**SPECIFICATIONS**

**Note:** Revised Additions are in bold, deletions have a strikethrough.

SECTION 22 08 00 - PLUMBING SYSTEMS COMMISSIONING REQUIREMENTS

1. Add entire new Section 22 08 00 as follows:

# **SECTION 22 08 00 - PLUMBING SYSTEMS COMMISSIONING REQUIREMENTS**

## **PART 1 - GENERAL**

**1.1 SUMMARY**

 **A. Section Includes: Related sections, warranties, and plumbing system commissioning**

 **requirements.**

 **B. Related Sections:**

 **1. Section 01 91 00, Commissioning Requirements.**

 **2. Section 23 08 00, HVAC Systems Commissioning Requirements.**

 **3. Section 26 08 00, Electrical Commissioning Requirements.**

**1.2 WARRANTY**

 **A. Manufacturer's Warranty: Commissioning, inspecting, and testing shall not modify terms or time periods of plumbing equipment, systems, and controls warranties including related equipment and systems, and adjacent work.**

**PART 2 - PRODUCTS**

**--- NOT USED ---**

**PART 3 - EXECUTION**

**3.1 WORK BY CONTRACTOR**

 **A. Work by Contractor:**

 **1. Refer to Section 01 91 00, Commissioning Requirements.**

 **2. Complete all phases of Work so functional mechanical and plumbing systems can be started, tested, adjusted, and balanced.**

 **3. Start of commissioning procedures before system completion does not relieve plumbing equipment installer from completing plumbing systems in accordance with the Contract Documents and the construction schedule.**

 **4. Ensure that equipment and systems are installed and started in accordance with the Contract Documents and manufacturer's requirements and recommendations.**

 **5. Perform functional testing using written commissioning test procedures and checklists for each commissioned system, subsystem, and piece of equipment in accordance with Section 01 91 00.**

 **6. Provide corrections, adjustments, and retesting in accordance with Section 01 91 00.**

**END OF SECTION 22 08 00**

SECTION 22 10 00 - PLUMBING PIPING AND PUMPS

1. Article 1.2, F: Revise as follows:

F. Plumbing System Disinfection shall be performed by an experienced, qualified, chemical treatment agency. ~~Mt. Hood Chemical or approved alternate.~~ **Nalco only.**

1. Article 2.1, C,2,b: Remove as follows:

~~b. Poly(vinyl chloride) (ASTM D1784) (PVC) plastic drain, waste and vent pipe (ASTM D2665 and D1785) and fittings (ASTM D2665) (DWV). PVC is only allowed for drain line with slopes of 1.5% or greater. No restrictions on vent pipe.~~

SECTION 22 40 00 - PLUMBING FIXTURES

1. Article 2.2, A: Revise as follows:

A. Single Fixture Tempering Valve: **Lead free construction t**hermostatic mixing valve **with ASSE1070 certification Watts LFMMV series or equal**. ~~Watts MMV. ASSE 1016 listed~~. Bronze/brass construction with stainless steel disc and springs, copper thermostat.

1. Article 2.3, B: Revise as follows:

B. Fixture Traps: Exposed fixture tailpieces, traps, and wastes shall be **ABS with** ~~chrome plated 17 gauge seamless brass tube with cast brass nuts and~~ deep or box style escutcheons as required to conceal rough piping. ~~Products to be stamped with manufacturer’s name and material gauge. McGuire, Keeney, Zurn, or approved~~.

1. Article 2.3, E,1: Revise as follows:

1. Faucet: Chrome plated brass body with ADA Dual Handle operation, unless otherwise noted, vandal resistant 0.5 gpm aerator with grid strainer waste. ~~Chicago 895-369-GNRGD2-E2805-5 JKCP.~~ **Moen Commercial 8210 series or equal American Standard.**

1. Article 2.3, F: Revise as follows:

F. Drinking Fountain “DF-1”: Wall mounted, 14 gauge, stainless steel, dual height with push button operator and vandal resistant bottom cover plate. Provide with stainless steel wall plate and upper basin extension for ADA compliance. ~~Fitered and Non-refrigerated.~~ Provide with bottle filler. Unit shall be 60HZ. Elkay ~~LZSTL8WSSP~~. **LZSTLDDWSVRSK**.

1. Article 2.3, G: Revise as follows:

G. Stainless Steel Sinks: Type 302 or 304, 18 gauge, self-rimming stainless steel sink (unless noted otherwise), fully undercoated, drawn bowl with satin finish. Elkay numbers are listed; Just is approved. Install with stainless steel crumb cup strainer outlet or grid strainer (as noted), flange tail piece, and 1-1/2” trap. For faucets, ~~Chicago~~ **Moen Commercial** numbers are listed, ~~and only~~ **American Standard is** allowed. Sinks shall be punched for faucet specified. Coordinate number of holes required. Cock hole covers are not allowed. Provide with tail piece as required for dishwasher or AC condensate drain per drawings.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Location** | **Tag** | **Basin (Elkay)** | **Faucet (Chicago)** | **ADA** | **Strainer, Disposal, etc.** |
| Band/Choir Room | S-4 | Single Compartment ELUHAD211555 with 5-3/8” depth. | ~~786 Series,~~ **8287,** 8” projection spout ~~(L8)~~ set rigid with 1.5 GPM vandal resistant aerator, ADA **2 1/2" long handles.** | Yes | Grid strainer. Provide with flexible guard style bubbler Chicago 748-665 FHCP. See note # 1. |
| Break Room  | S-2 | Single Compartment ELHAD211555 with 5-3/8” depth. | ~~2300~~ **8712** | Yes | 3/4" HP In-Sink-Earator Evolution series disposal. See note # 1. |
| Nurse | S-3 | Single Compartment ELUHAD211555 with 5-3/8 " depth. | ~~786 Series,~~  **8287** 8” projection gooseneck set rigid with 1.5 GPM vandal resistant aerator, ADA ~~317~~ **4" long** wrist blade handles. | Yes | Grid strainer. See note # 1. |
| Science  | S-1 | Epoxy Sink. See Architect division. | ~~786 Series~~, **8287,** 8” projection spout ~~(L8~~) set rigid with 1.5 GPM vandal resistant aerator, ADA ~~369~~ **2 1/2 " long** handles. | No | CPVC grid strainer & trap. |

1. Article 2.3, J,1: Revise as follows:

J. Combination Shower/Eyewash, "ESH-1":

1. ANSI Z358.1-2009 Compliant. Horizontal supply emergency shower with stainless steel shower head, ~~galvanized~~ **stainless** steel pipe, rigid stainless steel operating rod and chrome plated ball valve. Provide with concealed service line. Eyewash with stainless steel bowl, chrome plated ball valve with paddle handle, plastic eyewash heads with dust cover, pressure compensating stream controller, and emergency fixture sign. Provide eye-wash with trapped drain connection and wall bracket. Guardian G~~1643~~ **1691** with G1814 or equal Encon, Haws.

1. Article 2.3, J,3: Remove as follows:

~~3. Provide with 120 volt powered flow switch with audible (100dB at 10') alarm and visual (1000 min. Lumen LED) alarm. Provide with silence switch. Guardian AP275-100 or equal Haws or Encon.~~

1. Article 2.3, L: Add new paragraph as follows:

**L. Refrigerator Water Connection IRB-1: Guy Gray BIM 875 or approved.**

SECTION 23 08 00 - HVAC SYSTEMS COMMISSIONING REQUIREMENTS

1. Add entire new Section 23 08 00 as follows:

# **SECTION 23 08 00 - HVAC SYSTEMS COMMISSIONING REQUIREMENTS**

## **PART 1 - GENERAL**

1.1 SUMMARY

**A. Section Includes: Related sections, warranties, and HVAC system commissioning requirements.**

**B. Related Sections:**

**1. Section 01 91 00, Commissioning Requirements.**

**2. Section 22 08 00, Plumbing Systems Commissioning Requirements.**

**3. Section 26 08 00, Electrical Systems Commissioning Requirements.**

1.2 WARRANTY

**A. Manufacturer's Warranty: Commissioning, inspecting, and testing shall not modify terms or time periods of HVAC equipment, systems, and controls warranties including related equipment and systems, and adjacent work.**

## **PART 2 - PRODUCTS**

-- not used --

## **part 3 - execution**

3.01 work by contractor

**A. Work by Contractor:**

**1. Refer to Section 01 91 00, Commissioning Requirements.**

**2. Complete all phases of Work so functional mechanical and plumbing systems can be started, tested, adjusted, and balanced.**

**3. Start of commissioning procedures before system completion does not relieve HVAC equipment installer from completing mechanical systems in accordance with the Contract Documents and the construction schedule.**

**4. Ensure that equipment and systems are installed and started in accordance with the Contract Documents and manufacturer's requirements and recommendations.**

**5. Perform functional testing using written commissioning test procedures and checklists for each commissioned system, subsystem, and piece of equipment in accordance with Section 01 91 00.**

**6. Provide corrections, adjustments, and retesting in accordance with Section 01 91 00.**

**END OF SECTION 23 08 00**

SECTION 23 21 00 - HYDRONIC PIPING AND PUMPS

1. Article: 2.5, A: Add as follows:

A. In-Line Circulators: Pipe mounted, in-line arrangement with mechanical seals with ceramic seal seats, suitable for continuous operation at 225 deg. F at head and capacity stated on Drawings. Cast iron impeller casing, stainless steel cartridge with non-metalic impeller. 3250 rpm split capacitor motor. Taco **or Wilo** only.

SECTION 23 57 00 - HEAT EXCHANGERS

1. Article: 2.2, A: Revise as follows:

A. ~~Plate and frame~~ **Brazed plate** style heat exchanger. **Single plate type p**late material to be ~~0.0157 inch AISI 304~~ **316L** stainless steel with **99.9% copper braze alloy & 304 stainless steel connection** ~~Nitrile gasket material~~ rated for at least 150 psi and 250º F. See drawings for capacity. Bell & Gossett**, Kelvion** or approved. Unit shall be rated for 45% glycol. **Provide with 20-40 mesh water strainer on both inlet lines.**

**SUBSTITUTION REQUESTS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **SECTION** | **MANUFACTURE/****ITEM** | **PROPOSED****SUBSTITUTION** | **COMMENT** |
| 1. | 221000, 2.1, F | Pre-Insulated PEX Tubing | Rehau  | * Rejected.
 |
| 2. | 224000, Par. 2.3 | Guardian  | Lawler  | * Approved.
 |
| 3. | 224000, 2.3, D | American Standard, Moen - Dual Flush 1.1/1.6 GPF Flush Valve | Sloan  | * Rejected.
 |
| 4.5. | 224000, 2.3, J224000, 2.3, J | GuardianGuardian | Acorn Safety Stingray Systems | * Approved.
* Approved
 |
| 6. | 224000, Par. 2.3, J,2 | Guardian  | Lawler  | * Approved.
 |
| 7. | 224000, 2.3, K | Guardian  | Acorn Safety  | * Approved.
 |
| 8. | 224000, 2.3, K | Guardian  | Stingray Systems  | * Approved.
 |
| 9. | 232100, 2.1, C.2 | Cross-Linked Polyethylene Tubing - Wirsbo | Rehau  | * Rejected.
 |
| 10. | 232100, 2.3, C | Snowmelt System Headers - Uponor | Rehau  | * Rejected.
 |
| 11. | 233000, 2.3, C | Grilles, Registers & Diffusers | Nailor, Ind.  | * Approved.
 |
| 12. | 233000, 2.4 | Titus VAV Terminal Units | Price  | * Rejected.
 |
| 13. | 235700, 2.2, A | Heat Exchangers | Taco  | * Approved.
 |
| 14. | 237400, 2.1, H | Central Station Air Handlers | Thermal Corp. | * Approved.
 |
| 15. | 238000, 2.2, A | Space Mounted Prop Fans | Macroair | * Rejected.
 |

**Building E & F: PLANS**

Mechanical

M2.01:

 Replace existing neutralizers for three existing boilers.

M2.02A:

 Added lining on suction side of exhaust fans.

 Corrected some drafting/spelling errors.

 Added not to remove existing louver for instasllation of new AHU.

M2.02B:

 All floor mounted piping are removed and re-routed overhead.

M2.03

 Drafting errors corrected, made existing ductwork lighter for clarity.

M6.01:

 Exhaust fans: Revised RIS to Exernal spring isolations

 Heat Exchanger: Revised from Plate & Frame to Brazed Plate

 Pumps: Added controls and fluid type

 AHU’s: Revised min/min OSA airflow, added Basis of Design Mfr/model, and added \*note reference.

 VAV boxes: deleted some unnecessary columns to avoid confusion.

M6.02:

 Made changes to 4/M6.02 detail.

M6.03

 Revisions made to details 1,3, 4, 5, 6 8 and 9.

 Detail 1 Inline pump: DP line location is revised to include strainer in the DP reading.

 Detail 3 Relieff Louver detail: Corrected texting overlap.

 Detail 4 Coil piping diagram. Revised the detail name tor read 3-way control valve instead of end of loop: 3-way mixing valve.

 Detail 5 Chem Pot Feeder: Added not to drain to existing floor sink from chem pot feeder.

 Detail 6 Pipe Penetration through Stem Wall: Added more details to include slab penetration.

 Detail 8&9 AHU’s: Added notes . which required A HU’s to be constructed in sections to allow assembly in the mechanical room.

M6.04:

 Made corrections to AHU connection detail

Plumbing

PD1.01:

 Added note to abandon piping beyond from lift station.

 Made revisions to AW demo work.

PD1.02:

 Added notes to abandon CW and cap piping at exitsing janitor’s sink, sink and drinking fountains.

 Added demo of existing 1-1/2”waste line to new janitor’s break room.

PD2.01:

 Revised capping VTR’s to removing and patching.

PD2.02:

 Cap piping to underslab, and abandon all piping underground beyond.

P1.01:

 Show prime line to emergency shower drain from instructor’s sink.

 Added note to use Fernco for connection between existing and new AW piping.

 Removed reference to underground gas piping detail.

P1.02:

 showing existing underground piping to be abandoned.

 New waste lin to S-2 and floor sink in Janitor’s breakroom.

P2.01:

 Removed reference to capped VTR’s.

 Revised keyed note 6, to add the text “Auto”.(balance valve);.

 Revised the note for replacement of existing Gas PRV.

 Keyed note 13 revised to read ½” gas (CSST) from below.

P2.02:

 Added new CW, HW and HWR lines to janitor’ss sink and new sink in Band.

P6.01:

 Corrections made to plumbing fixture schedule.

 Detail 5 is removed.

 Revised detail 1 to read “tempered water”, rather than CW on the discharge line from MV.

 Added the words Valve handle” in detail 7,

 Added AW line type in the legend.

P6.02:

 Added plumbing details 5& 6 for new CW and HW connections to existing Janitor’s sink.

**Building A: PLANS**

 P6.01: Added Detail call out on Detail 1.

Takako Baker, P.E.

MFIA, Inc.