VCBO® ADDENDUM 002

project	PCSD Trailside Elementary Addition	**project no**	21635.04
date	2024-04-01	**no. pages**	
owner	Park City School District		
contractor	Hughes General Contractors		
bid date	2023-04-04	**bid time**	12:00 am

This Addendum shall be considered part of the Contract Documents and Project Manual for the above mentioned project as though it had been issued at the same time and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original Contract Documents and Project Manual, the Addendum shall govern and take precedence.

general

2.1 **Structural -** See the attached Narrative and Drawings from Reaveley Engineers

2.2 **Mechanical -** See the attached Narrative and Drawings from VBFA

2.3 **Electrical** - See the attached Narrative and Drawings from Envision Engineering

drawings

item	sheet#	description
2.1	G001	See revised sheet index per the attached sheet
2.2	A111.1	See finish updates and clarifications per the attached sheet
2.3	A111.2	See dimension clarifications per the attached sheet
2.4	A111.4	See ceiling type "D1" material clarification per the attached sheet
2.5	A201	See updated exterior elevations - clarify window system type with keynote 802.0 - clarify use of PT1 at hollow metal frame locations
2.6	A400	See finish adjustments per the attached sheet
2.7	A401	- See accent wall tile additions to restrooms and other misc. clarifications per the attached sheet - See Whiteboard size clarification - 16'X4'
2.8	A402	- New elevation in Tech office - See Elevation D3 - Cow Cart locations clarified with keynote 1023.0 - Project Screen shown in Kinder 1311 - See Elevation A4 - See updated white board size to be 16'X8' - See elevation B2 - Show whiteboard in elevation D1/A402 - see keynote 1002.0
2.9	A403	- White board size clarification - Full 16'X4' (not (2) 8x4) - See Elevation C2 - Window type clarification in Coat rooms - See Elevations B2, A2, and keynote 814.0

2.10	A404	See keynote clarifications and height of tack strips per the attached sheet

specifications

item	section#	description
2.1		**Specifications** - See the attached specification narrative and sections for miscellaneous changes to the project manual.

approvals

In addition to the manufacturers called out in the contract documents, the following manufacturers, trade names and products are acceptable with the provisions that they shall completely satisfy every requirement of the drawings, specifications, and all addenda, and shall conform to the design, quality and standards specified, established and required for the complete and satisfactory installation and performance of the building and all its respective parts. Any costs incurred due to the use of the following manufacturers shall be paid by the contractor.

section	material	manufacturer	action
101100	Visual Display Boards	ASI Visual Display Products	Approved
075419	POLYVINYL-CHLORIDE (PVC) ROOFING	SOPREMA	Approved

End of Addendum 002

PARK CITY SCHOOL DISTRICT – TRAILSIDE ELEMENTARY SCHOOL ADDITION
ADDENDUM #02

01 April 2024 - VCBO Project No. 21635.04

OVERALL TABLE OF CONTENTS

1. ***Delete*** original from Project Manual and ***substitute*** revised section, issued herewith.

SECTION 03 3100 CAST-IN-PLACE CONCRETE

1. ***Delete*** original section from Project Manual and ***substitute*** revised section, issued herewith. Footer has been corrected to reflect actual section number. No changes to technical language.

SECTION 05 1200 STRUCTURAL STEEL FRAMING

1. ***Delete*** original section from Project Manual and ***substitute*** revised section, issued herewith. Page numbers have been added to footer. No changes to technical language.

SECTION 08 4113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

1. ***Delete*** original section from Project Manual and ***substitute*** revised section, issued herewith.

SECTION 08 8000 GLAZING

1. ***Delete*** original section from Project Manual and ***substitute*** revised section, issued herewith.

SECTION 11 6823.13 EXTERIOR BASKETBALL EQUIPMENT

1. ***Delete*** original section from Project Manual and substitute revised section, issued herewith. Heading corrected to reflect actual section number. No changes to technical language.

DIVISION 22 TABLE OF CONTENTS

1. ***Delete*** original Table of Contents from Project Manual and substitute revised ToC, issued herewith.

SECTION 23 8239.13 CABINET UNIT HEATERS

1. ***Delete*** original section from Project Manual and ***substitute*** revised section, issued herewith. Heading corrected to reflect actual section number. No changes to technical language.

SECTION 27 EDUCATIONAL INTERCOMMUNICATIONS AND PROGRAM SYSTEMS (RAULAND)

1. ***Delete*** original section from Project Manual and ***substitute*** revised section, issued herewith. Heading corrected to reflect actual section number. No changes to technical language.

END OF ADDENDUM 02 LANGUAGE

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SECTION 03 3000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories" for form-facing materials.
2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
3. Section 033300 "Architectural Concrete" for general building applications of specially finished formed concrete.
4. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.
5. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete Subcontractor.

2. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction joints, control joints, isolation joints, and joint-filler strips.
c. Semirigid joint fillers.
d. Anchor rod and anchorage device installation tolerances.

e. Cold and hot weather concreting procedures.
f. Concrete finishes and finishing.
g. Curing procedures.
h. Forms and form-removal limitations.
i. Shoring and reshoring procedures.
j. Methods for achieving specified floor and slab flatness and levelness.
k. Floor and slab flatness and levelness measurements.
l. Concrete repair procedures.
m. Concrete protection.
n. Initial curing and field curing of field test cylinders (ASTM C31.)

1.4 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement
7. Aggregates.
8. Admixtures:

    a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.

9. Fiber reinforcement.
10. Floor and slab treatments.
11. Liquid floor treatments.
12. Curing materials.
13. Joint fillers.
14. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Shrinkage Limit.
8. Air content.
9. Nominal maximum aggregate size.
10. Steel-fiber reinforcement content.
11. Synthetic micro-fiber content.
12. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
13. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
14. Intended placement method.

15. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

a. Location of construction joints is subject to approval of the Architect and Engineer.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Ready-mixed concrete manufacturer.
3. Testing agency: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Fiber reinforcement.
4. Curing compounds.
5. Floor and slab treatments.
6. Bonding agents.
7. Adhesives.
8. Semirigid joint filler.
9. Joint-filler strips.
10. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement.
7. Aggregates.
8. Admixtures:

a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.

D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances.

E. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
2. For sheet vapor retarder, showing compliance with ICC AC380.

F. Preconstruction Test Reports: For each mix design.

G. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.

1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor to be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

D. Field Quality-Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Owner to engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

    a. Admixture dosage rates.
    b. Slump.
    c. Air content.
    d. Seven-day compressive strength.
    e. 28-day compressive strength.
    f. Permeability.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94 and ACI 301.

1.9 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
3. Obtain aggregate from single source.

4. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150, Type and color indicated on the drawings.
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989, Grade 100 or 120.
4. Silica Fume: ASTM C1240 amorphous silica.

C. Normal-Weight Aggregates: ASTM C33, Class indicated on drawings, coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: As indicated on the drawings.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Air-Entraining Admixture: ASTM C260.

E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494, Type A.
2. Retarding Admixture: ASTM C494, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494, Type D.

F. Water and Water Used to Make Ice: ASTM C94, potable or complying with ASTM C1602, including all limits listed in Table 2 and the requirements of paragraph 5.4.

2.3 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F: Black.
b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
c. Ambient Temperature Above 85 deg F: White.

D. Curing Paper: 8-feet-wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

E. Water: Potable or complying with ASTM C1602.

F. Type 1, Class A.

2.4 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.

B. Bonding Agent: ASTM C1059, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

2.5 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C150 portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand, as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C109.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C150 portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109.

2.6 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

2.7 CONCRETE MIXTURES

A. Structural Normal-weight concrete.

1. Exposure Class: ACI 318 as indicated on the drawings.
2. Minimum Compressive Strength: as indicated on the drawings.
3. Maximum w/cm: as indicated on the drawings.
4. Exposure Class: As indicated on the drawings.
5. Limit water-soluble, chloride-ion content in hardened concrete as indicated on the drawings.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94 and ASTM C1116, and furnish batch ticket information.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.

3. Install reglets as indicated in the drawings to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.4 JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect and Engineer.
2. Place joints perpendicular to main reinforcement.

    a. Continue reinforcement across construction joints unless otherwise indicated.
    b. Do not continue reinforcement through sides of strip placements of floors and slabs.

3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces unless noted otherwise.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect, Engineer, and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer in writing, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.6 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes: finish as follows unless indicated otherwise.

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.

    a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
    b. Remove projections larger than 1 inch.
    c. Tie holes do not require patching.
    d. Surface Tolerance: ACI 117 Class D.
    e. Apply to concrete surfaces not exposed to public view.

2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.

    a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
    b. Remove projections larger than 1/4 inch.
    c. Patch tie holes.
    d. Surface Tolerance: ACI 117 Class B.
    e. Locations: Apply to concrete surfaces exposed to public view to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

B. Rubbed Finish: Apply the following to as cast surface finishes where indicated on Drawings:

1. Smooth-Rubbed Finish:

    a. Perform no later than one day after form removal.
    b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
    c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.
    d. Maintain required patterns or variances as shown on Drawings or to match design reference sample.

2. Grout-Cleaned Rubbed Finish:

    a. Clean concrete surfaces after contiguous surfaces are completed and accessible.
    b. Do not clean concrete surfaces as Work progresses.
    c. Mix 1 part portland cement to 1-1/2 parts fine sand, complying with ASTM C144 or ASTM C404, by volume, with sufficient water to produce a mixture with the consistency of thick paint. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces.
    d. Wet concrete surfaces.
    e. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap, and keep surface damp by fog spray for at least 36 hours.
    f. Maintain required patterns or variances as shown on Drawings or to match design reference sample.

3. Cork-Floated Finish:

    a. Mix 1 part portland cement to 1 part fine sand, complying with ASTM C144 or ASTM C404, by volume, with sufficient water to produce a mixture with the consistency of thick paint.
    b. Mix 1 part portland cement and 1 part fine sand with sufficient water to produce a mixture of stiff grout. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces.
    c. Wet concrete surfaces.
    d. Compress grout into voids by grinding surface.
    e. In a swirling motion, finish surface with a cork float.
    f. Maintain required patterns or variances as shown on Drawings or to match design reference sample.

3.7 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.
3. Apply scratch finish to surfaces where indicated on the drawings.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces where indicated on the drawings.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces where indicated on the drawings.
7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:

    a. Slabs on Ground:

        1) Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.-long straightedge resting on two high spots and placed anywhere on the surface does not exceed the limit indicated by the architect.

    b. Suspended Slabs:

        1) Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.-long straightedge resting on two high spots and placed anywhere on the surface does not exceed the limit indicated by the architect.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated on Drawings. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.

1. Coordinate required final finish with Architect before application.

2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Architect before application.

3.8 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 6 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4500 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices.

    a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
    b. Cast anchor-bolt insert into bases.
    c. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.9 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305.1, before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:

    a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
    b. Continuous Sprinkling: Maintain concrete surface continuously wet.
    c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
    d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
    e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

        1) Recoat areas subject to heavy rainfall within three hours after initial application.
        2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:

    a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:

        1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

            a) Lap edges and ends of absorptive cover not less than 12 inches.
            b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

        2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.

            a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
            b) Cure for not less than seven days.

        3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

            a) Water.
            b) Continuous water-fog spray.

3.10 TOLERANCES

A. Conform to ACI 117.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least **one** month(s).
2. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect and Engineer.
2. Remove and replace concrete that cannot be repaired and patched to Architect’s and Engineer’s approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.

    a. Limit cut depth to 3/4 inch.
    b. Make edges of cuts perpendicular to concrete surface.
    c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
    d. Fill and compact with patching mortar before bonding agent has dried.
    e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.

    a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
    b. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Engineer.

D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.

    a. Correct low and high areas.
    b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.

    a. Finish repaired areas to blend into adjacent concrete.

5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.

    a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
    b. Feather edges to match adjacent floor elevations.

6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.

    a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
    b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
    c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
    d. Place, compact, and finish to blend with adjacent finished concrete.
    e. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.

    a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
    b. Dampen cleaned concrete surfaces and apply bonding agent.
    c. Place patching mortar before bonding agent has dried.
    d. Compact patching mortar and finish to match adjacent concrete.
    e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.13 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency to be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31.
2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

    a. Test reports to include reporting requirements of ASTM C31, ASTM C39, and ACI 301, including the following as applicable to each test and inspection:

        1) Project name.
        2) Name of testing agency.
        3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
        4) Name of concrete manufacturer.
        5) Date and time of inspection, sampling, and field testing.
        6) Date and time of concrete placement.
        7) Location in Work of concrete represented by samples.
        8) Date and time sample was obtained.
        9) Truck and batch ticket numbers.
        10) Design compressive strength at 28 days.
        11) Concrete mixture designation, proportions, and materials.
        12) Field test results.
        13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
        14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections: As indicated on the drawings.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172 to be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 150 cu. yd., nor less than once for each 5000 ft^2 of surface area for slabs or walls plus one set for each additional 50 cu. yd. or fraction thereof.

a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143:

   a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C231 pressure method, for normal-weight concrete; [**ASTM C173 volumetric method, for structural lightweight concrete**].

   a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C1064:

   a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C31:

   a. Cast and laboratory cure two sets of cylinder specimens for each composite sample per ASTM C31.

6. Compressive-Strength Tests: ASTM C39.

   a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
   b. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
8. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
9. Additional Tests:

   a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.
   b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 or by other methods as directed by Engineer.

      1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.6.6.3.

10. Additional testing and inspecting, at Contractor’s expense, will be performed to determine compliance of replaced or additional work with specified requirements.

11. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

3.14 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION

SECTION 05 1200

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural-steel materials.
2. Shrinkage-resistant grout.
3. Shear stud connectors.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame, miscellaneous steel fabrications and other steel items not defined as structural steel.
2. Section 099113 "Exterior Painting" and Section 099123 "Interior Painting" and Section 099600 "High-Performance Coatings" for painting requirements.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.

C. Demand-Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the seismic-load-resisting system and which are indicated as "demand critical" or "seismic critical" on Drawings.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data:

1. Structural-steel materials.
2. High-strength, bolt-nut-washer assemblies.
3. Anchor rods.
4. Threaded rods.
5. Shop primer.
6. Galvanized-steel primer.
7. Etching cleaner.
8. Galvanized repair paint.
9. Shrinkage-resistant grout.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
5. Identify members and connections of the seismic-load-resisting system.
6. Indicate locations and dimensions of protected zones.
7. Identify demand-critical welds.
8. Identify members not to be shop primed.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide in accordance with AWS D1.1/D1.1M for each welded joint whether prequalified or qualified by testing, including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand-critical welds.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator, and shop-painting applicators.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Mill test reports for structural-steel materials, including chemical and physical properties.

E. Product Test Reports: For the following:

1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Shear stud connectors.

F. Survey of existing conditions.

G. Source quality-control reports.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).

B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category ACSE.

C. Shop-Painting Applicator Qualifications: Qualified in accordance with AISC's Sophisticated Paint Endorsement P1, Endorsement P2, Endorsement P3, or to SSPC-QP 3.

D. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

1. Welders and welding operators performing work on bottom-flange, demand-critical welds are to pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G are to be considered separate processes for welding personnel qualification.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with applicable provisions of the following specifications and documents:

1. ANSI/AISC 303.
2. ANSI/AISC 341.
3. ANSI/AISC 360.
4. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

B. Connection Design Information:

1. Option 1: Connection designs have been completed and connections indicated on the Drawings.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: As indicated.

B. Channels, Angles, M-Shapes: As indicated.

C. Plate and Bar: As indicated.

D. Cold-Formed Hollow Structural Sections: As indicated.

E. Steel Castings: ASTM A216/A216M, Grade WCB, with supplementary requirement S11.

F. Steel Forgings: ASTM A668/A668M.

G. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.

2.4 RODS

A. Unheaded Anchor Rods: As indicated.

1. Configuration: As indicated.
2. Nuts: ASTM A563 heavy-hex carbon steel.
3. Plate Washers: ASTM A36/A36M carbon steel unless otherwise indicated.
4. Washers: ASTM F436, Type 1, hardened carbon steel.
5. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C or Mechanically deposited zinc coating, ASTM B695, Class 50.

B. Headed Anchor Rods: As indicated.

1. Nuts: ASTM A563 heavy-hex carbon steel.
2. Plate Washers: ASTM A36/A36M carbon steel.
3. Washers: ASTM F436, Type 1, hardened carbon steel unless otherwise indicated.
4. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C or Mechanically deposited zinc coating, ASTM B695, Class 50.

C. Threaded Rods: As indicated.

1. Nuts: ASTM A63 heavy-hex carbon steel.
2. Washers: ASTM F436, Type 1, hardened ASTM A36/A36M carbon steel unless otherwise indicated.

3. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C or Mechanically deposited zinc coating, ASTM B695, Class 50.

2.5 PRIMER

A. Steel Primer:

1. Comply with Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings."
2. SSPC-Paint 23, latex primer.
3. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

B. Galvanized-Steel Primer: MPI#26, MPI#80, or MPI#134.

1. Etching Cleaner: MPI#25, for galvanized steel.
2. Galvanizing Repair Paint: MPI#18, MPI#19, SSPC-Paint 20, or ASTM A780/A780M.

2.6 SHRINKAGE-RESISTANT GROUT

A. Metallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.7 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 1, SSPC-SP 2, or SSPC-SP 3.

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.8 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: As indicated.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.9 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize exterior lintels, exterior shelf angles, and other steel elements indicated.

2.10 SHOP PRIMING

A. Shop prime steel surfaces, except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
3. Surfaces of high-strength bolted, slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces unless indicated to be painted.
6. Corrosion-resisting (weathering) steel surfaces.
7. Surfaces enclosed in interior construction.

B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:

1. SSPC-SP 2.

C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.11 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.

1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
2. Bolted Connections: Inspect **and test** shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

    a. Liquid Penetrant Inspection: ASTM E165/E165M.
    b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
    c. Ultrasonic Inspection: ASTM E164.
    d. Radiographic Inspection: ASTM E94/E94M.

4. In addition to visual inspection, test and inspect shop-welded shear stud connectors in accordance with requirements in AWS D1.1/D1.1M for stud welding and as follows:

    a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear stud connector.
    b. Conduct tests in accordance with requirements in AWS D1.1/D1.1M on additional shear stud connectors if weld fracture occurs on shear stud connectors already tested.

5. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

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

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.

1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.

C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection unless approved by Engineer. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.

1. Joint Type: As indicated.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs , back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.5 REPAIR

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.

B. Touchup Painting:

1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

2. Cleaning and touchup painting are specified in Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings."

C. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

3.6 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.

a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1) Liquid Penetrant Inspection: ASTM E165/E165M.
2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
3) Ultrasonic Inspection: ASTM E164.
4) Radiographic Inspection: ASTM E94/E94M.

END OF SECTION

SECTION 08 4113

ALUMINUM ENTRANCES AND STOREFRONTS - REVISED

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following types of aluminum entrance and storefront work:
   1. Exterior and interior storefront framing.
   2. Storefront framing for window walls.
   3. Exterior and interior manual-swing entrance doors and door-frame units.

B. Related Sections: The following sections contain requirements that relate to this Section:
   1. Section 07 9200 “Joint Sealants” for sealing between storefront system and the substrate.
   2. Section 08 8000 "Glazing" for requirements for aluminum entrances and storefront, including entrances specified to be factory glazed.
   3. Section 08 7100 "Door Hardware" for door hardware to be installed on aluminum doors, except items noted specifically by aluminum door manufacturer. Installation of aluminum door hardware shall be by Aluminum contractor.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide aluminum entrance and storefront assemblies that comply with performance characteristics specified, as demonstrated by testing the manufacturer's corresponding stock assemblies according to test methods indicated.

B. Thermal Movement: Design the aluminum entrance and storefront framing systems to provide for expansion and contraction of the component materials. Entrance doors shall function normally over the specified temperature range.
   1. The system shall be capable of withstanding a metal surface temperature range of 180 degrees F without buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, stress on glass, or other detrimental effects.

C. Design Requirements: Provide aluminum entrance and storefront systems that comply with structural performance, air infiltration, and water penetration requirements indicated.
   1. Wind Loads: Provide aluminum entrance and storefront assemblies capable of withstanding wind pressures of 20 psf inward and 20 psf outward acting normal to the plane of the wall.

D. Structural Performance: Conduct tests for structural performance in accordance with ASTM E 330. At the conclusion of the tests there shall be no glass breakage or permanent damage to fasteners, anchors, hardware or actuating mechanism. Framing members shall have no permanent deformation in excess of 0.2 percent of their clear span.
   1. Deflection Normal to the Plane of the Wall: Test pressure required to measure deflection of framing members normal to the plane of the wall shall be equivalent to the wind load specified above. Deflection shall not exceed 1/175 of the clear span, when subjected to uniform load deflection test.
   2. Deflection Parallel to the Plane of the Wall: Test pressures required to measure deflection parallel to the plane of the wall shall be equal to 1.5 times the wind pressures specified above. Deflection of any member carrying its full dead load shall not exceed an amount that will reduce glass bite below 75 percent of the design dimension and shall not reduce the edge clearance between the member and the fixed panel, glass or other fixed member above to less than 1/8 inch. The clearance between the member and an operable door or window shall be at least 1/16 inch.

E. Air Infiltration: Provide aluminum entrance and storefront framing system with an air infiltration rate of not more than 0.06 CFM per sq. ft. of fixed area (excluding operable door edges) when tested in accordance with ASTM E 283 at an inward test pressure differential of 1.57 psf.

F. Water Penetration: Provide framing systems with no uncontrolled water penetration (excluding operable door edges) as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 lbf per sq. ft.

G. Condensation Resistance: Where framing systems are "thermal-break" construction, provide units tested for thermal performance in accordance with AAMA 1503 showing condensation resistance factor (CRF) of not less than 45.

1.4 SUBMITTALS

A. Product Data: Product data for each aluminum entrance and storefront system required, including:
   1. Manufacturer's standard details and fabrication methods.
   2. Data on finishing, hardware and accessories.
   3. Recommendations for maintenance and cleaning of exterior surfaces.

B. Shop Drawings: Shop drawings for each aluminum entrance and storefront system required, including:
   1. Layout and installation details, including relationship to adjacent work.
   2. Elevations at 1/4-inch scale.
   3. Detail sections of typical composite members.
   4. Anchors and reinforcement.
   5. Hardware mounting heights.
   6. Provisions for expansion and contraction and for draining moisture occurring within the assembly to the exterior.
   7. Glazing details.
   8. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
      a. Joinery, including concealed welds.
      b. Anchorage.
      c. Expansion provisions.
      d. Glazing.
      e. Flashing and drainage.

C. Samples for Color Selection: Submit pairs of samples of each specified color and finish on 12-inch-long sections of extrusions or formed shapes. Where normal color variations are anticipated, include 2 or more units in each set of samples indicating extreme limits of color variations.

D. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Test Reports: Provide certified test reports from a qualified independent testing laboratory showing that aluminum entrance and storefront systems have been tested in accordance with specified test procedures and comply with performance characteristics indicated.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed installations of aluminum storefront and entrances similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer's Qualifications: Provide aluminum entrances and storefront systems produced by a firm experienced in manufacturing systems that are similar to those indicated for this project and that have a record of successful in-service performance.

C. Single Source Responsibility: Obtain aluminum entrance and storefront systems from one source and from a single manufacturer.

D. Design Criteria: The drawings indicate the size, profile, and dimensional requirements of aluminum entrance and storefront work required and are based on the specific types and models indicated. Aluminum entrance and storefront by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

E. Certificate of Assembled U-factor: The installer or supplier on the fenestration system (which includes the glazing as well as the aluminum system) shall provide a signed and dated certificate for the installed fenestration system listing the assembly U-factor, the solar heat gain coefficient and the air leakage rate. This is to meet the exception to the Labeling of Fenestration Products under Item 5.8.2.2 of the ANSI/ASHRA/IESNA STANDARD 90.1-2007 and the requirements of IECC. Energy performance of fenestration must be determined based on criteria of NFRC 100 and 200. For LEED submissions or where windows and doors are to be site-built, furnish certificate of overall product performance generated using NFRC Component Modeling Approach software tool (CMAST).
   1. Fenestration systems shall have a maximum assembly U value of 0.40 and a maximum SHGC of 0.23.
   2. Certifications reflecting only the center of glass values are not acceptable.
   3. Once all site-built components have been installed, but prior to final inspection, the Contractor shall retain an ACE (Approved Calculation Entity) to generate the NFRC label certificate for the project based on the actual products installed.
   4. All costs associated with certification of fenestration systems shall be borne by the Contractor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver aluminum entrance and storefront components in the manufacturer's original protective packaging.

B. Store aluminum components in a clean dry location away from uncured masonry or concrete. Cover components with waterproof paper, tarpaulin or polyethylene sheeting in a manner to permit circulation of air.
   1. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.

1.7 PROJECT CONDITIONS

A. Field Measurements: Check openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work
   1. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit.

1.8 WARRANTY

A. Special Assembly Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.
   1. Failures include, but are not limited to, the following.
      a. Structural failures including, but not limited to, excessive deflection.
      b. Noise or vibration caused by thermal movements.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      d. Water leakage through fixed glazing and framing areas.
      e. Failure of operating components to function properly.
      f. Warranty Period: Five years from date of Substantial Completion.
   2. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
      a. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Contract Documents are based on products listed below to establish a standard of quality. Other available manufacturers offering products with equivalent characteristics may be considered, provided deviations are minor and design concept as expressed in the Contract Documents is not changed, as judged by the Architect.
   1. Manufacturer: Kawneer North American, an Arconic Company.
   2. Products:
      a. Storefront System (Exterior): Trifab Versaglaze 451UT.
         1) Includes standard glazing and SSG.
         2) Operable Sections: Glassvent for Storefront; project-out.
      b. Storefront System (Interior): Trifab Versaglaze 451.
      c. Entrance Doors and Frames: Tuffline 500.

B. Available Manufacturers: Subject to compliance with requirements of Contract Documents, manufacturers offering entrance and storefront systems that may be incorporated in the Work include, but are not limited to, the following:
   1. Kawneer North American, an Arconic Company.
   2. U.S. Aluminum Corp., a division of C.R. Laurence Co., Inc.
   3. EFCO Corporation, an Apogee Enterprises company.
   4. Oldcastle BuildingEnvelope.
   5. Manko

2.2 MATERIALS

A. Aluminum Members: Alloy and temper recommended by the manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 for aluminum extrusions, ASTM B 209 for aluminum sheet or plate, and ASTM B 211 for aluminum bars, rods and wire.

B. Carbon Steel: Carbon steel reinforcement of aluminum framing members shall comply with ASTM A 36 for structural shapes, plates and bars, ASTM A 611 for cold rolled sheet and strip, or ASTM A 570 for hot rolled sheet and strip.

C. Glass and Glazing Materials: Comply with requirements of "Glass and Glazing" section of these specifications.

D. Fasteners: Provide fasteners of aluminum, nonmagnetic stainless steel, zinc plated steel, or other material warranted by the manufacturer to be noncorrosive and compatible with aluminum components, hardware, anchors and other components.
   1. Reinforcement: Where fasteners screw-anchor into aluminum members less than 0.125 inches thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard noncorrosive pressed-in splined grommet nuts.
   2. Exposed Fasteners: Do not use exposed fasteners except for application of hardware. For application of hardware, use Phillips flat-head machine screws that match the finish of member or hardware being fastened.

E. Concealed Flashing: 0.0179-inch (26 gage) minimum dead-soft stainless steel, or 0.026-inch-thick minimum extruded aluminum of alloy and type selected by manufacturer for compatibility with other components.

F. Brackets and Reinforcements: Provide high-strength aluminum brackets and reinforcements; where use of aluminum is not feasible provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 123.

G. Concrete and Masonry Inserts: Provide cast iron, malleable iron, or hot-dip galvanized steel inserts complying with ASTM A 123.

H. Compression Weatherstripping: Manufacturer's standard replaceable compressible weatherstripping gaskets of molded neoprene complying with ASTM D 2000 or molded PVC complying with ASTM D 2287.

2.3 DOOR HARDWARE

A. General: Refer to Division 8 Section "Door Hardware" for door hardware other than those indicated to be provided by the aluminum entrance manufacturer.

B. Door hardware for aluminum doors shall be installed by aluminum door contractor.

2.4 COMPONENTS

A. Storefront Framing System: Provide storefront and entrance framing systems fabricated from extruded aluminum members of size and profile indicated. Include subframes and other reinforcing members of the type indicated. Provide for storefront glazed from the exterior on all sides with projecting stops as scheduled. Shop-fabricate and preassemble frame components where possible. Provide storefront frame sections without exposed seams.

1. Mullion Configurations: Provide pockets at the inside glazing face to receive resilient elastomeric glazing. Mullions and horizontals shall be one piece. Make provisions to drain moisture accumulation to the exterior.
2. Provide with structural silicone glazing (SSG) adaptor where indicated on Drawings.
3. Sub Frames: Provide custom-fabricated full depth sills and end dams where appropriate to application. Sill flashing system shall be designed to drain water to the exterior. Sill flashing shall be continuous and turn up at back edge of frame. Sill termination to be hemmed. Finish to match aluminum storefront system.

B. Entrance Door Frames: Provide tubular and channel frame entrance door frame assemblies, as indicated, with welded or mechanical joints in accordance with manufacturer's standards. Reinforce as necessary to support required loads. Entrance doors and frames shall be supplied as a complete system. Frames shall be minimum 3/16 inch wall thickness.

C. Stile-and-Rail Type Entrance Doors: Provide tubular frame members, fabricated with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts.

1. Glazing: Fabricate doors to facilitate replacement of glass or panels, without disassembly of stiles and rails. Provide snap-on extruded aluminum glazing stops, with exterior stops anchored for nonremoval.
2. Design: Provide 2-inch-thick doors with minimum 3/16 inch wall thickness.

2.5 FABRICATION

A. General: Fabricate aluminum entrance and storefront components to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes and profile requirements are indicated on the drawings. Variable dimensions are indicated, with maximum and minimum dimensions required, to achieve design requirements and coordination with other work.

1. Thermal-Break Construction: Fabricate exterior storefront framing system with an integrally concealed, low-conductance thermal barrier, located between exterior materials and exposed interior members to eliminate direct metal-to-metal contact. Use manufacturer's standard construction that has been in use for similar projects for period of not less than 3 years.

B. Prefabrication: Complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible before shipment to the Project site. Disassemble components only as necessary for shipment and installation.

1. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. Complete these operations for hardware prior to application of finishes.
2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.

C. Welding: Comply with AWS recommendations. Grind exposed welds smooth to remove weld spatter and welding oxides. Restore mechanical finish.
   1. Welding behind finished surfaces shall be performed in such a manner as to minimize distortion and discoloration on the finished surface.

D. Reinforcing: Install reinforcing as required for hardware and as necessary for performance requirements, sag resistance and rigidity.

E. Dissimilar Metals: Separate dissimilar metals with bituminous paint, or a suitable sealant, or a nonabsorptive plastic or elastomeric tape, or a gasket between the surfaces. Do not use coatings containing lead.

F. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members.

G. Fasteners: Conceal fasteners wherever possible.

H. Weather stripping: For exterior doors, provide compression weather stripping against fixed stops. At other edges, provide sliding weather stripping retained in adjustable strip mortised into door edge.
   1. Provide EPDM or vinyl-blade gasket weather stripping in bottom door rail, adjustable for contact with threshold.
   2. At interior doors and other locations without weather stripping, provide neoprene silencers on stops to prevent metal-to-metal contact.

2.6 FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. AA Designations: Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

D. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and supports, with the Installer present, for compliance with requirements indicated, installation tolerances, and other conditions that affect installation of aluminum entrances and storefronts. Correct unsatisfactory conditions before proceeding with the installation.
   1. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Comply with manufacturer's instructions and recommendations for installation.

B. General: Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Install components in proper alignment and relation to established lines and grades indicated. Provide proper support and anchor securely in place.

C. Construction Tolerances: Install aluminum entrance and storefront to comply with the following tolerances:
   1. Variation from Plane: Do not exceed 1/8 inch in 12 feet of length or 1/4 inch in any total length.
   2. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end to end in line shall not exceed 1/16 inch.
   3. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8 inch.
   4. Offset at Corners: The maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch.

D. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
   1. Zinc or cadmium plate steel anchors and other unexposed fasteners after fabrication.
   2. Paint dissimilar metals where drainage from them passes over aluminum.
   3. Paint aluminum surfaces in contact with mortar, concrete or other masonry with alkali resistant coating.
   4. Paint wood and similar absorptive material in contact with aluminum and exposed to the elements or otherwise subject to wetting, with two coats of aluminum house paint. Seal joints between the materials with sealant.

E. Drill and tap frames and doors and apply surface-mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.

F. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.

G. Refer to Section 08 8000 "Glazing" for installation of glass and other panels indicated to be glazed into doors and framing, and not preglazed by aluminum manufacturer.

3.3 ADJUSTING

A. Adjust operating hardware to function properly, for smooth operation without binding, and for weathertight closure.

3.4 CLEANING

A. Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings.

B. Clean glass surfaces after installation, complying with requirements contained in the "Glass and Glazing" Section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3.5 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

SECTION 08 8000

GLAZING - REVISED

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
   1. Windows.
   2. Doors.
   3. Glazed entrances.
   4. Interior borrowed lites.
   5. Spandrel glass.
   6. Security film.

B. Related Sections:
   1. Section 05 5000 "Metal Fabrications" for aluminum glazing channels at interior locations.
   2. Section 08 3613 "Sectional Overhead Doors" for glass ("Type F") furnished as part of the sectional doors.
   3. Section 08 8800 "Decorative Glass" for sand-blasted glass and direct-printed glass.

1.3 DEFINITIONS

A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.

B. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.

C. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

D. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:

1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
   a. Specified Design Wind Loads: Determine design wind loads applicable to Project from basic wind speed indicated in miles per hour (meters per second) at 33 feet above grade, according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 6.4.2, "Analytic Procedure," based on mean roof heights above grade indicated on Drawings.
   b. Specified Design Snow Loads: As indicated, but not less than snow loads applicable to Project, required by ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 7, "Snow Loads."
   c. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
      1) Load Duration: 60 seconds or less.
   d. Maximum Lateral Deflection: For the following types of glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch (25 mm), whichever is less.
      1) For monolithic-glass lites heat treated to resist wind loads.
      2) For insulating glass.
   e. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.
   f. Thickness of Tinted and Heat-Absorbing Glass: Provide the same thickness for each tint color indicated throughout Project.

C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 degrees F, ambient; 180 degrees F, material surfaces.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
2. For insulating-glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch- wide interspace.
3. Center-of-Glass U-Values: NFRC 100 methodology using LBL-35298 WINDOW 4.1 computer program, expressed as Btu/ sq. ft. x h x deg F.
4. Center-of-Glass Solar Heat Gain Coefficient: NFRC 200 methodology using LBL-35298 WINDOW 4.1 computer program.
5. Solar Optical Properties: NFRC 300.

1.5 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Samples: For the following products, in the form of 12-inch- square Samples for glass and of 12-inch- long Samples for sealants. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
   1. Each color of tinted float glass.
   2. Coated vision glass.
   3. Insulating glass for each designation indicated.
   4. For each color (except black) of exposed glazing sealant indicated.

C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

E. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

F. Product Test Reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:
   1. Tinted float glass.
   2. Coated float glass.
   3. Insulating glass.
   4. Glazing sealants.
   5. Glazing gaskets.

G. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: : An experienced installer who has completed glazing similar in material, design and extent to that indicated for this project; whose work has resulted in glass installations with a record of successful in-service performance.

B. Source Limitations for Clear Glass: Obtain clear float glass from one primary-glass manufacturer.

C. Source Limitations for Tinted Glass: Obtain tinted, heat-absorbing, and light-reducing float glass from one primary-glass manufacturer for each tint color indicated.

D. Source Limitations for Coated Glass: Obtain coated glass from one manufacturer for each type of coating and each type of class of float glass indicated.

E. Source Limitations for Insulating Glass: Obtain insulating-glass units from one manufacturer using the same type of glass and other components for each type of unit indicated.

F. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

G. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified testing agency based on testing glass products.
   1. Glass Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

H. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
   1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
   2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.

I. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glass type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants.
   1. Use manufacturer's standard test methods to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
      a. Perform tests under normal environmental conditions replicating those that will exist during installation.
   2. Submit not fewer than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, laminated, and insulating units) as well as one sample of each glazing accessory (gaskets, tape sealants, setting blocks, and spacers).
   3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
   5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

J. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities have jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

K. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.

L. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
   1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.

M. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."

2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
3. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines," and SIGMA TB-3001, "Sloped Glazing Guidelines."

N. Dual Seal Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:
1. Insulating Glass Certification Council.
2. Associated Laboratories, Inc.
3. National Accreditation and Management Institute.

O. Provide a signed and dated certificate for the installed fenestration system listing the assembly U-factor, the solar heat gain coefficient and the air leakage rate. This is to meet the exception to the Labeling of Fenestration Products under Item 5.8.2.2 of the ANSI/ASHRA/IESNA STANDARD 90.1-2004.
1. Fenestration systems shall have a maximum assembly U value of 0.44 and a minimum SHGC of 0.42.

P. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 degrees F.

1.9 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: 10 years from date of Substantial Completion.

C. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products indicated in schedules at the end of Part 3.

2.2 PRIMARY FLOAT GLASS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); class as indicated in schedules at the end of Part 3.

2.3 HEAT-TREATED FLOAT GLASS

A. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.

B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select); class, kind, and condition as indicated in schedules at the end of Part 3.

D. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.4 COATED FLOAT GLASS

A. General: Provide coated glass complying with requirements indicated in this Article and in schedules at the end of Part 3.
1. Provide Kind HS (heat-strengthened) coated float glass in place of coated annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.

B. Sputter-Coated Float Glass: Float glass with metallic-oxide or metallic-nitride coating deposited by vacuum deposition process after manufacture and heat treatment (if any), complying with requirements specified in schedules at the end of Part 3.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.
   1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.

B. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule at the end of Part 3 are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.

C. Sealing System: Dual seal, with primary and secondary sealants as follows:
   1. Primary Seal: Polyisobutylene.
   2. Secondary Seal: Silicone.

D. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
   1. Aluminum with mill or clear-anodized finish.
   2. Desiccant: Molecular sieve or silica gel, or blend of both.
   3. Corner Construction: Manufacturer's standard corner construction.

2.6 SECURITY FILM

A. Basis of Design: Contract Documents are based on products specified below to establish a standard of quality. Other available manufacturers with products having equivalent characteristics may be considered, provided deviations are minor and design concept as expressed in the Contract Documents is not changed, as judged by the Architect.
   1. Manufacturer: 3M™.
   2. Product: Scotchshield™ Safety & Security Window Films, Ultra Series S800.

B. Properties: Self-adhesive micro-layered polyester.
   1. Thickness: 8 mil (0.20 mm).
   2. Construction: Microlayered plastic.
   3. Tear Resistance: 1200 lbs.
   4. Tensile Strength: 27,000 psi.
   5. Break Strength: 215 lbs./inch.
   6. Color: Clear.
   7. Install using attachment system recommended by manufacturer to secure the filmed window to the window frame.

2.7 ELASTOMERIC GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:
   1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
   2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.

B. Elastomeric Glazing Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied, chemically curing sealant in the Glazing Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.
1. Additional Movement Capability: Where additional movement capability is specified in the Glazing Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements in ASTM C 920 for uses indicated.

C. Glazing Sealant for Fire-Resistive Glazing Products: Identical to product used in test assembly to obtain fire-protection rating.

2.8 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; non-staining and non-migrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

B. Expanded Cellular Glazing Tape: Closed-cell, PVC foam tape; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
1. Type 1, for glazing applications in which tape acts as the primary sealant.
2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 GLAZING GASKETS

A. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:
1. Neoprene.
2. EPDM.
3. Silicone.
4. Thermoplastic polyolefin rubber.
5. Any material indicated above.

2.10 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.11 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.

C. Grind smooth and polish exposed glass edges

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing glazing, with Installer present, for compliance with the following:
1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

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

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where the length plus width is larger than 50 inches (as follows:
1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

K. Set fully tempered glass with roll-wave distortion parallel to bottom edge of glass as installed

L. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

M. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until just before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 SECURITY FILM

A. Install using attachment system recommended by manufacturer to secure the filmed window to the window frame.

3.8 PROTECTION AND CLEANING

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.9 MONOLITHIC FLOAT-GLASS SCHEDULE

A. TYPE 'B' - 1/2 inch clear float glass.

B. Uncoated Clear Float Glass: Where glass as designated below is indicated, provide Type I (transparent glass, flat), Class 1 (clear) glass lites complying with the following:
   1. Uncoated Clear Annealed Float Glass: Annealed or Kind HS (heat strengthened), Condition A (uncoated surfaces) where heat strengthening is required to resist thermal stresses induced by differential shading of individual glass lites and to comply with performance requirements.
   2. Uncoated Clear Heat-Strengthened Float Glass: Kind HS (heat strengthened).
   3. Uncoated Clear Fully Tempered Float Glass: Kind FT (fully tempered). Provide as required and as indicated.

3.9 INSULATING-GLASS SCHEDULE

A. TYPE A: Solar-Control Low-E Insulating-Glass Units:
   1. Where glass of this designation is indicated, provide insulating-glass units complying with the following:
      a. Basis of Design: Contract Documents are based on products specified below to establish a standard of quality. Other acceptable manufacturers with products having equivalent characteristics may be considered, provided deviations are minor and design concept as expressed in the Contract Documents is not changed, as judged by the Architect.
         1) Manufacturer: Vitra Architectural Glass
         2) Products:
            (a) Outdoor Lite: Gray tint glass – match existing.
            (b) Low-E Coating: Solarban 60.
            (c) Indoor Lite: Clear (transparent) float.

b. Acceptable Manufacturers: Subject to compliance with requirements of Contract Documents, provide products by one of the following manufacturers. If not listed, submit as a substitution according to the Conditions of the Contract and provisions of Division 1 sections.
1) Vitra Architectural Glass
2) Guardian.

2. Overall Unit Thickness: 1 inch.
3. Thickness of Each Lite: 1/4 inch.
4. Interspace Content: Air.
5. Outdoor Lite: Class 1 Gray tint (match existing) float glass with Solarban 60.
a. Provide HS (heat strengthened) or FT (fully tempered) glass as indicated on the drawings. If FT (fully tempered) glass is not indicated on the drawings; but is required by the governing code, provide FT (fully tempered) glass.
6. Indoor Lite: Class 1 (clear) float glass.
a. Provide HS (heat strengthened) or FT (fully tempered) glass as indicated on the drawings. If FT (fully tempered) glass is not indicated on the drawings; but is required by the governing code, provide FT (fully tempered) glass.
7. Low-E Coating: Sputtered on second surface.
8. Performance Values (based on Vitro “Solargray”)
a. Visible Light Transmittance: 35 percent minimum.
b. Winter Nighttime U-Factor: 0.29 maximum.
c. Solar Heat Gain Coefficient: 0.25 maximum.
d. Outdoor Visible Reflectance: 6 percent maximum

3.10 GLAZING SEALANT SCHEDULE

A. Low-Modulus Nonacid-Curing Silicone Glazing Sealant:
1. Products: Available products include the following:
a. 790; Dow Corning.
b. UltraPruf SCS2300; GE Silicones.
c. Spectrem 1; Tremco.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Additional Movement Capability: 50 percent movement in extension and 50 percent movement in compression for a total of 100 percent movement.
5. Use Related to Exposure: NT (nontraffic).
6. Uses Related to Glazing Substrates: M, G, A, and, as applicable to glazing substrates indicated, O.
a. Use O Glazing Substrates: Coated glass, color anodic aluminum, aluminum coated with a high-performance coating, galvanized steel, and wood.

END OF SECTION

SECTION 11 6823.13

EXTERIOR BASKETBALL EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following gymnasium equipment:
   1. Outdoor basketball equipment.

B. Related Sections include the following:
   1. Section 11 6813 “Playground Equipment” for tetherball and “toss n’ score” activity structures as well as freestanding playground equipment.

C. Products furnished, but not installed under this Section, include insert sleeves for inserts to be cast in concrete pavement and footings.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, features, and finishes. Include details of anchors, hardware, and fastenings. If applicable, include assembly, disassembly, and storage instructions.

B. Shop Drawings: Show location and extent of fully assembled gymnasium equipment. Show location and extent of disassembled equipment and components and transport and storage accessories. Include elevations, sections, and details not shown in Product Data. Show method of field assembly, connections, installation details, mountings, floor inserts, attachments to other Work, operational clearances, and relationship to adjoining work.
   1. Setting Drawings: For cast-in floor insert sleeves for post standards.

C. Coordination Drawings: Court layout plans and elevations drawn to scale and coordinating game lines and markers applied to paved surfaces with basketball backstops.

D. Samples for Selection: For each type of equipment indicated.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify position and elevation of basketball equipment. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - BASKETBALL EQUIPMENT

A. Basis of Design: Contract Documents are based on products specified below to establish a standard of quality. Other available manufacturers with products having equivalent characteristics may be considered, provided deviations are minor and design concept as expressed in the Contract Documents is not changed, as judged by the Architect.
   1. Manufacturer: Spalding Equipment.
   2. Components:
      a. Supports: Model 401-807.
      b. Aluminum Backboards: Model 413-222.
      c. Goal: Gared double rim; furnish complete with net.

B. Available Manufacturers: Subject to compliance with requirements of Contract Documents, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. AL, Inc.; ADP Lemco, Inc.
   2. Jaypro Sports, Inc.
   3. Porter Athletic Equipment Co.
   4. Spalding Equipment.

2.2 MATERIALS, GENERAL

A. Steel: Comply with the following:
   1. Steel Plates, Shapes, and Bars: ASTM A 36, hot-dip galvanized.
   2. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53.
   3. Cold-Formed Steel Tubing: ASTM A 500, Grade A, unless another grade is required by structural loads.
   4. Steel Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513 or steel tubing fabricated from steel complying with ASTM A 569and complying with the dimensional tolerances in ASTM A 500.
   5. Malleable-Iron Castings: ASTM A 47, grade required by structural loads.

D. Anchors, Fasteners, Fittings and Hardware: Manufacturer's standard corrosion-resistant or noncorrodible units; concealed tamperproof, vandal and theft resistant. Provide as required for equipment assembly, mounting, and secure attachment.

E. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107 with minimum strength recommended in writing by equipment manufacturer.

2.4 OUTDOOR BASKETBALL EQUIPMENT

A. Upright post shall be 4-1/2 inch O.D. heavy wall galvanized steel pipe gooseneck style. Provide with anchor lugs on lower end for securing into concrete footing. Backboard shall be supported 5'-0" in front of center upright support.
   1. Furnish basketball standards in both 8 feet and 10 feet heights; locate as shown on Drawings.

B. Basketball Backboard: Provide predrilled holes or preset inserts for mounting goals.
   1. Description: Fan shaped, 54-inch maximum width by 39-inch maximum height, fabricated from the following:
      a. Aluminum: Cast with 1-1/2-inch- deep, roll-edged perimeter flange and integral reinforcing ribs; with integral, tapped mounting holes or cast-in threaded steel inserts for threaded fasteners for mounting backboard to backstop at standard mounting centers.
   2. Target Area and Border Markings: Marked in orange, with manufacturer's standard pattern and stripe width.
   3. Finish: Manufacturer's standard factory-applied, white background.

C. Double Rim Goals:
   1. Rim: 5/8 inch diameter cold drawn alloy steel round (top) and 1/2 inch diameter steel (bottom) formed to an 18 inch inside diameter ring.
   2. Position inside of ring 6 inches from face of backboard by a heavy, L-shaped, formed steel mounting plate with 5 inch x 5 inch mounting hole centers for front mounting on backboard.
   3. Rigidly brace rim by means of a 1/2 inch diameter cold drawn alloy steel round formed and welded in position.
   4. Provide rim with twelve “no-tie” net attachment clips for net attachment.
   5. Goal Finish: Durable, official orange powder coat finish.
   6. Furnish goal complete with a high quality nylon net and plated mounting hardware

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, and other conditions affecting performance.
   1. Verify critical dimensions.

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

3.2 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written installation instructions and competition rules indicated for each type of gymnasium equipment. Complete equipment field assembly, where required.

B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, have been completed.

C. Permanently Placed Gymnasium Equipment and Components: Rigid, level, plumb, square, and true; anchored securely; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with court layout.

D. Connections: Connect automatic operators to building electrical system.

3.3 ADJUSTING

A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING AND PROTECTION

A. After completing equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.

B. Provide final protection and maintain conditions acceptable to manufacturer and Installer that ensure equipment is without damage or deterioration at time of Substantial Completion.

C. Replace equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION

DIVISION 22 - PLUMBING

SECTION 23 8239.13

CABINET UNIT HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cabinet unit heaters with centrifugal fans and hot-water coils.
B. Section includes cabinet unit heaters with centrifugal fans and electric-resistance heating coils.

1.3 DEFINITIONS

A. BAS: Building automation system.

B. CWP: Cold working pressure.

C. PTFE: Polytetrafluoroethylene plastic.

D. TFE: Tetrafluoroethylene plastic.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include rated capacities, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings:

1. Include plans, elevations, sections, and details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include location and size of each field connection.
4. Include details of anchorages and attachments to structure and to supported equipment.
5. Include equipment schedules to indicate rated capacities, operating characteristics, furnished specialties, and accessories.
6. Indicate location and arrangement of piping valves and specialties.
7. Indicate location and arrangement of integral controls.
8. Wiring Diagrams: Power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

D. Samples for Initial Selection: Finish colors for units with factory-applied color finishes approved by architect.

E. Samples for Verification: Finish colors for each type of cabinet unit heater indicated with factory-applied color finishes.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Floor plans, reflected ceiling plans, and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Structural members to which cabinet unit heaters will be attached.
3. Method of attaching hangers to building structure.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling, including the following:

    a. Lighting fixtures.
    b. Air outlets and inlets.
    c. Speakers.
    d. Sprinklers.
    e. Access panels.

6. Perimeter moldings for exposed or partially exposed cabinets.

B. Seismic Qualification Certificates: Submit certification that cabinet unit heaters, accessories, and components will withstand seismic forces defined in Section 230548 "Vibration and Seismic Controls for HVAC." Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Include detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For cabinet unit heaters to include in emergency, operation, and maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Cabinet Unit-Heater Filters: Furnish one spare filter(s) for each filter installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Airtherm.
2. Dunham-Bush.
3. McQuay International; Daikin Industries.
4. Modine Mfg. Co.
5. Rittling
6. Ted Reed Thermal, Inc.
7. Trane.
8. Young Radiator Co.

2.2 DESCRIPTION

A. Factory-assembled and -tested unit complying with AHRI 440.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with UL 2021.

2.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Cabinet unit heaters shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified."
2. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2.4 COIL SECTION INSULATION

A. Insulation Materials: ASTM C 1071; surfaces exposed to airstream shall have aluminum-foil facing to prevent erosion of glass fibers.

B. Insulation Materials: ASTM C 1071; surfaces exposed to airstream shall have erosion-resistant coating to prevent erosion of glass fibers.

1. Thickness:
   a. 1/2 inch .
2. Thermal Conductivity (k-Value): 0.26 Btu x in./h x sq. ft. at 75 deg F mean temperature.
3. Fire-Hazard Classification: Maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84.
4. Adhesive: Comply with ASTM C 916 and with NFPA 90A or NFPA 90B.

C. Insulation Materials: Comply with NFPA 90A or NFPA 90B. Unicellular polyethylene thermal plastic, preformed sheet insulation complying with ASTM C 534, Type II, except for density.

1. Thickness: 1/2 inch.
2. Thermal Conductivity (k-Value): 0.24 Btu x in./h x sq. ft. at 75 deg F mean temperature.
3. Fire-Hazard Classification: Maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM C 411.
4. Adhesive: As recommended by insulation manufacturer and complying with NFPA 90A or NFPA 90B.

2.5 CABINETS

A. Material: Steel with baked-enamel finish with manufacturer's standard paint, in color selected by Architect

1. Vertical Unit, Exposed Front Panels: Removable panels with channel-formed edges secured with tamperproof cam fasteners.
   a. Minimum thickness: 15GA-0.0673-inch- sheet steel.
2. Horizontal Unit, Exposed Bottom Panels: Removable panels secured with tamperproof cam fasteners and safety chain.
   a. Minimum thickness: 15GA-0.0673-inch- sheet steel.
3. Recessed Flanges: Steel, finished to match cabinet.
4. Control Access Door: Key operated.
5. Base: Minimum 0.0528-inch- thick steel, finished to match cabinet:
   a. 6 inches high with leveling bolts.
6. Extended Piping Compartment: 8-inch- wide piping end pocket.
7. False Back: Minimum 0.0428-inch- thick steel, finished to match cabinet.
8. Outdoor-Air Wall Box (where shown otherwise omit): Minimum 0.1265-inch- thick, aluminum, rain-resistant louver and box with integral eliminators and bird screen; aluminum louver with baked-enamel finish in color selected by Architect from manufacturer's standard colors.

   a. Outdoor-Air Damper: Galvanized-steel blades with edge and end seals and nylon bearings; with;
      1) Manual two-position actuators.

2.6 FILTERS

A. Minimum Arrestance: According to ASHRAE 52.1 and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2.

1. Washable Foam: 70 percent arrestance and MERV 3.

2.7 COILS

A. Hot-Water Coil: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch and rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain.

2.8 CONTROLS

A. Fan and Motor Board: Removable.

1. Fan: Forward curved, double width, centrifugal, directly connected to motor; thermoplastic or painted-steel wheels and aluminum, painted-steel, or galvanized-steel fan scrolls.
2. Fan: Forward curved, high static, double width, centrifugal, directly connected to motor; thermoplastic or painted-steel wheels and aluminum, painted-steel, or galvanized-steel fan scrolls.
3. Motor: Permanently lubricated, multispeed; resiliently mounted on motor board. Comply with requirements in Section 230513 "Common Motor Requirements for HVAC Equipment."
4. Wiring Terminations: Connect motor to chassis wiring with plug connection.

B. Factory, Hot-Water Piping Package: ASTM B 88, Type L copper tube with wrought-copper fittings and brazed joints. Label piping to indicate service, inlet, and outlet.

1. Provide equipment for one of the following operated valve arrangements:

    a. Calibrated-Orifice Balancing Valves: Bronze body, ball type, 125-psig working pressure, 250 deg F maximum operating temperature; with calibrated orifice or venture, connection for portable differential pressure meter with integral seals, threaded ends, and equipped with a memory stop to retain set position.

2. Control valve:
    a. Two-way, modulating control valve.
3. Hose Kits: Minimum 400-psig working pressure, and operating temperatures from 33 to 211 deg F. Tag hose kits to equipment designations.

    a. Length: 24 inches.
    b. Minimum Diameter: Equal to cabinet unit-heater connection size.

4. Two-Piece, Ball Valves: Bronze body with full-port, chrome-plated bronze ball; PTFE or TFE seats; and 600-psig minimum CWP rating and blowout-proof stem.
5. Y-Pattern, Hot-Water Strainers: Cast-iron body (ASTM A 126, Class B); 125-psig minimum working pressure; with threaded connections, bolted cover, perforated stainless-steel basket, and bottom drain connection. Include minimum NPS 1/2 threaded pipe and full-port ball valve in strainer drain connection.
6. Wrought-Copper Unions: ASME B16.22.

C. Control devices and operational sequences are specified in Section 230900 "Instrumentation and Control for HVAC" and Section 230993 "Sequence of Operations for HVAC Controls."

D. Basic Unit Controls:

1. Control voltage transformer.
2. Thermostat with the following features:

    a. Wall-mounted.
    b. Heat-off switch.
    c. Fan on-auto switch.
    d. Adjustable deadband.
    e. Set point:

1) Concealed.

f. Indication:
1) Concealed.
2) Deg F.

3. Temperature sensor:
a. Wall-mounted.

4. Unoccupied period override push button.
5. Data entry and access port.

a. Input data includes room temperature and occupied and unoccupied periods.
b. Output data includes room temperature, supply-air temperature, entering-water temperature, operating mode, and status.

E. DDC Terminal Controller:

1. Scheduled Operation: Occupied and unoccupied periods on seven-day clock with a minimum of four programmable periods per day.
2. Unoccupied Period Override: Two hours.
3. Unit Supply-Air Fan Operations:

a. Occupied Periods: Fan runs continuously.
b. Unoccupied Periods: Fan cycles to maintain setback room temperature.

4. Heating-Coil Operations:

a. Occupied Periods: Provide heating if room temperature falls below thermostat set point via:
1) Modulate control valve or Energize electric-resistance coil.
b. Unoccupied Periods: If room temperature falls below setback temperature;
1) Start fan and open control valve.
2) Start fan and modulate control valve or energize electric-resistance coil.

5. Controller shall have volatile-memory backup.

F. BAS Interface Requirements:

1. Interface relay for scheduled operation.
2. Interface relay to provide indication of fault at central workstation.
3. Interface shall be BAC-net compatible for central BAS workstation and include the following functions:

a. Adjust set points.
b. Cabinet unit-heater start, stop, and operating status.
c. Data inquiry, including supply-air and room-air temperature.
d. Data inquiry, including outdoor-air damper position and supply-air and room-air temperature.
e. Occupied and unoccupied schedules.

4. Interface shall be LonWorks compatible for central BAS workstation and include the following functions:

a. Adjust set points.
b. Cabinet unit-heater start, stop, and operating status.

c. Data inquiry, including supply-air and room-air temperature.
d. Data inquiry, including outdoor-air damper position and supply-air and room-air temperature.
e. Occupied and unoccupied schedules.

G. Electrical Connection: Factory-wired motors and controls for a single field connection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive cabinet unit heaters for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for piping and electrical connections to verify actual locations before unit-heater installation.

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

3.2 INSTALLATION

A. Install wall boxes in finished wall assembly; seal and weatherproof. Joint-sealant materials and applications are specified in Section 079200 "Joint Sealants."

B. Install cabinet unit heaters to comply with NFPA 90A.

C. Suspend cabinet unit heaters from structure with elastomeric hangers. Vibration isolators are specified in Section 230548.13 "Vibration Controls for HVAC."

D. Install wall-mounted thermostats and switch controls in electrical outlet boxes at heights to match lighting controls. Verify location of thermostats and other exposed control sensors with Drawings and room details before installation.

E. Install new filters in each fan-coil unit within two weeks of Substantial Completion.

3.3 CONNECTIONS

A. Piping installation requirements are specified in Division 23 "Hydronic Piping," Division 23 Hydronic Piping Specialties," Division 23 "Steam and Condensate Heating Piping," and Division 23 Steam and Condensate Piping Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to machine to allow service and maintenance.

C. Connect piping to cabinet unit heater's factory, hot-water piping package. Install the piping package if shipped loose.

D. Connect supply and return ducts to cabinet unit heaters with flexible duct connectors specified in Division 23 "Air Duct Accessories."

E. Comply with safety requirements in UL 1995.

F. Unless otherwise indicated, install union and gate or ball valve on supply-water connection and union and calibrated balancing valve on return-water connection of cabinet unit heater. Hydronic specialties are specified in Division 23 "Hydronic Piping" and Division 23 Hydronic Piping Specialties."

G. Unless otherwise indicated, install union and gate or ball valve on steam-supply connection and union, strainer, steam trap, and gate or ball valve on condensate-return connection of cabinet unit heater. Steam specialties are specified in Division 23 Steam and Condensate Piping Specialties."

H. Ground equipment according to Division 23 "Grounding and Bonding for Electrical Systems."

I. Connect wiring according to Division 23 "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

C. Units will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.5 ADJUSTING

A. Adjust initial temperature set points.

B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain cabinet unit heaters.

END OF SECTION

SECTION 275123

EDUCATIONAL INTERCOMMUNICATION AND PROGRAM SYSTEMS

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

A. BOGEN NYQUIST E7000 SERIES IP-BASED COMMUNICATIONS SYSTEM

E7000 Series is a software-based state-of-the-art IP-based paging and intercom solution that leverages the latest digital, mobile and software technologies to address today's educational environments, security challenges and mobile lifestyles. But to call it a paging and intercom system is to understate its capabilities in communication, safety and security. Bogen's E7000 is a suite of powerful, yet easy to use tools that allows educators to quickly and effectively manage campus and district-wide communications.

E7000 features a remarkably easy to use software suite with an intuitive web-based Graphical User Interface (GUI). E7000 is built upon Bogen's Nyquist software platform and is designed to leverage existing LAN/WAN and/or legacy 'home-run' cable infrastructure for cost effective deployments. IP phones and purpose-built E7000-compatible appliances provide convenient communication control and interoperability with third-party devices.

1.02 GENERAL REQUIREMENTS

A. All bids shall be based on the equipment as specified herein. The catalog numbers and model designations are that of the Bogen Nyquist E7000 Series IP-Based Communications System and the specifying authority must approve any alternative system.

B. Contractors who wish to submit alternative equipment shall provide the specifying authority with the appropriate documentation at least 10 business days prior to bid opening. The submitted documentation must provide a feature by feature comparison identifying how the proposed equipment meets the operation and functionality of the system described in this specification. Prior to bid date, the contractor shall provide adequate and complete submittal information, which shall include but not be limited to specification sheets, working drawings, shop drawings, and system demonstration. The alternative supplier-contractor must also provide a list to include six installations identical to the proposed system.

C. The contractor shall provide the FCC registration number of the proposed system, where applicable.

D. Final approval of the alternative system shall be determined at the time of job completion. Failure to provide the "precise functional equivalent" shall result in the removal of the alternative system at the contractor's expense.

E. The contractor for this work shall have read all the bidding requirements, the general requirements of division xx, and the contract proposal forms, and shall be held to the execution of this work. The contractor shall be bound by all the conditions and requirements therein.

F. The contractor shall be responsible for providing a complete functional system, including all necessary components whether included in this specification or not.

G. In preparing the bid, the contractor should consider that no claim will be made against the owner for any costs incurred by the contractor for any equipment demonstrations requested by the owner.

1.03 SCOPE OF WORK

A. The contractor shall supply and install all equipment, accessories, and materials in accordance with these specifications and drawings to provide a complete and operating IP-Based Communications System including but not limited to:

1. The platform shall provide complete Nyquist E7000 intercom and employ state of the art IP Technology including the minimum functions listed.

    a. Intercom call between staff locations and classrooms with Unlimited Station capacity
    b. Interactive Facility Maps
    c. User customizable Announcements with priority
    d. Text-to-Speech Announcements
    e. Emergency Classroom Check-In can be used to enhances campus security
    f. Emergency or Normal Announcements are capable of being recorded and activated by a speed dial on an administrative console, DTMF, wireless panic button, mobile app, web browser or external IP networked system using HTTPS URL-based Application Programming Interface (API)
    g. Internal clock is synchronized with NTP network time server whether on the LAN, WAN or Internet keeping the Scheduled events (Bells) and Announcements accurate within milliseconds.
    h. Audio distribution allow for scheduled or manually activated audio to be activated from the Admin Web UI, contact closure, Admin phone and/or by use of Routines
    i. Unlimited Schedules
    j. Unlimited Time, Paging, and Audio Zones
    k. Unlimited Page Stacking/Queueing
    l. Unlimited Scheduled events
    m. Unlimited Scheduled Audio events
    n. Integrated Internet Radio Source
    o. Email Notifications and Alerts the system can send an email with a system event, contact closure, or when a Routine has been activated to name a few
    p. Supervised Station Status system can be setup to send an email when a Nyquist device goes offline.
    q. Clock / Messaging Display capability improves school communications
    r. Alert Filters – Allow facilities to monitor for such as weather events, earthquakes, tornados, tsunami, volcanoes, public health, power outages, and many other National Weather Alerts emergencies and warnings.
    s. Multi-Site All Call paging allows authorized users to make normal district wide pages
    t. Multi-Facility Emergency All-Call paging allows authorized users to make emergency district wide pages
    u. Administrative Graphical User Interface or GUI that can be used by technicians or Administrative: CoS and Roles define who has access to what parts of the GUI
    v. Push-to-Talk Microphone
    w. Ambient Noise Sensing

2. The system shall have a Routines feature that allows staff to activate via Admin Web UI, dial string, panic button, mobile app, API or with an Admin phone touch interface. Routines can automatically launch a procedure, or sequence of actions, that the E7000 system executes as a result of an input trigger. Routines are designed with school security plans and can support crisis plans for situations such as school lockdown, weather events, or emergency evacuation.

3. Direct Inward Station Access or DISA allows administrator or first responder or emergency personnel with proper login codes to call into the system from outside the school into any classroom, zone, or entire facility with customer supplied SIP enabled Telephone Network. DISA is designed to allow

remote monitoring, Facility All-Call or Zone Paging, and two-way conversation from outside the facility.

4. Authorized staff can use the Admin Web UI to configure the Clock/Messaging Display function. They can use it to create messages that will display on monitors connected to the 10-Watt plenum-rated Intercom Modules with HDMI 1.3 (max. 1920 x 1080 @ 24/30 Hz) output or the NQ-GA10PV devices in a selected zone, multiple zones, or to specific stations. When creating the message, you can set several options, including when and how long the messages are displayed, priority of messages, and the appearance of the messages. The schedule programming allows the event names to be displayed analog or digital clock along with day and date on an NQ-GA10PV Display. You can also remove messages from the message queue either manually or via a Routine.

5. The ADA requires that title II entities (State and local governments) and title III entities (businesses and nonprofit organizations that serve the public) communicate effectively with people who have communication disabilities. The goal is to ensure that communication with people with these disabilities is equally effective as communication with people without disabilities. With this in mind the Bogen Nyquist E7000 helps people who have vision disabilities with clear audio paging, massaging and hearing disabilities with visual messaging to any display to assist in communicating.

6. Interactive Facility Maps that are intuitive to use. Simply click on a classroom or area of the GUI and it can initiate an intercom, page or drill to another map level. I addition when the system is in Check-In mode the classroom has a pop up of a room's video feed via the Maps view if equipped. The system shall allow authorized staff to use the Map-based Audio/Video room monitoring during emergency check-in. Systems that don't have provisions for this are not considered equal.

7. In the event of wide area network or WAN outage every facility must be capable of operating standalone and allow for all features listed within this specification to work. Systems that rely on the WAN to operate shall not be considered for comparison in this bid.

8. Manage Check-In functionality that allows staff to quickly verify that they are aware that a check-in event is underway and are reporting classroom status for their assigned classrooms or areas. For staff to check-in all they have to do is press their Call Switch after they have completed their required check-in procedure. Examples of check-in events include but are not limited to weather related shelter-in-place, safety related lockdown, fire evacuation, room occupancy.

9. The E7000 has a Disable Audio feature that can be activated via contact closure from fire alarm or security system, Admin Web UI, dial string, panic button, mobile app., API or with an Admin phone touch interface. When the E7000 has its Audio Disabled the follow features are disabled: programmed or manually activated audio distribution, Zone Paging, normal announcement files, All-Call Paging, manual normal tones and scheduled event tones.

10. Optional password protection for multi-site emergency all-Call, multi-site all-call, facility page. Emergency all-call page, all-call page, emergency announcement, announcement, zone page, alarm, and tone are used to prevent unauthorized use of the system.

11. Text-to-Speech option allows Admin Web UI users to add custom announcements into the system by simply typing the text that you want converted to speech for this announcement. The system will then generate a .wav file that can be used by the E7000 system. Systems that don't offer Text-to-Speech options shall not be equivalent.

12. Installation Wizards are available for installers to reduce the setup time on major components in the system programming. Included wizards are as follows: Customer Information, Dialing Length, Station, User, Time Zone, Network Time Server, and Zones as a minimum.

1.04 SUBMITTALS

A. Specification sheets on all items including cable types

B. Outline drawing of system control cabinet showing relative position of all major components

C. Shop drawings, detailing integrated electronic communications network system including, but not limited to, the following:

1. Station wiring arrangement
2. Equipment cabinet detail drawing

D. Wiring diagrams showing typical connections for all equipment

E. Numbered Certificate of Completion for installation, programming, and service training, which identifies the installing technician(s) as having successfully completed the Nyquist E7000 technical training course provided by the Bogen Communications, Inc.

1.05 QUALITY ASSURANCE

A. All items of equipment shall be designed by the manufacturer to function as a complete system and shall be accompanied by the manufacturer's complete service notes and drawings detailing all interconnections.

B. The contractor shall be an established communications and electronics contractor that maintains a locally run and operated business and has done so for at least 10 years. The contractor shall be a duly authorized distributor of the equipment supplied with full manufacturer's warranty privileges.

C. The contractor shall show satisfactory evidence, upon request, that he or she maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The contractor shall maintain at his or her facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

1.06 SINGLE SOURCE RESPONSIBILITY

A. Except where specifically noted otherwise, all equipment supplied shall be the standard product of a single manufacturer of known reputation and a minimum of 30 years of experience in the industry. The supplying contractor shall have attended the manufacturer's installation and service training classes. A certificate of this training shall be provided with the contractor's submittal.

1.07 SAFETY / COMPLIANCE TESTING

A. The communications system and its components shall, where applicable, bear the label of a Nationally Recognized Testing Laboratory (NRTL), such as Environmental Technology Laboratory (ETL), and shall be listed by their re-examination service. All work must be completed in strict accordance with all applicable electrical codes, under direction of a qualified and factory-approved contractor, and to the approval of the owner.

B. Bogen's Nyquist E7000 solution is consistent with those NEMA SB 40-2015 requirements that specifically apply to school paging and intercom systems only as outlined within the ANSI/NEMA SB 40-2015 standards publication.

1.08 IN-SERVICE TRAINING

A. The contractor shall provide a minimum of eight hours of in-service training with this system. These sessions shall be broken into segments, which will facilitate the training of individuals in the operation of this system including Admin Web UI Dashboard operation, Scheduling, and Audio Distribution as a minimum. Operation manuals shall be provided at the time of this training.

1.09 WIRING

A. System wiring and equipment installation shall be in accordance with generally accepted engineering best practices as established by the EIA and the NEC. Wiring shall meet all state and local electrical codes. All wiring shall be tested to be free from grounds and shorts.

B. All system wiring shall be labeled at both ends of the cable. All labeling shall be based on the room numbers as indicated in the architectural graphics package.

C. Wiring shall be done per manufacturer's recommendation (Cat 5 or West Penn #357) depending on speaker type. All terminal connections are to be on barrier strips.

1.10 PROTECTION

A. The contractor shall provide all necessary transient protection on the AC power feed and on all station lines leaving or entering the building.

B. The contractor shall note on their system drawings, the type and location of these protection devices and all wiring information. Such devices are not to be installed above the ceiling.

1.11 SERVICE AND MAINTENANCE

A. The contractor shall, at the owner's request, make available a service contract offering continuing factory authorized service of this system after the initial hardware and software warranty periods.

B. System shall include software maintenance that includes bug fixes and new feature releases for a period of five years. In addition, the contractor shall provide at the owner's request additional maintenance contracts that are available as one-year, three-year, and five-year extensions. The contractor shall provide a 24-hour response time from call by customer.

C. The system manufacturer shall maintain engineering and service departments capable of rendering advice regarding installation and final adjustment of the system.

1.12 WARRANTY

A. The Bogen Nyquist hardware products identified in this specification shall be warranted to be free from defects in materials and workmanship for five (5) years from the date of sale to the original purchaser; except for the NQ-SYSCTRL, NQ-T1100 and NQ-T1000 which each carry a two (2) year warranty. The

Bogen Nyquist software products identified on this specification are warranted to be free from defects in material and workmanship for ninety (90) days from the date of sale to the original purchaser.

PART 2 - SYSTEM SPECIFICATION

2.01 MANUFACTURERS

A. Manufacturers, subject to compliance with requirements specifications, provide the following system:

1. Bogen Nyquist E7000 IP-based paging and intercom solution manufactured by Bogen Communications, Inc.

B. The specifying authority must approve any alternative system 10 days prior to bid day.

C. The intent is to establish a standard of quality, function, and features. It is the responsibility of the contractor to ensure that the proposed product meets or exceeds every standard set forth in these specifications.

D. The functions and features specified are vital to the operation of this facility; therefore, inclusion in the list of acceptable manufacturers does not release the contractor from strict compliance with the requirements of this specification.

2.02 EQUIPMENT

A. Nyquist NQ-SYSCTRL System Controller

1. Configuration and management via a Web-based Graphical User Interface (GUI)
2. Wizard based setup for quick installation
3. Remote access from virtually any PC/MAC, tablet, or mobile device
4. Continuous monitoring of stations and appliances to ensure system operation
5. Dual network adapters to allow the System Controller to operate on two separate networks
6. Music automatically added to music library and playlist from USB port
7. Network-based audio that can be sourced (input) from any number of Nyquist appliances (NQ-P0100, NQ-A2xxx, NQ-A4xxx, etc.)
8. Ample storage for music files, recorded announcements, and call recordings
9. G722 and OPUS audio codec support to deliver superior HD audio quality
10. Convection air cooled; fan-less design for quiet, maintenance-free operation
11. Wall, rack, or shelf mountable

B. Nyquist NQ-E7030 Analog Station Bridge (ASB)

1. 24 station interface supporting analog speakers and call switches

2. 120-Watts of available power at 25-Volts

3. Two dynamic talk paths/amplification channels

4. Support Category G wiring or better

5. 25/70-volt speaker(s), ceiling-mounted, wall-mounted, and paging horns

6. CAN Bus 2.0 interface designed for support of Nyquist Digital Call Switch (DCS) NQ-E7020 that can initiate Normal, Urgent, or Emergency priority calls, all with options for Privacy Mode

7. Analog/Mechanical Call Switches capable of placing Normal, Urgent, or Emergency priority calls, Bogen CA-15C rocker style momentary call button and Bogen CA-21B rocker style momentary call button with a push on position for privacy

8. Wall, rack, or shelf mountable

C. Nyquist NQ-P0100 Matrix Mixer Pre-Amplifier (MMPA)

1. No less than four Mic/Line inputs used for analog audio input like AM/FM Tuner or CD Player

2. Channel 4 configurable for Push-to-Talk MIC application

3. Line Level output to drive external amplifier

4. Software programmable configuration and operation

    a. Push-to-Talk Channel
    b. Push-to-Talk Type
    c. Push-to-Talk Zone
    d. Mixer Channels

5. Configurable built-in DSP

    a. Noise Gate
    b. Compressor/Limiter functions, etc.
    c. Tone Controls: Low Shelving, Mid Bandpass and Hi Shelving
    d. Multi-band Parametric EQ
    e. Variable Low-Cut/High-Pass filters
    f. CH1 can be configured as a digital AES/EBU (AES3) input

6. USB 2.0 host port, Type-A connector (future use)

7. Powered by 100V – 240V Universal AC Mains

8. Wall, rack, or shelf mountable

D. The Nyquist two and four channel amplifiers available in the following number of channels and watts

1. NQ-A2060 two channel with 60 watts per channel

2. NQ-A2120 two channel with 120 watts per channel

3. NQ-A2300 two channel with 300 watts per channel

4. NQ-A4060 four channel with 60 watts per channel

5. NQ-A4120 four channel with 120 watts per channel

6. NQ-A4300 four channel with 300 watts per channel

7. These amplifiers shall include GUI based DSP controls; 16-band Graphic Equalizer; Signal Present and Clip Monitor; Adjustable High Pass, Low Pass, and Bandpass Filters; Noise Gate; Compressor/Limiter; and 7-band Parametric Equalizer. Outputs shall be provided for 4-, 8-ohm, 25V, and 70V distributed systems.

8. Bridged or Mono Mode

9. Integrated Digital Signal Processor

    a. Noise Gate
    b. Compressor/Limiter functions, etc.
    c. Tone Controls: Low Shelving, Mid Bandpass and Hi Shelving
    d. Multi-band Parametric EQ
    e. Variable Low-Cut/High-Pass filters

10. One Line-Level Input on two channel amplifiers

11. Two Line-Level Inputs on the four channel amplifiers

12. 100/1000 GB ethernet connection

13. USB 2.0 host port, Type-A connector (future use)

14. 100V – 240V Universal AC Mains

15. Wall, rack, or shelf mountable

16. The amplifiers shall carry the necessary safety agency listings for both the US and Canada. The amplifier shall employ convection air cooling. Amplifiers that require fans for cooling shall not be considered equal.

E. Nyquist NQ-E7010 Input/Output Controller

1. Power over Ethernet 802.3af compliant

2. 8 x Dry Contact Closure Inputs

3. 8 x Relay Driver Outputs (Open-Collector)

4. USB 2.0 host port, Type-A connector (future use)

5. Software programmable configuration and operation including; Contact Type, Extension, Name, Close Interval, Actions (911, Audio, Alarm, Announcement, All-Call, Multi-Site-Emergency-All-Call, Emergency-Call, Emergency-All-Call, Hourly, Audio-Disabled, No Action, Page, Tone, Enable-Audio and Manual), Action ID, Zones, Close Extension, Dashboard Type, Dashboard Title, Dashboard Scope, Dashboard Text, Dashboard Style, Email and Routines

6. Wall, rack, or shelf mountable

F. Nyquist NQ-GA10P 10-Watt Intercom Module

1. Power over Ethernet 802.3af compliant
2. Low-impedance (8-ohm) speaker output. Designed for use with Drop-In Ceiling Speaker CSD2X2L/U
3. Network-based audio output (paging, intercom, audio distribution)
4. Talkback support
5. Push-to-Talk Microphone that can be routed anywhere over Bogen's Nyquist network
6. Ambient Noise Sensor connection for Amplifier volume output control
7. DSP-based noise rejection and voice bandwidth optimization
8. Web-based configuration
9. Analog Call Switch support (Bogen CA15C, or equivalent)
10. Digital Call Switch support (Bogen NQ-E7020)
11. Audio Active Control SPDT Relay Output Rated at 2A
12. In-wall, in-ceiling, shelf, or device mountable UL 2043 plenum-rated package
13. Integrated slotted mounting flanges
14. Available PS4815W 48VDC External Power Supply when PoE isn't available

G. Nyquist NQ-GA10PV 10-Watt Intercom Module with HDMI Clock/Messaging Display.

1. HDMI 1.3 (max. 1920 x 1080 @ 24/30 Hz) output that can be configured many ways:
    a. Analog Clock with Messaging
    b. Digital Clock with Messaging
    c. Single Column Messaging
    d. Two Column Messaging
    e. Three Column Messaging
    f. Priority Fullscreen Messaging
2. Power over Ethernet 802.3af compliant
3. Low-impedance (8-ohm) speaker output. Designed for use with Drop-In Ceiling Speaker CSD2X2L/U
4. Network-based audio output (paging, intercom, audio distribution)
5. Talkback support
6. Push-to-Talk Microphone that can be routed anywhere over Bogen's Nyquist network

7. Ambient Noise Sensor connection for Amplifier volume output control
8. DSP-based noise rejection and voice bandwidth optimization
9. Web-based configuration
10. Analog Call Switch support (Bogen CA15C, or equivalent)
11. Digital Call Switch support (Bogen NQ-E7020)
12. Audio Active Control SPDT Relay Output Rated at 2A
13. In-wall, in-ceiling, shelf, or device mountable UL 2043 plenum-rated package
14. Integrated slotted mounting flanges
15. Available PS4815W 48VDC External Power Supply when PoE isn't available

H. Nyquist NQ-S1810WT-G2 Classroom VoIP Wall Baffle Speaker(s) GEN-2

1. Adjustable volume in 3db increments 1/8, 1/4, 1/2, 1, 2, 4, and 8 Watts via web browser
2. Built-in 10W amplifier
3. MEMS digital microphone for talkback
4. Audio Active Control SPDT Relay Output Rated at 2A
5. Power over Ethernet 802.3af compliant
6. CAN Bus 2.0 Interface connects to Nyquist Digital Call Switches (NQ-E7020)
7. Capable of four (4) different wall mounting options:
    a. 2X2 Wall Mount
    b. Box Mount
    c. Corner Mount
    d. Tilted Mount

I. Nyquist NQ-S1810CT-G2 Classroom VoIP Ceiling Speaker(s) GEN-2

1. Adjustable volume in 3db increments 1/8, 1/4, 1/2, 1, 2, 4, and 8 Watts via web browser
2. Built-in 10W amplifier
3. MEMS digital microphone for talkback
4. Audio Active Control SPDT Relay Output Rated at 2A
5. Power over Ethernet 802.3af compliant
6. CAN Bus 2.0 Interface connects to Nyquist Digital Call Switches (NQ-E7020)
7. Optional hardware available:

a. RE84 Recessed Enclosure (Back box)
b. TB8 Time Bridge
c. MR8 Mounting Ring (for installation where RE84 is not used)

J. Nyquist NQ-GA20P2 Plenum-Rated 20-Watt Integrated Amplifier

1. Single 20-watt, 8-ohm speaker output
2. Single Balanced Line Output
3. Power over Ethernet Plus (PoE+) 802.3at compliant
4. Nyquist network-based audio output (paging, intercom, audio distribution)
5. Web-based configuration
6. Front panel Power and Status LEDs
7. In-wall, in-ceiling, shelf, or device mountable UL 2043 plenum-rated package
8. Integrated slotted mounting flanges
9. Available PS4830W 48VDC External Power Supply when PoE+ isn't available

K. NQ-T1100 VoIP Admin Phone Color Touch Display (aka Admin Station)

1. 7" 800 x 480-pixel color display with backlight
2. Touch screen display for one touch operation
3. Full-duplex hands-free speakerphone with AEC
4. Call hold
5. Mute
6. Redial, call return, auto answer
7. PoE (802.3af) Class-3 support
8. Headset with EHS support
9. Dual Gigabit Ethernet ports
10. Desk Mountable
11. Optional Wall mount available

L. NQ-T1000 VoIP Staff Phone LCD Display (aka Staff Station)

1. 132 x 64-pixel graphical LCD with backlight

2. Two-port 10/100M Ethernet Switch
3. Full-duplex hands-free speakerphone with AEC
4. Call hold
5. Mute
6. Redial, call return, auto answer
7. PoE (802.3af) Class-3 support
8. Dual-color (red or green) illuminated LEDs for line status information
9. Two 10/100M Ethernet ports
10. Wall or desk mountable

M. Optional third-party equipment support

1. Telephony interface device(s) for FXO/FXS analog port connectivity
2. Third-party hardware FXS gateway support includes:
    a. Two port FXS gateway Cisco SPA-112 typically used for analog interface to existing PBX CO port support
    b. 24 port FXS gateway Yeastar TA-2400 typically used for analog staff phone support

2.03 COMPONENTS AND DESCRIPTIONS

A. The Nyquist E7000 Series Educational System is a software-based VoIP paging and intercom system.

B. The System must be capable of supporting existing Bogen Multicom 2000 and Bogen Quantum Multicom IP wiring, 25-Volt speakers and analog call-switches, and equivalent competitive systems utilizing the existing architectural numbering scheme. The VoIP capabilities of the Nyquist system will enable the support of the features across the Nyquist appliances within the facility. The following sections define how the system handles each of the features in the system. Systems that do not allow the reuse of existing wiring or numbering scheme shall not be deemed acceptable. Systems that do not allow appliances to be seamlessly integrated via the existing customers LAN are not considered equal.

C. Nyquist E7000 Software

1. The Nyquist E7000 software is pre-installed on a Nyquist NQ-SYSCTRL System Controller or can be optionally installed on a dedicated dealer or customer supplied server. An unlimited number of facilities can be networked into a Nyquist-based District.
2. If the Nyquist Software is not a Nyquist NQ-SYSCTRL System Controller than the Minimum Server Requirements apply to dealer or customer supplied Server
    a. Debian Linux OS (AMD 64-bit version) release 8.4.x – 8.11.0
    b. Quad-core Intel-based processor running at 3.0 GHz or higher
    c. 8 GB RAM

d. One 250 GB disk drive or larger

3. Redundant Array of Independent Disks (RAID) is recommended for redundancy and high availability.

4. Consider using a larger drive if large amounts of audio (for example, voice mail, announcements, recordings, and music) are being stored on the system. Other factors that should be considered are:

   a. How often will backups be performed?
   b. Will the system be backed up locally or remotely on a detachable drive, SAN/NAS, or NFS?
   c. How many users will have voicemail ability?
   d. How long will voicemail messages be stored?
   e. Will voicemail messages be part of the local system backups?
   f. NIC 10/100/1000 MB Ethernet port
   g. One or more PCI/PCI Express (PCIe) slots if telephony network connectivity other than, or in addition to, SIP trunking
   h. One or more PCI/PCIe type third-party telephony interface cards (for example, FXO, FXS, etc.) if telephony network connectivity other than, or in addition to, SIP trunking

5. Audio shall be transmitted between the System Controller and the Nyquist appliances using the customer supplied LAN/WAN using both G.722 and Opus 48k audio encoding and streaming technology to deliver High Definition DVD quality audio. Systems that do not use G.722 and Opus for audio encoding and streaming shall not be deemed equivalent.

6. Installers have the ability to verify that the Nyquist System Controller can access Internet-based URLs required for the system to run properly by clicking on the "Check Internet Site Access" on the license activation wizard. If the installer made mistakes in configuring the network the install has the ability to go back and make changes to the network by clicking on the “Network Wizard” button.

7. The Nyquist software and Nyquist appliances firmware shall be upgradeable via the Nyquist Web UI System Update page that contains a list of available Nyquist software updates. When automatic software check and download are enabled, new software updates will automatically be downloaded and appear in the System Update list, and a dashboard message will be displayed to announce newly available software. Release notes can be viewed for each available update. System updates can be started via the System Update list. The System Update page includes a "Check for System Updates" button that can be used to manually check for and download available Nyquist software updates.

8. Prior to preforming Nyquist updates the technician shall have the ability to verify if the default gateway, Network Time Protocol, and Domain Name Servers are configured and available, to obtain network interface and routing tables status, and to display the Nyquist E7000’s public IP address. See "Check Internet Site Access" under "System Parameters”. The E7000 system can be setup to automatic check for new Nyquist System software and automatic download of new Nyquist System Software

9. It shall be possible for a Nyquist facility to make “station-to-station” calls and “remote facility” All-Call pages to a single facility or to all Nyquist facilities in a district via the Nyquist Web UI or an Admin Station. Systems that require remote viewing software or other application software to be installed/loaded on to additional servers or PCs to make station-to-station calls and remote facility All-Call or district paging shall not be considered equivalent.

10. The Nyquist software is designed to handle all facility and district-wide communications, including but not limited to, inter-facility intercom calling and paging, district-wide Emergency All-Call and local facility point-to-point calls. Via the Nyquist Web UI, every facility shall be configured with the IP addresses of all the other remote facilities within the district. To ensure that these communications

are operating correctly at all times the Nyquist appliances are supervised and remote facilities are monitored, if a device or facility has a fault the system can send and/or email and also display a message if a device changes state. System that don't provide Station Supervision and remote Facility Monitoring shall not be considered.

11. Nyquist can support an unlimited number of facilities; however, the maximum number of simultaneous remote facility intercom calls supported is based on the actual performance of the WAN and the Nyquist System Controller CPU load.

12. The voice quality of the facility calls may vary based on the WAN conditions. The maximum network bandwidth that All-Call and Zone Paging uses is average of 0.086 Mbps (Multicast G.722), and intercom calls average of 0.171 Mbps (unicast, G.722).

13. The system shall facilitate the repetitive playing of Normal or Emergency audio tones or announcements directed to an All-Call or a Paging Zone until stopped by the Nyquist user via the Web UI, an Admin Station, or a dry contact closure connected to the Nyquist I/O Controller NQ-E7010.

14. Through the use of Routines, a trained individual can create a routine that can perform a sequence of events that can include the repetitive playing of normal or emergency audio files, make or break contact closure(s), display different messages in different areas, send email(s), and place a phone call (if equipped) offsite and play a pre-recorded message. Routines can be triggered/started by Application Programming Interface (API) or the playing of normal or emergency audio files, make or break contact closure(s) or almost any feature or function in the E7000 system. The system must also be capable of executing multi-site Routines (e.g., supports District-wide lockdown). System that don't provide Routines are not equal.

15. A built-in Master Clock shall be included to automatically control class change bells or other time-based events. The Master Clock shall have an unlimited number of Events that may be programmed into any of the unlimited number of Facilities, unlimited number of Schedules, and unlimited number of Holiday events. The schedules shall be nameable for easy selection when assigning schedules to days or overriding a schedule. Schedules can be overridden via the Admin Web UI or Admin phone.

16. Network Time Synchronization. The system shall be capable of periodically updating/synchronizing the processor's time with a Network Time Server running Network Time Protocol (NTP) via the school's LAN network. Systems that do not provide Network Time Synchronization will not be deemed equivalent. The Nyquist server can be the NTP server for other devices on the LAN such as IP clocks and other IP devices.

D. Nyquist E7000 System Software Application

1. The Nyquist software is pre-installed on the Nyquist System Controller, and upon boot-up, users can log in to the Nyquist application via a web browser that supports WebRTC. Systems that require Com Port redirect software, client PC application, software or serial-to-Ethernet adapters for user access are not deemed equal. Communications between the System Controller and the Web UI(s) shall be via secure Hyper Text Transfer Protocol (HTTPS) connections (i.e., https://).

2. The Nyquist Web UI shall be configured with four different default user access levels, based on four unique user roles. Systems that do not provide unlimited access levels and unlimited number of user roles are not considered equal.

3. The four default roles shall be: admin, optech, operator, and user. These roles provide a starting point/example for administrators to create additional roles

4. Only a user assigned the admin role shall be able to provide access to users, giving them the ability to create, delete, edit, and view system parameters.

5. Only an Administrator shall have the ability to adjust roles and Class of Service (CoS) of users. The roles determine if users can view the definable data objects that can include configuration, alarms, and performance data and if users can perform certain operations based on the user's role and station's CoS. All changes to roles and CoS are effective immediately, without the need to restart the browser or reboot the System controller or server.

6. The Nyquist Web UI Dashboard shall provide full administrative capabilities to manage/operate the following system features:

    a. Calling/Paging – Used to access directory, dial pad, Page Exclusion, Call Forwarding, Zone Page, Record Page, Prepending Page, All-Call, Emergency All-Call, Manage Check-in and operate Routines.
    b. Multi-Site Calling/Paging – Used for Facility Page, Multi-Site All Call, and Multi-Site Emergency All Call.
    c. Tones/Announcements – Used for Tones, Announcements, Alarms, Stop Announcement, Display Message, and Remove Message.
    d. View Weekly Schedule – Used to show the current active Bell Schedules.
    e. Audio Distribution – Used to distribute audio sources to Stations, Audio Zones or entire facility. Operators can create an unlimited number Audio Distributions as needed by the facility
    f. Enable or Disable Audio – Used to place the Nyquist system into Page Exclusion mode (i.e., "mute" the system) when a contact closure is supplied from the fire alarm panel. Systems that do not provide this capability are deemed not equal.

7. Systems that require application software to be installed on a PC to manage the above features shall not be considered.

8. To facilitate installation and configuration of the system, additional Web UI menus are required. The menus shall only be visible to users with the correct roles and CoS. The navigation menus found on the Web UI shall be as follows:

    a. System Parameters – Allow installers to adjust core system parameters including Product License, Restart Server, Station Supervision, Email Configuration, System Update, Shut Down Server, Check Internet Site Access, Check Server Status, Edit system tools and adjust all the System Parameters.
    b. Zones and Queues – Allow installers to create and modify Paging, Time, and Audio Zones. Installers can also setup Queues that can be used to eliminate feedback.
    c. Schedules – Allow installers and administrators to create bell schedules for multiple Schools, predefine alternative schedules to run, prevent the bells from ringing on a holiday, and schedule an announcement to play. The system shall allow an unlimited number of schedules to operate simultaneously within a facility.
    d. CoS Configuration – Allow the installer to create, modify, and delete CoS groups that control station access to the following features: Call-in Level, Zone Paging, All-Call Paging, Emergency All-Call, Inter-Facility Call/Page, Audio Distribution, Remote Pickup, Join Conversation, Call Forwarding, Walking Class of Service, External Call Routing, Call Transfer/3-way Calling, Manually Activate Tone Signals, Call Any Station, Manage Recording, Monitor Calls, Monitor Locations, Conference Admin, Conference User, Voicemail, Record Calls, Activate Alarm Signals, Disable Audio, Enable Audio, Allow Callee Auto-answer, District Paging, Inter-Facility Features, Manage Output Contacts, and Execute Routines.
    e. Admin Groups – Allow the installer to create, modify, and delete software groupings of admin phones, staff phones, and Admin Web UIs that can ring when a station calls in with a call switch.

f. Stations – Allow the installer to set up, modify, and delete stations; set up Page Exclusion; view Station Status; and add New Stations.
g. Bridge Devices – Allow the installer to configure the Nyquist ASBs.
h. Amplifier Devices – Allow the installer to configure Nyquist Two and Four and PA Amplifiers
i. Audio – Allow the installer to upload and manage Announcements, Playlists, Recordings, Songs, Tones, and Internet Radio Services. The system must support the uploading of both MP3 and WAV files and make Audio file management simple for users. Systems that limit the size of Audio files shall not be considered equal.
j. Users – Allow the installer to manage users by giving them the proper roles and assign extensions if needed.
k. Roles – Allow the installer to grant users rights to Create, Delete, Edit, Restart System, Sort Menu, Systems Update, Manage, Import/Export, Restore, Settings, or View.
l. Facilities – Allow the installer to set up the district wide facilities for remote paging and calling.
m. Outside Lines – Allow the installer to set up FXS and FXO ports for inbound and outbound system calling.
n. SIP Trunks – Allow the installer to set up SIP trunks into the facility for inbound or outbound calling.
o. Call Details – Allow the installer to review the historical system activities that can be used for incident investigation or system troubleshooting.
p. System Backup/Restore – Allow the installer to preform system backups or restores and allow the backups to be schedule to run automatically.
q. System Logs – Allow the installer to view and export log files, Nyquist-Intercom, and Web Server logs that can be used for troubleshooting and technical assistance.
r. Paging Exclusions – Allow the installer to view and edit stations that are excluded from paging.
s. Firmware – Update firmware for Nyquist speakers and appliances.
t. Routines – Allow installers to create routines that are a sequence of actions, that the Nyquist system executes as a result of an input trigger. Routines can support crisis plans for situations such as school lockdowns, weather events, or emergency evacuations.
u. Alert Filters – Allow installers to select the National Weather Alerts that the facility needs to monitor for such as weather events, earthquakes, tsunami, volcanoes, public health, power outages, and many other emergencies.
v. Systems that do not provide these options as a minimum shall not be considered equal.

E. Nyquist NQ-E7030 Analog Station Bridge

1. The Nyquist NQ-E7030 ASB allows facilities with existing Multicom or Quantum or compatible intercom systems to upgrade to Nyquist. Each ASB supports up to 24 speakers and call switches with 120-Watts of embedded 25 Volt power. The ASB is designed to drive almost any combination of 25 Volt speakers and horns.

2. The Nyquist ASB contains two 120-Watt amplifiers that are used dynamically by the system and allows two simultaneous amplified audio paths through the ASB. Either amplifier can be used for an intercom call and/or program (Paging, Time Tones and Audio) distribution.

3. Each of the 24 station interface ports - Support connections to as many as 24 individual 25 Volt speakers with one 25 Volt speaker connection per interface used for direct communication between the admin area and the classroom via Half-duplex talkback using the speaker as pickup and the 24 dry contact closure-type analog Call Switch connections allow for support of legacy Call-Switches like the CA-21B or CA-15C.

4. On the back of the ASB is a CAN Bus 2.0 Interface designed to support the connection of 24 or more Nyquist NQ-E7020 Digital Call Switches DCS that can be associated with the programmed stations. Systems that don’t support Digital Call Switches shall not be considered equal.

5. On the front of the ASB are two (2) x RGB full spectrum LED's. The POWER LED appears as solid red during initial power up, flashes green during a boot sequence, and appears solid green when fully booted. The STATUS LED uses the following indicators to provide information about the appliance:

    a. Flashing red – No network connection found
    b. Solid blue – The ASB is in an uninitialized state and is not associated to a server. (The server may be in a discovery mode.)
    c. Solid green – The ASB is registered to a Nyquist server and is in normal operation
    d. Flashing green – The ASB has an IP address but is not registered with the Nyquist server
    e. Solid red – The ASB needs to be rebooted or reset so that the Nyquist application can resume
    f. Flashing Blue – The ASB is updating.

6. USB 2.0 host port, type A connector designed for future applications.

7. On the front of the ASB you will also find the 10/100 Ethernet network connection. The ASB can be configured with a static IP address or use DHCP for connection to the customers network as required by the Network Administrator

8. The ASB gets its power from a universal mains power supply (100VAC – 240VAC)

9. The Nyquist NQ-E7030 ASB shall be rack, wall, or shelf mountable and shall include the required mounting bracket hardware.

F. Nyquist NQ-P0100 Matrix Mixer Pre-Amplifier (MMPA)

1. The Nyquist NQ-P0100 MMPA is designed to bring external audio into the Nyquist system. The MMPA interfaces with a local sound system by accepting one or more analog audio sources, mixing them, and outputting them to either, a) the network for Audio Distribution, or b) the MMPA's line level output that can then be inserted into an external amplifier to drive local sound system in gyms, cafeterias, auditoriums, etc. The MMPA supports the following:

    a. Four software selectable Line/MIC Input channels via three XLR connectors and four sets of screw-terminals. Input channel four (4) shall be capable of being configured to support a Push-to-Talk microphone Bogen model DDU-250. Channel-1 can be configured as a digital AES/EBU (AES3) input. Line/Monitor output – The MMPA becomes a station on the Nyquist system, allowing users to call it directly or to include it in any of the Page, Time, or Audio Zones and can be direct one-way page by calling it extension.
    b. The MMPA shall support the following features: Line-Level output to drive input on a local amplifier or self-amplified speaker; One USB 2.0 host port (Type-A connector) for future use; two (2) x RGB full spectrum LED status indicators.
    c. Configurable built-in Digital Signal Processing for Noise Gate, Compressor/Limiter functions, etc., Tone Controls: Low Shelving, Mid Bandpass and Hi Shelving, Multi-band Parametric EQ, and Variable Low-Cut/High-Pass filters.
    d. The MMPA is powered by Universal mains supply (100VAC – 240VAC).
    e. The MMPA shall be wall or shelf mountable and shall include the required mounting bracket hardware.

2. The system shall be equipped a minimum of one (1) Nyquist MMPA that allows for up to four user-configurable audio inputs. The MMPA shall support Line, MIC, and digital AES/EBU (AES3) input sources. The system supports an unlimited number of MMPAs.

G. Nyquist NQ-E7010 Input/Output Controller

1. The Nyquist NQ-E7010 I/O Controller is designed to accept contact closure inputs and activate open-collector outputs to drive relay coils. These inputs and outputs are used to trigger events or to be triggered by an event or Routine within the Nyquist system.

    a. PoE Class-1; IEEE 802.3af compliant with Optional 48VDC 15W power supply
    b. Eight Dry Contact Closure Inputs that can be used with Fire Alarm Override Relays, external event triggers (for example, Lockdown Buttons, etc.)
    c. Eight Relay Driver Outputs (Open-Collector) for use with Clock Correction (Sync Pulse), response to contact closure inputs, etc.
    d. USB 2.0 host port, Type-A connector (future use)
    e. Two (2) x RGB full spectrum LED Power and Status indicators

2. The Nyquist NQ-E7010 I/O Controller shall support wall or shelf-mounting options and shall include the required mounting bracket hardware.

3. The Nyquist NQ-E7010 I/O Controller shall be designed for wall or shelf mounting.

H. Nyquist NQ-S1810CT-G2 VoIP Ceiling Speaker with Talkback and NQ-S1810WT-G2 VoIP Wall Baffle Speaker with Talkback

1. The VoIP speakers shall not require traditional intercom wiring or transformer taps to manually set or adjust volume. Simply connecting them via Cat 5 or better to a PoE Switch or PoE Injector on the system's network should allow them to be ready to program into the system. Volume is controlled via the Nyquist Web UI. All Nyquist audio appliances shall use a wideband Opus codec for DVD quality Audio Distribution. Use of the Opus codec, along with G.722, allows for High Definition (HD) audio. Nyquist VoIP speakers shall be equipped with a digital MEMS microphone to achieve superior talkback audio. VoIP Speakers that utilize the speaker as the microphone shall not be considered equal.

2. Software adjustable volume in 3db increments 1/8, 1/4, 1/2, 1, 2, 4, and 8 Watts via web browser allow the operators to adjust the Built-in 10W amplifier.

3. The MEMS digital microphone provide unprecedented talkback from the classroom allowing staff to hear the slightest inflection in anyone's voice.

4. Audio Activated Control Relay Output designed to override local classroom sound systems

5. The Nyquist VoIP speaker are equipped with an audio activated control Relay Output that is normally open or closed and changes state when audio is active. This relay can be used to override a local sound system in the classroom.

6. The VoIP Speakers shall be PoE IEEE 802.3af compliant allowing staff to effortlessly add additional speakers as needed on available PoE Ports throughout the campus. Making them easy to add move or change as the needs of the facility changes over time.

7. Connection to optional Digital Call Switch Nyquist NQ-E7020, which can place Normal, Urgent, or Emergency priority calls and can provide station status and the ability for the user to enable and disable Privacy Mode

8. The NQ-S1810WT VoIP Wall Baffle Speaker with Talkback design facilitates mounting the speaker up to four different ways:

a. 2x2 Wall Mount
b. Box Mount
c. Corner Mount
d. Tilted Mount

9. The NQ-S1810CT VoIP Ceiling Speaker is designed to work with the same Bogen hardware used with our analog ceiling speakers to make the installation process easy for installers that have installed ceiling speaker in the past available accessories:

    a. RE84 Recessed Enclosure (Back box)
    b. TB8 Time Bridge
    c. MR8 Mounting Ring (for installation where RE84 is not used)

10. Like all Nyquist Appliances we support the most common network features to rapidly deploy Nyquist Appliances on the network such as DHCP with Option 66 and VLAN support to aid in this effort.

11. The VoIP Speakers come pre-assembled for faster installation

I. Nyquist NQ-GA10P 10W Plenum-rated Intercom Modules

1. The Nyquist NQ-GA10P is designed to make any 8-ohm speaker into an IP speaker with the following capabilities

    a. Power-over-Ethernet (PoE) 802.3af compliant
    b. Low-impedance (8-ohm) speaker output
    c. Network-based audio output (paging, intercom, audio distribution)
    d. Talkback support by just attaching a speaker to achieve half-duplex talkback
    e. Push-to-Talk Microphone that can be routed anywhere over Bogen's Nyquist network
    f. Ambient Noise Sensor connection for Amplifier volume output control
    g. DSP-based noise rejection and voice bandwidth optimization
    h. Web-based configuration

J. Nyquist NQ-E7020 Digital Call Switch

1. The Nyquist DCS has been exclusively designed for use with Nyquist appliances equipped with a CAN Bus 2.0 Interface. The CAN Bus 2.0 interface provides power and signal, and multiple DCSs can connect to each CAN Bus 2.0 interface. The DCS fits into a Single Gang/ Low Voltage installation using standard 'decora-plate' covers (supplied).

2. The DCS is a capacitive touch button design, so it doesn't have any moving parts to wear out. The behavior of this switch is software definable. Systems that require membrane or mechanical rocker style call switches that can wear out over time shall not be acceptable.

3. Normal call initiation involves touching the DCS one time. When a user touches the button on the DCS once, one of the three LED segments will light up green, a normal call will be placed, and the light will start blinking green. This is the indication that the Normal call has been placed to the VoIP Admin Phone or to a group of VoIP Admin Phones and that the phone or phones are ringing.

4. Urgent call initiation involves touching the DCS one time. When a user touches the button on the DCS once, one of the three LED segments will light up yellow, an Urgent call will be placed, and the light will start blinking yellow. This is the indication that the Urgent call has been placed to the VoIP Admin Phone or to a group of VoIP Admin Phones.

5. Emergency call initiation involves touching the DCS one or three times depending on station programming. When a user touches the button on the DCS once or three times within three seconds, all three LED segments will light up red, an Emergency call will be placed, and the light will start blinking red. This is the indication that the Emergency call has been placed to the VoIP Admin Phone or to a group of VoIP Admin Phones.

6. Single Press Emergency Call, if programmed, involves touching the DCS one time. When a user touches the button once, all three LED segments will light up red on the DCS, an Emergency call will be placed, and the light will start blinking red. This is the indication that the Emergency call has been placed to the VoIP Admin Phone or to a group of VoIP Admin Phones.

7. Normal and Urgent calls can easily be upgraded to an Emergency call after the DCS is flashing by touching the button on the DCS one time. The Normal or Urgent call will be replaced by an Emergency call. Systems that don't allow the staff to upgrade the priority of a call shall not be considered equivalent.

8. Privacy Mode – Pressing and holding the button on the DCS for four seconds will place the speaker into Privacy Mode. As the user continually touches the DCS button, all LED segments will turn purple; when all three LED segments are lit purple, the speaker is in Privacy Mode. If a call comes into the classroom when the station is in Privacy Mode, the microphone will be disabled; the user in the classroom can touch the DCS once and it will allow talkback. Once the call ends, the classroom will need to manually return the speaker into Privacy Mode, if desired. The user can disable Privacy Mode without placing a call by pressing and holding the button on the DCS for four seconds. As the user continually touches the DCS, all LED segments will turn blue. When all three LED segments are lit blue, the speaker is no longer in Privacy Mode. Systems that require mechanical or membrane switches to achieve Privacy Mode shall not be considered equal.

9. The colors specified above are created by three RGB full spectrum LED segments to provide installers and users with visual status and feedback when installing and using the DCS. When the DCS is being installed and the power is connected before the signal, the LED will light red. It will also light red if the speaker in the classroom stops communicating with the Nyquist System Controller, indicating a problem with the station.

10. In addition to providing visual call status indications, a call confirmation audio file shall be played on the associated loudspeaker when a call is placed via a DCS. The three call-in levels shall have distinct audio confirmation messages:

    a. Call Placed
    b. Urgent Call Placed
    c. Emergency Call Placed

11. Emergency Link Transfer – If an Emergency call is unanswered by the VoIP Admin Phone and the Emergency Link Transfer is active, the Emergency call will be forwarded to the loudspeaker associated with the Emergency Link Station. Any station equipped with a loudspeaker can be programmed as the Emergency Link Station. Systems that do not provide Emergency Link Transfer shall not be considered equal.

K. Bogen Analog Call Switch CA-15C for use with the Nyquist ASB or NQ-GA10P(V)

1. The momentary Call Switch shall be capable of placing a combination of Normal/Urgent/Emergency Calls based on the software configuration of the Call Switch.

2. Normal/Emergency call configuration: Making a Normal call in this mode involves pressing the button on the Call Switch once. A call is then placed to the designated Admin Station. An Emergency call involves pressing the call switch at least four times. The Emergency call is then routed to the designated Admin Station. In both scenarios, the calling station number and call-in level (Normal or Emergency) are displayed on the Admin Station or on a group of Admin Stations. Additionally, Emergency calls can be routed to an alternative Admin Station or Emergency Link.

3. Urgent/Emergency call configuration: Making an Urgent call in this mode involves pressing the button on the Call Switch once. A call is then placed to the designated Admin Station. An Emergency call involves pressing the button on the Call Switch at least four times. The Emergency call is then routed to the designated Admin Station. In both scenarios, the calling station number and call-in level (Urgent or Emergency) are displayed on the Admin Station or on a group of Admin Stations. Additionally, Emergency calls can be routed to an alternative Admin Station or Emergency Link.

4. Emergency Only call configuration: Making an Emergency call in this mode involves pressing the Emergency call switch with Call Level Emergency one time. The call is then switched to the Admin Station. This requires the display of the station number and call-in level on the Admin Station or on a group of Admin Stations. Additionally, Emergency calls can be routed to any Admin Station, including Emergency Link.

5. Emergency Link Transfer - If an Emergency call goes unanswered by the Admin Station and the Emergency link transfer is active, the Emergency call will be forwarded to the loudspeaker associated with the Emergency Link Station. Any station equipped with a loudspeaker can be programmed as the Emergency Link Transfer. Systems that do not provide Emergency Link Transfer shall not be considered equal.

6. In addition to the mechanical click of a Call Switch button press, a call confirmation audio file shall be played on the associated loudspeaker when a call is placed. The three call-in levels shall have distinct audio confirmation messages:

    a. Call Placed
    b. Urgent Call Placed
    c. Emergency Call Placed

L. The Nyquist plenum-rated amplifier shall be a model NQ-GA20P2 20-watt integrated amplifier and shall utilize UL 2043 plenum-rated packaging.

1. One 20 watt 8-ohm speaker output (with PoE+)
2. One Balanced Line Output
3. RJ-45 for Nyquist network connection
4. Power-over-Ethernet Plus (PoE+) 802.3at compliant
5. Nyquist network-based audio output Web-based configuration
6. Power and Status LEDs
7. In-wall, in-ceiling, shelf, or device mountable UL 2043 plenum-rated package
8. Optional 48VDC External Power Supply (PS4830W; sold separately)

M. The Nyquist plenum-rated amplifier shall be a model NQ-GA20P2 20-watt integrated amplifier and shall utilize UL 2043 plenum-rated packaging. The amplifier shall be capable of being powered with an 802.3at compliant Power-over-Ethernet Plus (PoE+) switch, PoE+ power injector, or 48VDC external power supply PS4830W. The amplifier shall provide a frequency response from 20-20 kHz +/- 0.25 dB at rated power. Distortion shall be less than 0.05% THD+N. The amplifier shall include GUI based configuration. Output shall be provided for both line level or 8-ohm speaker connections. Audio line level output shall be 2.2V RMS @10kΩ (+27 dB) electronically balanced.

N. The Nyquist based two channel amplifier shall be a model _____, rated at ____ watts RMS per channel (NQ-A2060/2x60 watts, NQ-A2120/2x120 watts, and NQ-A2300/2x300 watts) with switch selectable 2-Channel or 1-Channel bridged operation. The amplifier shall have one dedicated Balanced Line Input. The amplifier shall provide a frequency response from 20-20 kHz +/- 0.25 dB at rated power. Distortion shall be less than 0.03%. The amplifier shall include GUI based DSP controls; 16-band Graphic Equalize; Signal Present and Clip Monitor; Adjustable High Pass, Low Pass, and Bandpass Filters; Noise Gate; Compressor/Limiter; and 7-band Parametric Equalizer. Outputs shall be provided for 4-, 8-ohm, 25V, and 70V distributed systems. The amplifier shall be rack mountable 1/2 Rack Width - Wall, Rack, or Shelf mountable 1RU and 2RU packages or by using a 19" Rack Mount Kit (NQ-RMK03; sold separately). It shall carry the necessary safety agency listings for both the US and Canada. The amplifier shall employ convection air cooling. Amplifiers that require fans for cooling shall not be considered equal.

O. The Nyquist based four channel amplifier shall be a model _____, rated at ____ watts RMS per channel (NQ-A4060/4x60 watts, NQ-A4120/4x120 watts, and NQ-A4300/4x300 watts) with switch selectable 4-Channel or 2-Channel bridged operation. The amplifier shall have two dedicated Balanced Line Inputs with both Phoenix plug and XLR connections for each input. The amplifier shall provide a frequency response from 20-20 kHz +/- 0.25 dB at rated power. Distortion shall be less than 0.03%. The amplifier shall include GUI based DSP controls; 16-band Graphic Equalizer; Signal Present and Clip Monitor; Adjustable High Pass, Low Pass, and Bandpass Filters; Noise Gate; Compressor/Limiter; and 7-band

P. Nyquist NQ-T1100 VoIP Admin Phone – Color Touch Display (Admin Station)

1. The Nyquist Admin Station shall have the following features:

    a. 7" 800 x 480-pixel color display with backlight
    b. Touch screen display for one touch operation
    c. Full-duplex hands-free speakerphone with AEC
    d. Call hold
    e. Mute
    f. Redial, call return, auto answer
    g. PoE (802.3af) Class-3 support
    h. Headset with EHS support
    i. Dual Gigabit Ethernet ports
    j. Desk Mountable
    k. Optional Wall mount capable

2. The Nyquist Admin Station display panel shall show the time of day and day of week, the current bell schedule(s), and the station numbers and call-in priority of staff stations that are calling in. Depending upon the system programming, an Admin Station shall display menus to activate Zone Paging, All-Call Paging, Emergency All-Call Paging, District All-Call paging, alarm signals, and external functions.

3. The Admin Station shall be capable of calling either the loudspeaker or Staff Station at each classroom location.

4. The Admin Station shall display the classroom number of any station that calls 911. This allows front-office administrators to direct emergency personnel to the correct physical location in the building when they arrive. If a system is not connected to outside phone lines, then 911 calls can be routed to a designated station within the facility. The system shall automatically record all 911 calls made from any station. The 911 call recording shall begin as soon as 911 is dialed and continue unit the call is terminated. Recorded calls shall be maintained on the system for later playback review and/or retrieval by authorized personnel and/or authorities. Systems that do not provide this feature will not be deemed equal.

Q. Nyquist NQ-T1000 Staff VoIP Phone – LCD Display (Staff Station)

1. Nyquist Staff Station shall have the following features:

    a. 132 x 64-pixel graphical LCD with backlight
    b. Two-port 10/100M Ethernet Switch
    c. Full-duplex hands-free speakerphone with AEC
    d. Call hold
    e. Mute
    f. Redial, call return, auto answer
    g. PoE (802.3af) Class-3 support
    h. Dual-color (red or green) illuminated LEDs for line status information
    i. Two 10/100M Ethernet ports
    j. Wall or desk mountable

2. The classroom Staff Station shall be capable of the following features depending on how the station CoS is configured:

    a. Emergency intercom call – Staff Stations shall be capable of making an Emergency intercom call, which is then routed to the assigned Admin Station. This requires the display of the architectural number and call in level on the Admin Station. Systems that do not provide this feature are not equivalent.
    b. Speed dial
    c. Toggle audio distribution on and off
    d. Call Forward activation and deactivation for All-Calls/Busy/No Answer/Busy or No Answer
    e. Conference Calling
    f. Transfer Call
    g. Dial Administrative station– Staff Stations can allow the user to dial the station number to call to the Admin phone or its associated speaker. The call shall be routed to the Admin Station showing the architectural number that is calling.
    h. Emergency All-Call – An emergency page shall be broadcasted to all the stations in the facility.
    i. Place Outside Call
    j. Remote Answer
    k. Single-Zone/All-Station Page
    l. Call Waiting Tone for Outside Calls – It shall be possible to feed the call waiting tone to the Administrative Phone during a conversation.
    m. Transfer call from VoIP speaker in classroom down to an associated Staff Station
    n. Transfer call from analog speaker in classroom down to an associated Staff Station
    o. Transfer call from VoIP Staff Station in classroom up to an associated VoIP speaker
    p. Transfer call from Staff Station in classroom up to an associated analog speaker

R. Additional Loudspeakers for use with the Nyquist ASB

1. 25-Volt Classroom Speakers shall be Bogen:

    a. Ceiling Mounted Speakers: CSD2X2U Drop-In Ceiling Speaker
    b. Ceiling Mounted Speakers: S810T725PG8U Ceiling Speaker
    c. Wall Baffle Speakers: MB8TSQ/SL Metal Box Speaker

2. 25-Volt Hallway Speakers shall be Bogen:

    a. Ceiling Mounted Speakers: CSD2X2U Drop-In Ceiling Speaker
    b. Ceiling Mounted Speakers: S810T725PG8U Ceiling Speaker

c. Wall Baffle Speakers: MB8TSQ/SL Metal Box Speaker

3. 25-Volt Outdoor/Gym/Locker Room Speakers shall be Bogen:

   a. FMH15T mounted in BBSM6 surface-mounted vandal-resistant enclosure/BBFM6 flush-mounted vandal-resistant enclosure with FMHAR8 adapter ring and SGHD8 heavy duty grille
   b. KFLDS30T Wide Dispersion Re-entrant Horn Loudspeakers

4. 25-Volt Common Area Speakers shall be Bogen:

   a. OCS1 Orbit Ceiling Speakers
   b. OPS1 Orbit Pendant Speakers

2.04 SYSTEM CAPABILITIES

A. The communication system shall be a Bogen Nyquist E7000 Series Educational System and shall provide a comprehensive communications network between administrative areas and staff locations throughout the facility.

B. The system shall provide no less than the following features and functions:

1. Software-based, state-of-the-art, Voice over IP (VoIP) paging and intercom solution.

2. The system shall provide a Web User Interface (Web UI) shall allow users to configure and control the system, in accordance with their assigned User Role, from any Web browser enabled PC, Mac, Android or iOS tablet or mobile device.

3. Amplified-voice communication with analog loudspeakers shall use a shielded audio pair when connected to an ASB.

4. The system shall support any combination of the following VoIP phone station types: NQ-T1100 Administrative VoIP Phone – Color Touch Display (Admin Station) or NQ-T1000 Staff VoIP Phone – LCD Display (Staff Station).

   a. All VoIP phone station types shall utilize the same type of field wiring.
   b. There shall be no limit to the number of Admin Stations that can be connected to a facility. Systems that require different head-end equipment to make Admin Stations function, or systems that limit the number of Admin or Staff Stations shall not be deemed acceptable.

5. Future station alterations shall only require the Station Type to be changed in system programming. Alterations shall not require field wiring or system head-end alterations, unless an analog station device is being replaced by a VoIP station device or vice-versa.

6. The system shall be a global non-blocking system. The system shall be capable of unlimited amplified intercom paths per facility. Two amplified intercom paths shall be provided with each ASB for its complement of 24 stations. All hardware, etc., required to achieve the necessary number of amplified-voice intercom channels for this system shall be included in this submittal. ASB amplified-voice intercom channels shall provide voice-activated switching. Systems requiring the use of a push-to-talk switch on administrative telephones shall not be acceptable. There shall be an automatic level control for return speech during amplified-voice communications. The intercom amplifier shall also provide control over the voice switching sensitivity and delay times of the VOX circuitry on the ASB.

7. The system shall provide 911 Dial-Through via outside FXO/FXS lines or SIP trunks to ensure that one or more lines are always available for 911 calls. The 911 Dial-Through is available to any properly configured station (via CoS). When a station dials 911, the 911 call is processed as follows:

    a. Call routes to an Emergency Group where the call can be answered.
    b. The 911 CO lines can be pre-configured and reserved. If the 911 reserved lines are busy, the normal CO lines will be connected to route the 911 calls. If all the normal CO lines are busy, then one of the ongoing calls shall be disconnected and the 911 call shall be placed.
    c. When 911 is dialed from any station, its designated Admin Station or Admin Group will receive a message that the station has dialed 911.
    d. The system shall automatically record all 911 calls made from any station. The 911 call recording shall begin as soon as 911 is dialed and shall continue until the call is terminated. Recorded calls shall be maintained on the system for later playback review and/or retrieval by authorized personnel and/or authorities.

8. It is of highest importance that Emergency calls from stations receive prompt attention. Therefore, it is important that there be an alternative destination in case the Emergency call does not get answered at the primary location. Details are as follows:

    a. Staff-generated Emergency calls shall be treated as the second highest system priority. Therefore, all Emergency calls shall annunciate at the top of the call queue of their respective Admin Station or Admin Group. Should that Emergency call go unanswered for 15 seconds, the call shall be re-routed to an alternative speaker station. Then, a tone will prompt the caller to make a verbal call for help and annunciates to the Emergency link station “Emergency.” During the transfer, the original administrative telephone shall continue to ring the distinctive Emergency Ring. Should the Emergency Transfer-to-Station have an associated Admin Station, it will also ring for the Emergency call.
    b. The Emergency Transfer-to-Station shall be software configurable.
    c. Systems failing to transfer unanswered Emergency calls or failing to immediately connect to the designated Admin Station shall not be deemed as equal.

9. There shall be a Facility Wide Emergency All-Call feature. The Emergency All-Call shall be accessed from designated Admin Stations or the Nyquist Dashboard or by the activation of an external contact closure that shall give a microphone input Emergency status. The Emergency All-Call function shall have the highest system priority and shall override all other loudspeaker-related functions including Time Tones, Normal All-Call or Zone Pages, or Audio Distribution.

    a. Considering that Emergency calls are to be treated with the highest level of concern, systems that do not regard Emergency All-Call with the highest priority shall not be deemed as equal.
    b. Upon touching the Directory icon, a menu shall appear on the Admin Station display prompting the user to select the desired menu.
    c. The Emergency All-Call shall capture the highest-level system priority and shall be transmitted over all speakers in the facility. It shall also be capable of activating an external control output, which can be used to activate external relays to automatically override volume controls, local sound systems, or strobe circuits.
    d. This Emergency All-Call feature can have a four-digit pin number associated with it that would be required to use the feature or override someone that is already using this feature.
    e. Systems without Emergency All-Call or systems with All-Call that cannot be activated by external means or that do not capture complete system priority or activate an external relay, shall not be acceptable.

10. There shall be unlimited Alarm Tones (four by default). Each may be accessed by dialing *91 and the two-digit tone number from any Admin Station, SIP Trunk, or FXO/FXS system interface. These

Alarm Tones are separate from the Time Tones. Users shall be able to add an unlimited number of Alarm Tones to the system by uploading MP3 or WAV files. Systems that do not allow the user to upload MP3 and WAV files to customize the Alarm Tones or need to use external alarm/tone generators or special software or have less than four Emergency Alarm Tones shall not be acceptable.

11. Upon touching the Directory icon on an Admin Station, a menu shall appear on the display prompting the user to select from the sub-menus. The Alarms sub-menu is the first available. This precludes the user from having to memorize complicated key sequences to access Alarm Tones.

12. There shall be unlimited I/O Controller relay driver outputs accessible and controllable by properly authorized users via an Administrative Web UI. These outputs remain set until accessed and reset. Users shall have the ability to review the status of each relay driver output. Users shall be prompted through fields via a plain English menu, precluding users from having to remember any dialing sequences to control this feature. The system shall support an unlimited number of I/O Controllers, and each I/O Controller shall be able to interact with any and all other I/O Controllers on the system (i.e., an input on one I/O Controller can trigger an output on one or more different I/O Controllers). Systems that require the user to remember complicated dialing schemes or prompt the user via cryptic commands shall not be acceptable.

13. The I/O Controller can create a contact closure when the following operations are performed in the system:

    a. 911 call placed
    b. Audio Distributed
    c. Alarm is played
    d. Announcement is played
    e. All-Call preformed
    f. Multi-Site All-Call performed
    g. Multi-Site Emergency-All-Call
    h. Emergency-Call
    i. Emergency-All-Call
    j. Audio-Disabled
    k. Page

14. The system shall provide software controlled and programmable control outputs for external relay activation for use with strobe lights, magnetic locks, card access systems, motion detectors, cameras, or any low-voltage, dry contact creating device. Systems using dedicated security stations for control of external functions shall not be acceptable.

15. The system shall be capable of interfacing to PSTN/PBX/iPBX via both FXO/FXS line and SIP trunk connectivity.

16. The system shall be capable of providing each facility (i.e., (i.e., Nyquist location) an unlimited number of incoming FXO/FXS or SIP trunk lines that can be designated by the user to ring the designated Day Admin or Night Admin. Where an Admin Station is designated to receive outside line calls, the incoming call's Caller ID information shall appear on the display. The system shall also provide the ability to make outside line calls from Admin Stations. This ability shall be programmable for each Admin Station and there shall be an unlimited number of CoS available to assign to any station.

17. The system shall be capable of supporting DID, DISA, and Security DISA functions.

a. The system shall provide a password-protected Security DISA feature that shall only be accessible from authorized Police, Fire, Emergency personnel, or an off-premise security office that monitors the facility's security system. The Security DISA feature shall function as follows: Upon dialing the Security DISA phone number, the caller will receive a dial tone from the system, after which he or she must enter the assigned Security DISA passcode on the dial pad. Upon confirmation, the system will present the dial tone again and will allow the authorized personnel to dial any station/classroom on the system and monitor the activity without any pre-announce tone or privacy beep. This will allow the authorized personnel to audibly assess the situation and determine what actions need to be taken.
b. All DISA and Security DISA calls shall be automatically recorded by the system for later playback review and/or retrieval by authorized personnel and/or authorities.

18. The system shall provide for field-programmable three-, four-, five-, or six-digit architectural station numbers.

19. There shall be an automatic level control for return speech during amplified-voice communications.

20. Each station loudspeaker shall be assignable to all or any combination of Paging, Time, and/or Audio Zones. Systems that do not provide unlimited Paging, Time, and/or Audio Zones shall not be acceptable.

21. There shall be unlimited schedules with unlimited programmable events per facility. Each event shall sound one user-selected tone or external audio source. It shall be possible to assign each schedule to a day of the week or to manually change schedules from an authorized user via a web-based UI. Systems that do not provide unlimited schedules, events, and tones, or that require software to be installed on a PC to perform these functions shall not be acceptable.

    a. The system shall provide multiple concurrent schedules per facility/location to accommodate split facilities (for example., combined Elementary and Middle School, combined Middle and High School, etc.).
    b. The system must be capable of providing Class Change Music to be played from an external audio source or audio files that are stored in playlists on the system during class change periods or whenever a facility wants music to be played in an area (i.e., (i.e., one or more Time Zones) on an automated schedule.
    c. Each event shall be able to be directed to any one or more of the unlimited Time Zones.
    d. Each of the unlimited Time Zones shall have a programmable, customizable Preannounce Tone and volume control that is unique unto itself.
    e. Each event shall play any of the Normal tones or external audio. Each event may utilize a different tone. For example, the system shall be capable of sending the gymnasium, shop classes, and pool a separate, unique time tone to indicate "clean up." Minutes later, the entire facility can be sent a different time tone to indicate class change.
    f. Each of the unlimited Time Tones may be manually activated by selected VoIP Admin Phones or via an authorized user with access to the Web UI. These tones shall remain active as long as the telephone remains off-hook or until canceled from the keypad or the Nyquist Web UI.
    g. Systems that do not provide an unlimited number of schedules or do not provide automatic activation of schedules shall not be acceptable.

22. Internal Master Clock shall be included, allowing an unlimited number of events per facility. Systems that do not provide an internal master clock or that must supply an external master clock to meet these specifications shall not be acceptable.

23. The Nyquist E7000 is capable of synchronizing with an NTP server and automatically adjusting the Daylight Savings Time for any time zone in the world. The server that the Nyquist E7000 application

is running on can also be used as an NTP server for other systems on the LAN (for example, IP Clocks and control systems).

24. There shall be a Zone Page/All-Call Page feature that is accessible by selected Admin Phones and FXO/FXS or SIP connection to the PSTN or PBX/iPBX.

25. There shall be an option to play a pre-announce tone at any loudspeaker selected for voice paging.

26. There shall be a voice-intercom feature that is accessible by CoS authorized staff phones, all Admin VoIP phones, and Admin Web UIs.

    a. There shall be a privacy beep played every 15 seconds at any selected loudspeaker to indicate that an intercom call is in progress.
    b. There shall be a pre-announce tone played at any selected loudspeaker for intercom call communication.
    c. For special applications, the privacy and pre-announce tone signals shall be capable of being disabled during system initialization.
    d. There shall be a switch over to private telephone communications should the person at the classroom loudspeaker pick up his or her Staff Station and dial *3 to transfer the call down to the associated classroom Staff Station.

27. There shall be various levels of telephonic communication accessible by all Admin Stations and Staff Stations.

    a. Staff Stations must be capable of being programmed to ring one Admin Station during day hours and a different Admin Station during night hours. Day and Night start hours shall be configurable. Staff Stations shall be capable of being assigned to any Admin station. Systems that limit the number and assignment of staff call-ins to an Admin Station shall not be acceptable.

28. Each VoIP speaker or ASB speaker equipped with a call switch (analog or digital) shall be configurable as one of three call-in types, as follows:

    a. Normal/Emergency
    b. Urgent/Emergency
    c. Emergency

29. Call buttons programmed for access Normal / Emergency or Urgent / Emergency shall be able to initiate an Emergency call by repeated flashing of the phone’s hook switch, or repeated pressing of the DCS or the Call Switch. Systems that require additional switches and/or conductors to initiate an Emergency call, shall not be acceptable.

30. Normal and Urgent calls shall be placed into the queue for the designated Admin Station or Admin Web UI.

31. Each Admin Station call queue shall first be sorted per call priority (for example, Emergency, then Urgent, and then Normal). Calls are sorted within each priority level on a first-in, first-out basis. When a call is answered, it shall automatically be removed from the queue. Systems that do not sort calls per priority and order received shall not be acceptable.

    a. The display shall simultaneously display a minimum of three intercom calls pending.
    b. Additional calls beyond three shall be indicated by a scrolling option on the right-hand side of the screen thus prompting the user that additional calls are waiting.

32. It shall be possible to answer any incoming call by picking up the handset while it is ringing. It shall not be necessary to press any buttons to answer a call unless the call has dropped into the queue.

33. Staff Stations shall receive a dial tone upon going off-hook. Outgoing calls are made by dialing the desired station. Incoming calls can be directed to the telephone or to the associated loudspeaker for a hands-free reply. There shall be a switchover from loudspeaker to private telephone communication when a person picks up the handset, dials *3, and presses Enter/OK.

34. Staff Stations shall be programmable for any type of system access, provided by or restricted by the following CoS options:

    a. CoS Name
    b. Call-in Level
    c. Zone Paging
    d. All-Call Paging
    e. Emergency All-Call
    f. Inter-Facility Call/Page
    g. Audio Distribution
    h. Remote Pickup
    i. Join Conversation
    j. Call Forwarding
    k. Walking Class of Service
    l. External Call Routing
    m. Call Transfer/3-way Calling
    n. Manually Activate Tone Signals
    o. Call Any Station
    p. Manage Recordings
    q. Monitor Calls
    r. Monitor Locations
    s. Conference Admin
    t. Conference User
    u. Voicemail
    v. Record Calls
    w. Activate Alarm Signals
    x. Disable Audio
    y. Enable Audio
    z. Allow Callee Auto-answer
    aa. District Paging
    bb. Inter-Facility Features
    cc. Manage Output Contacts
    dd. Execute Routines

35. Each Station in a facility can have a unique CoS programmed with an unlimited number of CoS combinations.

36. Staff Stations shall be able to make a Normal call to any Admin Station by dialing the Admin Station's extension number. Staff Stations shall also be able to initiate an Emergency Intercom Call by dialing ****. Emergency Calls shall ring the Designated Day/Night Admin Station. The system shall provide for each station to have a Personal Identification Number (PIN). By dialing the PIN at any system telephone, the administrator shall have access to Emergency paging regardless of the restrictions on the phone being used.

37. Admin Stations shall receive a dial tone upon going off-hook. Outgoing calls are made by dialing the desired stations. Incoming calls can be directed to the telephone or to the associated loudspeaker for a hands-free reply. There shall be an automatic switchover from loudspeaker to private telephone communication should the person pick up his or her handset.

38. The display shall normally show the time of day and day of week, bell schedule name, and the numbers of a minimum of three stations calling-in, along with the call-in status of each station (Normal, Urgent, Emergency). The Admin Station's display shall indicate the station number being dialed from the Admin Station.

39. The display shall also provide user-friendly menu selections to assist the operator when using the Nyquist system. Displays shall be in English for maximum ease-of-use. Systems that require the operator to memorize long lists of operating symbols or control codes shall not be acceptable.

40. Admin Stations shall be programmable for any type of system access, providing or restricting the following CoS options:
    a. Call-in Level
    b. Zone Paging
    c. All-Call Paging
    d. Emergency All-Call
    e. Inter-Facility Call/Page
    f. Audio Distribution
    g. Remote Pickup
    h. Join Conversation
    i. Call Forwarding
    j. Walking Class of Service
    k. External Call Routing
    l. Call Transfer/3-way Calling
    m. Manually Activate Tone Signals
    n. Call Any Station
    o. Manage Recordings
    p. Monitor Calls
    q. Monitor Locations
    r. Conference Admin
    s. Conference User
    t. Voicemail
    u. Record Calls
    v. Activate Alarm Signals
    w. Disable Audio
    x. Enable Audio
    y. Allow Callee Auto-answer
    z. District Paging
    aa. Inter-Facility Features
    bb. Manage Output Contacts
41. Execute RoutinesProgram selection and its distribution or cancellation shall be accomplished from a designated Admin Station with the assistance of the menu display system. Distribution and cancellation shall be to any one or combination of speakers, any Audio Zone or Audio Zones, or All Zones. It shall be possible to provide an unlimited number of program channels for the user to pick from.

    a. It shall be possible via an Admin Station to manually initiate any of the unlimited Normal Tones or Emergency Tones. The Tones shall be separate and distinctly different from the Alarm Tones.

The Tone selected shall be capable of being played one time, continuously until it is canceled, or until the administrative display phone is placed back on-hook.

b. Each Admin Station shall maintain a unique queue of all stations calling that Admin VoIP phone.

42. VoIP Wall Baffle and VoIP Ceiling Speakers shall be configurable as either a VoIP Speaker Only or as a VoIP Speaker with DCS.

    a. The Bogen Nyquist VoIP speakers are powered via PoE. Use an 802.3af compliant PoE network switch port or PoE Injector to power these speakers. One PoE network switch port or PoE Injector is required per VoIP speaker.
    b. VoIP speakers can be equipped with a DCS that can be programmed as a Normal/Emergency, Urgent/Emergency, or Emergency Only and shall be able to initiate an Emergency call by touching the DCS one, two, or three times depending on the CoS and current call state of the DCS. If the station is authorized for Privacy Mode, the users can touch and hold for 4 seconds to enable Privacy Mode or hold for four seconds to disable Privacy Mode. Systems that require mechanical, membrane, or an additional number of switches to initiate an Emergency call, shall not be acceptable.
    c. Emergency Calls from VoIP Speaker with DCS shall have priority over the Normal and Urgent calls in the queue on the Admin Stations and will show up at the top of the list. Systems that do not provide priority for Emergency Call shall not be acceptable.

    d. Normal and Urgent calls shall be logged into queue for the designated Admin Stations.

        1. Admin Stations shall ring for when they receive a call, and then the call will be removed from the queue when the call is answered or when the Admin Queue times out (default is 30 minutes).

    e. Each queue call shall first be sorted by call priority (Emergency, then Urgent, and then Normal). Calls are sorted within each priority level on a first-in, first-out basis. When a call is answered, it shall automatically be removed from the queue. Systems that do not sort calls by priority and order received, shall not be acceptable. The display shall simultaneously show a minimum of three staff calls pending. Additional staff calls beyond three shall be indicated by an arrow pointing down thus prompting the Admin user that additional calls are waiting.
    f. It shall be possible to answer any incoming call simply by picking up the handset while it is ringing. It shall not be necessary to hit any buttons to answer a call unless the call has dropped into the queue.

43. System programming shall be from an authorized Nyquist Admin User via any web browser. A valid username and password shall be required to gain access to the following programmable functions:

    a. System Parameters – Allow installers to adjust core system parameters.
    b. Zones – Allow installers to create and modify Paging, Time, and Audio Zones.
    c. Schedules – Allow installers and administrators to create Bell Schedules for the facility, predefine alternative schedules to run. Holiday Events prevent the bells from ringing on a school holiday. The system shall allow an unlimited number of schedules to operate simultaneous within a facility.
    d. Admin Groups – Allow the installer to create, modify, and delete software groupings of admin phones that can ring when a station calls in with a call switch.
    e. CoS Configuration – Allow the installer to create, modify, and delete CoS groups that can have the following features defined: Call in Level, Zone Paging, All-Call Paging, Emergency All-Call, Inter-Facility Call/Page, Audio Distribution, Remote Pickup, Join Conversation, Call Forwarding, Walking Class of Service, External Call Routing, Call Transfer/3-way Calling, Manually Activate Tone Signals, Call any Station, Manage Recording, Monitor Calls, Monitor Locations, Conference

Admin, Conference User, Voicemail, Record Calls, Activate Alarm Signals, Disable Audio, Enable Audio, Allow Callee Auto-answer, District Paging, Inter-Facility Features, and Execute Routines.

f. Stations – Allow the installer to set up, modify, delete stations, set up Page Exclusion, view stations' status, and add a station.
g. Bridge Devices – Allow the installer to install the Nyquist ASBs.
h. Audio – Allow the installer to upload and manage Announcements, Playlists, Announcements, Songs, and Tones. The must support the uploading of both MP3 and WAV files making Audio file management simple for users. Systems that limit the size of Audio files shall not be considered equal.
i. Users – Allow the installer to manage users by giving them the proper Role and assign an Extension if needed.
j. Roles – Allow the installer to limit user to the following: create, delete, edit, restart server, sort menu, systems update, manage, import/export, restore, settings, or view.
k. Facilities – Allow the installer to set up the district wide facilities for remote paging and calling.
l. Outside Line – allow the installer to set up FXS and FXO ports for inbound and outbound system calling.
m. SIP Trunks – allow the installer to set up SIP trunks into the facility for inbound or outbound calling.
n. Call Details – allow the installer to review the historical system activities that can be used for incident investigation or system troubleshooting.
o. System Backup/Restore – allow the installer to preform system backup or restores and allow the backups to be schedule to run automatically.
p. System Logs – allow the installer to view and export Server, Nyquist-Intercom, and Web Server logs that can be used for trouble shooting and technical assistance.
q. Paging Exclusions – allow the installer to view and edit station that are excluded from paging.
r. Firmware – is used to update Nyquist appliances.
s. Routines – Allow installers to create routines that are a sequence of actions, that the Nyquist system executes as a result of an input trigger. Routines can support crisis plans for situations such as school lockdowns, weather events, or emergency evacuations
t. Alert Filters – Allow installers to select the National Weather Alerts that the facility needs to monitor for such as weather events, earthquakes, tsunami, volcanoes, public health, power outages, and many other emergencies.
u. Help –Provides information about the system, online help topics, and System Administrator Manual.
v. Systems not capable of supporting web-based configuration and control, or require plugins or dedicated application software, shall not be deemed as equal.
w. Systems that require a Serial-to-Ethernet converter, or require additional application software on a PC for configuration and/or control shall not be deemed as equal.

44. Admin Groups

45. Admin Stations can be placed into Admin Groups, which are used if incoming calls are not answered by the assigned Admin Station or the Day or Night Admin associated with the Admin Station. Admin Groups act as an always answer feature by providing an alternate list of Admin Stations. If an incoming call is not answered by the assigned Admin Station within 30 seconds for normal calls or 15 seconds for emergency calls, all Admin Stations in the Admin Group will ring.

46. If Call Forwarding is enabled at the Admin Station, Nyquist tries the forwarded extension. If that station does not answer or is busy, the call timeout is reduced to 15 seconds. After 15 seconds, the call rolls over to the Admin Group.

47. If an Emergency level call receives no answer, the Admin Group will ring if the Day Admin or Night Admin does not answer.

48. Admin Stations can be assigned to multiple Admin Groups. A Day or Night Admin can also be assigned to one or more Admin Groups.

49. Call Detail Reporting

    a. The Call Details feature allows the viewing and/or printing of detail records of every call in a facility in a call log format. Calls include scheduled announcements, paging, and internally and externally made or received telephone calls.

50. System Backup/Restore

    a. The system backup feature allows users with access to back up the system database, voicemail, and recordings.
    b. The system restore allows users with access to perform a system restore of previously backed up database, voicemail, and/or recordings.
    c. The installer also can set up an automatic backup that can be performed daily, weekly, or monthly.

51. System Log Files

    a. A log file records either events or messages that occur when software runs and is used when troubleshooting the system. The following parts of the Nyquist system generate log files:

        1. Server (This provides access to the Debian Linux OS server log files.)
        2. Intercom (This provides access to the Intercom application server log files
        3. Web Server (This provides access to the web server log files.)

    b. From the web-based UI, system logs can be viewed directly or exported via download to a PC, Mac, or Android device and then copied to removable media or attached to an email to technical support.

52. Paging Exclusions

    a. For school testing and exams, the administrators shall be able to put stations into Page Exclusion mode. During this time, the stations will only receive Emergency All-Call pages – not music, tones, or All-Calls. Emergency pages will still be heard at the station even if that station is set to exclude paging.

53. Firmware

    a. Installers can manage the available firmware. Because the Nyquist E7000 is constantly evolving and changing new versions of firmware will become available and the Firmware section allow installers or authorized users the ability to upload, check for updates, or configure the system to automatically download new firmware for later installation. Systems that can't automatically check for new software are not considered equivalent.

54. Routines are designed to automatically launch a procedure, or sequence of actions, that the Nyquist system executes as a result of an input trigger.

55. Some of the events (triggered by dashboard, IP Phone, I/O Controller contact, or Routines API) that can be created are as follows:

a. Lockdown Routines
b. Emergency Evacuation Routines
c. Fire Alarm Routines
d. Weather Alert Routines

56. As you can see the power of Routines can support your facilities crisis plans for situations such as lockdown, lockout, weather events, or emergency evacuations.

57. Alert Filters Configuration - The Common Alerting Protocol (CAP) is an international standard format for emergency alerting and public warning. It is designed for all hazards related to weather events, earthquakes, tornado, tsunami, volcanoes, public health, power outages, and many other emergencies.

58. CAP elements and values are used when configuring alert filters for your Nyquist system. This part of the configuration allows installers to select or “Enable” or disable the filters needed for each facility. This filtered information can then be displayed on the NQ-GA10PV through the campus.

59. The growing list of information that can currently be displayed are as follows: 911 Telephone Outage, Administrative Message, Air Quality Alert, Air Stagnation Advisory, Arroyo And Small Stream Flood Advisory, Ashfall Advisory, Ashfall Warning, Avalanche Advisory, Avalanche Warning, Avalanche Watch, Beach Hazards Statement, Blizzard Warning, Blizzard Watch, Blowing Dust Advisory, Blowing Dust Warning, Brisk Wind Advisory, Child Abduction Emergency, Civil Danger Warning, Civil Emergency Message, Coastal Flood Advisory, Coastal Flood Statement, Coastal Flood Warning, Coastal Flood Watch, Dense Fog Advisory, Dense Smoke Advisory, Dust Advisory, Dust Storm Warning, Earthquake Warning, Evacuation - Immediate, Excessive Heat Warning, Excessive Heat Watch, Extreme Cold Warning, Extreme Cold Watch, Extreme Fire Danger, Extreme Wind Warning, Fire Warning, Fire Weather Watch, Flash Flood Statement, Flash Flood Warning, Flash Flood Watch, Flood Advisory, Flood Statement, Flood Warning, Flood Watch, Freeze Warning, Freeze Watch, Freezing Fog Advisory, Freezing Rain Advisory, Freezing Spray Advisory, Frost Advisory, Gale Warning, Gale Watch, Hard Freeze Warning, Hard Freeze Watch, Hazardous Materials Warning, Hazardous Seas Warning, Hazardous Seas Watch, Hazardous Weather Outlook, Heat Advisory, Heavy Freezing Spray Warning, Heavy Freezing Spray Watch, High Surf Advisory, High Surf Warning, High Wind Warning, High Wind Watch, Hurricane Force Wind Warning, Hurricane Force Wind Watch, Hurricane Local Statement, Hurricane Warning, Hurricane Watch, Hydrologic Advisory, Hydrologic Outlook, Ice Storm Warning, Lake Effect Snow Advisory, Lake Effect Snow Warning, Lake Effect Snow Watch, Lake Wind Advisory, Lakeshore Flood Advisory, Lakeshore Flood Statement, Lakeshore Flood Warning, Lakeshore Flood Watch, Law Enforcement Warning, Local Area Emergency, Low Water Advisory, Marine Weather Statement, Nuclear Power Plant Warning, Radiological Hazard Warning, Red Flag Warning, Rip Current Statement, Severe Thunderstorm Warning, Severe Thunderstorm Watch, Severe Weather Statement, Shelter In Place Warning, Short Term Forecast, Small Craft Advisory, Small Craft Advisory For Hazardous Seas, Small Craft Advisory For Rough Bar, Small Craft Advisory For Winds, Small Stream Flood Advisory, Snow Squall Warning, Special Marine Warning, Special Weather Statement, Storm Surge Warning, Storm Surge Watch, Storm Warning, Storm Watch, Test, Tornado Warning, Tornado Watch, Tropical Depression Local Statement, Tropical Storm Local Statement, Tropical Storm Warning, Tropical Storm Watch, Tsunami Advisory, Tsunami Warning, Tsunami Watch, Typhoon Local Statement, Typhoon Warning, Typhoon Watch, Urban And Small Stream Flood Advisory, Volcano Warning, Wind Advisory, Wind Chill Advisory, Wind Chill Warning, Wind Chill Watch, Winter Storm Warning, Winter Storm Watch, and Winter Weather Advisory.

60. Systems that are not capable of displaying National Weather Service CAP information to give advanced warning to facilities shall not be considered equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions, with the installer present, for compliance with requirements and other conditions affecting the performance of the Nyquist E7000 Series Educational System.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.02 EQUIPMENT MANUFACTURER'S REPRESENTATIVE

A. All work described herein to be done by the manufacturer's authorized representative shall be provided by a documented factory authorized representative of the basic line of equipment to be utilized.

B. As further qualification for bidding and participating in the work under this specification, the manufacturer's representative shall hold a valid C-10 Contractor's License issued by the Contractor's State License Board of [your state]. The manufacturer's representative shall have completed at least 10 projects of equal scope, giving satisfactory performance, and shall have been in the business of furnishing and installing sound systems of this type for at least five years. The manufacturer's representative shall be capable of being bonded to ensure the owner of performance and satisfactory service during the guarantee period.

C. The manufacturer's representative shall provide a letter with submittals from the manufacturer of all major equipment stating that the manufacturer's representative is an authorized distributor. This letter shall also state that the manufacturer guarantees service performance for the life of the equipment and that there will always be an authorized distributor assigned to service the area in which the system has been installed.

D. The contractor shall furnish a letter from the manufacturer of the equipment. This letter shall certify that the equipment has been installed according to factory intended practices, that all the components used in the system are compatible, and that all new portions of the systems are operating satisfactorily. Further, the contractor shall furnish a written unconditional guarantee, guaranteeing all parts and all labor for a period of five years after final acceptance of the project by the owner.

3.03 DIVISION OF WORK

A. While all work included under this specification is the complete responsibility of the contractor, the following division of actual work listed shall occur:

B. The conduit, outlets, terminal cabinets, etc., which form part of the rough-in work, shall be furnished and installed completely by the electrical contractor.

C. The balance of the system, including installation of speakers and equipment, making all connections, etc., shall be performed by the manufacturer's authorized representative. The entire responsibility of the system, its operation, function, testing and complete maintenance for one year after final acceptance of the project by the owner, shall also be the responsibility of the manufacturer's authorized representative.

3.04 INSTALLATION

A. The installation, adjustment, testing, and final connection of all conduit, wiring, boxes, cabinets, etc., shall conform to local electrical requirements and shall be sized and installed in accordance with the manufacturer's approved shop drawings.

B. Low-voltage wiring may be run exposed above ceiling areas where they are easily accessible.

C. The contractor shall install the new system at the location shown on the plans.

D. All Staff Stations and Call Switches shall be wall-mounted:

1. Mount at 54" AFF.
2. All wiring should be concealed.
3. Verify exact location with architect.
4. Avoid mounting near doors to prevent students from activating and running out of the rooms.

E. Admin Stations can be desk or wall mounted.

F. Speaker and telephone lines run above ceiling and not in conduit shall be tie-wrapped to a ceiling joist with a maximum spacing of 8' between supports. No wires shall be laid on top of ceiling tile.

G. Connect field cable to each Analog Speaker transformer using UL butt splices for #22 AWG wire.

H. Contractor shall provide a minimum of eight hours of configuration and operational instruction to school personnel.

I. On the first school day following installation of the Nyquist System, the contractor shall provide a technician to stand by and assist in system operation.

J. Mark and label all demarks IDF and MDF points with destination point numbers. Rooms with more than one outlet shall be marked XXX-1, XXX-2, XXX-3, etc. where XXX is the room number.

K. No graphic room number shall exceed the sequence from 000001 through 899999.

1. All outside speakers shall be on a separate Page Zone and Time Zone.
2. All zones shall be laid out not to exceed 40 Watts (@25V) maximum per zone.
3. All hallway speakers shall be tapped at 1 Watt (@25V) maximum.
4. All outside horns shall be tapped at 3.75 Watts (@25V) maximum.
5. All classroom speakers shall be tapped at ½ Watt (@25V) maximum.
6. Large rooms, such as cafeterias, shall be tapped at 2 Watts (@25V) maximum.

L. Plug disconnect: All major equipment components shall be fully pluggable by means of multi-pin receptacles and matching plugs to provide for ease of maintenance and service.

M. Protection of cables: Cables within terminal cabinets, equipment racks, etc., shall be grouped and bundled (harnessed) as to type and laced with No. 12 cord waxed linen lacing twine or T and B wire-ties, or hook and loop cable management. Edge protection material shall be installed on edges of holes, lips of ducts, or any other point where cables or harnesses cross a metallic edge.

N. Cable identification: Cable conductors shall be color-coded and individual cables shall be individually identified. Each cable identification shall have a unique number located approximately 1-1/2" from cable connection at both ends of cable. Numbers shall be approximately 1/4" in height. These unique numbers shall appear on the As-Built Drawings.

O. Shielding: Cable shielding shall be capable of being connected to common ground at point of lowest audio level and shall be free from ground at any other point. Cable shields shall be terminated in the same manner as conductors.

P. Provide complete “in service" instructions of system operation to school personnel. Assist in programming of telephone system.

3.05 GROUNDING

A. The contractor shall provide equipment grounding connections for Integrated Telecommunications/Time/Audio/Media System as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to ensure permanent and effective grounds.

B. The contractor shall provide ground equipment, conductor, and cable shields to eliminate shock hazard and to minimize the greatest extent possible, ground loops, common mode returns, noise pickup, cross talk, and other impairments.

C. The contractor shall provide all necessary transient protection on the AC power feed and on all station lines leaving or entering the building.

D. The contractor shall note on their drawings the type and locations of these protection devices and all wiring information.

E. The contractor shall furnish and install a dedicated, isolated earth ground from the central equipment rack and bond to the incoming electrical service ground buss bar.

4.01 DOCUMENTATION

A. Provide the following directly to the Supervisor of Technology Services.

1. One printed copy of all field programming for all components in system
2. One copy of all diagnostic software with a copy of field programming data for each unit
3. One copy of all field wiring runs, location, and end designation of system

END OF SECTION

ABBREVIATIONS

NOT ALL ABBREVIATIONS MAY BE USED

&	AND
@	AT
ACT	ACOUSTICAL CEILING TILE
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
ALT	ALTERNATE
AL / ALUM	ALUMINUM
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
BD	BOARD
BLDG	BUILDING
BLK	BLOCK(ING)
BO	BOTTOM OF
BRG	BEARING
BSMT	BASEMENT
BS	BOTH SIDES
BW	BOTH WAYS
CAB	CABINET
CB	CATCH BASIN
CCSA	CUSTOM COLOR SELECTED BY ARCHITECT
CG	CORNER GUARD
CHAM	CHAMFER
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CM	CONSTRUCTION MANAGER
COL	COLUMN
COMP	COMPUTER
CONC	CONCRETE
CONT	CONTINUOUS
CMU	CONCRETE MASONRY UNIT
CSBA	COLOR SELECTED BY ARCHITECT
CT	CERAMIC TILE
D	DEPTH
DB	DECK BEARING
DBL	DOUBLE
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DRN	DRAIN
DTL/DET	DETAIL
DW	DISHWASHER
DWG	DRAWING
E	EAST
(E)	EXISTING
EA	EACH
EIFS	EXTERIOR INSULATION SYSTEM
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EVAP	EVAPORATIVE
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
EWC	ELECTRIC WATER COOLER
FA	FIRE ALARM
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FG	FINISH GRADE
FH	FIRE HYDRANT
FIN	FINISHED
FLR	FLOOR
F.O.	FACE OF
FT	FOOT, FEET
FRP	FIBER REINFORCED PANEL
FRT	FIRE RETARDANT TREATED WOOD
FTG	FOOTING
FV	FIELD VERIFY
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GFRC	GLASSFIBER REINFORCED PANEL
GYP	GYPSUM
GWB	GYPSUM WALLBOARD
HB	HOSE BIB
HC	HANDICAP ACCESSIBLE
HDW	HARDWARE
HDF	HIGH DENSITY FIBERBOARD
HM	HOLLOW METAL
H	HEIGHT
HOR	HORIZONTAL
ID	INSIDE DIAMETER
ICF	INSULATED CONCRETE FORM
IN	INCH
INCL	INCLUDE
INFO	INFORMATION
INT	INTERIOR
INSUL	INSULATE, (D), (ION)
INV	INVERT
JST	JOIST
JT	JOINT
LAV	LAVATORY
LB / LBS	POUND (S)
MAT	MATERIAL (S)
MAX	MAXIMUM
MDF	MEDIUM DENSITY
MECH	MECHANICAL
MEMB	MEMBRANE
MEZZ	MEZZANINE
MFR	MANUFACTURER
MGR	MANAGER
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELANEOUS
MO	MASONRY OPENING
MTD	MOUNT (ED)
MTL	METAL
MW	MICROWAVE
N	NORTH
NIC	NOT IN CONTRACT
NO.	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED/ CONTRACTOR INSTALLED
OFD	OVERFLOW DRAIN
OH	OVERHEAD
OPG	OPENING
OPP	OPPOSITE
OSB	ORIENTED STRAND BOARD
OZ	OUNCE
PERI	PERIMETER
PERM	PERMANENT
PL	PLATE
PLAM	PLASTIC LAMINATE
PNL	PANEL
PNT	PAINT (ED)
P.O.	POINT OF
PR	PAIR
PT	POST TENSIONED
PART	PARTITION
PLY	PLYWOOD
QT	QUARRY TILE
R / RAD	RADIUS
RCP	REFLECTED CEILING PLAN
REC	RECESSED
REF	REFERENCE
REFG	REFRIGERATOR
REINF	REINFORCE (ED)
REM	REMOVE (ED)
REPL	REPLACE
REQD	REQUIRED
REV	REVISION (S)
RM	ROOM
RO	ROUGH OPENING
S	SOUTH
SALV	SALVAGE (ED)
SECT	SECTION
SF	SQUARE FOOT
SIM	SIMILAR
SLNT	SEALANT
SPEC	SPECIFICATION (S)
SQ	SQUARE
SS	STAINLESS STEEL
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUC	STRUCTURE (AL)
SUSP	SUSPENDED
SYM	SYMMETRY (ICAL)
T	THICKNESS
T & B	TOP AND BOTTOM
T & G	TONGUE AND GROOVE
TBD	TO BE DETERMINED
TEMP	TEMPORARY
THRU	THROUGH
T.O.	TOP OF
TRANS	TRANSFORMER
TS	TUBE STEEL
TYP	TYPICAL
UNF	UNFINISHED
UNO	UNLESS OTHERWISE NOTED
VAR	VARIES
VB	VAPOR BARRIER
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VWC	VINYL WALL COVERING
W	WEST
W	WIDTH
W/	WITH
WC	WATER CLOSET
WD	WOOD
W/O	WITHOUT
WSCT	WAINSCOT
WWF	WELDED WIRE FABRIC

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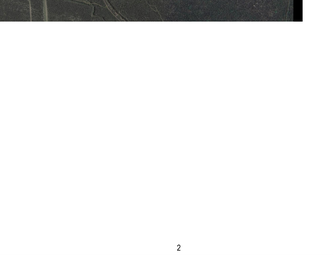
SHEET NUMBERING + NAMING



THIS IS A QUICK REFERENCE GUIDE TO THE SHEET NUMBERING AND NAMING SYSTEM USED IN VCBO CONSTRUCTION DOCUMENTS.

PLAN TYPE
.0 SLAB PLAN
.1 ANNOTATED PLAN
.2 DIMENSION + WALL TYPE PLAN
.3 FINISH PLAN
.4 REFLECTED CEILING PLAN

SEQUENCE
DENOTES AREA SEQUENCE IN PLAN, AND NUMERIC SEQUENCE IN NON-PLAN SHEETS

LEVEL
DENOTES LEVEL IN A MULTI-STORY BUILDING. ALSO BECOMES A SEQUENCE NUMBER DENOTING DIVISIONS IN NON-PLAN SHEETS

SHEET TYPE SEQUENCE
0 GENERAL NOTES + LEGENDS
1 FLOOR PLANS
2 ELEVATIONS
3 SECTIONS
4 ENLARGED PLANS, ELEVATIONS, SECTIONS
5 DETAILS
6 DOOR, WINDOW, OTHER SCHEDULES
7 SIGNAGE
8 USER DEFINED
9 3D DRAWINGS + PERSPECTIVES

VICINITY MAP

REFERENCE SYMBOL LEGEND

BUILDING SECTION
WALL SECTION NUMBER
SIM
DIRECTION OF VIEW
SHEET WHERE DRAWN

LAYOUT GRID LINES
GRID IDENTIFICATION

WALL SECTION
WALL SECTION NUMBER
SIM
DIRECTION OF VIEW
SHEET WHERE DRAWN

DETAIL SECTION
ELEVATION NUMBER AND DIRECTION
SIM
SHEET WHERE DRAWN

INTERIOR ELEVATION
ELEVATION NUMBER AND DIRECTION
SHEET WHERE DRAWN

LEVEL LINE
SECOND LEVEL
116' - 0"

DETAIL REFERENCE
DETAIL NUMBER
SHEET WHEN DRAWN, HYPEN INDICATES DETAIL ON SAME SHEET

ROOM NAME AND NUMBER
ROOM NAME
101

WALL TYPE MARK
CONSTRUCTION TYPE - BY CSI DIVISION
WALL TYPE
5A6 - 1
FIRE RATING
NOMINAL SIZE
SEE WALL TYPE SHEET FOR ADDITIONAL INFORMATION

DRAWING TAGS

REVISIONS TAG
REVISION NUMBER

CEILING TAG
CEILING TYPE
X - X"
CEILING HEIGHT

WINDOW TAG
WINDOW MARKER

FLOOR TRANSITIONS MARKER
TRANSITION SYMBOL

ELEVATION MARKER

FINISH TAG
NAME T: W?
R: W?
B? B: W?
F? F: L: W?

SHEET SYMBOLS

DRAWING TITLE
SCALE:
BASIC DRAWING TITLE

PROJECT NORTH

MATCH LINE

GENERAL NOTES

1. IT IS THE CONTRACTORS RESPONSIBILITY TO REVIEW AND COORDINATE THE WORK OF ALL SUB-CONTRACTORS, TRADES AND SUPPLIERS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BEFORE COMMENCING CONSTRUCTION, AND TO ASSURE THAT ALL PARTIES ARE AWARE OF ALL REQUIREMENTS, REGARDLESS OF WHERE THE REQUIREMENTS OCCUR IN THE CONTRACT DOCUMENTS, WHICH MIGHT AFFECT THE WORK OF THAT PARTY.
2. AS PART OF THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK OF ALL SUB-CONTRACTORS, TRADES AND SUPPLIERS, THE CONTRACTOR SHALL ENDEAVOR TO IDENTIFY AND NOTIFY THE ARCHITECT OF ANY CONFLICTS BETWEEN THE WORK OF DIFFERENT PARTIES AT THE EARLIEST POSSIBLE DATE SO AS TO ALLOW REASONABLE AND ADEQUATE TIME FOR THE CONFLICT TO BE RESOLVED WITHOUT DELAYING THE WORK. ALL DEVIATIONS FROM THAT WHICH IS REQUIRED BY THE CONTRACT DOCUMENTS MUST BE APPROVED IN ADVANCE BY THE ARCHITECT.
3. THE ARCHITECTURAL DRAWINGS ESTABLISH AND COORDINATE THE FINISHED APPEARANCE AND EXACT LOCATION OF ALL EXPOSED ELEMENTS OF THE WORK OF ALL THE TRADES, INCLUDING THAT WORK WHICH IS ILLUSTRATED PRIMARILY ON DRAWINGS OF OTHER DISCIPLINES. QUANTITIES ARE TO BE PROVIDED AS SHOWN ON DRAWINGS OF OTHER DISCIPLINES BUT LOCATIONS SHOWN ON OTHER DRAWINGS ARE SCHEMATIC, UNLESS OTHERWISE NOTED ON THE ARCHITECTURAL DRAWINGS. THE ARCHITECTURAL DRAWINGS TAKE PRECEDENCE FOR THE FINISHED APPEARANCE AND EXACT LOCATION OF ALL PARTS OF THE WORK.
4. EXCEPT WHERE DIRECTED TO PLACE ITEMS OF WORK AT THE APPROXIMATE LOCATION SHOWN; DO NOT SCALE DRAWINGS FOR DIMENSIONAL INFORMATION. ALL ELEMENTS OF THE DRAWINGS MAY NOT BE DRAWN TO EXACT SCALE. ALL DIMENSIONS REQUIRED ARE SHOWN OR MAY BE DERIVED FROM THOSE SHOWN ON THE FLOOR PLANS, DETAIL PLANS, ELEVATIONS, SECTIONS, DETAILS, SCHEDULES AND SPECIFICATIONS. IF DIMENSIONS ARE NOT PRESENT, THE ARCHITECT IS TO BE NOTIFIED SO THAT A CLARIFICATION CAN BE ISSUED.
5. CONTRACTOR TO FOLLOW CURRENT ANSI 117-1 STANDARDS AS REPRESENTED ON SHEET G301, GENERAL ACCESSIBILITY GUIDELINES. NOTIFY ARCHITECT IF THE DESIGN DRAWINGS CONFLICT WITH THIS SHEET.

DEFERRED SUBMITTALS

CONTRACTOR IS RESPONSIBLE TO SUBMIT DEFERRED SUBMITTALS IN ACCORDANCE WITH IBC 107.3.4.2. AS PART OF THE SUBMITTAL PROCESS, THE CONTRACTOR IS TO SUBMIT ALL ICC ERS REPORTS FOR ITEMS NOTED.

- METAL FABRICATIONS (STAIRS AND LADDERS)
- ALUMINUM CURTAIN WALLS
- SUSPENDED CEILING SYSTEMS
- CUSTOM SUSPENDED MILLWORK
- MECHANICAL SEISMIC RESTRAINTS
- FIRE ALARM SYSTEMS
- ELECTRICAL SEISMIC RESTRAINTS
- FIRE PROTECTION PER 107.2.2
- ROOFING MATERIALS

SHEET INDEX

NOTES TO BIDDERS

1. THIS SHEET CONTAINS A LIST OF DRAWINGS WHICH COMPRISE A FULL SET OF DRAWINGS FOR THIS PROJECT. ANY CONTRACTOR, SUBCONTRACTOR, VENDOR OR ANY OTHER PERSON PARTICIPATING IN OR BIDDING ON THIS PROJECT SHALL BE RESPONSIBLE FOR THE INFORMATION CONTAINED IN ANY AND ALL SHEETS OF DRAWINGS AND SPECIFICATIONS. IF ANY PERSON, PARTY OR ENTITY ELECTS TO SUBMIT BIDS FOR ANY PORTION, OR ALL, OF THIS PROJECT, THAT PERSON, PARTY OR ENTITY SHALL BE RESPONSIBLE FOR ANY AND ALL INFORMATION CONTAINED IN THESE DRAWINGS AND SPECIFICATIONS, INCLUDING, BUT NOT LIMITED TO, ANY SUBSEQUENT ADDENDUMS OR CLARIFICATIONS THAT MAY BE ISSUED.
2. THESE DOCUMENTS SHOW THE DESIGN INTENT. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE EVERYTHING SHOWN ON THE DRAWINGS OR SPECIFIED REGARDLESS OF WHERE IT IS SHOWN ON THE DRAWINGS OR IN THE SPECIFICATIONS. FOR EXAMPLE; SOME MILLWORK DETAILS HAVE STEEL FRAMES WHICH MAY BE PROVIDED BY DIVISION 05 OR WITH THE MILLWORK AT THE CONTRACTOR'S DISCRETION, BUT IT SHALL BE PROVIDED AS PART OF THE CONTRACT.
3. EVERYTHING CALLED FOR IN THESE DOCUMENTS SHALL BE "NEW" AND PROVIDED BY THE CONTRACTOR, SUBCONTRACTOR, VENDOR OR ANY OTHER PERSON PARTICIPATING IN OR BIDDING ON THIS PROJECT UNLESS NOTED OTHERWISE AS EXISTING (EXIST), NOT IN CONTRACT (NIC) OR FOR REFERENCE ONLY. FURNISHINGS SHOWN DASHED SHALL BE FOR REFERENCE ONLY.

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GENERAL INFORMATION + INDEX

G001

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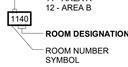
KEYED NOTES

230.0	EXISTING CARD READER, PROTECT & REPAIR AS NEEDED
615.0	ADJUSTABLE SHELVING SEE DETAILS D1/A570
616.0	COUNTERTOP, PLASTIC LAMINATE
621.0	24" ADJUSTABLE SHELVING, 3SHELVES, U.N.O
914.0	TACKABLE WALL SYSTEM
1002.0	192"X48" WALL MOUNTED MARKER BOARD
1105.0	PROJECTOR, CEILING MOUNTED, WITH MOUNT, OWNER PROIVDED, CONTRACTOR INSTALLED
2200.0	SINK + FAUCET
2609.0	ADA DOOR ACTUATOR
2803.0	SECURITY ACCESS CARD READER

GENERAL FINISH NOTES

1. PROVIDE EPOXY PAINT AT ALL RESTROOMS, SHOWERS, LOCKER ROOMS AND JANITOR CLOSETS.
2. ALL PAINTED STEEL BRACING AND COLUMNS TO BE PAINTED, UNLESS NOTED OTHERWISE.
3. AT SOFFITS RECEIVING COLOR - PAINT ALL SIDES OF SOFFIT.
4. ALL METAL GUARDRAILS AND STAIR STRINGERS TO BE PAINTED SEE FINISH SCHEDULE FOR H.M. DOOR AND FRAME PAINT COLORS.
5. ALL EXPOSED CEILINGS TO BE PAINTED. REFER TO REFLECTED CEILING PLANS.
6. ALL FLOOR TRANSITIONS TO BE LOCATED AT CENTER OF DOOR, U.N.O. ALL FLOOR TRANSITIONS AT FLOOR TILE (T1) LOCATIONS TO BE LOCATED AT INSIDE CORNER OF DOOR.
7. PROVIDE FLOOR FINISH 'RT: RUBBER STAIR TREAD' AT STAIR TREADS AND LANDING.
8. PROVIDE A SMOOTH TRANSITION AT ALL FLOOR MATERIALS - CONTRACTOR TO INSTALL ALL FLOOR FINISHES AT SAME LEVEL, DESPITE DIFFERENT THICKNESS. PROVIDE FLOOR TRANSITION WHERE OCCURS.
9. SEE SHEET AXXX FOR FLOORING TRANSITION DETAILS.
10. SEE ELEVATION SHEETS FOR ALL WALL TILE PATTERNS.
11. PROVIDE TILE 4"X4" CERAMIC WALL TILE AT ALL JANITOR SINKS UNLESS NOTED OTHERWISE. PROVIDE TILE BULLNOSE TO FINISH OFF ALL EXPOSED EDGES.
12. ALL WALLS RECEIVING TILE WAINSCOT TO RECEIVE PAINT P1 ABOVE, U.N.O. SEE FINISH PLANS FOR ACCENT WALL LOCATIONS.
13. ALL GROUT JOINTS TO BE NO LARGER THAN 1/8".
14. PROVIDE 'CG: CORNER GUARD' AT ALL LOCATIONS WHERE TILE WAINSCOT WRAPS GYP. BD. CORNERS. CAP ALL TILE WAINSCOT WITH SCHLUTER STRIP (SL).
15. AT ALL TILE WAINSCOT, SCRIBE BOTTOM TILE TO MATCH FINISH FLOOR SURFACE AND CAULK WITH BASE 'NB'.
16. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION OF MILLWORK.
17. COORDINATE ALL MILLWORK WITH APPLIANCES BEFORE FABRICATION.
18. ALL COUNTERTOP, BACKSPLASHES, AND EDGE BANDING TO HAVE COORDINATING FINISHES.
19. ALL WOOD TRIM TO BE STAINED TO MATCH DOOR STAIN.

ROOM NUMBERING GUIDE



PLAN NOTES

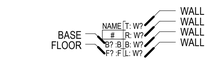
1. WHERE FLOOR DRAINS ARE INSTALLED THE FLOOR IS TO SLOPE TO THE DRAIN. THE MAXIMUM SLOPE IS NOT TO EXCEED 2% WHILE THE MINIMUM SLOPE IS NOT TO BE LESS THAN 1%.
2. WHERE CONCRETE PADS ARE CALLED TO BE CONSTRUCTED UNDER EQUIPMENT THE SLAB IS TO BE 6" THICK, & EXTEND 6" BEYOND EDGE OF EQUIPMENT, U.N.O., AND IS TO HAVE #4 BARS AT 16" O.C. EACH WAY & DOWELED INTO PRIMARY STRUCTURAL SLAB. COORDINATE DIMENSIONS OF PAD WITH ACTUAL EQUIPMENT SPEC.
3. SEE SHEET A505 FOR TYPICAL FLOORING TRANSITION DETAILS.
4. THE CONTRACTOR IS TO ENSURE THAT BETWEEN ANY FINISH FLOOR ELEVATION TO 34" A.F.F. ALL GUARDRAILS ARE TO BE CONSTRUCTED AND INSTALLED SO THAT A 4" SPHERE WILL NOT PASS BETWEEN ANY TWO ADJACENT GUARDRAIL COMPONENTS OR BETWEEN THE EDGE OF A GUARDRAIL AND ALL ADJACENT BUILDING ELEMENT SUCH AS A WALL OR FLOOR. AN 8" DIAMETER SPHERE IS NOT TO PASS BETWEEN THE ABOVE MENTIONED COMPONENTS AND ELEMENTS FROM AN ELEVATION 34" A.F.F. AND HIGHER.
5. SEE D2/A520 AND D4/A520 FOR TYPICAL FIRE EXTINGUISHER CABINET INSTALLATION DETAILS.
6. WHERE SHOWN, ALL FURNITURE SHOWN DASHED IS FOR REFERENCE ONLY. SEE PLANS AND SPECIFICATIONS FOR ANY BASE CONTRACT FURNITURE TO BE PROVIDED UNDER THIS CONTRACT.
7. ALL EXPOSED STRUCTURAL STEEL, PIPING, DUCTWORK, ETC. THAT IS EXPOSED TO VIEW SHALL BE FULLY PAINTED. REFER TO FINISH SCHEDULE FOR COLOR SELECTION.
8. ALL CONDUIT AND PIPING THAT PENETRATES A CONCRETE SLAB SHALL BE GROUPED TOGETHER AND SHALL RECEIVE A 6" TALL CONCRETE CURB TO ACCOMMODATE FLOOR AND BASE FINISHES, TYP. CONCRETE TO BE A GROUT MIX TO FACILITATE FILLING TIGHT SPACES AROUND PIPES AND CONDUIT.

GENERAL PLAN LEGEND

HALF-TONE LINE DENOTES ITEMS TO REMAIN

AREA TO REMAIN UNDISTURBED DURING CONSTRUCTION

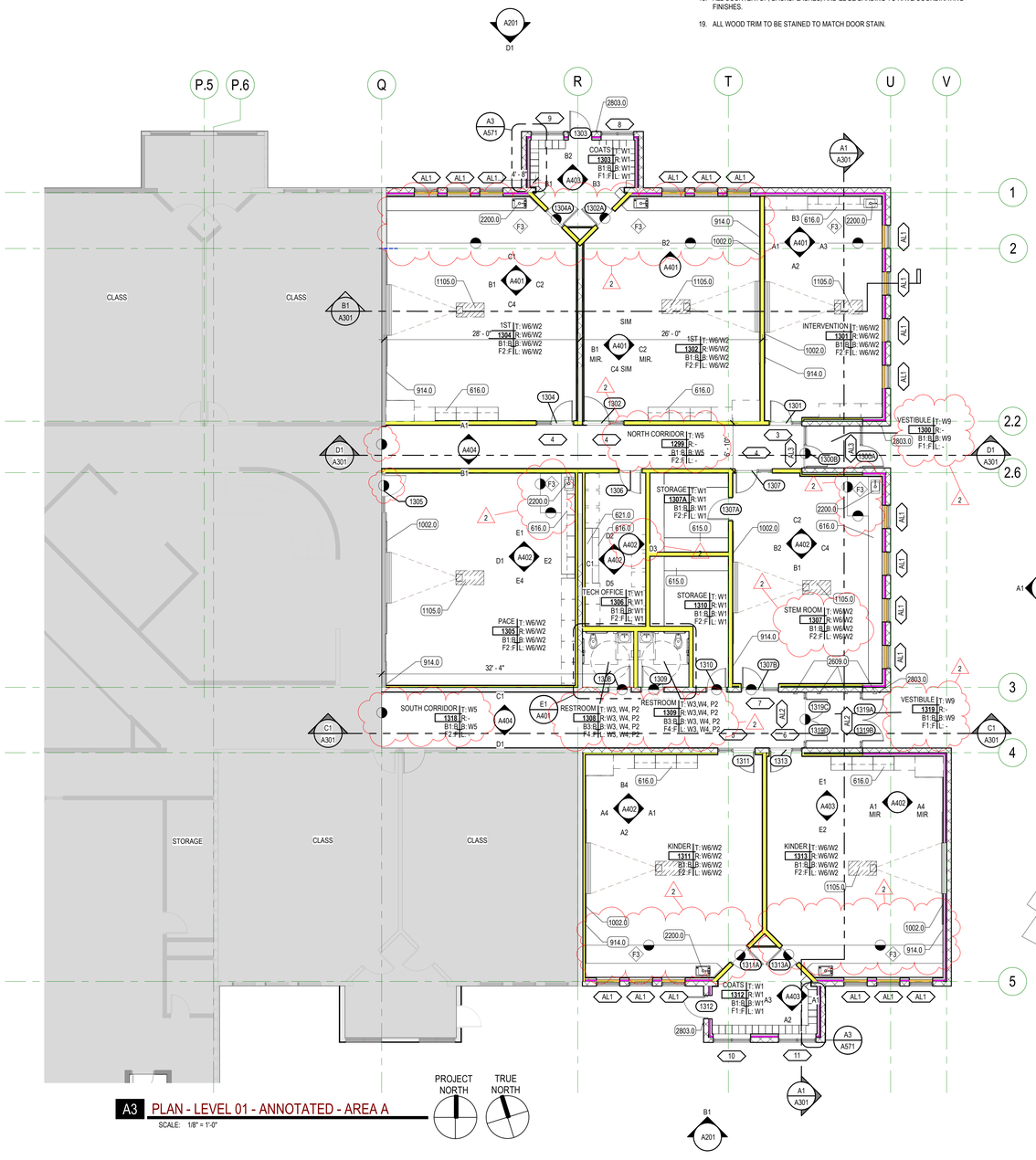
FINISH PLAN SYMBOLS

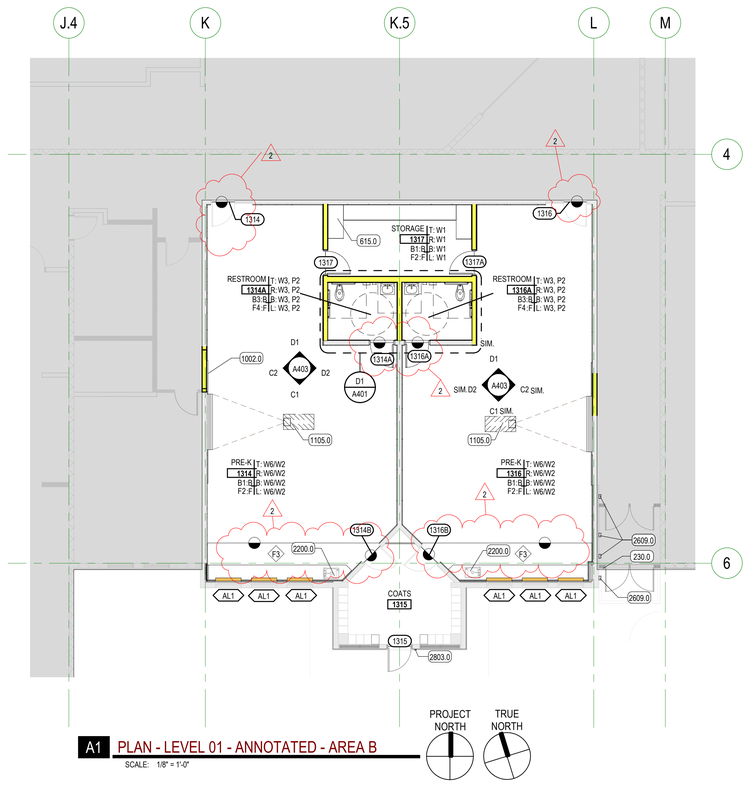


SINGLE FINISH SYMBOLS INDICATE WHERE FINISHES ARE DIFFERENT FROM GENERAL ROOM FINISHES, OR PROVIDE ADDITIONAL FINISH INFORMATION

CHANGE AT FLOOR MATERIAL

SIGNAGE TAG- SEE SIGNAGE SHEETS FOR DETAILS





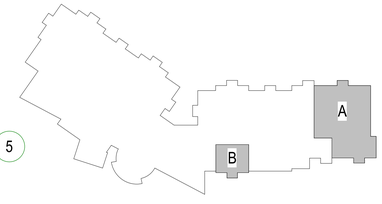
A1 PLAN - LEVEL 01 - ANNOTATED - AREA B

SCALE: 1/8" = 1'-0"

A3 PLAN - LEVEL 01 - ANNOTATED - AREA A

SCALE: 1/8" = 1'-0"

KEY PLAN



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ANNOTATED + FINISH PLAN- LEVEL 01

A111.1

DIMENSION NOTES

1. ALL DIMENSIONS ARE TO CENTER OF STUD WALL OR FACE OF CONCRETE, MASONRY OR ROUGH OPENING UNLESS NOTED OTHERWISE. WHERE THE END OF A WALL IS INDICATED THE DIMENSION IS TO THE FINISH SURFACE OF THE WALL END.
2. UNLESS DIMENSIONED OTHERWISE, THE DIMENSION FROM THE BUCK OF A DOOR FRAME IS TO BE 4" TO THE WALL CORNER.
3. EXCEPT WHERE DIRECTED TO PLACE ITEMS OF WORK AT THE APPROXIMATE LOCATION SHOWN, DO NOT SCALE DRAWINGS FOR DIMENSIONAL INFORMATION. ALL ELEMENTS OF THE DRAWINGS MAY NOT BE DRAWN TO EXACT SCALE. ALL DIMENSIONS REQUIRED ARE SHOWN OR MAY BE DERIVED FROM THOSE SHOWN ON THE FLOOR PLANS, DETAIL PLANS, ELEVATIONS, SECTIONS, DETAILS, SCHEDULES AND SPECIFICATIONS. IF DIMENSIONS ARE NOT PRESENT, THE ARCHITECT IS TO BE NOTIFIED SO THAT A CLARIFICATION CAN BE ISSUED.
4. SMOKE AND FIRE RATED WALLS SHALL PERMANENTLY BE IDENTIFIED WITH SIGNS OR STENCILING IN THE CONCEALED SPACE. SUCH IDENTIFICATION SHALL: BE LOCATED WITHIN 15 FEET OF THE END OF EACH WALL AND AT INTERVALS NOT EXCEEDING 30 FEET MEASURED HORIZONTALLY ALONG THE WALL OR PARTITION; INCLUDE LETTERING NOT LESS THAN 3 INCHES IN HEIGHT WITH A MINIMUM 3/8-INCH STROKE IN A CONTRASTING COLOR INCORPORATING THE WORDING, "FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS"

KEY FOR PARTITION TYPES

SEE SHEET A500 FOR WALL TYPE DETAILS AND NOTES

DENOTES TYPE OF CONSTRUCTION (SPEC. DIVISION) — WALL

4A8

3X 0 SERIES CONCRETE
4X 0 SERIES MASONRY
5X 0 SERIES COLD FORMED METAL STUDS, 16 GA MIN.
9X 0 SERIES METAL STUDS

NOMINAL SIZES: V = VARIABLE/MATCHEXISTING
1 = 1 5/8" STUDS
2 = 2 1/2" STUDS
3 = 3 5/8" STUDS
4 = 4" STUDS / 4" (NOM.) C.M.U.
6 = 6" STUDS / 6" (NOM.) C.M.U.
8 = 8" STUDS / 8" (NOM.) C.M.U.
10 = 10" (NOM.) C.M.U. OR CONC.
12 = 12" (NOM.) C.M.U. OR CONC.

EXAMPLE: WALL TYPE 9A3 IS A 3 5/8" METAL STUD WITH 5/8" GYPSUM BOARD ON BOTH SIDES.

RATED WALL LEGEND

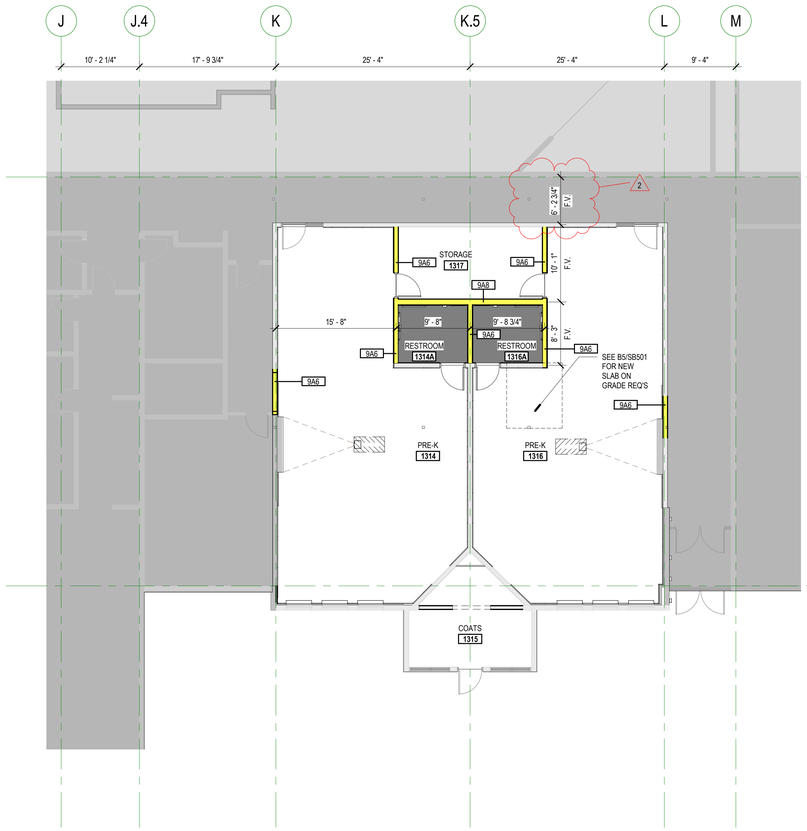
- INCIDENTAL USE AREAS
- 1 HOUR SEPARATION
- 2 HOUR SEPARATION
- 3 HOUR SEPARATION

EXAMPLE: WALL TYPE 9A3-1 IS A ONE HOUR RATED, 3 5/8" METAL STUD WALL WITH 5/8" GYPSUM BOARD ON BOTH SIDES, PER ASSEMBLY REQUIREMENTS.

90X-R SERIES
FIRE RATING (ONLY WHEN NOTED): 1 = 1 HOUR RATED ASSEMBLY
2 = 2 HOUR RATED ASSEMBLY
3 = 3 HOUR RATED ASSEMBLY

RECESSED SLAB LEGEND

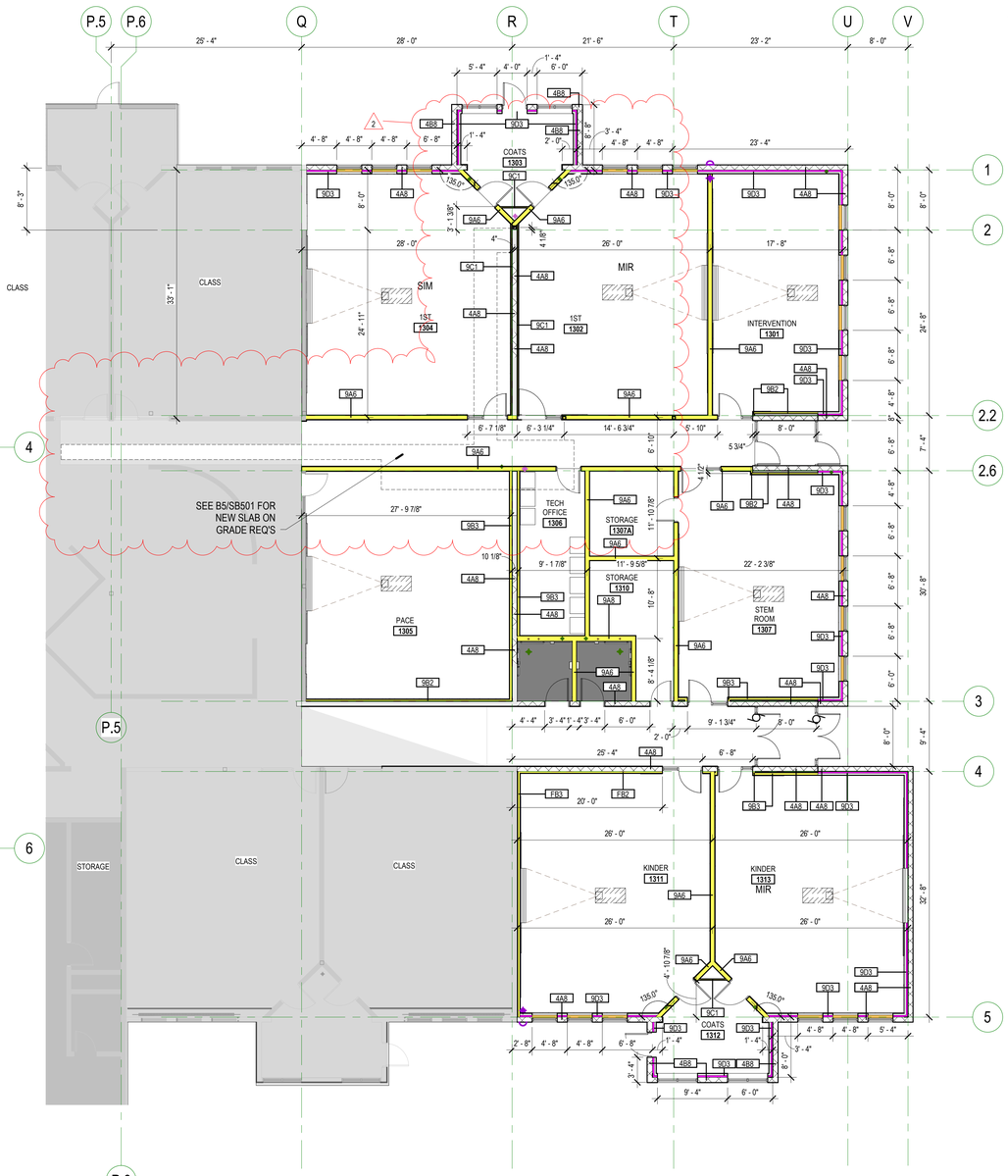
LOCATION OF RECESSED SLAB (2" U.N.O.), RECESSED SLABS ONLY OCCUR ON LEVEL 01



A1 PLAN - LEVEL 01 - DIMENSION + WALL TYPE - AREA B

SCALE: 1/8" = 1'-0"

PROJECT NORTH / TRUE NORTH

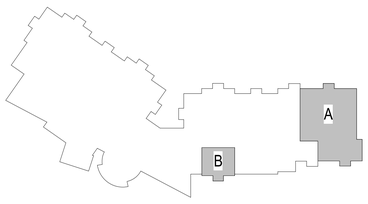


A3 PLAN - LEVEL 01 - DIMENSION + WALL TYPE - AREA A

SCALE: 1/8" = 1'-0"

PROJECT NORTH / TRUE NORTH

KEY PLAN



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DIMENSION + WALL TYPE PLAN - LEVEL 01

A111.2

GENERAL CEILING NOTES

1. REFER TO DETAIL **XX/AXXX** FOR TYPICAL CEILING SUSPENSION & SEISMIC BRACING
2. REFER TO DETAIL **XX/AXXX** FOR TYPICAL SUSPENDED GYP. BOARD CEILINGS
3. ALL UNIDENTIFIED CEILING TYPES ON THE PLANS SHALL BE TYPE " A1" AT 9'-4" A.F.F.
4. GRID SUSPENSION SYSTEMS SHALL BE CENTERED WITHIN AREAS INDICATED, UNLESS NOTED OTHERWISE
5. PAINT ALL EXPOSED STRUCTURE, MECHANICAL, DUCTS, ELECTRICAL WORK, PIPING, ETC. ALL VISIBLE ELEMENTS TO BE PAINTED AT TYPE "E1" (ABOVE VENTWOOD)
6. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF MECHANICAL GRILLES, AND TO MECHANICAL DRAWINGS FOR QUANTITIES AND TYPES
7. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF LIGHT FIXTURES AND TO ELECTRICAL DRAWINGS FOR QUANTITY AND TYPES
8. MECHANICAL AND ELECTRICAL CONTRACTORS TO COORDINATE WORK WITH SPRINKLER CONTRACTOR TO AVOID CONFLICTS IN FIELD
9. ALL CEILING HEIGHTS ARE ELEVATION ABOVE TOP OF IMMEDIATELY ADJACENT CONCRETE FLOOR SLAB.
10. ALL TYPE B CEILINGS IN RESTROOMS, LOCKER ROOMS, SHOWERS, AND WET AREAS TO BE EPOXY PAINTED.

CEILING LEGEND

- A1 - SUSPENDED 2' X 4' ACOUSTICAL LAY-IN TILE CEILING
- A2 - SUSPENDED 2' X 2' ACOUSTICAL LAY-IN TILE CEILING
- B1 - SUSPENDED 5/8" GYP. BD. CEILING SYSTEM - PAINTED P1, EPOXY PAINTE AT WET AREA
- B2 - SUSPENDED 5/8" GYP. BD CEILING SYSTEM - EPOXY, PAINTED P1,UNO
- D1 - PRE FINISHED METAL SOFFIT PANEL (TO MATCH MT2, REFER TO EXTERIOR ELEVATIONS AND EXTERIOR FINISHES SCHEDULE)
- E1 - OPEN TO STRUCTURE ABOVE

KEYED NOTES

1200.0 MANUAL ROLLER SHADES

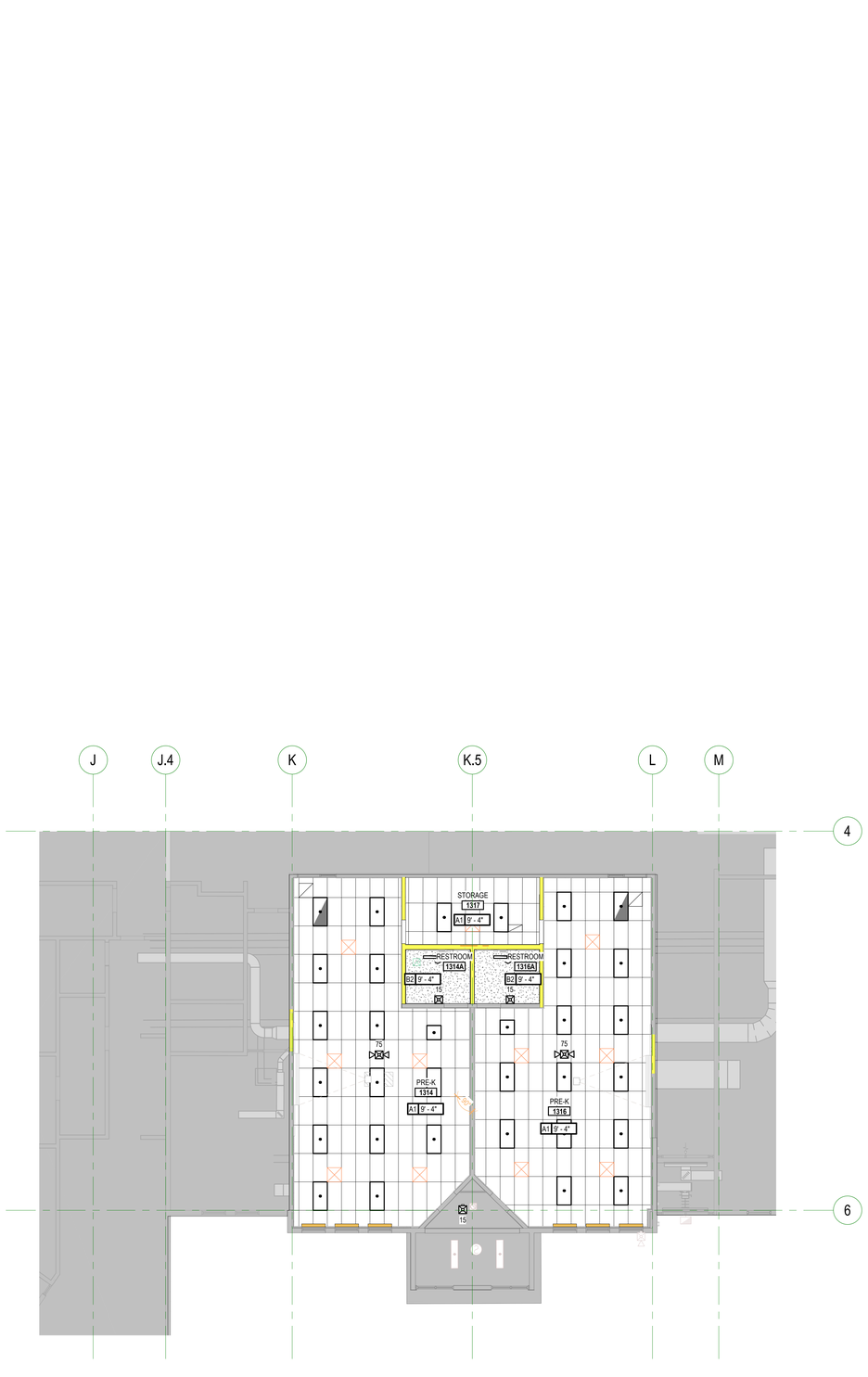
CEILING SYMBOLS

ELECTRICAL

- 2'X4' FLUORESCENT FIXTURE
- 2'X2' FLUORESCENT FIXTURE
- 1'X4' FLUORESCENT FIXTURE
- FLUORESCENT STRIP FIXTURE
- RECESSED DOWN LIGHT
- WALL WASH
- 1'X4' FLUORESCENT FIXTURE
- PENDANT LIGHT FIXTURE
- EXIT SIGN, SINGLE-SIDED
- EXIT SIGN, DOUBLE-SIDED
- FIRE ALARM
- SPEAKER
- SMOKE DETECTOR
- WIRELESS INTERNET

MECHANICAL

- SUPPLY GRILLE
- RETURN GRILLE
- EXHAUST GRILLE
- LINEAR DIFFUSER
- SPRINKLER HEAD - CEILING MOUNT
- SPRINKLER HEAD - WALL MOUNT



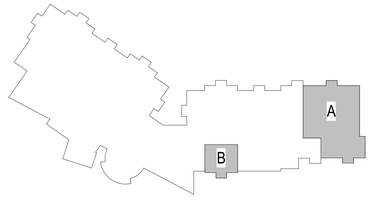
A1 PLAN - LEVEL 01 - RCP - AREA A

SCALE: 1/8" = 1'-0"

A3 PLAN - LEVEL 01 - RCP - AREA B

SCALE: 1/8" = 1'-0"

KEY PLAN



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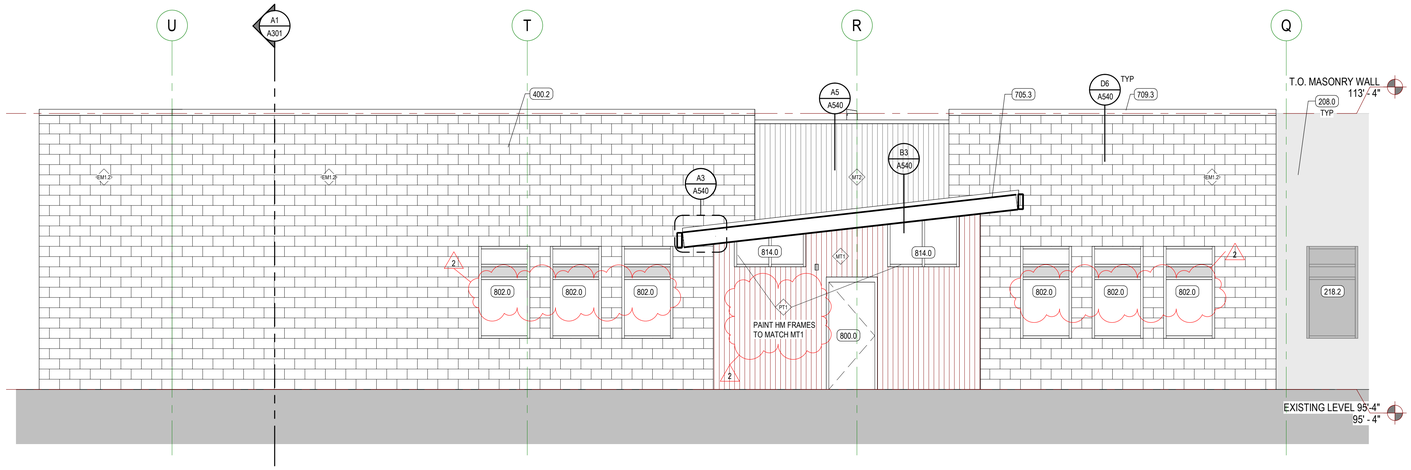
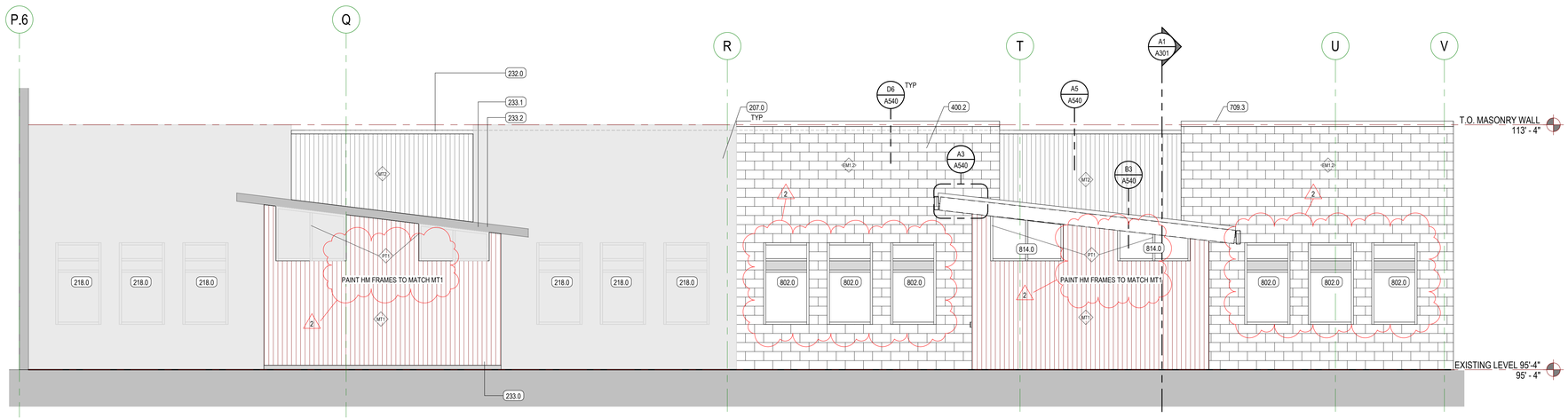
REFLECTED CEILING PLAN - LEVEL 01

A111.4



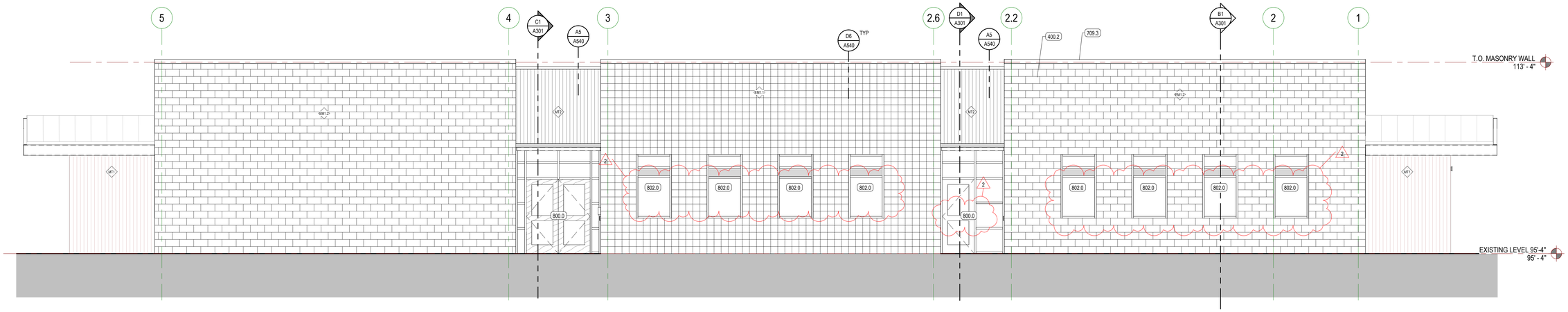
D1 NORTH ELEVATION

SCALE: 1/4" = 1'-0"



B1 SOUTH ELEVATION

SCALE: 1/4" = 1'-0"



A1 EAST ELEVATION

SCALE: 1/4" = 1'-0"

EXT. FINISH LEGEND

MARK	DESCRIPTION	MANUFACTURER	NAME	COLOR	COMMENTS
AC1	CAST-IN-PLACE ARCHITECTURAL CONCRETE		NATURAL CONCRETE	NATURAL CONCRETE	
EM1.1	8x8x16 HONED INTEGRAL COLOR CMU, SINGLE KERF	SUNROCK	HONED CMU	SANDAL W/O RED AGGRAGATE	RUNNING BOND - MORTAR COLOR: MC54 SAND 6 LBS. PER 70 LBS. RAKED & BRUSHED JOINTS
EM 1.2	8x8x16 SPLIT FACE INTEGRAL COLOR CMU	SUNROCK	SPLIT FACE CMU	SANDAL W/O RED AGGRAGATE	RUNNING BOND - MORTAR COLOR: MC54 SAND 6 LBS. PER 70 LBS. CONCAVED TOOLED & BRUSHED JOINTS
MT1	RED METAL PANEL	FABRAL	CORRUGATED	COLONIAL RED	TO MATCH EXISTING
MT2	GRAY METAL PANEL	FABRAL	CORRUGATED	PEWTER	TO MATCH EXISTING
MT5	METAL FLASHING/COPING AT EM1 CMU	FABRAL		COLONIAL RED	
MT6	METAL FLASHING/COPING AT MT1 METAL	FABRAL		COLONIAL RED	
MT7	METAL FLASHING/COPING AT MT2 METAL	FABRAL		PEWTER	
PT1	PAINT - EXTERIOR ACCENT	SHERWIN WILLIAMS	SEE SPECIFICATIONS	C.S.B.A.	EPOXY AT WET AREAS

KEYED NOTES

207.0	EXISTING MASONRY WALL, PROTECT AS NECESSARY, REPAIR AS REQUIRED
208.0	EXISTING CMU WALL, PROTECT AS NECESSARY, REPAIR AS REQUIRED
218.0	EXISTING DOOR/WINDOW, PROTECT AS NECESSARY, REPAIR AS REQUIRED
218.2	EXISTING WINDOW AND FRAME TO BE REMOVED IN ITS ENTIRETY
232.0	EXISTING PARAPET CAP FLASHING, REMOVE & REPLACE IT WITH A NEW
233.0	EXISTING CORRUGATED METAL PANEL, REMOVE & REPLACE AS SHOWN ON EXTERIOR ELEVATIONS
233.1	EXISTING STANDING SEAM METAL ROOF REPAIR, PATCH & REPAINT COLONIAL RED
233.2	EXISTING STEEL TUBE PAINTED COLONIAL RED WHERE EXPOSED
400.2	8"X8"X16" CMU
705.3	R-35 ROOF RIGID INSULATION BOARD SYSTEM
709.3	PRE-FINISHED METAL CAP AND CLEAT
800.0	DOOR AND FRAME
802.0	ALUMINUM STOREFRONT
814.0	HOLLOW METAL SYSTEM

VCBO ARCHITECTURE
524 SOUTH 600 EAST
SALT LAKE CITY, UT 84102
801.575.8800
VCBO.COM

REV	DATE	DESCRIPTION
2	2024-03-29	Addendum 02

VCBO NUMBER: 21635.04
CLIENT NUMBER:
DATE: 2024 03 08

PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

EXTERIOR ELEVATIONS

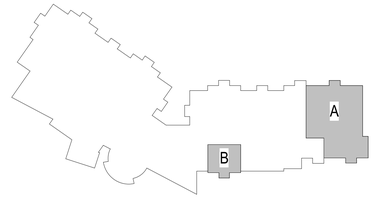
A201

ARCHITECTURE

KEY - FINISH

Key Name	Finish - Description	Finish - Manufacturer	Finish - Name	Finish - Color	Finish - Comments	VCBO Finish Sorting	VCBO Finish Title
FLOOR							
F1	ENTRY CARPET	MOHAWK	FIRST STEP II	983 IRON ORE	QUARTER TURN INSTALLATION, OWNER FURNISHED & INSTALLED	1-FLOOR	FLOOR
F2	CARPET TILE, GENERAL	MOHAWK	REFINED PASS	978 ALDER	BRICK ASHLAR INSTALLATION, OWNER FURNISHED & INSTALLED	1-FLOOR	FLOOR
F3	RESILIENT FLOORING - GENERAL	FORBO	MARMOLEUM STRIATO (SHEET)	5249 STONEHENGE	SEE FINISH PLANS FOR LINEAR DIRECTION, NET FIT SEAMS, NO WELDS	1-FLOOR	FLOOR
F4	FLOOR TILE - MOSAIC	DALTILE	KEYSTONES	DESERT GRAY SPECKLE D200	2"X2" SIZE GROUT CSBA	1-FLOOR	FLOOR
BASE							
B1	CARPET BASE	MOHAWK	-	-	MATCH ADJACENT CARPET FLOORING	2-BASE	BASE
B3	TILE BASE TRIM	SCHLUTER	-	-	SEE TRIM T2 BELOW. USE AT RESTROOMS/SHOWERS. DO NOT USE @ DRINKING FOUNTAINS. CAULK JOINT BETWEEN WALL AND FLOOR INSTEAD	2-BASE	BASE
PAINT							
P1	PAINT FINISH - GENERAL	SHERWIN WILLIAMS	7006 EXTRA WHITE	WHITE		3-PAINT	PAINT
P2	PAINT FINISH - ACCENT	SHERWIN WILLIAMS	PAINT TO MATCH EXISTING (SW 1244 RHYTHM N' BLUES)	ACCENT COLOR 1	-	3-PAINT	PAINT
SURFACE							
S1	PLASTIC LAMINATE @ GENERAL CABINET	FORMICA	WHITE DROPS 8824-58	-	MATTE FINISH	4-SURFACE	SURFACE
S2	SOLID SURFACE @ COUNTERTOPS	CORIAN	ARISTA BEIGE	-	1/2" THICKNESS	4-SURFACE	SURFACE
S3	CASEWORK INTERIOR MELAMINE	FORMICA	WHITE	-		4-SURFACE	SURFACE
S4	SOLID SURFACE @ WINDOW SILLS	CORIAN	MODERN WHITE			4-SURFACE	SURFACE
S5	NOT USED	-	-	-		4-SURFACE	SURFACE
S6	SOLID WOOD TRIM		MAPLE	CLEAR FINISH	SEE DETAILS	4-SURFACE	SURFACE
S7	RECEPTION DESK TACKABLE SURFACE	-	NATURAL CORK	-	1/4" THICKNESS	4-SURFACE	SURFACE
S8	MILLWORK EDGEBAND				3MM PVC, MATCH ADJACENT LAMINATE	4-SURFACE	SURFACE
S9	TACKBOARD TRACKS AND CHANNELS	-		WHITE	CSBA, FROM MANUFACTURER'S STANDARD COLOR LINE	4-SURFACE	SURFACE
S10	QUARTS SURFACE @ RECEPTION	SILESTONE	BLANCO MAPLE	-	2MM THICKNESS	4-SURFACE	SURFACE
S11	PLASTIC LAMINATE @ RECEPTION	NEVAMAR	S702MG	CHALK WHITE	MEDIUM GLOSS FINISH	4-SURFACE	SURFACE
S12	PLASTIC LAMINATE @ KITCHEN	FORMICA	BUFF ELM 5793-NG	-	NATURAL GRAIN TEXTURE	4-SURFACE	SURFACE
WALL							
W1	PAINT - GENERAL - SEE P1 ABOVE	-	-	-	EPOXY AT WET AREAS	5-WALL	WALL
W2	PAINT - ACCENT COLOR - SEE P2 ABOVE	-	-	-	EPOXY AT WET AREAS	5-WALL	WALL
W3	CERAMIC TILE @ RESTROOMS	DALTILE	3"X6" CERAMIC TILE	0190 ARTIC WHITE	TILE UP WALL TO 7'0", VERTICAL STACKED PATTERN, BULLNOSE TOP & OUTSIDE EDGES, PAIN P2 ABOVE U.N.O.	5-WALL	WALL
W4	ACCENT CERAMIC TILE @ RESTROOMS	DALTILE	3"X6" CERAMIC TILE	CSBA	SEE A111.1 AND RESTROOM INTERIOR ELEVATIONS FOR LOCATIONS	5-WALL	WALL
W5	PORCELAIN TILE WAINSCOT	DALTILE	FABRIQUE 12"X24"	0686 CRENE LININ, UNPOLISHED	TILE WALL UP TO FULL HEIGHT	5-WALL	WALL
W6	GENERAL TACKBOARD/TACK WALL/TACK PANELS	KOROSEAL	DESERT SAND	5621-02 SNOW	7'-0" HEIGHT, VINYL UPHOLSTERY OVER 1/2" FIBERBOARD, SEE SPECS	5-WALL	WALL
W7	NOT USED	-	-	-		5-WALL	WALL
W9	HONED INTEGRAL COLOR CMU, SINGLE KERF	SUNROCK	HONED CMU, SEALED	SANDAL W/O RED AGGRAGATE	RUNNING BOND - MORTAR COLOR: MC54 SAND 6 LBS. PER 70 LBS. RAKED & BRUSHED JOINTS	5-WALL	WALL
DOORS & TRIM							
D1	WOOD DOOR PANELS	MASONITE ARCHITECTURAL	WHITE BIRCH (ROTARY CUT)	CARAMEL	ASPIRO SERIES	6-DOORS & TRIM	DOORS & TRIM
D2	ALUMINUM STOREFRONT	KAWNEER	CLEAR ANODIZED ALUMINUM	-		6-DOORS & TRIM	DOORS & TRIM
D3	EXTERIOR HMDOOR PANELS & FRAMES	SHERWIN WILLIAMS	PAINT TO MATCH ADJACENT BRICK	CSBA		6-DOORS & TRIM	DOORS & TRIM
D4	INTERIOR HM DOOR PANEL & FRAMES @ ALL CLASSROOM AREAS	SHERWIN WILLIAMS	SEE P2 ABOVE		MATCH AREA ACCENT COLORS SHOWN IN FINISH PLANS	6-DOORS & TRIM	DOORS & TRIM
D4.1	TYPICAL HM DOOR PANELS & FRAMES	SHERWIN WILLIAMS	SW 7017 DORIAN GRAY	-	AT ALL INTERIOR HM DOORS/FRAMES EXCEPT AT CLASSROOMS, AS INDICATED IN D4	6-DOORS & TRIM	DOORS & TRIM
D5	INTERIOR OVERHEAD SECTIONAL	THE OVERHEAD DOOR COMPANY	ANODIZED ALUMINUM	SILVER METALLIC		6-DOORS & TRIM	DOORS & TRIM
D6	ACCORDION PANEL DOOR	MODERNFOLD	UPHOLSTERED PANELS	TEK-WALL RIDGE 015 SAVOR		6-DOORS & TRIM	DOORS & TRIM
T1	TILE TRIM - ALUMINUM EDGE TRIM	SCHLUTER	JOLLY/SCHEINE	CLEAR ANODIZED ALUMINUM	INSTALL @ ANY EXPOSED EDGE OF TILE, U.N.O. FILE ANY SHARP CORNERS	6-DOORS & TRIM	DOORS & TRIM
T2	TILE TRIM - ALUMINUM COVE BASE	SCHULTER	DILEX	CLEAR ANODIZED ALUMINUM	INSTALL WHERE WALL TILE MEETS FLOOR TILE IN RESTROOMS & SHOWERS. FLOAT FLOOR TIL UP TO MATCH THICKNESS OF TRIM AS NECESSARYE	6-DOORS & TRIM	DOORS & TRIM
T3	FLOORING TRANSITION STRIP	MOHAWK/SCHULTER	-	846 GREIGE	SEE DETAIL A1/A505. CLEAR ANODIZED ALUMINUM FOR ALL METAL TILE TRIMS.	6-DOORS & TRIM	DOORS & TRIM
T4	TACK STRIP	KOROSEAL	TAC-WALL	87 SANDALWOOD	AT TOP OF TILE WAINSCOT, AND AS SHOWN ON ELEVATIONS	6-DOORS & TRIM	DOORS & TRIM
T5	BYP BD REVEAL W/ SNAP-IN TRIM	FRY REGLET	DRM-SNAP-IN-50			6-DOORS & TRIM	DOORS & TRIM
MISC							
M1	ROLLER SHADE FABRIC	-	-	CSBA		7 - MISC	MISC
M2	ROLLER SHADE FACIA	-	CLEAR ANODIZED ALUMINUM	-		7 - MISC	MISC
M3	WALL MOUNTED SPEAKER	-		MATCH WALL COLOR		7 - MISC	MISC
M4	EXTERIOR HORN STROBES	-	-	WHITE		7 - MISC	MISC
M5	INTERIOR HORN STROBES	-	-	WHITE		7 - MISC	MISC
M6	ELECTRICAL DEVICES	-	-	GRAY		7 - MISC	MISC
M7	ELECTRICAL COVER PLATES	-	-	STAINLESS STEEL		7 - MISC	MISC
M8	STAINLESS STEEL CORNER GUARDS	-	SURFACE MOUNT	STAINLESS STEEL	1"X1"X48", MOUNT TO WALL ABOVE SCHEDULE BASE	7 - MISC	MISC
M9	ROOM SIGNAGE - FIELD COLOR	-	-	CSBA		7 - MISC	MISC
M10	ROOM SIGNAGE - ACCENT COLOR	-		CSBA		7 - MISC	MISC
M11	EXTERIOR ALUMINUM SIGNAGE	-	-	CLEAR ANODIZED ALUMINUM		7 - MISC	MISC
M13	GROMMETS @ COUNTERTOPS	-	-	BLACK		7 - MISC	MISC
M14	MECHANICAL WALL DIFFUSER	-	-	CSBA		7 - MISC	MISC

KEY PLAN



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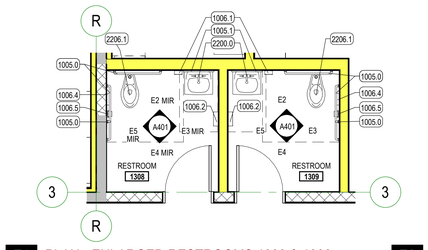
PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

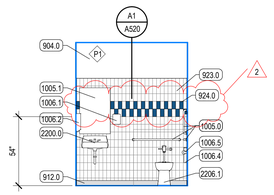
FINISH LEGEND + SCHEDULE

A400



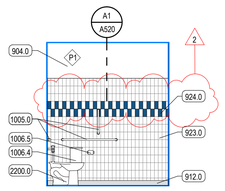
E1 PLAN - ENLARGED RESTROOMS 1308 & 1309

SCALE: 1/4" = 1'-0"



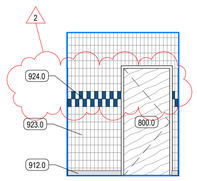
E2 RESTROOM 1309 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



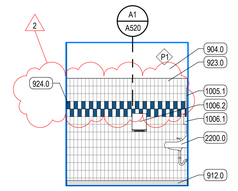
E3 RESTROOM 1309 - RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



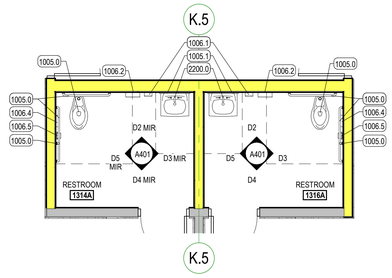
E4 RESTROOM 1309 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



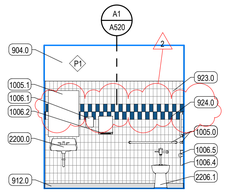
E5 RESTROOM 1309 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



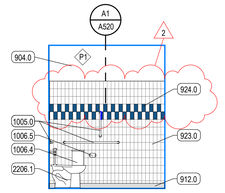
D1 PLAN - ENLARGED RESTROOMS 1314A & 1316A

SCALE: 1/4" = 1'-0"



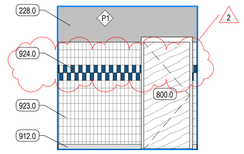
D2 RESTROOM 1316A - TOP ELEVATION

SCALE: 1/4" = 1'-0"



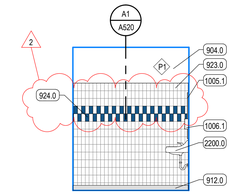
D3 RESTROOM 1316A- RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



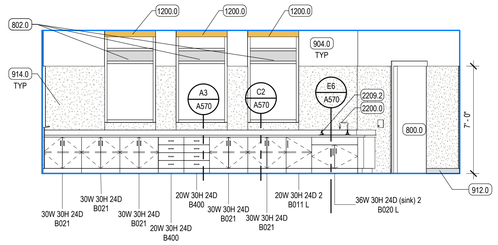
D4 RESTROOM 1316A - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



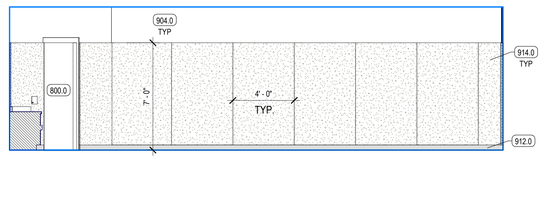
D5 RESTROOM 1316A - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



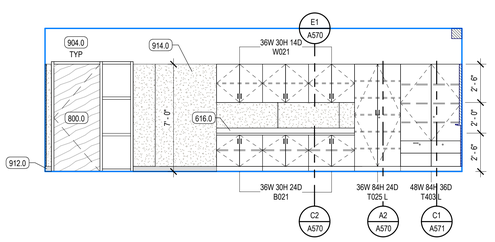
C1 1ST ROOM 1304 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



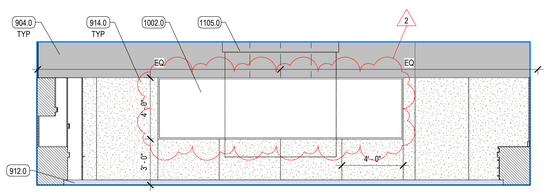
C2 1ST 1304 - RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



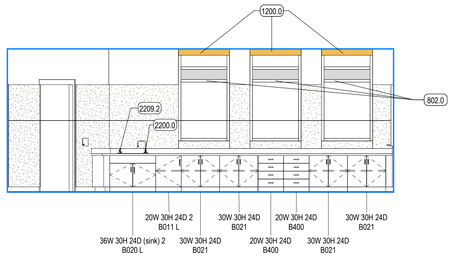
C4 1ST ROOM 1302 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



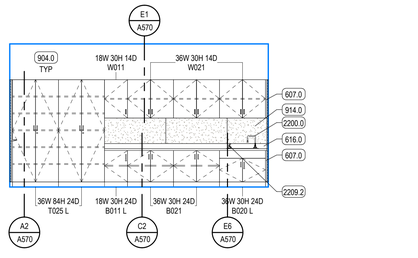
B1 1ST 1304 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



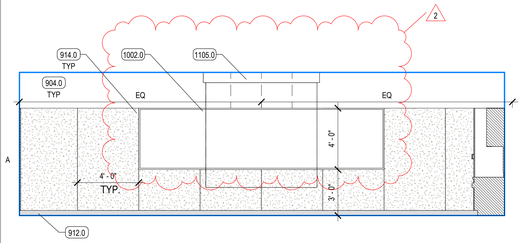
B2 1st 1302 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



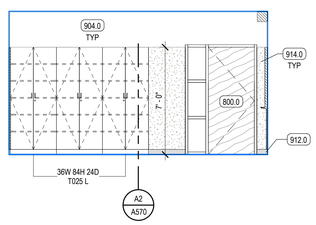
B3 INTERVENTION 1301 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



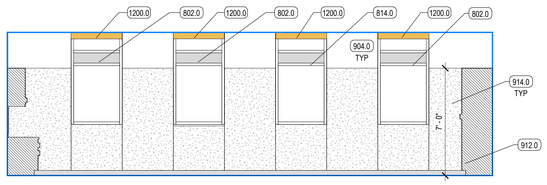
A1 INTERVENTION 1301 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



A2 INTERVENTION 1301 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"

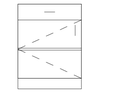


A3 INTERVENTION 1301 - RIGHT ELEVATION

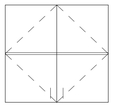
SCALE: 1/4" = 1'-0"

ARCHITECTURAL MILLWORK KEY

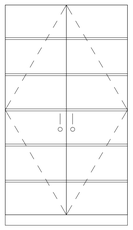
EXAMPLE:



B 1 1 1 **
- ACCESSORY (IF NOTED)
- ONE ADJUSTABLE SHELF
- ONE DOOR
- ONE DRAWER
- BASE CABINET *



W 0 2 1 **
- ACCESSORY (IF NOTED)
- ONE ADJUSTABLE SHELF
- TWO DOORS
- ZERO DRAWERS
- WALL CABINET *



T 0 2 5 L
- ACCESSORY (IF NOTED)
- FIVE ADJUSTABLE SHELVES
- TWO DOORS
- ZERO DRAWERS
- TALL CABINET *

* NOTE:

SB	DENOTES SINK BASE CABINET
TW	DENOTES TALL WARDROBE CABINET
FMD	DENOTES FRAMED PERFORATED METAL PANEL DOOR
FGD	DENOTES FRAMED GLASS PANEL DOOR

** NOTE:

L	DENOTES LOCKS AT DOOR (S) / DRAWER (S)
F	DENOTES FILE DRAWER (S)

CABINET MEASUREMENTS SHOWN ARE ACTUAL SIZES. BASE CABINET HEIGHTS ALLOW FOR A COUNTERTOP 1 1/2" THICK. CABINET DEPTHS ARE MEASURED FROM THE BACK TO THE FACE OF THE DOOR OR DRAWER FRONT (WHERE APPLICABLE)

ALL CABINET INTERIORS, WHETHER CONCEALED BEHIND DOORS OR OPEN, ARE STANDARD MELAMINE LAMINATE AS PER SPECIFICATIONS.

MILLWORK LEGEND

1. MILLWORK DIMENSION NUMBERS ARE WIDTH X HEIGHT X DEPTH.
2. ALL MILLWORK DIMENSIONED FROM BASE TO TOP OF IDENTIFIED COUNTERTOP, TYP
3. CABINET DEPTHES ARE MEASURED FROM THE WALL TO THE FACE OF THE DOOR OR DRAWER FRONT (WHERE APPLICABLE).
4. PROVIDE BASE AT ALL CABINET TOE SPACE, UNLESS NOTED OTHERWISE.
5. PROVIDE GROMMET WHERE "G" IS LABELED ON PLANOS OR ELEVATIONS.
6. ALL COUNTERTOPS TO HAVE A 4" BACKSPLASH, UNLESS NOTED OTHERWISE, TO MATCH COUNTERTOP, ON BACK AND SIDE WALLS.
7. PROVIDE FILLER PANELS TO SEAL SIDES AND TOPS OF ALL CABINETS PLACED AT AN ANGLE TO ADJACENT WALL(S).
8. ALL MILLWORK TO FINISHED ON ENDS, TYP.
9. CONTRACTOR TO PROVIDE BLOCKING BEHIND ALL CABINETS, COAT RACKS, PENCIL SHARPENER BLOCKS, T.V. BRACKETS AND PROJECTION SCREENS AS WELL AS ALL WALL MOUNTED ACCESSORIES, INCLUDING WHITE BOARDS, TACKBOARDS, TOILET AND URINAL PARTITIONS AND TOILET ROOM ACCESSORIES, ETC... NOTE: ONLY 2X WOOD BLOCKING IS ACCESPTABLE BEHIND MILLWORK AND TOILET ROOM PARTITIONS.
10. REFER TO SHEET **A400** FOR FINISH COLORS ON ALL MILLWORK AND CASEWORK.

TYPICAL MILLWORK DETAILS

1. TYPICAL MILLWORK ANCHORING DETAILS, PER DETAIL **E6/A570**
2. TYPICAL COUNTERTOP WORK SURFACE, PER DETAIL **D3/A570 & D3/A570**
3. TYPICAL BASE CABINET WITH DOOR(S), PER DETAIL **C2/A570**
4. TYPICAL BASE CABINET WITH DRAWER(S), PER DETAIL **A3/A570**
5. TYPICAL BASE CABINET WITH DOOR(S) AND DRAWER, PER DTL **A6/A570**
6. TYPICAL BASE CABINET WITH TWO FILE DRAWERS, PER DTL **D5/A570**
7. TYPICAL PLAN VIEW BASE CABINETS, PER DETAILS **B5/A570**
8. TYPICAL UPPER CABINET WITH DOORS, PER DETAIL **B3/A570**
9. TYPICAL UPPER CABINET W/O DOORS, PER DETAIL **E1/A570**
10. TYPICAL SINK BASE CABINET, PER DETAIL **E6/A570**
11. TYPICAL TALL CABINET WITH DOOR(S), PER DETAIL **A2/A571**
12. TYPICAL TALL CABINET W/O DOOR, PER DETAIL **A5/A570**
14. TYPICAL CUBBIES, PER DETAIL **A1/A571**

KEYED NOTES

228.0	EXISTING METAL STUD WALL, PROTECT AS NECESSARY, REPAIR & PAINT AS REQUIRED
607.0	MILLWORK, FILLER PANEL
616.0	COUNTERTOP, PLASTIC LAMINATE
800.0	DOOR AND FRAME
802.0	ALUMINUM STOREFRONT
814.0	HOLLOW METAL SYSTEM
904.0	5/8" GYPSUM BOARD PAINTED WHERE EXPOSED
912.0	SCHEDULED BASE
914.0	TACKABLE WALL SYSTEM
923.0	SCHEDULED WALL TILE
924.0	SCHEDULED WALL TILE, ACCENT COLOR, SEE FINISH SCHEDULE FOR DETAILS
1002.0	192"X48" WALL MOUNTED MARKER BOARD
1005.0	GRAB BAR
1005.1	MIRROR, 24x36
1006.1	DISPENSER, SOAP, OWNER PROVIDED, CONTRACTOR INSTALLED
1006.2	DISPENSER, PAPER TOWELS OWNER PROVIDED, CONTRACTOR INSTALLED
1006.4	DISPOSAL, SANITARY NAPKINS, OWNER PROVIDED, CONTRACTOR INSTALLED
1006.5	DISPENSER, TOILET PAPER, OWNER PROVIDED, CONTRACTOR INSTALLED
1105.0	PROJECTOR, CEILING MOUNTED, WITH MOUNT, OWNER PROIVDED, CONTRACTOR INSTALLED
1200.0	MANUAL ROLLER SHADES
2200.0	SINK + FAUCET
2206.1	TOILET, FLOOR MOUNT
2209.2	BUBBLER

VCBO ARCHITECTURE
524 SOUTH 600 EAST
SALT LAKE CITY, UT 84102
801.575.8800
VCBO.COM

REV	DATE	DESCRIPTION
2	2024-03-29	Addendum 02

VCBO NUMBER: 21635.04
CLIENT NUMBER:
DATE: 2024 03 08

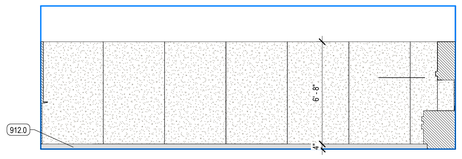
PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

ENLARGED PLANS + ELEVATIONS

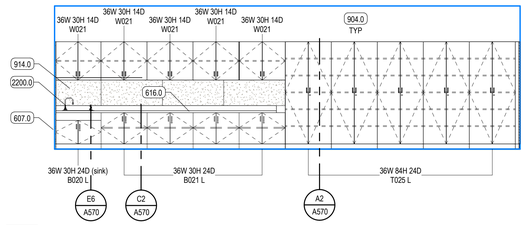
A401

ARCH E1 D1 B1 C1



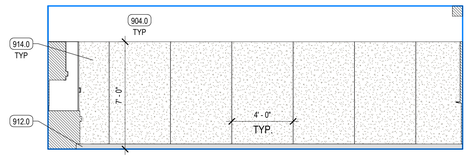
E1 PACE 1305 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



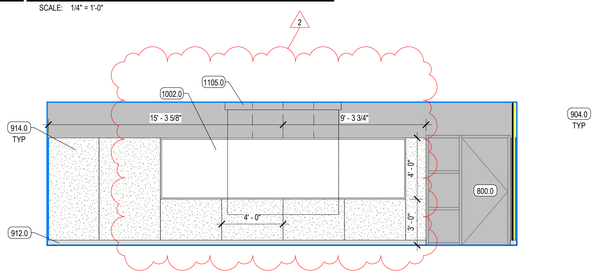
E2 PACE 1305 - RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



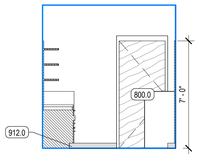
E4 PACE 1305 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



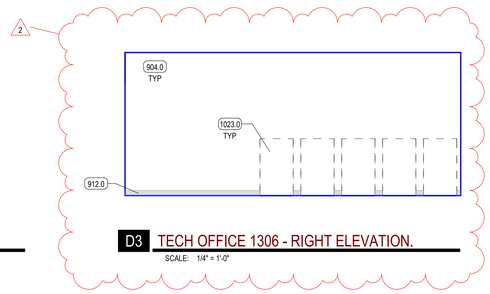
D1 PACE 1305 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



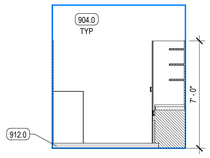
D2 TECH OFFICE 1306 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



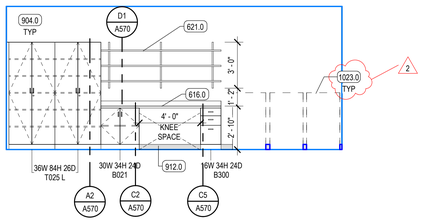
D3 TECH OFFICE 1306 - RIGHT ELEVATION.

SCALE: 1/4" = 1'-0"



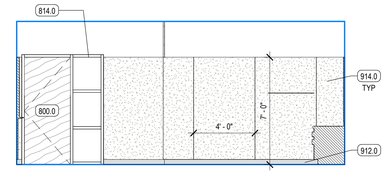
D5 TECH OFFICE 1306 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



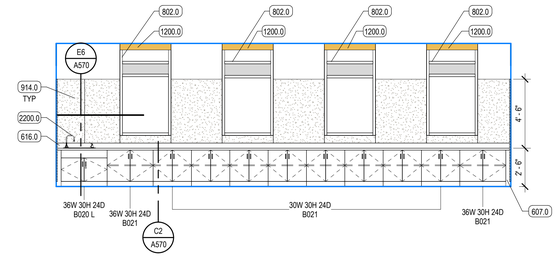
C1 TECH OFFICE 1306 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



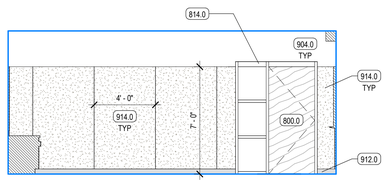
C2 STEM ROOM 1307 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



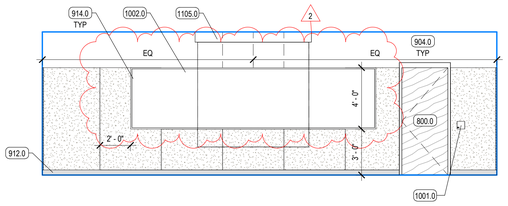
C4 STEM ROOM 1307 - RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



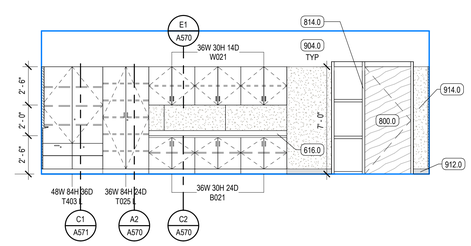
B1 STEM ROOM 1307 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



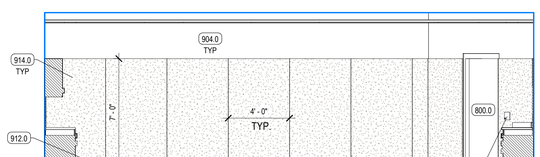
B2 STEM ROOM 1307 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



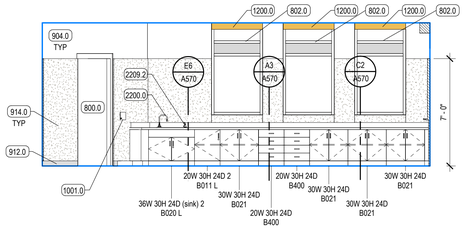
B4 KINDER 1311 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



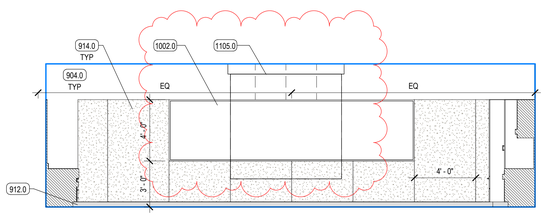
A1 KINDER 1311 - RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



A2 KINDER 1311 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



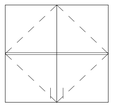
A4 KINDER 1311 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"

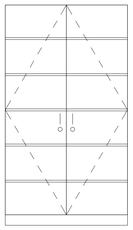
ARCHITECTURAL MILLWORK KEY

EXAMPLE:

B 1 1 1 **
- ACCESSORY (IF NOTED)
- ONE ADJUSTABLE SHELF
- ONE DOOR
- ONE DRAWER
- BASE CABINET *



W 0 2 1 **
- ACCESSORY (IF NOTED)
- ONE ADJUSTABLE SHELF
- TWO DOORS
- ZERO DRAWERS
- WALL CABINET *



T 0 2 5 L
- ACCESSORY (IF NOTED)
- FIVE ADJUSTABLE SHELVES
- TWO DOORS
- ZERO DRAWERS
- TALL CABINET *

* NOTE:

SB	DENOTES SINK BASE CABINET
TW	DENOTES TALL WARDROBE CABINET
FMD	DENOTES FRAMED PERFORATED METAL PANEL DOOR
FGD	DENOTES FRAMED GLASS PANEL DOOR

** NOTE:

L	DENOTES LOCKS AT DOOR (S) / DRAWER (S)
F	DENOTES FILE DRAWER (S)

CABINET MEASUREMENTS SHOWN ARE ACTUAL SIZES. BASE CABINET HEIGHTS ALLOW FOR A COUNTERTOP 1 1/2" THICK. CABINET DEPTHS ARE MEASURED FROM THE BACK TO THE FACE OF THE DOOR OR DRAWER FRONT (WHERE APPLICABLE)

ALL CABINET INTERIORS, WHETHER CONCEALED BEHIND DOORS OR OPEN, ARE STANDARD MELAMINE LAMINATE AS PER SPECIFICATIONS.

MILLWORK LEGEND

1. MILLWORK DIMENSION NUMBERS ARE WIDTH X HEIGHT X DEPTH.
2. ALL MILLWORK DIMENSIONED FROM BASE TO TOP OF IDENTIFIED COUNTERTOP, TYP
3. CABINET DEPTHES ARE MEASURED FROM THE WALL TO THE FACE OF THE DOOR OR DRAWER FRONT (WHERE APPLICABLE).
4. PROVIDE BASE AT ALL CABINET TOE SPACE, UNLESS NOTED OTHERWISE.
5. PROVIDE GROMMET WHERE "G" IS LABELED ON PLANOS OR ELEVATIONS.
6. ALL COUNTERTOPS TO HAVE A 4" BACKSPLASH, UNLESS NOTED OTHERWISE, TO MATCH COUNTERTOP, ON BACK AND SIDE WALLS.
7. PROVIDE FILLER PANELS TO SEAL SIDES AND TOPS OF ALL CABINETS PLACED AT AN ANGLE TO ADJACENT WALL(S).
8. ALL MILLWORK TO FINISHED ON ENDS, TYP.
9. CONTRACTOR TO PROVIDE BLOCKING BEHIND ALL CABINETS, COAT RACKS, PENCIL SHARPENER BLOCKS, T.V. BRACKETS AND PROJECTION SCREENS AS WELL AS ALL WALL MOUNTED ACCESSORIES, INCLUDING WHITE BOARDS, TACKBOARDS, TOILET AND URINAL PARTITIONS AND TOILET ROOM ACCESSORIES, ETC... NOTE: ONLY 2X WOOD BLOCKING IS ACCESPTABLE BEHIND MILLWORK AND TOILET ROOM PARTITIONS.
10. REFER TO SHEET **A400** FOR FINISH COLORS ON ALL MILLWORK AND CASEWORK.

TYPICAL MILLWORK DETAILS

1. TYPICAL MILLWORK ANCHORING DETAILS, PER DETAIL **E6/A570**
2. TYPICAL COUNTERTOP WORK SURFACE, PER DETAIL **D3/A570 & D3/A570**
3. TYPICAL BASE CABINET WITH DOOR(S), PER DETAIL **C2/A570**
4. TYPICAL BASE CABINET WITH DRAWER(S), PER DETAIL **A3/A570**
5. TYPICAL BASE CABINET WITH DOOR(S) AND DRAWER, PER DTL **A6/A570**
6. TYPICAL BASE CABINET WITH TWO FILE DRAWERS, PER DTL **D5/A570**
7. TYPICAL PLAN VIEW BASE CABINETS, PER DETAILS **B5/A570**
8. TYPICAL UPPER CABINET WITH DOORS, PER DETAIL **B3/A570**
9. TYPICAL UPPER CABINET W/O DOORS, PER DETAIL **E1/A570**
10. TYPICAL SINK BASE CABINET, PER DETAIL **E6/A570**
11. TYPICAL TALL CABINET WITH DOOR(S), PER DETAIL **A2A571**
12. TYPICAL TALL CABINET W/O DOOR, PER DETAIL **A5/A570**
14. TYPICAL CUBBIES, PER DETAIL **A1/A571**

KEYED NOTES

607.0	MILLWORK, FILLER PANEL
616.0	COUNTERTOP, PLASTIC LAMINATE
621.0	24" ADJUSTABLE SHELVING, 5SHELVES, U.N.O
800.0	DOOR AND FRAME
802.0	ALUMINUM STOREFRONT
814.0	HOLLOW METAL SYSTEM
904.0	5/8" GYPSUM BOARD PAINTED WHERE EXPOSED
912.0	SCHEDULED BASE
914.0	TACKABLE WALL SYSTEM
1001.0	SIGNAGE, SEE SCHEDULE
1002.0	192"X48" WALL MOUNTED MARKER BOARD
1023.0	COW CARTS, OWNER PROVIDED
1105.0	PROJECTOR, CEILING MOUNTED, WITH MOUNT, OWNER PROIVDED, CONTRACTOR INSTALLED
1200.0	MANUAL ROLLER SHADES
2200.0	SINK + FAUCET
2209.2	BUBBLER

VCBO ARCHITECTURE
524 SOUTH 600 EAST
SALT LAKE CITY, UT 84102
801.575.8800
VCBO.COM

REV	DATE	DESCRIPTION
2	2024-03-29	Addendum 02

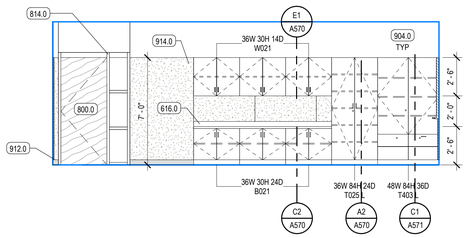
VCBO NUMBER: 21635.04
CLIENT NUMBER:
DATE: 2024 03 08

PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

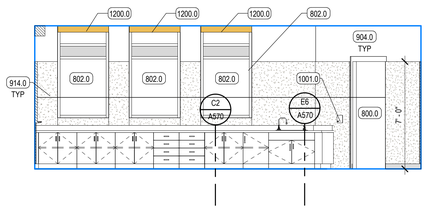
ENLARGED PLANS + ELEVATIONS

A402



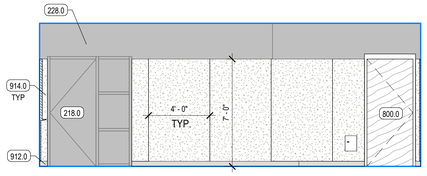
E1 KINDER 1313 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



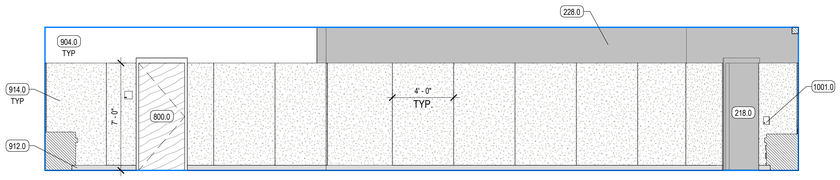
E2 KINDER 1313 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



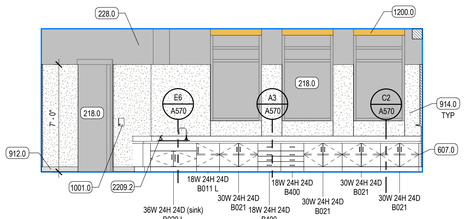
D1 PRE-K 1314 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



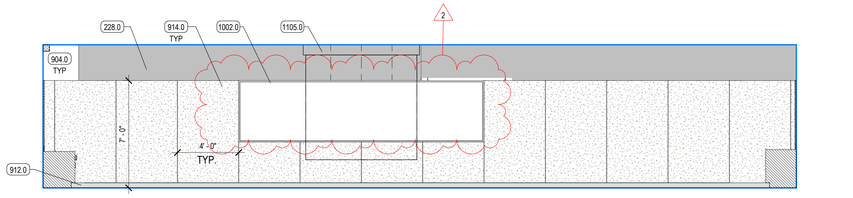
D2 PRE-K 1314 - RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



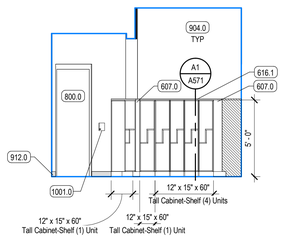
C1 PRE-K 1314 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



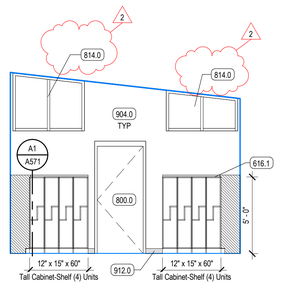
C2 PRE-K 1314 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



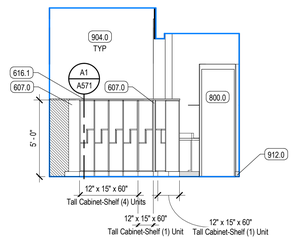
B1 COATS 1303 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"



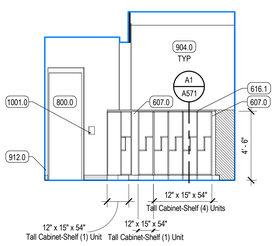
B2 COATS 1303 - TOP ELEVATION

SCALE: 1/4" = 1'-0"



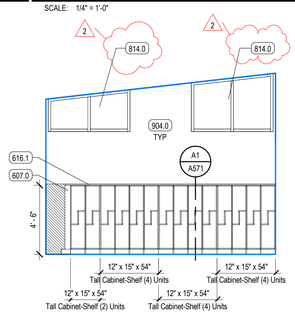
B3 COATS 1303 - RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



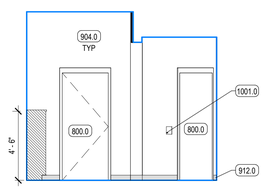
A1 COATS 1312 - RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



A2 COATS 1312 - BOTTOM ELEVATION

SCALE: 1/4" = 1'-0"



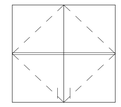
A3 COATS 1312 - LEFT ELEVATION

SCALE: 1/4" = 1'-0"

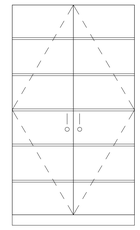
ARCHITECTURAL MILLWORK KEY

EXAMPLE:

B 1 1 1 **
- ACCESSORY (IF NOTED)
- ONE ADJUSTABLE SHELF
- ONE DOOR
- ONE DRAWER
- BASE CABINET *



W 0 2 1 **
- ACCESSORY (IF NOTED)
- ONE ADJUSTABLE SHELF
- TWO DOORS
- ZERO DRAWERS
- WALL CABINET *



T 0 2 5 L
- ACCESSORY (IF NOTED)
- FIVE ADJUSTABLE SHELVES
- TWO DOORS
- ZERO DRAWERS
- TALL CABINET *

* NOTE:

SB	DENOTES SINK BASE CABINET
TW	DENOTES TALL WARDROBE CABINET
FMD	DENOTES FRAMED PERFORATED METAL PANEL DOOR
FGD	DENOTES FRAMED GLASS PANEL DOOR

** NOTE:

L	DENOTES LOCKS AT DOOR (S) / DRAWER (S)
F	DENOTES FILE DRAWER (S)

CABINET MEASUREMENTS SHOWN ARE ACTUAL SIZES. BASE CABINET HEIGHTS ALLOW FOR A COUNTERTOP 1 1/2" THICK. CABINET DEPTHS ARE MEASURED FROM THE BACK TO THE FACE OF THE DOOR OR DRAWER FRONT (WHERE APPLICABLE)

ALL CABINET INTERIORS, WHETHER CONCEALED BEHIND DOORS OR OPEN, ARE STANDARD MELAMINE LAMINATE AS PER SPECIFICATIONS.

MILLWORK LEGEND

1. MILLWORK DIMENSION NUMBERS ARE WIDTH X HEIGHT X DEPTH.
2. ALL MILLWORK DIMENSIONED FROM BASE TO TOP OF IDENTIFIED COUNTERTOP, TYP
3. CABINET DEPTHES ARE MEASURED FROM THE WALL TO THE FACE OF THE DOOR OR DRAWER FRONT (WHERE APPLICABLE).
4. PROVIDE BASE AT ALL CABINET TOE SPACE, UNLESS NOTED OTHERWISE.
5. PROVIDE GROMMET WHERE "G" IS LABELED ON PLANOS OR ELEVATIONS.
6. ALL COUNTERTOPS TO HAVE A 4" BACKSPLASH, UNLESS NOTED OTHERWISE, TO MATCH COUNTERTOP, ON BACK AND SIDE WALLS.
7. PROVIDE FILLER PANELS TO SEAL SIDES AND TOPS OF ALL CABINETS PLACED AT AN ANGLE TO ADJACENT WALL(S).
8. ALL MILLWORK TO FINISHED ON ENDS, TYP.
9. CONTRACTOR TO PROVIDE BLOCKING BEHIND ALL CABINETS, COAT RACKS, PENCIL SHARPENER BLOCKS, T.V. BRACKETS AND PROJECTION SCREENS AS WELL AS ALL WALL MOUNTED ACCESSORIES, INCLUDING WHITE BOARDS, TACKBOARDS, TOILET AND URINAL PARTITIONS AND TOILET ROOM ACCESSORIES, ETC... NOTE: ONLY 2X WOOD BLOCKING IS ACCESPTABLE BEHIND MILLWORK AND TOILET ROOM PARTITIONS.
10. REFER TO SHEET **A400** FOR FINISH COLORS ON ALL MILLWORK AND CASEWORK.

TYPICAL MILLWORK DETAILS

1. TYPICAL MILLWORK ANCHORING DETAILS, PER DETAIL **E6/A570**
2. TYPICAL COUNTERTOP WORK SURFACE, PER DETAIL **D3/A570 & D3/A570**
3. TYPICAL BASE CABINET WITH DOOR(S), PER DETAIL **C2/A570**
4. TYPICAL BASE CABINET WITH DRAWER(S), PER DETAIL **A3/A570**
5. TYPICAL BASE CABINET WITH DOOR(S) AND DRAWER, PER DTL **A6/A570**
6. TYPICAL BASE CABINET WITH TWO FILE DRAWERS, PER DTL **D5/A570**
7. TYPICAL PLAN VIEW BASE CABINETS, PER DETAILS **B5/A570**
8. TYPICAL UPPER CABINET WITH DOORS, PER DETAIL **B3/A570**
9. TYPICAL UPPER CABINET W/O DOORS, PER DETAIL **E1/A570**
10. TYPICAL SINK BASE CABINET, PER DETAIL **E6/A570**
11. TYPICAL TALL CABINET WITH DOOR(S), PER DETAIL **A2/A571**
12. TYPICAL TALL CABINET W/O DOOR, PER DETAIL **A5/A570**
14. TYPICAL CUBBIES, PER DETAIL **A1/A571**

KEYED NOTES

218.0	EXISTING DOOR/WINDOW. PROTECT AS NECESSARY. REPAIR AS REQUIRED
228.0	EXISTING METAL STUD WALL, PROTECT AS NECESSARY, REPAIR & PAINT AS REQUIRED
607.0	MILLWORK, FILLER PANEL
616.0	COUNTERTOP, PLASTIC LAMINATE
616.1	COUNTERTOP, SOLID SURFACE
800.0	DOOR AND FRAME
802.0	ALUMINUM STOREFRONT
814.0	HOLLOW METAL SYSTEM
904.0	5/8" GYPSUM BOARD PAINTED WHERE EXPOSED
912.0	SCHEDULED BASE
914.0	TACKABLE WALL SYSTEM
1001.0	SIGNAGE. SEE SCHEDULE
1002.0	192"X48" WALL MOUNTED MARKER BOARD
1105.0	PROJECTOR, CEILING MOUNTED, WITH MOUNT, OWNER PROIVDED, CONTRACTOR INSTALLED
1200.0	MANUAL ROLLER SHADES
2209.2	BUBBLER

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REV	DATE	DESCRIPTION
2	2024-03-29	Addendum 02

VCBO NUMBER: 21635.04
CLIENT NUMBER:
DATE: 2024 03 08

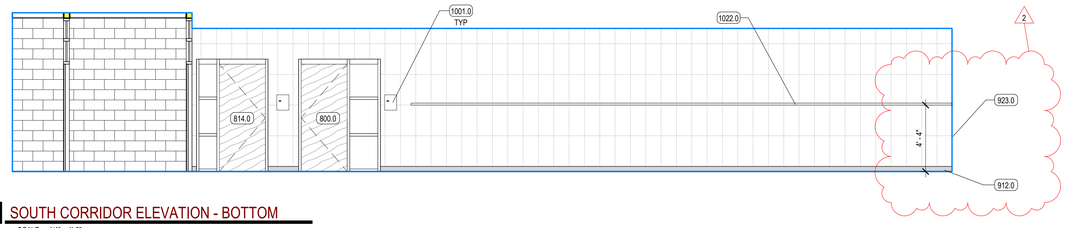
PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

ENLARGED PLANS + ELEVATIONS

A403

ARCHIVE-A.RVT

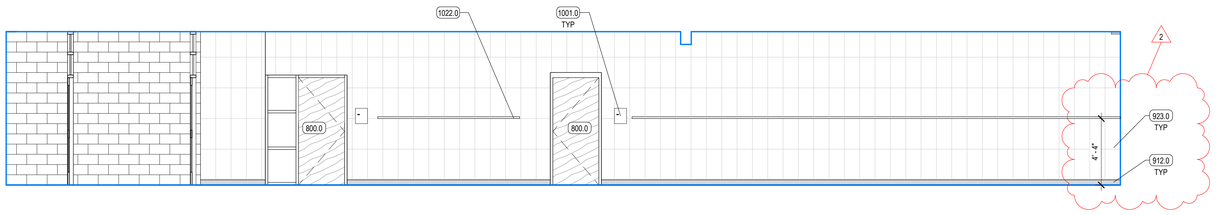


D1 SOUTH CORRIDOR ELEVATION - BOTTOM

SCALE: 1/4" = 1'-0"

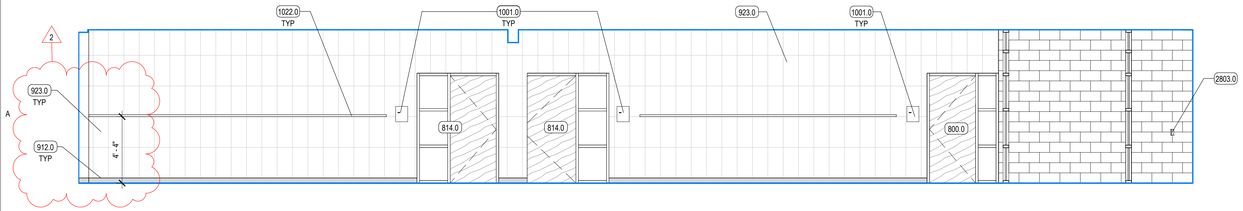
C1 SOUTH CORRIDOR ELEVATION - TOP

SCALE: 1/4" = 1'-0"



B1 NORTH CORRIDOR ELEVATION - BOTTOM

SCALE: 1/4" = 1'-0"



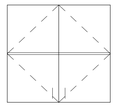
A1 NORTH CORRIDOR ELEVATION - TOP

SCALE: 1/4" = 1'-0"

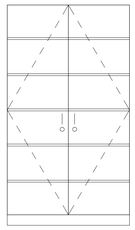
ARCHITECTURAL MILLWORK KEY

EXAMPLE:

B 1 1 1 **
- ACCESSORY (IF NOTED)
- ONE ADJUSTABLE SHELF
- ONE DOOR
- ONE DRAWER
- BASE CABINET *



W 0 2 1 **
- ACCESSORY (IF NOTED)
- ONE ADJUSTABLE SHELF
- TWO DOORS
- ZERO DRAWERS
- WALL CABINET *



T 0 2 5 L
- ACCESSORY (IF NOTED)
- FIVE ADJUSTABLE SHELVES
- TWO DOORS
- ZERO DRAWERS
- TALL CABINET *

* NOTE:

SB	DENOTES SINK BASE CABINET
TW	DENOTES TALL WARDROBE CABINET
FMD	DENOTES FRAMED PERFORATED METAL PANEL DOOR
FGD	DENOTES FRAMED GLASS PANEL DOOR

** NOTE:

L	DENOTES LOCKS AT DOOR (S) / DRAWER (S)
F	DENOTES FILE DRAWER (S)

CABINET MEASUREMENTS SHOWN ARE ACTUAL SIZES. BASE CABINET HEIGHTS ALLOW FOR A COUNTERTOP 1 1/2" THICK. CABINET DEPTHS ARE MEASURED FROM THE BACK TO THE FACE OF THE DOOR OR DRAWER FRONT (WHERE APPLICABLE)

ALL CABINET INTERIORS, WHETHER CONCEALED BEHIND DOORS OR OPEN, ARE STANDARD MELAMINE LAMINATE AS PER SPECIFICATIONS.

MILLWORK LEGEND

1. MILLWORK DIMENSION NUMBERS ARE WIDTH X HEIGHT X DEPTH.
2. ALL MILLWORK DIMENSIONED FROM BASE TO TOP OF IDENTIFIED COUNTERTOP, TYP
3. CABINET DEPTHES ARE MEASURED FROM THE WALL TO THE FACE OF THE DOOR OR DRAWER FRONT (WHERE APPLICABLE).
4. PROVIDE BASE AT ALL CABINET TOE SPACE, UNLESS NOTED OTHERWISE.
5. PROVIDE GROMMET WHERE "G" IS LABELED ON PLANOS OR ELEVATIONS.
6. ALL COUNTERTOPS TO HAVE A 4" BACKSPLASH, UNLESS NOTED OTHERWISE, TO MATCH COUNTERTOP, ON BACK AND SIDE WALLS.
7. PROVIDE FILLER PANELS TO SEAL SIDES AND TOPS OF ALL CABINETS PLACED AT AN ANGLE TO ADJACENT WALL(S).
8. ALL MILLWORK TO FINISHED ON ENDS, TYP.
9. CONTRACTOR TO PROVIDE BLOCKING BEHIND ALL CABINETS, COAT RACKS, PENCIL SHARPENER BLOCKS, T.V. BRACKETS AND PROJECTION SCREENS AS WELL AS ALL WALL MOUNTED ACCESSORIES, INCLUDING WHITE BOARDS, TACKBOARDS, TOILET AND URINAL PARTITIONS AND TOILET ROOM ACCESSORIES, ETC... NOTE: ONLY 2X WOOD BLOCKING IS ACCESPTABLE BEHIND MILLWORK AND TOILET ROOM PARTITIONS.
10. REFER TO SHEET **A400** FOR FINISH COLORS ON ALL MILLWORK AND CASEWORK.

TYPICAL MILLWORK DETAILS

1. TYPICAL MILLWORK ANCHORING DETAILS, PER DETAIL **E6/A570**
2. TYPICAL COUNTERTOP WORK SURFACE, PER DETAIL **D3/A570 & D3/A570**
3. TYPICAL BASE CABINET WITH DOOR(S), PER DETAIL **C2/A570**
4. TYPICAL BASE CABINET WITH DRAWER(S), PER DETAIL **A3/A570**
5. TYPICAL BASE CABINET WITH DOOR(S) AND DRAWER, PER DTL **A6/A570**
6. TYPICAL BASE CABINET WITH TWO FILE DRAWERS, PER DTL **D5/A570**
7. TYPICAL PLAN VIEW BASE CABINETS, PER DETAILS **B5/A570**
8. TYPICAL UPPER CABINET WITH DOORS, PER DETAIL **B3/A570**
9. TYPICAL UPPER CABINET W/O DOORS, PER DETAIL **E1/A570**
10. TYPICAL SINK BASE CABINET, PER DETAIL **E6/A570**
11. TYPICAL TALL CABINET WITH DOOR(S), PER DETAIL **A2/A571**
12. TYPICAL TALL CABINET W/O DOOR, PER DETAIL **A5/A570**
14. TYPICAL CUBBIES, PER DETAIL **A1/A571**

KEYED NOTES

800.0	DOOR AND FRAME
814.0	HOLLOW METAL SYSTEM
912.0	SCHEDULED BASE
923.0	SCHEDULED WALL TILE
1001.0	SIGNAGE, SEE SCHEDULE
1022.0	MAGNETIC TACK STRIPS
2609.0	ADA DOOR ACTUATOR
2803.0	SECURITY ACCESS CARD READER

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REV	DATE	DESCRIPTION
2	2024-03-29	Addendum 02

VCBO NUMBER: 21635.04
CLIENT NUMBER:
DATE: 2024 03 08

PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

ENLARGED PLANS + ELEVATIONS

A404

REAVELEY
Engineers

STRUCTURAL REVISIONS

PCSD TRAILSIDE ELEMENTARY ADDITION — ADDENDUM #02

APRIL 1, 2024

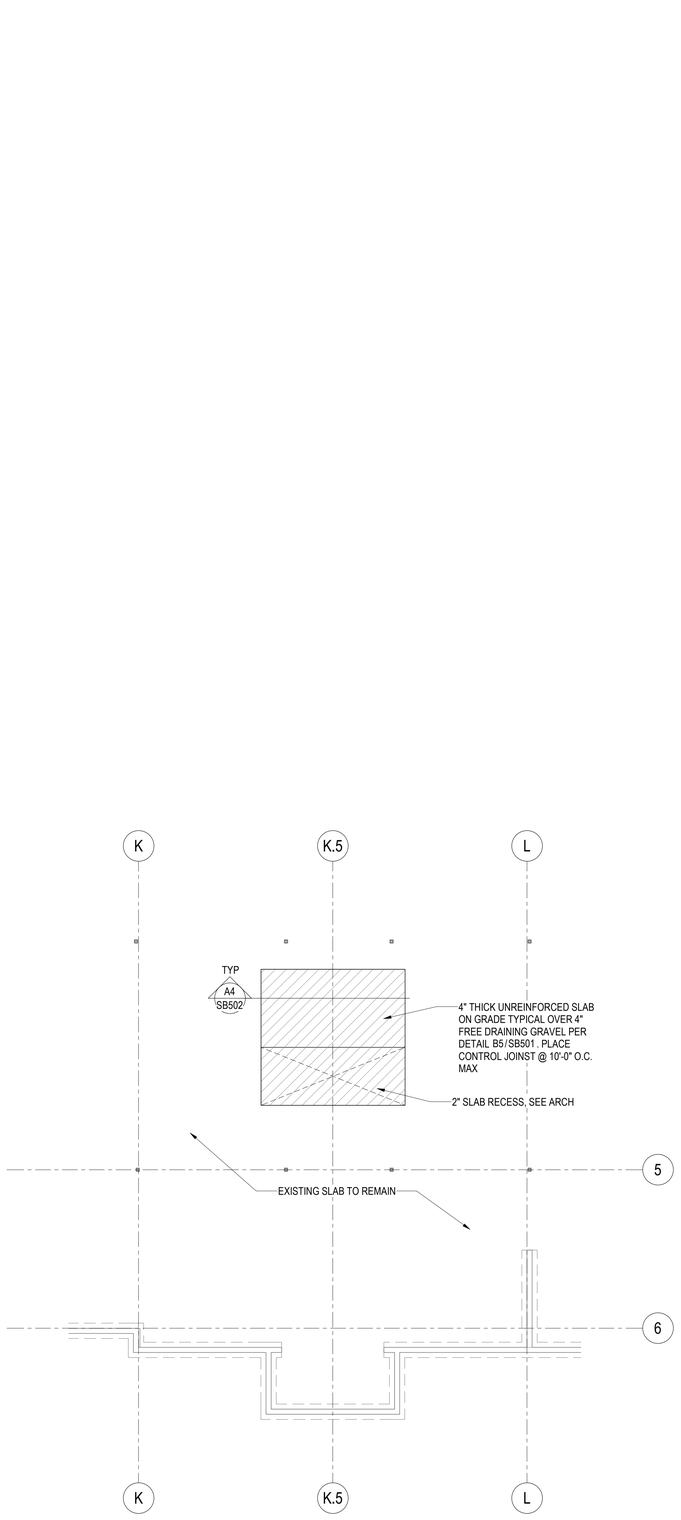
SB101: FOOTING AND FOUNDATION PLAN

1. Shifted columns along gridline 2.2 to be centered in stud wall.
2. Revised site retaining wall locations to match the architectural drawings.

SF101: ROOF FRAMING PLAN

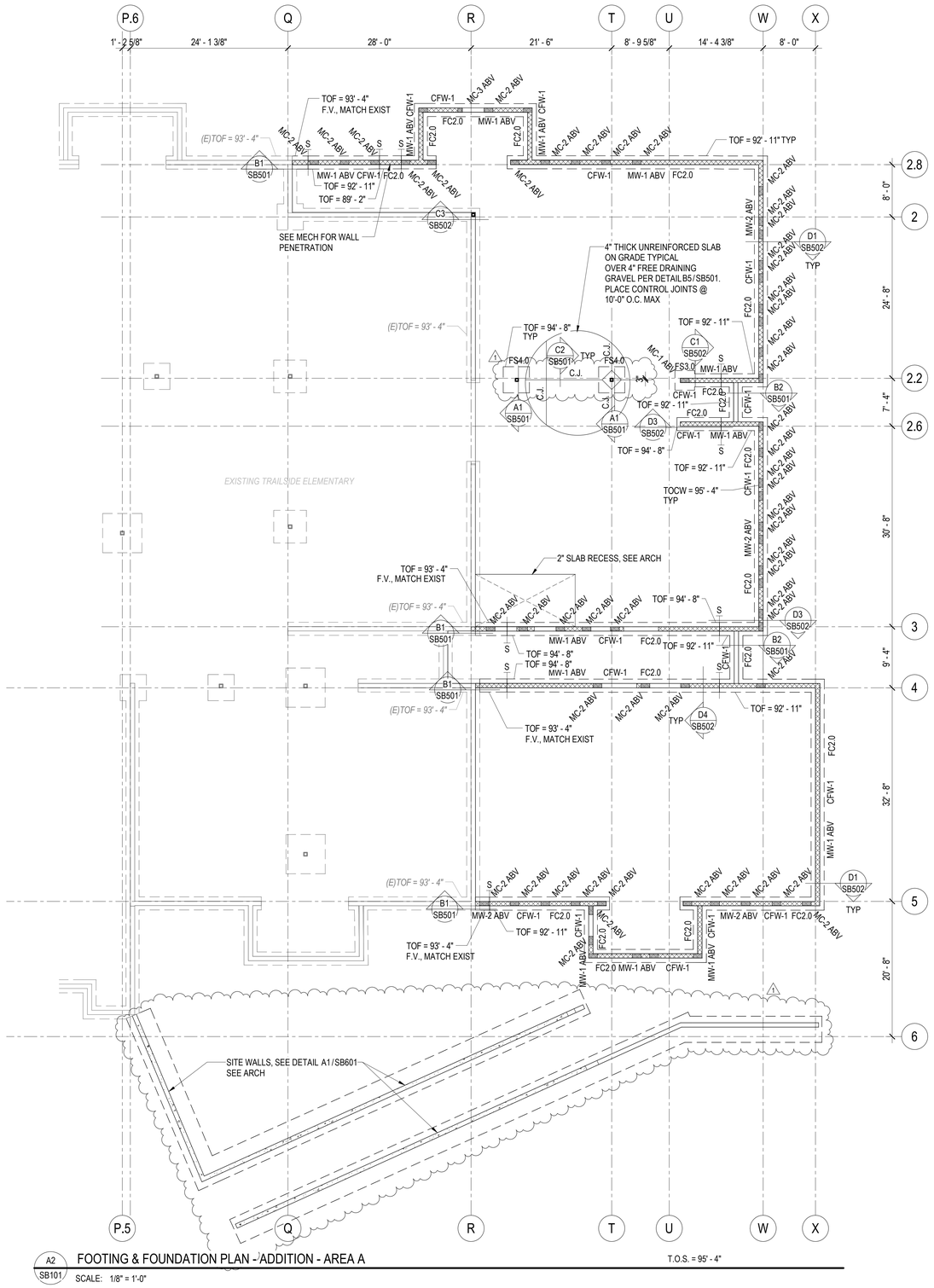
3. Shifted columns along gridline 2.2 to be centered in stud wall.

Attachments: SB101 and SF101



A1 / SB101 FOOTING & FOUNDATION PLAN - ADDITION - AREA B

SCALE: 1/8" = 1'-0"



A2 / SB101 FOOTING & FOUNDATION PLAN - ADDITION - AREA A

SCALE: 1/8" = 1'-0"

EXISTING BUILDING NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO DETAILING, FABRICATING, ERECTING OR INSTALLING ANY STRUCTURAL ELEMENT. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN TEAM IN A TIMELY MANNER SUCH THAT WORK WILL NOT BE DELAYED.

2. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING OF EXISTING STRUCTURE DURING CONSTRUCTION.

MASONRY WALL NOTES

1. TERMINATE HORIZONTAL REINFORCEMENT AT CONTROL JOINTS IN MASONRY WALLS PER DETAIL A1/SB611 .

2. PROVIDE ADDITIONAL HORIZONTAL AND VERTICAL REINFORCING AT WALL CORNERS, EDGES OF OPENINGS, WALL ENDS, AND WALL INTERSECTIONS PER D1/SB611

3. SEE A2/SB611 FOR TYPICAL REINFORCING AROUND MISCELLANEOUS OR RECESSED MASONRY WALL OPENINGS.

4. SEE B1/SB611 FOR REQUIRED ADDITIONAL DUCTILITY REINFORCING IN LOAD BEARING MASONRY WALLS.

SLAB ON GRADE PLAN NOTES

1. ALL SLABS ON GRADE SHALL BE 4 INCHES THICK, UNLESS NOTED OTHERWISE. SEE TYPICAL CONCRETE SLAB ON GRADE PROFILE DETAIL B5/SB501 FOR SUBGRADE REQUIREMENTS.

2. SEE ARCHITECTURAL, CIVIL AND LANDSCAPE DRAWINGS FOR EXTERIOR CONCRETE WORK AT DOORS, SIDEWALKS, ETC.

3. SEE ARCHITECTURAL DRAWINGS AND FINISH SCHEDULE FOR SLAB DEPRESSIONS, SLOPES TO DRAINS AND SLAB AREAS TO RECEIVE FLOOR TILE.

4. SEE TYPICAL CONCRETE SLAB ON GRADE DETAILS FOR CONSTRUCTION JOINTS, CONTROL JOINTS AND ADDITIONAL SLAB REINFORCING C2/SB501 .

5. SUBMIT SLAB ON GRADE CONTROL JOINT PLAN FOR REVIEW.

6. PROVIDE HOUSEKEEPING PADS AND CURBS PER DETAIL C4/SB501 . VERIFY DIMENSIONS AND LOCATIONS OF CURBS AND PADS WITH MECHANICAL AND EQUIPMENT SUPPLIER.

FOOTING & FOUNDATION PLAN NOTES

1. SEE ARCHITECTURAL, CIVIL AND LANDSCAPE DRAWINGS FOR EXTERIOR CONCRETE RETAINING AND / OR SITE WALLS NOT SHOWN ON THE STRUCTURAL DRAWINGS.

2. SEE TYPICAL STEP DETAIL AT CONTINUOUS FOOTING FOR REINFORCING REQUIREMENT D3/SB502 .

3. PROVIDE REINFORCEMENT AT WALL ENDS, INTERSECTIONS AND OPENINGS PER TYPICAL DETAILS D2/SB601 , C2/SB601 AND C4/SB601 .

4. DOWEL ALL CONCRETE WALLS TO FOOTING PER TYPICAL DETAIL D2/SB501.

5. PROVIDE COMPACTED STRUCTURAL FILL UNDER ALL CONCRETE FOOTINGS PER TYPICAL DETAIL B4/SB501 .

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No. 295737
JEROD G. JOHNSON
STATE OF UTAH

3/8/2024

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REV	DATE	DESCRIPTION
1	4/1/2024	Addendum #2

VCBO NUMBER:	21635.04
CLIENT NUMBER:	2021.0225D
DATE:	2024 03 08

PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
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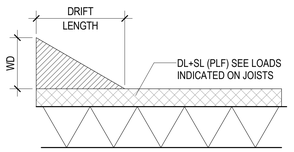
CONSTRUCTION DOCUMENTS

FOOTING & FOUNDATION PLAN - ADDITION

SB101

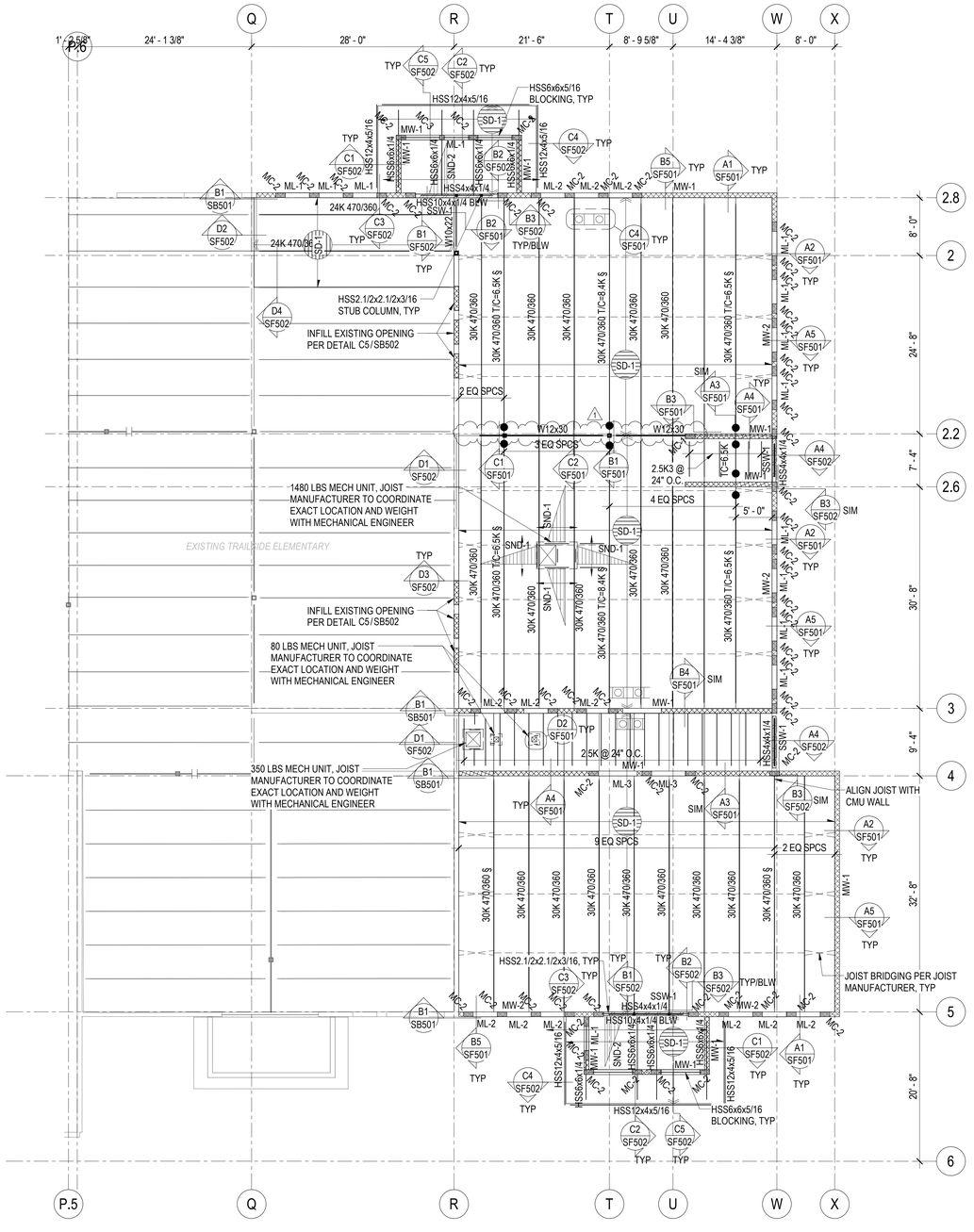
SNOW DRIFT SCHEDULE		
MARK	DRIFT LENGTH	WD (PSF)
SND-1	7' - 10"	26
SND-2	7' - 1"	47

NOTES:
1. FOR OWSJ DESIGN DRIFT LOADS SHALL BE IN ADDITION TO ALL LOADS INDICATED ON PLANS.
2. SNOW DRIFT VALUES IN SCHEDULE ARE IN UNITS OF PSF. MULTIPLY LOADS BY JOIST SPACING TO OBTAIN PLF LOADING FOR JOIST DESIGN.



B1 / SF101 SNOW DRIFT SCHEDULE
NO SCALE

A1 / SF101 ROOF FRAMING PLAN - AREA B
SCALE: 1/8" = 1'-0"



A2 / SF101 ROOF FRAMING PLAN - ADDITION - AREA A
SCALE: 1/8" = 1'-0"

EXISTING BUILDING NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO DETAILING, FABRICATING, ERECTING OR INSTALLING ANY STRUCTURAL ELEMENT. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN TEAM IN A TIMELY MANNER SUCH THAT WORK WILL NOT BE DELAYED.

2. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING OF EXISTING STRUCTURE DURING CONSTRUCTION.

MASONRY WALL NOTES

1. TERMINATE HORIZONTAL REINFORCEMENT AT CONTROL JOINTS IN MASONRY WALLS PER DETAIL A1/SB611 .

2. PROVIDE ADDITIONAL HORIZONTAL AND VERTICAL REINFORCING AT WALL CORNERS, EDGES OF OPENINGS, WALL ENDS, AND WALL INTERSECTIONS PER D1/SB611

3. SEE A2/SB611 FOR TYPICAL REINFORCING AROUND MISCELLANEOUS OR RECESSED MASONRY WALL OPENINGS.

4. SEE B1/SB611 FOR REQUIRED ADDITIONAL DUCTILITY REINFORCING IN LOAD BEARING MASONRY WALLS.

ROOF FRAMING PLAN NOTES

1. SEE ARCHITECTURAL FOR ROOF SLOPES AND DRAINS. PROVIDE STEEL FRAMES OR REINFORCE OPENINGS PER DETAIL C4/SF501 AT STEEL DECK.

OPEN WEB JOIST FRAMING PLAN NOTES

1. OPEN WEB STEEL JOISTS AND JOIST GIRDERS SHALL BE DESIGNED BY THE MANUFACTURER TO SUPPORT THE MECHANICAL AND LATERAL LOADS SHOWN ON THE ROOF FRAMING PLANS IN ADDITION TO THE UNIFORM AND POINT LOADS SHOWN. LOADS SHOWN ARE ASD UNO

2. ±#.##k – INDICATES POINT LOAD ON STEEL JOIST IN ADDITION TO UNIFORM LOADING SHOWN. + INDICATES DOWNWARD AND - INDICATES UPWARD LOADS. LOADS SHOWN ARE UNFACTORED, UNO.

3. T/C X.XXK INDICATES ADDITIONAL TOP CHORD AXIAL FORCE ON STEEL JOIST OR GIRDER. THIS FORCE IS A FACTORED SEISMIC LOAD THAT SHALL BE CONSIDERED IN BOTH TENSION AND COMPRESSION AND INCLUDES APPLICABLE OVERSTRENGTH FACTORS PER THE GOVERNING BUILDING CODE.

4. ALL LOADS SUPPORTED BY OPEN WEB STEEL JOISTS AND GIRDERS SHALL BE LOCATED WITHIN 6" OF JOIST OR GIRDER PANEL POINT OR THE JOIST OR GIRDER SHALL BE REINFORCED PER DETAIL

5. HORIZONTAL CROSS BRIDGING SHALL BE SIZED AND SUPPLIED BY THE JOIST MANUFACTURER. CONNECT TO WALLS AS INDICATED ON DETAILS C3/SF501 .

6. WHERE SKYLIGHTS OR MECHANICAL UNITS INTERRUPT HORIZONTAL BRIDGING, PROVIDE CROSS BRIDGING AT JOIST SPACES ON EACH SIDE, TYP.

7. OPEN WEB STEEL JOISTS BEARING AT MASONRY WALLS SHALL BE DESIGNED FOR A SEISMIC AXIAL LOAD TO BE RANSFERRED THROUGH THE JOIST BEARING SEAT. MINIMUM UNFACTORED LOAD SHALL BE 2.4K AT K JOISTS. UNO.

8. ALL OPEN WEB STEEL JOISTS WITH A SLOPE OF 3/8" PER FOOT OR LARGER SHALL HAVE SLOPED BEARING SEATS.

9. OPEN WEB STEEL JOISTS AT ROOF AREAS SHALL BE DESIGNED FOR THE FOLLOWING WIND ASD NET UPLIFT LOADS: 60 PSF WITHIN 10.1 FT 'L' SHAPE AT BUILDING CORNER, 44 PSF WITHIN 10.1 FT OF BUILDING EDGE, 33 PSF WITHIN 20.2 FT OF BUILDING EDGE AND 16 PSF AT ALL OTHER AREAS

NON-COMPOSITE FRAMING PLAN NOTES

1. SEE STEEL DECK SCHEDULE ON SHEET SF603 FOR DECK PROFILE AND DECK ATTACHMENT REQUIREMENTS.

2. PROVIDE FRAMING AT OPENINGS THROUGH STEEL DECK PER DETAIL D2/SF501. FOR ROUND OPENINGS LESS THAN 12 INCHES IN DIAMETER SEE DETAIL D4/SF501.

3. VERIFY SIZE WEIGHT, LOCATION AND CONFIGURATION OF ALL ROOF TOP EQUIPMENT WITH ARCHITECT AND MECHANICAL ENGINEER. PROVIDE STEEL FRAMES FOR SUPPORT OF ROOF TOP EQUIPMENT PER DETAIL D3/SF501. COORDINATE OPENINGS WITH MECHANICAL & ELECTRICAL.

4. SEE DETAIL D1/SF501 FOR SUPPORT OF HANGING MECHANICAL UNITS.

STEEL STUD NOTES

1. SEE SW501 FOR STEEL STUD DETAILS AND SCHEDULE.

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3/8/2024

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REV	DATE	DESCRIPTION
1	4/1/2024	Addendum #2

VCBO NUMBER: 21635.04
CLIENT NUMBER: 2021.02250
DATE: 2024 03 08

PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

ROOF FRAMING PLAN - ADDITION

SF101

ARCHIVE\21635.04

VBFA

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Murray, UT 84107
T 801 530 3148

St. George
230 N. 1680 E.
Building V
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Logan
40 W. Cache Valley Blvd.
Building 1, Suite B
Logan, UT 84341
T 435 752 5081

Arizona
1602 S. Priest Drive
Suite #103
Tempe, AZ 85281
T 480 889 5075

Date: 03-29-2023
Project No: 21635.04
Project: PCSD TRAILSIDE ELEM. ADDTITION
Revision: Addendum 2

Addendum - The following revision, additions, deletions, and/or items of clarification shall hereby be included as an integral part of the Contract Documents for the above-listed project and shall be fully binding. All other requirements shall remain in effect of the original plans and specification.

DIVISION – 23

DRAWINGS

Sheet: M111.1 – MECHANICAL FLOOR PLANS

1. ADDED RETURN AIR TRANSFER TO RESTROOM 1314A AND 1316A.
2. CLARIFIED RETURN GRILLE SIZE/OPENING.

Sheet: M502 MECHANICAL DETAILS

1. CLARIFIED ROOF MOUNTED MAKE-UP AIR HANDLER DETAIL LOUVERED INTAKE.
2. CLARIFIED DAMPER INFORMATION FOR ROOF MOUNTED DOWNBLAST EXHAUST FAN DETAIL.
3. ADDED IN-LINE PUMP DETAIL.

Sheet: MP111.1 – MECHANICAL PIPING PLANS

1. ADDED KEYED NOTE 5 TO PROVIDED 2-WAY CONTROL VALVE.
2. ADDED KEYED NOTE 5 TO PLAN.

- **PRIOR APPROVALS**

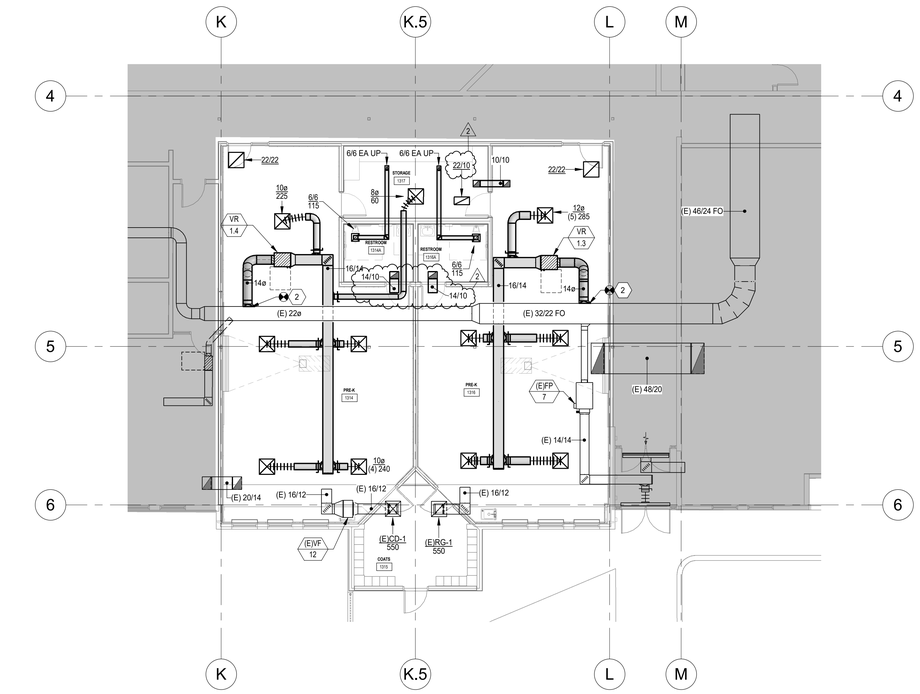
The following manufacturers, trade names and products are allowed to bid on a name brand only basis with the provision that they completely satisfy all and every requirement of the drawings, specifications and all addenda shall conform to the design, quality and standards specified, established and required for the complete and satisfactory installation and performance of the building and all its respective parts.

Item	**Manufacturer**	**Comments**
Make-up Air Unit	Titan Air	
Cabinet Unit Heaters	Sterling Commercial Hydronics	Spec. Section 238239.13

End of Addendum.

KEYED NOTES

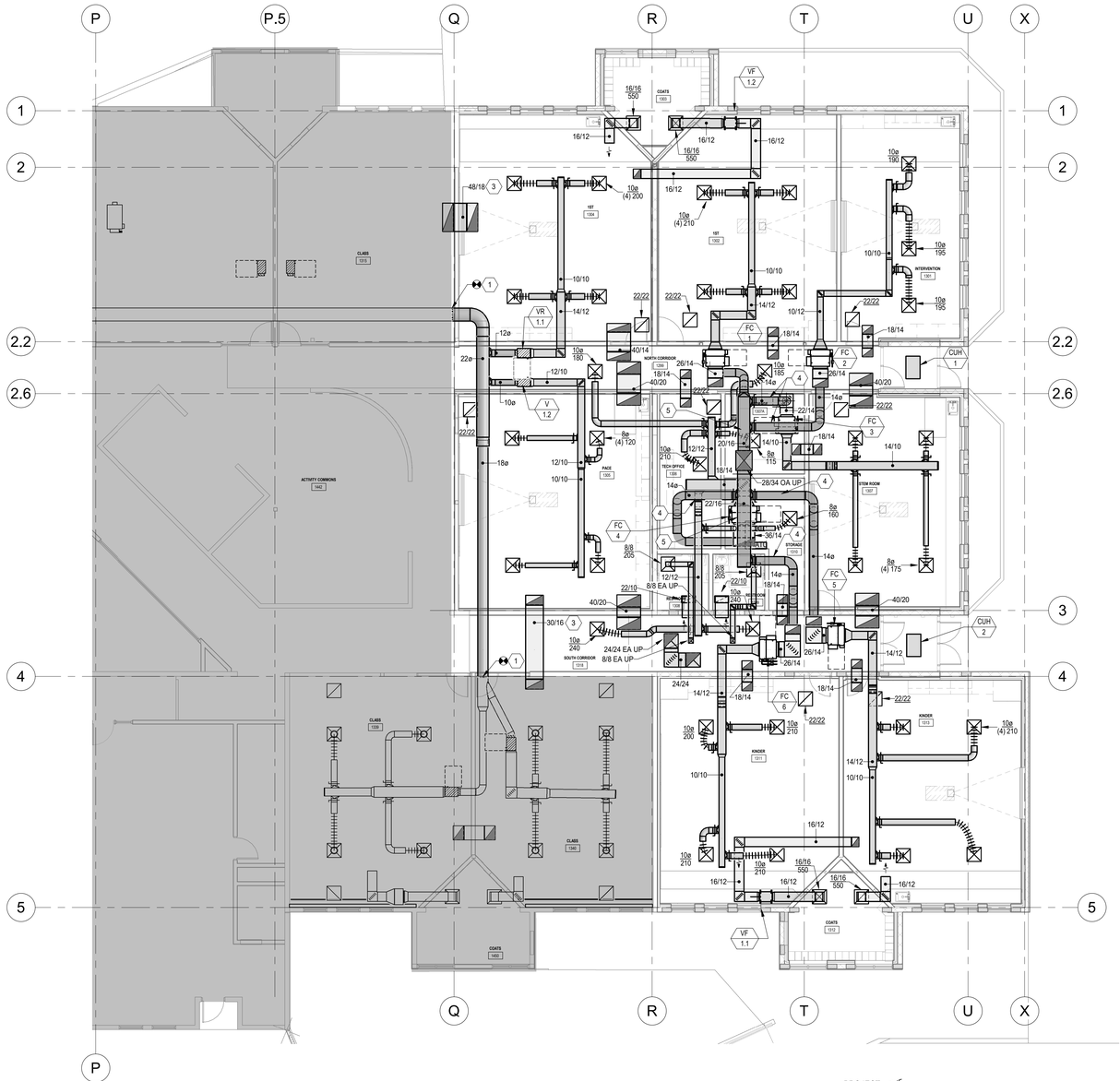
1. EXTEND / MODIFY MEDIUM PRESSURE DUCT AS SHOWN AND CONNECT TO EXISTING DUCT AT THESE LOCATIONS.
2. CONNECT NEW DUCT TO EXISTING MAIN AT THIS APPROXIMATE LOCATION.
3. PROVIDE NEW TRANSFER DUCT AS SHOWN, USE EXISTING PENETRATIONS THROUGH WALLS. COORDINATE WITH SITE CONDITIONS.
4. COORDINATE DUCT ROUTING THROUGH JOISTS. PROVIDE OFFSETS AS REQUIRED TO CONNECT TO RETURN PLENUM ON FAN COIL.
5. DUCTING TO BE ROUTED IN OPEN SPACE BETWEEN JOISTS.



2 MECHANICAL FLOOR PLAN - AREA B
SCALE: 1/8" = 1'-0"

0 4' - 0" 8' - 0" 16' - 0"

PROJECT NORTH TRUE NORTH



1 MECHANICAL FLOOR PLAN - AREA A
SCALE: 1/8" = 1'-0"

0 4' - 0" 8' - 0" 16' - 0"

PROJECT NORTH TRUE NORTH

VCBO ARCHITECTURE
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LICENSED PROFESSIONAL ENGINEER
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SPENCER W. HOWELL
03-08-2024
STATE OF UTAH

VBFA
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VBFA Project #: 21572

REV	DATE	DESCRIPTION
1	3/25/2024	ADD #001
2	3/29/2024	ADD #002

VCBO NUMBER: 21635.04
CLIENT NUMBER:
DATE: 2024 03 08

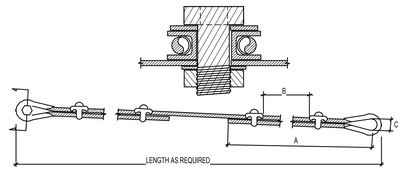
PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

MECHANICAL FLOOR PLANS

4/1/2024 8:50:33 AM

M111.1



NOTES:
1. CABLES, THIMBLES, CLIPS, GROMMETS & FLAT WASHERS ARE TO BE FURNISHED BY RESTRAINT MANUFACTURER. ALL OTHER HARDWARE TO BE PROVIDED BY CONTRACTOR.

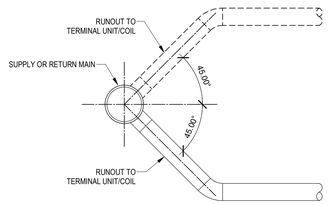
2. ENTIRE SYSTEM TO BE EQUAL TO AMBER BOOTH.

3. CABLE CLIPS MUST BE ORIENTED AS SHOWN WITH SHORT END OF CABLE ON THE CURVED PART OF THE CLIP.

CABLE SCHEDULE

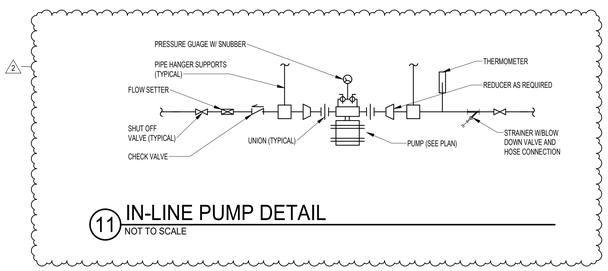
CABLE DIA.	CABLE DESIGN	A	B	C	BOLT SIZE	ALLOWABLE LOAD (lbf)	BREAKING STRENGTH (lbf)
1/8"	7X19 GALV.	5-1/4"	1-5/8"	5/8"	3/8"	660	2000
3/16"	7X19 GALV.	5-3/4"	1-7/8"	5/8"	3/8"	1400	4200
1/4"	7X19 GALV.	6-3/4"	2-3/8"	11/16"	3/8"	2330	7000
5/16"	7X19 GALV.	7-3/8"	2-5/8"	13/16"	5/8"	3260	9800
3/8"	7X19 GALV.	8-7/8"	3-1/4"	1"	5/8"	4800	14400
7/16"	6X19 IWRC	17"	3-5/8"	1"	5/8"	5920	17800
1/2"	6X19 IWRC	18"	3-7/8"	1-1/8"	3/4"	7660	23000

8 CABLE RESTRAINT DETAIL
NOT TO SCALE

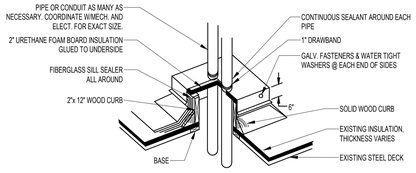


9 MECHANICAL PIPING BRANCH RUNOUT DETAIL
NOT TO SCALE

10 ROOF MOUNTED DOWNBLAST EXHAUST FAN DETAIL
NOT TO SCALE



11 IN-LINE PUMP DETAIL
NOT TO SCALE



5 MULTI-PIPE ROOF PENETRATION DETAIL
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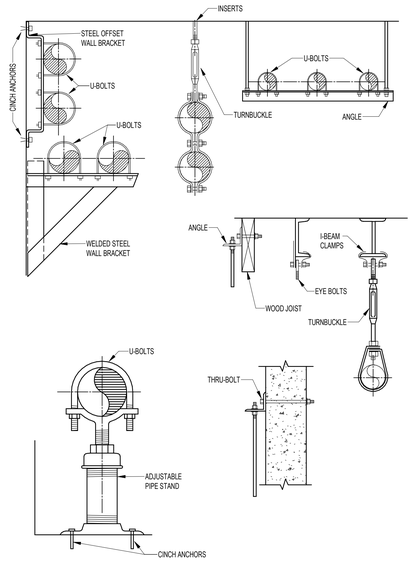
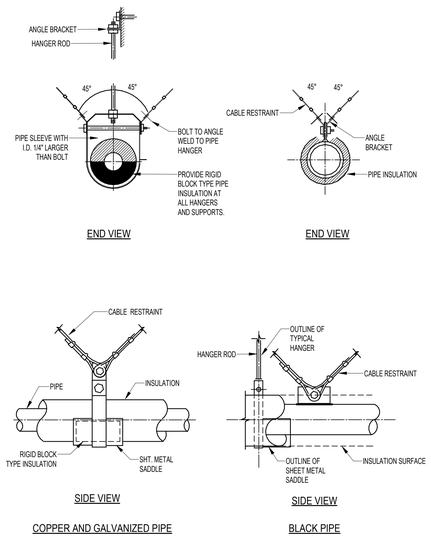
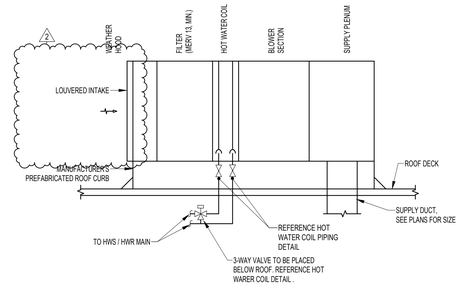


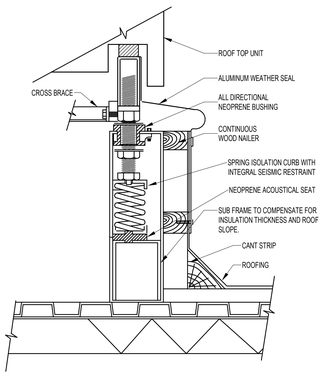
6 PIPE SUPPORT DETAIL
NOT TO SCALE



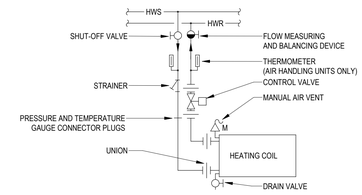
7 PIPING RESTRAINT DETAIL
NOT TO SCALE



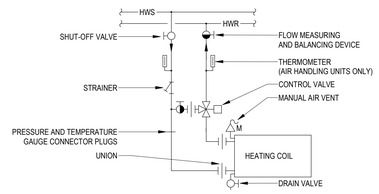
1 ROOF MOUNTED MAKE-UP AIR HANDLER UNIT DETAIL
NOT TO SCALE



2 ROOFTOP CURB DETAIL
NOT TO SCALE



3 HOT WATER COIL PIPING DETAIL W/2-WAY VALVE - SINGLE
NOT TO SCALE



4 HOT WATER COIL PIPING DETAIL W/3-WAY VALVE - SINGLE
NOT TO SCALE

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VBFA Project #: 21572

REV	DATE	DESCRIPTION
2	3/29/2024	ADD #002

VCBO NUMBER: 21635.04
CLIENT NUMBER:
DATE: 2024 03 08

PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

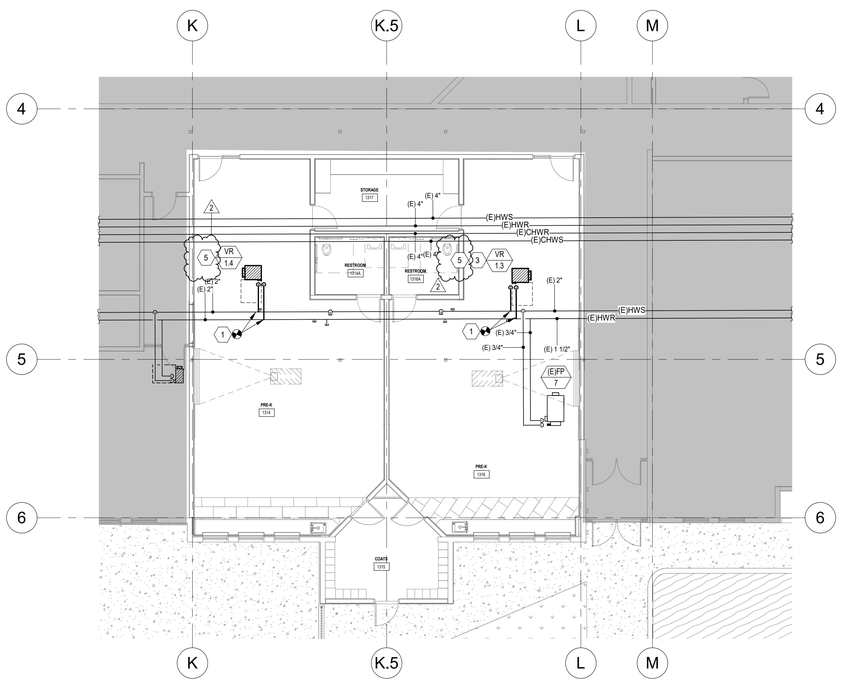
MECHANICAL DETAILS

4/1/2024 8:53:33 AM

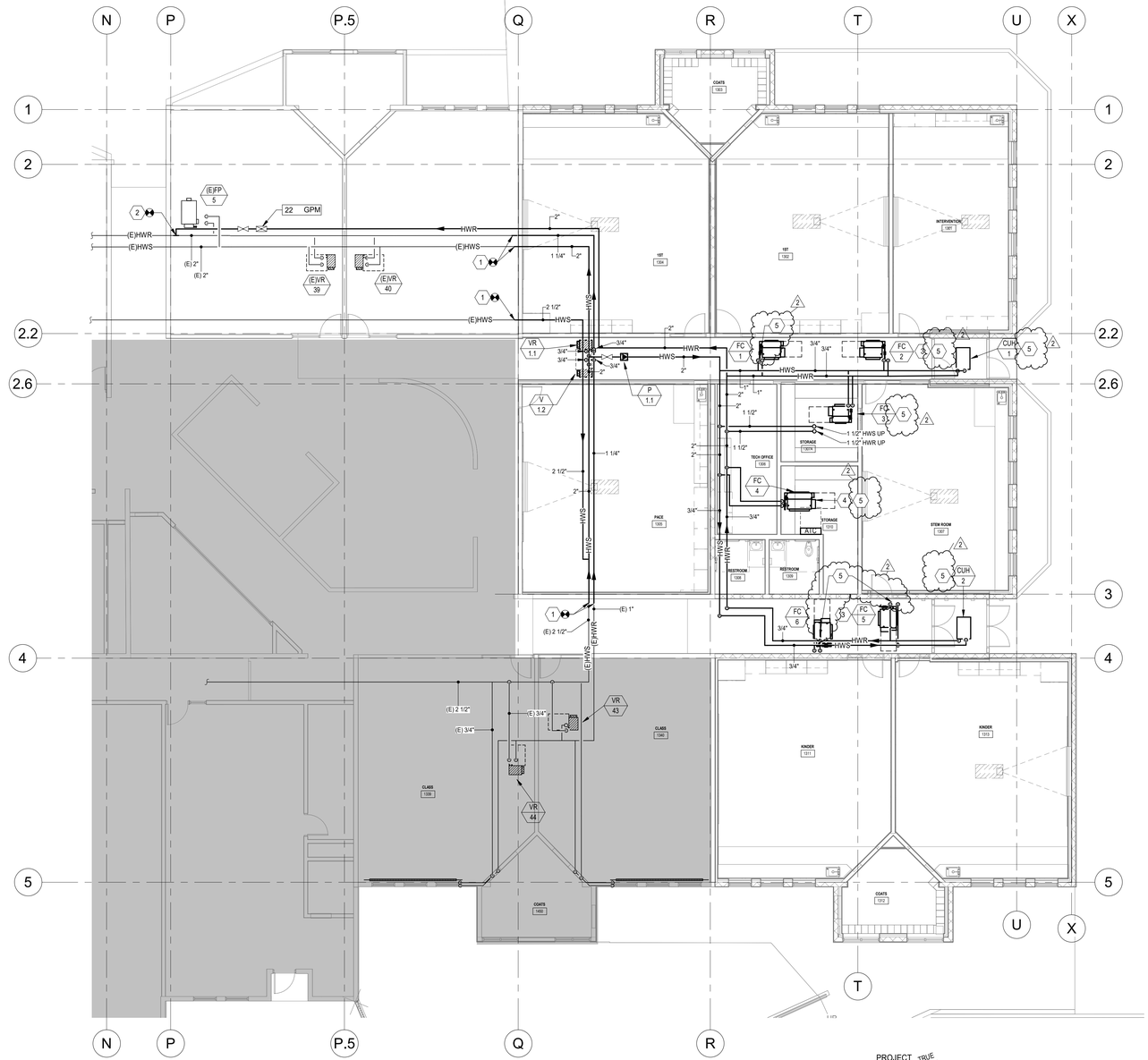
M502

KEYED NOTES

1. CONNECT NEW HEATING WATER SUPPLY / RETURN PIPING TO EXISTING MAIN(S) AS REQUIRED. COORDINATE ROUTE PIPING WITH EXISTING CONDITIONS.
2. ROUTE NEW HEATING WATER RETURN PIPING BACK TO THIS APROXIMATE LOCATION. NEW HEATING WATER RETURN PIPING TO CONNECT TO AN EXISTING 2" OR LARGER PIPE. COORINDATE PIPE ROUTING AND PIPE CONNECTION WITH SITE CONDITIONS.
3. REFERENCE MECHANICAL SCHEDULE SHEET FOR PIPE RUNOUT SIZE(S) TO MECHANICAL EQUIPMENT. TYPICAL.
4. ALL FAN COIL UNITS TO HAVE 2-WAY VALVE INSTALLED. REFERENCE DETAILS FOR PIPING ARRANGEMENTS FOR 2-WAY OR 3-WAY CONFIGURATIONS.
5. PROVIDE 2-WAY CONTROL VALVE.



2 MECHANICAL PIPING FLOOR PLAN - AREA B
SCALE: 1/8" = 1'-0"



1 MECHANICAL PIPING FLOOR PLAN - AREA A
SCALE: 1/8" = 1'-0"

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PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
5700 Trailside Dr, Park City, UT 84098
CONSTRUCTION DOCUMENTS

MECHANICAL PIPING FLOOR PLANS

4/1/2024 8:50:31 AM

MP111.1

ENVISION ENGINEERING

ADDENDUM

ELECTRICAL ADDENDUM NO. 02

To: Breanna Bonsavage **From:** Scott Kingery

Company: VCBO

Date: March 29, 2024

Project: PCSD – Trailside Elementary Addition

The following changes as described below are issued as an addendum to the construction documents prior to bid submittal due date. The contractors are responsible for ensuring all addendum additions and/or changes are included in their bid.

Lighting Prior Approvals

1. The following are added to the list of approved lighting manufacturers (subject to compliance with the project requirements):

AW1	Lithonia, Visionaire, Beacon, McGraw-Edison
DL1	Lithonia, Williams, F-Class, Halo
FA1	Lithonia, Williams, Columbia, Metalux
GP1	Lithonia, Day-Bright, ILP, Metalux
GP21	Lithonia, Day-Bright, ILP, Metalux
P1	Lithonia, Williams, ILP, Metalux
X1	Lithonia, Mule, Compass, Evenlite

If selected, the prior approved lighting products will be reviewed again during the submittal review process. If it's subsequently determined that the prior approved products are not equivalent to the basis of design light fixtures, the products will be rejected, and the Contractor shall be required to provide a product equivalent to the basis of design light fixture. All products must comply with a maximum of 30-day lead time.

Approved lighting controls: nLight, Wattstopper, Lutron, Cooper. Lighting controls shall be wired, wireless lighting controls will not be accepted.

Drawings

Sheet ED101 – Level 01 – Lighting Demolition Plan

1. Remove the existing building mounted light fixture as shown.
2. See attached revised sheet.

Sheet EL101 – Level 01 – Lighting Plan

1. Add new fixture AW1 as shown.
2. See attached revised sheet.

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Sheet EL501 – Lighting Details and Light Fixture Schedule

3. Fixture Type – AW1 – Custom Color shall be painting fixture to match the exterior finish. Confirm color with the Architect prior to ordering.
4. Fixture Type – X1 – Remove Self-Diagnostics. Exist is AC Only.

End of Electrical Addendum

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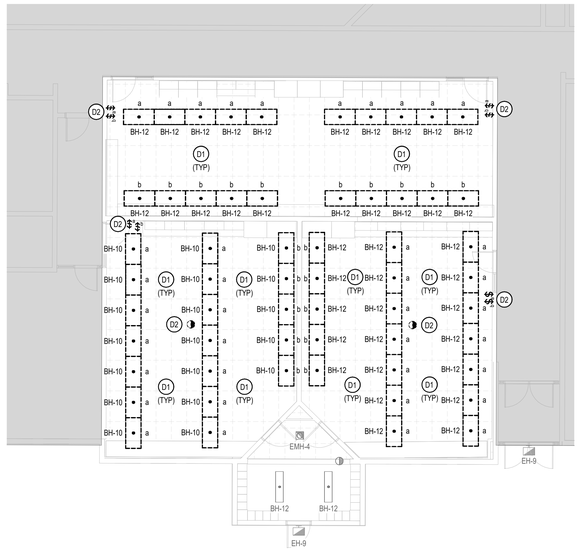
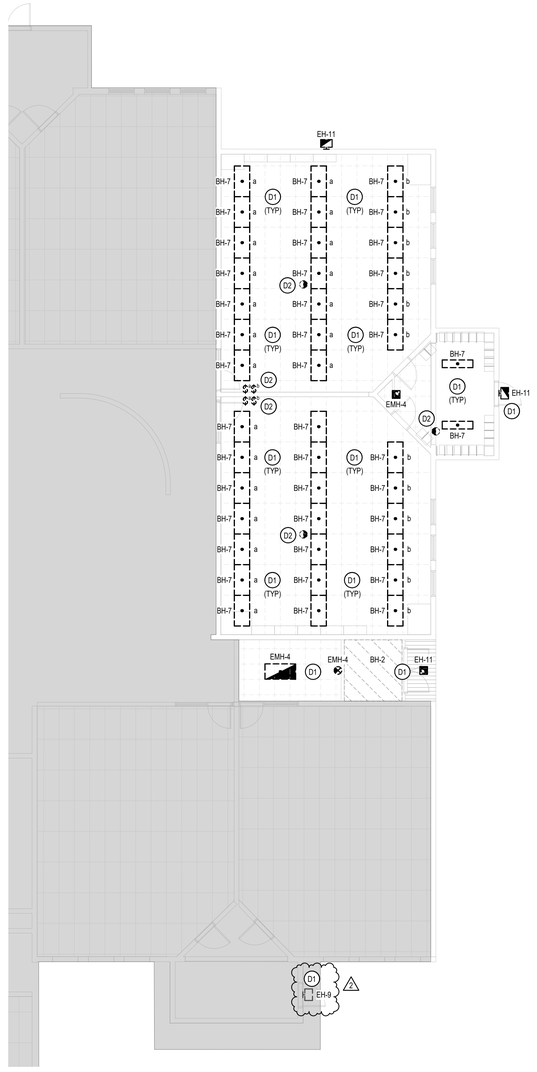


2 LEVEL 01 - LIGHTING DEMOLITION PLAN AREA B

SCALE: 1/8" = 1'-0"



1 LEVEL 01 - LIGHTING DEMOLITION PLAN AREA A

SCALE: 1/8" = 1'-0"

GENERAL DEMOLITION NOTES:

1. UNLESS SPECIFICALLY NOTED OTHERWISE, REMOVE ALL ELECTRICAL ITEMS SHOWN IN DARK AND DASHED LINES. LIGHT AND SOLID ITEMS ARE TO REMAIN. DEMOLITION ITEMS ARE SHOWN TO GIVE A BASIC DESCRIPTION OF THE EXTENT OF DEMOLITION WORK, BUT MAY NOT BE INCLUSIVE. PROVIDE DEMOLITION WORK IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
   - A. DISCONNECT AND REMOVE ANY/ALL FIXTURES, DEVICES, EQUIPMENT, ETC. REQUIRED FOR PROPER COMPLETION OF THE WORK WHETHER SHOWN OR NOT.
   - B. RELOCATE, REWIRE, AND/OR RECONNECT ANY/ALL FIXTURES, DEVICES, EQUIPMENT, ETC. THAT FOR ANY REASON OBSTRUCTS CONSTRUCTION.
   - C. LEAVE ALL EXISTING FIXTURES, DEVICES, EQUIPMENT, ETC. IN PORTIONS OF THE BUILDING NOT BEING REMODELED, IN WORKING CONDITION. RESTORE ALL INTERRUPTED BRANCH CIRCUITS, FEEDERS, ETC.
   - D. REMOVE AND DISPOSE OF ALL RACEWAYS, CONDUCTORS, BOXES, DEVICES, EQUIPMENT, ETC. THAT ARE NOT TO BE REUSED. TERMINATE AT ACCESSIBLE JUNCTION BOX BY PROVIDING PROPER KNOCK-OUT CLOSURE, TAPE CONDUCTORS, LABEL AS "SPARE" WITH CIRCUIT NO., ZONE NO, OR OTHER CHARACTERISTIC IDENTIFYING SOURCE.
   - E. EXISTING RACEWAYS MAY BE REUSED, IF IN PLACE, WHERE POSSIBLE, AND WHERE IN COMPLIANCE WITH THE SPECIFICATIONS AND THE INTENT OF THE CONTRACT DOCUMENTS. UPGRADE AND OR PROVIDE NEW CONDUIT SUPPORTS WHERE NECESSARY FOR ALL RACEWAYS BEING REUSED. ENSURE INTEGRITY OF EXISTING RACEWAYS BEFORE REUSE.
   - F. CONCEAL ALL RACEWAY AND WIRING IN EXISTING WALLS, CEILINGS, FLOORS, ETC. THE USE OF WIREMOLD IS PERMITTED ONLY WHERE SPECIFICALLY NOTED ON DRAWING.
   - G. DO NOT PENETRATE STRUCTURAL ELEMENTS OF FLOORS, WALLS, CEILINGS, ROOFS, ETC.
   - H. COORDINATE WITH OWNER WHAT EQUIPMENT SHOULD BE DISPOSED OF AND WHAT EQUIPMENT IS TO BE RETURNED TO OWNER.
   - I. FIRE ALARM SYSTEM MUST REMAIN OPERATIONAL DURING ALL PHASES OF CONSTRUCTION.

GENERAL NOTES:

1. REMOVE ANY UNUSED BRANCH CIRCUITS BACK TO THE SOURCE COMPLETELY. TURN OFF BREAKER AND LABEL "SPARE
2. BRANCH CIRCUITS, IF SHOWN WERE TAKEN FROM EXISTING RECORD DRAWINGS AND PANEL SCHEDULES. CONTRACTOR TO TRACE OUT ALL CIRCUITS PRIOR TO ANY DEMOLITION.
3. ANY EXISTING CONDUITS, BOXES, ETC THAT ARE LOCATED IN THE AFFECTED CONSTRUCTION AREA SHALL BE RELOCATED OR REROUTED AS NECESSARY
4. THE CONTRACTOR SHALL TRACE ALL EXISTING CIRCUITS AND CONFIRM ALL DEVICES ON THE CIRCUIT PRIOR TO ANY DEMOLITION.
5. THIS AND ANY OTHER DEMOLITION DRAWINGS ARE NOT INTENDED TO BE ALL-INCLUSIVE, NOR TO DEFINE THE SCOPE OF ALL DEMOLITION WORK REQUIRED FOR THIS PROJECT.DEMOLITION DRAWINGS ARE SHOWN ONLY TO AID THE CONTRACTOR IN PREPARING THE BID AND PERFORMING THE WORK. CONTRACTOR SHALL EXAMINE ALL CONTRACT DOCUMENTS AND VISIT THE SITE DURING BIDDING TO DETERMINE THE TOTAL EXTENT AND SCOPE OF THE DEMOLITION PORTION OF THIS WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOOLITION WORK REQUIRED TO CARRY OUT THE WORK AS SHOWN IN THE CONTRACT DOCUMENTS.

KEYED NOTES (#)

D1 DISCONNECT, REMOVE AND DISPOSE OF EXISTING LIGHT FIXTURE. EXISTING BRANCH CIRCUIT TO REMAIN IN PLACE FOR REUSE. REWIRE EXISTING LIGHT FIXTURES ON THE CIRCUIT SO THEY REMAIN OPERATIONAL. CONTRACTOR TO TRACE OUT CIRCUIT TO DETERMINE ACTUAL CIRCUIT FEEDING THE LIGHTS AND ALL LIGHTS CONNECTED TO THE CIRCUIT PRIOR TO THE START OF THE DEMOLITION.

D2 DISCONNECT, REMOVE AND DISPOSE OF EXISTING LIGHTING CONTROLS EXISTING BRANCH CIRCUIT TO REMAIN IN PLACE FOR REUSE. REWIRE EXISTING LIGHT FIXTURES ON THE CIRCUIT SO THEY REMAIN OPERATIONAL. CONTRACTOR TO TRACE OUT CIRCUIT TO DETERMINE ACTUAL CIRCUIT FEEDING THE LIGHTS AND ALL LIGHTS CONNECTED TO THE CIRCUIT PRIOR TO THE START OF THE DEMOLITION.

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REV	DATE	DESCRIPTION
2	03/29/24	Addendum #2

VCBO NUMBER: 21855
CLIENT NUMBER: 00000
DATE: 2024 03 08

PCSD TRAILSIDE ELEM. ADDITION

PCSD PARK CITY SCHOOL DISTRICT
PARK CITY, UT 84098
CONSTRUCTION DOCUMENTS

LEVEL 01 - LIGHTING DEMOLITION PLAN

ED101

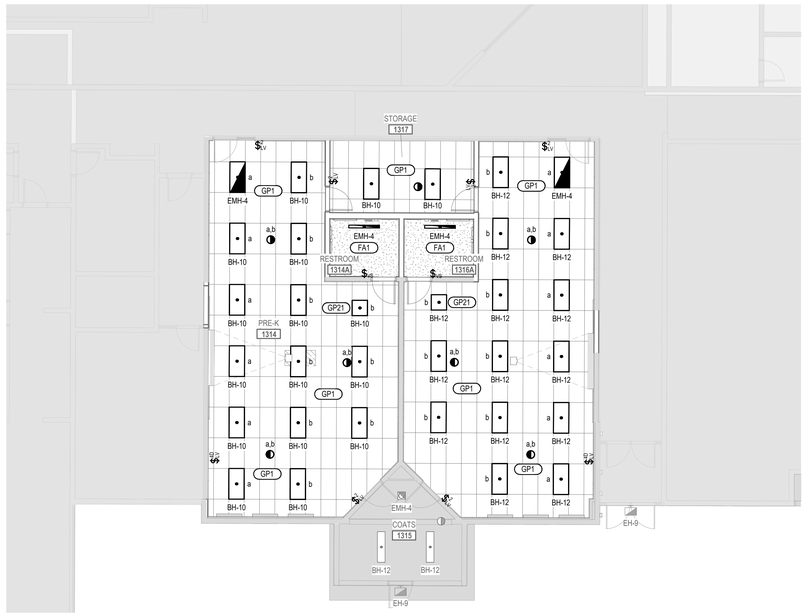
LIGHTING GENERAL NOTES:

1. REFER TO LIGHTING DETAILS SHEETS FOR TYPICAL CONTROL WIRING DIAGRAMS. PROVIDE COMPLETE SYSTEM WITH ALL REQUIRED CONDUIT, WIRING, SWITCHES, SENSORS, POWER PACK, ETC.
2. LOCATE POWER PACKS AND ROOM CONTROLLERS ABOVE ACCESSIBLE CEILING NEAR ROOM ENTRANCES.
3. CONFIRM ALL LOCATIONS OF LIGHT FIXTURES WITH ARCHITECT PRIOR TO INSTALLATION.
4. PROVIDE UNSWITCHED HOT FOR ALL EMERGENCY LIGHTS AND BATTERY PACKS.

KEYED NOTES (#)

L1 MOUNT AS SAME HEIGHT AT EXISTING. CONTRACTOR TO FIELD VERIFY HEIGHT AND CONFIRM HEIGHT WITH THE ARCHITECT PRIOR TO ANY ROUGH-IN.

L2 CONNECT TO THE EXISTING CIRCUIT THAT IS FEEDING THE EXISTING EXTERIOR LIGHTING. NEW LIGHT FIXTURE TO SWITCH WITH EXISTING.



2 LEVEL 01 - LIGHTING PLAN AREA B

SCALE: 1/8" = 1'-0"

1 LEVEL 01 - LIGHTING PLAN AREA A

SCALE: 1/8" = 1'-0"

RELAY CIRCUIT DESIGNATION → LCP-1

a → LOWERCASE LETTER DESIGNATES SWITCHING OR CIRCUIT ASSIGNMENT. ASSIGNMENTS, SUCH AS a/b, INDICATE DUAL LEVEL SWITCHING.

CIRCUIT DESIGNATION → 14EL-3

A2 → LETTER DESIGNATES FIXTURE TYPE.

EM

EXIT SIGNS. CONNECT TO UNSWITCHED HOT EMERGENCY LIGHTING CIRCUIT.

SHADING OR "EM" INDICATES EGRESS LIGHT FIXTURE. CONNECT TO EMERGENCY LIGHTING CIRCUIT.

TYPICAL LIGHT FIXTURE CONVENTION

SCALE: NONE

NOTE:

1. SEE SHEET EL501 FOR LIGHTING CONTROL REQUIREMENTS.

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PARK CITY, UT 84098
CONSTRUCTION DOCUMENTS

LEVEL 01 - LIGHTING PLAN

EL101