ARCHITECTURAL ABBREVIATIONS & SYMBOL LEGEND

ABBREVIATIONS

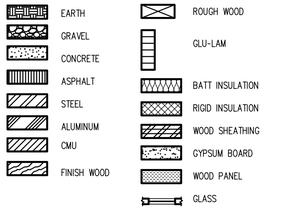
NOTE: SEE OTHER DRAWING DIVISIONS FOR ADDITIONAL ABBREVIATIONS.

&	AND
L	ANGLE
@	AT
#	NUMBER
AB	ANCHOR BOLT
AC	AIR CONDITIONING
ACOUS	ACOUSTICAL
AD	AREA DRAIN
ADA	AMERICANS W/ DISABILITIES ACT
ADJ	ADJUSTABLE
AL	ALUMINUM
ANOD	ANODIZE
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATC	ACOUSTICAL TILE CEILING
BSMT	BASEMENT
BD	BOARD
BLDG	BUILDING
BLKG	BLOCKING
BOT	BOTTOM
CB	CATCH BASIN
CI	CAST IRON
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS OR CONTINUE
CPT	CARPET
CT	CERAMIC TILE
CJ	CONSTRUCTION JOINT
DEMO	DEMOLITION
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DWG	DRAWING
E	EAST
EL	ELEVATION
EXP JT	EXPANSION JOINT
ELEC	ELECTRICAL
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
EXIST or (E)	EXISTING
EXT	EXTERIOR
FA	FIRE ALARM
FD	FLOOR DRAIN
FEC	FIRE EXTINGUISHER CABINET
FIN FLR	FINISHED FLOOR
FH	FIRE HYDRANT
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FT	FOOT(FEET)
FTG	FOOTING
FURR	FURRED(ING)
GA	GAGE, GAUGE
GALV	GALVANIZED
GLU LAM	GLUE LAMINATED
GB or GWB	GYPSUM BOARD
HB	HOSE BIBB
HC	HANDICAPPED
HORZ	HORIZONTAL
HPL	HIGH PRESSURE LAMINATE
HVAC	HEATING, VENTILATING & AIR CONDITIONING
ID	INSIDE DIAMETER
IN	INCH(ES)
INSUL	INSULATION
INTR	INTERIOR
JAN	JANITOR
JT	JOINT
LAM	LAMINATE(D)
LAV	LAVATORY
LPL	LOW PRESSURE LAMINATE
LT	LIGHT
LVP	LUXARY VINYL PLANK
MACH	MACHINE
MAX	MAXIMUM
MECH	MECHANIC(AL)
MFG	MANUFACTURER(ING)
MIN	MINIMUM
MISC	MISCELLANEOUS
MACH	MACHINE
MAX	MAXIMUM
MECH	MECHANIC(AL)
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTL	METAL
MULL	MULLION
N	NORTH
(N)	NEW
NIC	NOT IN CONTRACT
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED-CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED-OWNER INSTALLED
ORD	OVERFLOW ROOF DRAIN
PL	PLATE
PEMB	PRE-ENGINEERED MTL BUILDING
P-LAM	PLASTIC LAMINATE
PLYWD	PLYWOOD
PNL	PANEL
PR	PAIR
PSI	POUNDS PER SQUARE INCH
PSF	POUNDS PER SQUARE FOOT
PT	PRESSURE TREATED
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
R	RISER
RAD	RADIUS
RB	RUBBER BASE
RD	ROOF DRAIN
REFR	REFRIGERATOR
REINF	REINFORCE(D)(ING)
REV	REVISION(S) or REVISED
RM	ROOM
RO	ROUGH OPENING
S	SOUTH
SC	SOLID CORE
SECT	SECTION
SHR	SHOWER
SHT	SHEET
SD	SOAP DISPENSER
SM	SHEET METAL
SPECS	SPECIFICATIONS
SST	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SQ	SQUARE
SUSP CLG	SUSPENDED CEILING
SYMM	SYMMETRICAL
T	TREAD
TC	TOP OF CURB / CONCRETE
TEL	TELEPHONE
T&G	TONGUE AND GROOVE
TOA	TOP OF ASPHALT
TOP	TOP OF PLATE
TV	TELEVISION
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VR	VAPOR RETARDER
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VT	VINYL TILE
W	WEST
W/	WITH
WC	WATERCLOSET
WD	WOOD
WHTR	WATER HEATER
W/O	WITHOUT
WP	WATERPROOF
WSCT	WAINSCOT
WRB	WATER RESISTANT BARRIER

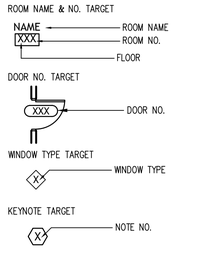
SYMBOLS

NOTE: SEE OTHER DRAWING DIVISIONS FOR ADDITIONAL SYMBOLS

MATERIALS



TARGETS



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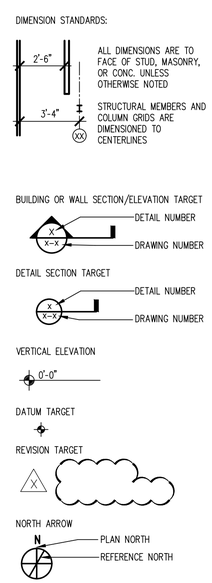
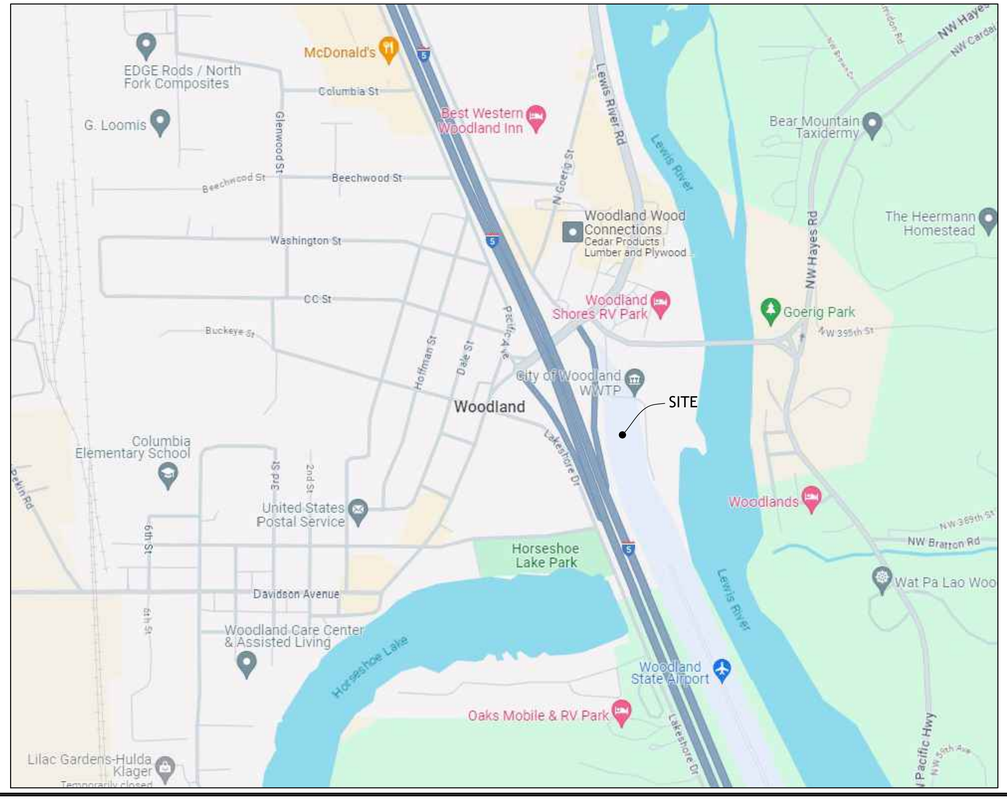


GENERAL NOTES

1. All ideas, designs, arrangements and plans indicated by these drawings are property of the Architect and were created for use on and in connection with the specified project and no other. None of the ideas, designs, arrangements or plans shall be used by or disclosed to any person, firm, or corporation for any purpose without the written permission of the Architect.
2. Contractors shall verify and be responsible for all dimensions and conditions on the job. If a discrepancy should exist between a small scale drawing and an enlarged drawing, enlarged drawing governs. Details govern over plans. Written dimensions on these drawings shall have precedence over scale dimensions. Architectural drawings govern over engineering drawings. If discrepancies exist, request written clarification from the Architect.
3. The Contractor is responsible for checking all contract documents, field conditions and dimensions for accuracy and coordination. If there are any questions regarding these or other coordination questions, the Contractor is responsible for obtaining a clarification from the Architect before proceeding with work.
4. As a warrantee, the contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final payment.
5. Any damage to areas inside or outside of the project area caused by the Contractor shall be repaired to the status prior to construction at no cost to owner.
6. All primary and subcontractors shall visit the site and familiarize themselves with the existing building and site conditions, the proposed work and the location of surrounding utilities, topography, plants and structures which may impact the execution of this project.
7. All trades are responsible for installing their work to allow ceiling heights, mechanical work, and light fixtures to be located as shown and for informing the architect in advance if heights or locations can not be achieved. Proceeding with non-coordinated work is with the understanding that any costs for corrective modifications will be the responsibility of the Contractor. Trade priority shall be as follows unless directed otherwise by the Architect:
   a. Structure
   b. Electrical lighting fixtures
   c. Mechanical grilles and diffusers
   d. Mechanical ductwork
   e. Piping systems (including fire suppression)
   f. Electrical conduit
8. All suppliers, primary, and subcontractors are responsible for field verifying as-built conditions prior to fabrication or assembly of building components. The general contractor shall be responsible for coordination between components produced by various suppliers, primary, and subcontractors.
9. Submit shop drawings and schedules to Architect for approval for all cabinets, counters, millwork, hardware, glass, frames, and doors. Allow ten (10) business days for architectural review.
10. The Architect is not responsible for safety on the job site. Job safety is the responsibility of the general contractor. Shoring and demolition are ultra hazardous activities. Design of shoring system shall be by the Contractor.
11. The Contractor shall comply with all building code requirements of the state or local authority having jurisdiction and shall obtain and pay for all required permits, fees, and inspections. Any permits required for plumbing, heating, or electrical, shall be paid by the respective subcontractor, but included in total cost of construction.
12. It is the Contractor's responsibility to keep the construction site neat and clear of excess debris as well as maintaining the adjacent public roads access the site clear of mud and construction materials.
13. Neither the final payment nor any provision in the contract documents nor partial or entire occupancy of the premises by the owner shall constitute an acceptance of work not done in accordance with the contract documents.
14. General conditions of the contract for construction shall be A.I.A. Document A201, current version, and shall be considered in its entirety to be a part of these specifications.
15. Whenever the contract, specifications, laws, ordinances, or public authority require any work to be specially inspected or approved, the Contractor shall give the governing authority timely notice of its readiness for inspection and of the date for inspection
16. The Architect's responsibility is limited to the items shown on the drawings. Obtain the Architect's specific approval prior to deviating from the drawings. Follow the best trade and engineering practices for the items not specifically detailed and indicated.
17. All changes or deviations from the contract, including those for extra or additional work, must be submitted in writing for approval of the Architect. No verbal orders will be recognized.
18. These notes and the drawings may refer to participants in this building project which may not correspond precisely with the terminology set forth in the contracts between the various participants in this project; therefore owner, leasor, developer or "other" refers to the same party unless otherwise specified; Contractor, builder refers to the same party unless otherwise specified; Architect, designer, interior designer, or engineer refers to the same party unless otherwise specified.
19. At substantial completion, provide the Owner with Operations and Maintenance manuals for all equipment and systems in the project. This will be collected and organized into a binder and includes, but is not limited to: warranties, instructions, maintenance programs, and operational data for mechanical/ electrical/ plumbing equipment, installed equipment, elevators, roofing systems, etc.

VICINITY MAP



SUBMITTALS

SHOP DRAWINGS AND PRODUCT SUBMITTALS
Provide the following shop drawings and/or product submittals to the Architect for review, as well as any others as indicated. Allow ten (10) business days for processing.
- Doors & Door Hardware
- Windows & Storefront systems
- Any products that are a substitution for those shown on the drawings

DEFERRED SUBMITTALS
Provide the following deferred submittals for Architect's review prior to submittal to the Authority Having Jurisdiction. Deferred submittals are designs prepared by others. Designs shall meet or exceed minimum code requirements and conform to the general design intent expressed in these construction documents.
- Wood roof trusses

CODE SUMMARY

Current Applicable Building Code
International Building Code, 2021 Edition (IBC) with Washington State Amendments.

Project Description:
The project consists of a 114sf addition to the Woodland Waste Water Treatment Plant admin building, and a new 28ft x 28ft shop building.

Occupancy & Use (302.1)
Group B: Business
Group S-1: Storage

Construction type (602.1)
Type VB, non-sprinklered

Building Height & Area (504)

Building height:	Allowed	Actual
Group B, S-1	40' allowed	20'-8"
Stories:		
Group B,	2	1
Group S-1	1	1
Area:		
Group B	9000sf	114sf
Group S-1	9000sf	784sf

Exterior fire rating based on separation (T602):
>10 feet to property line = none req'd in type VB

Energy Code Requirements
Climate zone: 4C Cowlitz [C301.1]
Analysis methodology: Prescriptive [C402]

R-Value Method [C 402.1.3]

Building elements	Required
Roof (Other)	R-49
Floor (slab on grade)	R-10 for 24" below
Wall (mass wall w/ exception)	See Exception 'C'
Swinging doors	R-0.37

Office Addition & New Shop Bldg for:
Woodland WWTP
Sandalwood Rd,
Woodland, WA 98674

DRAWING INDEX

BRITTELL ARCHITECTURE, INC.
LONGVIEW, WA
NEWBERG, OR
WWW.BRITTELLARCH.COM

Office addition & New Shop Bldg for:
Woodland WWTP
Sandalwood Rd, Woodland, WA 98674

7640 REGISTERED ARCHITECT
DAVID BRITTELL
STATE OF WASHINGTON

MRK	DATE	DESCRIPTION
0	11-30-23	ISSUE FOR PERMIT/BID

JOB NUMBER:
2330a

SHEET:
G1
COVER SHEET

01 DEMOLITION

1. Field verify all existing conditions, locations, and dimensions prior to commencing with demolition work. Prior to demolition, the contractor shall conduct appropriate field surveys and testing to determine the nature of the existing work to be removed. Due to the nature of renovation work, conditions may occur in the field that are not fully represented in these drawings, and the general contractor is to notify the Architect if such conditions conflict with new work to be done.
2. The owner assumes no responsibility for the actual condition of structures to be demolished. Conditions existing at the time of inspection for bidding purposes will be maintained by the owner insofar as practical. However, variations within the structure may occur by owner's removal and salvage operations prior to the start of the demolition work.
3. The following activities shall take place only on days and time as approved by the owner:
   a. coring or saw cutting of floors or cmu/concrete walls.
   b. jack hammer work
   c. work in rooms or floors other than as shown on the drawings.
   d. interruption of power, water, data or other services to any part of the building.
4. Indication of new materials or equipment shall infer all removal or demolition and patching required of existing materials and substrates for proper installation of new work per industry standards.
5. At demolition areas, remove all materials completely leaving surfaces smooth and ready for new work. Saw cut where necessary. Use appropriate measures to assure clean, neat surfaces and to facilitate tie-ins for new work and refinishing existing work to remain. For wall elements and devices to remain in service on demolished walls, relocate to the nearest existing or new wall unless otherwise noted. Confirm location with Architect before proceeding.
6. The contractor shall repair and patch all interior surfaces which will be exposed, where deterioration, cracks, damage, dents, holes or any other damage has occurred. Match adjacent materials if not noted.
7. Where walls or ceilings are removed all adjacent surfaces including walls, floors, or ceilings, which will remain exposed or provide a thermal, fire, tenant separation or acoustical barrier are to be repaired or replaced to like new condition. Match existing if not specified. All penetrations thru walls, floors, and ceiling deck shall be grouted/firestopped around each penetrating element as required by the local code enforcement agency.
8. Contractor shall ensure that dust and debris is prevented from entering non-work areas. Compartmentalize with temporary barriers as required, providing dust-proof enclosures over equipment such as computer, telephone service gear, and alarm system panels during construction. Coordinate closure and access with the Owner's rep.
9. Reconnect/reroute or properly terminate existing utilities and services as required by new work. In demolition areas, removal of abandoned mechanical, electrical, and plumbing elements shall be to or below wall surface to allow specified new construction and finishes. Cap-off or terminate as required.
10. Each trade shall be responsible for cutting and patching in existing floors, walls and ceiling for their work where required by new construction. Before commencing with any cutting and patching, contractor shall have approval of the owner. The general contractor shall be ultimately responsible for all cutting, supporting, and patching, if not covered by a specific trade.
11. See site plan for extent of site demolition (pole lights, concrete walks, curbs, asphalt, etc.)
12. The general contractor shall be responsible for proper and timely disposal of all demolished materials. Provide proper waste receptacles and request approval on their location and use from the owner. Removal of debris shall be coordinated with the owner's representative with respect to transportation schedule and routing.
13. The contractor is to return salvageable materials (doors, frames, hardware, equipment, and lighting fixtures) to the owner and stockpile them in an approved construction area. Dispose of these materials after owner's review and approval, unless otherwise specified in the contract documents.

01 ARCHITECTURAL

1. All dimensions are to the face of stud, structural center lines, or to face of masonry or concrete, unless noted otherwise.
2. Do not scale the drawings. If there are any coordination questions or dimensional discrepancies, the contractor is responsible for obtaining a clarification from the architect prior to proceeding.
3. Verify all critical dimensions relating to the existing structure; existing dimensions were determined by visual survey and existing drawings.
4. Dimensions and walls relating to existing steel columns are of highest importance; new walls are to be laid out from columns outward to ensure correct column placement within thickness of partitions.
5. Architectural dimensions take precedence over engineering drawings for electrical device location. If a conflict arises between the architectural and engineering drawings immediately consult the Architect.
6. "Align" as used in these documents shall mean to accurately locate faces in the same plane.
7. All stud walls to be full batt insulated unless otherwise noted.
8. Provide accessible signage as required by section 1110, to include restroom and exit signage.

03 CONCRETE (Also see Structural Notes)

1. Form materials shall be contractor's choice and design responsibility, selected from standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances and for easy removal without damage to concrete. Form facing for exposed surfaces shall be steel unless otherwise noted; release agents shall not adversely affect concrete or interfere with application of coatings. Do not remove bracing until the concrete has attained the specified compressive strength (F'c); for walls supporting soil loads, do not remove until after backfilling is complete.
2. Vapor retarder shall be minimum 6 mil polyethylene below slab. Lap all seams minimum 6" and tape edges and ends.
3. Gravel placed below slabs shall be crushed stone or other acceptable fill as approved by architect. Under no circumstances shall pea gravel or other smooth round stones be placed below slabs.
4. Joint filler shall be compressible asphalt mastic with felt faces, complying with ASTM D994, 1/4" thick and 4" deep.
5. Concrete finishing: Repair surface defects, including tie holes immediately after removing form-work. Rub down or chip off fins more than 1/4" tall. Saw cut joints 1/4 depth of slab spaced 30x slab thickness within 24 hours of placing.
   5.1. Steel trowel surfaces to be exposed, densified and polished. Use "Advanced Floor Products" or approved equal. This system is designated as CONC-1 in the finish schedule. Provide aggregate appearance Class-B (Fine aggregate) and polished concrete appearance Level 2 - Satin. Before performing the work, Contractor shall provide a mock-up 10' x 10' in area and using the same design as scheduled and with the same personnel that will place the finish concrete for the project. Obtain Owner's and Architect's approval before starting work on Project.
   5.2. Steel trowel surfaces to be left exposed and densified. Apply "Ashford Formula" densifier after slab has cured. Apply according to manufacturer's written instructions. This system is designated as CONC-2 in the finish schedule.
   5.3. Maintenance: provide Owner with maintenance instructions including methods and frequency recommendations. Include precautions against cleaning products and methods that may be detrimental to finishes and performance.
   5.4. Contractor to protect the concrete finish from spills and damage until construction is complete.
   5.5. Light broom finish all exterior walking surfaces unless otherwise noted; power floating is prohibited.
6. All footings are to bear on undisturbed soil or compacted engineered fill. Engineered fill beneath floor slabs and over footings should be compacted to a dry density of at least 95% of the standard proctor maximum dry density (ASTM D-698). This minimum compaction requirement should be increased to 100% for fill supporting footings. All compaction should be accomplished by placing the fill in 6" loose lifts and mechanically compacting each lift to at least the minimum specified dry density. Field density tests should be performed on each lift to ensure that adequate compaction is being achieved.
7. Foundations are designed for normal, stable soil with an assumed safe bearing pressure of 1,500psf unless otherwise noted on the structural drawings. Verify allowable soil bearing pressure at footing subgrade. Notify the Architect if saturated or other abnormal conditions.
8. All footing elevations are to bottom of footing and are referenced to finished floor elevation of 0'-0". Increase footing depths as required or directed by the Architect.
9. Anchor bolt tolerances are 1/8" center to center, 1/4" group to group. These tolerances must be maintained for steel to "fit." It is advised that the Contractor check his subcontractor's work prior to pouring piers or footings. Verify size & location of sleeves, openings, embedded items, etc. and ensure they are in place prior to pour.

04 MASONRY (Also see Structural Notes)

1. Concrete Masonry Units (CMU) assemblies shall comply with ASTM C-90-14, grade N-1 and shall have a minimum compressive strength and shrinkage per Structural.
2. CMU density to be 110 pcf or greater and units shall contain the integral water repellent admixture Dry-Block or equivalent.
3. Provide factory formed corner units and specialty units as required.
4. See structural drawings for mortar grout and reinforcing.

06 WOOD (Also see Structural Notes)

1. Provide rough lumber and wood panels in standard dimensions with moisture content not more than 19%.
2. Select and cut material to exclude damaged, marked, or defective areas.
3. All wood in contact with the concrete or masonry shall be pressure treated material suitable for this application. All sill plates must be true and level upon installation. Grout solid below sill plates installed on an out-of-level foundation or irregular surface.
4. Provide all necessary hardware in sizes and quantities required by local code or approved by Architect.
5. Timber Connectors to be "Strong Tie" by Simpson Company, as specified in the latest catalog. Where connectors are in exposed exterior application, connectors shall be hot dipped galvanized (HDG) or zinc galvanized (Z-max) finish or as specified in drawings.
6. Refer to IBC Table 304.9.1 "Fastening Schedule" fort nailing requirements, except as noted on the drawings.
7. Space all exposed fasteners at equal intervals.
8. Make all cuts true and square for full bearing at structural joints. Connect all framing securely together with nails, spikes, screws, or approved framing connectors as noted. Install any additional connectors if required by the local building official.
9. Beams and headers shall be constructed according to the drawings. All plywood specified shall be continuous and unbroken for the entire length of the beam or header, and shall be glued and nailed to the other members.
10. Beams and headers shall have double wall studs under each bearing point. This solid bearing material shall be continuous from the beam or header down to the foundation. Solid bearing shall be for the full width of the beam and shall bear on the full width of the side wall or column below. See the column schedule and structural details and elevations of beams that require special or increased bearing.
11. Provide full height structural studs at all corners, around doors, around borrowed light frames and behind all wall mounted equipment and casework.
12. Plywood roof sheathing shall be installed with "H" clips at unsupported edges and the long side shall always run perpendicular to the framing members unless otherwise noted.
13. Draft stopping and fire stopping shall be installed as required by all local and state codes.
14. Provide molding as indicated, required, or implied for joint and edge connection and concealment. Coordinate locations with fixture contractor and Architect.
15. Use finish or casing nails for exposed work except for where screws are specifically called for, and type "S" trim head screws for attachment of wood trim to metal studs. Space screws at equal intervals, sink, and putty in wood surfaces.
16. Use adhesives recommended by the manufacture for a particular application, in accordance with that manufacturer's most current printed application instructions.
17. Install material with tight joints.
18. Miter casings and moldings.
19. Match grain and color from piece to piece on running trim, use one piece for lengths 10'-0" or less.
20. Relieve backs of wood trim and kerf backs of members more than 5" wide and 1" nominal thickness. Ease all external corners. Ease all exposed wood edges 1/8" min. radius.
21. Finish exposed surfaces smooth and free from tool and machine marks.
22. Replace damaged surfaces for blending and concealment with adjacent pattern, grain, or finish. Remove excess adhesive and clean surfaces as recommended by manufacturer.

07.1 INSULATION

1. Extruded polystyrene insulation (XPS) board: K=.18, smooth face, square edge, 25psi compression, .3% max water absorption by volume; manufactured by Dow Chemical, Owens Corning, or approved
   1.1. Fit board insulation tight and tape all joints with joint sealing tape recommended by manufacturer. For installations with more than one layer, stagger joints.
2. Loose-fill perlite insulation: per ASTM C549
   2.1. Provide loose-fill perlite insulation in all CMU cores that are not grout filled.
   2.2. Loose-fill perlite must remain dry.
3. Closed cell spray foam insulation: Provide "Gaco-One-Pass" closed cell polyurethane foam insulation or other approved.
4. Batt insulation @ interior walls: As shown on drawings use mineral batt insulation manufactured by Owens Corning or other approved. Insulation R-value to be visible on insulation.
   4.1. Trim insulation to neatly fill all voids and wall cavities. Do not compress insulation. Seal all tears and openings in vapor retarder with approved tape.

07.2 STANDING SEAM METAL ROOFING

1. Provide 24 gauge standing seam metal roofing "NRM-1705" by Nu-Ray Metals. Provide Premium D2 Kynar Ocean Guard coating, color to be selected by owner
2. Install in accordance with manufacturer's most current printed application instructions.
3. Provide all flashing necessary for a complete installation including: eave flashing, ridge flashing and gable flashing
4. Finish installation to be smooth and free from tool and machine marks. Use Manufacturer's approved touch up paint.
5. Replace damaged surfaces for blending and concealment with adjacent pattern, grain, or finish. Remove excess adhesive and clean surfaces as recommended by manufacturer.
6. Provide 50 commercial year warranty.

07.4 SEALANTS

1. Provide non-sag sealant complying with federal specifications TTS-1543 or TTS-230 Type II, Class A. Primer as recommended by sealant manufacturer for specific conditions and substrates.
2. Provide backing material of appropriate size and profile to ensure sealant joint of uniform depth, Dow "Ethafoam" or approved substitute.
3. Clean and prep surfaces to be sealed per manufacturer's instructions. Sealant joints shall be continuous bead, entirely filling all joints and voids. Tool to uniform surface and clean any excess.
4. Seal all joints, transitions, and penetrations in exterior air barrier.
5. Seal around all door frames.
6. Acoustical sealants, if shown, shall be non-hardening, non-drying synthetic rubber sealing compound with minimum 90% solids. Use at all interior joints between intersecting planes and around door and window frames.

08 DOORS & FRAMES

1. Provide hollow metal doors with minimum thickness as follows: 18ga face sheets, 16ga edge channels, 22ga face stiffeners, 18ga interior frames.
2. Frame anchors shall be as required for a secure installation.
3. Install frames rigid, plumb, level, and true. Align with adjacent construction. Brace frames as required during construction, and adjust/shim as necessary to maintain tolerances.
4. Metal doors shall be fully welded, seamless construction with no visible joints on faces or vertical edges. Dress fill and sand exposed surfaces and imperfections, prime for painting.
5. Doors shall have reinforcement pre-installed for mounting of hinges, hardware, and other accessories, in accordance with best trade practices and requirements for the specific hardware intended. Use hardware templates provided by hardware manufacturers.
6. Doors shall be square, true in plane, and free from defects.
7. Hang doors with 1/8" clearance at top, 3/32" at meeting edge of pairs, and 3/8" at bottom unless specifically noted for undercut on drawings or as required for installation of specific hardware. Verify clearances required for carpeting and other floor finishes, and make no jobsite fit cuts unless approved by Architect.
8. Adjust doors for proper operation.

08 HARDWARE

1. Submit for review (2) copies of the hardware schedule on letter-sized sheets with cover sheet showing name of project, contractor contact information, and date of submittal. Schedule hardware items for for each door separately in typed, vertical format in numerical order by door number as indicated on the plan.
2. Furnish hardware as shown in drawings and as required for a complete installation. Install hardware in accordance with manufacturer's instructions, located in accordance with DHI guidelines. Set items plumb, level, and true and reinforce substrate as necessary for a secure installation.
3. Handles, pulls, latches, locks, and other operable parts on doors shall have a shape that is easy to grasp with one hand and does not require tight grasping, pinching, or twisting of the wrist to operate, or pressure greater than 5 pounds.
4. Provide "Best" 7- pin cylinders keyed to coordinate with Owner's keying program. Provide an extra key for each lock.
5. Hardware shall be US26D (626) finish unless specified otherwise. Cover hardware with protective film until owner occupancy.
6. Immediately prior to acceptance, make final adjustments and check all hardware for smooth operation and proper function. Clean items and relubricate with graphite-type lubricant unless otherwise recommended by manufacturer.
7. Provide special tools and wrenches as required for products installed.

09 FINISHES- RESILIENT BASE

1. Manufacturers: Johnsonite, Roppe, VPI or approved.
2. Install cove base in all areas unless noted otherwise.
3. Provide premolded inside and outside corners at all wall intersections.
4. Use low-VOC adhesives as recommended by material's manufacturer.
5. Upon completion, remove surplus adhesive from adjacent surfaces and clean per manufacturer's recommendations.

09 FINISHES- PAINTING

1. Manufacturers: Benjamin Moore, Sherwin Williams, or approved.
2. Unless noted otherwise, paint systems shall be low-VOC.
3. Paint types used shall be those specifically recommended by the manufacturer for the substrate to receive them. Follow manufacturer's instructions for proper application of paint.
4. Deliver all paint to jobsite in unopened containers with manufacturer's label showing paint type, sheen, and color.
5. Protect work of other trades from damage and defacement from painting, and repair any damage that occurs. Remove electrical outlets, faceplates, hardware, fittings, and fasteners prior to painting and replace upon completion.
6. Thoroughly clean and prepare all surfaces to be painted. Notify GC of any surface to be painted that is unsuitable to receive finish.
7. Backprime all exterior and interior wood trim, fill all nail holes and other surface imperfections with putty tinted to match primer, and sand all wood to a smooth surface. Prime all bare wood to receive paint.
8. Provide paint finishes as scheduled on drawings, including concrete floor where shown. Do not paint factory finished items, sealants, aluminum, nonferrous metal, stainless steel, or concealed piping.
9. Unless specified or directed otherwise by Architect, provide (1) coat tinted primer, (2) coats full color paint. Use eggshell sheen for all wallboard surfaces, semigloss for hollow metal and wood trim, and flat for ductwork.
10. Finish shall be uniform, free from streaks, runs, or holidays, and matching approved color sample. Make ends of paint adjoining other materials sharp and clean.
11. Touch up and restore finish where damaged and leave all surfaces in good and clean condition. Provide multiple site visits as required for touch-ups.
12. Leave one quart can of each paint type at jobsite, clearly labeled.

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7640 REGISTERED ARCHITECT
DAVID BRITTELL
STATE OF WASHINGTON

MRK	DATE	DESCRIPTION
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JOB NUMBER: 2330a

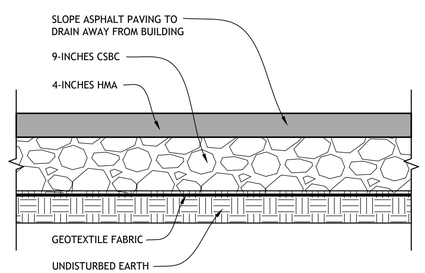
SHEET: G1

COVER SHEET

N

1 A0 SITE PLAN

1" = 30'



2 A0 ASPHALT DETAIL

1" = 1'-0"

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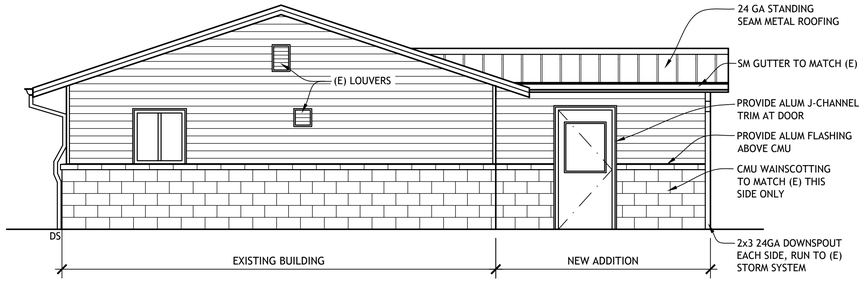
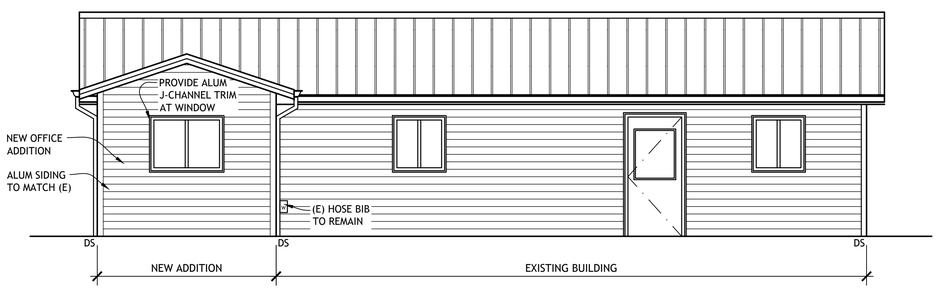
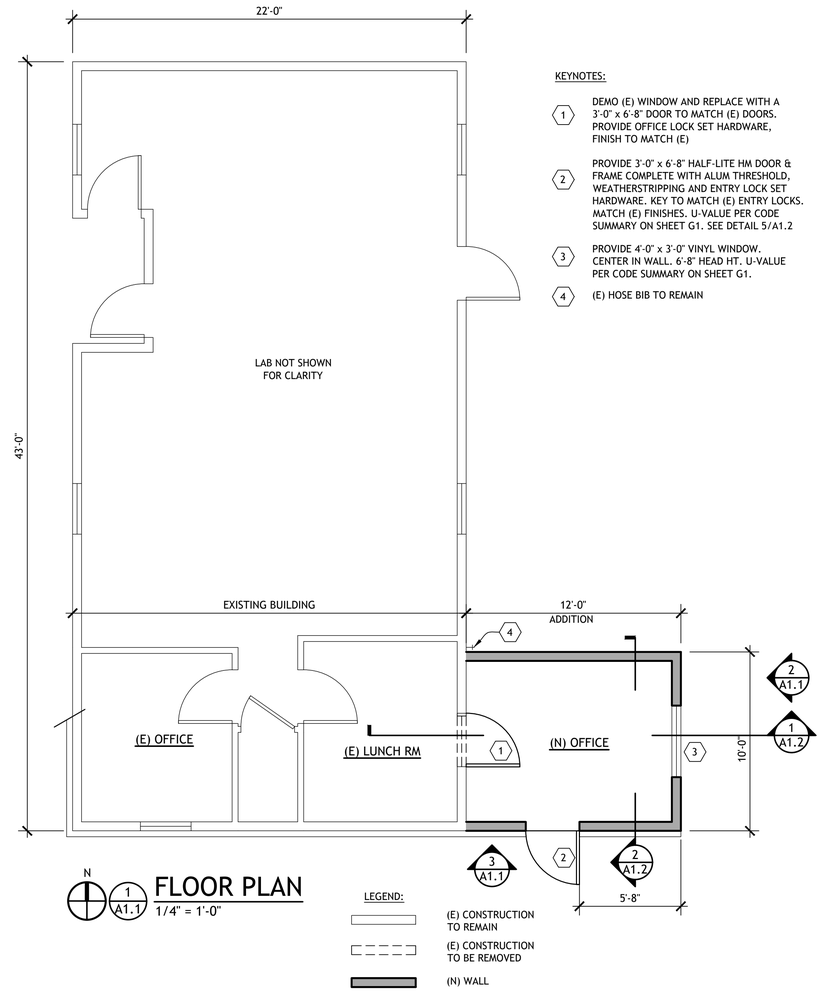
SITE PLAN



3 A1.1 **SOUTH ELEVATION**
1/4" = 1'-0"



2 A1.1 **EAST ELEVATION**
1/4" = 1'-0"



KEYNOTES:

1. DEMO (E) WINDOW AND REPLACE WITH A 3'-0" x 6'-8" DOOR TO MATCH (E) DOORS. PROVIDE OFFICE LOCK SET HARDWARE, FINISH TO MATCH (E)
2. PROVIDE 3'-0" x 6'-8" HALF-LITE HM DOOR & FRAME COMPLETE WITH ALUM THRESHOLD, WEATHERSTRIPPING AND ENTRY LOCK SET HARDWARE. KEY TO MATCH (E) ENTRY LOCKS. MATCH (E) FINISHES. U-VALUE PER CODE SUMMARY ON SHEET G1. SEE DETAIL 5/A1.2
3. PROVIDE 4'-0" x 3'-0" VINYL WINDOW. CENTER IN WALL. 6'-8" HEAD HT. U-VALUE PER CODE SUMMARY ON SHEET G1.
4. (E) HOSE BIB TO REMAIN

N 1 A1.1 **FLOOR PLAN**
1/4" = 1'-0"

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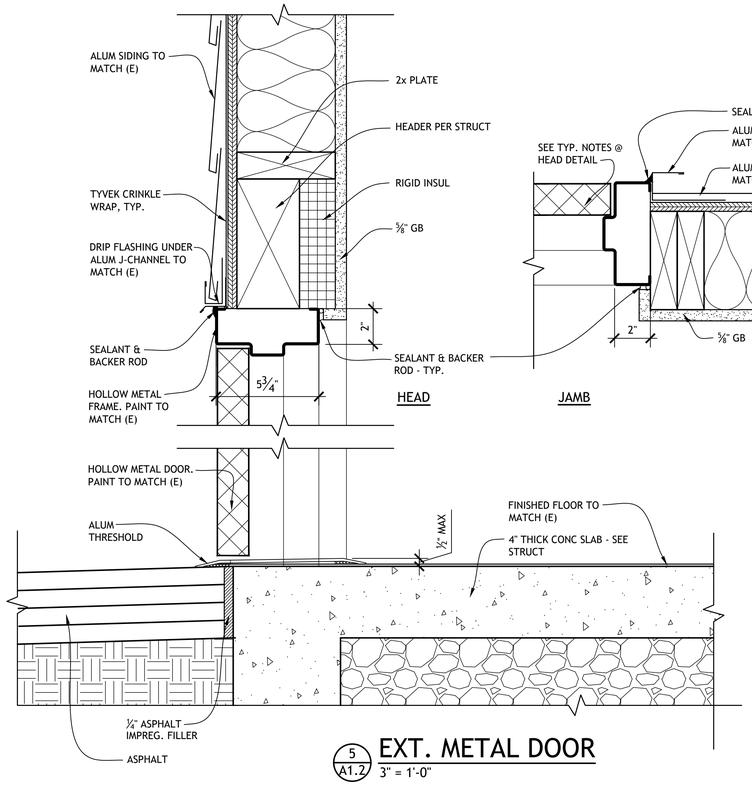
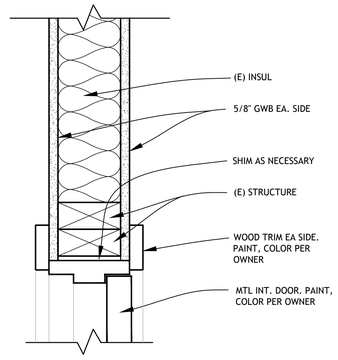
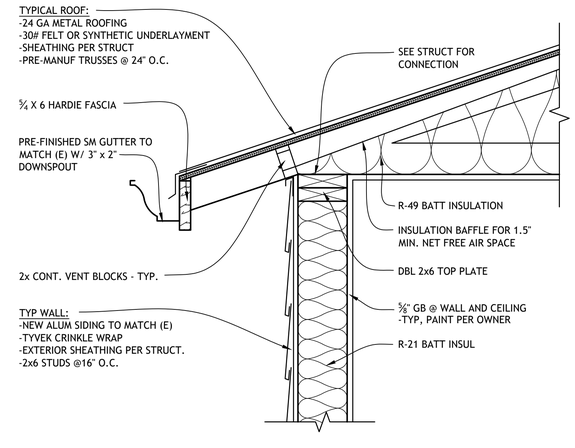
OFFICE ADDITION PLAN & ELEVATIONS



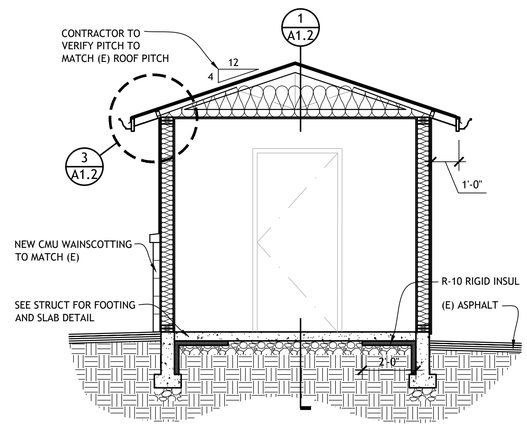
5 A1.2 EXT. METAL DOOR
3" = 1'-0"



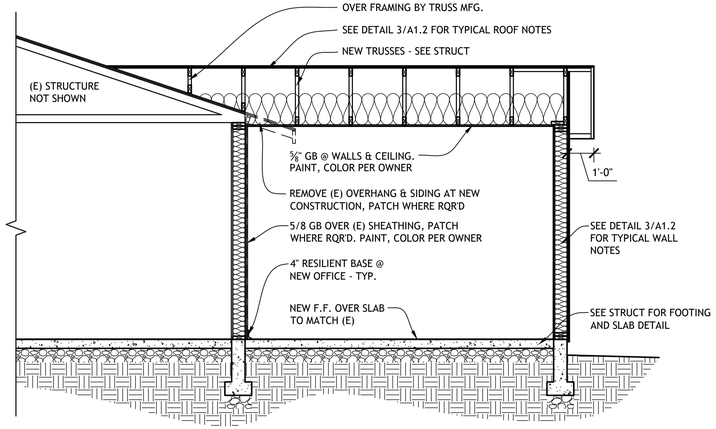
4 A1.2 INT. MTL DOOR HEAD
3" = 1'-0" JAMBS SIMILAR



3 A1.2 TYP EAVE DETAIL
1 1/2" = 1'-0"



2 A1.2 CROSS SECTION
3/8" = 1'-0"



PARTIAL
1 A1.2 LONGITUDINAL SECTION
3/8" = 1'-0"

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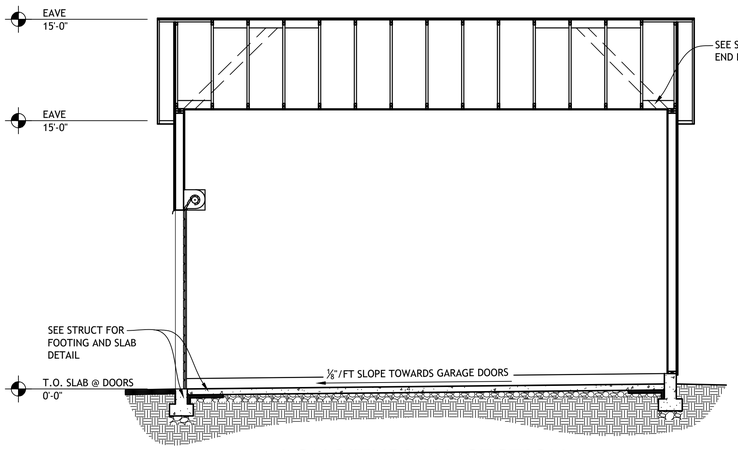
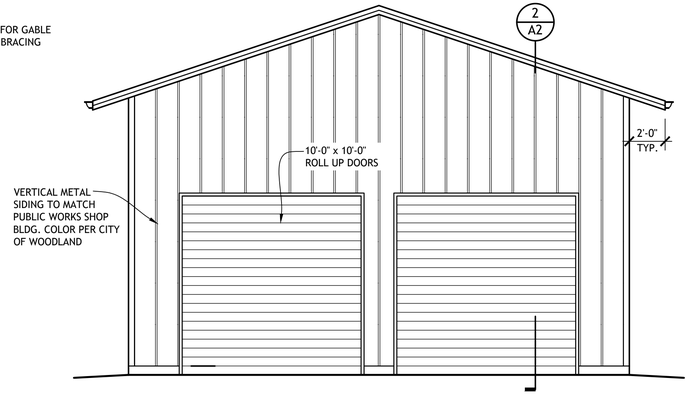
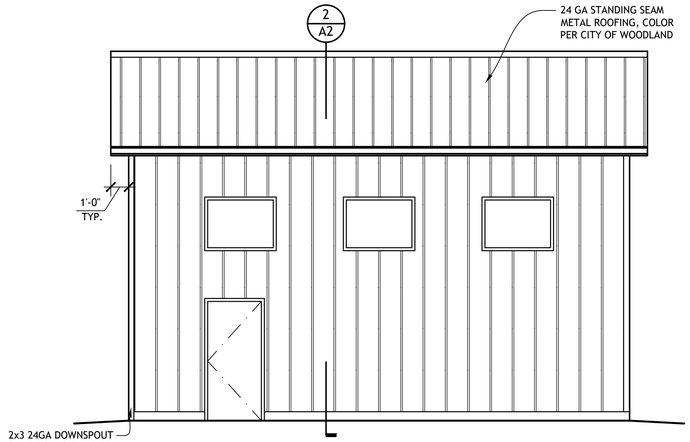
SECTIONS & DETAILS



6 A2 LONGITUDINAL SECTION
1/4" = 1'-0"

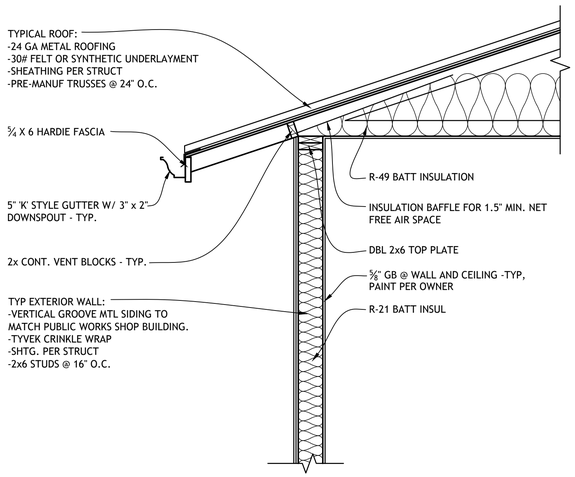


5 A2 WEST ELEVATION
1/4" = 1'-0"

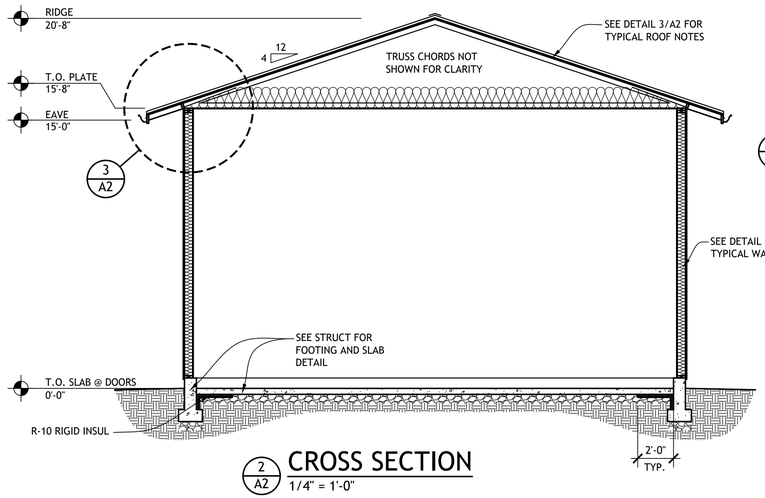


4 A2 SOUTH ELEVATION
1/4" = 1'-0"

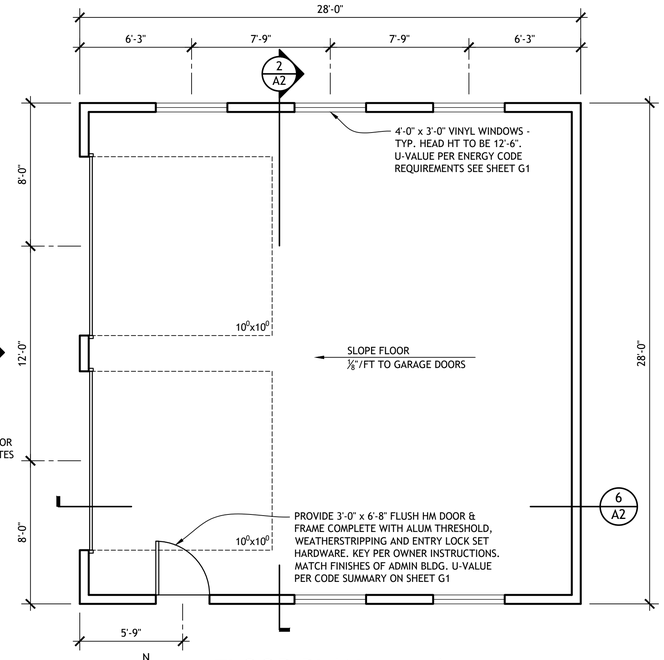
NOTE: NORTH ELEVATION SIMILAR



3 A2 TYP EAVE DETAIL
3/4" = 1'-0"



2 A2 CROSS SECTION
1/4" = 1'-0"



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

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A2

SHOP BLDG PLAN, ELEVATIONS & SECTIONS

STRUCTURAL GENERAL NOTES

GENERAL REQUIREMENTS

1. All work shall conform to IBC (2018) including its referenced standards.
2. Where details are not specifically shown, construction shall follow typical details for similar conditions, subject to review by the Architect or Engineer.
3. Architectural drawings are the prime contract documents. Refer to the Architectural drawings for information including but not limited to: dimensions, elevations, slopes, door and window openings, non-bearing walls, curtain walls, stairs, elevators, curbs, drains, depressions, railings, waterproofing, finishes and other nonstructural items. These structural drawings may not contain details of all the construction, depending on the scope of work for which the Engineer was engaged.
4. The Contractor is responsible for adequate bracing of the structure and parts thereof for wind, earthquake and construction forces until all structural components are permanently connected. The Contractor shall be responsible for formwork design and shoring removal schedules.
5. The Contractor shall verify all dimensions and conditions at the site. Conflicts between the drawings and actual site conditions shall be brought to the attention of the Architect/Engineer before proceeding with the work. In case of discrepancies between the General Notes, plans, and details, the Architect/Engineer shall determine which shall govern. Discrepancies shall be brought to the attention of the Architect/Engineer before proceeding with the work.
6. The Contractor shall determine the location of all adjacent underground utilities prior to earthwork, foundations, shoring, and excavation.
7. Alternatives for specified items may be submitted to the Architect/Engineer for review.

DESIGN LOADS

WIND: Basic Wind Speed: 110 MPH (Strength Level),
Risk Category II
Topographic Factor Kzt = 1.0
Gcpi = 0.18 (Enclosed building)
Exposure: C
Analysis procedure used: Directional Procedure

Office Addition
Wind Base Shear = 1.5 kips (N-S)
= 1.2 kips (E-W)

New Shop Building
Wind Base Shear = 6.5 kips (N-S)
= 7.2 kips (E-W)

SEISMIC: Seismic Importance Factor: I_e = 1.0
Spectral Response Coefficient (Short Period): S_{DS} = 0.76
Seismic Design Category = D
Site Class = D
Response Modification Factor: R = 6.5 (Light framed plywood sheathed shear walls)

Analysis procedure used: Equivalent Lateral Force Analysis

Office Addition
Seismic Base Shear = 0.5 kips

New Shop Building
Seismic Base Shear = 3.3 kips

DESIGN GRAVITY LOADS:	Roof dead load	17 psf (Metal. Roofing)
	Flat Roof Snow Load	25 psf
	Wall dead load	12 psf (drywall & siding)
ROOF DESIGN LOADS	Top chord dead load	7 psf
	Bottom chord dead load	10 psf

SUBMITTALS

1. Submit shop drawings to the architect prior to fabrication and construction regarding all structural items, including the following:
   - Concrete mix designs
   - Concrete reinforcement
2. Shop drawings that differ from or add to the design of the Structural drawings shall bear the seal and signature of a Structural Engineer registered in the state of Washington; such changes to the Structural drawings shall be submitted to the Architect and are subject to review and approval by the Structural Engineer.

SOILS AND FOUNDATIONS

1. Foundations are proportioned for a maximum bearing pressure of 1500 psf.
2. Footings shall be constructed on undisturbed soil. Frozen soil, organic material and deleterious matter not allowed. Any over excavation shall be backfilled with granular material compacted to 95% of the ASTM D-1557 (modified proctor) maximum dry density. All slabs-on-grade shall be founded on 4" minimum compacted crushed rock, or as directed by a Geotechnical Engineer. Base of footings shall be a minimum of 1'-6" below finished grade and a minimum of 1'-0" below existing grade.
3. Coordinate with following trades for embedded items, sleeves, shear wall holddowns, etc.

CAST-IN-PLACE CONCRETE

1. Concrete shall be normal-weight unless specified otherwise on the drawings.

TABLE OF MIX DESIGN REQUIREMENTS

MEMBER TYPE/LOCATION	STRENGTH (psi)	TEST AGE (days)	MAXIMUM AGGREGATE	MAXIMUM W/C RATIO	AIR CONTENT
FOUNDATIONS					
Foundations (Designed for 2500 psf)	3000	28	1"	--	5%
SLABS-ON-GRADE					
Interior	3000	28	1"	0.50	--

2. When pouring concrete in "cold" weather, follow ACI 306R.
3. When pouring Concrete in "Hot" weather, follow ACI 305R.

CONCRETE REINFORCEMENT

1. Concrete reinforcement shall comply with the following:

Reinforcing Bars	ASTM A615, Grade 60, deformed bars.
Weldable Reinforcing Bars	ASTM A706, Grade 60, deformed bars.
Deformed Welded Wire Fabric	ASTM A497

2. Bars shall not be welded unless authorized. When authorized, conform to ACI 301, Sec. 3.2.2.2. "Welding" and provide ASTM A706, grade 60 reinforcement.
3. Reinforcing shall conform to the following cover requirements unless specifically shown otherwise on the drawings:

Concrete cast against earth	3"
Concrete exposed to earth or weather	1-1/2" (#5 bars and smaller)
	2" (#6 bars and larger)
Ties in columns and beams	1-1/2"
Bars in slabs and walls	3/4"

4. Welded wire fabric in slabs on grade shall be chaired for 1 1/2" cover to the top of the slab.
5. All rebar shall be fabricated and placed in accordance with ACI Detailing Manual 315.

WOOD FRAMING

1. Certification: All sawn lumber and pre-manufactured wood products shall be identified by the grade mark or a certificate of inspection issued by the certifying agency.
2. Materials Sawn Lumber: Conform to grading rules of WWPA, WCLIB or NLGA. Finger jointed studs are acceptable at interior walls only.

MEMBER USE	SIZE	SPECIES	GRADE
Studs	2x4, 3x4, 2x6, 3x6	DF	No. 2
Sill Plate	2x4,3x4, 2x6, 3x6	P.T. HF	No. 2
Posts	4x4, 4x6, 4x8	DF	No. 2
Joists	2x6 - 2x12	DF	No. 2
Beams	4x8 - 4x12	DF	No. 2
Beams	6x8 - 6x12	DF	No. 1
Posts & Timbers	6x6, 8x8	DF	No. 1

3. Glued Laminated Timber: Conform to AITC 117 "Standard Specifications for Structural Glue-laminated Timber of Softwood Species, Manufacturing and Design" and ANSI/AITC A190.1 "Structural Glued Laminated Timber."

MEMBER USE	SIZE	SPECIES	SYMBOL	USES
Beams	All	DF/ DF	24F-V4	Simple Spans
	All	DF/ DF	24F-V8	Cantilever Spans

4. Engineered Wood Products: Micro-Lams (LVL), Timberstrand (LSL), Parallams (PSL) and Versa-Lam shall be documented by ICC reports confirming design properties in the table below:

MEMBER USE	MEMBER TYPE	MEMBER SIZE	Fb (psi)	Fv (psi)	E (psi)
Beams	LVL	All	2,600	285	1,900,000
	LSL	All	2,325	310	1,550,000
	PSL	All	2,900	290	2,000,000
	Versa-Lam	All	3,100	285	2,000,000

5. Structural Sheathing: Wood APA-rated structural sheathing includes: all veneer plywood, oriented strand board, waferboard, particleboard, and composites of veneer and wood based material with T&G joint.

Minimum APA Rating						
LOCATION	THICKNESS (3)	SPAN RATING (1)	PLYWOOD GRADE	EXPOSURE	EDGE NAILING (2)	FIELD NAILING (2)
Roof	15/32" CDX	32/16	C-D	1	8 @ 6"	8d @ 12"
Walls	15/32" CDX	24/16	C-D	1	PER PLAN	PER PLAN

(1) Unless noted otherwise on drawings, install roof and floor panels with long dimension across supports and with panel continuous over two or more spans. End joints shall occur over supports.
(2) Provide minimum sheathing edge nailing unless noted otherwise in the plans or structural schedules.
(3) CDX or OSB may be used interchangeably provided equivalent span ratings are achieved.

6. Timber Connectors: Timber connectors shall be "Strong Tie" by Simpson Company as specified in their latest catalog. Alternate connectors by other manufacturers may be substituted subject to review by the Engineer prior to installation. Connectors shall be installed per the manufacturer's instructions. Where straps are used as hold-downs, nail straps to wood framing just prior to drywall application, as late as possible in the framing process to allow the wood to shrink and the building to settle. Premature nailing of the strap may lead to strap buckling and potential finish damage. Where connectors are in exposed exterior applications in contact with preservative treated wood (PT) other than CCA, connectors shall be either batch hot-dipped galvanized (HDG), mechanically galvanized (ASTM B695, Class 40 or greater) stainless steel, or provided with 1.85 oz/sf of zinc galvanizing equal to or better than Simpson ZMAX finish.
7. Fasteners: Fasteners (nails, bolts, screws, etc) attaching sawn timber members or sheathing (shear walls) to PT wood shall be either HDG, mechanically galvanized (ASTM B695, Class 40 or greater) or stainless steel. Provide washers under the heads and nuts of all bolts and lag screws bearing on wood. All nails 12d and smaller shall be full length common unless noted otherwise. 16d nails may be 16d sinkers unless noted otherwise.
8. Nails: Conform to IBC Sec 2304.9 "Connections and fasteners." Unless noted otherwise all nails shall be common. Nail sizes specified on the drawings are based on the following specifications:

SIZE	LENGTH	DIAMETER
8d	2- 3/8"	.131" Ø
10d	3"	.148" Ø
12d	3 1/4"	.148" Ø
16d	3 1/2"	.162" Ø

Alternative nails may be used but are subject to review and approval by the Engineer. Substitution of staples for the nailing of rated sheathing is subject to review by the Engineer prior to construction.

9. Nailing requirements: Provide minimum nailing in accordance with IBC Table 2304.9.1 "Fastening Schedule" except as noted on the drawings. Nailing for roof/floor diaphragms/shear walls shall be per drawings. Nails shall be driven flush and shall not fracture the surface of sheathing.
10. Unless noted on the plans, construction shall conform to IBC Sec. 2308 "Conventional Light-Frame Construction."

SPECIAL INSPECTION/INSPECTOR REQUIREMENTS (IBC 1704)

1. Special Inspector: Employed by the Owner (IBC 1704.2).
2. Reports: Submitted to the Building Official and the Engineer. All discrepancies shall be brought to the immediate attention of the contractor for correction; then, if not corrected, to the building official and the Engineer (IBC 1704.2.4).
3. The Special Inspection is to be continuous during the performance of the work unless otherwise specified.
4. Certification: Inspector must be certified by the Building Official to perform the types of inspections specified.
5. The special inspection agency is responsible for providing a testing schedule that includes the type and frequency of tests.

SUMMARY OF STRUCTURAL CONTINUOUS AND PERIODIC SPECIAL INSPECTIONS

The construction inspections listed are in addition to the inspections required by IBC section 110. Special Inspection is not a substitute for inspection by the Building Official. Specially inspected work that is installed or covered without the approval of the Building Official and the Special Inspector is subject to removal or exposure.

1. Responsibility: It is the responsibility of the General Contractor to inform the Special Inspector or Inspection Agency with adequate lead time prior to performing any work that requires Special Inspection.
2. SPECIAL INSPECTIONS:

- Concrete construction per "REQUIRED VERIFICATION OF CONCRETE CONCRETE CONSTRUCTION".

REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD
1. Inspection of reinforcing steel and placement.	-	x	ACI 318: 3.5, 7.1-7.7
2. Verifying use of required design mix.	-	x	ACI 318:Ch.4,5.2-5.4
3. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	x	-	ASTM C 172, ASTM C 31, ACI 318:5.6,5.8
4. Inspection for maintenance of specified curing temperature and techniques.	-	x	ACI318: 5.11-5.13

ABBREVIATIONS	DEFINITION
AB	ANCHOR BOLT
ADDL	ADDITIONAL
ALT	ALTERNATE
ARCH	ARCHITECTURAL
B or BOT	BOTTOM
B/	BOTTOM OF
BTWN	BETWEEN
BLDG	BUILDING
BLKG	BLOCKING
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
C'SINK	COUNTERSINK
CTRD	CENTERED
ø	DIAMETER
DBL	DOUBLE
DF	DOUGLAS FIR
DL	DEAD LOAD
DN	DOWN
DP	DEPTH or DEEP
DWG	DRAWING
EA	EACH
EL	ELEVATION
EMBED	EMBEDMENT
EQ	EQUAL
EW	EACH WAY
(E)	EXISTING
FDN	FOUNDATION
FLR	FLOOR
FTG	FOOTING
GLB	GLUE LAMINATED BEAM
HDR	HEADER
HF	HEM-FIR
HGR	HANGER
HD	HOLD-DOWN

ABBREVIATIONS	DEFINITION
HORIZ	HORIZONTAL
IBC	INTERNATIONAL BUILDING CODE
LL	LIVE LOAD
LONGIT	LONGITUDINAL
LSL	LAMINATED STRAND LUMBER
LVL	LAMINATED VENEER LUMBER
MAX	MAXIMUM
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MULT	MULTIPLE
NTS	NOT TO SCALE
OC	ON CENTER
PERP	PERPENDICULAR
PLWD	PLYWOOD
PSF	POUNDS per SQUARE FOOT
PSI	POUNDS per SQUARE INCH
PSL	PARALLEL STRAND LUMBER
PT	PRESSURE TREATED
REINF	REINFORCING
REQ'D	REQUIRED
SCHED	SCHEDULE
SHTHG	SHEATHING
SIM	SIMILAR
SOG	SLAB ON GRADE
SQ	SQUARE
STAGG	STAGGER or STAGGERED
STD	STANDARD
STL	STEEL
T&G	TONGUE & GROOVE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W	WIDE
W/	WITH
W/O	WITHOUT
WWF	WELDED WIRE FABRIC
±	PLUS or MINUS

INDEX

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Office addition & New Shop Bldg for:
Woodland WWTP
Sandalwood Rd, Woodland, WA 98674

MICHAEL J. DAUBENSPECK — STATE OF WASHINGTON — 44296 — REGISTERED PROFESSIONAL ENGINEER

11.30.2023

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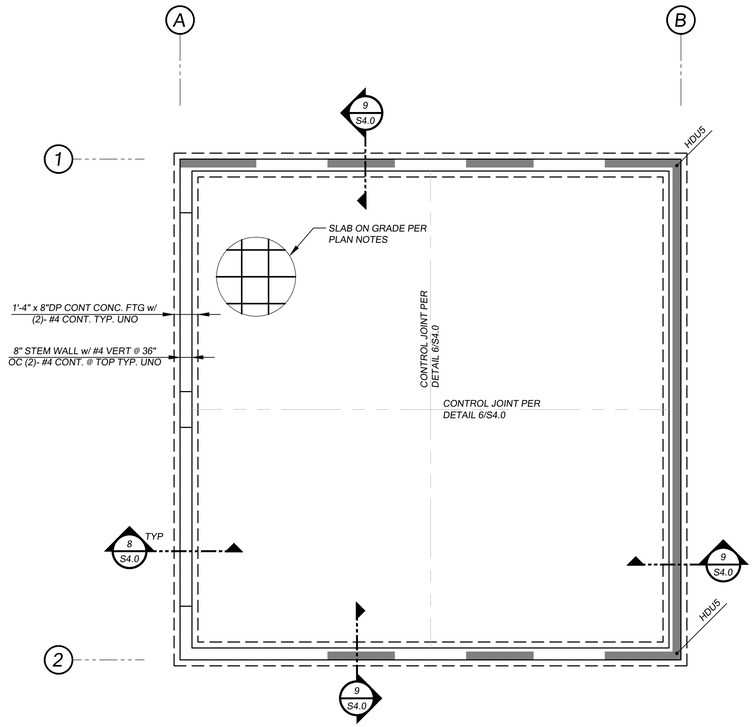
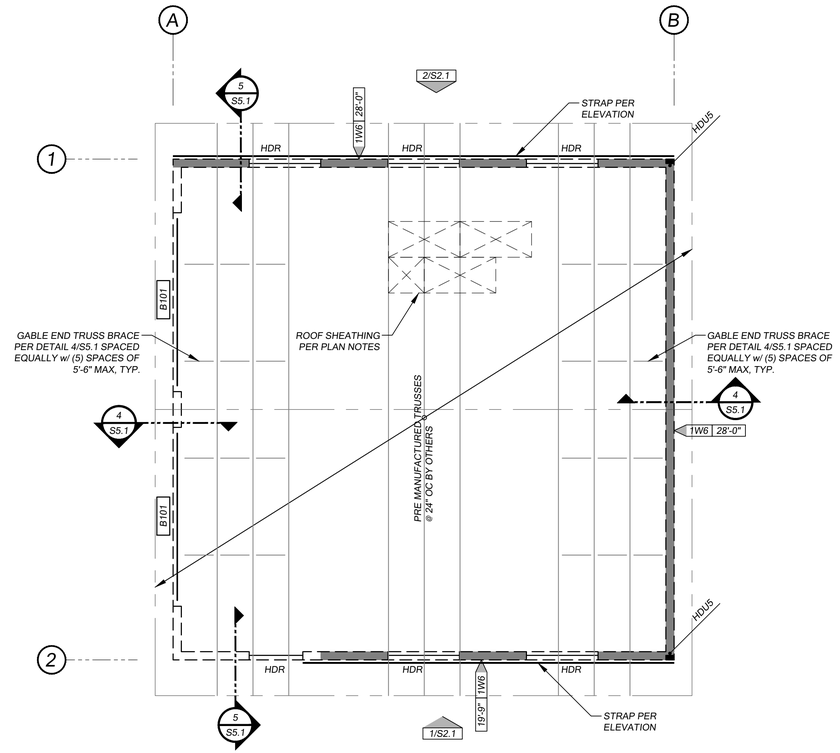


NORTH

NEW SHOP BUILDING FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



NORTH

NEW SHOP BUILDING ROOF FRAMING PLAN

SCALE: 1/4" = 1'-0"

FOUNDATION PLAN NOTES:

1. FOR STRUCTURAL GENERAL NOTES, DESIGN CRITERIA AND SCHEDULES REFERENCE S1.0 AND S5.0.
2. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS.
3. CONTRACTOR SHALL LOCATE AND VERIFY THE FOLLOWING WITH OTHERS PRIOR TO POURING CONCRETE; ALL BLOCKOUTS FOR DUCTS, PIPES AND VENTS.
4. TYPICAL BOTTOM OF EXTERIOR FOOTINGS SHALL BE 1'-6" MINIMUM BELOW EXISTING GRADE UNO.
5. CONTRACTOR TO VERIFY TOP OF CONCRETE (T/CONC) WALL ELEVATIONS PRIOR TO POURING CONCRETE.
6. ALL FOOTINGS AND SLABS SHALL BEAR ON COMPETENT NATIVE SOIL AND/OR STRUCTURAL FILL WITH A MINIMUM SOIL PRESSURE OF 1500 psf.
7. ALL WOOD EXPOSED TO CONCRETE, WEATHER, OR WITHIN 8" OF FINISHED GRADE SHALL BE PRESSURE-TREATED.
8. ANCHOR BOLTS FOR FOUNDATION SILL PLATES TO BE 5/8" DIA. WITH 7" MINIMUM EMBEDMENT @ 48"OC UNO ON SHEAR WALL SCHEDULE, SEE S5.0. PROVIDE HOT-DIPPED GALVANIZED ANCHOR BOLTS AT PRESSURE-TREATED SILL PLATES. 3" x 3" x 1/4" HOT DIP GALVANIZED PLATE WASHERS SHALL BE PLACED BETWEEN THE SILL PLATE AND NUT. REFERENCE 5/S4.0 FOR TYPICAL SILL PLATE ANCHORAGE.
9. AT DOOR BLOCKOUTS IN THE FOUNDATION, PROVIDE A MINIMUM OF (2)- #4 VERT. BARS WITHIN 3" FROM THE EDGE OF THE OPENING. VERTICAL BARS SHALL EXTEND FROM THE TOP OF FOUNDATION WALL TO WITHIN 3" OF THE BOTTOM OF THE FOOTING. ALL VERTICAL BARS SHALL HAVE A 6" 90° HOOK AT THE BOTTOM (EMBEDDED) END.
10. TYPICAL SLAB ON GRADE:
    - 6" COMPACTED CRUSHED ROCK BASE
    - MOISTURE BARRIER
    - 4" CONCRETE SLAB W/ #3 @ 18" OC EACH WAY OR 6x6 W2.9-W2.9 WWF CHAIRED FOR 1-1/2" COVER FROM TOP OF SLAB
    - CONTROL JOINTS PER ARCH
11. REFERENCE TYPICAL DETAILS AS FOLLOWS:

1/S4.0	TYPICAL CORNER REINF. AT CONCRETE FOOTING
2/S4.0	TYPICAL CORNER REINFORCEMENT AT CONCRETE WALLS
3/S4.0	TYPICAL LAP SPLICE SCHEDULE
5/S4.0	TYPICAL SILL PLATE ANCHOR DETAIL
6/S4.0	TYPICAL SLAB ON GRADE JOINT DETAIL

RBXX (LS) (RS)

RBXX (RS) (LS)

BEAMS LEFT TO RIGHT BEAMS TOP TO BOTT.

BEAM SCHEDULE				
BEAM MARK	BEAM TYPE	LEFT SUPPORT	RIGHT SUPPORT	NOTES
ROOF BEAMS				
B101	3 1/2" x 9" GLB	(2)T/(2)K*	(2)T/(2)K*	HEADER

* (X)T/(X)K INDICATES NUMBER OF TRIMMER STUDS AND NUMBER OF KING STUDS

DRAWING LEGEND

SYMBOL	DESCRIPTION
	INDICATES A FOOTING & STEMWALL
	INDICATES A SHEAR WALL FROM ABOVE
HDUx	INDICATES CONCRETE TO WOOD HOLD-DOWN, SEE HOLD-DOWN SCHEDULE ON S5.0
	INDICATES WOOD POST
	INDICATES STRUCTURAL EXTERIOR WALL
	INDICATES SHEAR WALL
TYPE LENGTH	INDICATES A SHEAR WALL, SEE SHEAR WALL SCHEDULE ON S5.0
	INDICATES ROOF LINE

ROOF FRAMING PLAN NOTES:

1. FOR STRUCTURAL GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND LEGEND, REFERENCE S1.0 AND S5.0.
2. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS.
3. ROOF SHEATHING SHALL BE 15/32" APA-RATED SHEATHING WITH A MINIMUM 32/16 SPAN RATING. SHEATHING SHALL BE NAILED TO ROOF FRAMING WITH 8d NAILS @ 6"OC AT PANEL EDGES AND @ 12"OC FIELD, UNO. LAY SHEATHING WITH FACE GRAIN (LONG DIRECTION) PERPENDICULAR TO SUPPORTS AND STAGGER PANEL END JOINTS. ALLOW 1/8" SPACE BETWEEN PANEL ENDS AND EDGES. BLOCK AND NAIL PANEL EDGES PER SCHEDULE. PROVIDE PANEL SHEATHING CLIPS CENTERED BETWEEN FRAMING AT UNBLOCKED SHEATHING EDGES AS REQUIRED BY ROOFING WARRANTY.
4. HEADERS (HDR) SHOWN BUT NOT SPECIFIED SHALL BE A MINIMUM OF 4x10. HEADERS SHOWN ON FRAMING PLAN SHALL BE SUPPORTED BY (1) TRIMMER AND (1) KING STUD MINIMUM, HEADERS 6FT OR LONGER SHALL BE SUPPORTED BY A MINIMUM OF (2)-TRIMMERS AND (2)- KING STUDS UNO. TRIMMERS SHALL MAKE A CONTINUOUS LOAD PATH TO THE FOUNDATION TO INCLUDE SOLID BLOCKING IN THE JOIST CAVITY BETWEEN LEVELS.
5. ALL EXTERIOR WALLS (BEARING AND NON-BEARING) SHALL BE 2x6 @ 16" OC UNO.
6. ALL EXTERIOR WALLS SHALL BE SHEAR WALL TYPE 1W6 UNO.
7. PROVIDE SOLID BLOCKING OVER ALL SHEAR WALLS AND BEARING WALLS WITH CLIPS AS NOTED IN THE SHEAR WALL SCHEDULE.
8. ROOF TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING CRITERIA:

- •• ROOF PLAN SHOWN IS ASSUMED TO BE THE FINAL LAYOUT. IF THE ACTUAL TRUSS LAYOUT DIFFERS FROM THAT SHOWN ON THIS PLAN, THE ENGINEER OF RECORD SHALL BE NOTIFIED PRIOR TO THE ERECTION OF THE TRUSSES.
- •• FOR STANDARD DEAD AND LIVE LOADS AND SUBMITTAL INFORMATION, REFERENCE THE STRUCTURAL GENERAL NOTES.
- •• ALL SINGLE LAMINATION TRUSSES OR JACK TRUSSES, PROVIDE A SINGLE H2.5A HURRICANE TIE AT ALL EXTERIOR WALLS AND BEAMS UNO.

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Sandalwood Rd, Woodland, WA 98674

MICHAEL J. DAUBENBERGER — STATE OF WASHINGTON — 44296 — REGISTERED PROFESSIONAL ENGINEER

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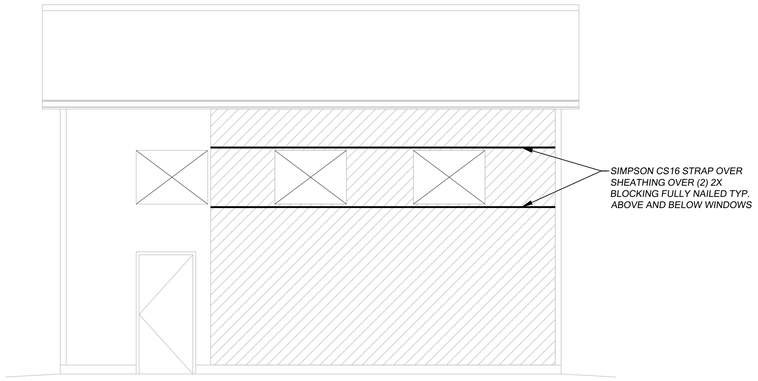
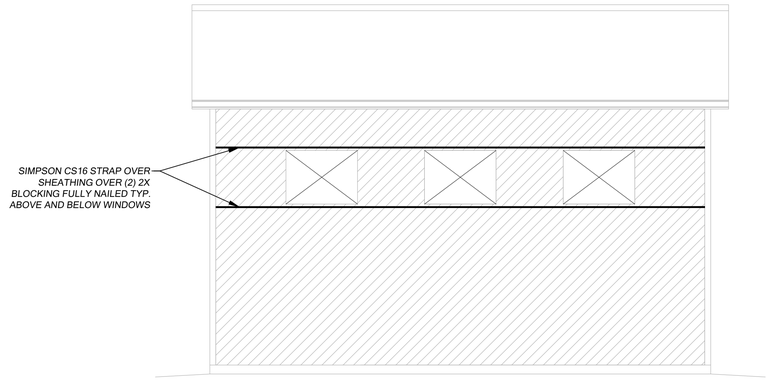


1 NEW SHOP BUILDING SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



2 NEW SHOP BUILDING NORTH ELEVATION
SCALE: 1/4" = 1'-0"

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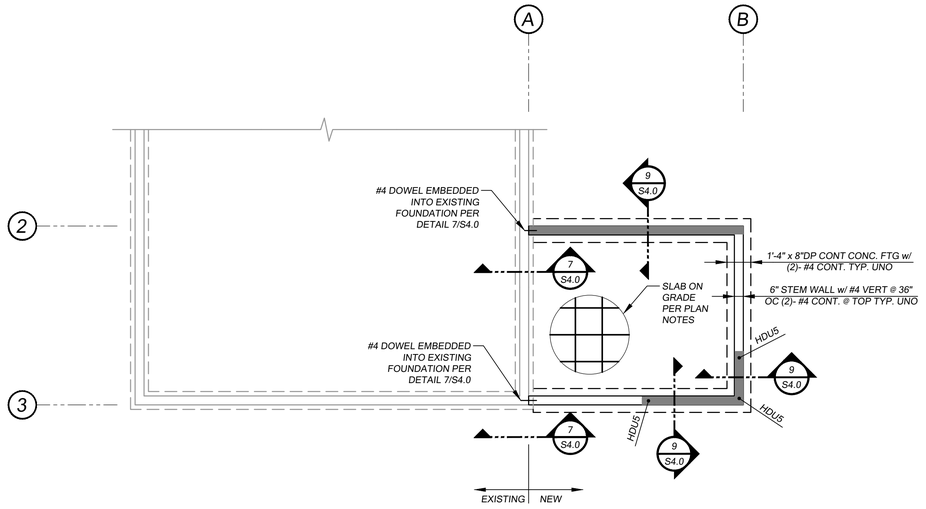
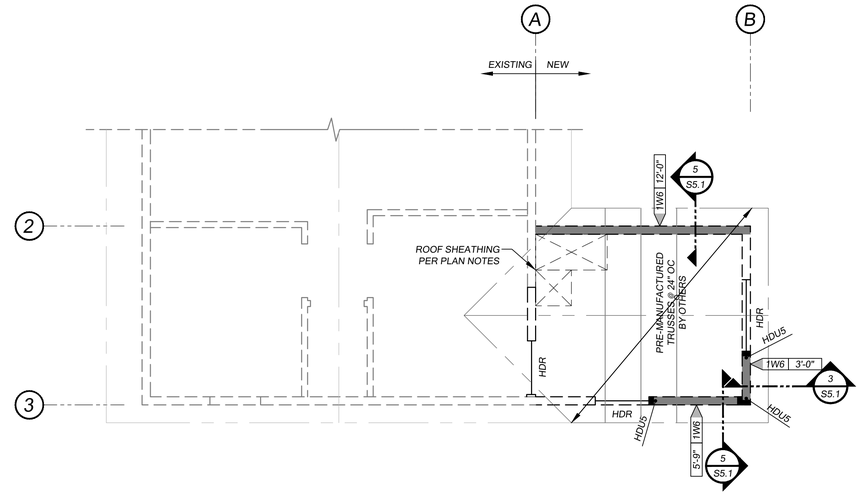


NORTH

OFFICE ADDITION FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



NORTH

OFFICE ADDITION ROOF FRAMING PLAN

SCALE: 1/4" = 1'-0"

FOUNDATION PLAN NOTES:

1. FOR STRUCTURAL GENERAL NOTES, DESIGN CRITERIA AND SCHEDULES REFERENCE S1.0 AND S5.0.
2. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS.
3. CONTRACTOR SHALL LOCATE AND VERIFY THE FOLLOWING WITH OTHERS PRIOR TO POURING CONCRETE; ALL BLOCKOUTS FOR DUCTS, PIPES AND VENTS.
4. TYPICAL BOTTOM OF EXTERIOR FOOTINGS SHALL BE 1'-6" MINIMUM BELOW EXISTING GRADE UNO.
5. CONTRACTOR TO VERIFY TOP OF CONCRETE (T/CONC) WALL ELEVATIONS PRIOR TO POURING CONCRETE.
6. ALL FOOTINGS AND SLABS SHALL BEAR ON COMPETENT NATIVE SOIL AND/OR STRUCTURAL FILL WITH A MINIMUM SOIL PRESSURE OF 1500 psf.
7. ALL WOOD EXPOSED TO CONCRETE, WEATHER, OR WITHIN 8" OF FINISHED GRADE SHALL BE PRESSURE-TREATED.
8. ANCHOR BOLTS FOR FOUNDATION SILL PLATES TO BE 5/8" DIA. WITH 7" MINIMUM EMBEDMENT @ 48"OC UNO ON SHEAR WALL SCHEDULE, SEE S5.0. PROVIDE HOT-DIPPED GALVANIZED ANCHOR BOLTS AT PRESSURE-TREATED SILL PLATES. 3" x 3" x 1/4" HOT DIP GALVANIZED PLATE WASHERS SHALL BE PLACED BETWEEN THE SILL PLATE AND NUT. REFERENCE 5/S4.0 FOR TYPICAL SILL PLATE ANCHORAGE.
9. AT DOOR BLOCKOUTS IN THE FOUNDATION, PROVIDE A MINIMUM OF (2)- #4 VERT. BARS WITHIN 3" FROM THE EDGE OF THE OPENING. VERTICAL BARS SHALL EXTEND FROM THE TOP OF FOUNDATION WALL TO WITHIN 3" OF THE BOTTOM OF THE FOOTING. ALL VERTICAL BARS SHALL HAVE A 6" 90° HOOK AT THE BOTTOM (EMBEDDED) END.
10. TYPICAL SLAB ON GRADE:
    - 6" COMPACTED CRUSHED ROCK BASE
    - MOISTURE BARRIER
    - 4" CONCRETE SLAB W/ #3 @ 18" OC EACH WAY OR 6x6 W2.9-W2.9 WWF CHAIRED FOR 1-1/2" COVER FROM TOP OF SLAB
11. REFERENCE TYPICAL DETAILS AS FOLLOWS:

1/S4.0	TYPICAL CORNER REINFORCEMENT AT CONCRETE FOOTINGS
2/S4.0	TYPICAL CORNER REINFORCEMENT AT CONCRETE WALLS
3/S4.0	TYPICAL LAP SPLICE SCHEDULE
4/S4.0	TYPICAL SHEAR WALL ANCHOR REINFORCEMENT
5/S4.0	TYPICAL SILL PLATE ANCHORAGE DETAIL

DRAWING LEGEND

SYMBOL	DESCRIPTION
	INDICATES A FOOTING & STEMWALL
	INDICATES A SHEAR WALL FROM ABOVE
HDUx	INDICATES CONCRETE TO WOOD HOLD-DOWN, SEE HOLD-DOWN SCHEDULE ON S5.0
	INDICATES WOOD POST
	INDICATES STRUCTURAL EXTERIOR WALL
	INDICATES SHEAR WALL
TYPE LENGTH	INDICATES A SHEAR WALL, SEE SHEAR WALL SCHEDULE ON S5.0
	INDICATES ROOF LINE

ROOF FRAMING PLAN NOTES:

1. FOR STRUCTURAL GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND LEGEND, REFERENCE S1.0 AND S5.0.
2. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS.
3. ROOF SHEATHING SHALL BE 15/32" APA-RATED SHEATHING WITH A MINIMUM 32/16 SPAN RATING. SHEATHING SHALL BE NAILED TO ROOF FRAMING WITH 8d NAILS @ 6"OC AT PANEL EDGES AND @ 12"OC FIELD, UNO. LAY SHEATHING WITH FACE GRAIN (LONG DIRECTION) PERPENDICULAR TO SUPPORTS AND STAGGER PANEL END JOINTS. ALLOW 1/8" SPACE BETWEEN PANEL ENDS AND EDGES. BLOCK AND NAIL PANEL EDGES PER SCHEDULE. PROVIDE PANEL SHEATHING CLIPS CENTERED BETWEEN FRAMING AT UNBLOCKED SHEATHING EDGES AS REQUIRED BY ROOFING WARRANTY.
4. HEADERS (HDR) SHOWN BUT NOT SPECIFIED SHALL BE A MINIMUM OF 4x10. HEADERS SHOWN ON FRAMING PLAN SHALL BE SUPPORTED BY (1) TRIMMER AND (1) KING STUD MINIMUM, HEADERS 6FT OR LONGER SHALL BE SUPPORTED BY A MINIMUM OF (2)-TRIMMERS AND (2)- KING STUDS UNO. TRIMMERS SHALL MAKE A CONTINUOUS LOAD PATH TO THE FOUNDATION TO INCLUDE SOLID BLOCKING IN THE JOIST CAVITY BETWEEN LEVELS.
5. ALL EXTERIOR WALLS (BEARING AND NON-BEARING) SHALL BE 2x6 @ 16" OC UNO.
6. ALL EXTERIOR WALLS SHALL BE SHEAR WALL TYPE 1W6 UNO.
7. PROVIDE SOLID BLOCKING OVER ALL SHEAR WALLS AND BEARING WALLS WITH CLIPS AS NOTED IN THE SHEAR WALL SCHEDULE.
8. ROOF TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING CRITERIA:

- •• ROOF PLAN SHOWN IS ASSUMED TO BE THE FINAL LAYOUT. IF THE ACTUAL TRUSS LAYOUT DIFFERS FROM THAT SHOWN ON THIS PLAN, THE ENGINEER OF RECORD SHALL BE NOTIFIED PRIOR TO THE ERECTION OF THE TRUSSES.
- •• FOR STANDARD DEAD AND LIVE LOADS AND SUBMITTAL INFORMATION, REFERENCE THE STRUCTURAL GENERAL NOTES.
- •• ALL SINGLE LAMINATION TRUSSES, PROVIDE A SINGLE H2.5A HURRICANE TIE AT ALL EXTERIOR WALLS UNO.

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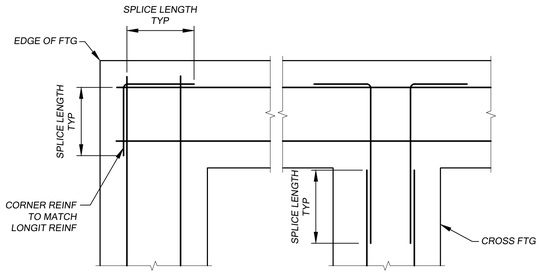
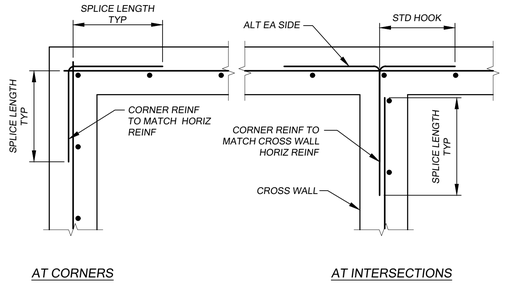


NOTES:

1. FOR SPLICE LENGTHS REFERENCE LAP SPLICE SCHEDULE.
2. FOR FOOTING REINFORCING, REFERENCE PLAN, SECTIONS AND DETAILS.
3. CORNER REINFORCING TO MATCH LONGITUDINAL FOOTING REINFORCING.

1 TYP CORNER REINF AT CONCRETE FOOTINGS

SCALE: NONE



NOTES:

1. FOR SPLICE LENGTHS REFERENCE LAP SPLICE SCHEDULE.
2. FOR WALL REINFORCING REFERENCE PLAN OR ELEVATIONS, SECTIONS AND DETAILS.
3. AT FOOTING AND STEM WALLS, CORNER REINFORCING TO MATCH FOOTING AND STEM WALL HORIZONTAL REINFORCING.

2 TYP CORNER REINFORCING @ CONCRETE WALLS

SCALE: NONE

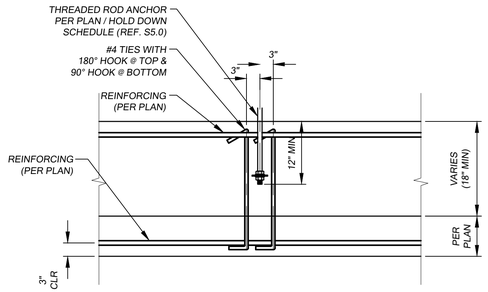
BAR SIZE	MISCELLANEOUS BARS			TOP BARS (see note #4)		
	Ld	CLASS A SPLICE	CLASS B SPLICE	Ld	CLASS A SPLICE	CLASS B SPLICE
f'c = 3000psi						
#3	17	17	22	22	22	28
#4	22	22	29	29	29	37
#5	27	27	36	36	36	46
#6	33	33	43	43	43	56
#7	48	48	62	62	62	81
#8	55	55	71	71	71	93
#9	62	62	80	80	80	104
#10	69	69	89	89	89	116
#11	75	75	98	98	98	127

NOTE:

1. VALUES FOR UNCOATED REINFORCING AND NORMAL WEIGHT CONCRETE WITH CLEAR SPACING > db, CLEAR COVER > db.
2. DEVELOP ALL REINFORCING IN STRUCTURAL SLABS WITH MINIMUM DEVELOPMENT LENGTH Ld.
3. TOP BAR IS DEFINED AS HORIZONTAL BARS WITH MORE THAN 12" OF FRESH CONCRETE BELOW OR AS NOTED ON DOCUMENTS AS "TOP BAR".
4. UNLESS NOTED OTHERWISE, ALL LAPS SHALL BE A MINIMUM CLASS B OR CLASS B (TOP BARS).
5. ALL TABULATED VALUES ARE IN INCHES.

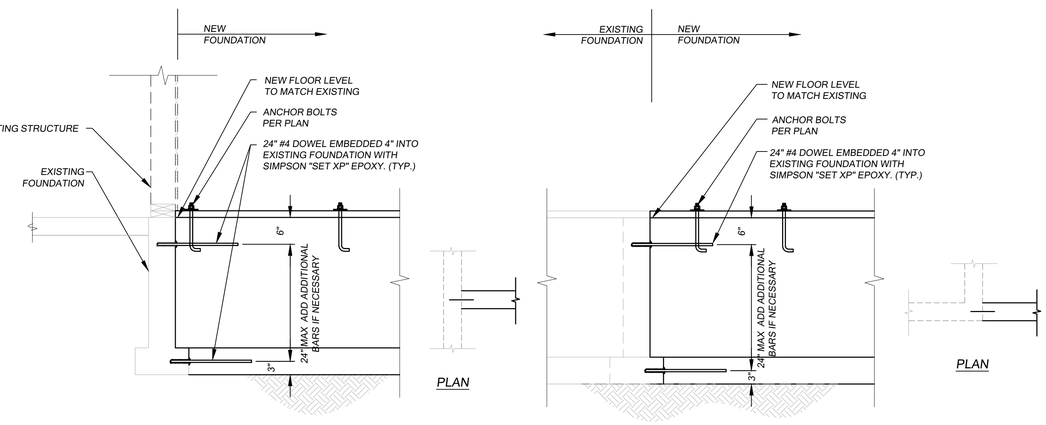
3 TYPICAL LAP SPLICE SCHEDULE

SCALE: NONE



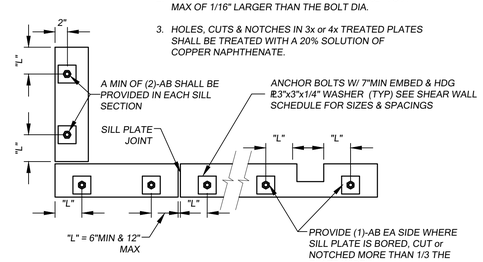
4 TYP. SHEAR WALL ANCHOR REINFORCEMENT

SCALE: NONE



7 NEW TO EXISTING FOUNDATION CONNECTION

SCALE: NONE

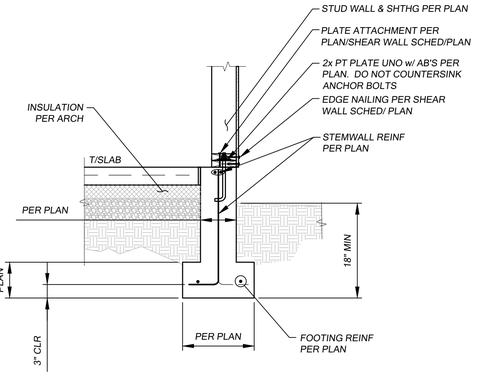


NOTES:

1. SILL PLATE SHALL BE PRESERVATIVE PRESSURE TREATED -REFER TO GENERAL NOTES FOR GLAV REQUIRMENTS FOR CONNECTORS & FASTENERS.
2. HOLES IN SILL PLATE SHALL BE A MIN OF 1/32" TO A MAX OF 1/16" LARGER THAN THE BOLT DIA.
3. HOLES, CUTS & NOTCHES IN 3x or 4x TREATED PLATES SHALL BE TREATED WITH A 20% SOLUTION OF COPPER NAPHTHENATE.

5 TYPICAL SILL PLATE ANCHORAGE DETAIL

SCALE: NONE

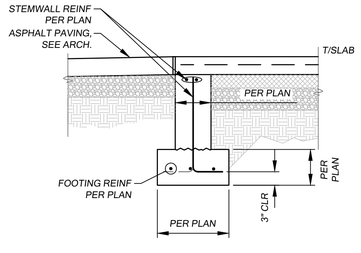


NOTES:

1. FOR CONSTRUCTION OR CONTROL JOINT LOCATIONS REFERENCE FOUNDATION/SLAB PLAN.
2. USE "EARLY ENTRY DRY-CUT SAW" AS SOON AS POSSIBLE WITHOUT CAUSING RAVELING OF CONCRETE EDGES. SAWCUT ALONG SHORT DIRECTION OF POUR FIRST.
3. PROVIDE CONSTRUCTION/CONTROL JOINT TO ENCLOSE APPROXIMATE SQUARE AREAS OF 225 SF MAX, WITH A MAXIMUM PANEL ASPECT RATIO OF 1.3 TO 1.0.

6 TYP SLAB ON GRADE JOINT DETAILS

SCALE: NONE



8 FOUNDATION SECTION

SCALE: NONE

9 FOUNDATION SECTION

SCALE 3/4" = 1'-0"

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SHEAR WALL SCHEDULE

SOME SHEAR WALL TYPES NOTED MAY NOT BE USED ON THIS PROJECT.

SHEAR WALL MARK (10)	CDX WALL SHEATHING, APA-RATED (8)	NAIL SIZE & SPACING @ ALL PANEL EDGES (3)	BLOCKING & STUD SIZE @ ADJOINING PANEL EDGES (2,4,9)	RIM JOIST or BLOCKING CONN. TO TOP PLATE BELOW (5)	2x PLATE ATTACHMENT NAILING TO WOOD BELOW	SILL PLATE ATTACHMENT		SHEAR CAPACITY lb/ft SEISMIC / WIND
						ANCHOR BOLTS TO CONC. BELOW (7)	SILL PLATE AT FOUNDATION	
L 1W6 ▶	15/32" ONE SIDE	8d @ 6"OC	2x	CLIP @ 20"OC	16d @ 6"OC	5/8"ø @ 48"OC	2x	260 / 364
L 1W4 ▶	15/32" ONE SIDE	8d @ 4"OC	2x	CLIP @ 12"OC	16d @ 4"OC	5/8"ø @ 32"OC	2x	350 / 490
L 1W3 ▶	15/32" ONE SIDE	8d @ 3"OC	3x	CLIP @ 10"OC	16d @ 3"OC	5/8"ø @ 12"OC	2x	490 / 686
						5/8"ø @ 32"OC	3x	
L 1W2 ▶	15/32" ONE SIDE	8d @ 2"OC	3x	CLIP @ 8"OC	(2)- ROWS 16d @ 4"OC (6)	5/8"ø @ 10"OC	2x	600 / 840
						5/8"ø @ 24"OC	3x	
L 2W4 ▶	15/32" BOTH SIDES (1)	8d @ 4"OC STAGGERED	3x	CLIP @ 12"OC EACH SIDE	(2)- ROWS 16d @ 4"OC (6)	5/8"ø @ 16"OC	3x	760 / 1064
L 2W3 ▶	15/32" BOTH SIDES (1)	8d @ 3"OC STAGGERED	3x	CLIP @ 10"OC EACH SIDE	(2)- ROWS 16d @ 3"OC (6)	5/8"ø @ 12"OC	3x	980 / 1372
L 2W2 ▶	15/32" BOTH SIDES (1)	8d @ 2"OC STAGGERED	3x	CLIP @ 6"OC	(2)- ROWS 16d @ 2"OC (6)	5/8"ø @ 10"OC	3x	1280 / 1792
L 2G4 ▶	5/8" GYB BOTH SIDES BLOCKED	6d COOLERS @ 4"OC	2x	CLIP @ 24"OC	16d @ 6"OC	5/8"ø @ 48"OC	2x	175 / 175

1. *Where sheathing is applied on both sides of wall, panel edge joints on 3x framing shall be staggered so that joints on the opposite sides are not located on the same studs.*
2. *Blocking is required at all panel edges in shear walls.*
3. *Panel edge nailing is required to each stud of a multiple stud hold-down post.*
4. *Intermediate framing to be 2x minimum members. Attach sheathing to intermediate framing with 8d nails at 12" oc*
5. *Framing clips: RBC, LTP4, LS50, or approved equivalent. Provide fasteners as required by Simpson. If SHEAR WALL sheathing is continuous across the top plate/ rim joist joint, framing clips may be omitted.*
6. *Where the bottom plate attachment specifies (2) rows of nails, provide a double joist, double rim joist, or double blocking. Alternatively, provide a member to match the wall plate width. Stagger nails 5/8", space 1 1/2" minimum. All members are to be solid sawn, or composite lumber. I-joists are not acceptable.*
7. *Foundation vents are acceptable under under shear wall types "1W6" and "1W4". Anchor bolts shall be placed 3" clear of foundation vents. Any two adjacent vents must have at least 12" of concrete between. Anchor bolt spacing may vary, but scheduled average spacing must be maintained. Foundation vents are not permitted under shear wall types "1w3", "1w2", "2w4", or "2w2".*
8. *7/16" APA-rated (OSB) sheathing may be used in place of 15/32" (CDX) sheathing provided that studs are spaced at 16' o.c. maximum.*
9. *(2)-2x studs nailed together at adjoining panel edges may be used in place of single 3x studs. Double 2x studs shall be connected together by nailing the studs together with 16d nails at the same spacing and diameter as the plate nailing.*
10. *L 2WX ▶ "L" indicates the minimum shear wall length, "Z" indicates number of sides requiring sheathing, "W" indicates wood sheathing and "X" indicates the minimum edge nail spacing.*

HOLD-DOWN SCHEDULE (1)

	TYPE	NUMBER OF STUDS/POST (2)	NAILS, SCREWS or BOLTS	DIAMETER	ANCHOR BOLT EMBEDMENT		CAPACITY kips
					STEMWALL (4)	SPREAD FOOTING	
					CIP (5)	CIP, (5, 6)	
CONCRETE TO WOOD	HTT4	(2) 2x	(18)-16d'S	5/8"ø	15"	12"	3.4
	HDU2-SDS2.5	(2) 2x	(6)-16d	5/8"ø	15"	12"	3.0
	HDU5-SDS2.5	(2) 2x	(14)-SDS 1/4"x2 1/2"	5/8"ø	15"	12"	5.6
	HDU8-SDS2.5	6x6	(20)-SDS 1/4"x2 1/2"	7/8"ø	17"	15"	7.8
	HDU14-SDS2.5	6x6	(36)-SDS 1/4"x2 1/2"	1"ø	22"	18"	14.4
WOOD TO WOOD (7)	MSTC28	(2) 2x	(6)-16d each end	-----	-----	-----	1.1
	MSTC40	(2) 2x	(14)-16d each end	-----	-----	-----	2.6
	MSTC52	(2) 2x	(22)-16d each end	-----	-----	-----	4.2
	MSTC66	(2) 2x	(32)-16d each end	-----	-----	-----	5.8

(1) SOME HOLD-DOWN TYPES NOTED MAY NOT BE USED ON THIS PROJECT.

(2) PROVIDE PANEL EDGE NAILING PER SHEAR WALL SCHEDULE AT HOLD-DOWN STUDS/POST. IF MULTIPLE STUDS ARE PROVIDED, NAIL STUDS TOGETHER WITH 16d NAILS STAGGERED TO MATCH THE SPACING OF THE SHEAR WALL EDGE NAILING

(3) BASED ON f'c = 2500 PSI CONCRETE.

(4) STEM WALLS SHALL BE 6" WIDE MINIMUM FOR 5/8" DIAMETER ANCHOR BOLTS AND 8" WIDE MINIMUM FOR 7/8" DIAMETER AND LARGER ANCHOR BOLTS.

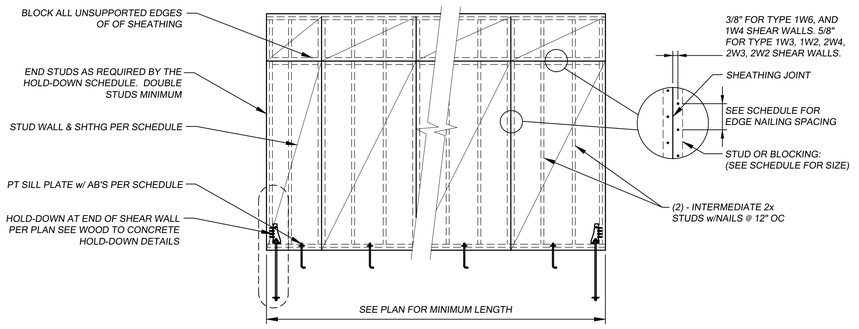
(5) CAST-IN-PLACE (CIP) TYPE ANCHOR BOLTS AT HOLD-DOWNS SHALL BE ASTM A36 THREADED RODS WITH A NUT AT THE BOTTOM EMBEDDED INTO CONCRETE AS SPECIFIED IN THE HOLD-DOWN SCHEDULE. SEE DETAILS.

(6) THREADED ROD WITH SIMPSON "SET-3G" EPOXY OR EQUIVALENT. OVERSIZE HOLES 1/8".

(7) CENTER STRAP ON CLEAR SPAN, PROVIED THE NUMBER OF SPECIFIED NAILS TO THE HOLD-DOWN STUDS ABOVE AND BELOW THE RIMBOARD.

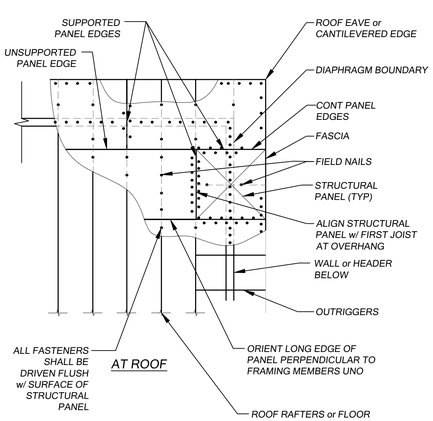
1 SHEAR WALL SCHEDULE

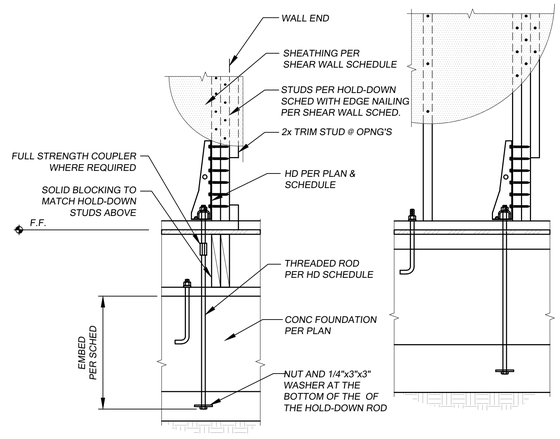
SCALE: 1"=1'-0"



3 HOLD-DOWN SCHEDULE

SCALE: 1"=1'-0"





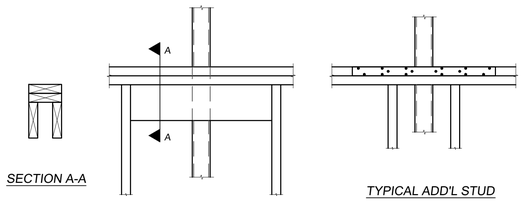
DIAPHRAGM NAILING SCHEDULE			
DIAPHRAGM TYPE	LOCATION	NAILS	SPACING
FLOOR DIAPHRAGM UNBLOCKED UNLESS NOTED ON PLAN	DIAPHRAGM BOUNDARY	10d	6" OC
	FIELD NAILS	10d	12" OC
	SUPPORTED PANEL EDGES	10d	6" OC
ROOF DIAPHRAGM UNBLOCKED UNLESS NOTED ON PLAN	DIAPHRAGM BOUNDARY	8d	6" OC
	FIELD NAILS	8d	10" OC
	SUPPORTED PANEL EDGES	8d	6" OC

NOTES:

1. *WHERE "DRAG STRUT" IS INDICATED ON PLAN, PROVIDE (2) ROWS OF SPECIFIED DIAPHRAGM BOUNDARY NAILING INDICATED IN TABLE.*
2. *WHERE A BLOCKED DIAPHRAGM IS INDICATED ON PLAN, PROVIDE 2x4 FLATWISE BLOCKING WITH SIMPSON Z2 CLIPS AT EACH END AT ALL UNSUPPORTED PANEL EDGES. USE 2x4 LSL FLATWISE BLOCKING IN LIEU OF SOLID SAWN WHERE NAILING SIZE OR SPACING EXCEEDS 8d @ 4"OC*

4 TYPICAL SHEAR WALL FRAMING DIAGRAM

SCALE: NONE



TYPICAL 2x6 BLOCKING

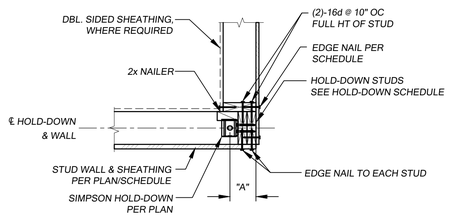
PLATE SIZE	WALL TYPE	HOLE DIAMETER	REINFORCEMENT	MINIMUM SPACING
2x4	TYPICAL	1" OR LESS	NONE	8" OC
		1 3/4" OR LESS	2x6 BLOCKING	24" OC
		2 1/2" OR LESS	ADD'L. STUD EA. SIDE & SIMPSON RPS22 EA. SIDE	48" OC
2x6	TYPICAL	1 1/2" OR LESS	NONE	8" OC
		2 1/2" OR LESS	2x6 BLOCKING OR ADD'L. STUDS	24" OC
		3 1/2" OR LESS	ATT'L. STUD EA. SIDE & SIMPSON RPS22 EA. SIDE	48" OC

6 TYPICAL PLATE PENETRATION

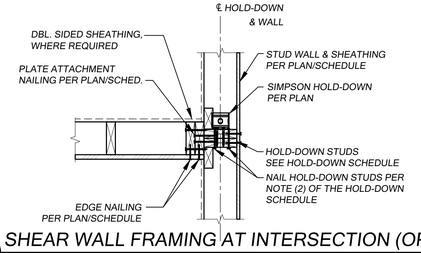
SCALE: 1"=1'-0"

5 TYPICAL DIAPHRAGM FRAMING DIAGRAM

SCALE: 1"=1'-0"

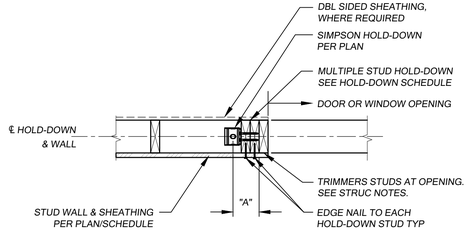


SHEAR WALL FRAMING AT CORNER



7 SHEAR WALL FRAMING AT INTERSECTION (OPTIONS A & B)

SCALE: 1"=1'-0"

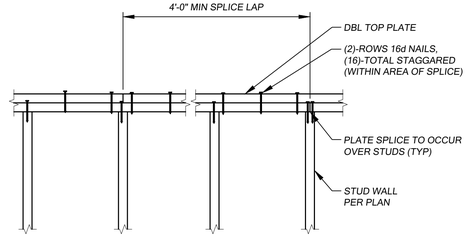


SHEAR WALL FRAMING AT OPENING

DIMENSION "A"			
HOLDDOWN	DBL 2x END STUDS	4x END STUDS	6x END STUDS
HTT	4 3/8"	4 7/8"	6 7/8"
HDU	4 1/4"	4 3/4"	6 3/4"
HHDQ	NA	NA	7"

5 WOOD TO CONCRETE HOLD-DOWN DETAIL

SCALE: 1"=1'-0"



NOTE:

FLOOR/ROOF JOISTS NOT SHOWN FOR CLARITY.

8 TYPICAL PLATE SPLICE

SCALE: NONE

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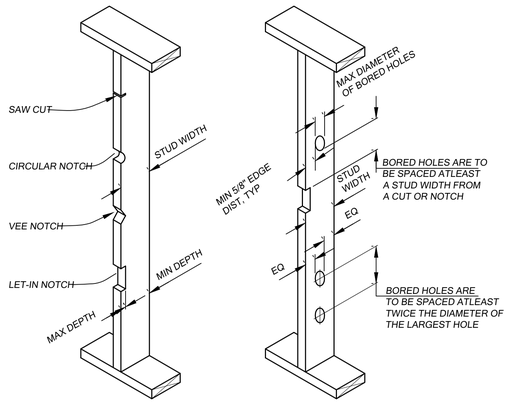
DANIEL J. DAUBENSPECK — STATE OF WASHINGTON — 44296 — REGISTERED PROFESSIONAL ENGINEER
11.30.2023

MRK	DATE	DESCRIPTION
	11-30-23	ISSUE FOR PERMIT/ BID

JOB NUMBER: 2330a

SHEET: S5.0



BEARING WALL STUDS		
STUD SIZE	MAX DEPTH OF EDGE CUT OR NOTCH	MIN DEPTH REMAINING AFTER CUT OR NOTCH
2x4	1"	2 1/2"
2x6	1 1/2"	4"

BEARING WALL STUDS		
STUD SIZE	MAX DIAMETER OF BORED HOLE	MIN DEPTH REMAINING AFTER BORED HOLE
2x4	1 5/8"	5/8" EA SIDE OF HOLE
2x6	2 1/2"	5/8" EA SIDE OF HOLE

NOTE:
STUDS MAY NOT BE BORED IN EXCESS OF 40% OF THE STUD. BORINGS SHALL NOT BE MADE AT THE SAME SECTION WHERE CUT OR NOTCH HAS BEEN MADE.

NON-BEARING WALL STUDS		
STUD SIZE	MAX DEPTH OF EDGE CUT OR NOTCH	MIN DEPTH REMAINING AFTER CUT OR NOTCH
2x4	1 5/8"	1 7/8"
2x6	2 1/2"	3"

NON-BEARING WALL STUDS		
STUD SIZE	MAX DIAMETER OF BORED HOLE	MIN DEPTH REMAINING AFTER BORED HOLE
2x4	2 1/4"	5/8" EA SIDE OF HOLE
2x6	3 5/8"	5/8" EA SIDE OF HOLE

NOTE:
STUDS MAY NOT BE BORED IN EXCESS OF 60% OF THE STUD. BORINGS SHALL NOT BE MADE AT THE SAME SECTION WHERE CUT OR NOTCH HAS BEEN MADE.

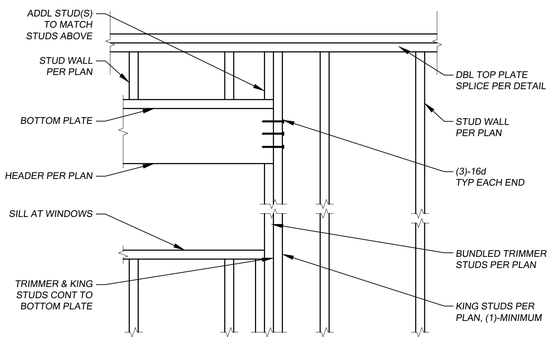
CUTTING & NOTCHING WOOD STUDS

NOTE:
DO NOT NOTCH MORE THAN THREE ADJACENT STUDS W/O REVIEW BY ENGINEER.

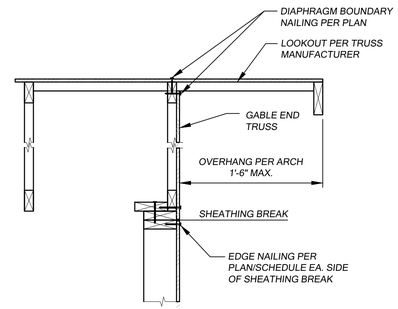
BORED HOLES IN WOOD STUDS

NOTE:
BORED HOLE NOT PERMITTED IN MORE THAN THREE ADJACENT STUDS W/O REVIEW BY ENGINEER.

1 TYPICAL STUD NOTCHING
SCALE: NONE

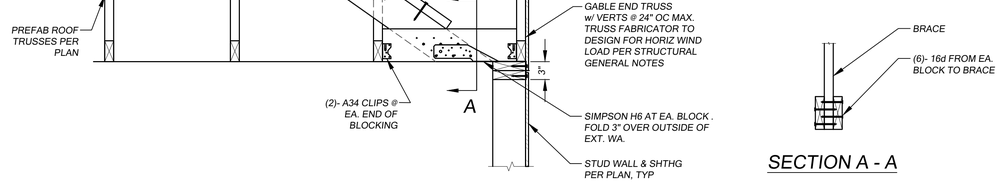


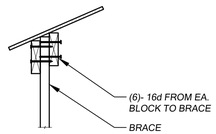
2 TYPICAL HEADER
SCALE: NONE



TRUSSES PARALLEL

3 TRUSS TO WALL FRAMING - PARALLEL
SCALE: 1"=1'-0"

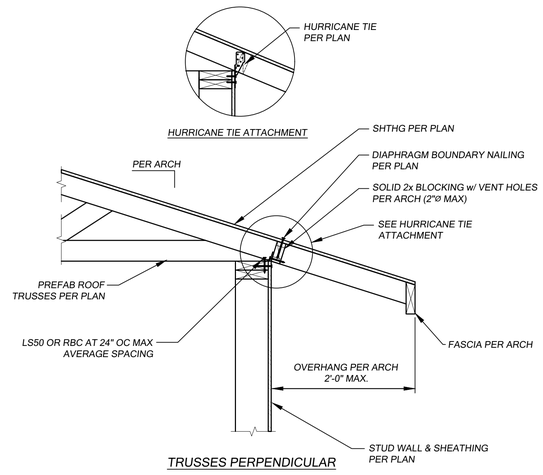




SECTION B - B

SECTION A - A

4 GABLE END TRUSS BRACE FRAMING
SCALE: 1"=1'-0"



TRUSSES PERPENDICULAR

5 TRUSS TO WALL FRAMING - PERPENDICULAR
SCALE: 1"=1'-0"

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11.30.2023

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JOB NUMBER: 2330a

SHEET: S5.1

OUTSIDE AIR VENTILATION SCHEDULE

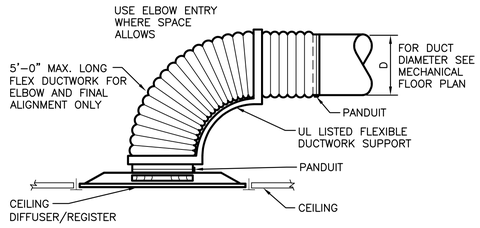
2021 IMC Table 403.3.3.1.1, WA AMMENDMENTS

System	Application	Cond. Area (SF)	Default Occ. Density # per 1000 SF	Occ. Load	Actual No.of Occ.or No. of Fixtures	CFM per Occ. or Fixture	People or Fixture Outdoor Airflow (CFM)	Area Outdoor Airflow (CFM/SF)	Area Outdoor Airflow (CFM)	Exhaust Airflow Rate (CFM/SF)	Exhaust Airflow Rate (CFM/FX)	Req'd Exhaust (CFM)	Req'd OSA (CFM)
FC-1	Office	185	5	1	1	5	5	0.06	11	–	0	0	16
											TOTAL REQ'D OSA CFM		16
											TOTAL REQ'D OSA CFM IN BREATHING ZONE		20
											TOTAL REQ'D EXHAUST CFM		0
											TOTAL PROVIDED OSA CFM		20
											DCV MINIMUM OSA CFM		0
											TOTAL PROVIDED EXHAUST CFM		0

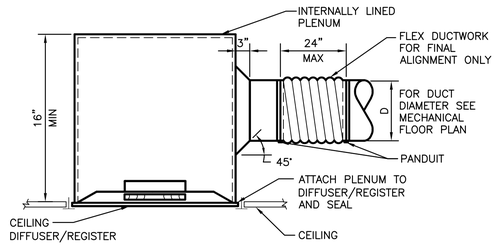
1. Existing OSA damper ventilation value to be increased by value shown on schedule. See sheet M2.

DIFFUSER,REGISTER, AND GRILLE SCHEDULE

TYPE	DESCRIPTION	MFR/MODEL	OBD
A	SUPPLY DIFFUSER, SURFACE MOUNTED	TITUS / TDC, 12x12 FACE	YES
B	RETURN, SURFACE MOUNTED	TITUS / PAR, 12x12 FACE	YES



ELBOW ENTRY



PLENUM ENTRY

NOTE: USE PLENUM ENTRY WHERE SPACE DOES NOT ALLOW FOR ELBOW ENTRY.

1 / M1 DIFFUSER / REGISTER DETAIL
NOT TO SCALE

MECHANICAL LEGEND

DUCTWORK FITTINGS (DOUBLE/SINGLE LINE) AND CONTROLS

DOUBLE LINE DUCTWORK / SINGLE LINE DUCTWORK

- SUPPLY AIR ELBOW UP
- RETURN/EXHAUST AIR ELBOW UP
- OUTSIDE AIR ELBOW UP
- SUPPLY AIR ELBOW DOWN
- RETURN/EXHAUST AIR ELBOW DOWN
- OUTSIDE AIR ELBOW DOWN
- FLEXIBLE DUCT
- TURNING VANE — SQUARE ELBOW
- D, R=1.5D — RADIUS ELBOW
- ACOUSTICALLY LINED DUCT (SIZES SHOWN ARE NET INSIDE)
- SUPPLY AIR DIFFUSER WITH THROW DIRECTION
- SUPPLY AIR SIDEWALL REGISTER
- RETURN/EXHAUST AIR CEILING REGISTER
- RETURN/EXHAUST AIR SIDEWALL REGISTER
- MVD MANUAL VOLUME DAMPER
- M — MD MOTORIZED DAMPER
- FSD FIRE SMOKE DAMPER
- T/S, VAV-1 — THERMOSTAT/SENSOR MOUNTED @ 48" AFF WITH UNIT SERVED NOTED

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
BDD	BACKDRAFT DAMPER
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
(E)	EXISTING
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST AIR
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
MA	MAKE-UP AIR
MBH	1000 BTU PER HOUR
MFR	MANUFACTURER
(N)	NEW
OSA	OUTSIDE AIR
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
SA	SUPPLY AIR

REFERENCE

- CONNECT TO EXISTING AT THIS POINT. VERIFY LOCATION, SIZE, AND CONDITION.
- 1 — SHEET NOTE
- VAV 1 — EQUIPMENT MARK NUMBER SEE SCHEDULES
- 1 — REVISION
- 20x10 / 500 A / OBD — DIFFUSER/REGISTER MARK NUMBER SCHEDULED TYPE; NECK SIZE; CFM; OPPOSED BLADE DAMPER

NOTE: NOT ALL SYMBOLS OR ABBREVIATIONS CONTAINED IN THIS LEGEND WILL APPEAR ON DRAWINGS.

DRAWING SCHEDULE

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Woodland WWTP
Sandalwood Rd, Woodland, WA 98674

MARK D. JONES — STATE OF WASHINGTON — #43743 — REGISTERED PROFESSIONAL ENGINEER
2023.11.29 12:44:32-08'00'

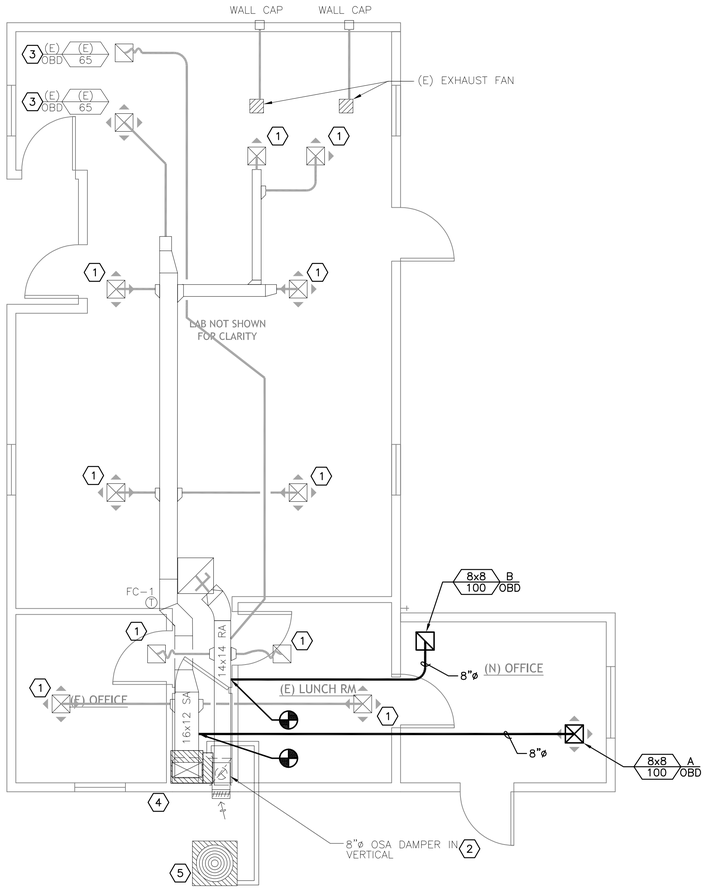
MRK	DATE	DESCRIPTION
0	11-30-23	PERMIT/BID SET

JOB NUMBER: 2330a

SHEET: M1

LEGEND AND ABBREVIATIONS

R&W ENGINEERING, INC.
9615 S.W. Allen Boulevard
Suite 107
Beaverton, Oregon 97005
Phone: (503)726-3324
Office: (503) 292-6000
E-mail: nweng@rweng.com
Project No.: 247.145.001 Contact: MARK JONES



1 / M2 MECHANICAL PLAN VIEW
SCALE: 1/4" = 1'-0"

0 4 8 12 16
SCALE IN FEET
1/4" = 1'-0"

NOTES THIS SHEET

1. (E) DIFFUSERS AND RETURNS TO REMAIN AT CURRENT AIRFLOW VALUE. PRIOR TO CONSTRUCTION, VERIFY EXISTING AIRFLOWS FOR USE IN FINAL BALANCING.
2. EXISTING OSA DAMPER VENTILATION VALUE TO BE INCREASED BY VALUE SHOWN ON OSA SCHEDULE. SEE SHEET M1.
3. REDUCE AIRFLOW TO VALUE SHOWN.
4. (E) 3-TON FC WITH AIRFLOW OF 1060 CFM.
5. (E) 3-TON HP.

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Office addition & New Shop Bldg for: Woodland WWTP

Sandalwood Rd, Woodland, WA 98674

MARK D. JONES STATE OF WASHINGTON #43743 REGISTERED PROFESSIONAL ENGINEER
2023.11.29 12:44:57-08'00'

MRK	DATE	DESCRIPTION
0	11-30-23	PERMIT/BID SET

JOB NUMBER: 2330a

SHEET: M2

MECHANICAL PLAN VIEW

R&W ENGINEERING, INC.
9615 S.W. Allen Boulevard
Suite 107
Beaverton, Oregon 97005
Phone: (503)726-3324
Office: (503) 292-6000
E-mail: rweng@rweng.com
Project No.: 247.145.001 Contact: MARK JONES

SECTION 15050 – BASIC MATERIALS AND METHODS

1 GENERAL

1.1 WORK INCLUDED:
A. PROVIDE ALL EQUIPMENT, MATERIAL AND LABOR TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS.
B. DRAWINGS ARE DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND, TEE, OR ELBOW WHICH MAY BE REQUIRED TO INSTALL WORK IN THE SPACE PROVIDED. DO NOT SCALE DRAWINGS FOR ROUGHING–IN MEASUREMENTS, NOR USE AS SHOP DRAWINGS. MAKE FIELD MEASUREMENTS AND PREPARE SHOP DRAWINGS AS REQUIRED. COORDINATE WORK WITH SHOP DRAWINGS OF OTHER TRADES. PROVIDE ANY BENDS, OFFSETS AND ELBOWS WHERE REQUIRED BY LOCAL CONDITIONS FROM MEASUREMENTS TAKEN AT THE BUILDING (SUBJECT TO APPROVAL) AND WITHOUT ADDITIONAL COST TO THE PROJECT. THE RIGHT IS RESERVED TO MAKE ANY REASONABLE CHANGES IN OUTLET LOCATION PRIOR TO ROUGHING–IN.
C. OBTAIN AND PAY FOR ALL PERMITS, LICENSES, FEES AND TAXES APPLICABLE TO THIS PROJECT AS REQUIRED BY LAW AND GOVERNING AUTHORITIES.

1.2 QUALITY ASSURANCE
A. REGULATORY REQUIREMENTS:
1. ALL WORK, INSTALLATIONS, MATERIALS AND EQUIPMENT SHALL COMPLY WITH THE PROVISION OF THE FOLLOWING CODES, STANDARDS AND REGULATIONS, EXCEPT WHERE MORE STRINGENT REQUIREMENTS ARE SHOWN OR SPECIFIED:
A. CURRENT EDITION OF STATE OF WASHINGTON UNIFORM PLUMBING CODE AND AMENDMENTS (UPC).
B. CURRENT EDITION OF STATE OF WASHINGTON INTERNATIONAL MECHANICAL CODE AND AMENDMENTS (IMC).
C. CURRENT EDITION OF STATE OF WASHINGTON STRUCTURAL SPECIALTY CODE AND AMENDMENTS (IBC).
D. NATIONAL ELECTRICAL CODE (NEC).
E. NATIONAL FIRE PROTECTION AGENCY (NFPA).
F. ALL CITY, COUNTY, STATE AND FEDERAL APPLICABLE LAWS AND REGULATIONS.
G. REGULATIONS AND STANDARDS SET FORTH BY ASME, ASHRAE, SMACNA, AGA AND ARI.
2. WHERE TWO OR MORE CODES OR REGULATIONS APPLY, THE MORE STRINGENT OF THE TWO SHALL BE EXERCISED.
3. ELECTRICAL PRODUCTS SHALL BEAR THE U.L. LABEL.
B. WORK SHALL BE OF GOOD QUALITY, FREE OF FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.
C. WORKMANSHIP: ALL MATERIALS SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.

1.3 SUBMITTALS
A. SHOP DRAWINGS AND PRODUCT DATA: SUBMIT ALL EQUIPMENT DRAWINGS AND PRODUCT DATA FOR WORK OF DIVISION 15 TOGETHER IN A GROUP IN A 3–RING LOOSE LEAF BINDER, WITH EACH ITEM FIELD UNDER A TAB, AND LABELED WITH ITS RESPECTIVE SPECIFICATION SECTION NUMBER, ARTICLE AND PARAGRAPH, AND MARK IF APPLICABLE.

1.4 OPERATING AND MAINTENANCE MANUAL AND PARTS LISTS:
A. SUBMIT THREE BOUND COPIES OF MANUFACTURER'S OPERATION AND MAINTENANCE INSTRUCTION MANUALS AND PARTS LISTS FOR EACH PIECE OF EQUIPMENT OR ITEM REQUIRING SERVICING. INCLUDE IN THE MANUAL MANUFACTURER'S SERVICE DATA, WIRING DIAGRAMS AND PARTS LISTS FOR ALL MAJOR ITEMS OF EQUIPMENT, VALVE CHARTS, BALANCING DATA, FINAL CONTROL DIAGRAMS SHOWING FINAL SET POINTS AND ANY ADDITIONAL EQUIPMENT ADDED BY CONTRACT MODIFICATION.

1.5 PROJECT RECORD (AS–INSTALLED) DRAWINGS:
A. KEEP DRAWINGS CLEAN, UNDAMAGED AND UP TO DATE.
B. MAKE DRAWINGS AVAILABLE WHEN REQUESTED BY ENGINEER FOR HIS REVIEW.

1.6 PROJECT CONDITIONS:
A. EXISTING CONDITIONS: PRIOR TO BIDDING, VERIFY AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS BY VISITING THE SITE AND INCLUDE ALL FACTORS WHICH MAY AFFECT THE EXECUTION OF THIS WORK. INCLUDE ALL RELATED COSTS IN THE INITIAL BID PROPOSAL.
B. COORDINATE EXACT REQUIREMENTS GOVERNED BY ACTUAL JOB CONDITIONS. CHECK ALL INFORMATION AND REPORT ANY DISCREPANCIES BEFORE FABRICATING WORK. REPORT CHANGES IN TIME TO AVOID UNNECESSARY WORK. MAKE CHANGES AS DIRECTED BY OWNER.

1.7 WARRANTY:
A. PROVIDE A WRITTEN GUARANTY COVERING THE WORK OF THIS DIVISION FOR A PERIOD OF ONE CALENDAR YEAR FROM THE DATE OF ACCEPTANCE OF THE ENTIRE PROJECT AS REQUIRED BY THE GENERAL PROVISIONS.

2 PRODUCTS

2.1 QUALITY ASSURANCE
A. PROVIDE PRODUCTS WHICH ARE COMPATIBLE WITH OTHER PORTIONS OF THE WORK AND PROVIDE PRODUCTS WITH THE PROPER AND CORRECT POWER AND FUEL BURNER CHARACTERISTICS AND SIMILAR ADAPTATIONS FOR THE PROJECT.

2.4 STARTERS AND SWITCHES
A. GENERAL: PROVIDE EACH MOTOR WITH STARTER OR SWITCH AS APPROVED AND RECOMMENDED BY MANUFACTURER OF MOTOR OR EQUIPMENT OF WHICH MOTOR IS A PART.
B. MAGNETIC STARTERS: PROVIDE FOR 1/2 HORSEPOWER AND LARGER MOTORS, AND FOR SMALLER MOTORS ON AUTOMATIC CONTROL OR WITH INTERLOCK SWITCH. INCLUDE PILOT LIGHTS, RESET, TRIP–FREE RELAY ON EACH PHASE, HAND–OFF–AUTO SWITCH IN COVER, AND DEVICES FOR COORDINATION WITH CONTROL SYSTEM (INCLUDING TRANSFORMER FOR CONTROL CIRCUIT, VERIFY HOLDING COIL VOLTAGE REQUIREMENTS WITH CONTROL SYSTEM DESIGN). PROVIDE AUTOMATIC AMBIENT TEMPERATURE COMPENSATION FOR STARTER HEATERS.
C. MANUAL SWITCHES: PROVIDE ON MOTORS 1/3 HORSEPOWER AND SMALLER EXCEPT WHERE AUTOMATIC CONTROL OR INTERLOCK IS INDICATED. INCLUDE PILOT LIGHT. PROVIDE OVERLOAD PROTECTION WHERE NOT PROTECTED BY PANELBOARD CIRCUIT BREAKER OR FUSED DISCONNECT SWITCH.
D. MANUFACTURERS: GENERAL ELECTRIC, ITE, ALLEN BRADLEY, ARROW–HART, CUTLER–HAMMER, SQUARE D OR ACCEPTED SUBSTITUTE.

2.5 IDENTIFICATION MARKERS
A. PIPE MARKERS:
1. ADHESIVE PIPE MARKERS OF WIDTH, LETTER SIZE AND BACKGROUND COLOR CONFORMING TO ANSI A13.1 AND UPC 601.2.1 AND 602.2.2.
2. ACCEPTABLE MANUFACTURERS: BRADY B350 WITH BANDING TAPE OR SIMILAR SEATON, ZESTON, PORTER, TNEMEL.
B. NAMEPLATES:
1. ENGRAVED NAMEPLATES, 1/16 INCHES THICK, LAMINATED 3–PLY PLASTIC, CENTER PLY WHITE, OUTER PLY BLACK, LETTERS FORMED BY EXPOSING CENTER PLY.
2. SIZE: 3 INCHES BY 5 INCHES NAMEPLATES WITH 1/4 INCH HIGH LETTERS.
3. ACCEPTABLE MANUFACTURERS: LAMICOID.

3 EXECUTION

3.1 MECHANICAL EQUIPMENT WIRING
A. PROVIDE ALL MECHANICAL EQUIPMENT MOTORS, AUTOMATIC TEMPERATURE, LIMIT, FLOAT AND SIMILAR CONTROL DEVICES REQUIRED, WITH WIRING COMPLETE FROM POWER SOURCE INDICATED ON ELECTRICAL DRAWINGS.
B. EQUIPMENT AND SYSTEMS SHOWN ON THE DRAWINGS AND/OR SPECIFIED, ARE BASED UPON REQUIREMENTS OF SPECIFIC MANUFACTURERS WHICH ARE INTENDED AS SOMEWHAT TYPICAL OF SEVERAL MAKES WHICH MAY BE APPROVED. PROVIDE ALL FIELD WIRING AND/OR DEVICES NECESSARY FOR A COMPLETE AND OPERABLE SYSTEM INCLUDING CONTROLS FOR THE ACTUAL SELECTED EQUIPMENT/SYSTEM.
C. PROVIDE ALL STARTERS FOR MECHANICAL MOTORS. REVIEW ELECTRICAL SPECIFICATIONS AND DRAWINGS TO DETERMINE WHICH MECHANICAL MOTOR STARTERS WILL BE PROVIDED UNDER THE ELECTRICAL SPECIFICATION SECTIONS AND PROVIDE ALL OTHERS.

3.2 MECHANICAL SYSTEM IDENTIFICATION
A. PIPING SYSTEM: INDICATE EACH PIPE SYSTEM BY ITS GENERIC NAME (ABBREVIATED) AS SHOWN; EXCEPT VENT AND DRAINAGE PIPING. COMPLY WITH ANSI A13.1 FOR MARKER LOCATIONS, LETTER SIZES, AND COLORS. INCLUDE ARROWS TO SHOW DIRECTION OF FLOW AND "ELECTRIC TRACED" SIGNS TO IDENTIFY HEAT CABLE WRAPPED PIPING.
B. EACH NEW PIECE OF EQUIPMENT SHALL BEAR A PERMANENTLY ATTACHED IDENTIFICATION PLATE, LISTING THE MANUFACTURER'S NAME, CAPACITIES, SIZES AND CHARACTERISTICS. IN ADDITION TO THE MANUFACTURER'S IDENTIFICATION PLATE, PROVIDE NAMEPLATES OF BLACK PHENOLIC RESIN LAMINATE AND IDENTIFY NEW EQUIPMENT BY NAME AND NUMBER 1/2" HIGH LETTERS.

3.3 CLEANING
A. GENERAL: CLEAN MECHANICAL AND PLUMBING EQUIPMENT, FIXTURES, PIPING AND DUCTWORK OF STAMPINGS AND MARKINGS (EXCEPT THOSE REQUIRED BY CODES), IRON CUTTINGS, AND OTHER REFUSE.

3.4 LAYOUT AND COORDINATION
A. SITE EXAMINATION: BEFORE STARTING WORK, CAREFULLY EXAMINE SITE AND ALL CONTRACT DRAWINGS SO AS TO BECOME THOROUGHLY FAMILIAR WITH CONDITIONS GOVERNING WORK ON THIS PROJECT. VERIFY ALL INDICATED ELEVATIONS, BUILDING MEASUREMENTS, ROUGHING–IN DIMENSIONS AND EQUIPMENT LOCATIONS BEFORE PROCEEDING WITH ANY OF THE WORK.
B. THE EXISTENCE OF ANY WIRES, CONDUITS, PIPES, DUCTS OR OTHER SERVICE FACILITIES ARE SHOWN IN A GENERAL WAY ONLY. IT WILL BE THE DUTY OF THE CONTRACTOR TO VISIT THE SITE AND MAKE EXACT DETERMINATION OF THE EXISTENCE OF ANY SUCH FACILITIES PRIOR TO SUBMITTING A BID. IT IS UNDERSTOOD THAT THE CONTRACTOR WILL BE RESPONSIBLE FOR MAKING THE EXACT DETERMINATION OF THE LOCATION AND CONDITION OF THESE FACILITIES.
C. SLEEVES, INSETS, CAST–IN–PLACE WORK: PROVIDE SLEEVES, INSERTS, ANCHORING DEVICES, CAST–IN–PLACE WORK, ETC. WHICH MUST BE SET IN CONCRETE SEQUENCED AT THE PROPER TIME FOR THE PROJECT SCHEDULE.
D. DISCREPANCIES: REPORT IMMEDIATELY ANY ERROR, CONFLICT OR DISCREPANCY IN PLANS, SPECIFICATIONS AND/OR EXISTING CONDITIONS.

3.5 MECHANICAL WORK CLOSEOUT
A. RECORD DRAWINGS: SUBMIT RECORD SET OF DRAWINGS AND SUBMITTALS AS PREVIOUSLY SPECIFIED IN THIS SECTION.
B. CLOSEOUT EQUIPMENT/SYSTEMS OPERATIONS: OPERATE EACH ITEM OF EQUIPMENT AND EACH SYSTEM IN A TEST RUN OF APPROPRIATE DURATION WITH THE OWNER'S OPERATING PERSONNEL PRESENT, TO DEMONSTRATE SUSTAINED, SATISFACTORY PERFORMANCE. ADJUST AND CORRECT OPERATIONS AS REQUIRED FOR PROPER PERFORMANCE. CLEAN AND LUBRICATE EACH SYSTEM, AND REPLACE DIRTY FILTERS, EXCESSIVELY WORN PARTS AND SIMILAR EXPENDABLE ITEMS OF THE WORK.
C. OPERATION AND INSTRUCTION: PROVIDE EIGHT (8) HOURS OF ON–SITE TRAINING TO OWNER'S PERSONNEL ON ALL MECHANICAL SYSTEMS AND EQUIPMENT. TRAINING SHALL INCLUDE MAINTENANCE, LUBRICATION, TROUBLESHOOTING AND REPAIR. CONTRACTOR SHALL PROVIDE NECESSARY WRITTEN MANUALS AND TRAINING AIDES EXPLAINING OPERATIONAL DIAGRAMS, EMERGENCY AND ALARM PROVISIONS, SEQUENCING REQUIREMENTS, SEASONAL PROVISIONS, SECURITY, SAFETY AND SIMILAR FEATURES OF THE INSTALLED SYSTEM. THREE (3) COPIES OF WRITTEN MANUALS SHALL BE LEFT WITH OWNER AT END OF TRAINING.

SECTION 15090 – SUPPORTS AND ANCHORS

1 GENERAL

1.1 WORK INCLUDED
A. PROVIDE SUPPORTS, ANCHORS, AND ALL RELATED ITEMS FOR COMPLETE SYSTEMS.

1.2 QUALITY ASSURANCE
A. PROVIDE PRE–MANUFACTURED HORIZONTAL DUCTWORK HANGERS, CLAMPS, HANGER ROD, SHIELDS, SUPPORTS, ETC.
B. SEISMIC REQUIREMENTS: PROVIDE SEISMIC RESTRAINTS IN ACCORD WITH THE FOLLOWING SEISMIC HAZARD LEVELS (SHL) AS RECOMMENDED IN THE "SEISMIC RESTRAINT MANUAL: GUIDELINES FOR MECHANICAL SYSTEMS," LATEST EDITION, SMACNA.
1. SHL "B": ALL SEISMIC ZONE "3" AND ALL OCCUPANCY CATEGORIES "I" AND "II" IN SEISMIC ZONE "2B".
2. SHL "C": ALL OCCUPANCY CATEGORIES "III" AND "IV" IN SEISMIC ZONE "2B".

2 PRODUCTS

2.1 HANGERS AND SUPPORTS
A. LISTED TYPES: THE MANUFACTURERS STANDARDIZATION SOCIETY (MSS) TYPES LISTED WITH GRINNELL FIGURE NUMBERS IN PARENTHESES WHERE APPLICABLE (OR OTHER MANUFACTURER'S AS NOTED). ITT GRINNELL, ELCEN, MICHIGAN, SUPER STRUT, KINDORF, UNISTRUT OR ACCEPTED SUBSTITUTE.

B. BUILDING ATTACHMENTS
1. CONCRETE INSERTS: MSS TYPE 18 (FIG. 282), STEEL OR GRINNELL POWER–STRUT PS349 CONTINUOUS CHANNEL.
2. CLAMPS: MSS TYPE 19 (FIG. 285, 281), TYPE 20, 21 (FIG. 225, 226, 131), TYPE 23 (FIG. 86, 87,88), TYPE 25 (FIG. 227), TYPE 27 THROUGH 30 WHERE APPLICABLE.

2.3 MISCELLANEOUS HANGER MATERIALS
A. METAL FRAMING: PROVIDE PRODUCTS COMPLYING WITH NEMA STD ML 1.
B. STEEL PLATES, SHAPES AND BARS: ASTM A–36.
C. CEMENT GROUT: PORTLAND CEMENT (ASTM C–150, TYPE I OR TYPE III) AND CLEAN UNIFORMLY GRADED, NATURAL SAND (ASTM C–404, SIZE NO. 2) MIX AT A RATIO OF 1.0 PART CEMENT TO 3.0 PARTS SAND, BY VOLUME WITH ONLY THE MINIMUM AMOUNT OF WATER REQUIRED FOR PLACEMENT AND HYDRATION.
D. HEAVY DUTY STEEL TRAPEZES: FABRICATE FROM STEEL SHAPES SELECTED FOR THE LOADS REQUIRED; WELD STEEL IN ACCORDANCE WITH AWS STANDARDS.
E. STANDARD BOLTS AND NUTS: ASTM A 307, GRADE A.
F. CONCRETE ANCHORS: RAWL LOK/BOLT, HILTI "HSL," ITT PHILLIPS, RED HEAD WEDGE ANCHORS, RAMSET TRUBOLT OR DYNABOLT OR ACCEPTED SUBSTITUTE.
G. SHOP PRIMER: MANUFACTURER'S STANDARD RUST INHIBITIVE PRIMER.

3 EXECUTION

3.1 INSTALLATION OF HANGERS AND SUPPORTS
A. GENERAL: PROCEED WITH THE INSTALLATION OF HANGERS, SUPPORTS AND ANCHORS ONLY AFTER THE REQUIRED BUILDING STRUCTURAL WORK HAS BEEN COMPLETED IN AREAS WHERE THE WORK IS TO BE INSTALLED. CORRECT INADEQUACIES INCLUDING (BUT NOT LIMITED TO) THE PROPER PLACEMENT OF INSERTS, ANCHORS AND OTHER BUILDING STRUCTURAL ATTACHMENTS.
B. ADJUST HANGERS AND SUPPORTS TO BRING PIPING TO PROPER LEVELS AND ELEVATIONS.
C. PROVIDE ALL NECESSARY STRUCTURAL ATTACHMENTS SUCH AS ANCHORS, BEAM CLAMPS, HANGER FLANGES AND BRACKETS IN ACCORDANCE WITH MSS SP–69. ATTACHMENTS TO BEAMS WHEREVER POSSIBLE. SUPPORTS SUSPENDED FROM OTHER PIPING, EQUIPMENT, METAL DECKING, ETC., ARE NOT ACCEPTABLE.

3.2 INSTALLATION OF ANCHORS
A. INSTALL ANCHORS AT THE PROPER LOCATIONS TO PREVENT STRESSES FROM EXCEEDING THOSE PERMITTED BY ANSI B31, WHERE RECOMMENDED IN SMACNA "SEISMIC RESTRAINT MANUAL" OR EXCEEDING MANUFACTURER'S RECOMMENDED LOADING, AND TO PREVENT THE TRANSFER OF LOADING AND STRESSES TO CONNECTED EQUIPMENT.
B. BOLTING: PROVIDE STANDARD PLATE WASHERS UNDER HEADS AND NUTS OF BOLTS BEARING ON WOOD. SOAP THREADS OF LAG BOLTS PRIOR TO INSTALLING.
C. STRUCTURAL BLOCKING: LOCATE AS INDICATED AND AS REQUIRED TO SUPPORT MECHANICAL PIPING AND EQUIPMENT.

SECTION 15260 – MECHANICAL INSULATION

1 GENERAL

1.1 WORK INCLUDED
A. PROVIDE DUCTWORK INSULATION INCLUDING JACKETING, ADHESIVE AND ALL RELATED ACCESSORIES FOR COMPLETE INSULATED SYSTEM.

1.2 FIRE HAZARD CLASSIFICATION
A. MAXIMUM FIRE HAZARD CLASSIFICATION OF THE COMPOSITE INSULATION TO BE NOT MORE THAN A FLAME SPREAD OF 25, FUEL CONTRIBUTED OF 50 AND SMOKE DEVELOPED OF 50 AS TESTED BY ASTM E84, NFPA 255 AND UL 723 METHOD.
B. TEST PIPE INSULATION IN ACCORDANCE WITH THE REQUIREMENTS OF UL 'PIPE AND EQUIPMENT COVERINGS R5583 400 8.15.', ASTM C1136 AND ASTM C547.
C. TEST DUCT INSULATION IN ACCORDANCE WITH ASTM E84 AND ASTM C1071 AND BEAR THE UL LABEL.

1.3 LINING MATERIALS
A. MATERIALS TO BE MOLD, HUMIDITY, AND EROSION RESISTANT SURFACE TO MEET THE REQUIREMENTS OF UL 181.

2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS
A. INSULATING MANUFACTURERS: JOHNS MANVILLE, KNAUF, ARMSTRONG, OWENS–CORNING, PABCO, IMCOA, CERTAIN TEED OR ACCEPTED SUBSTITUTE.
B. ADHESIVE MANUFACTURERS: BENJAMIN FOSTER, 3M, BORDEN, KINGCO OR ARMSTRONG.

2.2 DUCT INSULATION AND JACKETS
A. DUCT WRAP: 1 1/2 INCH FLEXIBLE GLASS FIBER; ANSI/ASTM C612; COMMERCIAL GRADE; 'K' VALUE OF 0.27 AT 75 DEGREES F. 1.0 PCF.
B. DUCT LINER: ASTM 1071; FLEXIBLE BLANKET. 'K' VALUE: ASTM C518, 0.25 AT 75F. NOISE REDUCTION COEFFICIENT: 0.65 OR HIGHER BASED ON 'TYPE A MOUNTING' MAXIMUM VELOCITY ON MAT OR COATED AIR SIDE: 5,000 FPM. ADHESIVE: UL LISTED WATERPROOF TYPE. FASTENERS: DUCT LINER GALVANIZED STEEL PINS, WELDED OR MECHANICALLY FASTENED. MOLD, HUMIDITY, AND EROSION RESISTANT SURFACES: UL 181.
C. JACKETING AND FASTENERS:
1. INDOOR JACKET: FOIL–SKRIM–KRAFT.
2. OUTDOOR JACKET: COATED GLASS FIBER SHEET, 30 LB/SQ YD.
3. LAGGING ADHESIVE: FIRE RESISTIVE TO ASTM E84, NFPA 255, AND UL 723.
4. IMPALE ANCHORS: GALVANIZED STEEL, 12 GAUGE, SELF–ADHESIVE PAD.
5. JOINT TAPE: GLASS FIBER CLOTH, OPEN MESH.
6. TIE WIRE: ANNEALED STEEL, 16 GAUGE (1.5 MM).

D. SOFTR® DUCT WRAP PAPER–FREE ASJ AND VAPORWICK® OR EQUAL APPROVED.

2.3 DUCT INSULATION ACCESSORIES
A. STAPLES, BANDS, WIRES, TAPE, ANCHORS, AND ACCESSORIES AS RECOMMENDED BY INSULATION MANUFACTURER.

2.4 DUCT INSULATION COMPOUNDS
A. CEMENTS, ADHESIVES, COATINGS, SEALERS, FINISHES AND ACCESSORIES AS RECOMMENDED BY INSULATION MANUFACTURER.

3 EXECUTION

3.1 PREPARATION
A. INSTALL MATERIALS AFTER PIPING, DUCTWORK AND EQUIPMENT HAS BEEN TESTED AND APPROVED.

3.2 DUCTWORK INSULATION INSTALLATION
A. INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
B. INSTALLATION:
1. BUTT INSULATION JOINTS FIRMLY TOGETHER AND INSTALL JACKETS AND TAPES SECURELY.
2. APPLY DUCT INSULATION CONTINUOUSLY THROUGH SLEEVES AND OPENINGS. APPLY VAPOR BARRIER MATERIALS TO FORM A VAPOR SEAL OVER THE INSULATION.
3. COVER BREAKS IN THE JACKET MATERIAL WITH PATCHES OF THE SAME MATERIAL AS THE VAPOR BARRIER. EXTEND THE PATCHES 2–INCHES BEYOND THE BREAK IN ALL DIRECTIONS AND SECURE WITH ADHESIVE.
4. SEAL INSULATION TERMINATIONS AND PIN PUNCTURES WITH A REINFORCED VAPOR BARRIER COATING.
5. CONTINUE INSULATION AT FIRE DAMPERS UP TO AND INCLUDING THOSE PORTIONS OF THE FIRE DAMPER FRAME WHICH ARE VISIBLE AND THE OUTSIDE OF THE RATED BARRIER.
6. DO NOT CONCEAL DUCT ACCESS DOORS WITH INSULATION.
7. DUCT LINERS: INSTALL MAT FINISH SURFACE ON AIR STREAM SIDE. SECURE INSULATION ON SHEET METAL DUCT WITH A CONTINUOUS 100 PERCENT COAT OF ADHESIVE. FOR WIDTHS OVER 20–INCH, ADDITIONALLY SECURE THE LINER WITH MECHANICAL FASTENERS15–INCH ON CENTER. CUT LINER AND COAT ENDS WITH ADHESIVE. BUTT JOINT TIGHTLY. TOP AND BOTTOM SECTIONS OF INSULATION OVERLAP SIDES. KEEP DUCT LINER CLEAN AND FREE FROM DUST. IF INSULATION IS INSTALLED WITHOUT HORIZONTAL, LONGITUDINAL AND END JOINTS BUTTED TOGETHER, INSTALLATION WILL BE REJECTED.
8. DUCT WRAP: COVER SUPPLY AIR DUCTS EXCEPT DUCTS INTERNALLY LINED OR WHERE FIBERGLASS DUCTBOARD IS UTILIZED. WRAP TIGHTLY WITH ALL CIRCUMFERENTIAL JOINTS BUTTED AND LONGITUDINAL JOINTS OVERLAPPED MINIMUM OF 2–INCH. ADHERE INSULATION WITH 4–INCH STRIPS OF INSULATING BENDING ADHESIVE AT 8–INCH ON CENTER. ON DUCTS OVER 24–INCH WIDE, ADDITIONALLY SECURE INSULATION WITH SUITABLE MECHANICAL FASTENERS AT 18–INCH ON CENTER. CIRCUMFERENTIAL AND LONGITUDINAL JOINTS STAPLED WITH FLARE STAPLES 6–INCH ON CENTER AND COVERED WITH 3–INCH WIDE FOIL REINFORCED TAPE.

C. CONTINUE INSULATION WITH VAPOR BARRIER THROUGH PENETRATIONS.
D. INTERNALLY LINED DUCTWORK: WHERE INTERNALLY LINED DUCTWORK IS INDICATED, NO EXTERIOR INSULATION IS REQUIRED. LAP THE ENDS OF THE EXTERIOR INSULATION A MINIMUM OF 6 INCHES PAST THE INTERIOR INSULATION UNLESS OTHERWISE SHOWN. SEAL THE END OF VAPOR BARRIER JACKET TO THE DUCT WITH MASTIC WHERE THE VAPOR BARRIER IS REQUIRED.

3.3 DUCTWORK SURFACES TO BE INSULATED

DUCTWORK	DUCT SIZE	INSULATION THICKNESS
SUPPLY AND RETURN DUCTWORK (EXCEPT WHERE DUCT IS LINED OR WHERE DUCTBOARD IS UTILIZED)	ALL	1–1/2" DUCT WRAP
SUPPLY AND RETURN DUCTWORK (EXPOSED TO WEATHER AND IN UNHEATED AREAS)	ALL	2" DUCT WRAP
OUTSIDE AIR DUCTS	ALL	2" DUCT LINER
HVAC PLENUMS	ALL	2" DUCT LINER

SECTION 15890 – AIR DISTRIBUTION

PART 1 – GENERAL

1.1 WORK INCLUDED

A. PROVIDE AIR DISTRIBUTION EQUIPMENT AS SPECIFIED HEREIN AND SHOWN.

B. EQUIPMENT CAPACITY AND SIZE SHALL BE AS SHOWN.

1.2 QUALITY ASSURANCE

A. DUCTWORK: COMPLY WITH REQUIREMENTS OF THE STATE MECHANICAL SPECIALTY CODE (LATEST EDITION).

1.3 SUBMITTALS

A. PROVIDE SUBMITTALS FOR THE FOLLOWING:
1. SPIRAL DUCTWORK.
2. FLEXIBLE DUCTWORK.
3. DAMPERS.
4. GRILLES, REGISTERS AND DIFFUSERS.

PART 2 – PRODUCTS

2.1 DUCTWORK

A. GALVANIZED STEEL SHEET METAL: METAL GAUGES, JOINTS AND REINFORCEMENT IN ACCORDANCE WITH MECHANICAL CODE, ASHRAE AND SMACNA TABLES AND RECOMMENDATIONS.

B. SPIRAL SEAM DUCT: ROUND AND FLAT OVAL SPIRAL SEAM DUCT SHALL BE MANUFACTURED OF GALVANIZED STEEL SHEET METAL WITH SPIRAL LOCK SEAM. MATCHING FITTINGS SHALL BE MANUFACTURED OF GALVANIZED STEEL WITH SPOT WELDED SEAMS. UNITED SHEET METAL, SEMCO, ROLOCK, METCO OR ACCEPTED SUBSTITUTE.

C. FLEXIBLE DUCTWORK: INSULATED LOW PRESSURE FLEXIBLE DUCT, FACTORY FABRICATED ASSEMBLY CONSISTING OF A ZINC COATED SPRING STEEL HELIX, SEAMLESS INNER LINER, WRAPPED WITH A NOMINAL ONE INCH THICK, ONE POUND PER CUBIC FOOT DENSITY FIBERGLASS INSULATION. THE ASSEMBLY SHALL BE SHEATHED IN A VAPOR BARRIER JACKET, FACTORY SEALED AT BOTH ENDS OF EACH SECTION ASSURING THE VAPOR RESISTANCE OF EACH SECTION AS WELL AS THE COMPLETED INSTALLATION. THE COMPOSITE ASSEMBLY, INCLUDING INSULATION AND VAPOR BARRIER, SHALL MEET THE CLASS I REQUIREMENTS OF NFPA 90A AND BE LABELED BY UL WITH A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR UNDER. THE DUCT SHALL HAVE FACTORY SEALED DOUBLE AIR SEAL (INTERIOR AND EXTERIOR), TO ASSURE AN AIRTIGHT INSTALLATION. GENFLEX, WIREMOLD, THERMAFLEX OR ACCEPTED SUBSTITUTE.

2.2 DUCT SEALING

A. ALUMINUM BONDED TO ALUMINIZED MYLAR REINFORCED WITH FIBERGLASS MESH BACKING AN ELASTOMERIC PRESSURE SENSITIVE ADHESIVE SPECIFICALLY FORMULATED FOR ADHESION TO GALVANIZED METAL. HARDCAST "AFG–1402" WITH "HD–181" DEGREASER OR ACCEPTED SUBSTITUTE.

B. TWO–PART SEALING SYSTEM WITH WOVEN FIBER, MINERAL GYPSUM IMPREGNATED TAPE AND NON–FLAMMABLE ADHESIVE. HARDCAST "DT–5300 TAPE AND "RTA–50" ADHESIVE OR UNITED "UNI–CAST" SYSTEM OR ACCEPTED SUBSTITUTE.

C. DUCT JOINTS FOR SHEET METAL DUCTS: "DUCTMATE SYSTEM" BY DUCTMATE INDUSTRIES, INC., FOR MAKING TRANSVERSE RECTANGULAR AND ROUND DUCT JOINTS. WARD DUCT CONNECTORS, INC., MEZ, LOCKFORMER TDC OR ACCEPTED SUBSTITUTES.

2.3 GRILLES, REGISTERS AND DIFFUSERS

A. DESCRIPTION: PROVIDE GRILLES, REGISTERS AND DIFFUSERS AS SHOWN.

B. FINISH:
1. STEEL: BAKED–ON WHITE ENAMEL FINISH, OR FLAT WHITE PRIME COAT, FACTORY APPLIED. VERIFY THE EXACT FINISH TYPE WITH ARCHITECTURAL DRAWINGS.
2. ALUMINUM: CLEAR ANODIZED.

C. MANUFACTURERS: AIR DEVICES, ANEMOSTAT, CARNES, KRUEGER, TUTTLE & BAILEY, PRICE CO., METALAIRE ARE ACCEPTED SUBSTITUTES WHERE TITUS MODEL NUMBERS ONLY ARE LISTED.

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MRK	DATE	DESCRIPTION
0	11-30-23	PERMIT/BID SET

JOB NUMBER: 2330a

SHEET: M3

MECHANICAL SPECIFICATIONS

PART 3 – EXECUTION

3.1 LAYOUT AND COORDINATION

A. SITE EXAMINATION: BEFORE STARTING WORK, CAREFULLY EXAMINE SITE AND ALL CONTRACT DRAWINGS. BECOME THOROUGHLY FAMILIAR WITH CONDITIONS GOVERNING WORK ON THIS PROJECT.

B. UTILITY LOCATIONS: THE LOCATION OF ALL UTILITIES, WIRES, CONDUITS, PIPES, DUCTS, OR OTHER SERVICE FACILITIES ARE SHOWN IN A GENERAL WAY ONLY ON THE DRAWINGS.

3.2 INSTALLATION

A. PROVIDE OPENINGS IN DUCTWORK WHERE REQUIRED TO ACCOMMODATE THERMOMETERS AND CONTROLLERS. PROVIDE PILOT TUBE OPENING WHERE REQUIRED FOR TESTING OF SYSTEMS, COMPLETE WITH METAL CAN WITH SPRING DEVICE OR SCREW TO ENSURE AGAINST AIR LEAKAGE. WHERE OPENINGS ARE PROVIDED IN INSULATED DUCTWORK, INSTALL INSULATION MATERIALS INSIDE A METAL RING.

B. LOCATE DUCTS WITH SUFFICIENT SPACE AROUND EQUIPMENT TO ALLOW NORMAL OPERATING AND MAINTENANCE ACTIVITIES.

C. PROVIDE MANUAL VOLUME DAMPERS AT POINTS ON LOW PRESSURE SUPPLY, RETURN, AND EXHAUST SYSTEMS WHERE BRANCHES ARE TAKEN FROM LARGER DUCTS FOR AIR BALANCING. USE SPLITTER DAMPERS ONLY WHERE SHOWN. LOCATION OF ALL VOLUME DAMPERS ARE NOT NECESSARILY SHOWN ON THE DRAWINGS.

D. PROVIDE FLEXIBLE CONNECTIONS IMMEDIATELY ADJACENT TO EQUIPMENT IN DUCTS ASSOCIATED WITH FANS AND MOTORIZED EQUIPMENT.

E. PROVIDE BACKDRAFT DAMPERS ON EXHAUST FANS OR EXHAUST DUCTS NEAREST TO OUTSIDE AND WHERE SHOWN.

F. PROVIDE DUCT ACCESS DOORS FOR INSPECTION AND CLEANING BEFORE AND AFTER FILTERS, COILS, FANS, AUTOMATIC DAMPERS, AT FIRE DAMPERS, AND ELSEWHERE AS INDICATED. PROVIDE MINIMUM 12 INCHES X 12 INCHES SIZE FOR HAND ACCESS, 18 INCHES X 24 INCHES SIZE FOR SHOULDER ACCESS AND AS INDICATED. INSTALL NECESSARY ACCESS OPENINGS AND COVERS FOR CLEANING, WIRING OR SERVICING MOTORS, FIRE DAMPERS, FILTERS, FANS, BOTH ENTERING AND LEAVING AIR SIDES OF COILS, AND TO OTHER EQUIPMENT LOCATED WITHIN OR BLOCKED BY DUCTWORK.

G. SUPPORT: INSTALL DUCTWORK WITH 1 INCH WIDE 16 GAUGE CRADLE HANGERS NOT MORE THAN 8 FEET C/C OR AS REQUIRED BY CODE. SUPPORT TERMINAL UNITS INDEPENDENT OF ADJACENT DUCTWORK. ATTACH TO AVAILABLE BUILDING CONSTRUCTION AS PER GOOD PRACTICES FOR MATERIALS INVOLVED. EXPOSED DUCTWORK SHALL BE SUPPORTED BY CLOSED CRADLE STRAP SUSPENDED FROM 3/8 INCH THREADED ROD.

H. CONNECTION FITTINGS: ROUND CONNECTIONS TO RECTANGULAR DUCTS MANUFACTURED SHEET METAL "SPIN–IN" FITTINGS. GENFLEX, WIREMOLD, THERMAFLEX, GLASSFLEX, CLEVEPAK, MANVILLE, OR ACCEPTED SUBSTITUTE.

I. ELBOWS AND FITTINGS: CONSTRUCT ELBOWS WITH THROAT RADIUS EQUAL TO DUCT WIDTH IN PLANE OR TURN OR MAKE THEM SQUARE AND PROVIDE DOUBLE WALL, AIR FOIL TURNING VANES.

J. FITTINGS: MAKE TRANSITIONS AND TAKE–OFFS AS SHOWN. PROVIDE VOLUME DAMPERS AND SPLITTER DAMPERS AS SHOWN AND AS SPECIFIED.

K. SLEEVES: PROVIDE GALVANIZED SHEET METAL PLASTER RING AROUND DUCTWORK PENETRATING EXPOSED FINISHED WALLS. SLEEVE AND FLASH ALL DUCT PENETRATIONS THROUGH EXTERIOR WALLS IN AN AIR TIGHT AND WEATHERPROOF MANNER.

L. PLENUMS: CONSTRUCT SHEET METAL PLENUMS AND PARTITIONS OF NOT LIGHTER THAN 18 GAUGE GALVANIZED STEEL AND REINFORCE WITH 1–1/2 INCH BY 1/2 INCH BY 1/8 INCH ANGLES AS REQUIRED TO PREVENT DRUMMING OR BREATHING.

M. ACOUSTICAL DUCT LINING: ACOUSTICALLY LINE ALL OUTSIDE AIR DUCTS AND PLENUMS, ALL FAN UNIT INTAKE AND DISCHARGE PLENUMS, ALL DUCTWORK INDICATED AS LINED ON THE DRAWINGS.

N. MANUAL VOLUME DAMPERS: LOCATION OF ALL VOLUME DAMPERS ARE NOT NECESSARILY SHOWN. PROVIDE A MINIMUM OF ONE VOLUME DAMPER IN EACH SUPPLY, RETURN OR EXHAUST BRANCH.

O. DUCT INSULATION: INSULATE ALL DUCTWORK PER SECTION 15 260 AS REQUIRING INSULATION. IN ADDITION, ALL DUCTWORK INDICATED IN TABLE NO. 13–S OF THE STRUCTURAL SPECIALTY CODE AND FIRE AND LIFE SAFETY REGULATIONS SHALL BE INSULATED OR LINED.

P. FLEXIBLE DUCTWORK: SUPPORT HANGER OR SADDLE MATERIAL IN CONTACT WITH DUCT SHALL BE OF SUFFICIENT WIDTH TO PREVENT ANY RESTRICTION OF THE INTERNAL DIAMETER OF THE DUCT, AND IN NO CASE LESS THAN 1 INCH WIDE. MAXIMUM SAG TO BE 1/2 INCH PER FOOT OF SPACING BETWEEN SUPPORTS. FLEXIBLE DUCTS SHALL BE INSTALLED IN A FULLY EXTENDED CONDITION FREE OF KINKS WITH NO DIRECTION CHANGE TO EXCEED 90 DEGREES, USING ONLY THE MINIMUM LENGTH REQUIRED TO MAKE THE CONNECTION WITH A MAXIMUM LENGTH OF 24 INCHES. SHEET METAL COLLARS TO WHICH THE DUCT IS ATTACHED SHALL BE A MINIMUM OF 2 INCHES LONG. FLEXIBLE DUCT SHALL BE INSERTED INTO THE COLLAR A MINIMUM OF 1 INCH AND INNER LINER SECURED WITH A MINIMUM 1/2 INCH WIDE POSITIVE LOCKING STEEL STRAP. IN DUCTS LARGER THAN 12 INCHES DIAMETER, STEEL STRAP MUST BE SECURED BY BEADING. RESHAPE INSULATION AND VAPOR BARRIER OVER DUCT AND COLLAR AND SECURE USING DRAWBAND. ATTACHMENT OF JOINTS IS SIMILAR USING A MINIMUM OF 4 INCHES LONG COLLAR.

Q. EXPOSED DUCTWORK JOINTS SHALL BE SEALED WITH "DUCTMATE SYSTEM".

R. DURING CONSTRUCTION PROVIDE TEMPORARY CLOSURES OF METAL OR TAPED POLYETHYLENE ON OPEN DUCTWORK TO PREVENT CONSTRUCTION DUST FROM ENTERING DUCTWORK SYSTEM.

S. FIBERGLASS DUCT INSTALLATION: ALL FABRICATION TO BE IN ACCORDANCE WITH SMACNA FIBROUS GLASS MANUAL, DUCT CONSTRUCTION STANDARDS.

3.3 ADJUSTING AND CLEANING

A. CLEAN DUCT SYSTEM AND FORCE AIR AT HIGH VELOCITY THROUGH DUCT TO REMOVE ACCUMULATED DUST. TO OBTAIN SUFFICIENT AIR, CLEAN HALF THE SYSTEM AT A TIME. PROTECT EQUIPMENT WHICH MAY BE HARMED BY EXCESSIVE DIRT WITH TEMPORARY FILTERS, OR BYPASS DURING CLEANING.

SECTION 15990 – TESTING, ADJUSTING, AND BALANCING

1 GENERAL

1.1 WORK INCLUDED

F. AFTER COMPLETION OF THE WORK OF INSTALLATION, TEST AND REGULATE ALL COMPONENTS OF THE HEATING, AIR CONDITIONING AND VENTILATING SYSTEMS TO VERIFY AIR AND WATER FLOW RATES SHOWN.

G. MEASUREMENT OF FINAL OPERATING CONDITION OF MECHANICAL SYSTEMS.

1.2 QUALITY ASSURANCE

A. AGENCY SHALL BE COMPANY SPECIALIZING IN THE ADJUSTING AND BALANCING OF SYSTEMS SPECIFIED IN THIS SECTION WITH MINIMUM FIVE YEARS DOCUMENTED EXPERIENCE.

2 PRODUCTS

2.1 EQUIPMENT

A. PROVIDE ALL NECESSARY PERSONNEL, EQUIPMENT AND SERVICES.

3 EXECUTION

3.1 EXAMINATION

A. BEFORE COMMENCING WORK, VERIFY THAT SYSTEMS ARE COMPLETE AND OPERABLE. ENSURE THE FOLLOWING: EQUIPMENT IS OPERABLE AND IN A SAFE AND NORMAL CONDITION. TEMPERATURE CONTROL SYSTEMS ARE INSTALLED COMPLETE AND OPERABLE. PROPER THERMAL OVERLOAD PROTECTION IS IN PLACE FOR ELECTRICAL EQUIPMENT. FINAL FILTERS ARE CLEAN AND IN PLACE. IF REQUIRED, INSTALL TEMPORARY MEDIA IN ADDITION TO FINAL FILTERS. DUCT SYSTEMS ARE CLEAN OF DEBRIS. CORRECT FAN ROTATION. FIRE AND VOLUME DAMPERS ARE IN PLACE AND OPEN. COIL FINS HAVE BEEN CLEANED AND COMBED. ACCESS DOORS ARE CLOSED AND DUCT END CAPS ARE IN PLACE. AIR OUTLETS ARE INSTALLED AND CONNECTED. DUCT SYSTEM LEAKAGE HAS BEEN MINIMIZED.

B. REPORT ANY DEFECTS OR DEFICIENCIES NOTED DURING PERFORMANCE OF SERVICES TO ARCHITECT.

C. BEGINNING OF WORK MEANS ACCEPTANCE OF EXISTING CONDITIONS.

3.2 PREPARATION

A. PROVIDE INSTRUMENTS REQUIRED FOR TESTING, ADJUSTING, AND BALANCING OPERATIONS. MAKE INSTRUMENTS AVAILABLE TO ARCHITECT TO FACILITATE SPOT CHECKS DURING TESTING.

3.3 INSTALLATION TOLERANCES

A. ADJUST AIR HANDLING SYSTEMS TO PLUS OR MINUS 10 PERCENT FOR SUPPLY, RETURN AND EXHAUST SYSTEMS FROM FIGURES INDICATED.

B. PERMANENTLY MARK SETTINGS OF VALVES, DAMPERS, AND OTHER ADJUSTMENT DEVICES ALLOWING SETTINGS TO BE RESTORED. SET AND LOCK MEMORY STOPS.

C. AT FINAL INSPECTION, RECHECK RANDOM SELECTIONS OF DATA RECORDED IN REPORT. RECHECK POINTS OR AREAS AS SELECTED AND WITNESSED BY THE OWNER.

3.4 ADJUSTING

A. AFTER ADJUSTMENT, TAKE MEASUREMENTS TO VERIFY BALANCE HAS NOT BEEN DISRUPTED OR THAT SUCH DISRUPTION HAS BEEN RECTIFIED.

B. LEAVE SYSTEMS IN PROPER WORKING ORDER, REPLACING BELT GUARDS, CLOSING ACCESS DOORS, CLOSING DOORS TO ELECTRICAL SWITCH BOXES, AND RESTORING THERMOSTATS TO SPECIFIED SETTINGS.

3.5 AIR SYSTEM PROCEDURE

A. MAKE AIR QUANTITY MEASUREMENTS IN DUCTS BY PITOT TUBE TRAVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT.

B. MEASURE AIR QUANTITIES AT AIR INLETS AND OUTLETS.

C. ADJUST DISTRIBUTION SYSTEM TO OBTAIN UNIFORM SPACE TEMPERATURES FREE FROM OBJECTIONABLE DRAFTS AND NOISE.

D. VARY TOTAL SYSTEM AIR QUANTITIES BY ADJUSTMENT OF FAN SPEEDS. PROVIDE DRIVE CHANGES REQUIRED. VARY BRANCH AIR QUANTITIES BY DAMPER REGULATION.

E. MEASURE STATIC AIR PRESSURE CONDITIONS ON AIR SUPPLY UNITS, INCLUDING FILTER AND COIL PRESSURE DROPS, AND TOTAL PRESSURE ACROSS THE FAN.

F. ADJUST OUTSIDE AIR AUTOMATIC DAMPERS, OUTSIDE AIR, RETURN AIR, AND EXHAUST DAMPERS FOR DESIGN CONDITIONS.

G. MEASURE TEMPERATURE CONDITIONS ACROSS OUTSIDE AIR, RETURN AIR, AND EXHAUST DAMPERS TO CHECK LEAKAGE.

H. WHERE MODULATING DAMPERS ARE PROVIDED, TAKE MEASUREMENTS AND BALANCE AT EXTREME CONDITIONS.

I. MEASURE BUILDING STATIC PRESSURE AND ADJUST SUPPLY, RETURN, AND EXHAUST AIR SYSTEMS TO PROVIDE REQUIRED RELATIONSHIP BETWEEN EACH TO MAINTAIN APPROXIMATELY 0.05 INCHES POSITIVE STATIC PRESSURE NEAR THE BUILDING ENTRIES.

3.6 VERIFICATION OF CONTRACTOR'S PERFORMANCE

A. BALANCING DATA MAY BE SPOT CHECKED WITH INSTRUMENTS SIMILAR TO THAT USED BY THE BALANCING FIRM.

B. IF, IN THE JUDGMENT OF THE ARCHITECT, THE DISCREPANCIES WARRANT ADDITIONAL ADJUSTMENT,READJUST AND REBALANCTHE SYSTEM AT NO ADDITIONAL PROJECT COST.

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MARK D. JONES STATE OF WASHINGTON #43743 REGISTERED PROFESSIONAL ENGINEER

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SHEET: M4

MECHANICAL SPECIFICATIONS

ELECTRICAL LEGEND AND ABBREVIATIONS

S/N — SOLID NEUTRAL CONNECTION

G N — GROUNDING AND NEUTRAL BUSES (BONDED)

GFI WP — DUPLEX RECEPTACLE–NORMAL, GROUND FAULT INTERRUPTING, WEATHERPROOF

CONNECTION TO SPECIAL EQUIPMENT OR OUTLET AS SHOWN

225 — TRANSFER SWITCH, CURRENT RATING SHOWN

GENERATOR SET

5 — MOTOR OUTLET, HORSEPOWER INDICATED.

30 30 — DISCONNECT SWITCH, RATING SHOWN

ELECTRICAL EQUIPMENT

ELECTRICAL EQUIPMENT TO BE DEMO'D

VFD — VARIABLE FREQUENCY DRIVE

LINE OR LOAD REACTOR

J — JUNCTION BOX

P4 — HOME RUN, ELECTRICAL PANEL DESTINATION SHOWN.

CONDUIT CONCEALED UNDERFLOOR OR UNDERGROUND.*

CONDUIT CONCEALED IN WALL OR ABOVE CEILING IN FINISHED AREAS, EXPOSED IN PROCESS AND EQUIPMENT AREAS.*

*NOTES:

1. RUNS MARKED WITH CROSS–HATCHES INDICATE NUMBER OF NO. 12 WIRE. LARGER GAUGES ARE SHOWN OR NOTED ELSEWHERE. LONG CROSS HATCH INDICATES NEUTRAL, REVERSE SLANT INDICATES GREEN GROUND WIRE.
2. FOR UNMARKED CONDUIT RUNS, CONTRACTOR SHALL INSTALL REQUIRED NUMBER OF WIRES FOR POWER AND/OR CONTROL OF ELEMENTS IN CIRCUIT(S) SHOWN. SIZE OF WIRE SHALL BE NO. 12, UNLESS OTHERWISE NOTED OR REQUIRED BY CODE.
3. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE.

CURRENT TRANSFORMER

TRANSFORMER

GROUND CONNECTION PER NEC ARTICLE 250

THERMAL MAGNETIC CIRCUIT BREAKER

15AG 400AT — MAGNETIC ONLY CIRCUIT BREAKER (MOTOR CIRCUITS ONLY) CONTINUOUS CURRENT RATING AND TRIP SETTINGS SHOWN

NEMA RATED CONTACTOR WITH MOTOR THERMAL OVERLOAD RELAY (MOTOR STARTER)

400A — FUSE

1 — DRAWING NOTE

1 — ELECTRICAL CIRCUIT IDENTIFICATION

2 1 4 3 — MULTIPLE ELECTRICAL CIRCUITS, SEPARATE CONDUITS

1"C 2 1 4 3 — MULTIPLE ELECTRICAL CIRCUITS, COMMON CONDUIT (SIZE SHOWN)

E — CEILING LIGHT OUTLET*

WALL MOUNTED LUMINAIRE*

E — BARE LAMP/ INDUSTRIAL LINEAR LUMINAIRE*

LINEAR LUMINAIRE

LINEAR LUMINAIRE W/BATTERY BACKUP

FLOOD LIGHT – DIRECTIONAL

* "E" INDICATES EMERGENCY LUMINAIRE WITH BATTERY–BACKED BALLAST/DRIVER (OF TYPE INDICATED IN LUMINAIRE SCHEDULE).

A — LUMINAIRE TYPE DESIGNATION

3/40 — NO. AND WATTAGE OF LAMPS

SPECIAL SWITCH

$x — WALL SWITCH
D – DIMMABLE
O – OCCUPANCY SENSOR
WP – WEATHERPROOF
3 – 3–WAY CONTROLLER

UNIT HEATER

OS — CEILING MOUNT MULTI–TECHNOLOGY OCCUPANCY SENSOR

PC — PHOTOCELL

OS — POWER SUPPLY (24V DC) FOR CEILING MOUNT OCCUPANCY SENSOR

CONDUIT SEAL–OFF (XP)

CONDUIT UP

CONDUIT DOWN

CONDUIT STUB–OUT

A	AMPERES, AMPS
A/V	AUDIO VISUAL
AC	ALTERNATING CURRENT, AMPS CONTINUOUS
AF	AMP FRAME
AFCI	ARC–FAULT CIRCUIT INTERRUPTER
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM, ALARM
AM	AMMETER
ANT	ANTENNA
ARCH	ARCHITECT
AS	AMP SWITCH
ASD	ADJUSTABLE SPEED DRIVE
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUD	AUDIOMETER BOX CONNECTION
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BLDG	BUILDING
C	CONDUIT, CONTROL, CONTINUOUS
CAM	CAMERA
CAT	CATALOG, CATEGORY
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CC	CONTROL CABLE
CCTV	CLOSED–CIRCUIT TELEVISION
CHH	COMMUNICATIONS HANDHOLE
CKT	CIRCUIT
CMH	COMMUNICATIONS MANHOLE
CNTRL, CTRL	CONTROL
CO	CONDUIT ONLY
COL	COLUMN
CONT	CONTINUOUS, CONTROL
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
CU	COPPER
CV	CONTROL VAULT, CHECK VALVE
CVLS	CHECK VALVE LIMIT SWITCH
D, DISC	DISCONNECT
DC	DIRECT CURRENT
DEMO	DEMOLISH
DET	DETECTOR
DIST	DISTRIBUTION
DN	DOWN
DT	DUST–TIGHT
DWG	DRAWING
E	EMERGENCY, EMERGENCY CIRCUIT
(E), EXIST	EXISTING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EL, ELEV	ELEVATION, ELEVATOR
ELEC	ELECTRIC(AL)
EMER	EMERGENCY, EMERGENCY CIRCUIT
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ENT	ELECTRICAL NON–METALLIC TUBING
EOL	END OF LINE
EP	EXPLOSION PROOF
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
ES, E–STOP	EMERGENCY STOP
ETM	ELAPSED TIME METER
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
F	FLUSH, FUSE
FA	FIRE ALARM
FBO	FURNISHED BY OTHERS
FC	FIRE PROTECTION CONTRACTOR
FCU	FAN COIL UNIT
FDN	FOUNDATION
FDR	FEEDER
FIXT	FIXTURE
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FLUOR	FLUORESCENT
FMC	FLEXIBLE METALLIC CONDUIT
FNC	FLEXIBLE NON–METALLIC CONDUIT
FRE	FIBERGLASS REINFORCED EPOXY CONDUIT
FU	FUSE
FURN	FURNITURE
FVNR	FULL VOLTAGE NON–REVERSING
FVR	FULL VOLTAGE REVERSING
G, GND	GROUND
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GFPE	GROUND FAULT PROTECTION EQUIPMENT
GFR	GROUND FAULT RELAY
GRC	GALVANIZED RIGID CONDUIT
GRS	GALVANIZED RIGID STEEL CONDUIT
H	HORN
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HMI	HUMAN–MACHINE INTERFACE
HOA	HAND–OFF–AUTOMATIC
HP	HORSEPOWER, HEAT PUMP
HPS	HIGH PRESSURE SODIUM
H–STAT	HUMIDISTAT
HT, HGT	HEIGHT
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HW	HOT WATER
HZ	HERTZ (CYCLE PER SECOND)
IAM	INDIVIDUAL ADDRESSABLE MODULE
IC	INTERRUPTING CAPACITY, INTERCOMMUNICATION
ID	IDENTIFICATION, INSIDE DIAMETER
IG	ISOLATED GROUND
IMC	INTERMEDIATE METALLIC CONDUIT
INC	INTERMEDIATE NON–METALLIC CONDUIT, OR INCANDESCENT
IPS	INTERRUPTIBLE POWER SUPPLY
IR	PASSIVE INFRARED
IR, ISR	INTRINSICALLY SAFE RELAY
J, JB	JUNCTION BOX
K	KEY INTERLOCK (KIRK–KEY)
K/O	KNOCK–OUT
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
LA	LIGHTNING ARRESTER
LC	LIGHTING CONTACTOR
LDR	LOAD RELAY
LFMC	LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT
LFNC	LIQUIDTIGHT FLEXIBLE NON–METALLIC CONDUIT
LOR	LOCAL–OFF–REMOTE
LOS	LOCKOUT STOP
LP	LIGHTING PANELBOARD
LR	LIGHTING RELAY
LTG	LIGHTING
LV	LOW VOLTAGE
M	MAGNETIC CONTACTOR COIL
MAINT	MAINTAINED
MAU	MAKE–UP AIR UNIT
MAX	MAXIMUM
MC	METAL CLAD CABLE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MFR, MANUF	MANUFACTURER
MH	MANHOLE, METAL HALIDE
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOD	MOTOR OPERATED DISCONNECT SWITCH
MS	MOTOR STARTER
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
N	NEUTRAL
(N)	NEW
N/A	NOT APPLICABLE
NA	NON–AUTOMATIC
NC	NORMALLY CLOSED, NON–CONTINOUS
NEC	NATIONAL ELECTRICAL CODE
NECA	NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
NEUT	NEUTRAL
NF	NON–FUSED
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NM	NON–METALLIC
NMC	NON–METALLIC SHEATHED CABLE
NO	NORMALLY OPEN
NRTL	NATIONALLY RECOGNIZED TESTING LAB
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
OHD	OVERHEAD DOOR OPERATOR
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD RELAY
OO	ON–OFF
P	POWER, POLE, PHASE, PANEL
PA	PUBLIC ADDRESS
PB	PULL BOX, PUSHBUTTON
PC	PHOTOCELL, PLUMBING SYSTEM CONTRACTOR
PE	PRIMARY ELECTRIC (SERVICE)
PFR	PHASE FAIL RELAY
PH or Ø	PHASE
PHH	POWER HANDHOLE
PIV	POST INDICATING VALVE
PMH	POWER MANHOLE
PMR	PHASE MONITOR RELAY
PNL	PANEL(BOARD)
PP	POWER PANEL
PR	PAIR
PRI	PRIMARY
PSI	PRESSURE
PT	POTENTIAL TRANSFORMER
PTT	PUSH–TO–TALK
PV	POWER VAULT, PHOTO–VOLTAIC (SOLAR CELL)
PVC	POLYVINYL CHLORIDE CONDUIT
PWR	POWER
R	RELAY
RE	REMOVE EXISTING
REC	RECESSED
RECP, RECEPT	RECEPTACLE
REF	ROOF EXHAUST FAN
RGS	RIGID GALVANIZED STEEL CONDUIT
RL	RELOCATE EXISTING
RM	ROOM
RMC	RIGID METALLIC CONDUIT
RNC	RIGID NON–METALLIC CONDUIT
RSC	RIGID STEEL CONDUIT
RT	RAINTIGHT
RTU	ROOFTOP UNIT
RVNR	REDUCED VOLTAGE NON–REVERSING
RVR	REDUCED VOLTAGE REVERSING
S	SOLENOID, SURFACE MOUNTED
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SCH	SCHEDULE
SD	SMOKE DAMPER
SE	SECONDARY ELECTRIC
SEC	SECONDARY
SIG	SIGNAL
SN, S/N	SOLID NEUTRAL
SP	SPARE
SPD	SPEED
SPKR	SPEAKER
SPL	SPLICE
SS	STAINLESS STEEL, SOLID–STATE
SSSS	SOLID–STATE SOFT STARTER
STL	CARBON STEEL
STP	SHIELDED TWISTED PAIR
SUSP	SUSPENDED
SV	SOLENOID VALVE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
T, T–STAT	THERMOSTAT
TB	TERMINAL BOARD
TC	TELEPHONE CABINET, TIME CLOCK
TC	TIME CLOSING
TCI	TELECOMMUNICATIONS CABLING INSTALLER
TCP	TEMPERATURE CONTROL PANEL
TD	THERMAL DETECTOR
TDR	TIME DELAY RELAY
TEL	TELEPHONE
TEL/DATA	TELEPHONE/DATA
TEMP	TEMPORARY, TEMPERATURE
TERM	TERMINAL(S)
TJB	TERMINAL JUNCTION BOX
TO	TIME OPENING
TR	TIMER–REPEAT CYCLE
TRANS	TRANSFORMER
TSP	TWISTED SHIELDED PAIR
TST	TWISTED SHIELDED TRIAD
TV	TELEVISION
TYP	TYPICAL
U	UP
UC	UNDER COUNTER, UNDERGROUND CONDUIT
UD	UP–DOWN
UG	UNDERGROUND
UH	UNIT HEATER
UOI	UNLESS OTHERWISE INDICATED
UON	UNLESS OTHERWISE NOTED
UOS	UNLESS OTHERWISE SHOWN
UPS	UNINTERRUPTIBLE POWER SOURCE
US, U/S	ULTRASONIC
UTL	UTILITY
UTP	UNSHIELDED TWISTED PAIR
UVR	UNDER VOLTAGE RELAY
V	VOLTAGE, VOLTS, VAULT
VFD	VARIABLE FREQUENCY DRIVE
VM	VOLT METER
VP	VAPORPROOF
VSD	VARIABLE SPEED DRIVE
VT	VAPORTIGHT, VOLTAGE TRANSFORMER
W	WATT
W/	WITH
WG	WIRE GUARD
WH	WATT–HOUR, WATER HEATER
WHD	WATT–HOUR DEMAND METER
WLH	WALL HEATER
WP	WEATHERPROOF
WT	WATER, WATERTIGHT
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
Y	WYE
Z	ZONE, IMPEDANCE
ZAM	ZONE ADAPTER MODULE

NOTES:
1. NOT ALL ABBREVIATIONS USED. ABBREVIATIONS LISTED APPLY TO ELECTRICAL AND INSTRUMENTATION DRAWINGS AND DETAILS. SOME ABBREVIATIONS MAY BE DERIVED FROM MULTIPLE, INDIVIDUAL ONES. LIST MAY BE INCOMPLETE; SEE NOTE 2.

2. MEANING OF ABBREVIATIONS WILL DEPEND ON THE CONTEXT OF USAGE. IF MEANING IS UNCLEAR, SEEK CLARIFICATION FROM ENGINEER BEFORE BIDDING. FAILURE TO UNDERSTAND ABBREVIATIONS AND THEIR POTENTIAL FINANCIAL IMPACT ON THE CONTRACTOR SHALL NOT BE GROUNDS FOR ADDITIONAL COMPENSATION AFTER BID OPENING.

3. COMMON, NON–ELECTRICAL ABBREVIATIONS, SUCH AS COMPASS DIRECTIONS (N, S, E, W, ETC.) AND CHEMICAL COMPOUNDS (O2, CL2, ETC.), ARE NOT INCLUDED.

4. ADDITIONAL ABBREVIATIONS FOR INSTRUMENTATION AND CONTROL ELEMENTS (FLOAT SWITCHES, ETC.) ARE DERIVED FROM ANSI/ISA–S5.1, AND ARE NOT NECESSARILY LISTED HERE.

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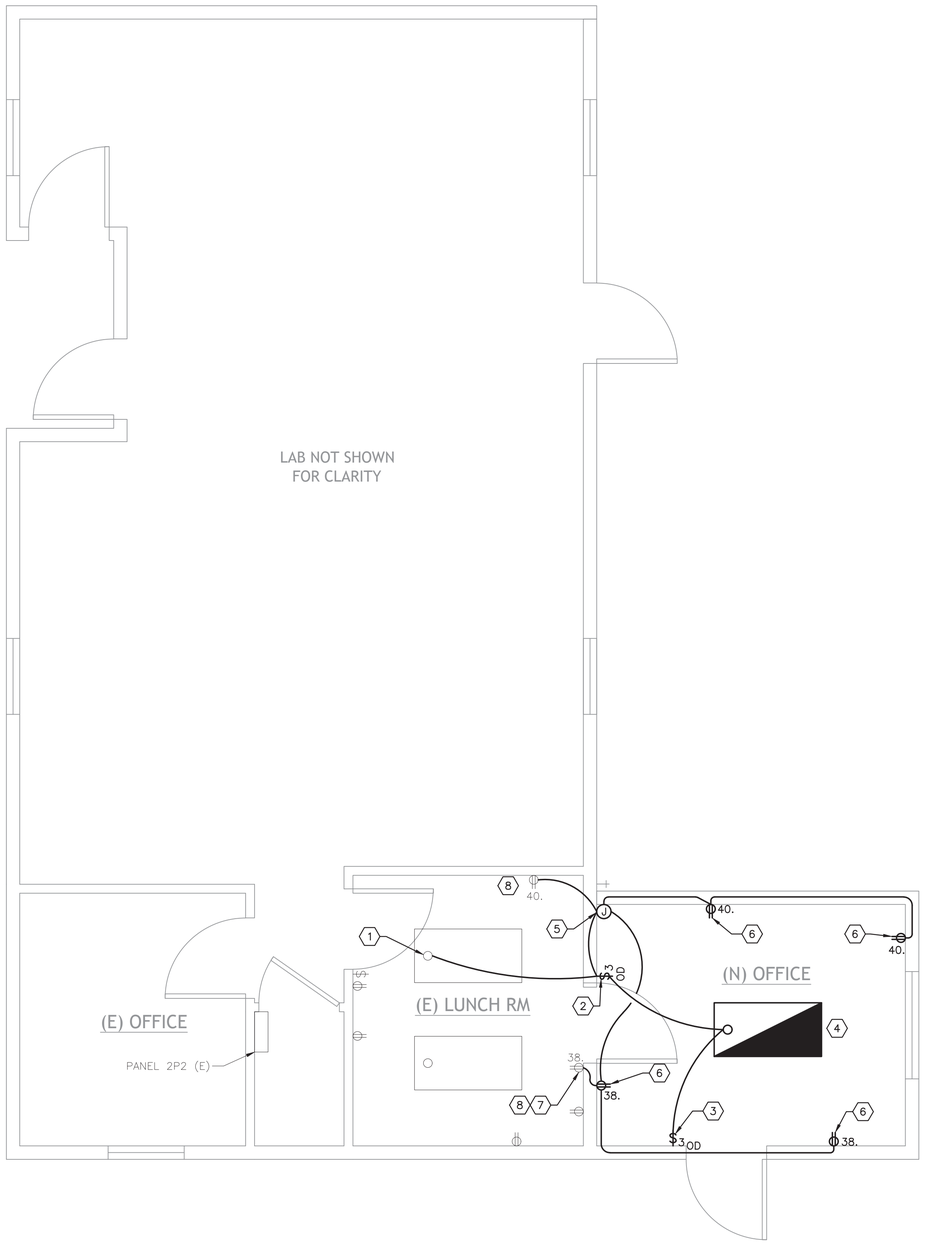
MRK	DATE	DESCRIPTION
0	11-30-23	PERMIT/BID SET

JOB NUMBER: 2330a

SHEET: E1

LEGEND AND ABBREVIATIONS



1 / E2 ELECTRICAL PLAN VIEW
SCALE: 3/8" = 1'-0"

0 1 2 4 6 8
SCALE IN FEET
3/8" = 1'-0"

GENERAL NOTES

A. ALL CIRCUITS ARE FROM EXISTING PANEL 2P2.

B. ONE HALF (MINIMUM) OF ALL NEW OFFICE RECEPTACLES TO BE CONTROLLED (SWITCHED) BY OCCUPANCY SENSOR, PER WASHINGTON ENERGY CODE. SWITCHING CONTACT TO BE RATED 20A.

C. INSTALL 20 AWG, TWISTED-SHIELDED PAIR FOR 0-10V DIMMING OF LUMINAIRE WITH POWER WIRING FROM OCCUPANCY SWITCHES TO LIGHT.

D. WIRING DEVICES TO BE WHITE WITH STAINLESS STEEL COVERS, MATCHING EXISTING.

NOTES THIS SHEET

1. EXTEND UNSWITCHED CIRCUIT 8 FROM EXISTING LIGHT TO NEW OFFICE LIGHTING CIRCUIT.
2. INSTALL DUAL TECHNOLOGY, DIMMABLE OCCUPANCY SWITCH WITH DUAL CONTACTS. CONNECT ONE SWITCH (VIA POWER PACK WITH DUAL, 20A RATED CONTACTS) TO RECEPTACLES FOR SWITCHING PER WA ENERGY CODE. WIRE LIGHTING CIRCUIT AS 3-WAY WITH OTHER SWITCH.
3. INSTALL DUAL TECHNOLOGY DIMMABLE OCCUPANCY SWITCH. WIRE AS 3-WAY WITH OTHER SWITCH.
4. SURFACE MOUNT, 7000 LUMEN (NOMINAL), 2' X 4', 40K CRI 95 LED LUMINAIRE WITH SYMMETRICAL DISTRIBUTION, ACRYLIC LENS, AND BATTERY-BACKED, DIMMABLE DRIVER. MATTE WHITE FINISH AND ALUMINUM INSERT PAINTED WHITE DOOR FINISH, UNLESS OTHERWISE DIRECTED BY ARCHITECT.
   LITHONIA
   HSTL-2X4-S-MVOLT-SYD-ALM-7000LM-40K-95CRI-ZT-MIN10-E10WLCP,
   OR APPROVED.
5. INSTALL OCCUPANCY POWER PACK WITH DUAL, 20A RATED CONTACTS IN JUNCTION BOX. JUNCTION BOX TO BE ACCESSIBLE, PER NEC REQUIREMENTS. COORDINATE ACCESS HATCH WITH CEILING INSTALLATION. CONNECT ONE CONTACT TO EACH RECEPTACLE CIRCUIT.
6. BREAK YOLK; TOP RECEPTACLE TO BE SWITCHED WITH OCCUPANCY SENSOR(S) PER WA ENERGY CODE. BOTTOM RECEPTACLE TO BE UNSWITCHED.
7. DEMO OR RELOCATE EXISTING RECEPTACLE, PER OWNER DIRECTION. COORDINATE DEMO/RELOCATION WITH NEW DOORWAY INSTALLATION.
8. EXTEND CIRCUIT TO NEW OFFICE RECEPTACLES, AS SHOWN.

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ELECTRICAL PLAN VIEW

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SECTION 26 05 00 GENERAL ELECTRICAL REQUIREMENTS

PART 1–GENERAL

1.01 SCOPE
A. Furnish all labor, equipment, appliances, materials, transportation, facilities, services, tools and other equipment, and skilled supervision necessary for the construction, erection, installation, connection, testing, and adjustment of all circuits and electrical equipment specified herein, shown, or noted on the drawings; specified or required in other portions of this specification; and its delivery to the City complete in all respects and ready for use.

PART 2–PRODUCTS

2.01 MATERIALS AND EQUIPMENT, COMMON REQUIREMENTS
A. Unless otherwise indicated, provide all first quality, new materials and equipment, free from any defects, in first class condition, and suitable for the space provided. Provide materials and equipment listed by UL (or other acceptable NRTL), bearing their label wherever standards have been established by that agency.
B. Where two or more units of the same class of material or equipment are required, provide products of a single manufacturer. Component parts of materials or equipment need not be products of the same manufacturer.
C. Unless otherwise indicated, provide materials and equipment which are the standard products of manufacturers regularly engaged in the production of such materials and equipment. Provide the manufacturers' latest standard design that conforms to these Specifications.
D. Indicated brand names and catalog numbers are used to establish standards of performance and quality. The description of materials listed herein governs in the event that catalog numbers do not correspond to materials described herein.

2.02 EQUIPMENT FINISHES
A. Provide materials and equipment with manufacturers' standard finish system. Provide manufacturers' standard finish color, except where specific color is indicated.

2.03 PORTABLE OR DETACHABLE PARTS
A. The Contractor shall retain in his possession and shall be responsible for all portable and detachable parts or portions of installations such as fuses, key locks, adaptors, blocking chips, and inserts until completion of his work.
B. These parts shall be delivered to the Engineer and an itemized receipt obtained. This receipt, together with 2 copies of the final inspection certificate, shall be attached to the Contractor's request for final payment.All equipment shall be demonstrated to operate in accordance with the requirements of this specification and the manufacturer's recommendation.

2.04 ACCESSORIES
A. Include special features, finishes, accessories, and other requirements as described in the Contract Documents regardless of the item's listed catalog number.
B. Provide incidentals not specifically mentioned herein or noted on Drawings, but needed to complete the system or systems, in a safe and satisfactory working condition.

PART 3–EXECUTION

3.01 EXAMINATION
A. Construction Documents:
1. Drawings are diagrammatic with symbols representing electrical equipment and wiring.
2. Electrical symbols indicating wiring and equipment shown in the Contract Documents are included in the Contract unless specifically noted otherwise.
3. Examine the entire set of Drawings to avoid conflicts with other systems. Determine exact route and installation of electrical wiring and equipment with conditions of construction.

3.02 INSTALLATION
A. Common Requirements:
1. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide work which has a neat and finished appearance.
2. Coordinate electrical work with work of other trades to avoid conflicts, errors, delays, and unnecessary interference with City operations during construction.
3. Install electrical equipment complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough–in of the electrical equipment, examine the instructions thoroughly. When requirements of the installation instructions conflict with the Contract Documents, request clarification from Engineer prior to proceeding with the installation.
4. Do not install electrical equipment in obvious passages, doorways, scuttles or crawl spaces which would impede or block the area passage's intended usage.
5. Do not install outlet boxes back to back. Do not use straight through boxes.
B. Cutting, Patching, and Framing:
1. The Contractor shall determine in advance the locations and sizes of all sleeves, chases, and openings necessary for the proper installation of his work.
2. Whenever practical, inserts or sleeves shall be installed prior to covering work. Cutting and patching shall be held to a minimum. All required holes in concrete construction shall be made with a core drill and patched with non–shrink grout.
3. Cutting, fitting, repairing, and finishing of carpentry work, metal work, or concrete work, and the like, which may be required for this work shall be done by craftsmen skilled in their respective trades. When cutting is required, it shall be done in such a manner as not to weaken walls, partitions, or floors; and holes required to be cut in floors must be drilled without breaking out around holes.
C. Keep the premises free from accumulation of waste material or rubbish. Upon completion of work, remove materials, scraps, and debris from premises and from interior and exterior of all devices and equipment. Touch up scratches, scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the color, consistency, and type of surface of the original finish.

END OF SECTION

SECTION 26 05 19 LOW–VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1–GENERAL

1.01 SCOPE
A. Provide and install all low voltage wiring as shown or required to provide complete operational systems as shown or specified.

1.02 SUBMITTALS
A. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

PART 2–PRODUCTS

2.01 CONDUCTOR AND CABLE GENERAL REQUIREMENTS
A. Provide products that comply with requirements of NFPA 70.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
D. Comply with NEMA WC 70.
E. Thermoplastic–Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
F. Thermoset–Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
G. Conductor Material:
1. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
2. Tinned Copper Conductors: Comply with ASTM B33.
H. Minimum Conductor Size:
1. Branch Circuits: 12 AWG.
I. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
J. Conductor Color Coding:
1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
2. Color Coding Method: Integrally colored insulation.
3. Color Code:
a. 208Y/120 V, 3 Phase, 4 Wire System:
1) Phase A: Black.
2) Phase B: Red.
3) Phase C: Blue.
4) Neutral/: White.
b. Equipment Ground, All Systems: Green.

2.02 SINGLE CONDUCTOR BUILDING WIRE
A. Description: Single conductor insulated wire.
B. Conductor Stranding:
1. Feeders and Branch Circuits: Stranded.
C. Insulation Voltage Rating: 600 V.
D. Insulation:
1. Copper Building Wire: Type THHN/THWN–2 or XHHW–2.

2.03 WIRING CONNECTORS
A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A–486B or UL 486C as applicable.

PART 3–EXECUTION

3.01 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
D. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
E. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

END OF SECTION

SECTION 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1–GENERAL

1.01 SCOPE
A. This section covers the work necessary to furnish and install and complete the electrical grounding system. Provide all grounding and bonding required by code; make connections mechanically secure and electrically continuous. Ground/bond all line voltage electrical system completely and effectively as required by code and as specified herein.

PART 2–PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS
A. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
B. Where conductor size is not indicated, size to comply with NFPA 70 but not less than 12 AWG.
C. Bonding and Equipment Grounding:
1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non–current–carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
4. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
5. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

2.02 GROUNDING AND BONDING COMPONENTS
A. General Requirements:
1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.
B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:
1. Use insulated copper conductors unless otherwise indicated.
C. Connectors for Grounding and Bonding:
1. Use connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.

PART 3–EXECUTION

3.01 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Make grounding and bonding connections using specified connectors.
1. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.

END OF SECTION

SECTION 26 05 33 CONDUIT AND BOXES FOR ELECTRICAL SYSTEMS

PART 1–GENERAL

1.01 SCOPE
A. This section covers the work necessary to furnish and install complete electrical raceway systems.

1.02 SUBMITTALS
A. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

PART 2–PRODUCTS

2.01 GENERAL
A. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.
B. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), or galvanized steel electrical metallic tubing (EMT).
C. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit (RMC), galvanized steel intermediate metal conduit (IMC), or galvanized steel electrical metallic tubing (EMT).
D. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit (RMC) or galvanized steel intermediate metal conduit (IMC).
E. Flexible Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit (FMC).

2.02 CONDUIT – GENERAL REQUIREMENTS
A. Comply with NFPA 70.
B. Provide conduit, fittings, supports, and accessories required for complete raceway system.
C. Provide products listed, classified, and labeled as suitable for purpose intended.
D. Minimum Conduit Size, Unless Otherwise Indicated:
1. 3/4–inch (21 mm) trade size.
E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)
A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
B. Fittings:
1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
2. Material: Use steel or malleable iron.
3. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.04 GALVANIZED STEEL INTERMEDIATE METAL CONDUIT (IMC)
A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.
B. Fittings:
1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 1242.
2. Material: Use steel or malleable iron.
3. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.05 FLEXIBLE METAL CONDUIT (FMC)
A. Description: NFPA 70, Type FMC standard–wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems.
B. Fittings:
1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.

2.06 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)
A. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
B. Fittings:
1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.
3. Connectors and Couplings: Use compression/gland or set–screw type.
a. Do not use indenter type connectors and couplings.

2.07 BOXES
A. General Requirements:
1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:
1. Use sheet–steel boxes for dry locations unless otherwise indicated or required.
2. Use suitable concrete type boxes where flush–mounted in concrete.
3. Use suitable masonry type boxes where flush–mounted in masonry walls.
4. Use raised covers suitable for the type of wall construction and device configuration where required.
5. Do not use shallow boxes, except where required by the type of wall construction.
6. Do not use "through–wall" boxes designed for access from both sides of wall.
7. Sheet–Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
8. Boxes for Supporting Luminaires: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
9. Boxes for Ganged Devices: Use multigang boxes of single–piece construction. Do not use field–connected gangable boxes unless specifically indicated or permitted.
C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
2. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
a. Provide screw–cover or hinged–cover enclosures unless otherwise indicated.

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BRITTELL ARCHITECTURE, INC.
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Office addition & New Shop Bldg for:
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MRK	DATE	DESCRIPTION
0	11-30-23	PERMIT/BID SET

JOB NUMBER: 2330a

SHEET: E3

ELECTRICAL SPECIFICATIONS

PART 3—EXECUTION

3.01 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Install conduit in accordance with NECA 1.
C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.
D. Intermediate Metal Conduit (IMC): Install in accordance with NECA 101.
E. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
F. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
G. Connections and Terminations:
1. Use approved zinc—rich paint or conduit joint compound on field—cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three—piece couplings or split couplings. Do not use running threads.
3. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
4. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
H. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
3. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
I. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings or approved flexible connections to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
J. Box Supports:
1. Secure and support boxes in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
K. Install boxes as required to preserve insulation integrity.
L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

END OF SECTION

SECTION 26 51 00 INTERIOR LIGHTING

PART 1—GENERAL

1.01 SCOPE
A. This section covers the work necessary to furnish and install and complete the electrical lighting system.

1.02 SUBMITTALS
A. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
1. LED Luminaires:
a. Include estimated useful life, calculated based on IES LM—80 test data.

PART 2—PRODUCTS

2.01 LUMINAIRE TYPES
A. Furnish products as indicated.

2.02 LUMINAIRES
A. Provide products that comply with requirements of NFPA 70.
B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
C. Provide products listed, classified, and labeled as suitable for the purpose intended.
D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, drivers, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
G. LED Luminaires:
1. Components: UL 8750 recognized or listed as applicable.
2. Tested in accordance with IES LM—79 and IES LM—80.
3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM—80 test data.

2.03 DRIVERS
A. Dimmable LED Drivers:
1. Dimming Range: Continuous dimming from 100 percent to ten percent relative light output unless dimming capability to lower level is indicated, without flicker.
2. Control Compatibility: Fully compatible with the dimming controls to be installed.

PART 3—EXECUTION

3.01 INSTALLATION
A. Coordinate locations of outlet boxes as required for installation of luminaires.
B. Install products in accordance with manufacturer's instructions.
C. Install luminaires securely, in a neat and workmanlike manner.
D. Provide required supports and attachments.
E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
F. Bond products and metal accessories to branch circuit equipment grounding conductor.

END OF SECTION

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Office addition & New Shop Bldg for:
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MRK	DATE	DESCRIPTION
0	11-30-23	PERMIT/BID SET

JOB NUMBER:
2330a

SHEET:
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ELECTRICAL SPECIFICATIONS