CITY OF Grand Junction COLORADO

Purchasing Division

ADDENDUM NO. 1

DATE: **April 18, 2019**
FROM: **City of Grand Junction Purchasing Division**
TO: **All Offerors**
RE: **Las Colonias Business Park Restrooms IFB-4637-19-DH**

Offerors responding to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.

Please make note of the following clarifications:

1. See attached additional plan sets.

The original solicitation for the project noted above is amended as noted.

All other conditions of subject remain the same.

Respectfully,

Duane Hoff Jr., Senior Buyer
City of Grand Junction, Colorado

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Grand Junction Park Restroom Medium

22 Februrary 2019

DRAWING INDEX

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Grand Junction Park Restroom Medium

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date: 22 Februrary 2019

revisions :

title:

Cover Sheet

sheet:

GI001

01000 – GENERAL REQUIREMENTS

SUMMARY OF WORK
Work required by the successful bidder of this project shall be conducted in a professional manner and to the satisfaction of the Architect. If the instructions and information contained in the Construction Documents are not sufficient for the Contractor to produce high quality work or if discrepancies or questions exist, the Contractor shall request interpretation, clarification or corrections prior to bidding. If the Contractor fails to take such action work must be be performed in a satisfactory manner and requests for additional time or fees may be denied. By submitting a bid, the Contractor represents that he fully understands the nature and extent of the work, all factors and conditions affecting or which may be affected by it and characteristics of its various parts and elements and their fitting together and functioning.

PROJECT COORDINATION
A. The Contractor shall be responsible for coordination of the Project. It is recognized the the Construction Drawings are diagrammatic in showing certain physical relationships of the various elements and systems and their interfacing with other elements and systems. Establishment and coordination of these relationships is the exclusive responsibility of the Contractor. Each entity involved in the performance of the Work shall cooperate in the overall coordination of the work.
B. The Owner shall designate a Project Coordinator who shall represent and be authorized to act on behalf of the Owner with respect to the Project.
C. During construction, coordinate use of site and facilities through the Project Coordinator.
D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
G. Make the following types of submittals to Architect through the Project Coordinator: Shop drawings, product data, and samples. Test and inspection reports. Closeout submittals.

RECORD DOCUMENTS
A. Maintain at job site, one copy of the Construction Drawings. Make note of revisions and note the actual location of concealed controls, underground utilities and conduits for future use.

EXISTING UTILITIES
A. Verify locations of all existing utilities prior to starting any work. Coordinate service and utility extensions to the Project site.

WASTE DISPOSAL
A. Establish and enforce a daily system for collecting and disposing of waste materials. Provide dumpster on site.

COMPLETE SYSTEMS
A. It is the intent of the Construction Drawings that all systems, including mechanical and electrical, be complete and functional to provide the intended or specified performance. The Contractor shall provide all incidental items and parts necessary to achieve this requirement. Provide power, utilities, piping, drains, services and their connections to equipment and systems requiring them.

CLEANING AND PROTECTION OF THE WORK
A. At the time each unit of the work or element of the construction is completed (substantially) in each area of the project, clean the unit or element to a condition suitable for use and repair damage. Replace elements which in the opinion of the Architect are damaged beyond successful restoration. Protect, clean and restore the Project elements throughout the Construction period until the Owner officially takes possession.

GUARANTEES
A. The basic warranty of the project and all of its elements shall extend for not less than one year after the Owner takes official possession.

SECTION 01400 – QUALITY REQUIREMENTS

CONTROL OF INSTALLATION
A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
B. Comply with manufacturers' instructions, including each step in sequence. All manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.
C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Have Work performed by persons qualified to produce required and specified quality.
F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

DEFECT ASSESSMENT
A. Replace Work or portions of the Work not conforming to specified requirements.
B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

SECTION 01600 – PRODUCT REQUIREMENTS

SUBMITTALS
A. Submit five (5) copies of shop drawings, product data and samples for all manufactured materials. Such submittals shall be completely reviewed by the Contractor prior to delivery to the Project Manager. The Contractor shall verify conformance with the requirements of Construction Documents and shall verify dimensions and compatibility with other elements of the Project. The Contractor shall submit with such promptness as to cause no delay in his own work allowing not less than two (2) weeks for Architect's review.
B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

TRANSPORTATION AND HANDLING
A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
B. Transport and handle products in accordance with manufacturer's instructions.
C. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

SECTION 01600 – PRODUCT REQUIREMENTS (continued)

STORAGE AND PROTECTION
B. Store and protect products in accordance with manufacturers' instructions.
C. Store with seals and labels intact and legible.
D. Prevent contact with material that may cause corrosion, discoloration, or staining.
E. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

SECTION 01700 – EXECUTION REQUIREMENTS

COORDINATION
A. Coordinate scheduling, submittals, and work of the various sections of the Project Requirements to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Notify affected utility companies and comply with their requirements.
C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
D. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
F. Coordinate completion and clean-up of work of separate sections.
G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PATCHING MATERIALS
A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

EXAMINATION
A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
D. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

PREPARATION
A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

LAYING OUT THE WORK
A. Promptly notify Architect of any discrepancies discovered.

GENERAL INSTALLATION REQUIREMENTS
A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

CUTTING AND PATCHING
A. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
C. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
E. Restore work with new products in accordance with requirements of Contract Documents.
F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material to full thickness of the penetrated element.
G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
H. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Remove debris, junk, and trash from site.
D. Leave site in clean condition, ready for subsequent work.
E. Clean up spillage and wind-blown debris from public and private lands.

PROTECTION OF INSTALLED WORK
A. Protect installed work from damage by construction operations.

ADJUSTING
A. Adjust operating products and equipment to ensure smooth and unhindered operation.

FINAL CLEANING
A. Use cleaning materials that are nonhazardous.
B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
D. Clean filters of operating equipment.

SECTION 01700 – EXECUTION REQUIREMENTS (continued)

CLOSEOUT PROCEDURES
A. Make submittals that are required by governing or other authorities.
B. Notify Architect when work is considered ready for Substantial Completion.
C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
D. Submit items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
E. Notify Architect when work is considered finally complete.
F. Complete items of work determined by Architect's final inspection.

SECTION 02200 – EARTHWORK

TEST REPORTS–EXCAVATING, FILLING AND GRADING
A. The Owner, at his own discretion and cost, may engage soil testing and inspection service (Soils Engineer) for quality control testing during earthwork operations.
B. The Soils Engineer shall be consulted as an Owner's representative and shall approve fill materials, method of placement, moisture contents and percent compaction. Soil materials, whether from sources on or off site must be approved by the Soils Engineer as suitable for intended use and specifically for foundation bearing, fill and backfill.
C. Location of the new structure and proposed Finish Floor Elevation shall be staked on site and approved by the Owner's Project Manager.
D. Finished Excavation shall be observed by the Soils Engineer and Structural Engineer prior to placement of any Concrete.
E. Backfill material shall be free of deleterious material and rocks having a diameter of more than 4". Fill material in areas to receive new concrete walks shall be placed in even layers not exceeding 8" of loose depth and uniformly compacted as directed by the Soils Engineer (not less than 95 percent of maximum dry density as defined by ASTM D698). Provide organic topsoil in other disturbed areas, compact and grade to match adjacent areas. Grade areas surrounding the structure to cause rapid runoff of surface water. Provide the slope required by the Soils Engineer or not less than 6" in 12 feet. Finish grade surfaces shall be free from irregular changes and within 0.10 foot of required sub or finish grade elevations. Spread stockpiled topsoil and compact to minimum six (6) inch depth at all areas not designated for walks, paving or structures.

SECTION 03300 – CONCRETE

A. STANDARDS: Conform to applicable ACI and ASTM Standards including but not limited to:
1. ACI 301 Specifications for Structural Concrete for Buildings
2. ASTM C-94 Specifications for Ready-Mixed Concrete
3. ACI 318 Building Code Requirements for Reinforced Concrete
B. SUBMITTALS: Furnish proposed design mix for each class of concrete specified, a minimum of two (2) weeks prior to placement. Provide product data for curing and sealing compounds.
C. CONCRETE MATERIALS: Refer to the Structural drawings for concrete strength and reinforcing requirements.
D. STAINING AND SEALING COMPOUNDS: Lithochrome Tintura Stain and Scofield Selectseal-W by L.M. Scofield Co., or approved equal.
E. EXECUTION:
1. Construct forms complying with ACI 347, to the exact sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, level and plumb work in finished structures. Plumbing and utilities which pass through floor slabs shall be isolated from the slab.
2. Comply with the specified codes and standards, and Concrete Reinforcing Steel Institute recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and coordinate locations of dowels with the Masonry Contractor.
3. Furnish ready-mixed concrete mixed and delivered per ASTM C94.
4. Place concrete in compliance with the practices and recommendations of ACI 304R-89, and as herein specified. Protect freshly placed concrete from premature drying and excessive cold and hot temperatures, and maintain without drying at a relatively constant temperature for the period of time necessary for hydration of the cement and proper hardening of the concrete. Cure in accordance with ACI 301 procedures.
5. After placing slabs, plane the surface to a tolerance not exceeding 1/8 inch in two feet. Slope surfaces uniformly to drain where required. After leveling, finish per the Architect.
6. Apply float finish to monolithic slab surfaces that are to receive trowel finish and other finishes as hereinafter specified. At Interior floors, apply trowel finish, unless otherwise shown. At Exterior walks, apply a non-slip broom finish. Broom finish shall be applied perpendicular to length of walk.
7. Do not use liquid curing materials on interior flatwoor. Cure interior flatwork with new, nonstaining, high quality curing paper.
8. Interior concrete shall be sufficiently cured to allow concrete to become effective, minimum 28 days.
9. Prepare surfaces and apply stain and sealer in strict conformance with manufacturers directions.

SECTION 04220 – MASONRY

REFERENCES
A. ASTM C90-03. All applicable NCMA TEK publications.

SUBMITTALS
A. Product Data on Concrete Masonry Units, reinforcing and all accessories. CMU and mortar color samples.

CONCRETE MASONRY UNITS
A. Provide light weight colored CMU with a compressive strength not less than 1900 psi. Architect shall select colors and pattern.

GENERAL PROCEDURES AND PROJECT CONDITIONS
1. Comply with applicable codes and National Concrete Masonry Association TEK publications.
2. Install units in a running bond pattern with concave mortar joints. Rake out mortar in preparation for application of sealants. Prevent grout, mortar or other materials from staining the face of masonry to be left exposed.
3. Provide high quality colored mortar, Type M or S in accordance with Table No. 2103.7 of the International Building Code. Submit True Tone Mortar colors for selection by the Architect.
4. Insulate exterior walls with Perlite.

SECTION 06100 – ROUGH CARPENTRY

REFERENCES
A. All lumber shall be gradestamped by an agency certified by the Board of Review of the American Lumber Standards Committee, Inc. and manufactured in accordance with Product Standard PS 20, as published by the U.S. Department of Commerce.

SUBMITTALS
A. Provide product data. Provide Cedar Siding samples.

PRODUCTS
A. Framing Lumber, provide Hem–Fir dress lumber, S4S, unless otherwise noted, kiln dried to maximum 19% moisture content. Stud Grade with Fb = 675 psi and E = 1,200,000 psi. Plywood concealed, APA rated sheathing grade, Exposure 1, Group 1 or 2 species for wall and roof sheathing.
B. Plywood soffits, 1/2" fir siding with grooves @ 4", T–1–11 or approved equal.

SECTION 06100 – ROUGH CARPENTRY (continued)

PRODUCTS
C. Cedar siding (for soffits), 1x4 tongue and groove, Select Tight Knot – STK grading.
D. Continuous soffit vents, aluminum, painted brown, provide model SV202 by Airvent or approved equal.

INSTALLATION
A. Refer to International Building Code for maximum span tables and fastening schedules.
B. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.
C. Comply with recommendations of the APA for installation of plywood. Provide Simpson Strong–Tie Panel Sheathing Clips to brace unsupported sheathing edges.

SECTION 06194 – FABRICATED WOOD TRUSSES

SUBMITTALS
A. Trusses shall be designed by a professional engineer employed by the Manufacturer and registered in the State of Colorado.
B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, details, fastening methods, accessory listings, hardware location and design loads.

INSTALLATION
A. Follow Manufacturer's installation instructions and recommendations.
B. Lift trusses into position, taking care to prevent out–of–plane bending. Set and secure level, plumb and at correct locations. Install permanent bracing and bridging prior to application of loads.

SECTION 07210 – BUILDING INSULATION

PRODUCTS
A. MINERAL/GLASS FIBER BATT INSULATION: Glass or other inorganic (non–asbestos) fibers formed with binders into resilient, flexible blankets or semi–rigid batts; ASTM C665, types as indicated, density not less than 0.5 pounds per cubic foot for glass and 2.5 pounds per cubic foot for mineral wool; thermal conductivity (k–value at 75oF) of 0.27; manufacturer's standard sizes, thicknesses to provide R–30 at roofs.

EXECUTION
A. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work. Extend insulation full thickness as shown over entire surface to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation and mastic. Apply a single layer of insulation of the required thickness, unless otherwise shown or required to make up the total thickness.

SECTION 07610 – METAL ROOFING

SUBMITTALS
A. Product data. Color samples.

PRODUCTS
A. Continuous length–roll formed panels with 1 3/4" tall ribs on 16 inch centers. Fastening system shall be concealed. Panel materials shall be minimum 24 gauge. Roof system shall include all flashings and fascia trims in materials and colors to match the roofing panel. Provide Snap–Clad metal panel system by PAC–CLAD Petersen Aluminum or approved equal. Panel finish selected from manufacturer's full line of colors including metallic finishes.
B. Provide all necessary items, trims, clips, nuts, and bolts necessary for a sound and secure weather–tight installation.
C. W.R. Grace Ice and Water Guard roof underlayment, or approved equal.

EXECUTION
A. Comply with manufacturer's instructions for the particular conditions of installation. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
B. Roll form radius roof panels as required to meet profile of arched roof.
C. Install metal roofing over a self adhesive, composite 40 mil rubberized membrane.

SECTION 07720 – ROOF ACCESSORIES

SUBMITTALS
A. Product data.

PRODUCTS
A. SKYLIGHTS: Provide Model #2448G by AIA industries or approved equal. Skylight shall be manufacturer's standard curb mount skylight. Provide curb extension as required for proper installation of skylight, membrane flashings, metal roofing, roofing flashings and roof insulation. Outside unit dimensions shall be approximately 24x48 (inches). Provide with heat–mirror treated, clear Glazing. Fabricate units to withstand 40 pound live loading.

EXECUTION
A. Separate metal surfaces of roof accessories from dissimilar metals, and from wood and cementitious substrates, by a thick coating of fibrated bituminous compound or other separation as recommended by the metal manufacturer, and as required to prevent corrosive action.
B. Anchor roof accessories permanently to the substrate by methods which are adequate for the sizes and locations of units. Comply with manufacturer's instructions for the particular conditions of installation. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.

08100 – HOLLOW METAL DOORS AND FRAMES

STANDARDS
1. ANSI/SDI–100–98 – Recommended Specifications for Standard Steel Doors an Frames
2. SDI–105–91 – Recommended Erection Instructions for Steel Frames
3. SDI–107–78 – Hardware on Steel Doors (reinforcement application)
4. ANSI–A250.4–1994 – Steel Doors and Frames Physical Endurance
5. Conform to HMMA 861 standards except where more stringent requirements are specified
6. IBC 2006 – International Building Code
7. ANSI–A117.1 – Accessible and Usable Building and Facilities

SUBMITTALS
A. Submit shop drawings showing fabrication and installation of standard steel doors and frames. Include details of each frame type, elevations of door and frame types, conditions at openings, details of construction, location and installation requirements of door and frame hardware reinforcements, and details of joints and connections. Show anchorage and accessory items.

PRODUCTS
A. All doors and frames shall be manufactured of commercial quality cold rolled steel per ASTM–A366 and A568 general requirements or galvanized to A60 or G60 minimum coating weight standard per ASTM–A924. Internal reinforcing may be manufactured of hot rolled pickled and oiled steel per ASTM–A569.

08100 – HOLLOW METAL DOORS AND FRAMES (continued)

PRODUCTS
B. Supports and anchors shall be fabricated of not less that 18–gauge sheet steel, galvanized where galvanized frames are used.
C. Where items are to be built into exterior walls, inserts, bolts and fasteners shall be hot dipped galvanized in compliance with ASTM–A153, Class C or D as applicable.
D. Rust inhibitive enamel or paint primer shall be used, baked on, and suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces on Steel Doors and Frames."

DOORS
A. Provide 1 3/4" thick doors of materials and ANSI/SDI–100 grades and models.
B. Exterior Doors: Level 3, Model 2 – Seamless: Exterior doors shall be minimum 16–gauge steel with both lock and hinge rail edge of door intermittently welded, filled and ground smooth the full height of door. Exterior doors shall be insulated with a solid slab of expanded polystyene or polyurethane foam permanently bonded to the inside of each face skin. The top of all doors shall be closed flush by the addition of a 16–gauge screwed–in top cap to prevent water infiltration.

FRAMES
A. Provide hollow metal frames for doors of types and styles as shown on the drawings and schedules. Conceal fastenings unless otherwise indicated. Exterior Frames: Level 2, 16–gauge. 5 3/4 inch jamb depth base bid, 7 3/4 inch jamb depth for stone veneer alternate.
B. Fabricate frames with mitered and faces only welded corners, re–prime at the welded areas. All welds to be flush with neatly mitered or butted material cuts.
C. All frames shall have minimum 7 gauge hinge reinforcements, 14–gauge lock strike reinforcing, and 12–gauge closer reinforcing.
D. Provide temporary shipping bars to be removed before setting frames.

INSTALLATION
A. Comply with provisions of SDI–105, "Recommended Erection Instructions for Steel Door Frames," unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
B. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T–shaped anchors. Coordinate frame anchor placement with wall construction.
C. Coordinate installation of hardware.
D. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

08700 – DOOR HARDWARE

SUBMITTALS
A. Submit copies of finish hardware schedule in vertical format, listing each door opening, and organized into "hardware sets" indicating complete designations of every item required for each door opening to function as intended. Note any special mounting instructions or requirements with the hardware schedule.
B. Submit catalog cuts and/or product data sheets for all scheduled finish hardware.

WARRANTY
A. All items, except as noted below, shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a minimum period of one (1) year commencing on the date of final completion and acceptance. In the event of product failure, promptly repair or replace item with no additional cost to the owner. Cylindrical locksets – Heavy Duty: Five (5) years. Door closers: Ten (10) years

HARDWARE GROUPS
A. MEN and WOMEN (doors 101 and 102) – Provide pushplate, pull, deadbolt, flushbolt, closer with adjustble stop and hold open, sign, weathering, and hinges.
B. STORAGE (door 103) – Provide storeroom type lever–lockset, latch–guard, deadbolt, overhead stop, weathering and hinges.

PRODUCTS
A. Provide the following or approved equal:

Hinges	Hager BB1279
Closers	Norton CLP–8301T – NO SUBSTITUTIONS
Locksets	Best 9K Series
Deadbolts	Best 9K Series
Flushbolts	Adams Rite Cylinder Operated Flushbolt –1870 HM Series (Restroom Doors to lock in the full open position)
Cylinders	Best (verify with Owner)
Push/Pulls	Trimco (4" x 16")
Latch–guard	Trimco
Weathering	Pemko
Wall Stops	Rockwood
Signs	Trimco (Men, Women, International symbol of accessibility).

FINISHES
A. All hardware to be furnished in US32D 630 Stainless Steel Satin Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

INSTALLATION
A. Mount hardware units at heights indicated in the following applicable publications, except as specifically indicated or required to comply with the governing regulations.
1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute (DHI.)
2. All hardware shall be applied and installed in accordance with best trade practice by an experienced hardware installer. Care shall be exercised not to mar or damage adjacent work.
B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface–mounted items until finishes have been completed on the substrates involved.

SECTION 09900 – PAINTS AND COATINGS

GENERAL
A. The work of this Section includes prep, priming, sanding and cleaning; painting/staining and finishing of all walls, ceilings, soffits, beams and wood trim; painting of all hollow metal door and door frames; painting of unfinished mechanical, plumbing and electrical items; application of graffiti protection; and caulking of all joints as required by these specifications and as directed by the Architect.
B. Paint and stain colors will be selected by the Architect after all samples are submitted and approved. The Architect will issue a color schedule with an itemized list of colors to be applied. No paint shall be applied until the color schedule is issued.
C. Rquirements of this section are that all items, and surfaces which are normally painted and finished in a project of this type and quality be included. All toilet room walls shall have block–fill and an elastomeric paint system. Typical plywood and cedar siding finished soffits and ceilings shall be stained. Provide a clear graffiti–guard system over CMU and stone surfaces that are not painted (submit a sample of each with the graffiti guard applied, prior to approval).

SECTION 09900 – PAINTS AND COATINGS (continued)

SUBMITTALS
A. Product Data: Provide data on all finishing products, including VOC content. Paint color fan deck.
B. Samples: Submit two paper chip samples, 8 x 8 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.
C. Manufacturer's instructions: Indicate special surface preparation procedures.
D. Maintenance Data: Submit data on cleaning, touch–up, and repair of painted and coated surfaces.

EXAMINATION
A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

PREPARATION
A. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
B. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
C. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra–sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
D. Shop–Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch–up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
E. Interior Wood Items to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
F. Interior Wood Items to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

APPLICATION
A. Apply products in accordance with manufacturer's instructions.
B. Caulk joints between similar materials, fill nail holes, prime and clean surfaces to be painted prior to painting.
C. Two separate coats of paint or stain shall be applied. Allow applied coats to dry before next coat is applied. Apply each coat to uniform appearance.
D. Caulk joints at perimeter of plumbing fixture and wall or floor.

SECTION 10155 – TOILET PARTITIONS

SUBMITTALS.
A. Submit manufacturer's detailed technical data for materials, fabrication and installation. Include catalog cuts of hardware, anchors, fastenings and accessories. Transmit copy of each to the Installer. Submit shop drawings for the fabrication and erection of toilet partition assemblies which are not fully described in manufacturer's data. Show all anchorage and accessory items. Provide one set actual samples of available finishes for Architect's selection.
B. Comply with Handicap Accessibility requirements of "The Americans With Disabilities Act." Submit setting drawings, templates and instructions for the installation of anchorage devices built into other work.

PRODUCTS
A. The work of this section includes stall doors at each of the toilets. Partitions shall be constructed of CMU. Provide heavy–duty high density polyethylene doors and hardware by Santana or approved equal.

Material: Solid Plastic High Density Polyethylene
Type: Pilaster type,
Finish: Colors as selected from manufacturer's standards

B. Hardware and Accessories: solid plastic pilaster shoes and full continuous plastic wall brackets, color to coordinate with system. Hardware: Manufacturer's standard design, heavy–duty operating hardware and accessories, cast aluminum. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of finished to match hardware, with security screw–type heads and nuts:

For each stall, pull, heavy slide bar latch, rubber–tipped bumpers, gravity hinges with concealed ball–bearing rollers. Coordinate, prepare as required for other accessories as specified in this section.

INSTALLATION
A. When possible, take field measurement prior to preparation of shop drawings and fabrications to ensure proper fitting of the work. Otherwise, indicate field measurements on final shop drawings. Furnish inserts and anchoring devices which must be built into other work for the installation of toilet partitions and related work. Coordinate delivery with other work to avoid delay.
B. Install partitions rigid, straight, plumb and level, with the panels laid out as shown on Drawings. Provide clearances of not more than 1/2 inch between pilasters and panels, and not more than one inch between panels and walls. Install door bumpers on partitions or walls.

SECTION 10800 – TOILET ACCESSORIES

SUBMITTALS.
A. Submit product literature of each proposed accessory to the Architect for review and approval. Submit manufacturer's technical data and installation instructions for each accessory. Transmit copies of installation instructions to the Installer.
B. Comply with Handicap Accessibility requirements of "The Americans With Disabilities Act." Submit setting drawings, templates and instructions for the installation of anchorage devices built into other work.

PRODUCTS
A. The work of this section includes the following items:

Hand Dryer, World Hand Dryer model XA5 surface mount.
Baby Changing Stations, Koala Kare KB112–01RE
Grab Bars, Bradley Model 812 (or approved equal)
Stainless Steel Mirrors (provide at each lav), Bradley Model 748, 24" x 30", (or approved equal)
Napkin/Tampon Disposal (provide at each women's toilet), Bradley 4722–15 (or approved equal)

Toilet Paper Holders, Supplied by Owner, Installed by General Contractor
Paper Towel Dispenser, Supplied by Owner, Installed by General Contractor

INSTALLATION
A. Use concealed fastenings. Provide anchors, bolts and other necessary anchorages, and attach accessories securely to walls and partitions in locations as shown or directed.
B. Install concealed mounting devices and fasteners fabricated of the same material as the accessories, or of galvanized steel, as recommended by manufacturer.
C. Install exposed mounting devices and fasteners finished to match the accessories.
D. Provide theft–resistant fasteners for all accessory mountings. Secure accessories in accordance with the manufacturer's instructions for each item and each type of substrate construction.
E. Unless otherwise indicated, align units with fixtures, other elements and as directed by Architect. Conform to The Americans With Disabilities Act for positions and mounting heights for access to the handicapped.

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consultant:

project:
Grand Junction Park Restroom Medium

project#: 18.0850
date: 22 February 2019

revisions :

title:
General Information

sheet:
G1002

DOOR SCHEDULE

Number	Door Dimensions WD	HGT	THK	Door Material	Door Finish	Frame Material	Frame Finish	Hardware Set	Comments
101A	3' - 0"	7' - 0"	1 3/4"	HM	PAINT	HM	PAINT		INSULATED WITH 4" FRAME HEAD
102A	3' - 0"	7' - 0"	1 3/4"	HM	PAINT	HM	PAINT		INSULATED WITH 4" FRAME HEAD
103A	3' - 0"	7' - 0"	1 3/4"	HM	PAINT	HM	PAINT		INSULATED WITH 4" FRAME HEAD

FINISH SCHEDULE

ROOMS Number	Name	FLOORS Floor Finish	Wall Material	Wall Finish	Ceiling Material	Ceiling Finish	Comments
100	ENTRY	CONCRETE SEALER	CMU	GRAFFITI GUARD	T&G CEDAR	STAIN	
101	WOMEN	CONCRETE SEALER	CMU	PAINT	GROOVED PLYWOOD	STAIN	
102	MEN	CONCRETE SEALER	CMU	PAINT	GROOVED PLYWOOD	STAIN	
103	CHASE	CONCRETE SEALER	CMU	PAINT	GROOVED PLYWOOD	STAIN	
104	SHELTER	CONCRETE SEALER	CMU	GRAFFITI GUARD	T&G CEDAR	STAIN	

EXTERIOR FINISHES

COLORED CMU 01	8X8X16 INTEGRAL COLORED, HONED CMU - "BUFF" COLOR BY BRICKYARD GJ, OR EQUAL
COLORED CMU 02	8X8X16 INTEGRAL COLORED, HONED CMU - "MT. GARFIELD" COLOR BY BRICKYARD GJ, OR EQUAL
METAL ROOFING	COLOR MATCHING MBCI "KOKO BROWN" OR "MEDIUM BRONZE" OR EQUAL COLOR AS APPROVED
PAINT	COLOR TO MATCH METAL ROOFING COLOR AS APPROVED, SIMILAR TO SHERWIN WILLIAMS SW097 "STURDY BROWN"
STAIN	AS SELECTED FROM MANUFACTURER'S FULL RANGE OF COLORS

CODE ANALYSIS

APPLICABLE CODES

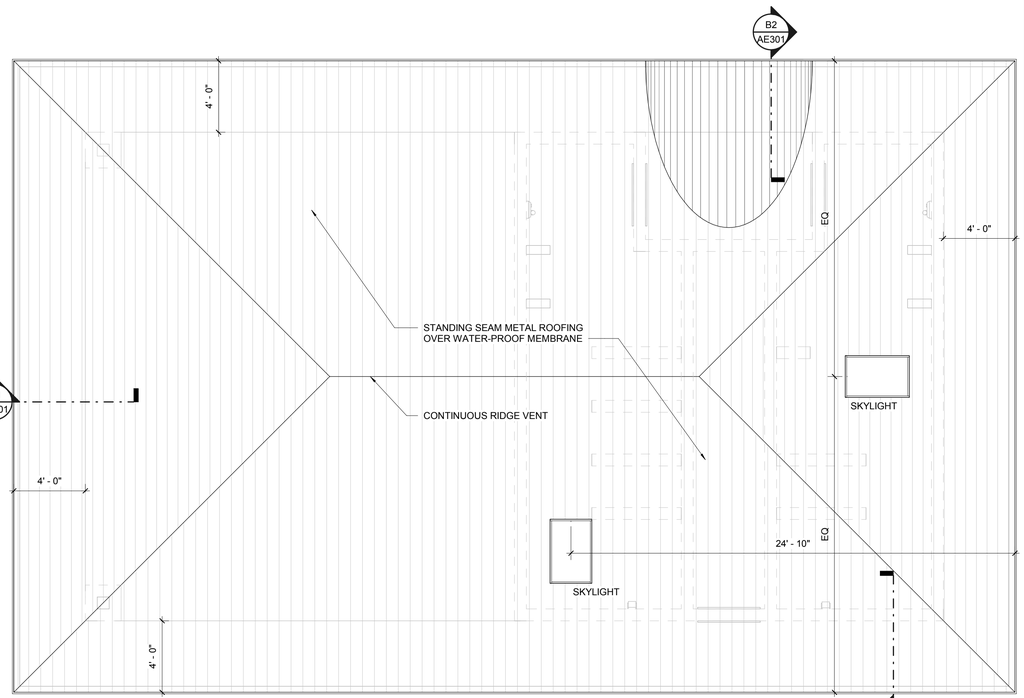
	Year		Year
International Building Code	2015	National Electrical Code	2014
International Mechanical Code	2015	Uniform Code for Building Conservation	
International Plumbing Code	2015	ADA Accessibility Guildelines	2010
International Fire Code	2015		
International Energy Conservation Code	2015		

A. Occupancy: GROUP B

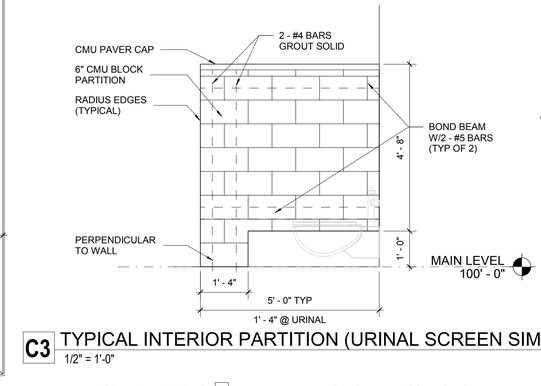
B. Type of Construction (circle one):

I A | I B | II A | II B | III A | III B | IV HT | V A | (V B)

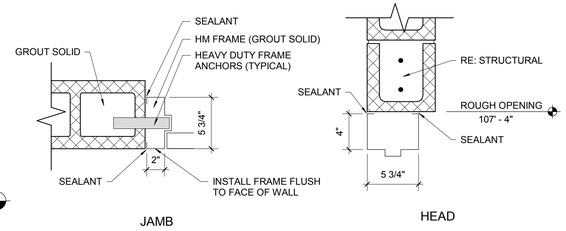
C: Total Interior Floor Area: 1,296 SF



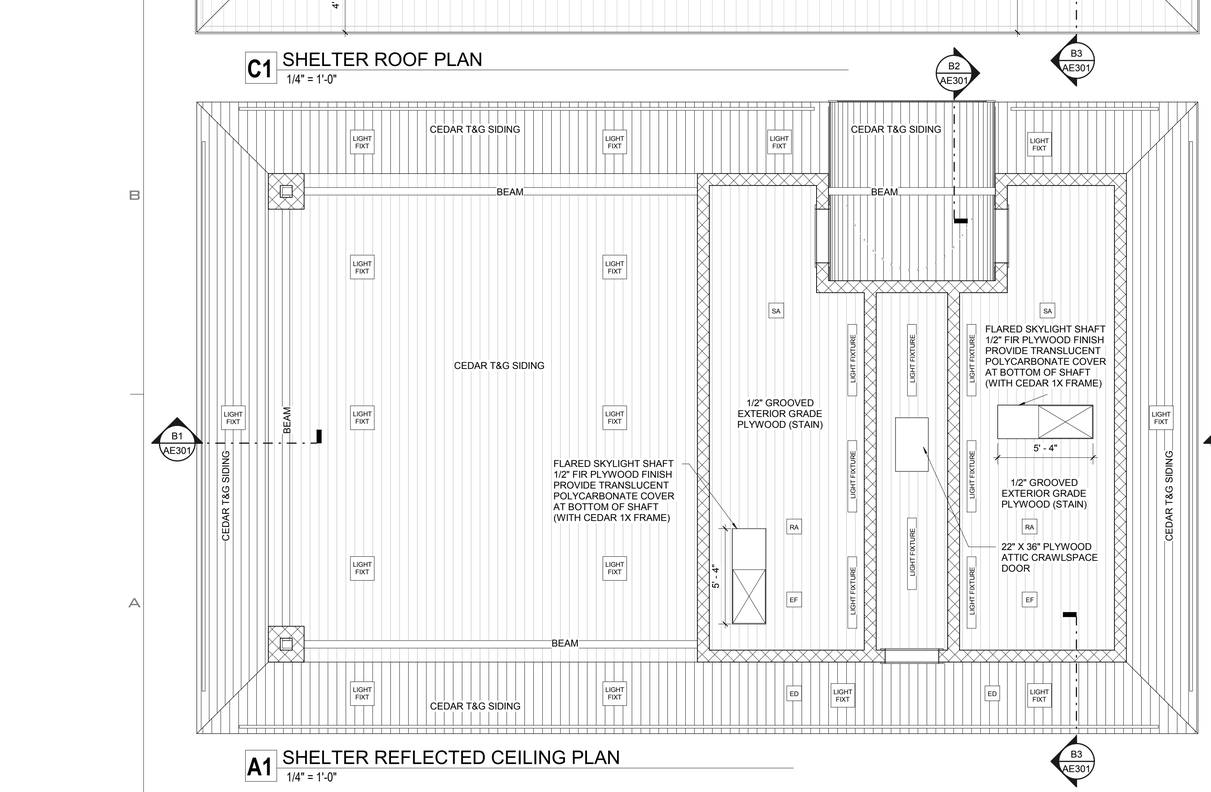
C1 SHELTER ROOF PLAN
1/4" = 1'-0"



C3 TYPICAL INTERIOR PARTITION (URINAL SCREEN SIM.)
1/2" = 1'-0"



C5 DOOR FRAME DETAILS
1 1/2" = 1'-0"

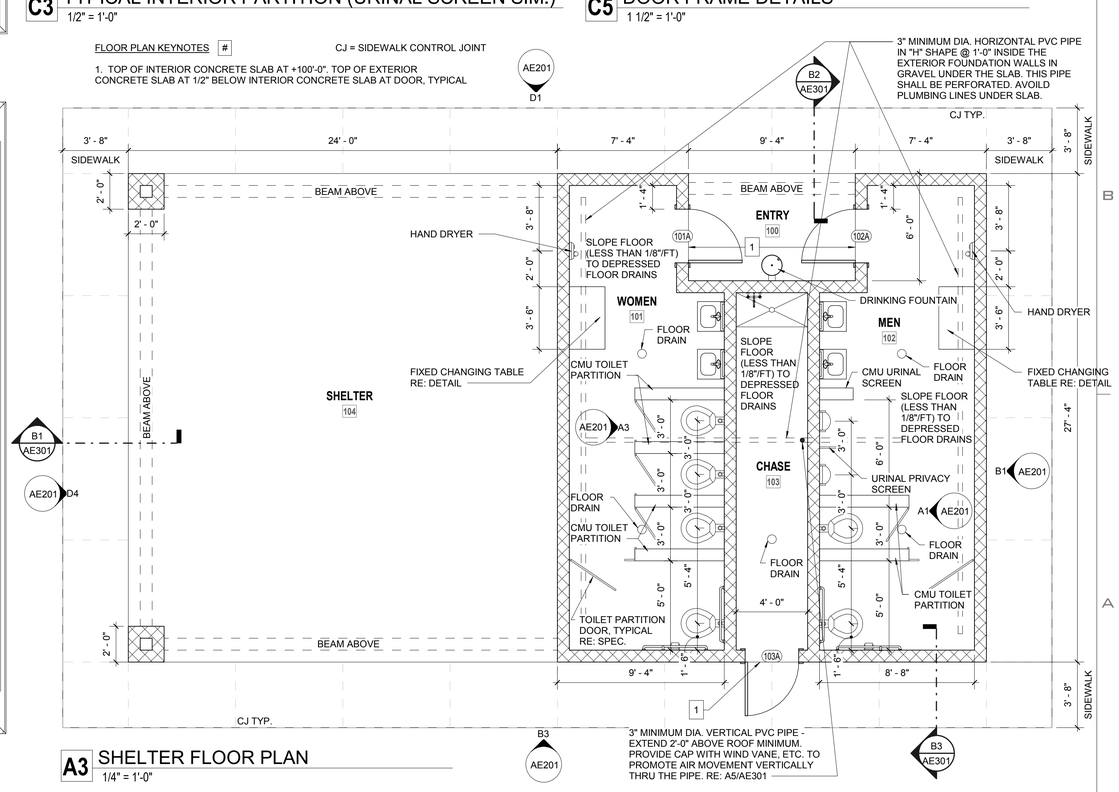


A1 SHELTER REFLECTED CEILING PLAN
1/4" = 1'-0"

FLOOR PLAN KEYNOTES [#]

CJ = SIDEWALK CONTROL JOINT

1. TOP OF INTERIOR CONCRETE SLAB AT +100'-0". TOP OF EXTERIOR CONCRETE SLAB AT 1/2" BELOW INTERIOR CONCRETE SLAB AT DOOR, TYPICAL



A3 SHELTER FLOOR PLAN
1/4" = 1'-0"

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Floor, RCP & Roof Plans

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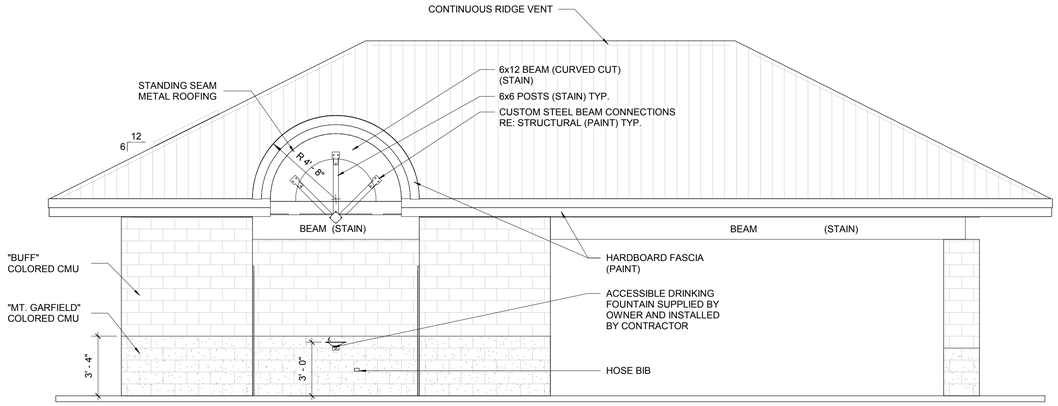
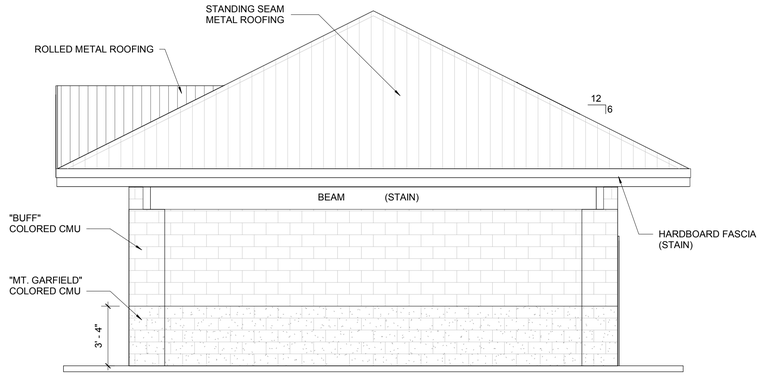
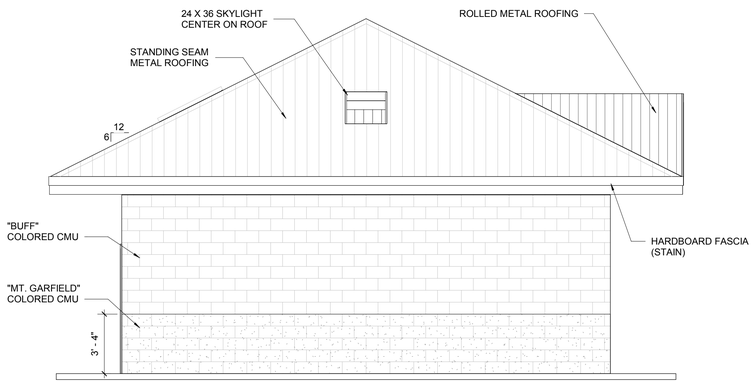
AE101



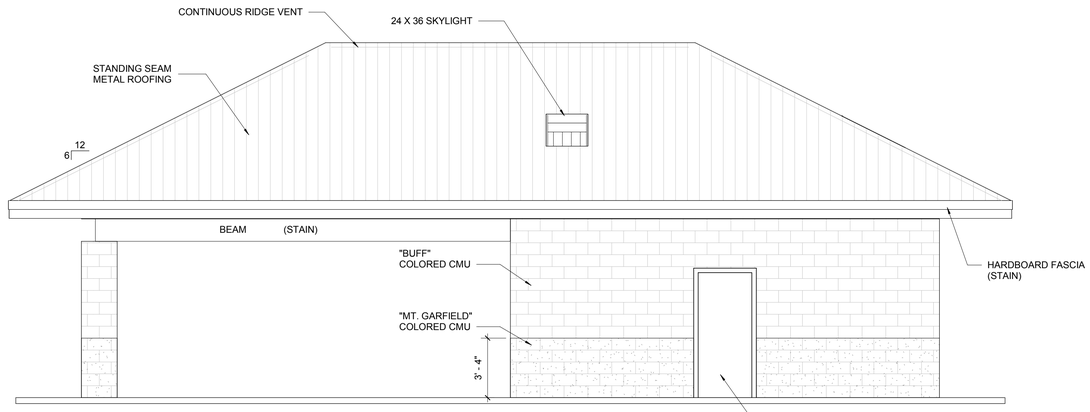
D1 North Exterior Elevation
1/4" = 1'-0"



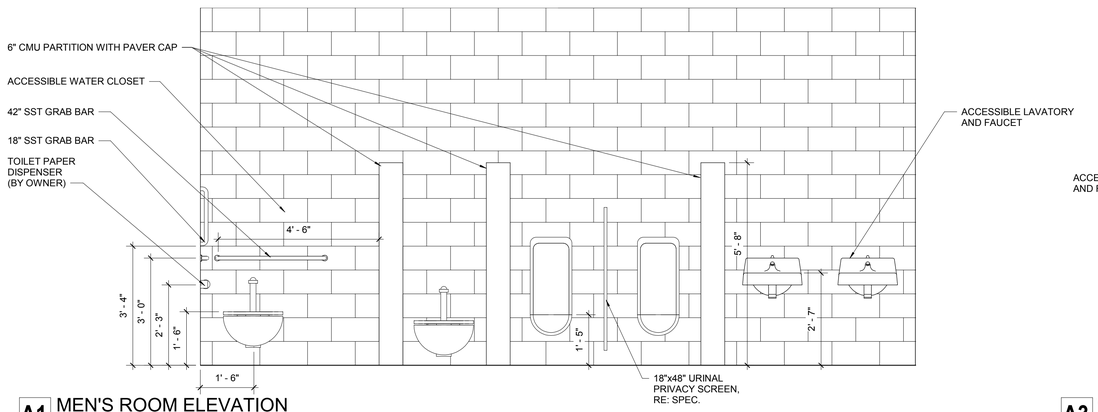
D4 West Exterior Elevation
1/4" = 1'-0"



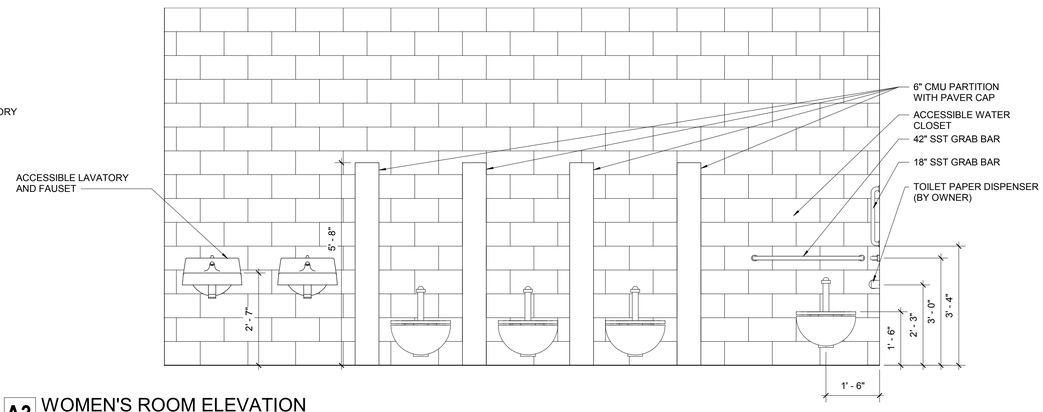
B1 East Exterior Elevation
1/4" = 1'-0"



B3 South Exterior Elevation
1/4" = 1'-0"



A1 MEN'S ROOM ELEVATION
1/2" = 1'-0"



A3 WOMEN'S ROOM ELEVATION
1/2" = 1'-0"

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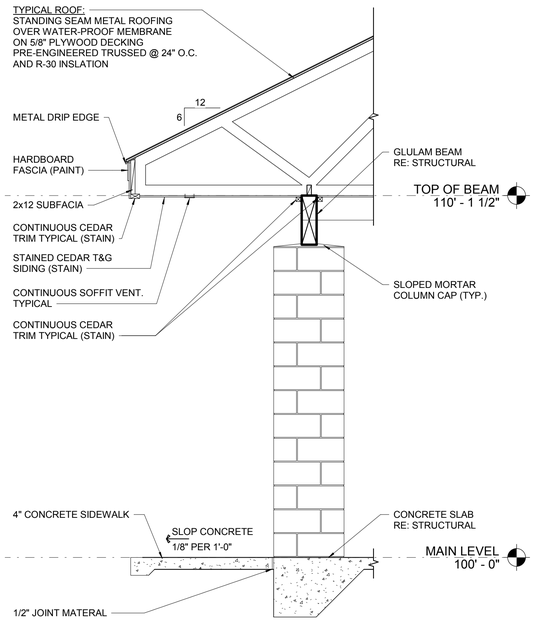
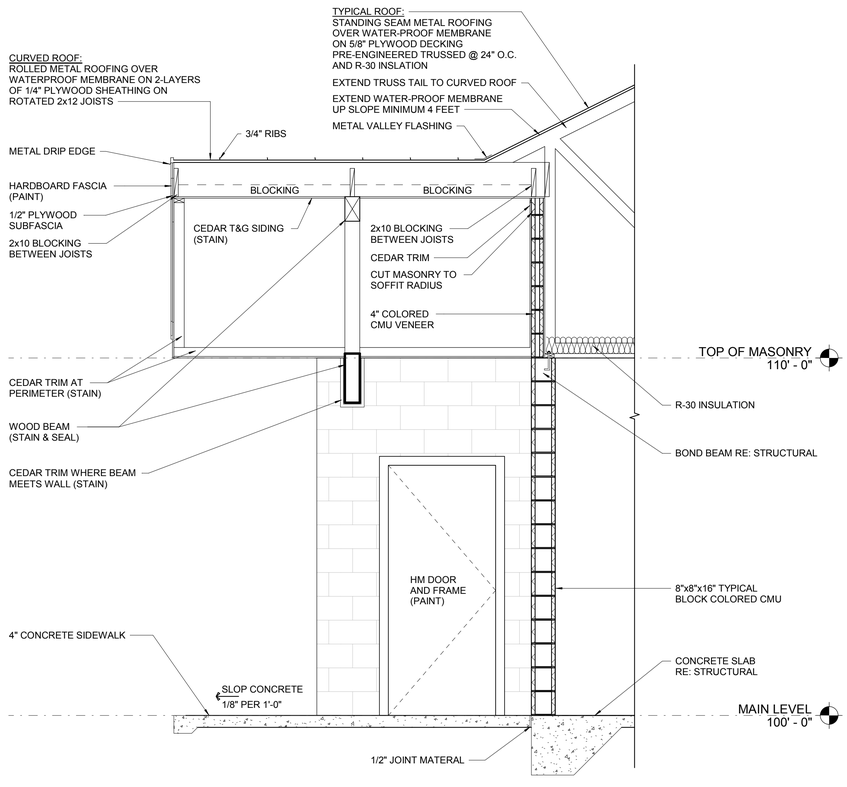
Exterior & Interior Elevations

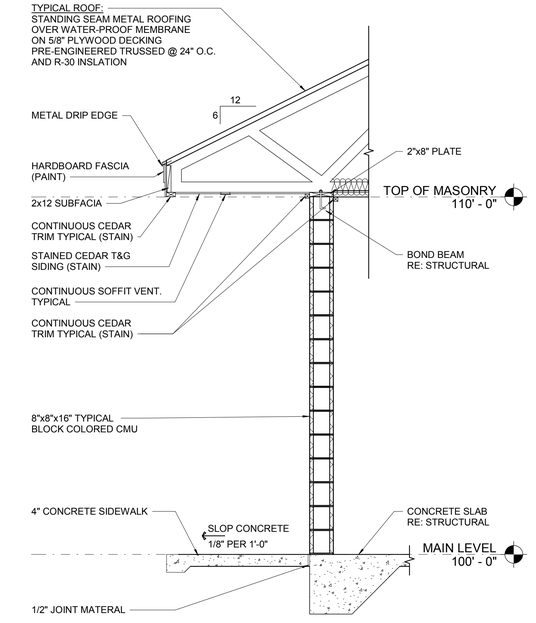
sheet:
AE201



B1 WALL SECTION
1/2" = 1'-0"



B2 BEAM SECTION
1/2" = 1'-0"



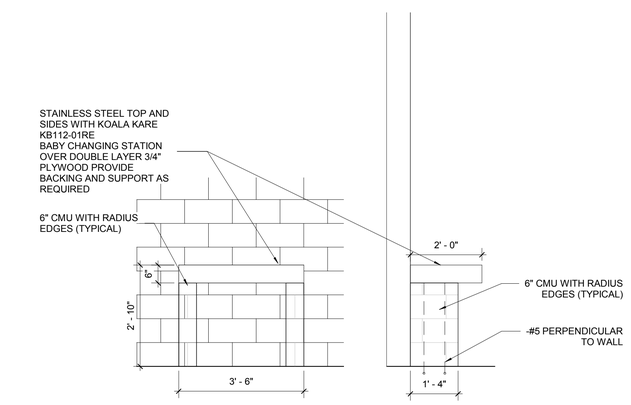
B3 WALL SECTION 2
1/2" = 1'-0"

NOTES:

1. ALL CONCRETE SLABS THAT COME IN CONTACT WITH THE GROUND SHALL BE LAID OVER A GAS PERMEABLE MATERIAL MADE UP OF EITHER A MINIMUM 4" THICK UNIFORM LAYER OF CLEAN AGGREGATE, OR A MINIMUM 4" THICK UNIFORM LAYER OF SAND, OVERLAIN BY A LAYER OR STRIPS OF MANUFACTURED MATTING DESIGNED TO ALLOW THE LATERAL FLOW OF SOIL GASES.

2. ALL OPENINGS, GAPS, AND JOINTS IN FLOOR AND WALL ASSEMBLIES IN CONTACT WITH SOIL OR GAPS AROUND PIPES, TOILETS, BATHTUBS OR DRAINS PENETRATING THESE ASSEMBLIES SHALL BE FILLED OR CLOSED WITH MATERIALS THAT PROVIDE A PERMANENT AIR-TIGHT SEAL. SEAL LARGE OPENINGS WITH NON-SHRINK MORTAR, GROUTS OR EXPANDING FOAM MATERIALS AND SMALLER GAPS WITH AN ELASTOMERIC JOINT SEALANT, AS DEFINED IN 'ASTM C920-87'.

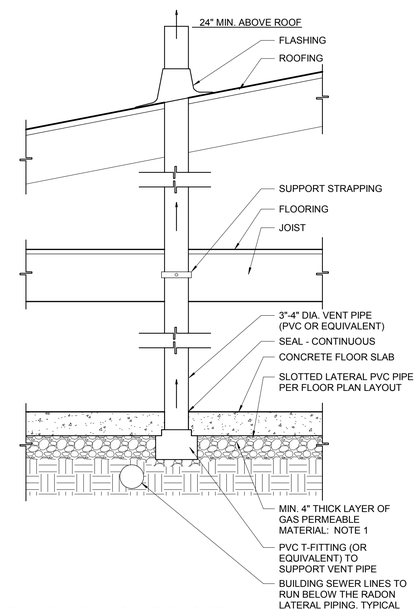
3. VENT PIPES SHALL BE INSTALLED SO THAT ANY RAINWATER OR CONDENSATION DRAINS DOWNWARD INTO THE GROUND BENEATH THE SLAB OR SOIL-GAS-RETARDER MEMBRANE.



A3 FIXED CHANGING TABLE FRONT
1/2" = 1'-0"

A4 FIXED CHANGING TABLE SIDE
1/2" = 1'-0"

EXHAUST (10' FROM OPENINGS INTO
CONDITIONED SPACES OF BUILDING)



A5 RADON PASSIVE SYSTEM
1" = 1'-0"

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2-22-19

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Restroom Medium

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revisions :

title:
Wall Sections & Details

sheet:
AE301

GENERAL STRUCTURAL NOTES

GENERAL

1. The structural notes are intended to complement the project specifications. Specific notes and details in the drawings shall govern over the structural notes and typical details.
2. Typical details and sections shall apply where specific details are not shown.
3. The contractor shall verify all site conditions and dimensions. If actual conditions differ from those shown in the contract drawings, the contractor shall immediately notify the architect/engineer before proceeding with the fabrication or construction of any affected elements.
4. Omissions or conflicts between the contract drawings and/or specifications shall be brought to the attention of the architect/engineer before proceeding with any work involved. In case of conflict, follow the most stringent requirement as directed by the architect/engineer at no additional cost to the owner.
5. The contractor shall submit a written request to the architect/engineer before proceeding with any changes, substitutions or modifications. Any work done by the contractor before receiving written approval will be at the contractor's risk.
6. The structural drawings are not all-inclusive and do not contain all dimensions, elevations, openings, mechanical shafts and penetrations needed to build the structure. The contractor shall coordinate these items with the Architectural, Mechanical and Electrical drawings.
7. The contractor shall coordinate with all trades any items that are to be integrated into the structural system such as openings, penetrations, mechanical and electrical equipment, etc. Sizes and locations of mechanical and other equipment that differs from those shown on the contract drawings shall be reported to the architect/engineer.
8. The contractor shall provide adequate shoring and bracing as required for the chosen method of erection. Shoring and bracing shall remain in place until final connections for the permanent members are completed. The building shall not be considered stable until all connections are completed. Walls shall not be considered self-supporting and shall be braced until the roof system is completed.
9. Site observations by BHB Consulting Engineers, P.C.'s field representative shall not be construed as approval of construction procedures nor special inspection.
10. Detailing and shop drawing production for structural elements will require information (including dimensions) contained in the architectural, structural and/or other consultants' drawings. The structural drawings shall be used in conjunction with the architectural and other consultant's drawings. Some dimensions and elements such as elevations, depressions, slopes, mechanical housekeeping pads, etc. are not shown in the structural drawings. All dimensions shown on structural drawings shall be verified by contractor with architectural, mechanical and electrical drawings.
11. Review of shop drawing submittals by BHB Consulting Engineers, P.C. is for general compliance only and is not intended for approval. The shop drawing review shall not relieve the contractor from the responsibility of completing the project according to the contract documents.
12. Shop drawings made from reproductions of the contract drawings will be rejected unless the contractor signs a release agreement prior to the shop drawings being reviewed.
13. Only an authorized representative of BHB Consulting Engineers, P.C. may make changes to these contract drawings. BHB Consulting Engineers, P.C. shall not be held responsible or liable for any claims arising directly or indirectly from changes made without written authorization by an authorized representative of BHB Consulting Engineers, P.C.

BASIS OF DESIGN

1. Governing Code — International Building Code 2015
   a. Risk Category — II
2. Snow Loads
   a. Ground Snow Load, Non-Reducible — P_g = 30 psf
   b. Roof Snow Load — P_f = 30 psf plus Snow Drift
3. Seismic Loads
   a. Seismic Importance Factor, I_e — 1.0
   b. Seismic Design Category — D
   c. Mapped Spectral Acceleration — S_s = 0.234g; S_1 = 0.069g
   d. Soil Site Class — D
   e. Soil Site Coefficients — F_a = 1.6; F_v = 2.4
   f. 5% Damped Design Spectral Response Acceleration — $S_{DS} = 2/3 * F_a * S_S = 0.25g$; $S_{D1} = 2/3 * F_v * S_1 = 0.11g$
   g. Seismic-Force-Resisting System — Special Reinforced Masonry Shear Walls
   h. Response Modification Coefficient — R = 5.0
   i. System Over-strength Factor — $\Omega_0 = 2.5$
   j. Deflection Amplification Factor — $C_d = 3.5$
   k. Redundancy Factor — $\rho_x = 1.0$; $P_y = 1.0$
   l. Fundamental Building Period — T = 0.152 seconds
   m. Seismic Response Coefficient — $Cs = SDS * I_e / R$; $Cs = SD1 * I_e / (R*T)$
   n. W — Dead Loads of Structure
   o. Base Shear — $V = C_S * W = 0.05$ W (Strength Design)
   p. Analysis Procedure — Equivalent Lateral Force (Static)
4. Wind Loads
   a. Wind Velocity (3 Second Gust) — 115 mph (Strength); 90 mph (Allowable (I_w = 1.0))
   b. Exposure Type — C
   c. Internal Pressure Coefficient, GCpi — +/-0.18
   d. Topographic Factor, Kzt — 1.0
   e. Components and Cladding Wind Force Table (psf; Strength Design)

Component Elevation above grade	Effective Wind Area for Component (sq ft.)				
	10 sq ft.	20 sq ft.	50 sq ft.	100 sq ft.	500 sq ft.
15	29.8	27.2	23.8	21.2	15.1
20	31.7	28.9	25.3	22.5	16.1

FOUNDATION

1. Soils Investigation Report: None
2. Assumed Soil bearing pressure: 1500 psf -Contractor shall verify at time of construction.
3. Frost Protection: 12 inches minimum.
4. Clear excavations of debris and loose soil prior to placing footings. All footings shall bear on undisturbed natural sub-grade or engineered compacted fill as noted in these drawings.

EARTHWORK

1. Prior to construction, the contractor shall verify that the soil conditions are adequate for 1,500 psf allowable soil bearing pressure. If needed, structural fill shall be provided beneath footings.
2. Clearing: Remove all existing structures and associated foundations, slabs, fencing, asphalt, concrete, and incidental structures as necessary for project completion. The building area shall be stripped of all vegetation, topsoil and debris. Following stripping, all fill soils and any remaining loose natural soils shall be excavated to expose competent natural soils.
3. Proof roll the entire building pad area with normal compaction equipment to check for the presence of unsuitable fills, soft spots, or other undesirable materials or conditions. Remove sub-grade materials that are unsuitable and replace with compacted structural fill or 2,000 psi lean concrete.
4. Compacted structural fill: All fill material shall be a well-graded granular material with a maximum size less than 3 inches and with not more than 15 percent passing a No. 200 sieve. It shall be compacted to at least 95 percent of the maximum laboratory density as determined by ASTM D 1557 for fill beneath footings and 90 percent for fill beneath floor slabs. All fill shall be tested. Compacted structural fill shall be placed in lifts not exceeding 8 inches in uncompacted thickness.
5. Floor slabs thicknesses shall be required by the plans and underlain by a granular layer at least 4 inches thick. The granular layer shall have a maximum size less than 1 inch with not more than 5 percent passing a #200 sieve and shall be compacted to at least 90 percent of the maximum laboratory density as determined by ASTM D 1557.
6. Consult the project specifications for further earthwork requirements.

CONCRETE

1. Materials, unless noted otherwise:
   a. Normal weight aggregates — ASTM C 33
      i. Combined aggregate gradation for slabs on grade and other designated concrete shall be 8% - 18% for large top size aggregates (1.1/2") or 8% - 22% for smaller top size aggregates (1" or 3/4") retained on each sieve below the top size and above the No. 100. The range for the No. 30 and No.50 sieves shall be 8% - 15% retained in each. To avoid gap gradation the following shall occur:
         1. The percent retained on two adjacent sieves shall not fall below 5%.
         2. The percent retained on three adjacent sieves shall not fall below 8%.
         3. When the percent retained on two adjacent sieves is less than 8%, the total retained on either of these sieves and the adjacent outside sieve shall be at least 13%. See ACI 302 Section 5.4.3.3 for more information.
      ii. Maximum Aggregate Size shall not be larger than:
         1. 1/5 the narrowest dimension of the forms
         2. 1/3 the depth of the slab
         3. 3/4 the minimum clear spacing between bars
   b. Reinforcing Steel — ASTM 615 Grade 60 (Fy = 60 ksi). Use Grade 40 (Fy = 40 ksi) for field bent dowels with spacings indicated reduced by 1/3.
   c. Headed Stud Anchors (HSA) — ASTM A108
   d. Anchor Rods
      Typical, uno — ASTM F1554, Grade 36, with ASTM A563 heavy hex nuts and hardened washers Grade A
   e. Admixtures:
      i. Air-entraining admixtures shall comply with ASTM C 260 (when used).
      ii. Calcium chloride shall not be added to the concrete mix.
      iii. Water-reducing admixture shall comply with ASTM C 494/C 494M, Type A (when used)
      iv. Retarding admixture shall comply with ASTM C 494/C 494M, Type B (when used).
      v. Water-reducing and retarding admixture shall comply with ASTM C 494/C 494M, Type D (when used).
      vi. High-range, water-reducing admixture shall comply with ASTM C 494/C 494M, Type F (when used).
      vii. High-range, water-reducing and retarding admixture shall comply with ASTM C 494/C 494M Type G (when used).
      viii. Admixture manufacturer shall have ISO 9001 Quality Certification. To ensure compatibility all admixtures shall be from the same manufacturer.
   f. Type I/II cement complying with ASTM C-150 shall be used for all concrete. Cement source shall remain the same for the entire job.
   g. The water/cementitious materials ratios shall meet the requirements of Table 19.3.2.1 of ACI 318-14.
   h. Fly Ash - ASTM C618, Class F – 25% maximum cementitious content.
   i. Provide air entraining as recommended by Table 19.3.3.1 of ACI 318-14. Concrete that extends abovegrade and is exposed to freezing and thawing while moist shall be air-entrained.
   j. No aluminum conduit or product containing aluminum or any other material injurious to concrete shall be embedded in concrete.
2. Compressive strengths of concrete at 28 days shall be as follows
   a. Exterior Footings & Exterior Foundation Walls
      Strength — 4,000 psi
      Classification — F0, S0, W0, C0
   b. All Site Concrete with Reinforcement
      Strength — 5,000 psi
      Classification — F3, S0, W1, C2
   c. All Site Concrete without Reinforcement
      Strength — 4,500 psi
      Classification — F3, S0, W1, C2
3. Only one grade or type of concrete shall be poured on the site at any given time.
4. The contractor shall be responsible for the design, detailing, care, placement and removal of all formwork and shores.
   a. Supporting forms and shoring shall not be removed until structural members have acquired sufficient strength to safely support their own weight and any construction load to which they may be subjected. In no case, however, shall forms and shoring be removed in less than 24 hours after concrete placement.
5. Reinforcement shall have the following concrete cover:

a. Cast-in-place Concrete	Clear Cover
i. Cast against and permanently exposed to earth	3"
ii. Formed concrete exposed to earth or weather:	
#5 and smaller bars	1.1/2"
iii. Concrete not exposed to weather or in contact with ground:	
Slabs, Walls, Joists; #11 bars and smaller	3/4"
Beams, Columns: Primary Reinf., Ties, Stirrups, Spirals	1.1/2"

6. Detailing:
   a. Lap splice lengths shall be detailed to comply with the "Concrete Reinforcing Bar Lap Splice Schedule" on sheet S601. Splices may be made with mechanical splices capable of 125% tension capacity of the bar being spliced. Mechanical splices shall be the positive connecting type coupler and shall meet all International Building Code requirements and shall have a current ICC-ES report or IAPMO Certification. Use "Lenton" Standard Couplers (ICC ER-3967), "Bar-Lock" (ICC ESR-2495) or equal with internal protector. If mechanical splices are used, splices or couplers on adjacent bars shall be staggered a minimum of 24" apart along the longitudinal axis of the reinforcing bars.
   b. At joints, provide reinforcing dowels to match the member reinforcing, unless noted otherwise.
   c. At all discontinuous control or construction slab on grade joints, provide 2 - #4 x 48 inches.
   d. Corner Bars: Provide corner bars at intersecting wall corners using the same bar size and spacing as the horizontal wall reinforcing. Corner bars shall lap the horizontal reinforcing with the required lap splice length.
   e. All vertical reinforcing shall be doweled to footings, or to the structure below with the same size and spacing as the vertical reinforcing for the element above. Dowels extending into footings shall terminate with a 90-degree standard hook and shall extend to within 4" of the bottom of the footing. Footing dowels (#8 bars and smaller) with hooks need not extend more than 20" into footings.
7. Construction Joints, Control (Contraction) Joints:
   f. Construction joints in all horizontal and vertical construction joints including between top of footing and foundation walls shall be intentionally roughened to a full amplitude of approximately 1/4 . The laitance on the concrete (thin, flaky layer of hardened but weak hydrated cement) shall be mechanically removed from the surface after the concrete has achieved final set.
   g. Control joints shall be installed in slabs on grade so the length to width ratio of the slab is no more than 1.25:1. Control joints shall be completed as soon as final set is achieved and it is okay to operate the cutter on the slab. Final set is typically achieved within the first 4 to 6 hours of the slab pour. For early entry saw cutting, joints should be cut within the first 1 to 4 hours, depending on weather conditions and concrete hydration rate. Where saw cut joints cannot be cut along the entire projected length of the joint, a 90-degree hand grinder or other tool shall be used to complete the joint. Control joints may be installed by:
      i. Saw cut a depth of 1/4 the thickness of the slab (1 1/4" ± for early entry saws)
      ii. Tooled joints a depth of 1/4 the thickness of the slab
   h. For interior concrete slabs-on-grade that are to receive **no** floor covering, install construction or control joints in slabs on grade at a spacing not to exceed 30 times the slab thickness in any direction, unless noted otherwise. For interior concrete slabs-on-grade that are to receive floor coverings the contractor has the option to eliminate control joints. Construction joints shall not exceed a distance of 125'-0" o.c. in any direction.
8. Construction
   i. Use chairs or other support devices recommended by the CRSI to support and tie reinforcement bars prior to placing concrete. Reinforcing steel for slabs on grade shall be adequately supported. Support reinforcing steel of slabs on grade with precast concrete units. Lifting the reinforcing off the grade during placement of concrete is not permitted.
   j. Concrete to be mechanically consolidated during placement per ACI standards.
   k. Contractor shall coordinate placement of all openings, curbs, dowels, sleeves, conduits, bolts, inserts and other embedded items prior to concrete placement.
   l. All embeds, anchors and dowels shall be securely tied to formwork or to adjacent reinforcing prior to the placement of concrete.
   m. No pipes, ducts, sleeves, etc shall be placed in structural concrete unless specifically detailed or approved by the structural engineer. Penetrations through walls when approved shall be built into the wall prior to concrete placement. Penetrations will not be allowed in footings or grade beams unless detailed. Piping shall be routed around footings and grade beams and unless detailed. Footings shall be stepped to avoid piping.
   n. Reinforcing Bars shall not be welded. Do not substitute reinforcing bars for DBAs or HSAs.

MASONRY

1. Materials, unless noted otherwise:
   a. Concrete Masonry Units (CMU) ASTM C90: Lightweight Grade N (minimum net area unit strength of 2,000 psi). f'_m = 2,000 psi.
   b. Mortar Cement: Use Type "S"
   c. Masonry Grout ASTM C476: grout shall attain a minimum compressive strength of 2,500 psi at 28 days.
   d. Reinforcing Steel — ASTM 615 Grade 60 (Fy = 60 ksi)
   e. Deformed Bar Anchors (DBA) — ASTM A496
   f. Headed Stud Anchors (HSA) — ASTM A108
   g. Anchor Rods — ASTM F1554, Grade 36,with ASTM A563 heavy hex nuts and ASTM F436 hardened washers
2. Reinforcement shall have the following cover:
3. Typical reinforcement shall have a minimum coverage of one bar diameter over all the bars, but not less than 3/4". When masonry is exposed to soil, minimum coverage shall be 1.5".
   Detailing Requirement
   a. Lap all masonry reinforcing per "Masonry Reinforcing Lap Schedule" on sheet S601. Joint reinforcement shall lap a minimum of 6 inches.
   b. All vertical reinforcing shall be doweled to the foundation wall, footing (structure below) and to the structure below with the same size dowel, spacing (and in the same core) as the vertical wall reinforcing above.
   c. Corner Bars: Provide corner bars at intersecting wall corners using the same bar size and spacing as the horizontal wall reinforcing. Corner bars shall lap the horizontal reinforcing with the required lap splice length.
   d. Wall Openings: For unscheduled openings wider than 24 inches, provide reinforcing on all sides per detail 7/S501. Also, for all scheduled openings, provide horizontal bar at bottom of opening per detail 7/S501. Vertical bars shall extend from floor level below to the floor, or roof level above. Horizontal bars for all openings shall extend a minimum of 48 bar diameters beyond the corners of the opening. Where a 48 bar diameter extension is not possible, extend bars as far beyond the opening as possible and terminate the bar(s) with a 90 degree standard ACI hook.
   e. Horizontal wall reinforcing shall be continuous through joining concrete walls, masonry walls, columns, and pilasters. Provide a key between the wall and the column or pilaster. Horizontal wall reinforcing shall be placed inside the column vertical reinforcing.
   f. Horizontal wall reinforcing shall terminate with a hook at edge of openings and at each side of control joints except at floor and roof levels, lintels, beams and at top of parapets. See detail 9/S501.
   g. All masonry column ties shall terminate with 135 degree hooks plus a 6 bar diameter extension (4" minimum).
4. Construction Requirements:
   a. Masonry coursing shall be coordinated with the architectural drawings.
   b. All units shall be laid with full mortar beds on the face shells. All head joints shall be filled solidly with mortar for a distance in from the face of the units not less than the thickness of the longitudinal face shells. Cells which are to be grouted shall have full head joints.
   c. Masonry walls, beams and columns shall be constructed with running bond, unless noted otherwise.
   d. All cells containing reinforcement, embeds, anchor bolts, etc. shall be filled solid with grout. Grout shall be placed by mechanical vibration during placing and re-vibrated after excess moisture has been absorbed but before workability is lost. Rodding of grout is not allowed.
   e. Where walls are not grouted solid, each grout pour shall terminate flush with the top of the uppermost unit except at cells with vertical reinforcing where the grout shall be 1-1/2 inches below top of unit to provide construction key.
   f. Grout pours shall be limited to 4'-0" unless written approval is obtained from the engineer of record.
   g. All walls below grade shall be grouted solid.
   h. Vertical cells to be filled with grout shall have vertical alignment sufficient to maintain a clear, unobstructed vertical cell measuring not less than 2 inches by 3 inches. All steel reinforcement shall be secured against displacement prior to grouting by wire positioners or other suitable devices at intervals not exceeding 200 bar diameters or 10 feet maximum, or at bar splice locations. Vertical reinforcing shall be located at the center of the wall unless noted otherwise
   i. Reinforcing Bars shall not be welded. Do not substitute reinforcing bars for DBAs or HSAs.
   j. Control Joints: Spacing shall not exceed 30'-0". See architectural drawings for locations.
   k. Grout all beam and joist pockets solid after installation of beams and joists.
   l. Embed channels and plates shall be placed so as to create a flush surface with the face of the wall.
   m. Anchor bolts and headed stud anchors shall be set in a grouted cell. Anchor bolts and headed stud anchors shall have 1" grout surrounding the shank at its penetration. Grout shall be flush with the face or top of the masonry.

WOOD

1. Materials:
   a. Fasteners
      i. Nails used for all framing anchors, post caps, hold downs, column bases, etc. shall be standard common with the following properties:

Nail Size	Shank Diameter	Min. Penetration into Support Member
8d	0.131"	1.50"
10d	0.148"	1.63"
16d	0.162"	1.75"

      ii. Fastener sizes other than those listed above are not permitted without prior written approval from the engineer.
      iii. All fasteners, including nails, for preservative-treated and fire retardant-treated wood shall be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.
   b. Engineered Lumber
      i. Glu-lam beams shall be Douglas-fir combination number 24F-V4 except cantilevered and continuous beams shall be combination number 24F-V8. Glu-lam columns shall be DF combination symbol #3 for columns.
2. All wood in contact with concrete, masonry or soil shall be pressure treated or be redwood.
3. All framing anchors, post caps, hold downs, column bases, etc. shall be provided by Simpson Strong-Tie, USP Structural Connectors or approved equal. If Simpson isn't used, the contractor shall provide a comparison list. All connectors shall be installed per manufacturer's instructions, with the specified number and type of fasteners, unless noted otherwise. In the event that multiple fastener combinations are allowed by the manufacturer to achieve varying capacities, the most stringent alternative shall be used, unless noted otherwise in the plans or details.

PRE-FABRICATED METAL PLATE WOOD TRUSSES

1. The Pre-fabricated metal plate wood trusses shall be designed, signed, and sealed by a Professional Engineer registered in the same state as the project location. They shall be designed to support the concentrated and other distributed loads as shown on the framing plans in addition to the following uniform loads:
   a. Dead Load (Top Chord)= 10 psf
   b. Dead Load (Bottom Chord)= 10 psf
   c. Snow Load (Top Chord)= 25 psf
   45 psf Total Load
   The wood truss designer shall consider unbalanced snow loading for all sloped roofs exceeding 2.38 degrees (1/2 on 12) or less than 70 degrees.
   Correlate the design with all mechanical equipment, fire sprinkling systems and hanging walls supported by the trusses. Provide extra trusses where required.
2. Design all wood trusses and bearing attachments for wind uplift. Assume a dead load of 8 psf to resist uplift.
3. No stress increase is allowed for snow loads.
4. Refer to architectural drawings for truss profile. Detailing and shop drawing production for prefab metal plate wood trusses will require information (including dimensions) contained in the architectural, structural and/or other consultants' drawings. The structural drawings shall be used in conjunction with the architectural and other consultant's drawings. Some dimensions and elements such as elevation and slopes are not shown in the structural drawings. All dimensions shown on structural drawings shall be verified by contractor with architectural drawings. Coordinate roof slope with architectural roof plan, sections and elevations.
5. All truss-to-truss connections shall be designed and provided by the truss manufacturer.
6. Design, handling, erection, and permanent bracing of metal plate connected wood trusses shall be in accordance with ANSI/TPI-1, National Design Standard for Metal Plated Connected Wood Truss Construction.
7. Steel Connector Plates: All steel gusset plates shall be galvanized and shall be approved by the "Research Committee for the International Code Council". Submit a copy of the ICC Report for the connector plate used. Values established by this committee must be indicated on the shop drawings.
   a. Stress increases for steel connector plate values for duration of load are not allowed.
   b. The minimum size for any connector shall be 8 square inches (not required at truss blocking).
   c. All steel gusset plates shall be located on the joint as the stresses require and shall provide a minimum bite of 2.5" length on all tension members (not required at truss blocking).
   d. All steel plate dimensions shall be increased by 10% above that required by analysis.
   e. Plates shall be pressed or rolled into member to obtain full penetration without crushing the outer surfaces of wood.
8. No wane, knots, skips, or other defects shall occur in the plated contact area or scarfed area of web members. Plates shall be centered with one required each side of wood truss
9. The trusses shall be handled and stored in a manner to prevent moisture from being absorbed by the wood.
10. Requirements for truss stability and erection shall comply with the Truss Plate Institute publications entitled "Commentary and Recommendations for Bracing Wood Trusses" and "Commentary and Recommendations for Handling and Erecting Wood Trusses." The contractor shall have copies of these publications on site and shall be familiar with their contents.
11. Shop Drawings: Complete calculations and shop drawings indicating all member forces, stresses, duration factors, lumber grades, dimensions, truss to truss connections, steel truss plate sizes and locations shall be submitted and reviewed by the engineer before fabrication. Each connector shall be dimensioned on the shop drawings as to its exact location at the joint.

COLORADO REGISTERED CHRISTIAN T. HALL 37436 PROFESSIONAL ENGINEER
2-22-2019

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925 south west temple
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project:
Grand Juction Park Restroom Medium

project#: 190062
date: Feb. 22, 2019

revisions :

title:
GENERAL STRUCTURAL NOTES

sheet:
S001

DESIGN DEVELOPMENT

REQUIREMENTS FOR SPECIAL INSPECTION, MATERIALS TESTING AND STRUCTURAL OBSERVATION

LEGEND OF MARKS AND ABBREVIATIONS

AB	ANCHOR BOLT(S)	k	KIP(S) = 1000 POUNDS
ABV	ABOVE	KLF	KIPS PER LINEAL FOOT
ALT	ALTERNATE	KSF	KIPS PER SQUARE FOOT
APPROX	APPROXIMATE		
ARCH	ARCHITECT(URAL)	LBS	POUNDS
		LF	LINEAL FOOT
BLDG	BUILDING	LVL	LAMINATED VENEER LUMBER
BLW	BELOW		
BM	BEAM	MAS	MASONRY
B.N.	BOUNDARY NAILING	MAX	MAXIMUM
BOT	BOTTOM	MCJ	MASONRY CONTROL JOINT
BRG	BEARING	MC-x	MASONRY COLUMN MARK
BTWN	BETWEEN	MECH	MECHANICAL
		MFR	MANUFACTURER
CC.	CENTER-TO CENTER	MIN	MINIMUM
C.J.	CONST/CONTROL JOINT	MISC	MISCELLANEOUS
CMU	CONCRETE MASONRY UNIT	ML-x	MASONRY LINTEL
COL	COLUMN	MP-x	MASONRY PIER
CONC	CONCRETE	MW-x	MASONRY WALL
CONST	CONSTRUCTION		
CTR	CENTER	NIC	NOT IN CONTRACT
CW-x	CONCRETE WALL	NTS	NOT TO SCALE
DB	DECK BEARING	O.C.	ON CENTER
DBA	DEFORMED BAR ANCHOR	O.F.	OUTSIDE FACE
DBE	DECK BEARING ELEVATION	OPNG	OPENING
DBL	DOUBLE	OPP	OPPOSITE
DET	DETAIL		
DIA	DIAMETER	PAF	POWDER-ACTUATED FASTENER
DIM	DIMENSION	PCF	POUNDS PER CUBIC FOOT
DN	DOWN	PLF	POUNDS PER LINEAL FOOT
DWG	DRAWING	PNL	PANEL
DWL	DOWEL	PSF	POUNDS PER SQUARE FOOT
		PSI	POUNDS PER SQUARE INCH
(E)	EXISTING	PT	POINT
EA	EACH		
E.N.	EDGE NAILING	REINF	REINFORCING
E.F.	EACH FACE	REQD	REQUIRED
E.J.	EXPANSION JOINT	R.D.	ROOF DRAIN
ELEC	ELECTRICAL	RTU	ROOF TOP UNITS
ELEV	ELEVATION		
EQUIP	EQUIPMENT	SHT	SHEET
EQ.	EQUAL	SI	SPECIAL INSPECTION
E.W.	EACH WAY	SIM	SIMILAR
EXST	EXISTING	SMU	SUSPENDED MECHANICAL UNITS
EXP	EXPANSION	SOG	SLAB-ON-GRADE
EXT	EXTERIOR	SQ	SQUARE
		STAG	STAGGERED
FC-x	CONTINUOUS FOOTING MARK	STD	STANDARD
F.D.	FLOOR DRAIN	STL	STEEL
FDN	FOUNDATION	STR	STRUCTURAL
F.F.	FINISHED FLOOR	STS	SELF TAPPING SCREWS
F.N.	FIELD NAILING		
FR-x	RECTANGULAR FOOTING	T&B	TOP AND BOTTOM
FS-x	SQUARE FOOTING MARK	TEMP	TEMPERATURE
FT	FOOT	THDS	THREADS
FTG	FOOTING	T.O.	TOP OF
FTS-x	THICKEN SLAB MARK	TOC	TOP OF CONCRETE
		TOD	TOP OF DECK
GA	GAUGE	TOF	TOP OF FOOTING
GALV	GALVANIZED	TOW	TOP OF WALL
GLB	GLU-LAM BEAM	TYP	TYPICAL
GSN	GENERAL STRUCTURAL NOTES		
		UNO	UNLESS NOTED OTHERWISE
HORIZ	HORIZONTAL		
HSA	HEADED STUD ANCHOR	VERT	VERTICAL
HT	HEIGHT		
		W/	WITH
		WT	WALL THICKNESS
ICC	INTERNATIONAL CODE COUNCIL	WWF	WELDED WIRE FABRIC
IBC	INTERNATIONAL BUILDING CODE	WWM	WELDED WIRE MESH
I.F.	INSIDE FACE		
IN.	INCH		
INT	INTERIOR		
JT	JOINT		
JST	JOIST		

STATEMENT OF SPECIAL INSPECTION AND QUALITY ASSURANCE

Special inspection and quality assurance, as required by section 1704 and 1705 of the 2015 IBC, shall be provided by an independent agency employed by the owner unless waived by the building official.	
The names and credentials of the Special Inspectors to be used shall be submitted to the Building Official for approval.	
Responsibilities of the Special Inspector	
	Special Inspector shall review all work listed in the special inspection schedules herein for conformance with the approved construction plans, specifications and 2015 IBC.
	All testing and inspection reports shall be sent within 24 hours of the test to the architect, engineer, building official and contractor for review. All items not in compliance shall be brought to the immediate attention of the contractor for correction, and if uncorrected, to the architect, engineer and building official.
	Once corrections have been made by the contractor, the special inspector shall submit a final signed report to the building official stating that the work requiring special inspection was, to the best of the special inspector's knowledge, in conformance with the approved construction plans, specifications and 2015 IBC.
Responsibilities of the Contractor	
	The contractor shall submit a written statement of responsibility to the owner and the building official prior to the commencement of work in accordance with 2015 IBC section 1704.4. This statement shall indicate that the contractor will coordinate and cooperate with the required inspections contained herein.
	The contractor shall notify the designated special inspector that work is ready for inspection at least 24 hours before said inspection is required.
	All work requiring special inspection shall remain open and accessible until it has been observed by the special inspector and deemed acceptable through inspection report.
	Special inspection during fabrication is not required if the fabricator is registered and approved to perform such work without special inspection.

SOILS CONSTRUCTION INSPECTIONS

Soils (2015 IBC Section 1705.6)			
ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Site Preparation	-	X	Verify that the site has been prepared in accordance with the soils report prior to placement of prepared fill.
Fill Material	X	-	Verify that the material being used, the maximum lift thickness and the in-place dry density of the compacted fill material comply with the soils report during placement and compaction of the fill material during placement and compaction.
Continuous Footing Backfill: at least one test for each 40 linear feet or less of wall length, but no fewer than 2 tests.	-	X	At each compacted backfill layer.
Spot Footing Backfill: Minimum of one compaction test for each lift for each spot footing.	-	X	At each compacted backfill layer.

WOOD CONSTRUCTION INSPECTIONS

ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Prefabricated metal plate wood trusses (2015 IBC Sections 1705.5, 1705.11.1, and 1705.12.2)			
Shop fabrication of trusses	-	X	Verify that detailed fabrication and quality control procedures exist that provide a basis of inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards.

STRUCTURAL OBSERVATION PROGRAM

If structural observations are required, they shall be done by the Engineer of Record or an approved subordinate at the stages of construction listed in the Construction Notification Phases section of these notes. At the conclusion of the project, the designated structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies that to the best of the structural observer's knowledge have not been resolved (See IBC 2015 1704.6).

STRUCTURAL OBSERVATION PROGRAM REQUIRED BY CODE:	YES	NO
		X

CONSTRUCTION MILESTONE SCHEDULE

CONTRACTOR TO NOTIFY ENGINEER AT THE FOLLOWING CONSTRUCTION PHASES:	
CONCRETE	
Footings, stem walls and piers	Prior to pouring concrete
MASONRY	
Masonry walls	Prior to pouring grout

DEFERRED SUBMITTALS

For the purpose of this section, deferred submittals are defined as per section 107.3.4.1 of the IBC 2015. Submittal documents for deferred submittal items shall be submitted to the engineer, architect and building official for their review for general conformance with the design of the building.

DEFERRED STRUCTURAL SUBMITTALS FOR THIS PROJECT ARE:

Prefabricated metal plate wood trusses

2-22-2019

METHOD STUDIO INC.
925 south west temple
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project:

Grand Junction Park Restroom Medium

project#: 190062
date: Feb. 22, 2019

revisions :

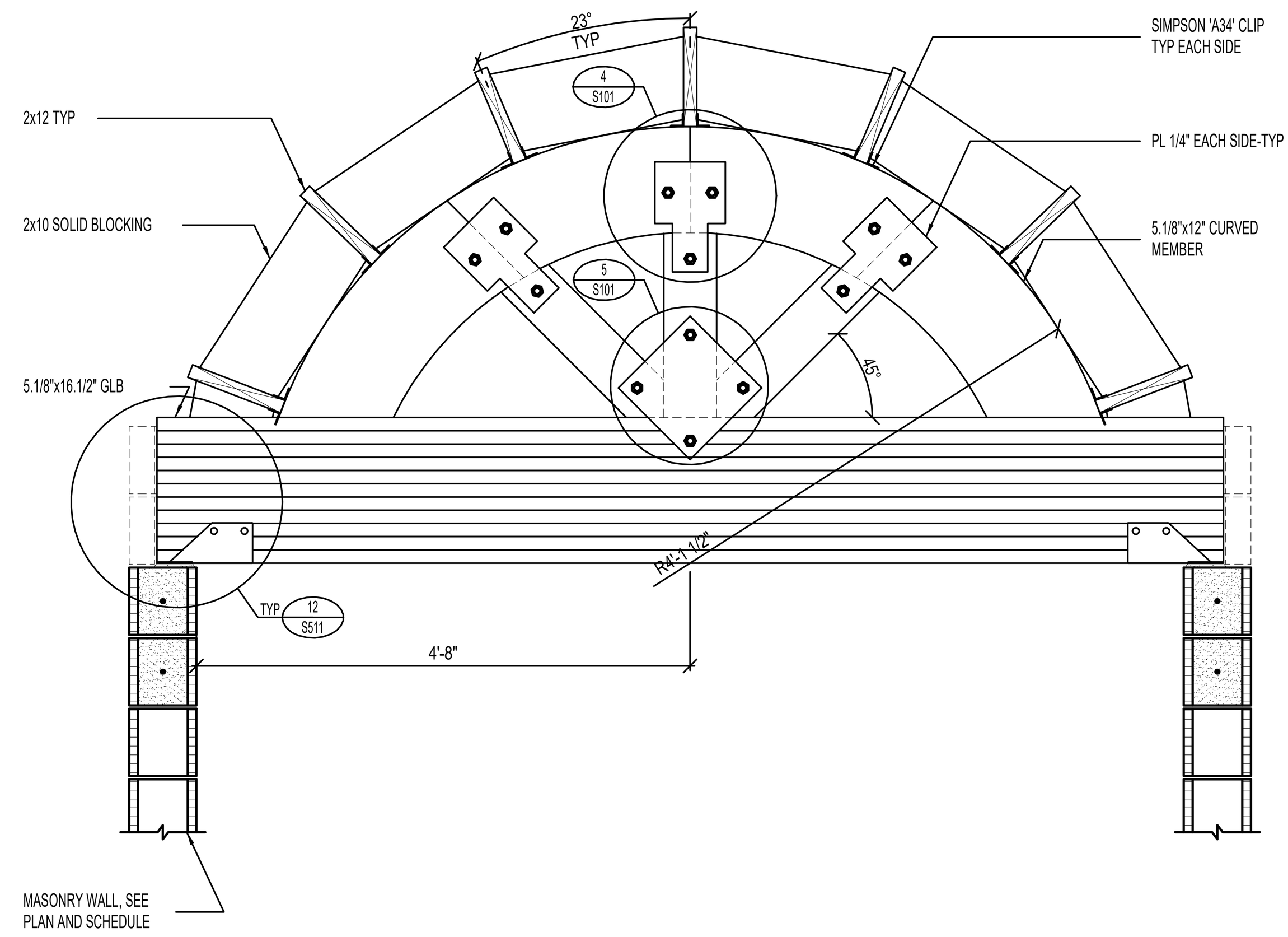
title:

SPECIAL INSPECTIONS

sheet:

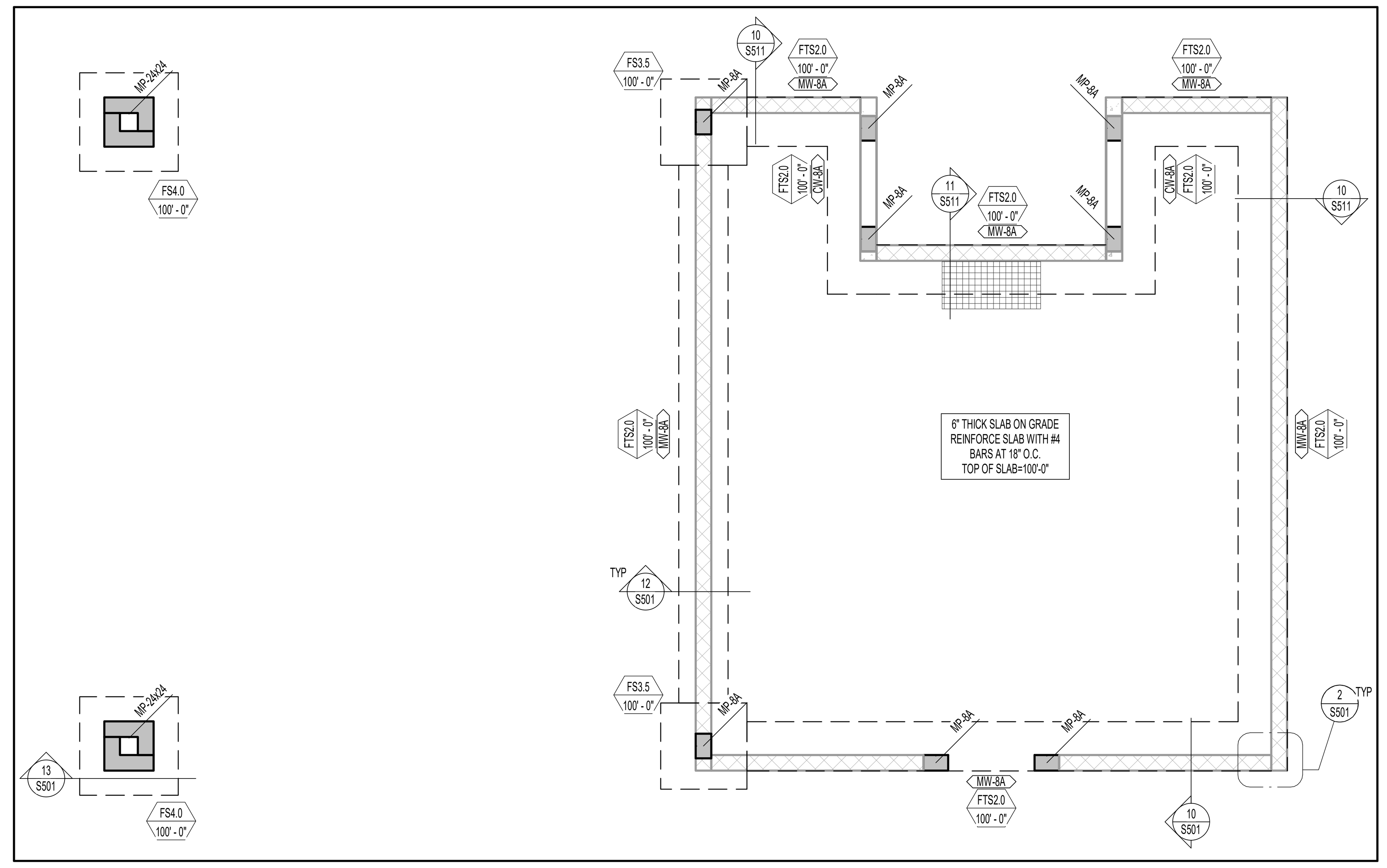
S002

DESIGN DEVELOPMENT



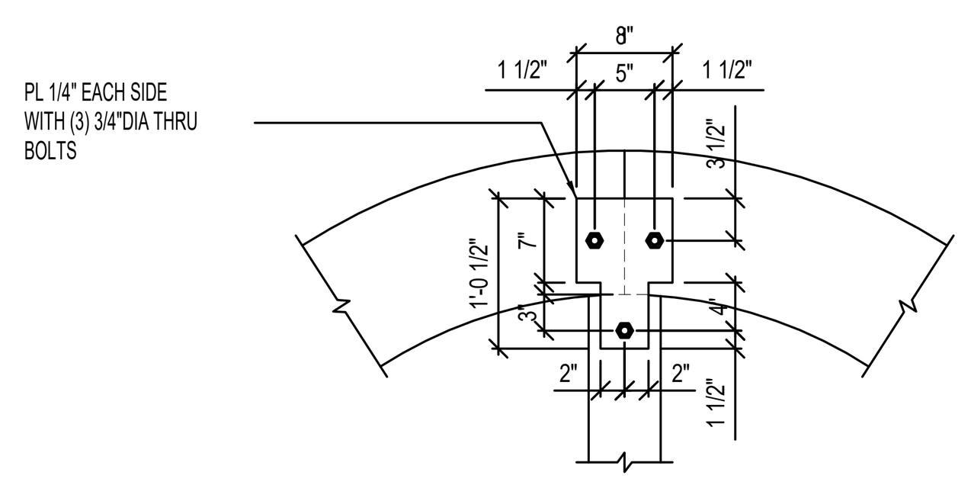
3 ARCH TRUSS ELEVATION

NO SCALE



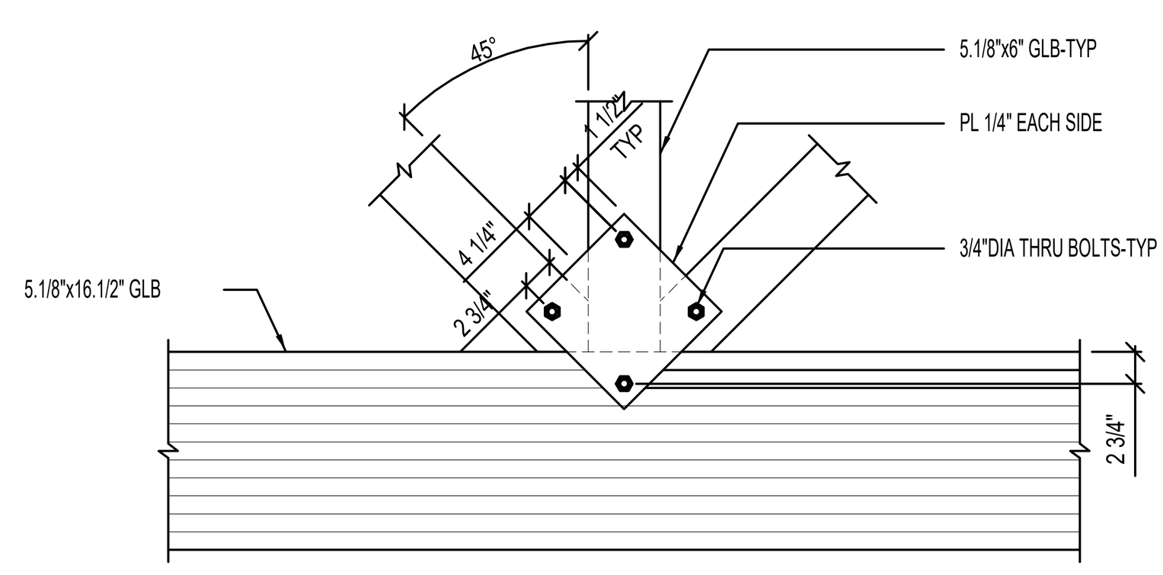
1 FOOTING AND FOUNDATION PLAN

1/4" = 1'-0"



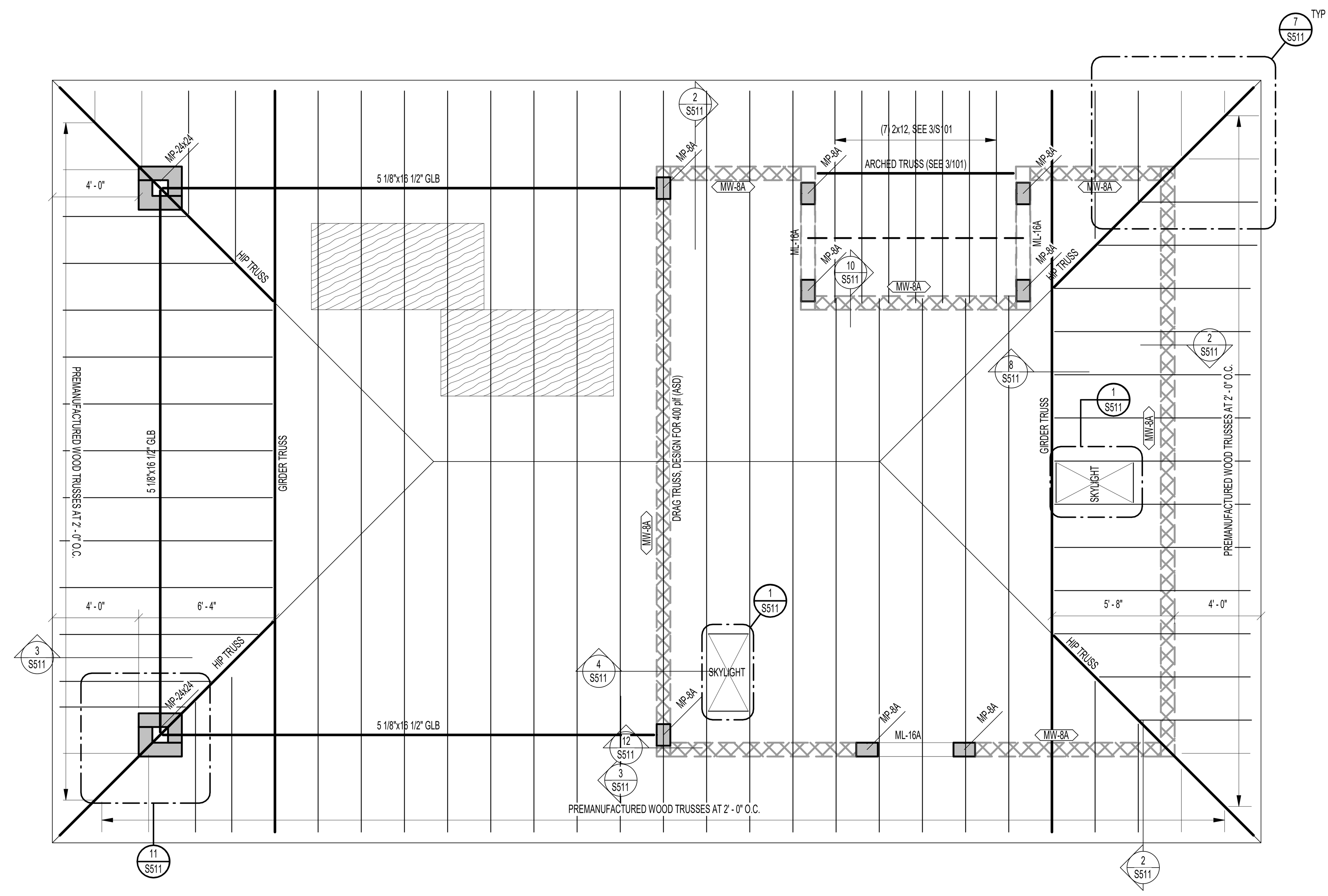
4 TRUSS CONNECTION DETAIL

NO SCALE



5 CONNECTION DETAIL

NO SCALE



2 ROOF FRAMING PLAN

1/4" = 1'-0"

MARKS AND SYMBOLS LEGEND

SECTION MARK / SHEET NUMBER	
FOOTING DESIGNATION / TOP OF FOOTING ELEVATION	
	INDICATES MASONRY WALL. DASHED WALLS STOP AT DECK
	DEPRESS FOUNDATION WALL AND POUR SLAB OVER. SEE DETAIL
	INDICATES DEPRESSED SLAB, SEE ARCHITECTURAL PLANS.
MW-x	INDICATES MASONRY WALL TYPE, SEE SCHEDULE ON SHEET S601
FCx.x	INDICATES CONTINUOUS FOOTING. SEE SCHEDULE ON SHEET S601
FSx.x	INDICATES SPOT FOOTING. SEE SCHEDULE ON SHEET S601
FTSx.x	INDICATES THICKENED SLAB FOOTING. SEE SCHEDULE ON SHEET S601
MP-x	INDICATES MASONRY PIER TYPE. SEE SCHEDULE ON SHEET S601

FOOTING AND FOUNDATION PLAN NOTES

1. COORDINATE LOCATION OF DEPRESSED SLABS, SLOPED SLABS, AND FLOOR DRAINS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
2. SEE ARCHITECTURAL AND CIVIL DRAWINGS FOR EXTERIOR CONCRETE WORK AT DOORS, SIDEWALKS, ETC.
3. SEE ARCHITECTURAL DRAWINGS FOR CONTROL JOINT LOCATIONS.
4. SEE "EARTHWORK" NOTES ON SHEET S001 FOR MINIMUM FILL REQUIRED BENEATH FOOTINGS.
5. ALL SPOT FOOTINGS SHALL BE CENTERED UNDER COLUMNS (UNO).
6. SEE DETAILS 1/S501 AND 6/S501 FOR CONDITION WHERE BURIED PIPES RUN PARALLEL AND PERPENDICULAR TO FOOTINGS.
7. SEE DETAIL 3/S501 FOR TYPICAL CONTROL/CONSTRUCTION JOINTS IN CONCRETE SLAB ON GRADE.
8. SEE DETAIL 5/S501 FOR SLAB REINFORCING WHERE CONTROL JOINTS ARE DISCONTINUOUS.
9. SEE DETAIL 7/S501 FOR ADDITIONAL REINFORCING AT MISCELLANEOUS OPENINGS IN MASONRY WALLS.
10. SEE DETAIL 8/S501 FOR CONDITION AT RECESSES IN MASONRY WALLS.
11. SEE DETAIL 9/S501 FOR TERMINATION OF HORIZONTAL REINFORCING IN MASONRY WALLS.
12. INTERIOR WALLS NOT SHOWN, REINFORCE AS MW-8A. DRILL AND EPOXY VERTICAL REINFORCEMENT 3.1/2" INTO SLAB.

MARKS AND SYMBOLS LEGEND

SECTION MARK / SHEET NUMBER	
	INDICATES MASONRY WALL. DASHED WALLS STOP AT DECK
MW-x	INDICATES MASONRY WALL TYPE, SEE SCHEDULE ON SHEET S601
	INDICATES PLYWOOD ROOF SHEATHING, SEE SCHEDULE ON SHEET
MP-x	INDICATES MASONRY PIER TYPE. SEE SCHEDULE ON SHEET S601
ML-x	INDICATES MASONRY LINTEL TYPE. SEE SCHEDULE ON SHEET S601

ROOF FRAMING PLAN NOTES

1. VERIFY ALL ROOF OPENINGS FOR MECHANICAL SHAFTS, DRAINS, ETC. WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
2. ALL ROOF OPENINGS GREATER THAN, OR EQUAL TO, 12" x 12" SHALL BE FRAMED AS INDICATED IN DETAIL 1/S511.
3. VERIFY SIZE, WEIGHT, AND LOCATION OF ALL ROOF TOP MECHANICAL UNITS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS. COORDINATE OPENINGS WITH MECHANICAL, ELECTRICAL, AND GENERAL CONTRACTORS.
4. LOCATE MISCELLANEOUS MECHANICAL OPENINGS BETWEEN JOISTS, NOT UNDERNEATH THEM.
5. SEE DETAIL 7/S501 FOR ADDITIONAL REINFORCING AT MISCELLANEOUS OPENINGS IN MASONRY WALLS.
6. SEE DETAIL 8/S501 FOR CONDITION AT RECESSES IN MASONRY WALLS.
7. SEE DETAIL 9/S501 FOR TERMINATION OF HORIZONTAL REINFORCING IN MASONRY WALLS.
8. INTERIOR WALLS NOT SHOWN, REINFORCE AS MW-8A. SEE DETAILS 5/S511 AND 6/S511 FOR TOP OF WALL BRACING.

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Restroom Medium

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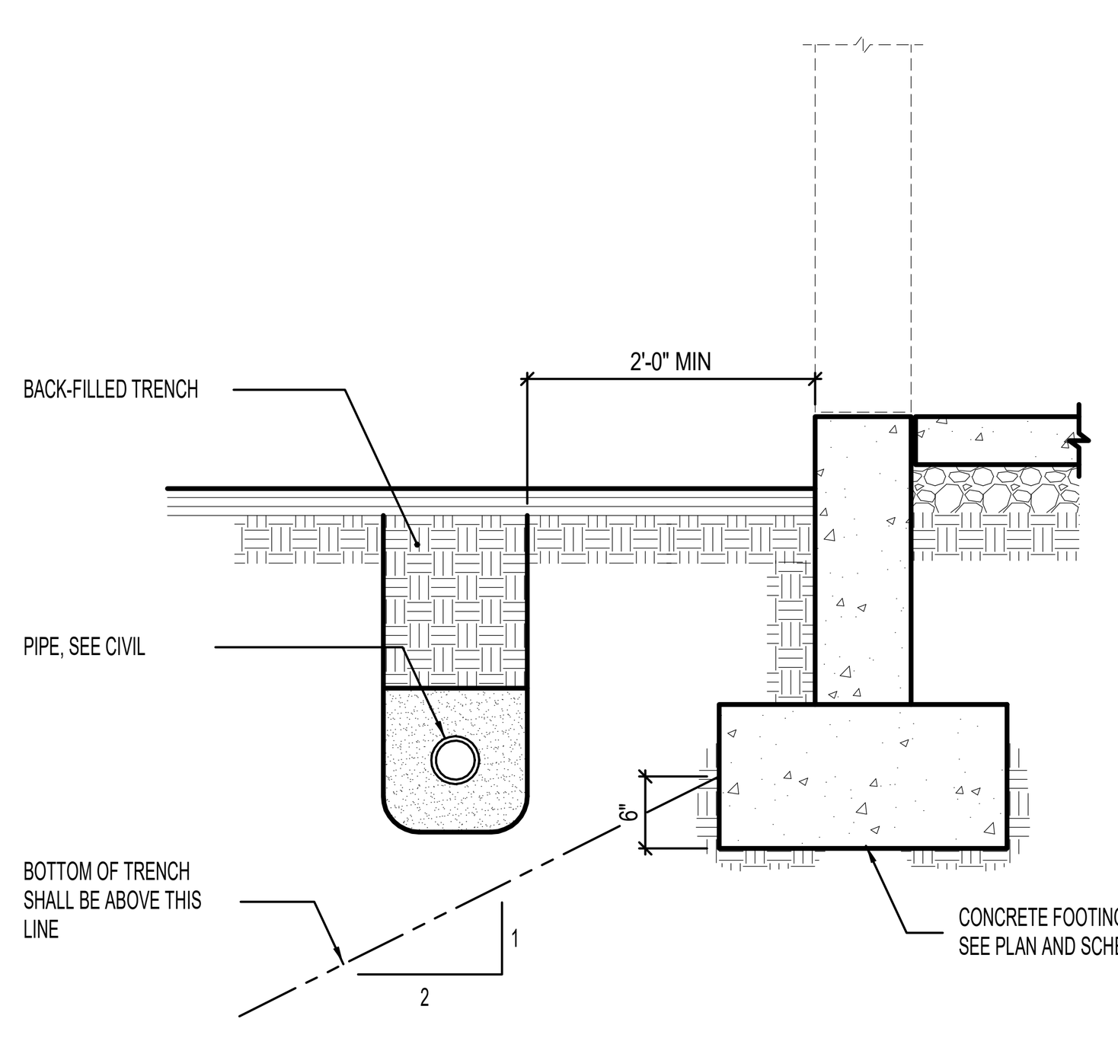
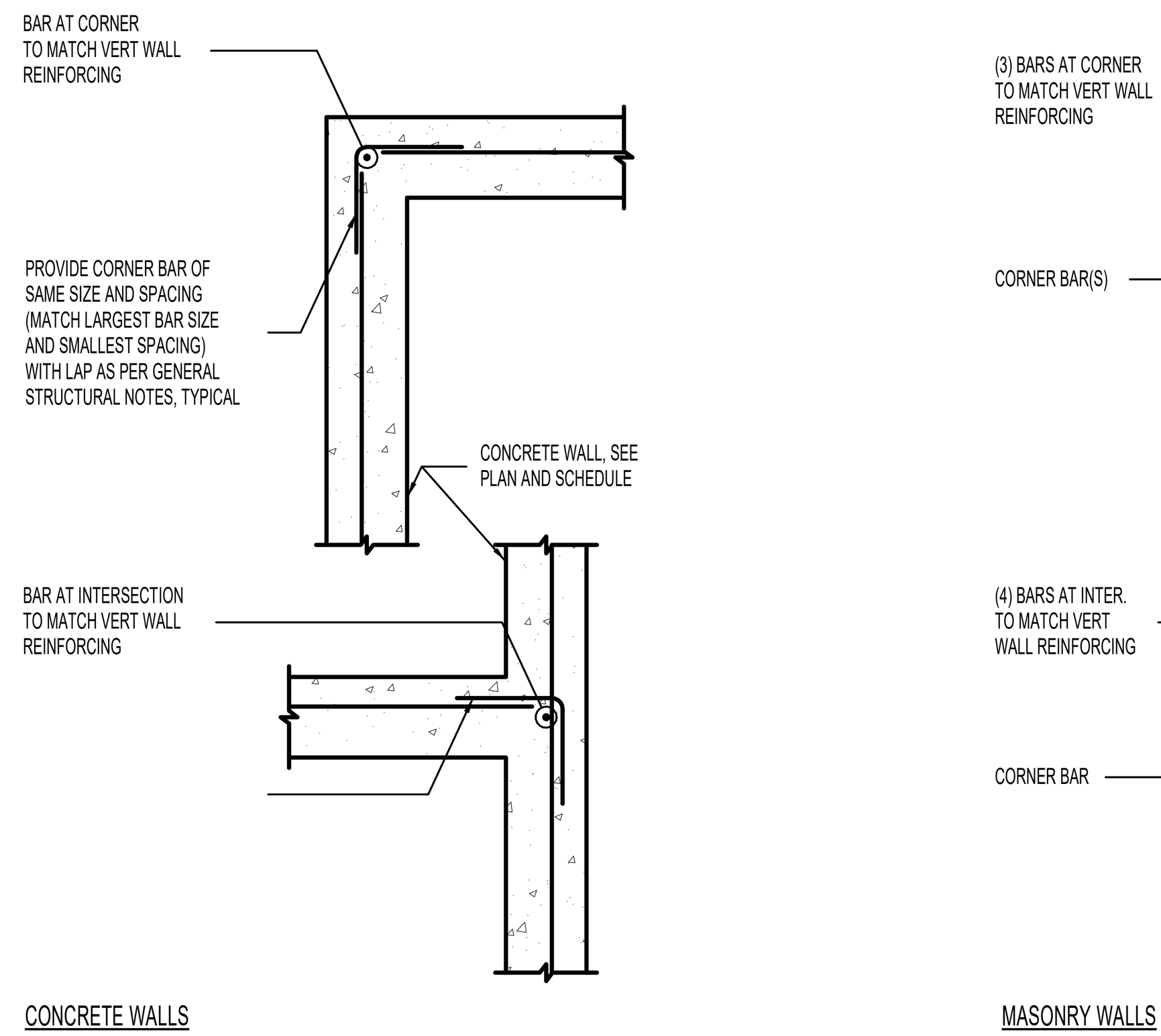
S101

DESIGN DEVELOPMENT



1 CONDITION AT PIPE PARALLEL TO CONCRETE FOOTING
NO SCALE



2 TYPICAL CORNER WALL REINFORCING [PLAN VIEW]
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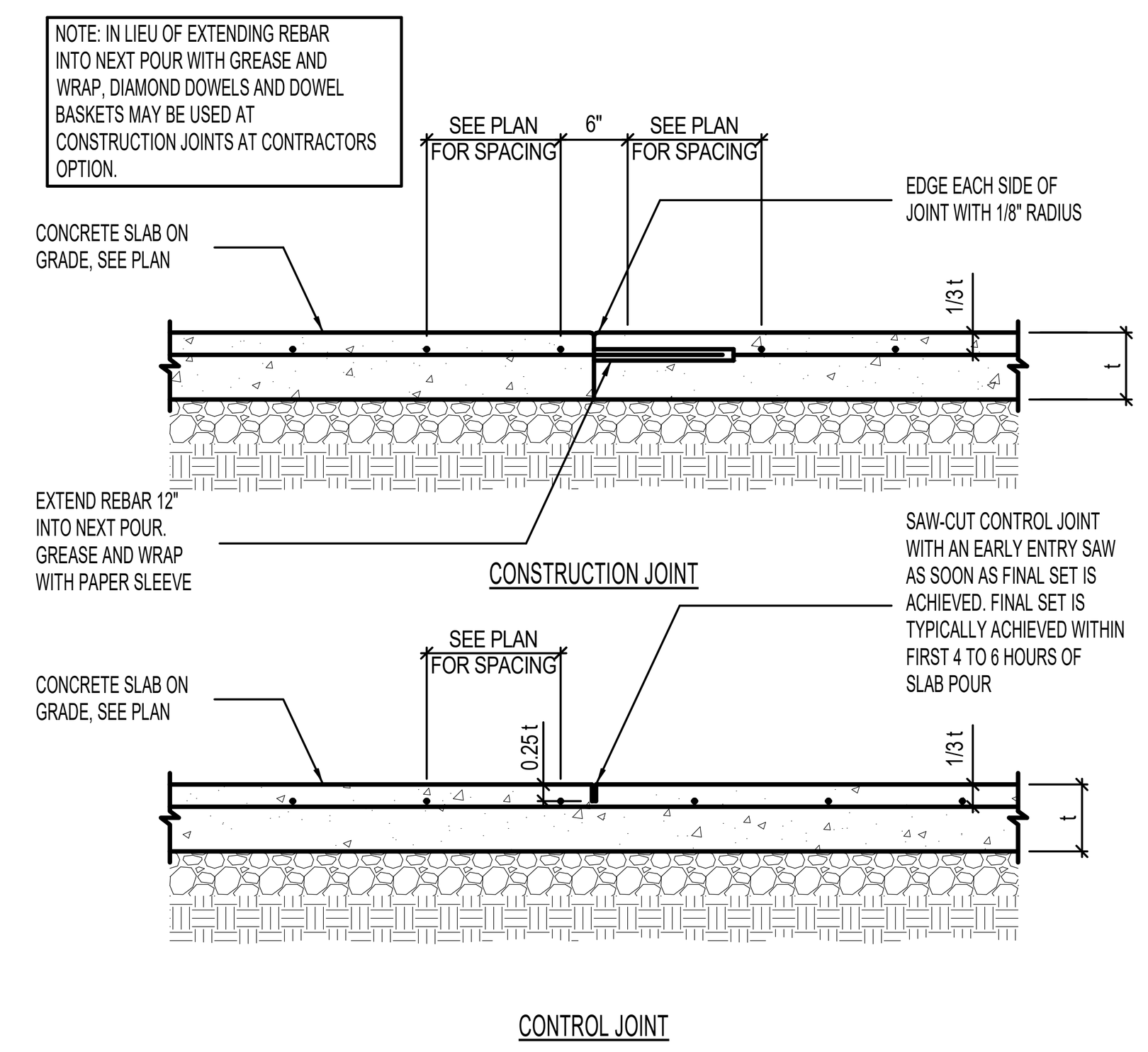

3 TYPICAL SLAB ON GRADE JOINT DETAILS
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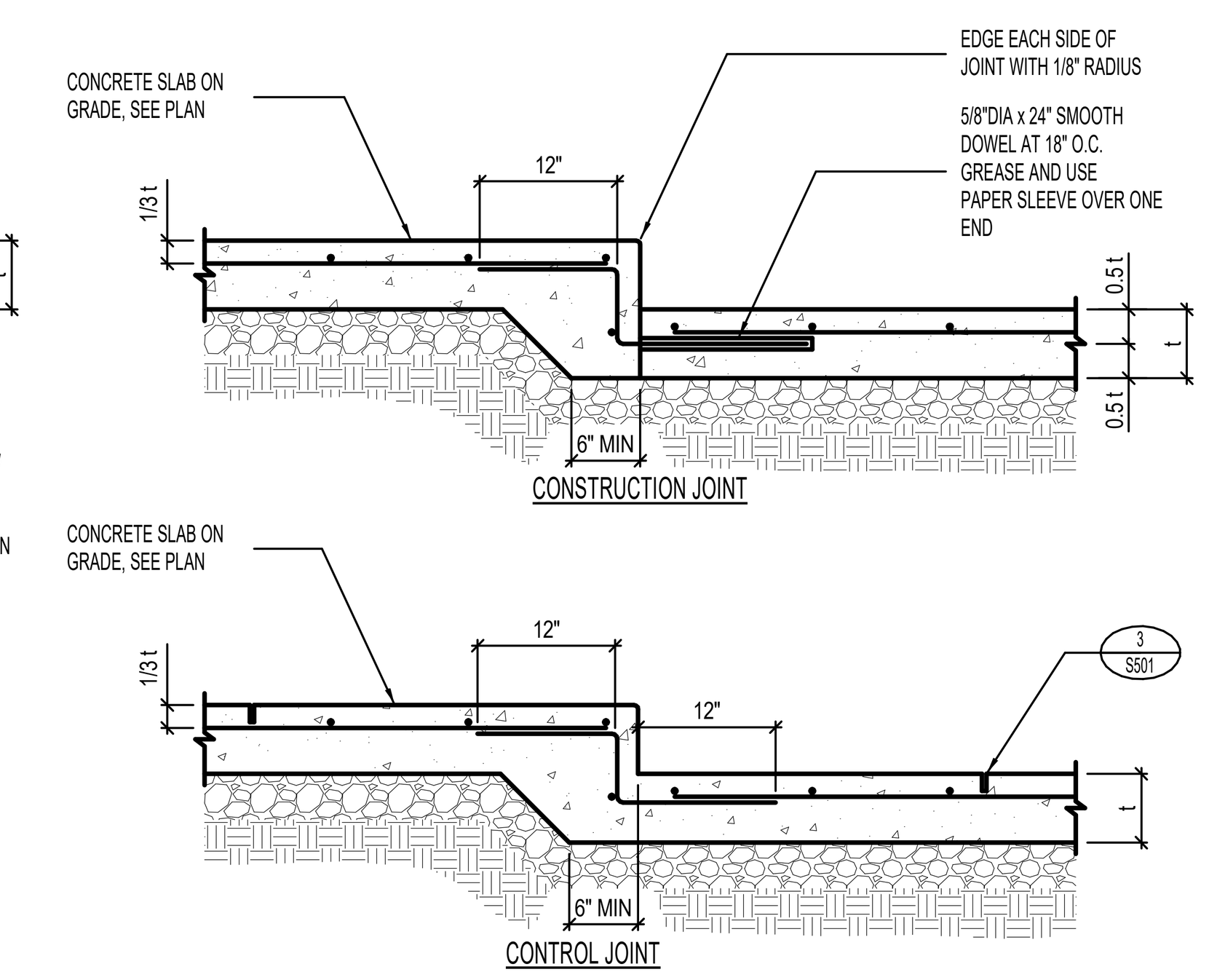

4 JOINT DETAILS AT SLAB DEPRESSIONS
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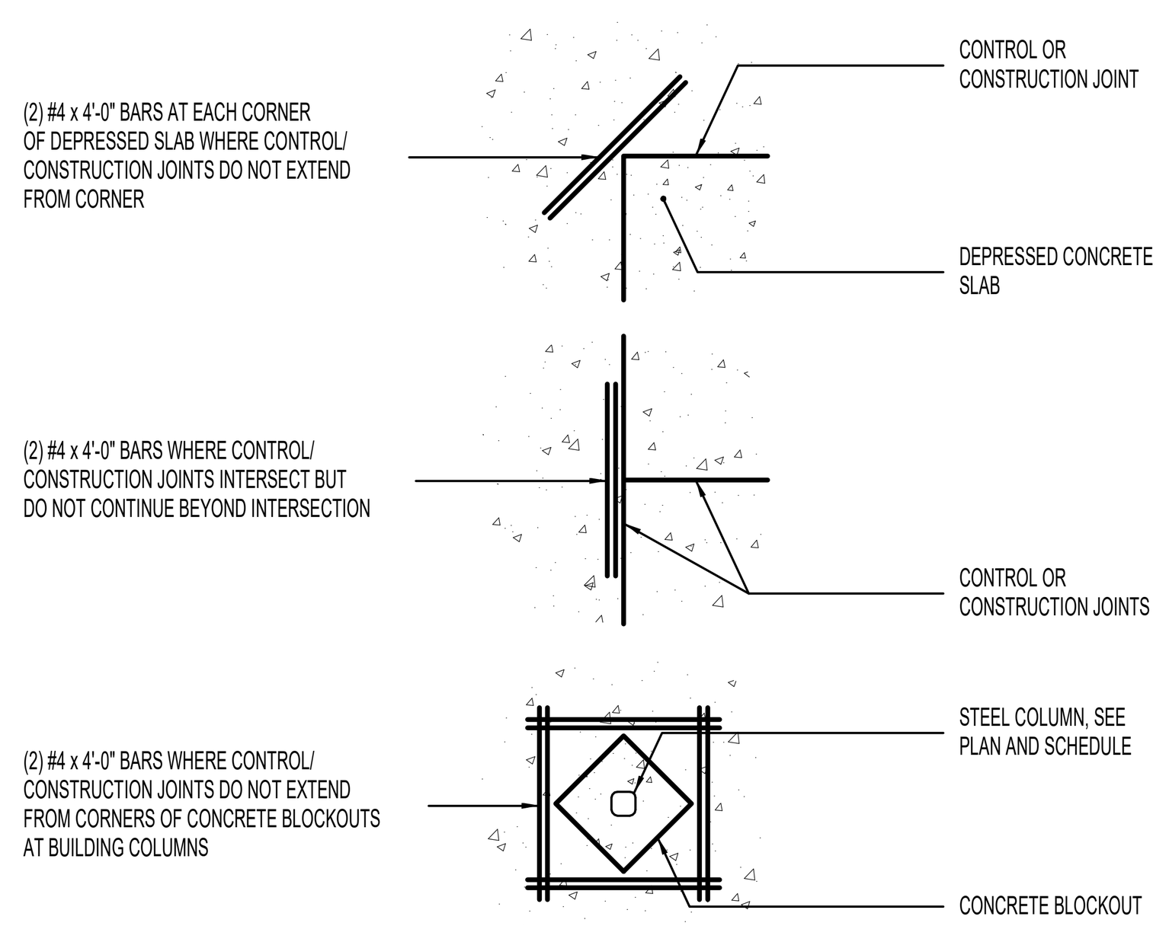

5 LOCATIONS REQUIRING ADDITIONAL SLAB REINFORCING [PLAN VIEW]
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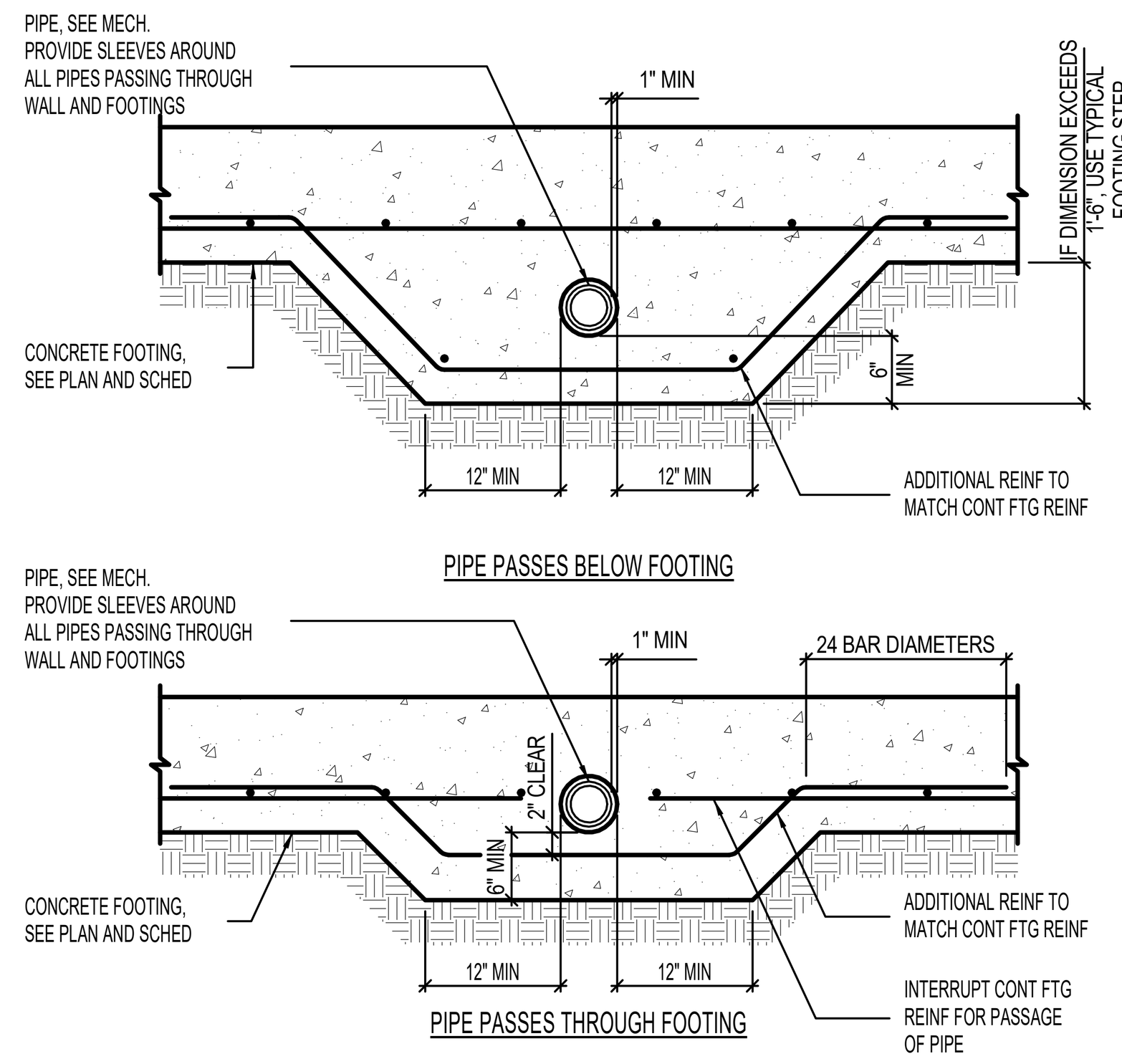
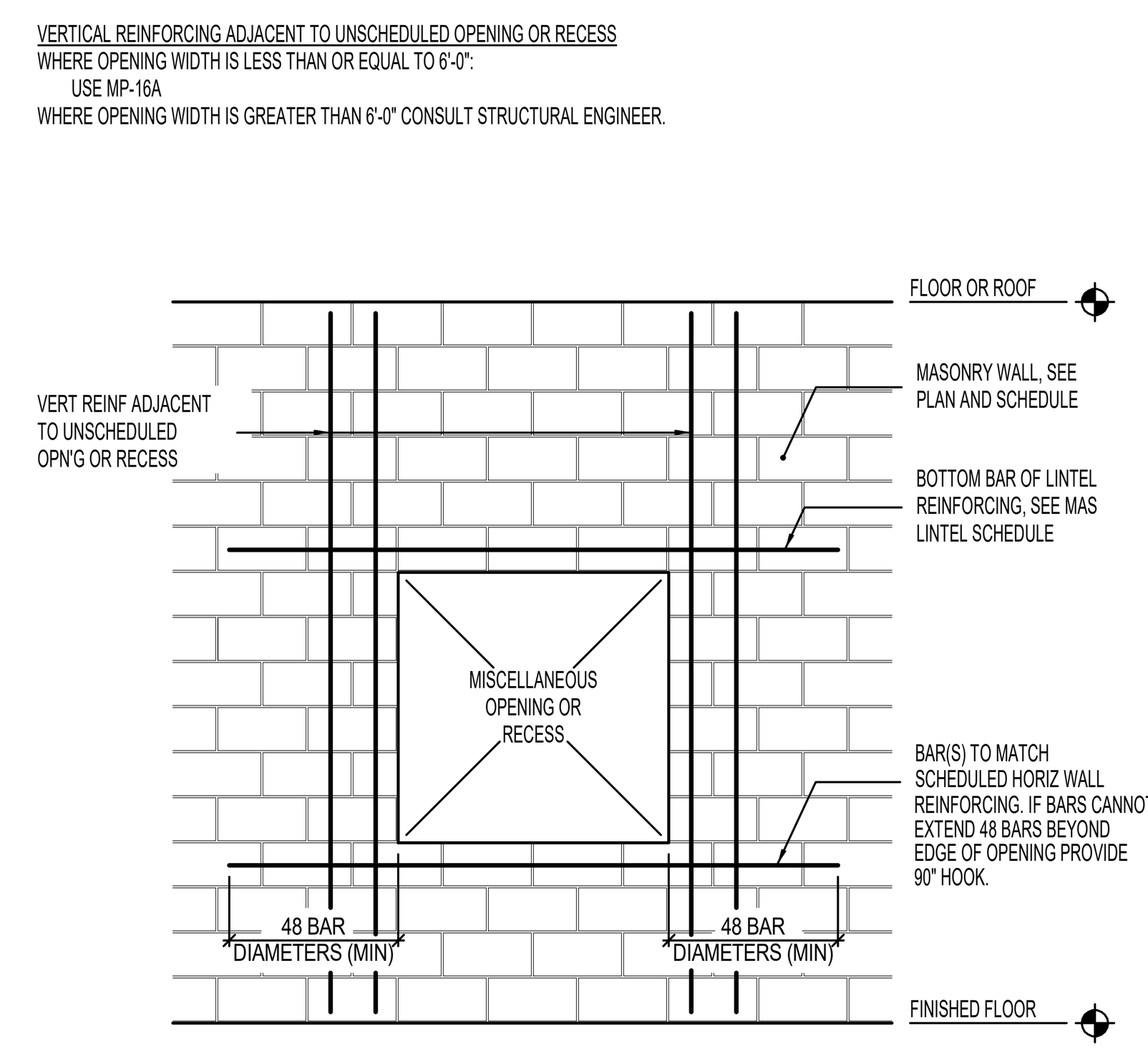
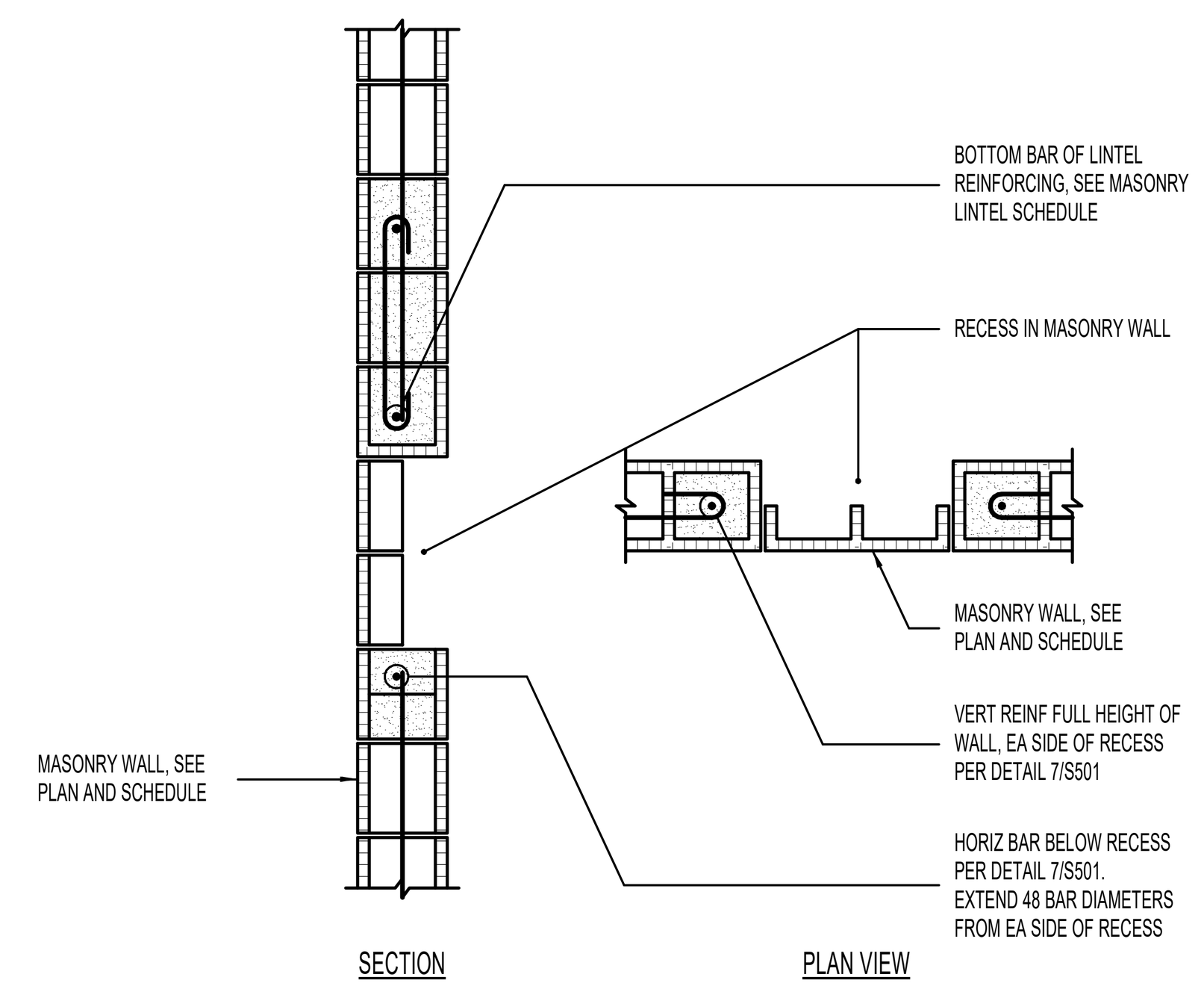


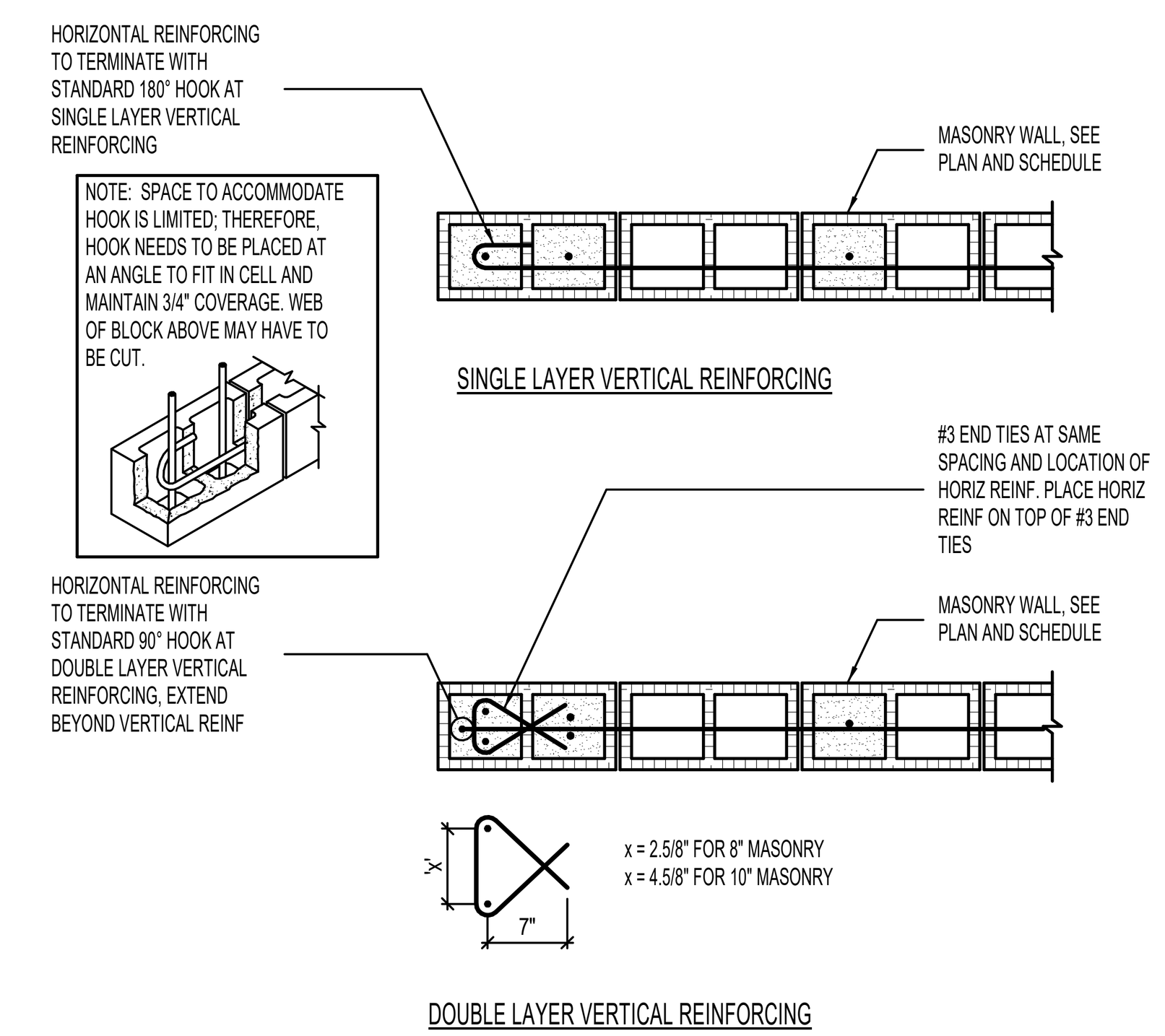
6 CONDITIONS AT PIPE PERPENDICULAR TO FOOTING
NO SCALE



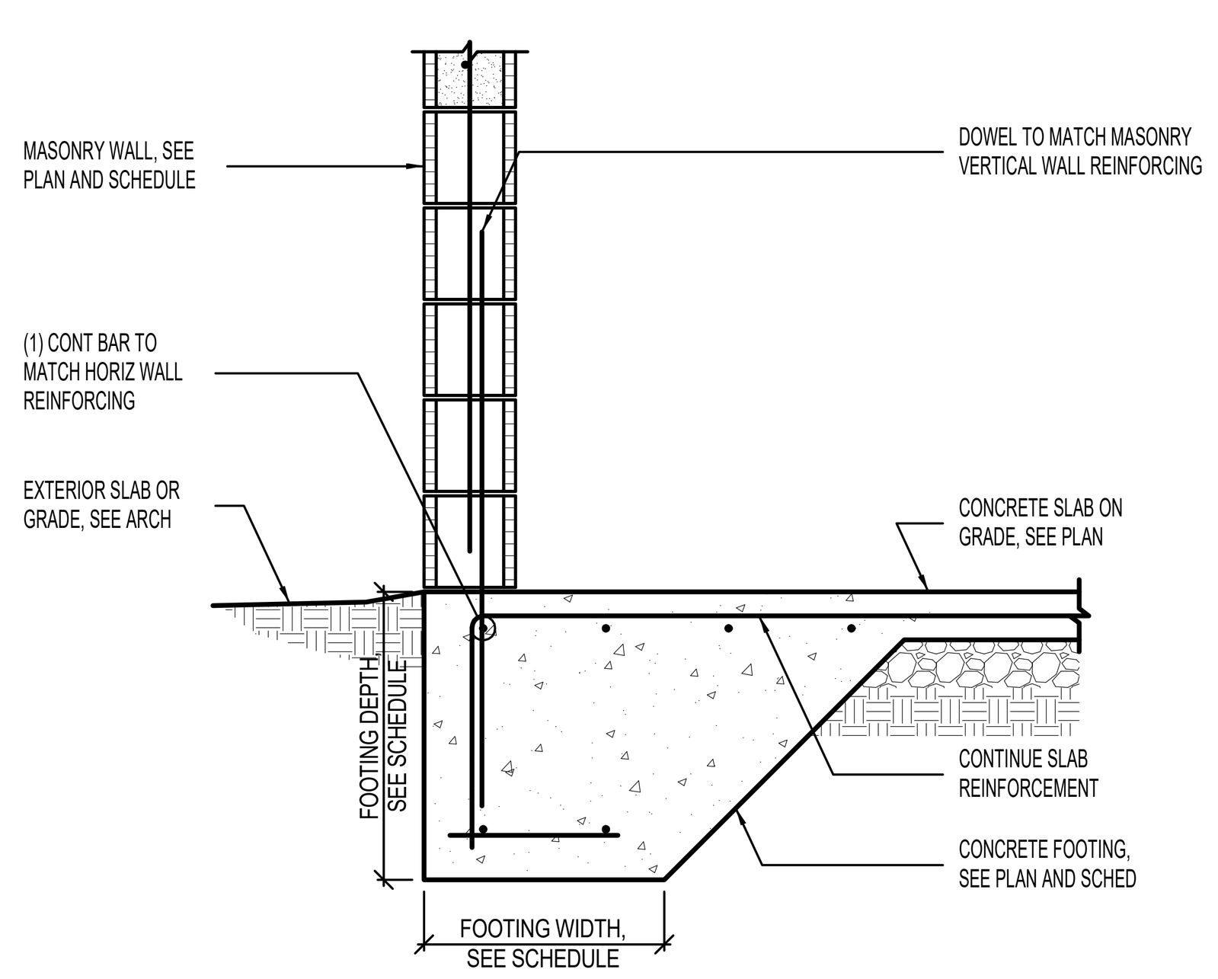
7 REINFORCING AT UNSCHEDULED MISCELLANEOUS OPENINGS OR RECESSES IN MASONRY WALLS
NO SCALE



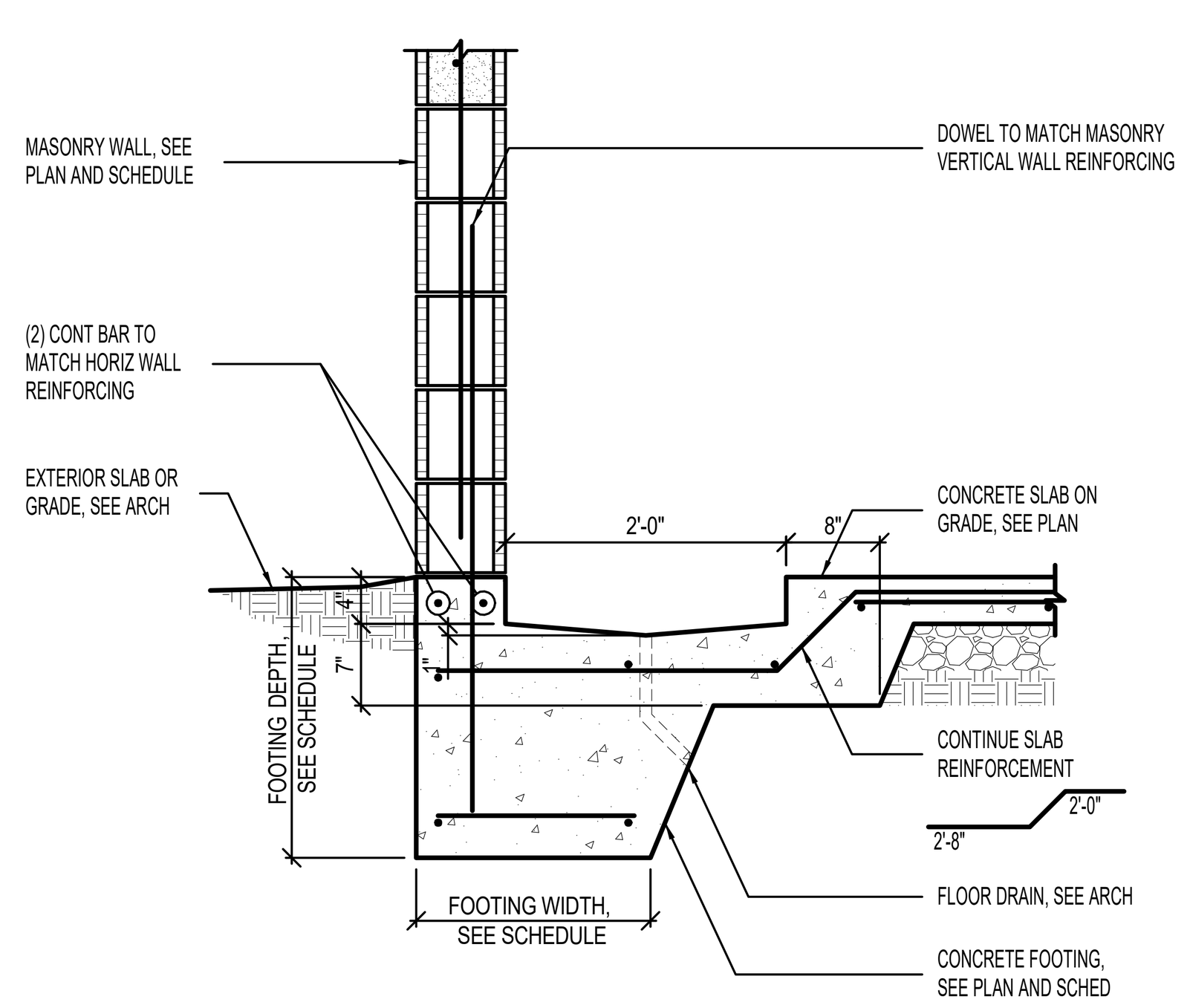
8 TYPICAL REINFORCING AT RECESS IN 8" OR 10" MASONRY WALLS
NO SCALE



9 TERMINATION OF HORIZONTAL REINFORCING IN 8" OR 10" MASONRY WALL [PLAN VIEW]
NO SCALE



10 FOUNDATION WALL DETAIL
NO SCALE



11 FOUNDATION WALL DETAIL AT DRAIN
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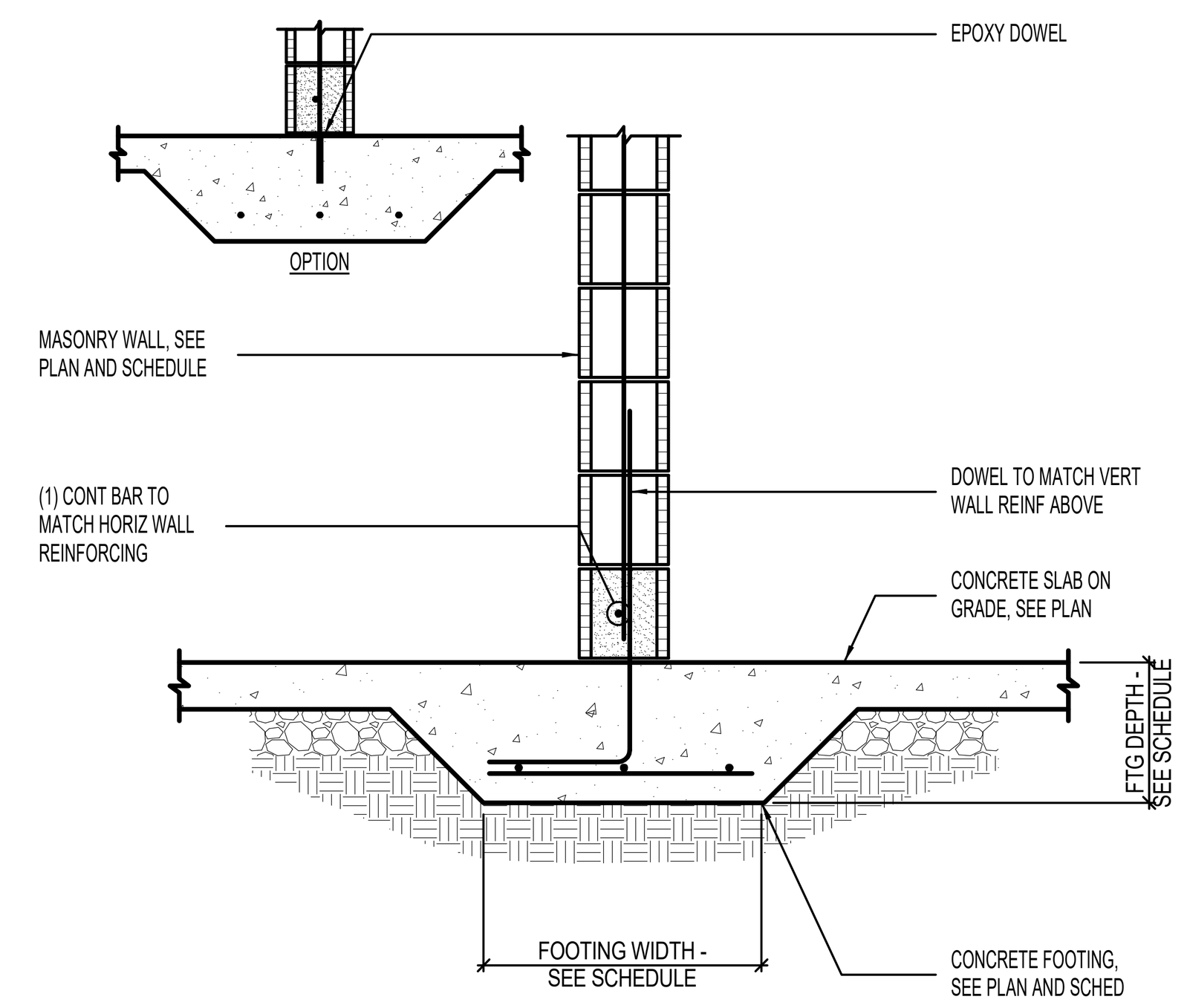
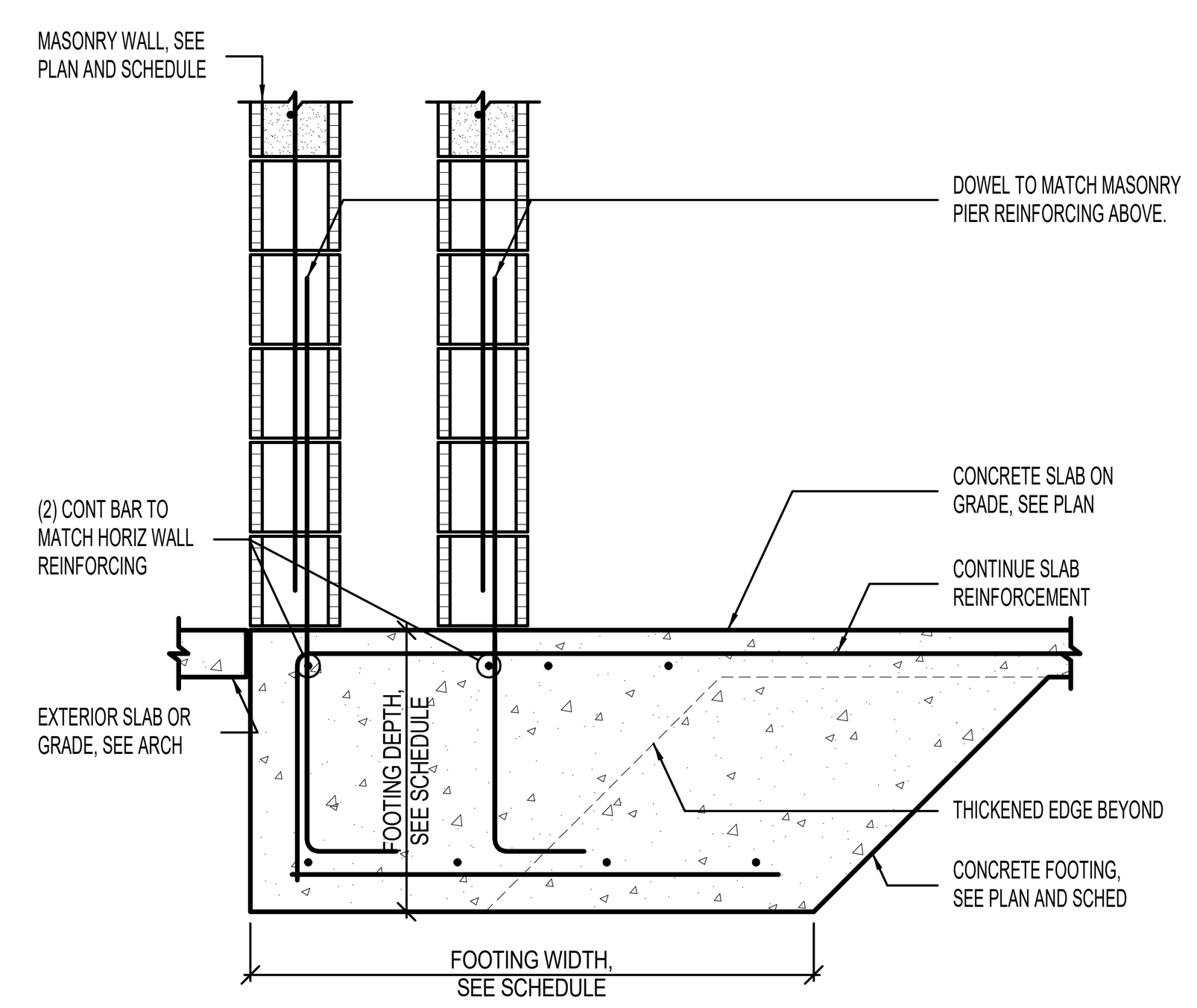


12 THICKENED SLAB FOOTING AT 8" OR 10" MASONRY WALL
NO SCALE



13 FOUNDATION WALL DETAIL
NO SCALE

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S501

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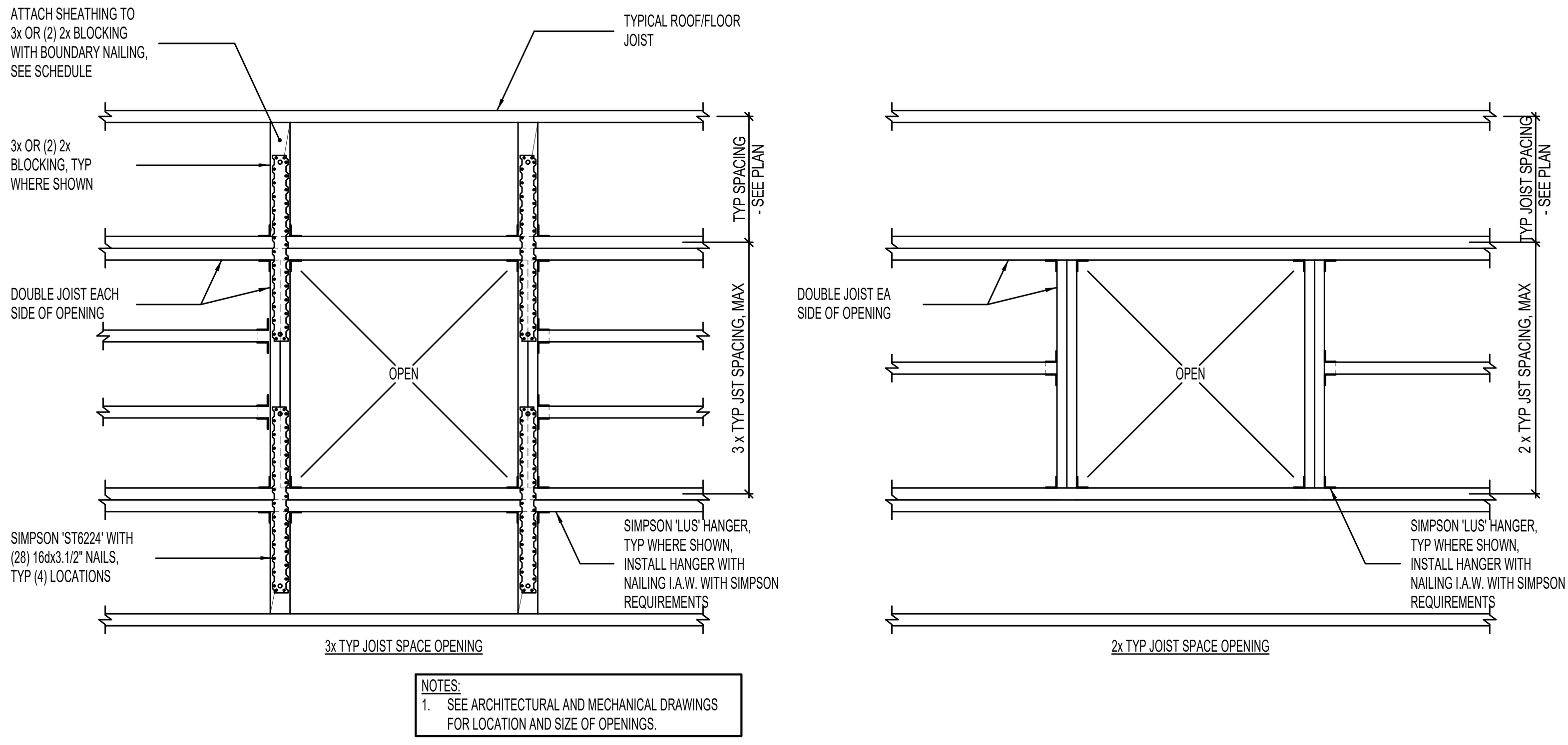
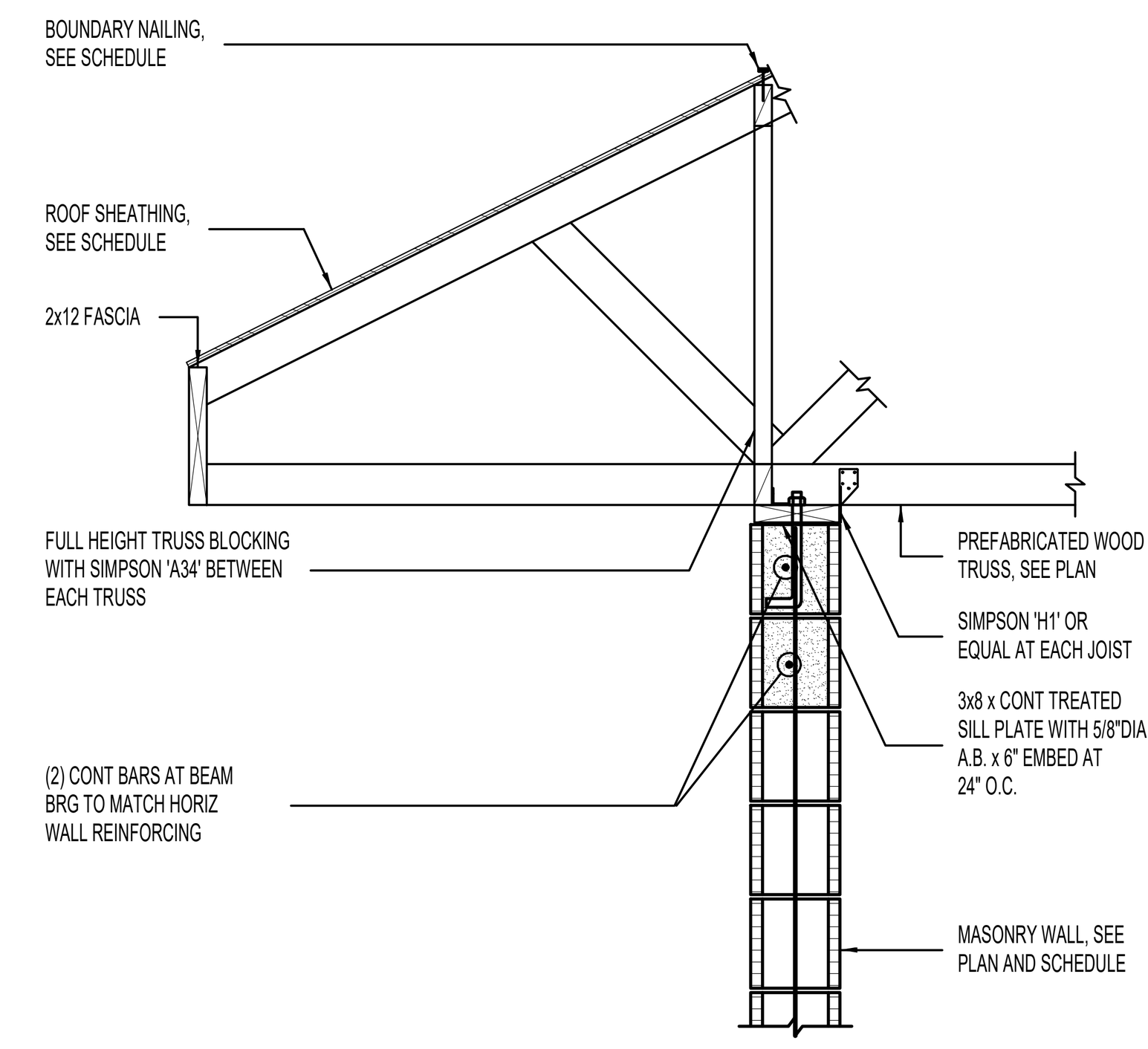
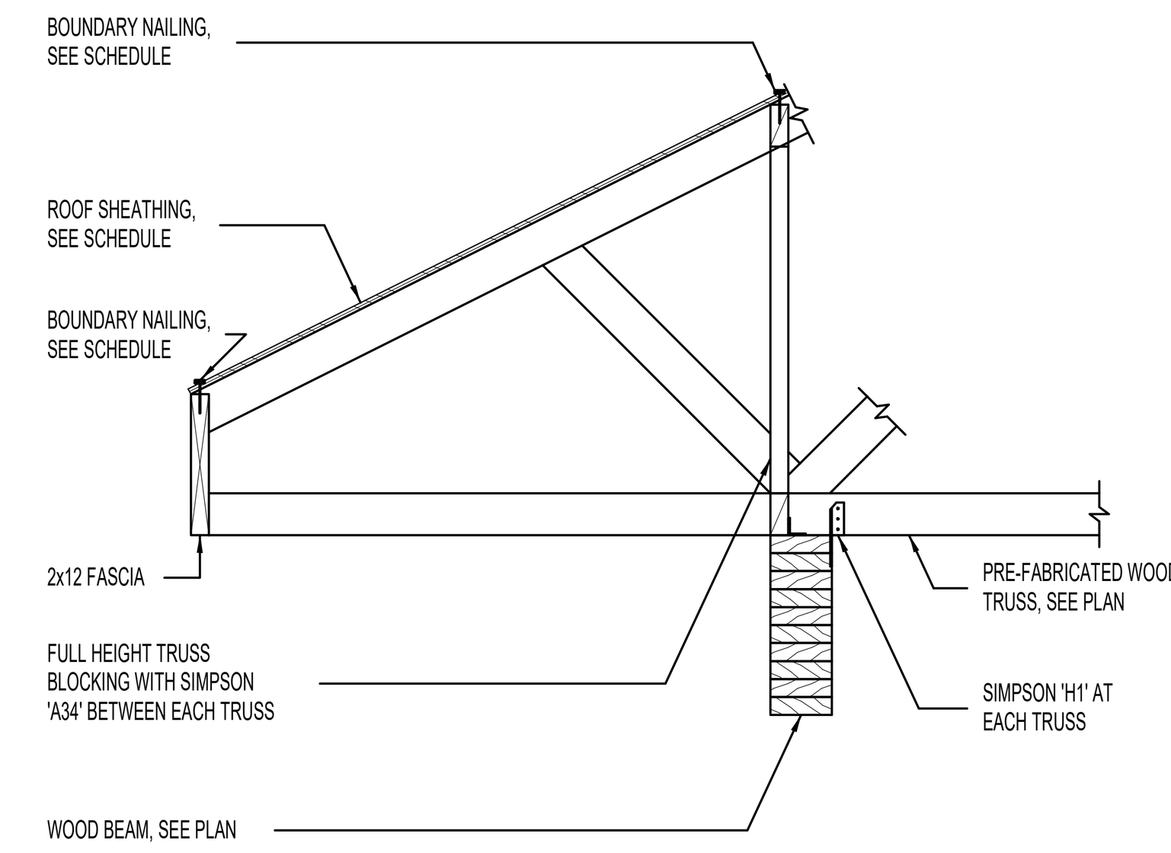


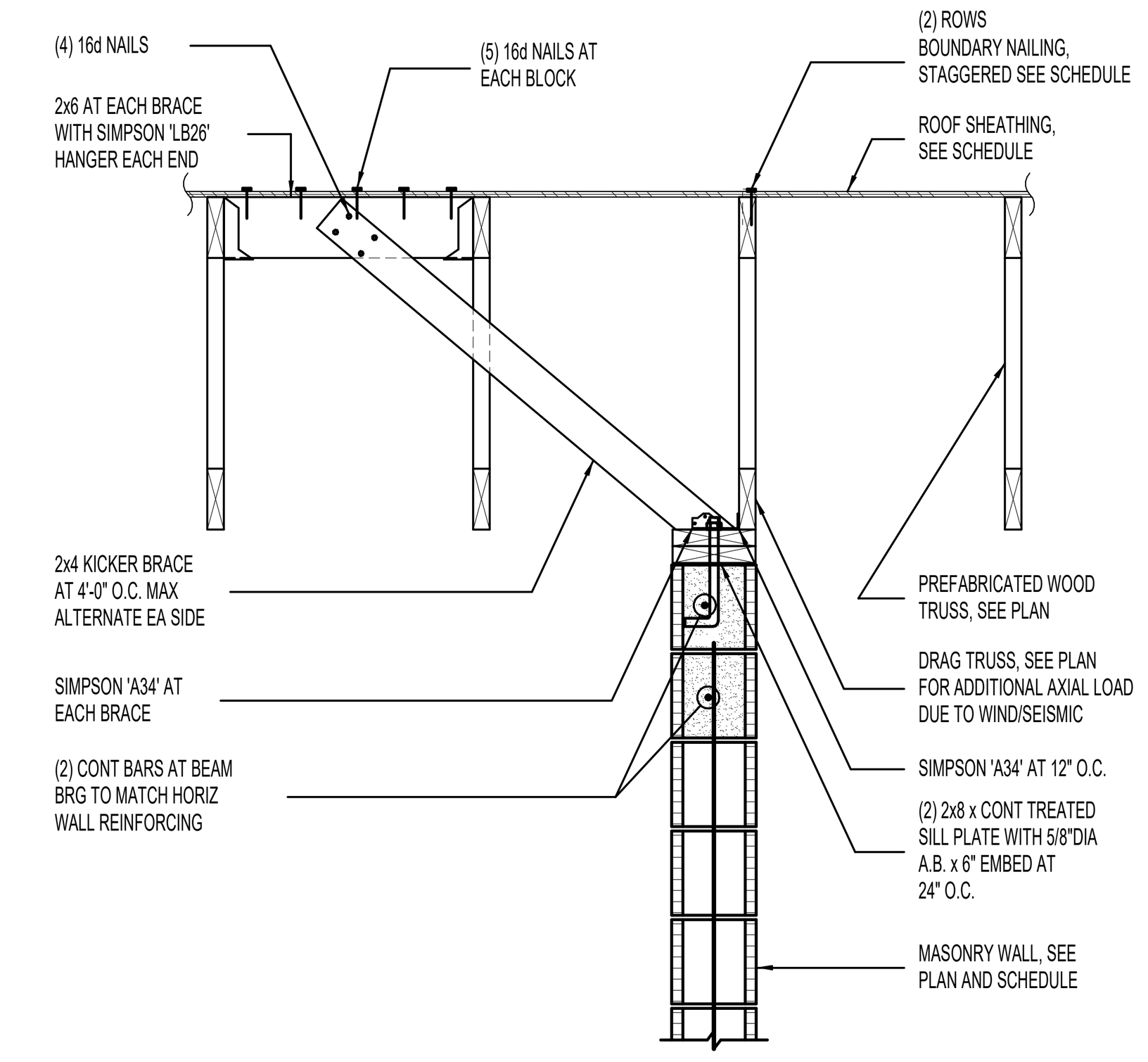
1 FRAMING AT CONVENTIONALLY FRAMED ROOF OPENINGS [PLAN VIEW] NO SCALE



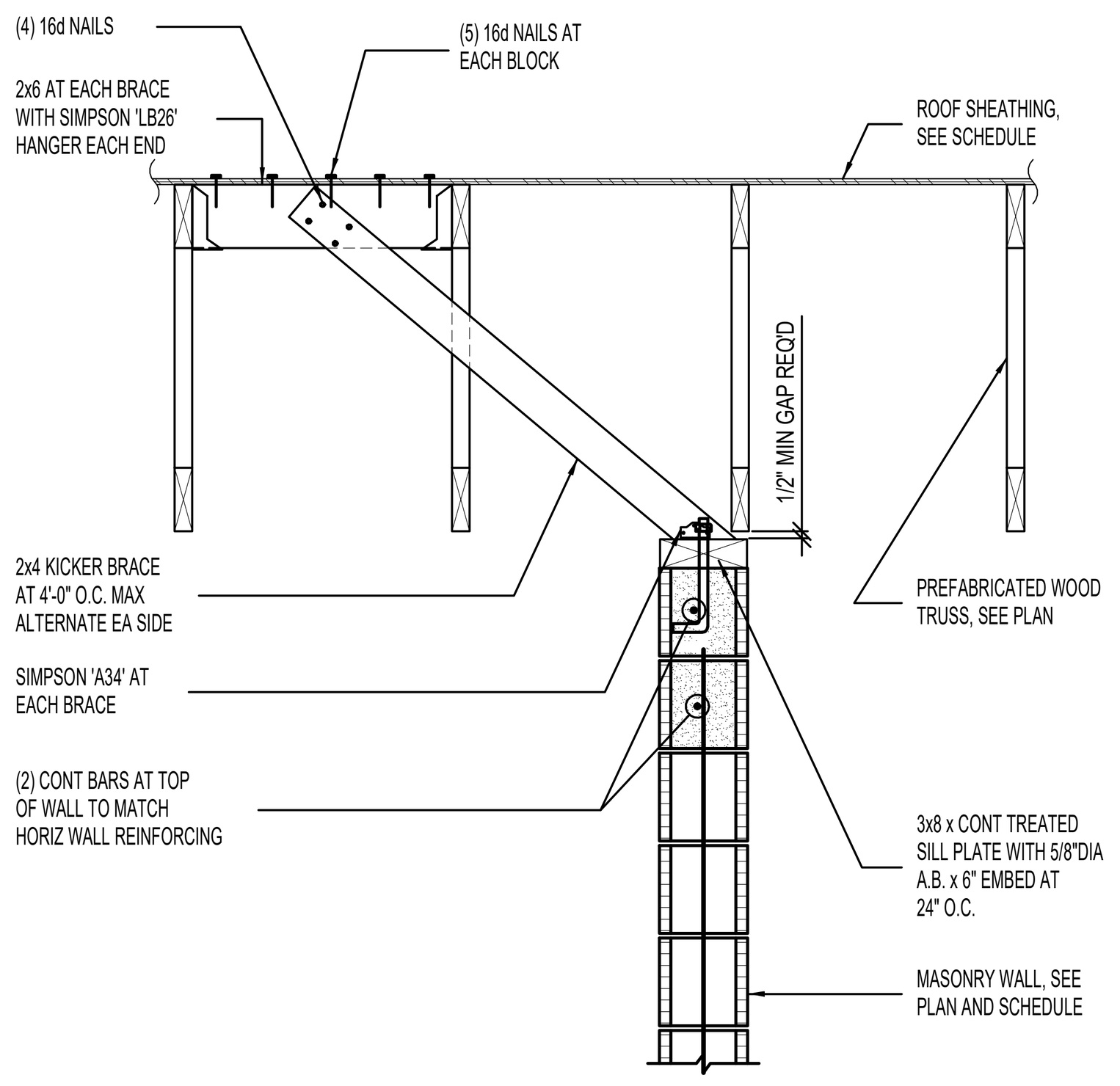
2 WOOD TRUSS BEARING AT MASONRY WALL NO SCALE



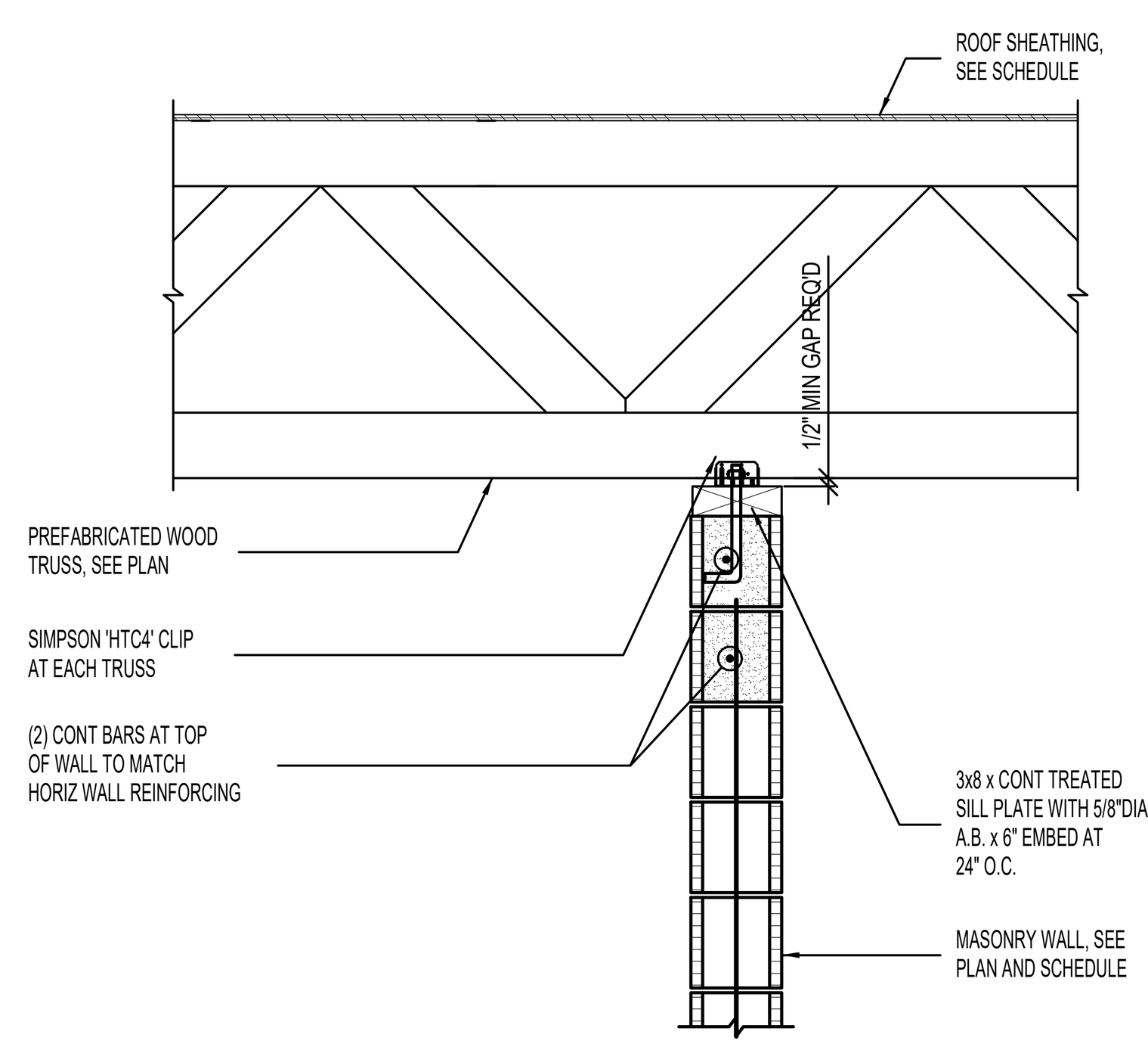
3 WOOD TRUSS AT WOOD BEAM NO SCALE



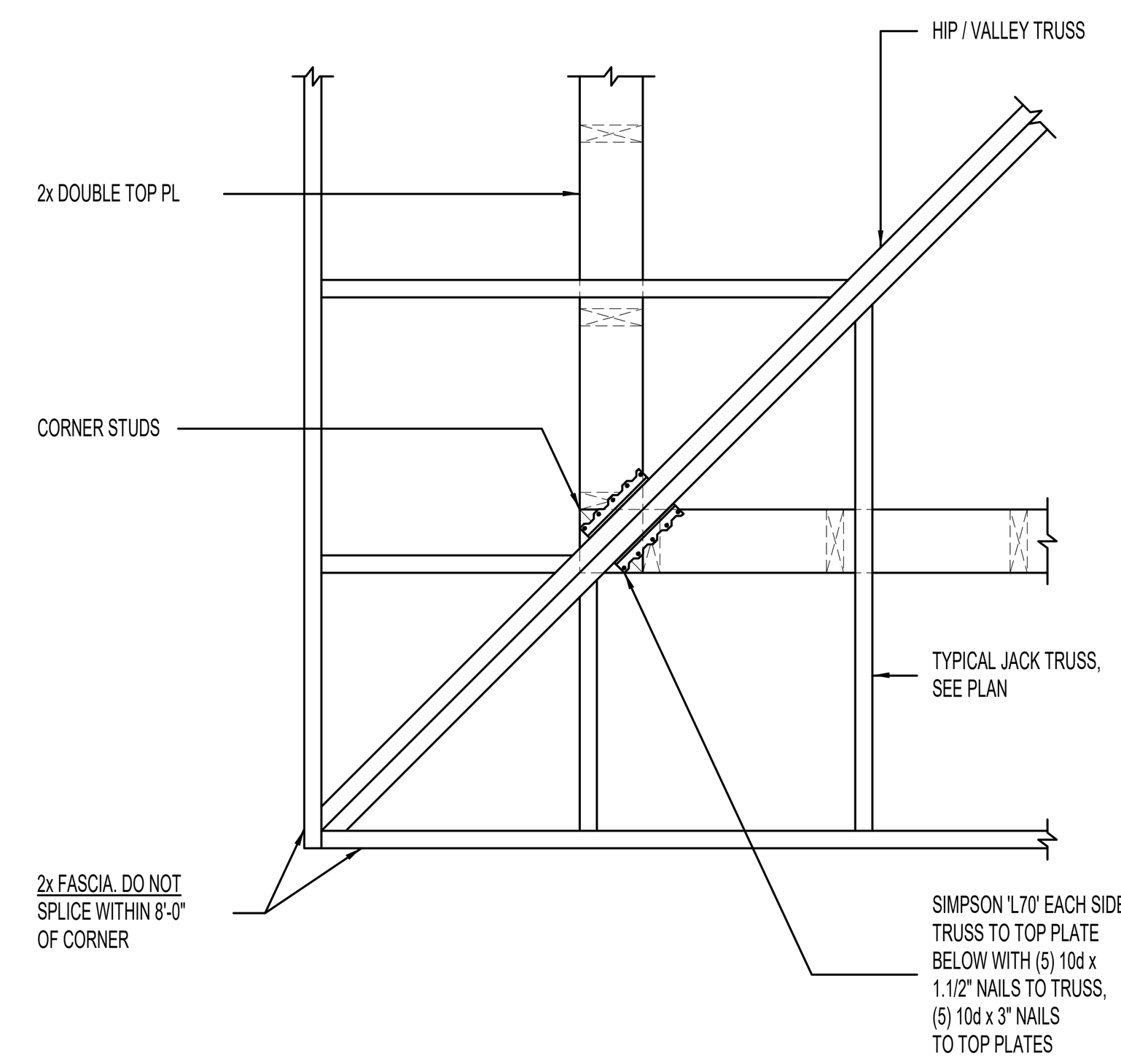
4 MASONRY SHEAR WALL PARALLEL TO WOOD TRUSS NO SCALE



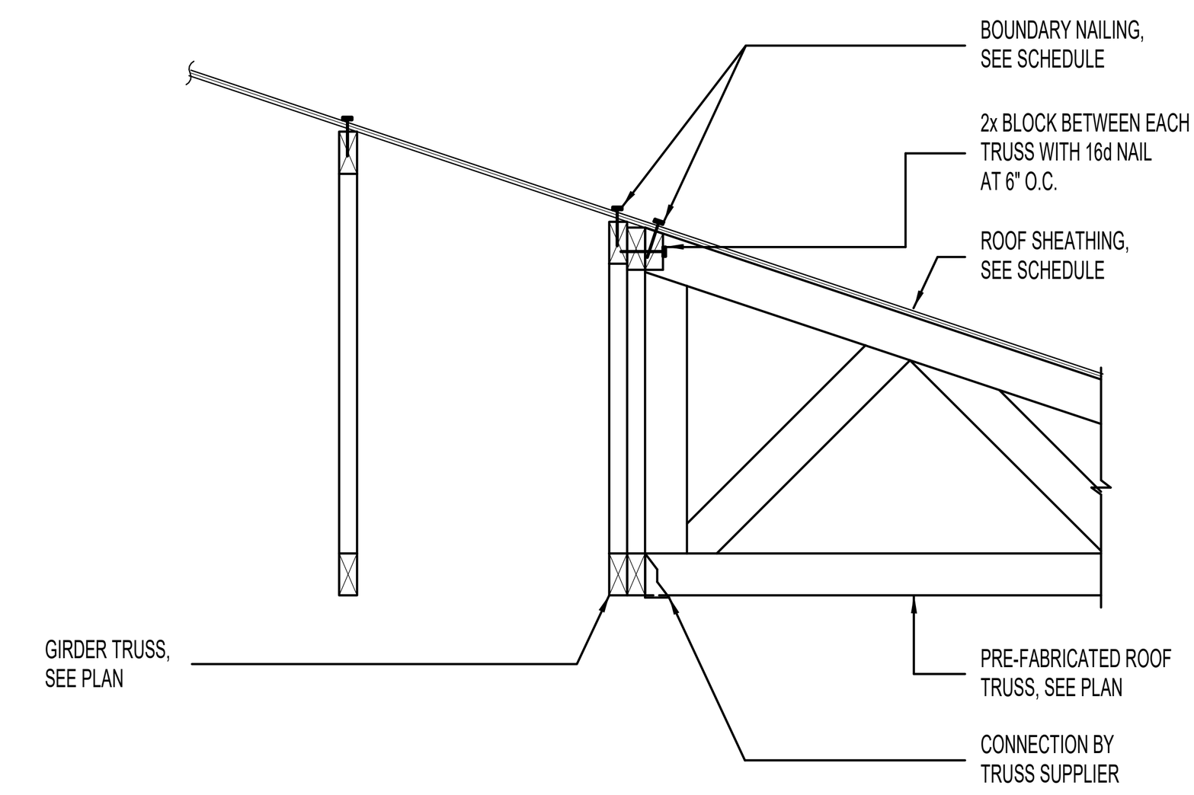
5 BRACING OF INTERIOR NON-BEARING MASONRY WALL PARALLEL TO TRUSS NO SCALE



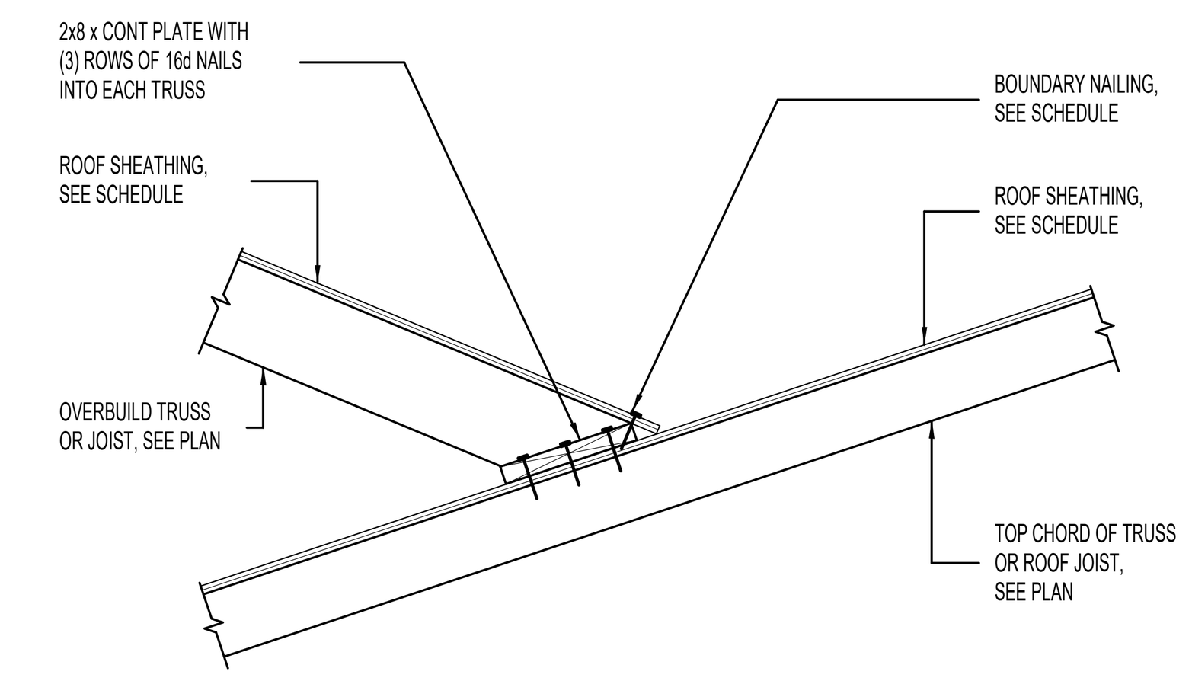
6 BRACING OF INTERIOR NON-BEARING MASONRY WALL PERPENDICULAR TO TRUSS NO SCALE



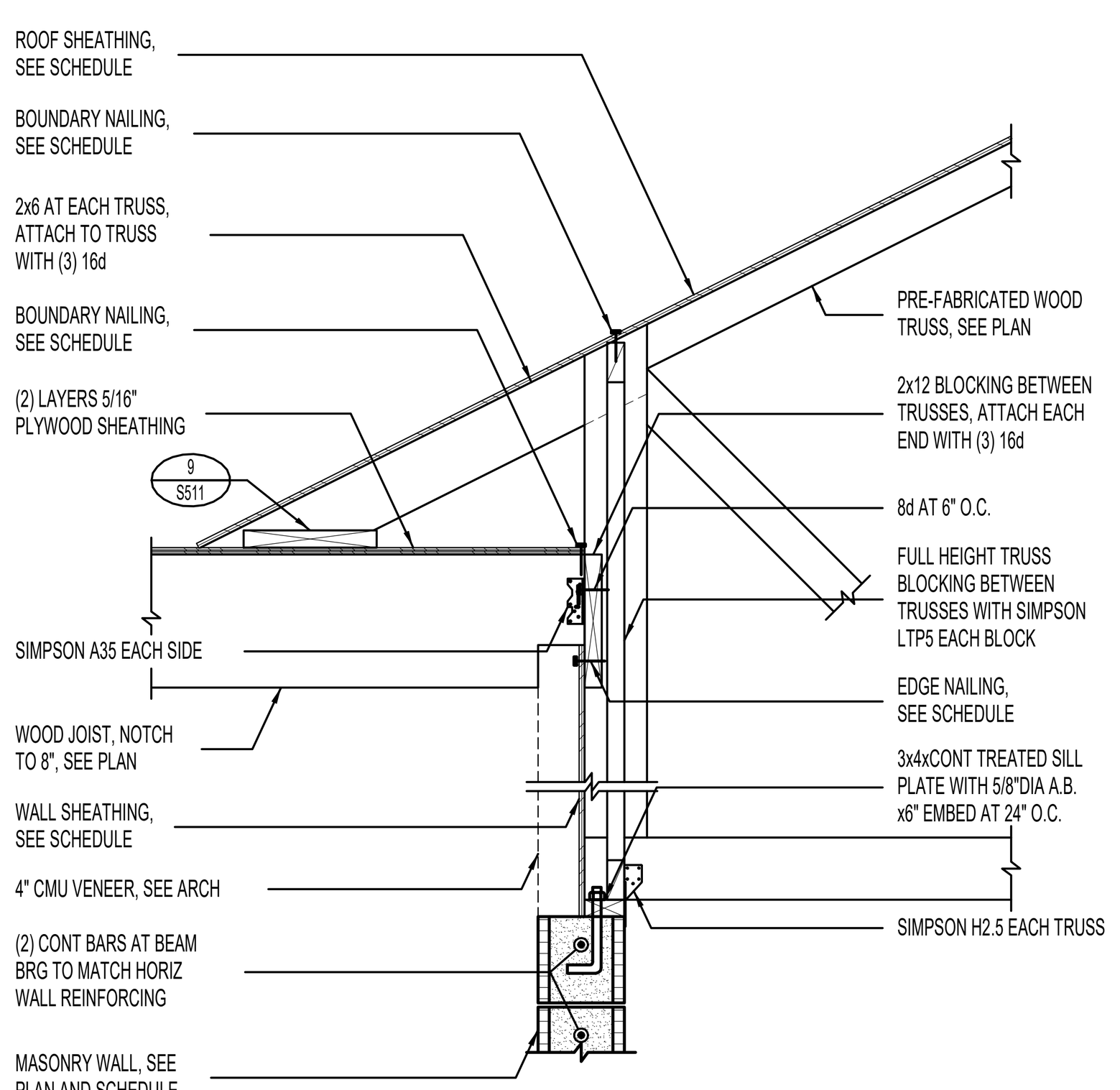
7 CORNER SOFFIT FRAMING [PLAN VIEW] NO SCALE



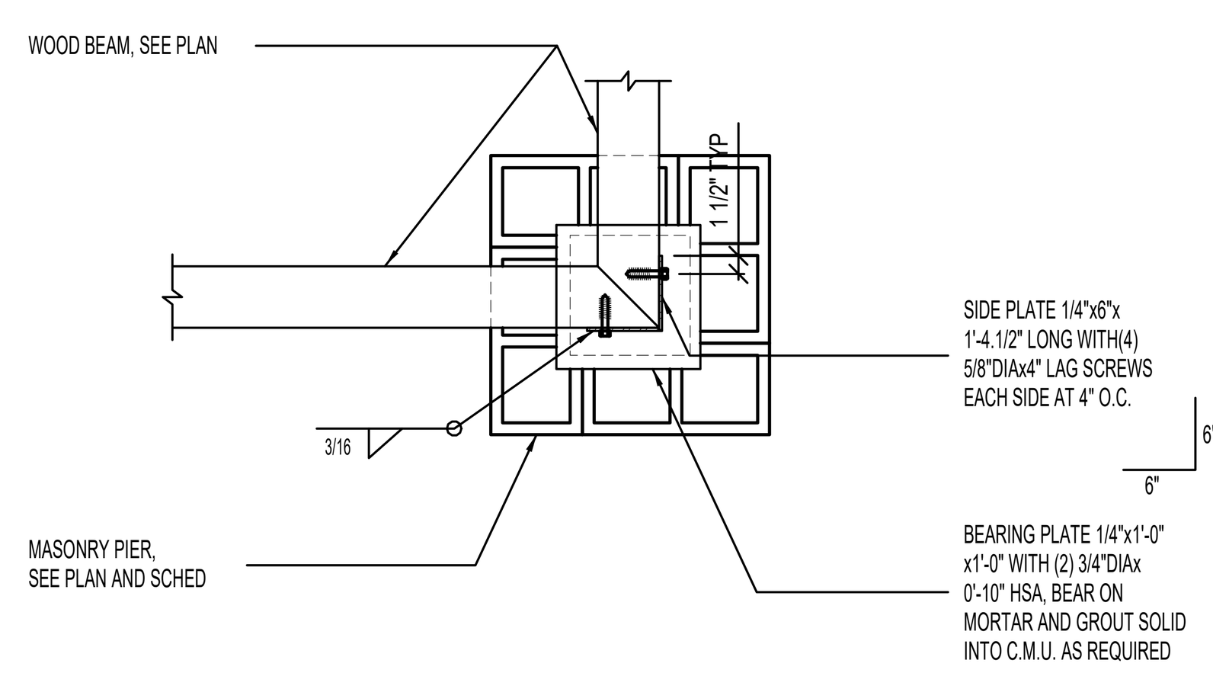
8 JACK TRUSS TO GIRDER TRUSS NO SCALE



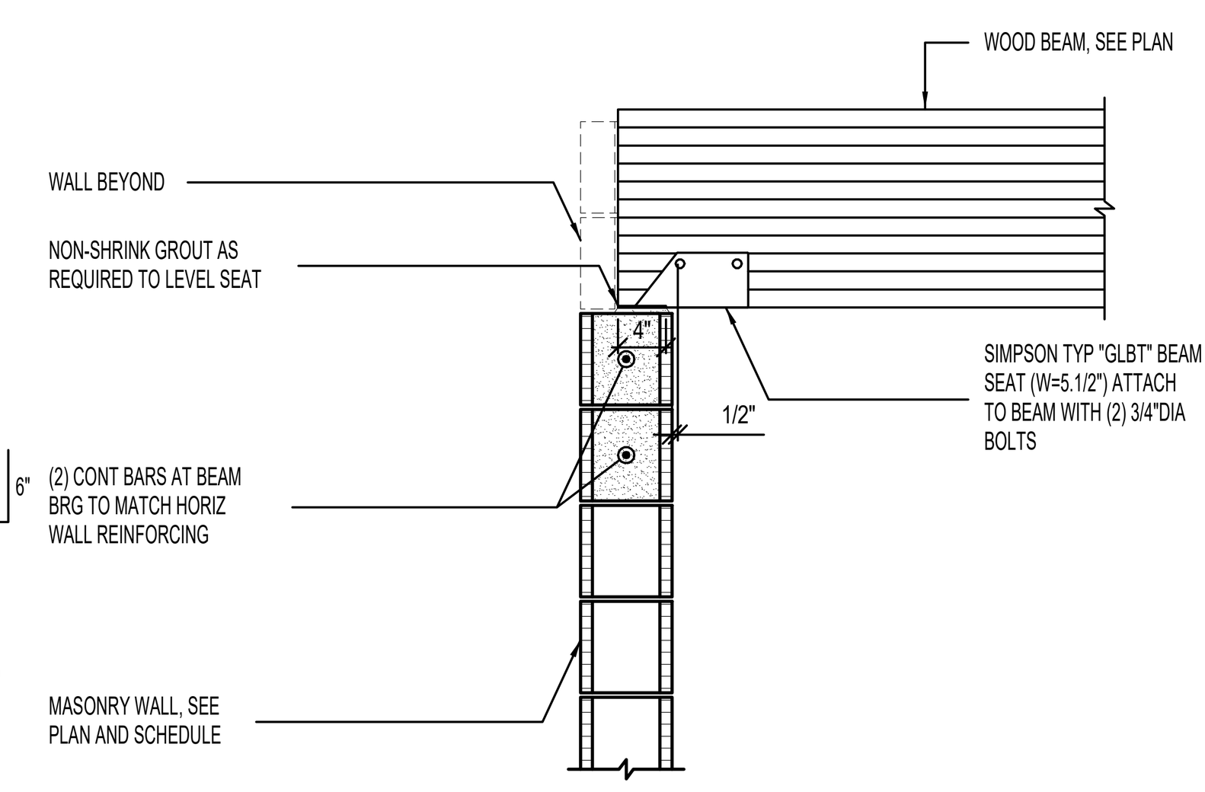
9 OVERBUILD DETAIL NO SCALE



10 ARCH ROOF DETAIL NO SCALE



11 WOOD BEAM AT MASONRY PIER DETAIL NO SCALE



12 WOOD BEAM AT MASONRY WALL NO SCALE

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S511

DESIGN DEVELOPMENT

CONCRETE FOOTING SCHEDULE

MARK	WIDTH	LENGTH	DEPTH	REINFORCING CROSSWISE				REINFORCING LENGTHWISE				COMMENTS
				No.	SIZE	LENGTH	SPACING	No.	SIZE	LENGTH	SPACING	.
FTS2.0	2'-0"	CONT	24"	-	#4	1'-6"	48"	3	#4	CONT	EQ	THICKENED SLAB
FS3.5	3'-6"	3'-6"	24"	5	#4	3'-0"	EQ	5	#4	3'-0"	EQ	THICKENED SLAB
FS4.0	4'-0"	4'-0"	24"	6	#4	3'-6"	EQ	6	#4	3'-6"	EQ	THICKENED SLAB

CONCRETE FOOTING NOTES:
1. PLACE ALL FOOTING REINFORCING IN THE BOTTOM OF THE FOOTING WITH 3" CLEAR CONCRETE COVER (UNO).
2. TOP REINFORCING, WHERE OCCURS, SHALL BE PLACED IN THE TOP OF THE FOOTING WITH 2" MINIMUM CONCRETE COVER.
3. IF FOOTINGS ARE EARTH-FORMED, FOOTINGS SHALL BE 6" LONGER AND WIDER THAN SCHEDULED.
4. RUN CONTINUOUS FOOTING REINFORCEMENT THROUGH SPOT FOOTINGS.
5. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.
6. SOME SCHEDULED FOOTINGS MAY NOT BE USED, SEE FOOTING AND FOUNDATION PLAN FOR FOOTING MARKS.

1 CONCRETE FOOTING SCHEDULE
NO SCALE

SCHED_CONC_FTG-C2500-S3000

MASONRY WALL SCHEDULE

MARK	THICKNESS	MATERIAL	SOLID GROUT	REINFORCING			COMMENTS
				VERTICAL	HORIZONTAL	JOINTS	
MW-8A	8"	CMU	NO	#5 AT 32" O.C.	#5 AT 48" O.C.	NONE	SEE NOTE 10

MASONRY WALL NOTES:
1. COORDINATE WALL FINISHES, MATERIALS, COURSING, ETC. WITH ARCHITECTURAL DRAWINGS.
2. DO NOT SOLID GROUT WALLS UNLESS REQUIRED BY SCHEDULE, NOTES, OR DETAILS.
3. SOLID GROUT ALL MASONRY COURSES BELOW GRADE.
4. SINGLE LAYER OF VERTICAL REINFORCING SHALL BE CENTERED IN WALL (UNO).
5. VERTICAL REINFORCING SHALL EXTEND INTO FOOTINGS AND TERMINATE WITH STANDARD HOOK. FOR CONCRETE FOUNDATION WALLS 4'-0" OR TALLER, VERTICAL WALL REINFORCING SHALL DOWEL 3'-0" MINIMUM INTO THE FOUNDATION WALL (UNO).
6. PROVIDE TWO VERTICAL BARS (MIN) AT ALL CORNERS AND END OF WALLS.
7. HORIZONTAL WALL REINFORCING SHALL CONTINUE THROUGH MASONRY LINTELS. WHERE BOTH HORIZONTAL WALL REINFORCING AND LINTEL REINFORCING OCCUR IN THE SAME COURSE, USE THE LARGER REINFORCING.
8. SEE DETAILS 7/S501 FOR WHERE HORIZONTAL REINFORCING TERMINATES AT EDGE OF OPENINGS.
9. IN CONCRETE FOUNDATION WALL BELOW, ALTERNATE VERTICAL CONCRETE WALL REINFORCING WITH VERTICAL MASONRY REINFORCING.
10. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

4 MASONRY WALL SCHEDULE
NO SCALE

SCHED_MAS_WALL-01

MASONRY REINFORCING LAP SCHEDULE

BAR SIZE	(1) BAR PER CELL	(2) BARS PER CELL
#3	16"	16"
#4	24"	24"
#5	40"	40"

2015 IBC

7 MASONRY REINFORCING LAP SCHEDULE (1500psi)
NO SCALE

SCHED_MAS_REINF-03

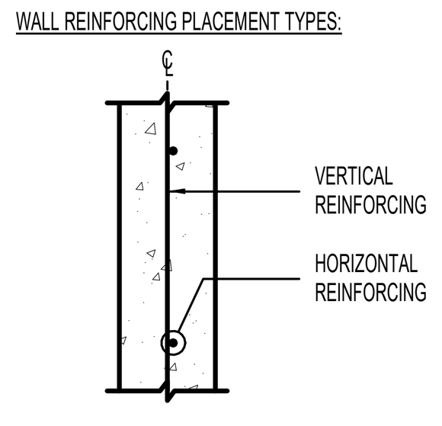
WALLS NOT DESIGNATED IN PLAN

THICKNESS	REINFORCING	
	VERTICAL	HORIZONTAL
6"	#4 AT 18" O.C.	#4 AT 16" O.C.
8"	#4 AT 18" O.C.	#4 AT 12" O.C.
10"	#4 AT 16" O.C.	#5 AT 15" O.C.
12"	#4 AT 18" O.C. E.F.	#4 AT 16" O.C. E.F.

ABBREVIATIONS:
E.F. EACH FACE
I.F. INSIDE FACE
O.F. OUTSIDE FACE

CONCRETE FOUNDATION WALL NOTES:
1. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

WALL REINFORCING PLACEMENT TYPES:



TYPE 'A'

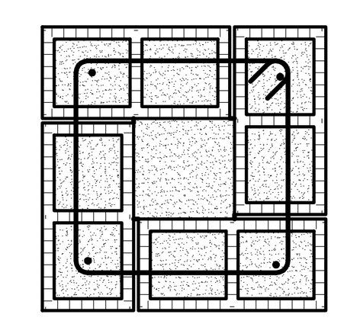
2 CONCRETE WALL SCHEDULE
NO SCALE

SCHED_CONC_WALL-01

MASONRY PIER SCHEDULE

MARK	SIZE	REINFORCING		REINFORCING SCHEMATIC	COMMENTS
		VERTICAL	TIES		
MP-8A	WT x 8"	(2) #5	NONE		
MP-24x24	24"x24	(4) #5	#3 AT 8" O.C.	TYPE A	

MASONRY PIER NOTES:
1. VERTICAL REINFORCING AND TIES SHALL EXTEND FULL HEIGHT OF WALL (UNO).
2. VERTICAL MASONRY PIER REINFORCING SHALL EXTEND INTO THE FOOTING AND TERMINATE WITH A STANDARD 90° HOOK. FOR CONCRETE FOUNDATION WALLS 4'-0" OR TALLER, VERTICAL PIER REINFORCING SHALL DOWEL 3'-0" MINIMUM INTO THE FOUNDATION WALL (UNO).
3. IN CONCRETE FOUNDATION WALLS, PROVIDE #3 TIE AT TOP OF FOUNDATION WALL WITH SAME CONFIGURATION OF MASONRY PIER ABOVE. HORIZONTAL REINFORCING OF ADJACENT WALLS SHALL RUN CONTINUOUS THROUGH MASONRY PIERS.
4. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



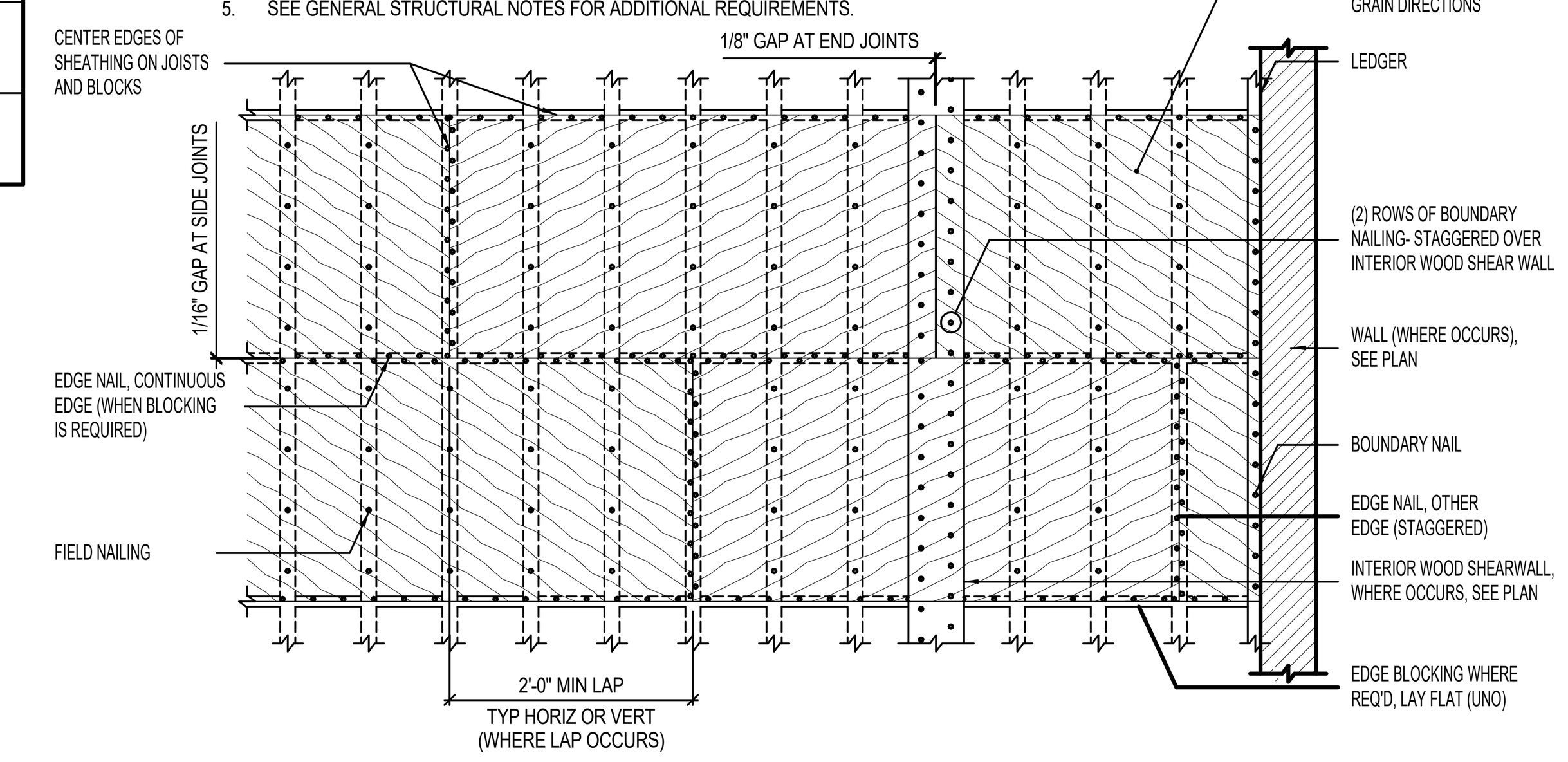
TYPE A

5 MASONRY PIER SCHEDULE
NO SCALE

SHEATHING SCHEDULE AT ROOF

LOCATION	WOOD SHEATHING THICKNESS	SPAN RATING	NAIL SIZE	EDGE NAIL		FIELD NAIL	BOUNDARY NAIL	EDGE BLOCK	COMMENTS
				CONT EDGE	OTHER EDGE				
ROOF	19/32"	40/20	10d	6"	6"	12"	6"	NO	

SHEATHING NOTES:
1. MINIMUM NAIL PENETRATION INTO FRAMING: 8d-1.1/2", 10d-1.5/8".
2. USE COMMON NAILS (8d DIAMETER = 0.131", 10d DIAMETER = 0.148").
3. ALL WOOD FLOOR SHEATHING SHALL BE GLUED AND NAILED. USE A CONSTRUCTION ADHESIVE.
4. PROVIDE (2) ROWS OF BOUNDARY NAILING STAGGERED OVER INTERIOR SHEAR WALLS AT FLOOR AND ROOF.
5. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



8 SHEATHING SCHEDULE AT ROOF AND FLOOR
[PLAN VIEW]
NO SCALE

190062_S601-08

CONCRETE REINFORCING BAR LAP SPLICE SCHEDULE

BAR SIZE	f'c = 3000psi & f'c = 3500 psi				f'c = 4000psi & f'c = 4500 psi				f'c = 5000psi			
	REGULAR		TOP		REGULAR		TOP		REGULAR		TOP	
	CLASS		CLASS		CLASS		CLASS		CLASS		CLASS	
	A	B	A	B	A	B	A	B	A	B	A	B
#3	17"	22"	22"	28"	15"	19"	19"	24"	13"	17"	17"	22"
#4	22"	29"	29"	37"	19"	25"	25"	32"	17"	22"	22"	29"
#5	28"	36"	36"	47"	24"	31"	31"	40"	22"	28"	28"	36"

TABULATED VALUES ARE FOR CASE 1 REINFORCEMENT, WHERE THE REQUIREMENTS OF TABLE BELOW ARE MET. WHERE THESE CONDITIONS ARE NOT MET, MULTIPLY THE LAP LENGTHS (ℓ_d) BY 1.5.

REQUIREMENT FOR CASE 1 LAP LENGTHS

BAR CLEAR SPACING	CLEAR COVER	STIRRUPS OR TIES
>=d_b	>=d_b	>=CODE FOR MINIMUM THROUGHOUT ℓ_d
>=2d_b	>=d_b	NO REQUIREMENT

d_b = BAR DIAMETER

CONCRETE REINFORCING BAR LAP SPLICE NOTES:
1. THIS SCHEDULE SHALL BE USED FOR ALL BAR SPLICES IN CONCRETE WALLS, UNLESS NOTED OTHERWISE.
2. CLASS 'A' SPLICES MAY BE USED ONLY IN CASES WHERE 50% OR LESS OF THE BARS ARE SPLICED WITHIN THE LAP SPLICE LENGTH.
3. CLASS 'B' SPLICES SHALL BE USED FOR ALL SPLICES UNLESS THE REQUIREMENTS OF NOTE No. 2 ABOVE ARE MET.
4. TIES AND STIRRUPS SHALL NOT BE SPLICED.
5. DO NOT SPLICE VERTICAL BARS IN RETAINING WALLS UNLESS SPECIFICALLY SHOWN.
6. THE VALUES TABULATED IN SCHEDULE ARE FOR GRADE 60 REINFORCING BARS. FOR GRADE 75, MULTIPLY LAP LENGTHS BY 1.25 AND FOR GRADE 80, MULTIPLY BY 1.33.
7. THE VALUES TABULATED IN SCHEDULE ARE MINIMUM REQUIREMENTS. LONGER LENGTHS MAY BE USED FOR CONSTRUCTIBILITY.
8. TOP BARS ARE CLASSIFIED AS HORIZONTAL BARS WHERE 12", OR MORE, OF FRESH CONCRETE IS CAST BELOW THE REINFORCING BAR.
9. FOR EPOXY-COATED OR ZINC AND EPOXY DUAL-COATED BARS WITH CLEAR COVER < 3d_b OR CLEAR SPACING <6d_b, MULTIPLY LAP LENGTHS BY 1.5. FOR ALL OTHER CASES MULTIPLY BY 1.2
10. FOR LIGHT WEIGHT CONCRETE, MULTIPLY LAP LENGTHS BY 1.33 UNLESS THE AVERAGE SPLITTING TENSILE STRENGTH (F_{ct}) IS SPECIFIED. FOR LIGHT WEIGHT CONCRETE WHERE F_{ct} IS SPECIFIED, REFER TO ACI318-14 SECTION 19.2.4.3
11. SPLICES FOR BUNDLED BARS:
    a. FOR BUNDLED BARS OF THREE OR LESS, LAP SPLICE LENGTHS SHALL BE MULTIPLIED BY 1.2.
    b. FOR BUNDLED BARS OF FOUR OR MORE, LAP SPLICE LENGTHS SHALL BE MULTIPLIED BY 1.33.
    c. INDIVIDUAL BAR SPLICES WITHIN A BUNDLE SHALL NOT OVERLAP.
    d. ENTIRE BUNDLES SHALL NOT BE LAP SPLICED.
12. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

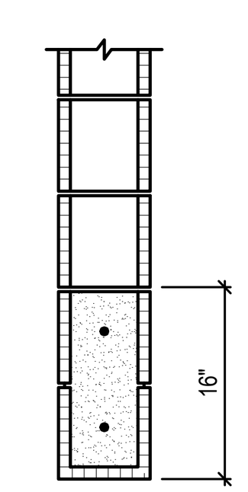
3 CONCRETE REINFORCING BAR LAP SPLICE SCHEDULE
NO SCALE

190062_S601-03

MASONRY LINTEL SCHEDULE

MARK	DEPTH	MAXIMUM SPAN FOR UNSCHEDULED OPENINGS	REINFORCING		COMMENTS
			HORIZONTAL	STIRRUPS	
ML-16A	16"	6'-0"	(1) #5 x CONT TOP AND BOTTOM	NONE	.

MASONRY LINTEL NOTES:
1. LINTEL WIDTH AND MATERIAL TYPE SHALL BE THE SAME AS THE WALL IN WHICH THE LINTEL IS CONSTRUCTED.
2. GROUT MASONRY LINTELS MONOLITHICALLY WITH THE SUPPORT WALL OR PIER AT EACH END.
3. MASONRY LINTEL ML-16A SHALL BE USED OVER OPENINGS IN MASONRY WALLS WHEN A SPECIFIC MASONRY LINTEL IS NOT OTHERWISE SPECIFIED. WHEN A LINTEL IS SPECIFIED ON THE PLANS, THE MAXIMUM SPAN AS NOTED IN THIS SCHEDULE SHALL NOT APPLY. CONSULT THE STRUCTURAL ENGINEER FOR LINTELS NOT SPECIFIED ON THE PLANS WHICH HAVE A SPAN GREATER THAN 6'-0".
4. EXTEND ALL HORIZONTAL REINFORCING 48 BAR DIAMETERS MINIMUM BEYOND THE EDGE OF ALL OPENINGS. IF HORIZONTAL REINFORCING CANNOT EXTEND 48 BAR DIAMETERS BEYOND EDGE OF OPENING, PROVIDE 90° STANDARD HOOK.
5. SPLICE TOP BARS AT MIDSPAN OF LINTEL ONLY AND BOTTOM BARS OVER SUPPORTS ONLY.
6. HORIZONTAL WALL REINFORCING SHALL CONTINUE THROUGH MASONRY LINTELS. WHERE BOTH HORIZONTAL WALL REINFORCING AND LINTEL REINFORCING OCCUR IN THE SAME COURSE, USE THE LARGER REINFORCING.
7. DOWEL VERTICAL REINFORCING OF WALL ABOVE LINTEL INTO THE FULL DEPTH OF LINTEL OR 48 BAR DIAMETERS, WHICHEVER IS LESS.
8. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



ML-16A

6 MASONRY LINTEL SCHEDULE
NO SCALE

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37436
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project:
Grand Juction Park
Restroom Medium

project#: 190062
date: Feb. 22, 2019

revisions :

title:
SCHEDULES

sheet:
S601

DESIGN DEVELOPMENT

SYMBOL LEGEND

SYMBOL	DESCRIPTION
VALVES, METERS, AND GAUGES	
	SHUT OFF VALVE
	GATE VALVE
	CHECK VALVE
	AUTO 2-WAY VALVE
	AUTO 3-WAY VALVE
	GLOBE VALVE
	BALL VALVE
	RELIEF VALVE
	CHAIN OPERATED GATE VALVE
	PRESSURE REDUCING VALVE
	BUTTERFLY VALVE
	SOLENOID VALVE
	ANGLE VALVE
	VENTURI
	BALANCING OR PLUG COCK
	FLOW SETTER
	EXPANSION VALVE (REFRIG.)
	GAS COCK
MAV	MANUAL AIR VENT
	STRAINER
	GAUGE COCK
	FLEXIBLE CONNECTION
	PRESSURE GAUGE
	THERMOMETER
	VICTUALIC COUPLING
	REDUCER CONCENTRIC
	REDUCER ECCENTRIC
	REFRIGERANT SITE GLASS
	REFRIGERANT STRAINER
	REFRIGERANT FILTER DRIER
	90 DEG ELBOW UP
	90 DEG ELBOW DOWN
	90 DEG TEE UP
	90 DEG TEE DOWN
	UNION
	CAPPED PIPE
	ANCHOR
	FLOAT AND THERMOSTATIC TRAP
HVAC SYMBOLS	
T	THERMOSTAT
S	TEMPERATURE SENSOR
H	HUMIDISTAT

SYMBOL LEGEND

SYMBOL	DESCRIPTION

DUCT WORK

SINGLE LINE	DOUBLE LINE	DESCRIPTION
		RECTANGULAR SUPPLY DUCT UP
		RECTANGULAR SUPPLY DUCT DOWN
		RECTANGULAR RETURN DUCT UP
		RECTANGULAR RETURN DUCT DOWN
		RECTANGULAR EXHAUST DUCT UP
		RECTANGULAR EXHAUST DUCT DOWN
		ROUND DUCT UP
		ROUND DUCT DOWN
		ACCOUSTICALLY LINED RECTANGULAR DUCT
		90° RECTANGULAR ELBOW WITH TURNING VANES
		90° RADIUS ELBOW R=1.5
		DUCT SIZE OR SHAPE TRANSITION
		OPPOSED BLADE BALANCING DAMPER (O.B.D.) IN RECT DUCT
		BUTTERFLY BALANCING DAMPER IN ROUND DUCTS
		COMBINATION TEE
		SPLITTER DAMPER
		SQUARE OR RECTANGULAR CEILING DIFFUSER
		ROUND CEILING DIFFUSER
		SIDEWALL REGISTER SUPPLY OR RETURN
		ROUND FLEXIBLE DUCT
		RETURN GRILLE
		EXHAUST GRILLE
		FIRE SMOKE DAMPER
		FIRE DAMPER
SD	SD	SMOKE DAMPER
FC	FC	FLEXIBLE CONNECTION
		FLEXIBLE CONNECTION
		DUCT TO BE REMOVED

PIPING LEGEND

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

HPS	HIGH PRESSURE STEAM
MPS	MEDIUM PRESSURE STEAM
LPS	LOW PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE RETURN
MPC	MEDIUM PRESSURE CONDENSATE RETURN
LPC	LOW PRESSURE CONDENSATE RETURN
PC	PUMP DISCHARGE
TWS	TEMPERED WATER SUPPLY
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUPPLY
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
D	DRAIN LINE
HG	HOT GAS BYPASS
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT

DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE, NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVED: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

SYMBOL LEGEND

SYMBOL	DESCRIPTION
REFERENCE LINES AND SYMBOLS	
# / SHEET	DETAIL INDICATOR: # INDICATES DETAIL NUMBER, SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, INTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
100	SPACE NUMBER
1	KEYNOTE INDICATOR
	REVISION INDICATOR
	EQUIPMENT INDICATOR
	PLUMBING FIXTURE INDICATOR
TYPE / CFM / SIZE	DIFFUSER/GRILLE INDICATOR
TYPE / SIZE	DIFFUSER/GRILLE INDICATOR
	BREAK, STRAIGHT
	BREAK, ROUND
MATCH LINE / SEE XX/X-XXX	MATCHLINE INDICATOR
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE
	CONTRACT LIMIT LINE: DASHDOT, WIDE LINE
	NEW CONNECTION TO EXISTING
	POINT OF DEMOLITION

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

(E)	EXISTING
(F)	FUTURE
AD	ACCESS DOOR
AIR COND	AIR CONDITION(-ING,-ED)
APD	AIR PRESSURE DROP
BD	BALANCING DAMPER
BHP	BRAKE HORSE POWER
BTU	BRITISH THERMAL UNIT
BTUH	BTU/HOUR
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	COOLING
COMP	COMPONENT
COND	CONDENS(-ER, -ING, -ATION)
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RECIRC
DIA	DIAMETER
DISCH	DISCHARGE
DP	DEPTH OR DEEP
EA	EXHAUST AIR
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL
ELEC	ELECTRIC
ELEV	ELEVATION
ENT	ENTERING
EVAP	EVAPORAT(-E, -ING, -ED, -OR)
EWT	ENTERING WATER TEMPERATURE
EXT	EXTERNAL
FC	FLEXIBLE CONNECT(-OR, -ION)
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
GAL	GALLON(S)
GE	GREASE EXHAUST
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HG	MERCURY
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTG	HEATING
HZ	HERTZ (FREQUENCY)
ID	INSIDE DIAMETER
IN	INCH
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LG	LENGTH
LH	LATENT HEAT
LRA	LOCKED ROTOR AMPS
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTUR(-ER, -ED)
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OZ	OUNCE
PD	PRESSURE DROP OR DIFFERENCE
PG	PROPOLENE GLYCOL
PH	PHASE
PPM	PARTS PER MILLION
PRESS	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
R	THERMAL RESISTANCE
RA	RETURN AIR
RECIRC	RECIRCULATE
REFR	REFRIGERATION
REQD	REQUIRED
RLA	RATED LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCW	SOFT COLD WATER
SF	SAFETY FACTOR
SH	SENSIBLE HEAT
SP	STATIC PRESSURE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
STD	STANDARD
SW	SOIL, WASTE
TA(R)	TRANSFER AIR (RETURN)
TA(S)	TRANSFER AIR (SUPPLY)
TD	TEMP. DROP OR DIFF.
TEMP	TEMPERATURE
THERM	THERMAL
TOT	TOTAL
TSTAT	THERMOSTAT
V	VOLT
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY TEMPERATURE
VEL	VELOCITY
VENT	VENT, VENTILATION
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
WB	WET BULB TEMP
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
WT	WEIGHT
WTR	WATER

MECHANICAL GENERAL NOTES

1. THE MECHANICAL DRAWINGS SHOW THE GENERAL DESIGN, ARRANGEMENT & EXTENT OF THE MECHANICAL SYSTEM. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THESE DRAWINGS DO NOT SHOW ALL OFFSETS, BENDS OR ELBOWS NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. CONTRACTOR SHALL MAKE SUCH SLIGHT ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE & OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT.

   MAJOR DEVIATIONS SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL REQUIRE PRIOR APPROVAL BY THE DESIGN ENGINEER.

2. THE DRAWINGS & SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER & SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE & NOT THE OTHER BEING FURNISHED & INSTALLED AS THOUGH SHOWN & CALLED OUT IN BOTH.

3. THE ENTIRE MECHANICAL INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY ADOPTED BUILDING CODES, MECHANICAL CODE, PLUMBING CODE, ELECTRICAL CODE, & ALL OTHER APPLICABLE CITY, COUNTY, STATE, & FEDERAL CODES & REGULATIONS IN EFFECT.

4. THE ENTIRE MECHANICAL INSTALLATION SHALL CONFORM TO ANY CODES, RULES, REGULATIONS & REQUIREMENTS OF THE BUILDING OWNER.

5. PRIOR TO FABRICATION & INSTALLATION OF ANY MECHANICAL COMPONENT THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL WORK WITH ALL OTHER BUILDING TRADES, INCLUDING BUILDING TRADES HIRED DIRECTLY BY THE OWNER. WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.

6. THE SPACE ABOVE ALL CEILINGS IS LIMITED. CAREFUL COORDINATION IS REQUIRED WITH ALL TRADES BEFORE ANY PIPE, DUCT, OR EQUIPMENT IS ORDERED & OR INSTALLED. ANY CONFLICTS &/OR CHANGES FOUND DURING INSTALLATION THAT RESULTS FROM THE LACK OF COORDINATION BY THE CONTRACTORS DURING THE SHOP DRAWING PROCESS ARE THE RESPONSIBILITY OF THE CONTRACTOR.

7. ALL MECHANICAL INFORMATION IS NOT SHOWN ON THE MECHANICAL DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENT.

8. THE CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW & USE, WHERE APPROPRIATE, ALL THE MECHANICAL DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE MECHANICAL SYSTEM WITHOUT USING THE INCLUDED DETAILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

9. THE STRUCTURE SHOWN ON ALL DETAILS MAY OR MAY NOT PERTAIN TO A PORTION OR ANY PORTION OF THE BUILDING. COORDINATE ALL MOUNTING REQUIREMENTS WITH ARCHITECTURAL & STRUCTURAL DRAWINGS.

10. ANY PART OF THE MECHANICAL INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

11. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL CEILING DIFFUSERS & GRILLES.

12. CONTRACTOR SHALL OPERATE THE SYSTEM & DEMONSTRATE ALL ASPECTS OF THE SYSTEM TO THE ENGINEER &/OR OWNER TO PROVE ALL SYSTEMS ARE OPERATIONAL.

13. DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A SET OF AS-BUILT REDLINED RECORD DRAINING AT THE PROJECT SITE. ALL CHANGES IN LAYOUT, ROUTING, EQUIPMENT, COMPONENTS, & ACCESSORIES SHALL BE RECORDED. THESE REDLINED DRAWINGS SHALL BE GIVEN TO THE ARCHITECT/ENGINEER AFTER THE FINAL INSPECTION IN ACCORDANCE WITH SPECIFICATIONS.

GENERAL EQUIPMENT NOTES

1. ALL CAPACITIES ARE AT JOB SITE CONDITIONS & ARE MINIMUM CAPACITY.
2. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED TO CONFORM WITH LOCAL SEISMIC REQUIREMENTS & THE REQUIREMENTS OF THESE CONSTRUCTION DOCUMENTS.
3. VERIFY ALL REQUIRED SERVICE CONNECTIONS, INCLUDING ELECTRICAL CHARACTERISTICS FOR ALL EQUIPMENT PRIOR TO ORDERING EQUIPMENT.
4. ALL EQUIPMENT SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURAL MEMBERS.
5. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
6. ALL SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.
7. AIR INLETS & OUTLETS SHALL BE OF THE SAME MANUFACTURER.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE HVAC EQUIPMENT CHECK-IN, SAFEKEEPING, & DAMAGE.

MECHANICAL SHEET INDEX

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2/22/2019
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project:
Grand Junction Park Restrooms Medium

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title:
MECHANICAL COVER SHEET

sheet:
ME001

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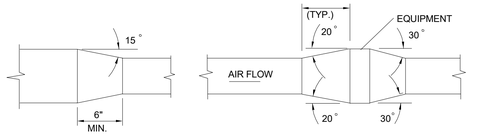
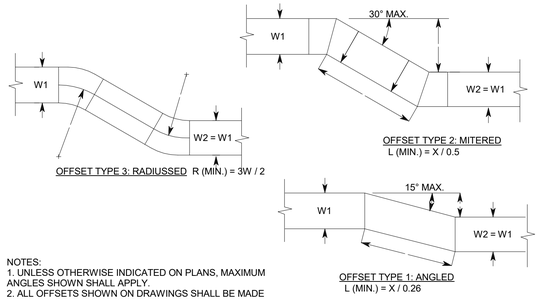
NOTE: UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.



PLAN OR SIDE VIEW
DUCT TRANSITION

PLAN OR SIDE VIEW
DUCT TRANSITION WITH EQUIPMENT IN DUCT

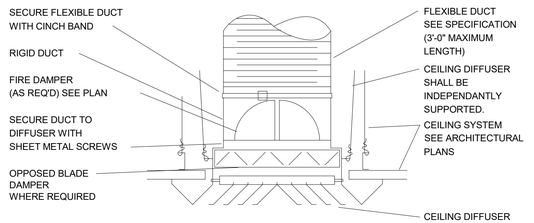
4 DUCT TRANSITION
NTS



NOTES:
1. UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.
2. ALL OFFSETS SHOWN ON DRAWINGS SHALL BE MADE WITH ANY OF THE 3 OFFSET TYPES ABOVE.

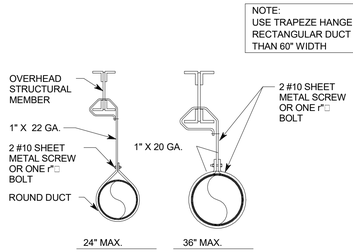
3 DUCT OFFSETS
NTS

NOTE:
CEILING INLETS AND OUTLETS SHALL BE INDEPENDENTLY SUPPORTED.



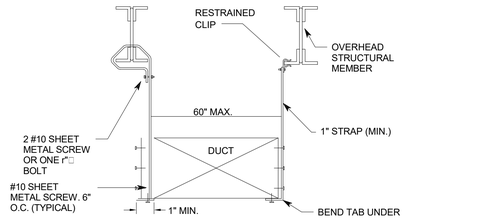
2 CEILING DIFFUSER(SURFACE)
NTS

NOTE:
USE TRAPEZE HANGER FOR RECTANGULAR DUCT LARGER THAN 60" WIDTH



5 ROUND DUCT HANGER
NTS

NOTE:
USE TRAPEZE HANGER FOR RECTANGULAR DUCT LARGER THAN 60" WIDTH



1 RECTANGULAR DUCT HANGER
NTS

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MECHANICAL DETAILS

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ME501

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AIR HANDLING UNIT SCHEDULE

SYMBOL	AREA SERVED	CFM	EXT S.P. @ S.L.	MIN. CKT. AMPS	HEATING COIL				CONDENSER				EVAP. FAN				UNIT		MANUGACTURER & MODEL NO.	HTG. INPUT KW	COOLING COIL CAP. MBH	NOTES
					NO.	KW	□	VOLT	NO.	RLA	□	VOLT	RLA	□	VOLTS	HP	□	VOLT				
AHU-1	ENTIRE BUILDING	660	.3"	27.1	1	6	1	23	---	---	---	---	---	---	---	---	1	230	FIRST CO. 18XMBX	6	(11)(12)(13)(14)(15)	(1)

NOTES:

(1) HORIZONTAL FAN COIL, WITH 1/8 HP DIRECT DRIVE THERMALLY PROTECTED MOTOR. 6 KW HEATER, FILTERS, CONTACTOR, AND RELAY TO CYCLE FAN AND HEATING ELEMENTS.

EXHAUST FAN SCHEDULE

SYMBOL	AREA SERVED	MANUFACTURER	MODEL NO.	CONFIG.	AIRFLOW (CFM)	STATIC PRESSURE (INCHES W.G.)	FAN SPEED (RPM)	MOTOR				MAXIMUM NOISE LEVEL (SONES)	OPTIONS AND ACCESSORIES	CONTROL	NOTES / COMMENTS
								HP	VOLTZ	PHASE	HERTZ				
EF-1	RESTROOMS	LOREN COOK	100 SDB	INLINE	280	0.4	1089	1 / 6	115	1	60	8	(1) (2)	(11)	(101)

ACCEPTABLE MANUFACTURERS	OPTIONS & ACCESSORIES	CONTROLS	NOTES & COMMENTS
LOREN COOK TWIN CITY PENN VENTILATOR GREENHECK	(1) GRAVITY BACKDRAFT DAMPER AT PENETRATION THROUGH BUILDING ENVELOPE. (2) ALUMINUM CONSTRUCTION.	(11) INTERLOCK OPERATION OF FAN WITH LIGHTS/OCCUPANCY SENSOR. (12) CONTINUOUS OPERATION.	(101) ALL CAPACITIES AT JOB SITE ELEVATION.

CEILING DIFFUSER, REGISTER & GRILLE SCHEDULE

SYMBOL	DESCRIPTION	SIZES		ACCEPTABLE MANUFACTURERS
		NOMINAL SIZE (NECK SIZE)	AIR FLOW (CFM)	
CD	CEILING DIFFUSER: FULL LOUVER FACE, REMOVABLE CORE, LAY-IN CEILING MOUNTING, 24" X 24" PANEL SIZE, 4-WAY PATTERN, ROUND NECK, ALUMINUM CONSTRUCTION NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC TEST 1062, OPTIONS & ACCESSORIES: BAKED ENAMEL WHITE FINISH. PROVIDE CEILING MOUNT TO MATCH CEILING TYPE.	6" DIA. 8" DIA. 10" DIA. 12" DIA. 14" DIA.	120 200 400 700 1000	KRUEGER 51400 TITUS PRICE
CG	CEILING EXHAUST GRILLE: PERFORATED FACEPLATE, ALUMINUM, CEILING MOUNTING, NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC 1062. 3/16" HOLES ON 1/4" STAGGERED CENTERS OPTIONS & ACCESSORIES: BAKED ENAMEL WHITE FINISH	6" X 6" 8" X 8" 10" X 10" 12" X 12" 14" X 14" 22" X 22"	130 260 450 700 900 2000	KRUEGER S580P PRICE TITUS
EG	CEILING EXHAUST GRILLE: EGGCRATE, 1/2"X1/2"X1/2", ALUMINUM NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC 1062. BAKED ENAMEL WHITE FINISH	SEE PLANS	SEE PLANS	KRUEGER EGC5 PRICE TITUS

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MECHANICAL SCHEDULES

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ME601

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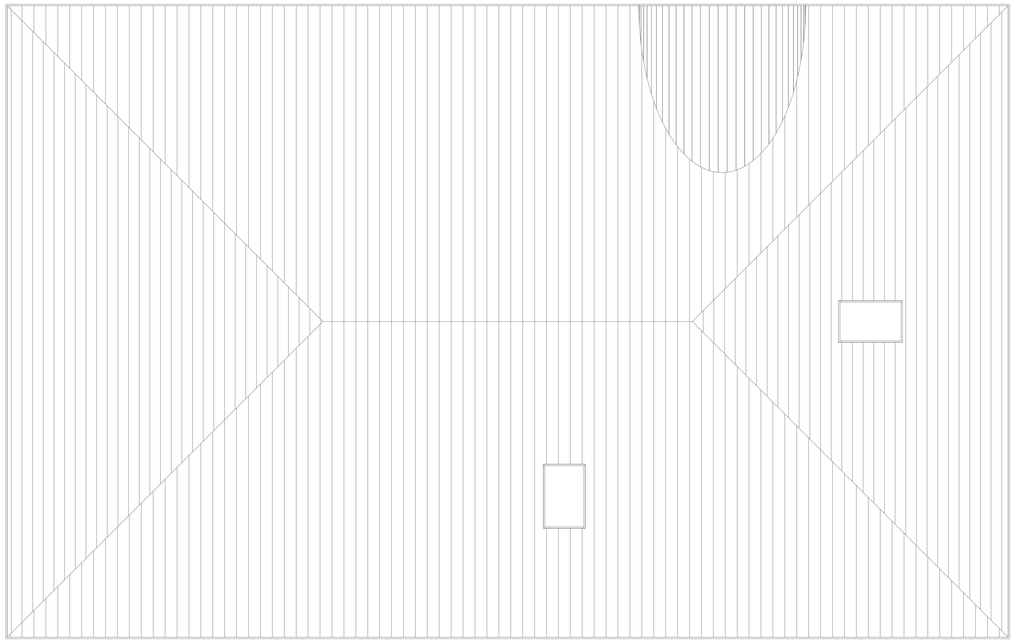
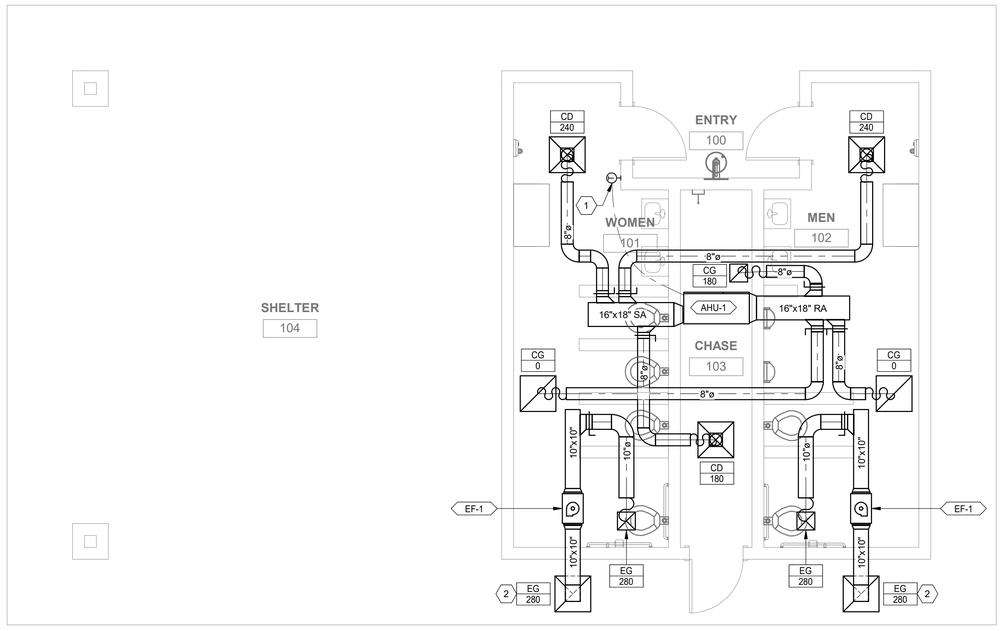


2 ROOF MECHANICAL PLAN
1/4" = 1'-0"



1 MAIN LEVEL MECHANICAL PLAN
1/4" = 1'-0"

SHEET KEYNOTES

1 PROVIDE TAMPER PROOF THERMOSTAT COVER WITH LOCK AND KEY. BASIS OF DESIGN HONEYWELL 2E379.

2 INSTALL EXHAUST GRILLE ON UNDERSIDE OF AWNING.

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MECHANICAL PLANS

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MH101

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MISC. SYMBOL LEGEND

SYMBOL	DESCRIPTION
# / SHEET	DETAIL INDICATOR: # INDICATES DETAIL NUMBER, SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
100	ROOM OR SPACE NUMBER.
1	KEYNOTE INDICATOR.
	REVISION INDICATOR.
CU-1	EQUIPMENT INDICATOR.
P-	PLUMBING FIXTURE INDICATOR.
TYPE / CFM / SIZE	DIFFUSER/GRILLE INDICATOR.
TYPE / SIZE	DIFFUSER/GRILLE INDICATOR.
	BREAK, STRAIGHT
	BREAK, ROUND.
	MATCH LINE INDICATOR
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE.
	CONTRACT LIMIT LINE: DASHDOT, WIDE LINE.
	NEW CONNECTION POINT TO EXISTING

PLUMBING SYMBOL LEGEND

SYMBOL	DESCRIPTION
C.B.	CATCH BASIN
M.H.	MANHOLE
W.H.	WALL HYDRANT
H.B.	HOSE BIBB
	CLEANOUT TO GRADE
	FLOOR CLEANOUT
	WALL CLEANOUT
	1/2 GRATE
	3/4 GRATE
	FULL GRATE

PLUMBING PIPING LEGEND

SYMBOL	DESCRIPTION
	SANITARY SEWER (SS)
	GREASE WASTE (GW)
	VENT (V)
AV	ACID VENT
AW	ACID WASTE
	DOMESTIC COLD WATER (DCW)
	DOMESTIC HOT WATER (DHW)
	DOMESTIC HOT WATER RECIRC (DHWR)
180	180°F HOT WATER
180R	180° HOT WATER RETURN
160	160° HOT WATER
160R	160° HOT WATER RETURN
RW	RAINWATER
SRW	SECONDARY RAINWATER
SD	STORM DRAIN
VTR	VENT THRU ROOF
#	NON POTABLE WATER
(E)	EXISTING PIPE
(E)	EXISTING PIPE TO BE REMOVED
IW	IRRIGATION WATER
SS	SANITARY SEWER
LPS	LOW PRESSURE STEAM
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
G	GAS
FP	FIRE PROTECTION
LPG	PROPANE
VAC	VACUUM
CA	COMPRESSED AIR
MA	MEDICAL AIR
O	OXYGEN
NO	NITROUS OXIDE
N	NITROGEN
CO2	CARBON DIOXIDE
EVAC	EVACUATION

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	VALVES, METERS, AND GAUGES
	SHUT OFF VALVE
	GATE VALVE
	CHECK VALVE
	AUTO 2-WAY VALVE
	AUTO 3-WAY VALVE
	GLOBE VALVE
	BALL VALVE
	RELIEF VALVE
	CHAIN OPERATED GATE VALVE
	PRESSURE REDUCING VALVE
	BUTTERFLY VALVE
	SOLENOID VALVE
	ANGLE VALVE
	VENTURI
	BALANCING OR PLUG COCK
	FLOW SETTER
	EXPANSION VALVE (REFRIG.)
	GAS COCK
MAV	MANUAL AIR VENT
	STRAINER
	GAUGE COCK
	FLEXIBLE CONNECTION
	PRESSURE GAUGE
	THERMOMETER
	VICTUALIC COUPLING
	REDUCER CONCENTRIC
	REDUCER ECCENTRIC
	REFRIGERANT SITE GLASS
	REFRIGERANT STRAINER
	REFRIGERANT FILTER DRIER
	90 DEG ELBOW UP
	90 DEG ELBOW DOWN
	90 DEG TEE UP
	90 DEG TEE DOWN
	UNION
	CAPPED PIPE
	ANCHOR
	FLOAT AND THERMOSTATIC TRAP

DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE, NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVED: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

(E)	EXISTING
(F)	FUTURE
AD	ACCESS DOOR
AIR COND	AIR CONDITION(-ING,-ED)
APD	AIR PRESSURE DROP
BD	BALANCING DAMPER
BHP	BRAKE HORSE POWER
BTU	BRITISH THERMAL UNIT
BTUH	BTU/HOUR
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	COOLING
COMP	COMPONENT
COND	CONDENS(-ER, -ING, -ATION)
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RECIRC
DIA	DIAMETER
DISCH	DISCHARGE
DP	DEPTH OR DEEP
EA	EXHAUST AIR
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL
ELEC	ELECTRIC
ELEV	ELEVATION
ENT	ENTERING
EVAP	EVAPORAT(-E, -ING, -ED, -OR)
EWT	ENTERING WATER TEMPERATURE
EXT	EXTERNAL
FC	FLEXIBLE CONNECT(-OR, -ION)
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
GAL	GALLON(S)
GE	GREASE EXHAUST
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HG	MERCURY
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTG	HEATING
HZ	HERTZ (FREQUENCY)
ID	INSIDE DIAMETER
IN	INCH
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LG	LENGTH
LH	LATENT HEAT
LRA	LOCKED ROTOR AMPS
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTUR(-ER, -ED)
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OZ	OUNCE
PD	PRESSURE DROP OR DIFFERENCE
PG	PROPOLENE GLYCOL
PH	PHASE
PPM	PARTS PER MILLION
PRESS	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
R	THERMAL RESISTANCE
RA	RETURN AIR
RECIRC	RECIRCULATE
REFR	REFRIGERATION
REQD	REQUIRED
RLA	RATED LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCW	SOFT COLD WATER
SF	SAFETY FACTOR
SH	SENSIBLE HEAT
SP	STATIC PRESSURE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
STD	STANDARD
SW	SOIL, WASTE
TA(R)	TRANSFER AIR (RETURN)
TA(S)	TRANSFER AIR (SUPPLY)
TD	TEMP. DROP OR DIFF.
TEMP	TEMPERATURE
THERM	THERMAL
TOT	TOTAL
TSTAT	THERMOSTAT
V	VOLT
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY TEMPERATURE
VEL	VELOCITY
VENT	VENT, VENTILATION
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
WB	WET BULB TEMP
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
WT	WEIGHT
WTR	WATER

PLUMBING GENERAL NOTES

1 THE PLUMBING DRAWINGS SHOW THE GENERAL DESIGN, ARRANGEMENT AND EXTENT OF THE PLUMBING SYSTEM. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THESE DRAWINGS DO NOT SHOW ALL OFFSETS, BENDS OR ELBOWS NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. CONTRACTOR SHALL MAKE SUCH SLIGHT ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE AND OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT. MAJOR DEVIATIONS SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL REQUIRE PRIOR APPROVAL BY THE DESIGN ENGINEER.

2 THE DRAWINGS AND SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER AND SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE AND NOT THE OTHER BEING FURNISHED AND INSTALLED AS THOUGH SHOWN AND CALLED OUT IN BOTH.

3 THE ENTIRE PLUMBING INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY ADOPTED BUILDING CODES, MECHANICAL CODE, PLUMBING CODE, ELECTRICAL CODE, AND ALL OTHER APPLICABLE CITY, COUNTY, STATE, AND FEDERAL CODES AND REGULATIONS IN EFFECT.

4 THE ENTIRE PLUMBING INSTALLATION SHALL CONFORM TO ANY CODES, RULES, REGULATIONS AND REQUIREMENTS OF THE BUILDING OWNER.

5 PRIOR TO FABRICATION AND INSTALLATION OF ANY PLUMBING COMPONENT THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL PLUMBING WORK WITH ALL OTHER BUILDING TRADES, INCLUDING BUILDING TRADES HIRED DIRECTLY BY THE OWNER. WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.

6 ALL PLUMBING INFORMATION IS NOT SHOWN ON THE PLUMBING DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENTS.

7 . THE CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW AND USE, WHERE APPROPRIATE, ALL THE PLUMBING DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE PLUMBING SYSTEM WITHOUT USING THE INCLUDED DETAILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

8 ANY PART OF THE PLUMBING INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

9 PROVIDE PROPER PROVISIONS FOR EXPANSION, CONTRACTION, OR MOVEMENT OF ALL PIPING.

10 PROVIDE LARGE ENOUGH PIPE SLEEVES THROUGH WALL OR FLOOR TO ALLOW FOR ANTICIPATED DIFFERENTIAL MOVEMENT.

11 ALL PIPING SHALL BE SUPPORT WITH CLEVIS HANGERS (MSS TYPE 1). PERFORATED METAL STRAPS OR PLASTIC STRAPPING (PLUMBER TAPE) SHALL NOT BE USED TO SUPPORT OR BRACE ANY PIPE.

12 PROVIDE PIPE HANGERS WITHIN 18-INCHES OF ALL CHANGES OF DIRECTION.

13 PROVIDE SWAY BRACING FOR ALL PIPING 4" AND LARGER AT ALL CHANGES IN DIRECTION GREATER THAN 45-DEGREES.

14 ALL STEEL CLEVIS HANGERS USED TO SUPPORT COPPER PIPING SHALL BE COPPER OR PLASTIC COATED.

15 COPPER PIPING SHALL NOT COME IN CONTACT WITH FIRE TREATED LUMBER. PROVIDE ½" THICK SLIP-ON CLOSED CELL INSULATION WHERE COPPER PIPING IS ADJACENT TO FIRE TREATED LUMBER. CLOSED CELL INSULATION SHALL EXTEND A MINIMUM OF 1-1/2" PAST LUMBER.

16 ALL EXPOSED PIPING SHALL BE INSTALLED IN A NEATLY ARRANGED MANNER PARALLEL TO THE BUILDING STRUCTURE.

17 ALL EXPOSED DOMESTIC WATER PIPE IN OCCUPIED SPACES SHALL BE POLISHED CHROME PLATED.

18 ALL EXPOSED DRAINAGE PIPING IN OCCUPIED SPACES INCLUDING TRAPS UNDER SINKS SHALL BE POLISHED CHROME PLATED.

19 DRAWINGS SHOW GENERAL ARRANGEMENT OF THE DRAIN WASTE AND VENT SYSTEM WITH THE REQUIRED CLEANOUTS. CONTRACTOR SHALL PROVIDE ALL ADDITIONAL CLEANOUTS AS REQUIRED BY THE PLUMBING CODE.

20 ALL SANITARY DRAINAGE SYSTEM PIPING 3" AND LARGER SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/8" PER FOOT.

21 ALL SANITARY DRAINAGE SYSTEM PIPING SMALLER THAN 3" SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/4" PER FOOT.

22 SLOPE VENT SYSTEM TOWARDS DRAINAGE SYSTEM.

23 SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.

24 ALL EQUIPMENT SHALL PROVIDE THE SCHEDULED PERFORMANCE AT THE JOB SITE ELEVATION.

25 FIXTURE AND EQUIPMENT MODEL NUMBERS SHOWN IN PLUMBING FIXTURE SCHEDULE AND PLUMBING EQUIPMENT SCHEDULE ARE SHOWN TO ESTABLISH THE TYPE OF PRODUCT THAT SHALL BE USED. THE SELECTED PRODUCT SHALL MEET THE SCHEDULED PERFORMANCE DATA SHOWN ON THE SCHEDULE EVEN IF A DIFFERENT MODEL IS SUPPLIED THAT IS DIFFERENT THAN THAT SCHEDULED.

26 ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE ALL NECESSARY FITTINGS, TRANSITIONS, VALVES AND OTHER DEVICES AND ACCESSORIES REQUIRED FOR A COMPLETE, WORKABLE INSTALLATION.

27 SEE "PLUMBING FIXTURE SCHEDULE" FOR INDIVIDUAL TRAPS, WASTE, VENT, AND DOMESTIC WATER PIPING FOR INDIVIDUAL FIXTURES.

28 ALL PLUMBING EQUIPMENT SHALL BE LISTED AND LABELED BY AN APPROVED TESTING AGENCY.

29 FIXTURES, EQUIPMENT AND PIPING INSTALLATION SHALL MEET NSF STANDARDS.

PLUMBING SHEET INDEX

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Grand Junction Park Restrooms Medium

project#:
date:

revisions :

title:

PLUMBING COVER SHEET

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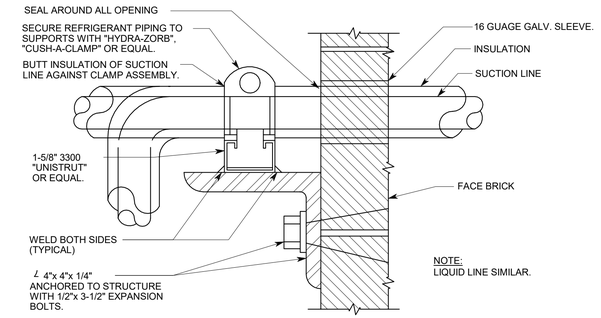

4 PIPE PENETRATION DETAIL

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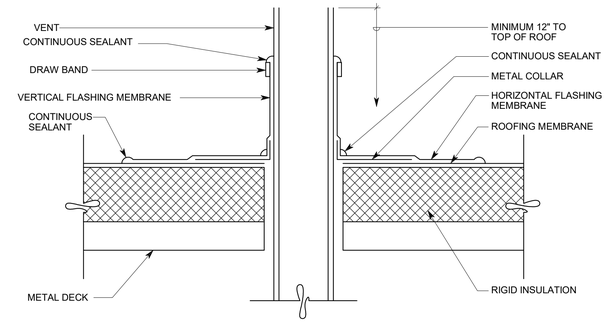

3 VENT THROUGH ROOF DETAIL

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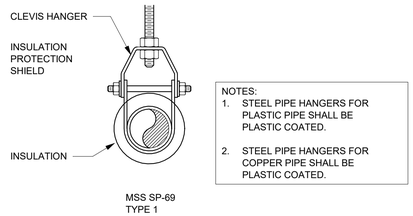

6 PIPE HANGER

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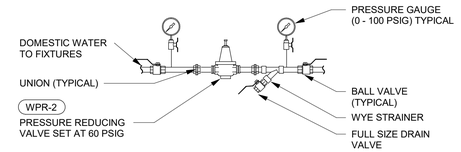

2 WATER PRESSURE REGULATOR DETAIL

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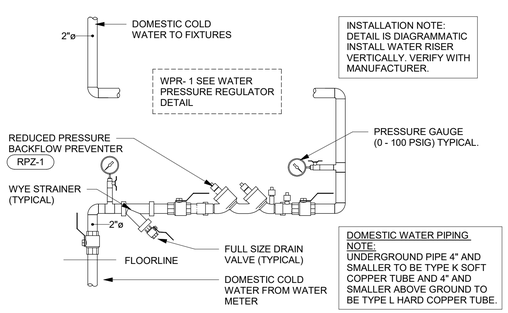

5 DOMESTIC WATER RISER

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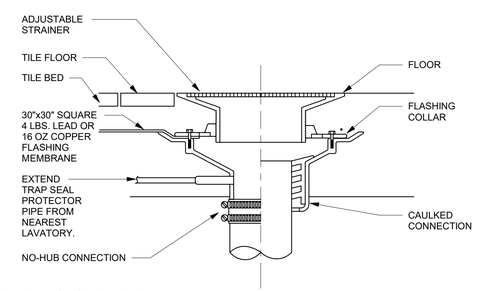

1 FLOOR DRAIN

SCALE: NTS

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PLUMBING DETAILS

sheet:

PE501

DOMESTIC COLD WATER DEMAND

EQUIPMENT	OCCUPANCY	TYPE OF SUPPLY CONTROL	QUANTITY	INDIVIDUAL WATER SUPPLY FIXTURE UNITS		TOTAL COLD WATER FIXTURE UNITS	TOTAL WATER SERVICE FIXTURE UNITS
				COLD WATER	TOTAL		
URINAL	PUBLIC	FLUSHOMETER VALVE	2	5.0	5.0	10	10
LAVATORY	PUBLIC	FAUCET	4	1.5	2.0	6	8
SINK	PUBLIC	FAUCET	0	2.3	3.0	0	0
DRINKING FOUNTAIN	PUBLIC	MIXING VALVE	1	.25	.25	0.3	0.25
WATER CLOSET, 1.6 GPF	PUBLIC	FLUSHOMETER VALVE	6	10.0	10.0	60	60
TOTAL WATER SUPPLY FIXTURE UNITS (WSFU)							78
CONVERSION FROM WSFU TO FLOW RATE (IPC TABLE E103.3(3)) (GPM)							58
ADDITIONAL FIXTURES (GPM)							0
CHAPTER 10 - WATER SUPPLY AND DISTRUBUTION, AND		SYSTEM IS PREDOMINATELY FLUSH VALVES					
TOTAL GPM							58
PIPE SIZE (WATER SUPPLY TO BUILDING) :						2"	
2012 IPC FIGURE E103.3(6) - FRICTION LOSS (PSI) FOR FAIRLY ROUGH PIPE						.5	PSIG / 100 FEET
2012 IPC FIGURE E103.3(6) - FLUID VELOCITY (FPS) FOR FAIRLY ROUGH PIPE						7	FPS

SANITARY SEWER DEMAND

EQUIPMENT	OCCUPANCY	QUANTITY	INDIVIDUAL DRAINAGE FIXTURE UNIT	TOTAL DRAINAGE FIXTURE UNITS
LAVATORY	PUBLIC	4	1.0	4
DRINKING FOUNTAIN	PUBLIC	1	.5	1
SHOWER	PUBLIC	0	2.0	0
URINAL	PUBLIC	2	4.0	8
SINK	PUBLIC	0	2.0	0
FLOOR DRAIN, 2" TRAP	PUBLIC	3	2.0	6
WATER CLOSET, 1.6 GPF FLUSHOMETER VALVE	PUBLIC	4	6.0	24
MISCELLANEOUS LOADS				0
TOTAL (WSFU):				42.5
2012 INTERNATIONAL PLUMBING CODE		SLOPE:	1/8" PER FOOT	4"
CHAPTER 11 - SANITARY DRAINAGE		REQUIRED PIPE SIZE		
TABLE 709.1 - DRAINAGE FIXTURE UNITS FOR FIXTURES & GROUPS		(180 DFU'S PERMITTED ON 4" MAIN)		
ADDITIONAL DRAINAGE CAPACITY FOR SELECTED BUILDING DRAIN SIZE		137.5		

WATER HAMMER ARRESTER SCHEDULE

SYMBOL	INLET SIZE (INCHES)	PDI SYMBOL	CAPACITY (WFU)
WHA-A	½	A	1-11
WHA-B	3/4	B	12-32
WHA-C	1	C	33-60
WHA-D	1	D	61-113

ACCEPTBLE MANUFACTURERS	NOTES / REMARKS
SOUIX CHIEF "HYDRA-ARRESTER" 652 MIFAB "MWH" PPP "SC" WATTS LF05	(1) ANSI/ASSE 1010 LISTED (2) LEAD FREE CONSTRUCTION (3) COPPR TUBE BODY; POLY PISTON; EPDM O-RINGS

PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND MODEL
WC	WATER CLOSET	INT.	4"	2"	1-1/4"	----	WALL MOUNTED, FLUSH VALVE, VITREOUS CHINA, ELONGATED, 1-1/2" REAR SPUD, BEDPAN LUGS, 15" RIM HEIGHT, SIPHON JET, 2-1/8" MINIMUM TRAPWAY, 1.6 GPF, SYSTEM PERFORMANCE MAP SCORE: 1,000 G. AT 1.28 GPF. LOW CONSUMPTION, DIAPHRAGM TYPE ELECTRONIC SENSOR FLUSH VALVE, 24V HARDWIRED, 1.6 GALLON PER FLUSH, PROVIDE TRANSFORMER. POLISHED CHROME PLATED BRASS. OPEN FRONT SEAT, LESS SEAT, HEAVY DUTY MOLDED PLASTIC, ELONGATED, STAINLESS STEEL HINGE POSTS.	KOHLER K-4349 SLOAN 140 ESS-1.6 BEMIS 1955C
WC-A	WATER CLOSET (ACCESSIBLE PUBLIC TOILET ROOM)	INT.	4"	2"	1-1/4"	----	WALL MOUNTED, FLUSH VALVE, VITREOUS CHINA, ELONGATED, 1-1/2" REAR SPUD, BEDPAN LUGS, 15" RIM HEIGHT, SIPHON JET, 2-1/8" MINIMUM TRAPWAY, 1.6 GPF, INSTALL MINIMUM 17" AFF. SYSTEM PERFORMANCE MAP SCORE: 1,000 G. AT 1.28 GPF. LOW CONSUMPTION, DIAPHRAGM TYPE ELECTRONIC SENSOR FLUSH VALVE, 24V HARDWIRED, 1.6 GALLON PER FLUSH, PROVIDE TRANSFORMER. POLISHED CHROME PLATED BRASS. OPEN FRONT SEAT, LESS SEAT, HEAVY DUTY MOLDED PLASTIC, ELONGATED, STAINLESS STEEL HINGE POSTS.	KOHLER K-4367 SLOAN 140 ESS-1.6 BEMIS 1955C
UR	URINAL (ACCESSIBLE)	INT.	2"	2"	1"	---	WALL MOUNTED, FLUSHING RIM, WASHOUT, VITREOUS CHINA. 3/4" REAR SPUD. ELECTRONIC, HARD WIRED, 24V, DIAPHRAGM TYPE FLUSH VALVE, 0.25 GALLON PER FLUSH POLISHED CHROME PLATED BRASS FLOOR MOUNTED SUPPORT, FLOOR BEARING PLATE, TOP AND BOTTOM BEARING STUDS	KOHLER K-4991-ER SLOAN 195 ESS J.R. SMITH 0615
LAV	LAVATORY (ACCESSIBLE)	1-1/4"	1-1/2"	1-1/2"	1/2"	1/2"	FIXTURE: VITREOUS CHINA, WALL MOUNTED, 4" CENTERS, ADA. FAUCET: SENSOR FAUCET, 24V HARD WIRED CONNECTION, LAMINAR FLOW RESTRICTOR, POLISHED CHROME PLATED LEAD FREE BRASS. DRAIN: CHROME PLATED GRID TYPE DRAIN, CHROME PLATED BRASS TAILPIECE, OFFSET TAILPIECE. TRAP: WHITE POLYVINYL CHLORIDE (PVC). AERATOR: POLISHED CHROME PLATED LEAD-FREE BRASS, LAMINAR FLOW, 0.5 GPM. STOPS: 1/2" I.P.S. x 3/8" O.D COMPRESSION, POLISHED CHROME PLATED HEAVY PATTERN LEAD FREE BRASS ANGLE BALL VALVE. SUPPLIES: PEX TUBING, FORMED NOSEPIECE WITH FLANGE, RUBBER WASHER OR GASKET, PLASTIC COMPRESSION SLEEVE, ASTM A112.18.6, ASTMF877. ENCLOSURE: RIGID POLYVINYL CHLORIDE ENCLOSURE, ADA ACCESSIBLE, UL LISTED	KOHLER K-2007 SLOAN ETF-600 MCGUIRE 155WCECO DEARBORN 9701-1 BRASSCRAFT KTCR19XC BRASSCRAFT P1-15A TRUEBRO "LAV SHIELD" 2018
MS	MOP SINK	3"	3"	2"	1/2"	1/2"	CAST - IN - PLACE CONCRETE. COORDINATE DIMENSIONS WITH OWNER. FLAT GRID DRAIN, POLISHED CHROME PLATED. POLISHED CHROME PLATED LEAD-FREE BRASS, ATMOSPHERIC VACUUM BREAKER, 3/4" THREADED HOSE CONNECTION. LEVER HANDLES OFFSET INLETS ARM WITH INTEGRAL CHECK PROVIDE ADDITIONAL HOSE BIB WATER CONNECTION FOR CHEMICAL DISPENSER. PROVIDE DOUBLE CHECK WITH VACUUM BREAKER ON WATER LINE SERVING ADDITIONAL HOSE BIB.	CHICAGO FAUCET 540-LD897SWXFABCP
DF	DRINKING FOUNTAIN	1-1/4"	1-1/2"	1-1/2"	1/2"	--	FIXTURE FURNISHED BY OWNER, INSTALLED BY THIS CONTRACTOR. SCHEDULE 40 PVC P-TRAP ANGLE BALL VALVE STOPS, 1/2" I.P.S. x 3/8" O.D COMPRESSION, POLISHED CHROME PLATED LEAD FREE BRASS, HEAVY PATTERN RIGID POLISHED CHROME PLATED COPPER TUBING SUPPLIES REMOTE CHILLER. 115V/1PH/60HZ	DEARBORN 9701-1 BRASSCRAFT KTCR19XC BRASSCRAFT P1-15A ELKAY ECH8

NOTES:
1. PROVIDE ALL FIXTURE CARRIERS FOR WALL MOUNTED PLUMBING FIXTURES.
2. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

PLUMBING FIXTURE SCHEDULE (DRAINS)

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION		MANUFACTURERS AND MODEL
FD	FLOOR DRAIN	2"	2"	2"	---	---	FIXTURE: STRAINER: TRAP:	PVC BODY, FLASHING COLLAR, TRAP PRIMER CONNECTION. 5" ROUND NICKEL BRONZE ADJUSTABLE. PVC P-TRAP.	JRS PRODUCTS 212 JRS PRODUCTS 210-12
CO	CLEANOUT	---	SAME AS PIPE	---	---	---	EQUIPMENT:	CAST IRON BLIND PLUG.	CHARLOTTE PIPE NH-50
FCO	FLOOR CLEANOUT	---	SAME AS PIPE	---	---	---	EQUIPMENT:	HEAVY DUTY NICKEL BRONZE TOP, BRASS PLUG	J. R. SMITH 4113S-NB
COTG	CLEANOUT TO GRADE	---	SAME AS PIPE	---	---	---	EQUIPMENT:	HEAVY DUTY NICKEL BRONZE TOP, BRASS PLUG	J. R. SMITH 4113S-NB
WCO	WALL CLEANOUT	---	SAME AS PIP	---	---	---	EQUIPMENT:	ROUND FLAT STAINLESS STEEL WALL PLATE	J.R. SMITH 4532S
ACCEPTABLE MANUFACTURERS:									
DRAINAGE (FLOOR DRAINS, ETC):		J.R. SMITH,	ZURN,	WATTS					

PLUMBING FIXTURE SCHEDULE (MISC. VALVES)

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION		MANUFACTURER AND MODEL
NFWH	NON-FREEZE WALL HYDRANT	---	---	---	3/4"	---	EQUIPMENT:	ENCASED, NON FREEZE, COMPRESSION CLOSURE VALVE, HINGED COVER WITH KEY LOCK 3/4" HOSE CONNECTION, INTEGRAL VACUUM BREAKER.	ZURN Z1305
WPR-1	WATER PRESSURE REGULATOR	---	---	---	2"	---	EQUIPMENT: CAPACITY:	LEAD FREE CONSTRUCTION, HIGH CAPACITY, WITH STRAINER 75 GPM AT 15 PSIG FALL OFF PRESSURE	WATTS LF223
RPZ-1	BACKFLOW PREVENTER	---	---	---	2"	---	EQUIPMENT:	REDUCED PRESSURE ZONE ASSEMBLY, LEAD FREE BRONZE BODY, BRONZE SEATS, OSY SEATED GATE VALVES, ASSE 1013 LISTED. 10 PSI DROP @ 75 GPM.	WATTS 909QT
BV	BALANCING VALVE	---	---	---	---	1/2"	EQUIPMENT:	CALIBRATED, LEAD FREE BRASS BODY, STAINLESS STEEL BALL, TEFLON SEAT RINGS, NSF 61-G COMPLIANT.	BELL & GOSSETT CB-LF
ACCEPTABLE MANUFACTURERS:									
BACKFLOW PREVENTER: BALANCING VALVE: PRESSURE REDUCING VALVES:		WATTS, ARMSTRONG, POWERS,	FEBCO, BELL & GOSSETT,						

ELECTRIC WATER HEATER SCHEDULE

SYMBOL	MANUFACTURER	MODEL NO.	FUEL	STORAGE CAPACITY (GALLONS)	RECOVERY CAPACITY			ELECTRICAL		INPUT CAPACITY (BTUH)	OPERATING WEIGHT (LBS)	OPTIONS & ACCESSORIES	NOTES / REMARKS
					GALLONS PER HOUR (GPH)	INLET WATER TEMP. (DEG. F.)	OUTLET WATER TEMP. (DEG. F.)	VOLTAGE/ PH/ HZ	WATTS				
WH	BRADFORD WHITE	RE250L6	ELECTRIC	47	21	40	140	240/1/60	5000	N/A	217	(1)(2)(3)	(A)(B)(C)
ACCEPTABLE MANUFACTURERS				OPTIONS AND ACCESSORIES (FURNISHED AND INSTALLED BY CONTRACTOR)							NOTES:		
A.O. SMITH LOCHINVAR STATE BRADFORD WHITE				(1) FULLY AUTOMATIC CONTROLS. (2) AGA/ASME TEMPERATURE AND PRESSURE RELIEF VALVE (3) DRAIN PAN. EXTEND DRAIN TO NEAREST FLOOR DRAIN.							(A) ASHRAE / IESNA 90.1 CERTIFIED (B) UL CERTIFIES TO ANSI Z21.10.3 (C) SET WATER HEATER OUTPUT TEMPERATURE AT 120 F.		

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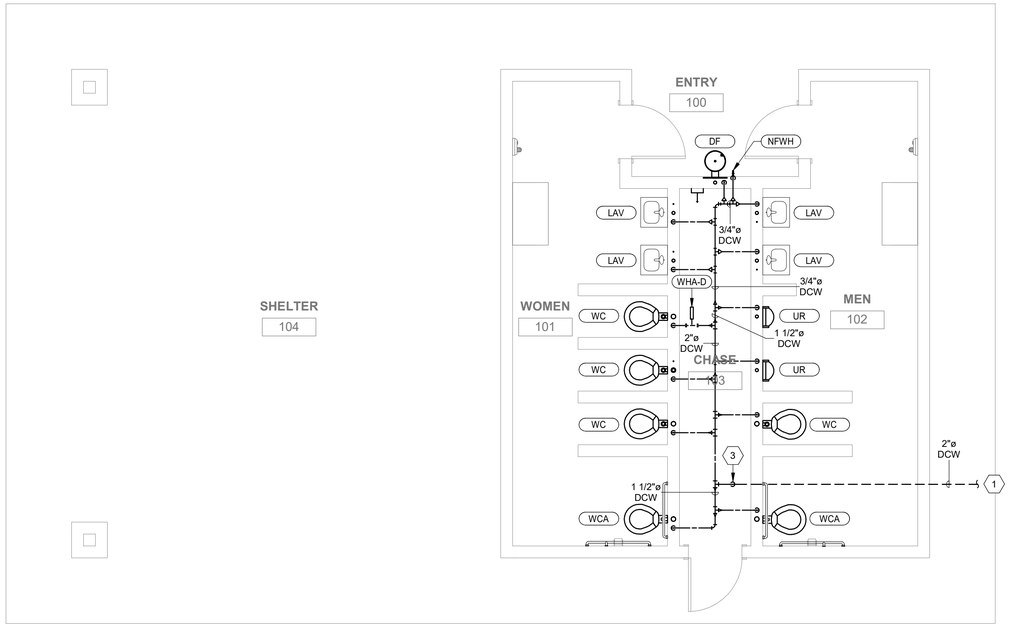
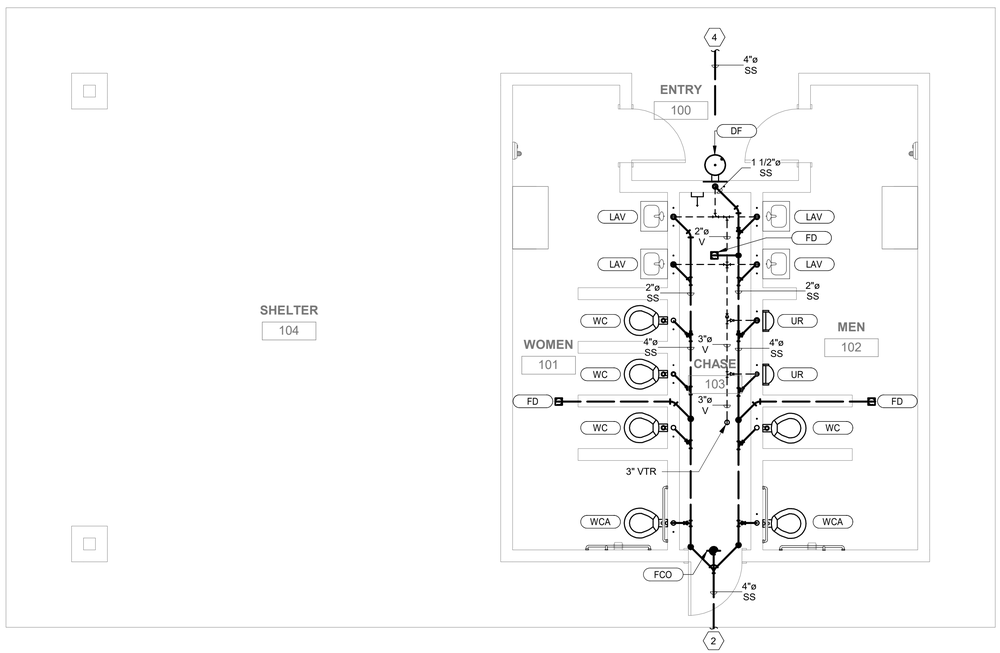


2 MAIN LEVEL PLUMBING PLAN - WATER

1/4" = 1'-0"



1 MAIN LEVEL PLUMBING PLAN - DWV

1/4" = 1'-0"

SHEET KEYNOTES

1 DOMESTIC WATER LINE TO CIVIL. ### CONSIDER STOP AND WASTE VALVE.

2 SANITARY MAIN TO CIVIL. MINIMUM INVERT DEPTH 36"

3 DOMESTIC WATER RISER. SEE DETAILS. SLOPE WATER LINES BACK TO MAIN RISER. PROVIDE ISOLATION VALVE AT BASE OF RISER AND HOSE BIBB ABOVE ISOLATION VALVE FOR DRAINING.

4 ALTERNATE LOCATION FOR WASTE LINE CONNECTION TO RESTROOMS. IF ROUTING IS REQUIRED TO ROUTE THIS WAY, DRAINAGE PIPING TO MIRROR LAYOUT INDICATED.

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SYMBOLS LEGEND

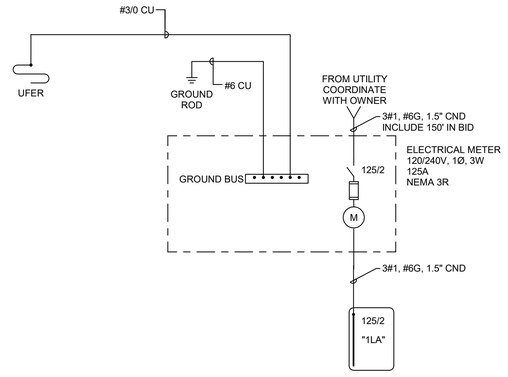
SYMBOL	DESCRIPTION
REFERENCE AND LINE SYMBOLS	
ROOM NAME 100	ROOM IDENTIFIER WITH ROOM NAME AND NUMBER.
1	KEYNOTE INDICATOR.
1	REVISION INDICATOR.
X-X XMDP	MECHANICAL EQUIPMENT INDICATOR. "X-X" INDICATES EQUIPMENT MARK SHOWN ON EQUIPMENT SCHEDULE. "XMDP" IDENTIFIES PANEL EQUIPMENT IS CIRCUITED TO. REFER TO EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.
	BREAK, STRAIGHT: TO BREAK PARTS OF DRAWING
	BREAK, ROUND
	NEW LINE: MEDIUM LINE.
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE
	EXISTING TO REMAIN LINE: THIN LINE.
	DEMOLITION LINE: DASHED, MEDIUM LINE
WIRING METHODS	
	WIRING.
	WIRING TURNED UP OR TOWARDS OBSERVER.
	WIRING TURNED DOWN OR AWAY FROM OBSERVER.
A-1,3,5	BRANCH CIRCUIT HOME RUN TO PANELBOARD: NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS. LETTER AND NUMBER NOTATIONS IDENTIFY PANEL AND CIRCUIT NUMBERS. USE #12 CONDUCTORS, EXCEPT #10 CONDUCTORS SHALL BE INSTALLED IF DISTANCES EXCEED THOSE SPECIFIED IN THE ELECTRICAL SPECIFICATIONS.
1 A-1,3,5	BRANCH CIRCUIT HOME RUN TO PANELBOARD: NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS. LETTER AND NUMBER NOTATIONS IDENTIFY PANEL AND CIRCUIT NUMBERS. NUMBER IN BOX REFERS TO THE CONDUCTOR AND CONDUIT SCHEDULE. FOR BRANCH WIRING USE #12 CONDUCTORS, EXCEPT #10 CONDUCTORS SHALL BE INSTALLED IF DISTANCES EXCEED THOSE SPECIFIED IN THE ELECTRICAL SPECIFICATIONS.
	LOW VOLTAGE WIRING: DIVIDE, MEDIUM LINE.
	CONDUIT STUB. DIMENSION RECORD DRAWINGS AND MARK.
1	CONDUCTOR & CONDUIT ("CC") SCHEDULE INDICATOR. REFER TO ONE-LINE DIAGRAM.
HC	ADA ACCESS PUSH PLATE
	JUNCTION BOX.
PB	PULL BOX.
C	JUNCTION BOX, CEILING.
	MECHANICAL EQUIPMENT CONNECTION. REFER TO EQUIPMENT SCHEDULE FOR REQUIREMENTS.

SYMBOLS LEGEND

SYMBOL	DESCRIPTION
WIRING DEVICES	
	RECEPTACLE, DUPLEX: NEMA 5-20R.
DF	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER, DRINKING FOUNTAIN: CONCEAL WATER COOLER RECEPTACLE BEHIND WATER COOLER. SEE MECHANICAL/PLUMBING SHOP DRAWINGS FOR INSTALLATION REQUIREMENTS.
W	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER, WET LABEL, "WEATHERPROOF IN USE": NEMA 5-20R.
	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER: NEMA 5-20R.
	RECEPTACLE, QUADRAPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER: NEMA 5-20R.
	RECEPTACLE, SPECIAL PURPOSE. PROVIDE RECEPTACLE TO MATCH EQUIPMENT PLUG.
X $	SWITCH, SINGLE POLE ("x" INDICATES FIXTURES CONTROLLED).
ELECTRICAL POWER AND DISTRIBUTION	
M	METER.
	DISCONNECT SWITCH, FUSED.
	DISCONNECT SWITCH, UNFUSED.
	STARTER, COMBINATION WITH DISCONNECT SWITCH.
	STARTER OR MOTOR CONTROLLER.
	PUSHBUTTON.
	PANELBOARD CABINET, SURFACE MOUNTED, 1 SECTION.
	LIGHTING CONTROL STATION.
$ST	SWITCH, TOGGLE MOTOR STARTER WITH OVERLOAD PROTECTION.

SYMBOLS LEGEND

SYMBOL	DESCRIPTION
LIGHTING (REFER TO FIXTURE SCHEDULE FOR SYMBOLS)	
(W-3)	FIXTURE IDENTIFICATION: (W-3) INDICATES FIXTURE TYPE AS SCHEDULED.
LIGHTING CONTROL	
	OCCUPANCY SENSOR, DUAL TECHNOLOGY, OMNI-DIRECTIONAL, CEILING.
	OCCUPANCY SENSOR, DUAL TECHNOLOGY, WALL.
a,b $	LOW VOLTAGE DIGITAL LIGHTING CONTROL SWITCH: LETTER "a,b" INDICATES ZONING WHERE SHOWN (REFER TO PLANS, SCHEDULES, AND DETAILS FOR EXACT BUTTON CONFIGURATION AND PROGRAMMING REQUIREMENTS)
DC	DIGITAL LIGHTING DIMMING CONTROLLER
RC	DIGITAL LIGHTING ROOM CONTROLLER
L X	LIGHTING SPACE CONTROL TYPE. X INDICATES TYPE. SEE SCHEDULE / DIAGRAM.



B2 ONE-LINE DIAGRAM

SCALE: 1/8" = 1'-0"

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

1P	SINGLE POLE
1PH	SINGLE-PHASE
1WAY	ONE-WAY
2/C	TWO-CONDUCTOR
2WAY	TWO-WAY
3/C	THREE-CONDUCTOR
3WAY	THREE-WAY
4OUT	QUADRUPLE RECEPTACLE OUTLET
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4W	FOUR-WIRE
4WAY	FOUR-WAY
A	ABOVE COUNTER
AC	ARMORED CABLE
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
ALUM	ALUMINUM
AMP	AMPERE
ANN	ANNUNCIATOR
AP	ACCESS POINT (WIRELESS DATA)
AR	AS REQUIRED
ASC	AMPS SHORT CIRCUIT
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAGE
BB XFMR	BUCK-BOOST TRANSFORMER
C	CEILING MOUNTED
CATV	COMMUNITY ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CCBA	CUSTOM COLOR AS SELECTED BY ARCHITECT
CCTV	CLOSED CIRCUIT TELEVISION
CF/CI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED
CF/OI	CONTRACTOR FURNISHED/ OWNER INSTALLED
CFBA	CUSTOM FINISH AS SELECTED BY ARCHITECT
CKT	CIRCUIT
CM	CONSTRUCTION MANAGER
CND	CONDUIT
CO	CONVENIENCE OUTLET
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
CTV	CABLE TELEVISION
CU	COPPER
dBA	UNIT OF SOUND LEVEL
DPDT	DOUBLE POLE, DOUBLE THROW
DS	DISCONNECT SWITCH
EA	EACH
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRIC NONMETALLIC TUBING
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
EX	EXISTING
F	FURNITURE MOUNTED
FA	FIRE ALARM
FCP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
FMC	FLEXIBLE METAL CONDUIT
FOB	FREIGHT ON BOARD
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	GROUND
GEN	GENERATOR
GFCI	GROUND FAULT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HD	HEAVY DUTY
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSE POWER
HPF	HIGH POWER FACTOR
HPS	HIGH PRESSURE SODIUM
HV	HIGH VOLTAGE
HZ	HERTZ
I/O	INPUT/ OUTPUT
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
IN/IS	INSULATED/ ISOLATED
IR	INFRARED
J-BOX	JUNCTION BOX
kV	KILOVOLT
kVA	KILOVOLT AMPERE
kVAR	KILOVOLT AMPERE REACTIVE
kW	KILOWATT
kWh	KILOWATT HOUR
LED	LIGHT EMITTING DIODE
LFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT
LFNC	LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT
LPS	LOW PRESSURE SODIUM
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LV	LOW VOLTAGE
MATV	MASTER ANTENNA TELEVISION SYSTEM
MAX	MAXIMUM
MC	METAL CLAD
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTION
MDP	MAIN DISTRIBUTION PANEL
MG	MOTOR GENERATOR
MH	MANHOLE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIOANL ELECTRICAL MANUFACTURERS ASSOCIATION
NFC	NATIONAL FIRE CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OCP	OVER CURRENT PROTECTION
OF/CI	OWNER FURNISHED/ CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED/ OWNER INSTALLED
OFP	OBTAIN FROM PLANS
OH DR	OVERHEAD (COILING) DOOR
OL	OVERLOAD
PB	PUSHBUTTON
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
PT	POTENTIAL TRANSFORMER
PTZ	PAN/TILT/ZOOM
QTY	QUANTITY
R	REMOVE
RCP	REFLECTED CEILING PLAN
RMC	RIGID METAL CONDUIT
RNC	RIGID NONMETAL CONDUIT
RPM	REVOLUTIONS PER MINUTE
RR	REMOVE AND RELOCATE
S/S	START/STOP
SCA	SHORT CIRCUIT AMPS
SCBA	STANDARD COLOR AS SELECTED BY ARCHITECT
SF	SQUARE FOOT (FEET)
SFBA	STANDARD FINISH AS SELECTED BY ARCHITECT
SPD	SURGE PROTECTIVE DEVICE
SPDT	SINGLE POLE, DOUBLE THROW
SPEC	SPECIFICATION
SPST	SINGLE POLE, SINGLE THROW
ST	SINGLE THROW
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TL	TWIST LOCK
TP	TELEPHONE POLE
TP	TWISTED PAIR
TTB	TELEPHONE TERMINAL BOARD
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSER
TYP	TYPICAL
UF	UNDERFLOOR
UGND	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPERE
VFC/VFD	VARIABLE FREQUENCY MOTOR CONTROLLER
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER

ELECTRICAL SHEET INDEX

GENERAL ELECTRICAL NOTES

1. CLARIFICATION METHODS: AT THE TIME OF BIDDING, BIDDERS SHALL FAMILIARIZE THEMSELVES WITH THE DRAWINGS AND SPECIFICATIONS. ANY QUESTIONS, MISUNDERSTANDINGS, CONFLICTS, DELETIONS, DISCONTINUED PRODUCTS, CATALOG NUMBER DISCREPANCIES, DISCREPANCIES BETWEEN THE EQUIPMENT SUPPLIED AND THE INTENT OR FUNCTION OF THE EQUIPMENT, ETC, SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER IN WRITING FOR CLARIFICATION PRIOR TO ISSUANCE OF THE FINAL ADDENDUM AND BIDDING OF THE PROJECT. WHERE DISCREPANCIES OR MULTIPLE INTERPRETATIONS OCCUR, THE MOST STRINGENT (WHICH IS GENERALLY RECOGNIZED AS THE MOST COSTLY) THAT MEETS THE INTENT OF THE DOCUMENTS SHALL BE ENFORCED.

2. OWNER FURNISHED ITEMS: THE OWNER WILL FURNISH MATERIAL AND EQUIPMENT AS INDICATED IN THE CONTRACT DOCUMENTS TO BE INCORPORATED INTO THE WORK. THESE ITEMS ARE ASSIGNED TO THE INSTALLER AND COSTS FOR RECEIVING, HANDLING, STORAGE, IF REQUIRED, AND INSTALLATION ARE INCLUDED IN THE CONTRACT SUM.
   A. THE INSTALLER'S RESPONSIBILITIES ARE THE SAME AS IF THE INSTALLER FURNISHED THE MATERIALS OR EQUIPMENT.
   B. THE OWNER WILL ARRANGE AND PAY FOR DELIVERY OF OWNER FURNISHED ITEMS FREIGHT ON BOARD JOB SITE AND THE INSTALLER WILL INSPECT DELIVERIES FOR DAMAGE. IF OWNER FURNISHED ITEMS ARE DAMAGED, DEFECTIVE OR MISSING, DOCUMENT DAMAGED ITEMS WITH THE TRANSPORT COMPANY AND THE OWNER WILL ARRANGE FOR REPLACEMENT. THE OWNER WILL ALSO ARRANGE FOR MANUFACTURER'S FIELD SERVICES, AND THE DELIVERY OF MANUFACTURER'S WARRANTIES AND BONDS TO THE INSTALLER.
   C. THE INSTALLER IS RESPONSIBLE FOR DESIGNATING THE DELIVERY DATES OF OWNER FURNISHED ITEMS AND FOR RECEIVING, UNLOADING AND HANDLING OWNER FURNISHED ITEMS AT THE SITE.THE INSTALLER IS RESPONSIBLE FOR PROTECTING OWNER FURNISHED ITEMS FROM DAMAGE, INCLUDING DAMAGE FROM EXPOSURE TO THE ELEMENTS, AND TO REPAIR OR REPLACE ITEMS DAMAGED AS A RESULT OF HIS OPERATIONS.

3. EXPOSED STRUCTURE AREAS (EXCLUDING MECHANICAL, ELECTRICAL, AND COMMUNICATION SPACES): INSTALL RACEWAYS BETWEEN DECK AND STRUCTURE WHEREVER POSSIBLE IN EXPOSED STRUCTURE CEILING AREAS. ROUTE RACEWAYS IN CONCEALED AREAS WHEREVER POSSIBLE. REFER ALL CONDITIONS WHERE RACEWAYS MUST BE INSTALLED WHICH CANNOT COMPLY WITH THESE REQUIREMENTS TO THE ARCHITECT.

4. SUBMITTALS: PROVIDE ORIGINAL ELECTRONIC PDF FORMAT, BOUND, BOOKMARKED (EACH SECTION AND PRODUCT), AND HIGHLIGHTED. JOB NAME AND SUBCONTRACTOR SHALL BE ON THE FRONT COVER. PREPARE INDEX OF EQUIPMENT SUBMITTED IN EACH TAB.

5. REFLECTED CEILING PLANS: COORDINATE THE LOCATION OF LIGHT FIXTURES WITH THE ARCHITECTURAL REFLECTED CEILING PLANS. REFER ALL DISCREPANCIES TO THE ARCHITECT AND ENGINEER.

6. ALL WORK SHALL BE DONE ACCORDING TO THE CURRENT NATIONAL ELECTRIC CODE (NEC), IBC, NFPA, AND IFC. COMPLIANCE AND FINAL APPROVAL IS SUBJECT TO THE ON SITE FIELD INSPECTION OF THE AHJ.

DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE, NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVED: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

TECHNOLOGY SYSTEMS: THE TERM "TECHNOLOGY SYSTEMS" IS USED TO DESCRIBE ALL LOW VOLTAGE SYSTEMS GENERALLY REFERRED TO AS "SPECIAL SYSTEMS". THESE SYSTEMS INCLUDE BUT ARE NOT NECESSARILY LIMITED TO ALL SYSTEMS WHICH UTILIZE VOLTAGES OF LESS THAN 71 VOLTS SUCH AS SOUND SYSTEMS, VIDEO SYSTEMS, TV SYSTEMS, SECURITY SYSTEMS, VOICE AND DATA CABLING SYSTEMS, ETC...

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project:

Grand Junction Park Restroom Medium

project#:
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title:

ELECTRICAL COVER SHEET

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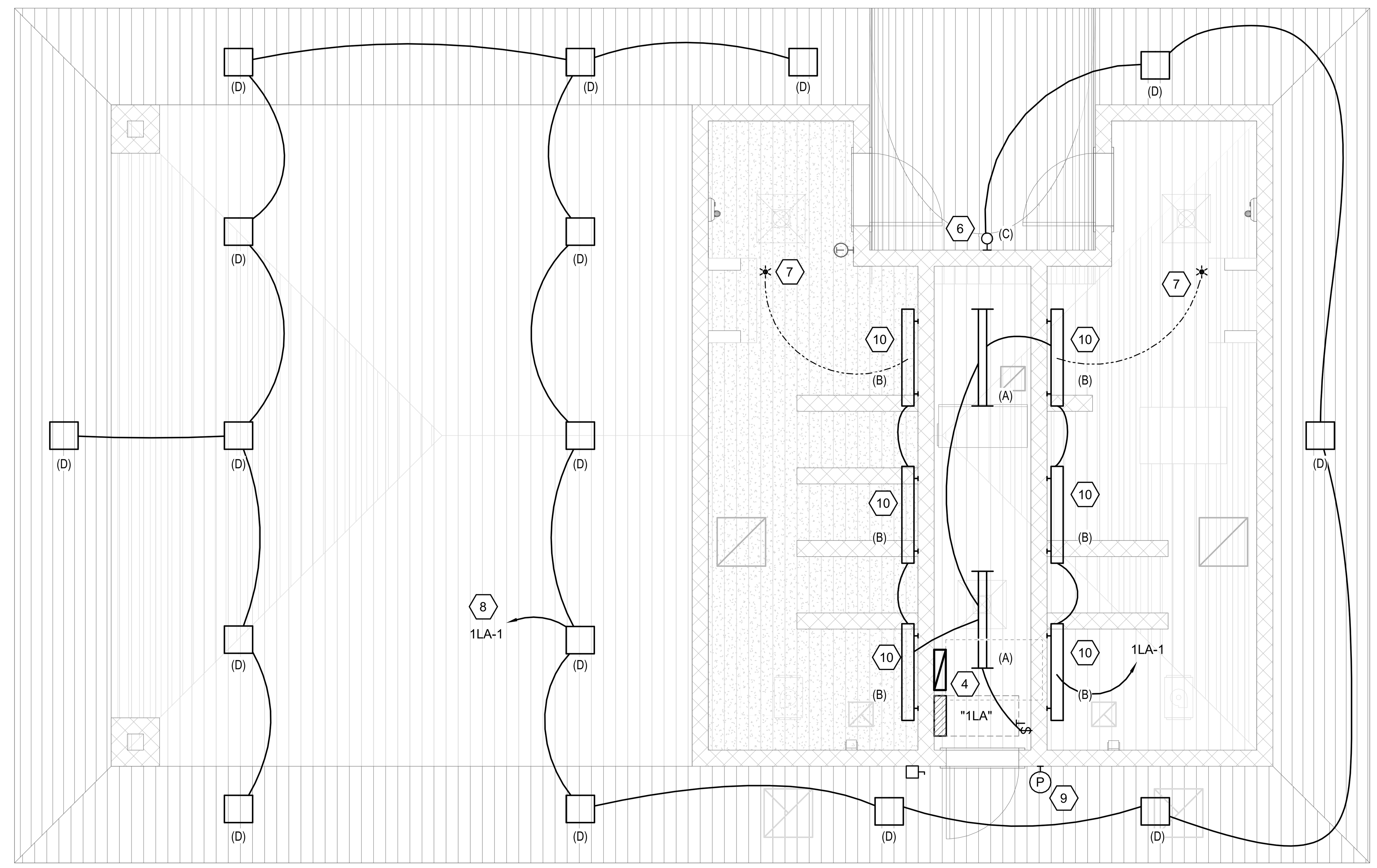
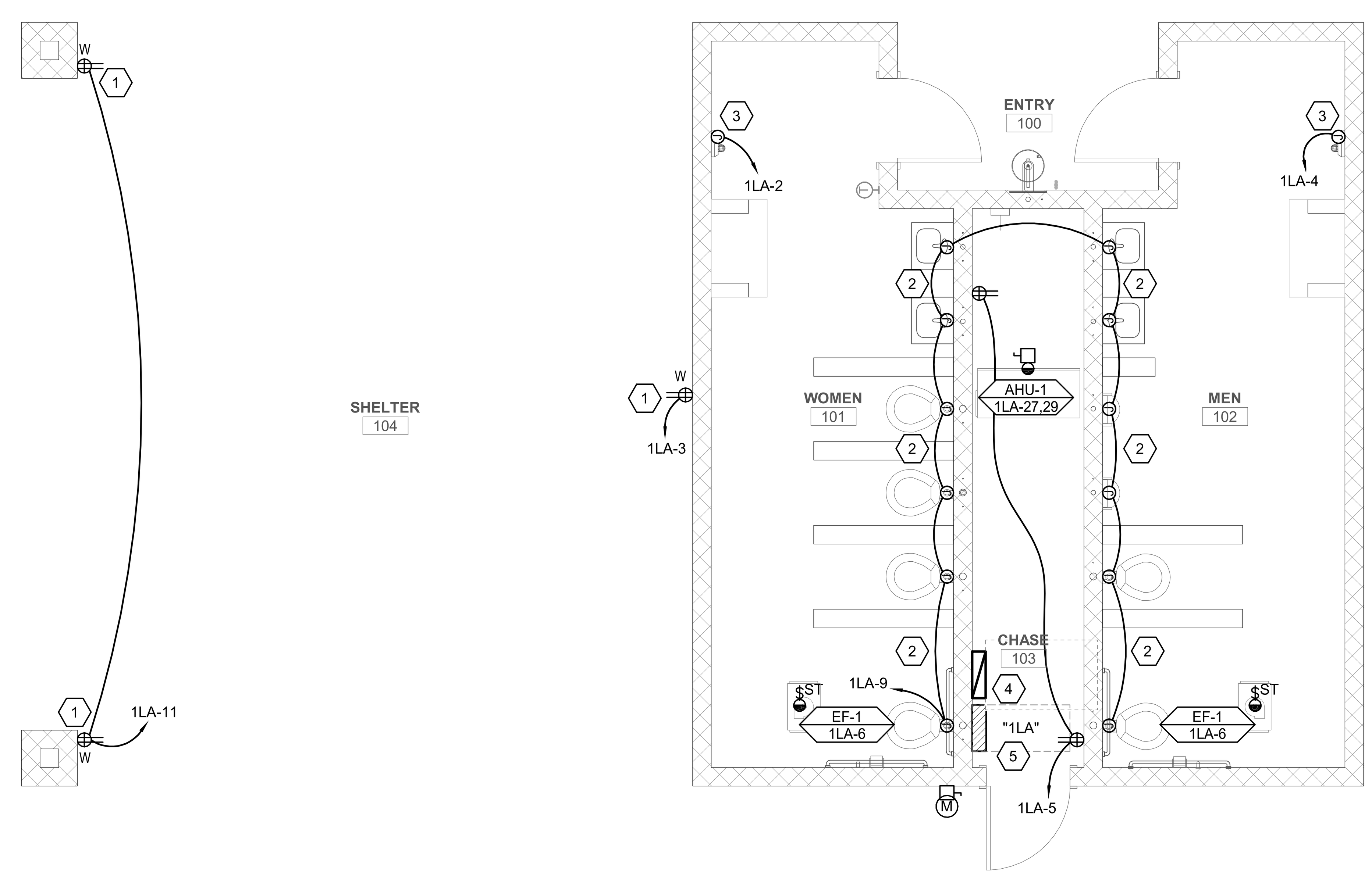


C2 LEVEL 1 LIGHTING PLAN
SCALE: 1/4" = 1'-0"



A2 LEVEL 1 POWER PLAN
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

SHEET KEYNOTES

1 EXTERIOR RECEPTACLES AND PLUG COVERS SHALL BE WEATHERPROOF TO COMPLY WITH NEC REQUIREMENTS. THEY SHALL BE MORTARED-IN TYPE, FLUSH MOUNTED AND LOCKABLE. ALL EXTERIOR RECEPTACLE AND PLUG COVERS SHALL BE OPENED BY A SINGLE KEY. EXTERIOR RECEPTACLE AND PLUG COVERS SHALL BE MADE OF HEAVY-DUTY CAST ALUMINUM. COORDINATE COLOR WITH THE ARCHITECT/OWNER. INSTALL CONDUITS FEEDING THE SHELTER AREA RECEPTACLES UNDER THE FLOOR SLAB.

2 PROVIDE ELECTRICAL CONNECTIONS TO FAUCET AND FLUSH VALVES. COORDINATE EXACT LOCATION WITH THE PLUMBING INSTALLERS. ALL CONNECTIONS AND CONDUITS SHALL BE RECESSED AND ACCESSIBLE ONLY IN THE PLUMBING CHASE.

3 PROVIDE ELECTRICAL CONNECTIONS TO HAND DRYERS. CIRCUIT WITH 2#10, #10G IN 0.75" CONDUIT. COORDINATE EXACT LOCATION WITH INSTALLERS PRIOR TO ROUGH-IN.

4 PROVIDE LIGHTING CONTACTOR PANEL WITH ASTRONOMICAL CLOCK OR EXTERIOR RATED ROOM CONTROLLER WITH ASTRONOMICAL CLOCK FOR LIGHTING CONTROL. COORDINATE PROGRAMMING OF THE LIGHTING WITH THE OWNER.

5 STUB (2) 1" PVC CONDUITS AND (4) 2" PVC CONDUITS FROM PANELBOARD LOCATION TO 5' BEYOND ADJACENT CONCRETE. MARK GPS COORDINATES OF CONDUITS ON RECORD DRAWINGS FOR FUTURE USE.

6 MOUNT FIXTURE AT 10'-4".

7 PROVIDE VANDAL RESISTENT OCCUPANCY SENSOR. MOUNT SENSOR AS HIGH AS POSSIBLE TO AVOID VANDALISM. PROVIDE SENSOR WITH AUXILIARY RELAY. CONNECT AUXILIARY RELAY TO EXHAUST FAN FOR CONTROL.

8 CIRCUIT THROUGH LIGHTING CONTROLLER. COORDINATE PROGRAMMING WITH THE OWNER.

9 PROVIDE EXTERIOR RATED PHOTOCELL, PRECISION #T-168 OR APPROVED EQUIVALENT.

10 MOUNT FIXTURES WITH THE TOP OF THE FIXTURE TIGHT AGAINST THE CEILING.

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ELECTRICAL PLANS

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INTERIOR LIGHTING FIXTURE SCHEDULE

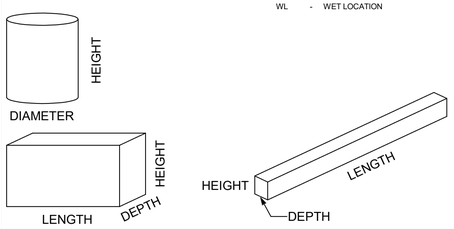
ABBREVIATIONS

MOUNTING

- B - BASE
- C - CEILING
- F - FLANGE
- G - GRID
- P - PENDANT
- PL - POLE
- R - RECESSED
- S - SURFACE
- W - WALL

LUMINAIRE OPTIONS

- ARHR - AIR RETURN AND HEAT REJECTION
- DL - DAMP LOCATION
- EQC - EARTHQUAKE CLIPS
- F - FUSING
- HLD - HINGED AND LATCHED DOOR
- HS - HOUSE SIDE SHIELD
- PS - PHOTOCELL SWITCH
- QRS - QUARTZ RESTRIKE
- ST - STATIC
- WG - WIRE GUARD
- WL - WET LOCATION



FINISH

- MW - MATTE WHITE
- BL - BLACK
- SL - SILVER
- GL - GOLD
- CL - CLEAR
- PW - PAINTED WHITE
- EA - EXTRUDED ALUMINUM
- S - STEEL
- GS - GALVANIZED STEEL
- C - CAST
- CBA - COLOR BY ARCHITECT
- SCBA - STANDARD COLOR BY ARCHITECT
- CCA - CUSTOM COLOR BY ARCHITECT
- FS 209D - MEETS FEDERAL STANDARD 209D
- TP - THERMALLY PROTECTED
- FL - FLUSH
- R - REGRESS
- M - MITERED

DIFFUSER/LENS

- #A - ACRYLIC #THICK
- #OA - ACRYLIC #THICK (OPAL)
- GC - GLASS (CLEAR)
- GO - GLASS (OPAL)
- GF - GLASS (FROSTED)
- SGL - SOFT GLOW LENS
- HPL - HIGH PERFORMANCE LENS
- DO - DROP OPAL
- CGL - CONVEX GLASS LENS
- S - SATIN LENS

REFLECTOR

- OP - NONE/OPEN
- SP - SPECULAR
- SS - SEMI-SPECULAR
- D - DIFFUSE (WHITE ENAMEL)
- SC - SPECULAR (COLORED)
- PR - PRISMATIC
- FDR - FULL DEPTH REFLECTOR
- DS - DIFFUSE (SEMI SPECULAR) SILVER
- LI - LOW IRIDESCENT
- IR - IRIDESCENT
- SL - SILVER
- GL - GOLD
- CA - CLEAR ALZAK

NOTES

GENERAL NOTES

1. PROVIDE UNIT PRICES AND FIXTURE BRAND SELECTED FOR ADD/DELETE CHANGES FOR EACH FIXTURE TYPES SHOWN WITHIN 48 BUSINESS HOURS OF THE BID DATE. FAILURE TO COMPLY WITH THIS REQUIREMENT MAY DISQUALIFY THE PRODUCTS AND EMPOWER THE ENGINEER TO DETERMINE FAIR VALUE FOR FIXTURE AND INSTALLATION CHANGES, WITHOUT FURTHER INPUT FROM THE CONTRACTOR OR INSTALLER.
2. CONTRACTOR ALLOWANCE PRICES ARE ACCURATE WHEN THIS JOB WAS SPECIFIED, CONTRACTOR AND ELECTRICAL DISTRIBUTOR SHALL VERIFY THIS ALLOWANCE AND REPORT ANY PROBLEMS TO THE ENGINEER BEFORE THE BID. ALLOWANCE PRICE MAY OR MAY NOT INCLUDE LAMP(S) OR FREIGHT AS NOTED, AND DO NOT INCLUDE ANY TAXES.
3. SUBSTITUTIONS AND/OR EQUAL FIXTURES MUST RECEIVE APPROVAL PRIOR TO BIDDING, THEY MUST BE SUBMITTED TO THE ENGINEER NO LESS THAN 2 WEEKS PRIOR TO BID OPENING.
4. SAMPLES MUST BE PROVIDED FOR ANY AND ALL FIXTURES UPON A/E REQUEST PRIOR TO RELEASING FIXTURES.
5. ALL FIXTURES SHALL BE LISTED AND APPROVED FOR THEIR INTENDED USE AND LOCATION.
6. VERIFY THE PROPER MOUNTING KITS OR ACCESSORIES TO FACILITATE INSTALLATION AS SHOWN AT EACH LOCATION ON THE DRAWINGS.
7. COMPLY WITH THE "INTERIOR LIGHTING" SECTION OF THE SPECIFICATIONS.
8. REFER TO SPECIFICATIONS FOR IMPORTANT TECHNICAL REQUIREMENTS FOR LIGHTING FIXTURES, DRIVERS, AND LAMPS.
9. ALL LIGHT FIXTURES TO BE EITHER "DLC" OR "LIGHTING FACTS" LISTED OR TO BE APPROVED BY ARCHITECT/ENGINEER AND OWNER.

ID	DESCRIPTION	NOMINAL SIZE				MOUNTING	TYPE	COLOR TEMP	CRI	DRIVER CONFIGURATION	VOLTAGE	WATTS	FINISH	FIXTURE LUMENS	DIFFUSER/LENS	REFLECTOR	OPTIONS	NOTES	MANUFACTURER (CATALOG SERIES)		
		LENGTH	DEPTH	HEIGHT	DIAMETER/ APERTURE														OPTION 1	OPTION 2	OPTION 3
(A)	GENERAL PURPOSE LENSED LED STRIPLIGHT.	4'	5"	4"		P	LED	3500K		LED DRIVER	120V	42		5000					COLUMBIA (LCL-4-35-ML-E-U)		
(B)	VANDAL RESISTANT CORNER MOUNT LINEAD LED FIXTURE.	4'	9"	9"			LED	3500K		LED DRIVER	120V	73		6500					FAIL-SAFE (FCC-X-4-LD4-2-STD-35-1 20-80/85-EDC-1-WL)		
(C)	PERIMETER LED WALL PACK.	12"	7"	6"		W	LED	5000K		LED DRIVER	120V	17		1700					HUBBELL (NRG-356L-5K-U-PC)		
(D)	SURFACE MOUNT LED FIXTURE.	14"	14"	8"		GS	LED	5000K		LED DRIVER	120V	35		4400					HUBBELL (NRG-4-30LU-5K-035-SCB A)		

EQUIPMENT SCHEDULE

GRAND JUNCTION RESTROOM

EQUIPMENT SCHEDULE KEY

E - DIVISION 26
Q - FURNISHED WITH EQUIPMENT
* - COORDINATE WITH THE DIVISION 23 TEMPERATURE CONTROL INSTALLER
** - AUTOMATIC CONTROL WIRING BY DIVISION 23

NOTES:
1. NEMA 3R
2. TOGGLE SWITCH W/ THERMAL OVERLOAD
3. PROVIDE FUSED DISCONNECT ELEVATOR POWER MODULE WITH SHUNT TRIP
4. CONTRACTOR TO PERFOM FINAL CONNECTION TO LINE VOLTAGE THERMOSTATS
5. TOGGLE SWITCH W/BACNET INTERFACE.
6. INDOOR UNITS FED FROM OUTDOOR UNIT. PROVIDE DISCONNECTS FOR BOTH.
7. PROVIDE SWITCH WITH BACNET MS/TP CAPABILITY.
8. PROVIDE LABEL ON DISCONNECT "DISCONNECT OUTDOOR UNIT PRIOR TO INDOOR."
9. LINE VOLTAGE THERMOSTAT ON WALL.
10. PROVIDE EXPLOSION PROOF DEVICES AND WIRING METHODS.
11. PROVIDE DUAL-REDUNDANT 100% RATED VFD'S FOR AIR HANLDER.
12. PROVIDE MANUAL STARTER WITH THERMAL OVERLOAD AND RELAY FOR ATC/BAS CONTROL.

MARK	QTY	ITEM DESCRIPTION	LOAD DATA							WIRE AND CONDUIT SIZE	OVERCURRENT PROTECTION			DISCONNECT			STARTER								NOTES	MARK
			HP	kW	MCA	FLA	VOLT	PH	Hz		FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	SIZES	SELECTOR SWITCH	PILOT LAMP	NORMALLY OPEN CONTACT	NORMALLY CLOSED CONTACT	PHASE FAILURE RELAY		
AHU-1	1	AIR HANDLING UNIT	-	6	-	27	240	1	60	2 #8, #10 GR 1" CND	E	30/2 CB	1LA	E	30A/2P NF	ADJ TO EQUIP	Q	-	-	-	-	-	-	-		AHU-1
EF-1	2	EXHAUST FAN	1/6	-	-	4.4	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	1LA	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	-	-		EF-1

PANEL: "1LA"

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE AND TYPE:	FED FROM:	CABINET:	LOCATION:	NOTES:
120/240 V, 1 PH 3 WIRE	22" W x 6" D, BOLT-ON	100 AMPERE		SURFACE	CHASE 103	

ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR — **AIC RATING:**

CKT NO	OCP AMP	OCP POLE	OCP BKR	LOAD (kVA) LTG	LOAD (kVA) PWR	LOAD (kVA) CO	DESCRIPTION	PHASE LOAD A	PHASE LOAD B	DESCRIPTION	LOAD (kVA) CO	LOAD (kVA) PWR	LOAD (kVA) LTG	OCP BKR	OCP POLE	OCP AMP	CKT NO
1	20	1		121...	0.0	0.0	AREA LIGHTING	12...	2.3		PWR: HAND DRYER	0.0	2.3	0.0		1	25	2
3	20	1		0.0	0.0	0.2	CO: SHELTER 104			0.2	2.3	PWR: HAND DRYER	0.0	2.3	0.0		1	25	4
5	20	1		0.0	0.0	0.4	CO ROOM 105, 103	0.4	0.6			PWR: EF-1	0.0	0.6	0.0		1	20	6
7	20	1		--	--	--	SPARE			0.0	0.0	SPARE	--	--	--		1	20	8
9	20	1		0.0	0.1	0.0	PWR: SENSORS	0.1	0.0			SPARE	--	--	--		1	20	10
11	20	1		0.0	0.0	0.4	CO: SHELTER 104			0.4	0.0	SPARE	--	--	--		1	20	12
13	20	1		--	--	--	SPARE	0.0	0.0			SPARE	--	--	--		1	20	14
15	20	1		--	--	--	SPARE			0.0	0.0	SPARE	--	--	--		1	20	16
17	20	1		--	--	--	SPARE	0.0	0.0			SPARE	--	--	--		1	20	18
19	20	1		--	--	--	SPARE			0.0	0.0	SPARE	--	--	--		1	20	20
21	20	1		--	--	--	SPARE	0.0	0.0			SPARE	--	--	--		1	20	22
23	20	1		--	--	--	SPARE			0.0	0.0	SPARE	--	--	--		1	20	24
25	20	1		--	--	--	SPARE	0.0	0.0			SPARE	--	--	--		1	20	26
27	30	2		0.0	2.0	0.0	PWR: AHU-1			1.0	0.0	SPARE	--	--	--		1	20	28
29	--	--		--	--	--	--	1.0	0.0			SPARE	--	--	--		1	20	30

TOTALS:		PHASE LOAD A	PHASE LOAD B		
	CONNECTED kVA PER PHASE	1221	4	CONNECTED TOTAL kVA =	1225
	CONNECTED AMPS PER PHASE	10174	32	AVERAGE CONNECTED AMPS PER PHASE =	5103

NEC DIVERSIFIED LOAD CALCULATIONS

LIGHTING & CONTINUOUS LOADS:	1216.5 kVA @ 125% = 1520.6...	- 100% CONNECTED LOAD PLUS 25%	DIVERSIFIED TOTAL kVA = 1529
RECEPTACLES:	0.9 kVA @ 100% = 0.9 kVA	- FIRST 10kVA @ 100%, REMAINDER @ 50%	AVERAGE AMPS PER PHASE = 6372
ALL OTHER LOADS @ 100% :	7.8 kVA	- MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED @ 125% PER NEC	

BKR: GF=GFCI, GF3=30mA GFCI CAPABLE OF BEING LOCAKED OUT IN OPEN POSITION, IG=ISOLATED GROUND, AF=AFCI, ST=SHUNT TRIP, RED=PROVIDE RED COLORED BREAKER, AF=ARC FAULT CURRENT INTERRUPTER, GA=COMBINATION OF GROUND FAULT AND ARC FAULT CIRCUIT INTERRUPTER, GS=COMBINATION OF SHUNT TRIP WITH GFCI

NOTES:

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ELECTRICAL SCHEDULES

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SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

GENERAL

MATERIALS AND INSTALLATION SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE, OTHER APPLICABLE NFPA SECTIONS, STATE AND LOCAL CODES, AND RECOGNIZED INDUSTRY STANDARDS AND PRACTICES.

LISTING AND LABELING: PROVIDE PRODUCTS THAT ARE UL LISTED AND LABELED.

NEMA COMPLIANCE: COMPLY WITH CONSTRUCTION AND INSTALLATION REQUIREMENTS OF APPLICABLE NEMA STANDARDS.

SUBMITTALS: SUBMIT PRODUCT DATA AND SHOP DRAWING ON THE FOLLOWING EQUIPMENT FOR APPROVAL:

1. WIRING DEVICES.
2. LIGHTING FIXTURES.

PRIOR TO SUBMITTING BID, VISIT SITE TO VERIFY ALL EXISTING CONDITIONS AND ANY ITEMS THAT WILL AFFECT WORK OF THIS PROJECT. INCLUDE ALL COSTS IN BID.

MAINTAIN A SET OF REDLINED AS-BUILT DRAWINGS AND DELIVER TO OWNER UPON COMPLETION OF PROJECT.

PROTECT ADJACENT MATERIALS INDICATED TO REMAIN. INSTALL AND MAINTAIN DUST AND NOISE BARRIERS TO KEEP DIRT, DUST, AND NOISE FROM BEING TRANSMITTED TO ADJACENT AREAS. REMOVE PROTECTION AND BARRIERS AFTER DEMOLITION OPERATIONS ARE COMPLETE.

LOCATE, IDENTIFY, AND PROTECT ELECTRICAL SERVICES WITHIN OR PASSING THROUGH DEMOLITION AREA AND SERVING OTHER AREAS OUTSIDE THE DEMOLITION LIMITS. MAINTAIN SERVICES TO AREAS OUTSIDE DEMOLITION LIMITS. WHEN SERVICES MUST BE INTERRUPTED, INSTALL TEMPORARY SERVICES FOR AFFECTED AREAS. COORDINATE POWER INTERRUPTIONS ONE WEEK IN ADVANCE WITH OWNER. IF POWER INTERRUPTIONS DISTURB NORMAL OPERATIONS, THEN POWER INTERRUPTIONS ARE ONLY ALLOWED DURING NON-BUSINESS OR NON-OPERATION HOURS.

PATCH AND REPAIR SURFACES THAT ARE DISTURBED OR DAMAGED AS A RESULT OF ELECTRICAL INSTALLATION. RESTORE SURFACES TO ORIGINAL CONDITION.

INSTALLATION OF FIRE-STOPPING SEALANT: INSTALL UL-LISTED SEALANT, INCLUDING FORMING, PACKING, AND OTHER ACCESSORY MATERIALS, TO FILL OPENINGS AROUND ELECTRICAL SERVICES PENETRATING FLOORS AND WALLS, TO PROVIDE FIRE-STOPS WITH FIRE-RESISTANCE RATINGS INDICATED FOR FLOOR OR WALL ASSEMBLY IN WHICH PENETRATION OCCURS. COMPLY WITH INSTALLATION REQUIREMENTS ESTABLISHED BY TESTING AND INSPECTING AGENCY.

SECTION 260519 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PRODUCTS

PROVIDE STEEL RACEWAY, FITTING, AND BOX SYSTEM FOR ALL WIRING, EXCEPT FOR PLASTIC CONDUIT MAY BE INSTALLED UNDERGROUND.

RIGID STEEL CONDUIT: ANSI C80.1.

INTERMEDIATE METAL CONDUIT: ANSI C80.6.

PLASTIC-COATED STEEL CONDUIT AND FITTINGS: NEMA RN 1.

PLASTIC-COATED INTERMEDIATE METAL CONDUIT AND FITTINGS: NEMA RN 1.

ELECTRICAL METALLIC TUBING AND FITTINGS: ANSI C80.3 WITH SET-SCREW OR COMPRESSION-TYPE FITTINGS. CAST FITTINGS ARE NOT ALLOWED.

FLEXIBLE METAL CONDUIT: ZINC-COATED STEEL.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.

FITTINGS: NEMA FB 1, COMPATIBLE WITH CONDUIT/TUBING MATERIALS AND SUITABLE FOR USE AND LOCATION.

RIGID NONMETALLIC CONDUIT (RNC): NEMA TC 2, SCHEDULE 40 OR 80 PVC.

PVC CONDUIT AND TUBING FITTINGS: NEMA TC 3; MATCH TO CONDUIT OR CONDUIT/TUBING TYPE AND MATERIAL. OUTLET AND DEVICE BOXES: USE ONE OF THE FOLLOWING:

1. SHEET METAL BOXES: NEMA OS 1.

EXECUTION

PROVIDE MINIMUM 3/4" RACEWAY.

OUTDOORS WIRING METHODS: USE THE FOLLOWING WIRING METHODS:

1. EXPOSED: RIGID OR INTERMEDIATE METAL CONDUIT.

2. CONCEALED: RIGID OR INTERMEDIATE METAL CONDUIT.

3. UNDERGROUND: RIGID NONMETALLIC CONDUIT, EXCEPT THAT WRAPPED RIGID METAL SHALL BE USED FOR BENDS GREATER THAN 22 DEGREES.

4. PENETRATING CONCRETE FLOORS AND FOUNDATIONS: WRAPPED RIGID METAL CONDUIT (MINIMUM 4' EACH SIDE).

5. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, OR ELECTRIC SOLENOID OR MOTOR-DRIVEN EQUIPMENT): LIQUIDTIGHT FLEXIBLE METAL CONDUIT.

6. BOXES AND ENCLOSURES: NEMA TYPE 3R OR TYPE 4.

DIRECT BURIED CONDUIT OUTSIDE A BUILDING SHALL NOT BE LESS THAN 24" DEEP, WITH MAGNETIC "YELLOW WARNING" RIBBON 12" DIRECTLY ABOVE AND 6" BELOW FINIISHED GRADE MEASURED FROM THE TOP OF THE CONDUIT.

INDOORS WIRING METHODS: USE THE FOLLOWING WIRING METHODS:

1. CONNECTION TO VIBRATING EQUIPMENT, INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, OR ELECTRIC SOLENOID OR MOTOR-DRIVEN EQUIPMENT: FLEXIBLE METAL CONDUIT WITH MINIMUM 18" OF LIQUID-TIGHT FLEXIBLE CONDUIT (MAXIMUM OF 6 FEET), EXCEPT IN WET OR DAMP LOCATIONS USE LIQUIDTIGHT FLEXIBLE METAL CONDUIT (MAXIMUM OF 6 FEET).

2. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.

3. EXPOSED: ELECTRICAL METALLIC TUBING, RIGID OR INTERMEDIATE METAL CONDUIT WHERE SUBJECT TO PHYSICAL DAMAGE.

4. CONCEALED: ELECTRICAL METALLIC TUBING.

5. CONNECTION FOR CONDUIT IN CRAMPED QUARTERS OR MISALIGNMENT EXIST. FLEXIBLE METAL CONDUIT (MINIMUM 1/2").
CONCEAL CONDUIT AND EMT, UNLESS OTHERWISE INDICATED, WITHIN FINISHED WALLS, CEILINGS, AND FLOORS.

INSTALL RACEWAYS LEVEL AND SQUARE AND AT PROPER ELEVATIONS. RUN PERPENDICULAR AND AT RIGHT ANGLES TO BUILDING AND STRUCTURAL ELEMENTS. RUN PARALLEL OR BANKED RACEWAYS TOGETHER, ON COMMON SUPPORTS WHERE PRACTICAL. MAKE BENDS IN PARALLEL OR BANKED RUNS FROM SAME CENTER LINE TO MAKE BENDS PARALLEL.

SUPPORT RACEWAYS AS FOLLOWS, IN COMPLIANCE WITH DIVISION 16 SECTION "SUPPORTING DEVICES": TWO SUPPORTS PER 10' RUN, WITHING 12" OF A COUPLING, FITTING OR BEND GREATER THAN 45 DEGREES, AND WITHIN 12" OF EVERY BOX TO WHICH THE RACEWAY IS ENTERING OR EXITING.

RUN CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE CONSIDERING THE TYPE OF BUILDING CONSTRUCTION AND OBSTRUCTIONS, EXCEPT AS OTHERWISE INDICATED.

RACEWAYS EMBEDDED IN SLABS: INSTALL IN MIDDLE THIRD OF THE SLAB THICKNESS WHERE PRACTICAL, AND LEAVE AT LEAST 1 INCH (25 MM) CONCRETE COVER.

JOINTS AND TERMINATIONS: JOIN RACEWAYS WITH FITTINGS DESIGNED AND APPROVED FOR THE PURPOSE AND MAKE JOINTS AND TERMINATIONS TIGHT.

1. MAKE RACEWAY TERMINATIONS TIGHT. USE BONDING BUSHINGS OR WEDGES AT CONNECTIONS SUBJECT TO VIBRATION.

2. USE BONDING JUMPERS WHERE JOINTS CANNOT BE MADE TIGHT.

3. USE INSULATED THROAT OR EQUAL TYPE PLASTIC BUSHINGS FOR BOX CONNECTIONS TO PROTECT CONDUCTORS.

4. CONNECTORS ON FLEXIBLE CONDUIT AND MC CABLE SHALL BE THREADED TYPE - NOT PUSH-IN QUICK CONNECT TYPE.

INSTALL 200-LB NYLON PULL CORD IN ALL EMPTY RACEWAYS. CAP RACEWAY USING A BLANK COVER SIMILAR TO ADJACENT WIRING DEVICE COVERS.

ALL FUTURE RACEWAYS SHALL TERMINATE IN AN ACCESSIBLE CEILING SPACE UNLESS NOTED OTHERWISE. EXTEND AS NECESSARY.

RECORD CIRCUIT NUMBERS ON THE INSIDE BACK OF RECEPTACLE AND LIGHTING OUTLET BOXES USING A PERMANT MARKER OR PERMANENT LABEL.

PROVIDE GROUNDING CONNECTIONS FOR RACEWAY, BOXES, AND COMPONENTS AS INDICATED AND INSTRUCTED BY MANUFACTURER. TIGHTEN CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, ACCORDING TO EQUIPMENT MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES FOR EQUIPMENT CONNECTORS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS ACCORDING TO TIGHTENING TORQUES SPECIFIED IN UL STANDARD 486A.

SECTION 260526 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PRODUCTS

WIRES AND CABLES: TYPE THHN/THWN COPPER CONDUCTOR.

SOLID CONDUCTOR FOR 10 AWG AND SMALLER; STRANDED CONDUCTOR FOR LARGER THAN 10 AWG.

CONNECTORS AND SPLICES: UL-LISTED FACTORY-FABRICATED WIRING CONNECTORS OF SIZE, AMPACITY RATING, MATERIAL, AND TYPE AND CLASS FOR APPLICATION AND FOR SERVICE INDICATED. SELECT TO COMPLY WITH PROJECT'S INSTALLATION REQUIREMENTS AND AS SPECIFIED IN THE "EXECUTION" ARTICLE.

DO NOT PROVIDE THE FOLLOWIN G UNLESS APPROVED BY THE DIRECTOR:

1. EXPOSED CABLE WIRING.

2. SPLICES IN PANELBOARD, SWITCHBOARD ENCLOSURES, OR IN CONDUIT BODIES.

DO NOT USE ALLUMINUM CONDUCTORS OR NON-METALLIC SHEATHED CABLE.

COLOR-CODING OF SECONDARY PHASE CONDUCTORS: COLOR CODE SWITCH LEGS, TRAVELERS AND OTHER WIRING FOR BRANCH CIRCUITS OTHER THAN THOSE LISTED BELOW. PERMANENTLY POST COLOR CODE AT EACH BRANCH PANELBOARD. USE THE FOLLOWING COLORS FOR SERVICE, FEEDER AND BRANCH-CIRCUIT PHASE CONDUCTORS:

1. 208/120-V CONDUCTORS:

   a. PHASE A: BLACK.
   b. PHASE B: RED.
   c. PHASE C: BLUE.
   d. NEUTRAL: WHITE.
   e. GROUND: GREEN.
   f. INSULATED GROUND: GREEN WITH WHITE STRIPE.

2. 480/277-V CONDUCTORS:

   a. PHASE A: BROWN.
   b. PHASE B: YELLOW
   c. PHASE C: VIOLET.
   d. NEUTRAL: GRAY.
   e. GROUND: GREEN.

3. ORANGE IS RESERVED FOR THE HIGH-LEG OF CENTER-TAPPED DELTA SYSTEM.

4. #8 AND LARGER CONDUCTORS MAY BE TAPED WITH 8" OF HALF-LAPPED COLORED TAPE AT TERMINATIONS AND PULL BOXES.

EXECUTION

INSTALL WIRES AND CABLES AS INDICATED, ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND THE NECA "STANDARD OF INSTALLATION."

PULL CONDUCTORS INTO RACEWAY SIMULTANEOUSLY WHERE MORE THAN ONE IS BEING INSTALLED IN SAME RACEWAY.

CONDUCTOR SPLICES: KEEP TO MINIMUM.

INSTALL SPLICES AND TAPES THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN CONDUCTORS BEING SPLICED.

USE SPLICE AND TAP CONNECTORS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL. DO NOT USE PUSH-IN TYPE QUICK-WIRE DEVICES OR WIRE CONNECTORS.

WIRING AT OUTLETS: INSTALL WITH AT LEAST 12 INCHES (300 MM) OF SLACK CONDUCTOR AT EACH OUTLET.

CONNECT OUTLETS AND COMPONENTS TO WIRING AND TO GROUND AS INDICATED AND INSTRUCTED BY MANUFACTURER. TIGHTEN CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, ACCORDING TO EQUIPMENT MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES FOR EQUIPMENT CONNECTORS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS ACCORDING TO TIGHTENING TORQUES SPECIFIED IN UL STANDARD 486A.

METAL CLAD (MC) CABLE:

1. MC CABLE MAY BE USED FOR FINAL CONNECTIONS TO DEVICES AND AT THE TAIL END OF THE ELECTRICAL CIRCUITS BUT NEVER FOR HOMERUNS OR IN THE ELECTRICAL ROOM.

SECTION 260529 - WIRING DEVICES

PRODUCTS

WIRING DEVICES: COMPLY WITH NEMA STANDARD WD 1, "GENERAL PURPOSE WIRING DEVICES."
COLOR: AS SELECTED BY ARCHITECT/OWNER, EXCEPT AS OTHERWISE INDICATED OR REQUIRED BY CODE.

STANDARD DUPLEX RECEPTACLES: 20A DEVICES; PROVIDE NYLON FACE, BACK AND SIDE WIRING. COMPLY WITH FEDERAL SPECIFICATION W-C-596 AND HEAVY-DUTY GRADE OF UL STANDARD 498, "ELECTRICAL ATTACHMENT PLUGS AND RECEPTACLES." PROVIDE NRTL LABELING OF DEVICES TO VERIFY THESE COMPLIANCES.

GROUND-FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLES: UL STANDARD 943, "GROUND FAULT CIRCUIT INTERRUPTERS," FEED-THROUGH TYPE, WITH INTEGRAL NEMA 5-20R DUPLEX RECEPTACLE ARRANGED TO PROTECT CONNECTED DOWNSTREAM RECEPTACLES ON THE SAME CIRCUIT. DESIGN UNITS FOR INSTALLATION IN A 2-3/4-INCH (70-MM) DEEP OUTLET BOX WITHOUT AN ADAPTER.

SNAP SWITCHES: 20A DEVICES; PROVIDE NYLON FACE, QUIET-TYPE A.C. SWITCHES, NRTL LISTED AND LABELED AS COMPLYING WITH UL STANDARD 20 "GENERAL USE SNAP SWITCHES," AND WITH FEDERAL SPECIFICATION W-S-896.

TELEPHONE JACK: RJ-45, 8-POSITION, MODULAR, LATCHING-PLUG TYPE, FLUSH IN FACE OF WALL PLATED.

WALL PLATES: SINGLE AND COMBINATION TYPES THAT MATE AND MATCH WITH CORRESPONDING WIRING DEVICES. FEATURES INCLUDE THE FOLLOWING:

1. COLOR: MATCHES WIRING DEVICE EXCEPT AS OTHERWISE INDICATED.

2. PLATE-SECURING SCREWS: METAL WITH HEADS COLORED TO MATCH PLATE FINISH.

3. MATERIAL FOR FINISHED SPACES: NYLON EXCEPT AS OTHERWISE INDICATED.

4. MATERIAL FOR UNFINISHED SPACES: STAINLESS STEEL.

EXECUTION

WIRING DEVICES SHALL CONNNECT CONDUCTORS USING THREADED SCREWS. DO NOT USE PUSH-IN QUICK-WIRE CONNECTIONS.

DO NOT USE GFCI FEED-THROUGHS,

INSTALL DEVICES AND ASSEMBLIES PLUMB AND SECURE. PROTECT DEVICES AND ASSEMBLIES DURING PAINTING AND INSTALL WALL PLATES WHEN PAINTING IS COMPLETE.

ARRANGEMENT OF DEVICES: EXCEPT AS OTHERWISE INDICATED, MOUNT FLUSH, WITH LONG DIMENSION VERTICAL, AND GROUNDING TERMINAL OF RECEPTACLES ON TOP. GROUP ADJACENT SWITCHES UNDER SINGLE, MULTIGANG WALL PLATES.

SECTION 260533 - LIGHTING CONTROL DEVICES

MANUFACTURERS:

1. INTERMATIC, INC.

2. PARAGON ELECTRIC CO.

3. TORK.

INDOOR OCCUPANCY SENSORS

MANUFACTURERS:

1. HUBBELL LIGHTING INC.
2. LEVITON MFG. COMPANY INC.
3. LITHONIA LIGHTING.
4. SENSOR SWITCH, INC.
5. COOPER/GREENGATE CONTROLS.
6. WATT STOPPER (THE).

GENERAL DESCRIPTION: WALL- OR CEILING-MOUNTING, SOLID-STATE UNITS WITH A SEPARATE RELAY UNIT.

1. OPERATION: UNLESS OTHERWISE INDICATED, TURN LIGHTS ON WHEN COVERED AREA IS OCCUPIED AND OFF WHEN UNOCCUPIED; WITH A TIME DELAY FOR TURNING LIGHTS OFF, ADJUSTABLE OVER A MINIMUM RANGE OF 1 TO 15 MINUTES.

2. SENSOR OUTPUT: CONTACTS RATED TO OPERATE THE CONNECTED RELAY, COMPLYING WITH UL 773A. SENSOR SHALL BE POWERED FROM THE RELAY UNIT.

3. RELAY UNIT: DRY CONTACTS RATED FOR 20-A BALLAST LOAD AT 120- AND 277-V AC, FOR 13-A TUNGSTEN AT 120-V AC, AND FOR 1 HP AT 120-V AC. POWER SUPPLY TO SENSOR SHALL BE 24-V DC, 150-MA, CLASS 2 POWER SOURCE AS DEFINED BY NFPA 70.

4. MOUNTING:

   a. SENSOR: SUITABLE FOR MOUNTING IN ANY POSITION ON A STANDARD OUTLET BOX.
   b. RELAY: EXTERNALLY MOUNTED THOUGH A 1/2-INCH (13-MM) KNOCKOUT IN A STANDARD ELECTRICAL ENCLOSURE.
   c. TIME-DELAY AND SENSITIVITY ADJUSTMENTS: RECESSED AND CONCEALED BEHIND HINGED DOOR.

5. INDICATOR: LED, TO SHOW WHEN MOTION IS BEING DETECTED DURING TESTING AND NORMAL OPERATION OF THE SENSOR.

6. BYPASS SWITCH: OVERRIDE THE ON FUNCTION IN CASE OF SENSOR FAILURE.

DUAL-TECHNOLOGY TYPE: CEILING MOUNTING; DETECT OCCUPANCY BY USING A COMBINATION OF PIR AND ULTRASONIC DETECTION METHODS IN AREA OF COVERAGE. PARTICULAR TECHNOLOGY OR COMBINATION OF TECHNOLOGIES THAT CONTROLS ON AND OFF FUNCTIONS SHALL BE SELECTABLE IN THE FIELD BY OPERATING CONTROLS ON UNIT.

1. SENSITIVITY ADJUSTMENT: SEPARATE FOR EACH SENSING TECHNOLOGY.

2. DETECTOR SENSITIVITY: DETECT OCCURRENCES OF 6-INCH (150-MM) MINIMUM MOVEMENT OF ANY PORTION OF A HUMAN BODY THAT PRESENTS A TARGET OF AT LEAST 36 SQ. IN. (232 SQ. CM), AND DETECT A PERSON OF AVERAGE SIZE AND WEIGHT MOVING AT LEAST 12 INCHES (305 MM) IN EITHER A HORIZONTAL OR A VERTICAL MANNER AT AN APPROXIMATE SPEED OF 12 INCHES/S (305 MM/S).

3. DETECTION COVERAGE (STANDARD ROOM): DETECT OCCUPANCY ANYWHERE WITHIN A CIRCULAR AREA OF 1000 SQ. FT. (93 SQ. M) WHEN MOUNTED ON A 96-INCH- (2440-MM-) HIGH CEILING.

MULTIPOLE CONTACTORS

MANUFACTURERS:

1. ALLEN-BRADLEY/ROCKWELL AUTOMATION.
2. ASCO POWER TECHNOLOGIES, LP; A DIVISION OF EMERSON ELECTRIC CO.
3. CUTLER-HAMMER; EATON CORPORATION.
4. GE INDUSTRIAL SYSTEMS; TOTAL LIGHTING CONTROL.
5. SIEMENS.
6. SQUARE D.

DESCRIPTION: ELECTRICALLY OPERATED AND MECHANICALLY HELD, COMPLYING WITH NEMA ICS 2 AND UL 508.

1. CURRENT RATING FOR SWITCHING: LISTING OR RATING CONSISTENT WITH TYPE OF LOAD SERVED, INCLUDING TUNGSTEN FILAMENT, INDUCTIVE, AND HIGH-INRUSH BALLAST (BALLAST WITH 15 PERCENT OR LESS TOTAL HARMONIC DISTORTION OF NORMAL LOAD CURRENT).
2. CONTROL-COIL VOLTAGE: MATCH CONTROL POWER SOURCE.
CONDUCTORS AND CABLES

POWER WIRING TO SUPPLY SIDE OF REMOTE-CONTROL POWER SOURCES: NOT SMALLER THAN NO. 12 AWG, COMPLYING WITH DIVISION 16 SECTION " CONDUCTORS AND CABLES."

CLASSES 2 AND 3 CONTROL CABLE: MULTICONDUCTOR CABLE WITH STRANDED COPPER CONDUCTORS NOT SMALLER THAN NO. 18 AWG, COMPLYING WITH DIVISION 16 SECTION "CONDUCTORS AND CABLES."

CLASS 1 CONTROL CABLE: MULTICONDUCTOR CABLE WITH STRANDED COPPER CONDUCTORS NOT SMALLER THAN NO. 14 AWG, COMPLYING WITH DIVISION 16 SECTION "CONDUCTORS AND CABLES."

INSTALL UNSHIELDED, TWISTED-PAIR CABLE FOR CONTROL AND SIGNAL TRANSMISSION CONDUCTORS, COMPLYING WITH DIVISION 16 SECTION "VOICE AND DATA COMMUNICATION CABLING."

EXECUTION

WIRING WITHIN ENCLOSURES: BUNDLE, LACE, AND TRAIN CONDUCTORS TO TERMINAL POINTS. SEPARATE POWER-LIMITED AND NONPOWER-LIMITED CONDUCTORS ACCORDING TO CONDUCTOR MANUFACTURER'S WRITTEN INSTRUCTIONS.

SIZE CONDUCTORS ACCORDING TO LIGHTING CONTROL DEVICE MANUFACTURER'S WRITTEN INSTRUCTIONS, UNLESS OTHERWISE INDICATED.

SPLICES, TAPS, AND TERMINATIONS: MAKE CONNECTIONS ONLY ON NUMBERED TERMINAL STRIPS IN JUNCTION, PULL, AND OUTLET BOXES; TERMINAL CABINETS; AND EQUIPMENT ENCLOSURES.

TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.

PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS:

1. AFTER INSTALLING TIME SWITCHES AND SENSORS, AND AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, ADJUST AND TEST FOR COMPLIANCE WITH REQUIREMENTS.

2. OPERATIONAL TEST: VERIFY ACTUATION OF EACH SENSOR AND ADJUST TIME DELAYS.

SECTION 260543 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PRODUCTS

MANUFACTURED SUPPORTING DEVICES:

1. RACEWAY SUPPORTS: CLEVIS HANGERS, RISER CLAMPS, CONDUIT STRAPS, THREADED C-CLAMPS WITH RETAINERS, CEILING TRAPEZE HANGERS, WALL BRACKETS, AND SPRING STEEL CLAMPS.

2. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:

   a. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
   b. TOGGLE BOLTS: ALL STEEL SPRINGHEAD TYPE.
   c. POWDER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.

3. U-CHANNEL SYSTEMS: 16-GAGE STEEL CHANNELS, WITH 9/16-INCH- DIAMETER HOLES, AT A MINIMUM OF 8 INCHES ON CENTER, IN TOP SURFACE. PROVIDE FITTINGS AND ACCESSORIES THAT MATE AND MATCH WITH U-CHANNEL AND ARE OF THE SAME MANUFACTURER.

FABRICATED SUPPORTING DEVICES: SHOP-OR FIELD-FABRICATED SUPPORTS OR MANUFACTURED SUPPORTS ASSEMBLED FROM U-CHANNEL COMPONENTS.

1. STEEL BRACKETS: FABRICATED OF ANGLES, CHANNELS, AND OTHER STANDARD STRUCTURAL SHAPES. CONNECT WITH WELDS AND MACHINE BOLTS TO FORM RIGID SUPPORTS.

EXECUTION

INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY TO BUILDING STRUCTURE IN ACCORDANCE WITH NEC REQUIREMENTS. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER ELECTRICAL INSTALLATION.

RACEWAY SUPPORTS: COMPLY WITH THE NEC AND THE FOLLOWING REQUIREMENTS:

1. CONFORM TO MANUFACTURER'S RECOMMENDATIONS FOR SELECTION AND INSTALLATION OF SUPPORTS.

2. STRENGTH OF EACH SUPPORT SHALL BE ADEQUATE TO CARRY PRESENT AND FUTURE LOAD MULTIPLIED BY A SAFETY FACTOR OF AT LEAST FOUR, BUT IN NO CASES SHALL BE LESS THAN 200 LBS IN THE STRENGTH OF EACH SUPPORT.

3. INSTALL INDEPENDENT AND LISTED INDIVIDUAL AND MULTIPLE (TRAPEZE) RACEWAY HANGERS AND RISER CLAMPS AS NECESSARY TO SUPPORT RACEWAYS. PROVIDE U-BOLTS, CLAMPS, ATTACHMENTS, AND OTHER HARDWARE NECESSARY FOR HANGER ASSEMBLY AND FOR SECURING HANGER RODS AND CONDUITS.

MISCELLANEOUS SUPPORTS: SUPPORT MISCELLANEOUS ELECTRICAL COMPONENTS AS REQUIRED TO PRODUCE THE SAME STRUCTURAL SAFETY FACTORS AS SPECIFIED FOR RACEWAY SUPPORTS. INSTALL METAL CHANNEL RACKS FOR MOUNTING CABINETS, PANELBOARDS, DISCONNECTS, CONTROL ENCLOSURES, PULL BOXES, JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES.

IN OPEN OVERHEAD SPACES, SUPPORT SHEET METAL BOXES INDEPENDANTLY AND DIRECTLY FROM THE BUILDING STRUCTURE OR BY BAR HANGERS. WHERE BAR HANGERS ARE USED, ATTACH THE BAR TO RACEWAYS ON OPPOSITE SIDES OF THE BOX AND SUPPORT THE RACEWAY WITH AN APPROVED TYPE OF FASTENER NOT MORE THAN 24 INCHES FROM THE BOX.

OUTLET BOXES: PROVIDE OUTLET BOXES WITH RIGID SUPPORT USING METAL BAR HANGERS BETWEEN STUDS.

FASTENING: UNLESS OTHERWISE INDICATED, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE BUILDING STRUCTURE, INCLUDING BUT NOT LIMITED TO CONDUITS, RACEWAYS, CABLES, CABLE TRAYS, BUSWAYS, CABINETS, PANELBOARDS, TRANSFORMERS, BOXES, DISCONNECT SWITCHES, AND CONTROL COMPONENTS IN ACCORDANCE WITH THE FOLLOWING:

1. FASTEN BY MEANS OF WOOD SCREWS OR SCREW-TYPE NAILS ON WOOD, TOGGLE BOLTS ON HOLLOW MASONRY UNITS, CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY, AND MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL. THREADED STUDS DRIVEN BY A POWDER CHARGE AND PROVIDED WITH LOCK WASHERS AND NUTS MAY BE USED INSTEAD OF EXPANSION BOLTS AND MACHINE OR WOOD SCREWS. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

2. HOLES CUT TO DEPTH OF MORE THAN 1-1/2 INCHES IN REINFORCED CONCRETE BEAMS OR TO DEPTH OF MORE THAN ¾ INCH IN CONCRETE SHALL NOT CUT THE MAIN REINFORCING BARS. FILL HOLES THAT ARE NOT USED.

3. ENSURE THAT THE LOAD APPLIED TO ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD. USE VIBRATION- AND SHOCK- RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

SECTION 260548 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PRODUCTS

GROUNDING AND BONDING PRODUCTS: TYPES AS INDICATED. WHERE TYPES, SIZES, RATINGS, AND QUANTITIES INDICATED DIFFER FROM NEC REQUIREMENTS, THE MORE STRINGENT REQUIREMENTS AND THE GREATER SIZE, RATING, AND QUANTITY INDICATIONS GOVERN.

CONDUCTOR MATERIALS: COPPER.

EQUIPMENT GROUNDING CONDUCTOR: GREEN INSULATED.

GROUNDING ELECTRODE CONDUCTOR: STRANDED CABLE.

BARE COPPER CONDUCTORS: CONFORM TO THE FOLLOWING:

1. SOLID CONDUCTORS: ASTM B-3.

2. ASSEMBLY OF STRANDED CONDUCTORS: ASTM B-8.

3. TINNED CONDUCTORS: ASTM B-33.

GROUND BUS: BARE ANNEALED COPPER BARS OF RECTANGULAR CROSS-SECTION.

BRAIDED BONDING JUMPERS: COPPER TAPE, BRAIDED FROM NO. 30-GAGE BARE COPPER WIRE AND TERMINATED WITH COPPER FERRULES.

BONDING STRAP CONDUCTOR/CONNECTORS: SOFT COPPER, 0.05 INCH THICK AND 2 INCHES WIDE, EXCEPT AS INDICATED.

CONNECTOR PRODUCTS: LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS WITH WHICH USED.

PRESSURE CONNECTORS: HIGH-CONDUCTIVITY PLATED UNITS.

BOLTED CLAMPS: HEAVY-DUTY UNITS LISTED FOR THE APPLICATION.

EXOTHERMIC WELDED CONNECTIONS: PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.

GROUND RODS: COPPER-CLAD STEEL, 3/4 INCH BY 10 FEET, MINIMUM.

EXECUTION

EQUIPMENT GROUNDING CONDUCTOR APPLICATION: COMPLY WITH NEC ARTICLE 250 FOR SIZES AND QUANTITIES OF EQUIPMENT GROUNDING CONDUCTORS, EXCEPT WHERE LARGER SIZES OR MORE CONDUCTORS ARE INDICATED. INSTALL EQUIPMENT GROUND CONDUCTORS IN ALL FEEDER AND BRANCH CIRCUIT RACEWAYS.

SIGNAL AND COMMUNICATIONS: FOR TELEPHONE, ALARM, AND COMMUNICATION SYSTEMS, PROVIDE A #4 AWG MINIMUM GREEN INSULATED COPPER CONDUCTOR IN RACEWAY FROM THE GROUNDING ELECTRODE SYSTEM TO EACH TERMINAL CABINET OR CENTRAL EQUIPMENT LOCATION.

SEPARATELY DERIVED SYSTEMS REQUIRED BY NEC TO BE GROUNDED SHALL BE GROUNDED AS APPROVED BY THE AUTHORITY HAVING JURISDICTION.

METAL POLES SUPPORTING OUTDOOR LIGHTING FIXTURES: GROUND POLE TO A GROUNDING ELECTRODE AS INDICATED IN ADDITION TO SEPARATE EQUIPMENT GROUNDING CONDUCTOR RUN WITH SUPPLY BRANCH CIRCUIT.

INSTALLATION, GENERAL: GROUND ELECTRICAL SYSTEMS AND EQUIPMENT IN ACCORDANCE WITH NEC EXCEPT WHERE GROUNDING IN EXCESS OF NEC REQUIREMENTS IS INDICATED.

GROUND RODS: LOCATE A MINIMUM OF ONE-ROD LENGTH FROM EACH OTHER AND AT LEAST THE SAME DISTANCE FROM ANY OTHER GROUNDING ELECTRODE. INTERCONNECT GROUND RODS WITH BARE CONDUCTORS BURIED AT LEAST 24 INCHES BELOW GRADE. CONNECT BARE-CABLE GROUND CONDUCTORS TO GROUND RODS BY MEANS OF EXOTHERMIC WELDS EXCEPT AS OTHERWISE INDICATED. MAKE THESE CONNECTIONS WITHOUT DAMAGING THE COPPER COATING OR EXPOSING THE STEEL. DRIVE RODS UNTIL TOPS ARE 6 INCHES BELOW FINISHED FLOOR OR FINAL GRADE EXCEPT AS OTHERWISE INDICATED.

GROUNDING ELECTRODE CONDUCTOR: PROVIDE INSULATED COPPER CONDUCTOR, SIZED AS INDICATED, IN CONDUIT. BOND THE GROUND CONDUCTOR CONDUIT TO THE CONDUCTOR AT EACH END. WHERE A DIELECTRIC FITTING IS INSTALLED IN THE MAIN METALLIC WATER SERVICE PIPE, CONNECT THE GROUND CONDUCTOR TO THE STREET SIDE OF THE FITTING. DO NOT INSTALL A GROUNDING JUMPER AROUND DIELECTRIC FITTINGS. BOND THE GROUND CONDUCTOR CONDUIT TO THE CONDUCTOR AT EACH END.

BRAIDED-TYPE BONDING JUMPERS: INSTALL TO CONNECT GROUND CLAMPS ON WATER METER PIPING TO ELECTRICALLY BYPASS WATER METERS. USE ELSEWHERE FOR FLEXIBLE BONDING AND GROUNDING CONNECTIONS.

ROUTE GROUNDING AND BONDING CONDUCTORS USING THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE WITHOUT OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE, EXCEPT AS INDICATED.

UFER GROUND: FABRICATE WITH 20 FEET OF CONDUCTOR LAID LENGTHWISE IN EXCAVATION FOR FOUNDATION OR FOOTINGS. INSTALL SO CONDUCTOR IS WITHIN 2 INCHES OF THE BOTTOM OF THE CONCRETE. WHERE BASE OF FOUNDATION IS LESS THAN 20 FEET IN LENGTH, COIL EXCESS CONDUCTOR AT BASE OF FOUNDATION. BOND CONDUCTOR TO REINFORCING STEEL AT FOUR LOCATIONS, MINIMUM. EXTEND CONDUCTOR BELOW GRADE AND CONNECT TO BUILDING GROUNDING GRID, GROUNDING ELECTRODE CONDUCTOR, OR GROUNDING ELECTRODE.

CONNECTIONS: MAKE CONNECTIONS IN SUCH A MANNER AS TO MINIMIZE POSSIBILITY OF GALVANIC ACTION OR ELECTROLYSIS. SELECT CONNECTORS, CONNECTION HARDWARE, CONDUCTORS, AND CONNECTION METHODS SO METALS IN DIRECT CONTACT WILL BE GALVANICALLY COMPATIBLE.

EXOTHERMIC WELDED CONNECTIONS: USE FOR CONNECTIONS TO STRUCTURAL STEEL AND FOR UNDERGROUND CONNECTIONS EXCEPT THOSE AT TEST WELLS. INSTALL AT CONNECTIONS TO GROUND RODS AND PLATE ELECTRODES. COMPLY WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS. WELDS THAT ARE PUFFED UP OR THAT SHOW CONVEX SURFACES INDICATING IMPROPER CLEANING ARE NOT ACCEPTABLE.

TIGHTEN GROUNDING AND BONDING CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL 486A AND UL 486B.

COMPRESSION-TYPE CONNECTIONS: USE HYDRAULIC COMPRESSION TOOLS TO PROVIDE THE CORRECT CIRCUMFERENTIAL PRESSURE FOR COMPRESSION CONNECTORS. USE TOOLS AND DIES RECOMMENDED BY THE MANUFACTURER OF THE CONNECTORS. PROVIDE EMBOSSING DIE CODE OR OTHER STANDARD METHOD TO MAKE A VISIBLE INDICATION THAT A CONNECTOR HAS BEEN ADEQUATELY COMPRESSED ON THE CONDUCTOR.
MOISTURE PROTECTION: WHERE INSULATED CONDUCTORS ARE CONNECTED TO GROUND RODS OR GROUND BUSES, INSULATE THE ENTIRE AREA OF THE CONNECTION AND SEAL AGAINST MOISTURE PENETRATION OF THE INSULATION AND CABLE.

TESTS: SUBJECT THE COMPLETED GROUNDING SYSTEM TO A MEGGER TEST AT EACH LOCATION WHERE A MAXIMUM GROUND RESISTANCE LEVEL IS SPECIFIED, AT SERVICE DISCONNECT ENCLOSURE GROUND TERMINAL, AND AT GROUND TEST WELLS. MEASURE GROUND RESISTANCE WITHOUT THE SOIL BEING MOISTENED BY ANY MEANS OTHER THAN NATURAL PRECIPITATION OR NATURAL DRAINAGE OR SEEPAGE AND WITHOUT CHEMICAL TREATMENT OR OTHER ARTIFICIAL MEANS OF REDUCING NATURAL GROUND RESISTANCE. PERFORM TESTS BY THE 2-POINT METHOD IN ACCORDANCE WITH SECTION 9.03 OF IEEE 81, "GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE AND EARTH SURFACE POTENTIALS OF A GROUNDING SYSTEM."

GROUND/RESISTANCE MAXIMUM VALUES SHALL BE AS FOLLOWS:

1. EQUIPMENT RATED 500 KVA AND LESS: 10 OHMS.

DEFICIENCIES: WHERE GROUND RESISTANCES EXCEED SPECIFIED VALUES, AND IF DIRECTED, MODIFY THE GROUNDING SYSTEM TO REDUCE RESISTANCE VALUES. WHERE MEASURES ARE DIRECTED THAT EXCEED THOSE INDICATED THE PROVISIONS OF THE CONTRACT, COVERING CHANGES WILL APPLY.

SECTION 265100 – INTERIOR LIGHTING

GENERAL

PROVIDE 10% SPARE LAMPS, DIFFUSERS, AND GLASS FOR EACH LIGHT FIXTURE TYPE WITH NOT LESS THAN ONE FOR LESS THAN 10.

PRODUCTS

COMPLY WITH THE REQUIREMENTS SPECIFIED IN THE ARTICLES BELOW AND LIGHTING FIXTURE SCHEDULE.

METAL PARTS: FREE FROM BURRS AND SHARP CORNERS AND EDGES.

SHEET METAL COMPONENTS: STEEL, EXCEPT AS INDICATED. COMPONENTS ARE FORMED AND SUPPORTED TO PREVENT WARPING AND SAGGING.

DOORS, FRAMES, AND OTHER INTERNAL ACCESS: SMOOTH OPERATING AND FREE FROM LIGHT LEAKAGE UNDER OPERATING CONDITIONS. ARRANGE TO PERMIT RELAMPING WITHOUT USE OF TOOLS. ARRANGE DOORS, FRAMES, LENSES, DIFFUSERS, AND OTHER PIECES TO PREVENT ACCIDENTAL FALLING DURING RELAMPING AND WHEN SECURED IN THE OPERATING POSITION.

REFLECTING SURFACES: MINIMUM REFLECTANCES AS FOLLOWS, EXCEPT AS OTHERWISE INDICATED:

1. WHITE SURFACES: 85 PERCENT.

2. SPECULAR SURFACES: 83 PERCENT.

3. DIFFUSING SPECULAR SURFACES: 75 PERCENT.

4. LAMINATED SILVER METALLIZED FILM: 90 PERCENT.

LENSES, DIFFUSERS, COVERS, AND GLOBES: 100 PERCENT VIRGIN ACRYLIC PLASTIC OR WATER WHITE, ANNEALED CRYSTAL GLASS EXCEPT AS INDICATED.

1. PLASTIC: HIGHLY RESISTANT TO YELLOWING AND OTHER CHANGES DUE TO AGING, EXPOSURE TO HEAT AND UV RADIATION. LENS THICKNESS: 0.125 INCHES, MINIMUM.

SINGLE-STEM HANGERS: 1/2-INCH STEEL TUBING WITH SWIVEL BALL FITTING AND CEILING CANOPY. FINISH SAME AS FIXTURE.

TWIN-STEM HANGERS: TWO, 1/2-INCH STEEL TUBES WITH SINGLE CANOPY ARRANGED TO MOUNT A SINGLE FIXTURE. FINISH SAME AS FIXTURE.

ROD HANGERS: 3/16-INCH DIAMETER CADMIUM PLATED, THREADED STEEL ROD.

HOOK HANGER: INTEGRATED ASSEMBLY MATCHED TO FIXTURE AND LINE VOLTAGE AND EQUIPPED WITH THREADED ATTACHMENT, CORD, AND LOCKING- TYPE PLUG.

FLUORESCENT FIXTURES: CONFORM TO UL 1570, "FLUORESCENT LIGHTING FIXTURES."

ELECTRONIC BALLASTS: CONFORM TO UL 935, "FLUORESCENT-LAMP BALLASTS." SOLID-STATE, FULL-LIGHT-OUTPUT, ENERGY-SAVING TYPE COMPATIBLE WITH ENERGY-SAVING LAMPS. CONFORM TO FCC REGULATIONS PART 15, SUBPART J. FOR ELECTROMAGNETIC INTERFERENCE. CONFORM TO IEEE C62.41, "GUIDE FOR SURGE VOLTAGES IN LOW-VOLTAGE AC POWER CIRCUITS," CATEGORY A, FOR RESISTANCE TO VOLTAGE SURGES FOR NORMAL AND COMMON MODES. BALLASTS MUST BE APPROVED BY USU.

1. CERTIFICATION: BY ELECTRICAL TESTING LABORATORY (ETL).

2. LABELING: BY CERTIFIED BALLAST MANUFACTURERS ASSOCIATION (CBM).

3. TYPE: CLASS P, HIGH-POWER-FACTORY TYPE EXCEPT AS INDICATED OTHERWISE.

4. SOUND RATING: A RATING, EXCEPT AS INDICATED OTHERWISE.

5. VOLTAGE: 120/277 UNIVERSAL.

6. MINIMUM POWER FACTOR: 90 PERCENT.

7. MINIMUM OPERATING FREQUENCY: 20,000 HZ.

8. THIRD HARMONIC CONTENT OF BALLAST CURRENT: LESS THAN 10 PERCENT.

APPROVED BALLASTS:

1. GE ULTRAMAX
2. OSRAM SYLVANIA QUICKTRONIC HIGH EFFICIENCY (QHE)
3. ADVANCE OPTANIUM
4. UNIVERSAL ULTIM 8

EXIT SIGNS: CONFORM TO UL 924, "EMERGENCY LIGHTING AND POWER EQUIPMENT," AND THE FOLLOWING:

1. SIGN COLORS: CONFORM TO LOCAL CODE.

2. MINIMUM HEIGHT OF LETTERS: CONFORM TO LOCAL CODE.

3. ARROWS: INCLUDE AS INDICATED.

4. LAMPS FOR AC OPERATION: LED.

EMERGENCY LIGHTING UNITS: CONFORM TO UL 924, "EMERGENCY LIGHTING AND POWER EQUIPMENT" REQUIREMENTS FOR "UNIT EQUIPMENT." PROVIDE SELF-CONTAINED UNITS WITH THE FOLLOWING FEATURES AND ADDITIONAL CHARACTERISTICS AS INDICATED.

1. BATTERY: SEALED, MAINTENANCE-FREE, LEAD-ACID TYPE WITH 10 YEAR NOMINAL LIFE MINIMUM, AND SPECIAL PROJECT WARRANTY.

2. CHARGER: MINIMUM TWO-RATE, FULLY-AUTOMATIC, SOLID-STATE TYPE, WITH SEALED TRANSFER RELAY.

3. OPERATION: RELAY AUTOMATICALLY TURNS LAMP ON WHEN SUPPLY CIRCUIT VOLTAGE DROPS TO 80-PERCENT OF NOMINAL OR BELOW. LAMP AUTOMATICALLY DISCONNECTS FROM BATTERY WHEN VOLTAGE APPROACHES DEEP-DISCHARGE LEVEL.

4. RELAY DISCONNECTS LAMPS AND BATTERY AUTOMATICALLY RECHARGES AND FLOATS ON TRICKLE CHARGE WHEN NORMAL VOLTAGE IS RESTORED.

5. WIRE GUARD: WHERE INDICATED, PROVIDE HEAVY CHROME PLATED WIRE GUARD ARRANGED TO PROTECT LAMP HEADS OR FIXTURES.

6. TIME-DELAY RELAY: PROVIDE TIME-DELAY RELAY IN EMERGENCY LIGHTING UNIT CONTROL CIRCUIT ARRANGED TO HOLD UNIT "ON" FOR FIXED INTERVAL AFTER RESTORATION OF POWER FROM AN OUTAGE. PROVIDE ADEQUATE TIME DELAY TO PERMIT HID LAMPS TO RESTRIKE AND DEVELOP ADEQUATE OUTPUT.

EMERGENCY FLUORESCENT POWER SUPPLY: CONFORM TO UL 924, "EMERGENCY LIGHTING AND POWER EQUIPMENT."

1. INTERNAL TYPE: SELF-CONTAINED, MODULAR, BATTERY-INVERTER UNIT FACTORY-MOUNTED WITHIN THE FIXTURE BODY.

   A. TEST SWITCH AND LED INDICATOR LIGHT: VISIBLE AND ACCESSIBLE WITHOUT OPENING FIXTURE OR ENTERING CEILING SPACE.

   B. BATTERY: SEALED, MAINTENANCE-FREE, NICKEL-CADMIUM TYPE, WITH A MINIMUM NOMINAL 10-YEAR LIFE.

   C. CHARGER: FULLY-AUTOMATIC, SOLID-STATE, CONSTANT-CURRENT TYPE.

   D. OPERATION: RELAY AUTOMATICALLY TURNS 2 LAMPS ON WHEN SUPPLY CIRCUIT VOLTAGE DROPS TO 80-PERCENT OF NOMINAL OR BELOW. RELAY DISCONNECTS LAMP AND BATTERY AUTOMATICALLY RECHARGES WHEN NORMAL VOLTAGE IS RESTORED.

LAMPS: PROVIDE LAMPS FOR EACH FIXTURE INDICATED. CONFORM TO ANSI STANDARDS, C78 SERIES APPLICABLE TO EACH TYPE OF LAMP. LAMPS SHALL BE TCLIP COMPLIANT. WHERE LAMPS ARE NOT INDICATED, PROVIDE LAMPS RECOMMENDED BY MANUFACTURER.

STEEL PARTS FINISH: MANUFACTURER'S STANDARD FINISH APPLIED OVER CORROSION-RESISTANT PRIMER, FREE OF STREAKS, RUNS, HOLIDAYS, STAINS, BLISTERS, AND DEFECTS. REMOVE FIXTURES SHOWING EVIDENCE OF CORROSION DURING PROJECT WARRANTY PERIOD AND REPLACE WITH NEW FIXTURES.

1. OTHER PARTS: MANUFACTURER'S STANDARD FINISH.

EXECUTION

INSTALLATION: UNLESS OTHERWISE INDICATED, INSTALL LIGHTING FIXTURES AS FOLLOWS:

1. SETTING AND SECURING: SET UNITS PLUMB, SQUARE, AND LEVEL WITH CEILING AND WALLS, AND SECURE ACCORDING TO MANUFACTURER'S PRINTED INSTRUCTIONS AND APPROVED SHOP DRAWINGS.

2. CONNECT EQUIPMENT GROUNDING CONDUCTOR TO FIXTURE HOUSING.

3. PROVIDE INDEPENDENT SAFETY WIRES ATTACHED TO STRUCTURE AT THE DIAGONAL CORNDERS OF LIGHTIGN FIXTURES IN COMPLIANCE WITH SEISMIC REQUIREMENTS.

4. SUPPORT FOR RECESSED AND SEMIRECESSED FIXTURES: INSTALLED UNITS MAY BE SUPPORTED FROM SUSPENDED CEILING SUPPORT SYSTEM. INSTALL CEILING SYSTEM SUPPORT RODS OR WIRES AT A MINIMUM OF FOUR RODS OR WIRES PER FIXTURE LOCATED NOT MORE THAN 6 INCHES FROM FIXTURE CORNERS.

   A. FIXTURES SMALLER THAN CEILING GRID: INSTALL A MINIMUM OF FOUR RODS OR WIRES FOR EACH FIXTURE AND LOCATE AT CORNER OF THE CEILING GRID WHERE THE FIXTURE IS LOCATED. DO NOT SUPPORT FIXTURES BY CEILING ACOUSTICAL PANELS.

   B. FIXTURES OF SIZES LESS THAN CEILING GRID: CENTER IN THE ACOUSTICAL PANEL. SUPPORT FIXTURES INDEPENDENTLY WITH AT LEAST TWO 3/4-INCH METAL CHANNELS SPANNING AND SECURED TO THE CEILING TEES.

   C. INSTALL SUPPORT CLIPS FOR RECESSED FIXTURES, SECURELY FASTENED TO CEILING GRID MEMBERS, AT OR NEAR EACH FIXTURE CORNERS.

5. SUPPORT FOR SUSPENDED FIXTURES: BRACE PENDANTS AND RODS THAT ARE 4-FEET LONG OR LONGER TO LIMIT SWINGING. SUPPORT STEM MOUNTED SINGLE-UNIT SUSPENDED FLUORESCENT FIXTURES WITH TWIN-STEM HANGERS. FOR CONTINUOUS ROWS, USE TUBING OR STEM FOR WIRING AT ONE POINT AND TUBING OR ROD FOR SUSPENSION FOR EACH UNIT LENGTH OF CHASSIS, INCLUDING ONE AT EACH END. PROVIDE SWIVEL BASES FOR STEMS SUPPORTING LIGHT FIXTURES WHICH EXCEED 12" IN LENGTH.

6. LAMPING: LAMP UNITS ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

7. RECESSED LIGHTING FIXTURES IN ACOUSTICAL TILE CEILING SHALL BE LOCATED CENTERED OF A SINGLE TILE.

ADJUSTING AND CLEANING: CLEAN FIXTURES UPON COMPLETION OF INSTALLATION. USE METHODS AND MATERIALS RECOMMENDED BY MANUFACTURER. ADJUST AIMABLE FIXTURES TO PROVIDE REQUIRED LIGHT INTENSITIES.

COLORADO REGISTERED PROFESSIONAL ENGINEER
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Grand Junction Park
Restroom Medium

project#:
date:

revisions :

title:

ELECTRICAL SPECIFICATIONS

sheet:

EE801

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Grand Junction Park Restrooms Large

22 February 2019

DRAWING INDEX

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title:

Cover Sheet

sheet:

GI001

01000 – GENERAL REQUIREMENTS

SUMMARY OF WORK
Work required by the successful bidder of this project shall be conducted in a professional manner and to the satisfaction of the Architect. If the instructions and information contained in the Construction Documents are not sufficient for the Contractor to produce high quality work or if discrepancies or questions exist, the Contractor shall request interpretation, clarification or corrections prior to bidding. If the Contractor fails to take such action work must be be performed in a satisfactory manner and requests for additional time or fees may be denied. By submitting a bid, the Contractor represents that he fully understands the nature and extent of the work, all factors and conditions affecting or which may be affected by it and characteristics of its various parts and elements and their fitting together and functioning.

PROJECT COORDINATION
A. The Contractor shall be responsible for coordination of the Project. It is recognized the the Construction Drawings are diagrammatic in showing certain physical relationships of the various elements and systems and their interfacing with other elements and systems. Establishment and coordination of these relationships is the exclusive responsibility of the Contractor. Each entity involved in the performance of the Work shall cooperate in the overall coordination of the work.
B. The Owner shall designate a Project Coordinator who shall represent and be authorized to act on behalf of the Owner with respect to the Project.
C. During construction, coordinate use of site and facilities through the Project Coordinator.
D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
G. Make the following types of submittals to Architect through the Project Coordinator: Shop drawings, product data, and samples. Test and inspection reports. Closeout submittals.

RECORD DOCUMENTS
A. Maintain at job site, one copy of the Construction Drawings. Make note of revisions and note the actual location of concealed controls, underground utilities and conduits for future use.

EXISTING UTILITIES
A. Verify locations of all existing utilities prior to starting any work. Coordinate service and utility extensions to the Project site.

WASTE DISPOSAL
A. Establish and enforce a daily system for collecting and disposing of waste materials. Provide dumpster on site.

COMPLETE SYSTEMS
A. It is the intent of the Construction Drawings that all systems, including mechanical and electrical, be complete and functional to provide the intended or specified performance. The Contractor shall provide all incidental items and parts necessary to achieve this requirement. Provide power, utilities, piping, drains, services and their connections to equipment and systems requiring them.

CLEANING AND PROTECTION OF THE WORK
A. At the time each unit of the work or element of the construction is completed (substantially) in each area of the project, clean the unit or element to a condition suitable for use and repair damage. Replace elements which in the opinion of the Architect are damaged beyond successful restoration. Protect, clean and restore the Project elements throughout the Construction period until the Owner officially takes possession.

GUARANTEES
A. The basic warranty of the project and all of its elements shall extend for not less than one year after the Owner takes official possession.

SECTION 01400 – QUALITY REQUIREMENTS

CONTROL OF INSTALLATION
A. Monitor quality control over suppliers, manufacturers; products, services, site conditions, and workmanship, to produce Work of specified quality.
B. Comply with manufacturers' instructions, including each step in sequence. All manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.
C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Have Work performed by persons qualified to produce required and specified quality.
F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

DEFECT ASSESSMENT
A. Replace Work or portions of the Work not conforming to specified requirements.
B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

SECTION 01600 – PRODUCT REQUIREMENTS

SUBMITTALS
A. Submit five (5) copies of shop drawings, product data and samples for all manufactured materials. Such submittals shall be completely reviewed by the Contractor prior to delivery to the Project Manager. The Contractor shall verify conformance with the requirements of Construction Documents and shall verify dimensions and compatibility with other elements of the Project. The Contractor shall submit with such promptness as to cause no delay in his own work allowing not less than two (2) weeks for Architect's review.
B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

TRANSPORTATION AND HANDLING
A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
B. Transport and handle products in accordance with manufacturer's instructions.
C. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

SECTION 01600 – PRODUCT REQUIREMENTS (continued)

STORAGE AND PROTECTION
B. Store and protect products in accordance with manufacturers' instructions.
C. Store with seals and labels intact and legible.
D. Prevent contact with material that may cause corrosion, discoloration, or staining.
E. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

SECTION 01700 – EXECUTION REQUIREMENTS

COORDINATION
A. Coordinate scheduling, submittals, and work of the various sections of the Project Requirements to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Notify affected utility companies and comply with their requirements.
C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
D. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
F. Coordinate completion and clean-up of work of separate sections.
G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PATCHING MATERIALS
A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

EXAMINATION
A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
D. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

PREPARATION
A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

LAYING OUT THE WORK
A. Promptly notify Architect of any discrepancies discovered.

GENERAL INSTALLATION REQUIREMENTS
A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

CUTTING AND PATCHING
A. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
C. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
E. Restore work with new products in accordance with requirements of Contract Documents.
F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material to full thickness of the penetrated element.
G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
H. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Remove debris, junk, and trash from site.
D. Leave site in clean condition, ready for subsequent work.
E. Clean up spillage and wind-blown debris from public and private lands.

PROTECTION OF INSTALLED WORK
A. Protect installed work from damage by construction operations.

ADJUSTING
A. Adjust operating products and equipment to ensure smooth and unhindered operation.

FINAL CLEANING
A. Use cleaning materials that are nonhazardous.
B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
D. Clean filters of operating equipment.

SECTION 01700 – EXECUTION REQUIREMENTS (continued)

CLOSEOUT PROCEDURES
A. Make submittals that are required by governing or other authorities.
B. Notify Architect when work is considered ready for Substantial Completion.
C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
D. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
E. Notify Architect when work is considered finally complete.
F. Complete items of work determined by Architect's final inspection.

SECTION 02200 – EARTHWORK

TEST REPORTS–EXCAVATING, FILLING AND GRADING
A. The Owner, at his own discretion and cost, may engage soil testing and inspection service (Soils Engineer) for quality control testing during earthwork operations.
B. The Soils Engineer shall be consulted as an Owner's representative and shall approve fill materials, method of placement, moisture contents and percent compaction. Soil materials, whether from sources on or off site must be approved by the Soils Engineer as suitable for intended use and specifically for foundation bearing, fill and backfill.
C. Location of the new structure and proposed Finish Floor Elevation shall be staked on site and approved by the Owner's Project Manager.
D. Finished Excavation shall be observed by the Soils Engineer and Structural Engineer prior to placement of any Concrete.
E. Backfill material shall be free of deleterious matter and rocks having a diameter of more than 4". Fill material in areas to receive new concrete walks shall be placed in even layers not exceeding 8" of loose depth and uniformly compacted as directed by the Soils Engineer (not less than 95 percent of maximum dry density as defined by ASTM D698). Provide organic topsoil in other disturbed areas, compact and grade to match adjacent areas. Grade areas surrounding the structure to cause rapid runoff of surface water. Provide the slope required by the Soils Engineer or not less than 6" in 12 feet. Finish grade surfaces shall be free from irregular changes and within 0.10 foot of required sub or finish grade elevations. Spread stockpiled topsoil and compact to minimum six (6) inch depth at all areas not designated for walks, paving or structures.

SECTION 03300 – CONCRETE

A. STANDARDS. Conform to applicable ACI and ASTM Standards including but not limited to:
1. ACI 301 Specifications for Structural Concrete for Buildings
2. ASTM C–94 Specifications for Ready–Mixed Concrete
3. ACI 318 Building Code Requirements for Reinforced Concrete
B. SUBMITTALS. Furnish proposed design mix for each class of concrete specified, a minimum of two (2) weeks prior to placement. Provide product data for curing and sealing compounds.
C. CONCRETE MATERIALS. Refer to the Structural drawings for concrete strength and reinforcing requirements.
D. STAINING AND SEALING COMPOUNDS. Lithochrome Tintura Stain and Scofield Selectseal–W by L.M. Scofield Co., or approved equal.
E. EXECUTION.
1. Construct forms complying with ACI 347, to the exact sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, level and plumb work in finished structures. Plumbing and utilities which pass through floor slabs shall be isolated from the slab.
2. Comply with the specified codes and standards, and Concrete Reinforcing Steel Institute recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and coordinate locations of dowels with the Masonry Contractor.
3. Furnish ready–mixed concrete mixed and delivered per ASTM C94.
4. Place concrete in compliance with the practices and recommendations of ACI 304R–89, and as herein specified. Protect freshly placed concrete from premature drying and excessive cold and hot temperatures, and maintain without drying at a relatively constant temperature for the period of time necessary for hydration of the cement and proper hardening of the concrete. Cure in accordance with ACI 301 procedures.
5. After placing slabs, plane the surface to a tolerance not exceeding 1/8 inch in two feet. Slope surfaces uniformly to drain where required. After leveling, finish per the Architect.
6. Apply float finish to monolithic slab surfaces that are to receive trowel finish and other finishes as hereinafter specified. At Interior floors, apply trowel finish, unless otherwise shown. At Exterior walks, apply a non–slip broom finish. Broom finish shall be applied perpendicular to length of walk.
7. Do not use liquid curing materials on interior flatwoor. Cure interior flatwork with new, nonstaining, high quality curing paper.
8. Interior concrete shall be sufficiently cured to allow concrete to become reactive, minimum 28 days.
9. Prepare surfaces and apply stain and sealer in strict conformance with manufacturers directions.

SECTION 04220 – MASONRY

REFERENCES
A. ASTM C90–03. All applicable NCMA TEK publications.

SUBMITTALS
A. Product Data on Concrete Masonry Units, reinforcing and all accessories. CMU and mortar color samples.

CONCRETE MASONRY UNITS
A. Provide light weight colored CMU with a compressive strength not less than 1900 psi. Architect shall select colors and pattern.

GENERAL PROCEDURES AND PROJECT CONDITIONS
1. Comply with applicable codes and National Concrete Masonry Association TEK publications.
2. Install units in a running bond pattern with concave mortar joints. Rake out mortar in preparation for application of sealants. Prevent grout, mortar or other materials from staining the face of masonry to be left exposed.
3. Provide high quality colored mortar, Type M or S in accordance with Table No. 2103.7 of the International Building Code. Submit True Tone Mortar color samples for selection by the Architect.
4. Insulate exterior walls with Perlite.

SECTION 06100 – ROUGH CARPENTRY

REFERENCES
A. All lumber shall be gradestamped by an agency certified by the Board of Review of the American Lumber Standards Committee, Inc. and manufactured in accordance with Product Standard PS 20, as published by the U.S. Department of Commerce.

SUBMITTALS
A. Provide product data. Provide Cedar Siding samples.

PRODUCTS
A. Framing Lumber, provide Hem–Fir dress lumber, S4S, unless otherwise noted, kiln dried to maximum 19% moisture content; Stud Grade with Fb = 675 psi and E = 1,200,000 psi.. Plywood concealed, APA rated sheathing grade, Exposure 1, Group 1 or 2 species for wall and roof sheathing.
B. Plywood soffits, 1/2" fir siding with grooves @ 4", T–1–11 or approved equal.

SECTION 06100 – ROUGH CARPENTRY (continued)

PRODUCTS
C. Cedar siding (for soffits), 1x4 tongue and groove, Select Tight Knot – STK grading.
D. Continuous soffit vents, aluminum, painted brown, provide model SV202 by Airvent or approved equal.

INSTALLATION
A. Refer to International Building Code for maximum span tables and fastening schedules.
B. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.
C. Comply with recommendations of the APA for installation of plywood. Provide Simpson Strong–Tie Panel Sheathing Clips to brace unsupported sheathing edges.

SECTION 06194 – FABRICATED WOOD TRUSSES

SUBMITTALS
A. Trusses shall be designed by a professional engineer employed by the Manufacturer and registered in the State of Colorado.
B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, details, fastening methods, accessory listings, hardware location and design loads.

INSTALLATION
A. Follow Manufacturer's installation instructions and recommendations.
B. Lift trusses into position, taking care to prevent out–of–plane bending. Set and secure level, plumb and at correct locations. Install permanent bracing and bridging prior to application of loads.

SECTION 07210 – BUILDING INSULATION

PRODUCTS
A. MINERAL/GLASS FIBER BATT INSULATION. Glass or other inorganic (non–asbestos) fibers formed with binders into resilient, flexible blankets or semi–rigid batts; ASTM C665, types as indicated, density not less than 0.5 pounds per cubic foot for glass and 2.5 pounds per cubic foot for mineral wool; thermal conductivity (k–value at 75oF) of 0.27; manufacturer's standard sizes, thicknesses to provide R–30 at roofs.

EXECUTION
A. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work. Extend insulation full thickness as shown over entire surface to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation and mastic. Apply a single layer of insulation of the required thickness, unless otherwise shown or required to make up the total thickness.

SECTION 07610 – METAL ROOFING

SUBMITTALS
A. Product data. Color samples.

PRODUCTS
A. Continuous length–roll formed panels with 1 3/4" tall ribs on 16 inch centers. Fastening system shall be concealed. Panel materials shall be minimum 24 gauge. Roof system shall include all flashings and fascia trims in materials and colors to match the roofing panel. Provide Snap–Clad metal panel system by PAC–CLAD Petersen Aluminum or approved equal. Panel finish selected from manufacturer's full line of colors including metallic finishes.
B. Provide all necessary items, trims, clips, nuts, and bolts necessary for a sound and secure weather–tight installation.
C. W.R. Grace Ice and Water Guard roof underlayment, or approved equal.

EXECUTION
A. Comply with manufacturer's instructions for the particular conditions of installation. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
B. Roll form radius roof panels as required to meet profile of arched roof.
C. Install metal roofing over a self adhesive, composite 40 mil rubberized membrane.

SECTION 07720 – ROOF ACCESSORIES

SUBMITTALS
A. Product data.

PRODUCTS
A. SKYLIGHTS: Provide Model #2448G by AIA industries or approved equal. Skylight shall be manufacturer's standard curb mount skylight. Provide curb extension as required for proper installation of skylight, membrane flashings, metal roofing, roofing flashings and roof insulation. Outside unit dimensions shall be approximately 24x48 (inches). Provide with heat–mirror treated, clear Glazing. Fabricate units to withstand 40 pound live loading.

EXECUTION
A. Separate metal surfaces of roof accessories from dissimilar metals, and from wood and cementitious substrates, by a thick coating of fibrated bituminous compound or other separation as recommended by the metal manufacturer, and as required to prevent corrosive action.
B. Anchor roof accessories permanentiy to the substrate by methods which are adequate for the sizes and locations of units. Comply with manufacturer's instructions for the particular conditions of installation. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.

08100 – HOLLOW METAL DOORS AND FRAMES

STANDARDS
1. ANSI/SDI–100–98 – Recommended Specifications for Standard Steel Doors an Frames
2. SDI–105–91 – Recommended Erection Instructions for Steel Frames
3. SDI–107–78 – Hardware on Steel Doors (reinforcement application)
4. ANSI–A250.4–1994 – Steel Doors and Frames Physical Endurance
5. Conform to HMMA 861 standards except where more stringent requirements are specified
6. IBC 2006 – International Building Code
7. ANSI–A117.1 – Accessible and Usable Building and Facilities

SUBMITTALS
A. Submit shop drawings showing fabrication and installation of standard steel doors and frames. Include details of each frame type, elevations of door and frame types, conditions at openings, details of construction, location and installation requirements of door and frame hardware reinforcements, and details of joints and connections. Show anchorage and accessory items.

PRODUCTS
A. All doors and frames shall be manufactured of commercial quality cold rolled steel per ASTM–A366 and A568 general requirements or galvanized to A60 or G60 minimum coating weight standard per ASTM–A924. Internal reinforcing may be manufactured of hot rolled pickled and oiled steel per ASTM–A569.

08100 – HOLLOW METAL DOORS AND FRAMES (continued)

PRODUCTS
B. Supports and anchors shall be fabricated of not less that 18–gauge sheet steel, galvanized where galvanized frames are used.
C. Where items are to be built into exterior walls, inserts, bolts and fasteners shall be hot dipped galvanized in compliance with ASTM–A153, Class C or D as applicable.
D. Rust inhibitive enamel or paint primer shall be used, baked on, and suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces on Steel Doors and Frames."

DOORS
A. Provide 1 3/4" thick doors of materials and ANSI/SDI–100 grades and models.
B. Exterior Doors: Level 3, Model 2 – Seamless: Exterior doors shall be minimum 16–gauge steel with both lock and hinge rail edge of door intermittently welded, filled and ground smooth the full height of door. Exterior doors shall be insulated with a solid slab of expanded polystyrene or polyurethane foam permanently bonded to the inside of each face skin. The top of all doors shall be closed flush by the addition of a 16–gauge screwed–in top cap to prevent water infiltration.

FRAMES
A. Provide hollow metal frames for doors of types and styles as shown on the drawings and schedules. Conceal fastenings unless otherwise indicated. Exterior Frames: Level 2, 16–gauge. 5 3/4 inch jamb depth base bid, 7 3/4 inch jamb depth for stone veneer alternate.
B. Fabricate frames with mitered and faces only welded corners, re–prime at the welded areas. All welds to be flush with neatly mitered or butted material cuts.
C. All frames shall have minimum 7 gauge hinge reinforcements, 14–gauge lock strike reinforcing, and 12–gauge closer reinforcing.
D. Provide temporary shipping bars to be removed before setting frames.

INSTALLATION
A. Comply with provisions of SDI–105, "Recommended Erection Instructions for Steel Door Frames," unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
B. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T–shaped anchors. Coordinate frame anchor placement with wall construction.
C. Coordinate installation of hardware.
D. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

08700 – DOOR HARDWARE

SUBMITTALS
A. Submit copies of finish hardware schedule in vertical format, listing each door opening, and organized into "hardware sets" indicating complete designations of every item required for each door opening to function as intended. Note any special mounting instructions or requirements with the hardware schedule.
B. Submit catalog cuts and/or product data sheets for all scheduled finish hardware.

WARRANTY
A. All items, except as noted below, shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a minimum period of one (1) year commencing on the date of final completion and acceptance. In the event of product failure, promptly repair or replace item with no additional cost to the owner. Cylindrical locksets – Heavy Duty: Five (5) years. Door closers: Ten (10) years

HARDWARE GROUPS
A. MEN and WOMEN (doors 101 and 102) – Provide pushplate, pull, deadbolt, flushbolt, closer with adjustble stop and hold open, sign, weathering, and hinges.
B. STORAGE (door 103) – Provide storeroom type lever–lockset, latch–guard, deadbolt, overhead stop, weathering and hinges.

PRODUCTS
A. Provide the following or approved equal:
Hinges Hager BB1279
Closers Norton CLP–8301T – NO SUBSTITUTIONS
Locksets Best 9K Series
Deadbolts Best 9K Series
Flushbolts Adams Rite Cylinder Operated Flushbolt –1870 HM Series (Restroom Doors to lock in the full open position)
Cylinders Best (verify with Owner)
Push/Pulls Trimco (4" x 16")
Latch–guard Trimco
Weathering Pemko
Wall Stops Rockwood
Signs Trimco (Men, Women, International symbol of accessibility).

FINISHES
A. All hardware to be furnished in US32D 630 Stainless Steel Satin Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

INSTALLATION
A. Mount hardware units at heights indicated in the following applicable publications, except as specifically indicated or required to comply with the governing regulations.
1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute (DHI.)
2. All hardware shall be applied and installed in accordance with best trade practice by an experienced hardware installer. Care shall be exercised not to mar or damage adjacent work.
B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protection with finishing work specified in the Division 9 Sections. Do not install surface–mounted items until finishes have been completed on the substrates involved.

SECTION 09900 – PAINTS AND COATINGS

GENERAL
A. The work of this Section includes prep, priming, sanding and cleaning; painting/staining and finishing of all walls, ceilings, soffits, beams and wood trim; painting of all hollow metal door and door frames; painting of unfinished mechanical, plumbing and electrical items; application of graffiti protection; and caulking of all joints as required by these specifications and as directed by the Architect.
B. Paint and stain colors will be selected by the Architect after all samples are submitted and approved. The Architect will issue a color schedule with an itemized list of colors to be applied. No paint shall be applied until the color schedule is issued.
C. Rquirements of this section are that all items, and surfaces which are normally painted and finished in a project of this type and quality be included. All toilet room walls shall have block–fill and an elastomeric paint system. Typical plywood and cedar siding finished soffits and ceilings shall be stained. Provide a clear graffiti–guard system over CMU and stone surfaces that are not painted (submit a sample of each with the graffiti guard applied, prior to approval).

SECTION 09900 – PAINTS AND COATINGS (continued)

SUBMITTALS
A. Product Data: Provide data on all finishing products, including VOC content. Paint color fan deck.
B. Samples: Submit two paper chip samples, 8 x 8 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.
C. Manufacturer's Instructions: Indicate special surface preparation procedures.
D. Maintenance Data: Submit data on cleaning, touch–up, and repair of painted and coated surfaces.

EXAMINATION
A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

PREPARATION
A. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
B. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
C. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra–sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
D. Shop–Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch–up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
E. Interior Wood Items to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
F. Interior Wood Items to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

APPLICATION
A. Apply products in accordance with manufacturer's instructions.
B. Caulk joints between similar materials, fill nail holes, prime and clean surfaces to be painted prior to painting.
C. Two separate coats of paint or stain shall be applied. Allow applied coats to dry before next coat is applied. Apply each coat to uniform appearance.
D. Caulk joints at perimeter of plumbing fixture and wall or floor.

SECTION 10155 – TOILET PARTITIONS

SUBMITTALS.
A. Submit manufacturer's detailed technical data for materials, fabrication and installation. Include catalog cuts of hardware, anchors, fastenings and accessories. Transmit copy of each to the Installer. Submit shop drawings for the fabrication and erection of toilet partition assemblies which are not fully described in manufacturer's data. Show all anchorage and accessory items. Provide one set actual samples of available finishes for Architect's selection.
B. Comply with Handicap Accessibility requirements of "The Americans With Disabilities Act." Submit setting drawings, templates and instructions for the installation of anchorage devices built into other work.

PRODUCTS
A. The work of this section includes stall doors at each of the toilets. Partitions shall be constructed of CMU. Provide heavy–duty high density polyethylene doors and hardware by Santana or approved equal.

Material: Solid Plastic High Density Polyethylene
Type: Pilaster type,
Finish: Colors as selected from manufacturer's standards

B. Hardware and Accessories: solid plastic pilaster shoes and full continuous plastic wall brackets, color to coordinate with system. Hardware: Manufacturer's standard design, heavy–duty operating hardware and accessories, cast aluminum. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of finished to match hardware, with security screw–type heads and nuts:

For each stall, pull, heavy slide bar latch, rubber–tipped bumpers, gravity hinges with concealed ball–bearing rollers. Coordinate, prepare as required for other accessories as specified in this section.

INSTALLATION
A. When possible, take field measurement prior to preparation of shop drawings and fabrications to ensure proper fitting of the work. Otherwise, indicate field measurements on final shop drawings. Furnish inserts and anchoring devices which must be built into other work for the installation of toilet partitions and related work. Coordinate delivery with other work to avoid delay.
B. Install partitions rigid, straight, plumb and level, with the panels laid out as shown on Drawings. Provide clearances of not more than 1/2 inch between pilasters and panels, and not more than one inch between panels and walls. Install door bumpers on partitions or walls:

SECTION 10800 – TOILET ACCESSORIES

SUBMITTALS.
A. Submit product literature of each proposed accessory to the Architect for review and approval. Submit manufacturer's technical data and installation instructions for each accessory. Transmit copies of installation instructions to the Installer.
B. Comply with Handicap Accessibility requirements of "The Americans With Disabilities Act." Submit setting drawings, templates and instructions for the installation of anchorage devices built into other work.

PRODUCTS
A. The work of this section includes the following items:

Hand Dryer, World Hand Dryer model XA5 surface mount.
Baby Changing Stations, Koala Kare KB112–01RE
Grab Bars, Bradley Model 812 (or approved equal)
Stainless Steel Mirrors (provide at each lav), Bradley Model 748, 24" x 30", (or approved equal)
Napkin/Tampon Disposal (provide at each women's toilet), Bradley 4722–15 (or approved equal)

Toilet Paper Holders, Supplied by Owner, Installed by General Contractor
Paper Towel Dispenser, Supplied by Owner, Installed by General Contractor

INSTALLATION
A. Use concealed fastenings. Provide anchors, bolts and other necessary anchorages, and attach accessories securely to walls and partitions in locations as shown or directed.
B. Install concealed mounting devices and fasteners fabricated of the same material as the accessories, or of galvanized steel, as recommended by manufacturer.
C. Install exposed mounting devices and fasteners finished to match the accessories.
D. Provide theft–resistant fasteners for all accessory mountings. Secure accessories in accordance with the manufacturer's instructions for each item and each type of substrate construction.
E. Unless otherwise indicated, align units with fixtures, other elements and as directed by Architect. Conform to The Americans With Disabilities Act for positions and mounting heights for access to the handicapped.

STATE OF COLORADO
KELLY BOYD MORGAN
ARC–401982
LICENSED ARCHITECT
2–22–19

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consultant:

project:
Grand Junction Park Restrooms Large

project#: 18.0850
date: 22 February 2019

revisions :

title:
General Information

sheet:
GI002

FINISH SCHEDULE

ROOMS		FLOORS					
Number	Name	Floor Finish	Wall Material	Wall Finish	Ceiling Material	Ceiling Finish	Comments
100	ENTRY	CONCRETE SEALER	CMU	GRAFFITI GUARD	T & G CEDAR	STAIN	
101	WOMEN	CONCRETE SEALER	CMU	PAINT	GROOVED PLYWOOD	STAIN	
102	MEN	CONCRETE SEALER	CMU	PAINT	GROOVED PLYWOOD	STAIN	
103	CHASE	CONCRETE SEALER	CMU	PAINT	GROOVED PLYWOOD	STAIN	
104	SHELTER	CONCRETE SEALER	CMU	GRAFFITI GUARD	T & G CEDAR	STAIN	
105	GARAGE	CONCRETE SEALER	CMU	PAINT	GROOVED PLYWOOD	STAIN	

EXTERIOR FINISHES

COLORED CMU 01	8X8X16 INTEGRAL COLORED, HONED CMU - "BUFF" COLOR BY BRICKYARD GJ, OR EQUAL
COLORED CMU 02	8X8X16 INTEGRAL COLORED, HONED CMU - "MT. GARFIELD" COLOR BY BRICKYARD GJ, OR EQUAL
METAL ROOFING	COLOR MATCHING MBCI "KOKO BROWN" OR "MEDIUM BRONZE" OR EQUAL COLOR AS APPROVED
PAINT	COLOR TO MATCH METAL ROOFING COLOR AS APPROVED, SIMILAR TO SHERWIN WILLIAMS SW097 "STURDY BROWN"
STAIN	AS SELECTED FROM MANUFACTURER'S FULL RANGE OF COLORS

DOOR SCHEDULE

	Door Dimensions			Door		Frame		Hardware Set	
Number	WD	HGT	THK	Material	Finish	Material	Finish		Comments
101A	3' - 0"	7' - 0"	1 3/4"	HM	PAINT	HM	PAINT		INSULATED WITH 4" FRAME HEAD
102A	3' - 0"	7' - 0"	1 3/4"	HM	PAINT	HM	PAINT		INSULATED WITH 4" FRAME HEAD
103A	3' - 0"	7' - 0"	1 3/4"	HM	PAINT	HM	PAINT		INSULATED WITH 4" FRAME HEAD
105A	3' - 0"	8' - 0"	1 3/4"	HM	PAINT	HM	PAINT		INSULATED WITH 4" FRAME HEAD
105B	8' - 0"	8' - 0"	2"						
105C	8' - 0"	8' - 0"	2"						
105D	8' - 0"	8' - 0"	2"						

FLOOR PLAN KEYNOTES [#] CJ = SIDEWALK CONTROL JOINT

1. TOP OF INTERIOR CONCRETE SLAB AT +100'-0". TOP OF EXTERIOR CONCRETE SLAB AT 1/2" BELOW INTERIOR CONCRETE SLAB AT DOOR, TYPICAL

CODE ANALYSIS

APPLICABLE CODES

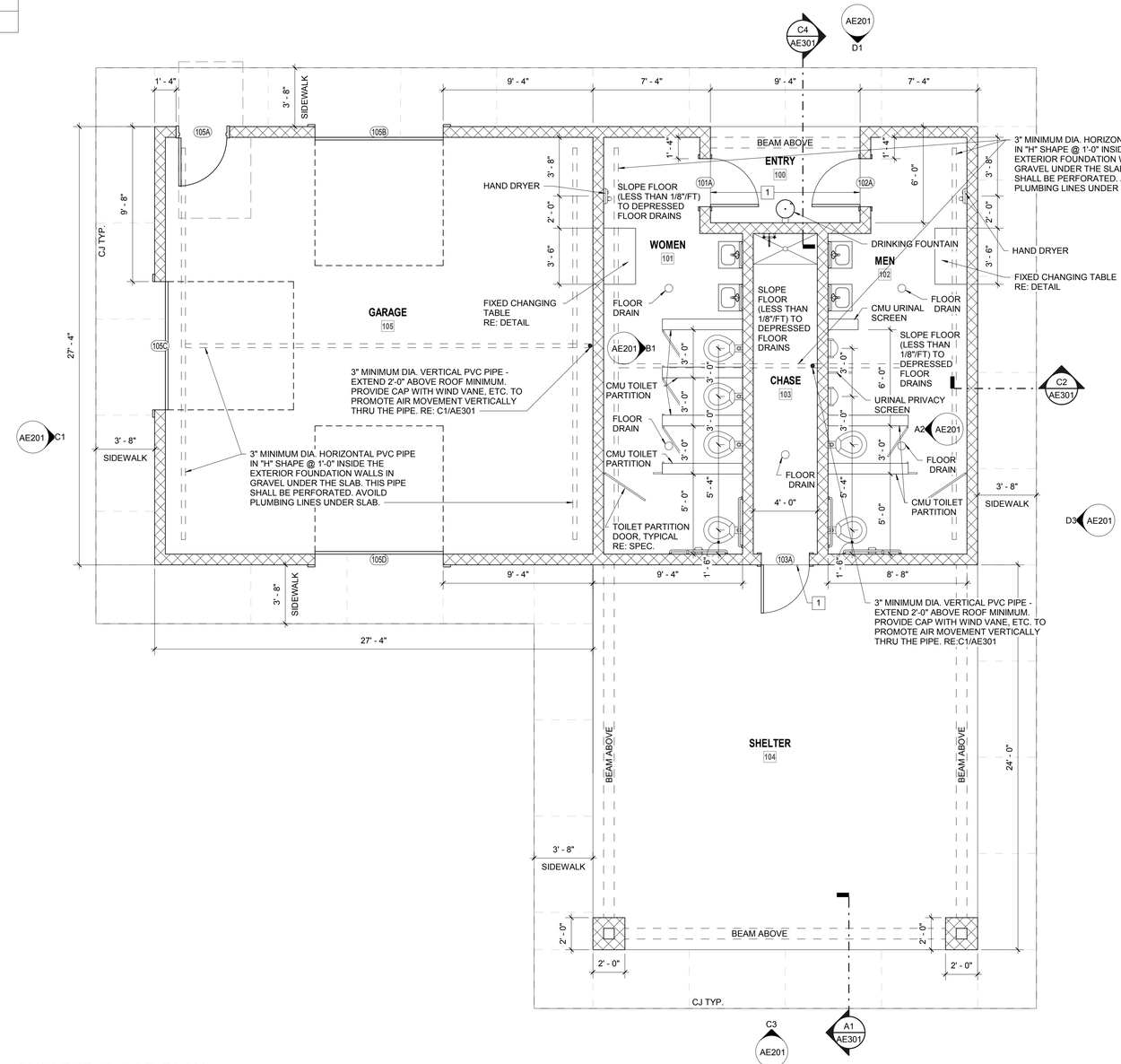
	Year		Year
International Building Code	2015	National Electrical Code	2014
International Mechanical Code	2015	Uniform Code for	
International Plumbing Code	2015	Building Conservation	
International Fire Code	2015	ADA Accessibility	
International Energy Conservation Code	2015	Guildelines	2010

A. Occupancy: GROUP B

B. Type of Construction (circle one):

I	I	II	II	III	III	IV	V	V
A	B	A	B	A	B	HT	A	B

C. Total Interior Floor Area: 1,944 SF



A2 SHELTER FLOOR PLAN
1/4" = 1'-0"

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Grand Junction Park Restrooms Large

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Floor Plan

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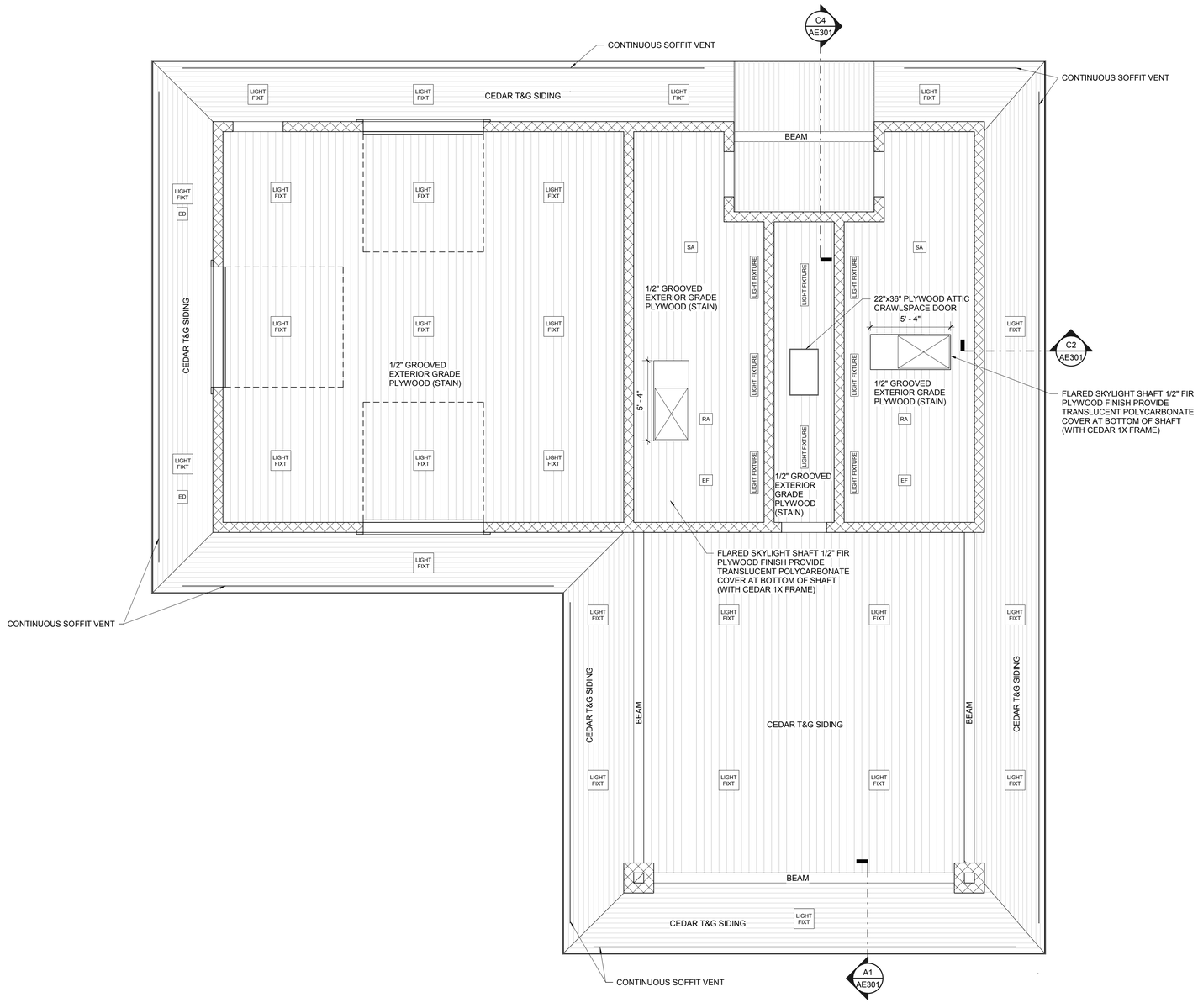
AE101



A2 SHELTER REFLECTED CEILING PLAN
1/4" = 1'-0"

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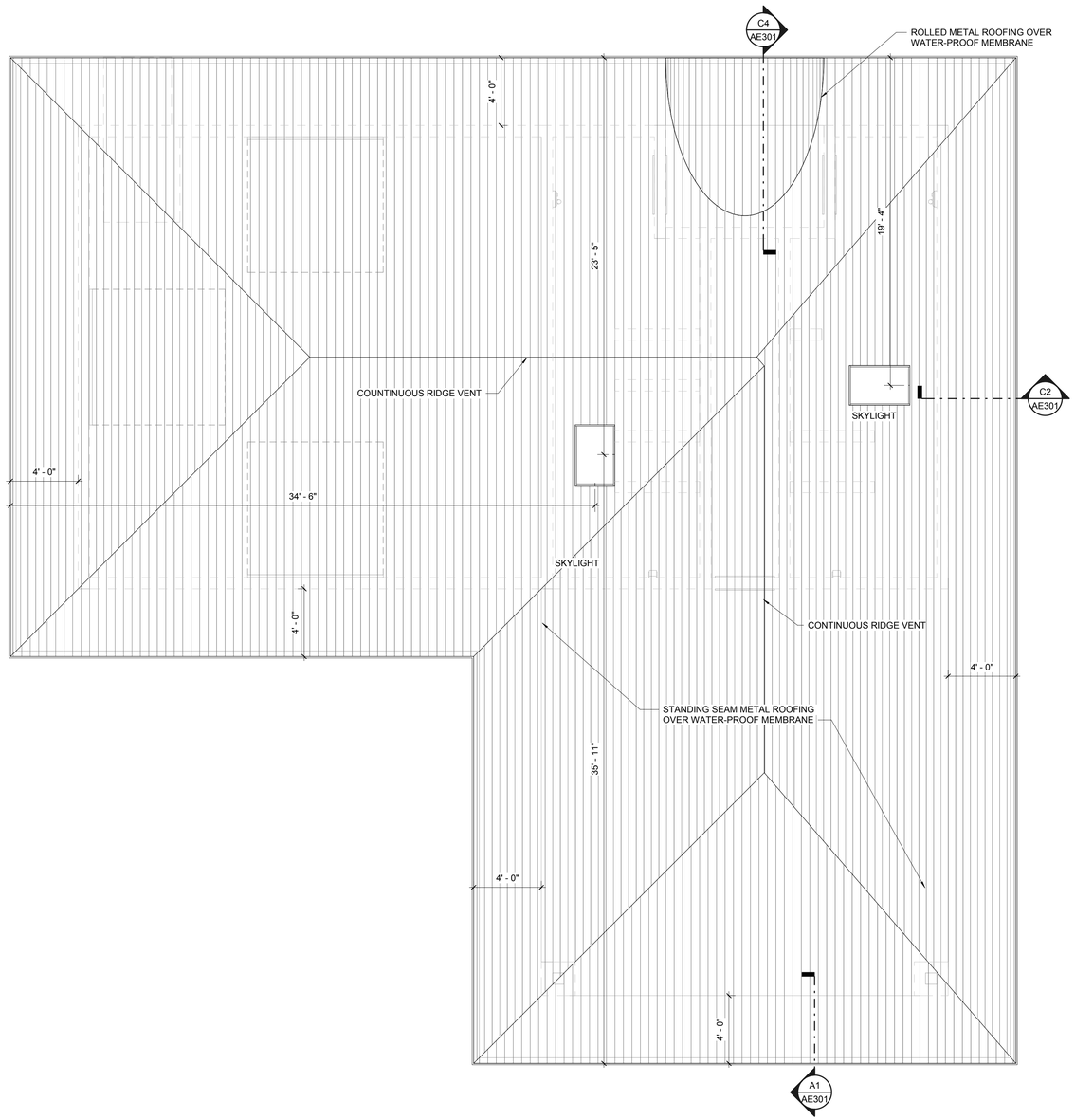
title:

Reflected Ceiling Plan

sheet:

AE102



A2 SHELTER ROOF PLAN
1/4" = 1'-0"

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Roof Plan

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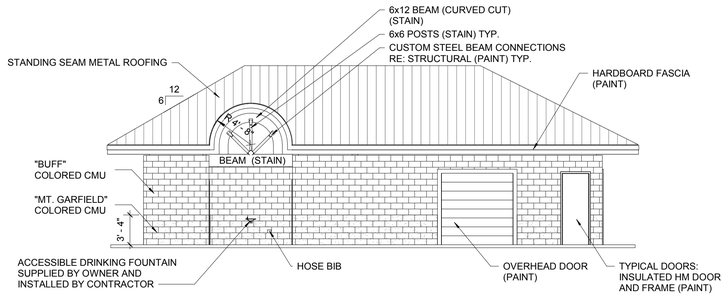
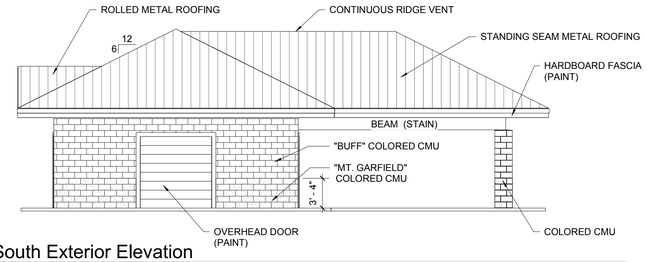
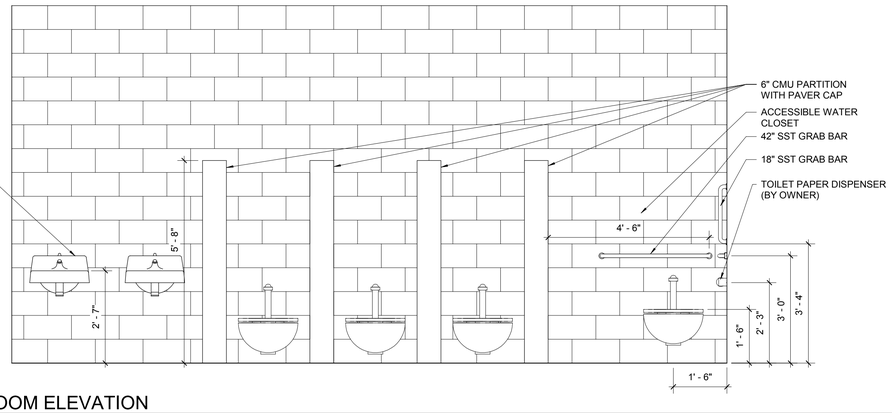
AE103



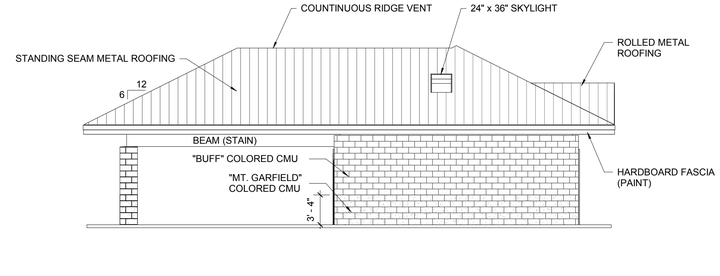
D1 North Exterior Elevation
1/8" = 1'-0"



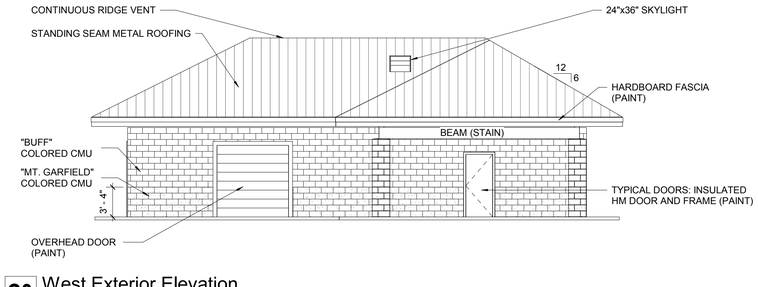
C1 South Exterior Elevation
1/8" = 1'-0"



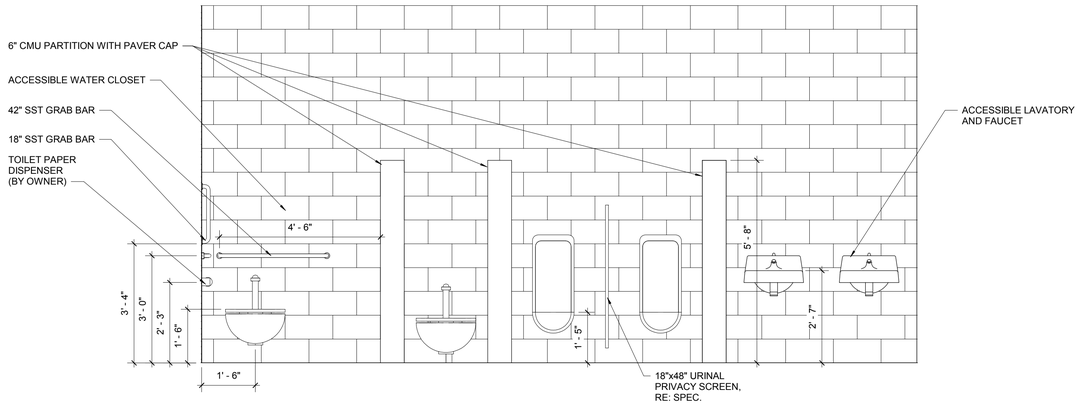
B1 WOMENS ROOM ELEVATION
1/2" = 1'-0"



D3 East Exterior Elevation
1/8" = 1'-0"



C3 West Exterior Elevation
1/8" = 1'-0"



A2 MENS ROOM ELEVATIONS
1/2" = 1'-0"

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Grand Junction Park
Restrooms Large

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title:
Exterior & Interior Elevations

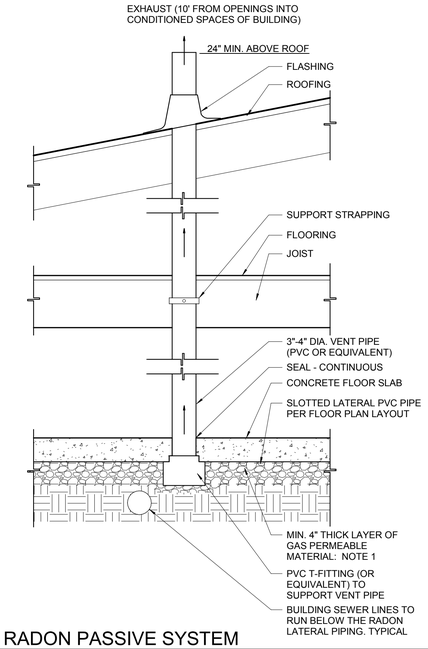
sheet:
AE201

NOTES:

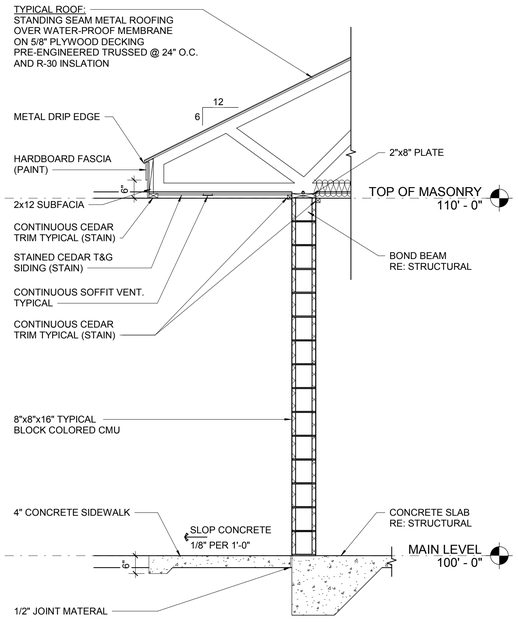
1. ALL CONCRETE SLABS THAT COME IN CONTACT WITH THE GROUND SHALL BE LAID OVER A GAS PERMEABLE MATERIAL MADE UP OF EITHER A MINIMUM 4" THICK UNIFORM LAYER OF CLEAN AGGREGATE, OR A MINIMUM 4" THICK UNIFORM LAYER OF SAND, OVERLAIN BY A LAYER OR STRIPS OF MANUFACTURED MATTING DESIGNED TO ALLOW THE LATERAL FLOW OF SOIL GASES.

2. ALL OPENINGS, GAPS, AND JOINTS IN FLOOR AND WALL ASSEMBLIES IN CONTACT WITH SOIL OR GAPS AROUND PIPES, TOILETS, BATHTUBS OR DRAINS PENETRATING THESE ASSEMBLIES SHALL BE FILLED OR CLOSED WITH MATERIALS THAT PROVIDE A PERMANENT AIR-TIGHT SEAL. SEAL LARGE OPENINGS WITH NON-SHRINK MORTAR, GROUTS OR EXPANDING FOAM MATERIALS AND SMALLER GAPS WITH AN ELASTOMERIC JOINT SEALANT, AS DEFINED IN 'ASTM C920-87'.

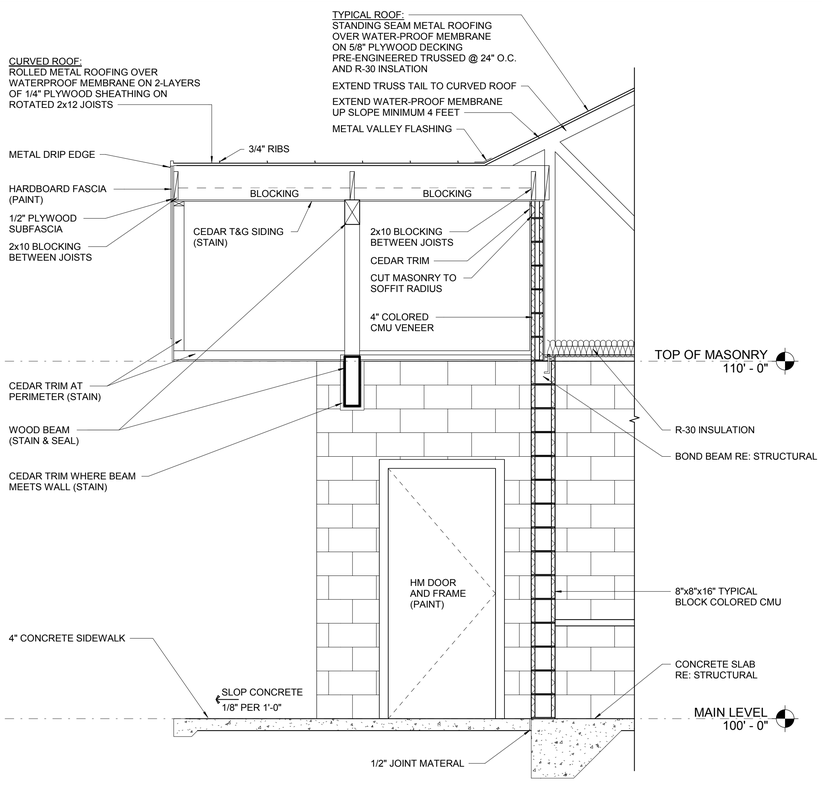
3. VENT PIPES SHALL BE INSTALLED SO THAT ANY RAINWATER OR CONDENSATION DRAINS DOWNWARD INTO THE GROUND BENEATH THE SLAB OR SOIL-GAS-RETARDER MEMBRANE.



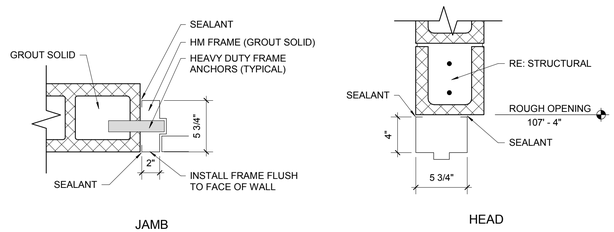
C1 RADON PASSIVE SYSTEM
1" = 1'-0"



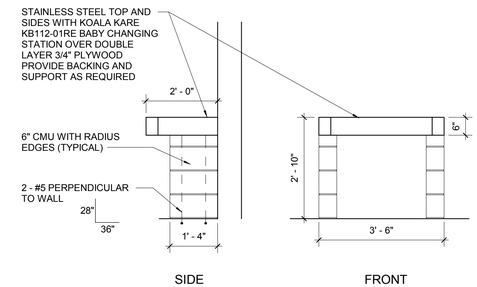
C2 WALL SECTION
1/2" = 1'-0"



C4 WALL SECTION
1/2" = 1'-0"

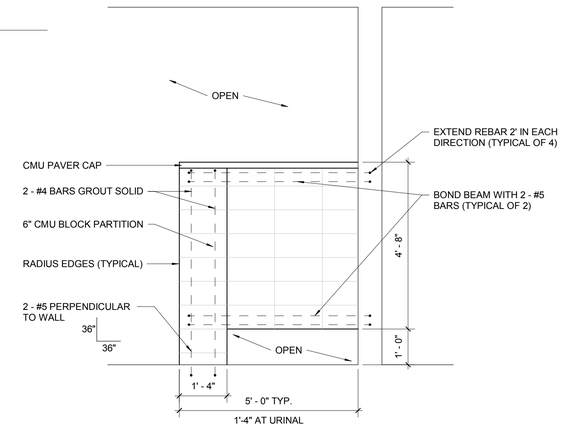


B2 DOOR FRAME DETAILS
1 1/2" = 1'-0"



A1 WALL SECTION
1/2" = 1'-0"

A2 FIXED CHANGING TABLE ELEVATIONS
1/2" = 1'-0"



A3 TYPICAL INTERIOR PARTITION (URINAL SCREEN SIM.)
1/2" = 1'-0"

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project:
Grand Junction Park Restrooms Large

project#: 18.0850
date: 22 February 2019

revisions :

title:
Wall Sections & Details

sheet:
AE301

GENERAL STRUCTURAL NOTES

GENERAL

1. The structural notes are intended to complement the project specifications. Specific notes and details in the drawings shall govern over the structural notes and typical details.
2. Typical details and sections shall apply where specific details are not shown.
3. The contractor shall verify all site conditions and dimensions. If actual conditions differ from those shown in the contract drawings, the contractor shall immediately notify the architect/engineer before proceeding with the fabrication or construction of any affected elements.
4. Omissions or conflicts between the contract drawings and/or specifications shall be brought to the attention of the architect/engineer before proceeding with any work involved. In case of conflict, follow the most stringent requirement as directed by the architect/engineer at no additional cost to the owner.
5. The contractor shall submit a written request to the architect/engineer before proceeding with any changes, substitutions or modifications. Any work done by the contractor before receiving written approval will be at the contractor's risk.
6. The structural drawings are not all-inclusive and do not contain all dimensions, elevations, openings, mechanical shafts and penetrations needed to build the structure. The contractor shall coordinate these items with the Architectural, Mechanical and Electrical drawings.
7. The contractor shall coordinate with all trades any items that are to be integrated into the structural system such as openings, penetrations, mechanical and electrical equipment, etc. Sizes and locations of mechanical and other equipment that differs from those shown on the contract drawings shall be reported to the architect/engineer.
8. The contractor shall provide adequate shoring and bracing as required for the chosen method of erection. Shoring and bracing shall remain in place until final connections for the permanent members are completed. The building shall not be considered stable until all connections are completed. Walls shall not be considered self-supporting and shall be braced until the roof system is completed.
9. Site observations by BHB Consulting Engineers, P.C.'s field representative shall not be construed as approval of construction procedures nor special inspection.
10. Detailing and shop drawing production for structural elements will require information (including dimensions) contained in the architectural, structural and/or other consultants' drawings. The structural drawings shall be used in conjunction with the architectural and other consultant's drawings. Some dimensions and elements such as elevations, depressions, slopes, mechanical housekeeping pads, etc. are not shown in the structural drawings. All dimensions shown on structural drawings shall be verified by contractor with architectural, mechanical and electrical drawings.
11. Review of shop drawing submittals by BHB Consulting Engineers, P.C. is for general compliance only and is not intended for approval. The shop drawing review shall not relieve the contractor from the responsibility of completing the project according to the contract documents.
12. Shop drawings made from reproductions of the contract drawings will be rejected unless the contractor signs a release agreement prior to the shop drawings being reviewed.
13. Only an authorized representative of BHB Consulting Engineers, P.C. may make changes to these contract drawings. BHB Consulting Engineers, P.C. shall not be held responsible or liable for any claims arising directly or indirectly from changes made without written authorization by an authorized representative of BHB Consulting Engineers, P.C.

BASIS OF DESIGN

1. Governing Code — International Building Code 2015
   a. Risk Category — II
2. Snow Loads
   a. Ground Snow Load, Non-Reducible — P_g = 30 psf
   b. Roof Snow Load — P_f = 30 psf plus Snow Drift
3. Seismic Loads
   a. Seismic Importance Factor, I_e — 1.0
   b. Seismic Design Category — D
   c. Mapped Spectral Acceleration — S_s = 0.234g; S_1 = 0.069g
   d. Soil Site Class — D
   e. Soil Site Coefficients — F_a = 1.6; F_v = 2.4
   f. 5% Damped Design Spectral Response Acceleration — $S_{DS} = 2/3 * F_a * S_S = 0.25g$; $S_{D1} = 2/3 * F_v * S_1 = 0.11g$
   g. Seismic-Force-Resisting System — Special Reinforced Masonry Shear Walls
   h. Response Modification Coefficient — R = 5.0
   i. System Over-strength Factor — $\Omega_0 = 2.5$
   j. Deflection Amplification Factor — $C_d = 3.5$
   k. Redundancy Factor — $\rho_x = 1.0$; $P_y = 1.0$
   l. Fundamental Building Period — T = 0.152 seconds
   m. Seismic Response Coefficient — $Cs = SDS * I_e / R$; $Cs = SD1 * I_e / (R*T)$
   n. W — Dead Loads of Structure
   o. Base Shear — $V = C_S * W = 0.05$ W (Strength Design)
   p. Analysis Procedure — Equivalent Lateral Force (Static)
4. Wind Loads
   a. Wind Velocity (3 Second Gust) — 115 mph (Strength); 90 mph (Allowable (I_w = 1.0))
   b. Exposure Type — C
   c. Internal Pressure Coefficient, GCpi — +/-0.18
   d. Topographic Factor, Kzt — 1.0
   e. Components and Cladding Wind Force Table (psf; Strength Design)

Component Elevation above grade	Effective Wind Area for Component (sq ft.)				
	10 sq ft.	20 sq ft.	50 sq ft.	100 sq ft.	500 sq ft.
15	29.8	27.2	23.8	21.2	15.1
20	31.7	28.9	25.3	22.5	16.1

FOUNDATION

1. Soils Investigation Report: None
2. Assumed Soil bearing pressure: 1500 psf -Contractor shall verify at time of construction.
3. Frost Protection: 12 inches minimum.
4. Clear excavations of debris and loose soil prior to placing footings. All footings shall bear on undisturbed natural sub-grade or engineered compacted fill as noted in these drawings.

EARTHWORK

1. Prior to construction, the contractor shall verify that the soil conditions are adequate for 1,500 psf allowable soil bearing pressure. If needed, structural fill shall be provided beneath footings.
2. Clearing: Remove all existing structures and associated foundations, slabs, fencing, asphalt, concrete, and incidental structures as necessary for project completion. The building area shall be stripped of all vegetation, topsoil and debris. Following stripping, all fill soils and any remaining loose natural soils shall be excavated to expose competent natural soils.
3. Proof roll the entire building pad area with normal compaction equipment to check for the presence of unsuitable fills, soft spots, or other undesirable materials or conditions. Remove sub-grade materials that are unsuitable and replace with compacted structural fill or 2,000 psi lean concrete.
4. Compacted structural fill: All fill material shall be a well-graded granular material with a maximum size less than 3 inches and with not more than 15 percent passing a No. 200 sieve. It shall be compacted to at least 95 percent of the maximum laboratory density as determined by ASTM D 1557 for fill beneath footings and 90 percent for fill beneath floor slabs. All fill shall be tested. Compacted structural fill shall be placed in lifts not exceeding 8 inches in uncompacted thickness.
5. Floor slabs thicknesses shall be required by the plans and underlain by a granular layer at least 4 inches thick. The granular layer shall have a maximum size less than 1 inch with not more than 5 percent passing a #200 sieve and shall be compacted to at least 90 percent of the maximum laboratory density as determined by ASTM D 1557.
6. Consult the project specifications for further earthwork requirements.

CONCRETE

1. Materials, unless noted otherwise:
   a. Normal weight aggregates — ASTM C 33
      i. Combined aggregate gradation for slabs on grade and other designated concrete shall be 8% - 18% for large top size aggregates (1.1/2") or 8% - 22% for smaller top size aggregates (1" or 3/4") retained on each sieve below the top size and above the No. 100. The range for the No. 30 and No.50 sieves shall be 8% - 15% retained in each. To avoid gap gradation the following shall occur:
         1. The percent retained on two adjacent sieves shall not fall below 5%.
         2. The percent retained on three adjacent sieves shall not fall below 8%.
         3. When the percent retained on two adjacent sieves is less than 8%, the total retained on either of these sieves and the adjacent outside sieve shall be at least 13%. See ACI 302 Section 5.4.3.3 for more information.
      ii. Maximum Aggregate Size shall not be larger than:
         1. 1/5 the narrowest dimension of the forms
         2. 1/3 the depth of the slab
         3. 3/4 the minimum clear spacing between bars
   b. Reinforcing Steel — ASTM 615 Grade 60 (Fy = 60 ksi). Use Grade 40 (Fy = 40 ksi) for field bent dowels with spacings indicated reduced by 1/3.
   c. Headed Stud Anchors (HSA) — ASTM A108
   d. Anchor Rods
      Typical, uno — ASTM F1554, Grade 36, with ASTM A563 heavy hex nuts and hardened washers Grade A
   e. Admixtures:
      i. Air-entraining admixtures shall comply with ASTM C 260 (when used).
      ii. Calcium chloride shall not be added to the concrete mix.
      iii. Water-reducing admixture shall comply with ASTM C 494/C 494M, Type A (when used)
      iv. Retarding admixture shall comply with ASTM C 494/C 494M, Type B (when used).
      v. Water-reducing and retarding admixture shall comply with ASTM C 494/C 494M, Type D (when used).
      vi. High-range, water-reducing admixture shall comply with ASTM C 494/C 494M, Type F (when used).
      vii. High-range, water-reducing and retarding admixture shall comply with ASTM C 494/C 494M Type G (when used).
      viii. Admixture manufacturer shall have ISO 9001 Quality Certification. To ensure compatibility all admixtures shall be from the same manufacturer.
   f. Type I/II cement complying with ASTM C-150 shall be used for all concrete. Cement source shall remain the same for the entire job.
   g. The water/cementitious materials ratios shall meet the requirements of Table 19.3.2.1 of ACI 318-14.
   h. Fly Ash - ASTM C618, Class F – 25% maximum cementitious content.
   i. Provide air entraining as recommended by Table 19.3.3.1 of ACI 318-14. Concrete that extends abovegrade and is exposed to freezing and thawing while moist shall be air-entrained.
   j. No aluminum conduit or product containing aluminum or any other material injurious to concrete shall be embedded in concrete.
2. Compressive strengths of concrete at 28 days shall be as follows
   a. Exterior Footings & Exterior Foundation Walls
      Strength — 4,000 psi
      Classification — F0, S0, W0, C0
   b. All Site Concrete with Reinforcement
      Strength — 5,000 psi
      Classification — F3, S0, W1, C2
   c. All Site Concrete without Reinforcement
      Strength — 4,500 psi
      Classification — F3, S0, W1, C2
3. Only one grade or type of concrete shall be poured on the site at any given time.
4. The contractor shall be responsible for the design, detailing, care, placement and removal of all formwork and shores.
   a. Supporting forms and shoring shall not be removed until structural members have acquired sufficient strength to safely support their own weight and any construction load to which they may be subjected. In no case, however, shall forms and shoring be removed in less than 24 hours after concrete placement.
5. Reinforcement shall have the following concrete cover:

a. Cast-in-place Concrete	Clear Cover
i. Cast against and permanently exposed to earth	3"
ii. Formed concrete exposed to earth or weather:	
#5 and smaller bars	1.1/2"
iii. Concrete not exposed to weather or in contact with ground:	
Slabs, Walls, Joists; #11 bars and smaller	3/4"
Beams, Columns: Primary Reinf., Ties, Stirrups, Spirals	1.1/2"

6. Detailing:
   a. Lap splice lengths shall be detailed to comply with the "Concrete Reinforcing Bar Lap Splice Schedule" on sheet S601. Splices may be made with mechanical splices capable of 125% tension capacity of the bar being spliced. Mechanical splices shall be the positive connecting type coupler and shall meet all International Building Code requirements and shall have a current ICC-ES report or IAPMO Certification. Use "Lenton" Standard Couplers (ICC ER-3967), "Bar-Lock" (ICC ESR-2495) or equal with internal protector. If mechanical splices are used, splices or couplers on adjacent bars shall be staggered a minimum of 24" apart along the longitudinal axis of the reinforcing bars.
   b. At joints, provide reinforcing dowels to match the member reinforcing, unless noted otherwise.
   c. At all discontinuous control or construction slab on grade joints, provide 2 - #4 x 48 inches.
   d. Corner Bars: Provide corner bars at intersecting wall corners using the same bar size and spacing as the horizontal wall reinforcing. Corner bars shall lap the horizontal reinforcing with the required lap splice length.
   e. All vertical reinforcing shall be doweled to footings, or to the structure below with the same size and spacing as the vertical reinforcing for the element above. Dowels extending into footings shall terminate with a 90-degree standard hook and shall extend to within 4" of the bottom of the footing. Footing dowels (#8 bars and smaller) with hooks need not extend more than 20" into footings.
7. Construction Joints, Control (Contraction) Joints:
   f. Construction joints in all horizontal and vertical construction joints including between top of footing and foundation walls shall be intentionally roughened to a full amplitude of approximately 1/4 . The laitance on the concrete (thin, flaky layer of hardened but weak hydrated cement) shall be mechanically removed from the surface after the concrete has achieved final set.
   g. Control joints shall be installed in slabs on grade so the length to width ratio of the slab is no more than 1.25:1. Control joints shall be completed as soon as final set is achieved and it is okay to operate the cutter on the slab. Final set is typically achieved within the first 4 to 6 hours of the slab pour. For early entry saw cutting, joints should be cut within the first 1 to 4 hours, depending on weather conditions and concrete hydration rate. Where saw cut joints cannot be cut along the entire projected length of the joint, a 90-degree hand grinder or other tool shall be used to complete the joint. Control joints may be installed by:
      i. Saw cut a depth of 1/4 the thickness of the slab (1 1/4" ± for early entry saws)
      ii. Tooled joints a depth of 1/4 the thickness of the slab
   h. For interior concrete slabs-on-grade that are to receive **no** floor covering, install construction or control joints in slabs on grade at a spacing not to exceed 30 times the slab thickness in any direction, unless noted otherwise. For interior concrete slabs-on-grade that are to receive floor coverings the contractor has the option to eliminate control joints. Construction joints shall not exceed a distance of 125'-0" o.c. in any direction.
8. Construction
   i. Use chairs or other support devices recommended by the CRSI to support and tie reinforcement bars prior to placing concrete. Reinforcing steel for slabs on grade shall be adequately supported. Support reinforcing steel of slabs on grade with precast concrete units. Lifting the reinforcing off the grade during placement of concrete is not permitted.
   j. Concrete to be mechanically consolidated during placement per ACI standards.
   k. Contractor shall coordinate placement of all openings, curbs, dowels, sleeves, conduits, bolts, inserts and other embedded items prior to concrete placement.
   l. All embeds, anchors and dowels shall be securely tied to formwork or to adjacent reinforcing prior to the placement of concrete.
   m. No pipes, ducts, sleeves, etc shall be placed in structural concrete unless specifically detailed or approved by the structural engineer. Penetrations through walls when approved shall be built into the wall prior to concrete placement. Penetrations will not be allowed in footings or grade beams unless detailed. Piping shall be routed around footings and grade beams and unless detailed. Footings shall be stepped to avoid piping.
   n. Reinforcing Bars shall not be welded. Do not substitute reinforcing bars for DBAs or HSAs.

MASONRY

1. Materials, unless noted otherwise:
   a. Concrete Masonry Units (CMU) ASTM C90: Lightweight Grade N (minimum net area unit strength of 2,000 psi). f'_m = 2,000 psi.
   b. Mortar Cement: Use Type "S"
   c. Masonry Grout ASTM C476: grout shall attain a minimum compressive strength of 2,500 psi at 28 days.
   d. Reinforcing Steel — ASTM 615 Grade 60 (Fy = 60 ksi)
   e. Deformed Bar Anchors (DBA) — ASTM A496
   f. Headed Stud Anchors (HSA) — ASTM A108
   g. Anchor Rods — ASTM F1554, Grade 36,with ASTM A563 heavy hex nuts and ASTM F436 hardened washers
2. Reinforcement shall have the following cover:
3. Typical reinforcement shall have a minimum coverage of one bar diameter over all the bars, but not less than 3/4". When masonry is exposed to soil, minimum coverage shall be 1.5".
   Detailing Requirement
   a. Lap all masonry reinforcing per "Masonry Reinforcing Lap Schedule" on sheet S601. Joint reinforcement shall lap a minimum of 6 inches.
   b. All vertical reinforcing shall be doweled to the foundation wall, footing (structure below) and to the structure below with the same size dowel, spacing (and in the same core) as the vertical wall reinforcing above.
   c. Corner Bars: Provide corner bars at intersecting wall corners using the same bar size and spacing as the horizontal wall reinforcing. Corner bars shall lap the horizontal reinforcing with the required lap splice length.
   d. Wall Openings: For unscheduled openings wider than 24 inches, provide reinforcing on all sides per detail 7/S501. Also, for all scheduled openings, provide horizontal bar at bottom of opening per detail 7/S501. Vertical bars shall extend from floor level below to the floor, or roof level above. Horizontal bars for all openings shall extend a minimum of 48 bar diameters beyond the corners of the opening. Where a 48 bar diameter extension is not possible, extend bars as far beyond the opening as possible and terminate the bar(s) with a 90 degree standard ACI hook.
   e. Horizontal wall reinforcing shall be continuous through joining concrete walls, masonry walls, columns, and pilasters. Provide a key between the wall and the column or pilaster. Horizontal wall reinforcing shall be placed inside the column vertical reinforcing.
   f. Horizontal wall reinforcing shall terminate with a hook at edge of openings and at each side of control joints except at floor and roof levels, lintels, beams and at top of parapets. See detail 9/S501.
   g. All masonry column ties shall terminate with 135 degree hooks plus a 6 bar diameter extension (4" minimum).
4. Construction Requirements:
   a. Masonry coursing shall be coordinated with the architectural drawings.
   b. All units shall be laid with full mortar beds on the face shells. All head joints shall be filled solidly with mortar for a distance in from the face of the units not less than the thickness of the longitudinal face shells. Cells which are to be grouted shall have full head joints.
   c. Masonry walls, beams and columns shall be constructed with running bond, unless noted otherwise.
   d. All cells containing reinforcement, embeds, anchor bolts, etc. shall be filled solid with grout. Grout shall be placed by mechanical vibration during placing and re-vibrated after excess moisture has been absorbed but before workability is lost. Rodding of grout is not allowed.
   e. Where walls are not grouted solid, each grout pour shall terminate flush with the top of the uppermost unit except at cells with vertical reinforcing where the grout shall be 1-1/2 inches below top of unit to provide construction key.
   f. Grout pours shall be limited to 4'-0" unless written approval is obtained from the engineer of record.
   g. All walls below grade shall be grouted solid.
   h. Vertical cells to be filled with grout shall have vertical alignment sufficient to maintain a clear, unobstructed vertical cell measuring not less than 2 inches by 3 inches. All steel reinforcement shall be secured against displacement prior to grouting by wire positioners or other suitable devices at intervals not exceeding 200 bar diameters or 10 feet maximum, or at bar splice locations. Vertical reinforcing shall be located at the center of the wall unless noted otherwise
   i. Reinforcing Bars shall not be welded. Do not substitute reinforcing bars for DBAs or HSAs.
   j. Control Joints: Spacing shall not exceed 30'-0". See architectural drawings for locations.
   k. Grout all beam and joist pockets solid after installation of beams and joists.
   l. Embed channels and plates shall be placed so as to create a flush surface with the face of the wall.
   m. Anchor bolts and headed stud anchors shall be set in a grouted cell. Anchor bolts and headed stud anchors shall have 1" grout surrounding the shank at its penetration. Grout shall be flush with the face or top of the masonry.

WOOD

1. Materials:
   a. Fasteners
      i. Nails used for all framing anchors, post caps, hold downs, column bases, etc. shall be standard common with the following properties:

Nail Size	Shank Diameter	Min. Penetration into Support Member
8d	0.131"	1.50"
10d	0.148"	1.63"
16d	0.162"	1.75"

      ii. Fastener sizes other than those listed above are not permitted without prior written approval from the engineer.
      iii. All fasteners, including nails, for preservative-treated and fire retardant-treated wood shall be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.
   b. Engineered Lumber
      i. Glu-lam beams shall be Douglas-fir combination number 24F-V4 except cantilevered and continuous beams shall be combination number 24F-V8. Glu-lam columns shall be DF combination symbol #3 for columns.
2. All wood in contact with concrete, masonry or soil shall be pressure treated or be redwood.
3. All framing anchors, post caps, hold downs, column bases, etc. shall be provided by Simpson Strong-Tie, USP Structural Connectors or approved equal. If Simpson isn't used, the contractor shall provide a comparison list. All connectors shall be installed per manufacturer's instructions, with the specified number and type of fasteners, unless noted otherwise. In the event that multiple fastener combinations are allowed by the manufacturer to achieve varying capacities, the most stringent alternative shall be used, unless noted otherwise in the plans or details.

PRE-FABRICATED METAL PLATE WOOD TRUSSES

1. The Pre-fabricated metal plate wood trusses shall be designed, signed, and sealed by a Professional Engineer registered in the same state as the project location. They shall be designed to support the concentrated and other distributed loads as shown on the framing plans in addition to the following uniform loads:
   a. Dead Load (Top Chord)= 10 psf
   b. Dead Load (Bottom Chord)= 10 psf
   c. Snow Load (Top Chord)= 25 psf
   45 psf Total Load
   The wood truss designer shall consider unbalanced snow loading for all sloped roofs exceeding 2.38 degrees (1/2 on 12) or less than 70 degrees.
   Correlate the design with all mechanical equipment, fire sprinkling systems and hanging walls supported by the trusses. Provide extra trusses where required.
2. Design all wood trusses and bearing attachments for wind uplift. Assume a dead load of 8 psf to resist uplift.
3. No stress increase is allowed for snow loads.
4. Refer to architectural drawings for truss profile. Detailing and shop drawing production for prefab metal plate wood trusses will require information (including dimensions) contained in the architectural, structural and/or other consultants' drawings. The structural drawings shall be used in conjunction with the architectural and other consultant's drawings. Some dimensions and elements such as elevation and slopes are not shown in the structural drawings. All dimensions shown on structural drawings shall be verified by contractor with architectural drawings. Coordinate roof slope with architectural roof plan, sections and elevations.
5. All truss-to-truss connections shall be designed and provided by the truss manufacturer.
6. Design, handling, erection, and permanent bracing of metal plate connected wood trusses shall be in accordance with ANSI/TPI-1, National Design Standard for Metal Plated Connected Wood Truss Construction.
7. Steel Connector Plates: All steel gusset plates shall be galvanized and shall be approved by the "Research Committee for the International Code Council". Submit a copy of the ICC Report for the connector plate used. Values established by this committee must be indicated on the shop drawings.
   a. Stress increases for steel connector plate values for duration of load are not allowed.
   b. The minimum size for any connector shall be 8 square inches (not required at truss blocking).
   c. All steel gusset plates shall be located on the joint as the stresses require and shall provide a minimum bite of 2.5" length on all tension members (not required at truss blocking).
   d. All steel plate dimensions shall be increased by 10% above that required by analysis.
   e. Plates shall be pressed or rolled into member to obtain full penetration without crushing the outer surfaces of wood.
8. No wane, knots, skips, or other defects shall occur in the plated contact area or scarfed area of web members. Plates shall be centered with one required each side of wood truss
9. The trusses shall be handled and stored in a manner to prevent moisture from being absorbed by the wood.
10. Requirements for truss stability and erection shall comply with the Truss Plate Institute publications entitled "Commentary and Recommendations for Bracing Wood Trusses" and "Commentary and Recommendations for Handling and Erecting Wood Trusses." The contractor shall have copies of these publications on site and shall be familiar with their contents.
11. Shop Drawings: Complete calculations and shop drawings indicating all member forces, stresses, duration factors, lumber grades, dimensions, truss to truss connections, steel truss plate sizes and locations shall be submitted and reviewed by the engineer before fabrication. Each connector shall be dimensioned on the shop drawings as to its exact location at the joint.

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GENERAL STRUCTURAL NOTES

sheet:
S001

DESIGN DEVELOPMENT

REQUIREMENTS FOR SPECIAL INSPECTION, MATERIALS TESTING AND STRUCTURAL OBSERVATION

LEGEND OF MARKS AND ABBREVIATIONS

AB	ANCHOR BOLT(S)	k	KIP(S) = 1000 POUNDS
ABV	ABOVE	KLF	KIPS PER LINEAL FOOT
ALT	ALTERNATE	KSF	KIPS PER SQUARE FOOT
APPROX	APPROXIMATE		
ARCH	ARCHITECT(URAL)	LBS	POUNDS
		LF	LINEAL FOOT
BLDG	BUILDING	LVL	LAMINATED VENEER LUMBER
BLW	BELOW		
BM	BEAM	MAS	MASONRY
B.N.	BOUNDARY NAILING	MAX	MAXIMUM
BOT	BOTTOM	MCJ	MASONRY CONTROL JOINT
BRG	BEARING	MC-x	MASONRY COLUMN MARK
BTWN	BETWEEN	MECH	MECHANICAL
		MFR	MANUFACTURER
CC.	CENTER-TO CENTER	MIN	MINIMUM
C.J.	CONST/CONTROL JOINT	MISC	MISCELLANEOUS
CMU	CONCRETE MASONRY UNIT	ML-x	MASONRY LINTEL
COL	COLUMN	MP-x	MASONRY PIER
CONC	CONCRETE	MW-x	MASONRY WALL
CONST	CONSTRUCTION		
CTR	CENTER	NIC	NOT IN CONTRACT
CW-x	CONCRETE WALL	NTS	NOT TO SCALE
DB	DECK BEARING	O.C.	ON CENTER
DBA	DEFORMED BAR ANCHOR	O.F.	OUTSIDE FACE
DBE	DECK BEARING ELEVATION	OPNG	OPENING
DBL	DOUBLE	OPP	OPPOSITE
DET	DETAIL		
DIA	DIAMETER	PAF	POWDER-ACTUATED FASTENER
DIM	DIMENSION	PCF	POUNDS PER CUBIC FOOT
DN	DOWN	PLF	POUNDS PER LINEAL FOOT
DWG	DRAWING	PNL	PANEL
DWL	DOWEL	PSF	POUNDS PER SQUARE FOOT
		PSI	POUNDS PER SQUARE INCH
(E)	EXISTING	PT	POINT
EA	EACH		
E.N.	EDGE NAILING	REINF	REINFORCING
E.F.	EACH FACE	REQD	REQUIRED
E.J.	EXPANSION JOINT	R.D.	ROOF DRAIN
ELEC	ELECTRICAL	RTU	ROOF TOP UNITS
ELEV	ELEVATION		
EQUIP	EQUIPMENT	SHT	SHEET
EQ.	EQUAL	SI	SPECIAL INSPECTION
E.W.	EACH WAY	SIM	SIMILAR
EXST	EXISTING	SMU	SUSPENDED MECHANICAL UNITS
EXP	EXPANSION	SOG	SLAB-ON-GRADE
EXT	EXTERIOR	SQ	SQUARE
		STAG	STAGGERED
FC-x	CONTINUOUS FOOTING MARK	STD	STANDARD
F.D.	FLOOR DRAIN	STL	STEEL
FDN	FOUNDATION	STR	STRUCTURAL
F.F.	FINISHED FLOOR	STS	SELF TAPPING SCREWS
F.N.	FIELD NAILING		
FR-x	RECTANGULAR FOOTING	T&B	TOP AND BOTTOM
FS-x	SQUARE FOOTING MARK	TEMP	TEMPERATURE
FT	FOOT	THDS	THREADS
FTG	FOOTING	T.O.	TOP OF
FTS-x	THICKEN SLAB MARK	TOC	TOP OF CONCRETE
		TOD	TOP OF DECK
GA	GAUGE	TOF	TOP OF FOOTING
GALV	GALVANIZED	TOW	TOP OF WALL
GLB	GLU-LAM BEAM	TYP	TYPICAL
GSN	GENERAL STRUCTURAL NOTES		
		UNO	UNLESS NOTED OTHERWISE
HORIZ	HORIZONTAL		
HSA	HEADED STUD ANCHOR	VERT	VERTICAL
HT	HEIGHT		
		W/	WITH
		WT	WALL THICKNESS
ICC	INTERNATIONAL CODE COUNCIL	WWF	WELDED WIRE FABRIC
IBC	INTERNATIONAL BUILDING CODE	WWM	WELDED WIRE MESH
I.F.	INSIDE FACE		
IN.	INCH		
INT	INTERIOR		
JT	JOINT		
JST	JOIST		

STATEMENT OF SPECIAL INSPECTION AND QUALITY ASSURANCE

Special inspection and quality assurance, as required by section 1704 and 1705 of the 2015 IBC, shall be provided by an independent agency employed by the owner unless waived by the building official.	
The names and credentials of the Special Inspectors to be used shall be submitted to the Building Official for approval.	
Responsibilities of the Special Inspector	
	Special Inspector shall review all work listed in the special inspection schedules herein for conformance with the approved construction plans, specifications and 2015 IBC.
	All testing and inspection reports shall be sent within 24 hours of the test to the architect, engineer, building official and contractor for review. All items not in compliance shall be brought to the immediate attention of the contractor for correction, and if uncorrected, to the architect, engineer and building official.
	Once corrections have been made by the contractor, the special inspector shall submit a final signed report to the building official stating that the work requiring special inspection was, to the best of the special inspector's knowledge, in conformance with the approved construction plans, specifications and 2015 IBC.
Responsibilities of the Contractor	
	The contractor shall submit a written statement of responsibility to the owner and the building official prior to the commencement of work in accordance with 2015 IBC section 1704.4. This statement shall indicate that the contractor will coordinate and cooperate with the required inspections contained herein.
	The contractor shall notify the designated special inspector that work is ready for inspection at least 24 hours before said inspection is required.
	All work requiring special inspection shall remain open and accessible until it has been observed by the special inspector and deemed acceptable through inspection report.
	Special inspection during fabrication is not required if the fabricator is registered and approved to perform such work without special inspection.

SOILS CONSTRUCTION INSPECTIONS

Soils (2015 IBC Section 1705.6)			
ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Site Preparation	-	X	Verify that the site has been prepared in accordance with the soils report prior to placement of prepared fill.
Fill Material	X	-	Verify that the material being used, the maximum lift thickness and the in-place dry density of the compacted fill material comply with the soils report during placement and compaction of the fill material during placement and compaction.
Continuous Footing Backfill: at least one test for each 40 linear feet or less of wall length, but no fewer than 2 tests.	-	X	At each compacted backfill layer.
Spot Footing Backfill: Minimum of one compaction test for each lift for each spot footing.	-	X	At each compacted backfill layer.

WOOD CONSTRUCTION INSPECTIONS

ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Prefabricated metal plate wood trusses (2015 IBC Sections 1705.5, 1705.11.1, and 1705.12.2)			
Shop fabrication of trusses	-	X	Verify that detailed fabrication and quality control procedures exist that provide a basis of inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards.

STRUCTURAL OBSERVATION PROGRAM

If structural observations are required, they shall be done by the Engineer of Record or an approved subordinate at the stages of construction listed in the Construction Notification Phases section of these notes. At the conclusion of the project, the designated structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies that to the best of the structural observer's knowledge have not been resolved (See IBC 2015 1704.6).

STRUCTURAL OBSERVATION PROGRAM REQUIRED BY CODE:	YES	NO
		X

CONSTRUCTION MILESTONE SCHEDULE

CONTRACTOR TO NOTIFY ENGINEER AT THE FOLLOWING CONSTRUCTION PHASES:	
CONCRETE	
Footings, stem walls and piers	Prior to pouring concrete
MASONRY	
Masonry walls	Prior to pouring grout

DEFERRED SUBMITTALS

For the purpose of this section, deferred submittals are defined as per section 107.3.4.1 of the IBC 2015. Submittal documents for deferred submittal items shall be submitted to the engineer, architect and building official for their review for general conformance with the design of the building.

DEFERRED STRUCTURAL SUBMITTALS FOR THIS PROJECT ARE:

Prefabricated metal plate wood trusses

2-22-2019

NOT FOR CONSTRUCTION

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project:
Grand Junction Park Restroom Large

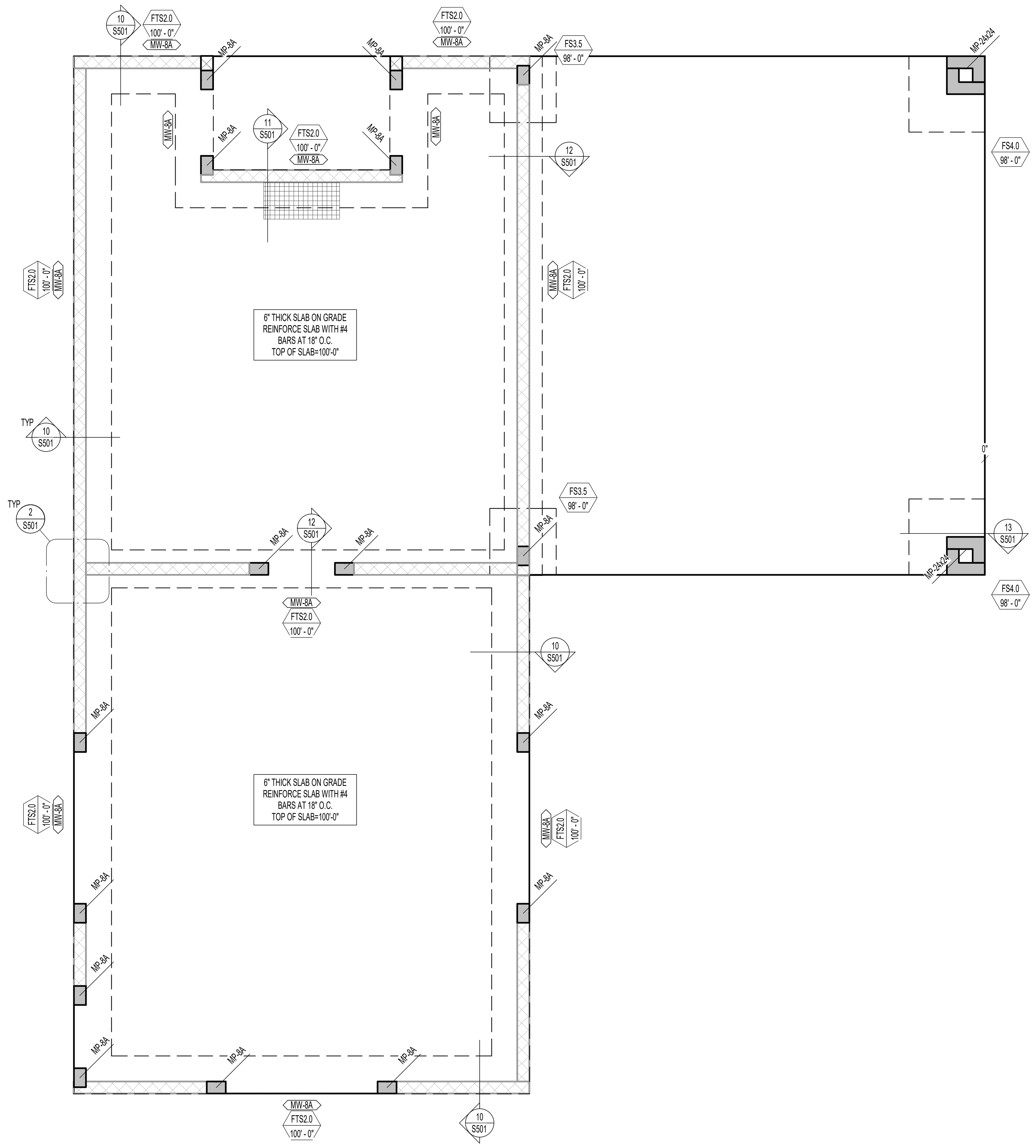
project#: 190062
date: Feb. 22, 2019

revisions :

title:
SPECIAL INSPECTIONS

sheet:
S002

DESIGN DEVELOPMENT



1 FOOTING AND FOUNDATION PLAN

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

2-22-2019

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project:

Grand Junction Park Restroom Large

MARKS AND SYMBOLS LEGEND

	SECTION MARK / SHEET NUMBER
	FOOTING DESIGNATION / TOP OF FOOTING ELEVATION
	INDICATES MASONRY WALL. DASHED WALLS STOP AT DECK
	DEPRESS FOUNDATION WALL AND POUR SLAB OVER. SEE DETAIL
	INDICATES DEPRESSED SLAB, SEE ARCHITECTURAL PLANS.
MW-x	INDICATES MASONRY WALL TYPE, SEE SCHEDULE ON SHEET S601
FCx.x	INDICATES CONTINUOUS FOOTING. SEE SCHEDULE ON SHEET S601
FSx.x	INDICATES SPOT FOOTING. SEE SCHEDULE ON SHEET S601
FTSx.x	INDICATES THICKENED SLAB FOOTING. SEE SCHEDULE ON SHEET S601
MP-x	INDICATES MASONRY PIER TYPE. SEE SCHEDULE ON SHEET S601

project#: 190062
date: Feb. 22, 2019

revisions :

FOOTING AND FOUNDATION PLAN NOTES

1. COORDINATE LOCATION OF DEPRESSED SLABS, SLOPED SLABS, AND FLOOR DRAINS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
2. SEE ARCHITECTURAL AND CIVIL DRAWINGS FOR EXTERIOR CONCRETE WORK AT DOORS, SIDEWALKS, ETC.
3. SEE ARCHITECTURAL DRAWINGS FOR CONTROL JOINT LOCATIONS.
4. SEE "EARTHWORK" NOTES ON SHEET S001 FOR MINIMUM FILL REQUIRED BENEATH FOOTINGS.
5. ALL SPOT FOOTINGS SHALL BE CENTERED UNDER COLUMNS (UNO).
6. SEE DETAILS 1/S501 AND 6/S501 FOR CONDITION WHERE BURIED PIPES RUN PARALLEL AND PERPENDICULAR TO FOOTINGS.
7. SEE DETAIL 3/S501 FOR TYPICAL CONTROL/CONSTRUCTION JOINTS IN CONCRETE SLAB ON GRADE.
8. SEE DETAIL 5/S501 FOR SLAB REINFORCING WHERE CONTROL JOINTS ARE DISCONTINUOUS.
9. SEE DETAIL 7/S501 FOR ADDITIONAL REINFORCING AT MISCELLANEOUS OPENINGS IN MASONRY WALLS.
10. SEE DETAIL 8/S501 FOR CONDITION AT RECESSES IN MASONRY WALLS.
11. SEE DETAIL 9/S501 FOR TERMINATION OF HORIZONTAL REINFORCING IN MASONRY WALLS.
12. INTERIOR WALLS NOT SHOWN, REINFORCE AS MW-8A. DRILL AND EPOXY VERTICAL REINFORCEMENT 3.1/2" INTO SLAB.

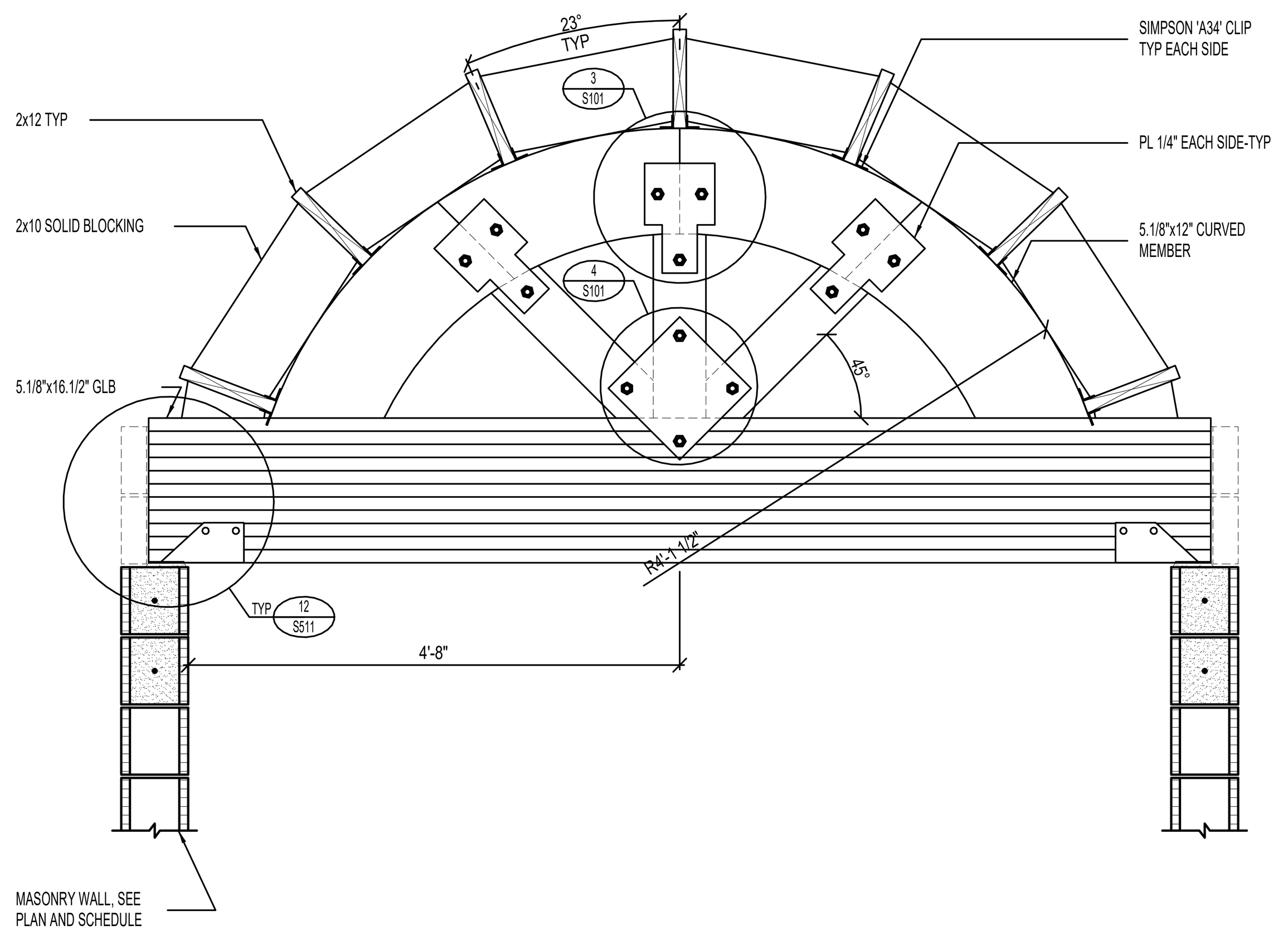
title:

FOOTING AND FOUNDATION PLAN

sheet:

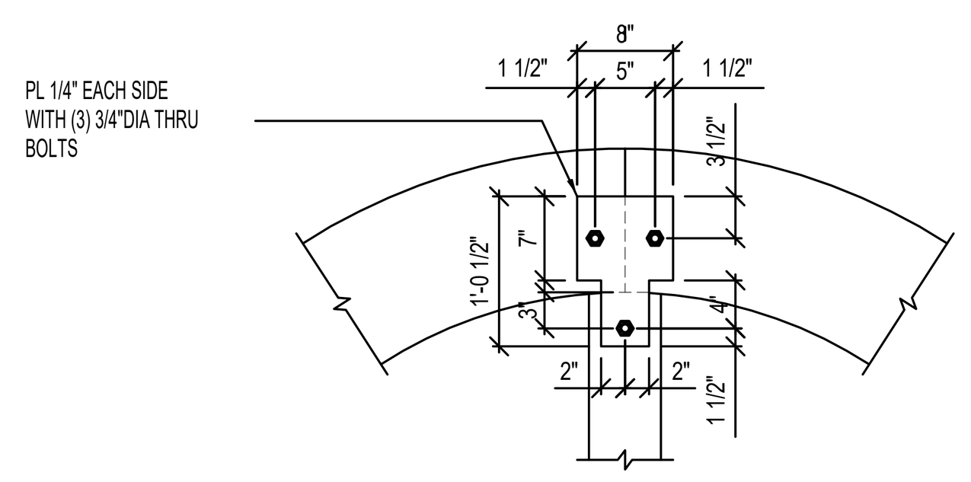
S101

DESIGN DEVELOPMENT



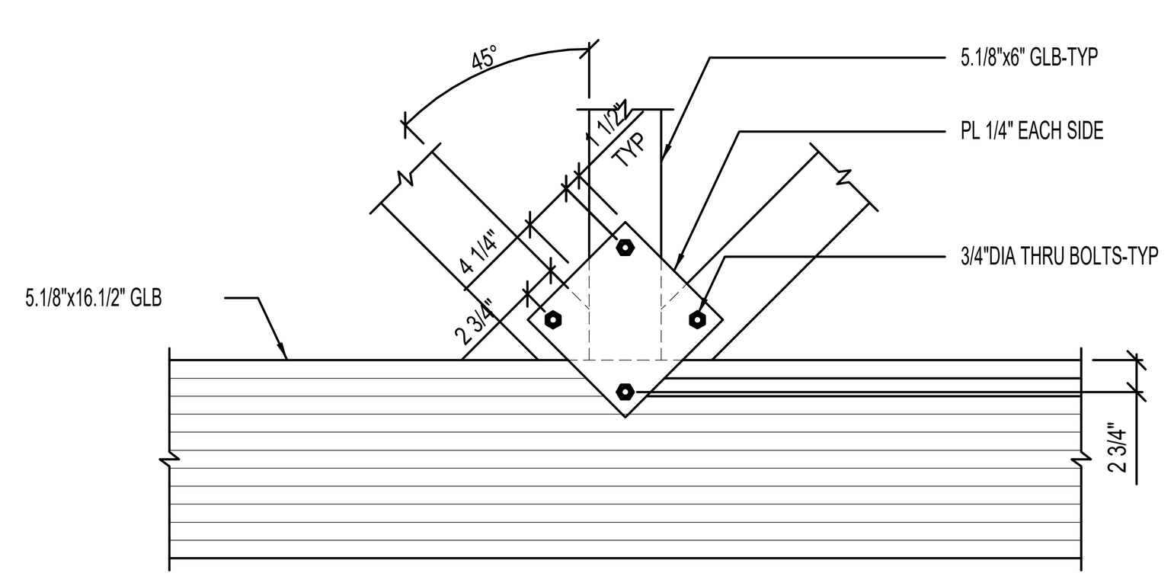
2 ARCH TRUSS ELEVATION

NO SCALE



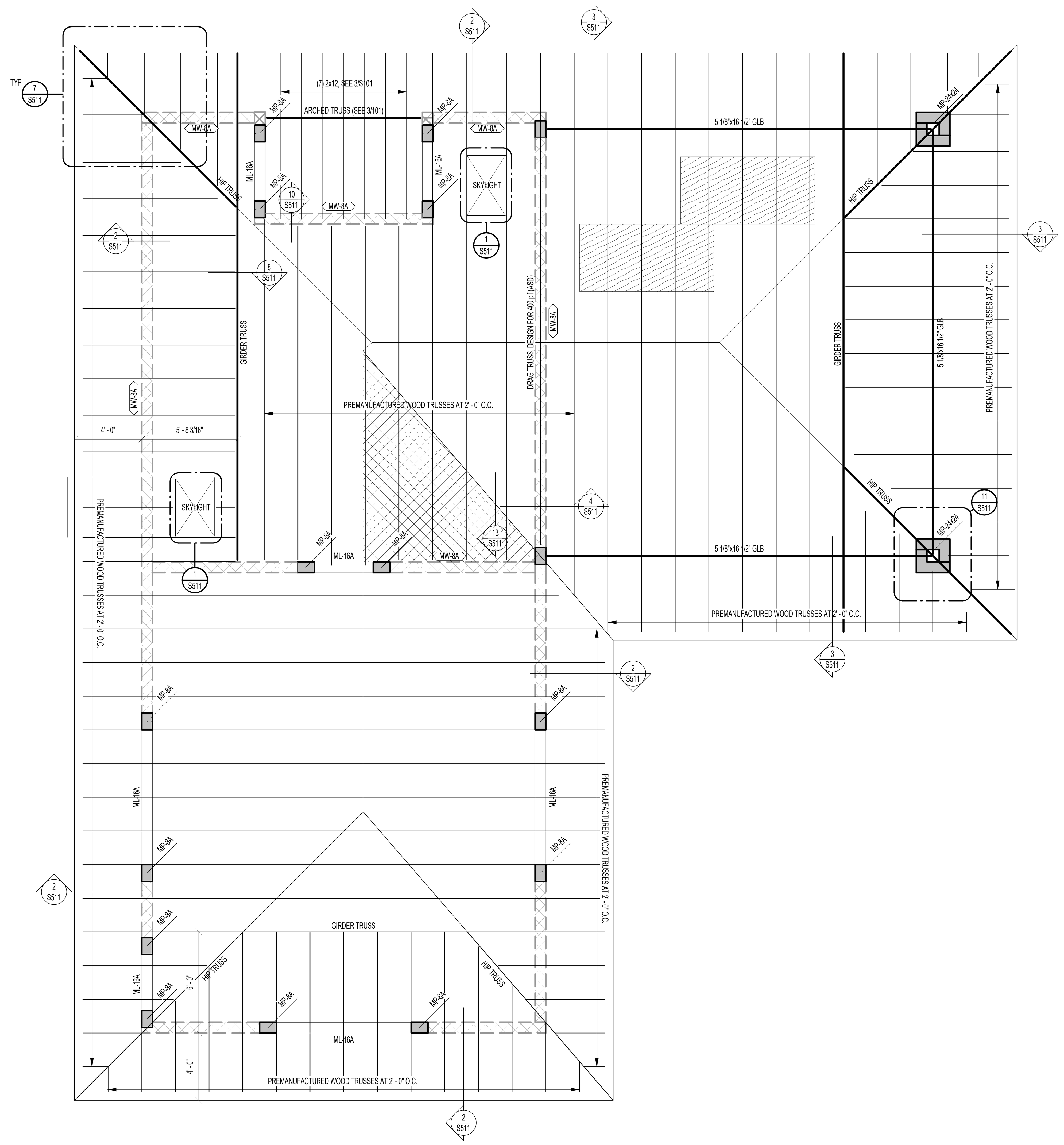
3 TRUSS CONNECTION DETAIL

NO SCALE



4 CONNECTION DETAIL

NO SCALE



1 ROOF FRAMING PLAN

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

MARKS AND SYMBOLS LEGEND

- SECTION MARK / SHEET NUMBER
- INDICATES MASONRY WALL. DASHED WALLS STOP AT DECK
- MW-x — INDICATES MASONRY WALL TYPE, SEE SCHEDULE ON SHEET S601
- INDICATES PLYWOOD ROOF SHEATHING, SEE SCHEDULE ON SHEET
- MP-x — INDICATES MASONRY PIER TYPE. SEE SCHEDULE ON SHEET S601
- ML-x — INDICATES MASONRY LINTEL TYPE. SEE SCHEDULE ON SHEET S601
- INDICATES OVERBUILD AREA, SEE DETAIL 13/S511

ROOF FRAMING PLAN NOTES

1. VERIFY ALL ROOF OPENINGS FOR MECHANICAL SHAFTS, DRAINS, ETC. WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
2. ALL ROOF OPENINGS GREATER THAN, OR EQUAL TO, 12" x 12" SHALL BE FRAMED AS INDICATED IN DETAIL 1/S511.
3. VERIFY SIZE, WEIGHT, AND LOCATION OF ALL ROOF TOP MECHANICAL UNITS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS. COORDINATE OPENINGS WITH MECHANICAL, ELECTRICAL, AND GENERAL CONTRACTORS.
4. LOCATE MISCELLANEOUS MECHANICAL OPENINGS BETWEEN JOISTS, NOT UNDERNEATH THEM.
5. SEE DETAIL 7/S501 FOR ADDITIONAL REINFORCING AT MISCELLANEOUS OPENINGS IN MASONRY WALLS.
6. SEE DETAIL 8/S501 FOR CONDITION AT RECESSES IN MASONRY WALLS.
7. SEE DETAIL 9/S501 FOR TERMINATION OF HORIZONTAL REINFORCING IN MASONRY WALLS.
8. INTERIOR NON-LOAD BEARING WALLS NOT SHOWN, REINFORCE AS MW-8A. SEE DETAILS 5/S511 AND 6/S511 FOR TOP OF WALL BRACING.

COLORADO REGISTERED PROFESSIONAL ENGINEER 37436

2-22-2019

NOT FOR CONSTRUCTION

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Grand Junction Park Restroom Large

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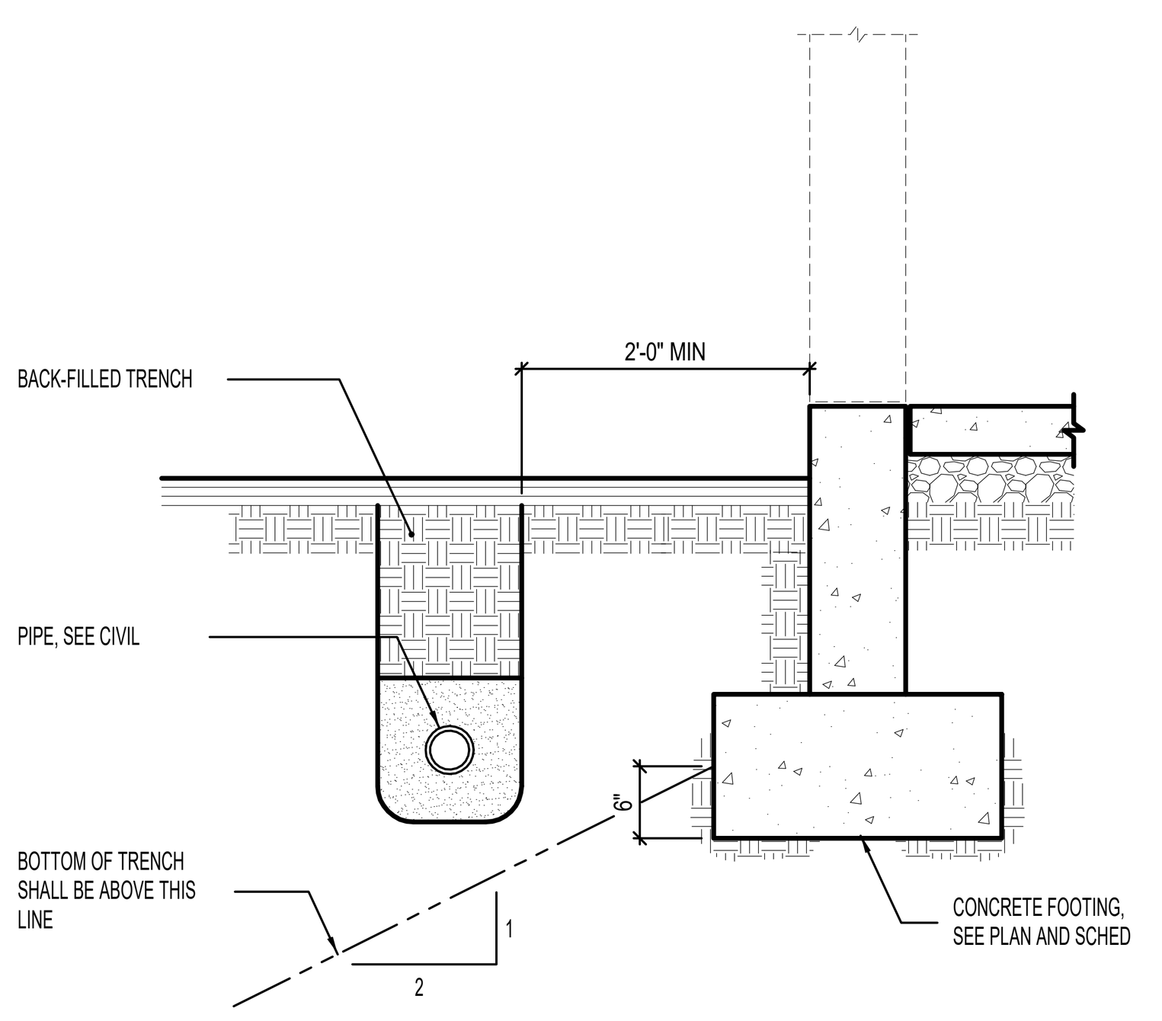
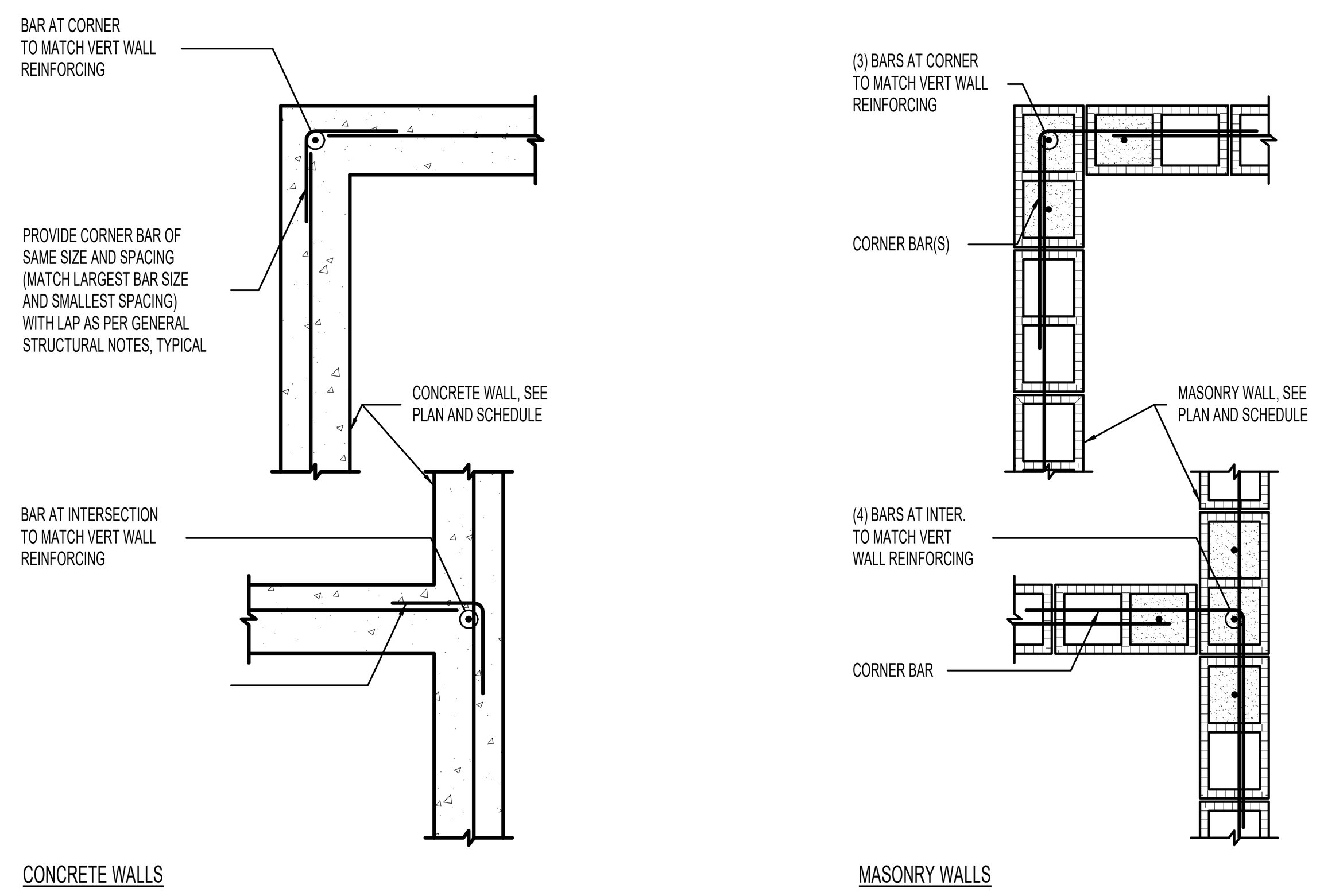
title:
ROOF FRAMING PLAN

sheet:
S111

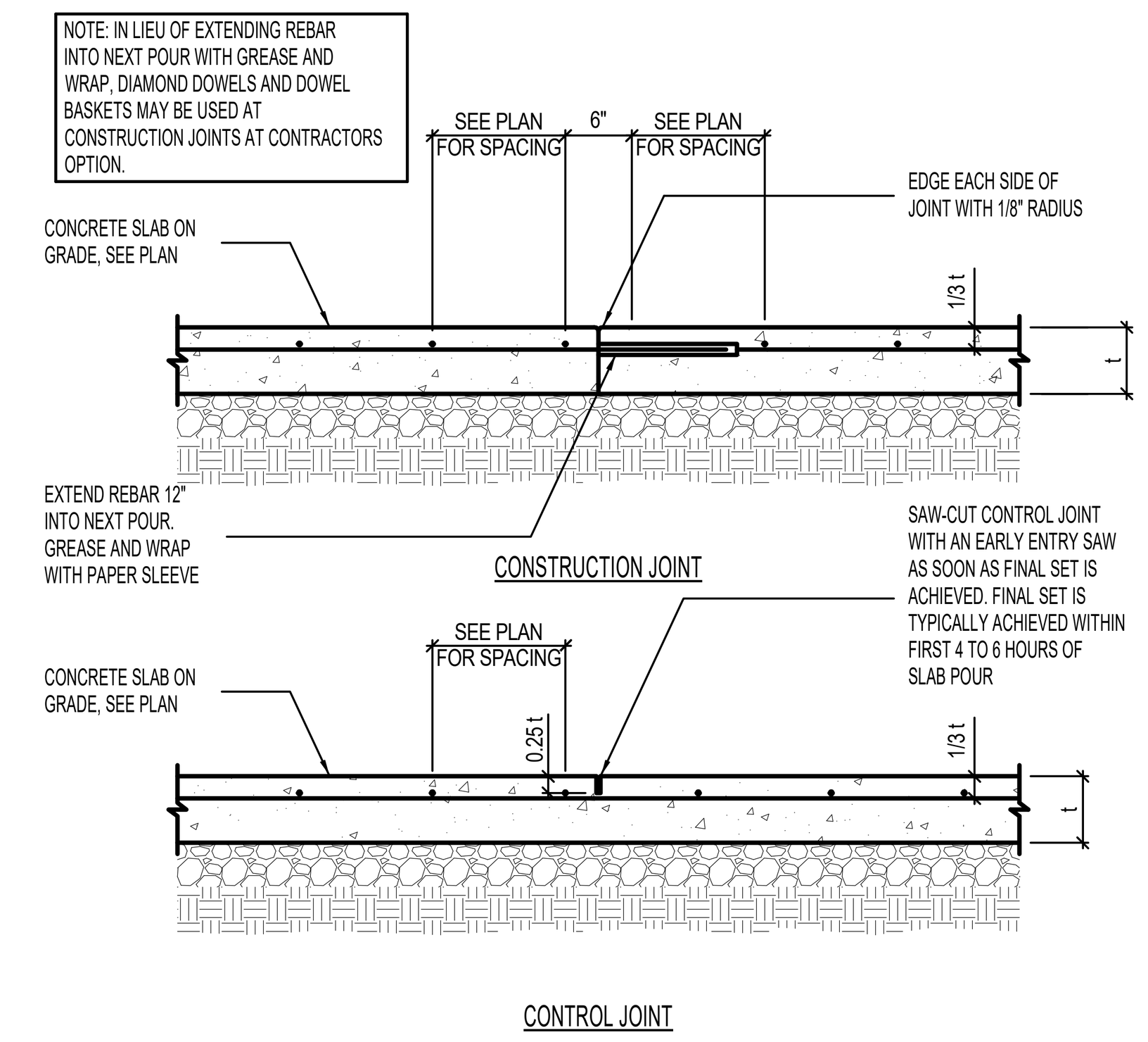
DESIGN DEVELOPMENT



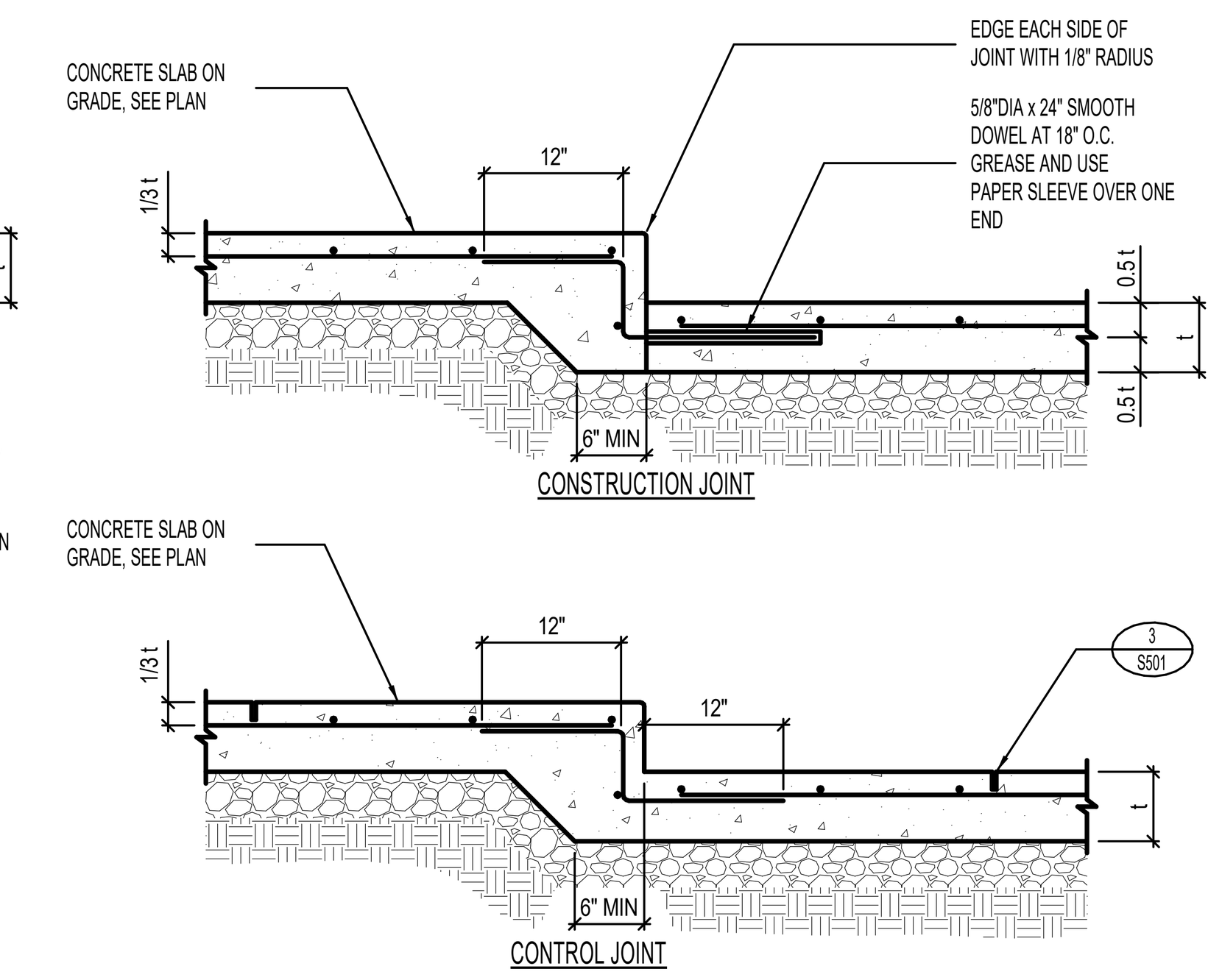
1 CONDITION AT PIPE PARALLEL TO CONCRETE FOOTING
NO SCALE



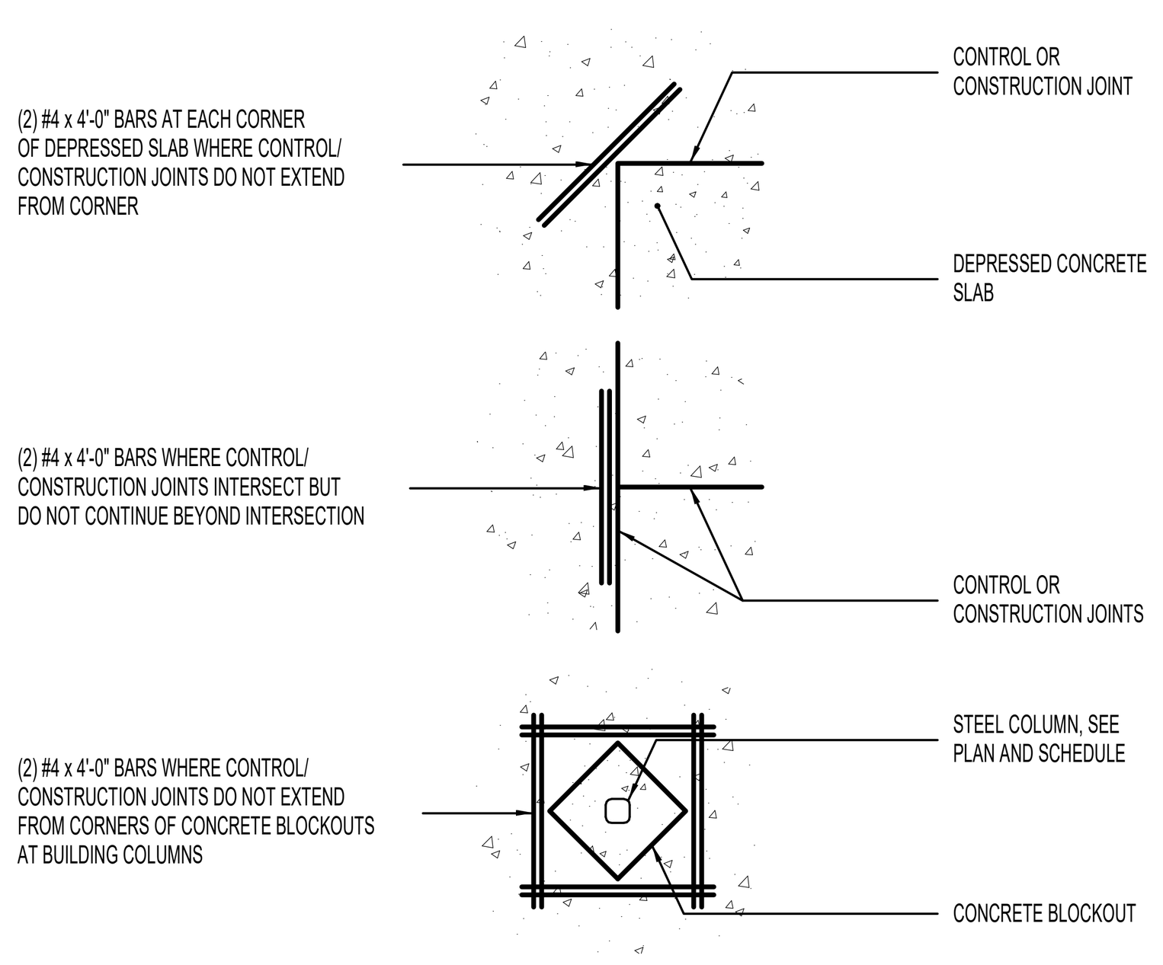
2 TYPICAL CORNER WALL REINFORCING [PLAN VIEW]
NO SCALE



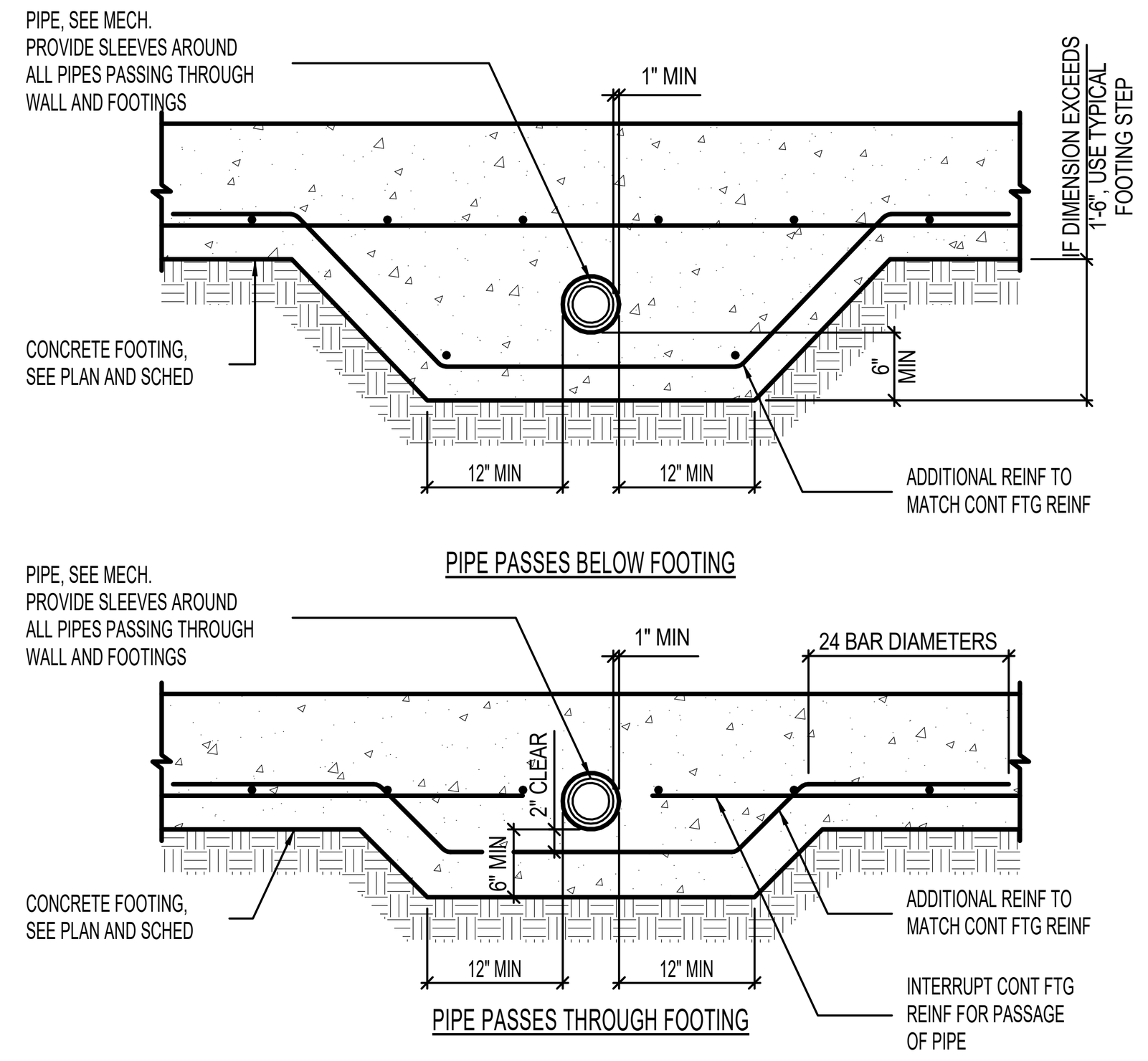
3 TYPICAL SLAB ON GRADE JOINT DETAILS
NO SCALE



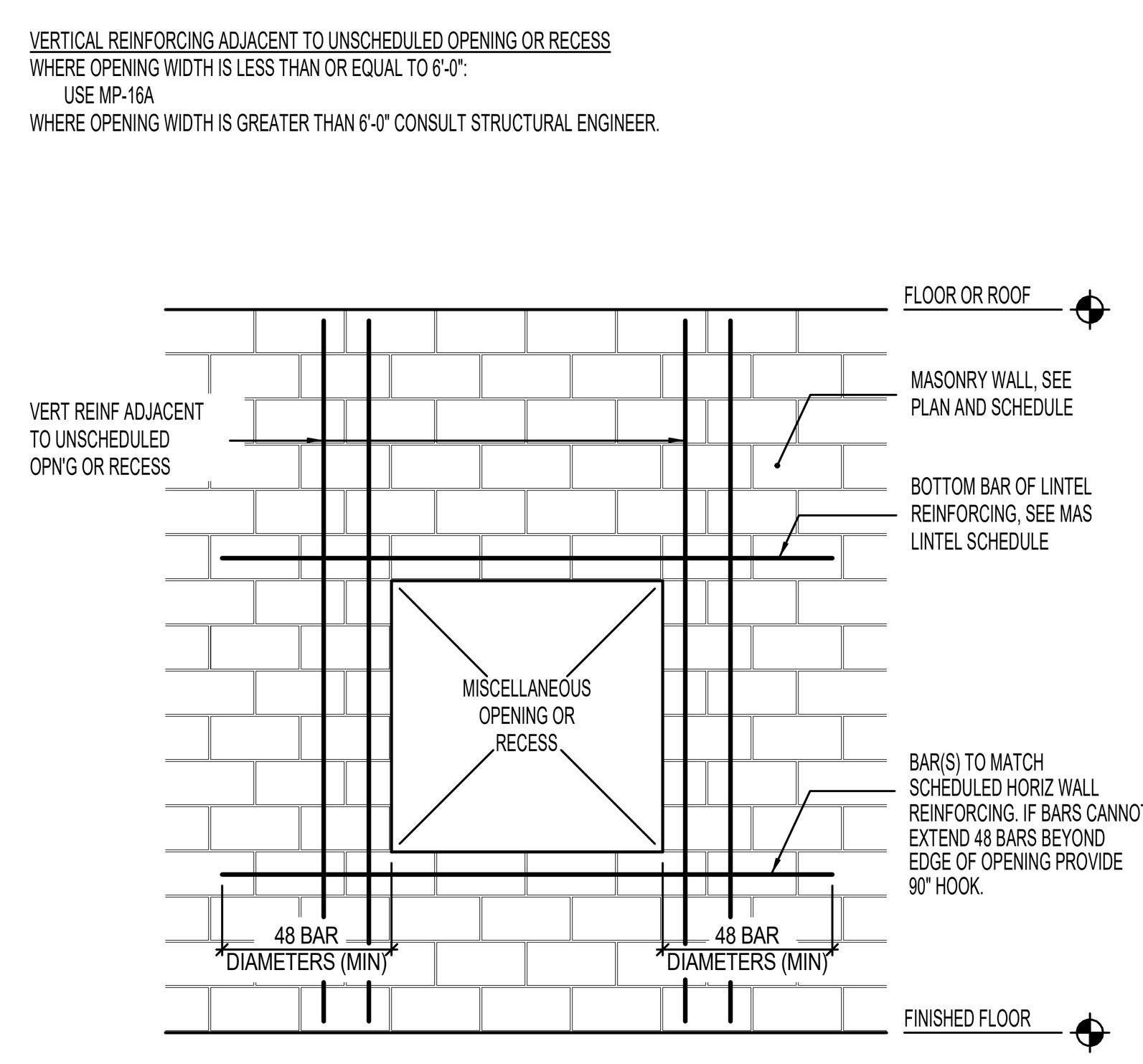
4 JOINT DETAILS AT SLAB DEPRESSIONS
NO SCALE



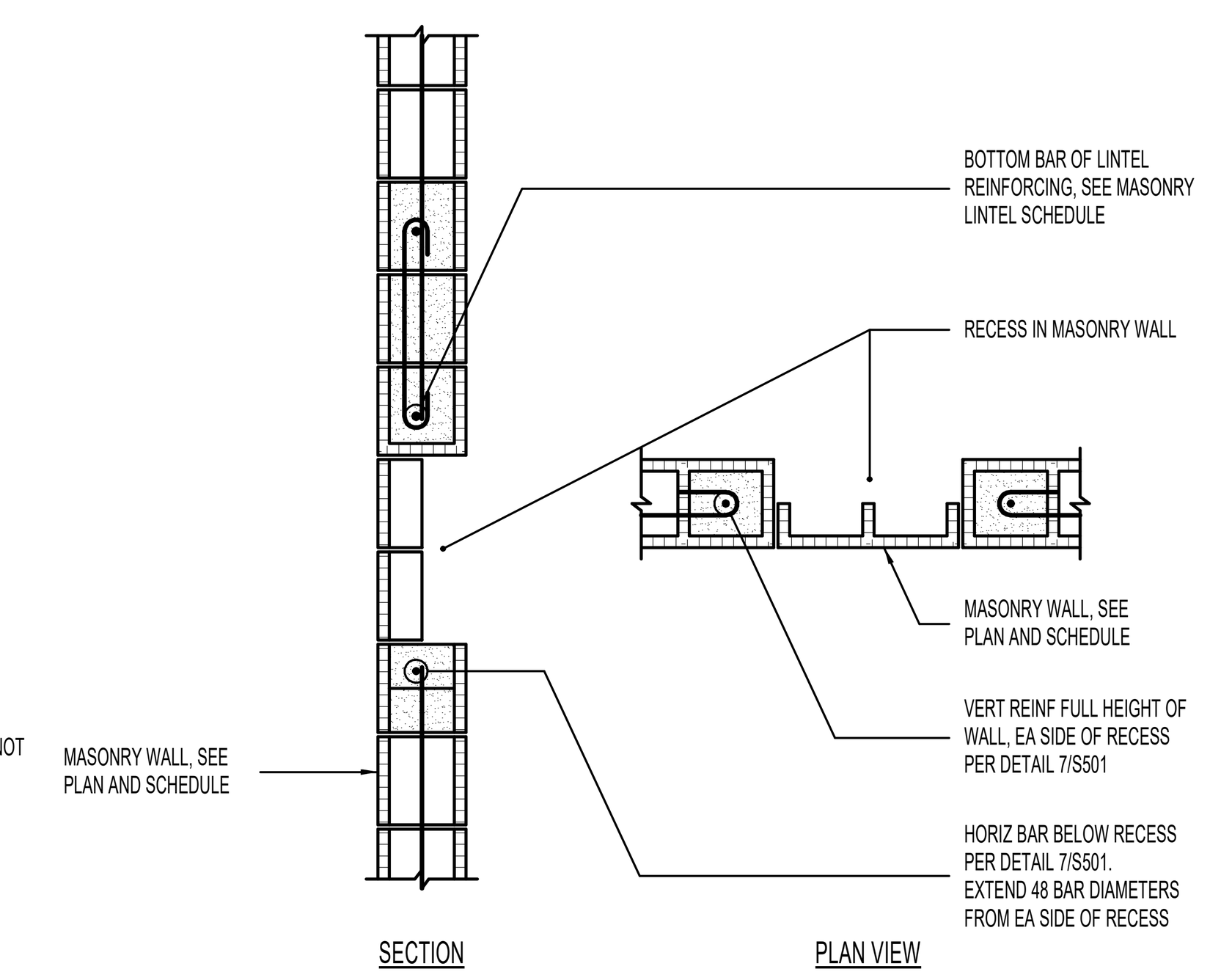
5 LOCATIONS REQUIRING ADDITIONAL SLAB REINFORCING [PLAN VIEW]
NO SCALE



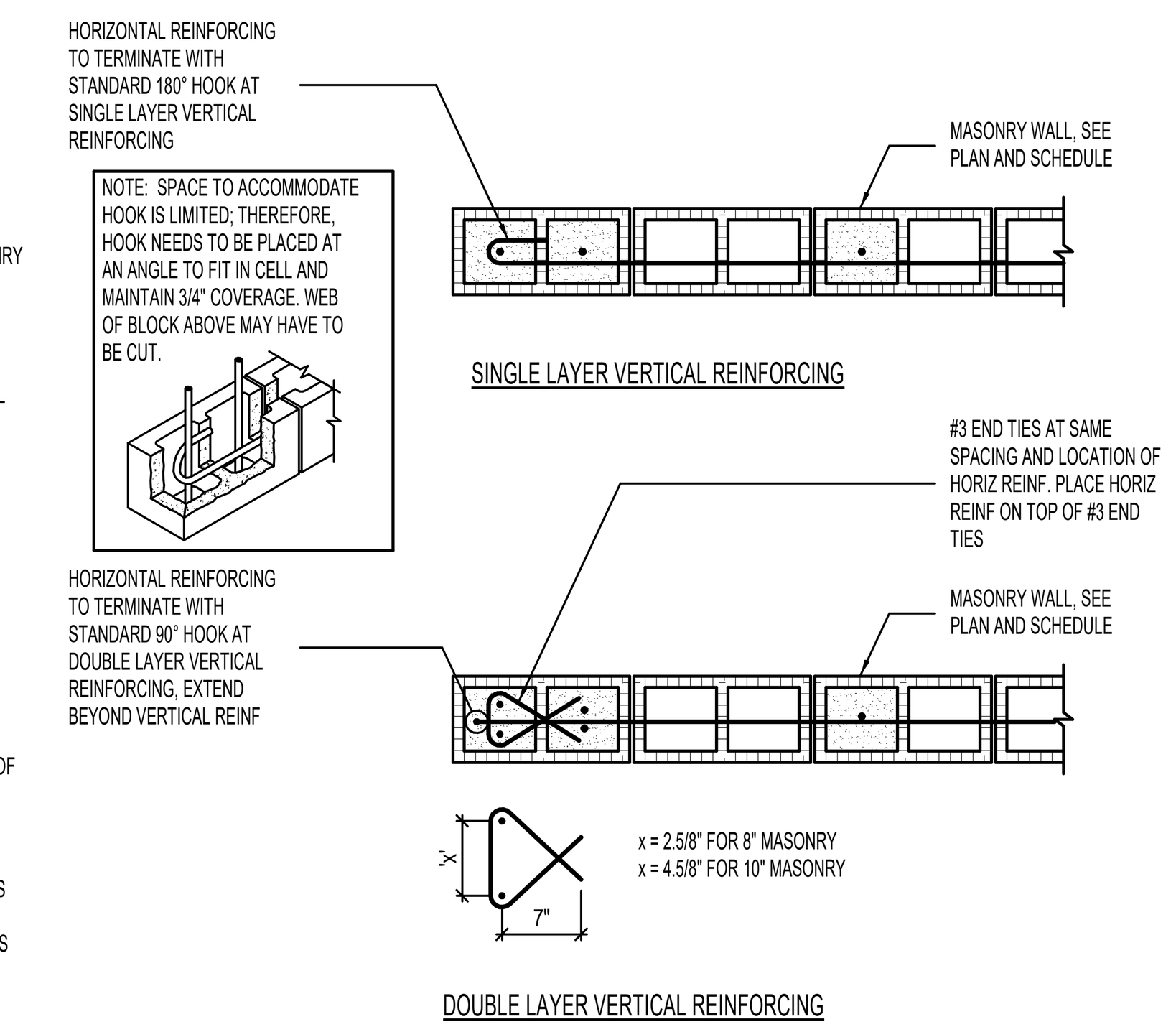
6 CONDITIONS AT PIPE PERPENDICULAR TO FOOTING
NO SCALE



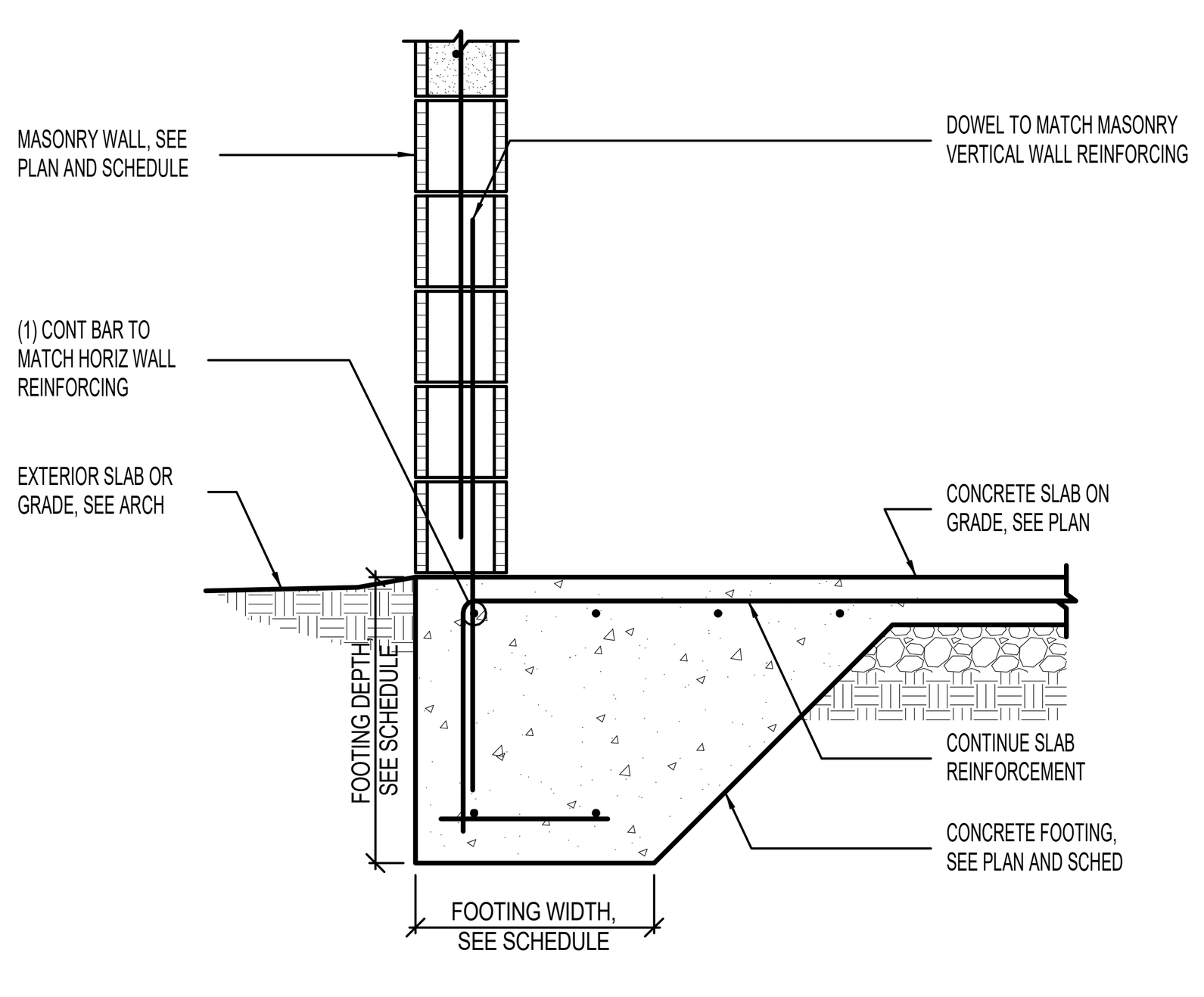
7 REINFORCING AT UNSCHEDULED MISCELLANEOUS OPENINGS OR RECESSES IN MASONRY WALLS
NO SCALE



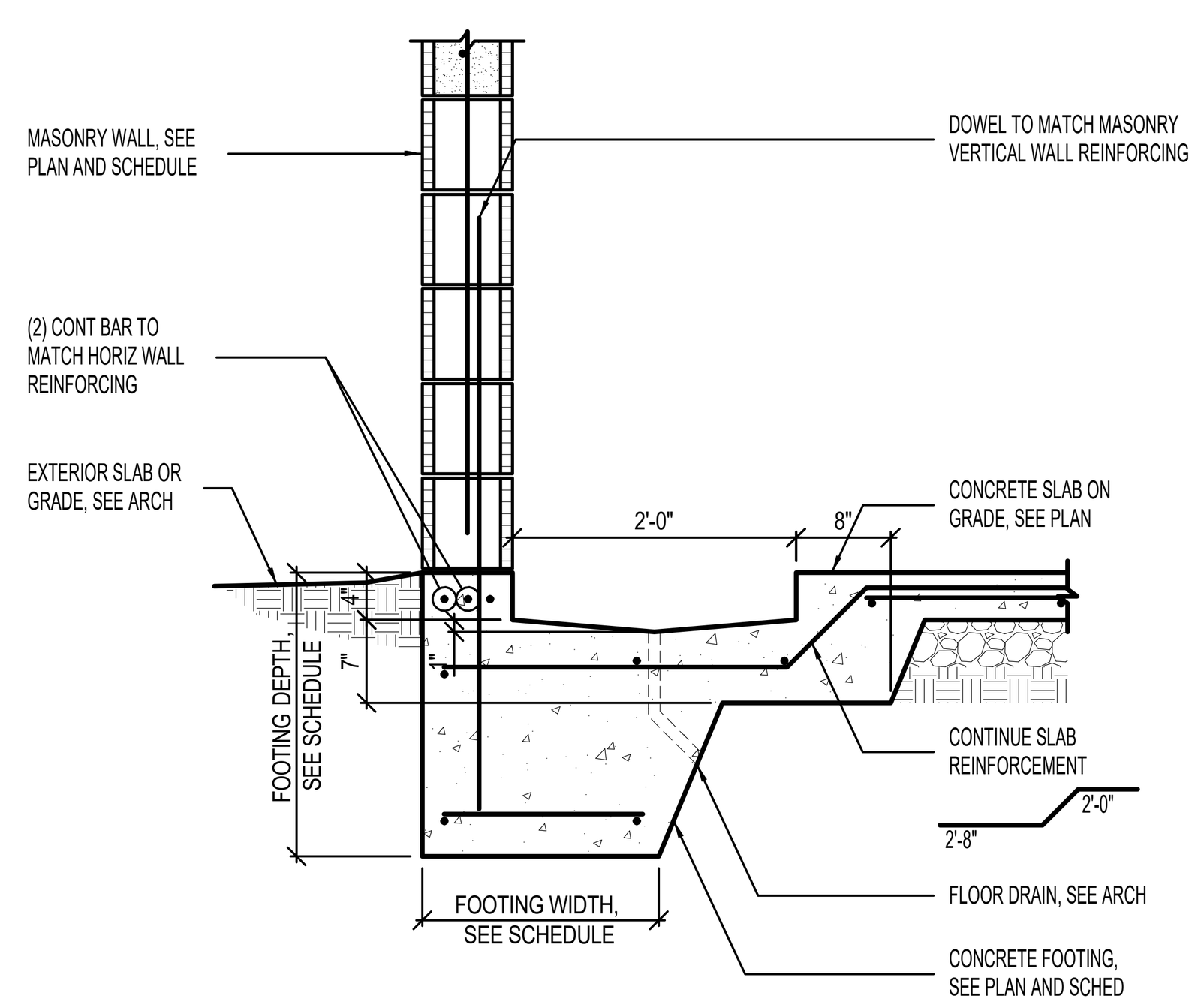
8 TYPICAL REINFORCING AT RECESS IN 8" OR 10" MASONRY WALLS
NO SCALE



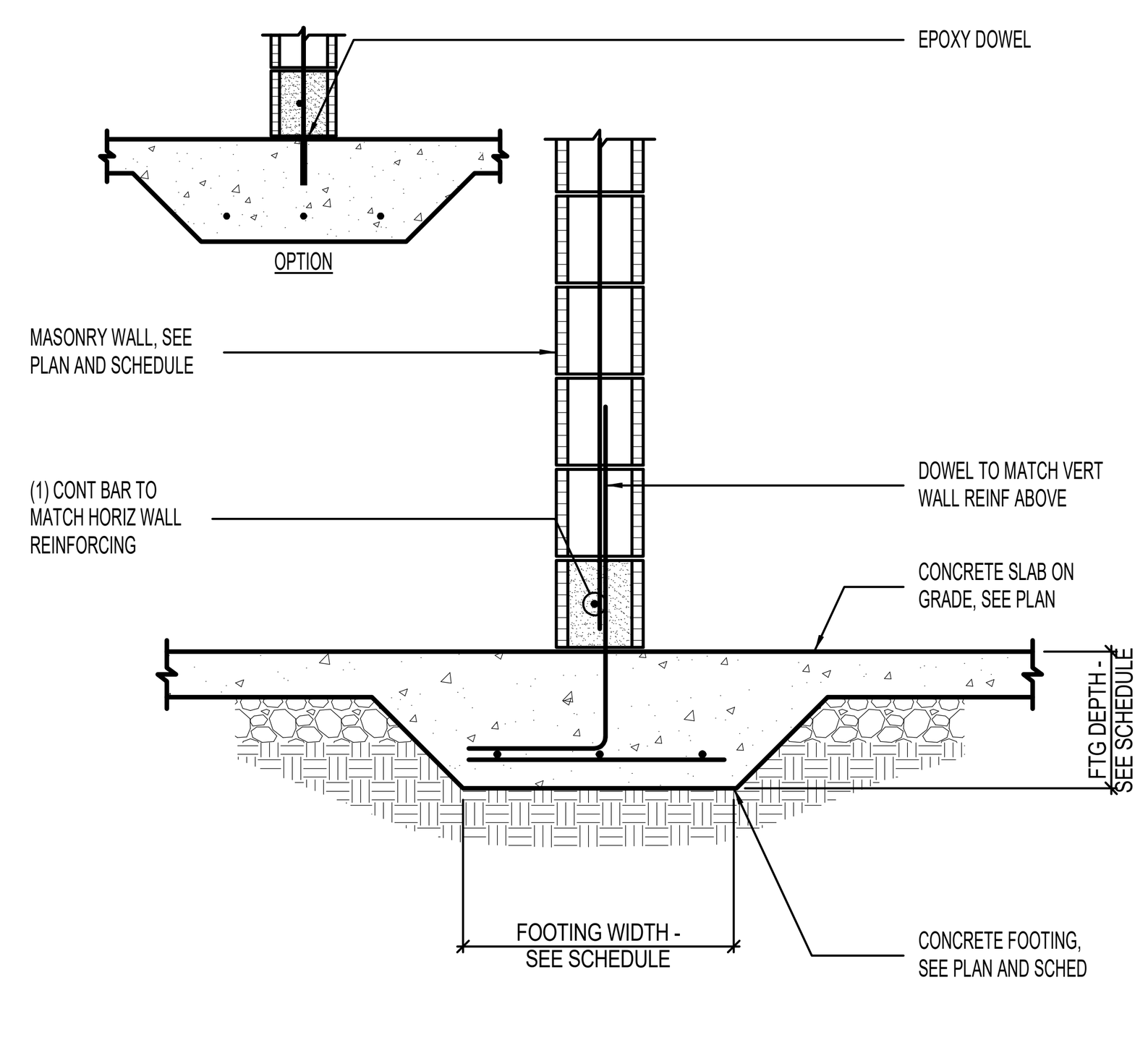
9 TERMINATION OF HORIZONTAL REINFORCING IN 8" OR 10" MASONRY WALL [PLAN VIEW]
NO SCALE



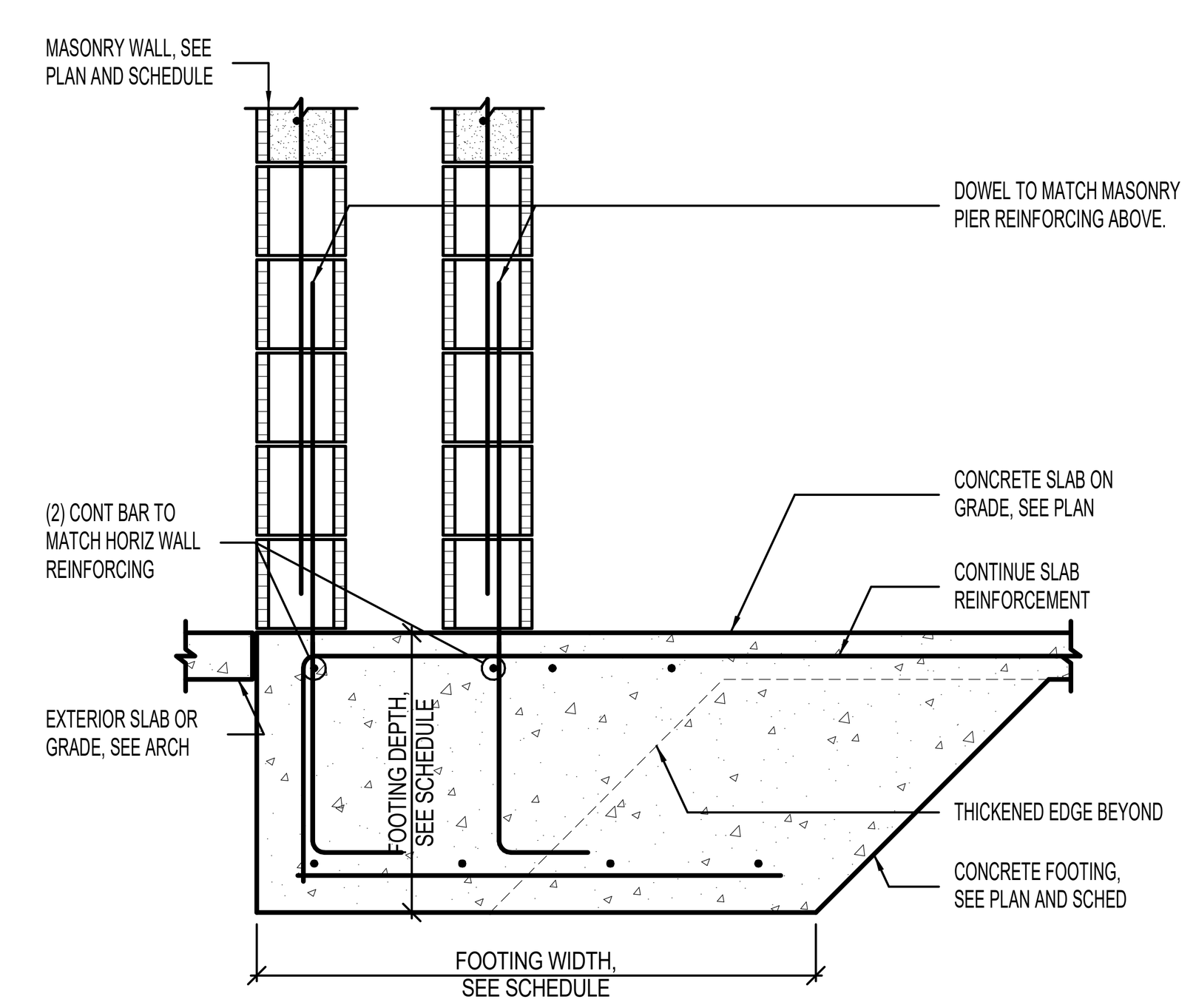
10 FOUNDATION WALL DETAIL
NO SCALE



11 FOUNDATION WALL DETAIL AT DRAIN
NO SCALE



12 THICKENED SLAB FOOTING AT 8" OR 10" MASONRY WALL
NO SCALE



13 FOUNDATION WALL DETAIL
NO SCALE

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Grand Junction Park Restroom Large

project#: 190062
date: Feb. 22, 2019

revisions :

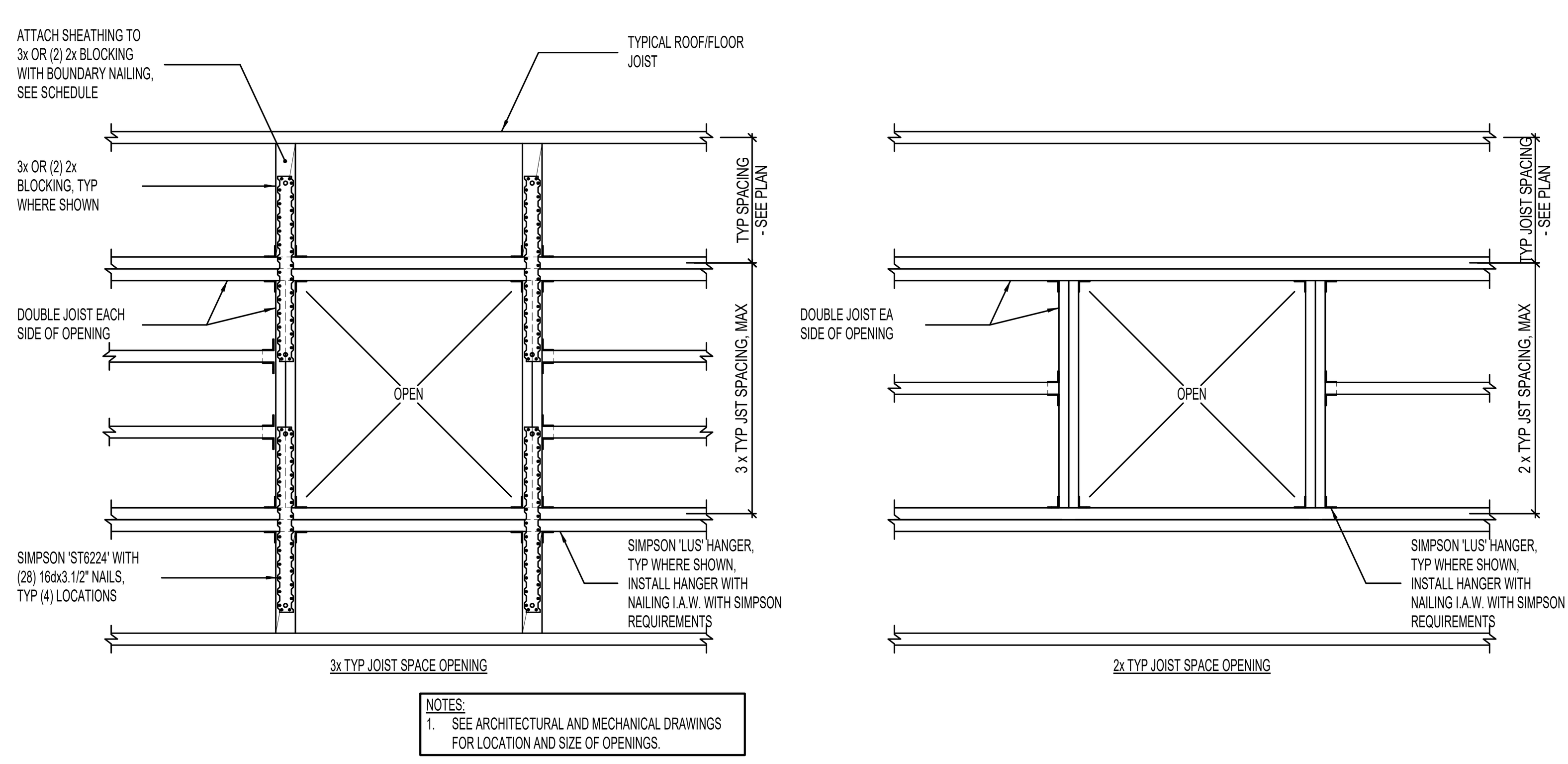
title:

FOOTING AND FOUNDATION DETAILS

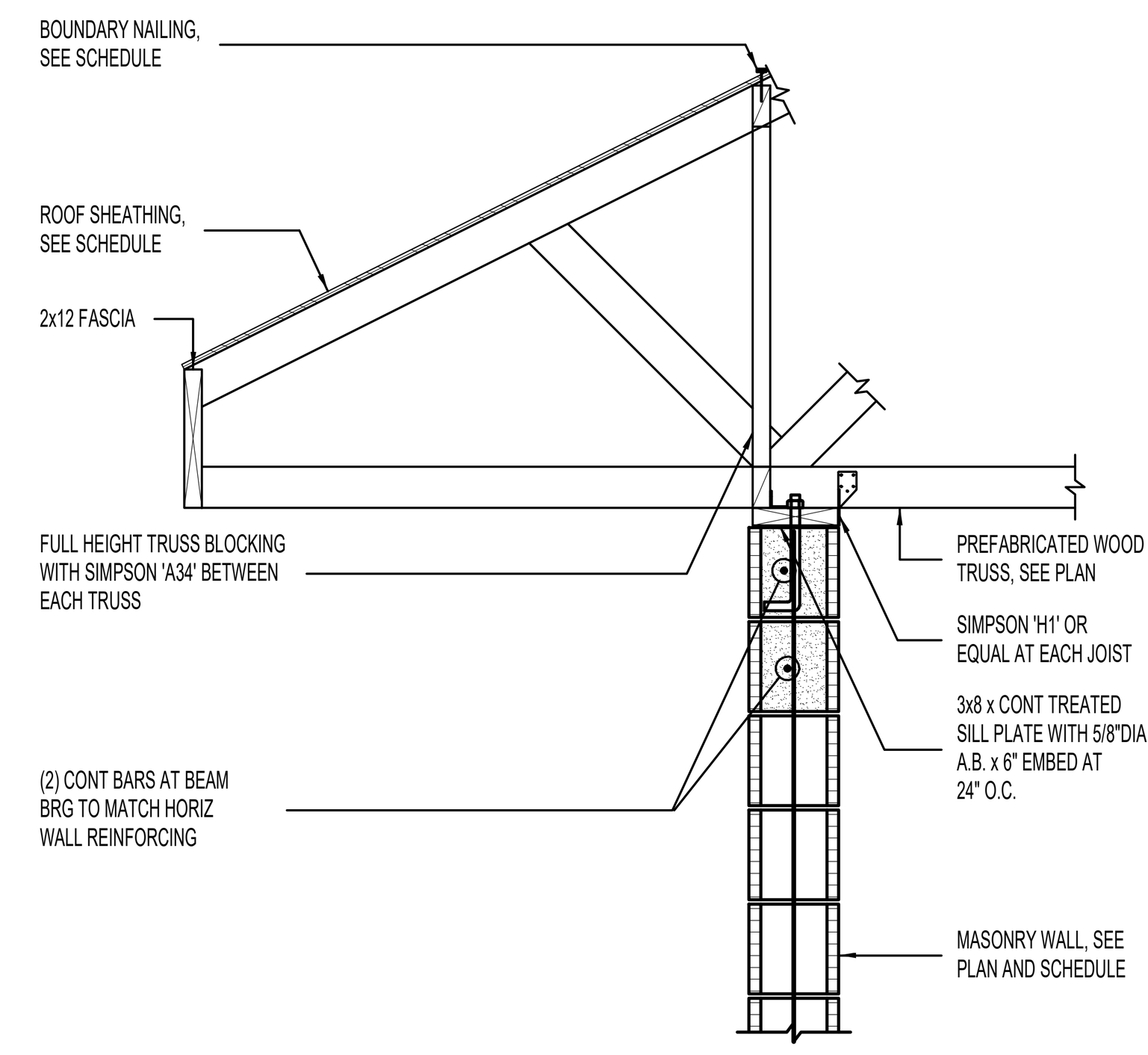
sheet:

S501

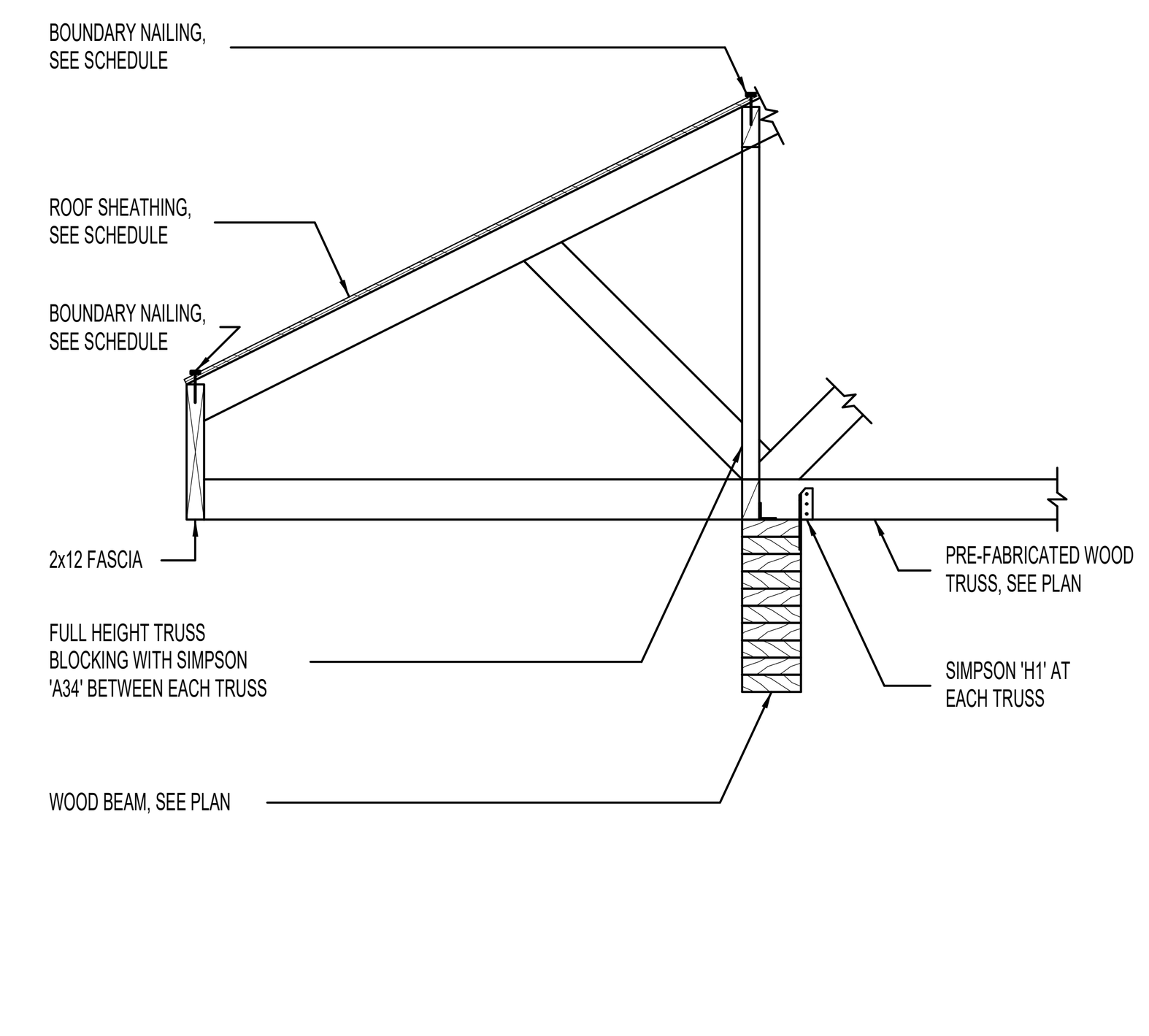
DESIGN DEVELOPMENT



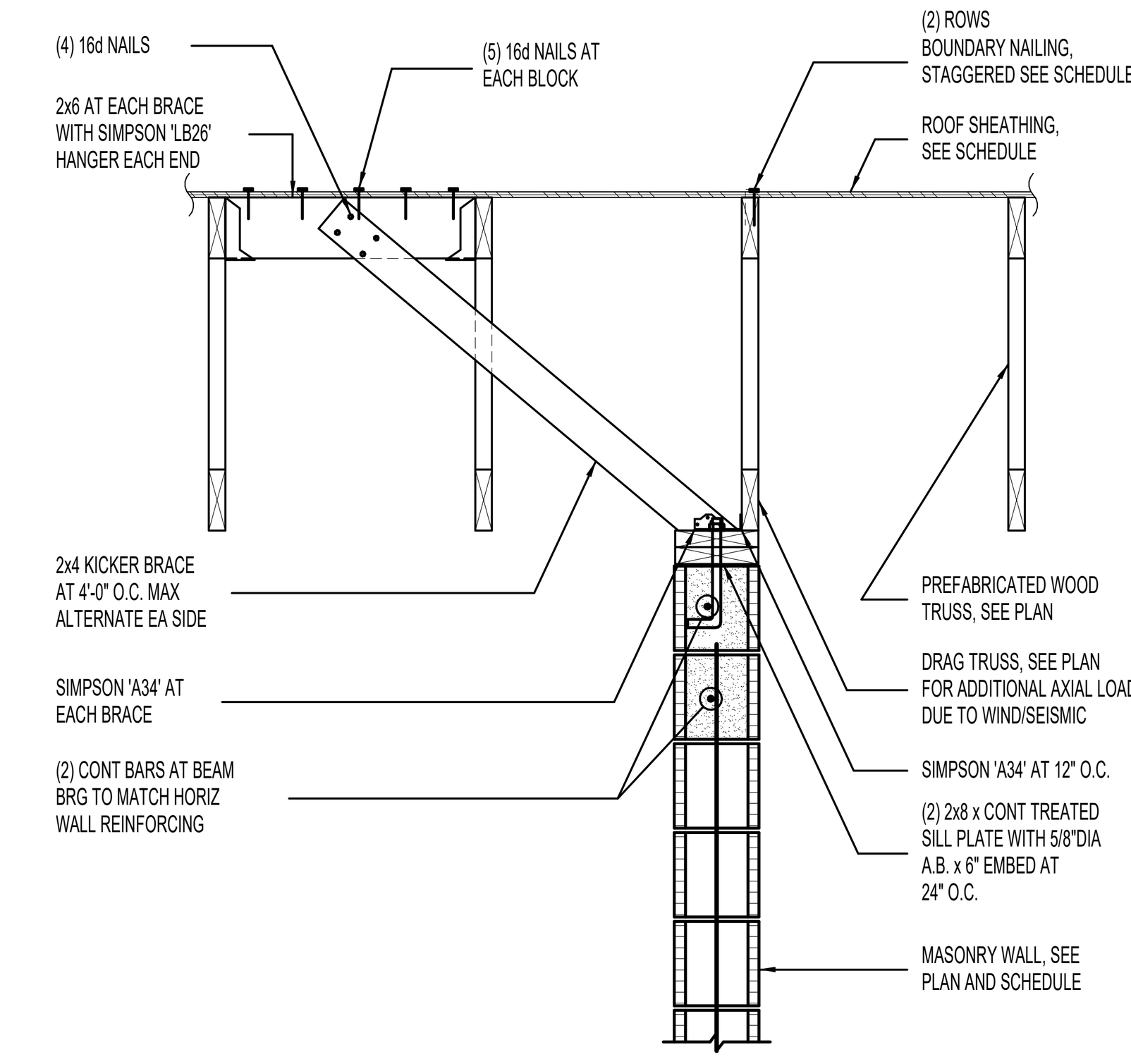
1 FRAMING AT CONVENTIONALLY FRAMED ROOF OPENINGS [PLAN VIEW] — NO SCALE



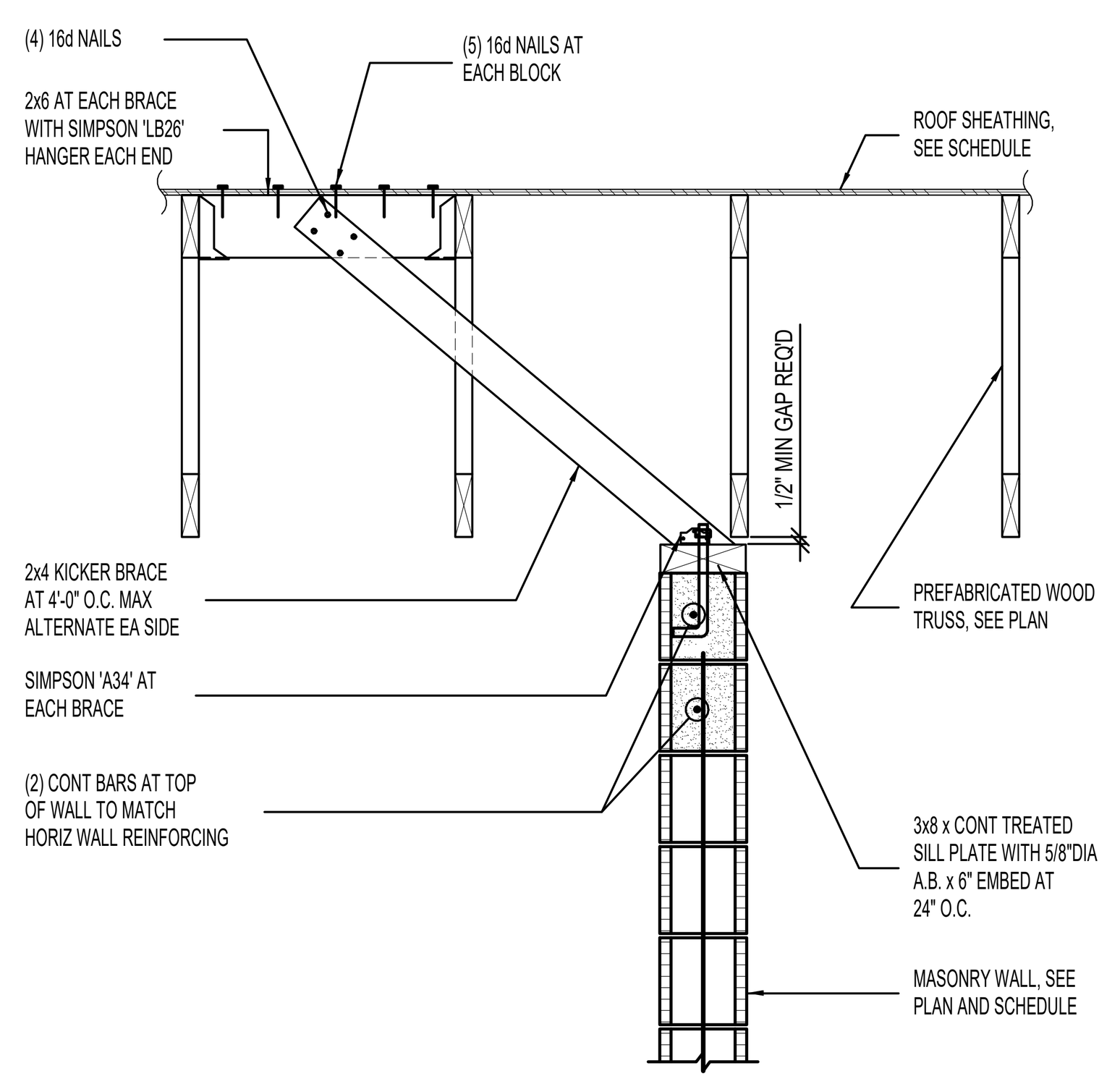
2 WOOD TRUSS BEARING AT MASONRY WALL — NO SCALE



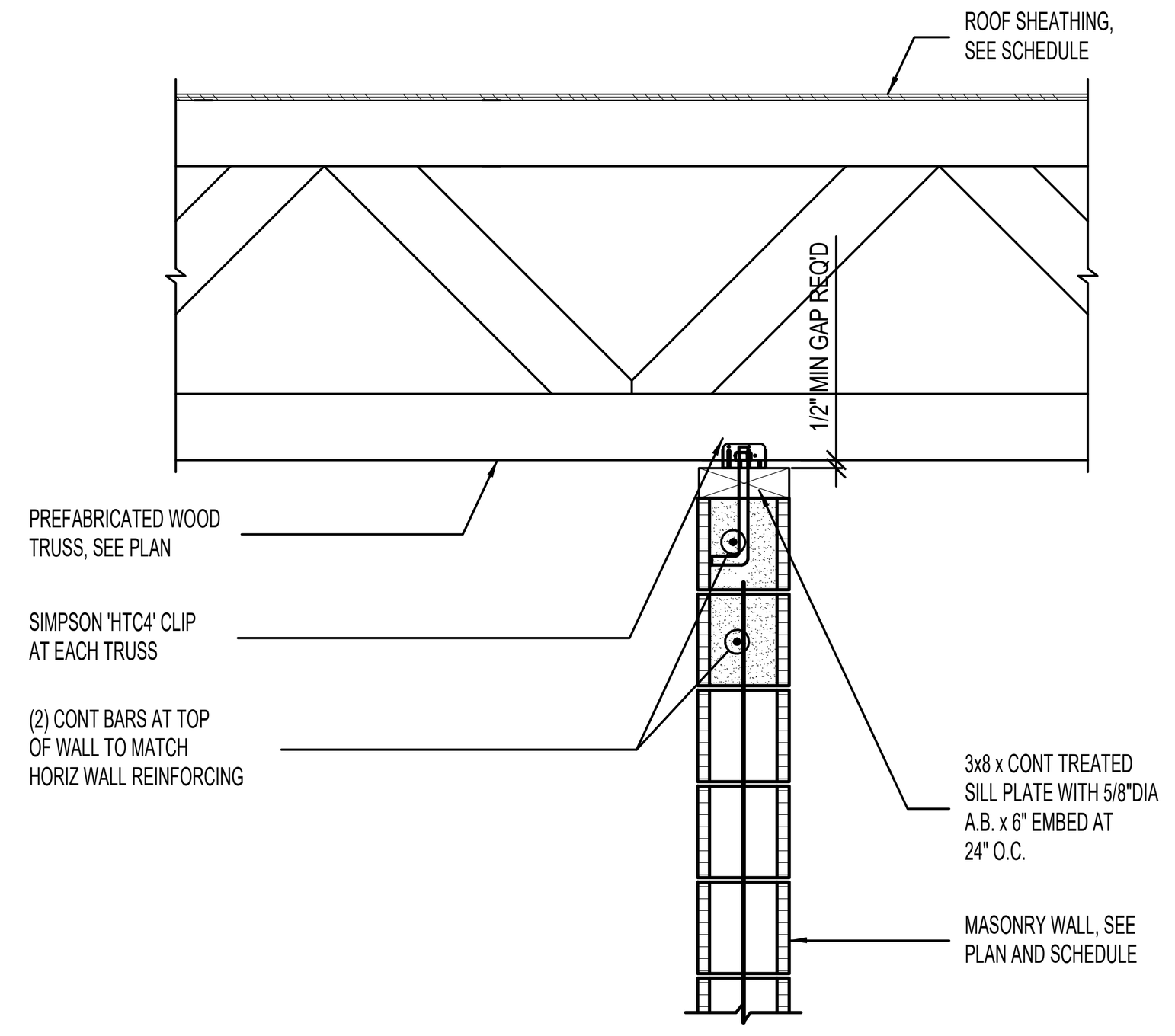
3 WOOD TRUSS AT WOOD BEAM — NO SCALE



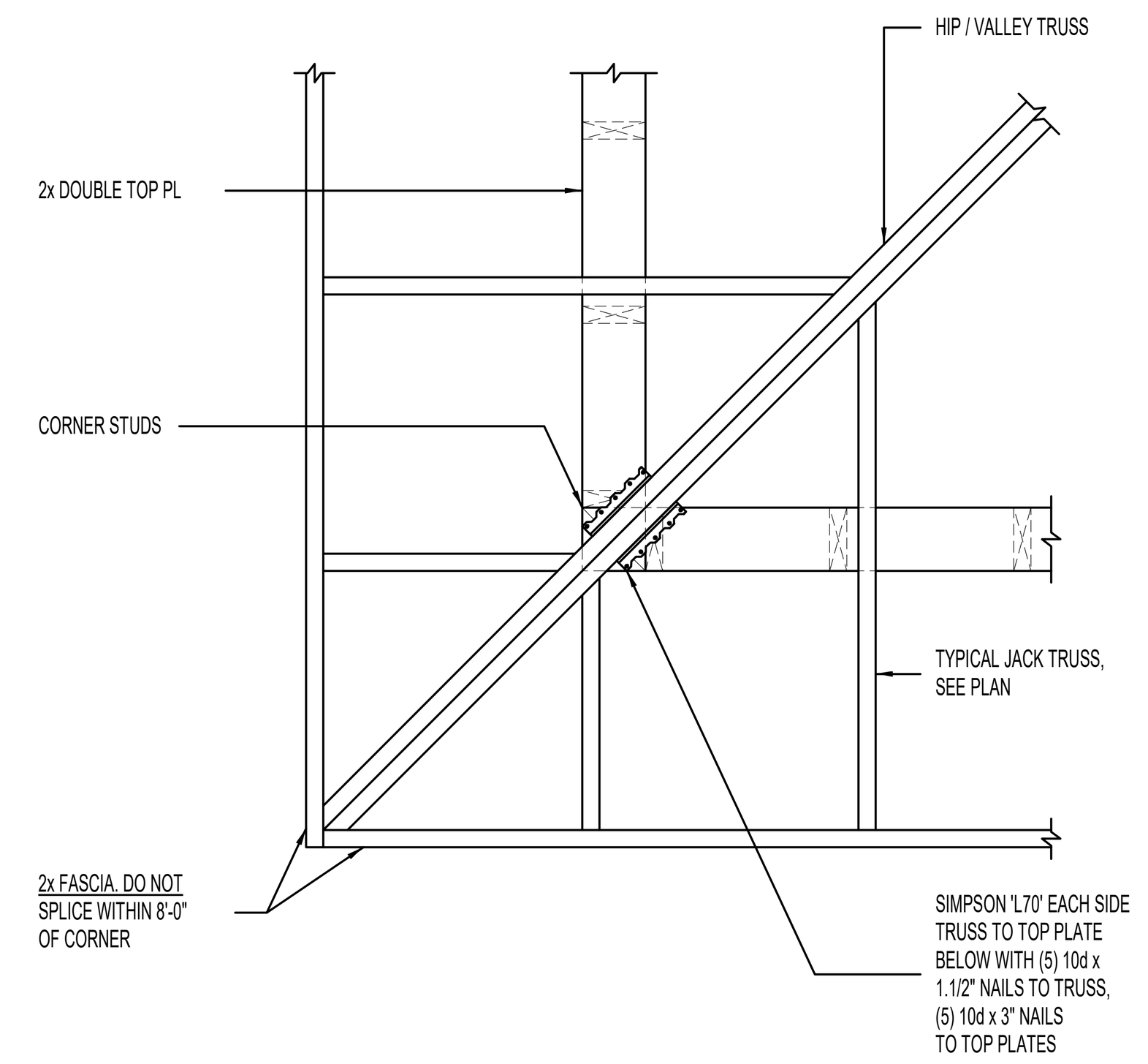
4 MASONRY SHEAR WALL PARALLEL TO WOOD TRUSS — NO SCALE



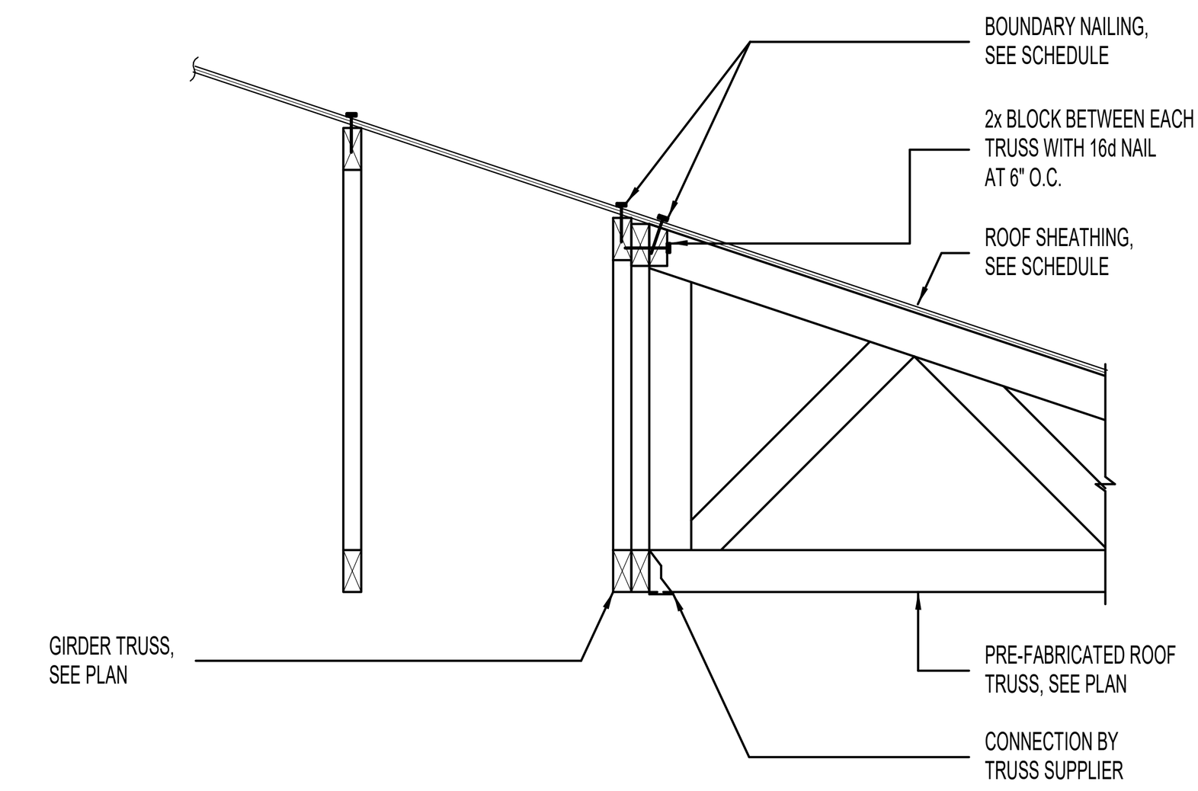
5 BRACING OF INTERIOR NON-BEARING MASONRY WALL PARALLEL TO TRUSS — NO SCALE



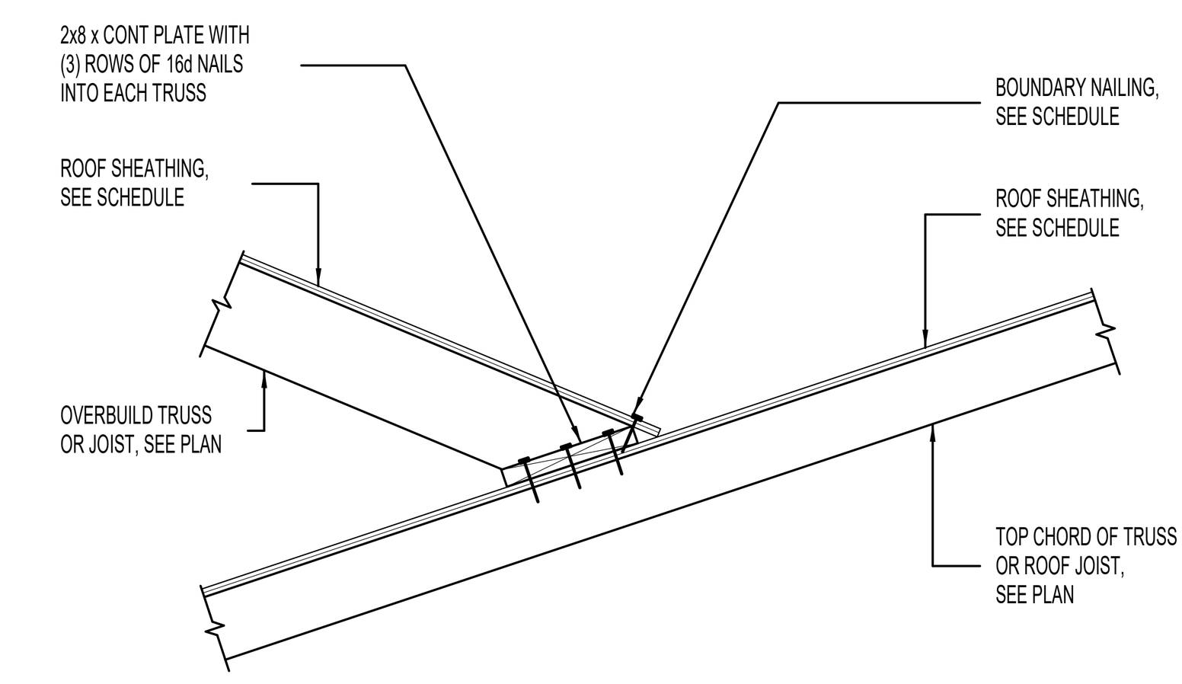
6 BRACING OF INTERIOR NON-BEARING MASONRY WALL PERPENDICULAR TO TRUSS — NO SCALE



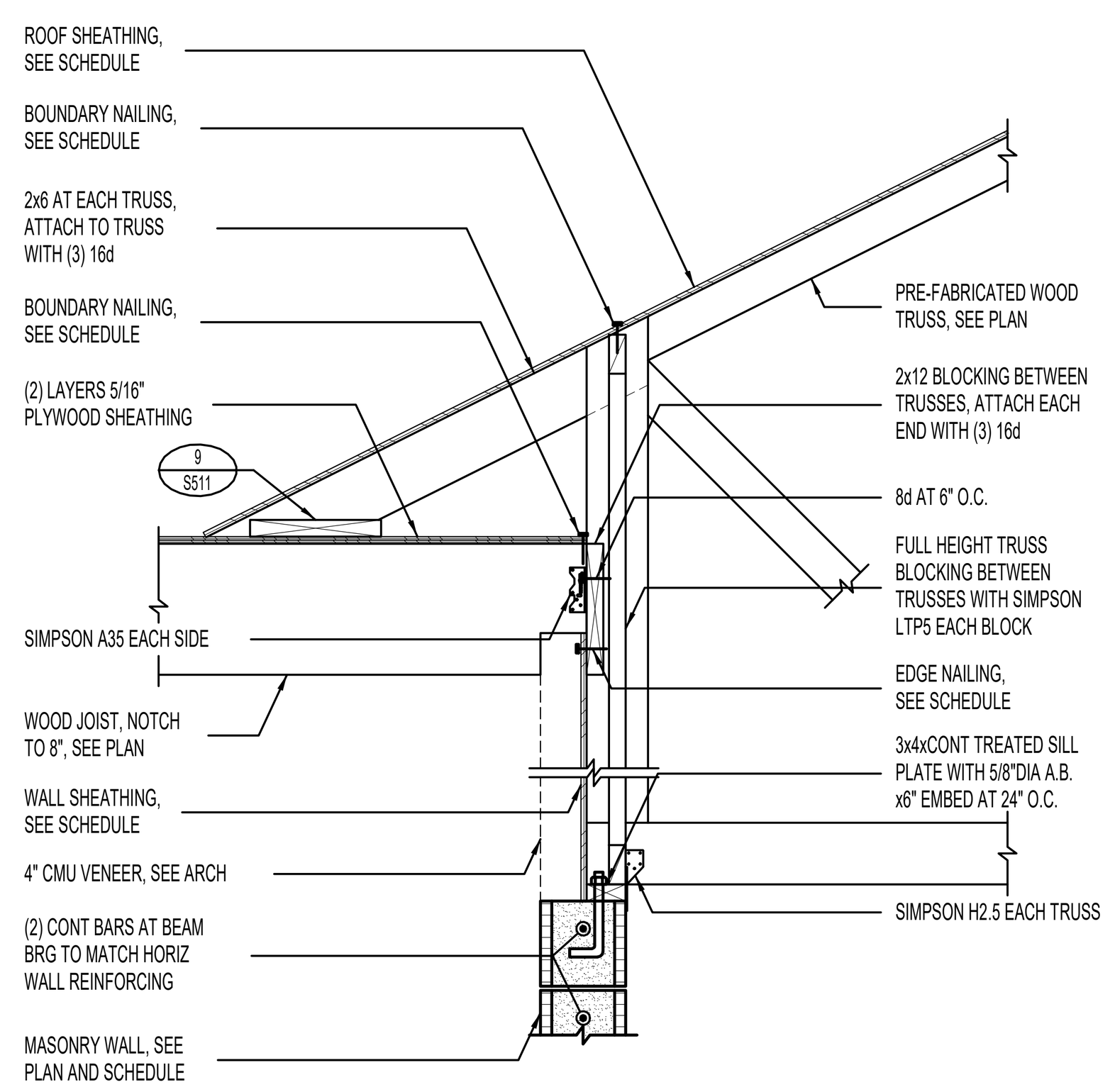
7 CORNER SOFFIT FRAMING [PLAN VIEW] — NO SCALE



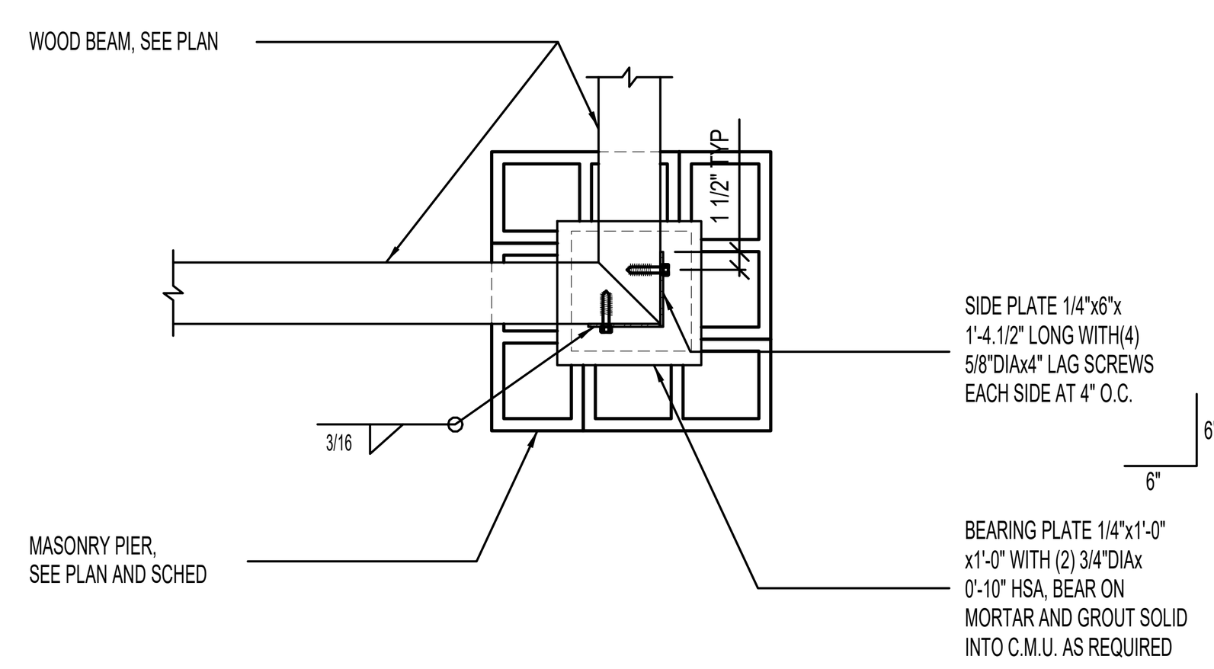
8 JACK TRUSS TO GIRDER TRUSS — NO SCALE



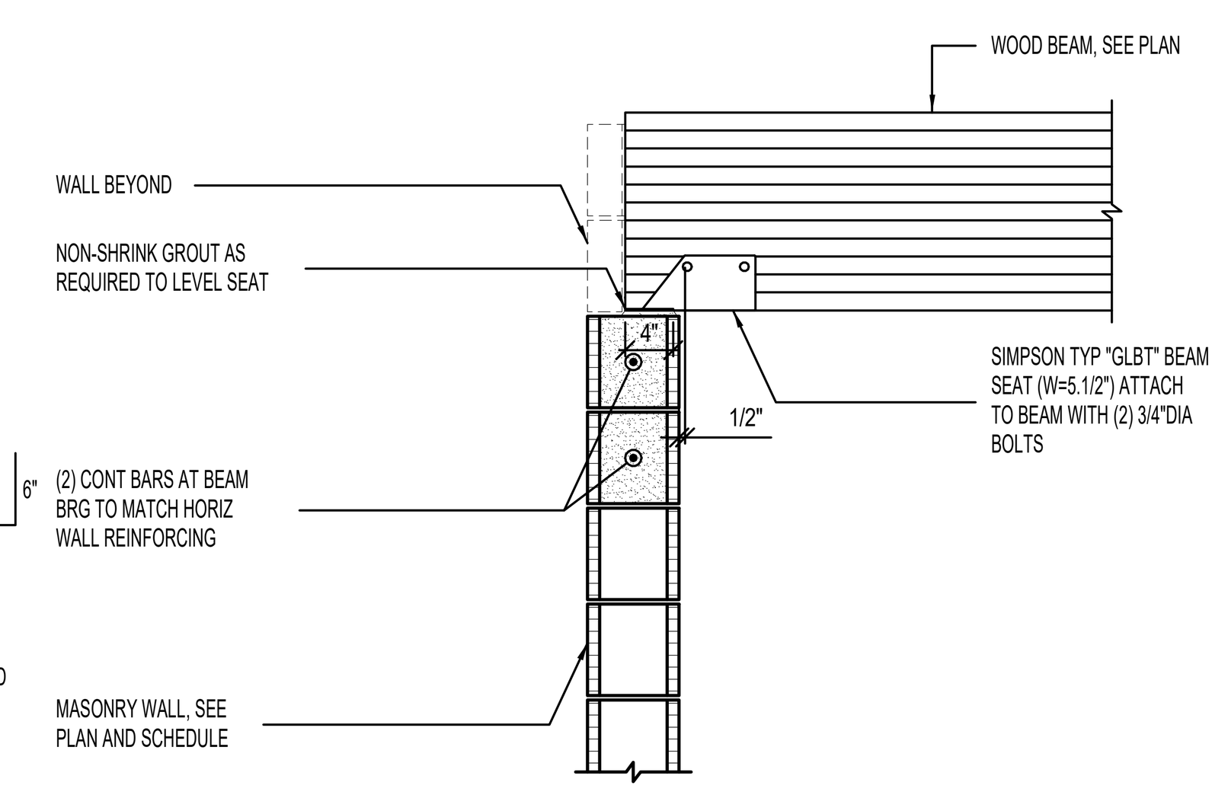
9 OVERBUILD DETAIL — NO SCALE



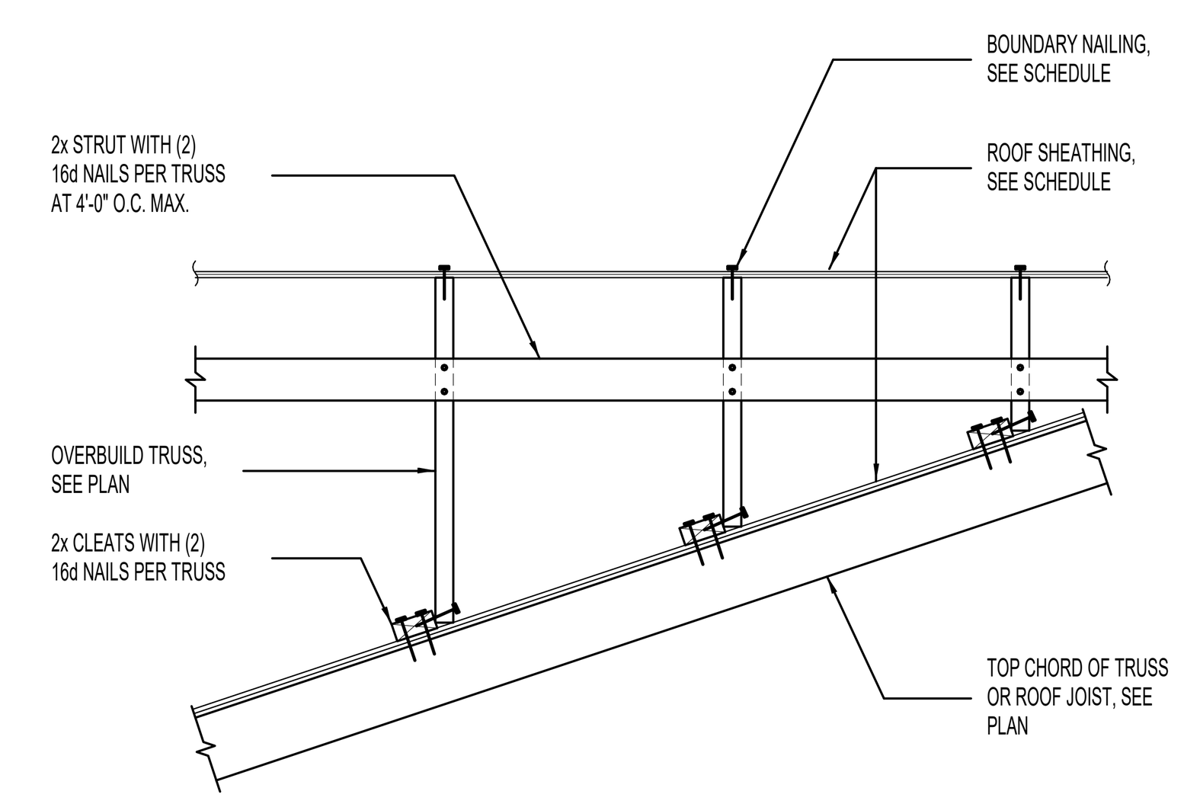
10 ARCH ROOF DETAIL — NO SCALE



11 WOOD BEAM AT MASONRY PIER DETAIL — NO SCALE



12 WOOD BEAM AT MASONRY WALL — NO SCALE



13 OVERBUILD DETAIL — NO SCALE

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ROOF FRAMING DETAILS

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S511

DESIGN DEVELOPMENT

CONCRETE FOOTING SCHEDULE

MARK	WIDTH	LENGTH	DEPTH	REINFORCING CROSSWISE				REINFORCING LENGTHWISE				COMMENTS
				No.	SIZE	LENGTH	SPACING	No.	SIZE	LENGTH	SPACING	
FTS2.0	2'-0"	CONT	24"	-	#4	1'-6"	48"	3	#4	CONT	EQ	THICKENED SLAB
FS3.5	3'-6"	3'-6"	24"	5	#4	3'-0"	EQ	5	#4	3'-0"	EQ	THICKENED SLAB
FS4.0	4'-0"	4'-0"	24"	6	#4	3'-6"	EQ	6	#4	3'-6"	EQ	THICKENED SLAB

CONCRETE FOOTING NOTES:
1. PLACE ALL FOOTING REINFORCING IN THE BOTTOM OF THE FOOTING WITH 3" CLEAR CONCRETE COVER (UNO).
2. TOP REINFORCING, WHERE OCCURS, SHALL BE PLACED IN THE TOP OF THE FOOTING WITH 2" MINIMUM CONCRETE COVER.
3. IF FOOTINGS ARE EARTH-FORMED, FOOTINGS SHALL BE 6" LONGER AND WIDER THAN SCHEDULED.
4. RUN CONTINUOUS FOOTING REINFORCEMENT THROUGH SPOT FOOTINGS.
5. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.
6. SOME SCHEDULED FOOTINGS MAY NOT BE USED, SEE FOOTING AND FOUNDATION PLAN FOR FOOTING MARKS.

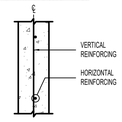
1 CONCRETE FOOTING SCHEDULE
NO SCALE

WALLS NOT DESIGNATED IN PLAN

THICKNESS	REINFORCING	
	VERTICAL	HORIZONTAL
6"	#4 AT 16" O.C.	#4 AT 16" O.C.
8"	#4 AT 16" O.C.	#4 AT 12" O.C.
10"	#4 AT 16" O.C.	#5 AT 15" O.C.
12"	#4 AT 16" O.C. E.F.	#4 AT 16" O.C. E.F.

CONCRETE FOUNDATION WALL NOTES:
1. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

WALL REINFORCING PLACEMENT TYPES:



TYPE 'A'

ABBREVIATIONS:
E.F. EACH FACE
I.F. INSIDE FACE
O.F. OUTSIDE FACE

2 CONCRETE WALL SCHEDULE
NO SCALE

CONCRETE REINFORCING BAR LAP SPLICE SCHEDULE

BAR SIZE	f'c = 3000psi & f'c = 3500 psi				f'c = 4000psi & f'c = 4500 psi				f'c = 5000psi			
	REGULAR		TOP		REGULAR		TOP		REGULAR		TOP	
	CLASS		CLASS		CLASS		CLASS		CLASS		CLASS	
	A	B	A	B	A	B	A	B	A	B	A	B
#3	17"	22"	22"	28"	15"	19"	19"	24"	13"	17"	17"	22"
#4	22"	29"	29"	37"	19"	25"	25"	32"	17"	22"	22"	29"
#5	28"	36"	36"	47"	24"	31"	31"	40"	22"	28"	28"	36"

TABULATED VALUES ARE FOR CASE 1 REINFORCEMENT, WHERE THE REQUIREMENTS OF TABLE BELOW ARE MET. WHERE THESE CONDITIONS ARE NOT MET, MULTIPLY THE LAP LENGTHS (f'_d) BY 1.5.

REQUIREMENT FOR CASE 1 LAP LENGTHS

BAR CLEAR SPACING	CLEAR COVER	STIRRUPS OR TIES
>=d_b	>=d_b	>=CODE FOR MINIMUM THROUGHOUT f'_d
>=2d_b	>=d_b	NO REQUIREMENT

d_b = BAR DIAMETER

CONCRETE REINFORCING BAR LAP SPLICE NOTES:
1. THIS SCHEDULE SHALL BE USED FOR ALL BAR SPLICES IN CONCRETE WALLS, UNLESS NOTED OTHERWISE.
2. CLASS 'A' SPLICES MAY BE USED ONLY IN CASES WHERE 50% OR LESS OF THE BARS ARE SPLICED WITHIN THE LAP SPLICE LENGTH.
3. CLASS 'B' SPLICES SHALL BE USED FOR ALL SPLICES UNLESS THE REQUIREMENTS OF NOTE No. 2 ABOVE ARE MET.
4. TIES AND STIRRUPS SHALL NOT BE SPLICED.
5. DO NOT SPLICE VERTICAL BARS IN RETAINING WALLS UNLESS SPECIFICALLY SHOWN.
6. THE VALUES TABULATED IN SCHEDULE ARE FOR GRADE 60 REINFORCING BARS. FOR GRADE 75, MULTIPLY LAP LENGTHS BY 1.25 AND FOR GRADE 80, MULTIPLY BY 1.33.
7. THE VALUES TABULATED IN SCHEDULE ARE MINIMUM REQUIREMENTS. LONGER LENGTHS MAY BE USED FOR CONSTRUCTIBILITY.
8. TOP BARS ARE CLASSIFIED AS HORIZONTAL BARS WHERE 12", OR MORE, OF FRESH CONCRETE IS CAST BELOW THE REINFORCING BAR.
9. FOR EPOXY-COATED OR ZINC AND EPOXY DUAL-COATED BARS WITH CLEAR COVER < 3d $_b$ OR CLEAR SPACING <6d$_b$, MULTIPLY LAP LENGTHS BY 1.5. FOR ALL OTHER CASES MULTIPLY BY 1.2
10. FOR LIGHT WEIGHT CONCRETE, MULTIPLY LAP LENGTHS BY 1.33 UNLESS THE AVERAGE SPLITTING TENSILE STRENGTH (F $_{ct}$) IS SPECIFIED. FOR LIGHT WEIGHT CONCRETE WHERE F $_{ct}$ IS SPECIFIED, REFER TO ACI318-14 SECTION 19.2.4.3
11. SPLICES FOR BUNDLED BARS:
    a. FOR BUNDLED BARS OF THREE OR LESS, LAP SPLICE LENGTHS SHALL BE MULTIPLIED BY 1.2.
    b. FOR BUNDLED BARS OF FOUR OR MORE, LAP SPLICE LENGTHS SHALL BE MULTIPLIED BY 1.33.
    c. INDIVIDUAL BAR SPLICES WITHIN A BUNDLE SHALL NOT OVERLAP.
    d. ENTIRE BUNDLES SHALL NOT BE LAP SPLICED.
12. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

3 CONCRETE REINFORCING BAR LAP SPLICE SCHEDULE
NO SCALE

MASONRY WALL SCHEDULE

MARK	THICKNESS	MATERIAL	SOLID GROUT	REINFORCING			COMMENTS
				VERTICAL	HORIZONTAL	JOINTS	
MW-8A	8"	CMU	NO	#5 AT 32" O.C.	#5 AT 48" O.C.	NONE	SEE NOTE 10

MASONRY WALL NOTES:
1. COORDINATE WALL FINISHES, MATERIALS, COURSING, ETC. WITH ARCHITECTURAL DRAWINGS.
2. DO NOT SOLID GROUT WALLS UNLESS REQUIRED BY SCHEDULE, NOTES, OR DETAILS.
3. SOLID GROUT ALL MASONRY COURSES BELOW GRADE.
4. SINGLE LAYER OF VERTICAL REINFORCING SHALL BE CENTERED IN WALL (UNO).
5. VERTICAL REINFORCING SHALL EXTEND INTO FOOTINGS AND TERMINATE WITH STANDARD HOOK. FOR CONCRETE FOUNDATION WALLS 4'-0" OR TALLER, VERTICAL WALL REINFORCING SHALL DOWEL 3'-0" MINIMUM INTO THE FOUNDATION WALL (UNO).
6. PROVIDE TWO VERTICAL BARS (MIN) AT ALL CORNERS AND END OF WALLS.
7. HORIZONTAL WALL REINFORCING SHALL CONTINUE THROUGH MASONRY LINTELS. WHERE BOTH HORIZONTAL WALL REINFORCING AND LINTEL REINFORCING OCCUR IN THE SAME COURSE, USE THE LARGER REINFORCING.
8. SEE DETAILS 7/S501 FOR WHERE HORIZONTAL REINFORCING TERMINATES AT EDGE OF OPENINGS.
9. IN CONCRETE FOUNDATION WALL BELOW, ALTERNATE VERTICAL CONCRETE WALL REINFORCING WITH VERTICAL MASONRY REINFORCING.
10. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

4 MASONRY WALL SCHEDULE
NO SCALE

MASONRY PIER SCHEDULE

MARK	SIZE	REINFORCING		REINFORCING SCHEMATIC	COMMENTS
		VERTICAL	TIES		
MP-8A	WT x 8"	(2) #5	NONE		
MP-24x24	24"x24	(4) #5	#3 AT 8" O.C.	TYPE A	

MASONRY PIER NOTES:
1. VERTICAL REINFORCING AND TIES SHALL EXTEND FULL HEIGHT OF WALL (UNO).
2. VERTICAL MASONRY PIER REINFORCING SHALL EXTEND INTO THE FOOTING AND TERMINATE WITH A STANDARD 90° HOOK. FOR CONCRETE FOUNDATION WALLS 4'-0" OR TALLER, VERTICAL PIER REINFORCING SHALL DOWEL 3'-0" MINIMUM INTO THE FOUNDATION WALL (UNO).
3. IN CONCRETE FOUNDATION WALLS, PROVIDE #3 TIE AT TOP OF FOUNDATION WALL WITH SAME CONFIGURATION OF MASONRY PIER ABOVE. HORIZONTAL REINFORCING OF ADJACENT WALLS SHALL RUN CONTINUOUS THROUGH MASONRY PIERS.
4. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

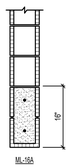
TYPE A

5 MASONRY PIER SCHEDULE
NO SCALE

MASONRY LINTEL SCHEDULE

MARK	DEPTH	MAXIMUM SPAN FOR UNSCHEDULED OPENINGS	REINFORCING		COMMENTS
			HORIZONTAL	STIRRUPS	
ML-16A	16"	6'-0"	(1) #5 x CONT TOP AND BOTTOM	NONE	

MASONRY LINTEL NOTES:
1. LINTEL WIDTH AND MATERIAL TYPE SHALL BE THE SAME AS THE WALL IN WHICH THE LINTEL IS CONSTRUCTED.
2. GROUT MASONRY LINTELS MONOLITHICALLY WITH THE SUPPORT WALL OR PIER AT EACH END.
3. MASONRY LINTEL ML-16A SHALL BE USED OVER OPENINGS IN MASONRY WALLS WHEN A SPECIFIC MASONRY LINTEL IS NOT OTHERWISE SPECIFIED. WHEN A LINTEL IS SPECIFIED ON THE PLANS, THE MAXIMUM SPAN AS NOTED IN THIS SCHEDULE SHALL NOT APPLY. CONSULT THE STRUCTURAL ENGINEER FOR LINTELS NOT SPECIFIED ON THE PLANS WHICH HAVE A SPAN GREATER THAN 6'-0".
4. EXTEND ALL HORIZONTAL REINFORCING 48 BAR DIAMETERS MINIMUM BEYOND THE EDGE OF ALL OPENINGS. IF HORIZONTAL REINFORCING CANNOT EXTEND 48 BAR DIAMETERS BEYOND EDGE OF OPENING, PROVIDE 90° STANDARD HOOK.
5. SPLICE TOP BARS AT MIDSPAN OF LINTEL ONLY AND BOTTOM BARS OVER SUPPORTS ONLY.
6. HORIZONTAL WALL REINFORCING SHALL CONTINUE THROUGH MASONRY LINTELS. WHERE BOTH HORIZONTAL WALL REINFORCING AND LINTEL REINFORCING OCCUR IN THE SAME COURSE, USE THE LARGER REINFORCING.
7. DOWEL VERTICAL REINFORCING OF WALL ABOVE LINTEL INTO THE FULL DEPTH OF LINTEL OR 48 BAR DIAMETERS, WHICHEVER IS LESS.
8. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



ML-16A

6 MASONRY LINTEL SCHEDULE
NO SCALE

MASONRY REINFORCING LAP SCHEDULE

BAR SIZE	(1) BAR PER CELL	(2) BARS PER CELL
#3	16"	16"
#4	24"	24"
#5	40"	40"

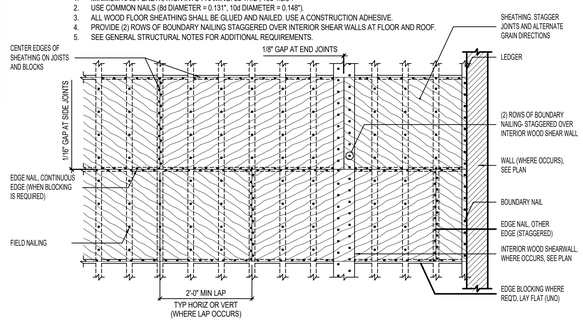
2018 IBC

7 MASONRY REINFORCING LAP SCHEDULE (1500psi)
NO SCALE

SHEATHING SCHEDULE AT ROOF

LOCATION	WOOD SHEATHING THICKNESS	SPAN RATING	NAIL SIZE	EDGE NAIL		FIELD NAIL	BOUNDARY NAIL	EDGE BLOCK	COMMENTS
				CONT EDGE	OTHER EDGE				
ROOF	19/32"	40/20	10d	6"	6"	12"	6"	NO	

SHEATHING NOTES:
1. MINIMUM NAIL PENETRATION INTO FRAMING: 8d-1.1/2", 10d-1 5/8".
2. USE COMMON NAILS (8d DIAMETER = 0.131", 10d DIAMETER = 0.148").
3. ALL WOOD FLOOR SHEATHING SHALL BE GLUED AND NAILED. USE A CONSTRUCTION ADHESIVE.
4. PROVIDE (2) ROWS OF BOUNDARY NAILING STAGGERED OVER INTERIOR SHEAR WALLS AT FLOOR AND ROOF.
5. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



8 SHEATHING SCHEDULE AT ROOF AND FLOOR
[PLAN VIEW]
NO SCALE

COLORADO REGISTERED CHRISTIAN T. LEE 37436 PROFESSIONAL ENGINEER
2-22-2019

NOT FOR CONSTRUCTION

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project#: 190062
date: Feb. 22, 2019

revisions :

title:
SCHEDULES

sheet:
S601

DESIGN DEVELOPMENT

SYMBOL LEGEND

SYMBOL	DESCRIPTION
VALVES, METERS, AND GAUGES	
	SHUT OFF VALVE
	GATE VALVE
	CHECK VALVE
	AUTO 2-WAY VALVE
	AUTO 3-WAY VALVE
	GLOBE VALVE
	BALL VALVE
	RELIEF VALVE
	CHAIN OPERATED GATE VALVE
	PRESSURE REDUCING VALVE
	BUTTERFLY VALVE
	SOLENOID VALVE
	ANGLE VALVE
	VENTURI
	BALANCING OR PLUG COCK
	FLOW SETTER
	EXPANSION VALVE (REFRIG.)
	GAS COCK
MAV	MANUAL AIR VENT
	STRAINER
	GAUGE COCK
	FLEXIBLE CONNECTION
	PRESSURE GAUGE
	THERMOMETER
	VICTUALIC COUPLING
	REDUCER CONCENTRIC
	REDUCER ECCENTRIC
	REFRIGERANT SITE GLASS
	REFRIGERANT STRAINER
	REFRIGERANT FILTER DRIER
	90 DEG ELBOW UP
	90 DEG ELBOW DOWN
	90 DEG TEE UP
	90 DEG TEE DOWN
	UNION
	CAPPED PIPE
	ANCHOR
	FLOAT AND THERMOSTATIC TRAP
HVAC SYMBOLS	
T	THERMOSTAT
S	TEMPERATURE SENSOR
H	HUMIDISTAT

SYMBOL LEGEND

SYMBOL	DESCRIPTION

DUCT WORK

SINGLE LINE	DOUBLE LINE	DESCRIPTION
		RECTANGULAR SUPPLY DUCT UP
		RECTANGULAR SUPPLY DUCT DOWN
		RECTANGULAR RETURN DUCT UP
		RECTANGULAR RETURN DUCT DOWN
		RECTANGULAR EXHAUST DUCT UP
		RECTANGULAR EXHAUST DUCT DOWN
		ROUND DUCT UP
		ROUND DUCT DOWN
		ACCOUSTICALLY LINED RECTANGULAR DUCT
		90° RECTANGULAR ELBOW WITH TURNING VANES
		90° RADIUS ELBOW R=1.5
		DUCT SIZE OR SHAPE TRANSITION
		OPPOSED BLADE BALANCING DAMPER (O.B.D.) IN RECT DUCT
		BUTTERFLY BALANCING DAMPER IN ROUND DUCTS
		COMBINATION TEE
		SPLITTER DAMPER
		SQUARE OR RECTANGULAR CEILING DIFFUSER
		ROUND CEILING DIFFUSER
		SIDEWALL REGISTER SUPPLY OR RETURN
		ROUND FLEXIBLE DUCT
		RETURN GRILLE
		EXHAUST GRILLE
		FIRE SMOKE DAMPER
		FIRE DAMPER
SD	SD	SMOKE DAMPER
FC	FC	FLEXIBLE CONNECTION
		FLEXIBLE CONNECTION
		DUCT TO BE REMOVED

PIPING LEGEND

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

HPS	HIGH PRESSURE STEAM
MPS	MEDIUM PRESSURE STEAM
LPS	LOW PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE RETURN
MPC	MEDIUM PRESSURE CONDENSATE RETURN
LPC	LOW PRESSURE CONDENSATE RETURN
PC	PUMP DISCHARGE
TWS	TEMPERED WATER SUPPLY
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUPPLY
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
D	DRAIN LINE
HG	HOT GAS BYPASS
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT

DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE, NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVED: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

SYMBOL LEGEND

SYMBOL	DESCRIPTION
REFERENCE LINES AND SYMBOLS	
# / SHEET	DETAIL INDICATOR: # INDICATES DETAIL NUMBER, SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, INTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
100	SPACE NUMBER
1	KEYNOTE INDICATOR
	REVISION INDICATOR
	EQUIPMENT INDICATOR
	PLUMBING FIXTURE INDICATOR
TYPE / CFM / SIZE	DIFFUSER/GRILLE INDICATOR
TYPE / SIZE	DIFFUSER/GRILLE INDICATOR
	BREAK, STRAIGHT
	BREAK, ROUND
MATCH LINE / SEE XX/X-XXX	MATCHLINE INDICATOR
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE
	CONTRACT LIMIT LINE: DASHDOT, WIDE LINE
	NEW CONNECTION TO EXISTING
	POINT OF DEMOLITION

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

(E)	EXISTING
(F)	FUTURE
AD	ACCESS DOOR
AIR COND	AIR CONDITION(-ING,-ED)
APD	AIR PRESSURE DROP
BD	BALANCING DAMPER
BHP	BRAKE HORSE POWER
BTU	BRITISH THERMAL UNIT
BTUH	BTU/HOUR
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	COOLING
COMP	COMPONENT
COND	CONDENS(-ER, -ING, -ATION)
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RECIRC
DIA	DIAMETER
DISCH	DISCHARGE
DP	DEPTH OR DEEP
EA	EXHAUST AIR
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL
ELEC	ELECTRIC
ELEV	ELEVATION
ENT	ENTERING
EVAP	EVAPORAT(-E, -ING, -ED, -OR)
EWT	ENTERING WATER TEMPERATURE
EXT	EXTERNAL
FC	FLEXIBLE CONNECT(-OR, -ION)
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
GAL	GALLON(S)
GE	GREASE EXHAUST
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HG	MERCURY
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTG	HEATING
HZ	HERTZ (FREQUENCY)
ID	INSIDE DIAMETER
IN	INCH
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LG	LENGTH
LH	LATENT HEAT
LRA	LOCKED ROTOR AMPS
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTUR(-ER, -ED)
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OZ	OUNCE
PD	PRESSURE DROP OR DIFFERENCE
PG	PROPOLENE GLYCOL
PH	PHASE
PPM	PARTS PER MILLION
PRESS	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
R	THERMAL RESISTANCE
RA	RETURN AIR
RECIRC	RECIRCULATE
REFR	REFRIGERATION
REQD	REQUIRED
RLA	RATED LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCW	SOFT COLD WATER
SF	SAFETY FACTOR
SH	SENSIBLE HEAT
SP	STATIC PRESSURE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
STD	STANDARD
SW	SOIL, WASTE
TA(R)	TRANSFER AIR (RETURN)
TA(S)	TRANSFER AIR (SUPPLY)
TD	TEMP. DROP OR DIFF.
TEMP	TEMPERATURE
THERM	THERMAL
TOT	TOTAL
TSTAT	THERMOSTAT
V	VOLT
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY TEMPERATURE
VEL	VELOCITY
VENT	VENT, VENTILATION
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
WB	WET BULB TEMP
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
WT	WEIGHT
WTR	WATER

MECHANICAL GENERAL NOTES

1 THE MECHANICAL DRAWINGS SHOW THE GENERAL DESIGN, ARRANGEMENT & EXTENT OF THE MECHANICAL SYSTEM. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THESE DRAWINGS DO NOT SHOW ALL OFFSETS, BENDS OR ELBOWS NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. CONTRACTOR SHALL MAKE SUCH SLIGHT ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE & OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT.

MAJOR DEVIATIONS SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL REQUIRE PRIOR APPROVAL BY THE DESIGN ENGINEER.

2 THE DRAWINGS & SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER & SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE & NOT THE OTHER BEING FURNISHED & INSTALLED AS THOUGH SHOWN & CALLED OUT IN BOTH.

3 THE ENTIRE MECHANICAL INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY ADOPTED BUILDING CODES, MECHANICAL CODE, PLUMBING CODE, ELECTRICAL CODE, & ALL OTHER APPLICABLE CITY, COUNTY, STATE, & FEDERAL CODES & REGULATIONS IN EFFECT.

4 THE ENTIRE MECHANICAL INSTALLATION SHALL CONFORM TO ANY CODES, RULES, REGULATIONS & REQUIREMENTS OF THE BUILDING OWNER.

5 PRIOR TO FABRICATION & INSTALLATION OF ANY MECHANICAL COMPONENT THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL WORK WITH ALL OTHER BUILDING TRADES, INCLUDING BUILDING TRADES HIRED DIRECTLY BY THE OWNER. WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.

6 THE SPACE ABOVE ALL CEILINGS IS LIMITED. CAREFUL COORDINATION IS REQUIRED WITH ALL TRADES BEFORE ANY PIPE, DUCT, OR EQUIPMENT IS ORDERED & OR INSTALLED. ANY CONFLICTS &/OR CHANGES FOUND DURING INSTALLATION THAT RESULTS FROM THE LACK OF COORDINATION BY THE CONTRACTORS DURING THE SHOP DRAWING PROCESS ARE THE RESPONSIBILITY OF THE CONTRACTOR.

7 ALL MECHANICAL INFORMATION IS NOT SHOWN ON THE MECHANICAL DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENT.

8 THE CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW & USE, WHERE APPROPRIATE, ALL THE MECHANICAL DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE MECHANICAL SYSTEM WITHOUT USING THE INCLUDED DETAILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

9 THE STRUCTURE SHOWN ON ALL DETAILS MAY OR MAY NOT PERTAIN TO A PORTION OR ANY PORTION OF THE BUILDING. COORDINATE ALL MOUNTING REQUIREMENTS WITH ARCHITECTURAL & STRUCTURAL DRAWINGS.

10 ANY PART OF THE MECHANICAL INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

11 SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL CEILING DIFFUSERS & GRILLES.

12 CONTRACTOR SHALL OPERATE THE SYSTEM & DEMONSTRATE ALL ASPECTS OF THE SYSTEM TO THE ENGINEER &/OR OWNER TO PROVE ALL SYSTEMS ARE OPERATIONAL.

13 DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A SET OF AS-BUILT REDLINED RECORD DRAINING AT THE PROJECT SITE. ALL CHANGES IN LAYOUT, ROUTING, EQUIPMENT, COMPONENTS, & ACCESSORIES SHALL BE RECORDED. THESE REDLINED DRAWINGS SHALL BE GIVEN TO THE ARCHITECT/ENGINEER AFTER THE FINAL INSPECTION IN ACCORDANCE WITH SPECIFICATIONS.

GENERAL EQUIPMENT NOTES

1 ALL CAPACITIES ARE AT JOB SITE CONDITIONS & ARE MINIMUM CAPACITY.

2 ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED TO CONFORM WITH LOCAL SEISMIC REQUIREMENTS & THE REQUIREMENTS OF THESE CONSTRUCTION DOCUMENTS.

3 VERIFY ALL REQUIRED SERVICE CONNECTIONS, INCLUDING ELECTRICAL CHARACTERISTICS FOR ALL EQUIPMENT PRIOR TO ORDERING EQUIPMENT.

4 ALL EQUIPMENT SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURAL MEMBERS.

5 ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

6 ALL SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.

7 AIR INLETS & OUTLETS SHALL BE OF THE SAME MANUFACTURER.

8 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE HVAC EQUIPMENT CHECK-IN, SAFEKEEPING, & DAMAGE.

MECHANICAL SHEET INDEX

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JANET M. McCULLOUGH
2/22/2019
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project:
Grand Junction Park Restrooms Large

project#:
date:

revisions :

title:
MECHANICAL COVER SHEET

sheet:
ME001

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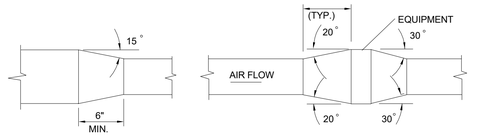
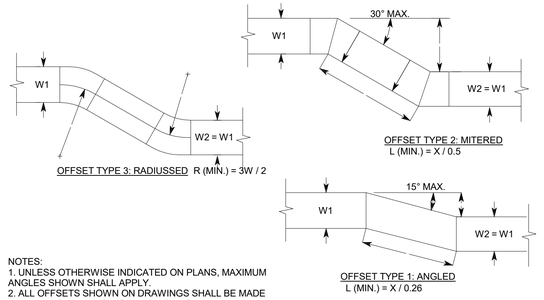
NOTE: UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.



PLAN OR SIDE VIEW
DUCT TRANSITION

PLAN OR SIDE VIEW
DUCT TRANSITION WITH EQUIPMENT IN DUCT

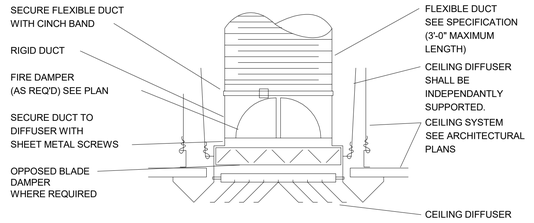
4 DUCT TRANSITION
NTS



NOTES:
1. UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.
2. ALL OFFSETS SHOWN ON DRAWINGS SHALL BE MADE WITH ANY OF THE 3 OFFSET TYPES ABOVE.

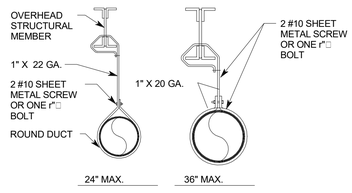
3 DUCT OFFSETS
NTS

NOTE:
CEILING INLETS AND OUTLETS SHALL BE INDEPENDENTLY SUPPORTED.



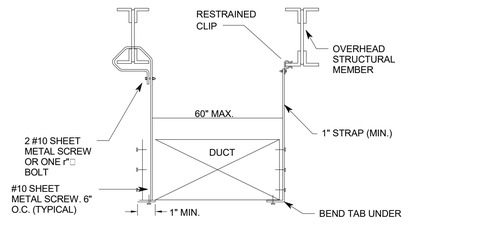
2 CEILING DIFFUSER(SURFACE)
NTS

NOTE:
USE TRAPEZE HANGER FOR RECTANGULAR DUCT LARGER THAN 60" WIDTH



5 ROUND DUCT HANGER
NTS

NOTE:
USE TRAPEZE HANGER FOR RECTANGULAR DUCT LARGER THAN 60" WIDTH



1 RECTANGULAR DUCT HANGER
NTS

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project:
Grand Junction Park Restrooms Large

project#:
date:

revisions :

title:
MECHANICAL DETAILS

sheet:
ME501

EXHAUST FAN SCHEDULE

SYMBOL	AREA SERVED	MANUFACTURER	MODEL NO.	CONFIG.	AIRFLOW (CFM)	STATIC PRESSURE (INCHES W.G.)	FAN SPEED (RPM)	MOTOR				MAXIMUM NOISE LEVEL (SONES)	OPTIONS AND ACCESSORIES	CONTROL	NOTES / COMMENTS
								HP	VOLTZ	PHASE	HERTZ				
EF-1	RESTROOMS	LOREN COOK	100 SDB	INLINE	280	0.4	1089	1 / 6	115	1	60	8	(1) (2)	(11)	(101)

ACCEPTABLE MANUFACTURERS	OPTIONS & ACCESSORIES	CONTROLS	NOTES & COMMENTS
LOREN COOK TWIN CITY PENN VENTILATOR GREENHECK	(1) GRAVITY BACKDRAFT DAMPER AT PENETRATION THROUGH BUILDING ENVELOPE. (2) ALUMINUM CONSTRUCTION.	(11) INTERLOCK OPERATION OF FAN WITH LIGHTS/OCCUPANCY SENSOR. (12) CONTINUOUS OPERATION.	(101) ALL CAPACITIES AT JOB SITE ELEVATION.

CEILING DIFFUSER, REGISTER & GRILLE SCHEDULE

SYMBOL	DESCRIPTION	SIZES		ACCEPTABLE MANUFACTURERS
		NOMINAL SIZE (NECK SIZE)	AIR FLOW (CFM)	
CD	CEILING DIFFUSER: FULL LOUVER FACE, REMOVABLE CORE, LAY-IN CEILING MOUNTING, 24" X 24" PANEL SIZE, 4-WAY PATTERN, ROUND NECK, ALUMINUM CONSTRUCTION NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC TEST 1062, OPTIONS & ACCESSORIES: BAKED ENAMEL WHITE FINISH. PROVIDE CEILING MOUNT TO MATCH CEILING TYPE.	6" DIA. 8" DIA. 10" DIA. 12" DIA. 14" DIA.	120 200 400 700 1000	KRUEGER 51400 TITUS PRICE
CG	CEILING EXHAUST GRILLE: PERFORATED FACEPLATE, ALUMINUM, CEILING MOUNTING, NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC 1062. 3/16" HOLES ON 1/4" STAGGERED CENTERS OPTIONS & ACCESSORIES: BAKED ENAMEL WHITE FINISH	6" X 6" 8" X 8" 10" X 10" 12" X 12" 14" X 14" 22" X 22"	130 260 450 700 900 2000	KRUEGER S580P PRICE TITUS
EG	CEILING EXHAUST GRILLE: EGGCRATE, 1/2"X1/2"X1/2", ALUMINUM NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC 1062. BAKED ENAMEL WHITE FINISH	SEE PLANS	SEE PLANS	KRUEGER EGC5 PRICE TITUS

AIR HANDLING UNIT SCHEDULE

SYMBOL	AREA SERVED	CFM	EXT S.P. @ S.L.	MIN. CKT. AMPS	HEATING COIL				UNIT		MANUGACTURER & MODEL NO.	NOTES
					NO.	KW	□	VOLT	□	VOLT		
AHU-1	ENTIRE BUILDING	660	.3"	27.1	1	6	1	230	1	230	FIRST CO. 18XMBX	(1)

NOTES:

(1) HORIZONTAL FAN COIL, WITH 1/8 HP DIRECT DRIVE THERMALLY PROTECTED MOTOR. 6 KW HEATER, FILTERS, CONTACTOR, AND RELAY TO CYCLE FAN AND HEATING ELEMENTS.

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MECHANICAL SCHEDULES

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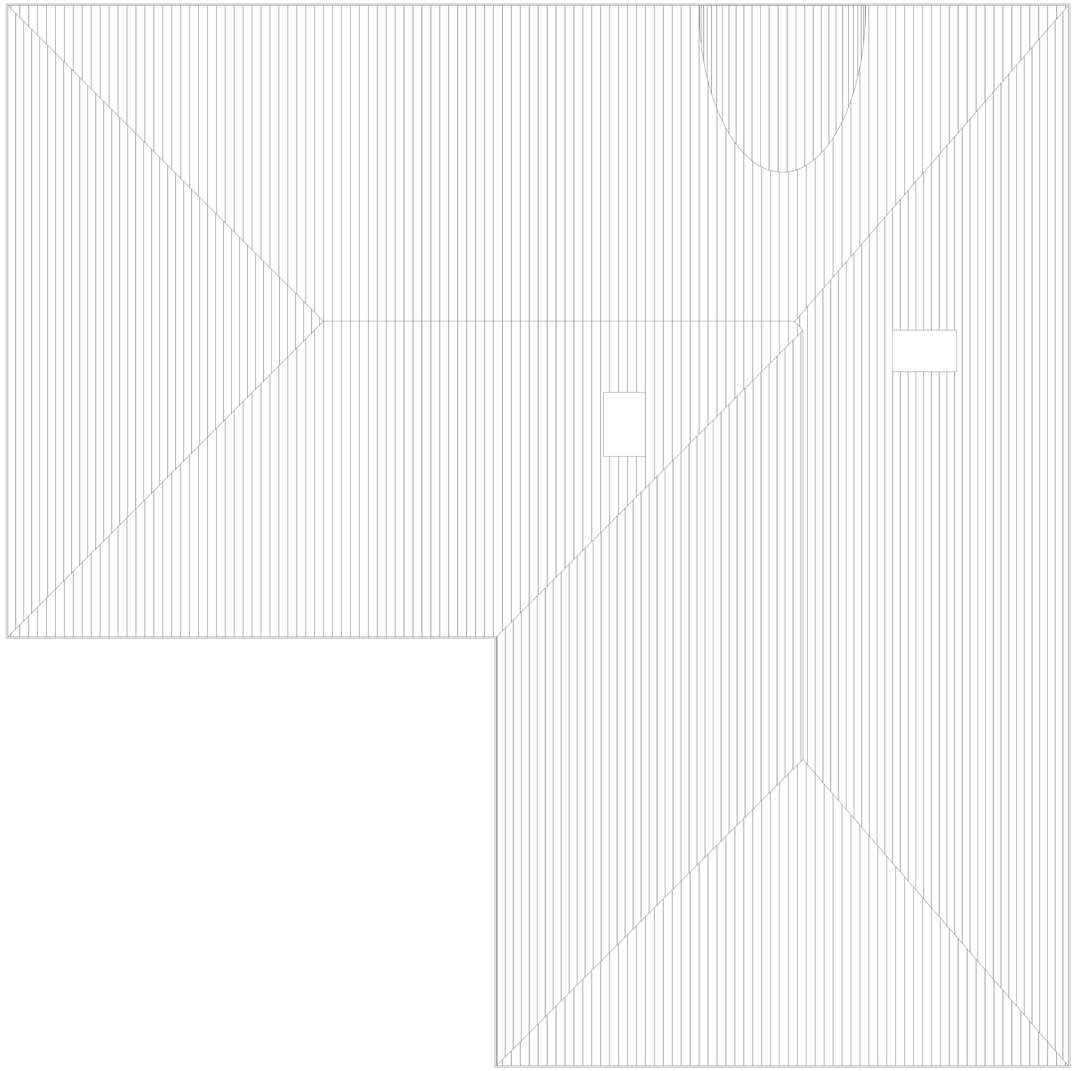
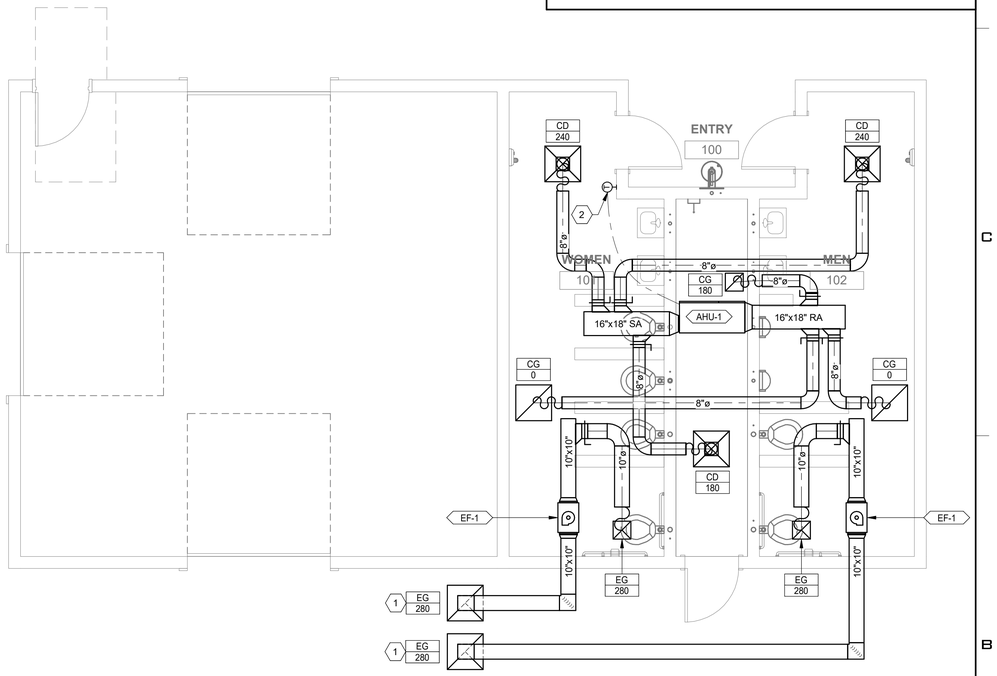
ME601

SHEET KEYNOTES

1 INSTALL EXHAUST GRILLE ON UNDERSIDE OF AWNING.

2 PROVIDE TAMPER PROOF THERMOSTAT COVER WITH LOCK AND KEY. BASIS OF DESIGN HONEYWELL 2E379.





2 ROOF MECHANICAL PLAN
1/4" = 1'-0"

1 MAIN LEVEL MECHANICAL PLAN
1/4" = 1'-0"

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COLORADO REGISTERED
JANET M. McCULLOUGH
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revisions :

title:
MAIN LEVEL MECHANICAL PLAN

sheet:
MH101

MISC. SYMBOL LEGEND

SYMBOL	DESCRIPTION
# / SHEET	DETAIL INDICATOR: # INDICATES DETAIL NUMBER, SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
100	ROOM OR SPACE NUMBER.
1	KEYNOTE INDICATOR.
	REVISION INDICATOR.
CU-1	EQUIPMENT INDICATOR.
P-	PLUMBING FIXTURE INDICATOR.
TYPE / CFM / SIZE	DIFFUSER/GRILLE INDICATOR.
TYPE / SIZE	DIFFUSER/GRILLE INDICATOR.
	BREAK, STRAIGHT
	BREAK, ROUND.
	MATCH LINE INDICATOR
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE.
	CONTRACT LIMIT LINE: DASHDOT, WIDE LINE.
	NEW CONNECTION POINT TO EXISTING

PLUMBING SYMBOL LEGEND

SYMBOL	DESCRIPTION
C.B.	CATCH BASIN
M.H.	MANHOLE
W.H.	WALL HYDRANT
H.B.	HOSE BIBB
	CLEANOUT TO GRADE
	FLOOR CLEANOUT
	WALL CLEANOUT
	1/2 GRATE
	3/4 GRATE
	FULL GRATE

PLUMBING PIPING LEGEND

SYMBOL	DESCRIPTION
	SANITARY SEWER (SS)
	GREASE WASTE (GW)
	VENT (V)
AV	ACID VENT
AW	ACID WASTE
	DOMESTIC COLD WATER (DCW)
	DOMESTIC HOT WATER (DHW)
	DOMESTIC HOT WATER RECIRC (DHWR)
180	180°F HOT WATER
180R	180° HOT WATER RETURN
160	160° HOT WATER
160R	160° HOT WATER RETURN
RW	RAINWATER
SRW	SECONDARY RAINWATER
SD	STORM DRAIN
VTR	VENT THRU ROOF
#	NON POTABLE WATER
(E)	EXISTING PIPE
(E)	EXISTING PIPE TO BE REMOVED
IW	IRRIGATION WATER
SS	SANITARY SEWER
LPS	LOW PRESSURE STEAM
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
G	GAS
FP	FIRE PROTECTION
LPG	PROPANE
VAC	VACUUM
CA	COMPRESSED AIR
MA	MEDICAL AIR
O	OXYGEN
NO	NITROUS OXIDE
N	NITROGEN
CO2	CARBON DIOXIDE
EVAC	EVACUATION

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	VALVES, METERS, AND GAUGES
	SHUT OFF VALVE
	GATE VALVE
	CHECK VALVE
	AUTO 2-WAY VALVE
	AUTO 3-WAY VALVE
	GLOBE VALVE
	BALL VALVE
	RELIEF VALVE
	CHAIN OPERATED GATE VALVE
	PRESSURE REDUCING VALVE
	BUTTERFLY VALVE
	SOLENOID VALVE
	ANGLE VALVE
	VENTURI
	BALANCING OR PLUG COCK
	FLOW SETTER
	EXPANSION VALVE (REFRIG.)
	GAS COCK
MAV	MANUAL AIR VENT
	STRAINER
	GAUGE COCK
	FLEXIBLE CONNECTION
	PRESSURE GAUGE
	THERMOMETER
	VICTUALIC COUPLING
	REDUCER CONCENTRIC
	REDUCER ECCENTRIC
	REFRIGERANT SITE GLASS
	REFRIGERANT STRAINER
	REFRIGERANT FILTER DRIER
	90 DEG ELBOW UP
	90 DEG ELBOW DOWN
	90 DEG TEE UP
	90 DEG TEE DOWN
	UNION
	CAPPED PIPE
	ANCHOR
	FLOAT AND THERMOSTATIC TRAP

DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE, NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVED: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

(E)	EXISTING
(F)	FUTURE
AD	ACCESS DOOR
AIR COND	AIR CONDITION(-ING,-ED)
APD	AIR PRESSURE DROP
BD	BALANCING DAMPER
BHP	BRAKE HORSE POWER
BTU	BRITISH THERMAL UNIT
BTUH	BTU/HOUR
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	COOLING
COMP	COMPONENT
COND	CONDENS(-ER, -ING, -ATION)
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RECIRC
DIA	DIAMETER
DISCH	DISCHARGE
DP	DEPTH OR DEEP
EA	EXHAUST AIR
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL
ELEC	ELECTRIC
ELEV	ELEVATION
ENT	ENTERING
EVAP	EVAPORAT(-E, -ING, -ED, -OR)
EWT	ENTERING WATER TEMPERATURE
EXT	EXTERNAL
FC	FLEXIBLE CONNECT(-OR, -ION)
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
GAL	GALLON(S)
GE	GREASE EXHAUST
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HG	MERCURY
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTG	HEATING
HZ	HERTZ (FREQUENCY)
ID	INSIDE DIAMETER
IN	INCH
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LG	LENGTH
LH	LATENT HEAT
LRA	LOCKED ROTOR AMPS
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTUR(-ER, -ED)
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OZ	OUNCE
PD	PRESSURE DROP OR DIFFERENCE
PG	PROPOLENE GLYCOL
PH	PHASE
PPM	PARTS PER MILLION
PRESS	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
R	THERMAL RESISTANCE
RA	RETURN AIR
RECIRC	RECIRCULATE
REFR	REFRIGERATION
REQD	REQUIRED
RLA	RATED LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCW	SOFT COLD WATER
SF	SAFETY FACTOR
SH	SENSIBLE HEAT
SP	STATIC PRESSURE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
STD	STANDARD
SW	SOIL, WASTE
TA(R)	TRANSFER AIR (RETURN)
TA(S)	TRANSFER AIR (SUPPLY)
TD	TEMP. DROP OR DIFF.
TEMP	TEMPERATURE
THERM	THERMAL
TOT	TOTAL
TSTAT	THERMOSTAT
V	VOLT
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY TEMPERATURE
VEL	VELOCITY
VENT	VENT, VENTILATION
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
WB	WET BULB TEMP
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
WT	WEIGHT
WTR	WATER

PLUMBING GENERAL NOTES

1 THE PLUMBING DRAWINGS SHOW THE GENERAL DESIGN, ARRANGEMENT AND EXTENT OF THE PLUMBING SYSTEM. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THESE DRAWINGS DO NOT SHOW ALL OFFSETS, BENDS OR ELBOWS NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. CONTRACTOR SHALL MAKE SUCH SLIGHT ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE AND OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT. MAJOR DEVIATIONS SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL REQUIRE PRIOR APPROVAL BY THE DESIGN ENGINEER.

2 THE DRAWINGS AND SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER AND SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE AND NOT THE OTHER BEING FURNISHED AND INSTALLED AS THOUGH SHOWN AND CALLED OUT IN BOTH.

3 THE ENTIRE PLUMBING INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY ADOPTED BUILDING CODES, MECHANICAL CODE, PLUMBING CODE, ELECTRICAL CODE, AND ALL OTHER APPLICABLE CITY, COUNTY, STATE, AND FEDERAL CODES AND REGULATIONS IN EFFECT.

4 THE ENTIRE PLUMBING INSTALLATION SHALL CONFORM TO ANY CODES, RULES, REGULATIONS AND REQUIREMENTS OF THE BUILDING OWNER.

5 PRIOR TO FABRICATION AND INSTALLATION OF ANY PLUMBING COMPONENT THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL PLUMBING WORK WITH ALL OTHER BUILDING TRADES, INCLUDING BUILDING TRADES HIRED DIRECTLY BY THE OWNER. WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.

6 ALL PLUMBING INFORMATION IS NOT SHOWN ON THE PLUMBING DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENTS.

7 . THE CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW AND USE, WHERE APPROPRIATE, ALL THE PLUMBING DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE PLUMBING SYSTEM WITHOUT USING THE INCLUDED DETAILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

8 ANY PART OF THE PLUMBING INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

9 PROVIDE PROPER PROVISIONS FOR EXPANSION, CONTRACTION, OR MOVEMENT OF ALL PIPING.

10 PROVIDE LARGE ENOUGH PIPE SLEEVES THROUGH WALL OR FLOOR TO ALLOW FOR ANTICIPATED DIFFERENTIAL MOVEMENT.

11 ALL PIPING SHALL BE SUPPORT WITH CLEVIS HANGERS (MSS TYPE 1). PERFORATED METAL STRAPS OR PLASTIC STRAPPING (PLUMBER TAPE) SHALL NOT BE USED TO SUPPORT OR BRACE ANY PIPE.

12 PROVIDE PIPE HANGERS WITHIN 18-INCHES OF ALL CHANGES OF DIRECTION.

13 PROVIDE SWAY BRACING FOR ALL PIPING 4" AND LARGER AT ALL CHANGES IN DIRECTION GREATER THAN 45-DEGREES.

14 ALL STEEL CLEVIS HANGERS USED TO SUPPORT COPPER PIPING SHALL BE COPPER OR PLASTIC COATED.

15 COPPER PIPING SHALL NOT COME IN CONTACT WITH FIRE TREATED LUMBER. PROVIDE ½" THICK SLIP-ON CLOSED CELL INSULATION WHERE COPPER PIPING IS ADJACENT TO FIRE TREATED LUMBER. CLOSED CELL INSULATION SHALL EXTEND A MINIMUM OF 1-1/2" PAST LUMBER.

16 ALL EXPOSED PIPING SHALL BE INSTALLED IN A NEATLY ARRANGED MANNER PARALLEL TO THE BUILDING STRUCTURE.

17 ALL EXPOSED DOMESTIC WATER PIPE IN OCCUPIED SPACES SHALL BE POLISHED CHROME PLATED.

18 ALL EXPOSED DRAINAGE PIPING IN OCCUPIED SPACES INCLUDING TRAPS UNDER SINKS SHALL BE POLISHED CHROME PLATED.

19 DRAWINGS SHOW GENERAL ARRANGEMENT OF THE DRAIN WASTE AND VENT SYSTEM WITH THE REQUIRED CLEANOUTS. CONTRACTOR SHALL PROVIDE ALL ADDITIONAL CLEANOUTS AS REQUIRED BY THE PLUMBING CODE.

20 ALL SANITARY DRAINAGE SYSTEM PIPING 3" AND LARGER SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/8" PER FOOT.

21 ALL SANITARY DRAINAGE SYSTEM PIPING SMALLER THAN 3" SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/4" PER FOOT.

22 SLOPE VENT SYSTEM TOWARDS DRAINAGE SYSTEM.

23 SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.

24 ALL EQUIPMENT SHALL PROVIDE THE SCHEDULED PERFORMANCE AT THE JOB SITE ELEVATION.

25 FIXTURE AND EQUIPMENT MODEL NUMBERS SHOWN IN PLUMBING FIXTURE SCHEDULE AND PLUMBING EQUIPMENT SCHEDULE ARE SHOWN TO ESTABLISH THE TYPE OF PRODUCT THAT SHALL BE USED. THE SELECTED PRODUCT SHALL MEET THE SCHEDULED PERFORMANCE DATA SHOWN ON THE SCHEDULE EVEN IF A DIFFERENT MODEL IS SUPPLIED THAT IS DIFFERENT THAN THAT SCHEDULED.

26 ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE ALL NECESSARY FITTINGS, TRANSITIONS, VALVES AND OTHER DEVICES AND ACCESSORIES REQUIRED FOR A COMPLETE, WORKABLE INSTALLATION.

27 SEE "PLUMBING FIXTURE SCHEDULE" FOR INDIVIDUAL TRAPS, WASTE, VENT, AND DOMESTIC WATER PIPING FOR INDIVIDUAL FIXTURES.

28 ALL PLUMBING EQUIPMENT SHALL BE LISTED AND LABELED BY AN APPROVED TESTING AGENCY.

29 FIXTURES, EQUIPMENT AND PIPING INSTALLATION SHALL MEET NSF STANDARDS.

PLUMBING SHEET INDEX

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PLUMBING COVER SHEET

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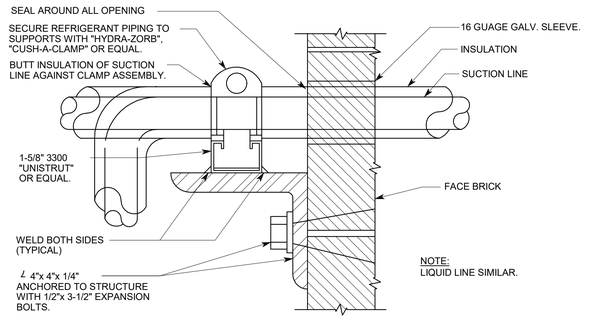
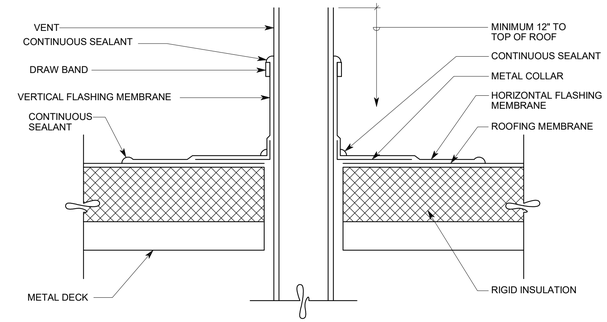


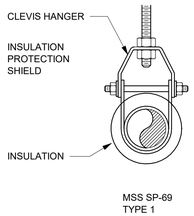
4 PIPE PENETRATION DETAIL

SCALE: NTS



3 VENT THROUGH ROOF DETAIL

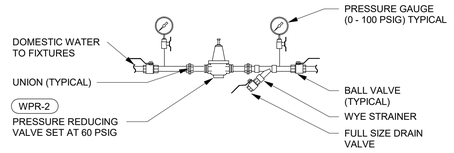
SCALE: NTS



NOTES:
1. STEEL PIPE HANGERS FOR PLASTIC PIPE SHALL BE PLASTIC COATED.
2. STEEL PIPE HANGERS FOR COPPER PIPE SHALL BE PLASTIC COATED.

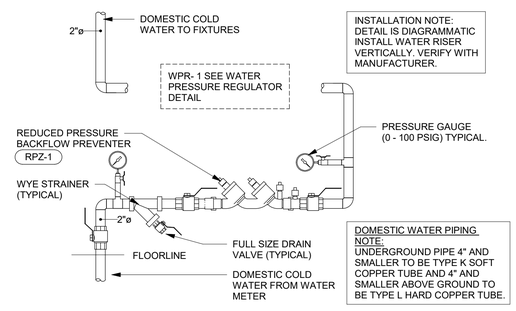
6 PIPE HANGER

SCALE: NTS



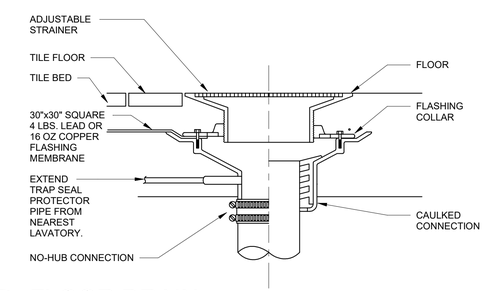
2 WATER PRESSURE REGULATOR DETAIL

SCALE: NTS



5 DOMESTIC WATER RISER

SCALE: NTS



1 FLOOR DRAIN

SCALE: NTS

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Grand Junction Park Restrooms Large

project#:
date:

revisions :

title:

PLUMBING DETAILS

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DOMESTIC COLD WATER DEMAND

EQUIPMENT	OCCUPANCY	TYPE OF SUPPLY CONTROL	QUANTITY	INDIVIDUAL WATER SUPPLY FIXTURE UNITS		TOTAL COLD WATER FIXTURE UNITS	TOTAL WATER SERVICE FIXTURE UNITS
				COLD WATER	TOTAL		
URINAL	PUBLIC	FLUSHOMETER VALVE	2	5.0	5.0	10	10
LAVATORY	PUBLIC	FAUCET	4	1.5	2.0	6	8
SINK	PUBLIC	FAUCET	0	2.3	3.0	0	0
DRINKING FOUNTAIN	PUBLIC	MIXING VALVE	1	.25	.25	0.3	0.25
WATER CLOSET, 1.6 GPF	PUBLIC	FLUSHOMETER VALVE	6	10.0	10.0	60	60
TOTAL WATER SUPPLY FIXTURE UNITS (WSFU)							78
CONVERSION FROM WSFU TO FLOW RATE (IPC TABLE E103.3(3)) (GPM)							58
ADDITIONAL FIXTURES (GPM)							0
CHAPTER 10 - WATER SUPPLY AND DISTRUBUTION, AND		SYSTEM IS PREDOMINATELY FLUSH VALVES					
TOTAL GPM							58
PIPE SIZE (WATER SUPPLY TO BUILDING) :						2"	
2012 IPC FIGURE E103.3(6) - FRICTION LOSS (PSI) FOR FAIRLY ROUGH PIPE						5	PSIG / 100 FEET
2012 IPC FIGURE E103.3(6) - FLUID VELOCITY (FPS) FOR FAIRLY ROUGH PIPE						7	FPS

SANITARY SEWER DEMAND

EQUIPMENT	OCCUPANCY	QUANTITY	INDIVIDUAL DRAINAGE FIXTURE UNIT	TOTAL DRAINAGE FIXTURE UNITS
LAVATORY	PUBLIC	4	1.0	4
DRINKING FOUNTAIN	PUBLIC	1	.5	1
SHOWER	PUBLIC	0	2.0	0
URINAL	PUBLIC	2	4.0	8
SINK	PUBLIC	0	2.0	0
FLOOR DRAIN, 2" TRAP	PUBLIC	3	2.0	6
WATER CLOSET, 1.6 GPF FLUSHOMETER VALVE	PUBLIC	4	6.0	24
MISCELLANEOUS LOADS				0
TOTAL (WSFU):				42.5
2012 INTERNATIONAL PLUMBING CODE		SLOPE:	1/8" PER FOOT	4"
CHAPTER 11 - SANITARY DRAINAGE		REQUIRED PIPE SIZE		
TABLE 709.1 - DRAINAGE FIXTURE UNITS FOR FIXTURES & GROUPS		(180 DFU'S PERMITTED ON 4" MAIN)		
ADDITIONAL DRAINAGE CAPACITY FOR SELECTED BUILDING DRAIN SIZE		137.5		

WATER HAMMER ARRESTER SCHEDULE

SYMBOL	INLET SIZE (INCHES)	PDI SYMBOL	CAPACITY (WFU)
WHA-A	½	A	1-11
WHA-B	3/4	B	12-32
WHA-C	1	C	33-60
WHA-D	1	D	61-113

ACCEPTBLE MANUFACTURERS	NOTES / REMARKS
SOUIX CHIEF "HYDRA-ARRESTER" 652 MIFAB "MWH" PPP "SC" WATTS LF05	(1) ANSI/ASSE 1010 LISTED (2) LEAD FREE CONSTRUCTION (3) COPPR TUBE BODY; POLY PISTON; EPDM O-RINGS

PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND MODEL
WC	WATER CLOSET	INT.	4"	2"	1-1/4"	----	WALL MOUNTED, FLUSH VALVE, VITREOUS CHINA, ELONGATED, 1-1/2" REAR SPUD, BEDPAN LUGS, 15" RIM HEIGHT, SIPHON JET, 2-1/8" MINIMUM TRAPWAY, 1.6 GPF, SYSTEM PERFORMANCE MAP SCORE: 1,000 G. AT 1.28 GPF. LOW CONSUMPTION, DIAPHRAGM TYPE ELECTRONIC SENSOR FLUSH VALVE, 24V HARDWIRED, 1.6 GALLON PER FLUSH, PROVIDE TRANSFORMER. POLISHED CHROME PLATED BRASS. OPEN FRONT SEAT, LESS SEAT, HEAVY DUTY MOLDED PLASTIC, ELONGATED, STAINLESS STEEL HINGE POSTS.	KOHLER K-4349 SLOAN 140 ESS-1.6 BEMIS 1955C
WC-A	WATER CLOSET (ACCESSIBLE PUBLIC TOILET ROOM)	INT.	4"	2"	1-1/4"	----	WALL MOUNTED, FLUSH VALVE, VITREOUS CHINA, ELONGATED, 1-1/2" REAR SPUD, BEDPAN LUGS, 15" RIM HEIGHT, SIPHON JET, 2-1/8" MINIMUM TRAPWAY, 1.6 GPF, INSTALL MINIMUM 17" AFF. SYSTEM PERFORMANCE MAP SCORE: 1,000 G. AT 1.28 GPF. LOW CONSUMPTION, DIAPHRAGM TYPE ELECTRONIC SENSOR FLUSH VALVE, 24V HARDWIRED, 1.6 GALLON PER FLUSH, PROVIDE TRANSFORMER. POLISHED CHROME PLATED BRASS. OPEN FRONT SEAT, LESS SEAT, HEAVY DUTY MOLDED PLASTIC, ELONGATED, STAINLESS STEEL HINGE POSTS.	KOHLER K-4367 SLOAN 140 ESS-1.6 BEMIS 1955C
UR	URINAL (ACCESSIBLE)	INT.	2"	2"	1"	---	WALL MOUNTED, FLUSHING RIM, WASHOUT, VITREOUS CHINA, 3/4" REAR SPUD. ELECTRONIC, HARD WIRED, 24V, DIAPHRAGM TYPE FLUSH VALVE, 0.25 GALLON PER FLUSH POLISHED CHROME PLATED BRASS FLOOR MOUNTED SUPPORT, FLOOR BEARING PLATE, TOP AND BOTTOM BEARING STUDS	KOHLER K-4991-ER SLOAN 195 ESS J.R. SMITH 0615
LAV	LAVATORY (ACCESSIBLE)	1-1/4"	1-1/2"	1-1/2"	1/2"	1/2"	FIXTURE: VITREOUS CHINA, WALL MOUNTED, 4" CENTERS, ADA. FAUCET: SENSOR FAUCET, 24V HARD WIRED CONNECTION, LAMINAR FLOW RESTRICTOR, POLISHED CHROME PLATED LEAD FREE BRASS. DRAIN: CHROME PLATED GRID TYPE DRAIN, CHROME PLATED BRASS TAILPIECE, OFFSET TAILPIECE. TRAP: WHITE POLYVINYL CHLORIDE (PVC). AERATOR: POLISHED CHROME PLATED LEAD-FREE BRASS, LAMINAR FLOW, 0.5 GPM. STOPS: 1/2" I.P.S. x 3/8" O.D COMPRESSION, POLISHED CHROME PLATED HEAVY PATTERN LEAD FREE BRASS ANGLE BALL VALVE. SUPPLIES: PEX TUBING, FORMED NOSEPIECE WITH FLANGE, RUBBER WASHER OR GASKET, PLASTIC COMPRESSION SLEEVE, ASTM A112.18.6, ASTMF877. ENCLOSURE: RIGID POLYVINYL CHLORIDE ENCLOSURE, ADA ACCESSIBLE, UL LISTED	KOHLER K-2007 SLOAN ETF-600 MCGUIRE 155WCECO DEARBORN 9701-1 BRASSCRAFT KTCR19XC BRASSCRAFT P1-15A TRUEBRO "LAV SHIELD" 2018
MS	MOP SINK	3"	3"	2"	1/2"	1/2"	CAST - IN - PLACE CONCRETE. COORDINATE DIMENSIONS WITH OWNER. FLAT GRID DRAIN, POLISHED CHROME PLATED. POLISHED CHROME PLATED LEAD-FREE BRASS, ATMOSPHERIC VACUUM BREAKER, 3/4" THREADED HOSE CONNECTION. LEVER HANDLES OFFSET INLETS ARM WITH INTEGRAL CHECK PROVIDE ADDITIONAL HOSE BIB WATER CONNECTION FOR CHEMICAL DISPENSER. PROVIDE DOUBLE CHECK WITH VACUUM BREAKER ON WATER LINE SERVING ADDITIONAL HOSE BIB.	CHICAGO FAUCET 540-LD897SWXFABCP
DF	DRINKING FOUNTAIN	1-1/4"	1-1/2"	1-1/2"	1/2"	--	FIXTURE FURNISHED BY OWNER, INSTALLED BY THIS CONTRACTOR. SCHEDULE 40 PVC P-TRAP ANGLE BALL VALVE STOPS, 1/2" I.P.S. x 3/8" O.D COMPRESSION, POLISHED CHROME PLATED LEAD FREE BRASS, HEAVY PATTERN RIGID POLISHED CHROME PLATED COPPER TUBING SUPPLIES REMOTE CHILLER. 115V/1PH/60HZ	DEARBORN 9701-1 BRASSCRAFT KTCR19XC BRASSCRAFT P1-15A ELKAY ECH8

NOTES:
1. PROVIDE ALL FIXTURE CARRIERS FOR WALL MOUNTED PLUMBING FIXTURES.
2. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

PLUMBING FIXTURE SCHEDULE (DRAINS)

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION		MANUFACTURERS AND MODEL
FD	FLOOR DRAIN	2"	2"	2"	---	---	FIXTURE: STRAINER: TRAP:	PVC BODY, FLASHING COLLAR, TRAP PRIMER CONNECTION. 5" ROUND NICKEL BRONZE ADJUSTABLE. PVC P-TRAP.	JRS PRODUCTS 212 JRS PRODUCTS 210-12
CO	CLEANOUT	---	SAME AS PIPE	---	---	---	EQUIPMENT:	CAST IRON BLIND PLUG.	CHARLOTTE PIPE NH-50
FCO	FLOOR CLEANOUT	---	SAME AS PIPE	---	---	---	EQUIPMENT:	HEAVY DUTY NICKEL BRONZE TOP, BRASS PLUG	J. R. SMITH 4113S-NB
COTG	CLEANOUT TO GRADE	---	SAME AS PIPE	---	---	---	EQUIPMENT:	HEAVY DUTY NICKEL BRONZE TOP, BRASS PLUG	J. R. SMITH 4113S-NB
WCO	WALL CLEANOUT	---	SAME AS PIP	---	---	---	EQUIPMENT:	ROUND FLAT STAINLESS STEEL WALL PLATE	J.R. SMITH 4532S

ACCEPTABLE MANUFACTURERS:

DRAINAGE (FLOOR DRAINS, ETC):	J.R. SMITH,	ZURN,	WATTS

PLUMBING FIXTURE SCHEDULE (MISC. VALVES)

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION		MANUFACTURER AND MODEL
NFWH	NON-FREEZE WALL HYDRANT	---	---	---	3/4"	---	EQUIPMENT:	ENCASED, NON FREEZE, COMPRESSION CLOSURE VALVE, HINGED COVER WITH KEY LOCK 3/4" HOSE CONNECTION, INTEGRAL VACUUM BREAKER.	ZURN Z1305
WPR-1	WATER PRESSURE REGULATOR	---	---	---	2"	---	EQUIPMENT: CAPACITY:	LEAD FREE CONSTRUCTION, HIGH CAPACITY, WITH STRAINER 75 GPM AT 15 PSIG FALL OFF PRESSURE	WATTS LF223
RPZ-1	BACKFLOW PREVENTER	---	---	---	2"	---	EQUIPMENT:	REDUCED PRESSURE ZONE ASSEMBLY, LEAD FREE BRONZE BODY, BRONZE SEATS, OSY SEATED GATE VALVES, ASSE 1013 LISTED. 10 PSI DROP @ 75 GPM.	WATTS 909QT
BV	BALANCING VALVE	---	---	---	---	1/2"	EQUIPMENT:	CALIBRATED, LEAD FREE BRASS BODY, STAINLESS STEEL BALL, TEFLON SEAT RINGS, NSF 61-G COMPLIANT.	BELL & GOSSETT CB-LF

ACCEPTABLE MANUFACTURERS:

BACKFLOW PREVENTER:	WATTS,	FEBCO,
BALANCING VALVE:	ARMSTRONG,	BELL & GOSSETT,
PRESSURE REDUCING VALVES:	POWERS,	

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PLUMBING SCHEDULES

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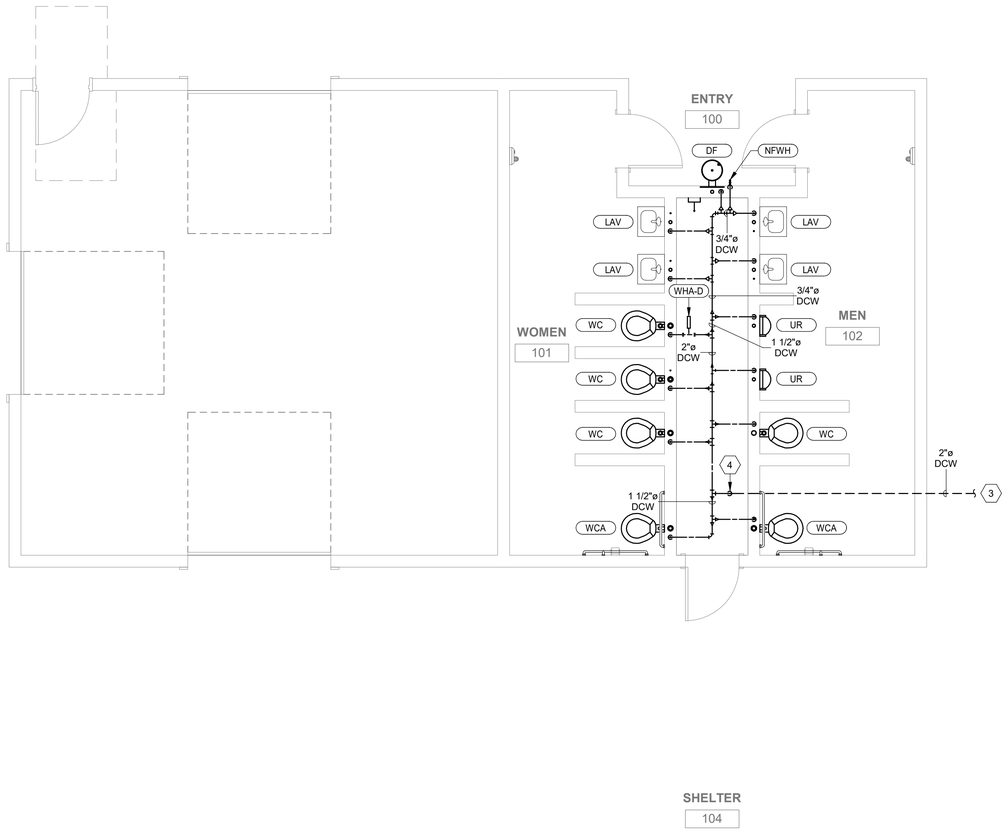
SHEET KEYNOTES

1 SANITARY MAIN TO CIVIL. MINIMUM INVERT DEPTH 36"

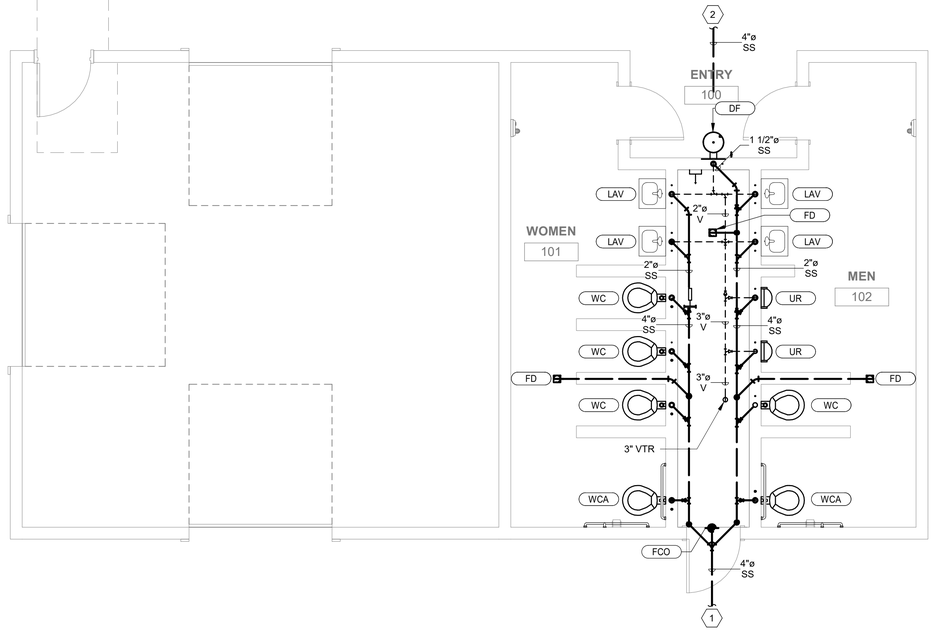
2 ALTERNATE LOCATION FOR WASTE LINE CONNECTION TO RESTROOMS. IF ROUTING IS REQUIRED TO ROUTE THIS WAY, DRAINAGE PIPING TO MIRROR LAYOUT INDICATED.

3 DOMESTIC WATER LINE TO CIVIL. ### CONSIDER STOP AND WASTE VALVE.

4 DOMESTIC WATER RISER. SEE DETAILS. SLOPE WATER LINES BACK TO MAIN RISER. PROVIDE ISOLATION VALVE AT BASE OF RISER AND HOSE BIBB ABOVE ISOLATION VALVE FOR DRAINING.



2 MAIN LEVEL PLUMBING PLAN - WATER
1/4" = 1'-0"



1 MAIN LEVEL PLUMBING PLAN - DWV
1/4" = 1'-0"

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SYMBOLS LEGEND

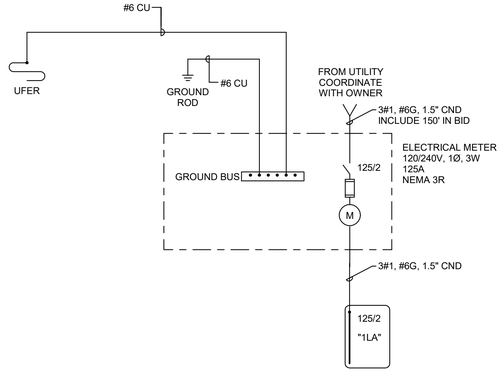
SYMBOL	DESCRIPTION
REFERENCE AND LINE SYMBOLS	
ROOM NAME / 100	ROOM IDENTIFIER WITH ROOM NAME AND NUMBER.
1	KEYNOTE INDICATOR.
1	REVISION INDICATOR.
X-X / XMDP	MECHANICAL EQUIPMENT INDICATOR. "X-X" INDICATES EQUIPMENT MARK SHOWN ON EQUIPMENT SCHEDULE. "XMDP" IDENTIFIES PANEL EQUIPMENT IS CIRCUITED TO. REFER TO EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.
	BREAK, STRAIGHT: TO BREAK PARTS OF DRAWING
	BREAK, ROUND
	NEW LINE: MEDIUM LINE.
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE
	EXISTING TO REMAIN LINE: THIN LINE.
	DEMOLITION LINE: DASHED, MEDIUM LINE
WIRING METHODS	
	WIRING.
	WIRING TURNED UP OR TOWARDS OBSERVER.
	WIRING TURNED DOWN OR AWAY FROM OBSERVER.
A-1,3,5	BRANCH CIRCUIT HOME RUN TO PANELBOARD: NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS. LETTER AND NUMBER NOTATIONS IDENTIFY PANEL AND CIRCUIT NUMBERS. USE #12 CONDUCTORS, EXCEPT #10 CONDUCTORS SHALL BE INSTALLED IF DISTANCES EXCEED THOSE SPECIFIED IN THE ELECTRICAL SPECIFICATIONS.
1 A-1,3,5	BRANCH CIRCUIT HOME RUN TO PANELBOARD: NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS. LETTER AND NUMBER NOTATIONS IDENTIFY PANEL AND CIRCUIT NUMBERS. NUMBER IN BOX REFERS TO THE CONDUCTOR AND CONDUIT SCHEDULE. FOR BRANCH WIRING USE #12 CONDUCTORS, EXCEPT #10 CONDUCTORS SHALL BE INSTALLED IF DISTANCES EXCEED THOSE SPECIFIED IN THE ELECTRICAL SPECIFICATIONS.
	LOW VOLTAGE WIRING: DIVIDE, MEDIUM LINE.
	CONDUIT STUB. DIMENSION RECORD DRAWINGS AND MARK.
1	CONDUCTOR & CONDUIT ("CC") SCHEDULE INDICATOR. REFER TO ONE-LINE DIAGRAM.
HC	ADA ACCESS PUSH PLATE
	JUNCTION BOX.
PB	PULL BOX.
C	JUNCTION BOX, CEILING.
	MECHANICAL EQUIPMENT CONNECTION. REFER TO EQUIPMENT SCHEDULE FOR REQUIREMENTS.

SYMBOLS LEGEND

SYMBOL	DESCRIPTION
WIRING DEVICES	
	RECEPTACLE, DUPLEX: NEMA 5-20R.
DF	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER, DRINKING FOUNTAIN: CONCEAL WATER COOLER RECEPTACLE BEHIND WATER COOLER. SEE MECHANICAL/PLUMBING SHOP DRAWINGS FOR INSTALLATION REQUIREMENTS.
W	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER, WET LABEL, "WEATHERPROOF IN USE": NEMA 5-20R.
	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER: NEMA 5-20R.
	RECEPTACLE, QUADRAPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER: NEMA 5-20R.
	RECEPTACLE, SPECIAL PURPOSE. PROVIDE RECEPTACLE TO MATCH EQUIPMENT PLUG.
X $	SWITCH, SINGLE POLE ("x" INDICATES FIXTURES CONTROLLED).
ELECTRICAL POWER AND DISTRIBUTION	
M	METER.
	DISCONNECT SWITCH, FUSED.
	DISCONNECT SWITCH, UNFUSED.
	STARTER, COMBINATION WITH DISCONNECT SWITCH.
	STARTER OR MOTOR CONTROLLER.
	PUSHBUTTON.
	PANELBOARD CABINET, SURFACE MOUNTED, 1 SECTION.
	LIGHTING CONTROL STATION.
$ST	SWITCH, TOGGLE MOTOR STARTER WITH OVERLOAD PROTECTION.

SYMBOLS LEGEND

SYMBOL	DESCRIPTION
LIGHTING (REFER TO FIXTURE SCHEDULE FOR SYMBOLS)	
(W-3)	FIXTURE IDENTIFICATION: (W-3) INDICATES FIXTURE TYPE AS SCHEDULED.
LIGHTING CONTROL	
	OCCUPANCY SENSOR, DUAL TECHNOLOGY, OMNI-DIRECTIONAL, CEILING.
	OCCUPANCY SENSOR, DUAL TECHNOLOGY, WALL.
a,b $	LOW VOLTAGE DIGITAL LIGHTING CONTROL SWITCH: LETTER "a,b" INDICATES ZONING WHERE SHOWN (REFER TO PLANS, SCHEDULES, AND DETAILS FOR EXACT BUTTON CONFIGURATION AND PROGRAMMING REQUIREMENTS)
DC	DIGITAL LIGHTING DIMMING CONTROLLER
RC	DIGITAL LIGHTING ROOM CONTROLLER
L X	LIGHTING SPACE CONTROL TYPE. X INDICATES TYPE. SEE SCHEDULE / DIAGRAM.



B2 ONE-LINE DIAGRAM

SCALE: 1/8" = 1'-0"

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

1P	SINGLE POLE
1PH	SINGLE-PHASE
1WAY	ONE-WAY
2/C	TWO-CONDUCTOR
2WAY	TWO-WAY
3/C	THREE-CONDUCTOR
3WAY	THREE-WAY
4OUT	QUADRUPLE RECEPTACLE OUTLET
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4W	FOUR-WIRE
4WAY	FOUR-WAY
A	ABOVE COUNTER
AC	ARMORED CABLE
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
ALUM	ALUMINUM
AMP	AMPERE
ANN	ANNUNCIATOR
AP	ACCESS POINT (WIRELESS DATA)
AR	AS REQUIRED
ASC	AMPS SHORT CIRCUIT
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAGE
BB XFMR	BUCK-BOOST TRANSFORMER
C	CEILING MOUNTED
CATV	COMMUNITY ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CCBA	CUSTOM COLOR AS SELECTED BY ARCHITECT
CCTV	CLOSED CIRCUIT TELEVISION
CF/CI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED
CF/OI	CONTRACTOR FURNISHED/ OWNER INSTALLED
CFBA	CUSTOM FINISH AS SELECTED BY ARCHITECT
CKT	CIRCUIT
CM	CONSTRUCTION MANAGER
CND	CONDUIT
CO	CONVENIENCE OUTLET
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
CTV	CABLE TELEVISION
CU	COPPER
dBA	UNIT OF SOUND LEVEL
DPDT	DOUBLE POLE, DOUBLE THROW
DS	DISCONNECT SWITCH
EA	EACH
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRIC NONMETALLIC TUBING
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
EX	EXISTING
F	FURNITURE MOUNTED
FA	FIRE ALARM
FCP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
FMC	FLEXIBLE METAL CONDUIT
FOB	FREIGHT ON BOARD
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G	GROUND
GEN	GENERATOR
GFCI	GROUND FAULT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HD	HEAVY DUTY
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSE POWER
HPF	HIGH POWER FACTOR
HPS	HIGH PRESSURE SODIUM
HV	HIGH VOLTAGE
HZ	HERTZ
I/O	INPUT/ OUTPUT
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
IN/IS	INSULATED/ ISOLATED
IR	INFRARED
J-BOX	JUNCTION BOX
kV	KILOVOLT
kVA	KILOVOLT AMPERE
kVAR	KILOVOLT AMPERE REACTIVE
kW	KILOWATT
kWh	KILOWATT HOUR
LED	LIGHT EMITTING DIODE
LFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT
LFNC	LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT
LPS	LOW PRESSURE SODIUM
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LV	LOW VOLTAGE
MATV	MASTER ANTENNA TELEVISION SYSTEM
MAX	MAXIMUM
MC	METAL CLAD
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTION
MDP	MAIN DISTRIBUTION PANEL
MG	MOTOR GENERATOR
MH	MANHOLE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIOANL ELECTRICAL MANUFACTURERS ASSOCIATION
NFC	NATIONAL FIRE CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OCP	OVER CURRENT PROTECTION
OF/CI	OWNER FURNISHED/ CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED/ OWNER INSTALLED
OFP	OBTAIN FROM PLANS
OH DR	OVERHEAD (COILING) DOOR
OL	OVERLOAD
PB	PUSHBUTTON
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
PT	POTENTIAL TRANSFORMER
PTZ	PAN/TILT/ZOOM
QTY	QUANTITY
R	REMOVE
RCP	REFLECTED CEILING PLAN
RMC	RIGID METAL CONDUIT
RNC	RIGID NONMETAL CONDUIT
RPM	REVOLUTIONS PER MINUTE
RR	REMOVE AND RELOCATE
S/S	START/STOP
SCA	SHORT CIRCUIT AMPS
SCBA	STANDARD COLOR AS SELECTED BY ARCHITECT
SF	SQUARE FOOT (FEET)
SFBA	STANDARD FINISH AS SELECTED BY ARCHITECT
SPD	SURGE PROTECTIVE DEVICE
SPDT	SINGLE POLE, DOUBLE THROW
SPEC	SPECIFICATION
SPST	SINGLE POLE, SINGLE THROW
ST	SINGLE THROW
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TL	TWIST LOCK
TP	TELEPHONE POLE
TP	TWISTED PAIR
TTB	TELEPHONE TERMINAL BOARD
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSER
TYP	TYPICAL
UF	UNDERFLOOR
UGND	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPERE
VFC/VF D	VARIABLE FREQUENCY MOTOR CONTROLLER
W/	WITH
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER

ELECTRICAL SHEET INDEX

GENERAL ELECTRICAL NOTES

1. CLARIFICATION METHODS: AT THE TIME OF BIDDING, BIDDERS SHALL FAMILIARIZE THEMSELVES WITH THE DRAWINGS AND SPECIFICATIONS. ANY QUESTIONS, MISUNDERSTANDINGS, CONFLICTS, DELETIONS, DISCONTINUED PRODUCTS, CATALOG NUMBER DISCREPANCIES, DISCREPANCIES BETWEEN THE EQUIPMENT SUPPLIED AND THE INTENT OR FUNCTION OF THE EQUIPMENT, ETC, SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER IN WRITING FOR CLARIFICATION PRIOR TO ISSUANCE OF THE FINAL ADDENDUM AND BIDDING OF THE PROJECT. WHERE DISCREPANCIES OR MULTIPLE INTERPRETATIONS OCCUR, THE MOST STRINGENT (WHICH IS GENERALLY RECOGNIZED AS THE MOST COSTLY) THAT MEETS THE INTENT OF THE DOCUMENTS SHALL BE ENFORCED.

2. OWNER FURNISHED ITEMS: THE OWNER WILL FURNISH MATERIAL AND EQUIPMENT AS INDICATED IN THE CONTRACT DOCUMENTS TO BE INCORPORATED INTO THE WORK. THESE ITEMS ARE ASSIGNED TO THE INSTALLER AND COSTS FOR RECEIVING, HANDLING, STORAGE, IF REQUIRED, AND INSTALLATION ARE INCLUDED IN THE CONTRACT SUM.
   A. THE INSTALLER'S RESPONSIBILITIES ARE THE SAME AS IF THE INSTALLER FURNISHED THE MATERIALS OR EQUIPMENT.
   B. THE OWNER WILL ARRANGE AND PAY FOR DELIVERY OF OWNER FURNISHED ITEMS FREIGHT ON BOARD JOB SITE AND THE INSTALLER WILL INSPECT DELIVERIES FOR DAMAGE. IF OWNER FURNISHED ITEMS ARE DAMAGED, DEFECTIVE OR MISSING, DOCUMENT DAMAGED ITEMS WITH THE TRANSPORT COMPANY AND THE OWNER WILL ARRANGE FOR REPLACEMENT. THE OWNER WILL ALSO ARRANGE FOR MANUFACTURER'S FIELD SERVICES, AND THE DELIVERY OF MANUFACTURER'S WARRANTIES AND BONDS TO THE INSTALLER.
   C. THE INSTALLER IS RESPONSIBLE FOR DESIGNATING THE DELIVERY DATES OF OWNER FURNISHED ITEMS AND FOR RECEIVING, UNLOADING AND HANDLING OWNER FURNISHED ITEMS AT THE SITE.THE INSTALLER IS RESPONSIBLE FOR PROTECTING OWNER FURNISHED ITEMS FROM DAMAGE, INCLUDING DAMAGE FROM EXPOSURE TO THE ELEMENTS, AND TO REPAIR OR REPLACE ITEMS DAMAGED AS A RESULT OF HIS OPERATIONS.

3. EXPOSED STRUCTURE AREAS (EXCLUDING MECHANICAL, ELECTRICAL, AND COMMUNICATION SPACES): INSTALL RACEWAYS BETWEEN DECK AND STRUCTURE WHEREVER POSSIBLE IN EXPOSED STRUCTURE CEILING AREAS. ROUTE RACEWAYS IN CONCEALED AREAS WHEREVER POSSIBLE. REFER ALL CONDITIONS WHERE RACEWAYS MUST BE INSTALLED WHICH CANNOT COMPLY WITH THESE REQUIREMENTS TO THE ARCHITECT.

4. SUBMITTALS: PROVIDE ORIGINAL ELECTRONIC PDF FORMAT, BOUND, BOOKMARKED (EACH SECTION AND PRODUCT), AND HIGHLIGHTED. JOB NAME AND SUBCONTRACTOR SHALL BE ON THE FRONT COVER. PREPARE INDEX OF EQUIPMENT SUBMITTED IN EACH TAB.

5. REFLECTED CEILING PLANS: COORDINATE THE LOCATION OF LIGHT FIXTURES WITH THE ARCHITECTURAL REFLECTED CEILING PLANS. REFER ALL DISCREPANCIES TO THE ARCHITECT AND ENGINEER.

6. ALL WORK SHALL BE DONE ACCORDING TO THE CURRENT NATIONAL ELECTRIC CODE (NEC), IBC, NFPA, AND IFC. COMPLIANCE AND FINAL APPROVAL IS SUBJECT TO THE ON SITE FIELD INSPECTION OF THE AHJ.

DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE, NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVED: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

TECHNOLOGY SYSTEMS: THE TERM "TECHNOLOGY SYSTEMS" IS USED TO DESCRIBE ALL LOW VOLTAGE SYSTEMS GENERALLY REFERRED TO AS "SPECIAL SYSTEMS". THESE SYSTEMS INCLUDE BUT ARE NOT NECESSARILY LIMITED TO ALL SYSTEMS WHICH UTILIZE VOLTAGES OF LESS THAN 71 VOLTS SUCH AS SOUND SYSTEMS, VIDEO SYSTEMS, TV SYSTEMS, SECURITY SYSTEMS, VOICE AND DATA CABLING SYSTEMS, ETC...

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project:

Grand Junction Park Restrooms Large

project#: 18.0850
date:

revisions :

title:

ELECTRICAL COVER SHEET

sheet:

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SHEET KEYNOTES

1 EXTERIOR RECEPTACLES AND PLUG COVERS SHALL BE WEATHERPROOF TO COMPLY WITH NEC REQUIREMENTS. THEY SHALL BE MORTARED-IN TYPE, FLUSH MOUNTED AND LOCKABLE. ALL EXTERIOR RECEPTACLE AND PLUG COVERS SHALL BE OPENED BY A SINGLE KEY. EXTERIOR RECEPTACLE AND PLUG COVERS SHALL BE MADE OF HEAVY-DUTY CAST ALUMINUM. COORDINATE COLOR WITH THE ARCHITECT/OWNER. INSTALL CONDUITS FEEDING THE SHELTER AREA RECEPTACLES UNDER THE FLOOR SLAB.

2 PROVIDE ELECTRICAL CONNECTIONS TO FAUCET AND FLUSH VALVES. COORDINATE EXACT LOCATION WITH THE PLUMBING INSTALLERS. ALL CONNECTIONS AND CONDUITS SHALL BE RECESSED AND ACCESSIBLE ONLY IN THE PLUMBING CHASE.

3 PROVIDE ELECTRICAL CONNECTIONS TO HAND DRYERS. CIRCUIT WITH 2#10, #10G IN 0.75" CONDUIT. COORDINATE EXACT LOCATION WITH INSTALLERS PRIOR TO ROUGH-IN.

4 PROVIDE LIGHTING CONTACTOR PANEL WITH ASTRONOMICAL CLOCK OR EXTERIOR RATED ROOM CONTROLLER WITH ASTRONOMICAL CLOCK FOR LIGHTING CONTROL. COORDINATE PROGRAMMING OF THE LIGHTING WITH THE OWNER.

5 STUB (2) 1" PVC CONDUITS AND (4) 2" PVC CONDUITS FROM PANELBOARD LOCATION TO 5' BEYOND ADJACENT CONCRETE. MARK GPS COORDINATES OF CONDUITS ON RECORD DRAWINGS FOR FUTURE USE.

6 PROVIDE VANDAL RESISTENT OCCUPANCY SENSOR. MOUNT SENSOR AS HIGH AS POSSIBLE TO AVOID VANDALISM. PROVIDE SENSOR WITH AUXILIARY RELAY. CONNECT AUXILIARY RELAY TO EXHAUST FAN FOR CONTROL.

7 MOUNT FIXTURE AT 10'-4".

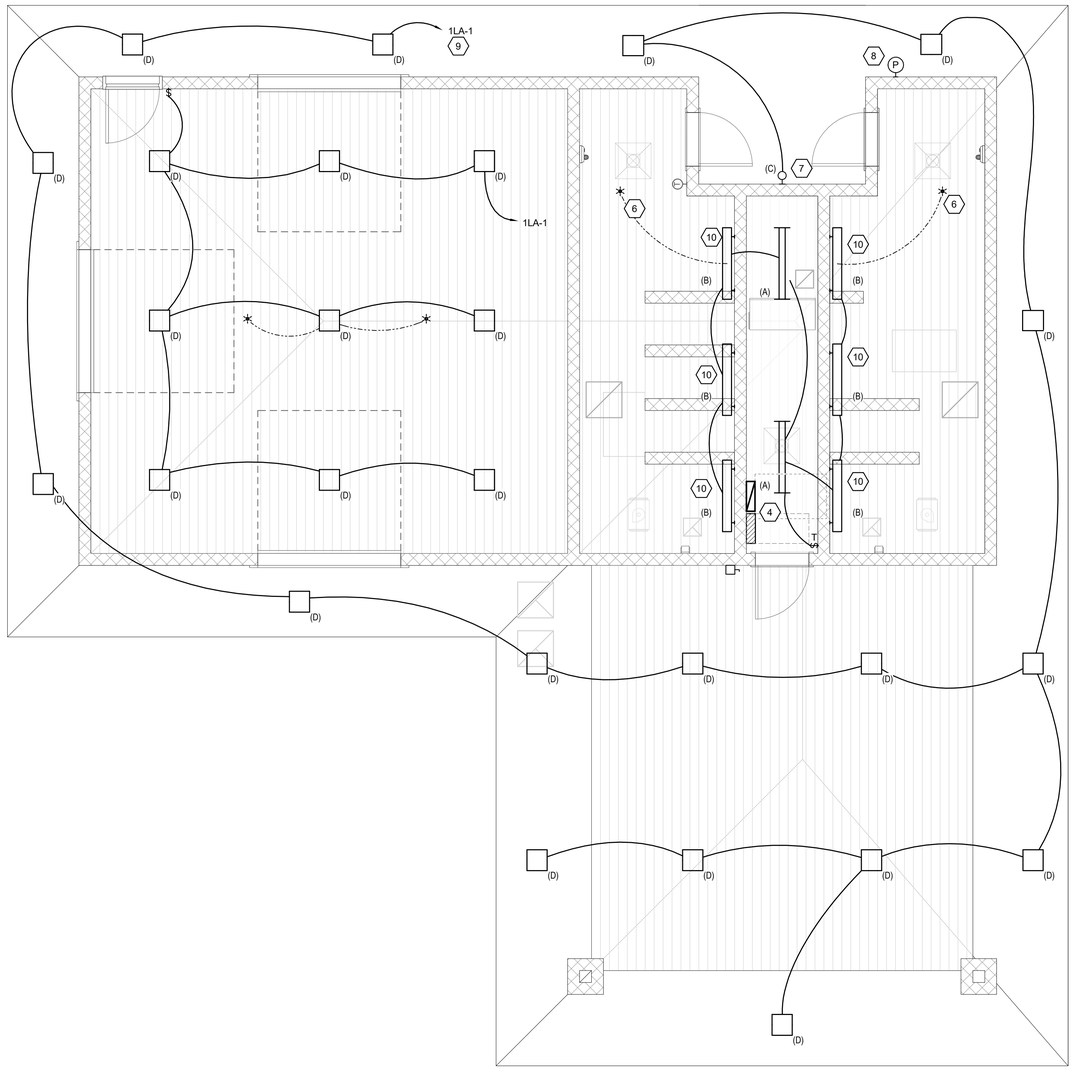
SHEET KEYNOTES

8 PROVIDE EXTERIOR RATED PHOTOCELL, PRECISION #T-168 OR APPROVED EQUIVALENT.

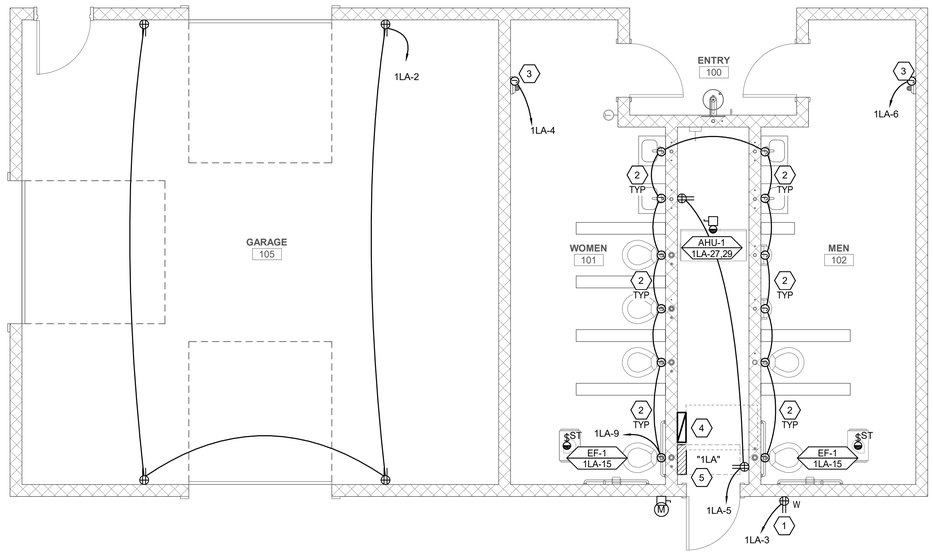
9 CIRCUIT THROUGH LIGHTING CONTROLLER. COORDINATE PROGRAMMING WITH THE OWNER.

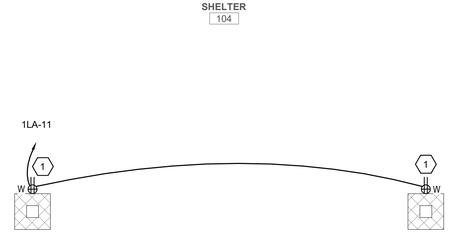
10 MOUNT FIXTURES WITH THE TOP OF THE FIXTURE TIGHT AGAINST THE CEILING.

GENERAL SHEET NOTES



A1 LEVEL 1 LIGHTING PLAN
SCALE: 1/4" = 1'-0"





A3 LEVEL 1 POWER PLAN
SCALE: 1/4" = 1'-0"

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ELECTRICAL PLANS

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INTERIOR LIGHTING FIXTURE SCHEDULE

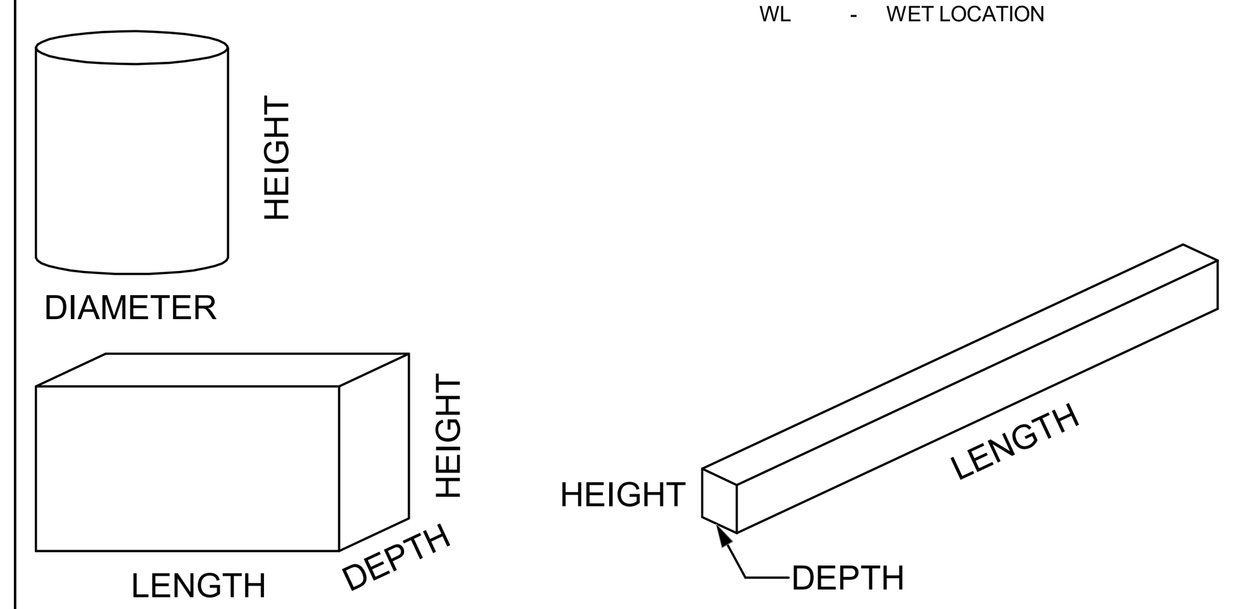
ABBREVIATIONS

MOUNTING

- B - BASE
- C - CEILING
- F - FLANGE
- G - GRID
- P - PENDANT
- PL POLE
- R - RECESSED
- S - SURFACE
- W - WALL

LUMINAIRE OPTIONS

- ARHR - AIR RETURN AND HEAT REJECTION
- DL - DAMP LOCATION
- EQC - EARTHQUAKE CLIPS
- F - FUSING
- HLD - HINGED AND LATCHED DOOR
- HS - HOUSE SIDE SHIELD
- PS - PHOTOCELL SWITCH
- QRS - QUARTZ RESTRIKE
- ST - STATIC
- WG - WIRE GUARD
- WL - WET LOCATION



FINISH

- MW - MATTE WHITE
- BL - BLACK
- SL - SILVER
- GL - GOLD
- CL - CLEAR
- PW - PAINTED WHITE
- EA - EXTRUDED ALUMINUM
- S - STEEL
- GS - GALVANIZED STEEL
- C - CAST
- CBA - COLOR BY ARCHITECT
- SCBA - STANDARD COLOR BY ARCHITECT
- CCA - CUSTOM COLOR BY ARCHITECT
- FS 209D - MEETS FEDERAL STANDARD 209D
- TP - THERMALLY PROTECTED
- FL - FLUSH
- R - REGRESS
- M - MITERED

DIFFUSER/LENS

- #A - ACRYLIC #THICK
- #OA - ACRYLIC #THICK (OPAL)
- GC - GLASS (CLEAR)
- GO - GLASS (OPAL)
- GF - GLASS (FROSTED)
- SGL - SOFT GLOW LENS
- HPL - HIGH PERFORMANCE LENS
- DO - DROP OPAL
- CGL - CONVEX GLASS LENS
- S - SATIN LENS

REFLECTOR

- OP - NONE/OPEN
- SP - SPECULAR
- SS - SEMI-SPECULAR
- D - DIFFUSE (WHITE ENAMEL)
- SC - SPECULAR (COLORED)
- PR - PRISMATIC
- FDR - FULL DEPTH REFLECTOR
- DS - DIFFUSE (SEMI SPECULAR) SILVER
- LI - LOW IRIDESCENT
- IR - IRIDESCENT
- SL - SILVER
- GL - GOLD
- CA - CLEAR ALZAK

NOTES

GENERAL NOTES

1. PROVIDE UNIT PRICES AND FIXTURE BRAND SELECTED FOR ADD/DELETE CHANGES FOR EACH FIXTURE TYPES SHOWN WITHIN 48 BUSINESS HOURS OF THE BID DATE. FAILURE TO COMPLY WITH THIS REQUIREMENT MAY DISQUALIFY THE PRODUCTS AND EMPOWER THE ENGINEER TO DETERMINE FAIR VALUE FOR FIXTURE AND INSTALLATION CHANGES, WITHOUT FURTHER INPUT FROM THE CONTRACTOR OR INSTALLER.
2. CONTRACTOR ALLOWANCE PRICES ARE ACCURATE WHEN THIS JOB WAS SPECIFIED, CONTRACTOR AND ELECTRICAL DISTRIBUTOR SHALL VERIFY THIS ALLOWANCE AND REPORT ANY PROBLEMS TO THE ENGINEER BEFORE THE BID. ALLOWANCE PRICE MAY OR MAY NOT INCLUDE LAMP(S) OR FREIGHT AS NOTED, AND DO NOT INCLUDE ANY TAXES.
3. SUBSTITUTIONS AND/OR EQUAL FIXTURES MUST RECEIVE APPROVAL PRIOR TO BIDDING, THEY MUST BE SUBMITTED TO THE ENGINEER NO LESS THAN 2 WEEKS PRIOR TO BID OPENING.
4. SAMPLES MUST BE PROVIDED FOR ANY AND ALL FIXTURES UPON A/E REQUEST PRIOR TO RELEASING FIXTURES.
5. ALL FIXTURES SHALL BE LISTED AND APPROVED FOR THEIR INTENDED USE AND LOCATION.
6. VERIFY THE PROPER MOUNTING KITS OR ACCESSORIES TO FACILITATE INSTALLATION AS SHOWN AT EACH LOCATION ON THE DRAWINGS.
7. COMPLY WITH THE "INTERIOR LIGHTING" SECTION OF THE SPECIFICATIONS.
8. REFER TO SPECIFICATIONS FOR IMPORTANT TECHNICAL REQUIREMENTS FOR LIGHTING FIXTURES, DRIVERS, AND LAMPS.
9. ALL LIGHT FIXTURES TO BE EITHER "DLC" OR "LIGHTING FACTS" LISTED OR TO BE APPROVED BY ARCHITECT/ENGINEER AND OWNER.

		NOMINAL SIZE																	MANUFACTURER (CATALOG SERIES)		
ID	DESCRIPTION	LENGTH	DEPTH	HEIGHT	DIAMETER/ APERTURE	MOUNTING	TYPE	COLOR TEMP	CRI	DRIVER CONFIGURATION	VOLTAGE	WATTS	FINISH	FIXTURE LUMENS	DIFFUSER/LENS	REFLECTOR	OPTIONS	NOTES	OPTION 1	OPTION 2	OPTION 3
(A)	GENERAL PURPOSE LENSED LED STRIPLIGHT.	4'	5"	4"		P	LED	3500K		LED DRIVER	120V	42		5000					COLUMBIA (LCL-4-35-ML-E-U)		
(B)	VANDAL RESISTANT CORNER MOUNT LINEAD LED FIXTURE.	4'	9"	9"			LED	3500K		LED DRIVER	120V	73		6500					FAIL-SAFE (FCC-X-4-LD4-2-STD-35-1 20-80/85-EDC-1-WL)		
(C)	PERIMETER LED WALL PACK.	12"	7"	6"		W	LED	5000K		LED DRIVER	120V	17		1700					HUBBELL (NRG-356L-5K-U-PC)		
(D)	SURFACE MOUNT LED FIXTURE.	14"	14"	8"		GS	LED	5000K		LED DRIVER	120V	35		4400					HUBBELL (NRG-4-30LU-5K-035-SCB A)		

EQUIPMENT SCHEDULE

GRAND JUNCTION RESTROOM

EQUIPMENT SCHEDULE KEY

E - DIVISION 26
Q - FURNISHED WITH EQUIPMENT
* - COORDINATE WITH THE DIVISION 23 TEMPERATURE CONTROL INSTALLER
** - AUTOMATIC CONTROL WIRING BY DIVISION 23

NOTES:

1. NEMA 3R
2. TOGGLE SWITCH W/ THERMAL OVERLOAD
3. PROVIDE FUSED DISCONNECT ELEVATOR POWER MODULE WITH SHUNT TRIP
4. CONTRACTOR TO PERFOM FINAL CONNECTION TO LINE VOLTAGE THERMOSTATS
5. TOGGLE SWITCH W/BACNET INTERFACE.
6. INDOOR UNITS FED FROM OUTDOOR UNIT. PROVIDE DISCONNECTS FOR BOTH.
7. PROVIDE SWITCH WITH BACNET MS/TP CAPABILITY.
8. PROVIDE LABEL ON DISCONNECT "DISCONNECT OUTDOOR UNIT PRIOR TO INDOOR."
9. LINE VOLTAGE THERMOSTAT ON WALL.
10. PROVIDE EXPLOSION PROOF DEVICES AND WIRING METHODS.
11. PROVIDE DUAL-REDUNDANT 100% RATED VFD'S FOR AIR HANLDER.
12. PROVIDE MANUAL STARTER WITH THERMAL OVERLOAD AND RELAY FOR ATC/BAS CONTROL.

			LOAD DATA								OVERCURRENT PROTECTION			DISCONNECT			STARTER									
MARK	QTY	ITEM DESCRIPTION	HP	kW	MCA	FLA	VOLT	PH	Hz	WIRE AND CONDUIT SIZE	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	SIZES	SELECTOR SWITCH	PILOT LAMP	NORMALLY OPEN CONTACT	NORMALLY CLOSED CONTACT	PHASE FAILURE RELAY	NOTES	MARK
AHU-1	1	AIR HANDLING UNIT	-	6	-	27	240	1	60	2 #8, #10 GR 1" CND	E	30/2 CB	1LA	E	30A/2P NF	ADJ TO EQUIP	Q	-	-	-	-	-	-	-		AHU-1
EF-1	2	EXHAUST FAN	1/6	-	-	4.4	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	1LA	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	-	-		EF-1

PANEL: "1LA"

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE AND TYPE:	FED FROM:	CABINET:	LOCATION:	NOTES:
120/240 V, 1 PH 3 WIRE	22" W x 6" D, BOLT-ON	125 AMPERE		SURFACE	CHASE 103	

ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR

AIC RATING:

CKT	OCP			LOAD (kVA)				PHASE LOAD					LOAD (kVA)			OCP			CKT
NO	AMP	POLE	BKR	LTG	PWR	CO	DESCRIPTION	A		B		DESCRIPTION	CO	PWR	LTG	BKR	POLE	AMP	NO
1	20	1		1.3	0.0	0.0	AREA LIGHTING	1.3	0.7			CO: GARAGE 105	0.7	0.0	0.0		1	20	2
3	20	1		0.0	0.0	0.2	CO: SHELTER 104			0.2	1.0	PWR: HAND DRYER	0.0	1.0	0.0		1	25	4
5	20	1		0.0	0.0	0.4	CO: ROOM 105, 103	0.4	1.0			PWR: HAND DRYER	0.0	1.0	0.0		1	25	6
7	20	1		--	--	--	SPARE			0.0	0.0	SPARE	--	--	--		1	20	8
9	20	1		0.0	0.1	0.0	PWR: SENSORS	0.1	0.0			SPARE	--	--	--		1	20	10
11	20	1		0.0	0.0	0.4	CO: SHELTER 104			0.4	0.0	SPARE	--	--	--		1	20	12
13	20	1		--	--	--	SPARE	0.0	0.0			SPARE	--	--	--		1	20	14
15	20	1		0.0	0.6	0.0	PWR: EF-1			0.6	0.0	SPARE	--	--	--		1	20	16
17	20	1		--	--	--	SPARE	0.0	0.0			SPARE	--	--	--		1	20	18
19	20	1		--	--	--	SPARE			0.0	0.0	SPARE	--	--	--		1	20	20
21	20	1		--	--	--	SPARE	0.0	0.0			SPARE	--	--	--		1	20	22
23	20	1		--	--	--	SPARE			0.0	0.0	SPARE	--	--	--		1	20	24
25	20	1		--	--	--	SPARE	0.0	0.0			SPARE	--	--	--		1	20	26
27	30	2		0.0	2.0	0.0	PWR: AHU-1			1.0	0.0	SPARE	--	--	--		1	20	28
29	--	--		--	--	--	--	1.0	0.0			SPARE	--	--	--		1	20	30

TOTALS:

	A	B		
CONNECTED kVA PER PHASE	**4**	**3**	CONNECTED TOTAL kVA =	**8**
CONNECTED AMPS PER PHASE	**37**	**26**	AVERAGE CONNECTED AMPS PER PHASE =	**32**

NEC DIVERSIFIED LOAD CALCULATIONS

LIGHTING & CONTINUOUS LOADS: **1.3 kVA @ 125% = 1.6 kVA** - 100% CONNECTED LOAD PLUS 25%

RECEPTACLES: **1.6 kVA @ 100% = 1.6 kVA** - FIRST 10kVA @ 100%, REMAINDER @ 50%

ALL OTHER LOADS @ 100% : **5.2 kVA** - MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED @ 125% PER NEC

DIVERSIFIED TOTAL kVA = **8**

AVERAGE AMPS PER PHASE = **35**

BKR: GF=GFCI, GF3=30mA GFCI CAPABLE OF BEING LOCAKED OUT IN OPEN POSITION, IG=ISOLATED GROUND, AF=AFCI, ST=SHUNT TRIP, RED=PROVIDE RED COLORED BREAKER, AF=ARC FAULT CURRENT INTERRUPTER, GA=COMBINATION OF GROUND FAULT AND ARC FAULT CIRCUIT INTERRUPTER, GS=COMBINATION OF SHUNT TRIP WITH GFCI

NOTES:

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ELECTRICAL SCHEDULES

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SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

GENERAL

MATERIALS AND INSTALLATION SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE, OTHER APPLICABLE NFPA SECTIONS, STATE AND LOCAL CODES, AND RECOGNIZED INDUSTRY STANDARDS AND PRACTICES.

LISTING AND LABELING: PROVIDE PRODUCTS THAT ARE UL LISTED AND LABELED.

NEMA COMPLIANCE: COMPLY WITH CONSTRUCTION AND INSTALLATION REQUIREMENTS OF APPLICABLE NEMA STANDARDS.

SUBMITTALS: SUBMIT PRODUCT DATA AND SHOP DRAWING ON THE FOLLOWING EQUIPMENT FOR APPROVAL:

1. WIRING DEVICES.
2. LIGHTING FIXTURES.

PRIOR TO SUBMITTING BID, VISIT SITE TO VERIFY ALL EXISTING CONDITIONS AND ANY ITEMS THAT WILL AFFECT WORK OF THIS PROJECT. INCLUDE ALL COSTS IN BID.

MAINTAIN A SET OF REDLINED AS-BUILT DRAWINGS AND DELIVER TO OWNER UPON COMPLETION OF PROJECT.

PROTECT ADJACENT MATERIALS INDICATED TO REMAIN. INSTALL AND MAINTAIN DUST AND NOISE BARRIERS TO KEEP DIRT, DUST, AND NOISE FROM BEING TRANSMITTED TO ADJACENT AREAS. REMOVE PROTECTION AND BARRIERS AFTER DEMOLITION OPERATIONS ARE COMPLETE.

LOCATE, IDENTIFY, AND PROTECT ELECTRICAL SERVICES WITHIN OR PASSING THROUGH DEMOLITION AREA AND SERVING OTHER AREAS OUTSIDE THE DEMOLITION LIMITS. MAINTAIN SERVICES TO AREAS OUTSIDE DEMOLITION LIMITS. WHEN SERVICES MUST BE INTERRUPTED, INSTALL TEMPORARY SERVICES FOR AFFECTED AREAS. COORDINATE POWER INTERRUPTIONS ONE WEEK IN ADVANCE WITH OWNER. IF POWER INTERRUPTIONS DISTURB NORMAL OPERATIONS, THEN POWER INTERRUPTIONS ARE ONLY ALLOWED DURING NON-BUSINESS OR NON-OPERATION HOURS.

PATCH AND REPAIR SURFACES THAT ARE DISTURBED OR DAMAGED AS A RESULT OF ELECTRICAL INSTALLATION. RESTORE SURFACES TO ORIGINAL CONDITION.

INSTALLATION OF FIRE-STOPPING SEALANT: INSTALL UL-LISTED SEALANT, INCLUDING FORMING, PACKING, AND OTHER ACCESSORY MATERIALS, TO FILL OPENINGS AROUND ELECTRICAL SERVICES PENETRATING FLOORS AND WALLS, TO PROVIDE FIRE-STOPS WITH FIRE-RESISTANCE RATINGS INDICATED FOR FLOOR OR WALL ASSEMBLY IN WHICH PENETRATION OCCURS. COMPLY WITH INSTALLATION REQUIREMENTS ESTABLISHED BY TESTING AND INSPECTING AGENCY.

SECTION 260519 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PRODUCTS

PROVIDE STEEL RACEWAY, FITTING, AND BOX SYSTEM FOR ALL WIRING, EXCEPT FOR PLASTIC CONDUIT MAY BE INSTALLED UNDERGROUND.

RIGID STEEL CONDUIT: ANSI C80.1.

INTERMEDIATE METAL CONDUIT: ANSI C80.6.

PLASTIC-COATED STEEL CONDUIT AND FITTINGS: NEMA RN 1.

PLASTIC-COATED INTERMEDIATE METAL CONDUIT AND FITTINGS: NEMA RN 1.

ELECTRICAL METALLIC TUBING AND FITTINGS: ANSI C80.3 WITH SET-SCREW OR COMPRESSION-TYPE FITTINGS. CAST FITTINGS ARE NOT ALLOWED.

FLEXIBLE METAL CONDUIT: ZINC-COATED STEEL.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.

FITTINGS: NEMA FB 1, COMPATIBLE WITH CONDUIT/TUBING MATERIALS AND SUITABLE FOR USE AND LOCATION.

RIGID NONMETALLIC CONDUIT (RNC): NEMA TC 2, SCHEDULE 40 OR 80 PVC.

PVC CONDUIT AND TUBING FITTINGS: NEMA TC 3; MATCH TO CONDUIT OR CONDUIT/TUBING TYPE AND MATERIAL. OUTLET AND DEVICE BOXES: USE ONE OF THE FOLLOWING:

1. SHEET METAL BOXES: NEMA OS 1.

EXECUTION

PROVIDE MINIMUM 3/4" RACEWAY.

OUTDOORS WIRING METHODS: USE THE FOLLOWING WIRING METHODS:

1. EXPOSED: RIGID OR INTERMEDIATE METAL CONDUIT.

2. CONCEALED: RIGID OR INTERMEDIATE METAL CONDUIT.

3. UNDERGROUND: RIGID NONMETALLIC CONDUIT, EXCEPT THAT WRAPPED RIGID METAL SHALL BE USED FOR BENDS GREATER THAN 22 DEGREES.

4. PENETRATING CONCRETE FLOORS AND FOUNDATIONS: WRAPPED RIGID METAL CONDUIT (MINIMUM 4' EACH SIDE).

5. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, OR ELECTRIC SOLENOID OR MOTOR-DRIVEN EQUIPMENT): LIQUIDTIGHT FLEXIBLE METAL CONDUIT.

6. BOXES AND ENCLOSURES: NEMA TYPE 3R OR TYPE 4.

DIRECT BURIED CONDUIT OUTSIDE A BUILDING SHALL NOT BE LESS THAN 24" DEEP, WITH MAGNETIC "YELLOW WARNING" RIBBON 12" DIRECTLY ABOVE AND 6" BELOW FINIISHED GRADE MEASURED FROM THE TOP OF THE CONDUIT.

INDOORS WIRING METHODS: USE THE FOLLOWING WIRING METHODS:

1. CONNECTION TO VIBRATING EQUIPMENT, INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, OR ELECTRIC SOLENOID OR MOTOR-DRIVEN EQUIPMENT: FLEXIBLE METAL CONDUIT WITH MINIMUM 18" OF LIQUID-TIGHT FLEXIBLE CONDUIT (MAXIMUM OF 6 FEET), EXCEPT IN WET OR DAMP LOCATIONS USE LIQUIDTIGHT FLEXIBLE METAL CONDUIT (MAXIMUM OF 6 FEET).

2. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.

3. EXPOSED: ELECTRICAL METALLIC TUBING, RIGID OR INTERMEDIATE METAL CONDUIT WHERE SUBJECT TO PHYSICAL DAMAGE.

4. CONCEALED: ELECTRICAL METALLIC TUBING.

5. CONNECTION FOR CONDUIT IN CRAMPED QUARTERS OR MISALIGNMENT EXIST. FLEXIBLE METAL CONDUIT (MINIMUM 1/2").
CONCEAL CONDUIT AND EMT, UNLESS OTHERWISE INDICATED, WITHIN FINISHED WALLS, CEILINGS, AND FLOORS.

INSTALL RACEWAYS LEVEL AND SQUARE AND AT PROPER ELEVATIONS. RUN PERPENDICULAR AND AT RIGHT ANGLES TO BUILDING AND STRUCTURAL ELEMENTS. RUN PARALLEL OR BANKED RACEWAYS TOGETHER, ON COMMON SUPPORTS WHERE PRACTICAL. MAKE BENDS IN PARALLEL OR BANKED RUNS FROM SAME CENTER LINE TO MAKE BENDS PARALLEL.

SUPPORT RACEWAYS AS FOLLOWS, IN COMPLIANCE WITH DIVISION 16 SECTION "SUPPORTING DEVICES": TWO SUPPORTS PER 10' RUN, WITHING 12" OF A COUPLING, FITTING OR BEND GREATER THAN 45 DEGREES, AND WITHIN 12" OF EVERY BOX TO WHICH THE RACEWAY IS ENTERING OR EXITING.

RUN CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE CONSIDERING THE TYPE OF BUILDING CONSTRUCTION AND OBSTRUCTIONS, EXCEPT AS OTHERWISE INDICATED.

RACEWAYS EMBEDDED IN SLABS: INSTALL IN MIDDLE THIRD OF THE SLAB THICKNESS WHERE PRACTICAL, AND LEAVE AT LEAST 1 INCH (25 MM) CONCRETE COVER.

JOINTS AND TERMINATIONS: JOIN RACEWAYS WITH FITTINGS DESIGNED AND APPROVED FOR THE PURPOSE AND MAKE JOINTS AND TERMINATIONS TIGHT.

1. MAKE RACEWAY TERMINATIONS TIGHT. USE BONDING BUSHINGS OR WEDGES AT CONNECTIONS SUBJECT TO VIBRATION.

2. USE BONDING JUMPERS WHERE JOINTS CANNOT BE MADE TIGHT.

3. USE INSULATED THROAT OR EQUAL TYPE PLASTIC BUSHINGS FOR BOX CONNECTIONS TO PROTECT CONDUCTORS.

4. CONNECTORS ON FLEXIBLE CONDUIT AND MC CABLE SHALL BE THREADED TYPE - NOT PUSH-IN QUICK CONNECT TYPE.

INSTALL 200-LB NYLON PULL CORD IN ALL EMPTY RACEWAYS. CAP RACEWAY USING A BLANK COVER SIMILAR TO ADJACENT WIRING DEVICE COVERS.

ALL FUTURE RACEWAYS SHALL TERMINATE IN AN ACCESSIBLE CEILING SPACE UNLESS NOTED OTHERWISE. EXTEND AS NECESSARY.

RECORD CIRCUIT NUMBERS ON THE INSIDE BACK OF RECEPTACLE AND LIGHTING OUTLET BOXES USING A PERMANT MARKER OR PERMANENT LABEL.

PROVIDE GROUNDING CONNECTIONS FOR RACEWAY, BOXES, AND COMPONENTS AS INDICATED AND INSTRUCTED BY MANUFACTURER. TIGHTEN CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, ACCORDING TO EQUIPMENT MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES FOR EQUIPMENT CONNECTORS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS ACCORDING TO TIGHTENING TORQUES SPECIFIED IN UL STANDARD 486A.

SECTION 260526 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PRODUCTS

WIRES AND CABLES: TYPE THHN/THWN COPPER CONDUCTOR.

SOLID CONDUCTOR FOR 10 AWG AND SMALLER; STRANDED CONDUCTOR FOR LARGER THAN 10 AWG.

CONNECTORS AND SPLICES: UL-LISTED FACTORY-FABRICATED WIRING CONNECTORS OF SIZE, AMPACITY RATING, MATERIAL, AND TYPE AND CLASS FOR APPLICATION AND FOR SERVICE INDICATED. SELECT TO COMPLY WITH PROJECT'S INSTALLATION REQUIREMENTS AND AS SPECIFIED IN THE "EXECUTION" ARTICLE.

DO NOT PROVIDE THE FOLLOWIN G UNLESS APPROVED BY THE DIRECTOR:

1. EXPOSED CABLE WIRING.

2. SPLICES IN PANELBOARD, SWITCHBOARD ENCLOSURES, OR IN CONDUIT BODIES.

DO NOT USE ALLUMINUM CONDUCTORS OR NON-METALLIC SHEATHED CABLE.

COLOR-CODING OF SECONDARY PHASE CONDUCTORS: COLOR CODE SWITCH LEGS, TRAVELERS AND OTHER WIRING FOR BRANCH CIRCUITS OTHER THAN THOSE LISTED BELOW. PERMANENTLY POST COLOR CODE AT EACH BRANCH PANELBOARD. USE THE FOLLOWING COLORS FOR SERVICE, FEEDER AND BRANCH-CIRCUIT PHASE CONDUCTORS:

1. 208/120-V CONDUCTORS:

   a. PHASE A: BLACK.
   b. PHASE B: RED.
   c. PHASE C: BLUE.
   d. NEUTRAL: WHITE.
   e. GROUND: GREEN.
   f. INSULATED GROUND: GREEN WITH WHITE STRIPE.

2. 480/277-V CONDUCTORS:

   a. PHASE A: BROWN.
   b. PHASE B: YELLOW
   c. PHASE C: VIOLET.
   d. NEUTRAL: GRAY.
   e. GROUND: GREEN.

3. ORANGE IS RESERVED FOR THE HIGH-LEG OF CENTER-TAPPED DELTA SYSTEM.

4. #8 AND LARGER CONDUCTORS MAY BE TAPED WITH 8" OF HALF-LAPPED COLORED TAPE AT TERMINATIONS AND PULL BOXES.

EXECUTION

INSTALL WIRES AND CABLES AS INDICATED, ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND THE NECA "STANDARD OF INSTALLATION."

PULL CONDUCTORS INTO RACEWAY SIMULTANEOUSLY WHERE MORE THAN ONE IS BEING INSTALLED IN SAME RACEWAY.

CONDUCTOR SPLICES: KEEP TO MINIMUM.

INSTALL SPLICES AND TAPES THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN CONDUCTORS BEING SPLICED.

USE SPLICE AND TAP CONNECTORS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL. DO NOT USE PUSH-IN TYPE QUICK-WIRE DEVICES OR WIRE CONNECTORS.

WIRING AT OUTLETS: INSTALL WITH AT LEAST 12 INCHES (300 MM) OF SLACK CONDUCTOR AT EACH OUTLET.

CONNECT OUTLETS AND COMPONENTS TO WIRING AND TO GROUND AS INDICATED AND INSTRUCTED BY MANUFACTURER. TIGHTEN CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, ACCORDING TO EQUIPMENT MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES FOR EQUIPMENT CONNECTORS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS ACCORDING TO TIGHTENING TORQUES SPECIFIED IN UL STANDARD 486A.

METAL CLAD (MC) CABLE:

1. MC CABLE MAY BE USED FOR FINAL CONNECTIONS TO DEVICES AND AT THE TAIL END OF THE ELECTRICAL CIRCUITS BUT NEVER FOR HOMERUNS OR IN THE ELECTRICAL ROOM.

SECTION 260529 - WIRING DEVICES

PRODUCTS

WIRING DEVICES: COMPLY WITH NEMA STANDARD WD 1, "GENERAL PURPOSE WIRING DEVICES."
COLOR: AS SELECTED BY ARCHITECT/OWNER, EXCEPT AS OTHERWISE INDICATED OR REQUIRED BY CODE.

STANDARD DUPLEX RECEPTACLES: 20A DEVICES; PROVIDE NYLON FACE, BACK AND SIDE WIRING. COMPLY WITH FEDERAL SPECIFICATION W-C-596 AND HEAVY-DUTY GRADE OF UL STANDARD 498, "ELECTRICAL ATTACHMENT PLUGS AND RECEPTACLES." PROVIDE NRTL LABELING OF DEVICES TO VERIFY THESE COMPLIANCES.

GROUND-FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLES: UL STANDARD 943, "GROUND FAULT CIRCUIT INTERRUPTERS," FEED-THROUGH TYPE, WITH INTEGRAL NEMA 5-20R DUPLEX RECEPTACLE ARRANGED TO PROTECT CONNECTED DOWNSTREAM RECEPTACLES ON THE SAME CIRCUIT. DESIGN UNITS FOR INSTALLATION IN A 2-3/4-INCH (70-MM) DEEP OUTLET BOX WITHOUT AN ADAPTER.

SNAP SWITCHES: 20A DEVICES; PROVIDE NYLON FACE, QUIET-TYPE A.C. SWITCHES, NRTL LISTED AND LABELED AS COMPLYING WITH UL STANDARD 20 "GENERAL USE SNAP SWITCHES," AND WITH FEDERAL SPECIFICATION W-S-896.

TELEPHONE JACK: RJ-45, 8-POSITION, MODULAR, LATCHING-PLUG TYPE, FLUSH IN FACE OF WALL PLATED.

WALL PLATES: SINGLE AND COMBINATION TYPES THAT MATE AND MATCH WITH CORRESPONDING WIRING DEVICES. FEATURES INCLUDE THE FOLLOWING:

1. COLOR: MATCHES WIRING DEVICE EXCEPT AS OTHERWISE INDICATED.

2. PLATE-SECURING SCREWS: METAL WITH HEADS COLORED TO MATCH PLATE FINISH.

3. MATERIAL FOR FINISHED SPACES: NYLON EXCEPT AS OTHERWISE INDICATED.

4. MATERIAL FOR UNFINISHED SPACES: STAINLESS STEEL.

EXECUTION

WIRING DEVICES SHALL CONNNECT CONDUCTORS USING THREADED SCREWS. DO NOT USE PUSH-IN QUICK-WIRE CONNECTIONS.

DO NOT USE GFCI FEED-THROUGHS,

INSTALL DEVICES AND ASSEMBLIES PLUMB AND SECURE. PROTECT DEVICES AND ASSEMBLIES DURING PAINTING AND INSTALL WALL PLATES WHEN PAINTING IS COMPLETE.

ARRANGEMENT OF DEVICES: EXCEPT AS OTHERWISE INDICATED, MOUNT FLUSH, WITH LONG DIMENSION VERTICAL, AND GROUNDING TERMINAL OF RECEPTACLES ON TOP. GROUP ADJACENT SWITCHES UNDER SINGLE, MULTIGANG WALL PLATES.

SECTION 260533 - LIGHTING CONTROL DEVICES

MANUFACTURERS:

1. INTERMATIC, INC.

2. PARAGON ELECTRIC CO.

3. TORK.

INDOOR OCCUPANCY SENSORS

MANUFACTURERS:

1. HUBBELL LIGHTING INC.
2. LEVITON MFG. COMPANY INC.
3. LITHONIA LIGHTING.
4. SENSOR SWITCH, INC.
5. COOPER/GREENGATE CONTROLS.
6. WATT STOPPER (THE).

GENERAL DESCRIPTION: WALL- OR CEILING-MOUNTING, SOLID-STATE UNITS WITH A SEPARATE RELAY UNIT.

1. OPERATION: UNLESS OTHERWISE INDICATED, TURN LIGHTS ON WHEN COVERED AREA IS OCCUPIED AND OFF WHEN UNOCCUPIED; WITH A TIME DELAY FOR TURNING LIGHTS OFF, ADJUSTABLE OVER A MINIMUM RANGE OF 1 TO 15 MINUTES.

2. SENSOR OUTPUT: CONTACTS RATED TO OPERATE THE CONNECTED RELAY, COMPLYING WITH UL 773A. SENSOR SHALL BE POWERED FROM THE RELAY UNIT.

3. RELAY UNIT: DRY CONTACTS RATED FOR 20-A BALLAST LOAD AT 120- AND 277-V AC, FOR 13-A TUNGSTEN AT 120-V AC, AND FOR 1 HP AT 120-V AC. POWER SUPPLY TO SENSOR SHALL BE 24-V DC, 150-MA, CLASS 2 POWER SOURCE AS DEFINED BY NFPA 70.

4. MOUNTING:

   a. SENSOR: SUITABLE FOR MOUNTING IN ANY POSITION ON A STANDARD OUTLET BOX.
   b. RELAY: EXTERNALLY MOUNTED THOUGH A 1/2-INCH (13-MM) KNOCKOUT IN A STANDARD ELECTRICAL ENCLOSURE.
   c. TIME-DELAY AND SENSITIVITY ADJUSTMENTS: RECESSED AND CONCEALED BEHIND HINGED DOOR.

5. INDICATOR: LED, TO SHOW WHEN MOTION IS BEING DETECTED DURING TESTING AND NORMAL OPERATION OF THE SENSOR.

6. BYPASS SWITCH: OVERRIDE THE ON FUNCTION IN CASE OF SENSOR FAILURE.

DUAL-TECHNOLOGY TYPE: CEILING MOUNTING; DETECT OCCUPANCY BY USING A COMBINATION OF PIR AND ULTRASONIC DETECTION METHODS IN AREA OF COVERAGE. PARTICULAR TECHNOLOGY OR COMBINATION OF TECHNOLOGIES THAT CONTROLS ON AND OFF FUNCTIONS SHALL BE SELECTABLE IN THE FIELD BY OPERATING CONTROLS ON UNIT.

1. SENSITIVITY ADJUSTMENT: SEPARATE FOR EACH SENSING TECHNOLOGY.

2. DETECTOR SENSITIVITY: DETECT OCCURRENCES OF 6-INCH (150-MM) MINIMUM MOVEMENT OF ANY PORTION OF A HUMAN BODY THAT PRESENTS A TARGET OF AT LEAST 36 SQ. IN. (232 SQ. CM), AND DETECT A PERSON OF AVERAGE SIZE AND WEIGHT MOVING AT LEAST 12 INCHES (305 MM) IN EITHER A HORIZONTAL OR A VERTICAL MANNER AT AN APPROXIMATE SPEED OF 12 INCHES/S (305 MM/S).

3. DETECTION COVERAGE (STANDARD ROOM): DETECT OCCUPANCY ANYWHERE WITHIN A CIRCULAR AREA OF 1000 SQ. FT. (93 SQ. M) WHEN MOUNTED ON A 96-INCH- (2440-MM-) HIGH CEILING.

MULTIPOLE CONTACTORS

MANUFACTURERS:

1. ALLEN-BRADLEY/ROCKWELL AUTOMATION.
2. ASCO POWER TECHNOLOGIES, LP; A DIVISION OF EMERSON ELECTRIC CO.
3. CUTLER-HAMMER; EATON CORPORATION.
4. GE INDUSTRIAL SYSTEMS; TOTAL LIGHTING CONTROL.
5. SIEMENS.
6. SQUARE D.

DESCRIPTION: ELECTRICALLY OPERATED AND MECHANICALLY HELD, COMPLYING WITH NEMA ICS 2 AND UL 508.

1. CURRENT RATING FOR SWITCHING: LISTING OR RATING CONSISTENT WITH TYPE OF LOAD SERVED, INCLUDING TUNGSTEN FILAMENT, INDUCTIVE, AND HIGH-INRUSH BALLAST (BALLAST WITH 15 PERCENT OR LESS TOTAL HARMONIC DISTORTION OF NORMAL LOAD CURRENT).
2. CONTROL-COIL VOLTAGE: MATCH CONTROL POWER SOURCE.
CONDUCTORS AND CABLES

POWER WIRING TO SUPPLY SIDE OF REMOTE-CONTROL POWER SOURCES: NOT SMALLER THAN NO. 12 AWG, COMPLYING WITH DIVISION 16 SECTION " CONDUCTORS AND CABLES."

CLASSES 2 AND 3 CONTROL CABLE: MULTICONDUCTOR CABLE WITH STRANDED COPPER CONDUCTORS NOT SMALLER THAN NO. 18 AWG, COMPLYING WITH DIVISION 16 SECTION "CONDUCTORS AND CABLES."

CLASS 1 CONTROL CABLE: MULTICONDUCTOR CABLE WITH STRANDED COPPER CONDUCTORS NOT SMALLER THAN NO. 14 AWG, COMPLYING WITH DIVISION 16 SECTION "CONDUCTORS AND CABLES."

INSTALL UNSHIELDED, TWISTED-PAIR CABLE FOR CONTROL AND SIGNAL TRANSMISSION CONDUCTORS, COMPLYING WITH DIVISION 16 SECTION "VOICE AND DATA COMMUNICATION CABLING."

EXECUTION

WIRING WITHIN ENCLOSURES: BUNDLE, LACE, AND TRAIN CONDUCTORS TO TERMINAL POINTS. SEPARATE POWER-LIMITED AND NONPOWER-LIMITED CONDUCTORS ACCORDING TO CONDUCTOR MANUFACTURER'S WRITTEN INSTRUCTIONS.

SIZE CONDUCTORS ACCORDING TO LIGHTING CONTROL DEVICE MANUFACTURER'S WRITTEN INSTRUCTIONS, UNLESS OTHERWISE INDICATED.

SPLICES, TAPS, AND TERMINATIONS: MAKE CONNECTIONS ONLY ON NUMBERED TERMINAL STRIPS IN JUNCTION, PULL, AND OUTLET BOXES; TERMINAL CABINETS; AND EQUIPMENT ENCLOSURES.

TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.

PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS:

1. AFTER INSTALLING TIME SWITCHES AND SENSORS, AND AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, ADJUST AND TEST FOR COMPLIANCE WITH REQUIREMENTS.

2. OPERATIONAL TEST: VERIFY ACTUATION OF EACH SENSOR AND ADJUST TIME DELAYS.

SECTION 260543 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PRODUCTS

MANUFACTURED SUPPORTING DEVICES:

1. RACEWAY SUPPORTS: CLEVIS HANGERS, RISER CLAMPS, CONDUIT STRAPS, THREADED C-CLAMPS WITH RETAINERS, CEILING TRAPEZE HANGERS, WALL BRACKETS, AND SPRING STEEL CLAMPS.

2. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:

   a. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
   b. TOGGLE BOLTS: ALL STEEL SPRINGHEAD TYPE.
   c. POWDER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.

3. U-CHANNEL SYSTEMS: 16-GAGE STEEL CHANNELS, WITH 9/16-INCH- DIAMETER HOLES, AT A MINIMUM OF 8 INCHES ON CENTER, IN TOP SURFACE. PROVIDE FITTINGS AND ACCESSORIES THAT MATE AND MATCH WITH U-CHANNEL AND ARE OF THE SAME MANUFACTURER.

FABRICATED SUPPORTING DEVICES: SHOP-OR FIELD-FABRICATED SUPPORTS OR MANUFACTURED SUPPORTS ASSEMBLED FROM U-CHANNEL COMPONENTS.

1. STEEL BRACKETS: FABRICATED OF ANGLES, CHANNELS, AND OTHER STANDARD STRUCTURAL SHAPES. CONNECT WITH WELDS AND MACHINE BOLTS TO FORM RIGID SUPPORTS.

EXECUTION

INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY TO BUILDING STRUCTURE IN ACCORDANCE WITH NEC REQUIREMENTS. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER ELECTRICAL INSTALLATION.

RACEWAY SUPPORTS: COMPLY WITH THE NEC AND THE FOLLOWING REQUIREMENTS:

1. CONFORM TO MANUFACTURER'S RECOMMENDATIONS FOR SELECTION AND INSTALLATION OF SUPPORTS.

2. STRENGTH OF EACH SUPPORT SHALL BE ADEQUATE TO CARRY PRESENT AND FUTURE LOAD MULTIPLIED BY A SAFETY FACTOR OF AT LEAST FOUR, BUT IN NO CASES SHALL BE LESS THAN 200 LBS IN THE STRENGTH OF EACH SUPPORT.

3. INSTALL INDEPENDENT AND LISTED INDIVIDUAL AND MULTIPLE (TRAPEZE) RACEWAY HANGERS AND RISER CLAMPS AS NECESSARY TO SUPPORT RACEWAYS. PROVIDE U-BOLTS, CLAMPS, ATTACHMENTS, AND OTHER HARDWARE NECESSARY FOR HANGER ASSEMBLY AND FOR SECURING HANGER RODS AND CONDUITS.

MISCELLANEOUS SUPPORTS: SUPPORT MISCELLANEOUS ELECTRICAL COMPONENTS AS REQUIRED TO PRODUCE THE SAME STRUCTURAL SAFETY FACTORS AS SPECIFIED FOR RACEWAY SUPPORTS. INSTALL METAL CHANNEL RACKS FOR MOUNTING CABINETS, PANELBOARDS, DISCONNECTS, CONTROL ENCLOSURES, PULL BOXES, JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES.

IN OPEN OVERHEAD SPACES, SUPPORT SHEET METAL BOXES INDEPENDANTLY AND DIRECTLY FROM THE BUILDING STRUCTURE OR BY BAR HANGERS. WHERE BAR HANGERS ARE USED, ATTACH THE BAR TO RACEWAYS ON OPPOSITE SIDES OF THE BOX AND SUPPORT THE RACEWAY WITH AN APPROVED TYPE OF FASTENER NOT MORE THAN 24 INCHES FROM THE BOX.

OUTLET BOXES: PROVIDE OUTLET BOXES WITH RIGID SUPPORT USING METAL BAR HANGERS BETWEEN STUDS.

FASTENING: UNLESS OTHERWISE INDICATED, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE BUILDING STRUCTURE, INCLUDING BUT NOT LIMITED TO CONDUITS, RACEWAYS, CABLES, CABLE TRAYS, BUSWAYS, CABINETS, PANELBOARDS, TRANSFORMERS, BOXES, DISCONNECT SWITCHES, AND CONTROL COMPONENTS IN ACCORDANCE WITH THE FOLLOWING:

1. FASTEN BY MEANS OF WOOD SCREWS OR SCREW-TYPE NAILS ON WOOD, TOGGLE BOLTS ON HOLLOW MASONRY UNITS, CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY, AND MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL. THREADED STUDS DRIVEN BY A POWDER CHARGE AND PROVIDED WITH LOCK WASHERS AND NUTS MAY BE USED INSTEAD OF EXPANSION BOLTS AND MACHINE OR WOOD SCREWS. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

2. HOLES CUT TO DEPTH OF MORE THAN 1-1/2 INCHES IN REINFORCED CONCRETE BEAMS OR TO DEPTH OF MORE THAN ¾ INCH IN CONCRETE SHALL NOT CUT THE MAIN REINFORCING BARS. FILL HOLES THAT ARE NOT USED.

3. ENSURE THAT THE LOAD APPLIED TO ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD. USE VIBRATION- AND SHOCK- RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

SECTION 260548 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PRODUCTS

GROUNDING AND BONDING PRODUCTS: TYPES AS INDICATED. WHERE TYPES, SIZES, RATINGS, AND QUANTITIES INDICATED DIFFER FROM NEC REQUIREMENTS, THE MORE STRINGENT REQUIREMENTS AND THE GREATER SIZE, RATING, AND QUANTITY INDICATIONS GOVERN.

CONDUCTOR MATERIALS: COPPER.

EQUIPMENT GROUNDING CONDUCTOR: GREEN INSULATED.

GROUNDING ELECTRODE CONDUCTOR: STRANDED CABLE.

BARE COPPER CONDUCTORS: CONFORM TO THE FOLLOWING:

1. SOLID CONDUCTORS: ASTM B-3.

2. ASSEMBLY OF STRANDED CONDUCTORS: ASTM B-8.

3. TINNED CONDUCTORS: ASTM B-33.

GROUND BUS: BARE ANNEALED COPPER BARS OF RECTANGULAR CROSS-SECTION.

BRAIDED BONDING JUMPERS: COPPER TAPE, BRAIDED FROM NO. 30-GAGE BARE COPPER WIRE AND TERMINATED WITH COPPER FERRULES.

BONDING STRAP CONDUCTOR/CONNECTORS: SOFT COPPER, 0.05 INCH THICK AND 2 INCHES WIDE, EXCEPT AS INDICATED.

CONNECTOR PRODUCTS: LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS WITH WHICH USED.

PRESSURE CONNECTORS: HIGH-CONDUCTIVITY PLATED UNITS.

BOLTED CLAMPS: HEAVY-DUTY UNITS LISTED FOR THE APPLICATION.

EXOTHERMIC WELDED CONNECTIONS: PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.

GROUND RODS: COPPER-CLAD STEEL, 3/4 INCH BY 10 FEET, MINIMUM.

EXECUTION

EQUIPMENT GROUNDING CONDUCTOR APPLICATION: COMPLY WITH NEC ARTICLE 250 FOR SIZES AND QUANTITIES OF EQUIPMENT GROUNDING CONDUCTORS, EXCEPT WHERE LARGER SIZES OR MORE CONDUCTORS ARE INDICATED. INSTALL EQUIPMENT GROUND CONDUCTORS IN ALL FEEDER AND BRANCH CIRCUIT RACEWAYS.

SIGNAL AND COMMUNICATIONS: FOR TELEPHONE, ALARM, AND COMMUNICATION SYSTEMS, PROVIDE A #4 AWG MINIMUM GREEN INSULATED COPPER CONDUCTOR IN RACEWAY FROM THE GROUNDING ELECTRODE SYSTEM TO EACH TERMINAL CABINET OR CENTRAL EQUIPMENT LOCATION.

SEPARATELY DERIVED SYSTEMS REQUIRED BY NEC TO BE GROUNDED SHALL BE GROUNDED AS APPROVED BY THE AUTHORITY HAVING JURISDICTION.

METAL POLES SUPPORTING OUTDOOR LIGHTING FIXTURES: GROUND POLE TO A GROUNDING ELECTRODE AS INDICATED IN ADDITION TO SEPARATE EQUIPMENT GROUNDING CONDUCTOR RUN WITH SUPPLY BRANCH CIRCUIT.

INSTALLATION, GENERAL: GROUND ELECTRICAL SYSTEMS AND EQUIPMENT IN ACCORDANCE WITH NEC EXCEPT WHERE GROUNDING IN EXCESS OF NEC REQUIREMENTS IS INDICATED.

GROUND RODS: LOCATE A MINIMUM OF ONE-ROD LENGTH FROM EACH OTHER AND AT LEAST THE SAME DISTANCE FROM ANY OTHER GROUNDING ELECTRODE. INTERCONNECT GROUND RODS WITH BARE CONDUCTORS BURIED AT LEAST 24 INCHES BELOW GRADE. CONNECT BARE-CABLE GROUND CONDUCTORS TO GROUND RODS BY MEANS OF EXOTHERMIC WELDS EXCEPT AS OTHERWISE INDICATED. MAKE THESE CONNECTIONS WITHOUT DAMAGING THE COPPER COATING OR EXPOSING THE STEEL. DRIVE RODS UNTIL TOPS ARE 6 INCHES BELOW FINISHED FLOOR OR FINAL GRADE EXCEPT AS OTHERWISE INDICATED.

GROUNDING ELECTRODE CONDUCTOR: PROVIDE INSULATED COPPER CONDUCTOR, SIZED AS INDICATED, IN CONDUIT. BOND THE GROUND CONDUCTOR CONDUIT TO THE CONDUCTOR AT EACH END. WHERE A DIELECTRIC FITTING IS INSTALLED IN THE MAIN METALLIC WATER SERVICE PIPE, CONNECT THE GROUND CONDUCTOR TO THE STREET SIDE OF THE FITTING. DO NOT INSTALL A GROUNDING JUMPER AROUND DIELECTRIC FITTINGS. BOND THE GROUND CONDUCTOR CONDUIT TO THE CONDUCTOR AT EACH END.

BRAIDED-TYPE BONDING JUMPERS: INSTALL TO CONNECT GROUND CLAMPS ON WATER METER PIPING TO ELECTRICALLY BYPASS WATER METERS. USE ELSEWHERE FOR FLEXIBLE BONDING AND GROUNDING CONNECTIONS.

ROUTE GROUNDING AND BONDING CONDUCTORS USING THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE WITHOUT OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE, EXCEPT AS INDICATED.

UFER GROUND: FABRICATE WITH 20 FEET OF CONDUCTOR LAID LENGTHWISE IN EXCAVATION FOR FOUNDATION OR FOOTINGS. INSTALL SO CONDUCTOR IS WITHIN 2 INCHES OF THE BOTTOM OF THE CONCRETE. WHERE BASE OF FOUNDATION IS LESS THAN 20 FEET IN LENGTH, COIL EXCESS CONDUCTOR AT BASE OF FOUNDATION. BOND CONDUCTOR TO REINFORCING STEEL AT FOUR LOCATIONS, MINIMUM. EXTEND CONDUCTOR BELOW GRADE AND CONNECT TO BUILDING GROUNDING GRID, GROUNDING ELECTRODE CONDUCTOR, OR GROUNDING ELECTRODE.

CONNECTIONS: MAKE CONNECTIONS IN SUCH A MANNER AS TO MINIMIZE POSSIBILITY OF GALVANIC ACTION OR ELECTROLYSIS. SELECT CONNECTORS, CONNECTION HARDWARE, CONDUCTORS, AND CONNECTION METHODS SO METALS IN DIRECT CONTACT WILL BE GALVANICALLY COMPATIBLE.

EXOTHERMIC WELDED CONNECTIONS: USE FOR CONNECTIONS TO STRUCTURAL STEEL AND FOR UNDERGROUND CONNECTIONS EXCEPT THOSE AT TEST WELLS. INSTALL AT CONNECTIONS TO GROUND RODS AND PLATE ELECTRODES. COMPLY WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS. WELDS THAT ARE PUFFED UP OR THAT SHOW CONVEX SURFACES INDICATING IMPROPER CLEANING ARE NOT ACCEPTABLE.

TIGHTEN GROUNDING AND BONDING CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL 486A AND UL 486B.

COMPRESSION-TYPE CONNECTIONS: USE HYDRAULIC COMPRESSION TOOLS TO PROVIDE THE CORRECT CIRCUMFERENTIAL PRESSURE FOR COMPRESSION CONNECTORS. USE TOOLS AND DIES RECOMMENDED BY THE MANUFACTURER OF THE CONNECTORS. PROVIDE EMBOSSING DIE CODE OR OTHER STANDARD METHOD TO MAKE A VISIBLE INDICATION THAT A CONNECTOR HAS BEEN ADEQUATELY COMPRESSED ON THE CONDUCTOR.
MOISTURE PROTECTION: WHERE INSULATED CONDUCTORS ARE CONNECTED TO GROUND RODS OR GROUND BUSES, INSULATE THE ENTIRE AREA OF THE CONNECTION AND SEAL AGAINST MOISTURE PENETRATION OF THE INSULATION AND CABLE.

TESTS: SUBJECT THE COMPLETED GROUNDING SYSTEM TO A MEGGER TEST AT EACH LOCATION WHERE A MAXIMUM GROUND RESISTANCE LEVEL IS SPECIFIED, AT SERVICE DISCONNECT ENCLOSURE GROUND TERMINAL, AND AT GROUND TEST WELLS. MEASURE GROUND RESISTANCE WITHOUT THE SOIL BEING MOISTENED BY ANY MEANS OTHER THAN NATURAL PRECIPITATION OR NATURAL DRAINAGE OR SEEPAGE AND WITHOUT CHEMICAL TREATMENT OR OTHER ARTIFICIAL MEANS OF REDUCING NATURAL GROUND RESISTANCE. PERFORM TESTS BY THE 2-POINT METHOD IN ACCORDANCE WITH SECTION 9.03 OF IEEE 81, "GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE AND EARTH SURFACE POTENTIALS OF A GROUNDING SYSTEM."

GROUND/RESISTANCE MAXIMUM VALUES SHALL BE AS FOLLOWS:

1. EQUIPMENT RATED 500 KVA AND LESS: 10 OHMS.

DEFICIENCIES: WHERE GROUND RESISTANCES EXCEED SPECIFIED VALUES, AND IF DIRECTED, MODIFY THE GROUNDING SYSTEM TO REDUCE RESISTANCE VALUES. WHERE MEASURES ARE DIRECTED THAT EXCEED THOSE INDICATED THE PROVISIONS OF THE CONTRACT, COVERING CHANGES WILL APPLY.

SECTION 265100 – INTERIOR LIGHTING

GENERAL

PROVIDE 10% SPARE LAMPS, DIFFUSERS, AND GLASS FOR EACH LIGHT FIXTURE TYPE WITH NOT LESS THAN ONE FOR LESS THAN 10.

PRODUCTS

COMPLY WITH THE REQUIREMENTS SPECIFIED IN THE ARTICLES BELOW AND LIGHTING FIXTURE SCHEDULE.

METAL PARTS: FREE FROM BURRS AND SHARP CORNERS AND EDGES.

SHEET METAL COMPONENTS: STEEL, EXCEPT AS INDICATED. COMPONENTS ARE FORMED AND SUPPORTED TO PREVENT WARPING AND SAGGING.

DOORS, FRAMES, AND OTHER INTERNAL ACCESS: SMOOTH OPERATING AND FREE FROM LIGHT LEAKAGE UNDER OPERATING CONDITIONS. ARRANGE TO PERMIT RELAMPING WITHOUT USE OF TOOLS. ARRANGE DOORS, FRAMES, LENSES, DIFFUSERS, AND OTHER PIECES TO PREVENT ACCIDENTAL FALLING DURING RELAMPING AND WHEN SECURED IN THE OPERATING POSITION.

REFLECTING SURFACES: MINIMUM REFLECTANCES AS FOLLOWS, EXCEPT AS OTHERWISE INDICATED:

1. WHITE SURFACES: 85 PERCENT.

2. SPECULAR SURFACES: 83 PERCENT.

3. DIFFUSING SPECULAR SURFACES: 75 PERCENT.

4. LAMINATED SILVER METALLIZED FILM: 90 PERCENT.

LENSES, DIFFUSERS, COVERS, AND GLOBES: 100 PERCENT VIRGIN ACRYLIC PLASTIC OR WATER WHITE, ANNEALED CRYSTAL GLASS EXCEPT AS INDICATED.

1. PLASTIC: HIGHLY RESISTANT TO YELLOWING AND OTHER CHANGES DUE TO AGING, EXPOSURE TO HEAT AND UV RADIATION. LENS THICKNESS: 0.125 INCHES, MINIMUM.

SINGLE-STEM HANGERS: 1/2-INCH STEEL TUBING WITH SWIVEL BALL FITTING AND CEILING CANOPY. FINISH SAME AS FIXTURE.

TWIN-STEM HANGERS: TWO, 1/2-INCH STEEL TUBES WITH SINGLE CANOPY ARRANGED TO MOUNT A SINGLE FIXTURE. FINISH SAME AS FIXTURE.

ROD HANGERS: 3/16-INCH DIAMETER CADMIUM PLATED, THREADED STEEL ROD.

HOOK HANGER: INTEGRATED ASSEMBLY MATCHED TO FIXTURE AND LINE VOLTAGE AND EQUIPPED WITH THREADED ATTACHMENT, CORD, AND LOCKING- TYPE PLUG.

FLUORESCENT FIXTURES: CONFORM TO UL 1570, "FLUORESCENT LIGHTING FIXTURES."

ELECTRONIC BALLASTS: CONFORM TO UL 935, "FLUORESCENT-LAMP BALLASTS." SOLID-STATE, FULL-LIGHT-OUTPUT, ENERGY-SAVING TYPE COMPATIBLE WITH ENERGY-SAVING LAMPS. CONFORM TO FCC REGULATIONS PART 15, SUBPART J. FOR ELECTROMAGNETIC INTERFERENCE. CONFORM TO IEEE C62.41, "GUIDE FOR SURGE VOLTAGES IN LOW-VOLTAGE AC POWER CIRCUITS," CATEGORY A, FOR RESISTANCE TO VOLTAGE SURGES FOR NORMAL AND COMMON MODES. BALLASTS MUST BE APPROVED BY USU.

1. CERTIFICATION: BY ELECTRICAL TESTING LABORATORY (ETL).

2. LABELING: BY CERTIFIED BALLAST MANUFACTURERS ASSOCIATION (CBM).

3. TYPE: CLASS P, HIGH-POWER-FACTORY TYPE EXCEPT AS INDICATED OTHERWISE.

4. SOUND RATING: A RATING, EXCEPT AS INDICATED OTHERWISE.

5. VOLTAGE: 120/277 UNIVERSAL.

6. MINIMUM POWER FACTOR: 90 PERCENT.

7. MINIMUM OPERATING FREQUENCY: 20,000 HZ.

8. THIRD HARMONIC CONTENT OF BALLAST CURRENT: LESS THAN 10 PERCENT.

APPROVED BALLASTS:

1. GE ULTRAMAX
2. OSRAM SYLVANIA QUICKTRONIC HIGH EFFICIENCY (QHE)
3. ADVANCE OPTANIUM
4. UNIVERSAL ULTIM 8

EXIT SIGNS: CONFORM TO UL 924, "EMERGENCY LIGHTING AND POWER EQUIPMENT," AND THE FOLLOWING:

1. SIGN COLORS: CONFORM TO LOCAL CODE.

2. MINIMUM HEIGHT OF LETTERS: CONFORM TO LOCAL CODE.

3. ARROWS: INCLUDE AS INDICATED.

4. LAMPS FOR AC OPERATION: LED.

EMERGENCY LIGHTING UNITS: CONFORM TO UL 924, "EMERGENCY LIGHTING AND POWER EQUIPMENT" REQUIREMENTS FOR "UNIT EQUIPMENT." PROVIDE SELF-CONTAINED UNITS WITH THE FOLLOWING FEATURES AND ADDITIONAL CHARACTERISTICS AS INDICATED.

1. BATTERY: SEALED, MAINTENANCE-FREE, LEAD-ACID TYPE WITH 10 YEAR NOMINAL LIFE MINIMUM, AND SPECIAL PROJECT WARRANTY.

2. CHARGER: MINIMUM TWO-RATE, FULLY-AUTOMATIC, SOLID-STATE TYPE, WITH SEALED TRANSFER RELAY.

3. OPERATION: RELAY AUTOMATICALLY TURNS LAMP ON WHEN SUPPLY CIRCUIT VOLTAGE DROPS TO 80-PERCENT OF NOMINAL OR BELOW. LAMP AUTOMATICALLY DISCONNECTS FROM BATTERY WHEN VOLTAGE APPROACHES DEEP-DISCHARGE LEVEL.

4. RELAY DISCONNECTS LAMPS AND BATTERY AUTOMATICALLY RECHARGES AND FLOATS ON TRICKLE CHARGE WHEN NORMAL VOLTAGE IS RESTORED.

5. WIRE GUARD: WHERE INDICATED, PROVIDE HEAVY CHROME PLATED WIRE GUARD ARRANGED TO PROTECT LAMP HEADS OR FIXTURES.

6. TIME-DELAY RELAY: PROVIDE TIME-DELAY RELAY IN EMERGENCY LIGHTING UNIT CONTROL CIRCUIT ARRANGED TO HOLD UNIT "ON" FOR FIXED INTERVAL AFTER RESTORATION OF POWER FROM AN OUTAGE. PROVIDE ADEQUATE TIME DELAY TO PERMIT HID LAMPS TO RESTRIKE AND DEVELOP ADEQUATE OUTPUT.

EMERGENCY FLUORESCENT POWER SUPPLY: CONFORM TO UL 924, "EMERGENCY LIGHTING AND POWER EQUIPMENT."

1. INTERNAL TYPE: SELF-CONTAINED, MODULAR, BATTERY-INVERTER UNIT FACTORY-MOUNTED WITHIN THE FIXTURE BODY.

   A. TEST SWITCH AND LED INDICATOR LIGHT: VISIBLE AND ACCESSIBLE WITHOUT OPENING FIXTURE OR ENTERING CEILING SPACE.

   B. BATTERY: SEALED, MAINTENANCE-FREE, NICKEL-CADMIUM TYPE, WITH A MINIMUM NOMINAL 10-YEAR LIFE.

   C. CHARGER: FULLY-AUTOMATIC, SOLID-STATE, CONSTANT-CURRENT TYPE.

   D. OPERATION: RELAY AUTOMATICALLY TURNS 2 LAMPS ON WHEN SUPPLY CIRCUIT VOLTAGE DROPS TO 80-PERCENT OF NOMINAL OR BELOW. RELAY DISCONNECTS LAMP AND BATTERY AUTOMATICALLY RECHARGES WHEN NORMAL VOLTAGE IS RESTORED.

LAMPS: PROVIDE LAMPS FOR EACH FIXTURE INDICATED. CONFORM TO ANSI STANDARDS, C78 SERIES APPLICABLE TO EACH TYPE OF LAMP. LAMPS SHALL BE TCLIP COMPLIANT. WHERE LAMPS ARE NOT INDICATED, PROVIDE LAMPS RECOMMENDED BY MANUFACTURER.

STEEL PARTS FINISH: MANUFACTURER'S STANDARD FINISH APPLIED OVER CORROSION-RESISTANT PRIMER, FREE OF STREAKS, RUNS, HOLIDAYS, STAINS, BLISTERS, AND DEFECTS. REMOVE FIXTURES SHOWING EVIDENCE OF CORROSION DURING PROJECT WARRANTY PERIOD AND REPLACE WITH NEW FIXTURES.

1. OTHER PARTS: MANUFACTURER'S STANDARD FINISH.

EXECUTION

INSTALLATION: UNLESS OTHERWISE INDICATED, INSTALL LIGHTING FIXTURES AS FOLLOWS:

1. SETTING AND SECURING: SET UNITS PLUMB, SQUARE, AND LEVEL WITH CEILING AND WALLS, AND SECURE ACCORDING TO MANUFACTURER'S PRINTED INSTRUCTIONS AND APPROVED SHOP DRAWINGS.

2. CONNECT EQUIPMENT GROUNDING CONDUCTOR TO FIXTURE HOUSING.

3. PROVIDE INDEPENDENT SAFETY WIRES ATTACHED TO STRUCTURE AT THE DIAGONAL CORNDERS OF LIGHTIGN FIXTURES IN COMPLIANCE WITH SEISMIC REQUIREMENTS.

4. SUPPORT FOR RECESSED AND SEMIRECESSED FIXTURES: INSTALLED UNITS MAY BE SUPPORTED FROM SUSPENDED CEILING SUPPORT SYSTEM. INSTALL CEILING SYSTEM SUPPORT RODS OR WIRES AT A MINIMUM OF FOUR RODS OR WIRES PER FIXTURE LOCATED NOT MORE THAN 6 INCHES FROM FIXTURE CORNERS.

   A. FIXTURES SMALLER THAN CEILING GRID: INSTALL A MINIMUM OF FOUR RODS OR WIRES FOR EACH FIXTURE AND LOCATE AT CORNER OF THE CEILING GRID WHERE THE FIXTURE IS LOCATED. DO NOT SUPPORT FIXTURES BY CEILING ACOUSTICAL PANELS.

   B. FIXTURES OF SIZES LESS THAN CEILING GRID: CENTER IN THE ACOUSTICAL PANEL. SUPPORT FIXTURES INDEPENDENTLY WITH AT LEAST TWO 3/4-INCH METAL CHANNELS SPANNING AND SECURED TO THE CEILING TEES.

   C. INSTALL SUPPORT CLIPS FOR RECESSED FIXTURES, SECURELY FASTENED TO CEILING GRID MEMBERS, AT OR NEAR EACH FIXTURE CORNERS.

5. SUPPORT FOR SUSPENDED FIXTURES: BRACE PENDANTS AND RODS THAT ARE 4-FEET LONG OR LONGER TO LIMIT SWINGING. SUPPORT STEM MOUNTED SINGLE-UNIT SUSPENDED FLUORESCENT FIXTURES WITH TWIN-STEM HANGERS. FOR CONTINUOUS ROWS, USE TUBING OR STEM FOR WIRING AT ONE POINT AND TUBING OR ROD FOR SUSPENSION FOR EACH UNIT LENGTH OF CHASSIS, INCLUDING ONE AT EACH END. PROVIDE SWIVEL BASES FOR STEMS SUPPORTING LIGHT FIXTURES WHICH EXCEED 12" IN LENGTH.

6. LAMPING: LAMP UNITS ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

7. RECESSED LIGHTING FIXTURES IN ACOUSTICAL TILE CEILING SHALL BE LOCATED CENTERED OF A SINGLE TILE.

ADJUSTING AND CLEANING: CLEAN FIXTURES UPON COMPLETION OF INSTALLATION. USE METHODS AND MATERIALS RECOMMENDED BY MANUFACTURER. ADJUST AIMABLE FIXTURES TO PROVIDE REQUIRED LIGHT INTENSITIES.

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ELECTRICAL SPECIFICATIONS

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