REYNOLDS SCHOOL DISTRICT
2025 HIGH SCHOOL COOLING TOWER/CHILLER PROJECT

REYNOLDS HIGH SCHOOL COOLING TOWER/CHILLER CM/GC RFP

ADDENDUM #4 RESPONSE TO PROPOSAL QUESTIONS

- Original RFP issued October 30, 2025
- Addendum 1 issued October 31, 2025 on OregonBuys site only. This Addendum changed the Bid Opening Date from "11/10/2025 10:00:00 AM" to "11/25/2025 05:00:00 PM".
- Addendum 2 issued October 31, 2025 on OregonBuys site only. This Addendum changed the Bid Opening Date from "11/25/2025 05:00:00 PM" to "11/25/2025 02:00:00 PM".
- Addendum 3 issued November 12, 2025 on OregonBuys site. This Addendum consisted of a title page 1 page of clarifications, 3 pages of Exhibit A showing the Pre-proposal meeting attendees, and 12 pages Exhibit B, the pre-proposal meeting presentation

OWNER

Reynolds School District
1204 NE 201st Ave
Fairview, OR 97024

SINGLE POINT OF CONTACT

Andrew Lent
Andrew.lent@otak.com
503-467-8954

PROPOSALS DUE:

November 25, 2025 - 2:00PM – **To be submitted electronically via email to Andrew.lent@otak.com**

This Addendum 4 forms a part of the Contract Documents and modifies the original Bidding Documents as noted below.

This Addendum consists of

- A title page
- 1 page of clarifications
- Appendix D which includes 28 pages of project scope narrative and 12 pages of schematic design documents.
- Appendix E – 3 pages of the Reynolds School Boards' Meeting minutes that include the action item on the procurement exemption for CM/GC
- Appendix G – 9 pages of the Findings of Fact document
- Appendix H – 4 pages of answers to the questions that have been asked by proposers

Clarification regarding Addendums 1 and 2.

Addendums 1 and 2 were only issued on Oregon Buys. Both addendums corrected the due date and time that the RFP responses are due.

BRIC ARCHITECTURE

1233 NW NORTHRUP STREET, SUITE 100
PORTLAND, OR 97209

T 503 595 4900

APPENDIX D

Project Narratives for Reynolds HS Cooling Tower Replacement Project

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Contents

50% Schematic Design Scope Set

November 18, 2025

INTERFACE ENGINEERING
100% EMPLOYEE OWNED

Interface Engineering, Inc.
100 SW Main Street, Suite 1600
Portland, OR 97204
TEL 503.382.2266
www.interfaceengineering.com

Basis of Design

Reynolds High School Central Plant Upgrades
2025-1285

Prepared for:

BRIC Architecture Inc.

Prepared by:

Andrew Lasse, PE, LEED AP
Troy Lowell, PE, BECxP
Brandon Volbeda, PE

November 18, 2025

Table of Contents

Project Description

Building/Project Description

Project Location

Reynolds High School
1698 SW Cherry Park Road, Troutdale, OR

Project Description

This project includes replacement of the Reynolds High School cooling tower, chiller and associated pumps and controls.

The school consists of two main buildings originally constructed in 1976 (Building A and Building B). The buildings are constructed as single stories, while mechanical rooms are positioned at a second-floor level and contain boiler, chiller and cooling tower systems. The total floor area is approximately 303,000 square feet. The Chiller and Cooling tower serve approximately 157,000 square feet of the total area.

Codes and Standards

Systems will be designed in accordance with the latest adopted standards of the following codes:

- Oregon Administrative Rules (OAR)
- Oregon Structural Specialty Code (OSSC)
- Oregon Electrical Specialty Code (OESC, NFPA 70)
- Oregon Fire Code (OFC)
- Oregon Mechanical Specialty Code (OMSC)
- Oregon Plumbing Specialty Code (OPSC)
- Oregon Energy Efficiency Specialty Code (OEESC)
- Municipal ordinances and amendments.

The following reference standards will be used in design:

- ADA - Americans with Disabilities Act - Standard for Accessible Design
- ANSI - American National Standards Institute
- ASCE - American Society of Civil Engineers
  - ASCE 7, Minimum Design Loads for Buildings and Other Structures
- ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
- ASME - American Society of Mechanical Engineers
- ASTM - American Society of Testing and Materials
- AWS - American Welding Society
- FM - FM Global Approval Guide

- IAPMO - International Association of Plumbing and Mechanical Officials
- ICC-ES - International Code Council Evaluation Service
- IES - Illuminating Engineering Society Standards
- NEMA - National Electrical Manufacturers Association
- NFPA - National Fire Protection Association
  - NFPA 70, as adopted by AHJ, National Electrical Code
- OSHA - Occupational Safety and Health Administration Standards
- UL - Underwriters' Laboratories, Inc.
  - UL Online Certifications Directory

Mechanical

Existing Conditions

Cooling Tower

- Existing Cooling Tower: 300-ton Baltimore Aircoil (BAC) VST-300 forced draft, centrifugal fan, open loop system.
- Existing Pumps: Two Lead/Stand-by pumps piped in parallel. Armstrong Model 65-7609, 10 HP motors @ 230/460 3ph. Pumps are base mounted end suction with spring isolated concrete filled inertia bases. Motors are not rated for VFD.
- Existing Cooling Tower Dimensions: 12′-1″ W x 9′-0″ D x 12′-10″ H.
- Cooling Tower Exterior Area-Well: Inside Clear Dimensions – 17′-10″ W x 20′-10″ D.
- The existing tower does not have any automatic connected chemical treatment system, filter, or basin cleaner.

Chiller

- Existing Chiller: 300-ton McQuay WSC063S37 centrifugal. Set on 4″ concrete pad. No spring isolation.
- Existing Pumps: Two Lead/Stand-by pumps piped in parallel. Armstrong Model 4E-4030, 10 HP motors @ 230/460 3ph. Pumps are base mounted end suction with spring isolated concrete filled inertia bases. Motors are not rated for VFD.
  - Chiller pumps are also used as boiler system pumps and are connected to the chilled water pipes with a series of electro-pneumatic isolation valves. When outside air temperatures reach below 50 F, chiller shut down and isolation valves close of the chiller loop and open to the heating loop. The building systems are served by a 4-pipe arrangement (heating Water Supply/Return, and separate Chilled Water Supply/Return).

Controls

- Controls are a series of Siemens APOGEE Automation Digital/Analog Input/Output devices. Current district access is through Insight on their server, networked to Siemens APOGEE Ethernet Micro Server (in panel near the chiller), to Siemens Modular Equipment Controller panel using Siemens Building Level Network and Floor Level Network (no BACnet)

Recommendations

Cooling Tower

- New Proposed Cooling Tower: Evapco AT 19-4K11 induced-draft, axial fan open loop tower.
  - Dimensions 10'-6" W x 8'-6" D x 13'-8" H.
  - Provide with cold basin stainless steel electric immersion heaters with separate thermostat and low water protection device, to maintain +40 F pan water at 0 F ambient temperature.
  - Provide cold water basin fitted with schedule 80 PVC sump sweeper piping complete with high-flow eductor nozzles to facilitate basin cleaning.
  - Provide external access ladder and service platform.
  - Provide Puroflux Filtration System, Model PF-64 pump package.
  - Provide Puroflux Controlled Release Chemical Treatment System.
  - Provide Restrained Spring Isolator Base, similar to Mason Industries WFSL and SLR restrained isolators, sized for minimum 3-inch static deflection.
  - [Alternate Manufacturer: BAC Model S15E-1285-07MN]
- New Condenser Water Circulator Pumps.
  - Provide end suction base mounted pumps, Taco Model SFI-Series with VFD.
  - Provide 4" concrete housekeeping pad, and concrete filled inertial base with springs with 1- to 2-inch static deflection such as Mason SLF, Kinetics FDS, or equal. Piping connected to vibration isolated equipment should have comparable isolation for the first 50 feet from the equipment.
  - [Alternate Manufacturer: Armstrong]

Chiller

- York YMC2-S1055BAS, 300 ton, Centrifugal, VFD Starter, R-513A mag bearing.
  - Provide 4" concrete housekeeping pad, Restrained Spring isolators, Mason SLR or iSAT, field welded to the bottom of the chiller end sheets. The chiller can be point loaded at its 4 corners, sized for 1- to 2-inch static deflection. Piping connected to vibration isolated equipment should have comparable isolation for the first 50 feet from the equipment.
  - [Alternate Manufacturer: McQuay]
- New Chilled Water Circulator Pumps.
  - Provide end suction base mounted pumps, Taco Model SFI-Series with VFD.
  - Provide 4" concrete housekeeping pad, and concrete filled inertial base with springs with 1- to 2-inch static deflection such as Mason SLF, Kinetics FDS, or equal.
  - [Alternate Manufacturer: Armstrong]

Controls

- The district's preferred building controller is Automated Logic. This project may or may not include replacement of existing Siemens Modular Equipment with new Automated Logic system to control new Tower, Chiller, Pumps (with VFDs), Chemical Treatment, and Changeover Valve Sequencing.

Electrical

Existing Conditions

Cooling Tower

- The Existing cooling tower is fed from motor control center MMC-1B 480Y/277V located in the boiler room.
- The size of the overcurrent protection fuses could not be observed while on site.
- A 60A fused disconnect serving the equipment is located adjacent to the cooling tower.
- There are two 10 HP pumps that serve the cooling tower system.
    - These two pumps are fed power from the local motor control center MCC-1B adjacent to the pumps.
    - The size of the overcurrent protection fuses could not be observed while on site.

Chiller

- The existing chiller is fed from a 480Y/277V 1600A fused distribution panelboard MDP located on the upper level of the electrical room just outside of the boiler room.
- The existing overcurrent protective device is a fused switch sized at 150 amp fuse in a 200 amp switch.
- The chiller includes a direct connection with a disconnect switch that is integral to the chiller.
- There are two 10 HP pumps that serve the chiller water loop.
    - These two pumps are fed power from the local motor control center MCC-1B adjacent to the pumps.
    - The size of the overcurrent protection fuses could not be observed while on site.

Recommendations

Boiler Room

- New LED lighting is recommended to be provided to replace existing fluorescent lights.
    - In the state of Oregon fluorescent lamps are being phased out such that you will not be able to purchase replacement lamps in the future.
    - Some of the lights may need to be removed during the HVAC duct work modifications. This would be a good opportunity to replace them.
- A new chemical treatment system is expected to be provided. A 120V circuit will be provided to serve the chemical treatment system.
- A new control system is expected to be provided. A 120V circuit will be provided to serve the control system.

Cooling Tower

- A new local fused disconnect shall be provided to replace the existing. The estimated size is 60 amps.
- The fuses in the MCC shall be replaced. The estimated size is 60 amps.

- Both pumps will be replaced and provided with local VFDs.
  - VFDs will be furnished by division 23, installed by division 26.
  - VFD cable shall be provided between the VFDs and the pumps.
  - Line reactors shall be provided on the supply side of the VFDs to mitigate harmonics.
  - New fuses shall be provided in the motor control center. The estimated size is 60 amps.
  - Any motor control components in the MCC shall be demolished.
  - The MCC bucket serving the pumps shall include overcurrent protection and disconnect switch only.

Chiller

- The fuses in distribution panelboard MDP shall be replaced. The estimated size is 150 amps.
- The new chiller is assumed to have a single point connection with an integral disconnect switch.
- Both pumps will be replaced and provided with local VFDs.
  - VFDs will be furnished by division 23, installed by division 26.
  - VFD cable shall be provided between the VFDs and the pumps.
  - Line reactors shall be provided on the supply side of the VFDs to mitigate harmonics.
  - New fuses shall be provided in the motor control center. The estimated size is 60 amps.
  - Any motor control components in the MCC shall be demolished.
  - The MCC bucket serving the pumps shall include overcurrent protection and disconnect switch only.

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Reynolds High School – Cooling Tower and Chiller Replacement

To:	Dan Hess	Project:	25494.10
Company:	BRIC Architecture		
From:	Evan Speer		
Date:	November 14, 2025		
Subject:	Structural Basis of Design & Narrative		

This Structural Basis of Design (BoD) is prepared for BRIC Architecture for the project at 1698 SW Cherry Park Road in Troutdale, Oregon and shall be read in conjunction with the Architectural drawings, prepared by Architect, dated 11/14/2025 and Preliminary Structural Layout drawings prepared by Holmes, dated 11/14/2025 (1 sheet)

The project consists of the replacement of an existing chiller and rooftop cooling tower at Reynolds High School in the athletic building and will be utilizing a CMGC delivery method. The chiller is located within a mechanical mezzanine and the cooling tower is located on the same mezzanine level but is exterior in a roof well. The existing mezzanine is a concrete pan joist floor system.

The structural scope includes preparation of engineering and design documentation services for the required for the new chiller and cooling tower, along with analysis of structural implications and recommendations for removal of the existing chiller to allow for crane access, and installation of the new chiller. We understand these modifications to be limited to only these two pieces of equipment.

The structural engineering scope encompasses comprehensive analysis, design documentation, and construction support services for the replacement of existing chiller and cooling tower equipment. This includes preparation of all necessary engineering calculations, structural drawings, specifications, and construction details required for permit submittal and contractor implementation.

This memorandum describes the structural design criteria that Holmes will be using for seismic, wind and gravity design of the project. A narrative of the proposed primary structural scope and assumptions are included to inform contractor cost estimates, in conjunction with the above referenced drawings.

EQUIPMENT REMOVAL AND DEMOLITION

The work involves structural assessment and recommendations for the removal of existing chiller equipment to facilitate crane access for the new installation. Selective demolition of existing non-structural wood-framed walls will be required to create adequate clearance for equipment movement from its current location to a crane-accessible pickup point adjacent to the cooling tower location. The structural engineer will identify specific knockout locations on plan for remaining wall sections as necessary to maintain structural integrity of the building envelope. It is anticipated that new wood-framed partition walls will be installed after installation of the new chiller.

NEW EQUIPMENT SUPPORT SYSTEMS

The new cooling tower will be supported on a structural steel support system with seismic spring isolators. This consists of one steel frame directly beneath the perimeter of the cooling tower, comprised of wide flange or channel steel beams. This frame will sit atop seismic spring isolators set atop a lower steel frame comprised of wide-channel steel beams. The design will include steel pipe column supports below the lower frame with anchorage into the existing concrete slab. These beams will be designed to transfer equipment loads, including operating weight, seismic forces, and vibration loads, to the existing concrete slab below. This will likely include epoxy bolt or wedge anchors into the existing concrete slab, with non-shrink grout for full bearing. The exterior steel system will require corrosion protection requirements due to exterior exposure.

For the new chiller unit, a 4" thick reinforced concrete housekeeping pad will be provided atop the existing concrete slab at the pumps, with epoxy dowels into the existing concrete. The chiller unit and pumps will then be fastened to the concrete with mechanical anchorage to resist lateral seismic loads. The design will address load path continuity from equipment through supports to the building's lateral force-resisting system.

Due to the concentrated weight of the chiller during relocation, temporary steel spreader plates will be required along the equipment's travel path. These plates will distribute point loads across a larger area of the existing mezzanine floor framing, preventing overstress of individual structural members.

Where the chiller movement path runs parallel to the existing mezzanine floor joists (perpendicular to the joist's strong axis), temporary shoring will be required. This shoring system will extend from the underside of the mezzanine floor down to the slab-on-grade below to provide supplemental vertical support during equipment rigging operations.

This structural scope is limited exclusively to the modifications required for the chiller and cooling tower replacement. Any additional structural work beyond these two pieces of equipment is excluded from this scope of services.

Basis of Design

1 SEISMIC DESIGN

Seismic design will be undertaken in accordance with the 2022 Oregon Structural Specialty Code (OSSC). These criteria are outlined in Table 1.

Table 1 - Seismic Design Parameters

Parameter	Value
Seismic Importance Factor, I_p	1.0
Short period acceleration parameter, S_{DS}	0.70 g
1-second period acceleration parameter, S_{D1}	0.47 g
Seismic Risk Category	III
Site Class	D
Seismic Design Category	D

Site Class determined from reference to 2021 Seismic Upgrades project at this address¸ Chapter 20 of ASCE 7-22

2 WIND DESIGN

Wind design loads will be determined in accordance with the 2022 OSSC. Site and building specific wind loads will be determined using ASCE 7-22 as referenced by the 2022 OSSC.

The basic wind speed for this site is: V = 105 mph

3 LIVE LOADS

Live Loads for the design of the gravity systems (floor slabs and roof framing) are in accordance with Table 2.

Table 2 - Live Load Allowances

Location	Uniform (PSF)	Concentrated (lbs)
Existing Mezzanine Floor:	100 (assumed)	-
Existing Mezzanine Floor Exterior (at Cooling Tower):	100 (assumed)	-
Existing Roof: Typical other areas	20	300
Existing Cooling Tower Weight	-	13,000 lbs (12'-0"x9'-0" footprint)
Existing Chiller Weight	-	16,000 lbs (13'-0"x4'-3" footprint)
Proposed Evapco AT 19-4K11 Cooling Tower	-	8,820 lbs (10'-6"x8'-6" footprint)
Proposed York YMC2-S1055BAS Chiller	20	12,612 lbs (10'-0"x5'-2" footprint)

4 EXISTING FRAMING AT MECHANICAL MEZZANINE LOCATION

4.1 Ground floor (Level 1)

- Foundations consist of 5" thick mild-steel reinforced slab on-grade and mild steel reinforced strip footings below existing walls
- Walls consist of mild-steel reinforced concrete bearing walls

4.2 Mezzanine

- The existing mezzanine floor slab consists of a minimum 3-1/2" thick mild-steel reinforced concrete slab supported on 14" deep 2-way mild-steel reinforced concrete pan joists, with varying thicknesses.
- The mezzanine floor slab system is in an interior space at the chiller location, and is an exterior exposed slab at the cooling tower location.
- Walls consist of tube steel beams and columns or glue laminated timber beams and columns bearing directly atop the reinforced concrete floor system and stub walls.

4.3 Roof level

- The roof framing consists of plywood sheathing and 2x sawn lumber joists supported by glue laminated timber beams above the enclosed portion of the mezzanine level.

4.4 Material properties and allowable stresses

- Structural Steel
  - All Steel plates, gussets and tabs are ASTM A36 (F_y = 36 ksi, U.O.N.).
  - Wide Flange Beams & Columns are ASTM A992 (F_y = 50 ksi).
  - Steel pipe is ASTM A501, or ASTM A53 (F_y = 36 ksi).
  - Structural steel tubing or HSS sections are ASTM A500 (F_y = 46 ksi).
  - All metal studs, track, etc. is ASTM A611, Grade C

- Concrete, f'c=4000 psi for all normal weight concrete.
  - Rebar: 60 ksi

- Bolts: A325 typical U.O.N. A307/A36 for anchor bolts and timber connectors.

- Wood Framing –
  - All wood is DF#1 U.O.N. (F_b = 1000 psi, F_v = 180 psi, E = 1700000 psi), studs and plates are construction grade.
  - All PSLs are grade 2.0E (F_b = 2900 psi, F_v = 290 psi, E = 2000000 psi).
  - All LVLs are grade 1.9E (F_b = 2600 psi, F_v = 285 psi, E = 1900000 psi).
  - All Glue laminated timber is Doug Fir 24F-V8 (F_b = 2400 psi, F_v = 265 psi, E = 1800000 psi)
  - Plywood grade, thickness. CDX or Type 2-M-W OSB

- Plywood nailing schedule and diaphragm, shear wall design values.

4.5 Design Values for Fabricated Items Used

- Simpson Wedge-All Expansion bolts, ICBO ESR-1396.
- Epoxy anchors use Simpson SET epoxy, ICBO Report ESR-1772.

4.6 Non-Shrink Grout

- Non-shrink grout shall achieve a minimum compressive strength at 28 days (f'c) of 7,000 psi.
- Non-shrink grout shall comply with one of the following:
  - Dry pack non-shrink grout shall be Euclid Chemical Company's "euco-ns", l&m crystex, master builders' "Masterflow 713", Simpson "FX-228", Five Star grout, or Sikagrout-212.
  - Where high fluidity or increased placing time is required, use Euclid Chemical Company's "Euco hi-flow grout", Master Builders' "Masterflow 928", Or Sikagrout-212.
- Comply with manufacturer's installation recommendations and requirements

5 MISCELLANEOUS

The following items are not included on the drawings. Suitable allowances shall be made for these items. The list is indicative only and not exhaustive. See also architectural drawings.

- Stairs and secondary steelwork supporting stairs and associated slab openings.
- Bracing and anchorage of nonstructural components not specifically indicated, including partitions, ceilings, and MEP equipment.
- Architectural components such as canopies, screens, etc. not reflected on the structural drawings.
- Rooftop enclosures for MEP shafts.
- Cleaning davits, tie backs, and support structures for building maintenance units.
- Site structures such as trellises, planter/site walls, trash enclosures, etc.

Sincerely,

HOLMES US

Evan Speer
Senior Engineer II

Jennifer Eggers, S.E.
Principal

THE GREENBUSCH GROUP, INC.

Memorandum

DATE: *November 13, 2025*

TO: *Dan Hess, AIA, LEED AP – BRIC Architecture, Inc.*

FROM: *Steve Robinson, INCE*

RE: *Reynolds High School – Chiller and Cooling Tower Replacement*
High Level Pre-Design Acoustical Narrative

This memorandum provides high-level acoustical comments for inclusion in the Pre-Design Narrative for the Chiller and Cooling Tower Replacement project at Reynolds High School in Troutdale, Oregon.

ACOUSTICS

Airborne Sound Isolation

The existing cooling tower is in a mechanical well and the chiller is in a mechanical mezzanine. Our understanding is that the existing equipment has not generated any acoustical issues inside or outside the building. Sensitive interior adjacencies are limited to physical fitness education spaces. Upgrades to the existing separating constructions are unlikely to be necessary but could potentially include additional layers of drywall with or without resilient attachment.

The mechanical well and surrounding buildings block line-of-sight to the cooling tower from ground-level outside the building. Based on preliminary equipment sound data, noise levels are anticipated to be below typical recommended criteria for outdoor circulation spaces without any need for mitigation.

Vibration Isolation

The following recommendations and guidelines are intended to be preliminary based on our understanding of the proposed equipment and would need to be coordinated as the design develops:

- Support cooling tower on restrained springs sized for minimum 3-inch static deflection such as Mason SLR, Kinetics FLS, or equal.
- Support chiller on restrained springs sized for 1- to 2-inch static deflection such as Mason SLR, Kinetics FLS, or equal.
- Associated pumps may require concrete inertia bases supported on open springs with 1- to 2-inch static deflection such as Mason SLF, Kinetics FDS, or equal.
- Piping connected to vibration isolated equipment should have comparable isolation for the first 50 feet from the equipment.
- Deflection of the supporting structure under the weight of the equipment should be limited to 0.2 inches.

SECTION 07 51 13
HOT-APPLIED BUILT-UP ASPHALT ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hot-applied built-up asphalt roofing system on wood deck, including but not limited to:
   1. Roof insulation.
   2. Roof membrane and membrane base flashings.
   3. Roof surfacing consisting of aggregate surfacing.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood nailers, wood cants, curbs, and blocking.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal roof penetration flashings, flashings, and counterflashings.

C. Section 07 95 13 - Expansion Joint Cover Assemblies: Manufactured roof expansion-joint assemblies.

D. Section 07 92 00 - Joint Sealants: Joint sealants, joint fillers, and joint preparation.

E. Division 22 for roof drains.

1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

C. ASTM C203 - Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.

D. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board.

E. ASTM D1079 - Standard Terminology Relating to Roofing and Waterproofing.

F. ASTM D146/D146M - Standard Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing.

G. ASTM D1621 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.

H. ASTM D1863/D1863M - Standard Specification for Mineral Aggregate Used on Built-Up Roofs.

I. ASTM D2136 - Coated Fabrics - Low-Temperature Bend Test.

J. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

K. ASTM D2824/D2824M - Standard Specification for Aluminum-Pigmented Asphalt Roof Coatings, Nonfibered, Asbestos Fibered, and Fibered without Asbestos.

L. ASTM D3111 - Standard Test Method for Flexibility Determination of Hot-Melt Adhesives by Mandrel Bend Test Method.

M. ASTM D312/D312M - Standard Specification for Asphalt Used in Roofing.

N. ASTM D36 - Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus).

O. ASTM D3746/D3746M - Standard Test Method for Impact Resistance of Bituminous Roofing Systems.

P. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.

Q. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

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

S. ASTM D4272/D4272M - Standard Test Method for Total Energy Impact of Plastic Films by Dart Drop.

T. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free.

U. ASTM D4601/D4601M - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.

V. ASTM D5/D5M - Standard Test Method for Penetration of Bituminous Materials.

W. ASTM D5147/D5147M - Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material.

X. ASTM D751 - Standard Test Methods for Coated Fabrics.

Y. ASTM D92 - Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester.

Z. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.

AA. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

AB. ASTM G152 - Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure on Nonmetallic Materials.

AC. ASTM G154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials.

AD. ASTM G155 - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials.

AE. CRRC-1 - Standard; Cool Roofs Rating Council.

AF. NRCA ML104 - The NRCA Roofing and Waterproofing Manual.

AG. SMACNA (ASMM) - Architectural Sheet Metal Manual.

AH. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

1.04 DEFINITIONS

A. Roofing Terminology: See ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to built-up roofing.

B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus 25 deg, measured at the mop cart or mechanical spreader immediately before application.

1.05 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck, orientation of membrane roofing, and fastening spacings and patterns for mechanically fastened components.
   1. Base flashings and built-up terminations.
      a. Indicate details meet requirements of NRCA required by this Section.
      b. Tapered insulation, including slopes.
      c. Crickets, saddles, and tapered edge strips, including slopes.
      d. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Samples for Verification: For the following products:
   1. 8-by-10-inch square of built-up roofing materials, including base sheet ply sheet and flashing sheet, of color specified.
   2. 8-by-10-inch square of roof insulation.
   3. 3 lb of aggregate surfacing material in gradation and color indicated.
   4. Walkway pads.
   5. Six insulation fasteners of each type, length, and finish.

D. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.

E. Qualification Data: For Installer, Manufacturer, and Roofing Inspector. Include letter from Manufacturer written for this Project indicating approval.
   1. Include letter from Manufacturer written for this Project indicating approval of Installer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.

G. Warranties: Unexecuted sample copies of special warranties.

H. Inspection Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.

I. Maintenance Data: To include in maintenance manuals.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: An employer, in business under the same name and license number for a minimum of ten consecutive years, of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing similar work of scope and size, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to furnish warranty of type specified.

B. Manufacturer Qualifications: Approved Manufacturer with minimum five years' experience in manufacture of specified products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.
   1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
      a. Product data, including certified independent test data indicating compliance with requirements.
      b. Samples of each component.
      c. Sample submittal from similar project.
      d. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.
      e. Sample warranty.
      f. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
      g. Approved manufacturers must meet separate requirements of Submittals Article.

C. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
   1. An authorized full-time technical employee of the manufacturer.
   2. An independent party certified as a Registered Roof Observer by the Roof Consultants Institute, retained by the Contractor or the Manufacturer and approved by the Manufacturer.

D. Source Limitations: Obtain roofing system components from or approved in writing by roofing system manufacturer.

1.07 PREINSTALLATION CONFERENCE

A. Preinstallation Roofing Meeting: Conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing manufacturer's representative, deck Installer, and

installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.09 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.

B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1.10 WARRANTY

A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Manufacturer's Warranty: Manufacturer's standard or customized form in which manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, fasteners, roof insulation, cover boards, substrate board, walkway products and other components of built-up roofing.
2. Warranty Period: 20 years from Date of Substantial Completion.

C. Manufacturer Inspection and Preventive Maintenance Requirement: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's annual inspections and

preventive maintenance is included in the Contract Sum. Inspections to occur in Years 2, 5, and 10 following completion.

D. Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, and walkway products, for the following warranty period:
   1. Warranty Period: Two years from Date of Substantial Completion.

E. Extended Roof System Warranty: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:
   1. Sheet metal flashing and trim, including roof penetration flashings.
   2. Manufactured copings, roof edge, counterflashings, and reglets.
   3. Roof curbs, hatches, and penetration flashings.
   4. Roof and parapet expansion joint assemblies.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tremco, Incorporated. (Basis-of-Design)

B. Substitutions: See Section 01 60 66 - Product Requirements.

C. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. General Performance: Roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.
   1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
   2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D3746/D3746M or ASTM D4272/D4272M.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by built-up roofing manufacturer based on testing and field experience.

C. Roofing System Design: Provide built-up roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.
   1. Oregon Structural Specialty Code (OSSC) Basic Wind Speed Design Criteria: The completed roofing system shall meet or exceed OSSC Basic Wind Speed Design Criteria of 135 mph, 3 second gust durations, Exposure B, urban and suburban areas, OSSC uplift pressures shall be calculated in accordance with ASCE 7, but not less than the following:
      a. Field: 38.5 psf.
      b. Perimeter: 70.5 psf.
      c. Corner: 102.5 psf.

D. SPRI Wind Design Standard: Manufacture and install copings roof-edge flashings tested according to SPRI ES-1, except the basic wind speed of 135 mph, 2 second gust, Exposure C.

E. Flashings and Fastening: Comply with requirements of Section 07 62 00 - Sheet Metal Flashing and Trim. Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
   1. NRCA ML104, NRCA Roofing Manual for construction details and recommendations.
   2. SMACNA (ASMM), SMACNA Architectural Sheet Metal Manual for construction details.

F. Exterior Fire-Test Exposure: ASTM E108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

G. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.03 BASE-SHEET MATERIALS

A. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft.

B. Base Sheet: ASTM D4601/D4601M, Type II asphalt-coated, SBS-modified fiberglass/fiberglass/polyester reinforced sheet dusted with fine mineral surfacing on both sides.
   1. Basis of Design Product: Tremco, BURmastic Modified Composite Ply HT.
   2. Tensile Strength, minimum, ASTM D5147/D5147M: machine direction, 165 lbf/in; cross machine direction, 150 lbf/in.
   3. Tear Strength, minimum, ASTM D5147/D5147M: machine direction, 210 lbf; cross machine direction, 185 lbf.
   4. Elongation at 77 deg. F, minimum, ASTM D5147/D5147M: machine direction, 6 percent; cross machine direction, 6 percent.
   5. Thickness, minimum, ASTM D146/D146M: 0.055 inch.

2.04 ROOFING MEMBRANE PLIES

A. Ply Sheet: ASTM D2178/D2178M, Type IV, asphalt-impregnated, glass-fiber felt.
   1. Basis of Design Product: Tremco, THERMglass Premium Type VI.
   2. Net Dry Mass, ASTM D146/D146M: 390 g/sq. m.
   3. Breaking Strength, minimum, ASTM D146/D146M: machine direction, 70 lbf/in; cross machine direction, 60 lbf/in.

2.05 ROOFING FLOOD COAT

A. Flood Coating, Low-VOC: Water-based, low-VOC, cold-applied restorative top pour and aggregate adhesive specially formulated for compatibility with asphalt and coal tar roofing membranes and flashings.
   1. Basis of Design Product: Tremco, ECOLastic.
   2. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 75 g/L.

2.06 BASE FLASHING SHEET MATERIALS

A. Elastomeric Flashing Sheet: Elastomeric, polyester-reinforced sheet with EPDM and SBR thermoset elastomers.
   1. Basis of Design Product: Tremco, TRA Elastomeric Sheeting.
   2. Breaking Strength, minimum, ASTM D751: machine direction 350 lbf; cross machine direction 300 lbf.
   3. Tear Strength, minimum, ASTM D751: machine direction 77 lbf; cross machine direction 77 lbf.
   4. Elongation at Failure: ASTM D751: 30 percent minimum.
   5. Low Temperature Flexibility, minimum, ASTM D2136: -40 deg. F.
   6. Thickness, minimum, ASTM D751: 0.045 inch.
   7. Color: White.

2.07 ASPHALT MATERIALS

A. Asphalt Primer, Low-VOC: ASTM D41/D41M, low-VOC, solvent-based asphalt primer with the following physical properties:
   1. Basis of Design Product: Tremco, TREMprime LV.
   2. Asbestos Content, EPA 600 R-93/116: None.
   3. Volatile Organic Compounds, maximum, ASTM D3960: 350 g/L.

B. Roofing Asphalt: ASTM D312/D312M, Type III, hot-melt asphalt.
   1. Basis of Design Product: Tremco, Premium III.
   2. Softening Point, min/max, ASTM D36: 195–205 deg. F.
   3. Penetration at 77 deg. F, min/max, ASTM D5/D5M: 15–25 dmm.
   4. Flash point, minimum, ASTM D92: 525 deg. F.

2.08 AUXILIARY BUILT-UP ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing manufacturer for intended use and compatible with built-up roofing.
   1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Elastomeric Roofing Membrane: One-part, trowel-grade, elastomeric roof mastic specially formulated for compatibility and use with specified roofing membranes and flashings.
   1. Basis of Design Product: Tremco, Trem-Lar LRM V.
   2. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 300 g/L.
   3. Elongation at 77 deg. F, minimum, ASTM D412: 1000 percent.
   4. Recovery from 500 percent Elongation, minimum, ASTM D412: 500 percent.
   5. Flexibility at -40 deg. F, ASTM D3111: No cracking.

C. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required by roofing manufacturer for application.

D. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.

E. Fasteners: Factory-coated, corrosion-resistant steel fasteners and metal or plastic plates designed for fastening built-up roofing components to substrate, tested by manufacturer for required pullout strength and acceptable to roofing manufacturer.

F. Metal Flashing Sheet: Metal flashing sheet is specified in Section 07 62 00 - Sheet Metal Flashing and Trim.

G. Miscellaneous Accessories: Provide miscellaneous accessories recommended by built-up roofing manufacturer.

2.09 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 2, approved and listed by FM Global for windstorm and fire characteristics specified, CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces. CCMC listed.
   1. Basis of Design Product: Tremco, Trisotech.
   2. Compressive Strength, ASTM D1621: Grade 3: 25 psi.
   3. Conditioned Thermal Resistance at 75 deg. F: 14.4 at 2.5 inches thick.
      a. Thermal Resistance: R-20 minimum.

C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.

D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.10 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with built-up roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate and acceptable to roofing manufacturer.

C. Insulation Cant Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.

D. Wood Cant Strips: Comply with requirements in Section 06 10 00 - Rough Carpentry.

E. Tapered Edge Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.

F. Cover Board: Cellulosic-fiber Insulation Board ASTM C208, Type II, Grades 1 and 2, with water-resistant binders, non-asphaltic primer coated on six sides and chemically treated for deterioration, 1/2 inch thick.

G. Substrate Joint Tape: 6- or 8-inch- wide, coated, glass fiber.

2.11 SURFACING

A. Aggregate Stone: Clean, dry, opaque, washed smooth-faced stone.
   1. Size: ASTM D1863/D1863M, No. 6, 3/8 to 3/4 inches.

B. Coatings, Acrylic Emulsion: Cold-Applied Reflective Aluminum Roof Coating: ASTM D2824/D2824M. Type III metallic-pigmented, fibrated asphalt-based roof coating, Energy Star qualified and CRRC-1 listed.
   1. Basis-of-Design Product: Tremco, Alumanation 301.

2.12 WALKWAYS

A. Walkway Pads: Mineral-granule-surfaced, reinforced asphaltic composition, slip-resisting pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 1/2-inch thick, minimum.
   1. Basis of Design Product: Tremco, Trem-Tred.
   2. Flexural Strength at max. load, minimum, ASTM C203: 218 psi.
   3. Impact Resistance at 77 deg. F, ASTM D3746/D3746M: No Damage to Roof.
   4. Pad Size: 3 by 4 foot.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
   1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
   2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
   3. Wood Roof Deck: Verify that wood deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.03 INSTALLATION, GENERAL

A. Install roofing system in accordance with manufacturer’s recommendations.

B. Install wood cants, blocking, curbs, and nailers in accordance with requirements of Section 06 10 00 - Rough Carpentry.

C. Install roofing system in accordance with the following NRCA Manual Plates and NRCA recommendations:
   1. Metal Parapet Cap (Coping) and Base Flashing: Plates BUR-1 and BUR-1S.
   2. Surface-Mounted Counterflashing for Concrete Walls (at Parapet Wall): Plates BUR-4 and BUR-4S.

3. Base Flashing for Wall-supported Deck: Plates BUR-5 and BUR-5S.
4. Base Flashing for Non-wall-supported deck (Movement Joint): Plates BUR-6 and BUR-6S.
5. Base and Surface-mounted Counterflashing: Plates BUR-4 and BUR-4S.
6. Base Flashing for Vented Base Sheet: Plates BUR-5A and BUR-5AS.
7. Raised Perimeter Edge with Metal Flashing (Fascia Cap): Plates BUR-2 and BUR-2S.
8. Embedded Edge Metal Flashing Edge (Gravel-stop): Plates BUR-3 and BUR-3S.
9. Expansion Joint with Premanufactured Cover: Plates BUR-7A and BUR-7AS and Section 07 95 13 - Expansion Joint Cover Assemblies.
10. Equipment Support Curb: Plates BUR-9 and BUR-9S.
11. Equipment Support Stand: Plates BUR-10.
12. Equipment Support Stand and Typical Rain Collar Penetration Detail: Plates BUR-11 and BUR-11S.
13. Raised Curb Detail at Rooftop HVAC Units (Job site constructed wood curb): Plates BUR-13 and BUR-13S and Section 06 10 00 - Rough Carpentry.
14. Penetration, Structural Member through Roof Deck: Plates BUR-15 and BUR-15S.
15. Penetration, Sheet Metal Enclosure for Piping Through Roof Deck: Plates BUR-16 and BUR-16S
16. Penetration, Isolated Stack Flashing: Plates BUR-17 and BUR-17S.
17. Penetration, Isolated Stack Flashing: Plates BUR-17A and BUR-17AS.
18. Penetration, Plumbing Vent: Plates BUR-18 and BUR-18S.
19. Penetration, Pocket: Plates BUR-19 and BUR-19S.
20. Roof Drain: Plates BUR-20 and BUR-20S.
21. Roof Drain: Plates BUR-20A and BUR-20AS.
22. Guide for Clearances between Pipes / Walls / Curbs – Table 4
23. Guide for Crickets and Saddles – Table 5
24. Guide for Edge Scuppers with Tapered Saddles - Table 6

3.04 INSULATION INSTALLATION

A. Comply with roofing manufacturer's written instructions for installing roof insulation.

B. Install tapered insulation under area of roofing to conform to slopes indicated.

C. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
   1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
   2. Install insulation under area of roofing to achieve required thickness. Install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
   3. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
   4. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

D. Mechanically Fastened Insulation: Install first layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
   1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

E. Adhered Insulation: Install second layer of insulation to first layer of insulation.
   1. Fasten second layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
   2. Set second layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.

F. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together. Tape joints if required by roofing manufacturer.
   1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
   2. Apply hot roofing asphalt to underside and immediately bond cover board to substrate.

3.05 HOT-APPLIED BUILT-UP ROOFING INSTALLATION, GENERAL

A. Install roofing membrane according to roofing manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing" and as follows:
   1. Deck Type: Wood deck.
   2. Base Sheet: One, installed over cover board.
      a. Adhering Method: Mopped.
      b. Number of Asphalt Ply Sheets: Four (1 ply composite ply HT and 3 plies Type VI glass)
         1) Adhering Method: Mopped.
      c. Surfacing Type: A (aggregate).

B. Start installation of built-up roofing in presence of manufacturer's Roofing Inspector.

C. Cooperate with testing agencies and personnel engaged or required to perform services for installing roofing.

D. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
   1. Provide tie-offs at end of each day's work configured as recommended by NRCA Roofing Manual Appendix: Quality Control Guidelines – Insulation to protect new roofing.
   2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
   3. Remove temporary plugs from roof drains at end of each day.
   4. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Hot Roofing Asphalt Heating: Heat asphalt to its equiviscous temperature, measured at the mop cart or mechanical spreader immediately before application. Circulate asphalt during heating. Do not raise asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed asphalt manufacturer's recommended temperature limits during asphalt heating. Do not heat asphalt within 25 deg F of flash point. Discard asphalt maintained at a temperature exceeding finished blowing temperature for more than four hours.
   1. Apply hot roofing asphalt within plus or minus 25 deg F of equiviscous temperature and adhere components to asphalt heated to not less than 425 deg F.

F. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging built-up roofing components or adjacent building construction.

3.06 ROOFING MEMBRANE INSTALLATION

A. Loosely lay one course of sheathing paper, lapping edges and ends a minimum of 2 inches and 6 inches, respectively.

B. Install ply sheets starting at low point of roofing. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.
   1. Embed each ply sheet in a solid mopping of hot roofing asphalt applied at rate required by roofing manufacturer, to form a uniform membrane without ply sheets touching.

3.07 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to built-up roofing manufacturer's written instructions and as follows:
   1. Prime substrates with asphalt primer if required by built-up roofing manufacturer.
   2. Backer Sheet Application: Adhere backer sheet to substrate in a solid mopping of hot roofing asphalt.
   3. Flashing Base Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 deg F. Apply hot roofing asphalt to back of flashing sheet if recommended by roofing manufacturer.
   4. Flashing Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive at rate required by roofing manufacturer.
   5. Coat base flashings with cold-applied reflective acrylic coating.

B. Extend base flashing up walls or parapets a minimum of 12 inches above built-up roofing and 6 inches onto field of built-up roofing.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
   1. Seal top termination of base flashing with a metal termination bar.

D. Install stripping, according to roofing manufacturer's written instructions, where metal flanges and edgings are set on built-up roofing.
   1. Flashing-Sheet Stripping: Install flashing-sheet stripping in a continuous coating of cold-applied adhesive, and extend onto roofing membrane.

E. Roof Drains: Set 30-by-30-inch metal flashing in bed of asphalt roofing cement on completed built-up roofing. Cover metal flashing with built-up roofing cap-sheet stripping and extend a minimum of 6 inches beyond edge of metal flashing onto field of built-up roofing. Clamp built-up roofing, metal flashing, and stripping into roof-drain clamping ring.
   1. Install flashing sheet stripping according to roofing manufacturer's written instructions.

3.08 SURFACING AND COATING INSTALLATION

A. Aggregate Surfacing: Promptly after installing and testing roofing membrane, base flashing, and stripping, flood-coat roof surface with 7 gallons per 100 sf of cold-applied coating. While flood coat is hot and fluid, cast the following average weight of aggregate in a uniform course:
   1. Aggregate Weight: 400 lb/100 sq. ft.
   2. If aggregate surfacing is delayed, promptly apply glaze coat of hot roofing asphalt at a rate of 10 lb/100 sq. ft.

B. Glaze-coat roofing membrane surface with hot roofing asphalt applied at a rate of 10 to 15 lb/100 sq. ft.

C. Apply coating to roofing membrane and base flashings according to manufacturer's written instructions, by spray, roller, or other suitable application method to provide a dry film thickness of not less than 20 mils.

3.09 WALKWAY INSTALLATION

A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
   1. Sweep away loose aggregate surfacing.
   2. Set walkway pads in cold-applied adhesive.
   3. Set walkway pads in additional pour coat of hot roofing asphalt.

B. Walkway Cap Sheet Strips: Install cap sheet strips, approximately 36 inches wide and in lengths not exceeding 10 feet, leaving a space of 6 inches between strips. Install roofing membrane walkway cap sheet strips over roofing membrane in hot roofing asphalt applied at not less than 425 deg F.

3.10 FIELD QUALITY CONTROL

A. Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections and to prepare test reports.

B. Final Roof Inspection: Arrange for roofing system manufacturer's Roofing Inspector to inspect roofing installation at commencement and upon completion.
   1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

C. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.
   1. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 PROTECTING AND CLEANING

A. Protect built-up roofing from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, and repair or reinstall roofing to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.12 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
   1. Owner:
   2. Address:
   3. Building Name/Type:
   4. Address:
   5. Area of Work:
   6. Acceptance Date:
   7. Warranty Period:
   8. Expiration Date:

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:
   1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
      a. lightning;
      b. peak gust wind speed exceeding 74 mph;
      c. fire;
      d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
      e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
      f. vapor condensation on bottom of roofing; and
      g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
      h. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
      i. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
      j. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
      k. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this

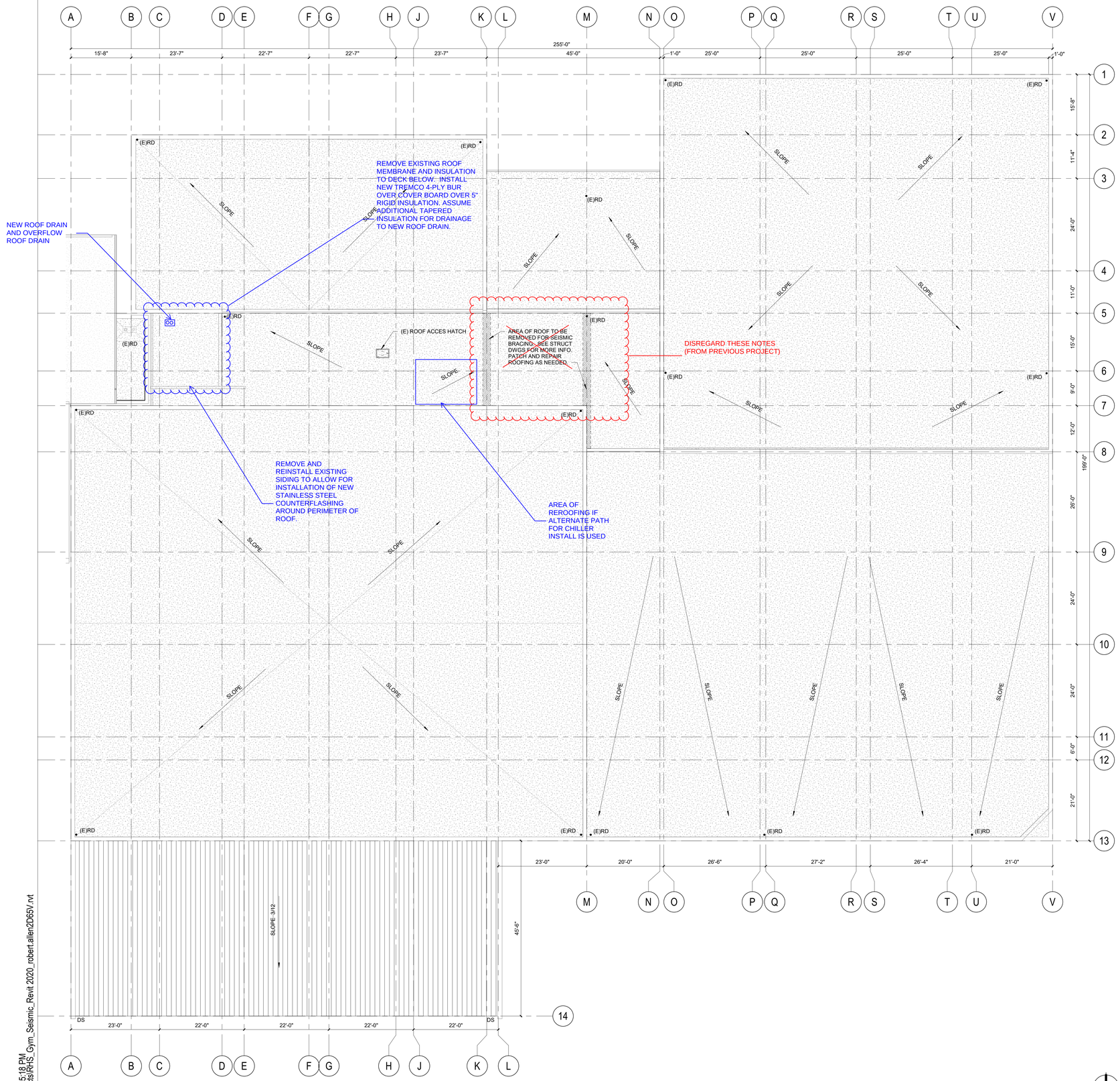
Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

l. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

m. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed by:
1. Authorized Signature:
2. Name:
3. Date:

END OF SECTION



OVERALL ROOF PLAN

SCALE: 3/32" = 1'-0"

GENERAL NOTES:

[redacted]

RHS COOLING TOWER
SHEET INDEX:

BR|IC
ARCHITECTURE, INC.

Reynolds High School ~~Gymnasium~~ Cooling Tower

~~Seismic Upgrades~~

1698 SW Cherry Park Road, Troutdale, OR 97060
Reynolds School District

REGISTERED ARCHITECT
3473
DANIEL J. HESS
PORTLAND, OREGON
STATE OF OREGON

revisions

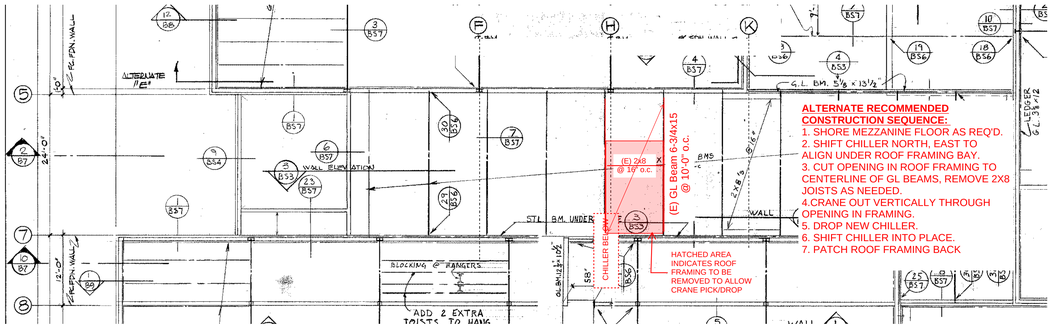
phase [redacted]

date 3/12/2021
project 2004 [redacted]

OVERALL ROOF PLAN

A2.20

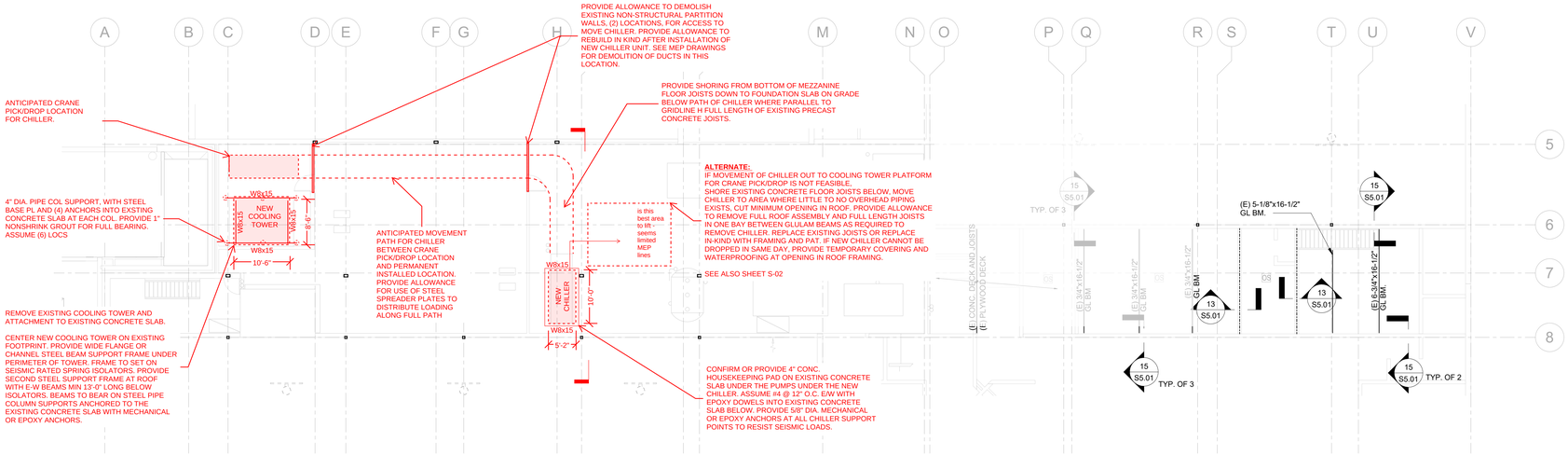
3/15/2021 12:25:18 PM
C:\BRIC Projects\RHS_Gym_Seismic_Revit 2020_robert.allen2D65V.rvt



3 S1.1 **PARTIAL ROOF FRAMING PLAN** (FOR ALTERNATE SCOPE ONLY)

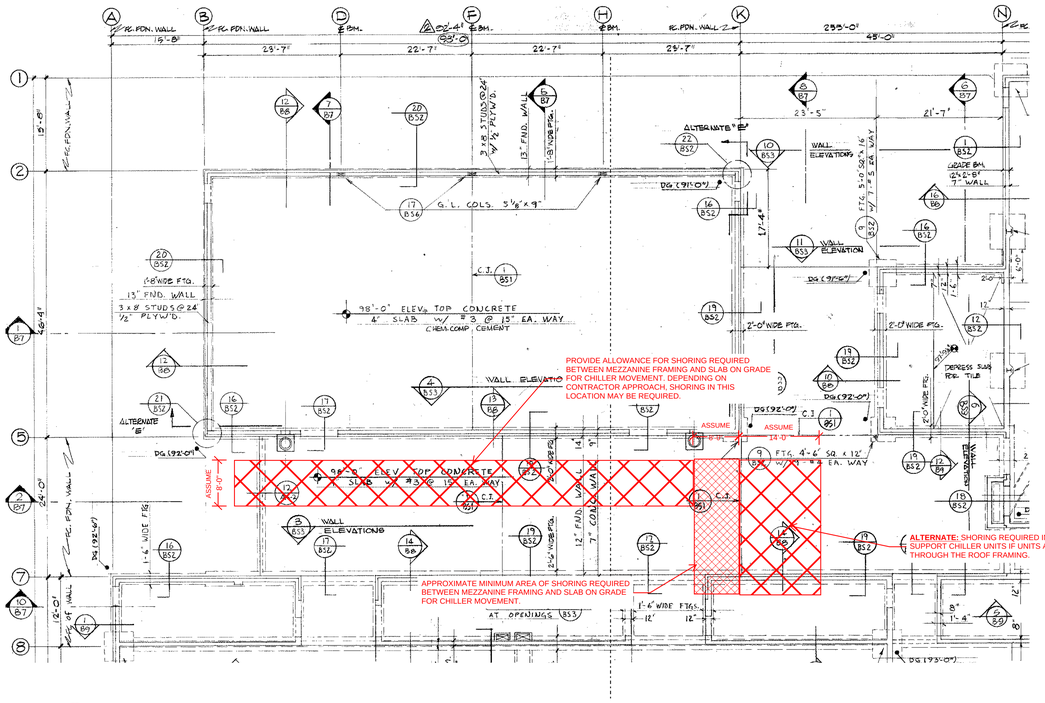
N.T.S.

BASE DRAWING: ORIGINAL CONSTRUCTION AS-BUILT SHEET BS-5, DATED FEBRUARY 23, 1976 AND PREPARED BY SELIG/HENSLEE



2 S1.1 **PARTIAL MEZZANINE FLOOR FRAMING PLAN**

N.T.S.



1 S1.1 **PARTIAL FOUNDATION PLAN**

N.T.S.

BASE DRAWING: ORIGINAL CONSTRUCTION AS-BUILT SHEET BS-1, DATED FEBRUARY 23, 1976 AND PREPARED BY SELIG/HENSLEE

SHEET NOTES:

1. SEE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS AND INFORMATION NOT SHOWN. FIELD VERIFY ALL MEASUREMENTS.
2. STRUCTURAL MEASURES SHOWN HERE ARE SUPERIMPOSED OVER PREVIOUS SEISMIC UPGRADE STRUCTURAL DRAWINGS, DATED MARCH 12, 2021 FOR GENERAL STRUCTURAL CONCEPT. SEISMIC IMPROVEMENT AND STRENGTHENING MEASURES SHOWN REPRESENT STRUCTURAL REPAIRS AND BRACING OF NEW MECHANICAL EQUIPMENT. SCOPE IS PENDING FURTHER COORDINATION.
3. FIELD VERIFY ALL EXISTING STRUCTURAL CONDITIONS AND ALL FINISHES AND SERVICES TO BE REPLACED FOR CONSTRUCTION.
4. SEE MEP DRAWINGS FOR MORE INFORMATION ON NEW MECHANICAL UNITS AND ATTACHMENT TO STRUCTURE SHOWN HERE.
7. SEE DETAILS 8 / S5.03 AND 9 / S5.03 FOR CONDITIONS WHERE NEW DIAPHRAGM BRACING CONFLICTS WITH BASKETBALL HOOP SUPPORTS

LEGEND:

- STRUCTURAL WALL (B)
- BEAM SPLICE
- SIMPSON STRAP
- OUT-OF-PLANE CONNECTION
- SPAN DIRECTION
- ROOF STEP
- (E) TECTUM DIAPHRAGM TO RECEIVE STEEL BRACE DIAPHRAGM STRENGTHENING BELOW ROOF

BRIC ARCHITECTURE, INC.

Holmes

Holmes Structures
555 SE MLK Jr Blvd. Suite 602
Portland, OR 97214 USA
T: 503 673 9323 holmesstructures.com

REYNOLDS HIGH SCHOOL CHILLER REPLACEMENT

1698 SW CHERRY PARK ROAD, TROUTDALE, OR 97060

PRELIMINARY - NOT FOR CONSTRUCTION

revisions	

phase	SD PRICING SET
date	11/14/2025
project	25494.10

SCHEMATIC STRUCTURAL PLANS

S1.01

Inside Clear Field Measured

Knockout Panels with duct penetrations. Exterior Frame-to-Frame field measured: 8'-5" W x 7'4" H

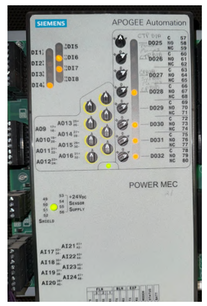
Pathway to bring in new chiller

Inside Clear Field Measured

Existing Cooling Tower Dimensions field measured: 12'-1" W x 9'-0" D x 12'-10" H

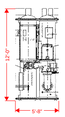
Existing Tower Pumps:
Armstrong Model 65-7609, 10 HP motors @ 230/460 3ph

Existing Controls: Siemens APOGEE Automation Digital/Analog Input/Output

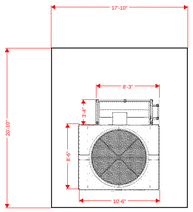


Existing Chiller: 300-ton McQuay WSC063S37 centrifugal.
Concrete Pad: 4'-9" W x 14'-6" L x 4" H

New Proposed Chiller: York YMC2-S1055BAS
Dimensions 5'-8" W x 12'-0" L x 6'-8" H.



New Proposed Cooling Tower: Evapco AT 19-4K11 induced-draft, axial fan open loop tower.
Dimensions 10'-6" W x 8'-6" D x 13'-8" H.



REGISTERED ARCHITECT
CHARLES E. SELIG
PORTLAND, OREGON
STATE OF OREGON

REGISTERED ARCHITECT
JOHN L. HENSLEE
PORTLAND, OREGON
STATE OF OREGON

REYNOLDS SCHOOL DISTRICT NO. 7
MULTNOMAH COUNTY
OREGON

SELIG/ HENSLEE *Architects & Planners*

213 sw Ash Street
Portland, Oregon 97204
(503) 224-0173

PROJECT ARCHITECT
DONALD L. ASHTON

REYNOLDS HIGH SCHOOL NUMBER TWO

SECOND FLOOR PLAN BLDG B

⚠ REVISIONS AS BUILT 6/16/76

KEY PLAN

AS-BUILT DRAWING

B 2

23 FEB 76

M1.1

DEMO DUCTWORK. THIS DUCT WILL NEED TO BE REPLACED AFTER MOVING IN NEW EQUIPMENT

DEMO TOWER AND ASSOCIATED SUPPORTS AND PIPING

DEMO (6) ELECTRO-PNEUMATIC ISOLATION VALVES

EXISTING ROOF DRAIN WEDGED UNDER TOWER. DEMO DRAIN. EXTEND PIPE TO MORE ACCESSIBLE LOCATION, ADD NEW ROOF DRAIN, AND ADD SECONDARY OVERFLOW DRAIN AND DAYLIGHT TO EXTERIOR WALL PENETRATION.

DEMO PUMPS, CONCRETE PAD, AND ASSOCIATED SUPPORTS AND PIPING

DEMO PUMPS, CONCRETE PAD, AND ASSOCIATED SUPPORTS AND PIPING

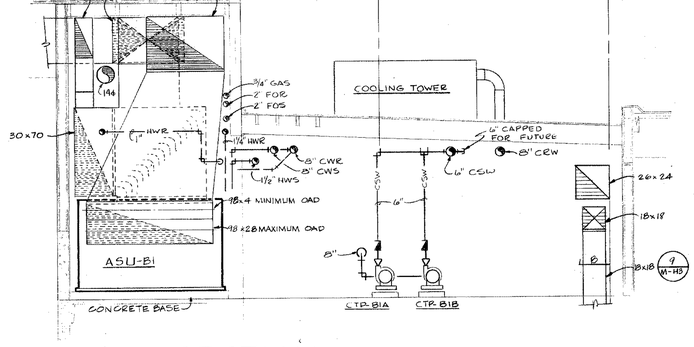
DEMO SIEMENS CONTROLS

DEMO CHILLER, CONCRETE PAD, AND ASSOCIATED SUPPORTS AND PIPING

PARTIAL PLAN, SECOND FLOOR, BOILER & MECHANICAL ROOM

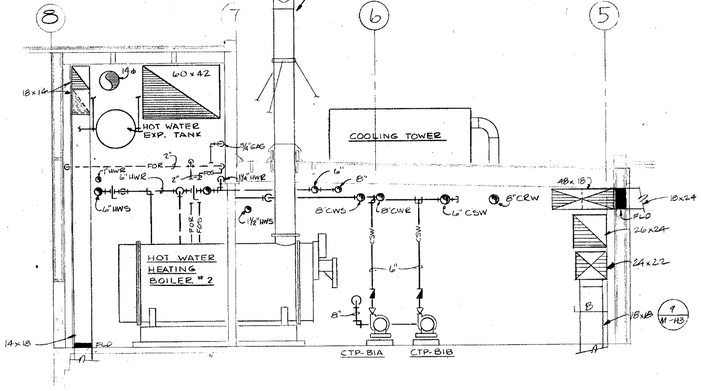
1/4" = 1'-0"

NOTES:
1. W = WELDED PIPE
2. M.J. = MECHANICAL JOINTS
3. SEAL ALL DUCT AND PIPE PENETRATIONS AIR AND WATER TIGHT.
4. PROVIDE COLLECTING FUNNELS AT FLOOR DRAINS WHERE REQUIRED.



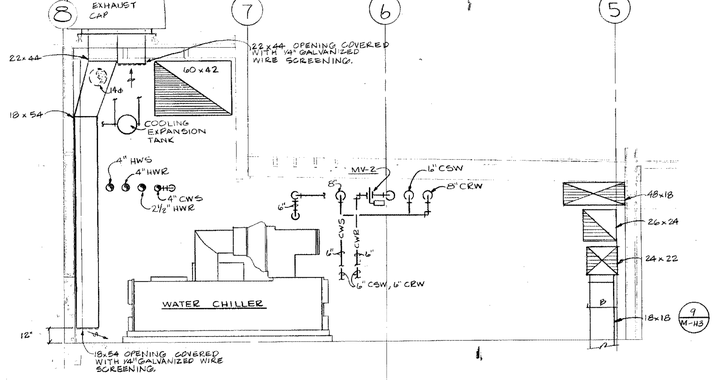
SECTION

2 / BM-H3 — 1/4" = 1'-0"



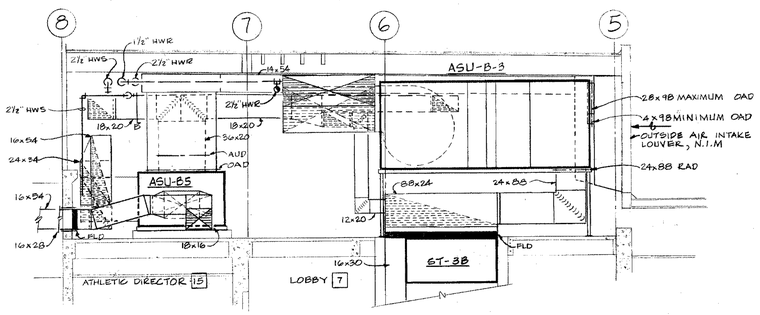
SECTION

3 / BM-H3 — 1/4" = 1'-0"



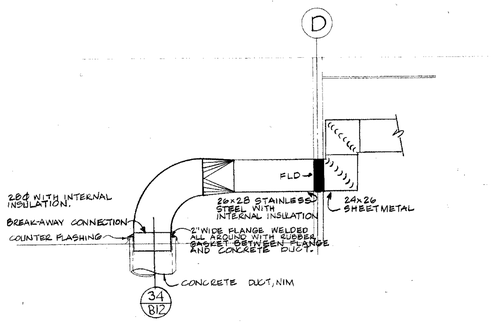
SECTION

4 / BM-H3 — 1/4" = 1'-0"



SECTION

5 / BM-H3 — 1/4" = 1'-0"



SECTION

6 / BM-H3 — 1/4" = 1'-0"

DEMO HIGHLIGHTED EQUIPMENT, PIPING, AND DUCT

SEE ADDITIONAL DETAILS ON ADDENDUM 2B-52 DRWGS. 23 & 24

Condenser Water Return

Condenser Water Supply

Chilled Water Return

Chilled Water Supply

Heating Water Return

M1.2

AS-BUILT DRAWING BM-H3

CASCADE ARCHITECTURAL AND ENGINEERING SUPPLIES CO., PORTLAND, OREGON

REGISTERED PROFESSIONAL ENGINEER 3671 OREGON JANUARY 7, 1974 JACKSON P. SCHLECK

C. W. Timmer Associates Inc.
Consulting Engineers
1128

REYNOLDS SCHOOL DISTRICT NO. 7
MULTNOMAH COUNTY
OREGON

SELIG/ HENSLEE *Architects & Planners*

213 sw Ash Street
Portland, Oregon 97204
(503) 224-0173

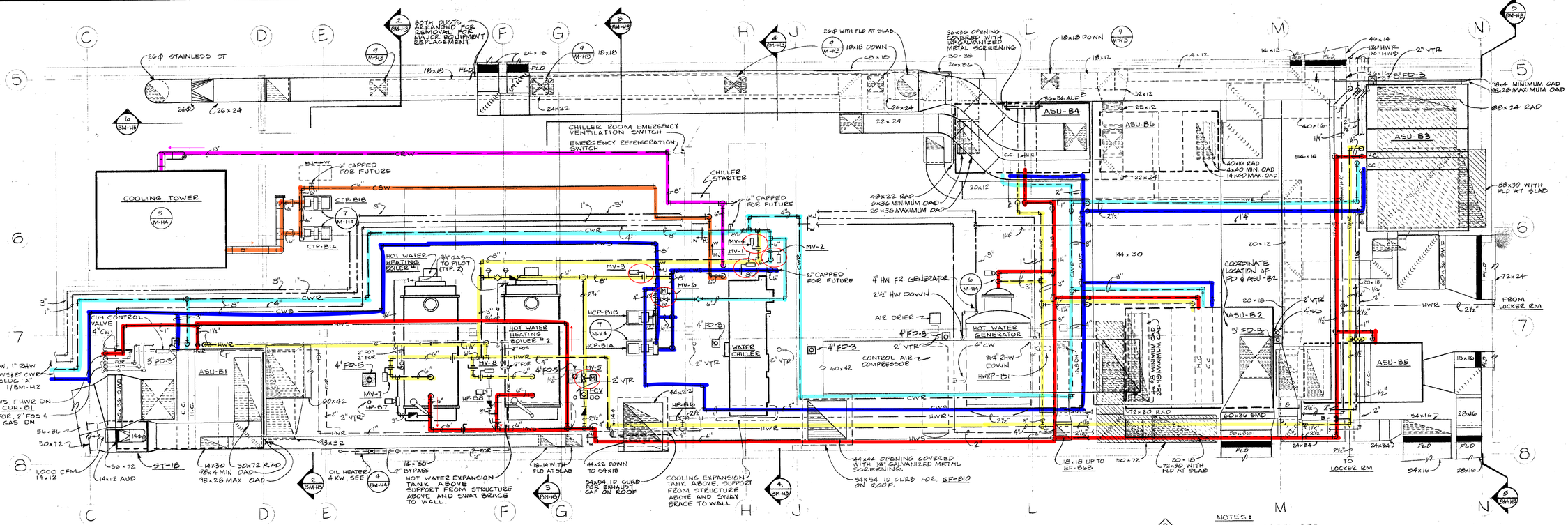
REYNOLDS HIGH SCHOOL NUMBER TWO

HVAC - PART FLOOR PLAN & SECTIONS

⚠ REVISIONS AS BUILT 5/17/78

BMH 3

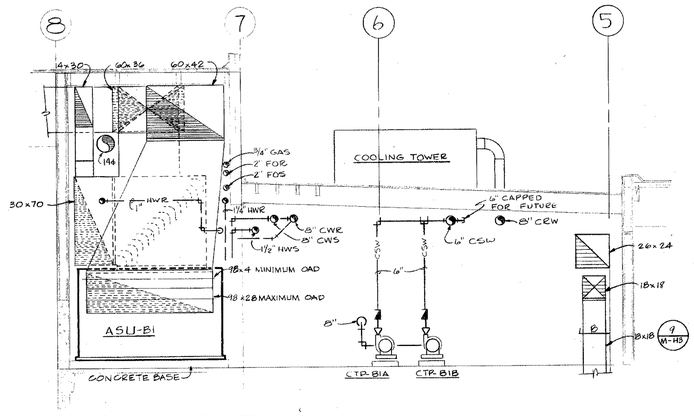
23 FEB 76



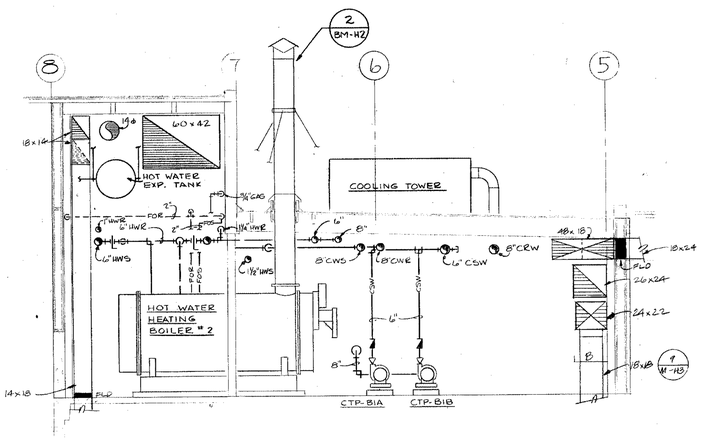
1 BM-H3 PARTIAL PLAN, SECOND FLOOR, BOILER & MECHANICAL ROOM
1/4" = 1'-0"

N

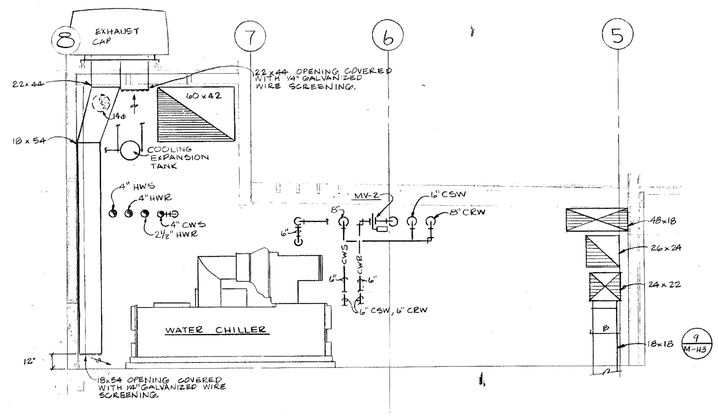
NOTES:
1. W = WELDED PIPE
2. M.J. = MECHANICAL JOINTS
3. SEAL ALL DUCT AND PIPE PENETRATIONS AIR AND WATER TIGHT.
4. PROVIDE COLLECTING FUNNELS AT FLOOR DRAINS WHERE REQUIRED.



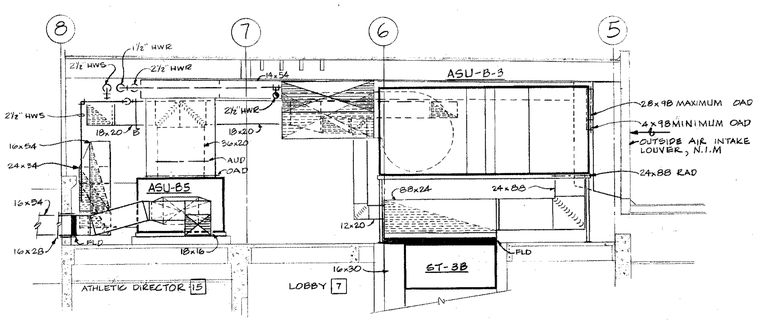
2 BM-H3 SECTION
1/4" = 1'-0"



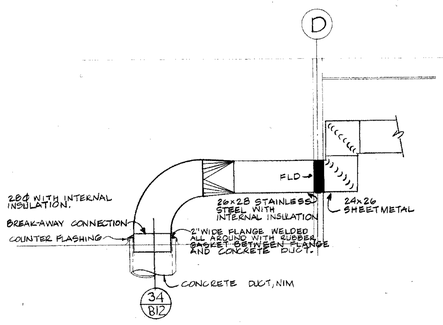
3 BM-H3 SECTION
1/4" = 1'-0"



4 BM-H3 SECTION
1/4" = 1'-0"



5 BM-H3 SECTION
1/4" = 1'-0"



6 BM-H3 SECTION
1/4"=1'-0"

Condenser Water Return
Condenser Water Supply
Chilled Water Return
Chilled Water Supply
Heating Water Return
HEating Water Supply

△SEE ADDITIONAL DETAILS ON ADDENDUM 2B-52 DRWGS. 23 & 24

FOR REFERENCE TO UNDERSTAMD FLOW PATHS

M1.3

AS-BUILT DRAWING BM-H3

REGISTERED PROFESSIONAL ENGINEER 3671 OREGON JANUARY 7, 1974 JACKSON P. SCHLICK

C.W. Timmer Associates Inc.
Consulting Engineers
1128

REYNOLDS SCHOOL DISTRICT NO. 7
MULTNOMAH COUNTY
OREGON

SELIG/ HENSLEE
Architects & Planners

213 sw Ash Street
Portland, Oregon 97204
(503) 224-0173

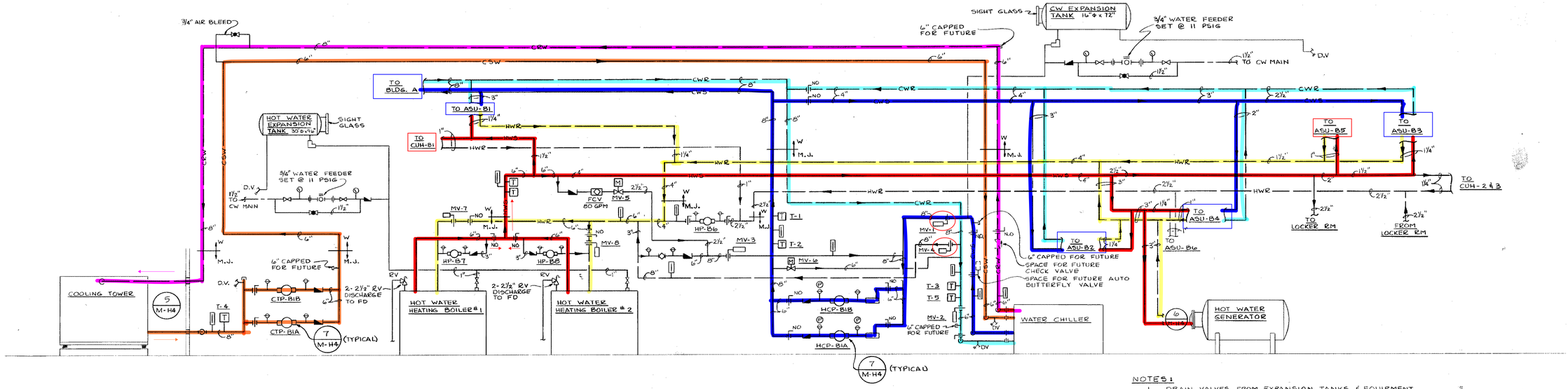
REYNOLDS HIGH SCHOOL NUMBER TWO

HVAC - PART FLOOR PLAN & SECTIONS

△REVISIONS AS BUILT 5/17/78

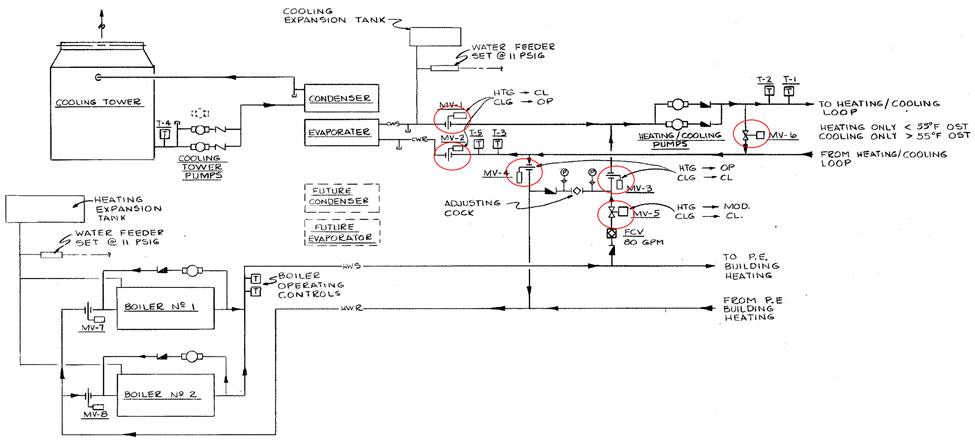
BMH 3

23 FEB 76

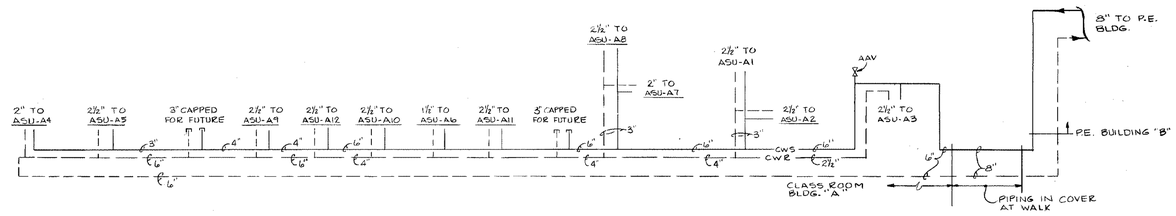


1 / BM-H4 BOILER, CHILLER ROOM PIPING DIAGRAM
NO SCALE

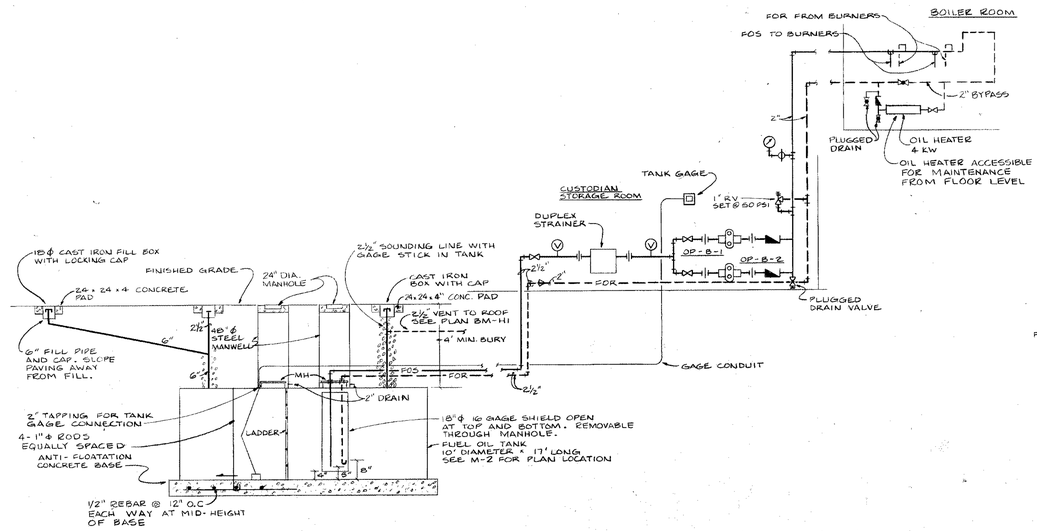
NOTES:
1. DRAIN VALVES FROM EXPANSION TANKS & EQUIPMENT ACCESSIBLE FROM FLOOR LEVEL.
2. ARRANGE PIPING FOR CONVENIENT ACCESS AT EQUIPMENT FOR MAINTENANCE
3. W = WELDED PIPE
4. M.J. = MECHANICAL JOINTS



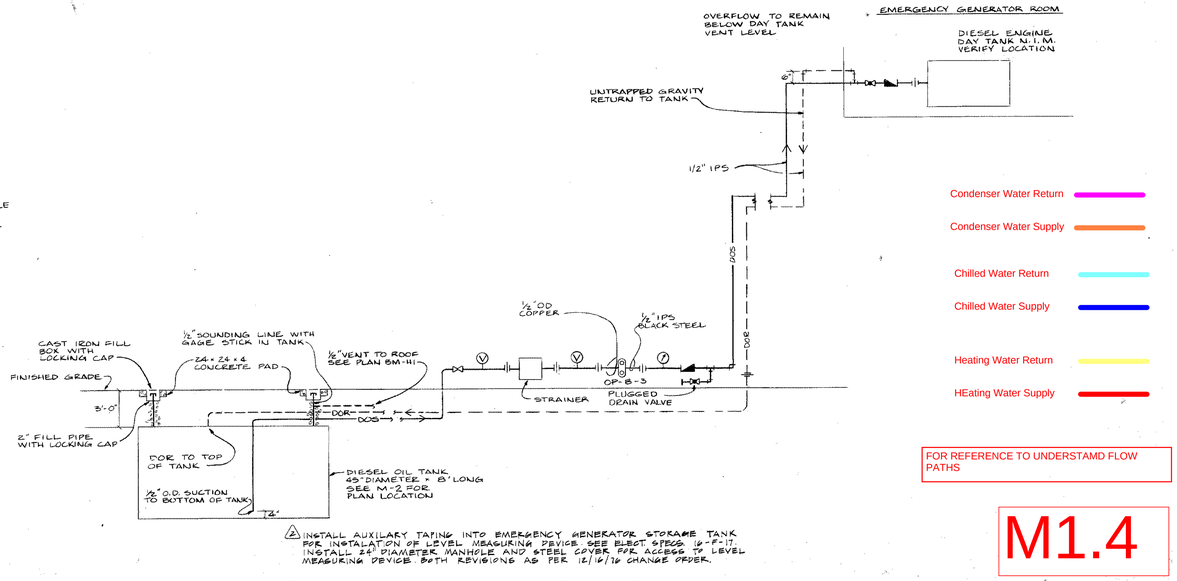
2 / BM-H4 CENTRAL HEATING – COOLING FLOW DIAGRAM
NO SCALE



3 / BM-H4 HEATING – COOLING LOOP PIPING DIAGRAM
NO SCALE



4 / BM-H4 FUEL OIL SYSTEM DIAGRAM
NO SCALE
NOTES:
1. ½ CUBIC YARD GRAVEL DRAINAGE AT EACH FILL BOX.
2. SEE 1/BM-H1 AND 10/M-2
⚠1 NOTE REVISIONS AS ON C.W. TIMMER DRAWING DATED 9/18/76



⚠2 INSTALL AUXILIARY TAPING INTO EMERGENCY GENERATOR STORAGE TANK PER INSTALLATION OF LEVEL MEASURING DEVICE. SEE ELECT SPECS. 16-F-17. INSTALL 24" DIAMETER MANHOLE AND STEEL COVER FOR ACCESS TO LEVEL MEASURING DEVICE. BOTH REVISIONS AS PER 12/16/76 CHANGE ORDER.

5 / BM-H4 DIESEL OIL SYSTEM DIAGRAM
NO SCALE
NOTES:
1. 1/2 CUBIC YARD GRAVEL DRAINAGE AT EACH FILL BOX.
2. SEE 1/BM-H1 AND 10/M-2

FOR REFERENCE TO UNDERSTAMD FLOW PATHS

M1.4

AS-BUILT DRAWING

BM-H4

REGISTERED PROFESSIONAL ENGINEER 3671 OREGON MAY 7, 1976 JACKSON P. SCHENCK

C. W. Timmer Associates Inc. Consulting Engineers

REYNOLDS SCHOOL DISTRICT NO. 7 MULTNOMAH COUNTY OREGON

SELIG/ HENSLEE *Architects & Planners*

213 sw Ash Street
Portland, Oregon 97204
(503) 224-0173

REYNOLDS HIGH SCHOOL NUMBER TWO

HVAC - CENTRAL SYSTEM DIAGRAMS

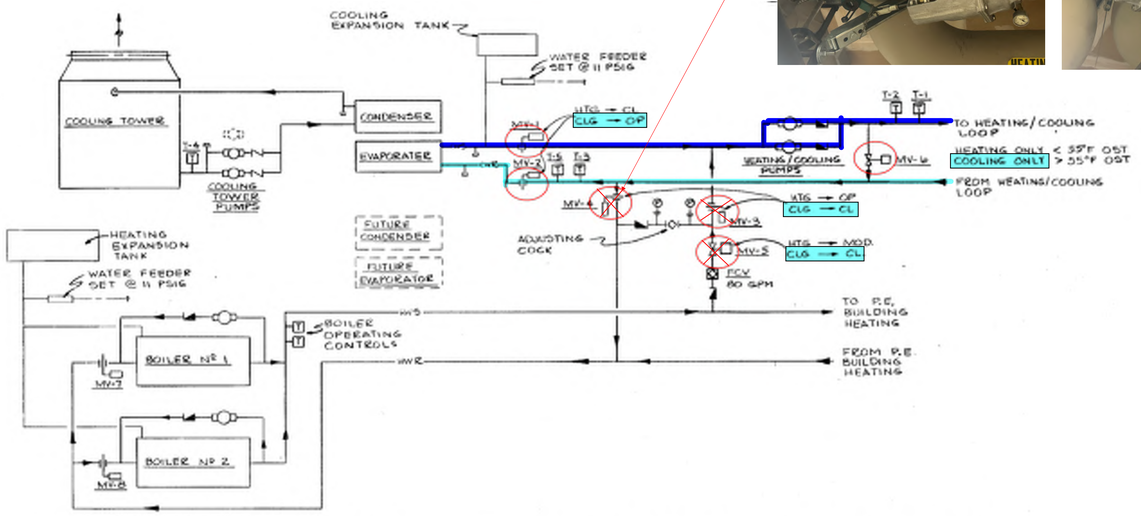
⚠1 REVISION AS BUILT 5/8/78

⚠2 REVISION AS BUILT 6/28/78

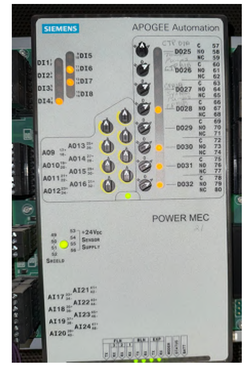
BMH 4

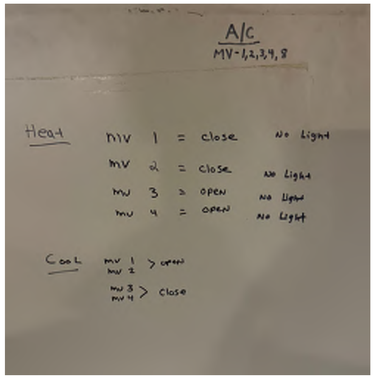
23 FEB 76

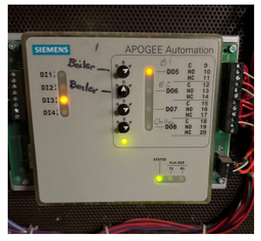
EXAMPLE OF EXISTING ELECTRO-PNEUMATIC VALVE ACTUATORS

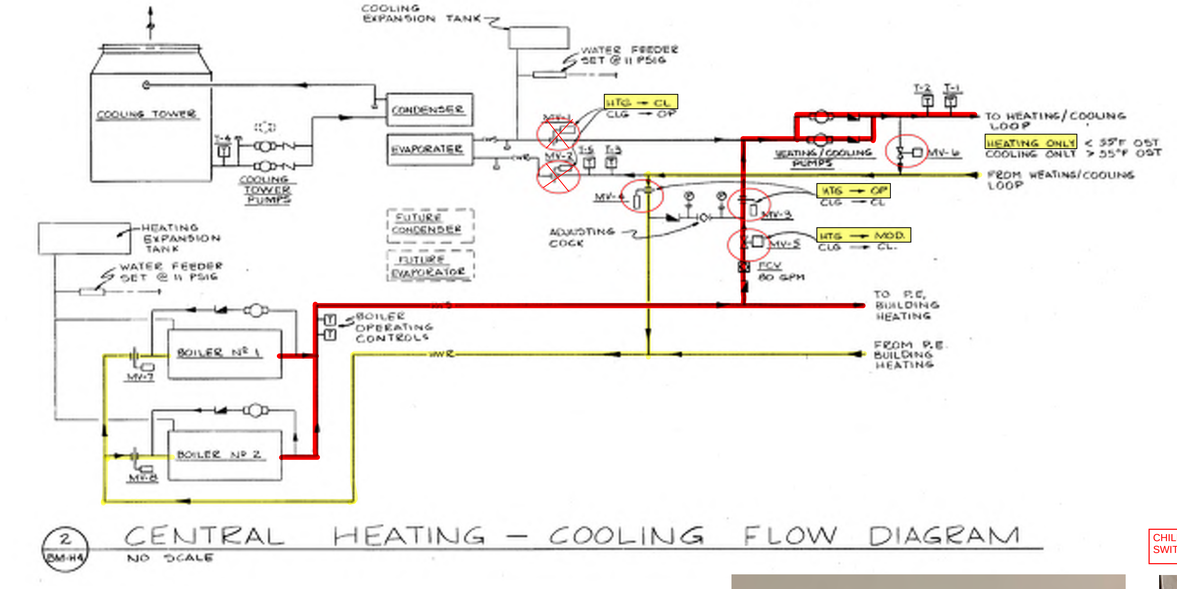


2 BM-H4 CENTRAL HEATING – COOLING FLOW DIAGRAM
NO SCALE



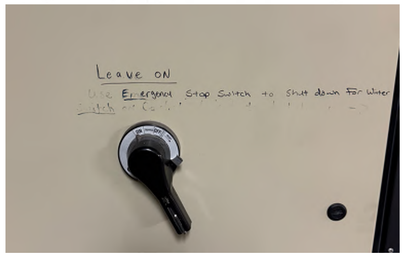






2 BM-H4 CENTRAL HEATING – COOLING FLOW DIAGRAM
NO SCALE

CHILLER DISCONNECT AND EMERGENCY STOP SWITCH



Condenser Water Return

Condenser Water Supply

Chilled Water Return

Chilled Water Supply

Heating Water Return

HEating Water Supply

FOR REFERENCE TO UNDERSTAMD FLOW PATHS AND CHANGEOVER SEQUENCE

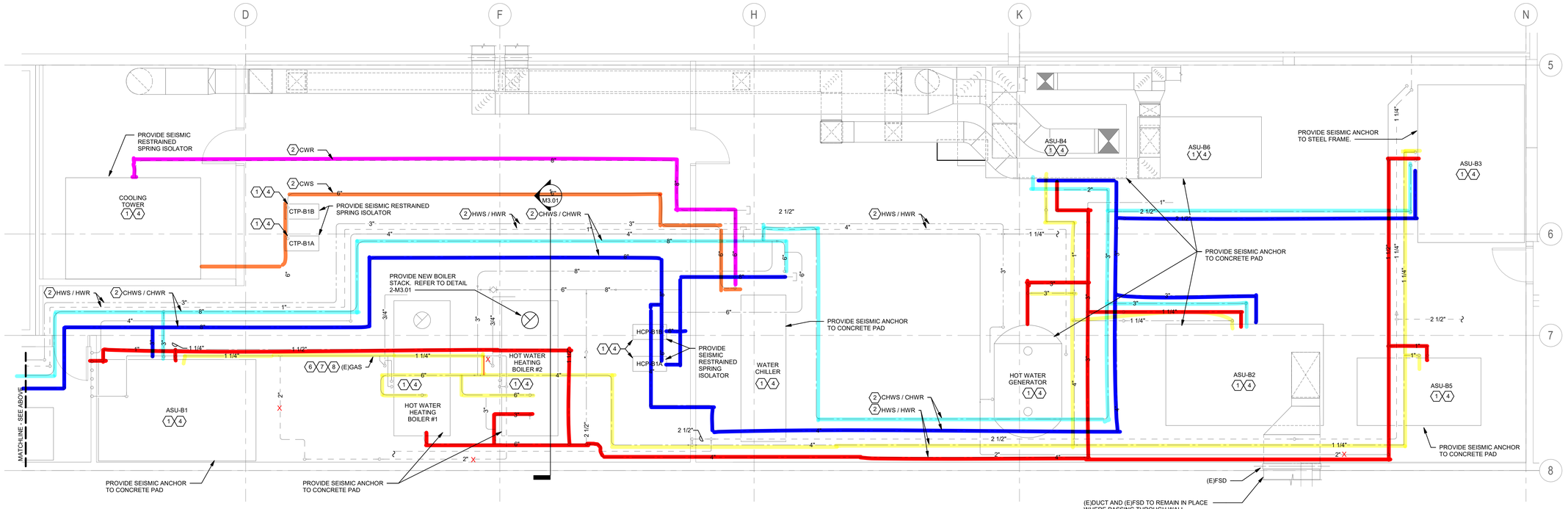
M1.5

GENERAL SHEET NOTES

A REFER TO STRUCTURAL DRAWINGS FOR DETAILING OF SEISMIC ANCHORING DETAILS.

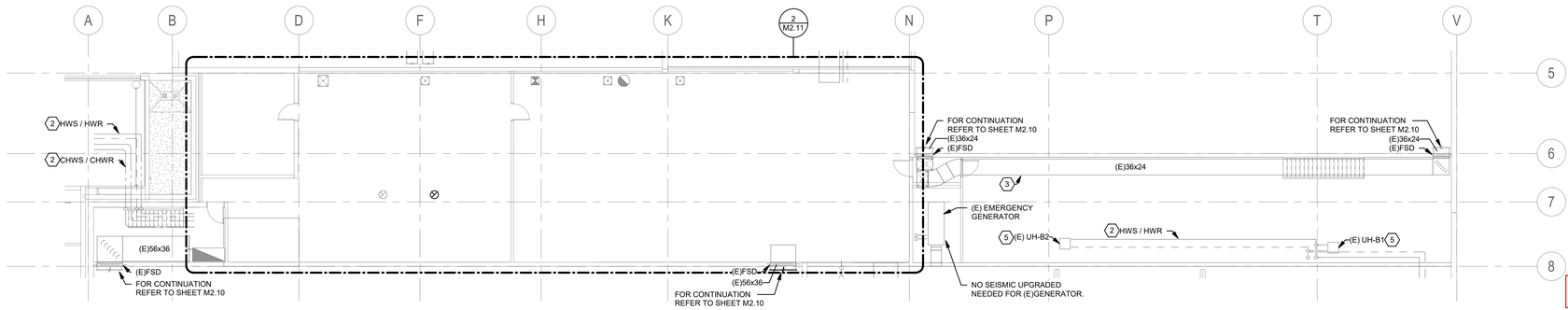
SHEET KEYNOTES

1 PROVIDE FLEXIBLE COUPLINGS FOR CHILLED WATER AND HEATING WATER PIPES.
2 BRACE CHILLED WATER AND HEATING WATER PIPES.
3 BRACE DUCTS LARGER THAN 6 ft^2 IN CROSS SECTIONAL AREA @30FT O.C. TRANSVERSE AND 60FT O.C. LONGITUDINALLY.
4 ANCHOR HEAVY EQUIPMENT (MORE THAN 400LBS)
5 BRACE IN-LINE EQUIPMENT WITH AN OPERATING WEIGHT MORE THAN 75LB.
6 BRACE (E) NATURAL GAS PIPING.
7 PROVIDE EMERGENCY GAS SHUT-OFF VALVE.
8 GAS PIPING CONTAIN FLEXIBLE COUPLINGS TO EQPT AND TO BUILDING FROM METER.



2 ENLARGED MEZZANINE MECHANICAL PLAN - MECHANICAL

0' 2' 4' 8'
1/4" = 1'-0"



1 MEZZANINE PLAN - MECHANICAL

0' 4' 8' 16'
3/32" = 1'-0"

Condenser Water Return
Condenser Water Supply
Chilled Water Return
Chilled Water Supply
Heating Water Return
HEating Water Supply

FOR REFERENCE TO SEE SEISMIC UPGRADES DONE IN 2021

M1.6

BR|IC ARCHITECTURE, INC.

INTERFACE ENGINEERING
PROJECT 2020-0421
CONTACT Michael McGaughey
100 SW Main Street, Suite 1600
Portland, OR 97204
TEL 503.382.2266
www.interfaceengineering.com

Reynolds High School Gymnasium Seismic Upgrade

1698 SW Cherry Park Road, Troutdale, OR 97060
Reynolds School District

REGISTERED PROFESSIONAL ENGINEER 65438PE MAY 10, 2005 ANDREW LASSE
EXPIRES: 12/31/22

key plan: H, D, J, E, C, F, G, A, B

revisions	

phase	100% CD SET
date	3/12/21
project	20017

MEZZANINE PLAN - MECHANICAL

M2.11

3/12/2021 11:21:51 AM
C:\Users\quinlanb\Documents\20-1119_RHS_Gym_Seismic_MEP Central_v20_quinlanb.rvt

UNIT	COOLING TOWER		EVAPCO, INC.	DWG. #	T3091148-DRE-LF	REV.	-
MODEL #	AT 19-4K11	SCALE	NTS	SERIAL #		DATE	11/2/2025

NOTES:
1. (M)- FAN MOTOR LOCATION
2. HEAVIEST SECTION IS UPPER SECTION
3. MPT DENOTES MALE PIPE THREAD
   FPT DENOTES FEMALE PIPE THREAD
   BFW DENOTES BEVELED FOR WELDING
   GVD DENOTES GROOVED
   FLG DENOTES FLANGE
4. +UNIT WEIGHT DOES NOT INCLUDE ACCESSORIES (SEE ACCESSORY DRAWINGS)
5. MAKE-UP WATER PRESSURE
   20 psi MIN [137 kPa], 50 psi MAX [344 kPa]
6. 3/4" [19MM] DIA. MOUNTING HOLES. REFER TO RECOMENDED STEEL SUPPORT DRAWING.
7. DIMENSIONS LISTED AS FOLLOWS:
   ENGLISH FT-IN
   [METRIC] [mm]

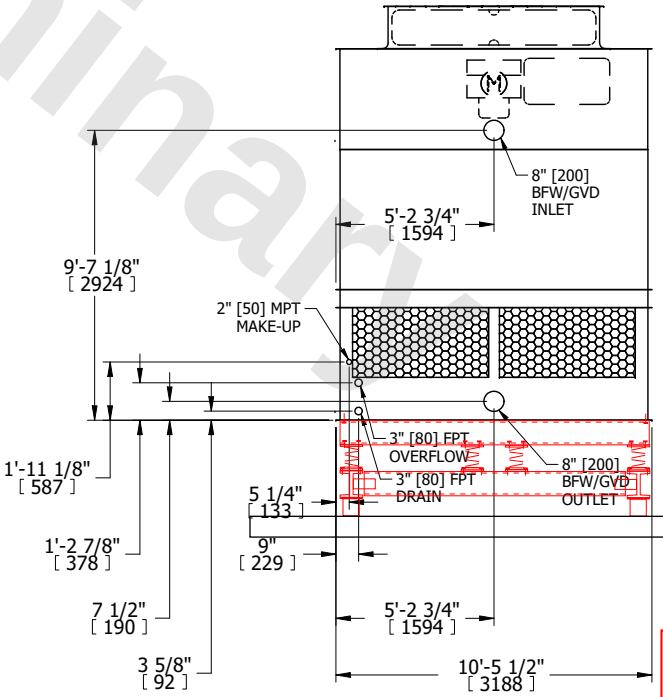
FACE C

FACE B

PLAN VIEW

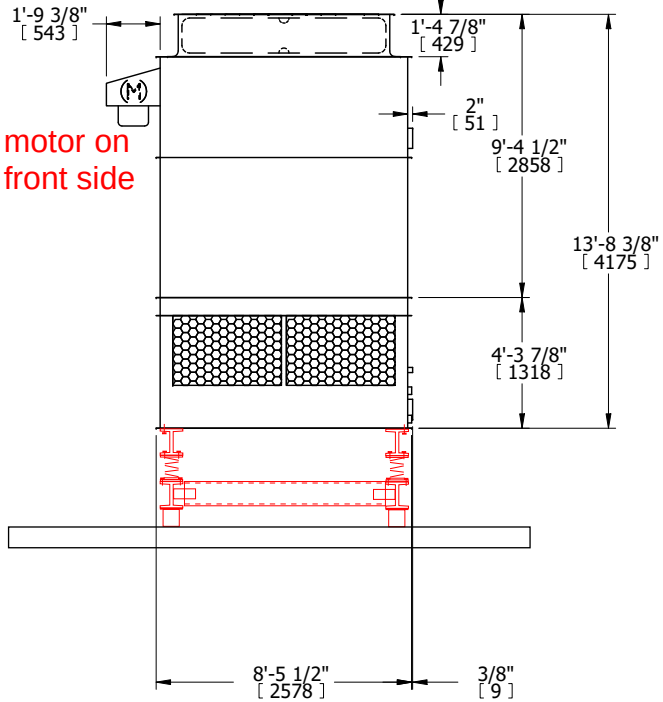
FACE D

FACE A



pipe connections on back side

motor on front side



FACE B

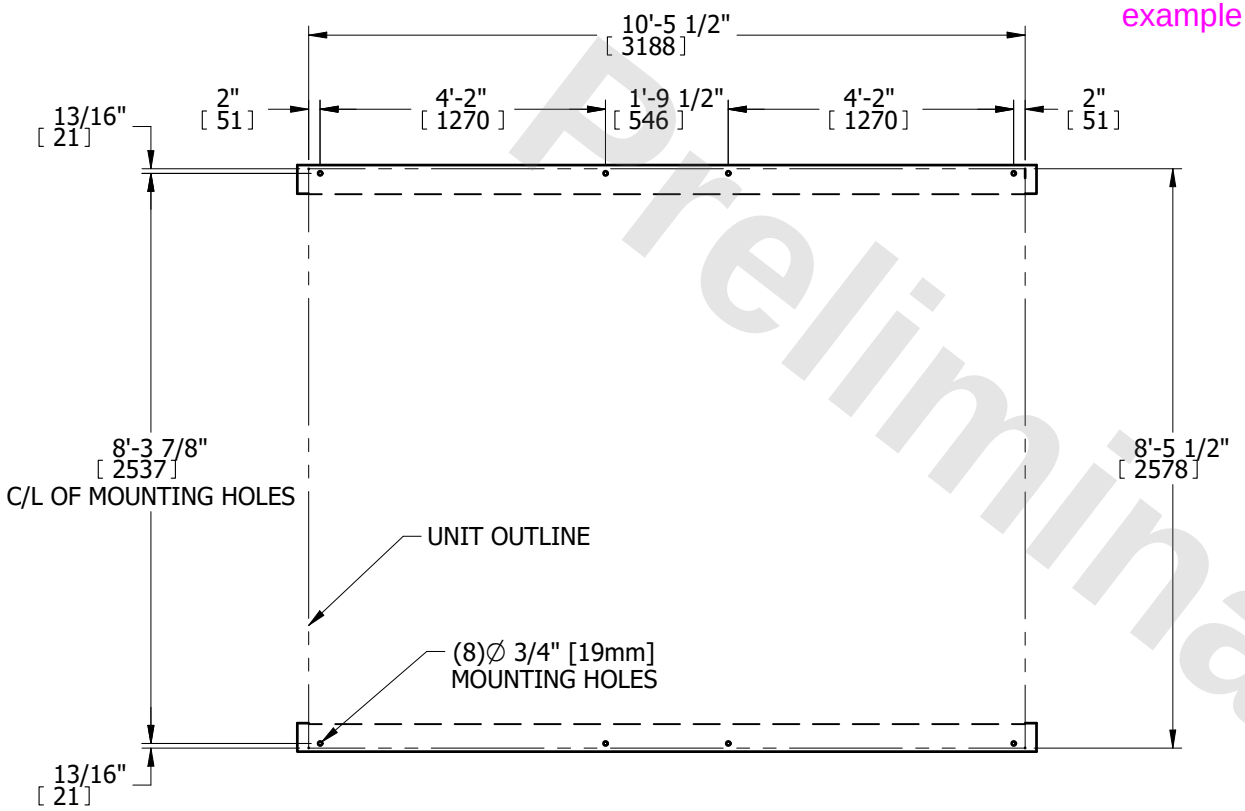
FACE A

CONCEPT FOR TOWER MOUNTING

M1.7

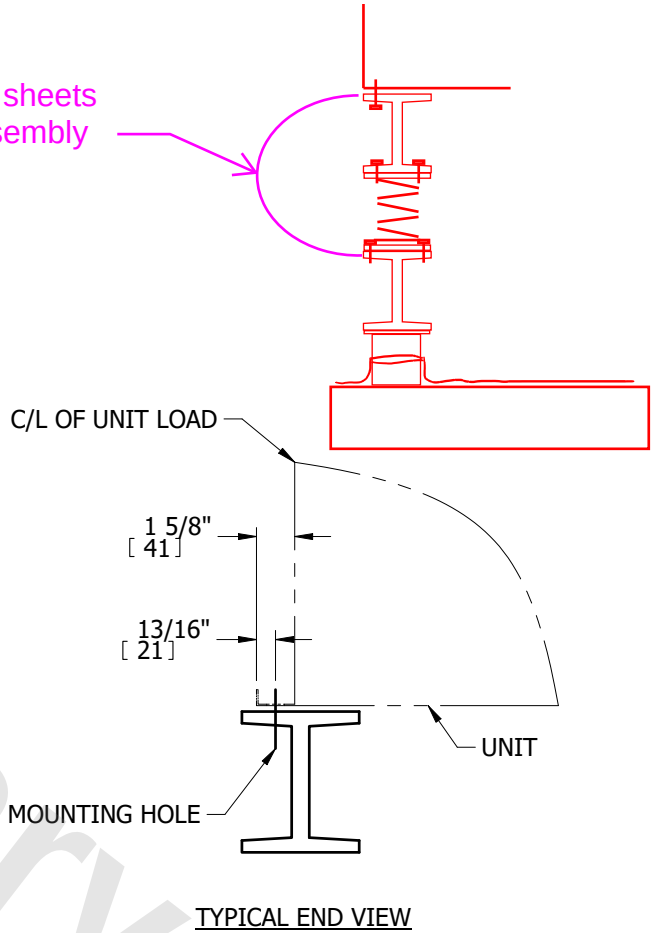
SHIPPING WEIGHT	5520 lbs+ [2505] kg+	OPERATING WEIGHT	8820 lbs+ [4005] kg+	HEAVIEST SECTION WEIGHT	3920 lbs+ [1780] kg+	NO. OF SHIPPING SECTIONS	2	DRAWN BY:	JLG

UNIT	AT 19-4K11		DWG. #	SLIX0911-DF
TITLE	STEEL SUPPORT CONFIGURATION	**EVAPCO, INC.**	SCALE	N.T.S.
			DRAWN BY	JLG



PLAN VIEW

Refer to cut sheets for base assembly example

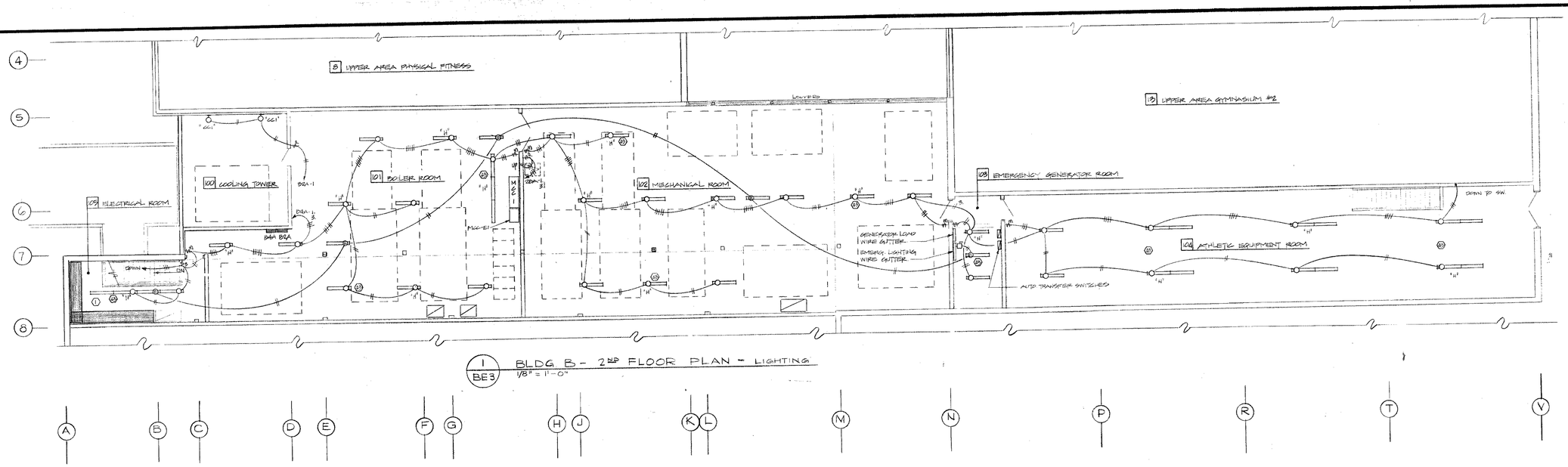


TYPICAL END VIEW

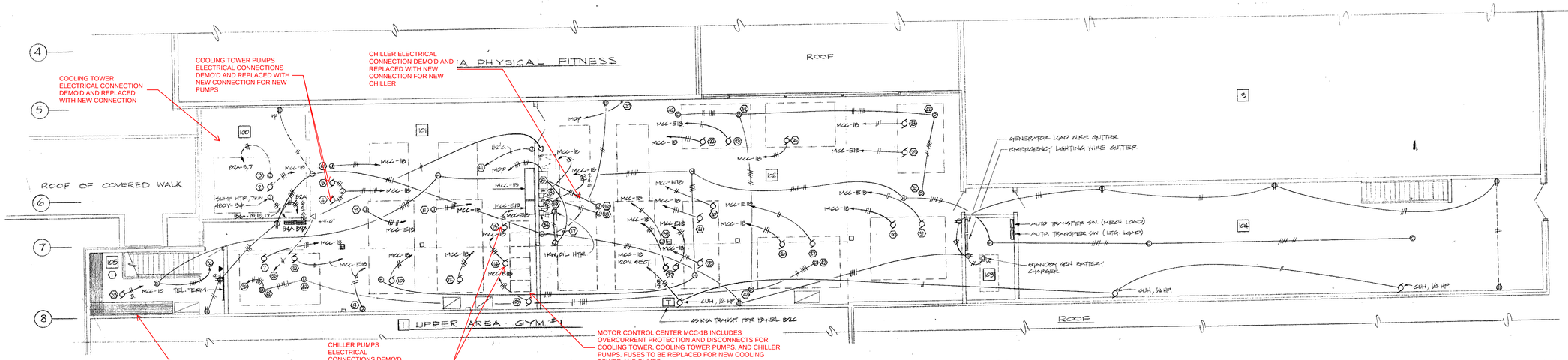
M1.8

NOTES:

1. BEAMS SHOULD BE SIZED IN ACCORDANCE WITH ACCEPTED STRUCTURAL PRACTICES. MAXIMUM DEFLECTION OF BEAM UNDER UNIT TO BE 1/360 OF UNIT LENGTH NOT TO EXCEED 1/2" [13mm].
2. DEFLECTION MAY BE CALCULATED BY USING 55% OF THE OPERATING WEIGHT AS A UNIFORM LOAD ON EACH BEAM. SEE CERTIFIED PRINT FOR OPERATING WEIGHT.
3. SUPPORT BEAMS AND ANCHOR HARDWARE ARE TO BE FURNISHED BY OTHERS. ANCHOR HARDWARE TO BE ASTM A325 5/8" [16mm] BOLT OR EQUIVALENT.
4. BEAMS MUST BE LOCATED UNDER THE FULL LENGTH OF THE PAN SECTION.
5. SUPPORTING BEAM SURFACE MUST BE LEVEL. DO NOT LEVEL THE UNIT BY PLACING SHIMS BETWEEN THE UNIT MOUNTING FLANGE AND THE SUPPORTING BEAM.
6. THE FACTORY RECOMMENDED STEEL SUPPORT CONFIGURATION IS SHOWN. CONSULT THE FACTORY FOR ALTERNATE SUPPORT CONFIGURATIONS.
7. UNIT SHOULD BE POSITIONED ON STEEL SUCH THAT THE ANCHORING HARDWARE FULLY PENETRATES THE BEAM'S FLANGE AND CLEARS THE BEAM'S WEB.
8. WHEN VIBRATION ISOLATION IS REQUIRED, THE VIBRATION ISOLATORS (BY OTHERS) MUST BE LOCATED UNDER THE SUPPORTING BEAMS AND NOT BETWEEN THE SUPPORTING STEEL BEAMS AND THE UNIT.
9. DIMENSIONS LISTED AS FOLLOWS: ENGLISH FT-IN [METRIC] [mm]



1 / BE3 BLDG B - 2ND FLOOR PLAN - LIGHTING
1/8" = 1'-0"



2 / BE3 BLDG. B - 2ND FLOOR PLAN - POWER & SIGNAL
1/8" = 1'-0"

NOTE: ALL FIRE DETECTORS, THERMAL OR IONIZATION, ON LEVEL 2 SHALL BE CONNECTED TO FIRE ALARM SYSTEM ZONE 16.

NOTES THIS SHEET

(1) BUILDING "B" MAIN DISTRIBUTION PANEL.

(2) COOLING TOWER CT-B-1, 30HP, 480V-3ø, 3-#6TWH IN 1" C.

(3) PROVIDE JUNCTION BOX FOR CONNECTION OF HEATING TAPE AND 120V CONTROL. HEAT TAPE PROVIDED BY OTHERS FOR CONNECTION BY ELECTRICAL.

(4) COND. WATER PUMP, CTP-B-1A, ⚠1 10 HP, 480V-3ø, 3-#10TW

(5) COND. WATER PUMP, CTP-B-1B, ⚠1 10 HP, 480V-3ø, 3-#10TW

(6) FUTURE COND. WATER PUMP, CTP-B-2, ⚠1 10 HP, 3/4" C ONLY.

(7) ASU-B1, 15HP, 480V-3ø, 3-#8TW IN 1"C.

(8) RETURN LINE OIL HEATER, OH-B-1, 5KW, 480V-1ø.

(9) BOILER B-1. 5HP BLOWER, 1/2HP OIL PUMP, 5KW OIL HEATER, 480V-3ø. 120V CONTROL FROM 120V SECTION OF MCC-E1B. 3-#10TW AND 2-#12TW IN 1" C.

(10) BOILER CIRC. PUMP, HP-B-7, 1HP, 480V-3ø.

(11) BOILER B-2, 5HP BLOWER, 1/2HP OIL PUMP, 5KW OIL HEATER, 480V-3ø. 120V CONTROL FROM 120V SECTION OF MCC-1B. 3-#10TW AND 2-#12TW IN 1" C.

(12) BOILER CIRC. PUMP, HP-B8, 1 HP, 480V-3ø.

(13) HEATING/COOLING PUMP FOR BLDG "A", HCP-B-1A, 10HP, 480V-3ø, 3-#10TW IN 3/4" C.

(14) HEATING/COOLING PUMP FOR BLDG "A", HCP-B-1B, 10HP, 480V-3ø, 3-#10TW IN 3/4" C.

(15) CHILLER STARTER (BY OTHERS), WCU-B-1, NOMINAL 250KW. FEEDER TO STARTER SHALL BE 6-#4/0THW IN 3" C., 2-#4/0 PER ø. FEEDER FROM STARTER TO CHILLER SHALL BE 6-#4/0THW IN 3" C, 2-#4/0 PER ø, COPPER CONDUCTORS ONLY PERMITTED.

(16) CHILLER TERMINAL BOX.

(17) CHILLER CONTROL, 14-#14 THW IN 1 1/4" C., TO COMPRESSOR STARTER. 120V CIRCUITS FOR CONTROL, PURGE SYSTEM AND OIL HEATER FROM 120V SECTION OF MCC-1B.

(18) 30A FUSED DISCONNECT FOR CHILLER OIL PUMP, 1/2HP, 480V-3ø.

(19) 30A FUSED DISCONNECT FOR CHILLER OIL HEATER, 1KW, 120V.

(20) PROVIDE 3" C. RACEWAY, ELL DOWN AT CEILING, FOR FUTURE WATER CHILLER, WCU-B-2.

(21) HP-B-9, HOT WATER TANK, 1 1/2HP, ⚠1 480V-3ø.

(22) ASU-B-4, 5HP, 480V-3ø.

(23) HEAT COIL CIRC PUMP, HP-B-4, 1/3 HP, CONNECT TO 120V SECTION OF MCC-E1B.

(24) ASU-B-6, 3HP, 480V-3ø.

(25) HEAT COIL CIRC. PUMP, HP-B-6, 1/2HP, 480V-3ø.

(26) ASU-B-2, 15HP, 480V-3ø, 3-#8TW IN 1" C.

(27) HEAT COIL CIRC. PUMP, HP-B-2, 1/3HP, CONNECT TO 120V SECTION OF MCC-E1B.

(28) ASU-B-3, 15HP, 480V-3ø, 3-#8TW IN 1"C.

(29) HEAT COIL CIRC. PUMP, HP-B-3, 1/3HP, CONNECT TO 120V SECTION OF MCC-E1B.

(30) ASU-B-5, 5HP, 480V-3ø.

(31) HEAT COIL CIRC. PUMP, HP-B-5, 1/3HP CONNECT TO 120V SECTION OF MCC-E1B.

(32) HEAT COIL CIRC. PUMP, HP-B-1, 1/3HP. CONNECT TO 120V SECTION OF MCC-E1B.

(33) EXHAUST FAN, EF-B-9, 1/6HP, CONNECT TO 120V SECTION OF MCC-1B.

(34) PURGE SYSTEM FUSED DISCONNECT SWITCH. EXTEND RACEWAY AND CONDUCTORS TO 1/6 HP PURGE PUMP., 120V.

(35) HOT WATER GENERATOR CIRCULATION PUMP, 3/4HP, 480V-3ø.

(36) EXTEND TO BARRIERED SIGNAL SYSTEM WIRE GUTTER IN CUSTODIAN ROOM 2.

(37) DUPLEX TEMPERATURE CONTROL AIR COMPRESSOR, TCC-B-1, 2-5HP; CONNECT ONE MOTOR TO MCC-1B, REMAINING MOTOR TO MCC-E1B.

(38) FAN CONTROL PANEL, 120V.

(39) REFRIGERATED AIR DRYER, 120V.

(40) HOT WATER RECIRCULATION PUMP, HWRP-B-1, 1/3HP, 120V

(41) 1 1/2C. DOWN TO MECHANICAL CONTROL PANEL IN CUSTODIAN ROOM 2. PROVIDE 6" X 6" X 4" JUNCTION BOX ON WALL FOR TERMINATION OF CONTROL CONDUCTORS.

(42) DUCT IONIZATION DETECTOR, PROVIDE WITH 1 PAIR N.O. AND N.C. LOAD CARRYING CONTACTS FOR MECHANICAL CONTROL.

(43) SUSPEND LIGHTING FIXTURES ON CHAIN HANGERS IN MECHANICAL SPACES. VERIFY LOCATION OF FIXTURES WITH MECHANICAL.

E1.1

AS-BUILT DRAWING

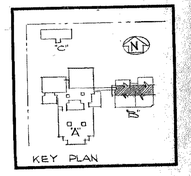
LANGTON, MEHLIG & ASSOC. INC.
ELECTRICAL ENGINEERS
6552 S E. Lake Road
Milwaukie, Oregon 97222
Ph. 659-6394

REYNOLDS SCHOOL DISTRICT NO. 7 MULTNOMAH COUNTY OREGON

REYNOLDS HIGH SCHOOL NUMBER TWO

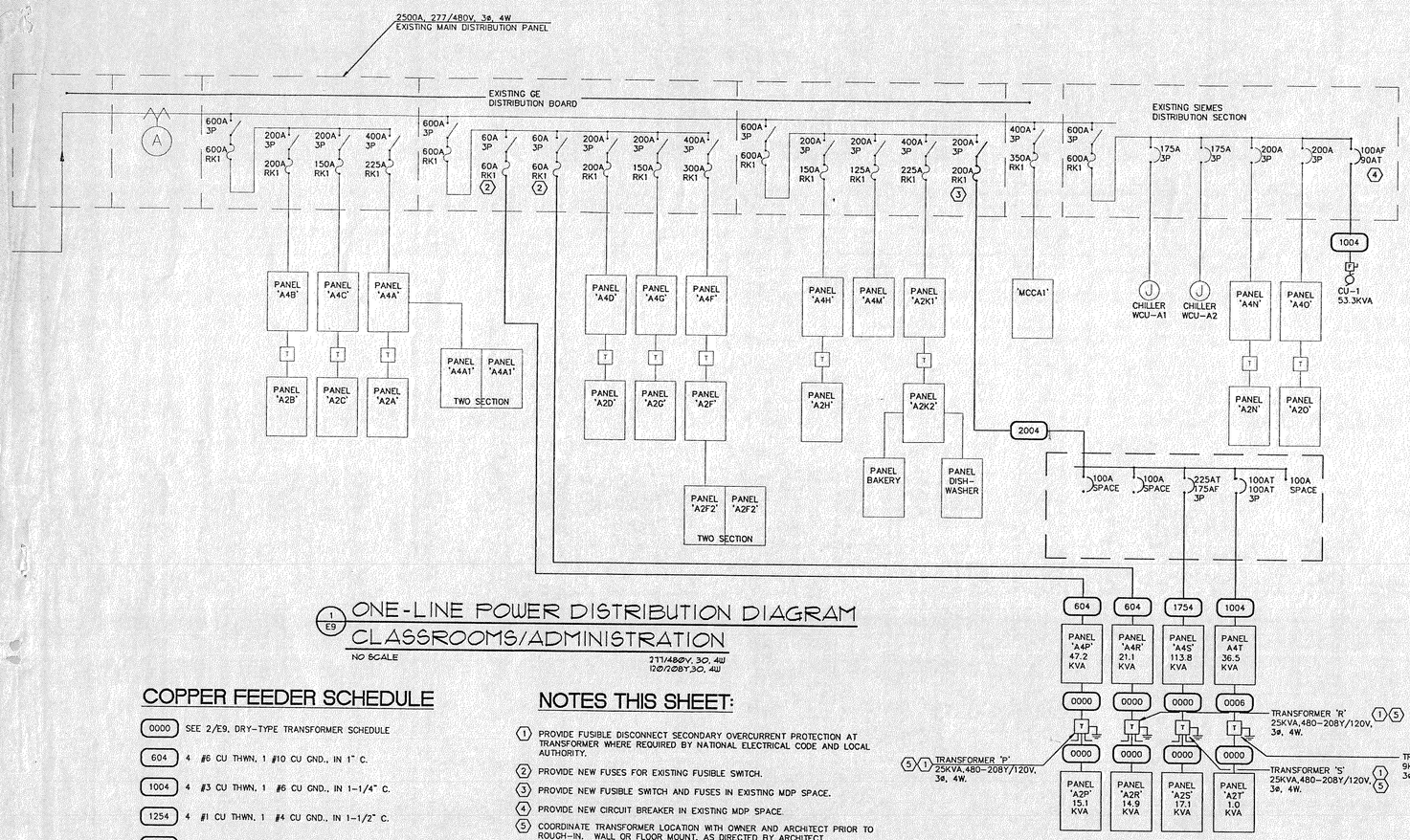
UPPER LEVEL LIGHTING, POWER & SIGNAL

⚠ NOTE REVISIONS ON BE-3R SEPIA AS BUILT DRAWING
⚠ REVISIONS "AS BUILT" 5/14/76

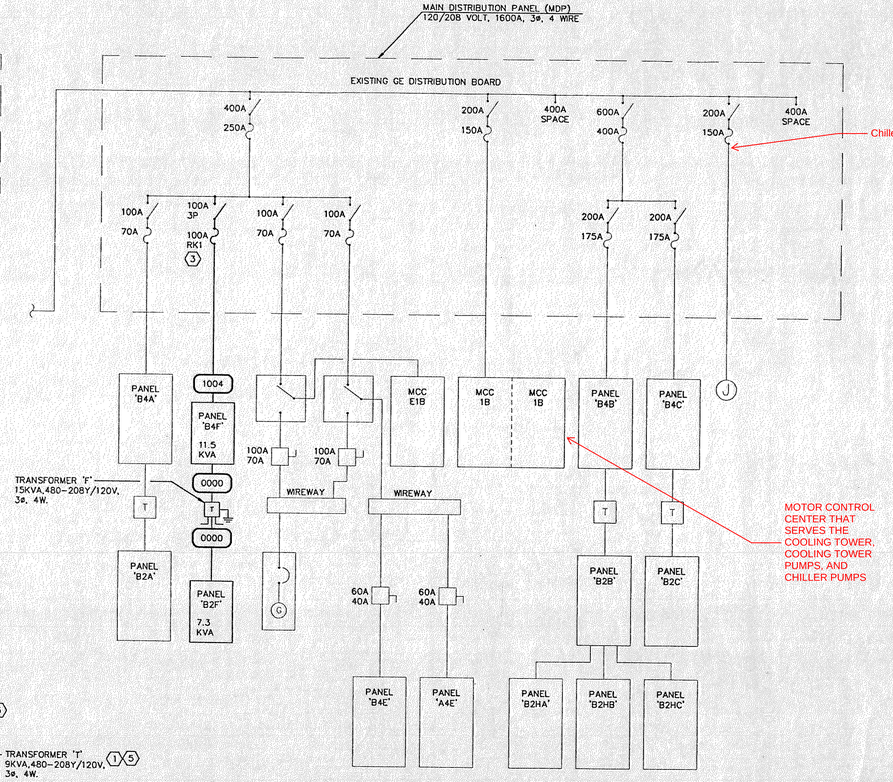


BE 3 23 FEB 76

SELIG/ HENSLEE
Architects & Planners
213 sw Ash Street
Portland, Oregon 97204
(503) 224-0173



E9/1 ONE-LINE POWER DISTRIBUTION DIAGRAM
CLASSROOMS/ADMINISTRATION
NO SCALE — 277/480V, 3Ø, 4W 120/208Y, 3Ø, 4W



E9/2 ONE-LINE POWER DISTRIBUTION DIAGRAM
PHYSICAL EDUCATION
NO SCALE — 277/480V, 3Ø, 4W 120/208Y, 3Ø, 4W

COPPER FEEDER SCHEDULE

0000	SEE 2/E9, DRY-TYPE TRANSFORMER SCHEDULE	
604	4	#6 CU THWN, 1 #10 CU GND., IN 1" C.
1004	4	#3 CU THWN, 1 #6 CU GND., IN 1-1/4" C.
1254	4	#1 CU THWN, 1 #4 CU GND., IN 1-1/2" C.
2004	4	#3/0 CU THWN, 1 #4 CU GND., IN 2" C.
1754	4	#2/0 CU THWN, 1 #4 CU GND., IN 2" C.

NOTES THIS SHEET:

1. PROVIDE FUSIBLE DISCONNECT SECONDARY OVERCURRENT PROTECTION AT TRANSFORMER WHERE REQUIRED BY NATIONAL ELECTRICAL CODE AND LOCAL AUTHORITY.
2. PROVIDE NEW FUSES FOR EXISTING FUSIBLE SWITCH.
3. PROVIDE NEW FUSIBLE SWITCH AND FUSES IN EXISTING MDP SPACE.
4. PROVIDE NEW CIRCUIT BREAKER IN EXISTING MDP SPACE.
5. COORDINATE TRANSFORMER LOCATION WITH OWNER AND ARCHITECT PRIOR TO ROUGH-IN. WALL OR FLOOR MOUNT, AS DIRECTED BY ARCHITECT.

Panel Schedule 700 A2P — 3 Phase 4 Wire — Voltage LL: 208 Voltage LG: 120

DC Devices: — Device Family: — Mounting: — Bus Rating: 60 — Enclosure: — Available Fault Duty: A 3 Phase

Ckt No	Description/ Location	#Load Type	Ea	Qty	Den	Criteria= Total VA	Remarks	Device Amps	P	H	Device Amps	P	Remarks	Total VA	#Load Type	Ea	Qty	Den	Criteria= Description/ Location	Ckt No
1	R-HVAC MEZZ			3		720		20	1	A	20	1		600				9	B-1	2
3	R-MULTIPURPOSE			3		720		20	1	B	20	1		1000				3	R-DRINKING FOUNTAIN	4
5	R-MULTIPURPOSE			3		720		20	1	C	20	1		1500				1	MULTIPURPOSE PA AMP	6
7	R-MULTIPURPOSE			3		720		20	1	A	30	2		2250				1	WH-1	8
9	R-MULTIPURPOSE			3		720		30	2	B	30	2		2250				1	WH-1	10
11	R-MULTIPURPOSE			3		200		20	1	C	20	1		200				9	EXP-1	12
13	R-MULTIPURPOSE			3		200		20	1	A	20	1		720				3	R-RESTROOMS	14
15	R-MULTIPURPOSE			3		200		20	1	B	20	1							SPARE	16
17	R-MULTIPURPOSE			3		200		20	1	C	20	1							SPARE	18
19	R-MULTIPURPOSE			3		200		20	1	A	20	1							SPARE	20
21	R-MULTIPURPOSE			3		200		20	1	B	20	1							SPARE	22
23	R-MULTIPURPOSE			3		200		20	1	C	20	1							SPARE	24
25	R-MULTIPURPOSE			3		200		20	1	A	20	1							SPARE	26
27	R-MULTIPURPOSE			3		800		20	1	B									SPACE	28
29	R-MULTIPURPOSE			3		400		20	1	C									SPACE	30
31	R-MULTIPURPOSE			3		800		20	1	A									SPACE	32
33	R-MULTIPURPOSE			3		720		20	1	B									SPACE	34
35	R-MULTIPURPOSE			3		720		20	1	C									SPACE	36
37	SPACE									A									SPACE	38
39	SPACE									B									SPACE	40
41	SPACE									C									SPACE	42

ENDUSE LOADS: PHASE A VA 5890. PHASE B VA 5570. PHASE C VA 3620.
TOTAL LOADS: CONNECTED KVA 15.0 DEMAND KVA 15.0 DESIGN KVA 15.0
CONNECTED FLA 41.7 DEMAND FLA 41.7 DESIGN FLA 41.7

Panel Schedule 701 A3R — 3 Phase 4 Wire — Voltage LL: 208 Voltage LG: 120

DC Devices: — Device Family: — Mounting: SURFACE — Bus Rating: 100 — Enclosure: — Available Fault Duty: A 3 Phase

Ckt No	Description/ Location	#Load Type	Ea	Qty	Den	Criteria= Total VA	Remarks	Device Amps	P	H	Device Amps	P	Remarks	Total VA	#Load Type	Ea	Qty	Den	Criteria= Description/ Location	Ckt No
1	CLASSRM TERM. UNITS			9		540		20	1	A	20	1		900				3	R-CLASSROOM 114	2
3	CLASSRM TERM. UNITS			9		360		20	1	B	20	1		900				3	R-CLASSROOM 114	4
5	WATER HEATER (WH-2)			9		2250		30	2	C	20	1		900				3	R-CLASSROOM 115	6
7	WATER HEATER (WH-2)			9		2250		30	2	A	20	1		900				3	R-CLASSROOM 115	8
9	RCP-1			9		200		20	1	B	20	1		1000				3	R-DRINKING FOUNTAIN	10
11	SPARE							20	1	C	20	1		400				3	R-STORAGE 117	12
13	SPARE							20	1	A	20	1		600				3	R-STORAGE 117	14
15	SPARE							20	1	B	20	1		1000				3	R-CLASSROOM 111	16
17	SPARE							20	1	C	20	1		900				3	R-CLASSROOM 111	18
19	SPARE							20	1	A	20	1		900				3	R-CLASSROOM 112	20
21	SPARE							20	1	B	20	1		900				3	R-CLASSROOM 112	22
23	SPACE									C									SPACE	24
25	SPACE									A									SPACE	26
27	SPACE									B									SPACE	28
29	SPACE									C									SPACE	30
31	SPACE									A									SPACE	32
33	SPACE									B									SPACE	34
35	SPACE									C									SPACE	36
37	SPACE									A									SPACE	38
39	SPACE									B									SPACE	40
41	SPACE									C									SPACE	42

ENDUSE LOADS: PHASE A VA 6090. PHASE B VA 4360. PHASE C VA 4450.
TOTAL LOADS: CONNECTED KVA 14.7 DEMAND KVA 14.7 DESIGN KVA 14.7
CONNECTED FLA 40.8 DEMAND FLA 40.8 DESIGN FLA 40.8

Panel Schedule 702 A2S — 3 Phase 4 Wire — Voltage LL: 208 Voltage LG: 120

DC Devices: — Device Family: — Mounting: SURFACE — Bus Rating: 100 — Enclosure: — Available Fault Duty: A 3 Phase

Ckt No	Description/ Location	#Load Type	Ea	Qty	Den	Criteria= Total VA	Remarks	Device Amps	P	H	Device Amps	P	Remarks	Total VA	#Load Type	Ea	Qty	Den	Criteria= Description/ Location	Ckt No
1	DU-1/IU-1			9		900		20	1	A	20	1		540				3	R-STORAGE 121	2
3	TERMINAL UNITS			9		400		20	1	B	20	1		540				3	R-STORAGE 121	4
5	SPARE							20	1	C	20	1		360				3	R-STORAGE 121	6
7	SPARE							20	1	A	20	1		1000				3	R-PHOTOCOPIER	8
9	SPARE							20	1	B	20	1		900				3	R-CONF/STORAGE	10
11	SPARE							20	1	C	20	1		900				3	R-CONF/STORAGE	12
13	SPARE							20	1	A	20	1		900				3	R-WORK RM/OPEN OFFI	14
15	SPACE							20	1	B	20	1		900				3	R-WORK RM/OPEN OFFI	16
17	SPACE							20	1	C	20	1		900				3	R-OFFICE/SECRETERY	18
19	SPACE							20	1	A	20	1		900				3	R-OFFICE/SECRETERY	20
21	SPACE							20	1	B	20	1		720				3	R-RECEPTION	22
23	SPACE							20	1	C	20	1		720				3	R-RECEPTION	24
25	SPACE							20	1	A	20	1		900				3	R-LARGE CONF.	26
27	SPACE							20	1	B	20	1		720				3	R-LARGE CONF.	28
29	SPACE							20	1	C	20	1		720				3	R-VP OFFICES	30
31	SPACE							20	1	A	20	1		720				3	R-VP OFFICES	32
33	SPACE							20	1	B	20	1		720				3	R-VP OFFICES	34
35	SPACE							20	1	C	20	1		720				3	R-VP OFFICES	36
37	SPACE							20	1	A	20	1		200				3	R-ROOF TOP	38
39	SPACE							20	1	B	20	1		1800				3	R-OVEN STORAGE	40
41	SPACE							20	1	C	20	1		1500				3	DISHWASHER	42
																			SPACE	42

ENDUSE LOADS: PHASE A VA 6860. PHASE B VA 6400. PHASE C VA 3800.
TOTAL LOADS: CONNECTED KVA 17.0 DEMAND KVA 14.1 DESIGN KVA 14.1
CONNECTED FLA 47.2 DEMAND FLA 39.2 DESIGN FLA 39.2

Panel Schedule 800 A4K3 — 3 Phase 4 Wire — Voltage LL: 480 Voltage LG: 277

DC Devices: MAIN LUGS — Device Family: BOLT-ON — Mounting: FLUSH — Bus Rating: 225 — Enclosure: NEMA 1 — Available Fault Duty: A 3 Phase

Ckt No	Description/ Location	#Load Type	Ea	Qty	Den	Criteria= Total VA	Remarks	Device Amps	P	H	Device Amps	P	Remarks	Total VA	#Load Type	Ea	Qty	Den	Criteria= Description/ Location	Ckt No
1	CONVECTION OVEN			7		8333		90	3	A	70	3		96	BUS#	801			$SPRI-K3	2
3	---			7		8333		--	3	B	--	3		96	BUS#	801			$SPRI-K3	4
5	---			7		8333		--	3	C	--	3		96	BUS#	801			$SPRI-K3	6
7	STEAMER OVEN			7		7000		60	3	A	20	1							SPARE	8
9	---			7		7000		--	3	B	20	1							SPARE	10
11	---			7		7000		--	3	C	20	1							SPARE	12
13	HOOD EXHAUST FAN			9		2105		20	3	A	20	1							SPARE	14
15	---			9		2105		--	3	B	20	1							SPARE	16
17	---			9		2105		--	3	C	20	1							SPARE	18
19	SPACE									A									SPARE	20
21	SPACE									B									SPACE	22
23	SPACE									C									SPACE	24
25	SPACE									A									SPACE	26
27	SPACE									B									SPACE	28
29	SPACE									C									SPACE	30
31	SPACE									A									SPACE	32
33	SPACE									B									SPACE	34
35	SPACE									C									SPACE	36
37	SPACE									A									SPACE	38
39	SPACE									B									SPACE	40
41	SPACE									C									SPACE	42

ENDUSE LOADS: PHASE A VA 17438. PHASE B VA 17438. PHASE C VA 17438.
TOTAL LOADS: CONNECTED KVA 71.2 DEMAND KVA 6.8 DESIGN KVA 6.8
CONNECTED FLA 85.7 DEMAND FLA 8.2 DESIGN FLA 8.2

Panel Schedule 703 A2T — 3 Phase 4 Wire — Voltage LL: 208 Voltage LG: 120

DC Devices: — Device Family: — Mounting: SURFACE — Bus Rating: 60 — Enclosure: — Available Fault Duty: A 3 Phase

Ckt No	Description/ Location	#Load Type	Ea	Qty	Den	Criteria= Total VA	Remarks	Device Amps	P	H	Device Amps	P	Remarks	Total VA	#Load Type	Ea	Qty	Den	Criteria= Description/ Location	Ckt No
1	B-2			9		600		20	1	A	20	1		400				3	R-PENTHOUSE	2
3										B										4
5										C										6
7										A										8
9										B										10
11										C										12
13										A										14
15										B										16
17										C										18
19										A										20
21										B										22
23										C										24
25										A										26
27										B										28
29										C										30
31										A										32
33										B										34
35										C										36
37										A										38
39										B										40
41										C										42

ENDUSE LOADS: PHASE A VA 1000. PHASE B VA 0. PHASE C VA 0.
TOTAL LOADS: CONNECTED KVA 1.0 DEMAND KVA 1.0 DESIGN KVA 1.0
CONNECTED FLA 2.7 DEMAND FLA 2.7 DESIGN FLA 2.7

Panel Schedule 803 A2K3 — 3 Phase 4 Wire — Voltage LL: 208 Voltage LG: 120

DC Devices: 175A MAIN — Device Family: BOLT-ON — Mounting: FLUSH — Bus Rating: 225 — Enclosure: NEMA 1 — Available Fault Duty: A 3 Phase

Ckt No	Description/ Location	#Load Type	Ea	Qty	Den	Criteria= Total VA	Remarks	Device Amps	P	H	Device Amps	P	Remarks	Total VA	#Load Type	Ea	Qty	Den	Criteria= Description/ Location	Ckt No
1	ICEMAKER			7		1164		20	1	A	20	1		400				7	CASH ACCT. SYSTEM	2
3	HOT FOOD CABINET			7		1500		20	1	B	20	1		800				7	CASH ACCT. SYSTEM	4
5	FRY STATION			7		1800		20	1	C	20	1		1500				7	HOT FOOD CART	6
7	---			7		1000		--	1	A	20	1		1500				7	HOT FOOD CART	8
9	HEAT LAMPS			7		800		20	1	B	20	1		1500				7	HOT FOOD CART	10
11	KITCHEN HOOD			7		200		20	1	C	20	1		1500				7	HOT FOOD CART	12
13	WATER CONDITIONER			7		240		20	1	A	20	1		1500				7	HOT FOOD CART	14
15	SLICER			7		1176		20	1	B	20	1		1500				7	HOT FOOD CART	16
17	HOOD FIRE PANEL			1		200		20	1	C	20	1		1500				7	HOT FOOD CART	18
19	SPARE							20	1	A	20	1		1500				7	HOT FOOD CART	20
21	SPARE							20	1	B	20	1		1500				7	HOT FOOD CART	22
23	SPARE							20	1	C									SPACE	24
25	SPARE							20	1	A									SPACE	26
27	SPARE							20	1	B									SPACE	28
29	SPARE							20	1	C									SPACE	30
31	SPACE									A									SPACE	32
33	SPACE									B									SPACE	34
35	SPACE									C									SPACE	36
37	SPACE									A									SPACE	38
39	SPACE									B									SPACE	40
41	SPACE									C									SPACE	42

ENDUSE LOADS: PHASE A VA 7304. PHASE B VA 8176. PHASE C VA 5900.
TOTAL LOADS: CONNECTED KVA 21.3 DEMAND KVA .3 DESIGN KVA .3
CONNECTED FLA 59.0 DEMAND FLA .8 DESIGN FLA .8

Panel Schedule 903 B2F — 3 Phase 4 Wire — Voltage LL: 208 Voltage LG: 120

DC Devices: 60A MAIN — Device Family: BOLT-ON — Mounting: SURFACE — Bus Rating: 100 — Enclosure: NEMA 1 — Available Fault Duty: A 3 Phase

Ckt No	Description/ Location	#Load Type	Ea	Qty	Den	Criteria= Total VA	Remarks	Device Amps	P	H	Device Amps	P	Remarks	Total VA	#Load Type	Ea	Qty	Den	Criteria= Description/ Location	Ckt No
1	MAT STORAGE DOOR			9		1500		20	1	A	20	1		1000				3	R-OFFICE 134	2
3	EF-6A			9		450		20	1	B	20	1		800				3	R-EQUIP RM 132	4
5	EF-6B			9		450		20	1	C	20	1		800				3	R-EQUIP RM 132	6
7	EF-7			9		450		20	1	A	20	1		800				3	R-EQUIP RM 132	8
9	SPARE							20	1	B	20	1		800				3	R-EQUIP RM 132	10
11	SPARE							20	1	C									SPACE	12
13	SPARE							20	1	A									SPACE	14
15	SPARE							20	1	B									SPACE	16
17	SPARE							20	1	C									SPACE	18
19	SPACE									A									SPACE	20
21	SPACE									B									SPACE	22
23	SPACE									C									SPACE	24
25	SPACE									A									SPACE	26
27	SPACE									B									SPACE	28
29	SPACE									C									SPACE	30
31	SPACE									A									SPACE	32
33	SPACE									B									SPACE	34
35	SPACE									C									SPACE	36
37	SPACE									A									SPACE	38
39	SPACE									B									SPACE	40
41	SPACE									C									SPACE	42

ENDUSE LOADS: PHASE A VA 3750. PHASE B VA 2050. PHASE C VA 1250.
TOTAL LOADS: CONNECTED KVA 7.0 DEMAND KVA 7.0 DESIGN KVA 7.0
CONNECTED FLA 19.3 DEMAND FLA 19.3 DESIGN FLA 19.3

Panel Schedule 900 B4F — 3 Phase 4 Wire — Voltage LL: 480 Voltage LG: 277

DC Devices: MLO — Device Family: BOLT-ON — Mounting: SURFACE — Bus Rating: 100 — Enclosure: NEMA 1 — Available Fault Duty: A 3 Phase

Ckt No	Description/ Location	#Load Type	Ea	Qty	Den	Criteria= Total VA	Remarks	Device Amps	P	H	Device Amps	P	Remarks	Total VA	#Load Type	Ea	Qty	Den	Criteria= Description/ Location	Ckt No
1	L-WEIGHT TRAINING			2		3000		20	1	A	30	3		2320	BUS#	901			$SPRI-BF	2
3	L-STORAGE ROOMS			2		1116		20	1	B	--	3		2320	BUS#	901			$SPRI-BF	4
5	SPARE							20	1	C	--	3		2320	BUS#	901			$SPRI-BF	6
7	SPARE							20	1	A									SPACE	8
9	SPARE							20	1	B									SPACE	10
11	SPARE							20	1	C									SPACE	12
13	SPARE							20	1	A									SPACE	14
15	SPARE							20	1	B									SPACE	16
17	SPACE									C									SPACE	18
19	SPACE									A									SPACE	20
21	SPACE									B									SPACE	22
23	SPACE									C									SPACE	24
25	SPACE									A									SPACE	26
27	SPACE									B									SPACE	28
29	SPACE									C									SPACE	30
31	SPACE									A									SPACE	32
33	SPACE									B									SPACE	34
35	SPACE									C									SPACE	36
37	SPACE									A									SPACE	38
39	SPACE									B									SPACE	40
41	SPACE									C									SPACE	42

ENDUSE LOADS: PHASE A VA 3000. PHASE B VA 1116. PHASE C VA 0.
TOTAL LOADS: CONNECTED KVA 11.1 DEMAND KVA 11.1 DESIGN KVA 12.1
CONNECTED FLA 13.3 DEMAND FLA 13.3 DESIGN FLA 14.5

100% CONSTRUCTION SET

REGISTERED PROFESSIONAL ENGINEER — 16,475 — OREGON — MARCH 16, 1993 — DOUG WILLIAM FICKETT — EXPIRES: 12/31/96

ADDITIONS AND REMODEL TO REYNOLDS HIGH SCHOOL
1698 S.W. CHERRY PARK ROAD
REYNOLDS SCHOOL DISTRICT
TROUTDALE OREGON

ELLIS ESLICK ASSOCIATES
ARCHITECTS P.C.
5200 S.W. MACADAM AVE.
SUITE 370
PORTLAND, OREGON
97201
(503) 223-6963
(503) 294-0827 FAX.

DATE: MAY 22, 1996
JOB NO.: 9541
DRAWN BY: DAS
CHECKED BY: KWS
REVISIONS:

ONE-LINE DIAGRAMS

E1.2

PROJECT NO.: 96-053

8542 SW Lake Road, Wilsonville, Oregon 97222
INTERFACE ENGINEERING INC.
Consulting Engineers
503 668-8364 KEN SPENCER

E9

As a community, we prepare lifelong learners to achieve their full potential in a complex and interconnected world.

APPENDIX E

Reynolds School District
Board of Education Business Meeting
Meeting Minutes

November 19, 2025
6:00 PM
Building I, Edgefield Campus

Present: Patty Carrera, Ana Gonzalez Muñoz, Francisco Ibarra, Michael Reyes, Joyce Rosenau, Cayle Tern,
Absent: Aaron Muñoz.

I. 5:30p - Executive Session

The Reynolds School Board and the Superintendent will meet in Executive Session at 5:30p, under ORS 192.660(2)(a) Personnel, ORS 192.660(2)(e) Real Estate, and ORS 192.660(2)(f) Confidential Information. Executive Session is closed to the public.

II. 6:00p - Call to Order

- Chair Michael Reyes called the November 19, 2025 Business Meeting to order at 6:11p.

A. Roll Call

B. Consider Approval of the November 19, 2025 Agenda

C. Pledge of Allegiance

D. Land Acknowledgement

- Read into the record by Chair Michael Reyes.

E. Mission and Vision

- Read into the record by Chair Michael Reyes.

III. 6:10p - Recognition

A. Student Recognition

IV. 6:20p - High School Student Report

V. 6:25p - Public to be Heard

Members of the public will address the board with comments and the board will listen only. Public Comment will be limited to 7 speakers with 3 minutes each. Forms must be turned in before the meeting start time.

VI. 6:40p - Bargaining Group Updates

VII. 6:50p - Presentation to the Board

A. Annual Nutrition Goal Report

- Nutrition services is closely watching any disruption or changes to CEP, SNAP, and regulations.

- CEP may be our biggest obstacle in the future - our current status is through June 2028 but we will then have to reapply and may not qualify for the entire district to have free meals.
- Using only whole grain or whole wheat items is a federal regulation.
- "Meatless Mondays" will focus on including plant-based items (nuggets, burgers, etc) verses the normal vegetarian options available daily, which tend to feature cheese or the regular meal just without meat.
- There are regulations that prevent us from giving away any excess food for free. There are a few initiatives that allow for donation but there are no resources provided and we don't currently have the staffing or infrastructure to do this correctly.
- We did a review, tracking waste for a couple years to see trends. Staff makes adjustments weekly regarding quantity of items to help keep waste lower.
- We average 60% of our enrollment eating meals for a variety of factors (bringing own lunches, off-campus lunch for upper RHS students, etc).
- We didn't run into any reimbursement issues while the federal government was shut down.

B. School District Debt Overview

- Our current PERS bond is through 2028. We don't yet know what it will look like after that.
- While we are eligible to try for a local option levy, it's unlikely to pass due to the burden is would put on our taxpayers.
- Our debt is fairly comparable to other districts.

VIII. 7:15p - Superintendent's Reports

A. Announcements/Reports

B. Financial Report

- Furlough days are accounted for in the October report but November will be a better reflection after the first payroll to include furlough has been processed.
- The furlough MOU trigger for the positions closed on October 31 would show up in the salary and associated payroll costs lines.

C. Enrollment Report

IX. 7:30p - Consent Agenda

I move that the Board approve all Consent Agenda items as presented. This motion, made by Ana Gonzalez Muñoz and seconded by Cayle Tern, Passed.

Yea: 6, Nay: 0

A. Approval of Personnel Order

B. Approval of Prior Meeting Minutes

C. RHS Boys Basketball Trip to San Diego, CA

X. 7:35p - Action Items

A. Procurement Exemption: Construction Manager / General Contractor

I move that the Board, acting as the Local Contract Review Board, approve the utilization of a Construction Manager / General Contractor procurement method to install a new cooling tower at Reynolds High School. This motion, made by Patty Carrera and seconded by Cayle Tern, Passed.

Yea: 6, Nay: 0

B. 25-26 Revised Certified and Student Calendars

- The Board would have to approve anytime a day is added back or any other changes are made.

I move that the Board approve the revised 2025-26 calendars for students and certified staff. This motion, made by Ana Gonzalez Muñoz and seconded by Patty Carrera, Passed.
Yea: 6, Nay: 0

C. OSBA Elections

I move that the Board vote to elect Kris Howatt for position 18 on the OSBA Board of Directors. This motion, made by Patty Carrera and seconded by Ana Gonzalez Muñoz, Failed.
Yea: 3, Nay: 3

I move that the Board vote to elect Brenda Rivas for position 18 on the OSBA Board of Directors. This motion, made by Patty Carrera and seconded by Ana Gonzalez Muñoz, Passed.
Yea: 6, Nay: 0

I move that the Board vote to elect Heather Coleman-Cox for position 17 on the OSBA Legislative Policy Committee. This motion, made by Patty Carrera and seconded by Ana Gonzalez Muñoz, Passed.
Yea: 6, Nay: 0

I move that the Board vote to elect Althea Ender for position 18 on the OSBA Legislative Policy Committee. This motion, made by Patty Carrera and seconded by Ana Gonzalez Muñoz, Passed.
Yea: 6, Nay: 0

I move that the Board vote to elect Christy Splitt for position 19 on the OSBA Legislative Policy Committee. This motion, made by Patty Carrera and seconded by Ana Gonzalez Muñoz, Passed.
Yea: 6, Nay: 0

D. Executive Session Complaint

I move to take no further action on the public complaints and to delegate authority to the Board Chair to respond to the Complaint discussed in executive session. This motion, made by Michael Reyes and seconded by Ana Gonzalez Muñoz, Passed.
Yea: 6, Nay: 0

XI. 7:55p - Board Announcements and Discussion

A. Individual Board Members - Announcements and Reports

B. Upcoming Board Meetings

XII. 8:10p - Adjourn

- Chair Michael Reyes adjourned the November 19, 2025 Business Meeting at 8:46p.

APPENDIX G

FINDINGS OF FACT FOR EXEMPTION FROM COMPETITIVE BIDDING AND THE USE OF THE CONSTRUCTION MANAGER/GENERAL CONTRACTOR (CM/GC) METHOD OF CONTRACTING FOR REYNOLDS SCHOOL DISTRICT REYNOLDS HIGH SCHOOL COOLING TOWER REPLACEMENT

1. General

ORS 279C.335 (2) permits a local contract review board to exempt contracts from traditional competitive bidding upon approval of findings of fact showing that an alternative contracting process is unlikely to encourage favoritism or diminish competition and that the process will result in substantial cost savings to the School District. The Reynolds School District ("District"), through its School Board, acts as the Local Contract Review Board ("LCRB") for the District.

ORS 279C.400 – ORS 279C.410 describe the Request for Proposals method of solicitation as an alternative to traditional competitive bidding. Pursuant to ORS 279C.410 (8), a public Agency using the Request for Proposals method may award a contract to the responsible proposer "whose proposal is determined in writing to be the most advantageous to the contracting Agency based on the evaluation factors set forth in the request for proposals and, when applicable, the outcome of any negotiations authorized by the request for proposals."

ORS 279C.330 defines "Findings" and identifies specific information to be provided as a part of the District justification. Under ORS 279C.335 (5) a public hearing must be held before the findings are adopted, allowing an opportunity for interested parties to comment on the draft findings.

PURPOSE OF THESE FINDINGS: The Reynolds School District will hold a public hearing as required by ORS 279C. 335 and makes the following findings with respect to the issue of whether Reynolds High School Cooling Tower Replacement Project, as defined herein, should be exempt from competitive bidding. The District seeks to utilize the CM/GC method of alternative method of contracting. The Findings of Facts apply to the CM/GC method of public improvement Projects described below, in accordance with ORS 279C.335 (2).

2. Background

Reynolds High School has a failing cooling tower that serves a large portion of the building cooling. The tower itself is currently operating below 50% efficiency, putting a strain on the chiller unit that works in tandem with the tower and which can only achieve half of its intended temperature reduction. The project will focus on the replacement of the Cooling Tower and any associated mechanical units, chilled water supply/chilled water return (CWS/CWR) piping, pumps, direct digital controls upgrades, chemical treatment systems and associated roof work. The selection of this procurement method will allow the district to procure the cooling tower using an early work amendment at an appropriate time in the project timeline to mitigate the long lead time for this equipment.

Available Bidders:

This project is a highly technical HVAC replacement project with the potential for complex design challenges. Successful project delivery will be dependent on selecting an experienced contractor, not necessarily the lowest competitive bid. The CM/GC delivery method gives

the local contracting authority the opportunity to evaluate and select a contractor based on their qualifications and experience with similar projects.

Public Benefits:
The HVAC equipment in question, the cooling tower, is close to failure. This project is addressing an acute need to replace this crucial cooling component for the high school as soon as possible to avoid any negative impacts to the use of the building. Using the CM/GC delivery method will allow the district to begin design and enter a contract with a GC much earlier than traditional design bid build. This will allow the contractor to both provide crucial value engineering and construction input during design and give them the ability to order the replacement cooling tower in advance of completing the construction documents. This ability is crucial to mitigate the lead time of the equipment and allow for a more timely installation.

FINDINGS OF FACT
SUMMARY FINDINGS

Use of the CM/GC process for the Reynolds High School Cooling Tower Replacement complies with the criteria outlined in ORS 279C.335 (2):

1. It is unlikely the exemption will encourage favoritism or substantially diminish competition. The selection process will be fair and open to all interested proposers as established within the findings below.

2. The exemption will result in substantial cost savings to the District. The District has found several areas in which substantial cost savings to the District will be achieved. Also, value will be added to the Projects that could not otherwise be obtained.

SPECIFIC FINDINGS which substantiate the summary findings are as follows:

1. The CM/GC will be selected through a competitive process in accordance with the qualifications-based selection process authorized by the District. Therefore, it is unlikely that the awarding of the construction contract for the Projects will encourage favoritism or substantially diminish competition. This finding is supported by the following:

A. SOLICITATION PROCESS: Pursuant to ORS 279C.360, the CM/GC solicitation will be advertised at least once on OregonBuys.

B. FULL DISCLOSURE: To ensure full disclosure of all information, the Request for Proposals solicitation package will include:

a. Detailed Description of the Projects
b. Contractual Terms and Conditions
c. Selection Process
d. Evaluation Criteria

e. Role of Evaluation Committee
f. Provisions for Comments
g. Complaint Process and Remedies Available

C. **COMPETITION:** As outlined below, the District will follow processes which maintain competition in the procurement of a CM/GC.

a. The District anticipates that competition for this contract will be similar to that experienced in other Projects of this type. The competition will remain open to all qualifying proposers.

b. The District has been communicating with the construction contracting community as well as the engineering consulting community about the CM/GC contracting method.

c. The evaluation and solicitation process employed will be open and impartial. Selection will be made on the basis of final proposal scores derived from price and other components, which expand the ground of competition beyond price alone to include experience, quality, innovation factors, etc.

d. The competitive process used to award subcontracts for all competitively bid construction work will be specified in the CM/GC contract and will be monitored by the District. The District will designate in the contract the proposed percentage of construction work that must be subcontracted and may not be self performed by the CM/GC.

D. SELECTION PROCESS: Other highlights of the selection process will include:

a. A pre-proposal vendor conference will be announced and held. This conference will be open to all interested parties. During this pre-proposal conference, as well as any time prior to ten (10) days before the close of the solicitation, interested parties will be able to ask questions, request clarifications and suggest changes in the solicitation documents if such parties believe that the terms and conditions of the solicitation are unclear, inconsistent with industry standards, or unfair and unnecessarily restrictive of competition.

b. The evaluation process will determine whether a proposal meets the screening requirements of the RFP, and to what extent. The following process will be used:

- Proposals will be evaluated for completeness and compliance with the screening requirements of the RFP. Those proposals that are materially incomplete or non-responsive will be rejected.

- Proposals considered complete and responsive will be evaluated to determine if they meet and comply with the qualifying criteria of the RFP. If a proposal is unclear, the proposer may be asked to provide written clarification. Those proposals that do not meet all requirements will be rejected.

- Proposals will independently be scored by the voting members of the

Evaluation Committee. Scores will then be combined and assigned to the proposals.

- The Evaluation Committee will convene to select from the highest-scoring proposers, finalist(s) who may be invited for formal interviews.

- The Evaluation Committee may conduct interviews if the district feels it is in the best interest of the project.

- The Evaluation Committee will use the interview to confirm the scoring of the proposal and to clarify any questions. Based upon the revised scoring, the Evaluation Committee will rank the proposers, and provide an award recommendation.

- The Reynolds School District will negotiate a contract with the top-ranked firm. If an agreement cannot be reached, the District will have the option to enter into an agreement with the second-ranked firm, and so forth.

c. Competing proposers will be notified in writing of the selection of the apparent successful proposal and will be given seven (7) calendar days after receipt of the notice to review the RFP file and evaluation report at the District Office. Any questions, concerns, or protests about the selection process will be subject to the requirements of the OAR 137-249-0450, must be in writing, and must be delivered to the Reynolds School District within seven (7) calendar days after receipt of the selection notice. No protest of the award selection shall be considered after this time period.

d. The contract achieved through this process will require the CM/GC to use an open competitive selection process to bid all components of the job. The CM/GC's general conditions and fee makes up 10-15% of the total cost, and will be evaluated as one of the scoring criteria. General Conditions, which include supervision, bonding, insurance, and mobilization, must be within the industry standard range of approximately 10%. The CM/GC's fee must be within the industry standard range of 3-5%. Since these amounts will be scored as part of the competitive RFP process, the entire dollar value of the Projects will be awarded through open competitive processes, at either the general contractor or subcontractor level.

2. FINDING: The awarding of construction contract(s) for the Projects using the CM/GC method will likely result in substantial cost savings to the District. This finding is supported by the following information required by ORS 279C.335 (2) (b) and ORS 279C.330.

A. **OPERATIONAL, BUDGET, FINANCIAL DATA**

a. BUDGET: The District has a fixed budget available for the Projects that cannot be exceeded. The completion date cannot be exceeded. Early reliable pricing provided by the CM/GC or other alternatively contracted contractor during the design phase will reduce the potential for time delays due to later discovery of

higher-than-anticipated costs and consequent changes of direction.

b. LONG TERM COSTS: The Projects will require expertise regarding the constructability and long-term cost/benefit analysis of innovative design. That knowledge is best obtained directly from the construction industry. Many decisions will be required during the design process that will encompass immediate feedback on constructability and pricing. Under the traditional design-bid-build process, there is a high risk of increased change orders and schedule impacts for Projects of this size and complexity. Since there are significant costs associated with delay, time is of the essence. The CM/GC process will assist in providing a scope of work and constructible design that best meet the requirements of the Projects with significantly lower risk to the Projects costs. Involving the CM/GC during design will allow Projects risks to be addressed early and teamwork between the District, the design consultant, and the construction contractor (CM/GC) to minimize those risks.

c. FEWER CHANGE ORDERS: When the CM/GC participates in the design process, fewer change orders occur during Projects construction. This is due to the CM/GC's better understanding of the owner's needs and the architect's design intent. As a result, the Projects are more likely to be completed on time and within budget. In addition, fewer change orders reduce the administrative costs of Projects management for both the District and the contractor.

d. GMP CHANGE ORDERS COST LESS: The fewer CM/GC change orders discussed above will be processed at a lower cost under the GMP. The design-bid-build method typically results in the contractor charging 15% markup on construction change orders. The GMP method applies lower predetermined markups.

e. SAVINGS: Under the GMP method the District will enjoy the full savings, if actual costs are below the GMP. When the CM/GC completes the Projects, any savings between the GMP and the actual cost accrue to the District.

f. CONTRACTOR'S FEE IS LESS: Contracts with CM/GC's are designed to create a better working relationship with the contractor. As a consequence, the overhead and profit fee is generally in the 3-5% range, and the contractors indicate this is slightly lower than the fee anticipated on similar design-bid-build contracts.

g. FUNDING SOURCE: The District intends to fund the Project from state and federal funds along with donated sources to include: CTE Revitalization Grant, United Way of the Mid-Willamette Valley and various other public/ private sources.

B. **PUBLIC BENEFITS**

a. TIME SAVINGS: Use of CM/GC or other alternative contracting methods will allow construction work to commence relatively rapidly on some portions of the work while design continues on the remaining portions. This will shorten the overall duration of the construction and provide for completion of the Projects by

the due date. It becomes critical to maintain both the schedule and budget of these Projects that the coordination of the District personnel and their facilities be fully evaluated and understood, and that construction work proceeds throughout with all necessary care given to the safety security of the Districts students and personnel.

b. COST SAVINGS: The Projects will benefit from the active involvement of a CM/GC contractor or other alternative contracting method during the design process in the following ways:

- The contractor's input regarding the constructability and cost-effectiveness of various alternatives will guide the design toward the most economic choices.
- Consideration of the specific equipment available to the contractor will allow the designer to implement solutions that utilize the capacity of that equipment.
- The contractor will be able to provide current and reliable information regarding the cost of materials that are experiencing price volatility and the availability of scarce materials.
- The contractor will also be able to order materials while design is being completed in order to avoid inflationary price increases and provide the lead-time that may be required for scarce materials.

c. GUARANTEED MAXIMUM PRICE (GMP) ESTABLISHES A MAXIMUM PRICE PRIOR TO COMPLETION OF DOCUMENTS: The CM/GC will be able to obtain a complete understanding of the District's needs, the architect's design intent, the scope of the Projects, and the operational needs of the individual School Projects by participating in the construction document phase. With the CM/GC participating in this phase they will be able to offer suggestions for improvement and make suggestions that will reduce costs. With the benefit of this knowledge, the CM/GC will also be able to guarantee a maximum price to be paid by the District for constructing the Projects.

C. **VALUE ENGINEERING**

WITH THE DESIGN-BID-BUILD PROCESS: If the District were to utilize the design-bid-build method, the contractor would not participate in this evaluation. In conducting value engineering under the design-bid-build approach, a value engineering consultant is hired to participate in the design and cost evaluation process. This process adds extra costs and administrative complications, without providing the same benefits of early contractor participation.

WITH CM/GC: The CM/GC process offers a unique opportunity for value engineering that is not possible through the design-bid-build process. An essential part of each construction Projects is the value engineering evaluation. Value engineering is the means used to determine the best Projects design that meets the needs and priorities of the owner, within the owner's budget. Value engineering is done most effectively by a team consisting of the owner, architect, consultants, and the contractor. When the contractor

participates, the team can render the most comprehensive evaluation of all factors that affect the cost, quality, and schedule of the Projects.

The CM/GC method has the benefit of:

- the ability to set the schedule
- the ability to sequence work; and
- commitment from the contractor to implement the design within the schedule and budget.

Through integrated participation, a Projects scope and design evolve that has greater value for the owner and is not likely to be the same Projects created by the design-bid-build method.

D. **SPECIALIZED EXPERTISE:** Early selection of the CM/GC creates more informed, better-quality decision making by the Projects construction team. A more efficient construction team saves the District money.

The construction Projects are highly complex because that involve significant construction over a short, mandated period of construction. Use of a CM/GC in conjunction with the team approach will result in a better coordinated Projects, speedy completion, and minimize disruption to operations. The CM/GC clarifies several critical variables valuable to the Projects design. The CM/GC: guarantees the maximum price (GMP) to complete the Projects; determines the construction schedule; establishes the sequence of work; is contractually bound to implement the final Projects design within the GMP; and participates as an essential member of the Projects design and construction team.

Several benefits of participation by the CM/GC on this Projects will be realized: developing the design documents to reflect the best work plan that accommodates the District, the design team, and contractor; the best grouping of the bid packages that will help insure better trade coverage; the most efficient construction staging area on 2022 Bond Projects; the most cost effective route through the campus and buildings for the various utilities; and to help in adjusting the work plan when the needs change along the way. This component cannot be addressed by the usual design/bid/build method of construction because the usual method is skewed towards the lowest bidder.

E. **PUBLIC SAFETY:** All work must be coordinated to avoid safety and security risks to the students, faculty, and the general public and to ensure efficiency in construction. The coordination between the District, designer and the CM/GC will assure coordination of work and consideration for the safety of vehicular and pedestrian paths crossed by the Projects. In addition, CM/GC contracting of the Projects will ensure that public safety and security is being effectively managed in a “fast track” mode to minimize delays.

F. **IMPACT ON SOURCES OF FUNDING: Granting the exemption from competitive bidding will not affect funding sources for this Project.**

G. **MARKET CONDITIONS:** As well as the multitude of construction market factors that exist today in Oregon (e.g., competition of other Projects, environmental issues that limit

construction materials, variable bid market, high unemployment, etc.), the difficulty in establishing the best work sequence complicates our ability therefore, to accurately estimate the cost of this Projects. The economy today makes it necessary for many contractors to bid for jobs for which they might not be qualified. Alternative contracting methods will be more likely to result in a more experienced and better suited contractor for the particular Projects than the usual completive procurement. The complexities which need to be addressed to accomplish the tasks are not well served by the usual competitive procurement as the lowest bidder may not be the most experienced contractor to perform the work.

G. **TECHNICAL COMPLEXITY:** Technical expertise will be required for environmental management, quality management, scheduling, estimating, meeting sustainable facilities standards and guidelines, and ensuring energy efficiency. The complexity and scheduling issues discussed in the Background section above will require special expertise. However, the Projects will draw upon existing skills and capabilities available in the construction community, as the Projects presents overall challenges similar to those faced on many public works Projects. Specialized skills will be required of the CM/GC to negotiate and price multiple options and schedule complex tasks. A high level of coordination among the District and all the design and construction entities is required and facilitated by the CM/GC approach.

H. **REDUCING RISK:** As previously mentioned, using the CM/GC project delivery method will allow for an early contract to be entered into with the GC, which will in turn allow for the soonest possible procurement of the replacement cooling tower. The lead time of the replacement equipment is significant and the sooner it is ordered the sooner the replacement can take place. Time is of the essence to complete this repair to limit the risk of the existing Cooling Tower failing.

I. **VALUE ENGINEERING:** Bringing on the GC early in the design process with the CM/GC method will also allow the contractor to weigh in on design early at the initial schematic design (SD) phase, providing potential cost savings to the district. We also plan on directing the contractor to perform investigative demolition to ascertain the condition of existing HVAC building infrastructure related to the operation of the cooling tower to identify as much additional scope as possible ahead of the cooling tower replacement. Investigating supply and return piping, associated pumps and chiller units will allow any problems to be factored into the design early, avoiding costly change orders later in the project.

J. **FUNDING SOURCES:** The District intends to fund the Project from Construction Excise Tax revenue.

K. **RENOVATION:** This project will entail a large-scale HVAC equipment replacement of the Cooling Tower at Reynolds High School

L. **OCCUPANCY: T**he public improvement will be unoccupied during construction.

M. **SINGLE PHASE:** It is the intent of Reynolds School District to construct the Project under a single phase of construction.

N. **PROJECT MANAGER:** Reynolds School District will enlist the assistance of Bob Collins and Andrew Lent as OTAK CPM Owners Representatives and Project Managers to assist with the public improvement contract. Reynolds School District School District will enlist Garrett Hemann Robertson P.C. to assist the District with legal counsel and legal enforcement of the public improvement contract.

Appendix H - Reynolds High School Cooling Tower CMGC RFP answers to questions received from proposers

Question **Why are you choosing to go CM/GC?**

Answer Due to anticipated unforeseen conditions

Question **Will a copy of the pre-proposal meeting presentation be provided?**

Answer This was provided in Addendum #3.

Question **Is the Chiller included in the project scope?**

Answer The chiller is included in the investigation to determine the life span and / or impact to the cooling tower.

Question **Does the scope include the piping and the pumps?**

Answer Pump replacement is in the schematic design. Associated piping will need to be investigated prior to replacement as part of an early work amendment

Question **Is there a main electrical room?**

Answer Our assumption is that yes there is a main electrical room -however the as-builts we have are unclear. The original 1976 main electrical room is the room adjacent to the boiler room with the stair in it. That was changed later, we're not sure when as we don't have that drawing set. A new main switchboard was added elsewhere on the property, and the original 1976 main switchboard became a sub-switchboard fed from the new main switchboard.

Question **Are the controls included?**

Answer Yes, the intent would be to integrate the controls for the new units into the existing Siemens controls panels, pending the units being compatible with the existing controls and sequence of operation. If new units are incompatible with existing Siemens controls, new controls would be included.

Question **Is there Glycol in the system?**

Answer There is no Glycol. The exterior cooling tower will likely have electric heat trace for freeze protection. Also, there will be new tower chemical treatment and filtering pump skids specified.

Question **Are the boilers included in the project scope?**

Answer No, they are not.

Appendix H - Reynolds High School Cooling Tower CMGC RFP answers to questions received from proposers

Question	**Does Reynolds School District have a chemical company that they work with?**
Answer	No, not currently
Question	**Has hazmat testing and abatement been completed on the systems?**
Answer	No, A hazmat survey of the affected systems is forthcoming. Upon completion of Hazmat survey, the district will be responsible for removing any Hazardous material prior to work starting
Question	**Is there a specific brand of equipment that the district is specifying?**
Answer	Please reference schematic design documents included in addendum for basis of design manufacturers and approved alternate manufacturers
Question	**Will specs be issued for the cooling tower?**
Answer	Yes
Question	**Does the GC need to provide Engineers as part of their sub-consultants?**
Answer	No, the engineering will be done by sub-consultants to the architect.
Question	**Is there a list of approved vendors that need to be selected for sub-consultants?**
Answer	No, Reynolds does not have a list of pre-approved sub-consultants
Question	**Is a Bid Bond Required?**
Answer	Bid bond is not required.
Question	**Do you happen to have any information on the weight of the existing cooling tower? We need that to size the crane correctly, and the older literature we found doesn't list it.**
Answer	Existing Cooling Tower 300 ton VST-300. Vseries literature shows approx. 13,400 lb operating and 7,500 lb shipping. Existing Chiller 300-ton McQuay WSC063S3. Weight depends on evap/cond size. McQuay literature show maximum weights around 16,800 operating and 15,000 lb shipping.

Appendix H - Reynolds High School Cooling Tower CMGC RFP answers to questions received from proposers

Question

As we review the existing conditions for the Reynolds High School Cooling Tower/Chiller CM/GC project, we came across some gaps in the available information. To ensure accurate preconstruction evaluation, could you please provide the following design parameters for both the chiller and the cooling tower?

Chiller System

- **Entering and leaving water temperatures**
- **Flow rate (GPM)**
- **Tons of cooling capacity**

Cooling Tower

- **Entering and leaving water temperatures**
- **Flow rate (GPM)**
- **Tons of cooling capacity**

We reviewed several legacy catalogs and existing equipment references, but the available data doesn't clearly confirm the current operating capacities or design values.

Any information or documentation you can share will help us align our preconstruction planning and equipment review with the District's expectations.

Answer (in red)

Chiller System

- Entering and leaving water temperatures *54 F EWT, 44 F LWT*
- Flow rate (GPM) *existing pump tag indicates 250 gpm, this seems low likely because it doubles as boiler loop pump. Needs upgraded to include VFD (new 718 gpm)*
- Tons of cooling capacity *300 ton*

Cooling Tower

- Entering and leaving water temperatures *90 F EWT, 80 F LWT (70 F wet bulb)*
- Flow rate (GPM) *750 gpm (new 900 gpm)*
- Tons of cooling capacity *300 ton*

We reviewed several legacy catalogs and existing equipment references, but the available data doesn't clearly confirm the current operating capacities or design values.

Any information or documentation you can share will help us align our preconstruction planning and equipment review with the District's expectations.

Appendix H - Reynolds High School Cooling Tower CMGC RFP answers to questions received from proposers

Question **Our electrical company seeks to be involved as an electrical subcontractor partner. At this Stage of the RFP, IF the proposing CM/GC solicits a preconstruction services (Phase 1) labor rate from our electrical subcontracting firm and includes that in their RFP Response – does the electrical scope need to be publicly advertised once the project enters Construction Services (Phase 2)? The RFP does not specifically disallow early selection of key MEP subs.**

Answer Any proposing prime CM/GC firm would need to include an electrical subcontractor as a partner or joint venture to list a MEP subcontractor rates in their proposal. Once a CMGC partner is under contract with the district, the CMGC can engage in early design assist during the preconstruction phase as an early work amendment. CM/GC (Construction Manager/General Contractor) design assist is a collaborative approach where a contractor is involved in the early design phase of a project to provide expertise on constructability, cost, and scheduling. This allows the contractor to offer input on how to best build the project, which helps refine the design before construction begins, improving efficiency, and potentially reducing costs. Once a GMP is set and approved by the Owner, our CM/GC will competitively bid on all scopes of work. Any sub-contractor who may have been under contract with the CM/GC to provide early design assistance during Pre-Construction phase does not automatically get awarded the full project scope and contract for their particular trade. They must bid on the Construction Documents in the same manner as any other sub would provide a proposal.