

March 10, 2020

SOLICITATION ADDENDUM NO. 1

ITB 19-0042

Westview high School Career Technical Education (CTE) Shop Renovation

THE FOLLOWING CHANGES/ADDITIONS TO THE ABOVE CITED SOLICITATION ARE ANNOUNCED:

This Addendum modifies the Invitation to Bid (ITB) document(s) only to the extent indicated herein. All other areas not changed or otherwise modified by this Addendum shall remain in full force and effect. This Addendum is hereby made an integral part of the ITB document. Bidder must be responsive to any requirements of this Addendum as if the requirements were set forth in the ITB. Failure to do so may result in Bid rejection. See the ITB regarding requests for clarification or change and protests of this Addendum, and the deadlines for the foregoing.

This addendum is to be acknowledged in the space provided on the Bidder Certification form supplied in the solicitation document. Failure to acknowledge receipt of this addendum may be cause to reject your offer.

The closing date is UNCHANGED: April 2, 2020 at 2:00 PM Pacific Time

CHANGES:

1. In the ITB documents, Section V – Attachments, the Bid Submission Checklist is hereby updated to included references to the following attachments, which are also referenced in the General Scope of Work and were published with the ITB Documents:

ATTACHMENT K Drawings

ATTACHMENT L Specifications

These Attachments are not to be returned with the Bid, but bidders must review their content.

2. The Specifications are hereby changed per the attached Specifications Revisions/Additions documents. A summary of such changes is found in a. through c. below for reference:
 - a. A Substitution Request Form has been added for use as specified in the Specifications
 - b. Section 03 30 00, Part 1, Item 1.4, Line B.2: are updated to “Include substantiating substantial test data to show compliance with ACI **301.**”
 - c. Update to spec section 05 50 00, Part 1, Item 1.4, Line C:
“Delegated-Design Submittal: For a platform support of the abort gate (Reference MEP documents for equipment information), including analysis data signed and sealed by the qualified professional engineer responsible for their preparation, calculations sealed by an engineer licensed in the state of Oregon prior to beginning of fabrication. **Design shall include design of framework for vertical and lateral loads, anchorage into concrete, attachment between mechanical unit and framework, and any other elements required to support the**

mechanical unit. Platform shall be constructed of galvanized steel members and shall meet the following design criteria:

- 1. $S_s=0.911g$**
- 2. $S_1=0.422$**
- 3. Site Class D**
- 4. $V_{ult}=115$ mph**
- 5. Exposure C**
- 6. Consideration shall be given to seismic separation and deflection of ductwork, etc.**

3. The Drawings are hereby changed according to the attached Drawings Revisions/Additions documents.

A summary of such changes is found below:

- a. General Sheet: G0.00 – Call out of Deferred Submittals
- b. Architectural Sheet: A4.02 – Update to details affected by mechanical ducting change
- c. Electrical Sheet: ED101 – Update to plan lighting
- d. Electrical Sheet: E101 – Update to plan lighting
- e. Mechanical Sheet: M201 – Update to plan mechanical ducting layout and air filter
- f. Mechanical Sheet: M601 – Update to plan mechanical ducting layout and air filter

CLARIFICATIONS:

Question: Do substitutions need to be pre-approved?

Answer: Yes, see substitution process in Specifications.

Question: Where is the substitution request form?

Answer: One has been added via this Addendum 1. See above CHANGES and attached documents.

End of CLARIFICATIONS

The Specifications Revisions/Additions and Drawings Revisions/Additions documents are hereby attached to this Addendum 1, and incorporated by reference.

-END of Addendum 1

Peter Madaus
Contract Specialist

Specifications Revisions/Additions

WHS CTE RENOVATION
BEAVERTON SCHOOL DISTRICT

100% CD SET

SECTION 033000 – CAST-IN-PLACE CONCRETE

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 specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. Related Sections include the following:
 - 1. Section 011000 – General Information and Requirements

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.4 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mix water to be withheld for later addition at Project site.
 - 2. Include substantiating substantial test data to show compliance with ACI 301.
- C. Steel Reinforcement Shop Drawings: Steel reinforcement shop drawings shall contain sufficient detail and information to allow complete fabrication and installation of the reinforcing steel without reference to the contract drawings either on the fabrication shop floor or at the project site. The steel reinforcement detailer shall generate all shop drawing bending and installation details from the structural and architectural drawings and specifications. The use of reproductions or photocopies of the contract drawings shall not be permitted. Submit prior to placement of reinforcement with sufficient time for review and return.
- D. Provide details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar

schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Owner's Representative.
- E. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
1. Cementitious materials and aggregates.
 2. Steel reinforcement and reinforcement accessories.
 3. Admixtures.
 4. Curing materials.
 5. Floor and slab treatments.
 6. Vapor barriers.
 7. Semi-rigid joint filler.
 8. Joint-filler strips.
 9. Repair materials.
- F. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.
- G. QUALITY ASSURANCE**
- H. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and supervisor who is an ACI-certified Concrete Flatwork Technician.
- I. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM 94/C94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete" Production Facilities.
- J. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- K. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- L. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specification for Structural Concrete"
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- M. Concrete Testing Service: Engage a qualified independent testing agency to perform

material evaluation tests and to design concrete mixtures.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

1.6 SYSTEM DESCRIPTION

- A. Redesign or Departures from Requirements of the Contract Documents Initiated by Contractor:
 - 1. Obtain written acceptance from the Owner.
 - 2. Bear costs for Contractor-initiated or construction error due to changes in type, form, system, or details of construction from those indicated by the contract documents.
 - 3. Costs of review of such changes by the Owner will be deducted from the Contract Sum by Change Order.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of the exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes not larger than 1 inch (25 mm) in diameter in concrete surface.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: Refer to General Structural Notes.
- B. Low-Alloy-Steel Reinforcing Bars: All reinforcing steel to be welded or bent in field: ASTM A 706/A 706M, deformed.

2.3 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I/II.
 - 1. Fly Ash: ASTM C 618, Class C or F. Refer to General Structural Notes.
 - 2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregate: ASTM C 33, uniformly graded:
 - 1. Nominal Maximum Aggregate Size: 3/4 inch (19 mm).
- D. Water: Potable and complying with ASTM C 94/94M.
- E. Regional Materials: Aggregates shall be extracted, harvested, or recovered, as well as manufactured, from materials within 500 miles of Project site.

2.5 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Water-Reducing Admixture: ASTM C 494, Type A.
- D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
- E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

- F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.6 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. (305 g/sq. m) dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 309, Type 1, Class B, dissipating.
- F. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - a. Axim Italcementi Group, Inc.; CATExOL CimFilm.
 - b. BASF Construction Chemicals – Building Systems; Confilm.
 - c. ChemMasters; Spray-Film.
 - 2. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.7 CONCRETE MIXES

- A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
 - 1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.
- B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.
- C. Proportion Concrete mix as follows:
 - 1. Compressive Strength: Refer to General Structural Notes.
 - 2. Maximum Water-Cementitious Materials Ratio: Refer to General Structural Notes.
 - 3. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having 5% +/-1% air entrainment for all exterior exposed horizontal concrete surfaces.

- D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash: maximum 20 percent
- E. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- F. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

2.8 RELATED MATERIALS

- A. Semi-rigid Joint Filler: Two-component, semi-rigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 or aromatic polyurea with a Type A shore durometer hardness range of 90 to 95] per ASTM D 2240.

2.9 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class B, 1/4 inch (6 mm).

2. Limit concealed surfaces to $\pm 1/16"$ at wall recesses for electric panels.
- D. Construct forms tight enough to prevent loss of concrete mortar.
 - E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
 1. Do not use rust-stained steel form-facing material.
 - F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
 - G. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
 - H. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
 - I. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 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. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 1. Install anchor bolts, accurately located, to elevations required.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Adjust mix as required to maintain specified air content at the point of discharge.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.
- D. 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. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-

textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

- E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
- F. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FINISHING FORMED SURFACES

- A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch (3 mm) in height.
 - 1. Do not apply rubbed finish to smooth-formed finish.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

- A. General: Comply with recommendations in ACI 302.1R for screeding, restraigthening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces indicated, to surfaces to receive trowel finish,
- C. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, or another thin film-finish coating system
 - 2. Finish surfaces to the following tolerances, measured within 72 hours according to ASTM E 1155/E 1155M for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, parking, stair treads and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.9 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:
 - 1. 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 (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or

tears during curing period using cover material and waterproof tape.

- D. Cure concrete according to ACI 308.1 by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with **12-inch** lap over adjacent absorptive covers.
 - 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. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

3.10 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least six months. 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 joint clean and dry.
- C. Install semi-rigid epoxy joint filler full depth in saw-cut joints and at least **2 inches** deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.11 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.2-mm) 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 (13 mm) in any dimension in solid concrete but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. 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 will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template. Submit repair plan to Architect for approval prior to beginning repairs.
1. Repair finished surfaces containing defects. Surface defects include spalls, pop-outs, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 5. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch (19 mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 6. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. 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.

3.12 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each 500 cu. yd. (38 cu. m) or fraction thereof of each concrete mix placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 - 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 - 5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 - 6. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
 - a. Cast and field cure one set of four standard cylinder specimens for each composite sample.
 - 7. Compressive-Strength Tests: ASTM C 39; test one laboratory-cured specimen at 7 days, two at 28 days, and hold one for later testing.
- C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- D. Strength of each concrete mix 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 (3.4 MPa).

- E. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, type of break for both 7-and 28-day tests, and air content
- F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- G. Additional Tests: Testing and inspecting agency shall 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 Contracting Officer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.
- H. Slab Leveling and Flatness Testing: Testing and inspecting agency shall test each bay of each floor for conformance to specified tolerance.

END OF SECTION 033000

SECTION 055000 - METAL FABRICATIONS

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:
 - 1. Steel framing and supports for applications where framing and supports are not specified in other Sections.

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 metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Paint products.
- B. Shop Drawings: Show fabrication and installation details. Include details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
 - 1. Abort gate platform
- C. Delegated-Design Submittal: For a platform support of the abort gate (Reference MEP documents for equipment information), including analysis data signed and sealed by the qualified professional engineer responsible for their preparation, calculations sealed by an engineer licensed in the state of Oregon prior to beginning of fabrication. Design shall include design of framework for vertical and lateral loads, anchorage into concrete, attachment between mechanical unit and framework, and any other elements

required to support the mechanical unit. Platform shall be constructed of galvanized steel members and shall meet the following design criteria:

1. $S_s=0.911g$
2. $S_1=0.422$
3. Site Class D
4. $V_{ult}=115$ mph
5. Exposure C
6. Consideration shall be given to seismic separation and deflection of ductwork, etc.

- D. Delegated-Design Submittal: For attachment to existing structure for Air Filter (Reference MEP documents for equipment information), including analysis data signed and sealed by the qualified professional engineer responsible for their preparation, calculations sealed by an engineer licensed in the state of Oregon prior to beginning of fabrication. Design shall include design of framework for vertical and lateral loads, anchorage into existing structure, attachment between mechanical unit and framework, and any other elements required to support the mechanical unit. Design shall meet the following criteria:

1. $S_s=0.911g$
2. $S_1=0.422$
3. Site Class D

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Mill Certificates: Signed by steel manufacturers, certifying that products furnished comply with requirements.
- C. Welding certificates.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design abort gate platform.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.
- D. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- E. Rolled-Stainless-Steel Floor Plate: ASTM A 793.
- F. Abrasive-Surface Floor Plate: Steel plate with abrasive material metallurgically bonded to steel.
- G. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- H. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless-steel fasteners for fastening stainless steel.
 - 3. Provide stainless-steel fasteners for fastening nickel silver.
 - 4. Provide bronze fasteners for fastening bronze.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

- C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3 (ASTM A 325M, Type 3); with hex nuts, ASTM A 563, Grade C3 (ASTM A 563M, Class 8S3); and, where indicated, flat washers.
- D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 1 (A1).
- E. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

2.4 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- B. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.
- C. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- D. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- E. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- H. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use

connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.
 2. Furnish inserts for units installed after concrete is placed.
- C. Fabricate supports for operable partitions from continuous steel beams of sizes with attached bearing plates, anchors, and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.
- D. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.
1. Provide bearing plates welded to beams where indicated.
 2. Drill or punch girders and plates for field-bolted connections where indicated.
 3. Where wood nailers are attached to girders with bolts or lag screws, drill or punch holes at 24 inches (600 mm) o.c.
- E. Galvanize miscellaneous framing and supports where indicated.
- F. Prime miscellaneous framing and supports with universal priming where indicated.

2.7 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.8 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.9 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

1. Shop prime with universal shop primer.
- D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 4. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.10 ALUMINUM FINISHES

- A. As-Fabricated Finish: AA-M12.
- B. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide

threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
 - 1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

3.3 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete or masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

SUBSTITUTION REQUEST

To: _____

Project: _____

Specified Item: _____

Specifications Section No.: _____ Page No.: _____ Para. (Line) No.: _____

Proposed Substitution Item: _____

Attached Data Includes:

1. Product description, specifications, photographs, drawings, performance data, and/or test data necessary for request evaluation.
2. Description of changes to Construction Documents that proposed substitution will require for proper installation.

The Undersigned hereby certifies that the following is correct, unless otherwise modified by included attachments:

1. Proposed substitution is equivalent or superior to specified item.
2. If proposed substitution should alter project design, dimensions, or installation requirements, the Undersigned will pay for any increased costs necessitated by substitution, including costs for additional engineering, drawing, and specifying.
3. Proposed substitution will have no adverse effect upon work of other trades, progress schedule, Code compliance, or warranty requirements.
4. Maintenance service and replacement products will be locally and readily available.

Additionally, the Undersigned hereby certifies that if this page is altered or modified, that the terms and requirements of the Contract Documents will remain unaltered or unmodified.

(Print or type the following)

Submitted by: _____

Signature: _____

Firm Name: _____

Street Address: _____

City, State, & Zip: _____

Phone: (____) _____ Date: _____

(If submitted after Contract award):

Contractor's Signature: _____

Owner's Signature: _____

(For use by design professional)

____ Approved ____ Approved as noted

____ Not approved ____ Received too late

By _____

Date _____

Remarks _____

October 10, 2003



Advancement
of Construction
Technology

Drawings Revisions/Additions

WESTVIEW HIGH SCHOOL

CAREER TECHNICAL EDUCATION RENOVATION

PROJECT TEAM

OWNER

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ABBREVIATIONS

# & §	NUMBER AND CENTERLINE	GA GAL	GAUGE, GYPSUM ASSOCIATION	PLAM PL	PLASTIC LAMINATE PLATE, PROPERTY LINE
AC	ACRE	GB	GALVANIZED	PLYWD	PLYWOOD
ACC	ACCESSIBLE	GPM	GALLONS PER MINUTE	PNL	PANEL
ACT	ACOUSTIC CEILING TILE	GYP	GYPSUM	PNT	PAINT
AED	AUTOMATED EXTERNAL DEFIBRILLATOR	HB	HOSE BIB	PR	PAIR
AFF	ABOVE FINISH FLOOR	HC-PHB	HOLLOW CORE PRIMED HARDBOARD	PREFIN	PREFINISHED
ADJ	ADJUSTABLE	HDR	HEADER	PREPR	PRE-PRIMED
AHU	AIR HANDLING UNIT	HDW	HARDWARE	PT	PRESSURE TREATED, POST TENSION
ALUM	ALUMINUM	HM	HOLLOW METAL	R	RISER, RADIUS
APPROX	APPROXIMATE	HORIZ	HORIZONTAL	R & S	ROD AND SHELF
APT	APARTMENT	HR	HOUR	RCP	REFLECTED CEILING PLAN(S)
		HVAC	HEATING VENTILATION AND AIR CONDITIONING	RD	ROOF DRAIN
				REF	REFERENCE
BD	BOARD	IB	INTERNATIONAL BUILDING CODE	REFL	REFLECTED
BDRM	BEDROOM	IBC	INTERNATIONAL BUILDING CODE	REFR	REFRIGERATOR
BLDG	BUILDING	IN	INCH	REOD	REQUIRED
BLKG	BLOCKING	INFO	INFORMATION	REST	RESTROOM
BM	BEAM	INSUL	INSULATE(D), (ION)	RM	ROOM
BOT	BOTTOM	INT	INTERIOR	RO	ROUGH OPENING
BR	BEDROOM	JAN	JANITOR'S	SAMF	SELF-ADHERING MEMBRANE
		JST	JOIST	SD	FLASHING
CIP	CAST-IN-PLACE	KDHM	KNOCK-DOWN HOLLOW METAL	SF	SMOKE DETECTOR
CJ	CONTROL JOINT	KITCHEN	KITCHEN	SHTHG	SQUARE FOOT
CL	CLOSET	KL	KITCHEN	SIM	SHEATHING
CLG	CEILING	LAM	LAMINATE	SIM	SIMILAR
CLR	CLEAR(ANCE)	LD	LAUNDRY	SPEC	SPECIFICATION
CMU	CONCRETE MASONRY UNIT	LGT	LOAD	STD	STANDARD
CPT	CARPET	LN	LINEN	STL	STEEL
COL	COLUMNS	LVT	LUXURY VINYL TILE	STOR	STORAGE
CONT	CONTINUOUS	LW	LIVEWORK	STC	SOUND TRANSMISSION CLASS
CONC	CONCRETE			STRUCT	STRUCTURAL
CORR	CORRIDOR			SV	SHEET VINYL
		D	DRYER	T	TREAD, TEMPERED
		DBL	DOUBLE	T & G	TONGUE & GROOVE
		DF	DRINKING FOUNTAIN	TB	TOWEL BAR
		DIA	DIAMETER	TG	TEMPERED GLASS
		DIM	DIMENSION	THK	THICK, THICKNESS
		DN	DOWN	TO	TOP OF
		DR	DOOR	TP	TOILET PAPER
		DS	DOWN SPOUT	TIS	TUBSHOWER
		DW	DWELLING UNIT	TYP	TYPICAL
		DWG	DRAWING		
		EA	EACH	UNO	UNLESS NOTED OTHERWISE
		EJ	EXPANSION JOINT	UNFIN	UNFINISHED
		EL	ELEVATION		
		ELEC	ELECTRICAL	VCT	VINYL COMPOSITION TILE
		ELEV	ELEVATOR	VERT	VERTICAL
		EP	ELECTRICAL PANEL	VRFY	VERIFY
		EQ	EQUIPMENT		
		EQ	EQUAL	W	WASHER
		EXIST	EXISTING	W/	WITH
		EXT	EXTERIOR	WD	WOOD
				WH	WATER HEATER
				WIC	WALK IN CLOSET
				WIN	WINDOW
				WP	WATERPROOF
				WR	WATER RESISTANT
				WRB	WATER RESISTANT BARRIER
		FCP	FIBER CEMENT PANEL		
		FD	FLOOR DRAIN	OLF	OPPOSITE
		FEC	FIRE EXTINGUISHER CABINET	OPN	OPENING
		FIN	FINISH	OPNG	OPENING
		FLR	FLOOR	ORD	OVERFLOW ROOF DRAIN
		FND	FOUNDATION	OSB	ORIENTED STRAND BOARD
		FO	FACE OF	OSSC	OREGON STRUCTURAL
		FOC	FACE OF CONCRETE		SPECIALTY CODE
		FOF	FACE OF FINISH	OVFL	OVERFLOW
		FOS	FACE OF STUD		
		FOW	FACE OF WALL		
		FT	FEET		
		FTG	FOOTING WALL		
		FT	FEET		

SYMBOLS

	ASSEMBLY TAG
	WINDOW TAG
	DOOR TAG
	NORTH ARROW
	DETAIL TAGS
	EXTERIOR ELEVATION TAG
	INTERIOR ELEVATION TAG
	BUILDING SECTION TAG
	WALL SECTION TAG
	ELEVATION DATUM
	GRID LINE/ GRID BUBBLE
	ROOM TITLE
	TEMPERED GLAZING
	GRAPHIC SCALE
	REVISION TAG AND CLOUD
	KEYNOTE TAG

DEFERRED SUBMITTALS

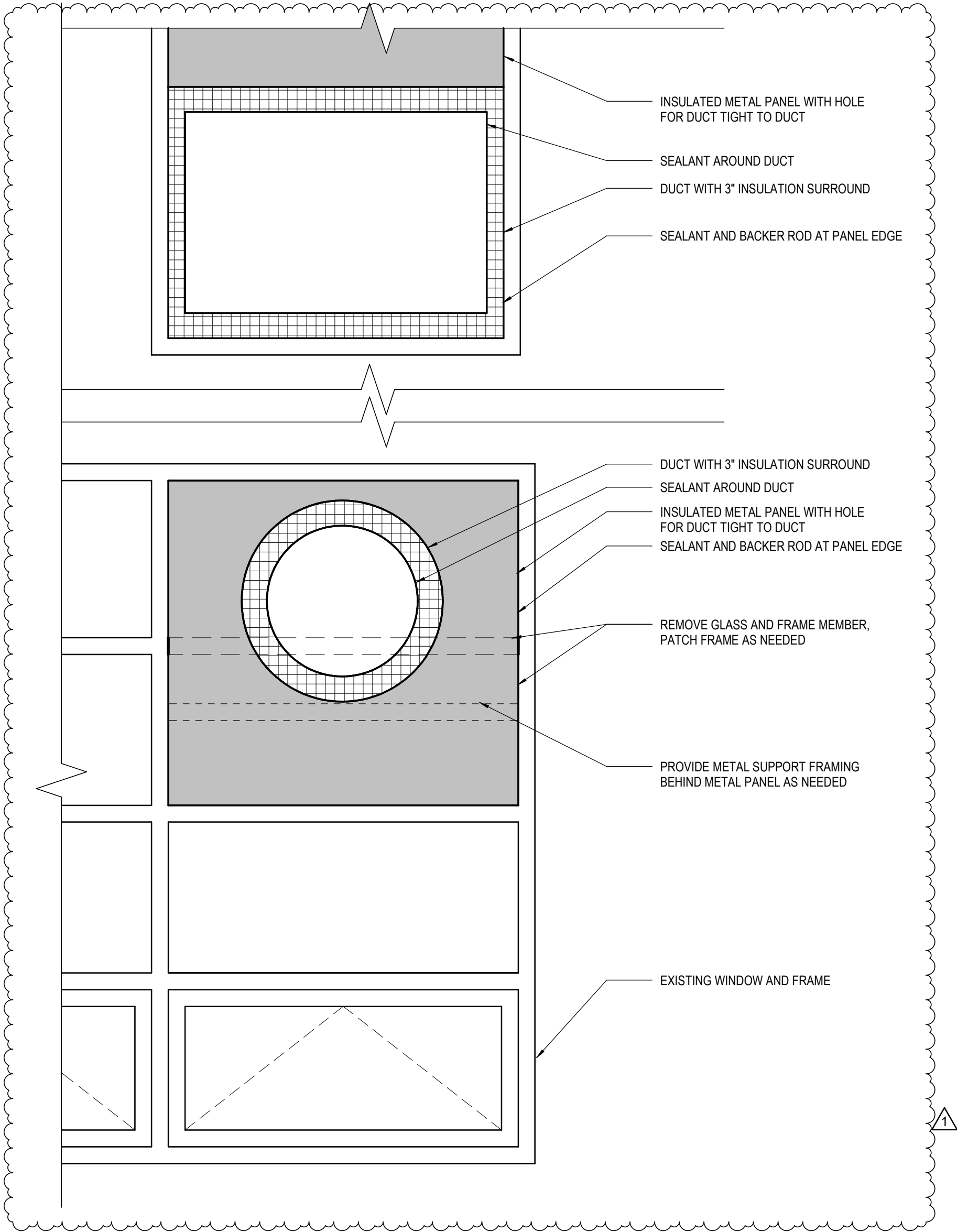
1. ABORT GATE STRUCTURAL SUPPORT
2. AIR FILTER STRUCTURAL ATTACHMENT

GENERAL NOTES

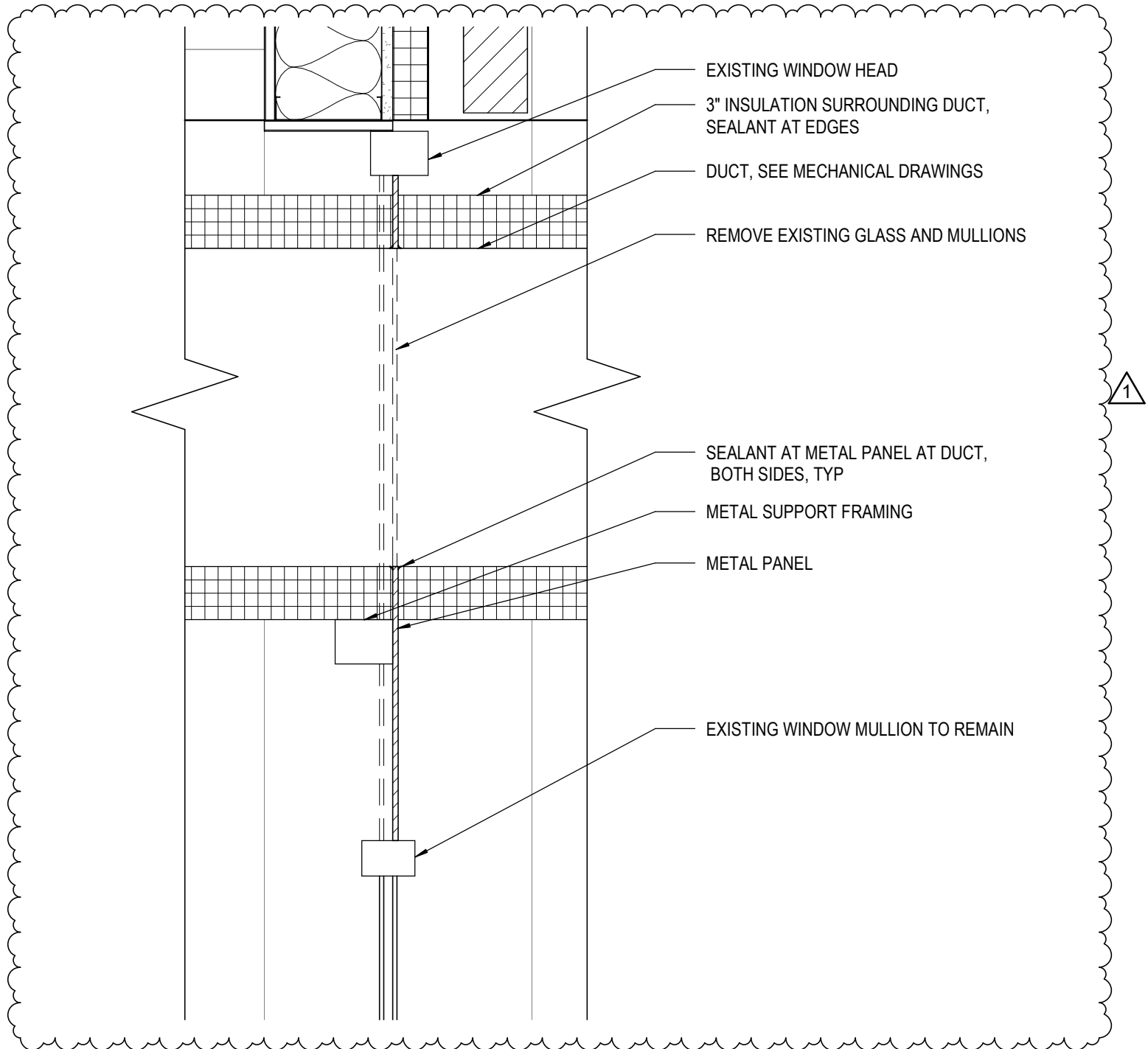
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4. IF COORDINATION OF ARCHITECTURAL, CIVIL, LANDSCAPE, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND SPRINKLER ELEMENTS RESULT IN CONFLICTS, NOTIFY ARCHITECT IMMEDIATELY PRIOR TO COMMENCING ANY WORK OF ELEMENTS RESULTING IN CONFLICTS.
5. SLOPE ALL GRADES AT PLANTING AREAS, SIDEWALKS AND ASPHALT PARKING PAVING WITHIN 5' OF A BUILDING AWAY FROM THE BUILDING. IF CONFLICTS OCCUR, NOTIFY ARCHITECT IMMEDIATELY. SEE CIVIL DRAWINGS FOR FINISHED GRADES ADJACENT TO BUILDINGS.
6. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH THE WORK.
7. DIMENSIONS TAKE PRECEDENCE OVER DRAWINGS. DO NOT SCALE DRAWINGS, NOTIFY ARCHITECT OF DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.
8. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS AND SHALL MAINTAIN THE STRUCTURAL INTEGRITY OF CONSTRUCTION UNTIL FINAL LATERAL AND VERTICAL CARRYING SYSTEMS ARE COMPLETED.
9. DIMENSIONS ARE SHOWN TO FACE OF STUD, FACE OF CONCRETE, FACE OF MASONRY, GRID/COLUMN LINE, CENTERLINE OF ELEMENT, COUNTERTOP EDGE, OR AS NOTED.
10. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND COORDINATION OF SUBCONTRACTOR WORK, COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS, AND ACCURATE LOCATION OF STRUCTURAL MEMBERS, OPENINGS FOR MECHANICAL, ELECTRICAL, AND MISCELLANEOUS EQUIPMENT. CONTRACTOR SHALL VERIFY DIMENSIONS AND OPENING SIZES (CLEARANCES REQUIRED) FROM THE MANUFACTURERS PRIOR TO CONSTRUCTION OF OR INSTALLATION OF EQUIPMENT, FURNISHINGS, AND ACCESSORIES.
11. PROVIDE ACCESS PANELS AS REQUIRED. LOCATION, FINISH, AND TYPE SHALL BE APPROVED BY ARCHITECT PRIOR TO OBTAINING AND INSTALLING. ACCESS PANEL LOCATIONS NOT APPROVED BY ARCHITECT WILL BE SUBJECT TO MODIFICATION AT NO ADDITIONAL COST. PROVIDE RATED ACCESS PANELS WITH THE SAME RATING AS THE ASSEMBLY IN WHICH THEY ARE INSTALLED. ACCESS PANELS IN SHAFT WALLS, RATED FLOOR/CEILINGS OR RATED ROOF/CEILINGS SHALL BE SMOKE SEALED.
- 12.

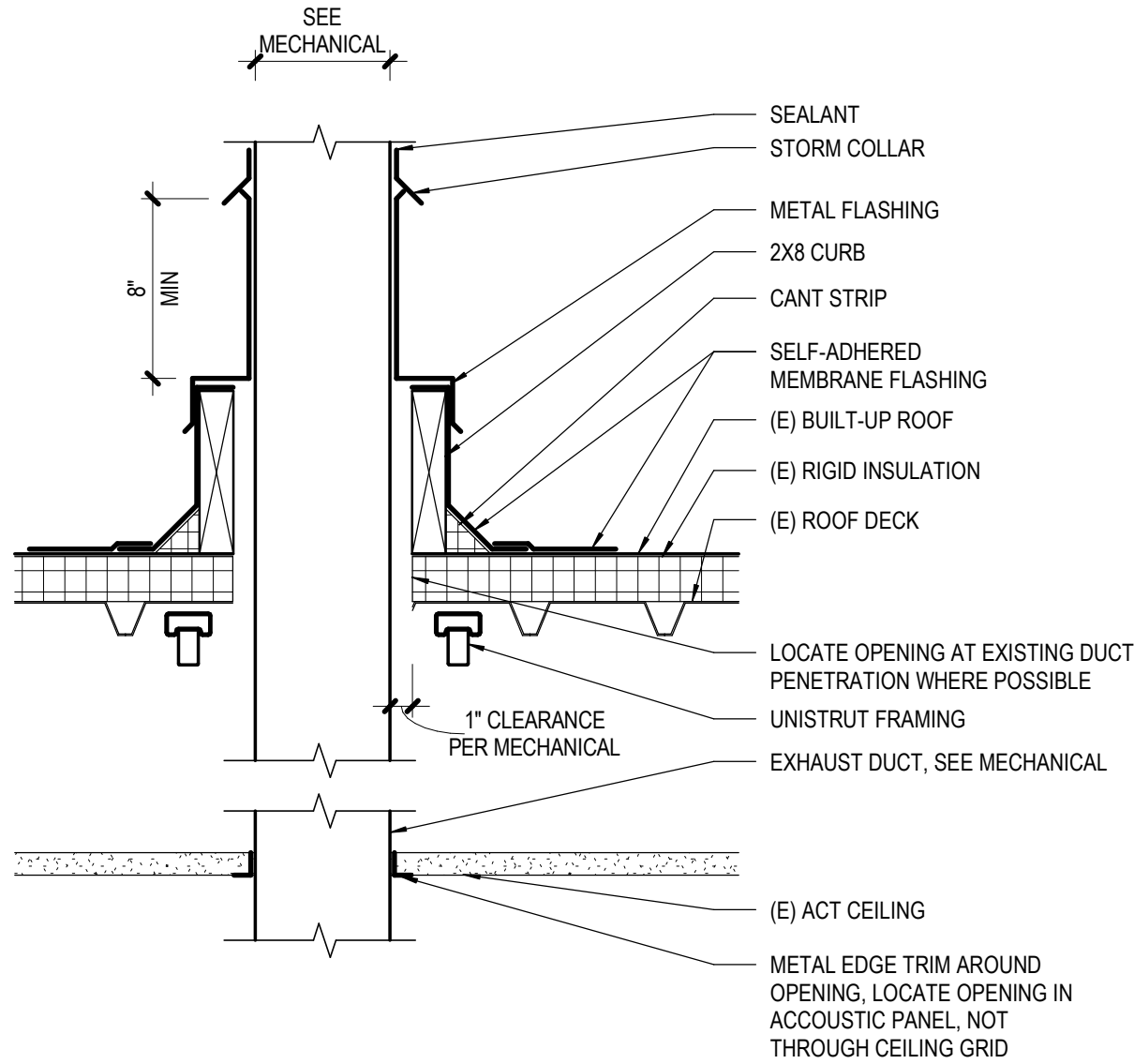
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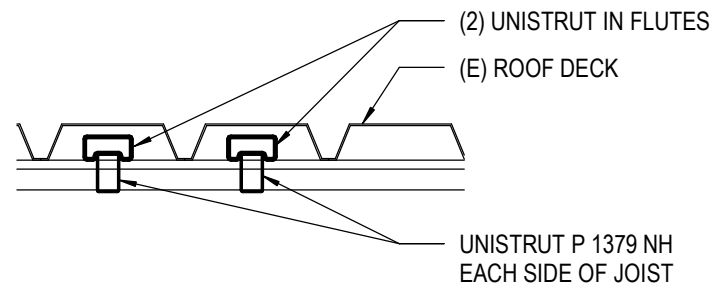
8 WINDOW PENETRATION ELEVATION
A4.02 SCALE: 1" = 1'-0"



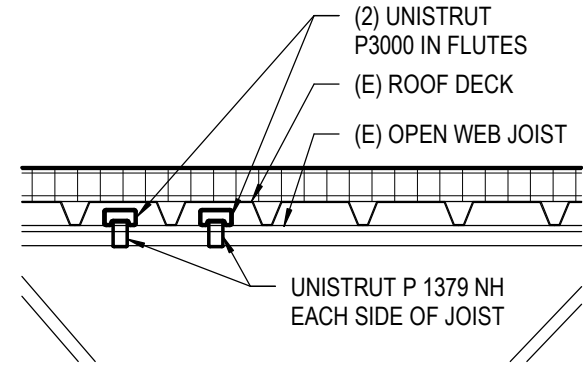
7 WALL SECTION AT WINDOW EXHAUST
A4.02 SCALE: 1 1/2" = 1'-0"



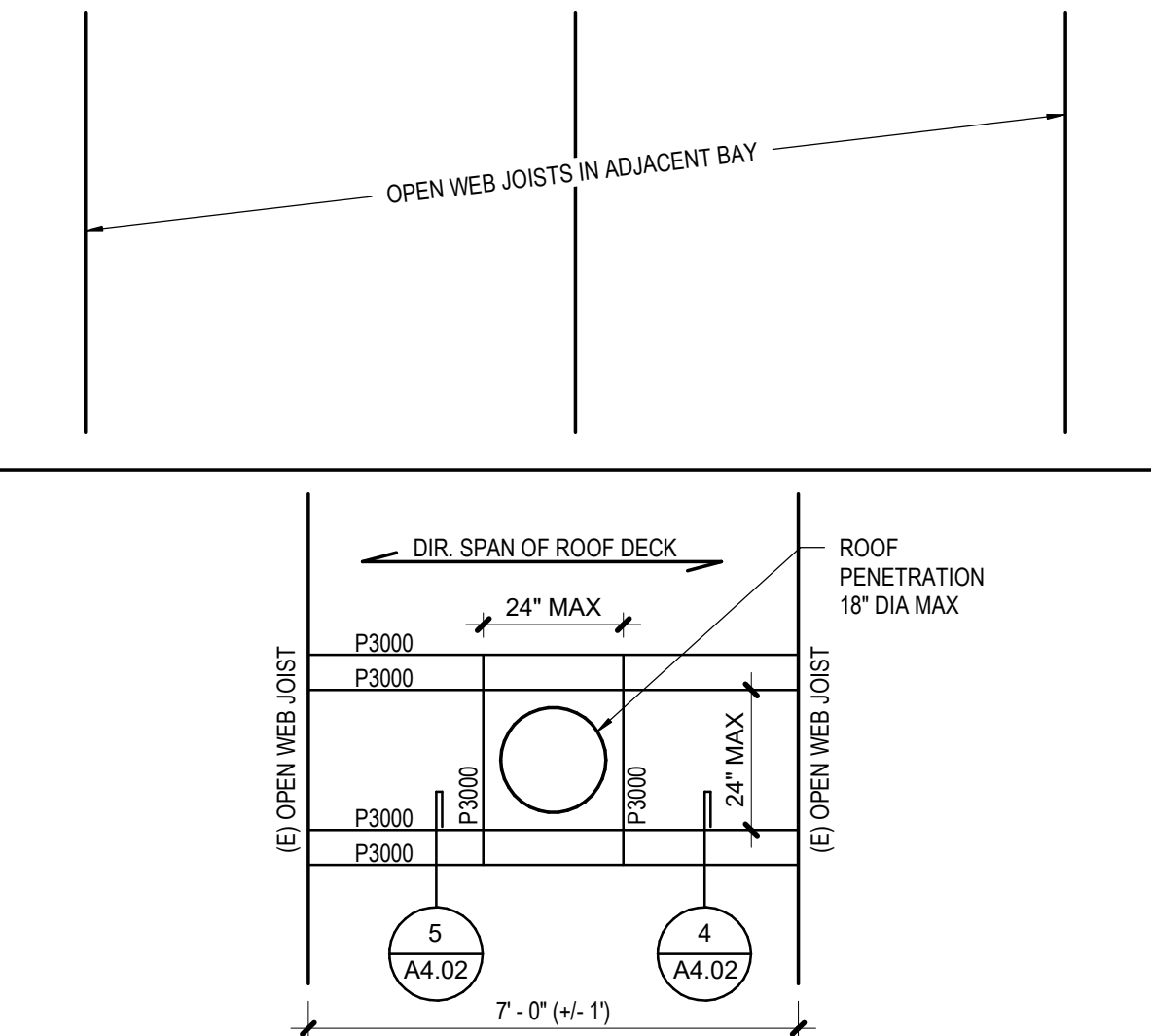
6 ROOF PENETRATION
A4.02 SCALE: 1 1/2" = 1'-0"



5 ROOF PENETRATION FRAMING DETAIL
A4.02 SCALE: 1 1/2" = 1'-0"



4 ROOF PENETRATION FRAMING DETAIL
A4.02 SCALE: 1" = 1'-0"



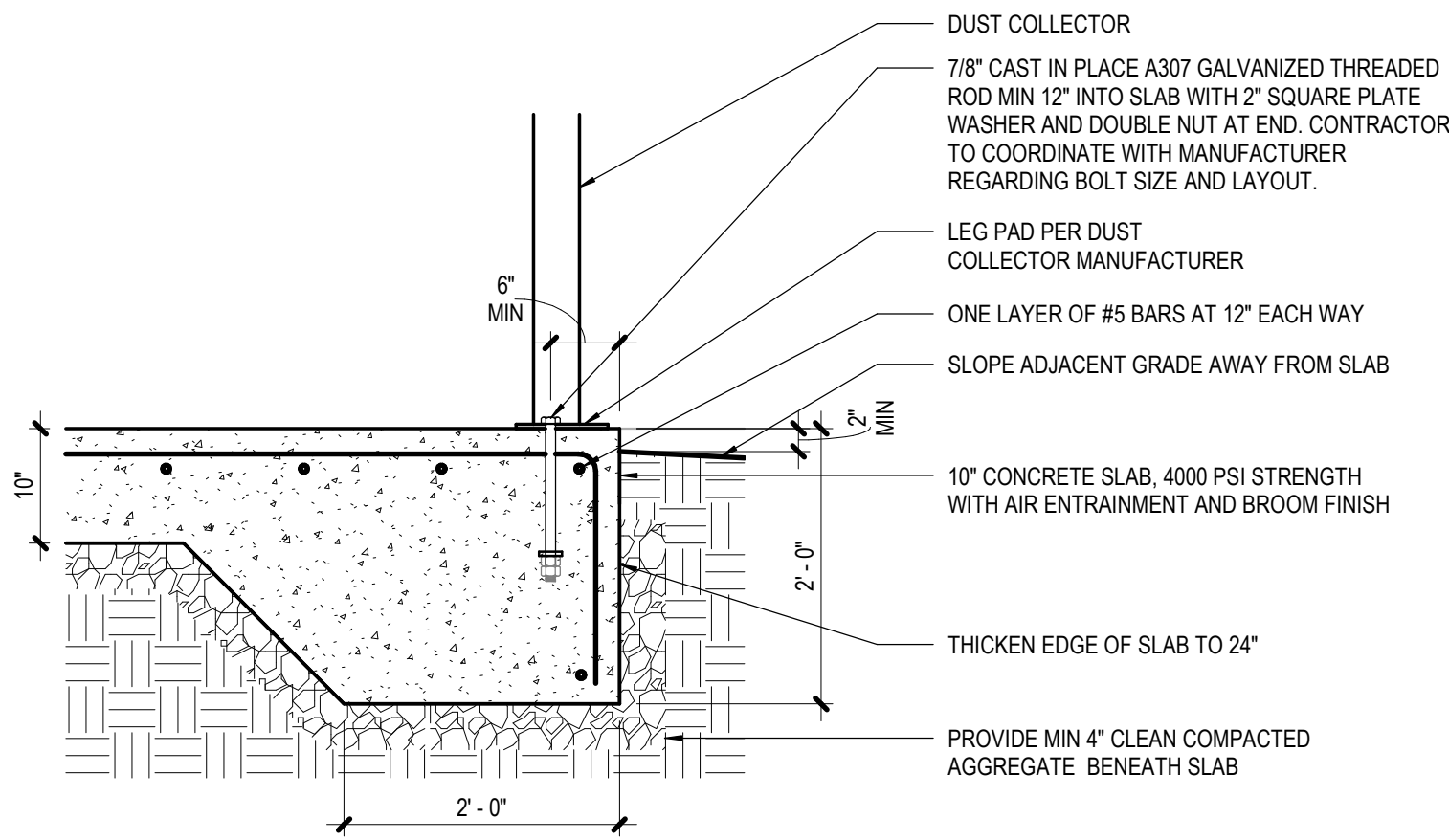
3 PLAN VIEW OF TYPICAL ROOF PENETRATION
A4.02 SCALE: 3/8" = 1'-0"

CONCRETE GENERAL NOTES

1. WORK IS TO BE DONE IN ACCORDANCE WITH THE 2019 OSSC.
2. CONCRETE TO HAVE A 28 DAY COMPRESSIVE STRENGTH OF FC = 4000PSI. MAXIMUM WATER TO CEMENT RATIO TO BE 0.45. EXPOSED CONCRETE TO HAVE AIR ENTRAINMENT OF 5% +/- 1%.
3. ALL REINFORCING SHALL CONFORM TO ASTM A706 OR ASTM A615, GR. 60.

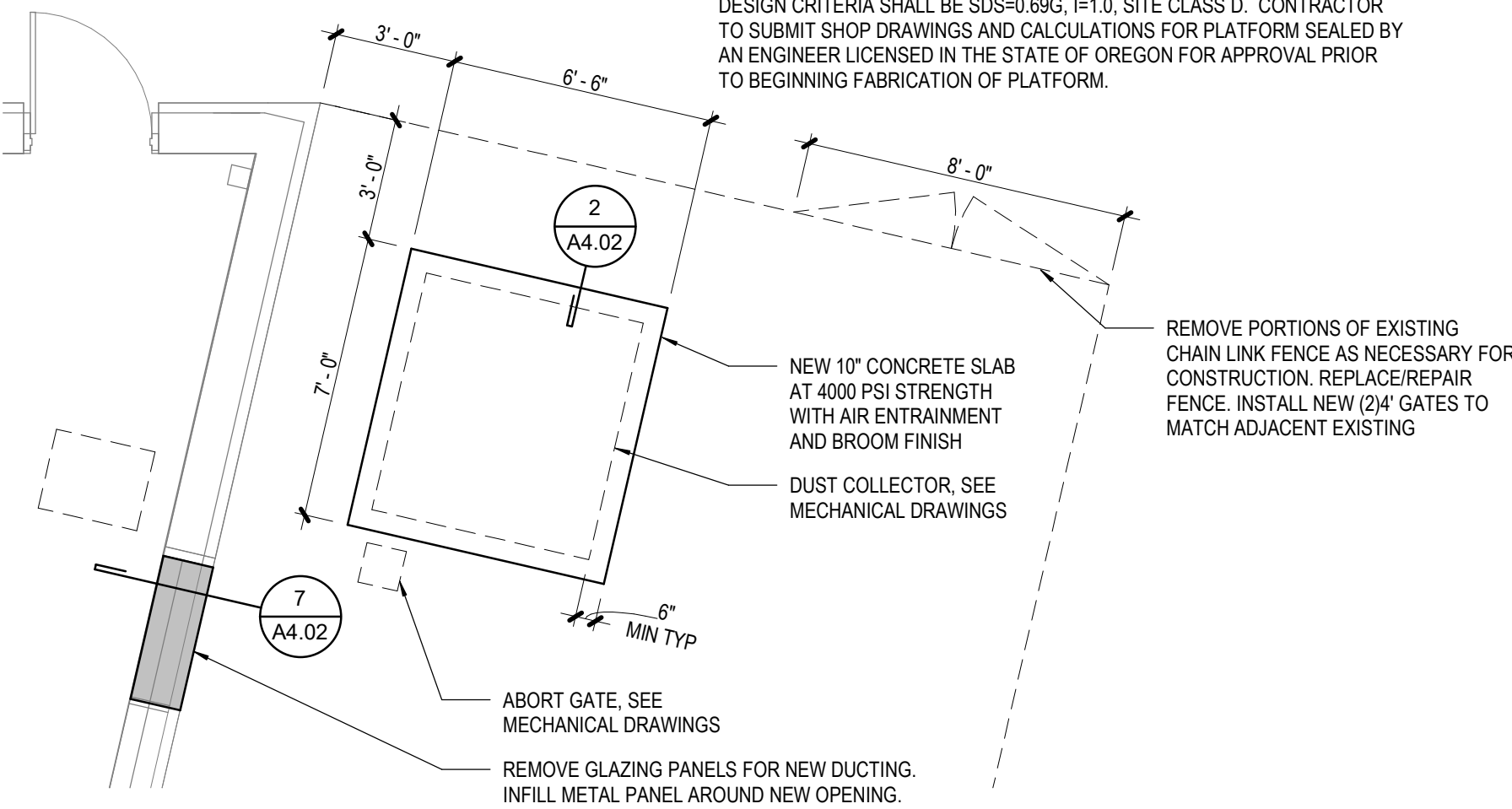
ROOF PENETRATION FRAMING GENERAL NOTES

1. FRAMING SHALL BE UNISTRUT CHANNEL FRAMING OR SIMILAR SYSTEM THAT MEETS OR EXCEEDS THE STRENGTH OF FRAMING SHOWN.
2. ALL CHANNEL FRAMING TO BE INSTALLED PER MANUFACTURER. INSTALLATION INCLUDES CHANNEL NUTS AND BOLTS AT ALL CONNECTIONS.
3. CONTRACTOR TO FIELD VERIFY ALL CONDITIONS AND NOTIFY ARCHITECT IF VARIATIONS ARE FOUND.
4. MAX ROOF LOAD 25 PSF.



2 CONCRETE SLAB DETAIL
A4.02 SCALE: 3/4" = 1'-0"

NOTE: CONTRACTOR TO PROVIDE A DESIGN FOR A PLATFORM TO SUPPORT THE ABORT GATE (SEE MECHANICAL DRAWINGS). MAX WEIGHT OF GATE IS 550 POUNDS. PLATFORM IS TO BE SUPPORTED OFF OF CONCRETE PAD ON GRADE AND BE CONSTRUCTED OF STRUCTURAL STEEL (ASTM A36, ASTM A992, OR SIMILAR). PLATFORM SHALL BE GALVANIZED AFTER FABRICATION. CONTRACTOR TO COORDINATE DESIGN WITH ABORT GATE MANUFACTURER AND INCLUDE SEISMIC ANCHORAGE OF ABORT GATE TO PLATFORM AND SEISMIC ANCHORAGE OF PLATFORM TO CONCRETE PAD. DESIGN TO INCLUDE CONCRETE PAD AND REINFORCING AS WELL. MINIMUM SEISMIC DESIGN CRITERIA SHALL BE SDS=0.66G, I=1.0, SITE CLASS D. CONTRACTOR TO SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR PLATFORM SEALED BY AN ENGINEER LICENSED IN THE STATE OF OREGON FOR APPROVAL PRIOR TO BEGINNING FABRICATION OF PLATFORM.



1 FLOOR PLAN - DUST COLLECTOR PAD
A4.02 SCALE: 1/4" = 1'-0"

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1 FIRST FLOOR PLAN - LIGHTING



SHEET KEYNOTES

1. RECIRCUIT LUMINAIRES TO EXISTING LIGHTING ZONE IN ROOM VIA NEW LIGHT SWITCH. RECIRCUIT EMERGENCY LUMINAIRES VIA UL 924 RELAY.
2. INSTALL NEW BANK OF LIGHT SWITCHES BELOW EXISTING BANK.
3. CIRCUIT NEW LUMINAIRES VIA EXISTING CIRCUIT IN PANELBOARD '2H2'.
4. NOT USED
5. EXTEND EXISTING EMERGENCY EXIT SIGN CIRCUIT TO NEW EMERGENCY EXIT SIGN.
6. CIRCUIT NEW LIGHT FIXTURES TO EXISTING CIRCUIT AT THIS LOCATION.



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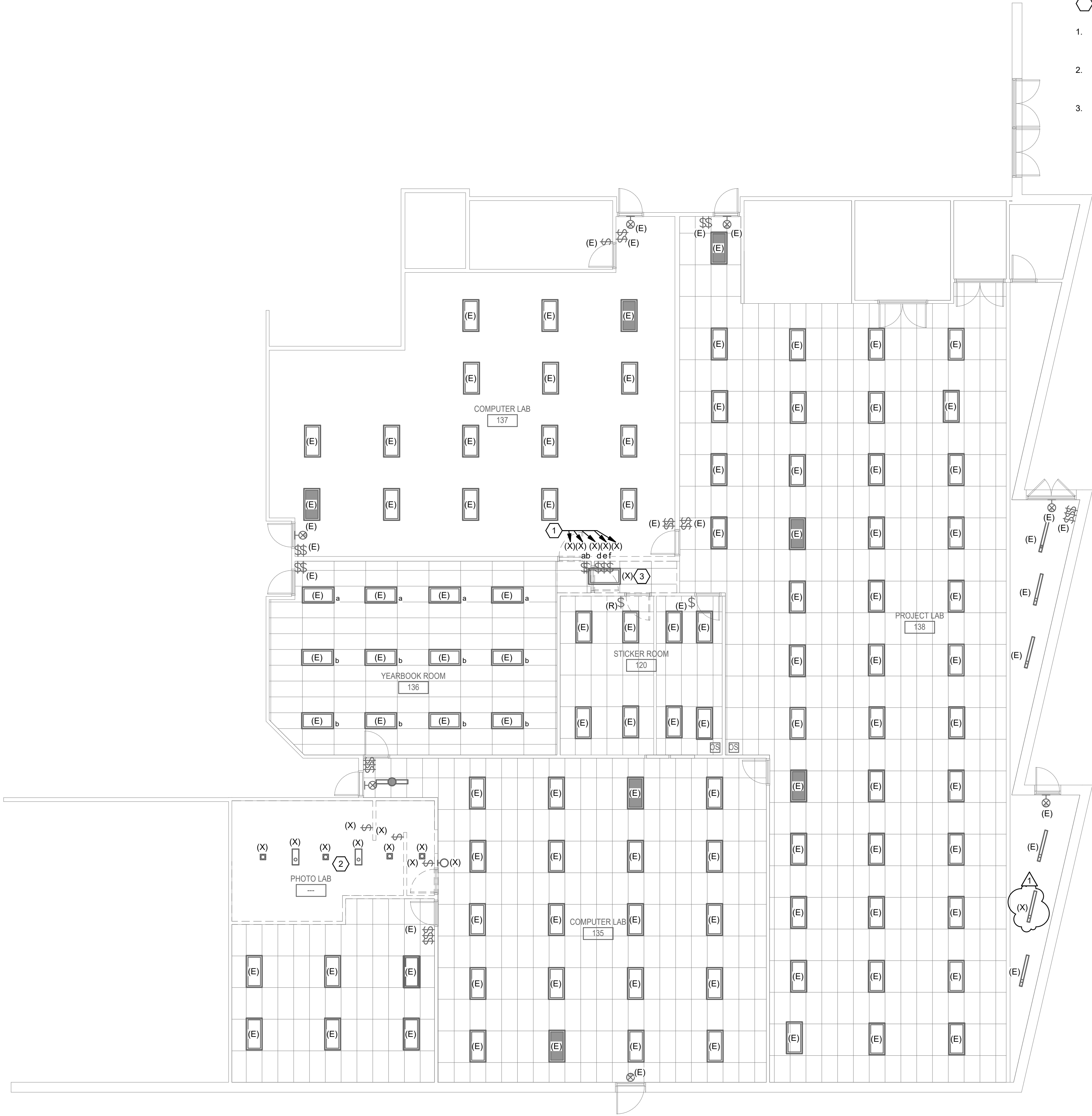
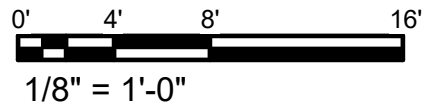
FIRST FLOOR OVERALL PLAN - LIGHTING

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1 DEMOLITION REFLECTED CEILING PLAN - LIGHTING



SHEET KEYNOTES

1. PULL BACK EXISTING CIRCUIT FROM LIGHT SWITCH TO FIRST ASSOCIATED LIGHT FIXTURE IN ZONE TO BE RECIRCUITED TO NEW LIGHT SWITCH PER NOTED ZONE ON SHEET E101.
2. PULL BACK EXISTING CONDUCTORS FOR REUSE. NEW ZONE 'd' FIXTURES TO BE CIRCUITED TO NEW SWITCH AND EXISTING CIRCUIT. REFER TO E101.
3. PULL BACK EXISTING CONDUCTOR FOR REUSE FOR NEW LIGHT FIXTURES AT THIS CEILING LOCATION.



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FIRST FLOOR OVERALL DEMO PLAN - LIGHTING

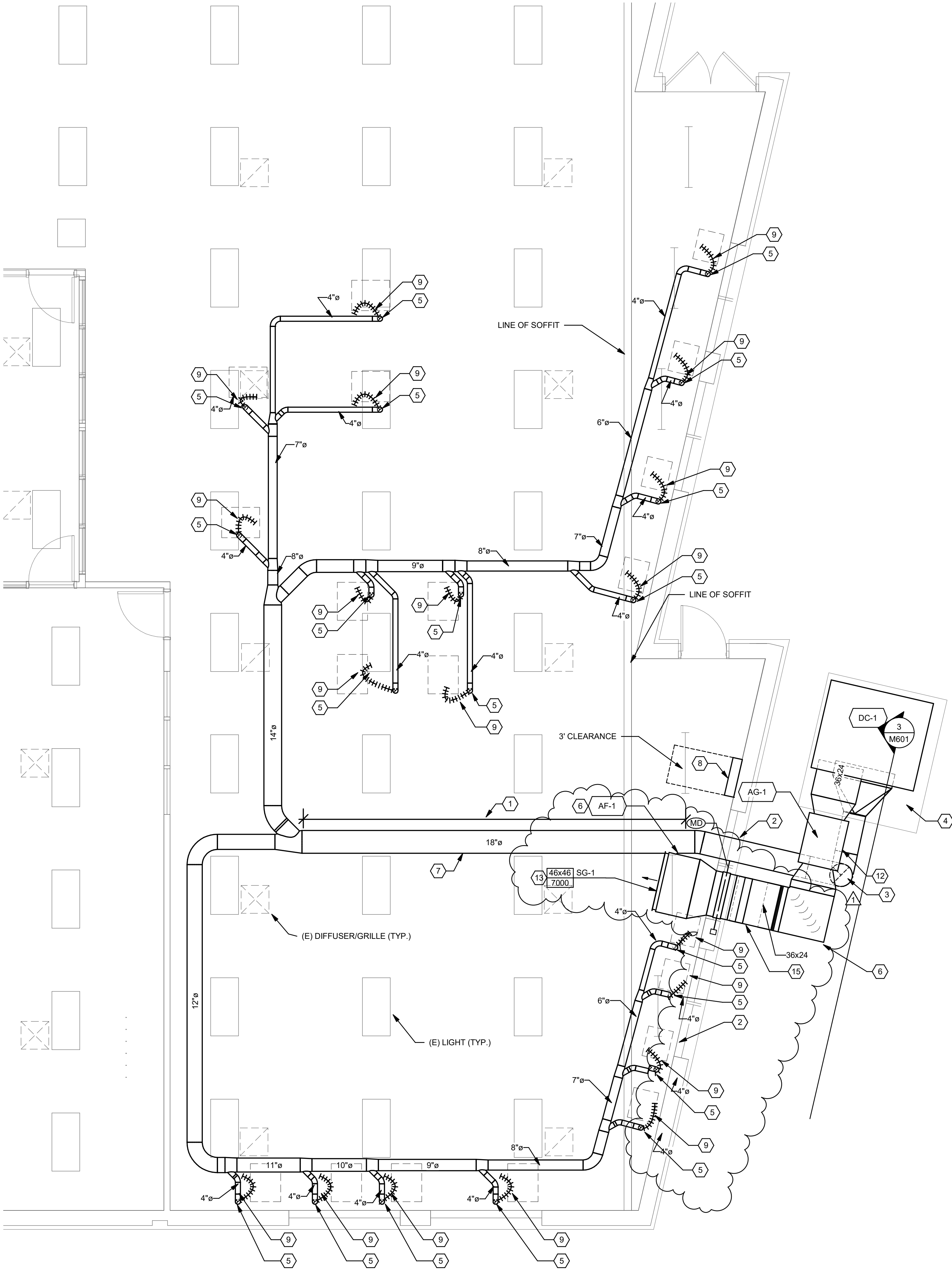
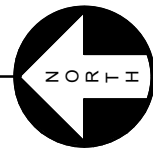
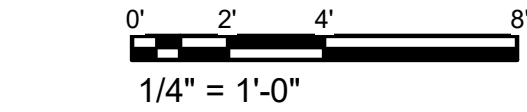
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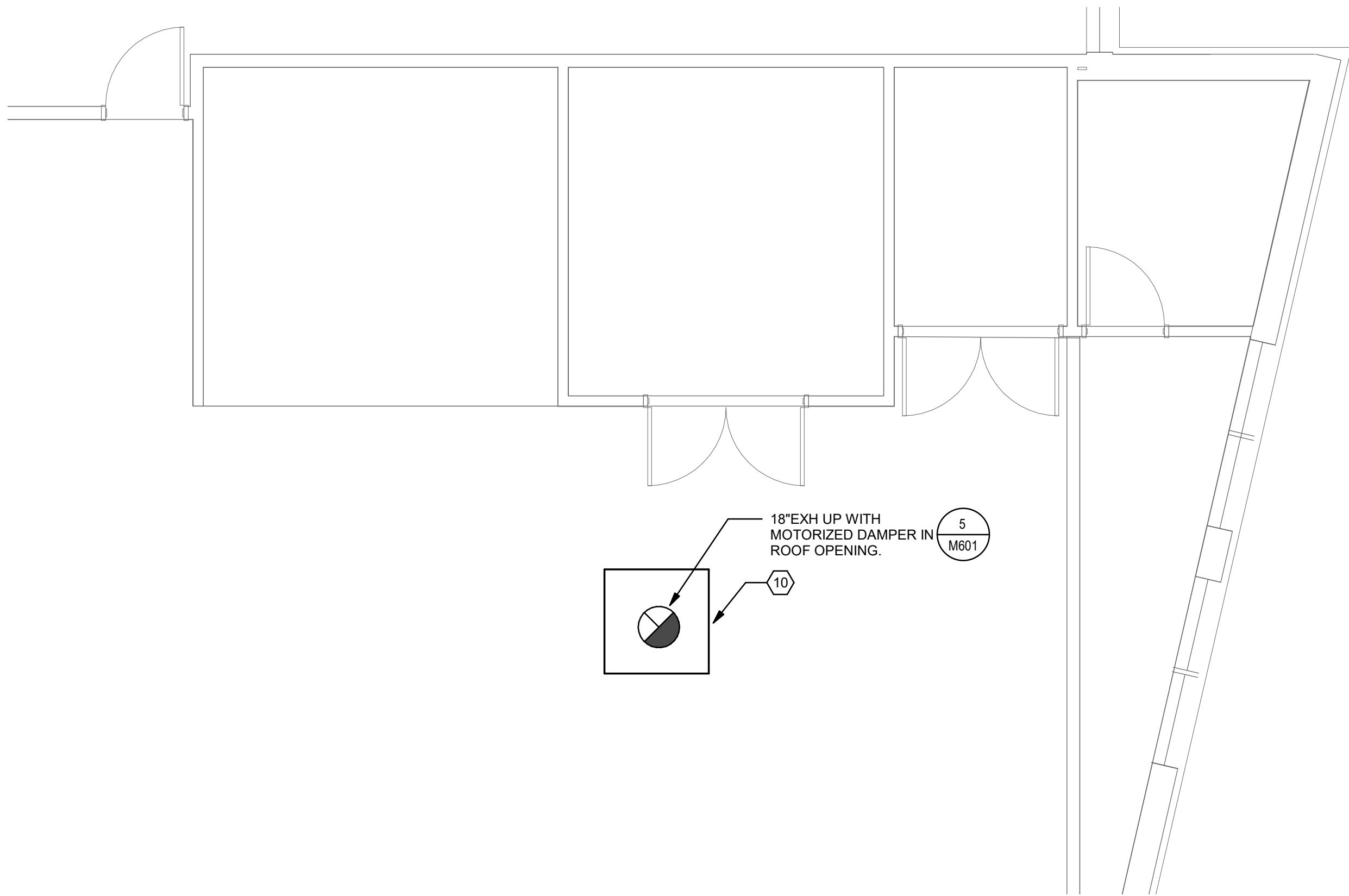
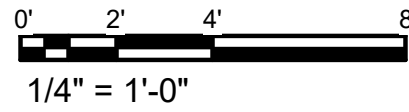
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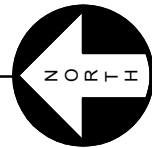
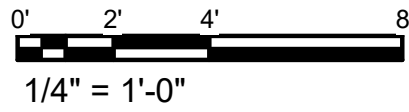
1 ENLARGED PLAN - WOOD SHOP - MECHANICAL



2 ENLARGED PLAN - PHOTO LAB - MECHANICAL



3 ENLARGED PLAN - METAL SHOP - MECHANICAL

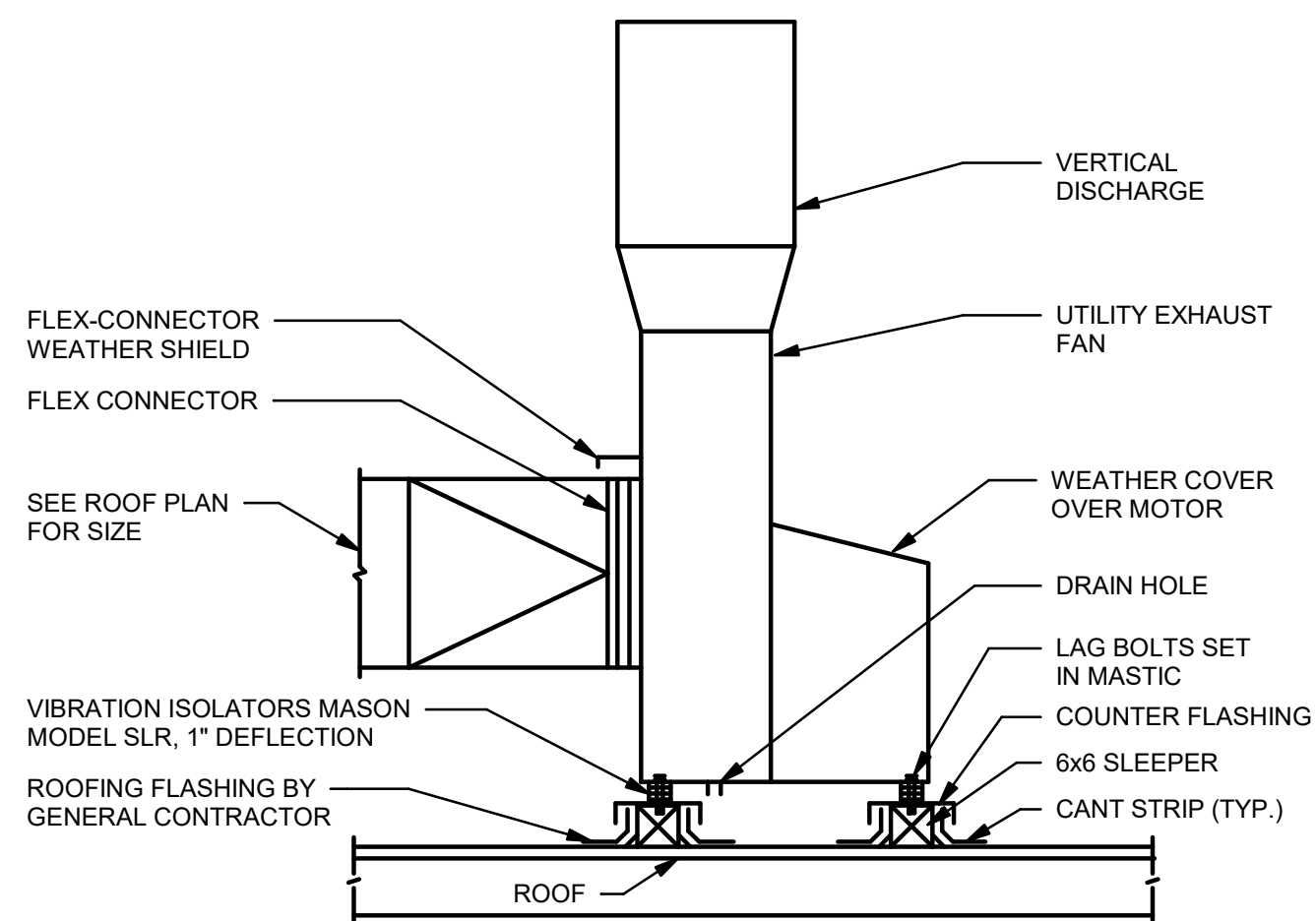


SHEET KEYNOTES

- 1 PROVIDE MINIMUM OF 25' OF STRAIGHT DUCTWORK BETWEEN EXTERIOR WALL AND LAST TAP OFF MAIN EXHAUST DUCT FOR SPARK DETECTION AND EXTINGUISHING SYSTEM. COORDINATE WITH DIVISION 21 FOR SPARK DETECTION AND EXTINGUISHING SYSTEM
- 2 UTILIZE WINDOW OPENINGS FOR DUCTWORK. REFER TO ARCHITECTURAL DRAWINGS FOR WEATHERPROOFING DETAILS AND ADDITIONAL INFORMATION.
- 3 18"Ø EXHAUST DOWN TO DUST COLLECTOR DC-1.
- 4 DUST COLLECTOR DC-1. MOUNT ON CONCRETE PAD; REFER TO ARCHITECTURAL PLANS FOR PAD DIMENSIONS. POINT EXPLOSION RELIEF VENT TOWARD GROUND VIA DUCT ELBOW.
- 5 PROVIDE BLAST GATE FOR BALANCING PURPOSES ONLY. BLAST GATE TO BE OPEN AT ALL TIMES. LOCK BLAST GATE IN POSITION AND PROVIDE LABEL THAT STATES "DO NOT ADJUST". THESE PIECES OF EQUIPMENT WILL HAVE DUST COLLECTION AT ANY TIME THE DUST COLLECTOR IS ON.
- 6 MOUNT AF-1 AT HIGH WINDOW LEVEL.
- 7 ROUTE EXHAUST DUCTWORK EXPOSED WITH B.O.D. AT 6'-3" A.F.F. COORDINATE ROUTING WITH EXISTING LIGHTING AND DIFFUSERS. TYPICAL.
- 8 DUST COLLECTOR CONTROL PANEL. COORDINATE FINAL LOCATION IN FIELD. COORDINATE LOCATION WITH ELECTRICAL CONTRACTOR. DIV 26 TO PROVIDE WIRING BETWEEN CONTROL PANEL AND DUST COLLECTION SYSTEM.
- 9 WIRE-WRAPPED HELIX FLEX HOSE FOR STATIC GROUNDING. ENSURE METAL TO METAL CONTACT. KEEP LENGTHS TO A MINIMUM. MAXIMUM LENGTH 10 FEET. SECURE CONNECTIONS TO WOOD SHOP EQUIPMENT AND METAL DUCTWORK.
- 10 FIELD FABRICATED PLASMA CUTTER EXHAUST HOOD. HOOD TO BE 16 GAUGE GALVANIZED SHEET METAL.
- 11 RE-USE EXISTING ROOF OPENING FOR EXHAUST DUCTWORK.
- 12 MOUNT ABORT GATE ABOVE GRADE ON CONCRETE PAD. CONTRACTOR TO PROVIDE FIELD FABRICATED SUPPORTS AS PER SPECIFICATIONS.
- 13 MOUNT RECIRCULATED AIR GRILLE AT DISCHARGE SIDE OF HEPA FILTER.
- 14 INTERLOCK MOTORIZED DAMPER WITH DUST COLLECTOR OPERATION. DUST COLLECTOR SHALL STARTUP AFTER MOTORIZED DAMPER IS PROVEN OPEN VIA AN END SWITCH.
- 15 OFFSET DUCT AS REQUIRED TO HIGH WINDOW LEVEL.

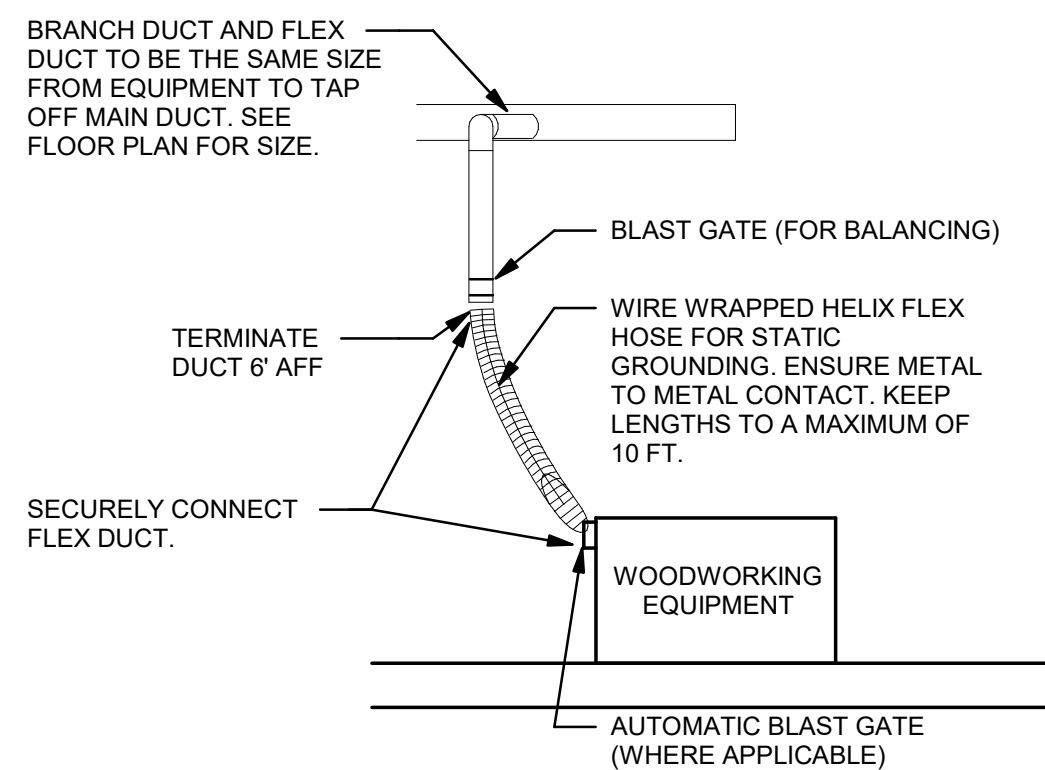
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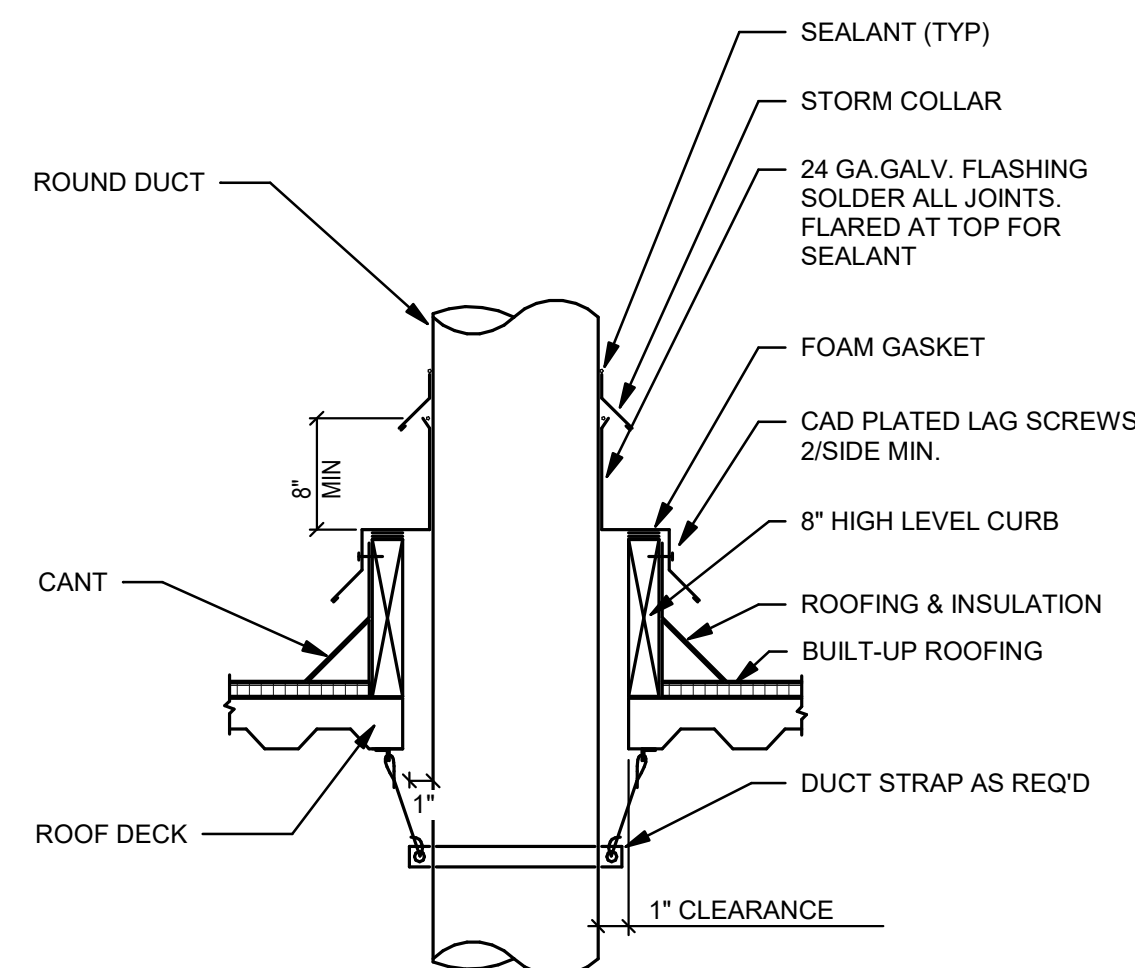
1 EXHAUST FAN

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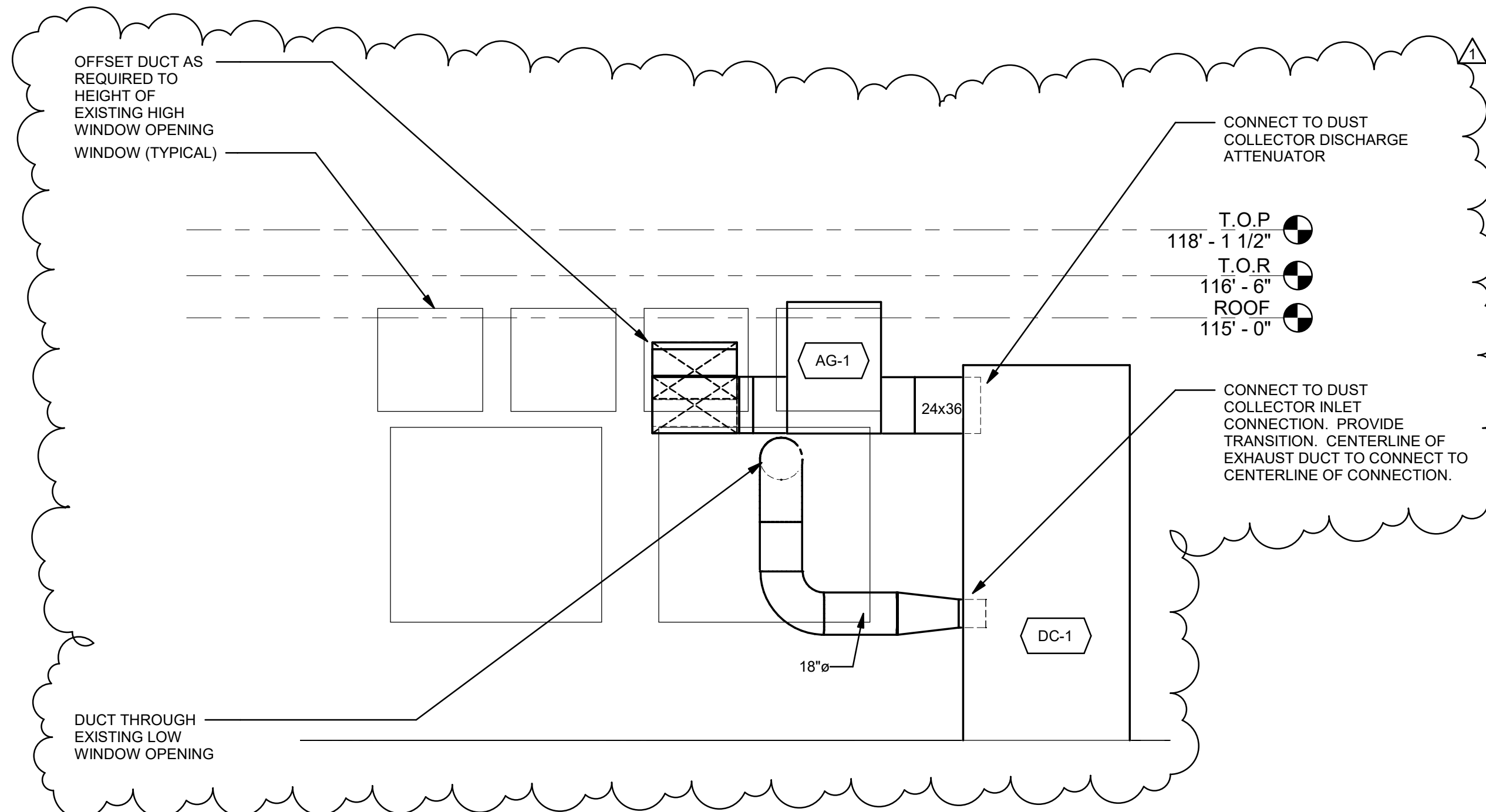
2 DUCT DROP

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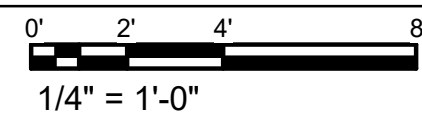


4 DUCT PENETRATION THROUGH ROOF - ROUND DUCT

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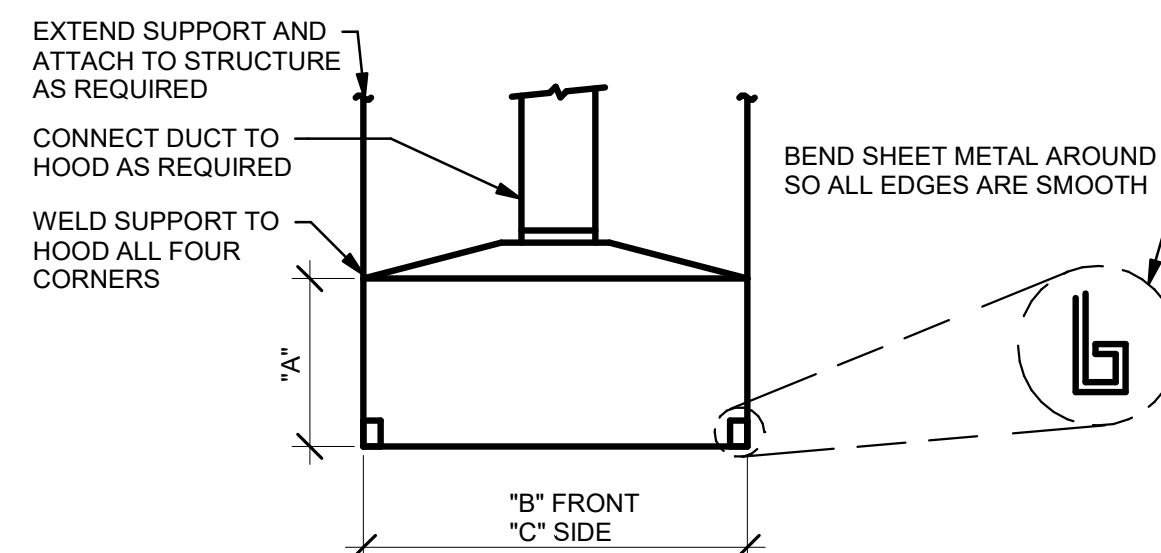


3 DUST COLLECTOR SECTION



GENERAL NOTES THIS DETAIL
A. ALL WELDED HOODS TO BE 16 GAUGE SHEET METAL, ALL WELDED CONSTRUCTION. PAINT INSIDE AND OUTSIDE OF HOOD AND OUTSIDE OF DUCT WITH COLOR AS SELECTED BY ARCHITECT.

HOOD DIMENSIONS	
FUME HOOD I:	"A" = 2'-0"
	"B" = 4'-0"
CFM = 1600	"C" = 4'-0"



5 PLASMA CUTTER FUME HOOD

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