DOCUMENT 00 90 00
ADDENDUM

ADDENDUM NO. [1] **Date: February 22, 2019**

RE: **WESTERN TECHNICAL COLLEGE**
ARC & WELCOME CENTER REMODELING PHASE 2
400 SEVENTH STREET NORTH
LA CROSSE, WISCONSIN 54601
HSR PROJECT NO. 18047

FROM: HSR Associates, Inc
100 Milwaukee Street
La Crosse, WI 54603
(608) 784-1830

To: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated February, 2019. Acknowledge receipt of this Addendum in the space provided on the bid form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of [5] page, Pre-bid Attendance, [10] specification sections, and [44] 30 x 42 drawings.

CHANGES TO BIDDING REQUIREMENTS AND CONDITIONS OF THE CONTRACT:

1. Pre-bid attendance attached hereto.
2. Section 00 22 13 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS
   a. After 5.3.2 add the following:
      "5.3.2.1 Low Bidder shall be determined by adding Base Bid and all alternates."

GENERAL REQUIREMENTS:

3. Section 01 10 00 SUMMARY
   a. 1.09, A: Change commencement date to May 1, 2019.

CHANGES TO SPECIFICATIONS:

4. Section 08 31 00 ACCESS DOORS AND PANELS
   a. Section attached hereto as part of Contract Documents.
5. Section 08 71 00 DOOR HARDWARE
   a. Revised hardware groups attached hereto.
6. Section 10 22 41 OPERABLE GLASS PARTITION
   a. 2.02, A, 7: Change frame finish to "clear anodized".
7. Section 22 10 02 VALVES AND COCKS-MANUAL
   a. Section attached hereto reissued replacing section issued in Bid Documents.

8. Division 22 Plumbing: The following statement shall apply to Sections 22 07 19 Pipe Insulation, 22 10 02 Valve and Cock, Manual, 22 10 11 Domestic Water System and Equipment, 22 21 00 Water Wells, 22 30 56 Water Conditioners, 22 40 41 China Fixtures, 22 40 43 Electric Water Coolers, 22 40 48 Stainless Steel Fixtures and Trim; "Correct defective Work within a two year period after the Date of Substantial Completion."

9. Section 22 10 11 DOMESTIC WATER SYSTEM AND EQUIPMENT
   a. Section attached hereto reissued replacing section issued in Bid Documents.

10. Section 22 10 92 NATURAL GAS SYSTEMS
    a. Section attached hereto as part of Contract Documents.
11. Section 22 30 56 WATER CONDITIONERS
    a. Section attached hereto as part of Contract Documents.

12. Section 22 40 41 CHINA FIXTURES
    a. 2.07, A, 2: The specified Sloan 140 ES-S shall be a concealed installation in chase.

13. Section 22 40 46 MOP BASINS
    a. Section attached hereto as part of Contract Documents.

14. Section 22 40 48 STAINLESS STEEL FIXTURES AND TRIM
    a. 2.04: Add Item B as follows:
       S-2: Elkay Lustertone ELUHAD131655PD; 16" X 18 ½" X 5 3/8", under-mount, sound deadening pads, 18 gauge, lustrous satin finish.
       Faucet: Chicago Faucet Model 786-E35XKABCP with gooseneck swing spout which can be locked rigid, ADA compliant lever handles, aerator, vandal proof wrist blade handles, ceramic cartridges

15. Section 22 40 49 MOP BASINS
    a. Section attached hereto as part of Contract Documents

16. Section 23 25 00 HVAC WATER TREATMENT
    a. Section attached hereto reissued with edits replacing section issued in Bid Documents.

17. Section 24 07 00 HVAC SYSTEM COMMISSIONING
    a. Section attached hereto as part of Contract Documents.

18. Section 32 13 13 PORTLAND CEMENT CONCRETE PAVING
    a. 2.01: Add Item G as follows:
       Concrete Sealant: Conforming to AASHTO T-260-78, Chloride Penetration.
       Approved Products: "TK-TRI-SILANE 590-100" by T.K. Products.
       Installation: Follow manufacturer's recommendations for surface preparation, timing of application and application process including types of tools.

CHANGES TO DRAWINGS

19. Sheet C100R DEMOLITION PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
    b. Removal of materials for new water main. Updated keynote for electrical sign.

20. Sheet C200R LAYOUT PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing.
    b. Updated keynotes. Placement of material for new water main. Added plantings to middle island. Small portion of concrete changed to reinforced concrete.

21. Sheet C300R GRADING PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing.
    b. Updated keynotes. Elevations on Northeast side of lot changed. Elevation for new water main updated. See attached plan.
22. Sheet C500R UTILITY PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing.
23. Sheet A000R COVER SHEET 30 x 42 attached hereto
    a. Revisions clouded on Drawing.
24. Sheet A001R CODE PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
25. Sheet A004R FIRST FLOOR OVERALL PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
26. Sheet A090R FIRST FLOOR REMOVAL PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
27. Sheet A091R SECOND FLOOR REMOVAL PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
28. Sheet A100R FIRST FLOOR REMODEL PLAN – SEGMENT 'A' 30 x 42 attached hereto
    a. Revisions clouded on Drawing.
29. Sheet A101R FIRST FLOOR REMODEL PLAN – SEGMENT 'B' 30 x 42 attached hereto
    a. Revisions clouded on Drawing
30. Sheet A102R SECOND FLOOR REMODEL PLAN – SEGMENT 'A' 30 x 42 attached hereto
    a. Revisions clouded on Drawing
31. Sheet A103R SECOND FLOOR REMODEL PLAN – SEGMENT 'B' 30 x 42 attached hereto
    a. Revisions clouded on Drawing
32. Sheet A110R FIRST FLOOR RCP – SEGMENT 'A' 30 x 42 attached hereto
    a. Revisions clouded on Drawing
33. Sheet A200R ELEVATIONS 30 x 42 attached hereto
    a. Revisions clouded on Drawing.
34. Sheet A210R INTERIOR ELEVATIONS AND DETAILS 30 x 42 attached hereto
    a. Revisions clouded on Drawing
35. Sheet A211R INTERIOR ELEVATIONS 30 x 42 attached hereto
    a. Revisions clouded on Drawing
36. Sheet A301R SECTIONS 30 x 42 attached hereto
    a. Revisions clouded on Drawing
37. Sheet A400R ENLARGED 30 x 42 attached hereto
    a. Revisions clouded on Drawing
38. Sheet A500R DETAILS 30 x 42 attached hereto
    a. Revisions clouded on Drawing
39. Sheet A600R WALL TYPES 30 x 42 attached hereto
    a. Revisions clouded on Drawing.

40. Sheet A601R DOOR SCHEDULE 30 x 42 attached hereto
    a. Revisions clouded on Drawing

41. Sheet ID102R FIRST FLOOR FINISH PLAN – SEGMENT 'A' 30 x 42 attached hereto
    a. Revisions clouded on Drawing
42. Sheet ID103R OVERALL SECOND FLOOR FINISH PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
43. Sheet ID104R FIRST FLOOR OVERALL PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
44. Sheet ID105R SECOND FLOOR FINISH PLAN – SEG A 30 x 42 attached hereto
    a. Revisions clouded on Drawing
45. Sheet ID106R SECOND FLOOR FINISH PLAN – SEG B 30 x 42 attached hereto
    a. Revisions clouded on Drawing
46. Sheet ID600R MASTER COLOR SCHEDULE 30 x 42 attached hereto
    a. Revisions clouded on Drawing
47. Sheet S100R FOUNDATION PLAN AND DETAILS 30 x 42 attached hereto
    a. Revisions clouded on Drawing
48. Sheet S200R FRAMING PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
49. Sheet P001R NOTES, SCHEDULES AND DETAILS 30 x 42 attached hereto
    a. Revisions clouded on Drawing
50. Sheet P092R SECOND FLOOR REMOVAL PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
51. Sheet P100R UNDER FLOOR REMODEL PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
52. Sheet P101R FIRST FLOOR REMODEL PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
53. Sheet P102R SECOND FLOOR REMODEL PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
54. Sheet P200R DWV RISER ISOMETRIC 30 x 42 attached hereto
    a. Revisions clouded on Drawing
55. Sheet P201R WATER RISER ISOMETRIC 30 x 42 attached hereto
    a. Revisions clouded on Drawing
56. Sheet E100R ELECTRICAL SITE PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
57. Sheet E101R PARTIAL FIRST FLOOR LIGHTING PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
58. Sheet E201R PARTIAL FIRST FLOOR POWER PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing

59. Sheet E301R PARTIAL FIRST FLOOR LOW VOLTAGE PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
60. Sheet E302R PARTIAL SECOND FLOOR LOW VOLTAGE PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing
61. Sheet E501R PARTIAL ELECTRICAL SCHEDULE 30 x 42 attached hereto
    a. Revisions clouded on Drawing
62. Sheet FA01R PARTIAL FIRST FLOOR FIRE ALARM PLAN 30 x 42 attached hereto
    a. Revisions clouded on Drawing

PRIOR APPROVALS

1. Dzh

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ARCHITECTURE
ENGINEERING
INTERIOR DESIGN

HSR Associates

Celebrating 65 Years of Innovative Design

Pre-Bid Meeting Sign-In Sheet

February 19, 2019

PROJECT: **WESTERN TECHNICAL COLLEGE**
ARC & WELCOME CENTER REMODELING PHASE 2
LA CROSSE, WISCONSIN 54601
HSR 18047

BID OPENING: 2:00 PM, March 7, 2019

Name	Company	Phone No.	E-mail
1. Jeff Johnson	CRM	608-783-6950	jeffjcrm@gmail.com
2. Kevin Kuderer	B+B Electric	715-577-4392	kevink@b-belectricinc.com
3. Mike Seichter M+J		608-7845000	mseichter@market-johnson.com
4. Monte Aspenson	The Key to Comfort	608-304-1188	monte@tk2c.com
5. Paul Siegesmund	PFT Electric	507-895-8585	paul@pfteleceneeringcc
6. Eric Lehmann	Fowler & Hammer	6087826849	elehmann@fowlerhammer.com
7. Mike Allen	Fowler	6087826849	mallen@fowlerhammer.com
8. Andrew Schlifer	Wieser Bros	507 895 8903	andrews@wiserbrothers.com
9. Pat Ries	Brickl Bros	608-769-5515	pries@bricklbros.com
10. Doug Ramsey	HSR		
11. Trent Schott	HSR		
12. Pat Popovich	Galileo		
13. Jay McHenry	WTC		
14. Paul Ambach	WTC		
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SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Access door and frame units, non-fire-rated, in wall locations.

1.02 RELATED REQUIREMENTS

A. Applicable provisions of Division 1 shall govern the work of this section.

B. Section 09 21 16 - Gypsum Board Assemblies: Openings in walls.

C. Section 09 91 23 - Interior Painting: Field paint finish.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

PART 2 PRODUCTS

2.01 WALL-MOUNTED UNITS

A. Wall-Mounted Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
   1. Material: Steel.
   2. Style: Exposed frame with door surface flush with frame surface.
      a. Gypsum Board Mounting Criteria: Use drywall bead type frame.
   3. Door Style: Single thickness with rolled or turned in edges.
   4. Frames: 16 gage, 0.0598 inch, minimum thickness.
   5. Single Steel Sheet Door Panels: 1/16 inch, minimum thickness.
   6. Steel Finish: Primed.
   7. Door/Panel Size: As indicated on the drawings.
   8. Hardware:
      a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
      b. Latch/Lock: Tamperproof tool-operated cam latch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

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3.04 HARDWARE GROUPS (Revised)

HARDWARE GROUP 1
EACH SINGLE DOOR TO HAVE:
DR. 1C1

6 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	STORERM LOCK	MB1-3-O2-15-626	MARSHALL B
1 EA	FLUSHBOLT	FB458 626(TOP ONLY)	IVES
2 EA	KICKPLATE	34 X 1”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	CONCEALED OHS	104S 630	GLYNN
1 EA	GASKET	F797B25	REESE
2 EA	ASTRAGAL FINS	S771D7	REESE

HARDWARE GROUP 2
EACH SINGLE ALUM DOOR TO HAVE:
DR. 1H1

1 EA	CONTINUOUS HINGE-ELEC WIRE	HINGE BY ALUM DR AND FRAME SUPPLIER	
1 EA	RIM EXIT DEVICE	99EO ALK 626	VONDUPRIN
1 EA	RIM CYLINDER WITH CORE	MBS-ICR X MBS-IC7 626	MBS
1 EA	CLOSER	4111 SCUSH 689	LCN
1 EA	DROP PLATE	4110-18 689	LCN
1 EA	BLADE STOP SPACER	4110-61 689	LCN
1 EA	CUSH SHOE SUPPORT	4110-30 689	LCN
1 EA	THRESHOLD	S425A48	REE
1 EA	WEATHERSTRIP AND SWEEPS	BY ALUM DR AND FR SUPPLIER	

HARDWARE GROUP 3
EACH SINGLE DOOR TO HAVE:
DR. 1H7, 2S4A

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	STORERM LOCK	MB1-3-O2-15-626	MARSHALL
1 EA	CLOSER	4011 REG 689	LCN
1 EA	ELECTRIC STRIKE	6211 US32D	VONDUPRIN
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

CARD READER AND POWER SUPPLY BY ACCESS CONTROL PROVIDER.

HARDWARE GROUP 4
EACH SINGLE DOOR TO HAVE:
DR. 1H9A

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	PASSAGE LOCK	MB1-3-30-15-626	MARSHALL
1 EA	CLOSER	4011 REG 689	LCN
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

HARDWARE GROUP 5
EACH SINGLE DOOR TO HAVE:
DR. 1H9B

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	RIM EXIT DEVICE	99EO ALK 626(HARD WIRED)	VONDUPRIN
1 EA	PWER SUPPLY	PS902	VONDUPRIN
1 EA	CLOSER	4111 EDA 689	LCN
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

HARDWARE GROUP 6
EACH PAIR OF ALUM DOORS TO HAVE:
DR.1H12A/B

2 EA	CONTINUOUS HINGES	BY ALUM DR/FR SUPPLIER	
1 EA	RIM EXIT DEVICE	99NL-OP X 110MD 626	VONDUPRIN
1 EA	RIM EXIT DEVICE	99EO 626	VONDUPRIN
1 EA	RIM CYLINDER WITH CORE	MBS-ICR X MBS-IC7 626	MBS
2 EA	OFFSET PULLS	BF157 US32D	ROCKWOOD
2 EA	ELECTRIC STRIKES	6300 US32D	VONDUPRIN
1 EA	CLOSERS	4111 EDA 689	LCN
1 EA	DROP PLATES	4110-18 689	LCN
1 EA	CUSH SHOE SUPPORT	4110-30 689	LCN
1 EA	BOLLARD	8310-866	LCN
2 EA	ACTUATORS	8310-853T	LCN
1 EA	WEATHER SEAL	8310-801	LCN
2 EA	THRESHOLD	S425A36	REESE
1 EA	WEATHERSTRIP/SWEEP	BY ALUM DR/FR SUPPLLIER	
1 EA	CARD READER	BY ACCESS CONTROL VENDOR	

SWIPE CARD TO ACCESS AREA AFTER HOURS OR BEGINNING OF DAY.
RELOCATE HARDWIRED AUTO OPERATOR FROM DEMO-ED VESTIBULE OPENING TRIAGE AREA D AREA.

HARDWARE GROUP 7
EACH PAIR OF ALUM DOORS TO HAVE:
DR.1H12C/D

2 EA	CONTINUOUS HINGES	BY ALUM DR/FR SUPPLIER	
2 EA	OFFSET PULLS/PUSH	BF15747 US32D	ROCKWOOD
1 EA	CLOSERS	4111 EDA 689	LCN
1 EA	DROP PLATES	4110-18 689	LCN
1 EA	CUSH SHOE SUPPORT	4110-30 689	LCN
2 EA	ACTUATORS	8310-853T	LCN
1 EA	SEALS	BY ALUM DR/FR SUPPLIER IF REQ	

RELOCATE HARDWIRED AUTO OPERATOR FROM DEMO-ED VESTIBULE OPENING TRIAGE AREA D AREA.

HARDWARE GROUP 8
EACH SINGLE DOOR TO HAVE:
DR. 1R1, 1R3, 1R6, 110

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	PRIVACY LOCK	MB1-3-20-15-626	MARSHALL
1 EA	CLOSER	4011 REG 689	LCN
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

HARDWARE GROUP 9
EACH SINGLE DOOR TO HAVE:
DR. 1R5a, 1S1, 1T2

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	STORERM LOCK	MB1-3-O2-15-626	MARSHALL
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

HARDWARE GROUP 10
EACH SINGLE DOOR TO HAVE:
DR. 1R4, 1R5, 2R1, 2R2

1 EA	AUTO OPERATORS	9531 STD 689	LCN
1 EA	WIRELESS ACTUATORS	8310-3860TW	LCN

REUSE ALL OTHER EXISTING HARDWARE. SUPPLIER TO VERIFY ALL LOCATIONS AND ENSURE THAT EXISTING HARDWARE WILL ALL WORK WITH NEW DOORS.

HARDWARE GROUP 11
EACH SINGLE ALUM DOOR TO HAVE:
DR. 1SS1

1 EA	CONTINUOUS HINGE	BY ALUM DR AND FRAME SUPPLIER	
1 EA	RIM EXIT DEVICE	99L-F X 996L-R US26D	VONDUPRIN
1 EA	CLOSER	4011 REG 689	LCN
1 EA	MAG HOLD OPEN	SEM7850 689	LCN
1 EA	THRESHOLD	S425A36	REE
1 EA	SEAKS IF REQ	BY ALUM DR AND FRAME SUPPLIER	

HARDWARE GROUP 12
EACH PAIR OF DOORS TO HAVE:
DR. 2SN1

6 EA	BUTTS	FBB168 4.5 X 4.5 652	STANLEY
2 EA	RIM EXIT DEVICE	9927L-F X 996L-BE LBR 626	VONDUPRIN
2 EA	CLOSERS	4111 EDA 689	LCN
2 EA	MAG HOLD OPENS	SEM7850 689	LCN
1 EA	SMOKE GASKET	F797B25	REESE
2 EA	SMOKE AST FINS	S771D7	PEMKO

HARDWARE GROUP 13
EACH PAIR OF DOORS TO HAVE:
DR. 100A/B, 101A/B

2 EA	CONTINUOUS HINGES	BY PROTECTIVE GLAZING FR ASSEMBLY SUPPLIER	
1 EA	RIM EXIT DEVICE	9927L-F X 996L-V LBR 626	VONDUPRIN
1 EA	RIM EXIT DEVICE	RX-QEL9927L-F X 996L-V LBR 626	VONDUPRIN
1 EA	POWER TRANSFER	EPT10 SP28	VONDUPRIN
1 EA	POWER SUPPLY	PS902 X 2RS-FA	VONDUPRIN
2 EA	RIM CYLINDER WITH CORE	MBS-ICR X MBS-IC7 626	MBS
1 EA	SENIOR SWING OPERATOR	9542 REG 689	LCN
1 EA	CLOSERS	4111 EDA 689	LCN
1 EA	DROP PLATES	4110-18 689	LCN
1 EA	CUSH SHOE SUPPORT	4110-30 689	LCN
1 EA	BLADE SPACER	4110-61 689	LCN
1 EA	SMOKE GASKET	F797B25	REESE
2 EA	SMOKE AST FINS	S771D7	PEMKO
1 EA	CARD READER	BY ACCESS CONTROL VENDOR	

SWIPE CARD TO ACCESS AREA AFTER HOURS OR BEGINNING OF DAY. VERIFY THICKNESS OF DOORS PRIOR TO ORDERING HARDWARE. AUTO OPERATOR TO BE USED AS PUSH/GO FEATURE ONLY. NO ACTUATORS REQUIRED

HARDWARE GROUP 14
EACH SINGLE DOOR TO HAVE:
DR. 107A, 107B, 201

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	OFFICE LOCK	MB1-3-O1-15-626	MARSHALL BEST
1 EA	CLOSER	4011 REG 689	LCN
1 EA	ELECTRIC STRIKE	6211 US32D	VONDUPRIN
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

CARD READER AND POWER SUPPLY BY ACCESS CONTROL PROVIDER.

HARDWARE GROUP 15
EACH SINGLE DOOR TO HAVE:
DR. 129, 131, 133, 135, 136A, 136B, 137, 139, 144, 149, 158, 160, 162, 164, 166, 200, 202, 202E, 202FA, 202FB, 224, 227,

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	OFFICE LOCK	MB1-3-O1-15-626	MARSHALL BEST
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

HARDWARE GROUP 16
EACH SINGLE DOOR TO HAVE:
DR. 156

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	OFFICE LOCK	MB1-3-O1-15-626	MARSHALL BEST
1 EA	CLOSER	4111 EDA 689	LCN
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

HARDWARE GROUP 17
EACH SINGLE DOOR TO HAVE:
DR. 222

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	OFFICE LOCK	MB1-3-O1-15-626	MARSHALL BEST
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	SURFACE OHS	450S 652	GLYNN
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

HARDWARE GROUP 18
EACH SINGLE DOOR TO HAVE:
DR.1C2, 1C3, 1R2, 112, 114, 116, 118, 124A, 124B, 125, 126, 127, 128, 130A, 130B, 131A, 132, 134, 138, 140, 141, 142, 143, 145, 147, 148, 150, 155, 1H3C, 1H11B, 2C1, 2R3, 2S1, 206A, 216A, 221, 221A, 221B, 221C, 221D, 272
REUSE ALL EXISTING HARDWARE. SUPPLIER/CONTRACTOR TO VERIFY ALL LOCATIONS AND CURRENT HARDWARE ON SITE PRIOR TO ORDERING ANYTHING. THESE DOORS WILL HAVE A MIX OF BOTH CYLINDRICAL LOCK AND MORTISE LOCK PREPS. BRING ANY MAJOR ISSUES TO ARCHITECT FOR REVIEW PRIOR TO PROCEEDING. SITE VISIT SHOULD TAKE PLACE PRIOR TO SCHEDULING JOB TO AVOID LISTS OF RFI QUESTIONS.

HARDWARE GROUP 19
EACH PAIR OF DOORS TO HAVE:
DR.2M2

2 EA	MAG HOLD OPENS	SEM7850 689	LCN

REUSE ALL EXISTING HARDWARE. SUPPLIER/CONTRACTOR TO VERIFY ALL LOCATIONS AND CURRENT HARDWARE ON SITE PRIOR TO ORDERING ANYTHING. THESE DOORS WILL HAVE A MIX OF BOTH CYLINDRICAL LOCK AND MORTISE LOCK PREPS, FIGURE FLUSHBOTS IN THIS PAIR. BRING ANY MAJOR ISSUES TO ARCHITECT FOR REVIEW PRIOR TO PROCEEDING. SITE VISIT SHOULD TAKE PLACE PRIOR TO SCHEDULING JOB TO AVOID LISTS OF RFI QUESTIONS.

HARDWARE GROUP 20
EACH SINGLE DOOR TO HAVE:
DR. 1H3A

3 EA	BUTTS	FBB179 4.5 X 4.5 652	STANLEY
1 EA	OFFICE LOCK	MB1-3-O1-15-626	MARSHALL BEST
1 EA	CLOSER	4111 EDA 689	LCN
1 EA	KICKPLATE	10 X 2”LDW US32D	ROCKWOOD
1 EA	WALL STOP	409 US32D	ROCKWOOD
1 EA	SILENCERS	608RKW GREY	ROCKWOOD

END OF SECTION 08 71 00

SECTION 22 10 02

VALVES AND COCKS: MANUAL

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division 00 and 01 of this Project Manual apply to this Section as though repeated herein.

B. The requirements of Section 22 05 00 apply to this Section.

1.02 SUBMITTALS

A. Submit descriptive product data describing all material furnished under Part 2 of this Section.

1.03 WARRANTY

A. Correct defective work within a two year period after the Date of Substantial Completion.

B. Provide manufacturer's standard product warranty.

PART 2: PRODUCTS

2.01 BALL VALVE (1/2"-1")

A. Based on products by Jomar, Appolo.

B. 1/2" – 1" valves to have threaded or soldered ends.

C. Jomar 100 series valves, 100% lead tested, lifetime leak-proof stem, dezincification resistant brass alloy, triple sealing stem with Viton o-rings and Teflon seal, 600 WOG, blow out proof stem, meets NSF 372, 61-8 and 61 annex G standards, ANSI B1.20.1, wetted surface contains less than .25 lead content, accessories available.

D. Apollo 70 series valves; Adjustable stem packing gland, blow out proof stem design, chromium plated ball, 100% factory tested, maxumun pressure 600 psi CWP, 150 psi SWP, max temperature 500F.

E. Apollo international valves will not be acceptable.

F. Provide 1-1/4" stem extensions on all hot water piping insulated with more than 1/2" thick insulation.

G. Provide 1-1/4" stem extensions on all insulated cold water piping.

1. Include a non-rotating sleeve with cap around the stem extensions on all insulated cold water piping to facilitate vapor barrier seal, similar to:

H. Contractor shall install bronze ball valves as specified and where shown on drawings. If brass ball valves are substituted and installed, the contractor will be required to replace each with as specified or to provide a credit of $150 for each valve substitution. A/E will discuss with the Owner and if acceptable will process a change order.

I. Contractor shall install ball valve stem extensions as specified. If not, the contractor will be required to install as specified or to provide a credit of $50 for the deletion of each valve stem extension. A/E will discuss with the Owner and if acceptable will process a change order.

2.02 DRAIN VALVE FITTING

A. Based on products by Jomar, Appolo, Nibco.

B. Jomar 100 series valves, 100% lead tested, lifetime leak-proof stem, dezincification resistant brass alloy, triple sealing stem with Viton o-rings and Teflon seal, 600 WOG, blow out proof stem, meets NSF 372, 61-8 and 61 annex G standards, ANSI B1.20.1, wetted surface contains less than .25 lead content, accessories available.

C. Jomar T-100HFG; Cap and chain for easy drain and hose connection, heavy steel chain, blow-out proof, Gland follower and single O-ring design.

2.03 BALL VALVE (1"-2")

A. Based on products by Jomar, Appolo, Nibco.

B. 1 ¼" - 2" Valves shall have threaded ends unless otherwise indicated

C. Jomar 100 series valves, 100% lead tested, lifetime leak-proof stem, dezincification resistant brass alloy, triple sealing stem with Viton o-rings and Teflon seal, 500 WOG, blow out proof stem, meets NSF 372, 61-8 and 61 annex G standards, ANSI B1.20.1, wetted surface contains less than .25 lead content, accessories available.

D. Apollo 70 series valves; Adjustable stem packing gland, blow out proof stem design, chromium plated ball, 100% factory tested, maxumun pressure 600 psi CWP, 150 psi SWP, max temperature 500F.

E. Apollo International valves will not be acceptable.

F. Provide 1-1/4" stem extensions on all hot water piping insulated with more than 1/2" thick insulation.

G. Provide 1-1/4" stem extensions on all insulated cold water piping.

1. Include a non-rotating sleeve with cap around the stem extensions on all insulated cold water piping to facilitate vapor barrier seal, similar to:
   a. Apollo (-11) 2 ¼" "Thermal-Seal" insulating tee handle, or
   b. Nibco "NIB-SEAL" insulated-handle with equivalent ball valves, or
   c. Nibco "CS" extended lever handle.

H. Contractor shall install bronze ball valves as specified and where shown on drawings. If brass ball valves are substituted and installed, the contractor will be required to replace each with as specified or to provide a credit of $150 for each valve substitution. A/E will discuss with the Owner and if acceptable will process a change order.

I. Contractor shall install ball valve stem extensions as specified. If not, the contractor will be required to install as specified or to provide a credit of $50 for the deletion of each valve stem extension. A/E will discuss with the Owner and if acceptable will process a change order.

2.04 GATE VALVES (2 ½" and larger)

A. Based on products by Watts, Zurn.

B. 2 ½" and larger: Watts 405-NRS-RW; Epoxy-coated, cast iron body, resilient wedge disc, cast iron bonnet, bronze non-rising stem and cast iron hand wheel, full port flow, low head loss, flanged and grooved ends, max temperature 140F, max pressure 200 psi.

2.05 PRESS SYSTEM VALVES

A. Based on product by Nibco, Viega Apollo.
1. Apollo equals are acceptable.

B. Ball valves, 2" and smaller, Nibco #PC-585-80-LF press x press, female end, copper ends, full port, two piece (1/2" - 2" sizes), PTFE stem packing, gland nut, silicone bronze body, dezincification resistant, silicone bronze ball, reinforced teflon seats (PTFE), blow-out proof stem, adjustable packing gland, 600 psi CWP, 250°F maximum operating temperature, lead free.

C. Contractor shall install bronze ball valves as specified and where shown on drawings. If brass ball valves are substituted and installed, the contractor will be required to replace each with as specified or to provide a credit of $150 for each valve substitution. A/E will discuss with the Owner and if acceptable will process a change order.

2.06 INDUSTRIAL LIQUID FLOW SWITCH

A. Based on products by Kobold, McDonnel, Speakman.

B. McDonnell & Miller series FS7-4 flow switch, 1 ¼" NPT, brass with sealed tube construction, single pole, single throw snap switch, magnetic switching, sensitivity adjusting screw, operating pressure 32F – 300 F, maximum operating pressure 300 psi.

2.07 CAST IRON BUTTERFLY VALVES (WATER)

A. Based on product by Nibco, Appolo.
1. Apollo, Crane, Hammond, Keystone, Milwaukee, Mueller Steam specialty (Muessco), and Victaulic equals, as acceptable.

B. Lug-wafer butterfly valves, 2" and larger, Nibco LC2000 with cast iron body, extended neck, molded in EPDM rubber body seal/liner, aluminum bronze disc, stainless steel stem, copper upper and lower bushings, brass collar bushing, EPDM rubber stem seal; lugs shall match number of holes in pipe flange.

C. Wafer type butterfly valves, are not acceptable.

D. Provide ten (10) position lever-lock handle operator; valves 8" and larger, use worm gear operator.

E. Maximum pressure to be 200 psi.

2.08 DUCTILE IRON BUTTERFLY VALVES (WATER)

A. Based on product by Nibco, Apollo.
1. Apollo, Hammond, Keystone, Milwaukee, Mueller Steam specialty (Muessco), Nibco and Victaulic equals, as acceptable.

B. Lug-wafer butterfly valves, 2” and larger, Crane "Gem" with ductile cast iron body (ASTM A-536), cartridge Type EPT seat, ductile iron disc coated with Nylon II and stainless steel stem; lugs shall match number of holes in pipe flange. (Valves with cast iron body and aluminum bronze alloy disc will also be acceptable.)

C. Wafer type butterfly valves, are not acceptable.

D. Flange type butterfly valves, 2” and larger, Crane "Monarch" with two-flange Ferrosteel cast iron body, bronze disc, Buna-N seat and stainless steel stem.

E. Provide ten (10) position lever handle operator; valves 8” and larger, use worm gear operator.

F. Maximum pressure to be 200 psi; maximum temperature - 275°F. (liquid) - EPT and 180 degrees F. (liquid) - Buna-N.

2.09 ACUATOR VALVES

A. Based on products by Watts, Belimo

B. Belimo F6 series no. F680HDU: 2-way, HDU butterfly valve, resilient seat, 304 stainless disc.

C. Used in conjunction with Belimo actuator; Valve with actuator; F680-150SHP

2.10 LOW WATER CUT OFF

A. Warrick 3E2A Cast iron liquid level sensor; epoxy coated housing, one piece probe, cast iron body, 125 psi as 353 F.

B. Series 26 modules, low water cutoff. Warrick no. 26MA3BOE; Powered contacts, modular plug-in design, low voltage sensor, 11-Pin socket, solid state reliability, LED monitoring.

2.11 VALVES (GROOVED PIPING)

A. Manufacturer - Victaulic.
1. Milwaukee, Mueller Steam Specialty (Muessco), Anvil Gruvlok equals are acceptable.

B. Ball valve: Victaulic series 721, Gruvlok 7500 standard port, 1-1/2"-6", 600# WOG.

C. Butterfly valves: Victaulic Series 300, 700, or 709. Gruvlok 7700, 7600, 8000GR.

D. Check valves: Victaulic Series 711, 712, 715 or 716 Gruvlok 400G, 7800

E. Muessco No. 105M AP globe type, cast iron body with bronze trim, flanged, 2 inch and larger, 125# WOG. Titan CV50-DI

2.12 SILENT CHECK VALVES (WATER)

A. Based on product by Watts.

B. Watts series LF-600, ¼” - 2", lead free, cast copper silicon alloy body, performs function of swing checks or vertical lift checks, prevents water hammer, conical lead free disc, PTFE seat, install in horizontal or vertical position, pressure drop equivalent to swing check, stainless steel guide rod and spring, threaded ends, silent operation, 400 psi WOG.

PART 3: EXECUTION

3.01 VALVES (GENERAL USE)

A. Use ball/butterfly valves for isolating equipment or main/branch piping. Install valves as indicated, full size of piping.

B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Ball valves to be installed with stems in the horizontal position.

C. Install swing check valves in the horizontal position, unless otherwise shown on drawings, with hinge pin horizontally perpendicular to centerline of pipe. Install for proper direction of flow.

D. Drain valves shall be ½" with standard hose ends. Provide screw-on-caps where located above suspended ceilings.

E. Install valves in piping, to isolate all equipment.

F. Install valves in water piping where indicated on Drawings.

G. Install isolation valve and tee with cap/plug on the water branch serving the lawn irrigation system. Compressed air will be used to winterize the system.

3.02 BALL VALVES

A. Piping and valve on cold water piping up to and including the non-rotating sleeve shall be insulated and sealed with vapor barrier mastic.

3.03 BUTTERFLY VALVES

A. To isolate equipment; lug wafer or two-flange type.

3.04 VALVES (GROOVED PIPING)

A. Install as recommended by manufacturer.

B. Butterfly and ball valves: Compressed air, water, gas and process.

3.05 SILENT (NON-SLAM) CHECK VALVES

A. Install in pump discharge, horizontal or vertical, as required.

B. Do not use with sewage ejectors.

END OF SECTION 22 10 02

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SECTION 22 10 11

DOMESTIC WATER SYSTEM AND EQUIPMENT

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division 00 and 01 of this Project Manual apply to this Section as though repeated herein.

B. The requirements of Section 22 05 00 apply to this Section.

1.02 RELATED WORK

A. Fire Stopping: Section 07 84 00.

B. Fire Protection: Section 21 13 00.

C. General Provisions: Section 22 05 00.

D. Pipe/Valve Identification: Section 22 05 53.

E. Tests: Section 22 05 93.

F. Pipe Insulation: Section 22 07 19.

G. Pipe and Pipe Fittings: Section 22 10 01.

H. Valves and Cocks (Manual): Section 22 10 02.

I. Piping Support Devices: Section 22 10 04.

J. Water Distribution - Water Systems: Section 33 11 16.

K. Water Distribution - Water Wells: Section 33 21 00.

L. Lawn Irrigation System: Section 33 61 00.

1.03 SUBMITTALS

A. Submit descriptive product data describing all material furnished under Part 2 of this Section.

1.04 WARRANTY

A. Correct defective work within a two year period after the Date of Substantial Completion.

B. Provide manufacturer's standard product warranty.

PART 2: PRODUCTS

2.01 WATER SERVICE

A. Ductile iron pressure type water pipe and fittings with polyethylene wrap per City specifications.

B. Ductile iron pressure type water pipe and fittings.

C. Pressure PVC pipe and fittings.

D. Type K (soft) copper with copper wrought sweat fittings, or cast bronze compression fittings.

E. Tape plastic coated 12 gauge copper tracer wire on top of non-metallic plastic mains located outside building. Secure to pipe every 6 to 20 feet and at all bends. Provide access every 300 feet where wire is brought up to grade with valve boxes, cleanouts, manholes, vaults, or other covered access devices. When running tracer wire up at curb stops, put the wire outside the box, so the tracer wire doesn't get tangled or torn when the valve is turned. Splices in tracer wire should be made with split bolt or compression-type connectors. Wire nuts shouldn't be used. A water-proof connection is necessary to prevent corrosion. Test tracer wire continuity after installation. If the tracer wire is ever broken, replace or repair as required to maintain continuity.

2.02 PIPING BELOW FLOOR

A. Ductile iron pressure type water pipe and fittings.

B. Type K (Soft) copper with copper wrought sweat fittings.

2.03 PIPING ABOVE FLOOR

A. Type L (Hard) copper with:
1. Wrought copper sweat fittings.
2. Mechanically formed tee connections.
    a. Joints shall be brazed using Sil-Fos. System shall be approved by Wisconsin Plumbing Code and shall be submitted for written approval of A/E.
    b. As created by T-Drill.
    c. All joints created in this manner shall be installed (brazed) in compliance with code and the manufacturer's recommendations. Soft soldered joints shall not be permitted. The branch tube shall be notched and contain a double dimple. The first to insure proper penetration into the main line. The second dimple will serve as a visual inspection point.
3. Copper tube press water fittings and couplings.
    a. Viega ProPress or Nibco Pressystem.
4. Grooved fittings and couplings.
    a. Victualic or Anvil Gruvlok.

B. Schedule 40 galvanized steel pipe with galvanized malleable iron fittings, or Victaulic fittings (230°F. max.).
1. should be restricted to use with water which can be expected to develop a protective calcium carbonate scale;
2. Should not be used for hot water above 140°F. unless there is documented evidence that the potential reversal between zinc and steel will not take place;
3. should not be installed downstream of copper tube systems;
4. couplings should not be used to connect copper;
5. nipples should not be used too close to bronze valves.

C. Soft temper copper tubing may be used when routing through floor or wall framing members.

2.04 NON-POTABLE WELL WATER PIPING ABOVE FLOOR (CONDENSER WATER SPLY & DISCHARGE)

A. Type L (Hard) copper with copper wrought sweat fittings.

B. Schedule 40 galvanized steel pipe with galvanized malleable iron fittings, or Victaulic fittings (230°F. max.).**WATER METER**

C. Shall be Badger, Sensus, or Hersey, meeting the approval of the local water department and complying with A.W.W.A. Specifications, size as shown on the Drawings. Meters are normally furnished by the municipality; if not, they must be provided by the Plumbing Contractor, with cost included under the Plumbing Work.

1. Coordinate with the municipality.
2. Meter shall be furnished with remote meter reading system (see plan for location).
3. Meter shall be furnished with automatic meter reading system including transponder and transmitter register assembly (radio frequency system).
4. Meter shall be capable of recording water usage at the design flow rate of 130 gpm with a corresponding pressure drop not exceeding 3 psi.

2.05 WATER METER

A. Based on product by Badger.

1. Sensus, Hersey, Carlon equals are acceptable.

B. Sensus Omni C2 water meter, size 1 ½”-10”, magnetic drive, reduced head loss, integral test port, electronic register, LCD display, resettable totalizer, low battery alarm, flanged design, 10 year battery, NSF/ANSI standard 61, Annex F and G approved. (city water connection)

C. It is the contractor’s responsibility to purchase meter from city water dept. (city water connection)

D. Badger meter Recordall Disk Series Meters; 5/8” – 2” sizes, .25 – 170 gpm, 150 psi max, (private well water connection)

2.06 CROSS CONNECTION CONTROL DEVICES

A. Based on product by Zurn/Wilkins.

1. Ames, Braukman, Cash Acme, Zurn/Wilkins equals are acceptable.

B. Hose Connection Vacuum Breaker: (threaded drains, hose bib, etc.) Watts No. 8, brass/chrome finish, 3/4" size, non-removable feature, 125 psi max. w.p., conforming to ASSE Std. 1011, designed for low/high hazard use and continuous pressure for up to 12 hours, and maximum back pressure of ten feet of water column.

C. Reduced Pressure Principle Backflow Preventer (2 1/2" - 10"):

1. Zurn model 375AST; 304L Stainless Steel, Stainless steel internals, EPDM seal rings, Buna Nitrile O-rings, Meets requirements of NSF/ANSI 61, sizes 21/2”-10”, Max working pressure 175 psi, Max working temp 140F, flanged or grooved connections.

2. In conjunction with Warrick relay module #26MA3BOE and #3E2A probe assembly.

3. Wiring to be completed by controls contractor

D. All cross connection assemblies require State (Wisconsin) approval and shall be approved prior to purchasing, installing or connecting. If the specified item is not approved, an equal product from another listed acceptable manufacturer that is approved must be used.

2.07 STRAINER

A. Based on product by Zurn/Wilkins.
1. Conbraco, Crane, Mueller Steam Specialty (Muessco), Nibco, Zurn/Wilkins equals are acceptable.

B. Zurn Model FSC-DOM cast iron wye type strainer; sizes 2 ½ through 12", epoxy coating, perforated stainless steel screens, 200 psi @ 150F, flanged class 125 lb., certified to NSF/ANSI 372 by IAPMO R&T.

C. Zurn Model YBXL wye type strainer; sizes ½" through 3", low lead cast bronze, threaded or soldered end connections, 400 psi @ 180F, 20 mesh stainless steel, certified to NSF/ANSI 372 by IAPMO R&T,

PART 3: EXECUTION

3.01 WATER SERVICE

A. Extend new water service from five feet of exterior building wall.

B. Pipe laying: The interior of the pipe shall be clean and joint surfaces brushed and wiped clean and dry when the pipe is lowered into trench. Lower each pipe, fitting and valve into the trench carefully and lay true to line and without objectionable breaks in grade. Under no circumstances drop or dump pipe or appurtenances into the trench. The depth of cover below finished grade shall be not less than 7 feet.

1. Give all pipes a uniform bearing on the trench bottom. Do not allow trench water or dirt to enter the pipe or joint space during laying; insert a watertight plug in the open end of the piping when pipe laying is not in progress. Cut pipe as necessary to locate fittings and valves in the positions required, cut pipe squarely and neatly and without damage to the pipe. Set plugs in openings left for branches to be installed later.
2. Contractor shall be responsible to check soil conditions at project site. If conditions would cause severe corrosion or deterioration of pipe material specified, A/E shall be notified before start of construction or a protective coating shall be applied.

C. Fittings and branch connections: Install proper fittings at all changes in direction, dead ends and interconnections of lines.

D. Pipe joints: Push-on rubber gasket joints or mechanical joints shall be installed as recommended by manufacturer. Mueller 110 compression connections are only permitted on underground water services utilizing Type "K" copper. Installation shall conform to manufacturer's recommendations.

E. Blocking: Pour lean-mix concrete thrust blocks between the undisturbed trench face and plugged ends, tees and elbows to prevent pipe movement at rubber gasket joints.

F. Bonding: At all non-welded joints in ferrous water lines, except where insulated joints are required, provide a jumper bond copper wire spot welded to each side of the joint. After welding, coat welded areas with a heavy coat of coal-tar enamel and wrap.

G. Insulated Fitting and Wrapping: Where copper pipe connects to any cast-iron pipe, provide a brass electrically insulated fitting. Coat and wrap the cast-iron pipe six inches in each direction from the insulated fitting and coat and wrap the fitting and the copper pipe for two feet from the fitting.

H. Patch areas to original condition.

I. Installation shall conform to NFPA 13 and 24 as much as is applicable, in addition to the above requirements. Coordinate with the Fire Sprinkler Contractor.

J. Assist the Fire Sprinkler Contractor in completing the "Contractor's Material and Test Certificate for Underground Piping" per NFPA 13, signing and turning over to the building Owner.

K. Sewer separation:
1. Water services 2" and smaller shall be at least 30" horizontally from any sanitary sewer.
2. Water services 2" and smaller may be less than 30" horizontally from any sanitary sewer if bottom of water piping is at least 12" above the sewer.
3. Water services 2 1/2" and larger shall be at least eight feet horizontally from any sanitary sewer.
4. Water services shall be at least 6" from any storm sewer.

L. Sewer crossing: Water services may cross a sanitary sewer if the water piping within ten feet of the crossing complies with the following:
1. Bottom of water pipe is at least 12" above top of sewer, or
2. Top of water pipe is at least 18" below bottom of sewer, or
3. Water pipe is installed within a water proof sleeve made of sanitary sewer materials.

M. When running service through a footing or foundation wall, provide sleeve or 2 inch thick compressible wrap.

N. New services (2” and smaller) between main and curb stop shall conform with requirements of City of La Crosse Standard Specifications. Contractor shall provide the local water utility with the following info:
1. As-built measurements locating new tap and/or water service and curb stop.
2. Piping materials.

3.02 BUILDING WATER PIPING SYSTEM

A. Piping shall be pitched to drain entire system; install drain valves at low points. Provide unions, at piping connections to all equipment, control valves, etc.

B. No water piping shall be installed in exterior walls above grade.

C. At each high point where air may be trapped in water distribution mains 3/4" and larger, install 1/2" air vent line with valve or a fixture branch off top of main.

D. Use dielectric unions/brass convertor fittings/flanges for connecting dissimilar piping materials, copper and steel or cast iron pipe or fittings. When pipe flanges are utilized, copper systems shall have bronze flanges and steel/cast iron systems shall have ferrous material flanges. Both shall be isolated from the other via gasket and thru bolts isolated from flanges via insulating bushings or grommets. **Nibco 633W will not be accepted.**

E. Sleeve piping as noted on drawings.

F. Seal openings around piping and pipe sleeves penetrating walls, floors and ceilings, including areas above suspended ceilings. Refer to Section 22 05 00.

G. See Section 07 84 00 for requirements when penetrating into or through required fire-resistive assemblies, fire protective membranes, thermal barriers, or construction providing a finish rating as an alternative to a fire resistive assembly.

H. See notes on drawing for information pertaining to the cutting, notching and boring of framing/structural members.

I. No piping shall be permitted to be installed in, enter or pass through spaces dedicated for electrical switchboards, panelboards, distribution boards, etc. Dedicated spaces extend from floor to structural ceiling with a width and depth that of the electrical equipment plus the working space in front of same with a width matching the equipment but not less than 30 inches, a depth of 36 inches and a height to at least 78 inches above floor. (Sections 110-16 and 384-4 of NFPA 70.)

J. Provisions for draining system shall be accomplished via 1/2" valve, where by air can be used to blow system clear of standing water.

K. Comply with the following to avoid erosion-corrosion of copper tubing:
1. Ream all ends.
2. Avoid forming solder globules on the inside surface of joints.
3. Insert tubing fully into the fittings prior to soldering.
4. Cut tubing squarely.
5. Avoid dents/dings.
6. Avoid crimping during bending.
7. Limit to 4-5 fps maximum on domestic hot water systems.
8. Limit to 2-3 fps maximum on domestic hot water return/circulation systems.
9. Limit to 8 fps maximum on domestic cold water systems.
10. Maintain less than 80 psi.
11. Treatment with sodium silicate/polyphosphate organic blends.

L. Comply with the following to avoid cold water pitting attack of copper tubing:
1. Avoid excessive flux on interior surfaces.
2. Use mild corrosive flux satisfying ASTM B 813 & B828.

M. Comply with the following to avoid hot water pitting attack of copper tubing:
1. Do not exceed 140°F.
2. Remove excessive amounts of manganese and iron.

3.03 CROSS CONNECTION CONTROL DEVICES

A. Install as recommended by manufacturer, where indicated on drawings.

B. Hose Connection Vacuum Breaker:
1. Install on discharge side of control valve.
2. Shall not be used where subjected to more than 12 hours continuous use.

C. Reduced Pressure Detector Assembly:
1. Contractor shall arrange for a performance test to be conducted at the time the device is put into service by a department-listed Backflow Prevention Device Tester. Complete the "Cross Connection Control Device Performance Test" form SBD-9927 upon completion of the test and send to the: Bureau of Building Water Systems, Owner and A/E.
2. Performance test shall comply with ASSE 5010-1047-1.
3. Contractor shall register this device with the State of Wisconsin by completing Form SBD-6154 and sending to the Bureau of Building Water Systems, Owner and A/E. Contractor to pay any associated fees.
4. Extend indirect waste from the pressure differential relief valve outlet to an acceptable hub drain/floor drain as applicable. Size of indirect waste to match outlet of the respectively sized air gap fitting.

5. Install four feet above floor along wall and maintain minimum required clearances to ensure accessibility / serviceability. Any part of the assembly shall be at least 12" above the floor (max. of 84") with clearances of 18" above, 4" from the back wall and 24" in front for servicing.
6. Identify all non-potable piping downstream of backflow preventer in accordance with the requirements of the Wisconsin Plumbing Code. (Tags or yellow bands at least 3" wide and spaced no more than 25' apart and at each side where the piping passes through a wall, floor or roof.)
7. Owner shall arrange for annual performance tests thereafter.

8. Install weather resistant tag securely attached to the device with the following information:

Wisconsin Department of Commerce
Identification/Object Number _____
Cross Connection Control Assembly
Do Not Remove This Tag

3.04 FLOOD PROTECTION SHUTDOWN VALVE

A. Install on piping downstream of strainer and upstream of 1 ½" backflow preventer located in Boiler Room.

B. Junction Box and flow sensor to be installed on horizontal discharge piping from backflow preventer relief valve.

C. Cut length of SS probes on the flow sensor to fit within RPZ drain pipe as required. Flow sensor to be installed in a horizontal position.

D. Adjust time delay as directed by Owner.

3.05 TESTS

A. Before joints are covered. (Refer to Section 22 05 93).

B. All new combined water service piping must be hydrostatically tested at not less than 200 psi pressure for two hours in the presence of the local authority having jurisdiction.

3.06 FLUSHING

A. Remove faucet outlets during the flushing process to prevent debris accumulation or clogging. Make sure each faucet outlet is unobstructed prior to A/E final inspection.

3.07 STERILIZATION

A. As soon as the water distribution system has been flushed out as above specified, it shall be sterilized in accordance with the requirements of the Wisconsin Plumbing Code or, in the absence of such, by the following method:
1. Introduce chlorine or a solution of calcium or sodium hypochlorite, filling the lines slowly and applying the sterilizing agent at a rate of 50 parts per million of chlorine, as determined by residual chlorine tests at the ends of the lines. Open and close all valves and hydrants while the system is being chlorinated.
2. After the sterilizing agent has been applied for 24 hours, test for residual chlorine at the ends of the lines. If less than 5 P.P.M. is indicated, repeat the sterilization process.
3. When tests show at least 5 P.P.M. of residual chlorine, flush out the system until all traces of the chemical used are removed.

4. 24 hours after the above flushing (3), arrange for a certified testing agency to collect a water sample, taken at the most remote location, and perform a potable water test. Submit copy of test report to HSR Construction Administrator. If sample fails to meet the potable water requirements, repeat the above procedure(s) as required.

B. After the water distribution system has been flushed out as above specified, let stand 24 hours and arrange for a certified testing agency to collect a water sample, taken at the most remote location, and perform a potable water test. Submit copy of test report to HSR Construction Administrator. If sample fails to meet the potable water requirements, then the water distribution system shall be re-flushed until a sample meets requirements or the system shall be sterilized by the previously stated method.

END OF SECTION 22 10 11

SECTION 22 10 92

NATURAL GAS SYSTEMS

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division 00 and 01 of this Project Manual apply to this Section as though repeated herein.

B. The requirements of Section 22 05 00 apply to this Section.

1.02 WORK INCLUDED

A. Work under this section shall include furnishing, installing and testing the complete piping system including pipe, fittings, valves, together with all permanent components attached.

1.03 RELATED WORK

A. Fire Stopping: Section 07 84 00.

B. General Provisions: Section 22 05 00.

C. Pipe/Valve Identification: Section 22 05 53.

D. Tests: Section 22 05 93.

E. Pipe and Pipe Fittings: Section 22 10 01.

F. Valves and Cocks (Manual): Section 22 10 02

G. Piping Support Devices: Section 22 10 04.

H. Water Heaters and Equipment: Section 22 30 57.

I. Packaged Boiler/Burner Units: See HVAC.

J. Modular Boiler/Burner Units: See HVAC.

1.04 QUALITY ASSURANCE

A. Conform to state and local codes.

B. Conform to NFPA #54, National Fuel Gas Code.

C. Conform to NFPA #101, Life Safety Code.

D. Conform to NFPA #110, Emergency and Standby Power.

E. Conform to local gas utility regulations.

F. Conform to manufacturer's instructions.

G. Conform to Uniform Mechanical Code (1988).

H. Notify the local gas utility before excavating in area of existing gas mains or service lines.

I. Conform to Wisconsin Administrative Code, Department of Commerce, Chapter Comm 40 – Gas Systems.

1.05 SUBMITTALS

A. Submit descriptive product data describing all material furnished under Part 2 of this Section.

1.06 PERMITS AND FEES

A. The Contractor shall obtain all required permits and approvals from the state and local fire department.

1.07 COMMISSIONING

A. Witness all tests and compile all documentation including verification of the following:
1. Pressure/leak testing prior to acceptance and operation per Section 22 05 93.
2. Purging.
3. Local gas utility or inspection department inspection report.

PART 2: PRODUCTS

2.01 METER

A. Based on product by Rockwell.
1. Equals are acceptable.

2.02 PIPING ABOVE GRADE (Over 5 PSI)

A. Schedule 40 black steel pipe with 150 psi steel weld fittings.

2.03 PIPING ABOVE GRADE (Under 5 PSI)

A. Schedule 40 black steel pipe with 150 psi steel weld fittings or 150 psi malleable iron screw fittings.

2.04 PIPING BELOW GRADE

A. Schedule 80 black steel pipe extra strong steel weld fittings. (Wrapping or coating and cathodic protection to be used).

B. Polyethylene (PE) gas pipe and tubing specified for gas main and service construction, suitable for use with natural gas installed by qualified/certified installer. Material and marking meeting ASTM D2513 (Specification for Thermoplastic Gas Pressure Pipe, tubing and fittings). Resin to be PE 2406 compounds, Type II, Grade P24, Class B, with antioxidants of ASTM D1248. Measurements per ASTM D1238. Burst pressure testing per ASTM D1599. Apparent tensile strength testing per ASTM D2290. Sustained pressure testing per ASTM D1598. Yellow color. (To be protected from shearing action caused by backfill settlement). (Sizes ½" - 1 ¼" and 2")

2.05 PIPING ABOVE FLOOR (Over 5 PSI)

A. Schedule 40 black steel pipe with 150 psi steel weld fittings or 150 psi malleable iron screw fittings.

2.06 PIPING ABOVE FLOOR (Under 5 PSI)

A. Schedule 40 black steel pipe with 150 psi malleable iron screw fittings.

B. Copper tubing type K or L (hard) conforming with ASTM B88 when gas contains less than 0.3 grains of hydrogen sulfide per 100 standard cubic feet, with copper wrought sweat fittings employing 1000°F soldering or brazing filler material.

2.07 STRAINER

A. Based on product by Watts.
1. Conbraco, Crane, Mueller Steam Specialty (Muessco), Zurn/Wilkins equals are acceptable.

B. Watts No. 777SI bronze "Y" type strainer, threaded connections, bronze body, 60 mesh stainless steel screen, tapped brass retainer cap and closure plug, 300 p.s.i. W.P. at 210°F, 3/8" - 3" sizes.

PART 3: EXECUTION

3.01 GAS SERVICE

A. Gas service to building, including meter, regulator and gas cock will be furnished and installed by local gas utility. Contractor shall verify what their responsibility entails. All costs not accepted by the utility will be assumed by the Plumbing Contractor. (Including, but not limited to permit fees, connection charges, etc.) Gas pressure to building shall be 7" w.c. or 2 psi.

B. Gas meters shall be located in ventilated spaces, readily accessible, not be subject to damage or excessive corrosion, at least three feet (radially) from sources of ignition, such as electric switches and air-conditioning units, and securely supported. The three foot distance must also be maintained from windows, vents and air intakes and outside water faucets. The natural gas service line must be a minimum of 15 feet from a water well.

3.02 PIPING ABOVE FLOOR, ABOVE GRADE, ABOVE ROOF

A. Where the first floor of a building is slab-on-grade, all gas piping shall rise above the ground outside the building and shall enter the building above the first floor slab.

B. Gas piping shall be installed with swing joints or other positive means of expansion to relieve the thrust on the pipe at the point where it pierces the building wall. The annular space between the pipe and sleeve, where the pipe pierces building walls, shall be grouted watertight and filled with fiberglass insulation.

C. Grounding of each gas piping entrance to building furnished and installed under DIVISION 26, Electrical. No other grounding in building is required even if switching to "Gastite" or other flexible tubing material.

D. All gas piping with gas pressures over 2 psi or 2 ½" and larger) shall be welded. Seamless welding fittings shall be used, except that welding nipples (Weldolets, Threadolets or Pipe-o-Lets, 250# minimum w.p.) may be used for branch take-offs up to one-half (1/2) the diameter of the main.

E. Piping 2" and smaller with gas pressures 2 psi or less may be screwed using taper pipe threads per ANSI/ASME B1.20.1. Thread compounds shall be resistant to the action of gas being used and applied to the male threads only.

F. No pipe bends will be allowed. Only where gas contains moisture shall gas piping grade 1/4 inch in 15 feet to drip pots at all low points. All changes in pipe sizes shall take place at branches. Take-offs to be at top or side of main.

G. No interior gas piping shall be concealed in solid partitions.

H. Gas piping may be installed in concealed locations such as hollow partitions, walls and floors as long as unions, tubing fittings, running threads, right and left couplings, bushings, swing joints, and compression couplings are not made by a combination of fittings. Normal fittings using tapered pipe thread may be used. Tubing joints shall be brazed.

1. When tubing is used, provide steel striker barriers not less than 0.0508 inch thick, or equivalent, between the tubing and the finished wall and extend at least 4" beyond concealed penetrations of plates, fire stops, wall studs, etc.
2. Install tubing in single runs and do not secure rigidly.

I. Gas piping may be installed above non-accessible and non-ventilated ceilings without sleeving as long as no valves or regulators are located in same space.

J. Gas piping may be installed in plenum areas without sleeving per NFPA 54 and COMM 64.41.

K. Open ends of gas piping shall be capped until extension or connection to equipment can be completed.

L. Extend from gas meter and connect to all equipment as required.

M. Insulating (dielectric) union shall be provided in the above ground gas piping at each gas service entrance, on the service-side of the gas meter. Coordinate with local utility.

N. All exterior piping and meter assembly shall be protected from corrosion by first applying a metal primer to the pipe, fittings and supports, then a top coat of an enamel paint that matches the adjacent building surfaces.

O. No piping will be permitted to enter or pass through spaces dedicated for electrical switchboards, panelboards, distribution boards, etc. Dedicated spaces extend from floor to structural ceiling, width and depth of electrical equipment plus three feet in front and minimum width of 30 inches. (NFPA 70)

P. Before any cutting or welding is done for pipe removal, disconnect gas piping system from source and thoroughly purge with air or inert gas venting to the outdoors.

Q. When regulators are located on the roof, they shall be at least five feet from the roof edge.

R. When regulators are located on the roof, they shall be either installed 12" - 18" above the roof or have the relief vent discharge extended to 12" - 18" above the roof using return bend elbow and bug screen.

S. All gas piping passing through walls, floors and ceilings shall be sleeved.

T. All gas piping passing through walls, floors and ceilings shall be sleeved with annular space packed with fiberglass insulation except through fire rated assemblies.

U. Seal openings around piping and pipe sleeves penetrating walls, floors and ceilings, including areas above suspended ceilings. Refer to Section 22 05 00.

V. See Section 07 84 00 for requirements when penetrating into or through required fire-resistive assemblies, fire protective membranes, thermal barriers, or construction providing a finish rating as an alternative to a fire resistive assembly.

3.03 GAS REGULATOR

A. Install where shown on drawing.

B. Extend vent pipe from regulator to location outside of the building of low hazard potential, as shown on drawings. The vent pipe shall be as short as possible and size be at least the same size as the outlet of the pressure relieving device. Size shall account for capacity and length. Vent size, from device to outside bldg, shall be:

1. The diameter of the device vent outlet if total equivalent length (TEL) is less than 10'. (An elbow is equivalent to three feet of pipe.)
2. The next nominal size larger than device vent outlet if TEL is 20'.
3. Two nominal pipe sizes larger than device vent outlet if TEL is 30'.
4. Etc.

C. Regulator vents shall not be vented into equipment flue or exhaust system.

D. Vent discharge shall be provided with cap designed to exclude water and insects.

E. Verify with local authorities and regulator manufacturer before common venting of appliance regulator reliefs.

F. Line pressure regulator reliefs shall not be common vented but shall extend separately to the outside.

G. Install regulator for equipment downstream of shut-off valve, dirtleg and union, as required.

H. Install strainer upstream of regulator.

3.04 EQUIPMENT CONNECTIONS

A. Provide shut-off valve, dirt leg and union at each equipment connection including food service equipment; install regulator furnished for equipment downstream of shut-off valve, dirtleg and union, as required. Unions are not required where flexible gas hoses and / or quick connects are used.

B. Verify inlet pressures to equipment and regulators to be connected / installed. Replace equipment regulator or install additional regulator as required.

C. Regulators on equipment less than 250,000 btuh input shall be of the "vent limiting means" which limits the escape of gas from the vent opening in the event of diaphragm failure.

D. Regulators may be installed in any position, however, the spring case vent on exterior regulators shall be pointed downward.

E. Use natural gas detector at final connections to equipment.

3.05 TESTING

A. Prior to acceptance and operation, the entire piping system (new and existing) shall be pressure tested. All necessary repairs shall be made and retested.

B. Test medium shall be air or inert gas of nitrogen or carbon dioxide unless system operating pressure is 1/2 psi or less, then fuel gas may be used. Oxygen shall never be used.

C. Test pressure shall be at least 1 1/2 times the maximum system working pressure, but not less than 3 PSIG.

D. Test duration shall be not less than 1/2 hour for each 500 cubic feet of pipe volume. System volumes of less than 10 cubic feet may be tested for 10 minutes. Systems with greater than 24,000 cubic feet shall be tested for 24 hours.

3.06 PURGING

A. Purge with an inert gas to remove all air, then use the fuel gas to remove the inert gas from the distribution system, which will be ready for services at the time of acceptance of the work. System purging shall not discharge within a confined space.

B. Notify local gas utility or inspection department upon completion of the system and submit copy of inspection report to A/E. This must be done prior to building occupancy.

END OF SECTION 22 10 92

SECTION 22 30 56

WATER CONDITIONERS

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division 00 and 01 of this Project Manual apply to this Section as though repeated herein.

B. The requirements of Section 22 05 00 apply to this Section.

1.02 RELATED WORK

A. Equipment Insulation: Section 22 07 16.

B. Pipe Insulation: Section 22 07 19.

C. Domestic Water System and Equipment: Section 22 10 11.

D. Deionized Water System: Section 22 10 84.

E. Distilled Water System: Section 22 10 85.

F. Reverse Osmosis System: Section 22 10 96.

1.03 SUBMITTALS

A. Submit descriptive product data describing all material furnished under Part 2 of this Section.

A. Witness all tests and compile all documentation including verification of the following:
1. Start-up and testing of the entire system.
2. Providing As-Built Drawings.
3. Pressure/leak testing before joints are covered per Section 22 05 93.

1.04 WARRANTY

A. Correct defective work within a two year period after the Date of Substantial Completion.

B. Provide manufacturer's standard product warranty.

PART 2: PRODUCTS

2.01 WATER SOFTENER

A. Based on product by Capital

B. Capital Model 2850, automatic water softener.

C. Capacity: Mineral tank shall have minimum capacity of 48,000 grains per 22.5 pound salt dosage and a pressure drop of 15 p.s.i. when flowing 22 g.p.m.

D. Mineral Tanks: 10 x 44 inch, 1 cu. ft. resin capacity; designed for 150 p.s.i. W.P.; Fiberglass reinforced pressure vessel.

E. Brine Tanks: 18 x 33 inch; tank and cover molded of corrosion free, High Density Polyethylene Brine Tank with environmental stress crack properties and dust resistant cover.

F. Includes:
1. 1.5” inlet & outlets.
2. Solid brass lead free control valve body for strength and durability.
3. Fully adjustable five cycle control delivers controlled upflow backwash with downflow brining, slow rinse, rapid rinse, and service.
4. Factory installed flow controls for accurate and efficient salt dosage with each regeneration.
5. Timed brine refill is fully adjustable to accommodate any desired salt dosage.

G. Brine System: Will automatically open to admit brine, close to prevent the entrance of air and refill the brine tank with the proper amount of water; regulation of the brine dosage will be accomplished by adjustment of cycle programmer; will be designed to allow proper refilling regardless of the salt level in the brine tank.

H. Warranty: Complete system shall be warranted to be free from defects in materials and workmanship for a period of not less than one year from the date of start up of system. The manufacturer shall further warranty that, in normal use, loss of resin through attrition during the first three years shall not exceed 3% per year; that the resin shall not be washed out of the system during backwash; and that the turbidity or color of the effluent, by reasons of passing through the softener, shall not be greater than the incoming water.

PART 3: EXECUTION

3.01 WATER SOFTENER

A. Install equipment, related components and accessories as recommended by manufacturer.

B. Install and extend drain lines from softener to building sanitary drain as shown on drawings. Provide air gap at drain.

C. Electrical connection under Division 26, Electrical.

D. Electrical receptacle under Division 26, Electrical.

E. Provide salt as required to properly adjust and set into operation.

F. Arrange to have the manufacturer's representative to take water sample, analyze, record findings, and set regeneration accordingly. Softening system shall regenerate immediately. Regeneration shall be based on the low salt setting. Instruct the Owner on the operating procedures, and provide A/E with written certification of the above upon completion.

G. Arrange to have the manufacturer's representative perform all initial and final adjustments and efficiency settings, as well as to instruct the Owner on the operating procedures, and provide A/E with written certification of the above upon completion.

H. All piping at softener shall be insulated. See Section 22 07 19.

I. All piping at softener shall be properly supported and anchored to minimize excessive weight on unit and stress due to movement.

J. Install gravel and softening resin in mineral tank as required.

K. Install, start-up, test and adjust in accordance with manufacturer's recommendations.

L. Install union at the outlet of the flow meter.

M. Provide full size valved bypass and valved inlet/outlet piping.

END OF SECTION 22 30 56

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SECTION 22 40 46

MOP BASINS

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division 00 and 01 of this Project Manual apply to this Section as though repeated herein.

B. The requirements of Section 22 05 00 apply to this Section.

1.02 SUBMITTALS

A. Submit descriptive product data describing all material furnished under Part 2 of this Section.

PART 2: PRODUCTS

2.01 MOP BASIN

A. Based on product by Powers-Fiat.
1. Acorn, AquaGlass, Eljer, E.L. Mustee, Florestone, Hal-Stone Products, ProFlo, Stern-Williams, Zurn, equals are acceptable.

B. MB-1: Powers Fiat Model (MSB-2424) molded stone "Mop Service Basin", one-piece, homogeneous product, 10" high sides. Color to be 219 "White" with Black accents. Drain body, stainless steel flat strainer, leaded caulked joint to a (3" I.P.S., 2" I.P.S.), optional Quick Drain Connector “QDC-3" gasket for 3" pipe, optional Quick Drain Connector “QDC-3-2" gasket for 2" pipe and #E-77-AA vinyl bumperguards on exposed sides. On floor installation.

C. Include: Powers Fiat Model MSG 2424 stainless steel wall guard to protect wall adjacent to the mop basin.

D. MB-2: Powers Fiat Model (MSB-2424) molded stone "Mop Service Basin", one-piece, homogeneous product, 10" high sides. Color to be 219 "White" with Black accents. Drain body, stainless steel flat strainer, leaded caulked joint to a (3" I.P.S., 2" I.P.S.), optional Quick Drain Connector “QDC-3" gasket for 3" pipe, optional Quick Drain Connector “QDC-3-2" gasket for 2" pipe. Recessed in floor to accept a grate. Grate to be flush with finished floor surface. Fiberglass grate provided by others.

2.02 FITTINGS

A. Based on product by Chicago, T & S Brass, Watts.
1. American Standard, Central Brass, Crane, Grohe, Kohler, Royal Brass, Sloan, Speakman, Union Brass, Wolverine Brass equals are acceptable.

B. Fittings: MB-1, MB-2; Chicago No. 305-R-XK-CP, exposed faucet, rigid spout with hose end, pail hook, integral stops, ceramic disc cartridges, all metal moving parts in water stream shall be monel, polished chrome finish. Provide Watts LF-600 silent checks on Hot and Cold piping.

C. Include Watts No. 8AC hose connection vacuum breaker, polished chrome finish.

D. Include Powers-Fiat #832-AA hose and hose bracket: 30" long 5/8" rubber hose, stainless steel bracket with rubber grip.

E. Include Powers-Fiat #889-CC stainless steel mop hanger, 24" long x 3" wide with three (3) rubber tool grips.

F. Mop basin fitting is exempt from compliance with ANSI/NSF Standard 61, section nine.

G. Install Watts LF600 silent check valve (threaded) on each hot and cold water branch to mop basin faucet including ball valve.

PART 3: EXECUTION

3.01 MOP BASINS

A. Recess basin flush with finished floor.

B. Seal joints at wall and floor using clear G.E. Silicone rubber.

C. Do not use cleaning chemicals that will be detrimental to the finish of the product.

D. Install faucet outlet 28" above floor.

E. Install hose bracket 18" above floor.

F. Install mop hanger 56" above floor above side of mop basin.

G. Attach hose connection vacuum breaker to faucet spout outlet.

H. Install stainless steel wall guards as recommended by the manufacturer.

I. Water rough-ins in wall shall be secure and perpendicular to wall/fixture.

END OF SECTION 22 40 46

SECTION 22 40 49

WASHFOUNTAINS

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Conditions of the Contract and portions of Division 00 and 01 of this Project Manual apply to this Section as though repeated herein.

B. The requirements of Section 22 05 00 apply to this Section.

1.02 SUBMITTALS

A. Submit descriptive product data describing all material furnished under Part 2 of this Section.

PART 2: PRODUCTS

2.01 WASH FOUNTAINS

A. Based on product by Bradley, Intersan.
1. Acorn, Bradley, Intersan, Willoughby equals are acceptable.

2.02 MODULAR DOUBLE LAVATORY SYSTEM

A. Based on product by Bradley.
1. Acorn, Intersan, Sloan, Willoughby equals are acceptable.

L-2: Bradley Verge Wash Basin, LVAD2-CAP-DCA-NSD-PT, Single piece molded design, access panel, infrared sensor operated, P-trap, flexible supplies, independent aerators, plug-in transformer (110/24 VAC), thermostatic mixing valve (TMA), Bradley Navigator mixing assembly with stops and supply hoses, 3-station, 30” centers, 300 series stainless steel trim components. No soap dispenser (NSD). Provide Watts LF-600 silent checks on Hot and Cold piping.

2.03 MODULAR MULTIPLE LAVATORY SYSTEM

A. Based on product by Bradley.
1. Acorn, Intersan, Sloan, Willoughby equals are acceptable.

L-3: Bradley Verge Wash Basin, LVAD3-CAP-DCA-NSD-PT, Single piece molded design, access panel, infrared sensor operated, P-trap, flexible supplies, independent aerators, plug-in transformer (110/24 VAC), thermostatic mixing valve (TMA), Bradley Navigator mixing assembly with stops and supply hoses, 3-station, 30” centers, 300 series stainless steel trim components. No soap dispenser (NSD). Provide Watts LF-600 silent checks on Hot and Cold piping.

2.04 FIXTURE CAULKING

A. GE Silicone Sanitary 1700, Dow Corning 786, or equivalent, clear silicone rubber sealant, mildew resistant, 25% movement.

PART 3: EXECUTION

3.01 FIXTURE CAULKING

A. Space between fixture and wall or floor shall be **neatly** caulked with a narrow bead of clear silicone rubber sealant.

1. PREPARATION
   a. Clean joint surfaces immediately before installation of sealant. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond of sealant.
   b. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer.
   c. Roughen vitreous or glazed joint surfaces as recommended by sealant manufacturer.
   d. Prime or seal the joint surfaces as recommended by the sealant manufacturer.
   e. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.
2. APPLICATION, GENERAL
   a. Apply sealant with a gun having proper size nozzle or with a knife, as required. Use sufficient pressure to fill all voids and joints solid. **Remove excess sealant and leave surfaces smooth, neat and clean.** Upon completion sealant shall have a smooth, even finish and all joints shall be weather tight. All work shall be in accordance with manufacturer's printed instructions.
   b. **Do not allow sealants to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage. Sealant shall be confined to the space only between the fixture and wall or floor and not beyond. Temporarily tape off adjacent surfaces as required to ensure compliance. Installation not conforming to the above will not be accepted.**

3.02 WASHFOUNTAINS

A. Fixtures shall be installed tight to wall. Space between wall and fixture exceeding 1/16” will not be accepted. Coordinate with the general contractor prior to beginning wall installation.

B. Fixture shall be securely fastened to wall/floor construction.

C. Do not use cleaning chemicals that will be detrimental to the finish of the product.

D. Include supplies from ceiling "P" trap in floor.

E. "P" trap below floor. (WF-1)

F. Install as recommended by manufacturer.

G. Install strainer check stops on supplies.

H. Install tie pipe assembly and anchor to floor and top of sprayhead. (WF-1)

I. Install telescoping shroud. Attach to top of washfountain sprayhead and other end to bottom of soffit/stair landing.

J. Install two telescoping shroud soap dispenser adaptors/mounting brackets on each washfountain (dispensers by Owner). Mount so bottom of soap dispensers are 46" above floor (verify).

K. Install two telescoping shroud towel dispenser adaptors/mounting brackets on each washfountain (dispensers by Owner). Mount so bottom of towel dispensers are 60" above floor (verify).

L. Coordinate installation heights and spacing between the towel and soap dispenser adaptors/mounting brackets with Owner. Towel dispensers shall be above the soap dispensers. Rotate the two soap dispenser adaptors/mounting brackets 60 degrees from the two upper towel dispenser adaptors/mounting brackets. Secure adaptors/brackets to the shroud as recommended by manufacturer. Note that the adaptors/brackets shall be modified as required so that when soap dispensers are mounted, the soap dispenser outlets will be beyond the sprayhead to avoid soap build-up on top of sprayhead.

M. Verify proper operation and adequate flow from each outlet.

N. Remove flow control in solenoid valve to increase flow capacity.

O. Sensor operated:
1. Relocate factory mounted transformer and J-box to where shown on plan.
2. 120 volt ~~GFCI~~ duplex electrical wall outlet under Division 26, Electrical. To be located on wall behind enclosure panel.
3. Plug transformer into electrical wall outlet.
4. Wiring~~, from a GFI protected circuit,~~ to transformer and earth grounding of fixture under Division 26, Electrical. See plan for location of transformer.
5. Conduit between transformer and washfountain, under Division 26, Electrical. Coordinate.
6. Extend wiring in conduit from transformer to washfountain. See plan for location of transformer. Coordinate with electrical.

3.02 MODULAR MULTIPLE LAVATORY SYSTEM

A. Space between wall and fixture shall not exceed 1/16". Coordinate with the general contractor prior to beginning wall installation.

B. Install as recommended by manufacturer.

C. Fixtures shall be securely fastened to wall construction.

D. Install strainer check stops on water rough-ins, extend s.s. flexible supplies to thermostatic mixing valve, install tailpiece and P-trap with waste arm to wall. All to be accessible through base panels.

E. Verify proper operation and adequate flow from each outlet.

F. Sensor operated:
1. 120 volt duplex electrical wall outlet connected to GFI circuit breaker under Division 26, Electrical. To be located on wall behind enclosure panel.
2. Plug transformer into electrical wall outlet.

END OF SECTION 22 40 49

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SECTION 23 25 00 - HVAC WATER TREATMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Project drawings, related applicable specification sections, and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. This Section includes the following HVAC water-treatment systems:
   1. HVAC water-treatment chemicals.
   2. ~~**Provide Third party verification of Glycol Content in Heating and Chilled Water Systems. All costs for this work shall be bid as part of this section.**~~
   3. Glycol concentration percentages indicated in this section shall be provided regardless of glycol concentration percentages indicated on mechanical equipment schedules.
   4. Glycol shall be added to the hydronic heating and chilled water piping system including all new and existing piping.
   5. All glycol system fill and filtration equipment.

B. Water from the project site shall not be utilized. Water shall be premixed to the required solution concentrations for the Hydronic Heating and Chilled Water shall be delivered via 55 gallon drums. ~~**Systems and shall be hauled to the site via a tanker truck.**~~ Water shall also be mixed, adjusted, and tested to the performance requirements indicated in these specifications before introduction into the piping systems.

1.3 APPROVED PROVIDERS

A. ***This section of work shall be provided by Wisconsin Mechanical.***
   1. ***Contact Jim Kent at 715-834-7676 for pricing.***
   2. ***Not alternate vendors allowed.***

1.4 PERFORMANCE REQUIREMENTS

A. Water quality for HVAC systems shall minimize corrosion, scale buildup, and biological growth for optimum efficiency of HVAC equipment without creating a hazard to operating personnel or the environment.

B. Hydronic heating and chilled water systems shall be filled with glycol solutions to insure bursting protection to ***20 deg***. F and in the percentages listed below.

C. Provide water treatment and corrosion inhibitors for the Heating and Chilled Water Systems to maintain the water quality below even though glycol will not be installed in the chilled water systems.

D. Glycol types and concentrations:
   1. ***30%*** Propylene Glycol / ***70%*** water solution in the Hydronic Heating Water System.
   2. ***30%*** Propylene Glycol / ***70%*** water solution in the Hydronic Chilled Water System.

E. Closed hydronic systems, including hot-water heating and chilled water cooling, shall have the following water qualities:
   1. pH: Maintain a value within 8.0 to 9.0
   2. CaCO3 Alkalinity: Maintain a value within 100 to 500 mg/l
   3. CaCO3 Harness: Maintain a value within 100 to 500 mg/l
   4. Inhibitors: Maintain a phosphate value of 1,500-3,000 ppm.

5. Soluble Copper: Maintain a maximum value of 0.20 ppm.
6. Total Iron: Maintain a maximum of 5 mg/l
7. Ammonia: Maintain a level less than 2.0 mg/l
8. Chlorides: Maintain a level less than 200 mg/l
9. Dissolved Solids: Maintain a level less than 1000 mg/l
10. Manganese: Maintain a level less than 0.4 mg/l
11. Nitrate: Maintain a level less than 100 mg/l
12. Sulfate: Maintain a level less than 200 mg/l
13. Microbiological Limits:
    a. Total Aerobic Plate Count: Maintain a maximum value of 1000 organisms/ml.
    b. Total Anaerobic Plate Count: Maintain a maximum value of 100 organisms/ml.
    c. Nitrate Reducers: Maintain a maximum value of 100 organisms/ml.
    d. Sulfate Reducers: Maintain a maximum value of 0 organisms/ml.
    e. Iron Bacteria: Maintain a maximum value of 0 organisms/ml.
    f. Legionella: Maximum of 0 organisms/ml.
14. The water shall be mixed, treated, and tested to meet these requirements before shipment to site.

1.5 SUBMITTALS

A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for the following products:
1. Side stream Filters.
2. Glycol fill pumps.
3. Chemical material safety data sheets.
4. Glycol.

1.6 QUALITY ASSURANCE

A. HVAC Water-Treatment Service Provider Qualifications: An experienced HVAC water-treatment service provider capable of analyzing water qualities, installing water-treatment equipment, and applying water treatment as specified in this Section.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

~~1.7 THIRD PARTY VERIFICATION~~

~~A. The glycol and mineral content of the Heating and Chilled Water Piping System shall be verified by a third party contractor and a written report must be provided to the engineer after the tests have been complete. This third party contractor shall not be the chemical supplier or installing mechanical contractor for this job.~~

~~B. This verification shall be witnessed and approved by the owner.~~

~~C. Glycol test requirements shall entail the following:~~
~~1. Mineral Content via argon plasma spectroscopy to determine the level as specified above that may be in the samples of both heating and chilled water piping.~~
~~2. Testing for glycol freeze testing and identification of the glycol product as well as glycol percentage in the systems.~~

~~D. Procurement and Costs for this third party test shall be by the bidding contractor of this bid section.~~

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Dowfrost Propylene Glycol – Heating Water Systems
   2. Dowfrost Propylene Glycol – Chilled Water Systems

2.2 CHEMICALS

A. Chemicals shall be as recommended by water-treatment system manufacturer that are compatible with piping system components and connected equipment, and that can attain water quality specified in Part 1 "Performance Requirements" Article.

B. Cleaning Chemicals:
   1. Per the HVAC treatment contractor.

C. Corrosion Inhibitors:
   1. Glycol shall have phosphate and corrosion inhibitors integral to glycol.

2.3 SIDE STREAM FILTERS

A. Provide Parker side arm filter for chilled water and hot water system. Provide 30 additional fulflo honeycomb filters.

2.4 GLYCOL FEED EQUIPMENT

A. Provide a 50 gallon drum of premixed glycol solution and integral pumping system for the chilled water system.
   1. Unit shall be Equal to Axiom Industries Model SF100 Package Hydronic System Feeder.
   2. Unit shall have the following:
      a. 55 gallon capacity
      b. 115 volt integral pump with plug in cord
      c. Fluid level switch to shut the pump off if the level gets too low
      d. Diverter valve for air purging
      e. Flexible connection hose with integral check valve
      f. Low level alarm panel with remote monitoring dry contacts and selectable audible alarm.
      g. Install label as SDS mandates.

B. Provide a 50 gallon drum of premixed glycol solution and integral pumping system for the chilled water system.
   1. Unit shall be Equal to Axiom Industries Model SF100 Package Hydronic System Feeder.
   2. Unit shall have the following:
      a. 55 gallon capacity
      b. 115 volt integral pump with plug in cord
      c. Fluid level switch to shut the pump off if the level gets too low
      d. Diverter valve for air purging
      e. Flexible connection hose with integral check valve
      f. Low level alarm panel with remote monitoring dry contacts and selectable audible alarm.
      g. Install label as SDS mandates.

PART 3 - EXECUTION

3.1 WATER ANALYSIS

A. Water from the project site shall not be utilized. Water shall be premixed to the required solution concentrations for the Hydronic Heating and Chilled Water Systems and shall be hauled to the site via a tanker truck. Water shall also be mixed, adjusted, and tested to the performance requirements indicated in these specifications before introduction into the piping systems.

3.2 INSTALLATION REQUIREMENTS

A. Systems: Assist install of the following glycol solutions into the hydronic systems.
   1. ***30%*** Propylene Glycol / ***70%*** water solution in the Hydronic Heating Water System.
   2. ***30%*** Propylene Glycol / ***70%*** water solution in the Hydronic Chilled Water System.

B. Deliver chemical application equipment and chemicals to site. Oversee and facilitate all chemical installation, which will be installed by Section “Hydronic Piping”.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:
   1. Inspect field-assembled components and equipment installation, including piping and electrical connections.
   2. Inspect piping and equipment to determine that systems and equipment have been cleaned, flushed, and filled with water, and are fully operational before introducing chemicals for water-treatment system.
   3. Test for leaks and defects. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
   4. Leave uncovered and unconcealed new, altered, extended, and replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
   5. Cap and subject piping to static water pressure of 75 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow test pressure to stand for four hours. Leaks and loss in test pressure constitute defects.
   6. Repair leaks and defects with new materials and retest piping until no leaks exist.

C. Remove and replace malfunctioning units and retest as specified above.

D. Sample hot water heating and chilled water system water at two-week intervals after boiler startup for a period of eight weeks, and prepare test report advising Owner of changes necessary to adhere to Part 1 "Performance Requirements" Article for each required characteristic.
   1. Add additional chemicals as required to meet the performance characteristics.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC water-treatment systems and equipment.

~~B. Provide third party testing of glycol systems per these specifications. Provide written report with the owner's signature.~~

END OF SECTION 23 25 00

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SECTION 24 0700 – HVAC SYSTEM COMMISSIONING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Project drawings, related applicable specification sections, and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. Section includes commissioning process requirements for HVAC&R systems, assemblies, and equipment.

1.3 MECHANICAL CONTRACTOR COSTS

A. Labor, instrumentation, tools, and equipment costs for technicians for the performance of commissioning tasks and commissioning agent assistance are to be included in each contractors cost.

B. Contractors shall include costs in their bid amount to provide commissioning assistance (per the specified contractors responsibilities and execution sections below) via a contractor supplied skilled senior technician / journeyman for the following:

1. Western Technical College – Integrated Technology Addition and Remodel:
    a. Ventilation Contractor: 8 labor hours
    b. Piping Contractor: 8 labor hours
    c. Controls Contractor: 24 labor hours
    d. TAB Contactor: 16 labor hours

1.4 CONTRACTOR'S RESPONSIBILITIES

A. Perform commissioning tests and equipment function tests at the direction of the Commissioning Agent (CxA).

B. Participate in HVAC&R systems, assemblies, equipment, and component maintenance orientation and inspection as directed by the CxA.

C. Provide information requested by the CxA for final commissioning documentation.

D. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.

1.5 COMMISSIONING AGENT'S (CxA) RESPONSIBILITIES

A. Provide Project-specific construction checklists and commissioning process test procedures for actual HVAC&R systems, assemblies, equipment, and components to be furnished and installed as part of the construction contract.

B. Commissioning testing.

C. Verify testing, adjusting, and balancing of work are complete.

D. Provide test data, inspection reports, and certificates in systems manual.

1.6 COMMISSIONING DOCUMENTATION

A. Provide the following information to the CxA for inclusion in the commissioning plan:
1. Submittals, systems manuals, operation and maintenance manuals.
2. Identification of installed systems, assemblies, equipment, and components including design changes that occurred during the construction phase.
3. Schedule for completing construction checklists and manufacturer's pre-start and startup checklists for HVAC&R systems, assemblies, equipment, and components to be verified and tested.
4. Certificate of completion certifying that installation, pre-start checks, and startup procedures have been completed.
5. Certificate of readiness certifying that HVAC&R systems, subsystems, equipment, and associated controls are ready for testing.
6. Test and inspection reports and certificates.
7. Verification of testing, adjusting, and balancing reports.
8. Review of operation and maintenance manuals.

1.7 SUBMITTALS

A. Copy of all equipment submittals.

B. Operation and Maintenance Manuals.

C. Certificates of completion of installation, pre-start, and startup activities.

PART 2 - <u>PRODUCTS (Not Used)</u>

PART 3 - EXECUTION

3.1 COMPONENTS TO BE COMMISSIONED

A. The following equipment and systems, at a minimum, will be tested and commissioned to assure installation and function per the design documents and design intent.
   1. Equipment will be cycled through the specified controls sequences and critical controls points will be verified.
   2. Equipment will be turned on and off to assure function.
   3. Discharge temperatures will be verified.
   4. Valve and damper cycling will be verified.
   5. Outdoor airflow rates will be verified.

B. Heating and Cooling Systems
   1. Hydronic Coils
   2. Wall Radiant Panels
   3. Glycol Concentrations in Heating and Cooling Water Piping Systems
   4. Controls Systems for the Heating Water Systems

C. Ventilation Systems
   1. Air Handling Unit
   2. Shutoff VAV Boxes
   3. Exhaust Fans
   4. Controls Systems for Ventilation Systems

D. Plumbing Systems
   1. Water Softener
   2. Non-Potable Well

3.2 TESTING PREPARATION

A. Certify that HVAC&R systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.

B. Certify that HVAC&R instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.

C. Certify that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.

D. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

E. Inspect and verify the position of each device and interlock identified on checklists.

F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.3 TESTING AND BALANCING VERIFICATION

A. Prior to performance of testing and balancing Work, provide sample copies of reports, sample forms, checklists, and certificates to the CxA.

B. Notify the CxA at least 7 days in advance of testing and balancing Work, and provide access for the CxA to witness critical portions of the testing and balancing Work.

3.4 HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

A. HVAC Instrumentation and Control System Testing: Assist the CxA with preparation of testing plans.

B. Pipe system cleaning, flushing, hydrostatic tests, and chemical treatment requirements are specified in piping Sections. HVAC Contractors shall prepare a pipe system cleaning, flushing, and hydrostatic testing plan. Provide cleaning, flushing, testing, and treating final reports to the CxA.

C. HVAC Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of air, steam, and hydronic distribution systems; special exhaust; and other distribution systems, including HVAC terminal equipment and unitary equipment.

END OF SECTION 24 0700

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