
- 24

25 **3.4. DEMONSTRATION AND TRAINING PROGRAM PREPARATION**

- 26 A. Each contractor having a responsibility for providing D&T sessions shall meet with the GC, CPM, and other City
- 27 Staff as needed to review the extent of the Training Objectives in section 3.3 above needed for each piece of
- 28 equipment, system, finish, etc. This meeting shall occur no less than four (4) weeks prior to the anticipated
- 29 training session.
- 30 B. The contractor shall use the information from item 3.4.A above to prepare a formal training program for each
- 31 piece of equipment or system based on the Training Objectives in 3.3 above.
- 32 1. The formal training program shall include the following information:
- 33 a. Session title
- 34 b. List of systems, equipment, use, care, etc to be covered during the session
- 35 c. Provide the following for each systems, equipment, use, care, etc to be covered during the session
- 36 i. Name and affiliation of each instructor to be used. As needed and discretion of the Owner
- 37 the GC to require attendance by the installing technician, installing Contractor and the
- 38 appropriate trade or manufacturer’s representative.
- 39 ii. Qualifications of each instructor to be used. Practical building operation expertise as well
- 40 as in-depth knowledge of all modes of operation of the specific piece of equipment as
- 41 installed in this project is required by the training personnel. If Owner determines training
- 42 was not adequate, the training shall be repeated until acceptable to Owner.
- 43 iii. A checklist of all documentation and system/equipment requirements necessary to
- 44 complete a successful training session and the current status of each
- 45 iv. Any additional documents, training aids, video or other items to be used to complete the
- 46 training
- 47 v. Any special requirements or needs associated with item iv above to complete the training
- 48 d. The intended audience for the training
- 49 e. The approximate duration of each objective or topic to be covered
- 50 2. Submit the completed training program to the GC for review and approval by the PA/PE and CPM.
- 51 C. The PA/PE and CPM shall work with staff as necessary to ensure all points of anticipated training needs have
- 52 been met. The PA/PE and CPM will approve the program as submitted or recommend changes for re-submittal
- 53 as necessary.
- 54

55 **3.5. CONDUCTING A DEMONSTRATION AND TRAINING SESSION**

- 56 A. All contractors shall conduct their required D&T Sessions as follows:
- 57 1. Begin with a classroom session
- 58 a. Provide a sign in sheet indicating all training to be conducted, instructors, etc.

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- b. Provide an overview of the training to be conducted including the approximate schedule.
  - 2. Conduct a general walk-through of the site.
    - a. Point out locations of various equipment, valves, charts, and other related items.
    - b. Use the Division or Trade As-Built record drawings to indicate locations of hidden or buried items.
  - 3. Provide a demonstration of general equipment/system operation including using the O&M manual.
    - a. Startup and shutdown procedures.
    - b. Normal operational levels as depicted by any gauges, software, etc.
    - c. Indicate warning devices, signs etc. and demonstrate emergency shut-down procedures.
  - 4. Provide a demonstration of all owner level maintenance using the O&M manual.
    - a. Indicate frequency of maintenance.
    - b. Provide and review all spare parts, special tools, and special materials.
  - 5. Provide and review all spare parts, special tools, special materials, or attic stock as applicable.
  - 6. While conducting D&T sessions:
    - a. Allow hands on training whenever practical.
    - b. Answer questions promptly
    - c. Repeat demonstrations and procedures as necessary.
  - B. Within two (2) working days of completing the D&T session the contractor responsible for the session shall turn-in any documentation generated including the sign in roster to the GC.
  - C. The GC shall turn over all training documentation to the PA/PE and CPM upon completion of D&T sessions.
  - D. Re-schedule any training that has been determined to be inadequate or inappropriate for any reason including but not limited to any of the following;
    - 1. Unqualified instructor
    - 2. System installation incomplete or untested to the specifications
    - 3. Equipment failure during demonstration
    - 4. Un-expected cancellation

**3.6. CLOSEOUT PROCEDURE**

- A. Prior to receiving the 90% Progress payment the GC shall:
  - 1. Verify with the PA/PE and CPM that each Demonstration and Training Session was conducted properly and according to the submitted plan.
  - 2. Any required "Off Season" equipment testing, balancing, and Demonstration and Training Sessions have been tentatively scheduled with the GC, necessary sub-contractors, instructors and Owner/Owner Representatives as necessary.

**END OF SECTION**

**SECTION 22 05 00  
COMMON WORK RESULTS FOR PLUMBING**

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**PART 1 – GENERAL**

**1.1. SCOPE**

- A. This section includes information common to Plumbing and applies to all sections in this Division.
- B. Included are all code-required items even if not specifically shown on plans or mentioned in specifications. This includes but is not limited to traps, cleanouts, isolation valves etc.

**1.2. REFERENCES**

- A. Work under this section depends on applicable provisions from other sections and the plan set in this contract. Examples of related sections include, but are not limited to:
  - 1. DIVISION 26 - ELECTRICAL
- B. ACI – American Concrete Institute
  - 1. ACI 614 - Recommended Practice for Measuring, Mixing and Placing of Concrete
- C. ANSI - American National Standards Institute
  - 1. ANSI A112.14.1 - Backwater Valves
  - 2. ANSI A112.21.1 - Floor Drains.
  - 3. ANSI A112.21.2 - Roof Drains.
  - 4. ANSI A112.6.1M - Supports for Off-the Floor Plumbing Fixtures for Public Use.
  - 5. ANSI A112.18 - Finished and Rough Brass Plumbing Fixture Fittings.
  - 6. ANSI A112.19.1 - Enameled Cast Iron Plumbing Fixtures.
  - 7. ANSI A112.19.2 - Vitreous China Plumbing Fixtures.
  - 8. ANSI A112.19.5 - Trim for Water Closet Bowls, Tanks and Urinals.
  - 9. ANSI A112.26.1 - Water Hammer Arrestors
  - 10. ANSI Z21.22 - Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems.
- D. ASSE - American Society of Sanitary Engineering
  - 1. ASSE 1001 - Pipe Applied Atmospheric Type Vacuum Breakers
  - 2. ASSE 1003 - Water Pressure Reducing Valves for Domestic Water Supply Systems
  - 3. ASSE 1010 - Water Hammer Arrestors.
  - 4. ASSE 1011 - Hose Connection Vacuum Breakers.
  - 5. ASSE 1018 - Trap Seal Primer Valves.
  - 6. ASSE 1019 - Wall Hydrants, Frost Proof Automatic Draining, Anti-Backflow Type.
- E. ASTM - American Society for Testing and Materials
  - 1. ASTM B650 - Electrodeposited Engineering Chromium Coatings on Ferrous Substrates
  - 2. ASTM C76 - Reinforced Concrete Culvert, Storm Drain and Sanitary Pipe
  - 3. ASTM C165 - Test Method for Compressive Properties of Thermal Insulations
  - 4. ASTM C302 - Density of Preformed Pipe Insulation
  - 5. ASTM C355 - Test Methods for Test for Water Vapor Transmission of Thick Materials
  - 6. ASTM C518 - Heat Flux and Thermal Transmission Properties
  - 7. ASTM C534 - Preformed Flexible Elastomeric Thermal Insulation
  - 8. ASTM C547 - Mineral Fiber Preformed Pipe Insulation
  - 9. ASTM C552 - Cellular Glass Block and Pipe Thermal Insulation
  - 10. ASTM C921 - Properties of Jacketing Materials for Thermal Insulation

- 1 11. ASTM C1136 - Flexible Low Permeance Vapor Retarders for Thermal Insulation
- 2 12. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
- 3 13. ASTM D1557 - Standard Test Method for Moisture-Density Relations of Soils
- 4 14. ASTM D1785 - Poly Vinyl Chloride (PVC) Plastic Pipe
- 5 15. ASTM D2466 - Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
- 6 16. ASTM D2513 - Thermoplastic Gas Pressure Pipe, Tubing and Fittings
- 7 17. ASTM D2665 - Poly Vinyl Chloride (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
- 8 18. ASTM D2729 - Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
- 9 19. ASTM D2774 - Recommended Practice for Underground Installation of Thermoplastic Pressure Piping
- 10 20. ASTM D2855 - Making Solvent Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings
- 11 21. ASTM D3034 - Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
- 12 22. ASTM D3139 - Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
- 13 23. ASTM D3212 - Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- 14 24. ASTM D3311 - Drain, Waste and Vent (DWV) Plastic Fitting Patterns
- 15 25. ASTM D2241 - Poly Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
- 16 26. ASTM D2564 - Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings
- 17 27. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops
- 18 28. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
- 19 29. ASTM F656 - Primers for Use in Solvent Cement Joints of Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings
- 20 F. AWWA - American Water Works Association
- 21 1. AWWA C104 - Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
- 22 2. AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water
- 23 3. AWWA C110 - Ductile Iron and Gray Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids
- 24 4. AWWA C111 - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
- 25 5. AWWA C151 - Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids
- 26 6. AWWA C153 - Ductile Iron Compact Fittings, 3 In. Through 48 In., for Water and Other Liquids
- 27 7. AWWA C600 - Installation of Ductile Iron Water Mains and Their Appurtenances
- 28 8. AWWA C651 - Disinfecting Water Mains
- 29 9. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution
- 30 G. NSF - National Sanitation Foundation
- 31 H. PDI - Plumbing and Drainage Institute
- 32 I. UL - Underwriters Laboratories Inc.
- 33 1. UL1479 - Fire Tests of Through-Penetration Firestops
- 34 2. UL723 - Surface Burning Characteristics of Building Materials

35

### 36 1.3. SUBMITTALS

- 37 A. Records of tests performed to certify compliance with system requirements
- 38 B. Manufacturer's wiring diagrams for electrically powered equipment
- 39 C. Certificates of inspection by regulatory agencies
- 40 D. Lubrication instructions, including list/frequency of lubrication
- 41 E. Parts lists for fixtures, equipment, valves and specialties.
- 42 F. Manufacturer's installation, operation and maintenance recommendations for fixtures, equipment, valves and specialties.
- 43 G. Certification products comply with NSF 61 and NSF 372 (lead free) for potable water service

44

### 45 1.4. ENVIRONMENTAL AND INDOOR AIR QUALITY IMPACT

- 46 A. LEAD FREE REQUIREMENTS: All materials that contact potable water shall be lead free. Lead free refers to the wetted
- 47 surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content smaller than
- 48 required per the current Federal Safe Drinking Water Act. This requirement applies to all of the subsequent Plumbing
- 49 Specification and Plumbing Drawings and supersedes any part or model number that may conflict with this requirement.
- 50 Products shall comply with NSF 61 and NSF 372.

51

### 52 1.5. QUALITY ASSURANCE

- 53 A. Manufacturer Qualifications: ISO 9001 certified
- 54 B. REGULATORY REQUIREMENTS:
- 55 1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
- 56 2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials,
- 57 installation, testing, and disinfection.
- 58 3. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials,
- 59 hose threads, installation, and testing.
- 60 C. Piping materials shall bear label, stamp, or other markings of specified testing agency.

61



**1.6. DEFINITIONS**

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene-diene terpolymer rubber.
- C. LLDPE: Linear, low-density polyethylene plastic.
- D. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- E. PA: Polyamide (nylon) plastic.
- F. PE: Polyethylene plastic.
- G. PP: Polypropylene plastic.
- H. PVC: Polyvinyl chloride plastic.
- I. RTRF: Reinforced thermosetting resin (fiberglass) fittings.
- J. RTRP: Reinforced thermosetting resin (fiberglass) pipe.

**PART 2 – PRODUCTS**

**2.1. IDENTIFICATION**

**A. EQUIPMENT LABELS:**

- 1. Identify all equipment with engraved name plates may be used. Locate identification conspicuously.
- 2. Minimum size: 3/4" x 2 1/2" with 3/8" letters.
- 3. White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, screw mounting, Setonply Style 2060 by Seton Name Plate Company or Emedolite Style EIP by EMED Co., or equal by W. H. Brady.

**B. PIPE IDENTIFICATION:**

- 1. Identify interior piping not less than once every 30', not less than once in each room, adjacent to each access door or panel, and on both side of the partition where accessible piping passes through walls or floors. Label all pipes with name of loop and arrows for flow direction with permanent label. Mark pipes based on served system as "hot", "cold", and "hard", "soft" or "water".

Service	Background Color	Stencil color
Potable / Supply Water	Green	White
Non-potable water	Yellow	Black
Compressed Air	Blue	White
Condensate	Yellow	Black
Domestic Hot Water	Yellow	Black
Vent	Yellow	Black

- 2.
- 3. Pipe identification shall conform to ANSI A13.1 "Scheme for Identification of Piping Systems".
- 4. Printed labels identifying the fluid conveyed and direction of flow shall be attached to pipes in accessible locations, at intervals not to exceed 20 feet, not less than once in each room, at each branch, adjacent to each access door or panel, at each valve and where exposed piping passes through walls and floors.

Outside Diameter of Covering	Minimum Letter Size
<= 2"	1"
<= 6"	1.5"
< 10"	3"
>= 10"	4"

- 5. Manufacturers: EMED Co., Seton Name Plate Company, or W. H. Brady.
- 6. 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.

**C. UNDERGROUND PIPING:**

- 1. 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.
- 2. 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.
- 3. 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 Department of Safety and Professional Services Chapter 384 requirements. Tracer wire shall be continuous solid copper or steel plastic coated with split bolt or compression-type connectors.
- 4. Owner will perform own locating with GPS. Owner needs to be notified 3 business days prior backfill.

- 1 5. Contractor will install marker balls at start, end, bends, at least every 20' and at other significant locations. Owner will  
2 mark up plans to determine ball locations. Balls shall not be installed deeper than 3' below final grade. Multiple lines in  
3 parallel (i.e. geothermal laterals) exceeding 3' in installation width shall receive markers at each side. Owner will verify  
4 proper marker function:

Utility	Markertype	Ball
Water	Water blue	3M 1403-XR
Sanitary	Wastewater green	3M 1404-XR
Storm	Wastewater green	3M 1404-XR

- 5 D. ADHESIVE LABELS: Pressure-sensitive, adhesive backed, vinyl pipe markers with applicable labeling, 3/4" min. size for  
6 lettering and surrounding tape on both ends. With flow arrows on piping. Conforming to ANSI, ANSI and NFPA standards.  
7 Seton Opti-Code, MSI, Brady or approved equal. Clean piping before application.  
8 E. VALVES:  
9 1. Identify valves with brass tags bearing a system identification and a valve sequence number. Identify medical gas and  
10 vacuum valves with brass tags and wall or cabinet mounted color coded engraved nameplate with the following "(Type  
11 of Gas) Shutoff Valve for (Location or Zone)". Valve tags are not required at a terminal device unless the valves are  
12 greater than 10' from the device, located in another room or not visible from device.  
13 2. VALVE TAGS: Round brass tags with 1/2 inch numbers, 1/4 inch system identification abbreviation, 1-1/4 inch minimum  
14 diameter, with brass jack chains, brass "S" hooks or one piece nylon ties around the valve stem, available from EMED  
15 Co., Seton Name Plate Company, or W. H. Brady.  
16

## 17 2.2. PIPE PENETRATIONS

- 18 A. RATED SURFACES: seal per firestopping  
19 B. NON-RATED SURFACES:  
20 1. At interior partitions where pipe penetrations are sealed, use Tremco Dymonic, Sika Corp. Sikaflex 1a, Sonneborn  
21 Sonolastic NPI, or Mameco Vulken 116 urethane caulk to effect seal. Use galvanized sheet metal sleeves in hollow wall  
22 penetrations.  
23 2. Install stamped steel, chrome plated, hinged, split ring escutcheons or floor/ceiling plates where pipe penetrates non-  
24 fire rated surfaces in occupied spaces. Size units to accommodate insulation, where applicable. Escutcheons are not  
25 required when insulation completely covers wall opening and insulation end is trimmed in a neat manner. Occupied  
26 spaces for this Paragraph include only those rooms with finished ceilings and penetration occurs below ceiling.  
27 3. In exterior wall openings below grade, place water-stop type wall sleeve before concrete pour or core drill opening  
28 after pour. Assemble rubber links to proper size for pipe and tighten in place in accordance with manufacturer's  
29 instructions.  
30 C. Provide galvanized sheet metal sleeves for pipe penetrations through interior and exterior walls to provide a backing for  
31 sealant or firestopping. Apply sealant to both sides of penetration in a manner that annular space between pipe sleeve and  
32 pipe or insulation is completely blocked. Patch wall around sleeve to match adjacent wall construction and finish. Grout  
33 area around sleeve in masonry construction. In finished spaces where pipe penetration through wall is exposed to view,  
34 sheet metal sleeve shall be installed flush with face of wall. In existing poured concrete walls where penetration is core  
35 drilled, pipe sleeve is not required. Pipe sleeves in new poured concrete construction shall be schedule 40 steel pipe (sized  
36 to allow insulated pipe to run through sleeve), cast in place.  
37 D. In all piping floor penetrations, fire rated and non-fire rated, top of sleeve shall extend 1 inch above the adjacent finished  
38 floor. In existing floor penetrations, core drill sleeve opening large enough to insert schedule 40 sleeve and grout area  
39 around sleeve with hydraulic setting, non-shrink grout. If the pipe penetrating the sleeve is supported by a pipe clamp  
40 resting on the sleeve, weld a collar or struts to the sleeve that will transfer weight to existing floor structure.  
41

## 42 PART 3 – EXECUTION

### 43 3.1. DEMOLITION

- 44 A. Perform all demolition as indicated on the drawings to accomplish new work. Where demolition work is to be performed  
45 adjacent to existing work that remains in an occupied area, construct temporary dust partition to minimize the amount of  
46 contamination of the occupied space. Where pipe is removed and not reconnected with new work, cap ends of existing  
47 services as if they were new work. Coordinate work with the Owner to minimize disruption to the existing building  
48 occupants.  
49 B. All pipe, fixtures, equipment, wiring and associated conduit, insulation and similar items demolished, abandoned, or  
50 deactivated are to be removed from the site by the Contractor except as specifically noted otherwise. All designated  
51 equipment is to be turned over to the user agency for their use at a place and time so designated. Maintain the condition  
52 of material and/or equipment that is indicated to be reused equal to that existing before work began.  
53

### 54 3.2. INSTALLATION

- 55 A. Expansion and contraction of piping shall be provided for by expansion loops, bends, swing joints, or expansion joints to  
56 prevent damage to connections, piping, equipment of the building.

- 1 B. Unions or flanges shall be installed on all by-passes, ahead of all traps, 1 adjacent to screw connection valves and at all
- 2 connections to equipment, whether or not shown on drawings.
- 3 C. Install all Work to permit removal (without damage to other parts) of all parts requiring periodic replacement or
- 4 maintenance. Arrange pipes and equipment to permit ready access to valves, cocks, traps, starters, motors, control
- 5 components and to clear the openings of swinging and overhead doors and of access panels.
- 6 D. Flashings on the roof shall be closely coordinated. Install flashings to insure proper vapor barrier.
- 7 E. Roof attachments, equipment supports, piping systems and other roof penetrations shall be waterproofed.
- 8 F. B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- 9 G. C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to
- 10 building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- 11 H. D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- 12 I. E. Install piping to permit valve servicing.
- 13 J. F. Install piping at indicated slopes.
- 14 K. G. Install piping free of sags and bends.

15  
 16 **3.3. EXCAVATION AND BACKFILL**

- 17 A. Perform all excavation and backfill work necessary to accomplish indicated plumbing systems installation. Excavate to
- 18 bottom of pipe and structure bedding, 4" in stable soils, 6" in rock or wet trenches and 8" in unstable soil. Finish bottoms of
- 19 excavations to true, level surface.
- 20 B. Tunnel or remove sidewalk and curb in areas of excavation to the nearest joint. Remove pavements, curbs and gutters to
- 21 neat and straight lines to the limits of removal. Make sawcut lines parallel to existing joints, or parallel or perpendicular to
- 22 pavement edges to form a neat patch. Carefully remove remaining pavement within the sawcut area. Leave existing base
- 23 materials between the area disturbed by the work and the sawcut line undisturbed by the sawcutting, pavement removal,
- 24 or pavement replacement processes.
- 25 C. Strip topsoil from area to be excavated, free from subsoil and debris, and store for later respreading.
- 26 D. At no time place excavated materials where they will impede surface drainage unless such drainage is being safely rerouted
- 27 away from the excavation.
- 28 E. Excavate whatever materials are encountered as required to place at the elevations shown, all pipe, manholes, and other
- 29 work. Remove debris and rubbish from excavations before placing bedding and backfill material.
- 30 F. Remove surplus excavated materials from site.
- 31 G. Verify the locations of any water, drainage, gas, sewer, electric, telephone or steam lines which may be encountered in the
- 32 excavation. Underpin and support all lines. Cut off service connections encountered which are to be removed at the limits
- 33 of the excavation and cap.
- 34 H. Provide and maintain all fencing, barricades, signs, warning lights, and/or other equipment necessary to keep all excavation
- 35 pits and trenches and the entire subgrade area safe under all circumstances and at all times. No excavation shall be left
- 36 unattended without adequate protection.
- 37 I. Elevations shown on the plans are subject to such revisions as may be necessary to fit field conditions. No adjustment in
- 38 compensation will be made for adjustments up to two (2) feet above or below the grades indicated on the plans.
- 39 J. Install lines passing under foundations with minimum of 1-1/2 inch clearance to concrete and insure there is no disturbance
- 40 of bearing soil.
- 41 K. Bed pipe up to a point 12" above the top of the pipe. Take care during bedding, compaction and backfill not to disturb or
- 42 damage piping.
- 43 L. Mechanically compact bedding and backfill to prevent settlement. The initial compacted lift to not exceed 24" compacted
- 44 to 95% density per Modified Proctor Test (ASTM D-1557). Subsequent lifts under pavements, curbs, walks and structures
- 45 are not to exceed 12" and be compacted to 95% density per Modified Proctor Test. In all other areas where construction
- 46 above the excavation is not anticipated within 2 years, mechanically compact backfill in lifts not exceeding 24" to 90%
- 47 density per Modified Proctor Test. Route the equipment over each lift of the material so that the compaction equipment
- 48 contacts all areas of the surface of the lift.
- 49 M. Bedding up to a point 12" inches above the top of the pipe shall be thoroughly compacted sand or crushed stone chips
- 50 meeting the following gradations:

Gradation for Bedding Sand		Gradation for Crushed Stone Chip Bedding	
Sieve Size	% Passing (by Wt)	Sieve Size	% Passing (by Wt)
1"	100	0.5"	100
No. 16	45-80	No. 4	75-100
No. 200	2-10	No. 100	10-25

- 51 N. Backfill above the bedding in lawn areas shall be thoroughly compacted excavated material free of large stones, organic,
- 52 perishable, and frozen materials.
- 53 O. Backfill above the bedding under existing and future utilities, paving, sidewalks, curbs, roads and buildings shall be granular
- 54 materials, pit run sand, gravel, or crushed stone, free from large stones, organic, perishable, and frozen materials.
- 55 P. ROCK EXCAVATION: Remove rock encountered in the excavation to a minimum dimension of 6 inches outside the pipe.
- 56 Rock excavation includes all hard, solid rock in ledges, bedded deposits and unstratified masses, all natural conglomerate

- 1 deposits so firmly cemented as to present all the characteristics of solid rock; which material is so hard or so firmly  
2 cemented that in the opinion of the Engineer it is not practical to excavate and remove same with a power shovel except  
3 after thorough and continuous drilling and blasting. Rock excavation includes rock boulders of 1/2 cubic yard or more in  
4 volume.  
5 Q. SURFACE RESTORATION: Completely restore the surface of all disturbed areas to a like condition of the surface prior to the  
6 work. Level off all waste disposal areas and clean up all areas used for the storage of materials or the temporary deposit of  
7 excavated earth. Remove all surplus material, tools and equipment.  
8

9 **3.4. SHEETING, SHORING AND BRACING**

- 10 A. Provide shoring, sheet piling and bracing in conformance with the Wisconsin Administrative Code to prevent earth from  
11 caving or washing into the excavation. Shore and underpin to properly support adjacent or adjoining structures. Abandon  
12 in place shoring, sheet piling and underpinning below the top of the pipe, or, if approved in advance by the engineer,  
13 maintained in place until other permanent support approved by the engineer is provided.  
14

15 **3.5. DEWATERING**

- 16 A. Provide, operate and maintain all pumps and other equipment necessary to drain and keep all excavation pits, trenches and  
17 the entire subgrade area free from water under all circumstances. Obtain general permit from the Wisconsin Department  
18 of Natural Resources district office for discharge of construction dewatering effluent. Obtain well permit from the  
19 Wisconsin Department of Natural Resources district office for dewatering wells discharging more than 70 GPM. Comply  
20 with permit requirements.  
21

22 **END OF SECTION**

**SECTION 23 05 00  
COMMON WORK RESULTS FOR HVAC**

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**PART 1 – GENERAL**

**1.1. SCOPE**

A. This section includes information common to HVAC systems for this project and applies to all sections in this Division.

**1.2. REFERENCES**

A. Work under this section depends on applicable provisions from other sections and the plan set in this contract.

B. AABC - Associated Air Balance Council

    1. AABC - National Standards for Total System Balance

C. ABMA - American Boiler Manufacturers Association

D. ADC - Air Diffusion Council

E. AGA - American Gas Association

F. AMCA - Air Movement and Control Association

G. ANSI - American National Standards Institute

    1. ANSI/IEEE 112 Test Procedure for Polyphase Induction Motors and Generators

    2. ANSI/NEMA MG-1 Motors and Generators

    3. ANSI/NFPA 70 National Electrical Code

H. ARI - Air-Conditioning and Refrigeration Institute

I. ASHRAE – American Society of Heating, Refrigeration and Air Conditioning Engineers

    1. ASHRAE - ASHRAE Handbook, HVAC Applications, Chapter 37, Testing Adjusting and Balancing.

    2. ASHRAE 111 – Practice for Measurement, Adjusting, and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems

J. ASME - American Society of Mechanical Engineers

K. ASTM - American Society for Testing and Materials

    1. ASTM A527 - Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dipped Process, Lock-Forming Quality

    2. ASTM A53 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

    3. ASTM A234 - Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel

    4. ASTM B209 - Aluminum and Aluminum Alloy Sheet and Plate

    5. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

    6. ASTM D1000 - Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications

    7. ASTM D2240 - Standard Test Method for Rubber Property—Durometer Hardness

    8. ASTM E84 - Surface Burning Characteristics of Building Materials

    9. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems

    10. ASTM E2336 - Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems

L. AWWA - American Water Works Association

M. AWS - American Welding Society

N. CGA - Compressed Gas Association

O. CTI - Cooling Tower Institute

- 1 P. EPA - Environmental Protection Agency
- 2 Q. GAMA - Gas Appliance Manufacturers Association
- 3 R. IEEE - Institute of Electrical and Electronics Engineers
- 4 S. ISA - Instrument Society of America
- 5 T. MCA - Mechanical Contractors Association
- 6 U. MICA - Midwest Insulation Contractors Association
- 7 V. MSS - Manufacturer's Standardization Society of the Valve & Fitting Industry, Inc.
  - 8 1. MSS SP-58 Materials, Design, Manufacture, Selection, Application, and Installation
  - 9 2. SP-127 Bracing for Piping Systems Seismic-Wind-Dynamic Design, Selection, Application
- 10 W. NADCA - Mechanical Cleaning of Non-Porous Air Conveyance System Components National Air Duct Cleaners Association
  - 11 1. NADCA Understanding Microbial contamination in HVAC Systems
- 12 X. NAIME – North American Insulation Manufacturers Association
  - 13 1. NAIMA - Cleaning Fibrous Glass Insulated Air Duct Systems
- 14 Y. NBS - National Bureau of Standards
- 15 Z. NEBB - National Environmental Balancing Bureau
  - 16 1. NEBB - Procedural Standards for Testing Adjusting Balancing of Environmental Systems
- 17 AA. NEC - National Electric Code
- 18 BB. NEMA - National Electrical Manufacturers Association
- 19 CC. NFPA - National Fire Protection Association
  - 20 1. NFPA 54 - National Fuel Gas code
  - 21 2. NFPA 225 - Surface Burning Characteristics of Building Materials
- 22 DD. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association. Inc.
- 23 EE. TABB – Testing Adjusting and Balancing Bureau
  - 24 1. TABB - Tab Procedural Guide, First Edition, 2003
- 25 FF. UL - Underwriters Laboratories Inc.
  - 26 1. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors
  - 27 2. UL 586 - Standard for High Efficiency Particulate Air Filter Units
  - 28 3. UL 723 - Surface Burning Characteristics of Building Materials
  - 29 4. UL 795 - Commercial Industrial Gas Heating Equipment
  - 30 5. UL 900 - Standard for Air Filter Units
  - 31 6. UL 2998 - Environmental Claim Validation Procedure (ECVP) for Zero Ozone Emissions from Air Cleaners

32  
33 **1.3. SUBMITTALS**

- 34 A. Before submitting electrically powered equipment, verify that the electrical power and control requirements for the
- 35 equipment are in agreement with the electrical design documents. Include a statement on the shop drawing transmittal
- 36 that the equipment submitted and the electrical design documents are in agreement or indicate any discrepancies
- 37 B. EQUIPMENT GENERAL:
  - 38 1. Weight (dry and wet)
  - 39 2. Indicate metal gauges, material finishes, assembly, construction details, and field connection details including the
  - 40 following:
  - 41 3. Construction details and material finishes.
  - 42 4. All required service and operation clearances.
  - 43 5. Filter, coil, and damper performance data.
  - 44 6. Piping connection diagrams and field fabrication details.
  - 45 7. Unit specific power and control circuit wiring diagrams.
  - 46 8. Interconnection wiring diagrams.
  - 47 9. Provide calculated 8 octave maximum sound power levels at unit discharge and return connections, and maximum
  - 48 casing radiated sound power levels.
- 49 C. FANS:
  - 50 1. Indicate fan class, fan performance and motor electrical characteristics. Provide fan curves with specified operating
  - 51 point clearly plotted. Include efficiency data for the design airflows, drive loss and bhp
- 52 D. MOTORS AND POWER EQUIPMENT:
  - 53 1. Include with the equipment which the motor drives the following motor information: motor manufacturer,
  - 54 horsepower, voltage, phase, hertz, rpm and full load efficiency. Include project wiring diagrams prepared specifically
  - 55 for this work.
  - 56 2. Lubrication instructions, including list/frequency of lubrication
  - 57 3. Table noting full load power factor, service factor, NEMA design designation, insulation class and frame type for each
  - 58 motor provided

- 1 4. Field connection details.
- 2 E. HANGERS AND SUPPORTS:
- 3 1. Schedule of all hanger and support devices indicating shields, attachment methods, and type of device for each pipe
- 4 size and type of service.
- 5 F. VIBRATION AND SEISMIC CONTROL:
- 6 1. Include isolator type, materials of construction, isolator free and operating heights, and isolation efficiency based on
- 7 the lowest operating speed of the equipment supported.
- 8 G. BALANCING:
- 9 1. General Information: Inside cover sheet identifying Test and Balance Agency, Contractor, Architect, Engineer, Project
- 10 Name and Project Number. Include addresses, contact names and telephone numbers. Also include a certification
- 11 sheet containing the seal and signature of the Test and Balance Supervisor.
- 12 2. Summary: Provide summary sheet describing mechanical system deficiencies. Describe objectionable noise or drafts
- 13 found during testing, adjusting and balancing. Provide recommendations for correcting unsatisfactory performances.
- 14 List instrumentation used during testing, adjusting and balancing procedures.
- 15 3. The remainder of the report to contain the appropriate standard NEBB or AABC forms for each respective item and
- 16 system. Fill out forms completely. Where information cannot be obtained or is not applicable indicate it.
- 17 4. Submit to owner daily work activity reports for each day on which testing and balancing work is performed. Reports
- 18 shall include description of day's activities and description of any system deficiencies.
- 19 5. All interim flow rates and final flow rates vs. design flowrates
- 20 6. Balancing device settings

21

22 **PART 2 - PRODUCTS**

23 **2.1. IDENTIFICATION**

- 24 A. MANUFACTURERS: 3M, Brady Corporation, Kolbi Pipe Markers, Seton Identification Products
- 25 B. All labels shall be permanent, and machine generated. No handwritten or non-permanent labels are allowed.
- 26 C. Before any labelling confer with owner to ensure all labels meet legibility and longevity requirements. Owner may request
- 27 at no extra cost the use of different colors, different font, size or type of label.
- 28 D. EQUIPMENT: Identify all equipment with stencils or engraved name plates. Letters shall not be smaller than 4" unless
- 29 equipment sizes prevents this size. Where equipment is elevated or away from main walkways, larger letters shall be used
- 30 to ensure legibility. Letters shall be colored in contrast to background.
- 31 1. Engraved nameplates: White letters on a black background, 1/16 inch thick plastic laminate, beveled edges, screw
- 32 mounting, Setonply Style 2060 or Emedolite Style EIP or equal by W. H. Brady).
- 33 E. PIPING: Identify all piping with stencils or snap-around pipe marker Equal to Seton Setmark not less than once every 20
- 34 feet, not less than once in each room, not less than once per 6' (or larger) section, adjacent to each access door or panel,
- 35 and on both side of the partition where accessible piping passes through walls or floors. Use one coat of black enamel
- 36 against a light background or white enamel against a dark background for stenciling, or provide snap-on pipe markers.

Outside Diameter of Covering	Minimum Letter Size
<=2"	1"
<= 6"	1.5"
< 10"	3"
>= 10"	4"

- 37 F. Label all pipes with name of loop, pipe size, and arrows for flow direction with permanent label. Mark pipes based on
- 38 served system as "hot", "cold", and as "boiler", "chilled", "geothermal" and also as "glycol", "hard", "soft" or "water". Label
- 39 all gauges. Use one coat of black enamel against a light background or white enamel against a dark background.

Service	Background Color	Stencil color
Chilled Water	Green	White
Potable / Supply Water	Green	White
Non-potable water	Yellow	Black
Compressed Air	Blue	White
Condensate	Yellow	Black
Domestic Hot Water	Yellow	Black
Fire Protection	Red	White
Fuel Gas	Yellow	Black
Glycol	Orange	Black
Heating	Yellow	Black
Vent	Yellow	Black

- 1 G. VALVES: Identify with brass tags bearing a system identification and the normal position. Use round brass tags with 1/2 inch  
 2 numbers, 1/4 inch system identification abbreviation, 1-1/4 inch minimum diameter, with brass jack chains, brass "S" hooks  
 3 or one piece nylon ties around the valve stem, available from EMED Co., Seton Name Plate Company, or W. H. Brady. Valve  
 4 tags are not required at a terminal device unless the valves are greater than ten feet from the device, located in another  
 5 room or not visible from device. For balancing valves include balancing and detail the setting and flow set at time of  
 6 balancing.  
 7 H. DUCTS: Identify ducts around air handling equipment and in mechanical rooms. Label with name and flow direction. Use  
 8 one coat of black enamel against a light background or white enamel against a dark background. Minimum letter size 3".

Service	Background Color	Stencil color
Exhaust Air	Brown	White
Tempered Exhaust Air	Brown	White
Outside Air	Blue	White
Tempered Outside Air	Blue	White
Supply Air	Green	Black
Return Air	Yellow	Black

- 9 I. Label fire, smoke and combination fire smoke dampers on the exterior surface of ductwork directly adjacent to access  
 10 doors using a minimum of 1" height lettering reading, "SMOKE DAMPER" or "FIRE DAMPER". Utilize stencils or  
 11 manufactured labels. All labels shall be clearly visible from the ceiling access point.

- 12 J. UNDERGROUND:  
 13 1. Provide all buried utilities, conduit and pipes with detectable underground warning tape, 5.0 mil overall thickness, 6"  
 14 width, .0035" thick aluminum foil core with polyethylene jacket bonded to both sides. Color code tape and print  
 15 caution along with name of buried service in bold letters on face of tape. Manufacturers: Thor Enterprises Magnatec  
 16 or equal by Carlton, MSI Marking Services, Seton. Extend tape to surface at building entrances, meters, hydrants and  
 17 valves. Where existing underground warning tape is broken during excavation, replace with new tape identifying  
 18 appropriate service and securely spliced to ends of existing tape.  
 19 2. All underground non-metallic services/mains shall be provided with tracer wire installations. Tracer wire installations  
 20 shall conform to code. Tracer wire shall be continuous solid copper or steel plastic coated with split bolt or  
 21 compression-type connectors.  
 22 3. Underground Installation marking:

Utility	Markertype	Ball
Power	Power red	3M 1402-XR
Water	Water blue	3M 1403-XR
Sanitary	Wastewater green	3M 1404-XR
Storm	Wastewater green	3M 1404-XR
Gas	Gas yellow	3M 1405-XR
Fiber	Communication orange / black	3M 1407-XR
Telephone	Telephone orange	3M 1421-XR/iD
CATV	CATV orange / black	3M 1427-XR/iD
Geothermal	General Purpose pink	3M 1408-XR

28  
 29 **2.2. SEALING AND FIRE STOPPING**

- 30 A. FIRE AND/OR SMOKE RATED PENETRATIONS:  
 31 1. Provide all fire stopping of fire rated penetrations and sealing of smoke rated penetrations in compliance with Division  
 32 07.  
 33 2. Provide sleeve required for fire dampers in fire-rated partitions and floors.  
 34 B. NON-RATED PENETRATIONS:  
 35 1. Pipe Penetrations Through Below Grade Walls: In exterior wall openings below grade, use a modular mechanical type  
 36 seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the  
 37 uninsulated pipe and the cored opening or a water-stop type wall sleeve. Assemble rubber links of mechanical seal to  
 38 the proper size for the pipe and tighten in place, in accordance with manufacturer's instructions. Install so that the bolts  
 39 used to tighten the seal are accessible from the interior of the building or vault.  
 40 2. Pipe Penetrations: At all interior walls and exterior walls, pipe penetrations are required to be sealed. At pipe  
 41 penetrations of non-rated interior walls, floors and exterior walls above grade, use urethane caulk in annular space



- 1 between pipe insulation and sleeve. For non-rated drywall, plaster or wood walls where sleeve is not required use  
2 urethane caulk in annular space between pipe insulation and wall material. Apply sealant to both sides of the  
3 penetration in such a manner that the annular space between the pipe sleeve or cored opening and the pipe or  
4 insulation is completely blocked.
- 5 3. Duct Penetrations: Annular space between duct (with or without insulation) and the non-rated walls or floor opening  
6 shall not be larger than 2". Where existing openings have an annular space larger than 2", the space shall be patched to  
7 match existing construction to within 2" around the duct. Pack annular space with fiberglass batt insulation or mineral  
8 wool insulation. Provide 4" sheet metal escutcheon around duct on both sides of partition or floor to cover annular  
9 space.
- 10 C. PIPE SLEEVES: Provide galvanized sheet metal sleeves for pipe penetrations through interior and exterior walls to provide a  
11 backing for sealant or firestopping. Pipe sleeves shall be schedule 40 steel pipe (sized to allow insulated pipe to run through  
12 sleeve)  
13

### 14 **2.3. MOTOR REQUIREMENTS FOR HVAC EQUIPMENT**

- 15 A. PERFORMANCE REQUIREMENTS
- 16 1. All motors must meet or exceed current NEMA premium efficiency requirements
- 17 2. Motors shall be sized to not operate into motor service factor when operating under design conditions.
- 18 3. Design motors for continuous operation in 40°C environment, and for temperature rise in accordance with ANSI/NEM  
19 A MG 1 limits for insulation class, service factor, and motor enclosure type.
- 20 4. Visible Nameplate: Indicating horsepower, voltage, phase, hertz, RPM, full load amps, locked rotor amps, frame size,  
21 manufacturer's name and model number, service factor, power factor, insulation class.
- 22 5. All motors shall have a minimum service factor of 1.15.
- 23 6. All motors shall have ball or roller bearings with a minimum L-10 fatigue life of 150,000 hours.
- 24 7. Coordinate with electrical installer for electrical sizing. Scheduled motor data may not be correct and need to be  
25 verified and corrected prior ordering equipment.
- 26 8. Provide fuses sized for specific motor.
- 27 B. AC MOTORS:
- 28 1. Motor totally enclosed, fan-cooled (TEFC) with main dimensions to NEMA standard. Whenever available 3-phase  
29 motor shall be used as opposed to single-phase.
- 30 2. All single phase motors to have inherent thermal overload protection.
- 31 3. Motors for emergency smoke ventilation shall use insulation class F or H as noted below:
- 32 a. F-rated: minimum of 5 hours of operation at 150 °C and 2 hours at 250°C
- 33 b. H-rated: minimum of 4 hours of operation at 260 °C and 1 hours at 300°C
- 34 c. Verify the proper rotation of each three-phase motor as it is being wired or before the motor is energized
- 35 C. MOTORS ON VFD
- 36 a. Meet NEMA MG 1-2011, Part 30, performance standards for general-purpose motors used with VFDs. When  
37 operated under usual service conditions, no significant reduction in service life should occur if the peak voltage  
38 at the motor terminals is limited to 1,000 V and rise times equal and exceed 2 microseconds. If peak voltages are  
39 expected to exceed 1,000 V or rise times will be less than 2 microseconds, a definite-purpose, inverter-duty  
40 motor and/or harmonic suppression filter, load reactor, or other voltage conditioning equipment are required.
- 41 b. Ground input and output of VFD
- 42 c. All motors operated on variable frequency drives shall be rated for VFD operation and equipped with a  
43 maintenance-free, AEGIS SGR Conductive MicroFiber Shaft Grounding Ring (SGR) to meet NEMA MG-1, 3.4.4.4.3  
44 requirements and to discharge damaging shaft voltages away from the bearings to ground. SGR's Service Life  
45 shall be equal or higher to service life of motor. SGR shall be factory installed inside the motors by the  
46 manufacturer wherever possible and label shall clearly indicate the presence of a grounding assembly. SGR's may  
47 be field installed by installing contractor subject to Engineer's approval. Provide AEGIS SGR Colloidal Silver Shaft  
48 Coating on shafts prior to rings installation, per SGR manufacturer's recommendations, after first cleaning shafts.
- 49 d. Motors up to 100 HP shall have insulated bearing on the non-drive end and a shaft grounding ring on the drive  
50 end of the motor with the exception of line contact bearings in the drive end of the machine. In this instance the  
51 line contact bearing must be electrically insulated and the AEGIS Bearing Protection Ring installed on the  
52 opposite drive end of the motor.
- 53 e. Bond from the motor foot to system ground with a high-frequency ground strap made of flat braided, tinned  
54 copper with terminations to accommodate motor foot and system ground connection. Provide AEGIS HF Ground  
55 Straps.
- 56 D. EC MOTORS (ECM):
- 57 1. Motor shall be electronic commutation (EC) motor specifically designed for applications.AC induction type motors are  
58 not acceptable.

- 1           2. Motors shall be permanently lubricated with heavy-duty ball bearings to match the load and prewired to the specific
- 2           voltage and phase. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the
- 3           motor. Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled by
- 4           either a potentiometer dial mounted on the motor or by a 0-10 VDC signal. Motor shall be a minimum of 85%
- 5           efficient at all speeds.
- 6    E. Mount motors on a rigid base designed to accept a motor, using shims if required under each mounting foot to get a
- 7           secure installation.
- 8    F. Flexible Coupling: mount coupling to the shafts in accordance with the coupling manufacturer's recommendations. Using
- 9           a dial indicator, check angular misalignment and run-out of the two shafts; adjust motor position as necessary so that the
- 10           angular misalignment of the shafts does not exceed 0.002 inches per inch diameter of the coupling hub.
- 11    G. Belt Drive: Mount sheaves on the appropriate shafts in accordance with the manufacturer's instructions. Use laser-
- 12           alignment tool to check alignment of the sheaves; reposition sheaves as necessary. After sheaves are aligned, loosen the
- 13           adjustable motor base so that the belt(s) can be added and tighten the base so that the belt tension is in accordance with
- 14           the drive manufacturer's recommendations. Frequently recheck belt tension and adjust if necessary during the first day of
- 15           operation and again after 80 hours of operation.
- 16    H. Lubricate all motors requiring lubrication. Record lubrication material used and the frequency of use.
- 17    I. SHAFT GROUNDING:
- 18           1. Install the SGR so that the aluminum frame maintains an even clearance around the shaft. Conductive microfibers
- 19           shall be in full circumferential contact with conductive metal surface of the shaft. Do not use thread lock to secure the
- 20           mounting screws as it may compromise the conductive path to ground. If thread lock is required, use a small amount
- 21           of EP2400 AEGIS Conductive Epoxy to secure the screws in place.
- 22           2. Shafts shall be clean and free of any coatings, paint, or other nonconductive material (clean to bare metal). Clean with
- 23           emery cloth or Scotch-Brite. If the shaft is visibly clean, a non petroleum based solvent may be used to remove any
- 24           residue. Check the conductivity of the shaft using an ohm-meter. Place the positive and negative meter leads on the
- 25           shaft at a place where the microfibers will contact the shaft. Maximum resistance shall 2 ohms. If the reading is
- 26           higher, clean the shaft again and retest.
- 27           3. After motors with SGR are fully installed test for a conductive path to ground using an Ohm-meter. Place one probe
- 28           on metal frame of SGR and one probe on motor frame. Motor must be grounded to common earth ground with
- 29           variable frequency drive according to applicable standards. Verify that SGR installations and test readings comply with
- 30           SGR manufacturer's requirements.

**2.4. METERS AND GAGES**

- 33    A. PIPE WELLS:
- 34           1. Basis of Design: ACI A/2.5"
- 35           2. 0.26" bore diameter.
- 36           3. Stainless Steel 304SS with 1/2" NPT process thread, 1/2" NPS instrument thread
- 37           4. Intersection Length: 2.5"
- 38           5. Well shall not protrude into pip by more than 25% of pipe diameter. Install in Tee or weldolet as required
- 39    B. PIPE THERMOMETERS:
- 40           1. Basis of Design: Weiss 5VBM25, US Gauge ADJ-5-2.5
- 41           2. Stem Length 2.5" unless thermo-well requires different length
- 42           3. 5" adjustable Display; at owner's choice a smaller display may be allowed for locations clearly visible.
- 43           4. Stainless Steel Stem with 1/2" NPT connection
- 44           5. Dual Scale °F and °C

Service	Scale Range °F	Scale Range °C	Increment °F
Hot Water	0 - 200	-15 - 90	2
Chilled / Condenser / Geothermal	0 - 120	-15 - 50	2
Solar Hot Water	30 - 250	0 - 120	2

- 45    C. DUCT THERMOMETER
- 46           1. Basis of Design: Trerice BX9-9-012
- 47           2. 3-hole duct attachment
- 48           3. 12" insertion (6" acceptable in ducts <= 12")
- 49           4. 9 inch scale spirit filled
- 50           5. Dual Scale °F and °C

Service	Scale Range °F	Scale Range °C	Increment °F
Outside Air	-40 - 110	-40 - 40	2
All other air	30 - 130	0 - 55	1

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D. P/T (PRESSURE/TEMPERATURE) TEST PLUGS

1. Basis of Design: Peterson Equipment Model 400, Watts LFTP-E
2. Stainless Steel plug with 1/4" NPT threads, EPDM or neoprene valve core, knurled cap with cap strap. Use extended length plugs to clear insulated piping. Adaptors shall have 1/4" FPT connection for standard pressure gauges.

E. WATER PRESSURE GAUGES:

1. Basis of Design: Weiss TL45-4L
2. Cast aluminum case of not less than 4.5 inches in diameter, double strength glass window, black lettering on a white background, phosphor bronze bourdon tube with bronze bushings, recalibration from the front of the dial, 99% accuracy over the middle half of the scale, 98.5% accuracy over the remainder of the scale, with scale range as follows or as relief valve range. At owner's choice a smaller display may be allowed for locations clearly visible.
3. Install with shut-off ball-valve to allow replacement without pipe-draining.
4. Install snubber for each gage.
5. Dual Scale psi and kPa

Service	Scale Ranke psi	Scale Ranke kPa	Increment psi
Hot Water	0 – 1.5 times relief valve setting		1
Chilled Water	System pressure + maximum available pumphead		1
Compressed Air	0 - 200	0 - 1400	2

F. FILTER GAUGES:

1. Basis of Design: Dwyer, Series 2000
2. Direct reading, 4" dial type, Scale range 2 in-wg
3. Lettering shall be black figures on white background. Installed to be read from outside of device.

**2.5. HANGERS AND SUPPORT**

A. Overhead Supports Basis of Design:

1. Adjustable Clevis Hanger: Pipe Shields A1000 (hot fluid) or A 2000 (chilled Fluid) or FNW Figure 7005E (epoxy finish) for un-insulated pipe.
2. Adjustable Pipe Roll: Pipe Shields A3000 (hot fluid) or A 4000 (cold fluid)

B. Wall Support Basis of Design:

1. Carbon steel welded bracket with hanger. B-Line 3068 Series, Grinnell 194 Series. Perforated, epoxy painted finish, 16-12 gauge, min., steel channels securely anchored to wall structure, with interlocking, split-type, bolt secured, galvanized pipe/tubing clamps. B-Line type S channel with B-2000 series clamps, Grinnell type PS 200 H with PS 1200 clamps.
2. Flat Surface: Pipe Shields A1000 (hot fluid) or A 2000 (chilled Fluid)
3. Pipe Roll: Pipe Shields A3000 (hot fluid) or A 4000 (cold fluid)

C. Vertical Support Basis of Design:

1. Pipe Shields E100
2. Secure to structure below each floor

D. Floor Support: Carbon steel pipe saddle, stand and bolted floor flange. B-Line B3088T/B3093.

E. SUPPORT STRUCTURE:

1. Unistrut pre-galvanized P1000 or similar with electro-galvanized bolts, nuts and washers.
2. In corrosive environments use hot-dipped galvanized channel and stainless steel bolts, nuts and washers.
3. Design and size for the loads.

F. BEAM CLAMPS

1. MSS SP-58 Type 23 malleable black iron clamp for attachment to beam flange to 0.62 in thick for single threaded rods of 3/8, 1/2, and 5/8 inch diameter, for use with pipe sizes 4 inch and less. Furnish with hardened steel cup point set screw. Anvil fig. 86.
2. MSS SP-58 Type 28 or Type 29 forged steel jaw type clamp with a tie rod to lock clamp in place, suitable for rod sizes to 1-1/2 inch diameter but limited in application to pipe sizes 8 inch and less without prior approval. Anvil figure 228.

G. CONCRETE INSERTS

1. Poured in Place:
  - a. MSS SP-69 Type 18 wedge type to be constructed of a black carbon steel body with a removable malleable iron nut that accepts threaded rod to 7/8 inch diameter. Wedge design to allow the insert to be held by concrete in compression to maximize the load carrying capacity. B-Line B2505, Grinnell 281.
  - b. MSS SP-69 Type 18 universal type to be constructed of black malleable iron body with a removable malleable iron nut that accepts threaded rod to 7/8 inch diameter. B-Line B3014N, Grinnell 282.
2. Drilled Fasteners: Carbon steel expansion anchors, vibration resistant, with ASTM B633 zinc plating, minimum tension load of 3200 pounds. Use drill bit of same manufacturer as anchor. Manufactured By: Hilti, Powers/Rawl, Redhead, Sammys

- 1 H. Do not fasten supports to piping, ductwork, mechanical equipment, cable tray or conduit. Do not drill structural steel  
 2 members unless approved by owner. Fabricate supports from galvanized structural steel or steel channel, rigidly welded or  
 3 bolted to present a neat appearance.
- 4 I. WOOD INSERTS:
- 5 1. Carbon steel coach screw rods machine threaded on opposite ends, minimum 3/8" diameter. Anvil Figure 142.  
 6 2. Carbon steel side beam bracket with minimum 3/8" rod size and fastened with minimum 1/2" x 3" lag screws. Anvil  
 7 Figure 207
- 8 J. STEEL HANGER RODS:
- 9 1. Basis of Design B-Line B3205 black finish. Provide adjusting and lock nuts.  
 10 2. Size rods for individual hangers and trapeze support as indicated in the following schedule. Total weight of equipment,  
 11 including valves, fittings, pipe, pipe content, and insulation, are not to exceed the limits indicated.

Maximum Load (Lbs.)	Rod Diameter (in.)
600	3/8
1100	1/2
1800	5/8
2700	3/4
3800	7/8
4900	1
8000	1.25
11600	1.5

- 12 K. CORROSIVE ATMOSPHERE COATINGS: Factory coat supports and anchors used in corrosive atmospheres with hot dip  
 13 galvanizing after fabrication, ASTM A123, 1.5 ounces/square foot of surface, each side. Mechanical galvanize threaded  
 14 products, ASTM B695 Class 150, 2.0 mil coating. Field cuts and damaged finishes to be field covered with zinc rich paint of  
 15 comparable thickness to factory coating. Corrosive atmospheres include Exterior locations, Washbays, Parking ramps,  
 16 Swimming pool equipment rooms, Chemical storage and hazardous waste storage rooms, Wet wells, Sanitary pumping  
 17 stations, Food service/kitchen areas, Walk-in coolers/freezers, Locker/shower rooms, Greenhouses, Meter Pits

- 18 L. ROOF MOUNTED SUPPORTS
- 19 1. Use for all pipe and ductwork on roof. Secure bottom of support flat on roof deck. Apply two coats of zinc rich paint to  
 20 cut edges of all galvanized steel elements. Flash and Counterflash.
- 21 2. Use galvanized structural steel members supported by pipe supports and use pipe or duct rollers fastened to the  
 22 structural member. Pipe supports to be secured to the roof structure and sealed per pipe penetrations through roof  
 23 specifications as specified in this section.
- 24 3. For longest support member 36" and shorter: minimum support height 18"  
 25 4. For longest support member 36" and longer: minimum support height 36"

- 26 M. EQUIPMENT CURBS
- 27 1. Prefabricated Metal Curb: Constructed of not less than 18 gauge galvanized steel reinforced so it is structurally capable  
 28 of supporting the intended load with no penetrations through the curb flashing, inside and outside corner sections that  
 29 are mitered and continuously welded, filled with 3 pound density rigid fiberglass insulation, integral deck mounting  
 30 flange, nominal two inch wood nailer, galvanized steel counter flashing. Do not use built-in metal base flashings or  
 31 cants. Use 18 inch high equipment curbs where the curb completely surrounds the perimeter of the equipment and  
 32 there is no roof exposed to the weather.
- 33 2. Wood Build Sleeper Curb: Constructed of wood blocking and anchored to the deck. The curb must be structurally  
 34 capable of supporting the intended load with no penetrations through the curb flashing. Galvanized steel counter  
 35 flashing. Do not use built-in metal base flashings or cants. Use 18 inch high equipment curbs where the curb  
 36 completely surrounds the perimeter of the equipment and there is no roof exposed to the weather.
- 37 3. Secure bottom of support flat on roof deck. Secure equipment to curb in accordance with equipment manufacturer's  
 38 instructions. Flash and Counter-flash. Fill the entire void space with compressible fiberglass insulation.

- 39 N. INSTALLATION OF PIPING SUPPORT
- 40 1. Multiple or Trapeze Hangers: Where several pipes are running parallel and pitching in the same direction, strut style  
 41 support may be used. Steel channel, 12-gauge thickness, Dura-Green epoxy coating or electro-plated, B-Line B11.
- 42 2. Multiple Pipe Roof Penetrations: An 8" high (minimum) curb height is required. The coping cap shall be constructed  
 43 from laminated acrylic clad thermoplastic (ABS) with graduated step boots to accommodate various size pipes, stainless  
 44 steel fastening screws for cover, stainless steel band clamps for securing boots around the pipe, and stainless steel band  
 45 clamp or mechanical locking seal for securing boots around the ABS coping cap flanges. Flash and Counterflash.
- 46 3. Single Pipe Roof Penetrations: A stack flashing penetration may be utilized for single pipe penetrations through built up  
 47 roofs and single ply membrane roofs. Utilize high temperature sealant for all high temperature applications. This  
 48 includes but is not limited to steam condensate vent piping, steam safety relief piping, and flues. A single pre-  
 49 manufactured boot may be utilized for single pipe penetrations through single ply membrane roofs only. Flash and  
 50 Counterflash.
- 51 4. Place a hanger within 12 inches of each horizontal elbow, valve, strainer, or similar piping specialty item. Space Hangers  
 52 as follows:

Pipe Material	Pipe Size	Max. Hor. Spacing	Max. Vertical Spacing
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Steel	0.5" - 1.25"	6.5'
Steel	1.5" - 6"	10'
Steel	8" - 12"	14'
Steel	14" and over	20'
Plastic	All	6'
Copper	0.5" - 1.25"	5'
Copper	1.5" and larger	8'

- 1 5. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.
- 2 6. Piping connected to base mounted pumps, compressors, or other rotating or reciprocating equipment is to have
- 3 vibration isolation supports for a distance of one hundred pipe diameters or three supports away from the equipment,
- 4 whichever is greater. Standard pipe hangers/supports as specified in this section are required beyond the 100 pipe
- 5 diameter/3 support distance.
- 6 7. Piping flexible connections and vibration isolation supports are required for piping connected to coils that are in a fan
- 7 assembly where the entire assembly is mounted on vibration supports; the vibration isolation supports are required for
- 8 a distance of one hundred pipe diameters or three supports away from the equipment, whichever is greater. Piping
- 9 flexible connection and vibration isolation supports are not required when the fan section is separately and
- 10 independently isolated by means of vibration supports and duct flexible connections. Standard pipe hangers/supports
- 11 as specified in this section are required when there are no vibration isolation devices in the piping and beyond the 100
- 12 pipe diameter/3 support distance.
- 13 O. INSTALLATION:
- 14 1. Provide all supporting devices as required for the installation of mechanical equipment and materials. All supports and
- 15 installation procedures are to conform to the latest requirements of the ANSI Code for pressure piping.
- 16 2. Do not hang any mechanical item directly from a metal deck or run piping so it rests on the bottom chord of any truss
- 17 or joist.
- 18 3. Support apparatus and material under all conditions of operation, variations in installed and operating weight of
- 19 equipment and piping, to prevent excess stress, and allow for proper expansion and contraction.
- 20 4. Protect insulation at all hanger points
- 21 5. Provide all supporting steel required for the installation of mechanical equipment and materials, whether or not it is
- 22 specifically indicated or sized, including angles, channels, beams, etc. to suspend or floor support tanks and equipment.
- 23 6. Piping supported by laying on the bottom chord of joists or trusses will not be accepted.
- 24 7. Fasteners depending on soft lead for holding power or requiring powder actuation will not be accepted.
- 25 8. Allow sufficient space between adjacent pipes and ducts for insulation, valve operation, routine maintenance, etc.
- 26 9. Hangers shall be insulated and a load distribution shield or pipe or sturdy insulation shall prevent insulation collapse.
- 27 10. Anvil, B-Line, Fee and Mason, FNW, Kindorf, Michigan Hanger, Pipe Shields, Unistrut, or approved equal.

**2.6. VIBRATION AND SEISMIC CONTROL**

**A. PERFORMANCE REQUIREMENTS:**

- 31 a. Isolate all motor driven mechanical equipment from the building structure and from the systems which they serve
- 32 to prevent equipment vibrations from being transmitted to the structure. Consider equipment weight distribution
- 33 to provide uniform isolator deflections.
- 34 b. For equipment with variable speed capability, select vibration isolation devices based on the lowest speed.
- 35 c. Provide flexible piping connections for all piping to rotating or reciprocating equipment mounted on vibration
- 36 isolators except do not use flexible piping connectors on any type of gas piping or with inline pumps. Piping
- 37 connected to a coil which is in an assembly mounted on vibration isolators is to have flexible piping connections and
- 38 piping vibration hangers as specified below. Piping connected to a coil which is in an assembly where the fan is
- 39 separately isolated by means of vibration isolators and duct flexible connections does not require flexible piping
- 40 connectors or piping vibration hangers. Install flexible piping connections on the equipment side of shut-off valves.
- 41 Pipe supports or hangers located between the flexible piping connection and the equipment shall also be provided
- 42 with vibration isolation devices. Suitable for pressure, temperature, and fluid involved; minimum pressure rating for
- 43 any system is 125 psig at the design temperature of the fluid. Use 12-inch minimum line length of flexible hose or
- 44 length required to absorb 3/4" lateral movement, whichever is greater.
- 45 d. Select vibration isolation devices for minimum deflection as indicated below or to provide not less than 95%
- 46 isolation efficiency, whichever is greater.

Type of Equipment	On Grade	20' floor Span	30' Floor Span	40' Floor Span	Note
Refrigeration	0.1" / Pad	0.75" / Floor Mount	1.5" / Floor Mount	1.5" / Floor Mount	
Pump base-mounted	Bolt to Pad	0.75" / Floor Mount	1.5" / Floor Mount	1.5" / Floor Mount	
Air-cooled Condenser	Bolt to Pad	0.75" / Floor	1.5" / Floor	2.5" / Floor	

		Mount	Mount	Mount	
AHU Floor mounted <= 5hp	0.35" / Floor Mount	0.75" / Floor Mount	0.75" / Floor Mount	0.75" / Floor Mount	Not required for internally isolated fans
AHU Floor mounted >= 5hp	0.35" / Floor Mount	1.5" / Floor Mount	1.5" / Floor Mount	1.5" / Floor Mount	
AHU suspended <= 5hp		1" / Spring Hanger	1" / Spring Hanger	1" / Floor M/ Spring Hanger out	
AHU suspended >= 5hp		1.5" / Spring Hanger	1.5" / Spring Hanger	1.5" / Spring Hanger	
Compressor	1" / Floor Mount	1.5" / Floor Mount	2.5" / Floor Mount	3.5" / Floor Mount	
Fan <= 224 rpm	0.35"	3.5"	4.5"	4.5"	Floor Mount or Spring Hanger
Fan 225-299 rpm	0.35"	3.5"	3.5"	3.5"	
Fan 300-374 rpm	0.35"	2.5"	2.5"	3.5"	
Fan 375-499 rpm	0.35"	1.5"	2.5"	3.5"	
Fan >= 500 rpm	0.35"	0.75"	1.5"	2.5"	

- 1 B. Procedures and material are based on Mason industries bulletin VCS-100-13
- 2 C. Coordinate the selection of devices with the isolator and equipment manufacturers.
- 3 D. MATERIALS:
- 4 1. APPROVED MANUFACTURERS: Mason Industries, Amber/Booth Co., Vibration Mounting & Controls, Peabody Noise
- 5 Control.
- 6 2. Use materials that will retain their isolation characteristics for the life of the equipment served. Use industrial grade
- 7 neoprene for elastomeric materials.
- 8 3. Treat all isolators to resist corrosion. For isolation devices exposed to the weather or used in high humidity areas, hot
- 9 dip galvanize steel parts, apply a neoprene coating on all steel parts, or use stainless steel parts; include limit stops to
- 10 resist wind.
- 11 4. Provide pairs of neoprene side snubbers or restraining springs where side torque or thrust may develop.
- 12 5. Use isolators with a ratio of lateral to vertical stiffness not less than 1.0 or greater than 2.0.
- 13 6. Provide rails and other material by same manufacturer.
- 14 E. PAD:
- 15 1. BASIS OF DESIGN: Mason W-Neoprene Waffle Pad;
- 16 2. Ni-Ntrile Waffle pad for locations with exposure to oil, grease or gasoline. Locations called out to be shops or to store
- 17 such material require this type even if not called on plans.
- 18 3. For concentrated loads provide Mason WMSW (cemented with friction pad) or Mason MBSW (bolted)
- 19 F. FLOOR MOUNT:
- 20 1. BASIS OF DESIGN: Mason SLR
- 21 2. INERTIA BASE: Rectangular structural beam or channel concrete form for floating foundation. Include support for
- 22 suction and discharge base ells for split case pump bases. Use perimeter steel members with a minimum depth equal
- 23 to 1/12 of the longest dimension of the base but not less than 6"; base depth need not exceed 12" unless specifically
- 24 recommended by the base manufacturer for mass or rigidity. Include concrete reinforcements consisting of steel
- 25 angles or 1/2" bars welded in place on 6" centers running in two layers perpendicular to each other and 1-1/2" above
- 26 the bottom; provide additional steel if required by the structural conditions. Furnish form with steel bolting templates
- 27 and anchor bolt sleeves to receive equipment anchor bolts where anchor bolts fall in concrete locations. Use height
- 28 saving brackets in all mounting locations to maintain a base clearance of at least 1" above the floor or housekeeping
- 29 pad. Mason type KSL or BMK
- 30 G. SPRING HANGERS:
- 31 1. BASIS OF DESIGN: Mason PC30N
- 32 2. Design hanger with a release mechanism to free the spring after the installation is complete and the hanger is subjected
- 33 to its full load. Pre-compressed to the rated deflection to keep the piping or equipment at a fixed elevation during
- 34 installation.
- 35 3. Applications not allowing horizontal movement: Mason HES
- 36 4. Duct isolation hangers (where required): Mason 30N
- 37 H. VERTICAL PIPE ANCHOR AND GUIDE:

- 1 1. All directional acoustical pipe anchor and guide consisting of a telescopic arrangement of two sizes of steel tubing  
2 separated by a minimum half inch thickness of heavy duty neoprene and duck or neoprene isolation material. Provide  
3 vertical restraints of similar material to prevent vertical travel in either direction. Design isolation materials for a  
4 maximum allowable load of 500 psi, balanced for equal resistance in any direction. Mason type ADA .
- 5 I. HORIZONTAL THRUST RESTRAINT:  
6 1. Spring element in series with a neoprene pad as described for Type 3 mount with the same deflection as specified for  
7 the mounting or hanger. Design the assembly so the spring element is contained within a steel frame, so it can be  
8 preset for thrust at the factory, and adjusted in the field for a maximum of 1/4" movement at start and stop. Include  
9 threaded rod and angle brackets for attachment to both equipment and ductwork or equipment and structure. Mason  
10 type WB.
- 11 J. FLEXIBLE PIPE CONNECTORS:  
12 1. Multiple plies of nylon tire cord fabric reinforced with an EPDM cover and liner. Do not use steel wire or rings as  
13 pressure reinforcement. Use soldered connections for sizes 2" and smaller and floating steel or ductile iron flanges for  
14 sizes 2-1/2" and larger; design the steel flange end so the steel flange is recessed to lock a steel wire bead ring in the  
15 raised face of the EPDM flange. Construct straight-through connections with twin spheres. Use control rods when  
16 recommended by the manufacture  
17 2. Large Expansion: Mason VFL  
18 3. Small Expansion: Mason CPSB, FFL or equivalent.
- 19 K. FLEXIBLE DUCT CONNECTORS:  
20 1. BASIS OF DESIGN: Ventfabrics Ventglas (indoor) and Ventlon (outdoor)  
21 2. Use on all duct connection to equipment with fans.  
22 3. Material to be fire retardant, be UL 214 listed, and meet the requirements of NFPA 90A.  
23 4. Connections to be a minimum of 3 inches wide, crimped into metal edging strip, and air tight. Connections to have  
24 adequate flexibility and width to allow for thermal expansion/contraction, vibration of connected equipment, and other  
25 movement.  
26 5. Use coated glass fiber fabric for all applications. Material for inside applications other than corrosive environments,  
27 fume exhaust, or kitchen exhaust to be double coated with neoprene, air and water tight, suitable for temperatures  
28 between -10°F and 200°F, and have a nominal weight of 30 ounces per square yard. Material used for outdoor  
29 applications other than corrosive environments, fume exhaust, or kitchen exhaust to be double coated with Hypalon,  
30 air and water tight, suitable for temperatures between -10°F and 250°F, and have a nominal weight of 26 ounces per  
31 square yard.  
32 6. For corrosive environments or fume exhaust applications indoors or outdoors, use a material coated with Teflon that is  
33 air and water tight, suitable for temperatures between -20°F and 500°F, and has a nominal weight of 14 ounces per  
34 square yard. Basis of Design: Ventfabrics Ventel.  
35 7. Do not use connectors in kitchen exhaust ducts. Use upblast fans that are roof mounted on curbs and have no direct  
36 connection between the exhaust duct and the fan housing. Connectors that have the temperature properties that may  
37 be needed in this application will absorb the grease being conveyed; this could provide fuel to a fire if one developed.  
38 8. Install at all duct connections to rotating or vibrating equipment, including air handling units (unless unit is internally  
39 isolated), fans, or other motorized equipment in accordance with SMACNA Figure 2-19. Install thrust restraints to  
40 prevent excess strain on duct flexible connections at fan inlets and outlets.  
41 9. For applications in corrosive environments or fume exhaust systems, use a double layer of the Teflon<sup>®</sup> coated fabric  
42 when making the connector.
- 43 L. SUSPENDED FANS:  
44 1. Install horizontal thrust restraint if air thrust exceeds 10% of weight. Attach horizontal thrust restraints at centerline of  
45 thrust and symmetrically on either side of unit. Thrust restraints are not required when fan section is not isolated from  
46 remainder of ductwork or AHU by means of duct flexible connections.
- 47 M. VERTICAL PIPE RISERS GREATER THAN 30 FEET IN HEIGHT:  
48 1. Use type 7 hangers at the top of the riser and type AG with pipe clamps at intermediate points.
- 49 N. DUCTWORK IN MECHANICAL EQUIPMENT ROOMS:  
50 1. Use type 8 hanger with .75" minimum deflection for all ducts with a cross sectional area greater than 2.0 square feet  
51 and, where either the air velocity is great than 3500 fpm or, the pressure class is 4" water column or higher.
- 52 O. ISOLATION DEVICES OUTDOORS OR IN HIGH HUMIDITY AREAS:  
53 1. Use only hot dip galvanized, stainless steel, or neoprene coated steel parts.
- 54 P. PACKAGED AIR HANDLING UNITS AND CENTRIFUGAL FANS:  
55 1. Attach horizontal thrust restraints at the centerline of thrust and symmetrically on either side of the unit. Thrust  
56 restraints are not required when the fan section is not isolated from the remainder of the air handling unit by means of  
57 duct flexible connections.  
58 2. Do not allow installation practices to short circuit isolation devices.

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**2.7. CONTROL OPTIONS**

- A. Heating equipment (UH-1, EH-1) to run with stand alone thermostats, with setpoint not to exceed 50 F. Thermostat required to have temperature limiting device and locking covers.
- B. EF-1 to run when any occupancy sensor goes to occupied mode. Long off delay (30 minutes)
- C. DF-1 to be interlocked with EF-1.
- D. EF-2 to run 24/7.

**2.8. PLEATED PANEL FILTERS**

- A. MANUFACTURER: American Air Filter or approved equal
- B. Pleated panels, 100% synthetic, self supported media fully bonded and sealed in cardboard frame.
- C. 1" w.c. recommended final resistance
- D. MERV 8 Filter:
  - 1. Use for all air intake and space-circulated air to protect equipment
  - 2. Basis of Design: Use 2" thick PerfectPleat Ultra, PerfectPleat HD M8, Perfect Pleat HC M8
  - 3. Media nominal rating to be 500 FPM face velocity, 0.23 inch WG initial resistance

**PART 3 - EXECUTION**

**3.1. TESTING, ADJUSTING, AND BALANCING**

- A. Contractor shall be an independent Firm specializing in the Testing and Balancing of HVAC systems for a minimum of 3 years. Contractor shall be a certified member of AABC or certified by NEBB or TABB in the specific area of work performed. Maintain certification for the entire duration of the project.
- B. Technicians on this project must have satisfactorily completed work on a minimum of 3 projects of at least 50% in size, and of similar complexity. Size is defined as the quantity of each specific individual item requiring testing and balancing such as, but not limited to, equipment, devices, terminal devices, and grilles and diffusers.
- C. Prior to beginning testing, adjusting and balancing, foreman shall meet with owner and the mechanical system contractors and provide TAB plan for the project. Indicate work required to be completed prior to testing, adjusting, and balancing and identify the party responsible for completion of that work. TAB Plan at minimum shall consist of:
  - 1. Detailed step-by-step procedures for TAB work for each system: terminal flow calibration, diffuser proportioning, branch/sub-main proportioning, total flow calculations, rechecking, diversity issues, expected problems and solutions, etc.
  - 2. List of all airflow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used. Details of how total flow will be determined
  - 3. Specific procedures that will ensure that both air and water side are operating at the lowest possible pressures.
- D. 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.
- E. All instruments used for measurements shall be accurate, and calibration histories for each instrument to be available for examination by owner. Calibration shall be per instrument's manufacturer recommendation.
- F. PRELIMINARY PROCEDURES:
  - 1. Check equipment for proper rotation and belt tension. Verify controls system is complete.
  - 2. 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 verify system completion, readiness for balancing and assist TAB contractor in providing specified system performance.
  - 3. Verify building openings and ceilings are complete.
  - 4. Verify all connected equipment is started up and functioning properly.
- G. PERFORMING TESTING, ADJUSTING AND BALANCING:
  - 1. Cut insulation, ductwork and piping for installation of test probes to the minimum extent necessary for adequate performance of procedures. Patch using materials identical to those removed, maintaining vapor barrier integrity and pressure rating of systems.
  - 2. Account for Viscosity differences of different fluids.
  - 3. Measure motor power draw and compare to design conditions.
  - 4. Permanently mark equipment settings, including damper and valve positions, control settings, and similar devices allowing settings to be restored. Set and lock memory stops. Provide set values of balancing devices in balancing report.
- H. HYDRONIC FLOW BALANCING
  - 1. N/A



- 1 I. AIRFLOW BALANCING:  
2 1. Measure flow in ducts by traversing with procedure (5x5 measurement points minimum) recommended by “TSI Airflow  
3 instruments” Application Note AF-106.  
4 2. Measure flow in diffusers and grilles with flow hood. Alternatively measure flow in branch duct.  
5 3. Verify filters are installed and clean. Verify all dampers work correctly.  
6 4. Final air system measurements to be within the following range of specified cfm:  
Fans: -1% to +5%  
Supply grilles, disusers: -1% to +5%  
Return/Exhaust frilles, registers: -1% to -5%  
Space pressurization: -10% to +10%
- 7 J. VAV SYSTEM:  
8 1. N/A
- 9 K. SINGLEZONE CV SYSTEM:  
10 1. Reduce fan speed to achieve design flow.  
11 2. If applicable, If multiple air terminals should be balanced per procedure below.  
12 3. Re-iterate fan speed adjustment to achieve 100% design flow with critical path damper 100% open.  
13 4. Report final fan speed to Controls Contractor to be used as fan speed. This will be set in VFD or ECM controller.
- 14 L. BALANCE MULTIPLE AIR TEMRINALS IN ZONE:  
15 1. Open all balancing dampers 100% to determine critical path (lowest Design flow / actual flow ratio).  
16 2. Leave this damper 100% open and adjust the remaining dampers to balance flow in each zone.  
17 3. Re-iterate measurements of all diffusers and adjust dampers again if needed. Note that the critical path damper  
18 always is 100% open.  
19 4. Single air terminal zones should not have balancing damper or damper should be wide open.  
20
- 21 **3.2. AIR DISTRIBUTION CLEANING**  
22 A. SCOPE:  
23 1. Protect new exhaust duct from dirt and water entering openings  
24 2. Clean all exhaust duct if dirt or water enters openings, prior to operating fans  
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**END OF SECTION**

**SECTION 26 05 00  
COMMON WORK RESULTS FOR ELECTRICAL**

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**PART 1 – GENERAL**

**1.1. SCOPE**

- 20 A. This section includes information common to electrical work and applies to all sections in this contract.  
21 B. The mention of any article, operation or method requires that the Contractor shall provide same and work in complete  
22 accordance with the conditions stated. The contractor shall provide all material, labor, equipment, tools and transportation  
23 as needed to complete the project according to contract documents. This work includes all items to complete the electrical  
24 installation of all items indicated on the drawings, specified herein, and needed for a complete and operable facility but not  
25 specifically described in any other sections of this document. Among the items required are:  
26 1. Temporary power and lighting.  
27 2. Branch circuit panels for power and lighting.  
28 3. Complete branch circuit wiring system for lighting, motors, receptacles, junction boxes and similar uses.  
29 4. Wall switches, receptacles and similar items.  
30 5. New electrical service per plans.  
31 6. Distribution panels as shown on plans. Include selective coordination study and arc flash study. Label panels per arc flash  
32 study as required by NEC, NFPA 70 and OSHA. Electrical contractor to provide field information for selective coordination  
33 study and arc flash study as required.  
34 7. Complete feeder system, in conduit, to power panels, large individual loads and branch circuit  
35 8. Lighting fixtures.  
36 9. Controls power included in equipment listed elsewhere. This includes but is not limited to HVAC controls.  
37 10. Motors and other electricity-requiring devices in equipment furnished and/or installed by contractor and other parts  
38 requiring electricity. Power from same source as the main unit unless direct otherwise by owner.  
39 11. Emergency Generator: Provide emergency generator systems as required.  
40 12. Necessary equipment as shown on plans.  
41 13. All items and appurtenances necessary, reasonably incidental or customarily included, even though each and every item  
42 is not specifically called out for or shown.  
43 14. Demo work as required. Relocate existing items as required. See drawings and notes.  
44 C. All work shall be installed in accordance with all state and local inspection authorities having jurisdiction together with the  
45 recommendations of the manufacturer whose equipment is to be supplied and installed under this contract.  
46 D. The contractor shall coordinate with the architect and establish exact locations of all materials and equipment to be installed.  
47 Consideration shall be given to construction features, equipment of other trades and requirements of the equipment.  
48 E. Bids to include cost of all necessary permits and review fees.

**1.2. REFERENCES**

- 51 A. Work under this section depends on applicable provisions from other sections and the plan set in this contract. Examples of  
52 related sections include, but are not limited to:  
53 B. NFPA – National Fire Protection Agency  
54 1. NFPA 70 National Electrical Code.  
55 C. NECA - National Electrical Contractors Association  
56 1. NECA "Standard of Installation."  
57 D. All state and local codes.

**1.3. SUBMITTALS**

- 60 A. Shop drawings:  
61 1. Light fixtures including lamp, ballast and driver data

- 1 2. Occupancy sensors
- 2 3. Lighting control panels
- 3 4. Wiring devices
- 4 B. Show variations from contract documents.
- 5 C. The contractor shall not be relieved of responsibility for executing work in accord with contract documents, even though
- 6 such drawings have been approved.
- 7

#### 8 **1.4. QUALITY ASSURANCE**

- 9 A. Furnish products listed and classified by Underwriters Laboratories, inc. as suitable for purpose specified and shown.
- 10 B. INSTALLERS: For the actual fabrication, installation and testing of the work of this section, use only thoroughly trained and
- 11 experienced personnel who are completely familiar with the requirements for this work and with the installation
- 12 recommendations of the Manufacturers of the specified items.
- 13 C. Perform work to meet all codes.
- 14 D. REPLACEMENTS: In the event of damage, immediately make all repairs and replacements necessary to the approval of the
- 15 Architect and at no additional cost to the Owner.
- 16

#### 17 **1.5. RESTRICTIONS IN ADDITION TO CODE REQUIREMENTS**

- 18 A. The following restrictions detail methods and material that are not acceptable even if allowed under NEC:
- 19 1. Aluminum or aluminum-clad conductors are not acceptable.
- 20 2. Shared Neutrals between different branch circuits or other wiring are not acceptable.
- 21 3. Field-marking of cables is not acceptable. All wires need to be in manufactured color.
- 22 4. Combining lighting and other loads in one branch circuit is not acceptable.
- 23 5. Use of grounded circuit conductors metal conduit, raceway or cable trays as sole grounding conductor is not
- 24 acceptable. A separate grounding wire is required.
- 25 6. Omission of bonding jumpers in boxes, and omission of grounding/bonding wires in metal raceways and conduit is not
- 26 acceptable.
- 27 7. Underground wiring without conduit or raceway is not acceptable.
- 28 8. Underground wiring less than 24" deep regardless of concrete pads is not acceptable.
- 29 9. Exposed insulation is not acceptable.
- 30 10. Sizing of conductors at 100% of continuous load only is not acceptable. Conductors shall be sized without the code-
- 31 allowed exceptions for overcurrent devices rated for operation at 100% of its rating.
- 32 11. Electric Nonmetallic Tubing (ENT) is not acceptable.
- 33 12. Knob and tube wiring is not acceptable.
- 34 13. Open wiring on insulators is not acceptable.
- 35 14. Overhead wiring without messenger support is not acceptable.
- 36 15. Device disconnect by circuit breaker only is not acceptable. Devices need separate disconnects.
- 37 16. Cast metal, split or gland type fittings are not acceptable.
- 38

#### 39 **1.6. OPERATION AND MAINTENANCE DATA**

- 40 A. Provide all data required in section "01 78 23 – Operation and Maintenance data"
- 41 B. Submit panel schedules including alterations to existing panels
- 42

### 43 **PART 2 - PRODUCTS**

#### 44 **2.1. MATERIALS**

- 45 A. All equipment and materials shall be new, unless specifically noted otherwise and shall bear the Manufacturer's name,
- 46 trademark and ASME, UL and/or other labels in every case where a standard has been established for the particular item.
- 47 Equipment shall be the latest approved design of the standard product of a manufacturer regularly engaged in the
- 48 production of the required type of equipment and shall be supported by a service organization that is, in the opinion of the
- 49 architect reasonably convenient to the site.
- 50

### 51 **PART 3 – EXECUTION**

#### 52 **3.1. PREPARATION**

- 53 A. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is
- 54 complete to the point where this installation may properly commence.
- 55 B. Verify that all electrical installation may be made in complete accord with all pertinent codes, regulations, drawings and
- 56 specifications.
- 57 C. DISCREPANCIES: In the event of discrepancy, notify the Architect and/or Engineer immediately for clarification. Do not
- 58 proceed until discrepancies have been fully resolved.
- 59 D. CO-ORDINATION OF WORK: The Contractor shall compare the electrical drawings and specifications with the drawings and
- 60 specifications of other trades and report any discrepancies for changes necessary in the electrical work. The electrical work
- 61 shall be installed in cooperation with other trades installing interrelated work. Before installation, the Contractor shall make

- 1 proper provisions to avoid interferences. Changes required in the work of the Contractor caused by neglect to do so, shall  
2 be made at the Contractor's own expense.
- 3 E. VERIFICATION OF DIMENSIONS: The contractor shall visit the premises to verify all dimensions in the field; and shall advise  
4 the Architect and/or Engineer of any discrepancies before performing any work.
- 5

### 6 **3.2. INSTALLATION**

- 7 A. The contractor shall be responsible for the proper location of roughing in and connections by other trades. All changes shall  
8 be made at no increase in the contract amount or additional costs to other trades.
- 9 B. The contractor shall support work and equipment plumb, rigid and true to line. The contractor shall study the general,  
10 structural, mechanical and electrical drawings, shop drawings and catalog data to determine how equipment, fixtures,  
11 conduit, etc. are to be installed and shall provide foundations, bolts, inserts, stands, hangers, brackets and accessories for  
12 proper support whether or not shown on the drawings.
- 13 C. All materials and equipment shall be installed in accord with the approved recommendations of the manufacturer, the best  
14 practices of the trade, and in conformance with contract documents. Should the contractor perform any work that does not  
15 comply with the manufacturer's directions, the contractor shall bear all costs arising in correcting deficiencies.
- 16 D. INTERFERENCES:
- 17 1. Locations: Locations of conduit, equipment, fixtures, etc., shall be adjusted to accommodate the work to interferences  
18 anticipated or encountered. Devices specifically dimensioned on the drawings are critical dimensions and shall installed  
19 as shown. The contractor shall determine the exact route and locations of each conduit prior to installation.
- 20 2. Right-of-way: Lines which pitch shall have right-of-way over those which do not pitch. For example, plumbing drains  
21 shall normally have right-of-way over lines whose elevations can be changed.
- 22 3. Offsets: Offsets and changes in direction in conduit shall be made as required to maintain proper head room and not  
23 interfere with pitch of sloping lines whether or not indicated on the drawings.
- 24 E. Location of lighting switches, outlets and equipment as shown on drawings is approximate and exact locations will be  
25 verified.
- 26 F. Minor modifications in location of switches, outlets and equipment is considered incidental up to a distance of 10 feet with  
27 no additional compensation, provided necessary instructions are given prior to rough in.
- 28 G. Existing Conditions (if applicable):
- 29 1. Move or remove electrical connections, devices or equipment necessary for completion of project and reconnect  
30 reused existing equipment or wiring removed to accommodate new work.
- 31 2. Existing electrical equipment indicated on the drawings as being removed, reworked or relocated, are shown for  
32 guidance and estimating purposes only; additional work found in field or changes required but not shown shall be  
33 included in the base bid.
- 34 3. Existing equipment that is removed shall remain the property of the owner. That which the owner does not want shall  
35 be disposed of by the electrical contractor.
- 36 4. Work involving shutdown of present service and equipment now functioning in present area shall be done at such time  
37 as to provide the least amount of inconvenience to the owner at times established by the owner.
- 38 5. Any existing electrical devices or equipment found at the job site, but not shown on the drawings shall be reconnected  
39 to spare circuit breakers in new panels, if such circuits are necessary for operation of the remodeled portion of the  
40 building.
- 41 6. Locations and elevations of utilities have been obtained from utility maps or other sources and are offered as a general  
42 guide only without guarantee as to accuracy. The Contractor shall verify the location and elevation of utilities and their  
43 relation to the work before beginning work.
- 44 H. Unless otherwise specified, job finish painting will be done by the painting contractor. Electrical equipment shall have a  
45 baked enamel finish. The electrical contractor shall restore damaged painted surfaces of electrical equipment to its original  
46 condition.
- 47 I. The electrical contractor shall daily remove crates, boxes, metal cuttings and debris from the building. At the end of the  
48 project, all electrically related debris shall be removed and the building shall be left in a clean condition.
- 49 J. The electrical contractor shall leave all electrical equipment (interior and exterior), in a clean condition.
- 50

### 51 **3.3. FIELD QUALITY CONTROL**

- 52 A. Control circuits, branch circuits, feeders, motor circuits and transformers:
- 53 1. Megger check of phase-to-phase and phase-to-ground insulation levels. Do not megger check solid state equipment.
- 54 2. Continuity.
- 55 3. Short circuit.
- 56 4. Operational check.
- 57 B. Wiring devices: Test receptacles with Hubbell 5200, Woodhead 1750 or equal tester for correct polarity, proper ground  
58 connection and wiring faults.
- 59
- 60

**END OF SECTION**

**SECTION 26 09 23**  
**LIGHTING CONTROL DEVICES**

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**PART 1 – GENERAL**

**1.1. SCOPE**

A. This section includes information common to and applies to all sections in this Division.

**1.2. SPARE PARTS**

A. Provide the following devices as a spare parts. Provide one per specific model used in this project:

1. Sensor
2. Analog dimmer
3. Rewind timer

**PART 2 - PRODUCTS**

**2.1. INTERIOR MOTION AND PHOTO SENSORS**

A. BASIS OF DESIGN MANUFACTURER: Sensorswitch

B. Operate with 120-277V and 0-10V dimming signal

1. Low voltage sensors will not be acceptable except:

- a. Retrofit installations where line-voltage conduit installation would not be possible. This include installation behind existing drywall
- b. Where plans indicate use of low-voltage control is acceptable
- c. Where low-voltage control is allowed, use the low-voltage sensor and power pack version of the scheduled line-voltage sensors. Include same features. Schedules will show the line-voltage device regardless. No cost shall be added to contract due to use of low-voltage controls.

C. Occupancy Detection based on Combination of (IR) Technology and passive microphonic (PM) based on scheduled sensor.

D. Where daylight is present, photosensor shall control dim-level of associated fixtures. After sufficient daylight is detected, lights shall be completely turned off. Sensors shall be able to auto calibrate and to differentiate between artificial and natural light. Adaptive delay must prevent system from cycling on cloudy days.

E. Where fixtures operate on 2-poles (e.g. 208V) a 2-pole sensor shall be used and included in bid price.

F. Plans will show sensor locations. Sensors shall be located to enable early detection when person enters the zone but shall also avoid detection bypassing persons in adjacent zones. Locations on plans may have to be adjusted to enable proper function. Coordinate final sensor location with engineer prior installation.

G. Sensors shall receive permanent label indicating the model number. Label shall be placed under removable sensor cover.

H. Flexible conduit behind suspended ceiling (i.e. acoustic, drywall) shall enable relocation of sensor by 5 feet in any direction.

I. Sensors mounted to fixtures may be the scheduled sensor or an equal fixture-mounted type with appropriate bracket.

**2.2. ANALOG DIMMERS 0-10V**

A. BASIS OF DESIGN: Wattstopper RH4BL3PW

B. Color: Match face plate color in same space

C. 3-way installation where indicated on plans

D. Manual Switch shall switch line voltage to downstream controls and fixtures

E. 0-10V sliding dimmer shall control dimming level. Flicker-free from 1-100%

**2.3. DIMMERS LINE-VOLTAGE (TRACK LIGHTING)**

A. BASIS OF DESIGN:

1. Use scheduled dimmer approved by track fixture manufacturer.

- 1 2. Use 400VA model or higher.
- 2 3. If the listed model is not available, an equal model (same functionality and same model, but re-branded) will be accepted. The
- 3 originally listed manufacturer has to confirm the model is functionally and electrically the same.
- 4 B. Install in separate single-gang box to avoid de-rating.
- 5

### 6 **2.3. REWIND TIMER**

- 7 A. BASIS OF DESIGN: Intermatic FD/FF series
- 8 B. No hold function shall be implemented
- 9 C. Electromechanical spring wound timer
- 10 F. Color: Match face plate color to surrounding in finished spaces. Brushed metal in unfinished spaces.
- 11 D. Select Model based on length of time indicated on plans
- 12 E. Switch shall be rated for 120/277V, 800W load.
- 13

### 14 **2.4. PROGRAMMABLE TIMERS**

- 15 A. BASIS OF DESIGN: Intermatic ET 2800 Series
- 16 B. Minimum Features:
  - 17 1. 120-277V wide range input
  - 18 2. Astronomic time and dusk-dawn scheduling
  - 19 3. Holiday programming
  - 20 4. 100-hour superconductor
  - 21 5. Non-volatile EEPROM
  - 22 6. LED compatible
  - 23 7. Relays with zero-crossing technology
- 24 C. Models:
  - 25 1. 1-circuit: ET2805C
  - 26 2. 2-circuit: ET2825C
  - 27 3. 4-Circuit: ET2845C
  - 28 4. For exterior or wet-rated installation use NEMA 3R-rated version
- 29

### 30 **2.5. SWITCHES**

- 31 A. 20 Amp commercial specification grade series unless noted otherwise
- 32 B. SINGLE POLE SWITCH: P&S CSB20AC1, Hubbell: CBS120 or Leviton: CSB1-20
- 33 C. 3- AND 4-WAY SWITCHES: Same series and quality as single-pole
- 34 D. When water is near switch, use code-approved type of switch for the location.
- 35 E. Color: typically white or per architect and owner.
- 36 F. Install switches with OFF position down.
- 37 G. Install multi-switches close together. Scaled plans may show switches further apart for better readability.
- 38

### 39 **2.6. LOCKABLE COVERS**

- 40 A. BASIS OF DESIGN: Honeywell CG512A, CG511A, CG510A
  - 41 1. Use similar types if required to fit all controls.
  - 42 2. Owner approval required for differing type.
- 43 B. Where indicated on plans, provide lockable cover for all switches, timers and dimmers in the vicinity.
  - 44 1. Tags might indicate "COVER" or similar.
  - 45 2. If multiple switches in publicly accessible areas are labelled to be have a cover, it is to be assumed that all switches and
  - 46 dimmers in those public areas are to receive a cover even if not every single instance is labelled.
- 47 C. All locks shall be keyed the same unless owner provides keying scheme.
- 48

### 49 **2.7. LOW VOLTAGE CONTROL**

- 50 A. Use equipment equivalent to and compatible with the scheduled line-voltage devices. Where available, use same manufacturer and
- 51 adjust model number to reflect low-voltage version.
- 52 B. Use Powerpack with integrated power supply and relay to switch the line voltage and provide low-voltage
- 53 C. Low voltage control is only allowed in these applications:
  - 54 1. REMOTE MANUAL SWITCH:
    - 55 a. Where plans show manual lighting control (i.e. switches) located far outside the controlled zone. Typical applications include:
    - 56 i. Switches located in a staff area to control lights in public areas
  - 57 2. TIMER OVERRIDE:
    - 58 a. Where plans show timer override the local zone is forced on by programmable timer.
    - 59 b. Local line voltage sensor can be overridden ON (parallel to sensor) with a power pack relay. Wiring from programmable timer
    - 60 to local powerpack can be low-voltage
  - 61 3. INACCESSIBLE LOCATIONS:

- 1           a. Where plans show inaccessible locations. This typically includes existing drywall ceiling.  
2           b. Areas outside the inaccessible location shall be controlled by line voltage as scheduled. This typically includes a lay-in ceiling  
3           adjacent to an inaccessible drywall ceiling.  
4       D. For multiple zones controlled by a single contact in “remote manual switch” and “timer override mode” use Wattstopper BZ-50  
5           powerpacks in parallel (maximum 10 parallel devices). For normally-closed applications, use Wattstopper From-C powerpack.  
6  
7

8       **PART 3 – EXECUTION**

9       **3.1. INSTALLATION**

- 10       A. Install in accordance with manufacturer's instructions and all code requirements.  
11  
12

**END OF SECTION**

**SECTION 26 50 00**  
**LIGHTING**

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**PART 1 – GENERAL**

**1.1. SCOPE**

- A. This section includes information common to lighting fixtures.
- B. All light fixtures marked as emergency light fixtures (black dot on plans) and EXIT signs shall be powered by the emergency lighting source. Refer to plans whether that source is a central battery inverter or a generator.
- C. Egress light fixtures shall be equipped with fire alarm relay. Upon activation of fire alarm and/or power outage the following shall happen:
  - 1. Turn light on regardless of local lighting control (sensor or switch)
  - 2. Turn light to 100% light output regardless of local dimming signal (dimmer or sensor)

**1.2. REFERENCES**

- A. Work under this section depends on applicable provisions from other sections and the plan set in this contract.
- B. UL – Underwriters Laboratory - [www.ul.com](http://www.ul.com)
  - 1. UL 924 - Standard for Emergency Lighting and Power Equipment

**1.3. SPARE PARTS**

- A. Provide the following devices as a spare parts. Provide one per specific model used in this project:
  - 1. UL 924 relay
  - 2. Light fixtures: none unless schedule indicates a number of spare fixtures to be provided

**PART 2 - PRODUCTS**

**2.1. INTERIOR LUMINAIRES AND ACCESSORIES**

- A. Provide scheduled fixtures.
- B. If the manufacturer offers a higher, or lower efficiency option, the higher efficiency option is to be used.
- C. Driver shall operate with 120-277V and 0-10V dimming signal.
- D. Include all accessories required for proper installation compatible with the wall, ceiling and other mounting surfaces. This includes, but is not limited to, suspension cables, mounting clips, and other items. Linear fixtures shown to be installed in a row shall include all required connector, and end pieces. Schedules don't necessarily show those accessories.
- E. PANEL FIXTURES: provide required surface- or drywall kit required for specific installation location.
- F. FIXTURES DESIGNED TO BE PENDANT-MOUNT:
  - 1. Use fixture manufacturer provided cables, connectors, end pieces and other accessories required for a stable and neat looking installation.
- G. WALL WASH FIXTURES: Alternate model allowed is "Axis Beam 2 TB2WDLED" series

**2.2. TRACK LIGHTS**

- A. Provide complete track system from fixture manufacturer. Include all required adapters, connectors, end pieces, pendant kits etc. Track shall match fixture color.
- B. Plans will show location and approximate length of track systems. Contractor shall derive required track material needs.
- C. Install current-limiting feed for each dimmer. Select current based on down-rated dimmer (typically 75% of dimmer rating). Example: 400 VA dimmer requires  $\leq 2.5A$  current limiting device. Use mini end-feed. Unless noted otherwise, select largest possible (based on de-rating) current limiter to allow future addition of track heads.
- D. Corner connectors shall be solid (not accordion style) where installation angles allow use of pre-fabricated corners.



1 **2.3. AC-POWERED EXIT SIGNS**

- 2 A. Approved Manufacturer: Lithonia or approved equal  
3 1. Approved Substitute: Chloride VERW  
4 B. UL-damp location listed 50°F – 104°F.  
5 C. MOUNTING:  
6 1. Wall, ceiling, back, or end mounting as required by location.  
7 2. Provide required number of face plates  
8 D. FINISH: White face for both with clear baked enamel protective coating.  
9 E. LAMPS: Light-emitting diode (LED), red color for EXIT signs.  
10 F. MOUNTING HEIGHT: 90" above floor or 1" above door casing where mounted over doors. Where ceiling height is too low to  
11 maintain at least 6'8" clearance, locate sign next to path of egress. Consult designer for exact location.  
12 G. Power from emergency lighting power source.  
13 H. Enable directional arrows as shown on plans or to direct occupants towards exits. Confer with designer on egress paths.

14  
15 **2.4. FIRE ALARM RELAY**

- 16 A. BASIS OF DESIGN: Functional Devices ESRN  
17 B. Multiple relays wire in parallel. 0.016 mA for each relay.  
18 C. UL 924 rated as "Emergency Lighting Equipment"  
19 D. UL 2043 plenum rated  
20 E. LED indicators for normal voltage, emergency voltage and load status  
21 F. When fire alarm is triggered or if regular power is out, the relay shall force emergency lights on at 100% brightness level  
22 (override any dimming signals).  
23 G. When fixture is outdoors, install relay in adjacent indoor space at accessible location.  
24 H. For fixture-mounted sensors re-fit fixture to use appropriate relay inside or external to the fixture.  
25 I. Install one relay per emergency lighting zone. Wire to emergency power source (inverter or generator).  
26 J. Wire to local fire alarm panel. Contractor shall coordinate with fire alarm contractor and manufacturer the relay  
27 requirements. Provide additional relays as required to work with the different alarm panel types. Re-program or re-  
28 configure fire alarm panel as required to enable required functionality.  
29

30 **2.5. EXTERIOR LUMINAIRES AND ACCESSOIRES**

- 31 A. Driver shall operate with 120-277V and 0-10V dimming signal.  
32 B. Fixture must be water- and dust tight and corrosion resistant and UL listed for location.  
33 C. Provide with built-in sensor and controls where schedule indicates fixture-control.  
34

35 **2.6. POLES**

- 36 A. Furnish poles as specified in schedule on Drawings. Poles shall be galvanized. Handhole in pole shall have removable  
37 weatherproof cover. Anchor bolts as recommended by pole manufacturer. Provide template, flat washers, lock washers,  
38 and hex nuts for each pole.  
39 B. No precast bases for poles are permitted. Construct from reinforced concrete in sizes as shown on drawings and to meet  
40 the minimum structural requirements of AASHTO (American Association of State Highway and Transportation Officials) or  
41 as designed by a licensed structural engineer. The exposed surface area of the foundation shall have the forms removed  
42 and the concrete rubbed out to a smooth finish.  
43 C. Provide 3/4" X 10'0" ground rods in the pole foundation so that the ground rod projects 3" up into center of pole base.  
44 D. Install lighting poles at locations indicated. Install poles plumb. Provide shims or double nuts to adjust plumb. Use belt slings  
45 or non-chafing ropes to raise and set pre-finished luminaire poles.  
46 E. Provide double nuts to adjust plumb. Grout around each base.  
47 F. Minimum underground conduit size is 1 inch.  
48 G. Underground and exterior wire shall be type XHHW-2 or USE.  
49 H. Project anchor bolts 2 inches (50 mm) minimum above base. Install all anchor bolts and handhole fasteners with anti-seize  
50 compound.  
51

52 **2.7. PILOT LIGHTS**

- 53 A. BASIS OF DESIGN: Line voltage indicator-LED in color specified  
54 B. Visibility from a 180° angle  
55 C. In finished areas only expose the tip of the pilot light. Conceal box.  
56

57 **END OF SECTION**