

MECHANICAL SYMBOLS LIST

EQUIPMENT SYMBOL		CONTROLS AND SENSORS	
AIR DEVICES			THERMOSTAT
CEILING DIFFUSER SUPPLY			DUCT SMOKE DETECTOR
CEILING DIFFUSER RETURN		DUCTWORK	
			AIR DUCT W/ 1.5" ACOUSTICAL LINING
			FLEXIBLE DUCT
			FLEXIBLE CONNECTION
			RECTANGULAR DUCT (WIDTH X DEPTH)
			ROUND DUCT (DIAMETER)
DUCT ACCESSORIES			SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
			RETURN AIR RECTANGULAR DUCT CROSS SECTION
			ROUND DUCT CROSS SECTION

GENERAL NOTES

- CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
- ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.
- THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
- WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
- CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
- PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWNS.
- SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
- PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.
- SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
- INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- ACCESS DOORS ARE REQUIRED FOR ALL BUILDING SERVICE VALVES THAT RUN THROUGH THE SPACE, AND ACCESS DOOR SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL. COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH THE ARCHITECT.
- REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
- THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
- ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

MECHANICAL NOTES

GENERAL:

- PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
- CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
- THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
- THE LOCATION OF EXISTING UNDERGROUND UTILITIES IS APPROXIMATELY SHOWN. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PAY FOR AND REPAIR ALL DAMAGES CAUSED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES UNLESS OTHERWISE INDICATED.
- WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
- COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
- INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
- WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
- COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
- ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.
- PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
- PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO AND WITHIN 50 FT. OF ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS) THROUGHOUT MECHANICAL EQUIPMENT ROOMS. DO THE SAME FOR SUPPORTS OF STEAM MAINS WITHIN 50 FT. OF BOILER OR PRESSURE-REDUCING VALVES.
- PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS OF STEAM MAINS WITHIN 50 FT. OF BOILERS AND PRESSURE-REDUCING VALVES.
- MAINTAIN A MINIMUM 6"-8" CLEARANCE TO THE UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.
- LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
- ALL MECHANICAL ROOM DOORS SHALL BE A MINIMUM OF 4'-0" WIDE.
- WHERE BEAMS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH BEAM OPENING SIZE AND OPENING LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO THE FABRICATION OF DUCTWORK, CUTTING OF PIPING, OR FABRICATION OF BEAMS.
- ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.
- MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.
- ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.
- ALL DUCTWORK, PIPING, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL

NOT BE PERMITTED.

- ALL ROOF-MOUNTED EQUIPMENT CURBS FOR EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.
- LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
- ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.

MECHANICAL ABBREVIATIONS

BD	BACKDRAFT DAMPER
RTU	ROOF TOP UNIT
VD	VOLUME DAMPER
CFM	CUBIC FEET PER MINUTE
COP	COEFFICIENT OF PERFORMANCE
EA	EXHAUST AIR
FC	FLEXIBLE CONNECTION
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
OA	OUTSIDE AIR
RA	RETURN AIR
SA	SUPPLY AIR
SP	STATIC PRESSURE
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
EF	EXHAUST FAN

MECHANICAL DRAWING LIST

M0.1	MECH. GENERAL NOTES, SYMBOLS LIST & ABBREVIATIONS
M0.2	MECHANICAL SPECIFICATIONS
M1.0	MECHANICAL FLOOR PLAN
M2.0	MECHANICAL ROOF PLAN
M3.0	MECHANICAL DETAILS
M4.0	MECHANICAL SCHEDULES

ELIZABETH CITY BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2018 NORTH CAROLINA BUILDING CODE, BUILDING. (BASE CODE - IBC 2015) AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

- THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS. TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2018 NORTH CAROLINA BUILDING CODE. (BASE CODE - IBC 2015)
- THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.
- TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION MC 107 AND THE FOLLOWING SECTIONS OF THE 2018 NORTH CAROLINA BUILDING CODE, (BASE CODE - IBC 2015):
 - REFRIGERATION SYSTEMS - 2018 NORTH CAROLINA MECHANICAL CODE, (BASE CODE - IMC 2015).
 - VENTILATION SYSTEM BALANCING MC 403.8.
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
 - STANDARDS OF HEATING - 2018 NORTH CAROLINA MECHANICAL CODE (BASE CODE - IMC 2015) - SECTION 309.1
 - DUCT CONSTRUCTION AND INSTALLATION - 2018 NORTH CAROLINA MECHANICAL CODE (BASE CODE - IMC 2015) - SECTION 603
 - AIR INTAKES, EXHAUSTS AND RELIEF - 2018 NORTH CAROLINA MECHANICAL CODE (BASE CODE - IMC 2015) - SECTION 401.5
 - AIR FILTERS - 2018 NORTH CAROLINA MECHANICAL CODE (BASE CODE - IMC 2015) - SECTION 605
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- VENTILATION FOR ALL AREA SHALL COMPLY WITH 2018 NORTH CAROLINA MECHANICAL CODE (BASE CODE - IMC 2015) - SECTION 401.
- A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2018 NORTH CAROLINA MECHANICAL CODE (BASE CODE - IMC 2015) - SECTION 403.3.
- REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
- SMOKE DETECTOR SHALL MEET UL268A.

CODE COMPLIANCE

ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT.

- 2018 NORTH CAROLINA ENERGY CONSERVATION CODE, (BASE CODE - 2015 IECC).
- 2018 NORTH CAROLINA MECHANICAL CODE, (BASE CODE - 2015 IMC).
- 2018 NORTH CAROLINA PLUMBING CODE, (BASE CODE - 2015 IPC).
- 2020 NORTH CAROLINA ELECTRICAL CODE, (BASE CODE - 2020 NFPA 70).
- 2018 NORTH CAROLINA BUILDING CODE, (BASE CODE - 2015 IBC).

SCOPE OF WORK

SCOPE OF WORK

- THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLANS) DESIGN, DETAIL DRAWINGS, NOTES, RFIS, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN NEAT, WORKMANLIKE MANNER.
- THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
- THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OF ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

FOREFRONT
DERMATOLOGY

DRAWING ISSUE

NO	DESCRIPTION	DATE
1	OWNER REVISION COMMENTS	07/08/2025
2		
3		
4		
5		
6		

M0.1
GENERAL
NOTES

SPECIFICATIONS

SECTION 0001 - NOTICE TO BIDDERS

- 1.1 BIDDERS REPRESENTATIONS
A. THE BIDDER BY MAKING A BID REPRESENTS THAT:
THE BIDDER HAS READ AND UNDERSTANDS THE BIDDING DOCUMENTS, TO THE EXTENT THAT SUCH DOCUMENTATION RELATES TO THE WORK FOR WHICH THE BID IS SUBMITTED, AND FOR OTHER PORTIONS OF THE PROJECT, IF ANY, BEING BID CONCURRENTLY OR PRESENTLY UNDER CONSTRUCTION.
B. THE BID IS MADE IN COMPLIANCE WITH THE BIDDING DOCUMENTS.
C. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS FOR THE BIDDER TO SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR.
D. SHOULD CONFLICTS OR DISCREPANCIES OCCUR WITHIN THE BIDDING DOCUMENTS, THE ITEM OR ITEMS IN DISPUTE THAT REPRESENT THE GREATER COST SHALL PREVAIL IN THE FINAL BID.
E. THE BID IS BASED UPON THE MATERIALS, EQUIPMENT AND SYSTEMS REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION.

- 1.2 EXISTING CONDITIONS AND COORDINATION
A. THE BIDDER HAS VISITED THE SITE, BECOME FAMILIAR WITH LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND HAS CORRELATED THE BIDDER'S PERSONAL OBSERVATIONS WITH THE REQUIREMENTS OF THE PROPOSED BIDDING DOCUMENTS.
B. THE BIDDER SHALL PROPOSE COORDINATION OF WORK SUCH THAT CONFLICTS WITH OTHER TRADES AND SPACE ALLOCATIONS ARE AVOIDED.

- 1.3 RESPONSIBILITIES
A. THE BIDDER UNDERSTANDS THAT ANY CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE TIMELY COMPLETION AND ACCEPTANCE OF THEIR WORK AND THAT ANY ITEMS DAMAGED, LOST OR STOLEN DURING TIME OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED WITHOUT ANY ADDITIONAL COST TO THE OWNER.
B. THE BIDDER UNDERSTANDS THAT ANY PROPOSED WORK IN OCCUPIED TENANT SPACES SHALL BE PERFORMED DURING TIMES OF NON-TENANT OCCUPANCY OR AS SCHEDULED OR DIRECTED BY THE BUILDING MANAGER.
C. THE BIDDER UNDERSTANDS THAT ANY PROPOSED SHUT-DOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE-ARRANGED WITH THE BUILDING MANAGER AND THAT SUCH SHUT-DOWNS ARE TO BE KEPT TO A MINIMUM.

END OF SECTION 0001

SECTION 0101 - QUALITY OF WORK

- 1.1 WORKMANSHIP
A. ALL WORK SHALL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.
B. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING MANAGER AT NO ADDITIONAL COST TO THE OWNER.
C. UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL REMOVE FROM THE SITE, ALL TOOLS, DEMOLISHED APPLIANCES AND ANY SURPLUS MATERIAL.
1.2 CODE COMPLIANCE
A. ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.

END OF SECTION 0101

SECTION 0102 -REQUIRED DOCUMENTS

- 1.1 SHOP DRAWINGS
A. A SET OF PRINTS FOR ANY MECHANICAL WORK INCLUDING BUT NOT LIMITED TO, DUCTWORK AND PIPING LAYOUT SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO CONSTRUCTION OR PURCHASE OF MATERIALS.
1.2 SUBMITTALS
A. EQUIPMENT SUBMITTALS OF ALL PROPOSED MECHANICAL AND ANCILLARY EQUIPMENT INCLUDING ALL ACCESSORIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL PERTINENT MODELS, SIZES, ACCESSORIES AND CHOICES SHALL BE CLEARLY CHECKED, PRINTED OR OTHERWISE INDICATED ON THE SUBMITTALS.
1.3 RECORD DRAWINGS
A. UPON COMPLETION OF THE WORK, A RECORD DRAWING SHALL BE SUBMITTED TO THE OWNER DEPICTING ALL SUBSEQUENT CHANGES, ADDITIONS AND OR CORRECTIONS TO THE CONTRACT DRAWINGS AND OR CONTRACT SCOPE MADE DURING CONSTRUCTION. THIS DRAWING SHALL REPRESENT A COMPLETE RECORD OF THE WORK INSTALLED.

- 1.4 EQUIPMENT OPERATING INSTRUCTIONS
A. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS, EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.
B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE-RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE ELECTRONIC COPY TO THE ENGINEER.
C. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.

END OF SECTION 0102

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

- 1.1 SLEEVE-SEAL SYSTEMS
A. FIELD-ASSEMBLED, MODULAR SEALING-ELEMENT UNIT FOR FILLING ANNULAR SPACE BETWEEN PIPING AND SLEEVE.
1. SEALING ELEMENTS: EPDM RUBBER OR NBR.
2. PRESSURE PLATES: CARBON STEEL, PLASTIC, STAINLESS STEEL.
3. CONNECTING BOLTS AND NUTS: CARBON STEEL WITH CORROSION-RESISTANT COATING, STAINLESS STEEL.
B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
1. ADVANCE PRODUCTS & SYSTEMS, INC.
2. CALPICO, INC.
3. METRAFLEX COMPANY (THE).
4. PIPELINE SEAL AND INSULATOR, INC.
5. PROCO PRODUCTS, INC.

- 1.2 SLEEVE-SEAL FITTINGS
A. MANUFACTURED PLASTIC, SLEEVE-TYPE, PLASTIC OR RUBBER WATER-STOP ASSEMBLY MADE FOR IMBEDDING IN CONCRETE SLAB OR WALL.
1.3 GROUT
A. NON-SHRINK, FACTORY PACKAGED.
1.4 SLEEVE AND SLEEVE-SEAL SCHEDULE
A. USE SLEEVES AND SLEEVE SEALS FOR THE FOLLOWING PIPING-PENETRATION APPLICATIONS:
1. INTERIOR PARTITIONS:
a. PIPING SMALLER THAN NPS 6 (DN 150): GALVANIZED-STEEL-PIPE SLEEVES, PVC-PIPE SLEEVES.
b. PIPING NPS 6 (DN 150) AND LARGER: GALVANIZED-STEEL-SHEET SLEEVES.

END OF SECTION 230517

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING

- PART 2 - PRODUCTS
2.1 ESCUTCHEONS
A. ONE-PIECE, CAST-BRASS TYPE: WITH POLISHED, CHROME-PLATED AND ROUGH-BRASS FINISH AND SETSCREW FASTENER.
B. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-DRAWN, BOX-SHAPED BRASS WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
C. ONE-PIECE, STAMPED-STEEL TYPE: WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
2.2 FLOOR PLATES
A. ONE-PIECE FLOOR PLATES: CAST-IRON FLANGE WITH HOLES FOR FASTENERS.
PART 3 - EXECUTION
3.1 INSTALLATION
A. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS.
B. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.

- 1. ESCUTCHEONS FOR NEW PIPING:
a. PIPING WITH FITTING OR SLEEVE PROTRUDING FROM WALL: ONE-PIECE, DEEP-PATTERN TYPE.
b. INSULATED PIPING: ONE-PIECE, STAMPED-STEEL TYPE.
c. BARE PIPING AT WALL AND FLOOR PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
d. BARE PIPING AT CEILING PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
3.2 FIELD QUALITY CONTROL
A. REPLACE BROKEN AND DAMAGED ESCUTCHEONS AND FLOOR PLATES USING NEW MATERIALS.

END OF SECTION 230518

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

- 1.1 PERFORMANCE REQUIREMENTS
A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS, AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.
1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
2. DESIGN EQUIPMENTS SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS.
3. DESIGN SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.

END OF SECTION 230529

- 1.2 SUBMITTALS
A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER
1.3 QUALITY ASSURANCE
A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE - STEEL."
1.4 COMPONENTS
A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL
B. TRAPEZE PIPE HANGERS: CARBON OR STAINLESS STEEL
C. FIBERGLASS PIPE HANGERS: -CLEVIS, CENTURY COMPOSITES, COOPER B-LINE
D. METAL FRAMING SYSTEMS: MFMA MANUFACTURER
E. FIBERGLASS STRUT SYSTEMS: COOPER B-LINE
F. THERMAL-HANGER SHIELD INSERTS:
G. FASTENER SYSTEMS: POWDER-ACTUATED FASTENERS OR MECHANICAL-EXPANSION ANCHORS
H. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB-MOUNTED TYPE
I. EQUIPMENT SUPPORTS.
END OF SECTION 230529

SECTION 230548 - VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

- 1.1 COMPONENTS
A. VIBRATION ISOLATORS:
1. ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
2. MOUNTS: DOUBLE-DEFLECTION TYPE.
3. RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
4. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
5. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
6. HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
7. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
8. SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
9. SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
10. PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
11. RESILIENT PIPE GUIDES.
B. AIR-MOUNTING SYSTEMS:
1. AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSIONED-AIR BELLOW.
2. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOW.
C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR- AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBERS BUSHINGS.
D. VIBRATION ISOLATION EQUIPMENT BASES:
1. STEEL BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS.
2. INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE.

END OF SECTION 230548

SECTION 230713 - DUCT INSULATION

- 1.1 QUALITY ASSURANCE
SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E 84.
1.2 FIELD QUALITY CONTROL
A. TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.
PART-2 PRODUCTS
1.1 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES
A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. HILT, INC.
5. ISOLATION TECHNOLOGY, INC.
6. KINETICS NOISE CONTROL.
7. LOOS & CO.; CABLEWARE DIVISION.
8. MASON INDUSTRIES.
9. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
10. UNISTRUT; TYCO INTERNATIONAL, LTD.
END OF SECTION 230548

- 1.2 UNCONDITIONED SPACES WITHIN BUILDING: R-6 WITHIN BUILDING ENVELOPE ASSEMBLY: R-8 OUTSIDE OF BUILDING: R-8
1.4 ITEMS NOT INSULATED:
1. FIBROUS-GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
3. FACTORY-INSULATED FLEXIBLE DUCTS.
4. FACTORY-INSULATED PLENUMS AND CASINGS.
5. FLEXIBLE CONNECTORS.
6. VIBRATION-CONTROL DEVICES.
7. FACTORY-INSULATED ACCESS PANELS AND DOORS.
8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.
1.5 PRODUCTS
A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:
1. JOHNS-MANVILLE
2. OWENS-CORNING
1.6 ACOUSTICAL TREATMENT
1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50, DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED,

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

- 1.1 SUMMARY
A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:

- 1. AIR SYSTEMS: CONSTANT VOLUME.
END OF SECTION 230713
1.2 QUALITY ASSURANCE
A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO,1 SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AA8C, NEBB OR TABB CERTIFIED.
1.3 EXECUTION
A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

- END OF SECTION 230593
SECTION 230713 - DUCT INSULATION
1.1 QUALITY ASSURANCE
SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E 84.
1.2 FIELD QUALITY CONTROL
A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.
1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE:
A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:
B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:
UNCONDITIONED SPACES WITHIN BUILDING: R-6 WITHIN BUILDING ENVELOPE ASSEMBLY: R-8 OUTSIDE OF BUILDING: R-8
1.4 ITEMS NOT INSULATED:
1. FIBROUS-GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
3. FACTORY-INSULATED FLEXIBLE DUCTS.
4. FACTORY-INSULATED PLENUMS AND CASINGS.
5. FLEXIBLE CONNECTORS.
6. VIBRATION-CONTROL DEVICES.
7. FACTORY-INSULATED ACCESS PANELS AND DOORS.
8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.
1.5 PRODUCTS
A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:
1. JOHNS-MANVILLE
2. OWENS-CORNING
1.6 ACOUSTICAL TREATMENT
1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50, DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED,

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

- 1.1 QUALITY ASSURANCE
SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E 84.
1.2 FIELD QUALITY CONTROL
A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.
1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE:
A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:
B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:
UNCONDITIONED SPACES WITHIN BUILDING: R-6 WITHIN BUILDING ENVELOPE ASSEMBLY: R-8 OUTSIDE OF BUILDING: R-8
1.4 ITEMS NOT INSULATED:
1. FIBROUS-GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
3. FACTORY-INSULATED FLEXIBLE DUCTS.
4. FACTORY-INSULATED PLENUMS AND CASINGS.
5. FLEXIBLE CONNECTORS.
6. VIBRATION-CONTROL DEVICES.
7. FACTORY-INSULATED ACCESS PANELS AND DOORS.
8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.
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A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:
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1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50, DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED,

- 1.4 ITEMS NOT INSULATED:
1. FIBROUS-GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
3. FACTORY-INSULATED FLEXIBLE DUCTS.
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5. FLEXIBLE CONNECTORS.
6. VIBRATION-CONTROL DEVICES.
7. FACTORY-INSULATED ACCESS PANELS AND DOORS.
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A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:
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1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50, DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED,

SECTION 230713 - DUCT INSULATION

- 1.1 QUALITY ASSURANCE
SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E 84.

SECTION 233113 - METAL DUCTS

- CONSTRUCTION
A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS, WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 1 INCH WG PRESSURE, SEAL CLASS "A".
B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 1" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

- 1. CONSTRUCT SO THAT ALL INTERIOR SURFACES ARE SMOOTH USE SLIP AND DRIVE OR FLANGED AND BOLTED CONSTRUCTION WHEN FABRICATING RECTANGULAR DUCTWORK; USE SPIRAL LOCK SEAM CONSTRUCTION WHEN FABRICATING ROUND SPIRAL DUCTWORK. SHEET METAL SCREWS MAY BE USED ON DUCT HANGERS, TRANSVERSE JOINTS AND OTHER SMACNA APPROVED LOCATIONS IF THE SCREW DOES NOT EXTEND MORE THAN 1/2 INCH INTO THE DUCT.
2. SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC IRON ALLOY-COATED (GALVANNEALED) BY HOT DIP PROCESS AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENT FOR SHEET METALLIC-COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.
3. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30-03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30-02 AND COVERED WITH APPROVED SEALING TAPE.
4. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.

- C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:
USG MAX. SIDE INCHES TRANSVERSE JOINTS AND BRACING
22 UP TO 12 S SLIP, DRIVE SLIP, ONE INCH POCKET LOCK ON 8 FOOT CENTERS
22 13 TO 24 1"X1"X1/8" ANGLES ON 4 FOOT CENTERS
20 25 TO 35 1"X1"X1/8" ANGLES ON 2 FOOT CENTERS

- D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:
1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.

- E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS SHOWN IN FIG. 3-6 AND AS SHOWN IN FIG. 3-1 AND 3-2 FOR ROUND DUCTWORK.
F. ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.

- 1.2 MATERIALS
A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
B. SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS.
C. SHEET METAL MATERIALS:
1. GALVANIZED SHEET STEEL.
2. STAINLESS-STEEL SHEETS.
3. ALUMINUM SHEETS.
4. FACTORY-APPLIED ANTI-MICROBIAL COATING.
D. DUCT LINER:
1. FIBROUS GLASS, TYPE I, FLEXIBLE.
a. WITH ANTI-MICROBIAL EROSION-RESISTANT COATING.
2. FLEXIBLE ELASTOMERIC.
3. NATURAL FIBER.

- E. SEALANT MATERIALS:
1. TWO-PART TAPE SEALING SYSTEM.
2. WATER-BASED JOINT AND SEAM SEALANT.
3. SOLVENT-BASED JOINT AND SEAM SEALANT.
4. FLANGED JOINT SEALANT.
5. FLANGE GASKETS.
6. ROUND DUCT JOINT O-RING SEALS.
1.3 DUCT CLEANING
A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
B. CLEAN THE FOLLOWING ITEMS:
1. AIR OUTLETS AND INLETS.
2. SUPPLY, RETURN, AND EXHAUST FANS.
3. AIR HANDLING UNIT.
4. COILS AND RELATED COMPONENTS.
5. RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
6. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.

- 7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.
1.4 DUCT SCHEDULE
A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:
1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.
END OF SECTION 233113

SECTION 233713 - DIFFUSERS AND GRILLES

- 1.1 PRODUCTS
A. DIFFUSERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.
B. MANUFACTURERS: TITUS
1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:
a. CARNES.
b. HART & COOLEY INC.
c. KRUEGER.
d. METALAIR, INC.
e. NAILOR INDUSTRIES INC.
C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.
D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

- 7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.
1.4 DUCT SCHEDULE
A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:
1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.
END OF SECTION 233113

SECTION 233713 - DIFFUSERS AND GRILLES

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B. MANUFACTURERS: TITUS
1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:
a. CARNES.
b. HART & COOLEY INC.
c. KRUEGER.
d. METALAIR, INC.
e. NAILOR INDUSTRIES INC.
C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.
D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

END OF SECTION 233713

- THERMOSTATIC CONTROLS (MANDATORY):
C403.2.4.1 THERMOSTATIC CONTROLS
THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.
EXCEPTION: INDEPENDENT PERIMETER SYSTEMS THAT ARE DESIGNED TO OFFSET ONLY BUILDING ENVELOPE HEAT LOSSES, GAINS OR BOTH SERVING ONE OR MORE PERIMETER ZONES ALSO SERVED BY AN INTERIOR SYSTEM PROVIDED THAT BOTH OF THE FOLLOWING CONDITIONS ARE MET:
1. THE PERIMETER SYSTEM INCLUDES NOT FEWER THAN ONE THERMOSTATIC CONTROL ZONE FOR EACH BUILDING EXPOSURE HAVING EXTERIOR WALLS FACING ONLY ONE ORIENTATION (WITHIN ± 45 DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 MM).
2. THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THERMOSTATS LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.

- C403.2.4.1.1 HEAT PUMP SUPPLEMENTARY HEAT
HEAT PUMPS HAVING SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL HAVE CONTROLS THAT, EXCEPT DURING DEFROST, PREVENT SUPPLEMENTARY HEAT OPERATION WHERE THE HEAT PUMP CAN PROVIDE THE HEATING LOAD.

- IN SYSTEMS WITH A COOLING CAPACITY OF LESS THAN 65,000 BTUH, A HEAT STRIP OUTDOOR TEMPERATURE LOCKOUT SHALL BE PROVIDED TO PREVENT SUPPLEMENTAL HEAT OPERATION IN RESPONSE TO THE THERMOSTAT BEING CHANGED TO A WARMER SETTING. THE LOCKOUT SHALL BE SET NO LOWER THAN 35°F AND NO HIGHER THAN 40°F.

- C403.2.4.1.2 DEADBAND
WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.
EXCEPTIONS:
1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
2. OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.

- C403.2.4.1.3 SETPOINT OVERLAP RESTRICTION
WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.2.4.1.2.

- C403.2.4.2 OFF-HOUR CONTROLS
EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.
EXCEPTIONS:
1. ZONES THAT WILL BE OPERATED CONTINUOUSLY.
2. ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTUH (2 KW) AND HAVING A MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.

- C403.2.4.2.1 THERMOSTATIC SETBACK
THERMOSTATIC SETBACK CONTROLS SHALL BE CONFIGURED TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

- C403.2.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN
AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS. A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

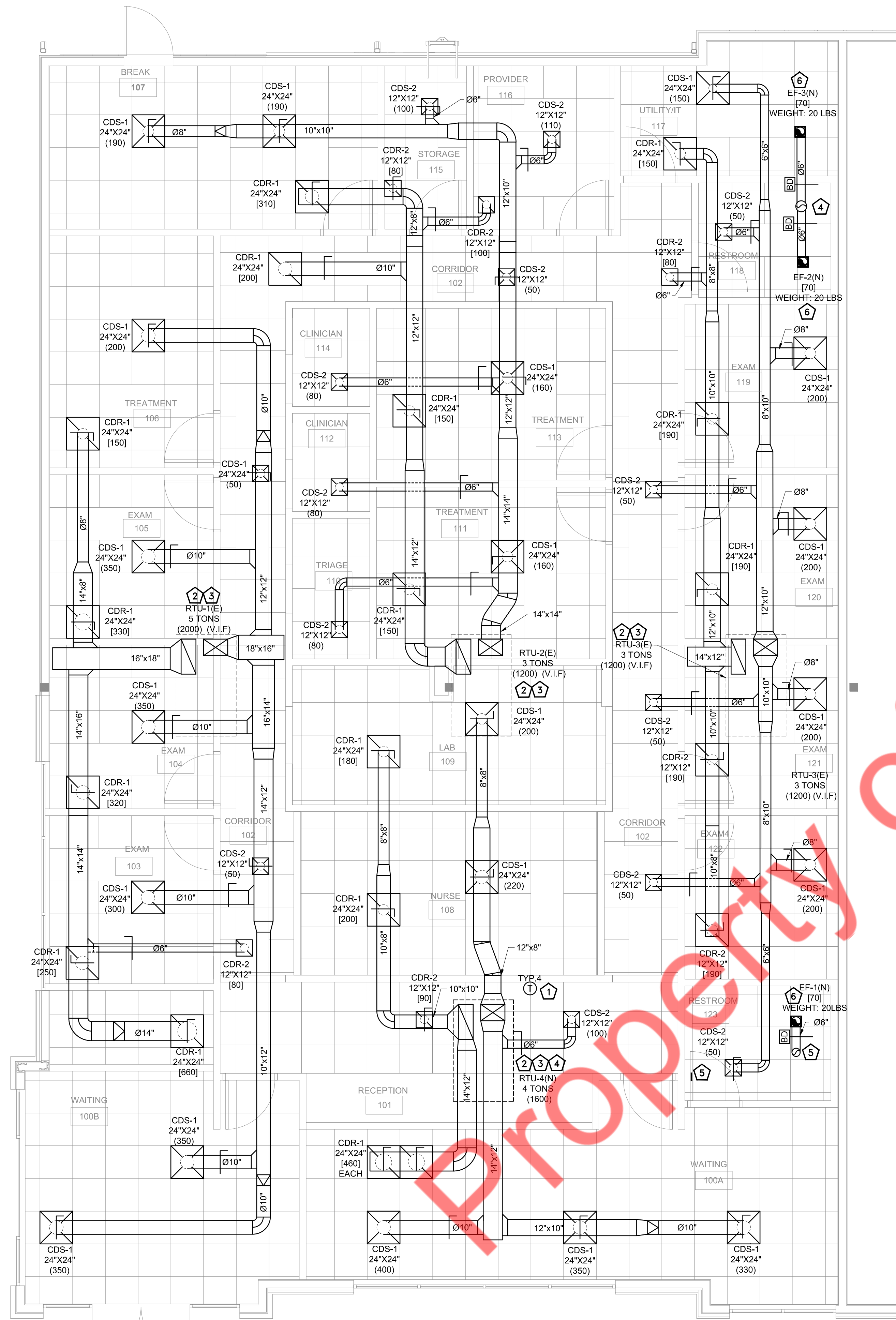
- C403.2.4.2.3 AUTOMATIC START
AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM PROVIDED WITH SETBACK CONTROLS AND DIRECT DIGITAL CONTROL (DDC) SYSTEM. THE CONTROLS SHALL BE CAPABLE OF AUTOMATICALLY ADJUSTING THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

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Table with columns: NO, DATE, OWNER REVISION COMMENTS. Row 1: 1, 07/08/2025

M0.2
MECHANICAL SPECIFICATION



MECHANICAL GENERAL NOTES

- A. CONTRACTOR SHALL BALANCE EACH DEVICE WITH CFM SHOWN ON PLAN.
- B. NEW DUCTWORK SHOWN ON THE PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFSET AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED, PROVIDE ANY EXTRA PIPING, DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.
- C. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
- D. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATES WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR THE FIRE RATINGS OF THE WALLS.
- E. KEEP ALL ADJOINING AREAS ADJACENT TO THE WORK AREAS CLEAN AND FREE OF DEBRIS.
- F. ALL EXHAUST AND RETURN AIR TERMINALS TO HAVE RIGID DUCT CONNECTIONS.
- G. DIFFUSERS IN THE BLACK CEILING AREA MUST BE OF TYPE SO THAT DIFFUSER GRILLE DOES NOT HANG BELOW CEILING GRID.
- H. ANY DIFFUSERS LOCATED IN THE BLACK CEILING AREA ARE TO BE PAINTED TO MATCH.
- I. PROVIDE ALL NEW DUCTWORK AS SHOWN. DUCT WORK ABOVE CEILING TO BE INSULATED ACCORDING TO 2018 NORTH CAROLINA ENERGY CONSERVATION CODE.
- J. FLEXIBLE AIR CONNECTORS SHALL BE TESTED IN ACCORDANCE WITH UL 181. SUCH DUCTS SHALL BE LISTED AND LABELED AS CLASS 0 OR CLASS 1 FLEXIBLE AIR CONNECTORS. FLEXIBLE AIR CONNECTORS SHALL BE LIMITED IN LENGTH TO 14 FEET.
- K. TEST & BALANCE SYSTEM PRIOR TO CLOSEOUT OF PROJECT. PROVIDE A DETAILED REPORT TO OWNER, ARCHITECT, & ENGINEER.
- L. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, SEALED, AND INSULATED PER THE LATEST ISSUE OF SMACNA LOW-VELOCITY DUCT MANUAL.
- M. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF TRUSSES AND MODIFY DUCTWORK ACCORDINGLY.
- N. ALL WORK SHALL BE SUBJECT TO THE ACCEPTANCE AND APPROVAL OF THE ARCHITECT AND OWNER. THE ARCHITECT SHALL BE NOTIFIED OF ANY AND ALL DISCREPANCIES BETWEEN FIELD CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. FAILURE OF PROPER NOTIFICATION DOES NOT RELIEVE THE CONTRACTOR. THE CONTRACTOR SHALL CORRECT ANY AND ALL WORK ARISING FROM SUCH FAILURE TO COORDINATE DISCREPANCIES TO THE SATISFACTION OF THE ARCHITECT WITHOUT ADDITIONAL COST TO THE OWNER.
- O. THE CONTRACTOR SHALL, UPON COMPLETION OF PROJECT, PERFORM A COMPLETE TEST AND BALANCE OF ALL EQUIPMENT. PROVIDE A WRITTEN REPORT TO THE ARCHITECT. ALL CAPACITIES MUST BE SET TO WITHIN ±10% OF AMOUNTS INDICATED ON THE FLOOR PLAN AND SCHEDULES.
- P. PROVIDE DUCT INSULATION AS SPECIFIED WITH MINIMUM VALUES AS FOLLOWS:
 R-6 SUPPLY & RETURN DUCT INSULATION IN UNCONDITIONED SPACES WITHIN BUILDING.
 R-8 SUPPLY & RETURN DUCT INSULATION WITHIN BUILDING ENVELOPE ASSEMBLY.
 R-8 SUPPLY & RETURN DUCT INSULATION OUTSIDE OF BUILDING.

MECHANICAL FLOOR PLAN KEY NOTES

- 1 PROVIDE NEW 7-DAY PROGRAMMABLE THERMOSTATS WITH LOCKING COVER. PROVIDE REMOTE SENSORS LOCATED 48" A.F.F., NEAR LOCATION INDICATED. COORDINATE LOCATION ON SITE WITH GENERAL CONTRACTOR AND EQUIPMENT. AVOID LOCATING NEAR OR ABOVE SOURCES OF HEAT. INTERLOCK WITH ASSOCIATED RTUS. CONFIRM FINAL LOCATION WITH ARCHITECT/OWNER.
- 2 EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM ROOFTOP UNITS TO SPACE. EXTEND AS SHOWN. TRANSITION DUCT AS NECESSARY TO MAKE CONNECTION. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
- 3 CONTRACTOR TO PROVIDE TEMPERATURE SENSOR IN RETURN AIR DUCT & WIRE BACK TO RTUS.
- 4 08" EXHAUST DUCT UP TO THE ROOF. TERMINATE WITH GOOSENECK AND BIRDSCREEN.
- 5 06" EXHAUST DUCT UP TO THE ROOF. TERMINATE WITH GOOSENECK AND BIRDSCREEN.
- 6 CEILING MOUNTED EXHAUST FAN. FAN SHALL BE SUSPENDED FROM STRUCTURE ABOVE. VERIFY EXACT LOCATION OF STRUCTURAL MEMBERS PRIOR TO INSTALLATION.

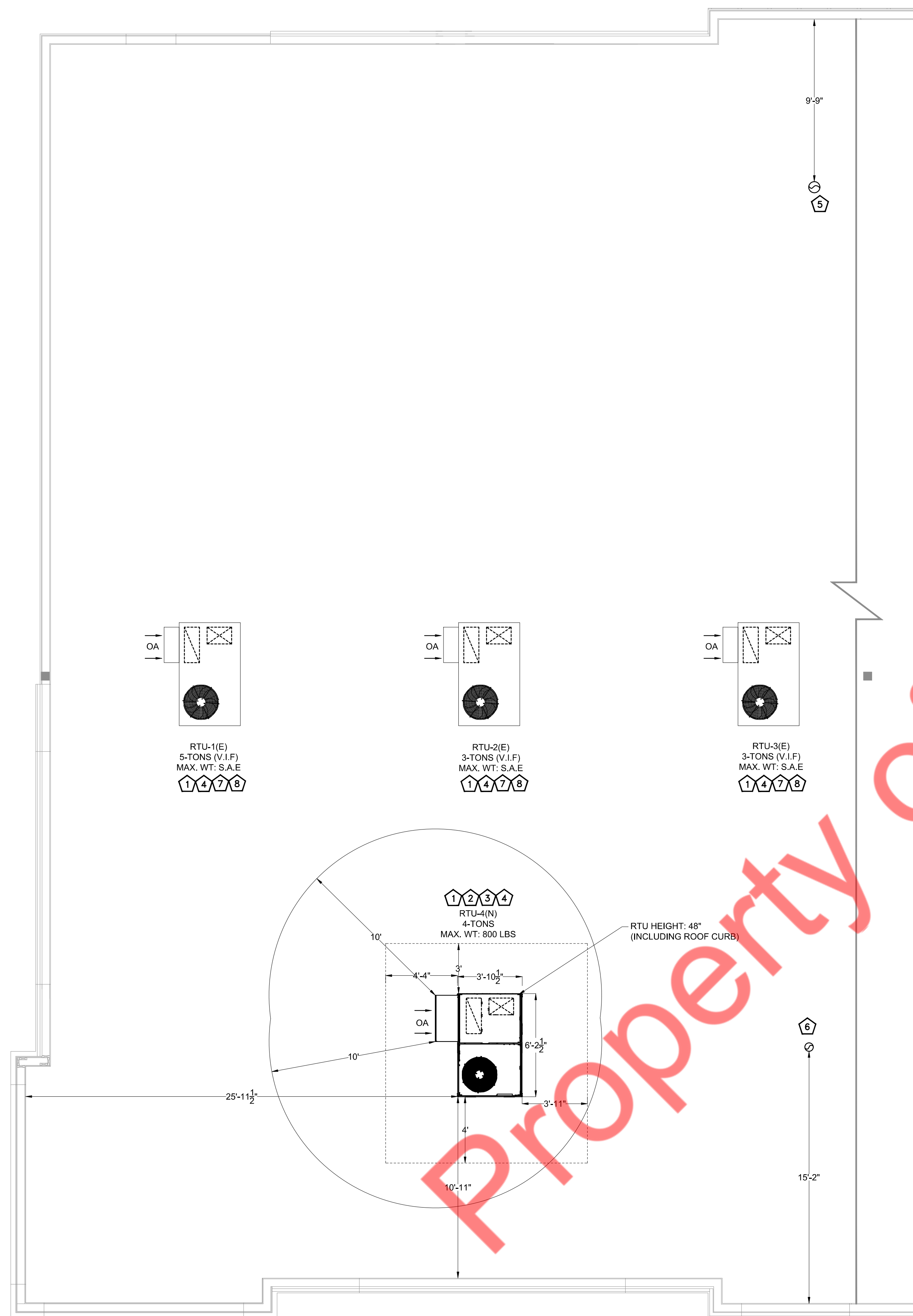
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1	OWNER REVISION COMMENTS	07/08/2025
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MECHANICAL FLOOR PLAN
SCALE 1/4"=1'-0"

M1.0
FLOOR
PLAN



MECHANICAL GENERAL NOTES

- A. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS
- B. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED. VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
- C. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
- D. ALL SOURCE OF MECHANICAL INTAKE SHALL MAINTAIN 10 LINEAR FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.
- E. RTU WEIGHTS ARE INCLUDED ROOF CURBS AND/OR ADAPTORS.

MECHANICAL ROOF PLAN KEY NOTES

- 1 COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL ENGINEER/ DRAWINGS.
- 2 NEW ROOFTOP UNIT IS PROVIDED. PROVIDE FLEXIBLE CONNECTORS ON SUPPLY AND RETURN DUCT CONNECTIONS. SET OUTSIDE AIR AS INDICATED ON ROOFTOP UNIT SCHEDULES. MECHANICAL CONTRACTOR SHALL SCRIBE INTO UNIT POSITION OF OUTSIDE AIR DAMPER AND LABEL OUTSIDE AIR VOLUME AND PERCENT OF OUTSIDE AIR. TRANSITION AND CONNECT SUPPLY AND RETURN DUCTWORK FROM BELOW. COORDINATE ROUTING THROUGH STRUCTURAL TRUSSES AND OFFSET AS REQUIRED IN CURB SPACE.
- 3 CONDENSATE DRAIN FROM RTU SHALL BE CONVEYED TO AN APPROVED PLACE OF DISPOSAL. SUCH PIPING SHALL MAINTAIN A MINIMUM HORIZONTAL SLOPE IN THE DIRECTION OF NOT LESS THAN 1/4 TH UNIT VERTICAL IN 12 UNITS HORIZONTAL (1% SLOPE). CONDENSATE SHALL NOT DISCHARGE INTO A STREET, ALLEY OR OTHER AREAS SO AS TO CAUSE NUISANCE.
- 4 CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY EXHAUST SOURCE SHOULD BE AT LEAST 10' AWAY FROM THE OUTSIDE AIR INTAKE OPENING OF RTUS.
- 5 08" EXHAUST DUCT UP THROUGH ROOF. TERMINATE WITH GOOSENECK AND BIRD SCREEN. MAINTAIN MINIMUM 10'-0" DISTANCE FROM ANY OUTSIDE AIR INTAKE SOURCE.
- 6 06" EXHAUST DUCT UP THROUGH ROOF. TERMINATE WITH GOOSENECK AND BIRD SCREEN. MAINTAIN MINIMUM 10'-0" DISTANCE FROM ANY OUTSIDE AIR INTAKE SOURCE.
- 7 EXISTING CONDENSATE DRAIN FROM RTUS TO REMAIN AS IT IS. CONTRACTOR TO FLUSH THE EXISTING DRAIN LINES. REPLACE AS/IF REQUIRED.
- 8 EXISTING RTUS (BY THE LANDLORD) ALONG WITH ALL ITS ACCESSORIES TO REMAIN AND TO BE REUSED. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION AND CONFIGURATION ON SITE. CLEAN AND REFURBISH TO "LIKE-NEW" CONDITION. REPAIR / REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE A FULLY FUNCTIONING.

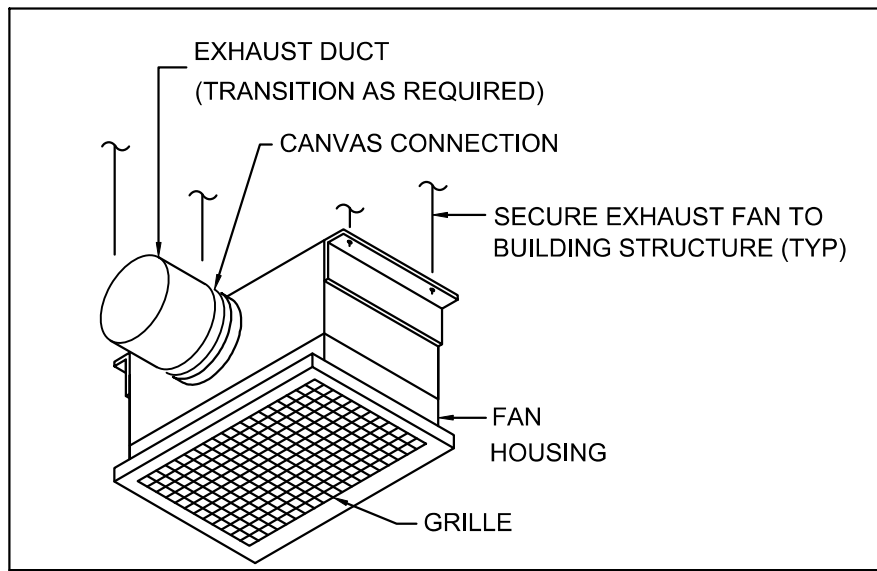
1
M2.0
MECHANICAL ROOF PLAN
SCALE 1/4"=1'-0"

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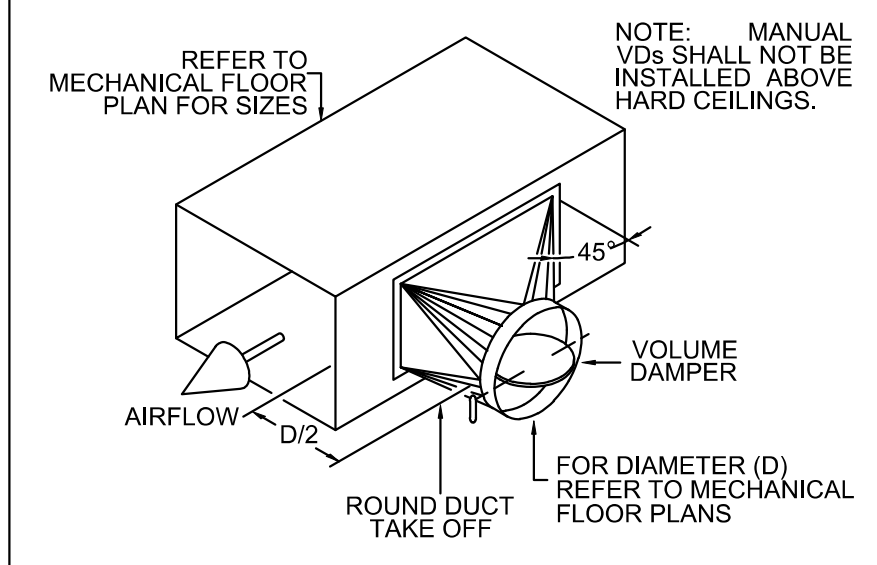
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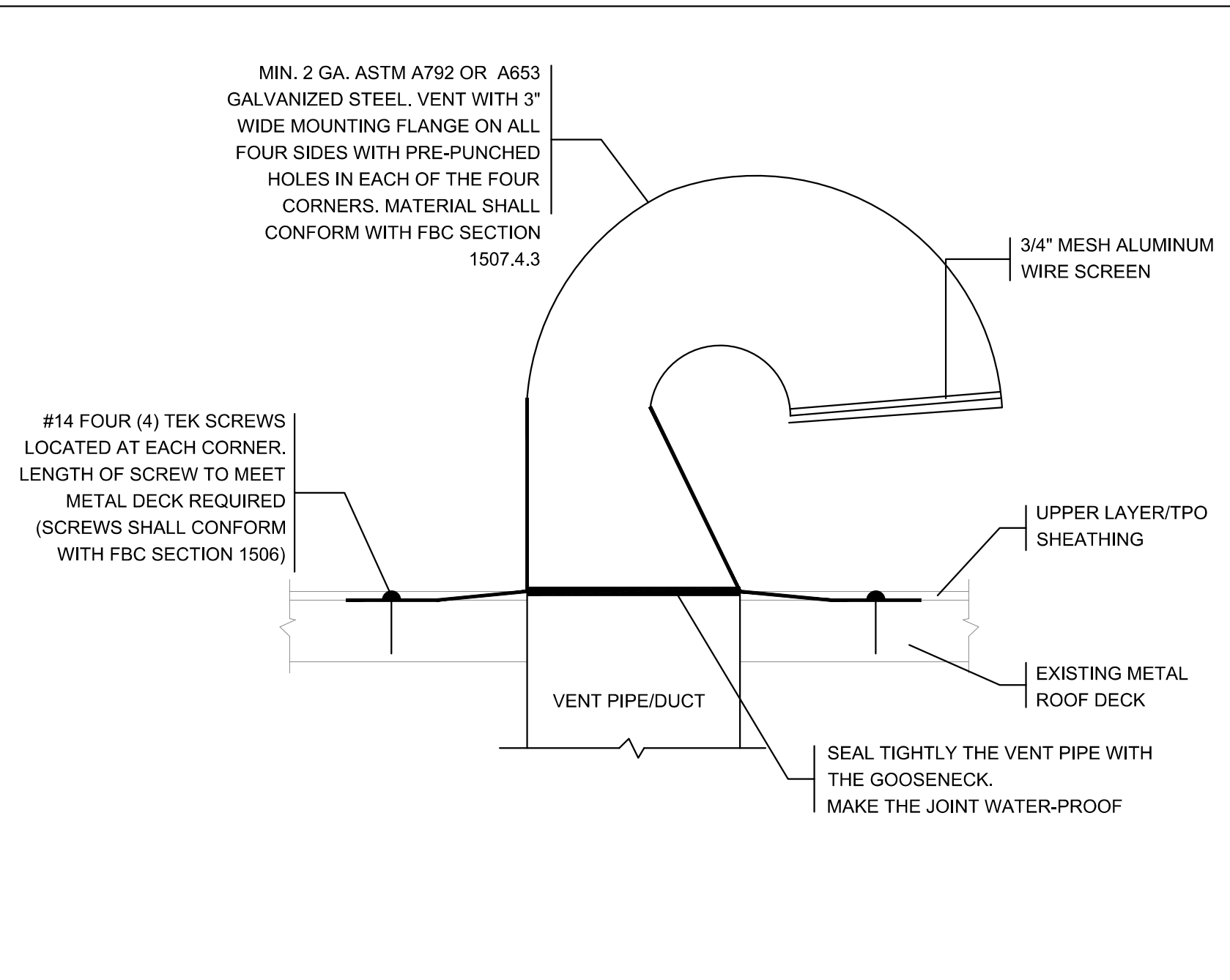
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ROOF
PLAN



1 CEILING EXHAUST FAN DETAIL
M3.0 N.T.S.



2 ROUND DUCT TAKE OFF DETAIL
M3.0 N.T.S.



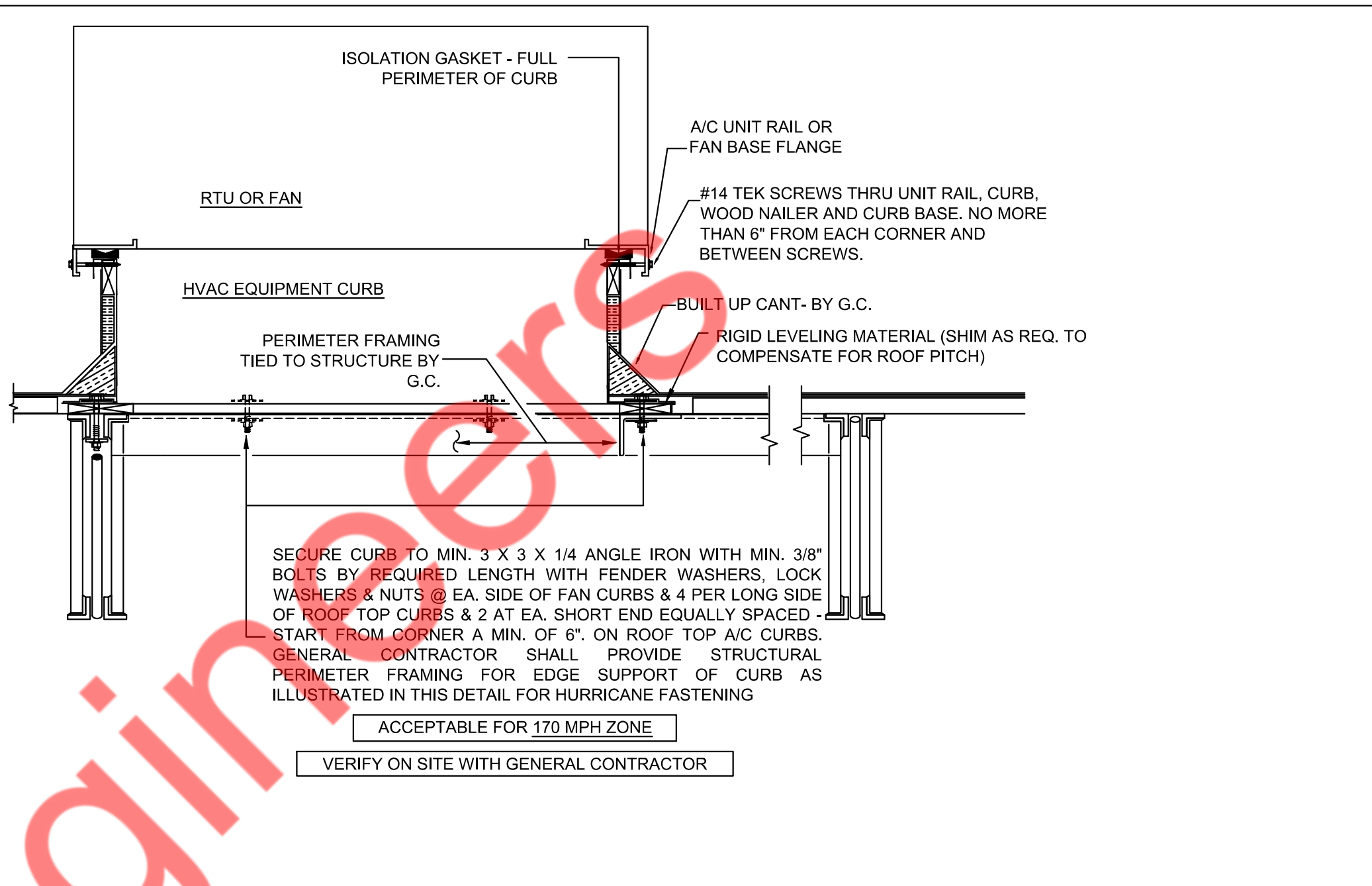
3 TYPICAL DETAIL OF ROOF GOOSENECK
M3.0 N.T.S.

ATTACHMENT METHOD:
CUT OUT THE GOOSENECK VENT OPENING IN THE ROOF SHEATHING ACCORDING WITHIN MAXIMUM DIMENSIONS. DO NOT CUT INTO TRUSSES OR RAFTERS WHEN CUTTING OPENING IN THE ROOF.

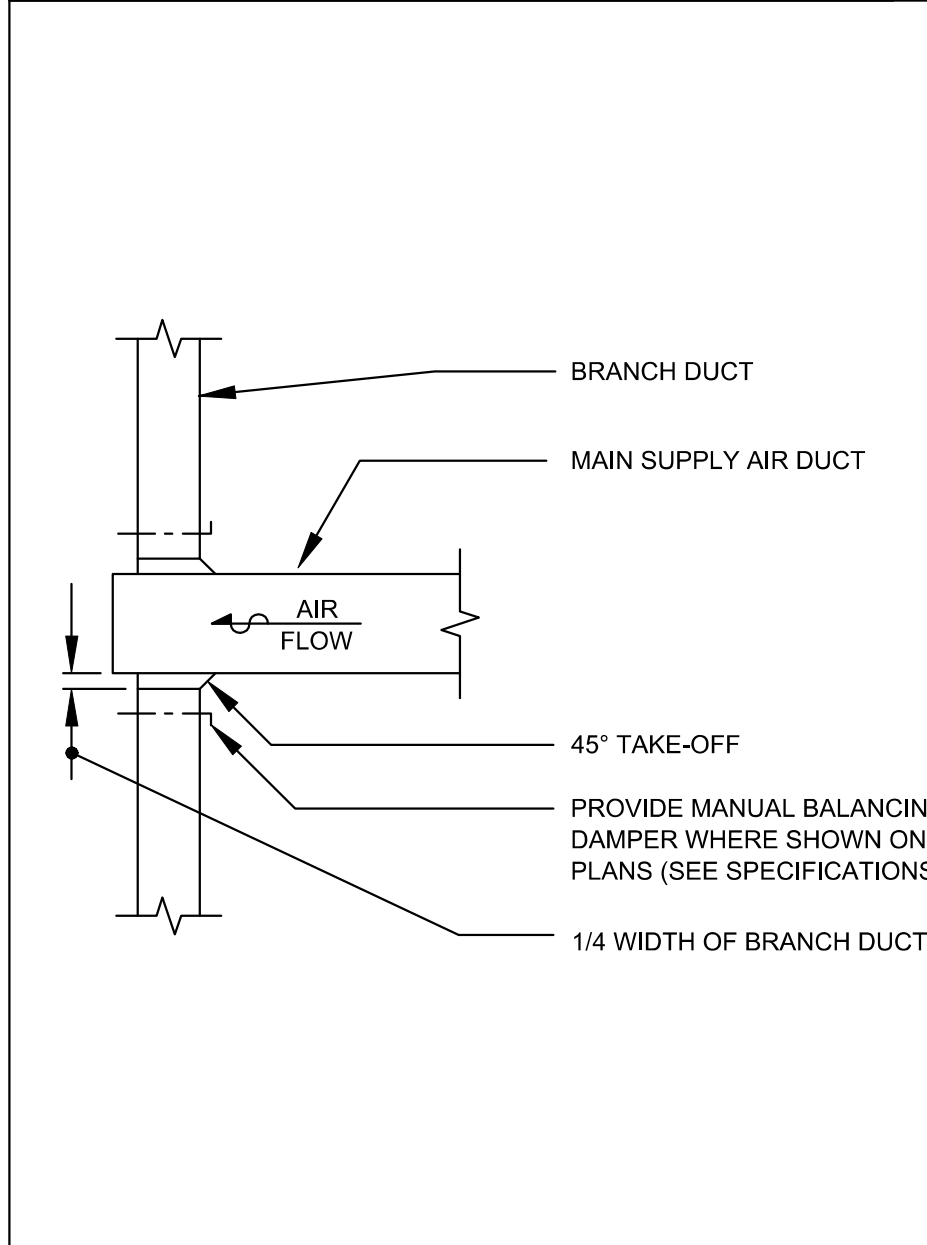
REMOVE INTERFERING SHINGLE NAILS AROUND THE PERIMETER OF THE OPENING AND ANY DEBRIS SO THAT THE NAILING FLANGE OF THE VENT LAYS FLAT TO THE ROOF SHEATHING. SLIDE THE TOP AND SIDE FLANGES OF THE VENT UNDERNEATH THE SHINGLES AND ALLOW THE BOTTOM FLANGE TO LIE ON THE TOP OF THE SHINGLES. CARE SHOULD BE TAKEN IN KEEPING THE VENT PROPERLY ALIGNED. VENT PIPE IS SEALED IF UTILIZED. SCREW IN PLACE USING FOUR (4) TEK SCREWS LOCATED AT EACH CORNER (SCREWS SHALL CONFORM WITH FBC SECTION 1506). ROOFING CEMENT SHOULD BE APPLIED TO ALL SHINGLE EDGES NEAR THE OUTER EDGE AND AROUND THE ENTIRE PERIMETER.

ALLOWABLE ROOF COVERINGS: ASPHALT SHINGLES

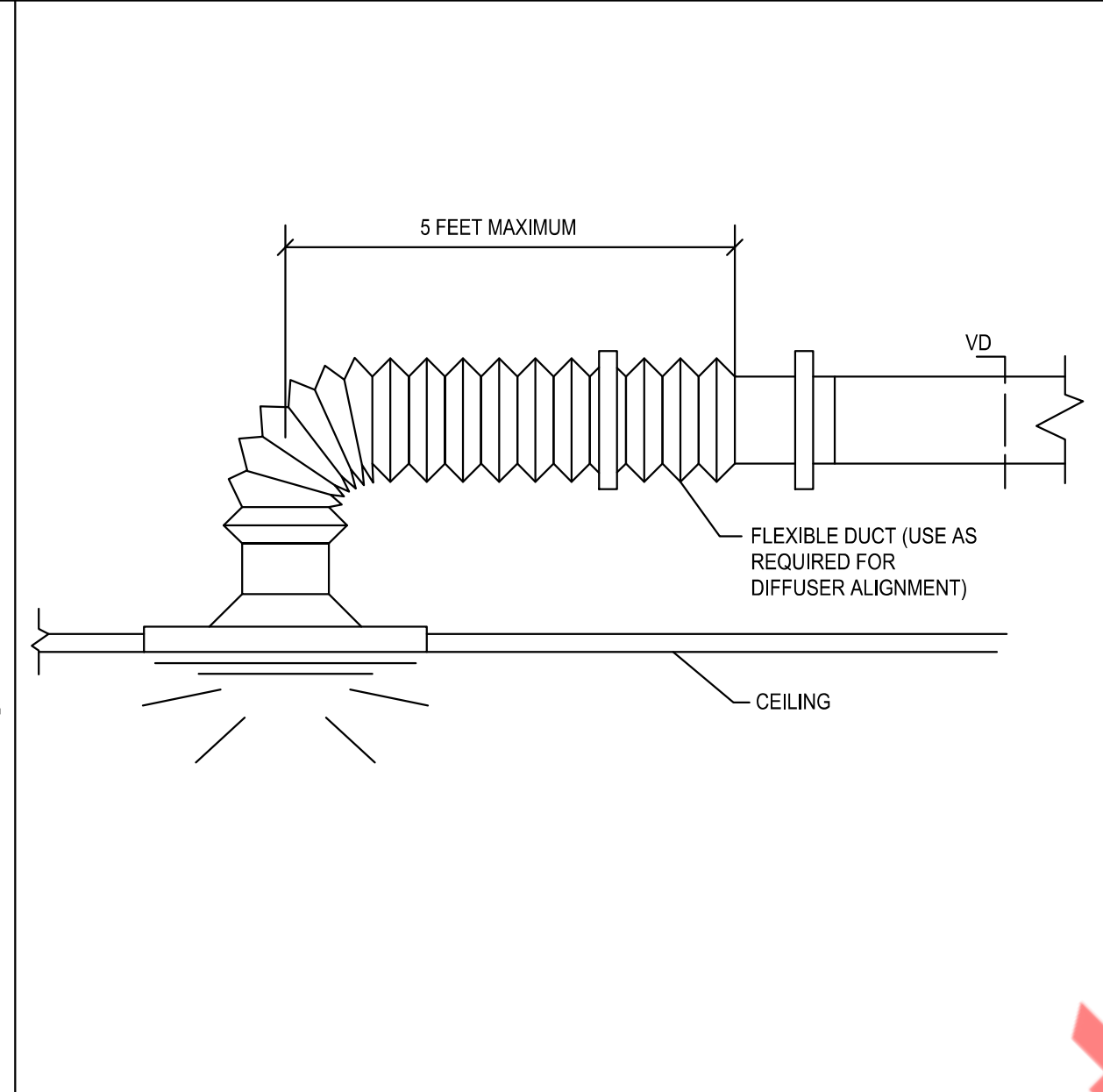
MAXIMUM DESIGN PRESSURE:
-52.5 PSF FOR INSTALLATIONS OVER PLYWOOD DECK
-22.5 PSF FOR INSTALLATION OVER OSB DECK
PRESSURES CALCULATED USING 2.1 MARGIN OF SAFETY PER 1504.9.



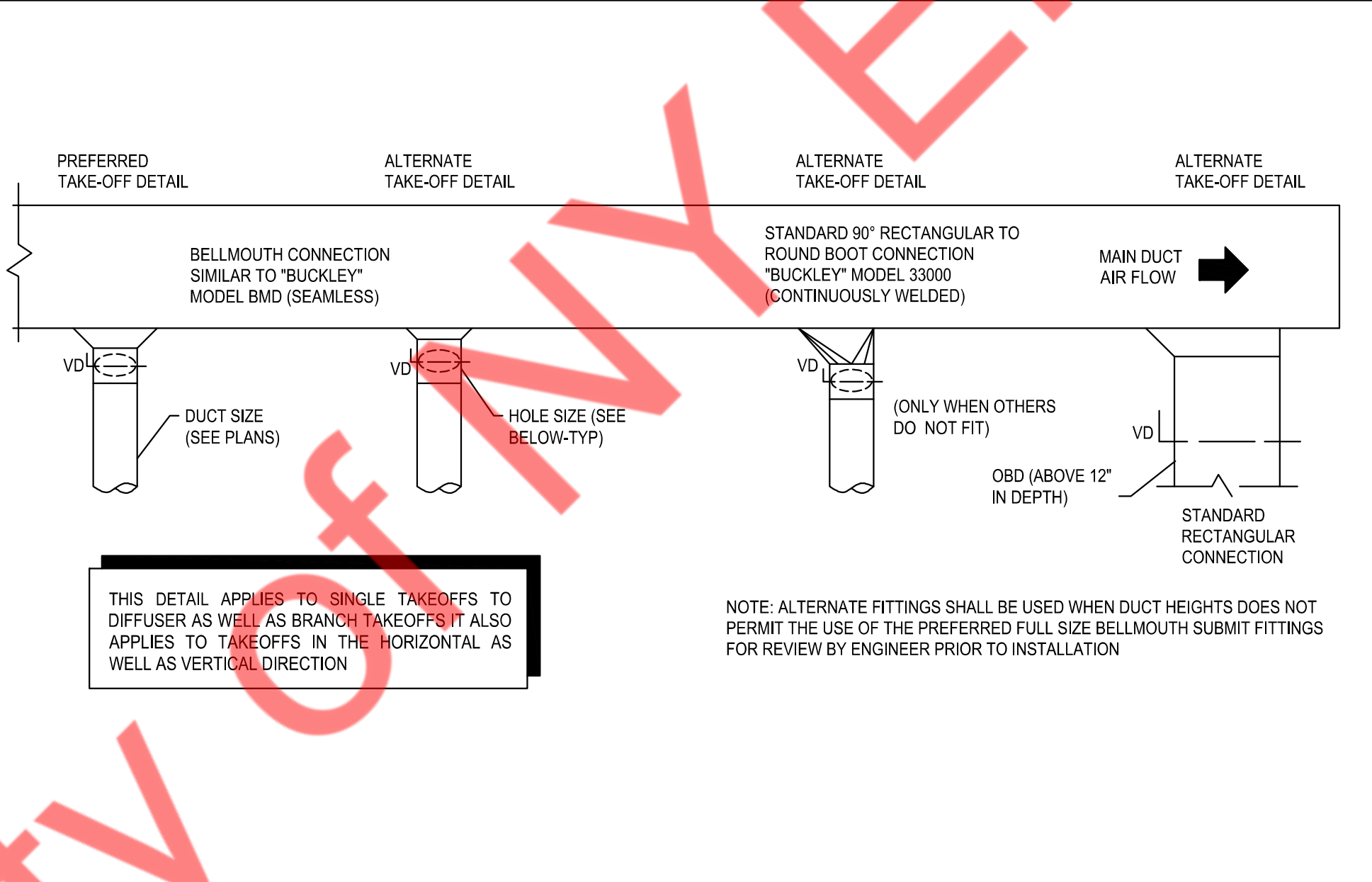
4 ROOF TOP UNIT INSTALLATION DETAILS
M3.0 N.T.S.



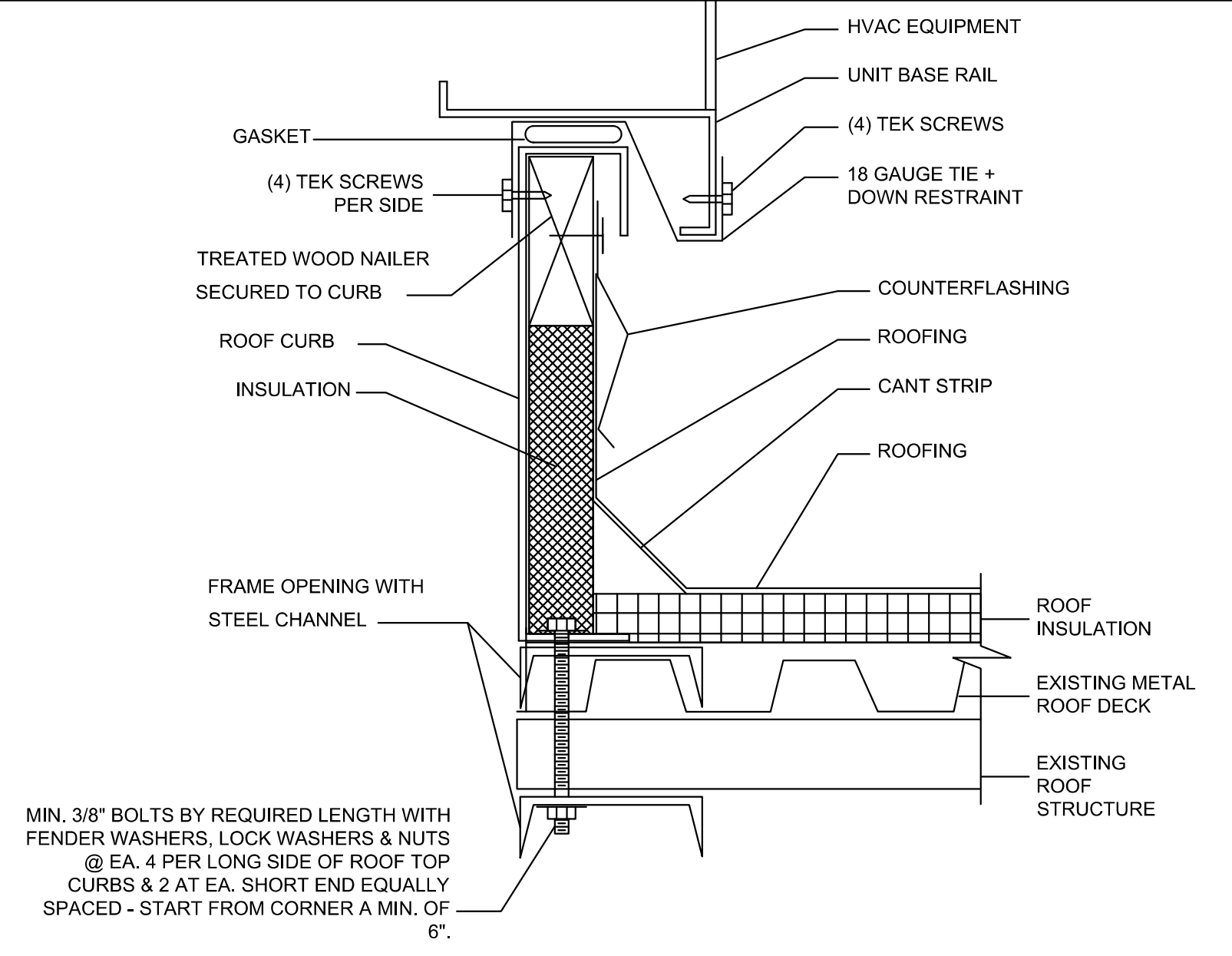
5 SUPPLY AIR DUCT DETAIL
M3.0 N.T.S.



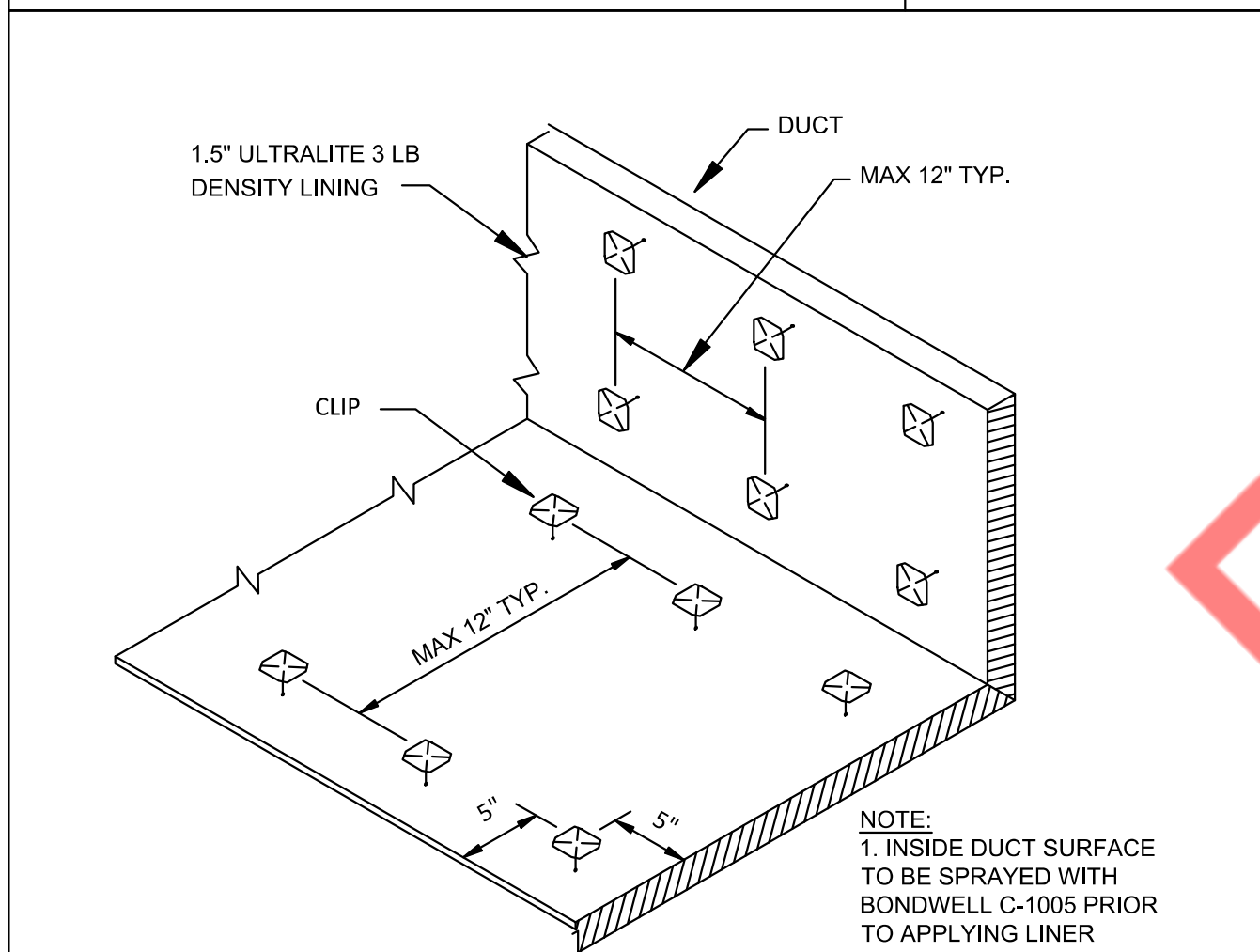
6 CEILING DIFFUSER BRANCH DUCT CONNECTION
M3.0 N.T.S.



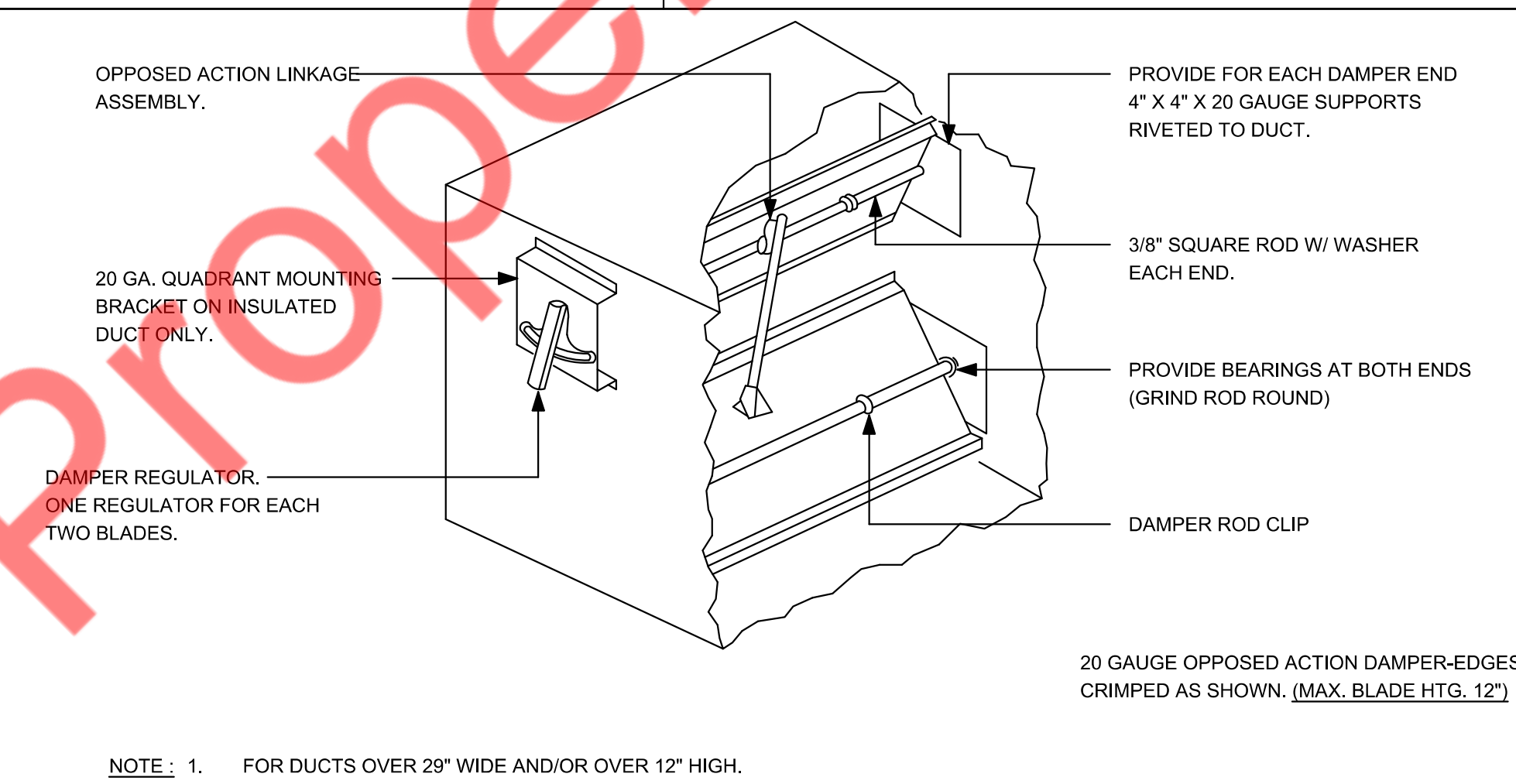
7 DUCT TAKEOFFS
M3.0 N.T.S.



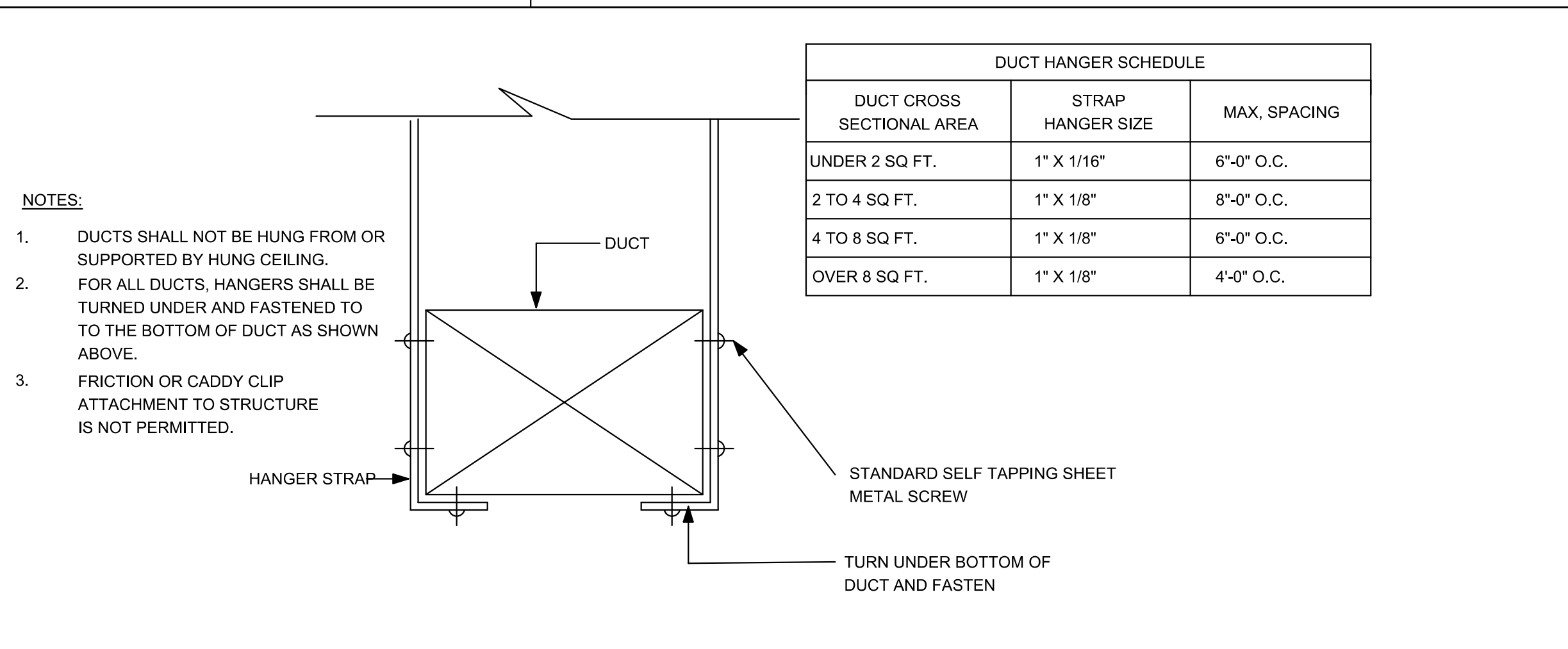
8 ROOF-TOP UNIT CURB DETAIL
M3.0 N.T.S.



9 LOW PRESSURE BALANCING DAMPER
M3.0 N.T.S.



10 LOW PRESSURE BALANCING DAMPER
M3.0 N.T.S.



11 DUCT HANGING DETAILS
M3.0 N.T.S.

DUCT HANGER SCHEDULE		
DUCT CROSS SECTIONAL AREA	STRAP HANGER SIZE	MAX. SPACING
UNDER 2 SQ. FT.	1" X 1/16"	6'-0" O.C.
2 TO 4 SQ. FT.	1" X 1/8"	8'-0" O.C.
4 TO 8 SQ. FT.	1" X 1/8"	6'-0" O.C.
OVER 8 SQ. FT.	1" X 1/8"	4'-0" O.C.

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MECHANICAL
DETAILS

ROOF TOP UNIT (GAS HEAT) SCHEDULE																		
UNIT ID	MANUFACTURER	STATUS	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN			HEATING CAPACITY (MBH)		COOLING CAPACITY		ELECTRICAL DATA			AFUE (%)	SEER/EER	MAX OPERATING WEIGHT (LBS.)
						SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	MAX. ESP (IN. OF W.G.)	INPUT (MBH)	OUTPUT (MBH)	TOTAL (MBH)	SENSIBLE (MBH)	VOLTS/PH/HZ	MCA (A)	MOCP (A)			
RTU-1(E)	CARRIER (V.I.F)	EXISTING	S.A.E	SEE PLAN	5 (V.I.F)	2000 (V.I.F)	210	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	33 (V.I.F)	45 (V.I.F)	S.A.E	S.A.E	S.A.E	
RTU-2(E)	CARRIER (V.I.F)	EXISTING	S.A.E	SEE PLAN	3 (V.I.F)	1200 (V.I.F)	210	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	24 (V.I.F)	30 (V.I.F)	S.A.E	S.A.E	S.A.E	
RTU-3(E)	CARRIER (V.I.F)	EXISTING	S.A.E	SEE PLAN	3 (V.I.F)	1200 (V.I.F)	210	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	24 (V.I.F)	30 (V.I.F)	S.A.E	S.A.E	S.A.E	
RTU-4(N)	CARRIER	NEW	48FEEA05A2A5-0A9A0 (OR EQUIVALENT)	SEE PLAN	4	1600	210	1	110	88	52.3	37.7	208-230/3/60	26	30	80	14.0/11.8	800

- NOTES / ACCESSORIES FOR RTU-1(E), RTU-2(E), RTU-3(E) -**
- 1) S.A.E - SAME AS EXISTING, V.I.F - VERIFY IN FIELD.
 - 2) EXISTING RTUS WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
 - 3) CONTRACTOR TO CONFIRM IF EXISTING RTUS IS WORKING AT ITS 100% RATED CAPACITY.
 - 4) CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF RTUS ON SITE.
 - 5) CONTRACTOR TO RE-BALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON EXISTING RTUS TO MATCH VALUES MENTIONED IN ABOVE TABLE.
 - 6) REPLACE ALL AIR FILTERS WITH NEW MERV-13 FILTERS BEFORE HANDING OVER THE SPACE TO THE OWNER / TENANT.
- NOTES / ACCESSORIES FOR RTU-4(N) -**
- 1) CONTRACTOR TO BALANCE OUTSIDE AIR DAMPER ON RTUS TO MATCH VALUE MENTIONED IN EQUIPMENT SCHEDULE.
 - 2) REPLACE ALL AIR FILTERS WITH NEW MERV-13 FILTERS BEFORE HANDING OVER THE SPACE TO THE OWNER/TENANT.
 - 3) BOTTOM DISCHARGE & RETURN CONFIGURATION.
 - 4) UNIT TO BE PROVIDED WITH LOW LEAKAGE VOLUME CONTROL DAMPER, NEMA 3R DISCONNECT, FAN WITH VFD, VIBRATION ISOLATION SPRING SUPPORTED BLOWER, INTAKE HOOD, SCREEN INTAKE.
 - 5) CONTRACTOR TO BALANCE OUTSIDE AIR DAMPER ON RTU TO MATCH VALUE MENTIONED IN EQUIPMENT SCHEDULE.
 - 6) PROVIDE FLEXIBLE CONNECTION AT DUCT CONNECTION TO UNIT.
 - 7) PROVIDE VIBRATION ISOLATOR FOR UNIT MOUNTING.
 - 9) PROVIDE ALL COMPRESSORS WITH 5 YEAR WARRANTY.
 - 10) ANTI SHORT CYCLE TIMER.
 - 11) CONNECT CONDENSATE DRAIN LINE FROM RTU ON THE ROOF TO THE NEAREST DRAIN POINT. CONNECT TO A DRAIN LINE VIA AIR GAP IN AN APPROVED MANNER.
 - 12) PROVIDE 14" ROOF CURB. CONTRACTOR TO FIELD INSULATE.
 - 13) REMOTE SENSORS SHALL BE PROVIDED IN RETURN AIR DUCT WIRED BACK TO PROGRAMMABLE, 24 HOUR, 7 DAY, THERMOSTATS.

EXHAUST FAN SCHEDULE											
TAG	QUANTITY	FLOW RATE CFM	STATIC PRESSURE EXTERNAL IN W.G.	ELECTRIC DATA			MAXIMUM LOUDNESS DBA	BASIS OF DESIGN		MAX. WEIGHT (LBS)	
				SPEED RPM	V/PH/HZ	MCA (A)		MOCP (A)	MANUFACTURER		MODEL
EF-1(N), EF-2(N), EF-3(N)	3	70	0.5	817	115/60/1	0.4	15	35	GREENHECK	SP-AP0511W-1 (OR EQUIVALENT)	20

NOTES:

1. INTERLOCK EF-1(N), EF-2(N) WITH RESTROOM LIGHT.
2. PROVIDE THERMAL OVERLOAD PROTECTION, BACKDRAFT DAMPER, AMCA SEAL AND UL CERTIFIED.
3. PROVIDE ALL NECESSARY ACCESSORIES AND INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS.
4. INTERLOCK EF-3(N) WITH RTU-3(E).

AIR BALANCE TABLE					
UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-1(E)	SEE PLAN	2000 CFM	210 CFM	1790 CFM	-
RTU-2(E)	SEE PLAN	1200 CFM	210 CFM	990 CFM	-
RTU-3(E)	SEE PLAN	1200 CFM	210 CFM	990 CFM	-
RTU-4(N)	SEE PLAN	1600 CFM	210 CFM	1390 CFM	-
EF-1(N)	SEE PLAN	-	-	-	70 CFM
EF-2(N)	SEE PLAN	-	-	-	70 CFM
EF-3(N)	SEE PLAN	-	-	-	70 CFM
TOTAL:		6000 CFM	840 CFM	5160 CFM	210 CFM
BUILDING PRESSURE:		630 CFM		POSITIVE	

1. CONTRACTOR TO BALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON RTUS TO MATCH VALUES AS MENTIONED IN ABOVE TABLE.

AIR TERMINAL DEVICES SCHEDULE							
TAG	SIZE (IN.)	DESCRIPTION	CONSTRUCTION	NECK SIZE (IN.)	BASIS OF DESIGN		NOTES
					MANUFACTURER	MODEL	
CDS-1	24"x24"	SQUARE CONE DIFFUSER	ALUMINUM	PER PLAN	TITUS (OR EQUIVALENT)	TMS-AA	1-5
CDS-2	12"x12"	SQUARE CONE DIFFUSER	ALUMINUM	PER PLAN	TITUS (OR EQUIVALENT)	TMS-AA	1-5
CDR-1	24"x24"	ALUMINUM EGGCRATE RETURN GRILLE	ALUMINUM	PER PLAN	TITUS (OR EQUIVALENT)	50F	1-5
CDR-2	12"x12"	ALUMINUM EGGCRATE RETURN GRILLE	ALUMINUM	PER PLAN	TITUS (OR EQUIVALENT)	50F	1-5

NOTES:

1. PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING. IN AREAS WITH HARD CEILINGS, PROVIDE FRAMES FOR SURFACE MOUNTING.
2. UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.
3. ARCHITECT/OWNER TO CONFIRM FINAL COLOR/FINISH/BORDER TYPE.
4. MAXIMUM NOISE CRITERION RATING < 30 DBA.
5. PROVIDE AN OPPOSITE BLADE DAMPER FOR AIR BALANCING.

FOR ROUND NECK DIFFUSERS: NECK SIZES SHALL BE:-

16" DIA: 901-1100 CFM
14" DIA: 601-900 CFM
12" DIA: 401-600 CFM
10" DIA: 201-400 CFM
8" DIA: 101-200 CFM
6" DIA: 0-100 CFM

VENTILATION CALCULATION TABLE													
ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000sq.ft AS PER 2015 IMC	NUMBER OF PEOPLE AS PER 2015 IMC	NUMBER OF CHAIR	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER 2015 IMC		REQUIRED OUTSIDE AIR (CFM)	REQUIRED OUTSIDE AIR WITH EFFECTIVENESS (0.8)	PROVIDED OUTSIDE AIR (CFM)	EXHAUST AIRFLOW RATE (CFM/SQ.FT) OR (CFM/FIXTURE)	REQUIRED EXHAUST (CFM)	PROVIDED EXHAUST (CFM)
						CFM/PEOPLE	CFM/SQ.FT						
WAITING-1	228	50	12	10	12	7.5	0.06	104	130		0	0	0
RECEPTION	494	30	15	13	15	5	0.06	105	135		0	0	0
WAITING-2	102	50	6	5	6	7.5	0.06	51	65		0	0	0
NURSE	184	5	1	5	5	5	0.06	36	50		0	0	0
LAB	160	5	1	3	3	5	0.06	25	35		0	0	0
EXAM-1	108	5	1	2	2	5	0.06	16	25		0	0	0
EXAM-2	108	5	1	2	2	5	0.06	16	25		0	0	0
EXAM-3	108	5	1	2	2	5	0.06	16	25		0	0	0
EXAM-4	94	5	1	2	2	5	0.06	16	20		0	0	0
EXAM-5	94	5	1	2	2	5	0.06	16	20		0	0	0
EXAM-6	94	5	1	2	2	5	0.06	16	20		0	0	0
EXAM-7	94	5	1	2	2	5	0.06	16	20		0	0	0
TREATMENT-1	148	5	1	2	2	5	0.06	19	25		0	0	0
TREATMENT-2	148	5	1	2	2	5	0.06	19	25		0	0	0
TREATMENT-3	148	5	1	2	2	5	0.06	19	25		0	0	0
TRIAGE	40	5	1	1	1	5	0.06	7	10		0	0	0
CLINICIAN-1	28	5	1	1	1	5	0.06	7	10		0	0	0
CLINICIAN-2	28	5	1	1	1	5	0.06	7	10		0	0	0
BREAK ROOM	200	50	10	6	10	5	0.06	62	80		0	0	0
STORAGE	54	0	0	0	0	0	0.12	6	10		0	0	0
PROVIDER	86	5	1	2	2	5	0.06	15	20		0	0	0
UTILITY/IT	90	0	0	0	0	0	0.12	11	15		54	70	70
CORRIDOOR	472	0	0	0	0	0	0.06	28	40		0	0	0
RR-1	56	0	0	0	0	0	0	0	0		70	70	70
RR-2	62	0	0	0	0	0	0	0	0		70	70	70
TOTAL	3428	-	59	67	76	-	-	632	840	840	-	210	210

**FOREFRONT
DERMATOLOGY**

DRAWING ISSUE		DATE
NO	DESCRIPTION	DATE
1	OWNER REVISION COMMENTS	07/08/2025
2		
3		
4		
5		
6		

**M4.0
MECHANICAL
SCHEDULES**

ELECTRICAL DRAWING GENERAL NOTES:

A. (####) INDICATES THE LIGHTING SEQUENCE OF OPERATION FOR THE SPACE. REFER TO THE LIGHTING SEQUENCE OF OPERATION TABLE.

B. SHADED LUMINARIES INDICATES LUMINARIE IS CONNECTED TO AN EMERGENCY BATTERY.

LUMINAIRE KEY:

F1 = FIXTURE TAG

A1:# = CIRCUIT NUMBER IN "PANEL-A1"

a = SWITCH DESIGNATION

"NL" INDICATES LUMINAIRE IS UNSWITCHED FOR NIGHT LIGHT.

"SE" INDICATES LUMINAIRE IS SWITCHED/CONTROLLED DURING NORMAL OPERATION AND OPERATES FROM EMERGENCY BATTERY (EXTEND UNSWITCHED CIRCUIT LEG TO BATTERY) UPON LOSS OF POWER.

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: F1 / 1 / a / N

ELECTRICAL MOUNTING SUBSCRIPT KEY:

A MOUNT AT +6" TO CENTERLINE ABOVE COUNTER OR BACKSPASH

C MOUNT AT CEILING (DEVICE OR ROUGH-IN CONTEXT)

H MOUNT ORIENTED HORIZONTALLY

L MOUNT IN CASEWORK

CODE COMPLIANCE

ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT.

A. 2018 NORTH CAROLINA ENERGY CONSERVATION CODE, (BASE CODE - 2015 IECC)

B. 2018 NORTH CAROLINA MECHANICAL CODE, (BASE CODE - 2015 IMC).

C. 2018 NORTH CAROLINA PLUMBING CODE, (BASE CODE - 2021 IPC).

D. 2020 NORTH CAROLINA ELECTRICAL CODE, (BASE CODE - 2020 NFPA 70).

E. 2018 NORTH CAROLINA BUILDING CODE, (BASE CODE - 2015 IBC).

ELECTRICAL DRAWING LIST

E0.1	LEGENDS, SYMBOLS & NOTES
E0.2	ELECTRICAL SPECIFICATION
E1.0	ELECTRICAL LIGHTING PLAN
E2.0	ELECTRICAL POWER PLAN
E2.1	ELECTRICAL ROOF POWER PLAN
E2.2	ELECTRICAL FLOOR LV PLAN
E3.0	ELECTRICAL DETAILS
E4.0	ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

ELECTRICAL INSTALLATION NOTES:

A. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADA STANDARDS FOR ACCESSIBLE DESIGN. REFER TO THE ADA GUIDELINES FOR ALL CONFIGURATION DETAILS ON THIS PAGE FOR ADDITIONAL INFORMATION.

B. CIRCUIT NUMBERS ARE SHOWN FOR CIRCUIT IDENTIFICATION. CIRCUITING SHALL AGREE WITH NUMBERING ON THE PANEL PROVIDED. COMMON NEUTRALS MAY NOT BE USED FOR BRANCH CIRCUITS. BALANCE THE LOAD ON PANEL AS EVENLY AS POSSIBLE BETWEEN EACH PHASE.

C. FLUSH MOUNT ALL LIGHTING CONTROL DEVICES AT +42" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED.

D. FLUSH MOUNT ALL DUPLEX RECEPTACLES AND TECHNOLOGY OUTLETS AT +18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED. MOUNT EXTERIOR LOCATED RECEPTACLES WITH WHILE-IN-USE COVERS AT +20" FROM FINISHED GRADE (CENTER DIMENSIONS) TO MAINTAIN INSTALLATION ADA COMPLIANCE.

E. FLUSH MOUNT ALL DUPLEX RECEPTACLES AND TECHNOLOGY OUTLETS AT +18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED. MOUNT EXTERIOR LOCATED RECEPTACLES WITH WHILE-IN-USE COVERS AT +20" FROM FINISHED GRADE (CENTER DIMENSIONS) TO MAINTAIN INSTALLATION ADA COMPLIANCE.

F. ALL MATERIALS USED TO SEAL PENETRATIONS OF FIRE RATED WALLS AND FLOORS SHALL BE TESTED AND CERTIFIED AS A SYSTEM PER ASTM E814 STANDARDS FOR FIRE TESTS OF THROUGH-PENETRATION FIRESTOPS.

G. CONNECTION FOR ELECTRIC WATER COOLERS (EWC) SHALL BE A JUNCTION BOX CONCEALED BEHIND WATER COOLER ACCESS PLATE OR BE A GFI RECEPTACLE LOCATED DIRECTLY BELOW AND CENTERED ON EWC. CONTRACTOR SHALL VERIFY TYPE OF EWC TO BE INSTALLED.

H. MOUNT ALL FIRE ALARM PULL STATIONS AT +42" FROM FLOOR (CENTERLINE DIMENSION) WHERE OTHERWISE NOTED.

I. INSTALL ALL WALL MOUNTED FIRE ALARM NOTIFICATION DEVICES AT 90° ABOVE FINISHED FLOOR OR 6" BELOW THE CEILING, WHICHEVER IS LOWER, EXCEPT WHERE OTHERWISE NOTED. HEIGHT SHALL BE MEASURED TO THE TOP OF THE DEVICE.

J. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINARIES, SPRINKLER, AND CEILING DIFFUSERS, CENTER ALL DEVICES IN CEILING TILE PATTERN. SMOKE DETECTORS, CARBON MONOXIDE DETECTORS, AND OCCUPANCY/VACANCY SENSORS SHALL BE LOCATED NO CLOSER THAN 3 FEET TO AN AIR SUPPLY DIFFUSER OR RETURN GRILLE. CARBON MONOXIDE DETECTORS SHALL BE LOCATED 10 PLUS FT FROM FIRE PLACES, COOKING, AND SIMILAR FUEL-BURNING APPLIANCES.

K. CONTRACTOR SHALL VERIFY ALL FURNITURE, MODULAR FURNITURE, AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS, AND REVIEWED SHOP DRAWINGS. PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION, THIS CONTRACTOR SHALL ADJUST RECEPTACLES, OUTLETS, OR CONNECTION LOCATIONS TO ACCOMMODATE FURNITURE AND/OR EQUIPMENT.

L. ELECTRICAL AND TECHNOLOGY EQUIPMENT SHALL BE MOUNTED TO AVOID IMPEDANCE OF, OPERATION OF, AND/OR ACCESS TO ELECTRICAL AND MECHANICAL EQUIPMENT. ALL MOUNTING OF ELECTRICAL AND TELECOMMUNICATIONS EQUIPMENT, ON EQUIPMENT SUPPLIED BY ANOTHER CONTRACTOR, SHALL BE APPROVED IN ADVANCE BY THE OTHER CONTRACTOR.

M. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.

N. CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO THE WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.

O. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER ELECTRICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.

P. ELECTRICAL IDENTIFICATION. REFER TO SPECIFICATION SECTION 26 05 53 FOR COLOR/LABEL REQUIREMENTS FOR CONDUIT, BOX, CABLE/WIRE, AND EQUIPMENT.

ELECTRICAL ABBREVIATIONS

A	AMPERES
AF	AMPERE FRAME / AMP FUSE
AFF	ABOVE FINISHED FLOOR
AIC	AMPS INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CL	CEILING
CT	CURRENT TRANSFORMER
CU	COPPER
°C	DEGREE CELSIUS
CL	CURRENT LIMITER
DPSP	DOUBLE POLE SINGLE THROW
DPDT	DOUBLE POLE DOUBLE THROW
E	EXISTING
EF	EXHAUST FAN
EM	EMERGENCY
ER	EXISTING TO BE RELOCATED
ETR	EXISTING TO REMAIN
EOR	ENGINEER OF RECORD
E.C.	ELECTRICAL CONTACTOR
FA	FIRE ALARM
G	GROUND
GFI	GROUND FAULT INTERRUPTER
G.C.	GENERAL CONTRACTOR
HD	HAND DRYER
IG	ISOLATED GROUND
JB	JUNCTION BOX
KCMIL	ONE THOUSAND CIRCULAR MILS
KVA	KILOVOLT-AMPERES
KW	KILOWATTS
LL	LANDLORD
LTG	LIGHTING
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
NL	NIGHT LIGHT
NTS	NOT TO SCALE
PP	POWER PANEL
PWR	POWER
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
TR	TAMPER RESISTANT
TYP	TYPICAL
USB	USB JACK
UN	UNLESS OTHERWISE NOTED
VA	VOLT AMPERE
VIF	VERIFY IN FIELD
WP	WEATHER PROOF
W	WIRE / WATT
XMER	TRANSFORMER

ELECTRICAL SPECIFICATION:

26 05 00 BASIC ELECTRICAL REQUIREMENTS

SCOPE OF WORK

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW MATERIALS AS INDICATED ON THE DRAWINGS, AND/OR IN THESE SPECIFICATIONS, AND ALL ITEMS REQUIRED TO MAKE ASSOCIATED PORTION OF THE ELECTRICAL WORK A FINISHED AND WORKING SYSTEM.

TELECOMMUNICATIONS CABLING WILL BE BY OTHERS, IN RACEWAYS AND CONDUITS FURNISHED AND INSTALLED AS PART OF THE ELECTRICAL WORK.

TEMPERATURE CONTROL WIRING FOR PLUMBING AND HVAC EQUIPMENT WILL BE BY OTHER CONTRACTORS.

NORTH CAROLINA, CODES, LAWS, ORDINANCES, AND OTHER REGULATIONS HAVING JURISDICTION

CODES AND STANDARDS

CONFORM TO ALL REQUIREMENTS OF THE UNINCORPORATED ELIZABETH CITY &

OVER THIS INSTALLATION.

IF THE CONTRACTOR NOTES, AT THE TIME OF BIDDING, THAT ANY PARTS OF THE DRAWINGS OR SPECIFICATIONS DO NOT COMPLY WITH THE CODES OR REGULATIONS, THE CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING, REQUESTING A CLARIFICATION.

PERMITS AND FEES

PROCURE ALL APPLICABLE PERMITS AND LICENSES. ABIDE BY LOCAL AND STATE LAWS, REGULATIONS, AND ORDINANCES. PAY ALL CHARGES FOR PERMITS OR LICENSES. PAY ALL FEES AND TAXES IMPOSED BY STATE, MUNICIPAL, AND OTHER REGULATORY BODIES. PAY ALL CHARGES ARISING OUT OF REQUIRED INSPECTIONS BY AN AUTHORIZED BODY. PAY ALL CHARGES ARISING OUT OF REQUIRED CONTRACT DOCUMENT REVIEWS ASSOCIATED WITH THE PROJECT AND AS INITIATED BY THE OWNER OR AUTHORIZED AGENCY/CONSULTANT.

WHERE APPLICABLE, ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL BE LISTED BY UNDERWRITER'S LABORATORIES, INC. OR A NATIONALLY RECOGNIZED TESTING ORGANIZATION.

DRAWINGS

THE DRAWINGS FOR THE ELECTRICAL WORK ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF THE WORK AND TO INDICATE THE GENERAL ARRANGEMENTS AND LOCATIONS OF EQUIPMENT, OUTLETS, ETC., AND THE APPROXIMATE SIZES OF EQUIPMENT.

CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS OF EQUIPMENT AND ROUGH-INS, AND THE EXACT ROUTING OF RACEWAYS SO AS TO BEST FIT THE LAYOUT OF THE JOB, CONDUIT ENTRY POINTS FOR ELECTRICAL EQUIPMENT INCLUDING, BUT NOT LIMITED TO, PANELBOARDS, SWITCHBOARDS, SWITCHGEAR AND UNIT SUBSTATIONS, SHALL BE DETERMINED BY THE CONTRACTOR UNLESS NOTED IN THE CONTRACT DOCUMENTS.

CONSTRUCTION DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED UTILIZING REVIT. CONTRACTORS AND SUBCONTRACTORS MAY REQUEST ELECTRONIC MEDIA FILES OF THE CONTRACT DRAWINGS, THE ELECTRONIC CONTRACT DOCUMENTS CAN BE USED FOR PREPARATION OF SHOP DRAWINGS AND AS-BUILT DRAWINGS ONLY. THE INFORMATION MAY NOT BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT.

VERIFY ALL PERTINENT DIMENSIONS AT THE JOB SITE BEFORE ORDERING ANY CONDUIT, CONDUCTORS, WIREWAYS, BUS DUCT, FITTINGS, ETC.

SUBMITTALS

SUBMITTALS SHALL BE REQUIRED WHERE REQUIRED IN THE SPECIFICATIONS OR ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF EACH SHOP DRAWING FOR REVIEW BY THE ARCHITECT/ENGINEER BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT.

THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE ALL SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ARCHITECT/ENGINEER. CONTRACTOR SHALL CLEARLY MARK ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS, ASSEMBLE ALL SUBMITTALS IN SETS, SUCH AS PANELBOARDS, FIRE ALARM, LIGHTING, OR MOTOR CONTROL. ALL SETS SHALL BE IDENTICAL AND CONTAIN AN INDEX OF THE ITEMS ENCLOSED WITH A GENERAL TOPIC DESCRIPTION ON THE COVER. WHERE MORE THAN ONE MODEL IS SHOWN ON A MANUFACTURER'S SHEET, CLEARLY INDICATE EXACTLY WHICH ITEM AND WHICH DATA IS RELEVANT TO THE WORK. REFER TO SUBSECTIONS FOR SPECIFIC SUBMITTAL REQUIREMENTS.

WARRANTY

PROVIDE MINIMUM ONE-YEAR WARRANTY FOR ALL FIXTURES, EQUIPMENT, MATERIALS, AND WORKMANSHIP. REFER TO SUBSECTIONS FOR ADDITIONAL WARRANTY REQUIREMENTS.

MATERIAL SUBSTITUTION

WHERE SEVERAL MANUFACTURERS' NAMES ARE GIVEN, THE MANUFACTURER FOR WHICH A CATALOG NUMBER IS GIVEN IS THE BASIS OF DESIGN AND ESTABLISHES THE QUALITY REQUIRED. EQUIVALENT EQUIPMENT MANUFACTURED BY THE OTHER NAMED MANUFACTURERS MAY BE USED. CONTRACTOR SHALL ENSURE THAT ALL ITEMS SUBMITTED BY THESE OTHER MANUFACTURERS MEET ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND FIT IN THE ALLOCATED SPACE. THE ARCHITECT/ENGINEER SHALL MAKE THE FINAL DETERMINATION OF WHETHER A PRODUCT IS EQUIVALENT.

ANY MATERIAL, ARTICLE, OR EQUIPMENT OF OTHER UNNAMED MANUFACTURERS WHICH WILL ADEQUATELY PERFORM THE SERVICES AND DUTIES IMPOSED BY THE DESIGN AND IS OF A QUALITY EQUAL TO OR BETTER THAN THE EQUIPMENT IDENTIFIED BY THE DRAWINGS MAY BE USED IF APPROVAL IS SECURED IN WRITING FROM THE ARCHITECT/ENGINEER VIA ADDENDUM.

PROJECT CLOSEOUT

SUBMIT THE FOLLOWING: OPERATION AND MAINTENANCE MANUALS INCLUDING BOUND COPIES OF APPROVED SHOP DRAWINGS, RECORD DOCUMENTS, SPARE PARTS AND EXTRA MATERIALS IN QUANTITIES SPECIFIED IN THESE SPECIFICATIONS, INSPECTION AND TESTING REPORT BY THE FIRE ALARM SYSTEM MANUFACTURER.

OPERATION AND MAINTENANCE INSTRUCTIONS

OPERATION AND MAINTENANCE DATA SHALL CONSIST OF WRITTEN INSTRUCTIONS FOR THE CARE, MAINTENANCE, AND OPERATION OF THE EQUIPMENT AND SYSTEMS. INSTRUCTION BOOKS, CARDS, AND MANUALS FURNISHED WITH THE EQUIPMENT SHALL BE INCLUDED.

PROVIDE BOUND MANUALS WITH COPIES OF APPROVED SHOP DRAWINGS WITH TITLE PAGE AND INDEX SYSTEM SIMILAR TO OPERATION AND MAINTENANCE MANUAL.

RECORD DOCUMENTS

MAINTAIN AT THE JOB SITE A SEPARATE AND COMPLETE SET OF ELECTRICAL DRAWINGS AND SPECIFICATIONS WITH ALL CHANGES MADE TO THE SYSTEMS CLEARLY AND PERMANENTLY MARKED IN COMPLETE DETAIL. MARK DRAWINGS TO INDICATE APPROVED SUBSTITUTIONS, CHANGE ORDERS, AND ACTUAL EQUIPMENT AND MATERIALS USED. ALL CHANGE ORDERS, RFI RESPONSES, CLARIFICATIONS, AND OTHER SUPPLEMENTAL INSTRUCTIONS SHALL BE MARKED ON THE DOCUMENTS. RECORD DOCUMENTS THAT MERELY REFERENCE THE EXISTENCE OF THE ABOVE ITEMS ARE NOT ACCEPTABLE. RECORD CHANGES DAILY AND KEEP THE MARKED DRAWINGS AVAILABLE FOR THE ARCHITECT/ENGINEER'S EXAMINATION AT ANY NORMAL WORK TIME.

UPON COMPLETING THE JOB AND BEFORE FINAL PAYMENT IS MADE, PROVIDE REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD TO THE ARCHITECT/ENGINEER.

CLEANING

THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS PRIOR TO THE OWNER'S FINAL ACCEPTANCE OF THE PROJECT. CLEAN ALL FOREIGN PAINT, GREASE, OIL, DIRT, LABELS, STICKERS, ETC. FROM ALL EQUIPMENT. REMOVE ALL RUBBISH, DEBRIS, ETC., ACCUMULATED DURING CONSTRUCTION FROM THE PREMISES.

26 05 05 ELECTRICAL DEMOLITION FOR REMODELING

THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS.

WHERE WALLS, CEILINGS, STRUCTURES, ETC., ARE INDICATED AS BEING REMOVED ON GENERAL OR ELECTRICAL DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL ELECTRICAL EQUIPMENT, DEVICES, FIXTURES, RACEWAYS, WIRING, SYSTEMS, ETC., FROM THE REMOVED AREA.

WHERE CEILINGS, WALLS, STRUCTURES, ETC., ARE TEMPORARILY REMOVED AND REPAIRED BY OTHERS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL, STORAGE, AND REPLACEMENT OF EQUIPMENT, DEVICES, FIXTURES, RACEWAYS, WIRING, SYSTEMS, ETC.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISCONNECTING EQUIPMENT REMOVED BY OTHER TRADES AND REMOVING ALL ASSOCIATED STARTERS, CONTROLLERS, RACEWAYS, WIRING, ETC.

VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED EQUIPMENT OR FACILITIES. EXTEND CONDUIT AND WIRE TO FACILITIES AND EQUIPMENT THAT WILL REMAIN IN OPERATION FOLLOWING DEMOLITION. EXTENSION OF CONDUIT AND WIRE TO EQUIPMENT SHALL BE COMPATIBLE WITH THE SURROUNDING AREA. EXTENDED CONDUIT AND CONDUCTORS SHALL MATCH EXISTING SIZE AND MATERIAL.

COORDINATE SCOPE OF WORK WITH ALL OTHER CONTRACTORS AND THE OWNER AT THE PROJECT SITE. SCHEDULE REMOVAL OF EQUIPMENT AND ELECTRICAL SERVICE TO AVOID CONFLICTS.

BID SUBMITTAL SHALL MEAN THE CONTRACTOR HAS VISITED THE PROJECT SITE AND HAS VERIFIED EXISTING CONDITIONS AND SCOPE OF WORK.

PREPARATION

PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL TRAINED IN SUCH OPERATIONS. ASSUME ALL EQUIPMENT AND SYSTEMS MUST REMAIN OPERATIONAL UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.

REMOVE ABANDONED WIRING AND RACEWAY TO SOURCE OF SUPPLY. EXISTING CONDUIT IN GOOD CONDITION MAY BE REUSED IN PLACE BY INCLUDING AN EQUIPMENT GROUND CONDUCTOR IN REUSED CONDUIT. REUSED CONDUIT AND BOXES SHALL HAVE SUPPORTS REWIRED TO MEET CURRENT CODES. RELOCATING CONDUIT SHALL NOT BE ALLOWED.

REMOVE EXPOSED ABANDONED RACEWAY, INCLUDING ABANDONED RACEWAY ABOVE ACCESSIBLE CEILING FINISHES. CUT EMBEDDED RACEWAY FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES. REMOVE ALL ASSOCIATED CLAMPS, HANGERS, SUPPORTS, ETC.

DISCONNECT AND REMOVE OUTLETS AND DEVICES THAT ARE TO BE DEMOLISHED. REMOVE CONDUIT, SUPPORTS, AND CONDUCTORS BACK TO SOURCE. BACK BOX AND CONDUIT MOUNTED IN WALLS THAT ARE TO REMAIN CAN BE ABANDONED IN PLACE. PROVIDE APPROPRIATE COVER PLATE FOR ALL ABANDONED BACK BOXES PER WIRING DEVICES SPECIFICATION.

DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES. BALLASTS IN LIGHT FIXTURES INSTALLED PRIOR TO 1980 SHALL BE INCINERATED IN EPA-APPROVED INCINERATOR OR DISPOSED OF IN EPA-CERTIFIED CONTAINERS AND DEPOSITED IN AN EPA LANDFILL CERTIFIED FOR PCB DISPOSAL OR RECYCLED BY PERMITTED BALLAST RECYCLER.

HID AND FLUORESCENT LAMPS DETERMINED BY THE TOXICITY CHARACTERISTIC LEADPATE PROCEDURE (TCLP) TO BE HAZARDOUS WASTE SHALL BE DISPOSED OF IN AN EPA-PERMITTED HAZARDOUS WASTE DISPOSAL FACILITY OR BY A PERMITTED LAMP RECYCLER.

REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK. PATCH OPENINGS TO MATCH EXISTING SURROUNDING FINISHES. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS THAT REMAIN ACTIVE. VERIFY INSTALLATION OR PROVIDE JUNCTION BOXES AND ACCESS PANEL AS APPROPRIATE. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS.

FLOOR SLABS MAY CONTAIN CONDUIT SYSTEMS. THIS CONTRACTOR IS RESPONSIBLE FOR TAKING ANY MEASURES REQUIRED TO ENSURE NO CONDUITS OR OTHER SERVICES ARE DAMAGED. THIS INCLUDES X-RAY OR SIMILAR NON-DESTRUCTIVE METHODS. WHERE CONDUIT IS IN CONCRETE SLAB, CUT CONDUIT FLUSH WITH FLOOR, FULL OUT CONDUCTORS, AND PLUG CONDUIT ENDS.

THIS CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED IN REPAIR, RELOCATIONS, OR REPLACEMENT OF ANY CABLES, CONDUITS, OR OTHER SERVICES IF DAMAGED WITHOUT PROPER INVESTIGATION.

CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT THAT REMAIN OR ARE TO BE REUSED.

ELECTRICAL ITEMS REMOVED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MATERIAL THE OWNER ABANDONS.

26 05 13 WIRE AND CABLE

FEEDERS AND BRANCH CIRCUITS 8 AWG AND LARGER SHALL BE COPPER, STRANDED, 600 VOLT INSULATION, THHN. UNDERGROUND OR IN SLABS ON GRADE SHALL BE THWN or XHHW-2.

FEEDERS AND BRANCH CIRCUITS 10 AWG AND SMALLER: COPPER, SOLID OR STRANDED, 600 VOLT INSULATION, THHN/THWN. NOTED ON THE DRAWINGS. MINIMUM SIZE #12 AWG.

CONTROL CABLE FOR CLASS 1, CLASS 2, AND CLASS 3 CIRCUITS SHALL BE COPPER, 600 VOLT INSULATION, RATED 60°C, INDIVIDUAL CONDUCTORS TWISTED TOGETHER, SHIELDED, AND COVERED WITH PVC. MINIMUM SIZE #14 AWG.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING AND SIZING CONDUCTORS AND CONDUITS TO EQUAL OR EXCEED THE AMPACITY OF NEC TABLE B.310.15(B)(2)(7), IF METHODS OR MATERIALS OTHER THAN THE BASIS OF DESIGN ARE USED.

USE # 10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUIT HOME RUNS LONGER THAN 75 FEET.

ALL WIRES IN OUTLET BOXES NOT CONNECTED TO FIXTURES OR OTHER DEVICES SHALL BE ROLLED UP, SPLICED IF CONTINUITY OF CIRCUIT IS REQUIRED, AND INSULATED.

OPEN CABLE SHALL BE SUPPORTED BY THE APPROPRIATE SIZE BRIDLE RINGS OR OTHER MEANS IF CALLED FOR ON THE DRAWINGS. WIRE AND CABLE FROM DIFFERENT SYSTEMS SHALL NOT BE INSTALLED IN THE SAME BRIDLE RINGS. BRIDLE RING SUPPORTS SHALL BE INSTALLED AT A MINIMUM OF FIVE FOOT (5) INTERVALS.

OPEN CABLE INSTALLED ABOVE SUSPENDED CEILINGS SHALL NOT REST ON THE SUSPENDED CEILING CONSTRUCTION, NOR UTILIZE THE CEILING SUPPORT SYSTEM FOR WIRE AND CABLE SUPPORT. SPLICE AND TAP ONLY IN ACCESSIBLE JUNCTION BOXES.

USE SOLDERLESS, TIN-PLATED COPPER LUGS APPLIED WITH CIRCUMFERENTIAL CRIMP FOR COPPER TERMINATIONS #8 AWG AND LARGER. USE INDENTER CRIMP #10 AWG AND SMALLER.

TEST WIRE AND CABLE INSULATION WITH DEVICE SUCH AS A "MEGGER"; USING NOT LESS THAN 500 VOLTS D.C. TEST POTENTIAL.

26 05 26 GROUNDING AND BONDING

COMPLY WITH UL 467 GROUNDING AND BONDING EQUIPMENT.

CONDUCTORS SHALL BE COPPER IN ACCORDANCE WITH 26 05 13.

CONNECTORS SHALL BE HYDRAULIC COMPRESSION TYPE.

DRAWING ISSUE

DATE	07/08/2025				
DESCRIPTION					
OWNER REVISION COMMENTS					
NO	1	2	3	4	5

E0.1
LEGENDS,
SYMBOL
& NOTES

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EQUIPMENT GROUNDING

INSTALL EQUIPMENT GROUNDING CONDUCTORS IN ALL FEEDERS AND CIRCUITS.
EQUIPMENT GROUNDING CONDUCTORS: INSULATED WITH GREEN-COLORED INSULATION.

FIELD QUALITY CONTROL

PROVIDE GROUND TESTING IN ACCORDANCE WITH IEEE STANDARDS.

26 05 27 SUPPORTING DEVICES

APPROVED MANUFACTURERS: ALLIED, COOPER B-LINE, ERICO, HILTI, POWER FASTENERS.

SUPPORT CHANNELS SHALL BE PAINTED STEEL. PROVIDE GALVANIZED STEEL FOR WET/DAMP LOCATIONS. ALL HARDWARE TO BE CORROSION RESISTANT.

ANCHORS AND STRUCTURAL COMPONENTS

SUPPORTS SHALL HAVE STRUCTURAL SAFETY FACTOR STRENGTH OF TWICE THE MAXIMUM SEISMIC FORCES TO WHICH THEY WILL BE SUBJECTED. THROUGH BOLTS SHALL COMPLY WITH ASTM A 325. WELDING LUGS SHALL COMPLY WITH MSS-SP-48, TYPE 57.

BEAM CLAMPS FOR STRUCTURAL STEEL SHALL BE DOUBLE SIDED.

FASTEN CONCRETE ANCHORS PER THE REQUIREMENTS OF APPENDIX D OF ACI 318-11.

FASTEN MASONRY ANCHORS WITH EXPANSION ANCHORS OR SELF-TAPPING MASONRY SCREWS.

DO NOT EXCEED 25 LBS. PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING.

ROOFTOP SUPPORT SYSTEM:

PROVIDE PRE-FABRICATED ROOF SUPPORTS FOR ALL CONDUIT AND EQUIPMENT INSTALLED ABOVE THE ROOF. SUPPORT ALL CONDUIT AND EQUIPMENT A MINIMUM OF 4" ABOVE ROOF. SUPPORT SYSTEM SHALL BE COMPATIBLE WITH SINGLE PLY, BITUMINOUS, METAL AND SPRAY FOAM ROOF SYSTEMS. THE BASE SHALL BE ROUNDED TO PREVENT DAMAGE TO THE ROOF. AND DRAINAGE HOLES SHALL PREVENT PONDING OF WATER IN THE SUPPORT.

26 05 33 CONDUIT AND BOXES

CONDUIT

ACCEPTABLE CONDUIT MANUFACTURERS: ALLIED, LTV, STEELDUCT, WHEATLAND TUBE CO, O-Z GEDNEY.

ACCEPTABLE FITTINGS MANUFACTURERS: APPLETON ELECTRIC, O-Z GEDNEY, ELECTROLINE, RACO, BRIDGEPORT, MIDWEST, REGAL, THOMAS & BETTS, CROUSE-HINDS, KILLARK

ELECTRICAL METALLIC TUBING (EMT), MINIMUM 3/4" AND 1" FOR LOW VOLTAGE RACEWAYS, SHALL BE USED IN FINISHED SPACES FOR ALL BRANCH CIRCUITS, TELECOMMUNICATIONS SYSTEMS, ELECTRICAL DISTRIBUTION AND PANEL BOARDS.

RIGID METALLIC CONDUIT (RMC) SHALL BE USED IN WET OR DAMP LOCATIONS.

FLEXIBLE METALLIC CONDUIT (FMC) SHALL BE USED FOR CONNECTIONS TO MOTORS AND LIGHT FIXTURES. LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC) WITH WATERTIGHT FITTINGS SHALL BE USED IN EXTERIOR OR WET/DAMP LOCATIONS. LENGTH OF CONDUIT SHALL NOT EXCEED 6'.

EMT CONDUIT FITTINGS SHALL BE COMPRESSION TYPE.

CONDUIT AND CONDUCTOR SIZING SHALL BE COORDINATED TO LIMIT CONDUCTOR FILL TO LESS THAN 40%, MAINTAIN CONDUCTOR AMPERE CAPACITY AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.

CONDUIT SHALL NOT CONTAIN MORE FOUR (4) QUARTER BENDS (360°) BETWEEN PULL BOX POINTS. TELECOMMUNICATIONS CONDUITS SHALL HAVE NO MORE THAN TWO (2) 90° BENDS BETWEEN PULL BOX POINTS AND CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 100 FEET.

ALL CONDUITS THROUGH WALLS SHALL BE GROUDED OR SEALED INTO OPENINGS, WHERE CONDUIT PENETRATES FIREWALLS AND DOORS, SEAL WITH AL LISTED SEALANT. SEAL INTERIOR OF CONDUIT AT EXTERIOR ENTRIES.

PROVIDE A POLYPROPYLENE PULL CORD WITH 2000 LBS. TENSILE STRENGTH IN EACH EMPTY CONDUIT.

EXPOSED CONDUIT ON EXTERIOR WALLS OR ABOVE ROOF WILL NOT BE ALLOWED.

BOXES

OUTLET BOXES FOR LUMINAIRES TO BE MINIMUM 1-1/2" DEEP.

LIGHT CONTROL SWITCHES, DIMMERS AND OCCUPANCY SENSOR BOXES SHALL BE 4 INCHES SQUARE BY 2-1/8 INCHES DEEP.

MULTIPLE GANG SWITCH OUTLETS SHALL CONSIST OF THE REQUIRED NUMBER OF GANG BOXES APPROPRIATE TO THE QUANTITY OF SWITCHES COMPRISING THE GANG. PROVIDE PLASTER RINGS AND COVERS AS NEEDED.

RECEPTACLE OUTLET BOXES SHALL BE 4 INCHES SQUARE WITH RAISED COVER TO FIT FLUSH WITH FINISHED WALL LINE.

PROVIDE FIRE-RATED MOLDABLE PADS.

GALVANIZED STEEL BOXES MAY BE USED IN CONCEALED OR EXPOSED INTERIOR LOCATIONS, ABOVE CEILINGS, AND MIN RECESSED STUDDED PARTITIONS.

CAST BOXES SHALL BE USED IN EXTERIOR LOCATIONS, HAZARDOUS LOCATIONS, WET LOCATIONS, CONCRETE SLAB ON GRADE.

[ECONN]: ELECTRICAL CONNECTION TO EQUIPMENT AND MOTORS, SIZED PER NEC.

[JB]: PULL AND JUNCTION BOXES, GALVANIZED STEEL, SIZED PER NEC.

[RI-TECH]: TECHNOLOGY ROUGH-IN CONSISTING OF ONE (1) 1" CONDUIT STUBBED TO ABOVE THE LAY-IN CEILING.

26 05 53 ELECTRICAL IDENTIFICATION

COLOR ADHESIVE MARKING TAPE FOR BANDING RACEWAYS, WIRES, AND CABLES: 3 MILS THICK BY 2" WIDTH.

PRETENSIONED FLEXIBLE WRAPAROUND COLORED PLASTIC SLEEVES FOR CABLE IDENTIFICATION.

WIRE/CABLE DESIGNATION TAPE MARKERS: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND, WITH PREPRINTED NUMBERS AND LETTERS.

CABLE TIES: NYLON, 0.18" WIDTH, 50-LB MINIMUM TENSILE STRENGTH.

ALUMINUM WRAPAROUND MARKER BANDS: 1" WIDTH, 0.014 INCH THICK ALUMINUM BANDS WITH STAMPED OR EMBOSSED LEGEND, AND FITTED WITH SLOTS OR EARS FOR PERMANENTLY SECURING AROUND WIRE OR CABLE JACKET OR AROUND GROUPS OF CONDUCTORS.

ENGRAVED, PLASTIC-LAMINATED LABELS, SIGNS AND INSTRUCTION PLATES: BLACK LETTERS ON WHITE FACE FOR NORMAL POWER.

SAFETY SIGNS: COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145.

JUNCTION, PULL AND CONNECTION BOXES: 3/8-INCH KROY TAPE.

APPLY DESIGNATION LABELS OF ENGRAVED PLASTIC LAMINATE FOR PUSHBUTTONS, PILOT LIGHTS, ALARMSIGNAL COMPONENTS, AND SIMILAR ITEMS, EXCEPT WHERE LABELING IS SPECIFIED ELSEWHERE.

INSTALL ARC FLASH WARNING SIGNS ON ALL PANELBOARDS.

COVER PLATES FOR RECEPTACLES AND SWITCHES: INDICATE SOURCE AND CIRCUIT NUMBER SERVING THE DEVICE: 3/8-INCH KROY TAPE OR BROTHER SELF-LAMINATING VINYL LABEL WITH BLACK LETTERS.

PAINT JUNCTION BOX COVERS AS FOLLOWS: FIRE ALARM: RED.

WHERE CONDUIT LEAVES A PANELBOARD, IDENTIFY EACH CONDUIT INDICATING LOAD SERVED.

CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:

208Y/120 VOLT, 4_WIRE:

A_PHASE - BLACK

B_PHASE - RED

C_PHASE - BLUE

NEUTRAL - WHITE

GROUND BOND - GREEN

PROVIDE ENGRAVED IDENTIFICATION ON THE FRONT OF ALL POWER DISTRIBUTION AND CONTROL EQUIPMENT, SUCH AS PANELBOARDS, STARTERS, DISCONNECTS, ETC LABELING SHALL INCLUDE: EQUIPMENT DESIGNATION, VOLTAGE, UPSTREAM SOURCE OF ORIGIN, RATING, AND TYPE OF THE OVERCURRENT PROTECTION DEVICE SERVING THE EQUIPMENT.

BRANCH PANELBOARDS SHALL BE PROVIDED WITH TYPED PANEL SCHEDULES UPON COMPLETION OF THE PROJECT. HANDWRITTEN MARKINGS SHALL NOT BE ACCEPTABLE.

26 09 33 LIGHTING CONTROL SYSTEMS

PERFORMANCE STATEMENT: THIS SPECIFICATION SECTION AND THE ACCOMPANYING LIGHTING DESIGN DOCUMENTS DESCRIBE THE MINIMUM MATERIAL QUALITY, REQUIRED FEATURES, AND OPERATIONAL REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM (LCS). THESE DOCUMENTS DO NOT CONVEY EVERY WIRE THAT MUST BE INSTALLED AND EVERY EQUIPMENT CONNECTION THAT MUST BE MADE, BASED ON THE PERFORMANCE REQUIRED OF THE SYSTEM, AS PRESENTED IN THESE DOCUMENTS. THE CONTRACTOR AND SYSTEM MANUFACTURER/VENDOR ARE SOLELY RESPONSIBLE FOR DETERMINING ALL EQUIPMENT, WIRING, AND PROGRAMMING REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.

PROVIDE AN INTEGRATED LIGHTING CONTROL SYSTEM CONSISTING OF PANELS, POWER SUPPLIES, CONTROLLERS, SENSORS, RELAYS, SWITCHES, DEVICES, WIRING, ETC. NECESSARY TO PERFORM THE LIGHTING CONTROL SEQUENCE OF OPERATION, AS DEFINED ON THE PLANS AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THAT ALL COMPONENTS AND LUMINAIRES INTEROPERATE AS A SINGLE SYSTEM.

SEQUENCE OF OPERATION: DESCRIBES THE REQUIRED OPERATION AND PERFORMANCE FOR LIGHTING CONTROL IN EACH SPACE. SEQUENCES OF OPERATION ARE INDICATED ON THE DRAWINGS.

DRAWINGS: THE DRAWINGS INCLUDE SEQUENCES OF OPERATION, LOCATIONS OF CONTROL INTERFACE DEVICES, SENSORS, AND CONTROL ZONES, WIRING AND ADDITIONAL EQUIPMENT TO MAKE A COMPLETE AND FUNCTIONING SYSTEM HAS NOT BEEN SHOWN, BUT SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.

THE FOLLOWING CONTROL TYPES AND FEATURES ARE ACCEPTABLE: ACCEPTABLE CONTROL LOCATIONS ARE SHOWN ON THE DRAWINGS.

LINE VOLTAGE CONTROL: CONTROL EQUIPMENT CONSISTS OF TRADITIONAL LINE VOLTAGE WIRING DEVICES AND EQUIPMENT SUCH AS DIMMERS AND COMBINATION OCCUPANCY/VACANCY SENSOR SWITCHES, ETC.

DISTRIBUTED CONTROL: CONTROL EQUIPMENT IS LOCATED IN THE SPACE/ZONE BEING CONTROLLED; NOT RELIANT ON CENTRALIZED CONTROLLERS. ALL LOCATIONS SHALL HAVE THE ABILITY TO BE NETWORKED FOR REMOTE CONTROL AND MONITORING, BUT NETWORK CONNECTIONS ARE NOT REQUIRED.

SUBMIT SHOP DRAWING PRODUCT DATA INCLUDING ALL DEVICES, FLOOR PLAN DRAWINGS INCLUDING SENSOR COVERAGE AND ACCESSORIES, SUBMIT PROJECT SPECIFIC CONTROL WIRING DIAGRAMS SHOWING ALL EQUIPMENT, LINE VOLTAGE AND CONTROL WIRING REQUIREMENTS FOR ALL COMPONENTS.

CONTRACTOR SHALL VERIFY THAT WALL DIMMER RATINGS ARE ACHIEVED WHERE A GANGED INSTALLATION IS USED.

WALL SWITCHES

[SW-1P]: SINGLE POLE SWITCH: HUBBELL HBL1221, LEVITON 1221-2, PASS & SEYMOUR PS20A01, COOPER AH1221, OR EQUIVALENT

[SW-3W]: THREE-WAY SWITCH: HUBBELL 1223, LEVITON 1223-2, PASS & SEYMOUR PS20A03, COOPER AH1223, OR EQUIVALENT

WALL DIMMERS

[SW-D-LED]: LED ELECTRONIC DRIVER DIMMER: LUMINAIRE MANUFACTURER SHALL LIST COMPATIBLE DIMMER MANUFACTURERS AND MODELS, COMPATIBLE WITH PROVIDED LED DRIVER.

[SW-D3-LED]: LED ELECTRONIC DRIVER DIMMER: LUMINAIRE MANUFACTURER SHALL LIST COMPATIBLE DIMMER MANUFACTURERS AND MODELS, COMPATIBLE WITH PROVIDED LED DRIVER.

INDOOR OCCUPANCY AND VACANCY SENSORS

OCCUPANCY AND VACANCY SENSORS SHALL HAVE AN ADJUSTABLE OFF TIME DELAY OF 1-30 MINUTES. SENSORS SHALL COMPLY WITH UL773A AND HAVE A 5-YEAR WARRANTY.

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

[SW-OC-O]: DUAL TECHNOLOGY 360 DEGREE COVERAGE PATTERN: APPROVED MANUFACTURERS: WATTSTOPPER DT 305 SERIES, HUBBELL OMNI-DT2000 OR ATD2000C, GREENGATE OAC-DT, LEVITON OSC#MOW, SENSOR SWITCH CM PDT 10.

[SW-OC-P-O]: WALL SWITCH OCCUPANCY SENSOR: APPROVED MANUFACTURERS: WATTSTOPPER PW-100 SERIES, SENSOR SWITCH WSX, HUBBELL LHRS1 OR AP1277, LEVITON ODS15, GREENGATE OSW-P-0451.

[SW-OC-P-P]: PASSIVE INFRARED CEILING MOUNTED - 360 DEGREE COVERAGE PATTERN: APPROVED MANUFACTURERS: WATTSTOPPER CI SERIES, SENSOR SWITCH CM-9, HUBBELL AUTOMATION OMNI-IR, LEVITON OSC SERIES, GREENGATE OMR-P SERIES.

[SW-OC-A]: ULTRASONIC 360 DEGREE TWO-SIDED CORRIDOR COVERAGE PATTERN. APPROVED MANUFACTURERS: WATTSTOPPER WT-2250 SERIES, HUBBELL OMNI-US OR ATU SERIES, LEVITON OSC SERIES, GREENGATE ODCU-C SERIES.

26 24 16 PANELBOARDS

SUBMIT SHOP DRAWINGS INCLUDING OUTLINE AND SUPPORT POINT DIMENSIONS, VOLTAGE, MAIN BUS AMPACITY, INTEGRATED SHORT CIRCUIT AMPERE RATING, CIRCUIT BREAKER OR FUSIBLE SWITCH ARRANGEMENT AND SIZES.

FURNISH SPARE PARTS TO OWNER INCLUDING FOUR (4) KEYS AND THREE (3) BREAKERS OF EACH TYPE AND RATING.

PANELBOARDS FOR THIS PROJECT SHALL BE FULLY RATED.

BRANCH CIRCUIT PANELBOARDS

DOOR-IN-DOOR CONSTRUCTION, HINGED TRIM TO ALLOW ACCESS TO WIRING GUTTERS WITHOUT REMOVAL OF TRIM. COPPER BUS: SQUARE D NQ / NP, GENERAL ELECTRIC AQ / AE, SIEMENS P1, CUTLER HAMMER PRL1, PRL2.

MOLDED CASE BOLT-ON TYPE CIRCUIT BREAKERS WITH THERMAL MAGNETIC TRIP, TYPE SWD FOR LIGHTING CIRCUITS. DO NOT USE TANDEM CIRCUIT BREAKERS.

INSTALLATION

ARRANGE CIRCUITS IN PANELBOARDS TO BALANCE THE PHASE LOADS WITHIN 20 PERCENT. MAINTAIN PROPER PHASING FOR MULTI-WIRE BRANCH CIRCUITS.

INSTALL PANELBOARDS PLUMB AS INDICATED ON THE DRAWINGS IN CONFORMANCE WITH NEMA PB 1.1. HEIGHT: 6 FEET TO HANDLE OF HIGHEST DEVICE.

PROVIDE FILLER PLATES FOR UNUSED SPACES IN PANELBOARDS.

PROVIDE CUSTOM NEW TYPED CIRCUIT DIRECTORY FOR EACH NEW BRANCH CIRCUIT PANELBOARD INCLUDED IN THE SCOPE OF WORK. LABEL SHALL INCLUDED EQUIPMENT NAME OR FINAL APPROVED ROOM NAME, ROOM NUMBER, AND LOAD TYPE FOR EACH CIRCUIT. EXAMPLES: SUMP PUMP SP-1 OR ROOM 101 RECEP(T). PRINTED COPIES OF THE BID DOCUMENT PANEL SCHEDULES ARE NOT ACCEPTABLE AS CIRCUIT DIRECTORIES.

VISUAL AND MECHANICAL INSPECTION: INSPECT FOR PHYSICAL DAMAGE, PROPER ALIGNMENT, ANCHORAGE, AND GROUNDING. CHECK PROPER INSTALLATION AND TIGHTNESS OF CONNECTIONS FOR CIRCUIT BREAKERS, FUSIBLE SWITCHES, AND FUSES.

26 27 26 WIRING DEVICES

SUBMIT SHOP DRAWING PRODUCT DATA INCLUDING ALL DEVICES AND ACCESSORIES.

ALL SWITCH, RECEPTACLE, OUTLET, AND COVERPLATE COLORS SHALL BE WHITE, UNLESS INDICATED OTHERWISE.

ALL SWITCHES, RECEPTACLES, AND OUTLET FACEPLATES SHALL BE COMPLETE WITH UNBREAKABLE THERMOPLASTIC COVERPLATES IN FINISHED SPACES WHERE WALLS ARE FINISHED. PROVIDE #302 STAINLESS STEEL COVERPLATES IN UNFINISHED SPACES FOR FLUSH BOXES, AND GALVANIZED STEEL COVERPLATES IN UNFINISHED SPACES FOR SURFACE MOUNTED BOXES.

WHERE SEVERAL DEVICES ARE GANGED TOGETHER, THE COVERPLATE SHALL BE OF THE GANGED STYLE FOR THE NUMBER OF DEVICES USED.

INSTALL RECEPTACLES VERTICALLY WITH GROUND SLOT UP, HORIZONTALLY WHERE INDICATED ON DRAWINGS WITH GROUND SLOT TO THE LEFT.

INSTALL PLATES ON SWITCH, RECEPTACLE, AND BLANK OUTLETS IN FINISHED AREAS, USING JUMBO SIZE PLATES FOR OUTLETS INSTALLED IN MASONRY WALLS. INSTALL GALVANIZED STEEL PLATES ON OUTLET BOXES AND JUNCTION BOXES IN UNFINISHED AREAS, ABOVE ACCESSIBLE CEILINGS, AND ON SURFACE MOUNTED OUTLETS.

INSTALL NAMEPLATE IDENTIFICATION TO RECEPTACLE COVER PLATES INDICATED. IDENTIFICATION SHALL IDENTIFY PANEL NAME AND CIRCUIT NUMBER.

TEST RECEPTACLES FOR PROPER POLARITY, GROUND CONTINUITY, AND COMPLIANCE WITH REQUIREMENTS.

RECEPTACLES

REFER TO ELECTRICAL SYMBOLS LIST FOR DEVICE TYPE.

[REC-DUP]: NEMA 5-20R DUPLEX RECEPTACLE: HUBBELL 5352, LEVITON 5362-S, PASS & SEYMOUR 5362, COOPER 5362.

[REC-DUP-GFI]: NEMA 5-20R GROUND FAULT DUPLEX RECEPTACLE: HUBBELL GF20L, LEVITON GFNT2, PASS & SEYMOUR 2097, COOPER SGF20.

[REC-DUP-WP]: NEMA 5-20R WEATHERPROOF GROUND FAULT DUPLEX RECEPTACLE WITH CAST ALUMINUM COVER: HUBBELL GFR20(RW57300) WP#26, LEVITON GFWT2(5977-CL) M5979, PASS & SEYMOUR 2097TRWR(WUC10-C) WUCAST1, COOPER WRS9F20(WU-1) WUUMV-1.

[REC-SM-1430R]: NEMA 14-30R SIMPLEX RECEPTACLE: HUBBELL HBL9430A, LEVITON 278, PASS & SEYMOUR 3864, COOPER 5744N.

[REC-TAMP]: NEMA 5-20R TAMPER RESISTANT DUPLEX RECEPTACLE: HUBBELL BR20TR, LEVITON TR#20, PASS & SEYMOUR TR5962, COOPER TR#20.

[REC-TAMP-GFI]: NEMA 5-20R GFI TAMPER RESISTANT RECEPTACLE: HUBBELL GFTR20, COOPER TRS9F20, PASS & SEYMOUR 2097TR, LEVITON GFTR2.

FLOOR BOXES

FLOOR BOXES SHALL BE CAST-IRON IN WET LOCATIONS OR SLAB ON GRADE. PROVIDE STEEL BOXES IN SLABS ABOVE GRADE.

[FB-1]: CAST IRON FLOOR BOX WITH ONE (1) [REC-DUP], MINIMUM 3" CONCRETE POUR: HUBBELL B2357 (BOX) S3925 (COVER), S3082 (FLANGE), HBL5362 (RECEPT), WIREMOLD 880 CS1, STEEL CITY 802-SG / P#0-S.

26 28 13 FUSES

FURNISH SPARE PARTS TO OWNER INCLUDING TWO (2) FUSE PULLERS AND THREE (3) OF EACH SIZE AND TYPE OF FUSE INSTALLED.

ACCEPTABLE MANUFACTURERS: COOPER BUSSMAN, EAGLE ELECTRIC, MERSEN, TRACOR, LITTELFUSE SUBSIDIARY.

CLASS RK-5: FUSES WITH RATINGS LESS THAN OR EQUAL TO 200 AMPERES.

26 28 16 DISCONNECT SWITCHES

SUBMIT SHOP DRAWINGS INCLUDING PRODUCT DATA, DIMENSIONS, WEIGHTS, PERFORMANCE, RATINGS, ENCLOSURE TYPE, CURRENT, VOLTAGE, AND SHORT-CIRCUIT RATINGS.

REFER TO DISCONNECT SCHEDULE ON DRAWINGS FOR ADDITIONAL INFORMATION.

FUSIBLE AND NON-FUSIBLE SWITCHES

ACCEPTABLE MANUFACTURERS: SQUARE D 3110 SERIES, EATON DH SERIES, ABB TH SERIES, SIEMENS HNF / HF SERIES.

[FDS-#]: FUSIBLE SWITCH ASSEMBLIES, HEAVY DUTY TYPE, QUICK-MAKE, QUICK-BREAK, LOAD INTERRUPTER ENCLOSED KNIFE SWITCH, HANDLE LOCKABLE IN OFF POSITION, CLASS 'R' FUSE.

[DS-#]: NON-FUSIBLE SWITCH ASSEMBLIES, HEAVY DUTY TYPE, QUICK-MAKE, QUICK-BREAK, LOAD INTERRUPTER ENCLOSED KNIFE SWITCH, HANDLE LOCKABLE IN OFF POSITION.

26 51 00 LIGHTING

SUBMIT PRODUCT DATA SHEETS FOR LUMINAIRES, LED LIGHTING ENGINES, DRIVERS, INCLUDE COMPLETE PRODUCT MODEL NUMBER WITH ALL OPTIONS AS SPECIFIED. SUBMITTAL SHALL BE ARRANGED WITH LUMINAIRES LISTED IN ASCENDING ORDER, AND WITH EACH LUMINAIRE ASSOCIATED LED LIGHT ENGINE, DRIVER, OR POLE INFORMATION FOLLOWING LUMINAIRE'S PRODUCT DATA.

DELIVER PRODUCTS TO SITE. PROTECT LUMINAIRE FINISHES, LENSES, AND TRIMS FROM DAMAGE DURING STORAGE AND INSTALLATION. DO NOT REMOVE PROTECTIVE FILMS UNTIL CONSTRUCTION CLEANUP WITHIN EACH AREA IS COMPLETE.

THE WARRANTY PERIOD BEGINS AT THE DATE OF SUBSTANTIAL COMPLETION. PROVIDE LED LIGHT ENGINES AND DRIVERS WITH A FIVE (5) YEAR WARRANTY. PROVIDE EMERGENCY LIGHTING UNITS AND EXIT SIGNS WITH A THREE (3) YEAR NON-PRORATED WARRANTY. PROVIDE EMERGENCY UNITS AND EXIT SIGN BATTERIES WITH SEALED LEAD ACID OR LEAD CALCIUM CELL, REQUIRING NO MAINTENANCE OR REPLACEMENT FOR TEN (10) YEARS UNDER NORMAL CONDITIONS. PROVIDE EMERGENCY BATTERY, SEALED NICKEL CADMIUM, WITH FIVE (5) YEAR NON-PRORATED WARRANTY. PROVIDE LED LIGHT ENGINE WITH THREE (3) YEAR WARRANTY AND ANY DRIVER WITH FIVE (5) YEAR WARRANTY.

PROVIDE LENSED TROFFERS WITH HINGED FRAMES WITH LATCHES AND 0.125-INCH THICK VIRGIN ACRYLIC LENSES. PRISMATIC LENSES SHALL HAVE DEPTH OF NO LESS THAN 0.080", K3H12 OR EQUAL. OTHER LENSES AS SCHEDULED. CONFIRM CEILING AND WALL TYPE FOR RECESSED LUMINAIRES AND FURNISH TRIM AND ACCESSORIES NECESSARY TO PERMIT PROPER INSTALLATION IN EACH SYSTEM, WHERE FIRE-RATED CEILING OR WALL ASSEMBLIES ARE SPECIFIED. FURNISH AND INSTALL LISTED ENCLOSURES AROUND LUMINAIRES THAT MAINTAIN THE SYSTEM RATING. FOR SUSPENDED LUMINAIRES, COORDINATE POWER FEED AND SUSPENSION CANOPIES WITH CEILING TYPE AND ARCHITECTURAL RCP FOR PROPER FIT AND LOCATION. VERIFY SUSPENSION LENGTH PRIOR TO SUBMITTAL. PAINTED REFLECTOR SURFACES SHALL HAVE A MINIMUM REFLECTANCE OF 90%.

LIGHT EMITTING DIODES USED IN INTERIOR APPLICATIONS SHALL HAVE A MINIMUM COLOR RENDERING INDEX (CRI) OF 80. LIGHT EMITTING DIODES USED IN EXTERIOR APPLICATIONS SHALL HAVE A MINIMUM COLOR RENDERING INDEX (CRI) OF 70. COLOR TEMPERATURE OF THE LUMINAIRES SHALL BE AS NOTED ON THE LUMINAIRE SCHEDULE. PROVIDE LIGHT SOURCE COLOR CONSISTENCY BY UTILIZING A BINNING TOLERANCE WITHIN A MAXIMUM 3-STEP MCADAM ELLIPSE UNLESS NOTED OTHERWISE. RATED LIFE SHALL BE MINIMUM OF 50,000 HOURS AT L70. LED CHIPS SHALL BE WIRED SO THAT FAILURE OF ONE CHIP DOES NOT PROHIBIT OPERATION OF THE REMAINDER OF THE CHIP ARRAY. LUMINAIRE DELIVERED LUMENS IS DEFINED AS THE ABSOLUTE LUMENS PER THE MANUFACTURER'S LM-79-08 TEST REPORT. LED LIGHT ENGINE SHALL HAVE A MAXIMUM LLD OF 0.85 AT 50,000 HOURS AT 25°C AMBIENT.

PROVIDE SOLID STATE DRIVERS WITH INTEGRAL HEAT SINK. DRIVER SHALL HAVE OVERHEAT, SHORT-CIRCUIT AND OVERLOAD PROTECTION. POWER FACTOR 0.90 OR ABOVE, AND MAXIMUM TOTAL HARMONIC DISTORTION OF 20%. DIMMING SHALL CONTROL LIGHT OUTPUT IN A CONTINUOUS CURVE FROM 100% TO 10% UNLESS NOTED OTHERWISE. DRIVER SHALL HAVE A MINIMUM OF 50,000 HOURS RATED LIFE. DRIVER SHALL BE FIELD REPLACEABLE WITHOUT REMOVAL OF THE LUMINAIRE. CLASS A SOUND RATING; INAUDIBLE IN A 27 DBA AMBIENT.

PROVIDE SELF-POWERED EMERGENCY LIGHTING UNITS: ONE-PIECE, SELF-CONTAINED UNIT WITH SEALED, MAINTENANCE-FREE NICKEL CADMIUM BATTERY, AUTOMATIC CHARGER AND ELECTRONIC CIRCUITRY. BATTERY: MAINTENANCE FREE LEAD CALCIUM TYPE, WITH 90 MINUTE CAPACITY TO SUPPLY THE CONNECTED LOAD. CHARGER: DUAL-RATE SOLID STATE CURRENT LIMITING CHARGER, CAPABLE OF MAINTAINING THE BATTERY IN A FULL-CHARGE STATE DURING NORMAL CONDITIONS AND CAPABLE OF RECHARGING DISCHARGED BATTERY TO FULL CHARGE WITHIN 188 HOURS. LOW VOLTAGE DISCONNECT TO PREVENT DEEP DISCHARGE OF BATTERY. BATTERY SHALL BE PROVIDED WITH INDICATOR LIGHT AND TEST SWITCH. UNIT SHALL BE SELF-DIAGNOSTIC WITH CONTINUOUS MONITORING OF CHARGER PERFORMANCE AND BATTERY VOLTAGE. ANY MALFUNCTION OF BATTERY, CHARGER, TRANSFER CIRCUIT, OR EMERGENCY LAMPS SHALL BE DETECTED AND VISUALLY INDICATED. UNIT SHALL BE PROGRAMMED TO EXERCISE THE BATTERY AND TEST EMERGENCY OPERATION BY PERFORMING A FIVE-MINUTE DISCHARGE/DIAGNOSTIC CYCLE EVERY SIX MONTHS. A MANUAL TEST SWITCH SHALL ALLOW A FIVE-MINUTE DISCHARGE/DIAGNOSTIC TEST AT ANY TIME.

EXIT SIGNS SHALL BE STENCIL FACE, 6-INCH HIGH LETTERS, DIRECTIONAL ARROWS AS INDICATED. UNIVERSAL MOUNTING TYPE AS INDICATED ON THE DRAWINGS WITH DIRECTIONAL INDICATOR (CHEVRON TYPE MEETING ALL REQUIREMENTS OF NFPA 101). UNIT SHALL BE SELF-DIAGNOSTIC WITH CONTINUOUS MONITORING OF CHARGER PERFORMANCE AND BATTERY VOLTAGE.

LED LAMPS USED WITH DIMMING SHALL BE VERIFIED FOR COMPATIBILITY WITH DIMMER MANUFACTURER PRIOR TO ORDERING.

SECURELY FASTEN LUMINAIRES TO THE LISTED AND LABELED CEILING FRAMING MEMBER BY MECHANICAL MEANS SUCH AS BOLTS, SCREWS, RIVETS OR LISTED CLIPS IDENTIFIED FOR USE WITH THE TYPE OF CEILING FRAMING MEMBERS. PROVIDE A MINIMUM OF TWO (2) #12 GAUGE WIRES LOCATED ON DIAGONAL CORNERS OF LUMINAIRES. THE ARCHITECTURAL CEILING FRAMING SYSTEM MAY BE USED IN LIEU OF INDEPENDENT SUPPORT WITH PRIOR WRITTEN APPROVAL BY THE CEILING SYSTEM MANUFACTURER AND AUTHORITY HAVING JURISDICTION (AHJ). LUMINAIRES AND WIRING INSTALLED IN FIRE-RATED CEILING ASSEMBLIES SHALL BE INDEPENDENTLY SUPPORTED FOR ALL APPLICATIONS.

INSTALL RECESSED FLANGED LUMINAIRES TO PERMIT REMOVAL FROM BELOW. USE MANUFACTURER-SUPPLIED PLASTER FRAME AND SWITCH GATE SUPPORTS. SUPPORT LUMINAIRES INDEPENDENT OF CEILING WITH A MINIMUM OF TWO (2) #12 GAUGE WIRES LOCATED ON DIAGONAL CORNERS. SUPPORT SURFACE-MOUNTED LUMINAIRES DIRECTLY FROM BUILDING STRUCTURE. SUPPORT SUSPENDED OR PENDANT MOUNTED LUMINAIRES INDEPENDENT OF CEILING GRID WITH A MINIMUM OF TWO #12 GAUGE WIRES LOCATED ON DIAGONAL CORNERS. SUSPENSION ASSEMBLY AND ANCHORS SHALL BE CAPABLE OF SUPPORTING 300 POUNDS DEAD LOAD AT EACH SUSPENSION POINT.

THE CONTRACTOR SHALL PROVIDE TEMPORARY CONSTRUCTION LIGHTING PER THE REQUIREMENTS OF DIVISION 1. THE PROJECT LUMINAIRES SHOWN ON THE CONSTRUCTION DOCUMENTS SHALL NOT BE USED FOR TEMPORARY CONSTRUCTION PURPOSES WITHOUT PROVIDING A PLAN FOR OWNER APPROVAL THAT ADDRESSES ENERGY AND LUMINAIRE OPERATING HOURS.

REPLACE FAILED LED LIGHT ENGINE MODULES OR ARRAYS AT COMPLETION OF WORK.

ALIGN LUMINAIRES AND CLEAN LENSES AND DIFFUSERS AT COMPLETION OF WORK. CLEAN PAINT SPLATTERS, DIRT, AND DEBRIS FROM INSTALLED LUMINAIRES. TOUCH UP LUMINAIRE AND POLE FINISH AT COMPLETION OF WORK.

DRAWING ISSUE

NO	DESCRIPTION	DATE
1	OWNER REVISION COMMENTS	07/08/2025
2		
3		
4		
5		
6		

E0.2

ELECTRICAL SPECIFICATION

FOREFRONT DERMATOLOGY



1 ELECTRICAL LIGHTING PLAN
SCALE 1/4"=1'-0"

PLAN ID	LIGHTING SWITCHED
(LS1)	SEQUENCE: SWITCHED LIGHTS ARE CONTROLLED IN THIS SPACE. ON: THE LIGHTS ARE TURNED ON BY OCCUPANCY SENSOR OR BY WALL SWITCH. EXHAUST FAN BY OCCUPANCY SENSOR. OFF: THE LIGHTS MAY BE TURNED OFF USING A WALL CONTROLLER. AFTER THE SPACE HAS BEEN VACANT FOR 15 MINUTES, THE LIGHTS AND EXHAUST FAN WILL AUTOMATICALLY TURN OFF.
(LS2)	SEQUENCE: SWITCHED LIGHTS ARE CONTROLLED IN THIS CORRIDOR. ON: THE NORMAL LIGHTS TURN ON BY BY OCCUPANCY SENSOR. OFF: THE LIGHTS MAY BE TURNED OFF BY AFTER THE SPACE HAS BEEN VACANT FOR 15 MINUTES, THE LIGHTS AUTOMATICALLY TURN OFF.
(LS3)	SEQUENCE: SWITCHED LIGHTS ARE CONTROLLED IN THIS SPACE. ON: THE LIGHTS ARE TURNED ON BY OCCUPANCY SENSOR OR BY WALL SWITCH. OFF: THE LIGHTS MAY BE TURNED OFF USING A WALL CONTROLLER. AFTER THE SPACE HAS BEEN VACANT FOR 15 MINUTES, THE LIGHTS AUTOMATICALLY TURN OFF.
(LS4)	SEQUENCE: SWITCHED LIGHTS ARE CONTROLLED IN THIS SPACE. ON: THE LIGHTS ARE TURNED ON BY SCHEDULED TIME ONLY. OFF: THE LIGHTS ARE TURNED OFF BY SCHEDULED TIME ONLY.
(LS5)	SEQUENCE: SWITCHED LIGHTS ARE CONTROLLED IN THIS SPACE. ON: THE LIGHTS ARE TURNED ON IN COMBINATION WITH TIME CLOCK & DAYLIGHT SENSOR. WHEN DAYLIGHT IS LESS SCHEDULED TIME. OFF: THE LIGHTS ARE TURNED OFF WHEN DAYLIGHT IS MORE IN SCHEDULED TIME.

NOTES:
1) DENOTES THE LIGHTING SEQUENCE OF OPERATIONS FOR THIS SPACE.
2) a = SWITCH DESIGNATION FOR LIGHTING CONTROL
3) VERIFY AND COORDINATE ALL TIME CLOCK SETTINGS WITH OWNER PRIOR TO FINAL PROGRAMMING.
4) VERIFY AND COORDINATE ALL PUSH BUTTON WALL DEVICES AND QUANTITIES OF INDIVIDUAL BUTTONS WITH SCENES AND ZONES PER LOCATION.
5) VERIFY AND COORDINATE ALL PUSH BUTTON QUANTITIES AND SCENE NAMES WITH OWNER PRIOR TO SUBMITTING ENGRAVING TEMPLATE TO MANUFACTURER.

LIGHTING PLAN LEGENDS:	
DS	DAYLIGHT SENSOR CEILING MOUNTED
OS	OCCUPANCY SENSOR - CEILING MOUNTED
\$	SWITCH - OCCUPANCY SENSOR WALL SWITCH
\$	SWITCH-SINGLE POLE
\$	TIMER SWITCH
\$	SWITCH-SINGLE POLE (*# INDICATE SWITCH NAME)
TC	TIME CLOCK
LC	LIGHTING CONTACTOR
⊕	BUG EYE - EMERGENCY LIGHT WITH BATTERY
⊕	ILLUMINATED EXIT SIGN
⊕	ILLUMINATED DIRECTIONAL SIGN
⊕	BUG EYE & EXIT SIGN COMBO WITH BATTERY

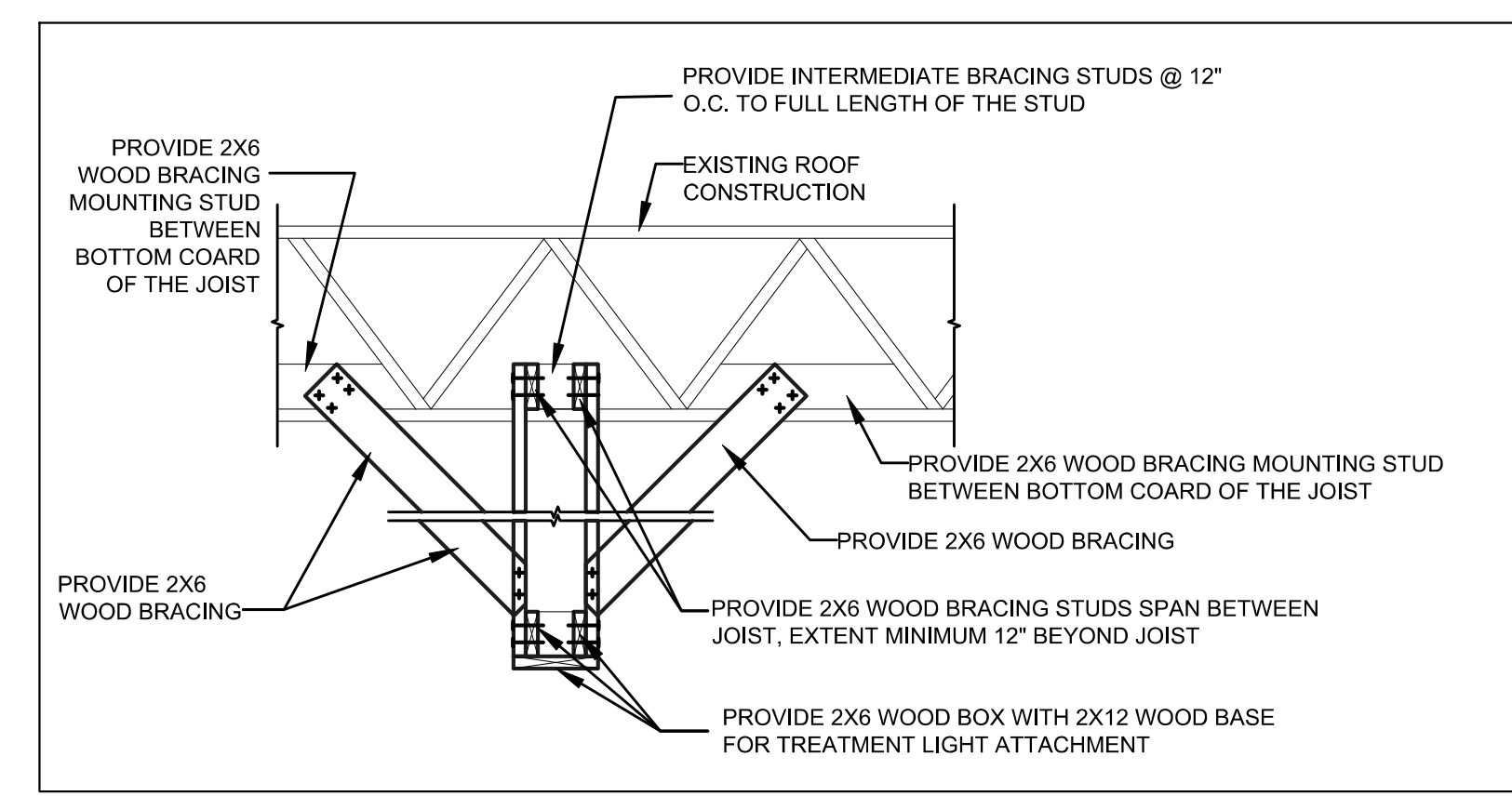
LIGHT FIXTURE SCHEDULE							
TAG	QTY	FIXTURE DETAIL	MAKE	MODEL	WATTAGE	DIMMABLE	NOTES
A	6	4" RECESSED LIGHT LIGHTING	USA	US_104-R-ICAT	15W	-	3
D	19	2 X 4 LED FLAT LENS	METALUX	GR	48W	-	1
D/EM	17	2 X 4 LED FLAT LENS	METALUX	GR	48W	-	1,2
E	33	2 X 2 LED FLAT LENS	METALUX	GR	30W	-	1
E/EM	11	2 X 2 LED FLAT LENS	METALUX	GR	30W	-	1,2
F	3	UNDERCABINET TASK LIGHT	HALE	HUS3	21.4W	-	1,4
G	3	CEILING MOUNTED SURGICAL LIGHT (FOREFRONT PROVIDED)	BURTON	OUTPATIENT LED	42W	-	1,4
EX1	-	EXIT SIGN	TBD	TBD	-	-	1,2
EX2	-	DIRECTIONAL EXIT SIGN	TBD	TBD	-	-	1,2
EM	-	EMERGENCY LIGHT BUGEYE	TBD	TBD	-	-	1,2

NOTES:
1- COORDINATE/VERIFY EXACT MAKE/MODEL NUMBER WITH THE OWNER/ARCHITECT.
2- THE LIGHT FIXTURE SHALL HAVE MINIMUM OF 90 MINUTES OF BATTERY BACKUP.
3- THE LIGHTING FIXTURE WATTAGE HAS BEEN ASSUMED FOR THE COMCHECK AND LOAD CALCULATION PURPOSES
4- COORDINATE CONNECTION REQUIREMENT & ACCESSORIES WITH THE VENDOR AND PROVIDE AS NEEDED.

- LIGHT FIXTURE SCHEDULE GENERAL NOTES:**
- VERIFY ALL LUMINAIRES COLORS, TRIMS, LENGTHS, ETC. WITH THE ARCHITECT PRIOR TO PLACING FINAL PURCHASE ORDERS. SUBMISSION PF SHOP DRAWINGS WILL BE INTERPRETED AS HAVING BEEN COORDINATED WITH THE ARCHITECTURAL DRAWINGS.
 - PROVIDE ALL LENGTHS, FEEDS, ACCESSORIES, CONNECTORS, WIRING, POWER SUPPLIES, DRIVERS ETC. FOR A COMPLETE INSTALLATION. THE E.C. SHALL VERIFY THE COMPLETE BILL OF MATERIAL WITH MANUFACTURER'S REPRESENTATIVE AND ENSURE ALL EQUIPMENT ARE INCLUDED IN BID PRICE. COORDINATE INSTALLATION WITH ARCHITECTURAL DETAILS.
 - VERIFY FINAL LUMINAIRES LOCATIONS WITH OTHER CEILING MOUNTED EQUIPMENTS SUCH AS DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLANS.
 - VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF ALL WALL MOUNTED LUMINAIRES WITH ARCHITECTURAL PLANS AND ELEVATIONS PRIOR TO ROUGH-IN.
 - ANY PROPOSED ALTERNATE LUMINAIRES SHALL BE APPROVED BY THE ARCHITECT PRIOR TO FINAL BID PRICING.
 - SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS, EQUIPMENT AND DEVICES OTHER THAN THOSE SPECIFIED AND LISTED, THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS, TO THE ENGINEERS AT LEAST TEN (10) BUSINESS DAYS PRIOR TO BID OPENING. THE REQUEST SHALL BE AN ALTERNATE TO THE ORIGINAL BID AND SHALL INCLUDE A COMPLETE SPECIFICATIONS CUT SHEET SUBMITTAL AS OUTLINED IN THE SPECIFICATIONS. COMPLETE WITH DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ALL ITEMS. INDICATE ANY ADDITIONS OR DEDUCTIONS TO THE CONTRACT PRICE WITH THE SUBSTITUTION SUBMITTAL AND ON THE BID FORM.
 - VERIFY FINAL SELECTION OF LIGHT FIXTURES WITH THE ARCHITECT.
 - CATALOG NUMBER SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND CATALOG NUMBER ONLY. THE COMPLETE DESCRIPTION AND THE SPECIFICATION SHALL BE COORDINATED WITH THE CATALOG NUMBER TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.
 - CONFIRM ALL COLORS AND FINISHES OF ALL LUMINAIRE COMPONENTS WITH ARCHITECT INTERIOR DESIGNER PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
 - UNLESS INDICATED ON LIGHTING PLANS OR BELOW. REFER TO ARCHITECTURAL AND INTERIOR DESIGN ELEVATIONS, SECTIONS AND DETAILS FOR ALL SUSPENDED AND WALL MOUNTED LUMINAIRE MOUNTING HEIGHTS.

- ELECTRICAL LIGHTING PLAN KEY NOTES : (#)**
- E.C. TO PROVIDE POWER FOR PROCEDURE LIGHT IN COORDINATION WITH ARCHITECT/OWNER. VERIFY PROCEDURE LIGHT SCOPE WITH ARCHITECT/OWNER BEFORE BID.
 - E.C. SHALL VERIFY AVAILABILITY OF EXISTING JUNCTION BOX FOR SIGNAGE & PROVIDE NEW DISCONNECT FOR EXTERIOR SIGNAGE COORDINATE EXACT LOCATION & POWER REQUIREMENTS WITH THE ARCHITECT/OWNER IN THE FIELD.
 - E.C. SHALL COORDINATE EXACT LOCATION OF SWITCH BANK WITH ARCHITECT/OWNER IN THE FIELD.
 - E.C. TO MOUNT THE UNDER CABINET LIGHT INSET 2" FROM FRONT OF THE UPPER CABINET. FOR EXACT LOCATION & CONTROLS OF FIXTURE COORDINATE WITH ARCHITECT/OWNER IN THE FIELD.
 - E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF DAY LIGHT SENSOR & LIGHTING IN DAY LIGHT ZONE SHALL BE CONTROLLED BY DAY LIGHT SENSOR. PROVIDE WIRING ACCORDINGLY.

- ELECTRICAL LIGHTING PLAN GENERAL NOTES :**
- LIGHTING CONTROLS (SENSORS AND SWITCHES) SHALL BE RATED FOR LINE VOLTAGE (UON); ELSE PROVIDE POWER BASE.
 - THE PROPOSED LOCATION OF THE SWITCHES AND SENSORS IS SHOWN ON THE PLAN. FOR CONTROLS WITH DIFFERENT CAPABILITIES, THE CONTRACTOR SHALL ADJUST THE QUANTITY, LOCATION, AND MOUNTING HEIGHT ACCORDINGLY.
 - THE OCCUPANCY SENSOR, TIMERS, AND OTHER APPROVED LIGHTING CONTROLS SHALL MATCH THE CONTROL FUNCTION REQUIREMENT SPECIFIED IN THE IECC C405.2.
 - THE MANUAL OVERRIDE SWITCH SHALL TURN OFF THE INTENDED LIGHTING (TIME CLOCK AND CONTACTOR) BEFORE 2 HOURS. WHEN IT IS INITIATED.
 - A PHOTOCELL SHALL BE LOCATED/INSTALLED IN ANY LOCATION EXPOSED TO THE SUNLIGHT BUT CONCEALED FROM PUBLIC VIEW. COORDINATE EXACT LOCATION IN FIELD.
 - CONNECT THE EMERGENCY LIGHTING, EXIT SIGNS, OR EXIT SIGN AND BUG-EYE COMBO TO THE NEAREST LIGHTING CIRCUIT AHEAD OF SWITCHING. UON.
 - EMERGENCY LIGHT FIXTURES SHALL TURN ON DURING POWER FAILURE WHEREAS ALL EXIT SIGNS SHALL BE PERMANENTLY ON. E.C. TO WIRE THE FIXTURE ACCORDINGLY.
 - E.C. SHALL REARRANGE (IF REQUIRED) THE EMERGENCY FIXTURES TO PROVIDE INITIAL ILLUMINATION THAT IS NOT LESS THAN AN AVERAGE OF 1 FOOTCANDLE (1 LUX) AND A MINIMUM AT ANY POINT OF 0.1 FOOTCANDLE (1 LUX) MEASURED ALONG THE PATH OF EGRESS AT FLOOR LEVEL. ILLUMINATION LEVELS SHALL BE PERMITTED TO DECLINE TO 0.6 FOOTCANDLE (6 LUX) AVERAGE AND A MINIMUM AT ANY POINT OF 0.06 FOOTCANDLE (0.6 LUX) AT THE END OF THE EMERGENCY LIGHTING TIME DURATION. A MAXIMUM-TO-MINIMUM ILLUMINATION UNIFORMITY RATIO OF 40 TO 1 SHALL NOT BE EXCEEDED.
 - PROVIDE EACH SWITCHED EMERGENCY FIXTURE WITH A FIRE ALARM CONTROL MODULE TO INTERFACE WITH FIRE ALARM SYSTEM. LIGHTS TO TURN ON AUTOMATICALLY WHERE THERE IS FIRE ALARM.
 - PROVIDE UL RATED PENETRATION KITS FOR ALL CONDUITS PENETRATING RATED WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATION OF RATED WALLS.
 - COORDINATE EXACT LOCATION OF TIME CLOCK, MANUAL OVERRIDE SWITCH & PHOTOCELL IN THE FIELD WITH ARCHITECT/OWNER.

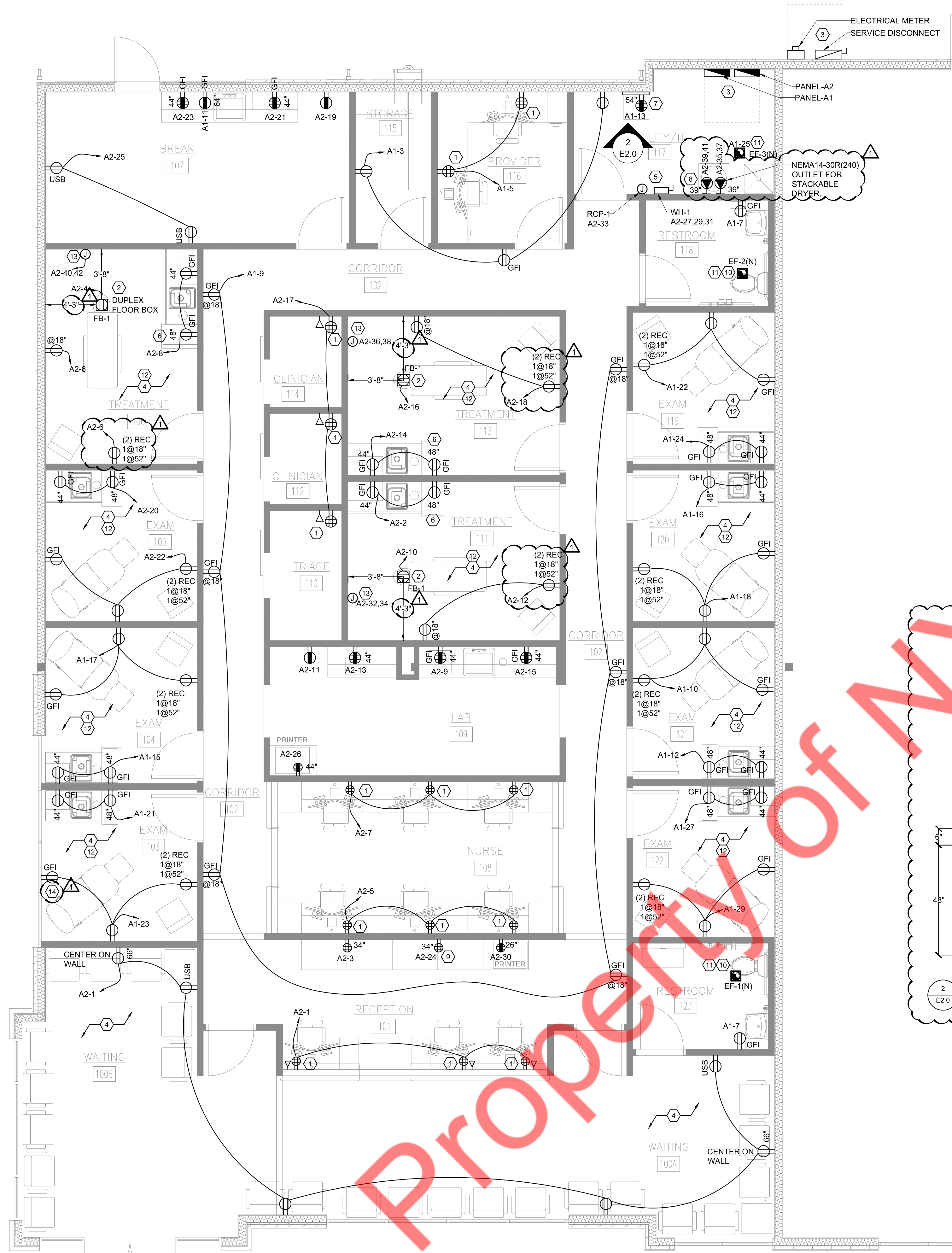


2 "G" SURGICAL LIGHT MOUNTING DETAIL
N.T.S.

FOREFRONT DERMATOLOGY

NO	DATE	DESCRIPTION	DRAWING ISSUE		
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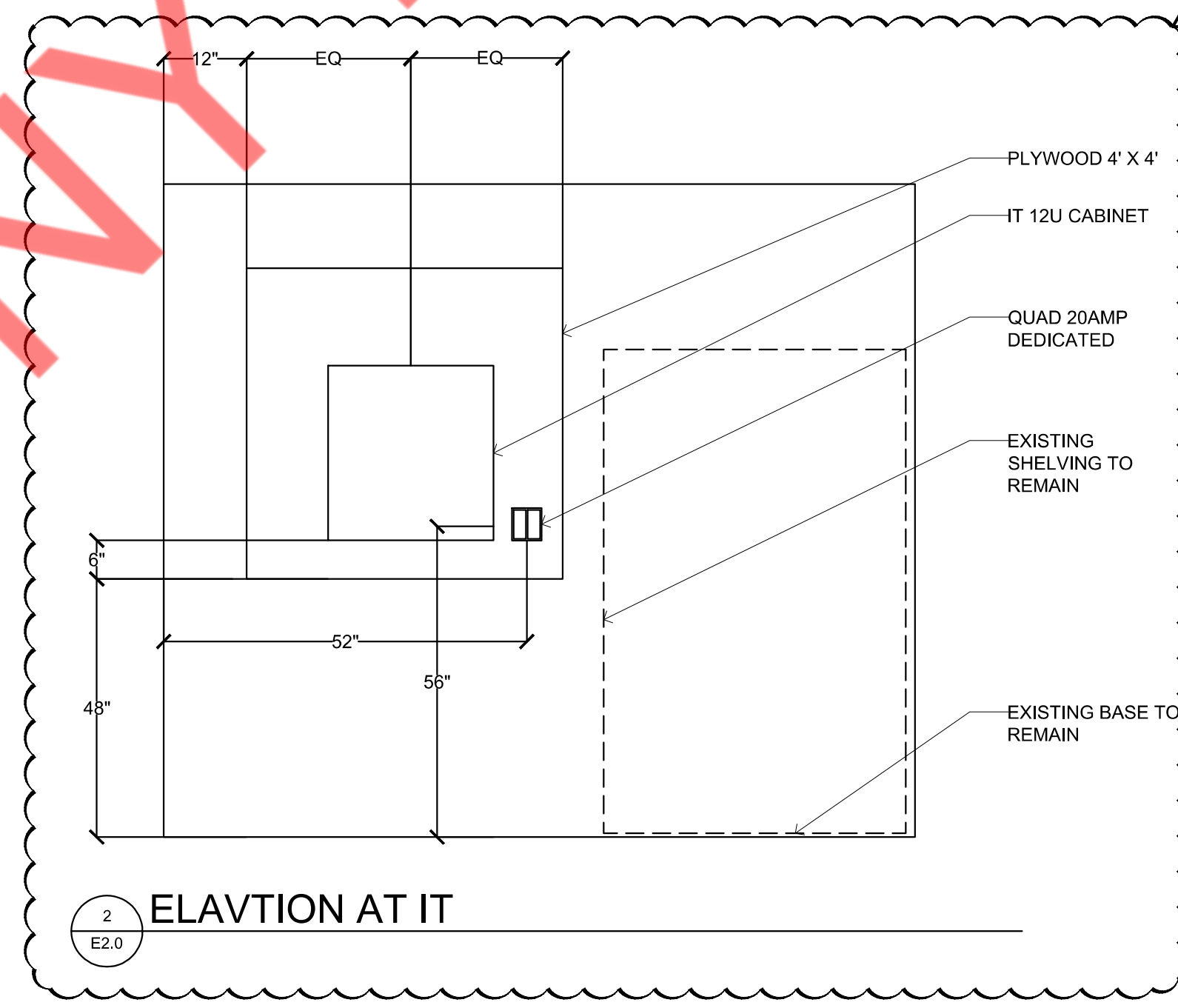
E1.0 ELECTRICAL LIGHTING PLAN



ELECTRICAL SYMBOL LIST :	
	DUPLEX RECEPTACLE STANDARD HEIGHT. MEASURE TO CENTER OF RECEPTACLE.
	GFCI DUPLEX RECEPTACLE
	QUAD RECEPTACLE STANDARD HEIGHT
	DATA/TEL. OUTLET, STANDARD HEIGHT
	NURSE CALL
	DUPLEX FLOOR RECEPTACLE FOR PROCEDURE TABLE, 115/230VAC, 12/6A, 60HZ
	DEDICATED QUAD RECEPTACLE STANDARD HEIGHT
	DEDICATED DUPLEX RECEPTACLE
	DATA OUTLET - QUANTITY AS INDICATED
	TELEPHONE OUTLET - QUANTITY AS INDICATED
	DATA / TELEPHONE COMBINATION OUTLET - QUANTITY AS INDICATED
	DATA RACK + TELEPHONE DISTRIBUTION BOARD - AS REQUIRED
	CABLE TV OUTLET
	NON FUSED DISCONNECT SWITCH - RATING EQUAL TO OR MORE THAN BREAKER RATING
	FUSED DISCONNECT SWITCH - FUSE RATING AS NEEDED -
	SPECIAL RECEPTACLE

- ELECTRICAL POWER PLAN GENERAL NOTES:**
- PROVIDE UL RATED PENETRATION KITS FOR ALL CONDUITS PENETRATING RATED WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATION OF RATED WALLS. SEE 6/E5 FOR FIRE BARRIER PENETRATION DETAIL.
 - THE ARCHITECTURAL PLAN SHALL TAKE PRECEDENCE OVER THE ELECTRICAL DRAWING FOR EQUIPMENT LOCATION AND MOUNTING. THE LOCATION OF ALL ELECTRICAL EQUIPMENT NOT PROVIDED IN THE ARCHITECTURAL PLAN SHALL BE VERIFIED WITH THE ARCHITECT/OWNER BEFORE BID.
 - POWER AND LOCATION OF ALL THE MECHANICAL AND PLUMBING UNITS SHALL BE COORDINATED WITH THE RESPECTIVE CONTRACTOR BEFORE BID.
 - ELECTRICAL OUTLETS PLACED ON BOTH SIDES OF THE WALL PARTITION TO BE LOCATED OFFSET OF EACH OTHER.
 - ELECTRICAL OUTLETS AND DEVICES LOCATED IN DEMISING WALLS TO HAVE FIRE PUTTY AROUND THE BOX TO MAINTAIN PARTITION FIRE RATING.
 - COORDINATE THE EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENTS OF THE DUCT SMOKE DETECTORS, FIRE DAMPERS, FIRE SMOKE DAMPERS, MOTORIZED DAMPERS, AND THERMOSTATS IN THE FIELD WITH THE MECHANICAL DRAWING. PROVIDE WIRING AS REQUIRED.
 - GFI MARKED ON THE PLAN INDICATES THAT THE CIRCUIT SHALL BE GFI PROTECTED. E.C. SHALL PROVIDE A GFI RECEPTACLE DISCONNECT IN THE READILY ACCESSIBLE LOCATION. PROVIDE A GFI BREAKER IN THE PANEL IF EITHER THE RECEPTACLE IS NOT AVAILABLE OR NOT ACCESSIBLE WHEN INSTALLED IN THE DESIRED LOCATION.
 - ALL 125V-250V RECEPTACLES SUPPLIED BY SINGLE-PHASE CIRCUITS RATED 150V OR LESS TO GROUND, 50A OR LESS, AND ALL RECEPTACLES SUPPLIED BY THREE-PHASE BRANCH CIRCUITS RATED 150V OR LESS TO GROUND, 100A OR LESS INSTALLED IN THE LOCATIONS SPECIFIED IN NEC 210.8(B)(1) THROUGH (12) SHALL HAVE GFCI PROTECTION.
 - THE DISCONNECT SWITCHES FOR THE BRANCH CIRCUIT SHOWN ON THE PLAN SHALL BE RATED EQUAL TO OR HIGHER THAN THE BREAKER RATING. REFER TO BREAKER RATING IN THE PANEL SCHEDULE AND PROVIDE DISCONNECT AS NEEDED.

- ELECTRICAL POWER PLAN KEYED NOTES: (#)**
- COORDINATE LOCATION OF RECEPTACLE WITH GROMMET LOCATION IN MILLWORK.
 - COORDINATE LOCATION OF FB-1 WITH OWNER PRIOR TO INSTALLATION.
 - E.C. SHALL COORDINATE WITH THE ARCHITECT/OWNER FOR THE EXACT LOCATION OF ELECTRICAL EQUIPMENT IN THE FIELD. ALSO, ENSURE CLEAR WORKING AND DEDICATED SPACE HAVE BEEN PROVIDED AS PER NEC 110.26.
 - ALL 20 AMP 125 AND 250V NON-LOCKING TYPE RECEPTACLES IN THE EXAM ROOM, TREATMENT ROOM, WAITING AREA AND CORRIDOR LOCATIONS SHALL BE TAMPER-RESISTANT AS PER NEC 406.12.
 - E.C. SHALL COORDINATE WITH THE PLUMBING CONTRACTOR FOR THE EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENT OF THE UNIT IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
 - ELECTRICAL CONTRACTOR TO CENTER ELECTRICAL RECEPTACLE ON COUNTERTOP.
 - E.C. TO PROVIDE 4' X 4' PLYWOOD FOR DATA CABINET AT 4' AFF. COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION.
 - E.C. SHALL COORDINATE WITH ARCHITECT/VENDOR FOR EXACT POWER REQUIREMENT & CONTROL OF THE WASHER AND DRYER.
 - ELECTRICAL CONTRACTOR TO PROVIDE/INSTALL SINGLE GANG BOX AND 3/4" CONDUIT WITH PULL STRING STUBBED UP ABOVE FINISH CEILING(S) FOR XM RADIO HEAD UNIT. XM EQUIPMENT FURNISHED AND INSTALLED BY FOREFRONT VENDOR.
 - EF-1 (N) & EF-2 (N) INTERLOCK WITH ROOM LIGHT.
 - E.C. SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR THE EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENT OF THE UNIT IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
 - INSTALLATION OF OUTLETS, CONDUITS, WIRING, GROUNDING AND MOUNTING IN THE PATIENT CARE AREA (TREATMENT ROOM, EXAM ROOM ETC.) SHALL BE IN ACCORDANCE WITH THE NEC SECTION 517.
 - E.C. SHALL INSTALL JUNCTION BOX FOR FOR FUTURE L6-30P WITH CONDUIT AND PROVIDE CONDUIT WITH PULL STRING FOR FUTURE USE. COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION. BASE BID ACCORDINGLY.
 - COORDINATE EXACT PLACEMENT OF RECEPTACLE WITH ARCHITECT/OWNER IN THE FIELD.



**FOREFRONT
DERMATOLOGY**

1
E2.0
ELECTRICAL FLOOR POWER PLAN
SCALE 1/4"=1'-0"

DRAWING ISSUE	
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**E2.0
ELECTRICAL
POWER
PLAN**

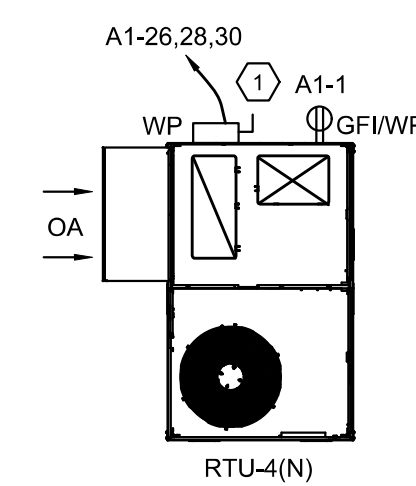
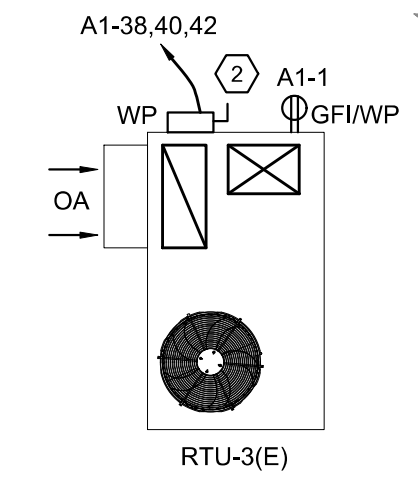
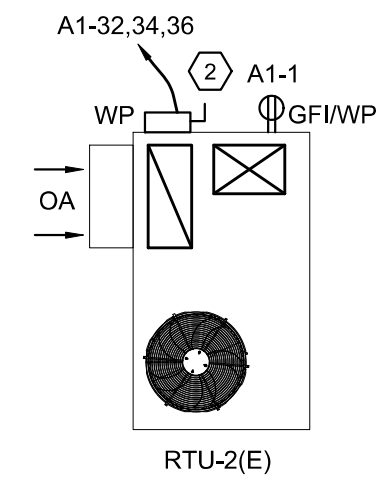
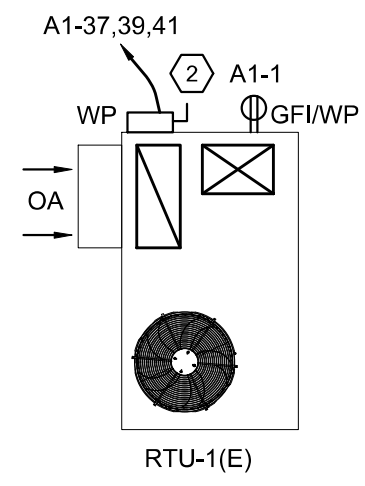
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ELECTRICAL ROOF POWER PLAN GENERAL NOTES:

- ALL THE ELECTRICAL ELEMENTS, VIZ., CONDUITS, WIRING, AND DISCONNECT SWITCHES, SHALL BE RATED FOR EXTERIOR USE.
- THE DISCONNECT SWITCHES FOR THE BRANCH CIRCUIT SHOWN ON THE PLAN SHALL BE RATED EQUAL TO OR HIGHER THAN THE BREAKER RATING. REFER TO BREAKER RATING IN THE PANEL SCHEDULE AND PROVIDE DISCONNECT AS NEEDED.
- GFI MARKED ON THE PLAN INDICATES THAT THE CIRCUIT SHALL BE GFI PROTECTED. E.C. SHALL PROVIDE A GFI BREAKER IN THE PANEL FOR THE INDICATED CIRCUIT IF EITHER THE RECEPTACLE IS NOT AVAILABLE OR NOT ACCESSIBLE.
- A 125-VOLT, SINGLE-PHASE, 15- OR 20-AMPERE-RATED RECEPTACLE OUTLET SHALL BE INSTALLED AT AN ACCESSIBLE LOCATION WITHIN 7.5 M (25 FT) OF THE EQUIPMENT AS SPECIFIED IN 210.63(A) AND (B) AS PER NEC 210.63.

ELECTRICAL ROOF POWER PLAN WORK KEYED NOTES: (E)

- E.C. SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR THE EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENT OF THE UNIT IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
- EXISTING MECHANICAL EQUIPMENT SHALL REMAIN CONNECTED TO THE EXISTING CIRCUIT. E.C. SHALL VERIFY THE OPERABLE CONDITION OF THE ELECTRICAL CIRCUIT AND CONTROL IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.



1 ELECTRICAL ROOF POWER PLAN
E2.1 SCALE 1/4"=1'-0"

FOREFRONT
DERMATOLOGY

DRAWING ISSUE		DATE
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1	OWNER REVISION COMMENTS	
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E2.1
ELECTRICAL
ROOF POWER
PLAN

LV PLAN GENERAL NOTES:

A. PROVIDE UL RATED PENETRATION KITS FOR ALL CONDUITS PENETRATING RATED WALLS. REFER TO ARCHITECTURAL PLANS FOR LOCATION OF RATED WALLS. SEE 5/66 FOR FIRE BARRIER PENETRATION DETAIL.

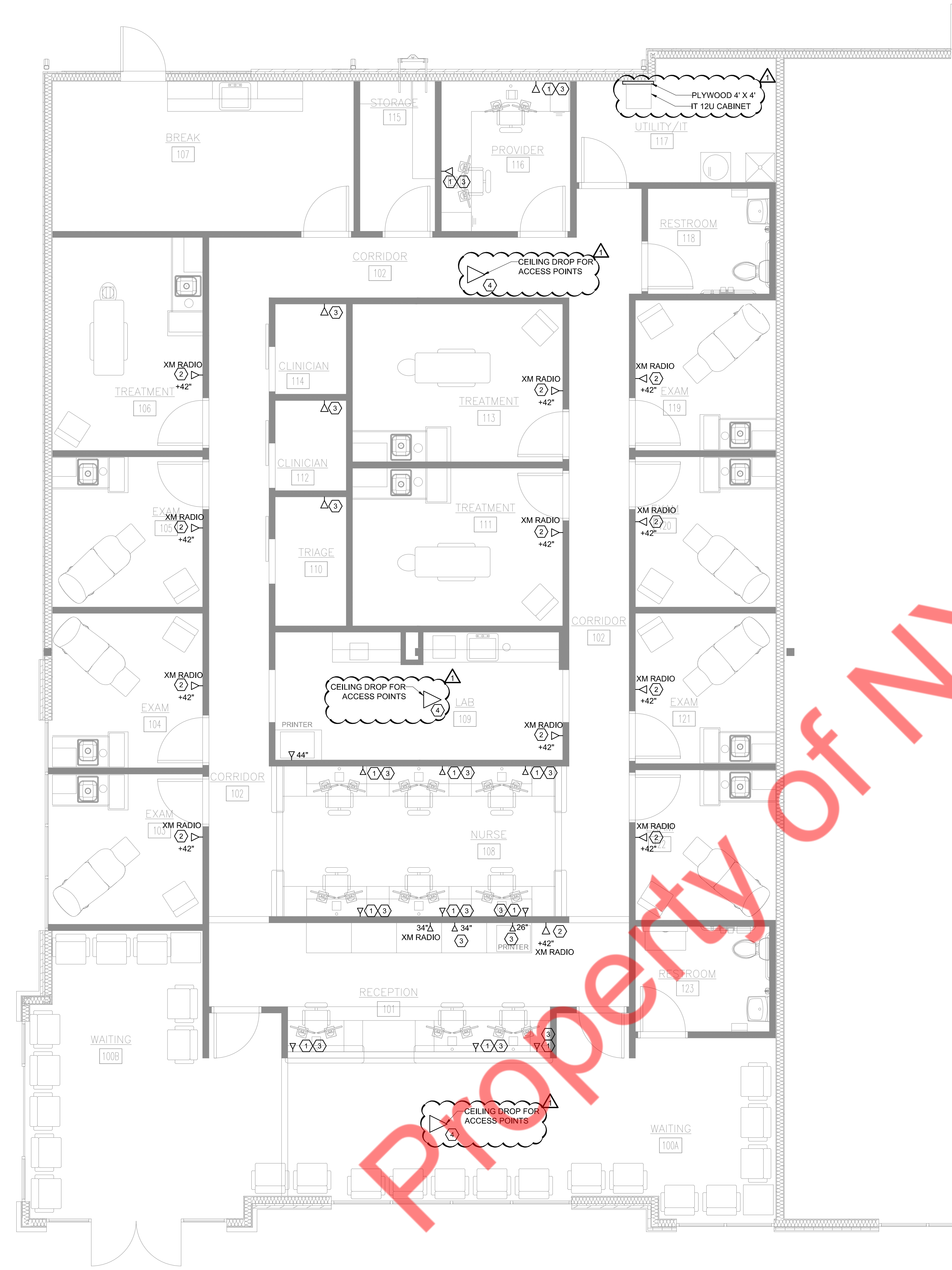
LV PLAN KEYED NOTES:

1. COORDINATE LOCATION OF DATA ROUGH-IN WITH GROMMET LOCATION IN MILLWORK.

2. E.C. TO PROVIDE AND INSTALL 2X4 BOX AND 3/4" C WITH PULL STRING STUBBED UP ABOVE FINISHED CEILING FOR VOLUME CONTROL FOR XM RADIO. LOCATE WITHIN 4" OF LIGHT SWITCH, VOLUME CONTROL AND WIRE PROVIDED BY OTHERS.

3. E.C. TO PROVIDE AND INSTALL 2X4 BOX AND 3/4" C WITH PULL STRING STUBBED UP ABOVE FINISHED CEILING FOR FOREFRONTS. DATA CONTRACTOR TO RUN CABLING AND MAKE FINAL TERMINATIONS.

4. PROVIDE CEILING DROPS FOR ACCESS POINTS WITH 10' SERVICE LOOP AND TERMINATE ON A BISCUIT BLOCK. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER PROVIDE AS NEEDED.

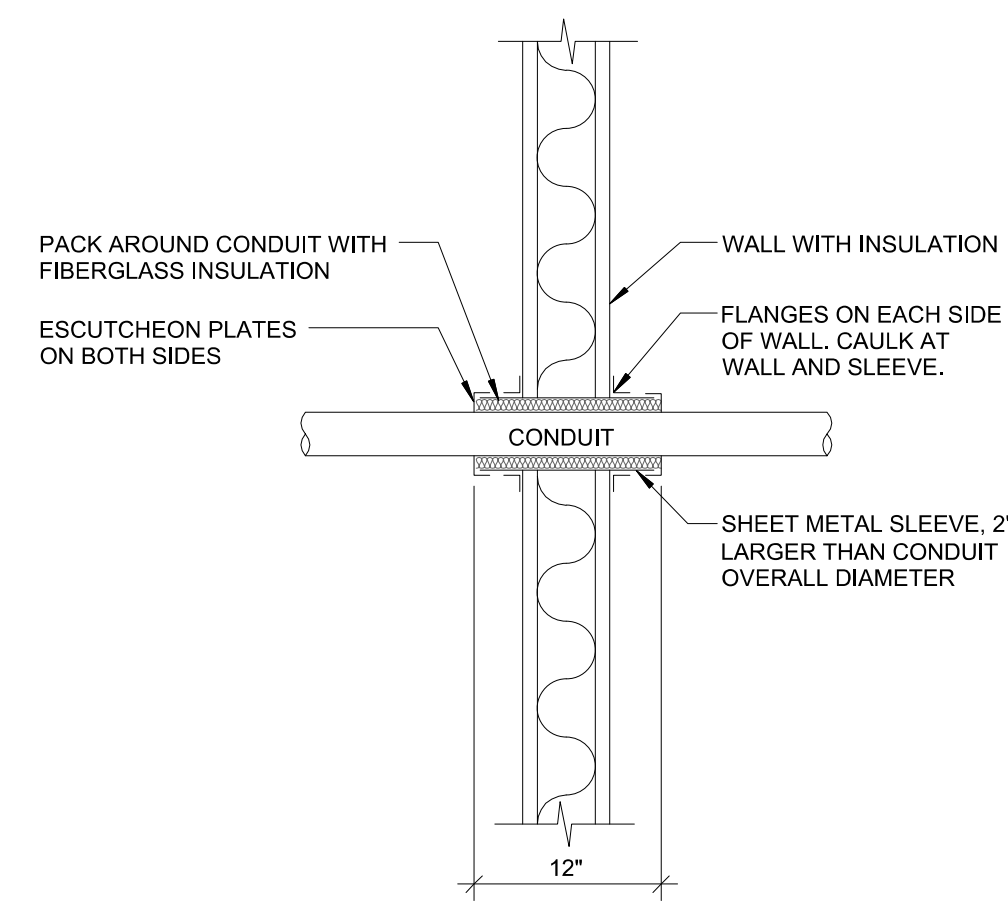


1
E2.2
ELECTRICAL FLOOR LV PLAN
SCALE 1/4"=1'-0"

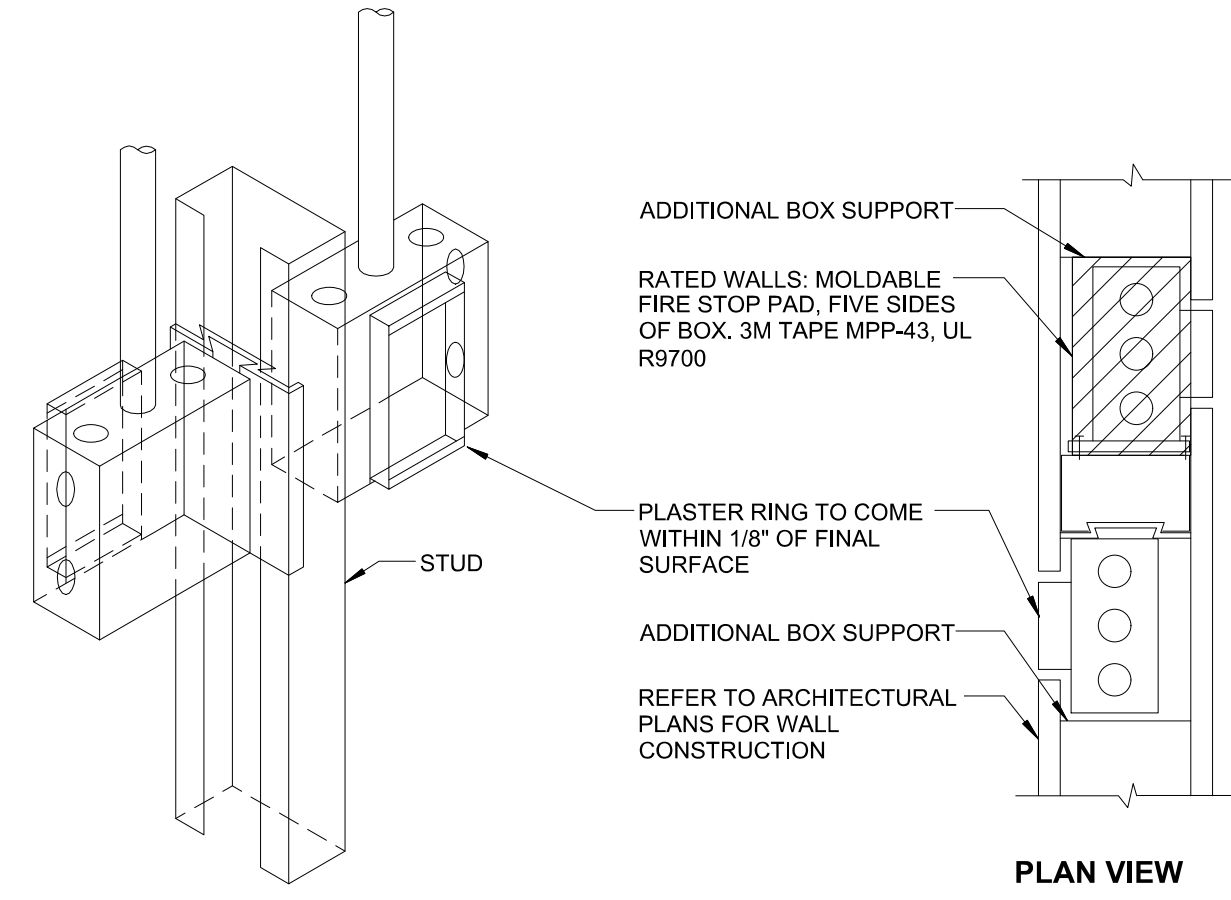
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E2.2
ELECTRICAL
FLOOR LV
PLAN

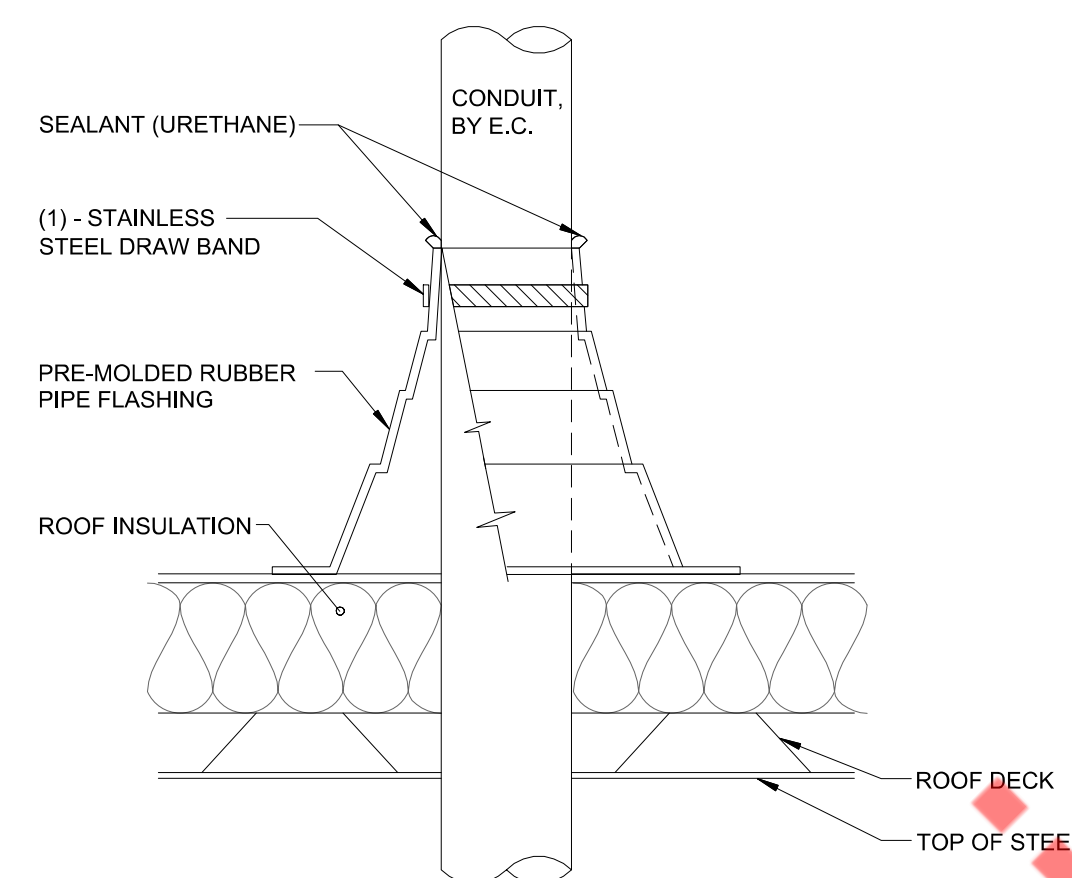


1 CONDUIT WALL PENETRATION
E3.0 N.T.S



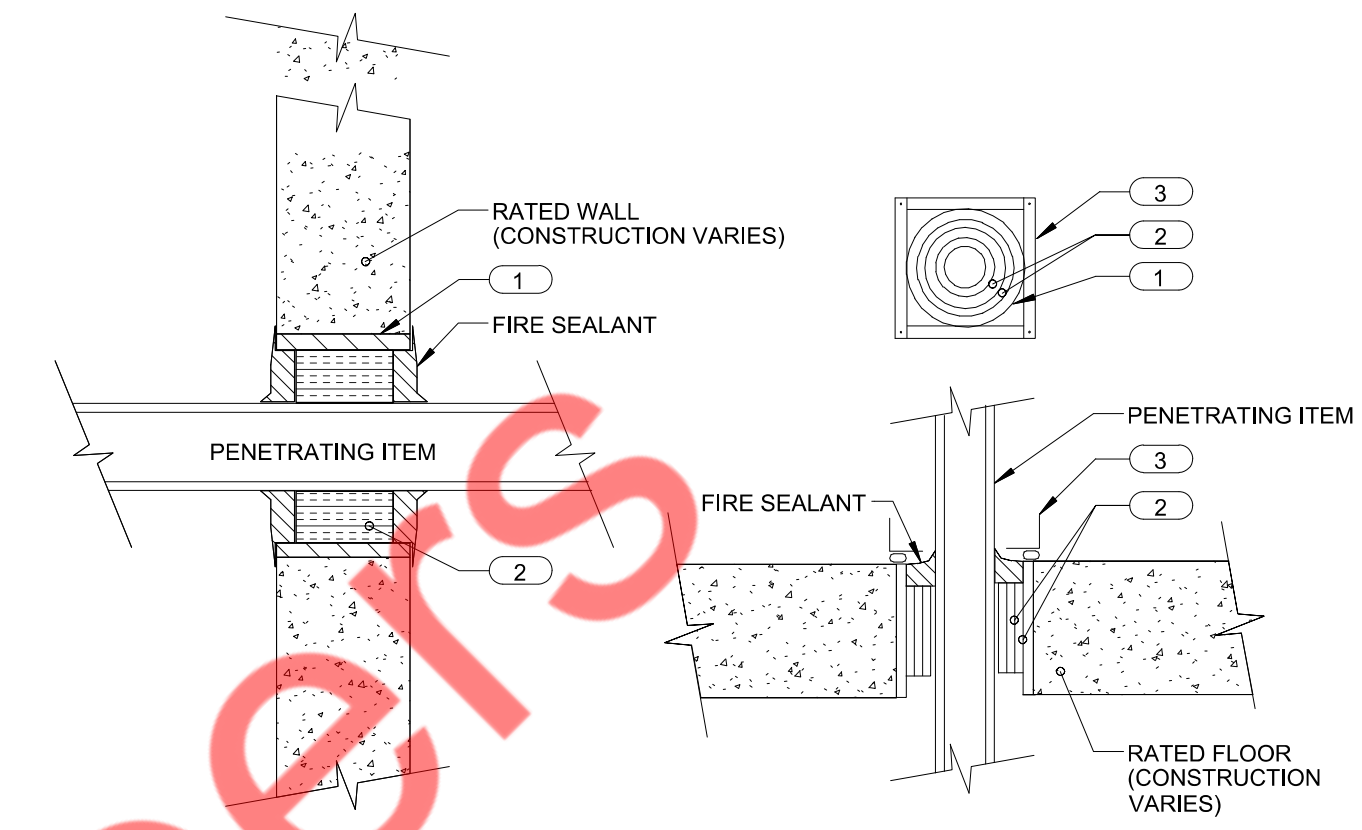
NOTES:
1. HORIZONTAL CONDUIT CONNECTION BETWEEN BOXES LESS THAN 2'-0" NOT PERMITTED. SEE SPECIFICATIONS AND DRAWING NOTES FOR ADDITIONAL SPACE REQUIREMENTS BETWEEN DEVICES.

2 SIDE BY SIDE DEVICE OPENINGS
E3.0 N.T.S



NOTES:
1. CONDUIT SHALL BE SUPPORTED WITHIN 24 INCHES ABOVE AND BELOW ROOF.
2. VERIFY FINAL REQUIREMENTS WITH GENERAL CONTRACTOR (G.C.) AND ROOFING INSTALLER PRIOR TO INSTALLATION.

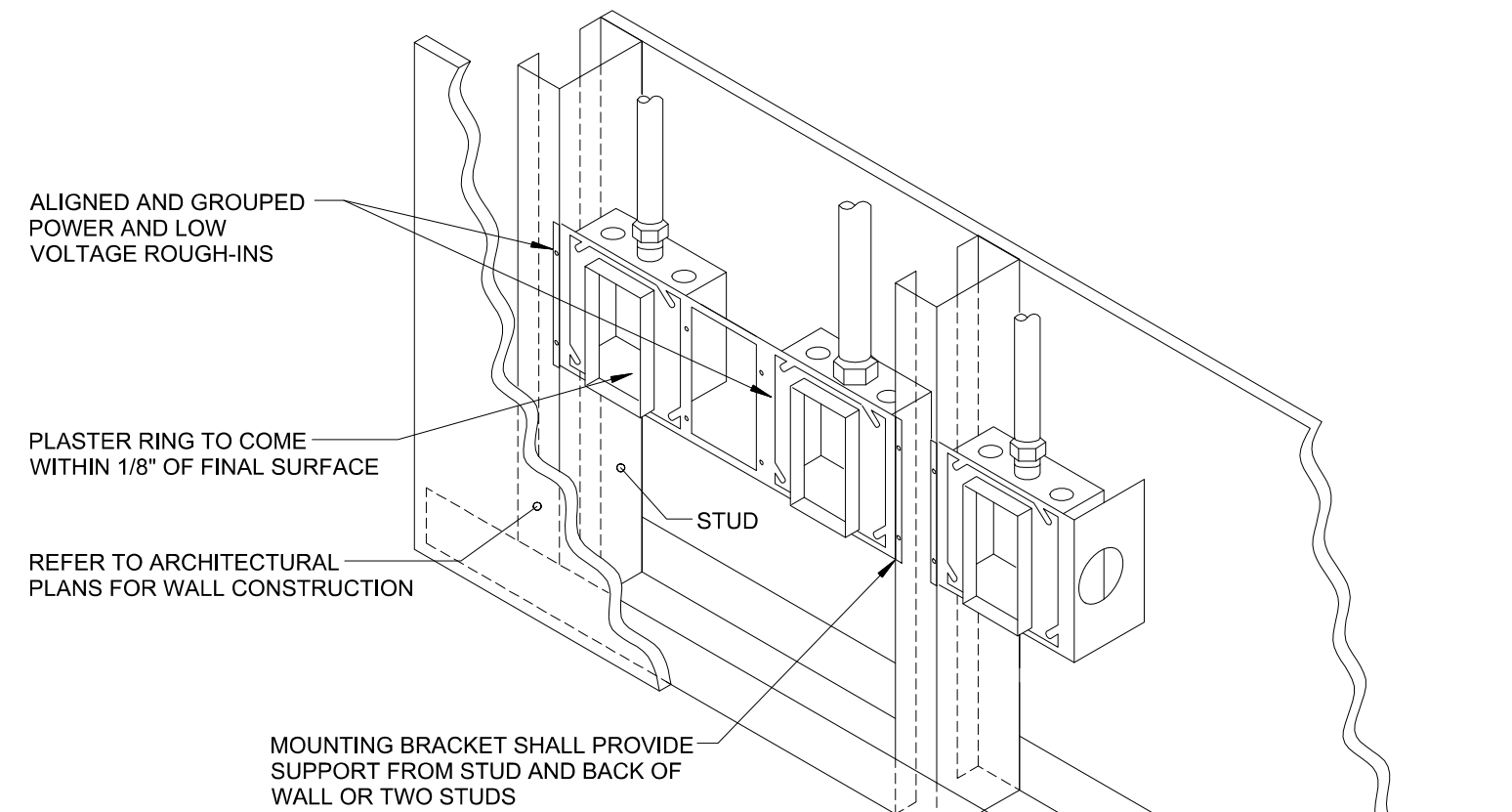
3 CONDUIT ROOF PENETRATION
E3.0 N.T.S



NOTES:
1. THIS GENERAL DETAIL APPLIES TO ALL ITEMS PENETRATING FIRE RATED WALLS OR FLOORS. THE INTENT IS TO MAINTAIN THE FIRE RATING AND TO ALLOW LONGITUDINAL MOVEMENT. REFER TO SPECIFICATION FOR ADDITIONAL INFORMATION.

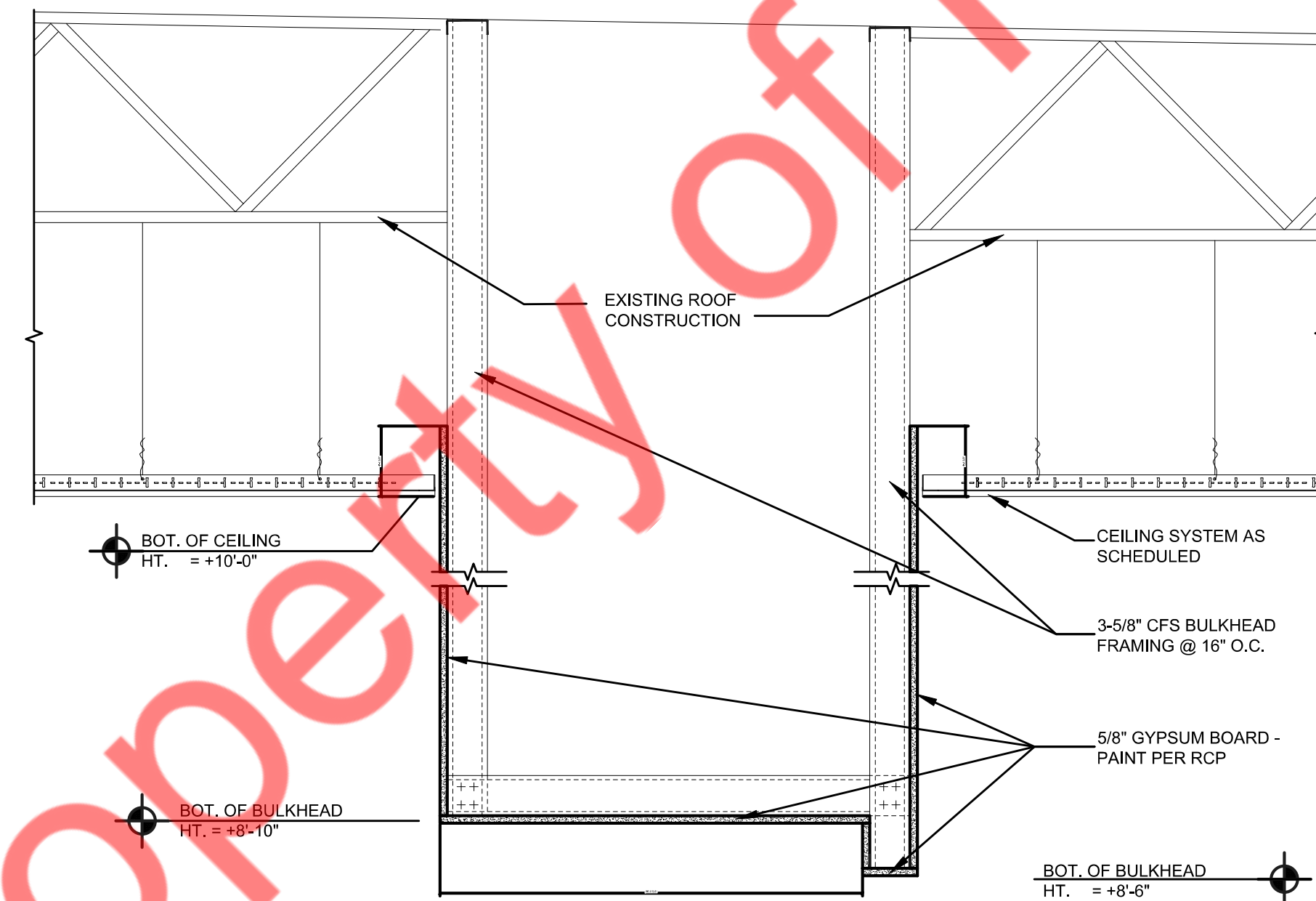
KEYNOTES:
1. SCHEDULE 5 PIPE SLEEVE EMBEDDED IN WALL OR FLOOR, OR SMOOTH CORE DRILL. EACH CONTRACTOR FURNISHES SLEEVE TO G.C., COORDINATES SLEEVE LOCATIONS AND DEBURS SLEEVE. G.C. BUILDS SLEEVE INTO WALL OR FLOOR ALLOWING NO GAP AROUND SLEEVE. IF SLEEVE IS NOT PROVIDED WHEN WALL OR FLOOR IS BUILT, CONTRACTOR SHALL INSTALL SLEEVE. SLEEVE SIZE SHALL ALLOW ANNUAL SPACE REQUIRED BY THE SELECTED FIRE STOP SYSTEM.
2. INSTALL BACKING MATERIAL, SUCH AS MINERAL WOOL SAFING, AS REQUIRED FOR FIRE STOP SYSTEM. INSTALL IN ACCORDANCE WITH FIRE STOP SYSTEM APPLICATION LISTING. SECURE TO WALL OR FLOOR TO ALLOW LONGITUDINAL MOVEMENT OF PENETRATING ITEM WITHOUT MOVEMENT OF FIRE BARRIER.
3. WATER-TIGHT WELDED 1"x1" 20 GAUGE MINIMUM GALVANIZED SHEET METAL ANGLE FRAME, BY CONTRACTOR IN EQUIPMENT ROOMS FOR WATER STOP. PLACE A BEAD OF WATERPROOF SEALANT BETWEEN FLOOR AND BOTTOM OF ANGLE FRAME. SECURE TO FLOOR WITH MASONRY ANCHORS IN CORNERS AND ON 12" MAXIMUM CENTERS. MULTIPLE PENETRATING ITEMS MAY BE ENCLOSED IN ONE FRAME.

4 FIRE BARRIER PENETRATION
E3.0 N.T.S

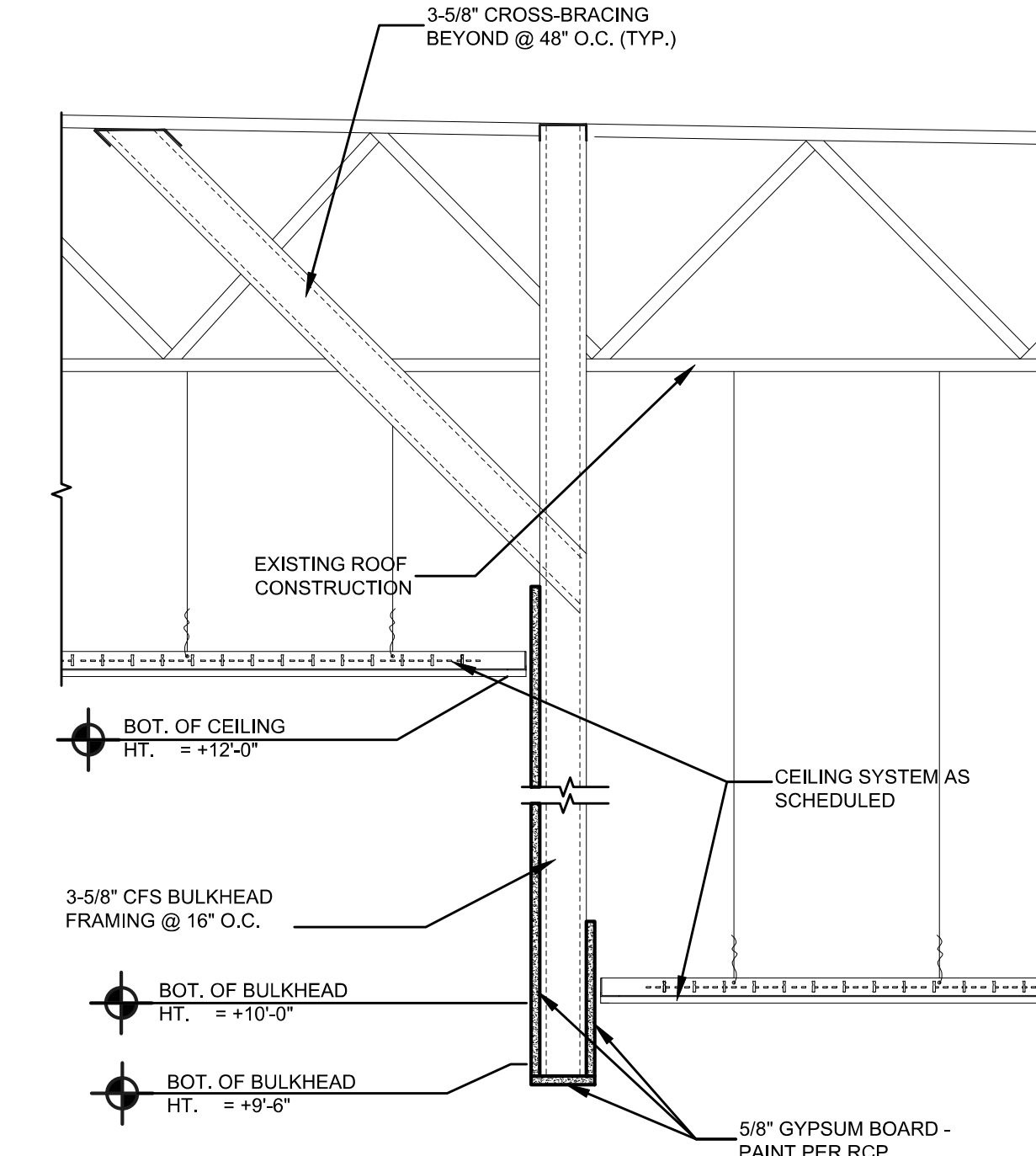


NOTES:
1. THE INTENT OF THE DETAIL IS TO ALIGN AND GROUP DEVICE ROUGH-INS FOR POWER AND LOW VOLTAGE TECHNOLOGY SYSTEMS. SOLIDLY MOUNTED AND THE SURFACE OF THE TRIM IS EITHER FLUSH WITH THE WALL SURFACE OR WITHIN 1/8" OF THE WALL SURFACE. JUNCTION BOXES LARGER THAN 4" SQUARE SHALL BE MOUNTED IN A MANNER THAT IS SIMILAR TO THE SYSTEM NOTED ABOVE OR ACHIEVES THE SAME RESULTS.
2. PLASTER RINGS DEPTH SHALL BE 1/8" DEEPER THAN THE GYP BOARD APPLIED TO THE WALL. PLASTER RING SHALL BE 3/4" FOR USE WITH 5/8" GYP BOARD.
3. METAL STUD-TO-STUD MOUNTING BRACKETS FOR MULTIPLE BOXES BETWEEN STUD. ERICO CADDY RBS# SERIES, EATON B-LINE BB SERIES, OR EQUAL.
4. MOUNTING SUPPORT BRACKETS SIZES FOR SINGLE BOXES IN A STUD CAVITY SHALL MATCH THE STUD DEPTH. ERICO CADDY H# SERIES, EATON B-LINE BB# SERIES, OR EQUAL.
5. WHERE RECEPTACLE AND TECHNOLOGY DEVICES ARE SHOWN SERVING A COMMON COMPUTER OR EQUIPMENT, OR SHOWN IN SIMILAR LOCATIONS ON THE DRAWINGS THE DEVICES SHALL BE INSTALLED IN THE SAME STUD CAVITY WITH MOUNTING BRACKETS OR ALIGNED ON OPPOSITE SIDES OF A COMMON STUD WITH SEPARATE SUPPORT.

5 BACKBOX MOUNTING DETAIL
E3.0 N.T.S



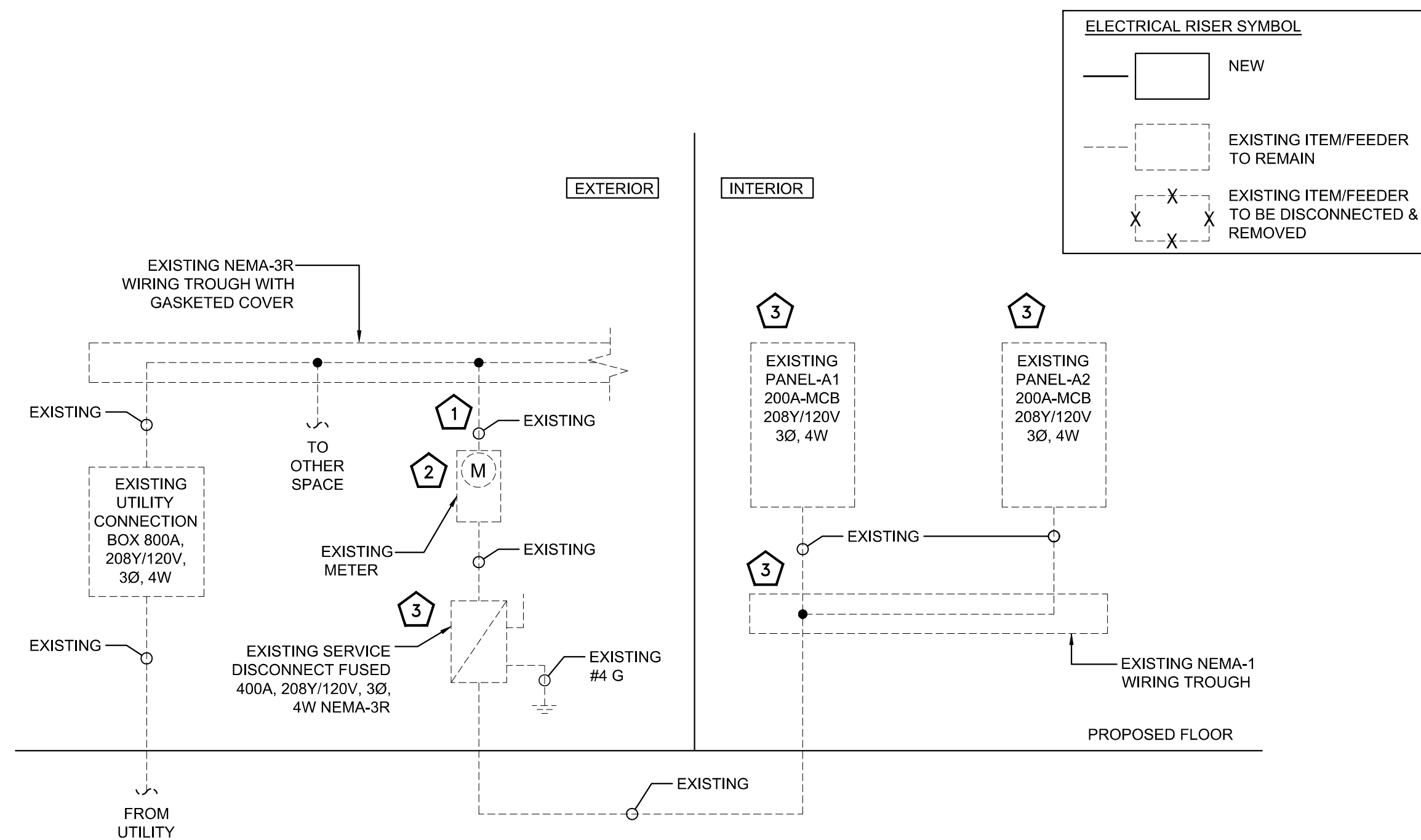
6 SOFFT SECTION
E3.0 N.T.S



7 SOFFT SECTION
E3.0 N.T.S

**FOREFRONT
DERMATOLOGY**

DRAWING ISSUE		DATE
NO	DESCRIPTION	07/08/2025
1	OWNER REVISION COMMENTS	
2		
3		
4		
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- RISER DIAGRAM GENERAL NOTES**
- RISER DIAGRAM MARKED AS EXISTING IS FOR REFERENCE PURPOSES ONLY. E.C. SHALL VERIFY EXACT POWER DISTRIBUTION IN FIELD AND INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY.
 - E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION IN FIELD COORDINATION WITH OWNER/ARCHITECT.
 - ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.
 - E.C. SHALL VERIFY THE RATING, SIZE, LOCATION AND OPERABLE CONDITION OF ALL THE EXISTING PANELS AND ELECTRICAL CONNECTION IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK.
 - E.C. SHALL VERIFY THE EXACT POWER DISTRIBUTION & INCOMING CONNECTION TO ALL PANELS IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND.
 - E.C. SHALL COORDINATE WITH LANDLORD/OWNER/ARCHITECT FOR THE EXACT LOCATION OF EXISTING ELECTRICAL SERVICE IN THE LANDLORD RISER ROOM. BASE BID ACCORDINGLY.
 - E.C. TO VERIFY SCOPE OF WORK WITH LANDLORD/OWNER PRIOR TO BID.
 - COORDINATE THE EXACT POWER DISTRIBUTION AND SCOPE OF WORK WITH THE LANDLORD/OWNER BEFORE BID.
 - COORDINATE THE AVAILABILITY OF THE EMERGENCY POWER IN THE FIELD. CONNECT THE PANELS FROM THE EMERGENCY SOURCE VIA AUTOMATIC TRANSFER SWITCH. BASE BID ACCORDINGLY.

- RISER DIAGRAM KEYED WORK NOTES:**
- EXISTING 400A, 208Y/120V, 3PH, 4W ELECTRICAL SERVICE FEEDER FROM EXISTING WIRING TROUGH TO EXISTING METER (PROVIDED BY LANDLORD) FOR THE PROJECT SPACE. VERIFY LOCATION, RATING, AND OPERABLE CONDITION IN THE FIELD. INFORM THE ENGINEER OF THE RECORD OF ANY DISCREPANCY. BEFORE BID.
 - E.C. SHALL VERIFY WITH THE LANDLORD FOR EXACT RATING OF EXISTING METER CL320 FOR THE PROJECT SPACE. INFORM THE ENGINEER OF THE RECORD OF ANY DISCREPANCY. BEFORE BID.
 - E.C. SHALL VERIFY THE EXACT LOCATION, RATING, AND OPERABLE CONDITION OF EVERY PIECE OF EQUIPMENT MARKED AS EXISTING IN THE FIELD. INFORM THE ENGINEER OF THE RECORD OF ANY DISCREPANCY BEFORE BIDDING.

1
E4.0
ELECTRICAL RISER DIAGRAM
SCALE = N.T.S

PANEL: A1 (EXISTING)		PHASE 3		AIC RATING (in kA) 22		DEMAND LOAD 57.14		MOUNTING: SURFACE					
208Y/120 200A MCB		WIRE 4		NEMA RATING 1		DEMAND CURRENT 158.79		PANEL LOCATION: UTILITY FED FROM: EXIST. DISCONNECT					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	NOTES	PER PHASE (KVA)			LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C					
1	20/1P	REC- ROOF TOP GFI	R	0.72	RWC	1.92			1.20	L	INTERIOR LIGHTING	20/1P	2
3	20/1P	UTILITY/IT & STORAGE GEN. RECEPT.	R	0.72	RWC	1.92			1.20	L	INTERIOR LIGHTING	20/1P	4
5	20/1P	PROVIDER ROOM - QUAD RECEPT.	R	0.72	RWC		1.62		0.90	L	INTERIOR LIGHTING	20/1P	6
7	20/1P	RESTROOM GFI RECEPT.	R	0.36	RWC	0.86			0.50	O	TIME CLOCK	20/1P	8
9	20/1P	CORRIDOR GEN. RECEPT.	R	1.08	RWC		1.80		0.72	R	EXAM ROOM GEN. RECEPT.	20/1P	10
11	20/1P	BREAK ROOM - MICROWAVE RECEPT	E	1.10	RWC			1.46	0.36	R	EXAM ROOM RECEPT.	20/1P	12
13	20/1P	UTILITY/IT - DATA RACK RECEPT.	R	0.36	RWC	0.36			0.36	R	SPARE	20/1P	14
15	20/1P	EXAM ROOM GEN. RECEPT.	R	0.36	RWC		0.72		0.36	R	EXAM ROOM GEN. RECEPT.	20/1P	16
17	20/1P	EXAM ROOM RECEPT.	R	0.72	RWC		1.44		0.72	R	EXAM ROOM RECEPT.	20/1P	18
19	20/1P	SPARE				0.00					SPARE	20/1P	20
21	20/1P	EXAM ROOM GEN. RECEPT.	R	0.36	RWC		1.08		0.72	R	EXAM ROOM GEN. RECEPT.	20/1P	22
23	20/1P	EXAM ROOM RECEPT.	R	0.72	RWC		1.08		0.36	R	EXAM ROOM RECEPT.	20/1P	24
25	15/1P	FF-3 (N)	M	0.05	RWC, NBEP	3.17			3.12	H		26	
27	20/1P	EXAM ROOM GEN. RECEPT.	R	0.36	RWC		3.48		3.12	H	RTU-4 (N)	30/3P	28
29	20/1P	EXAM ROOM DED. RECEPT.	R	0.72	RWC			3.84	3.12	H		30	
31	20/1P	EXTERIOR SIGNAGE	L	1.20	RWC	4.08			2.88	H		32	
33	20/1P	EXTERIOR SIGNAGE	L	1.20	RWC		4.08		2.88	H	RTU-2 (E)	30/3P	34
35	20/1P	SPARE						2.88	2.88	H		36	
37			H	3.96	SAE	6.84			2.88	H		38	
39	45/3P	RTU-1 (E)	H	3.96	SAE		6.84		2.88	H	RTU-3 (E)	30/3P	40
41			H	3.96	SAE			6.84	2.88	H		42	
						17.23	19.92	19.16					

PANEL: A2 (EXISTING)		PHASE 3		AIC RATING (in kA) 22		DEMAND LOAD 36.71		MOUNTING: SURFACE					
208Y/120 200A MCB		WIRE 4		NEMA RATING 3R		DEMAND CURRENT 102.03		PANEL LOCATION: UTILITY FED FROM: EXIST. DISCONNECT					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	NOTES	PER PHASE (KVA)			LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C					
1	20/1P	RECEPTION AREA QUAD RECEPT.	R	1.08	RWC	1.44			0.36	R	TREATMENT ROOM GEN. RECPT.	20/1P	2
3	20/1P	RECEPTION AREA QUAD RECEPT.	R	0.36	RWC		1.36		1.00	R	FB-1 TREATMENT ROOM RECPT.	20/1P	4
5	20/1P	NURSE AREA QUAD RECEPT.	R	1.08	RWC			1.62	0.54	R	TREATMENT ROOM GEN. RECPT.	20/1P	6
7	20/1P	NURSE AREA QUAD RECEPT.	R	1.08	RWC	1.44			0.36	R	TREATMENT ROOM GEN. RECPT.	20/1P	8
9	20/1P	LAB AREA QUAD DED. RECEPT.	R	0.36	RWC		1.36		1.00	R	FB-1 TREATMENT ROOM RECPT.	20/1P	10
11	20/1P	LAB AREA DUPLEX DED. RECEPT.	R	0.36	RWC			0.72	0.54	R	TREATMENT ROOM GEN. RECPT.	20/1P	12
13	20/1P	LAB AREA QUAD DED. RECEPT.	R	0.36	RWC	0.72			0.36	R	TREATMENT ROOM GEN. RECPT.	20/1P	14
15	20/1P	LAB AREA QUAD DED. RECEPT.	R	0.36	RWC		1.36		1.00	R	FB-1 TREATMENT ROOM RECPT.	20/1P	16
17	20/1P	CLINICIAN & TRIANGLE ROOM RECEPT.	R	1.08	RWC			1.62	0.54	R	TREATMENT ROOM GEN. RECPT.	20/1P	18
19	20/1P	BREAK ROOM - RER. RECEPT.	E	0.80	RWC	1.16			0.36	R	EXAM ROOM GEN. RECEPT.	20/1P	20
21	20/1P	BREAK ROOM - QUAD RECEPT.	R	1.50	RWC		2.22		0.72	R	EXAM ROOM RECEPT.	20/1P	22
23	20/1P	BREAK ROOM - QUAD RECEPT.	R	1.50	RWC			1.86	0.36	R	RECEPTION AREA QUAD RECEPT.	20/1P	24
25	20/1P	BREAK ROOM - GEN. RECEPT.	R	0.72	RWC, NBEP	2.22			1.50	R	PRINTER DED. RECEPT.	20/1P	26
27			O	2.00	NBEP		2.00				SPARE	20/1P	28
29	20/3P	WATER HEATER (WH-1)	O	2.00	RWC, NBEP			3.50	1.50	R	PRINTER DED. RECEPT.	20/1P	30
31			O	2.00		4.50			2.50	R		32	
33	20/1P	RCP-1	M	0.50	RWC, NBEP		3.00		2.50	R	TREATMENT ROOM RECEPTACLE	30/2P	34
35	30/2P	WASHER	O	1.00	RWC, NBEP			3.50	2.50	R		36	
37			O	1.00	RWC, NBEP	3.50			2.50	R	TREATMENT ROOM RECEPTACLE	30/2P	38
39	30/2P	DRYER	O	2.45	RWC, NBEP			4.95	2.50	R		40	
41			O	2.45	RWC, NBEP			4.95	2.50	R	TREATMENT ROOM RECEPTACLE	30/2P	42
						14.97	16.24	17.76					

ELECTRICAL SERVICE LOAD CALCULATION						
LOAD DESCRIPTION	LOAD TAG	CONNECTED LOAD (kVA)		TOTAL KVA	D.F.	DEMAND (kVA)
		PANEL A1	PANEL A2			
TOTAL LIGHTING	L	5.70	0.00	5.70	125%	7.13
TOTAL RECEPTACLE	R	10.44	34.78	45.22	#	27.61
TOTAL EQUIPMENT	E	1.10	0.80	1.90	65%	1.24
TOTAL OTHER	O	0.50	12.90	13.40	100%	13.40
TOTAL HVAC	H	38.52	0.00	38.52	100%	38.52
NON COINCIDENT	N	0.00	0.00	0.00	0%	0.00
TOTAL MOTOR	M	0.05	0.50	0.00	100%	0.00
LARGEST MOTOR					25%	0.00
# = Demand factor 100% for first 10kVA and 50% for rest of the receptacle load						
SERVICE VOLTAGE	208Y/120					
DEMAND (kVA)	87.89					
DEMAND (AMPS)	244.24					
SERVICE SIZE	305.30					
SPARE	20%					
SWITCH SIZE	400A					

PANEL SCHEDULE ABBREVIATIONS AND NOTES	
TAG	DESCRIPTION
L	LIGHTING
R	RECEPTACLE
H	HVAC
E	ELECTRICAL EQUIPMENT
M	LARGEST MOTOR
O	OTHER
N	NON COINCIDENT
X	LINKED CELL
*	VERIFY/COORDINATE IN FIELD
RWC	REFER TO THE WIRING CHART FOR WIRE SIZE
RRF	REFER RISER FOR FEEDER SIZE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
AFCI	ARC FAULT CIRCUIT INTERRUPTER
NBEP	NEW BREAKER IN THE EXISTING PANEL
HACR	HEAT AIR CONDITIONING AND REFRIGERATION
PAN	PROVIDE ADDITIONAL WIRE FOR NEUTRAL
LO	LOCKOUT BREAKER
STB	SHUNT TRIP BREAKER
SB	SPLIT BREAKER
ETR	EXISTING TO REMAIN
SAE	SAME AS EXISTING
VIF	VERIFY IN FIELD
LC	WIRE THROUGH LIGHTING CONTACTOR
NCL	NON COINCIDENT LOAD
DFB	DUAL FUNCTION BREAKER (AFCI+GFCI)
CB	COMBINATION BREAKER (S/P)

BRANCH CIRCUIT WIRING CHART	
BREAKER	BRANCH CIRCUIT SIZE
15/1P	2#12 + 1#12G, 3/4" C
20/1P	2#12 + 1#12G, 3/4" C
25/1P	2#10 + 1#10G, 3/4" C
30/1P	2#10 + 1#10G, 3/4" C
15/2P	2#12 + 1#12G, 3/4" C
20/2P	2#12 + 1#12G, 3/4" C
25/2P	2#10 + 1#10G, 3/4" C
30/2P	2#10 + 1#10G, 3/4" C
35/2P	2#8 + 1#10G, 3/4" C
40/2P	2#8 + 1#10G, 3/4" C
45/2P	2#8 + 1#10G, 3/4" C
50/2P	2#8 + 1#10G, 3/4" C
15/3P	3#12 + 1#12G, 3/4" C
20/3P	3#12 + 1#12G, 3/4" C
25/3P	3#10 + 1#10G, 3/4" C
30/3P	3#10 + 1#10G, 3/4" C
35/3P	3#8 + 1#10G, 3/4" C
40/3P	3#8 + 1#10G, 3/4" C
45/3P	3#8 + 1#10G, 3/4" C
50/3P	3#8 + 1#10G, 3/4" C
60/3P	3#6 + 1#10G, 3/4" C
70/3P	3#4 + 1#8G, 1" C

DRAWING ISSUE

NO	DATE	DESCRIPTION
1	07/08/2025	OWNER REVISION COMMENTS
2		
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4		
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6		

FOREFRONT
DERMATOLOGY

E4.0
ELECTRICAL
RISER
DIAGRAM

2
E4.0
ELECTRICAL PANEL SCHEDULE
SCALE = N.T.S

PLUMBING SYMBOLS LIST	
— SAN —	SANITARY SEWER (UNDERFLOOR)
— V —	VENT PIPING
— CW —	COLD WATER PIPING
— HW —	HOT WATER PIPING
— HWR —	HOT WATER RETURN PIPING
— EX. CW —	EXISTING COLD WATER PIPING
— G —	NEW GAS PIPING
— EX. G —	EXISTING GAS PIPING
— P —	P-TRAP
— U —	PIPE UP
— D —	PIPE DROP
— C —	CLEANOUT
— PC —	POINT OF CONNECTION
— BFP —	SECONDARY BFP

PLUMBING ABBREVIATIONS	
CO	CLEANOUT
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
V	VENT
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
AFF	ABOVE FINISH FLOOR
FD	FLOOR DRAIN
SQ. FT.	SQUARE FEET
BFP	BACK FLOW PREVENTER
WH-1	WATER HEATER
N.I.C.	NOT IN SCOPE
ET-1	EXPANSION TANK
RCP-1	HOT WATER CIRCULATION PUMP

PLUMBING DRAWING LIST	
P0.1	PLUMBING SPECIFICATIONS
P1.0	UNDERGROUND PLAN - PLUMBING
P1.1	GROUND FLOOR PLAN - PLUMBING
P1.2	ROOF FLOOR PLAN - PLUMBING
P3.0	PLUMBING DETAILS
P4.0	PLUMBING SCHEDULES
P4.1	PLUMBING RISERS

BUILDING DEPARTMENT PLUMBING NOTES

- ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, WATER) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2015 INTERNATIONAL PLUMBING CODE.
- INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 702.2
- PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION PC 305.
- TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION PC 306.
- RODENT PROOFING AS PER PC 304
- MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 303, PC 605, PC 702, PC 902, PC 1102.
- EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 4, 5, 6, 7 AND 9.
- DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER PC 1002, AND CLEANOUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 708
- DRAINAGE PIPE CLEANOUTS AS PER SECTION PC 708.
- VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 308
- WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 6 SECTION PC 601-603, 604, 606, 607, 608, 610
- THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 SECTION PC 701, 704, 705, 706, 707, 708, 711.
- VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTIONS PC 901 THROUGH PC 912 THROUGH PC 917
- INSPECTION AND TESTING OF PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION PC 107.
- GAS PIPING INSTALLATION SHALL BE IN ACCORDANCE WITH 2015 INTERNATIONAL FUEL GAS CODE, CHAPTER 4.

PLUMBING SPECIFICATIONS:

- BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS
 - SCOPE
 - PROVIDE ALL MATERIAL, TOOLS, SUPERVISION AND LABOR INCLUDING ALL MISCELLANEOUS AND INCIDENTAL ITEMS REQUIRED FOR COMPLETE AND OPERABLE PLUMBING INSTALLATIONS AS SHOWN OR DESCRIBED ON THE DRAWINGS AND IN THESE SPECIFICATIONS.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING AND NEW CONDITIONS AND MATERIALS WITHIN THE CONSTRUCTION AREA. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE OWNER'S SATISFACTION.
 - OBTAIN ALL PERMITS, PAY ALL PERMIT FEES AND SCHEDULE ALL REQUIRED INSPECTIONS. COPIES OF ALL PERMITS AND INSPECTION CERTIFICATES SHALL BE FORWARDED TO THE OWNER FOR RECORD.
 - THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISION 1 REQUIREMENTS APPLY TO THE WORK OF THIS SECTION.
 - THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO DETERMINE CONDITIONS AND THE EXTENT OF THE WORK. BY COMMENCING WORK, THE CONTRACTOR ACKNOWLEDGES HIS CONFIRMATION OF ALL CONDITIONS AS ACCEPTABLE WITH REFERENCE TO HIS CONTRACT, SCOPE OF WORK AND BID PRICE SUCH THAT NO ADDITIONAL COMPENSATION SHALL BE FORTHCOMING FOR UNFORESEEN EXISTING CONDITIONS.
 - IN ALL AREAS SUBJECT TO FREEZING CONDITIONS, THE CONTRACTOR SHALL PROVIDE FREEZE PROTECTION FOR ALL DOMESTIC WATER PIPING INSTALLED UNDER HIS CONTRACT.
 - ALL ELECTRICAL REQUIREMENTS SHALL BE COORDINATED WITH THE CONTRACTOR FOR ELECTRICAL WORK. THIS CONTRACTOR IS RESPONSIBLE FOR ALL LOW VOLTAGE WIRING FOR EQUIPMENT INSTALLED UNDER HIS CONTRACT. THE CONTRACTOR FOR ELECTRICAL WORK IS RESPONSIBLE FOR LINE VOLTAGE POWER WIRING ONLY.
 - COLOR AND FINISH SELECTIONS FOR ALL MATERIALS, INCLUDING PAINTING OF PIPING, SHALL BE AS DIRECTED AND/OR APPROVED BY THE ARCHITECT.
 - MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED AS IF SPECIFIED OR INDICATED ON THE DRAWINGS.
 - THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS FOR THE INSTALLATION, CONNECTION, EXTENSION OR MODIFICATION TO ALL UTILITY SERVICES WITH RESPECTIVE PROVIDERS INCLUDING PAYMENT OF ALL ASSOCIATED FEES.
 - THE CONTRACTOR IS RESPONSIBLE FOR ALL PAINTING ASSOCIATED WITH CUTTING AND PATCHING. ALL PAINTING IN AREAS WITH COMPLETE FINISH RENOVATIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.
 - SUBMITTALS
 - PIPE AND FITTINGS
 - VALVES
 - HANGERS AND SUPPORTS
 - PLUMBING PIPING LAYOUT
 - TESTS
 - PLUMBING FIXTURES
 - WATER HEATERS & ACCESSORIES
 - MIXING VALVES
 - ALL SCHEDULED PLUMBING EQUIPMENT
 - SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED.
 - THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS STAMP.
 - REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL BE LIMITED TO THE INITIAL REVIEW, AND A SECOND REVIEW OF ANY REQUIRED RESUBMITTED DATA. IF THE ENGINEER IS REQUIRED TO REVIEW SHOP DRAWINGS FOR A THIRD (OR MORE) SUBMISSION OF THE SAME ITEM, THE CONTRACTOR SHALL BE LIABLE FOR COMPENSATING THE ENGINEER FOR THESE SUBSEQUENT REVIEWS AS PER THE ENGINEER'S CURRENT HOURLY RATE SCHEDULE.
 - SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.
 - SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.
 - FOR ALL BELOW GRADE PIPING WHERE ACTUAL INSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.
 - RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.
 - SUBSTITUTIONS
 - ALL EQUIPMENT SHALL BE PRODUCTS OF THE SPECIFIED MANUFACTURER OR MANUFACTURERS. ALL BIDS SHALL BE BASED ON THE SPECIFIED MANUFACTURER OR MANUFACTURER'S EQUIPMENT. FOR SUBSTITUTIONS OF OTHER MANUFACTURER'S EQUIPMENT TO BE CONSIDERED, THE SUBSTITUTION MUST BE INDICATED PRIOR TO BIDDING WITH THE REASON FOR THE PROPOSED SUBSTITUTION IDENTIFIED, AND THE PROPOSED CREDIT TO THE OWNER INDICATED. THE ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF ANY PROPOSED SUBSTITUTIONS.
- THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS.

1.04 DEFINITIONS

- FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.
- INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES.
- PROVIDE: TO FURNISH AND INSTALL.
- PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS.

1.05 DRAWINGS

- THE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO ILLUSTRATE THE GENERAL ARRANGEMENT AND ROUTING OF PIPING AND GENERAL LOCATIONS OF EQUIPMENT. PRECISE LOCATIONS OF EQUIPMENT, RISERS AND STACKS, AND ROUTING AND ELEVATION OF ALL PIPING SYSTEMS SHALL BE COORDINATED IN THE FIELD WITH THE ARCHITECT, ARCHITECTURAL DRAWINGS, THE WORK OF OTHER TRADES, EXISTING AND NEW BUILDING CONDITIONS AND/OR THE PREFERENCES OF THE OWNER/TENANT AS CONSTRUCTION PROCEEDS. ALL PIPING SHALL BE INSTALLED CONCEALED IN FINISHED SURFACES, UNLESS NOTED OTHERWISE.
- PROVIDE ALL NECESSARY INCIDENTAL MATERIALS AND ACCESSORIES REQUIRED TO MAKE THE WORK COMPLETE IN ALL RESPECTS, EVEN IF NOT PARTICULARLY SHOWN OR SPECIFIED.
- REFER TO PLUMBING EQUIPMENT/FIXTURE SCHEDULE ON THE DRAWINGS FOR ALL FIXTURE AND EQUIPMENT SPECIFICATIONS.
- REFER TO FIXTURE CONNECTION SIZE SCHEDULE FOR ALL FIXTURE ROUGHING SIZE REQUIREMENTS.
- VERIFY ALL INDICATED CONDITIONS BEFORE STARTING WORK AND REPORT ANY DISCREPANCIES. THE DRAWINGS REFLECT CONDITIONS WHICH CAN BE REASONABLY INTERPRETED FROM THE EXISTING VISIBLE CONDITIONS OR FROM DRAWINGS AND INFORMATION FURNISHED BY THE OWNER.
- LOCATE ALL FIXTURES AND EQUIPMENT AS PER THE FINAL ARCHITECTURAL DRAWINGS.

1.06 PRODUCTS

- SANITARY AND VENT PIPING:
 - ABOVE GRADE AND UNDERGROUND PIPING SHALL BE POLYVINYL CHLORIDE (PVC) PIPE AS PER ASTM D2665, ASTM F881, ASTM F1488, CSA B181.2 AS PER 2015 INTERNATIONAL PLUMBING CODE, TABLE 702.1 AND TABLE 702.2. OR PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM 4 BANDS PER COUPLING.
 - SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (D.I.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (D.I.). VENT PIPING SHALL BE PITCHED TO DRAIN.
 - ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

- ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE. PEX PIPING IS AN ACCEPTABLE SUBSTITUTE AS PER ASTM F876 AWWA C904 AND CSA B137.5
- FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
- JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
- THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
- COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
- ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH 2015 INTERNATIONAL ENERGY CONSERVATION CODE (2015 IECC) SECTION C404.4 REFER BELOW TABLE C403.2.10.

MINIMUM PIPE INSULATION THICKNESS			
FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)
	CONDUCTIVITY BTU IN/ (H ² FT ² °F)	MEAN RATING TEMPERATURE °F	
141-200	0.25-0.29	125	1.5 1.5 2 2 2
105-140	0.21-0.28	100	1.0 1.0 1.5 1.5 1.5
40-80	0.21-0.27	75	0.5 0.5 1.0 1.0 1.0

- WATER DISTRIBUTION SYSTEM AS PER 2015 INTERNATIONAL ENERGY CONSERVATION CODE (2015 IECC), C404.7 HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
 - THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
 - THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).
- AS PER 2015 INTERNATIONAL ENERGY CONSERVATION CODE (2015 IECC), C404.6.1 HEATED-WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH A CIRCULATION PUMP. THE SYSTEM RETURN PIPE SHALL BE A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE PUMP BASED ON THE IDENTIFICATION OF A DEMAND FOR HOT WATER WITHIN THE OCCUPANCY. THE CONTROLS SHALL AUTOMATICALLY TURN OFF THE PUMP WHEN THE WATER IN THE CIRCULATION LOOP IS AT THE DESIRED TEMPERATURE AND WHEN THERE IS NO DEMAND FOR HOT WATER.

- HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER 2015 INTERNATIONAL ENERGY CONSERVATION CODE (2015 IECC), C404.5.1. THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAV	OTHER FIXTURES
1/2"	2'	43'
3/4"	0.5'	21'
1"	0.5'	13'
1 1/2"	0.5'	8'
1 1/2"	0.5'	6'
2" OR LARGER	0.5'	4'

- SEAL ALL JOINTS BETWEEN SEGMENTS OF INSULATION.
- PROVIDE SHIELDS BETWEEN HANGERS AND INSULATION.

C. HANGERS AND SUPPORTS:

- HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.
- SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.
- ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.
- PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

D. VALVES:

- PROVIDE GATE VALVES, BUTTERFLY OR BALL VALVES FOR SHUT-OFF DUTY ON MAIN AND BRANCH SUPPLY LINES. FOR ALL PIPE RUNS 2" AND SMALLER, PROVIDE BALL FOR ALL PIPE RUNS LARGER THAN 2" AND SMALLER THAN 4", PROVIDE GATE VALVES. PIPING 4" AND LARGER, PROVIDE BUTTERFLY VALVES FOR SHUT-OFF DUTY.
- ALL FIXTURES WITH THE EXCEPTION OF FLUSHMETER-EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME-PLATED STOPS WITH CHROME-PLATED ESCUTCHEONS ON PIPING PENETRATIONS.
- ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT-OFF VALVES ON SUPPLY LINES.
- ALL BRANCH LINES TO HAVE SHUT-OFF VALVES.
- ALL VALVES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS WHERE REQUIRED FOR VALVE ACCESS.
- PROVIDE GLOBE VALVES FOR THROTTLING/BALANCING OF THE HOT WATER CIRCULATING SYSTEM.

- INSTALL PIPING TO CONSERVE BUILDING SPACE. DO NOT INTERFERE WITH USE OF BUILDING SPACE AND THE WORK OF OTHER TRADES. ALL PIPING RUN IN CEILING SHALL BE INSTALLED TIGHT TO THE STRUCTURE ABOVE.

- INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS OR CONNECTED EQUIPMENT. PROVIDE PIPE ANCHORS, GUIDES AND EXPANSION JOINTS OR LOOPS IN ALL HOT WATER AND HOT WATER CIRCULATING MAIN SUPPLY PIPING AND SEGMENTS OF SUCH PIPE THAT EXCEED 30'-0" IN LENGTH.

- IN ALL AREAS WITH FINISHED SURFACES, SYSTEM PIPING AND COMPONENTS SHALL BE CONCEALED ABOVE OR WITHIN FINISHED SURFACES.

- REDUCTIONS IN PIPE SIZES SHALL BE MADE WITH ONE-PIECE REDUCING FITTINGS. BUSHINGS ARE NOT ACCEPTABLE. USE FLANGED FITTINGS AT THE BASE OF RISERS.

- VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

- IF WATER PRESSURE EXCEEDS 80 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE INSTALLED IN WATER PIPING AT CONNECTION TO MAIN.

- PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

- PIPE BACKFLOW PREVENTER DRAINS TO FLOOR DRAIN OR OTHER APPROVED INDIRECT WASTE SOURCE.

- PROVIDE ACCESS DOORS/PANELS FOR SERVICE AND ACCESS TO ALL VALVES AND OTHER SYSTEM COMPONENTS ENCLOSED IN WALLS AND CEILINGS. ACCESS DOORS SHALL BE FURNISHED BY THIS CONTRACTOR, INSTALLED BY THE GENERAL CONTRACTOR.

- ALL FIXTURES REQUIRING VACUUM BREAKERS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKERS.

- ANY PENETRATIONS THROUGH FIRE RATED PARTITIONS, FLOORS, OR CEILINGS SHALL BE STEEL SLEEVED AND SEALED WITH 3M BRAND UL RATED FIRE BARRIER CAULK OR APPROVED EQUAL.

- WHEN THE WATER PIPING SYSTEM IS COMPLETE, THOROUGHLY FLUSH ALL DIRT, SEDIMENT, SOLDER, ETC., OUT OF THE SYSTEM, REMOVING ALL STRAINERS, VALVE STEM SEATS, ETC., REQUIRED TO ACCOMPLISH THE FLUSHING.

- AT ALL INDIRECT WASTE DRAINS, MAINTAIN AIR GAP AS REQUIRED BY CODE.

- INSTALL SLEEVES FOR ALL PIPES WHICH PASS THROUGH WALLS, FLOORS AND CEILINGS. WHERE PIPES ARE TO BE INSULATED, THE SLEEVE SHALL BE LARGE ENOUGH TO ACCOMMODATE INSULATION. SLEEVES SHALL BE FLUSH WITH FINISHED SURFACES AT BOTH ENDS. ON FINISHED SURFACES IN EXPOSED AREAS PROVIDE ESCUTCHEONS COMPATIBLE WITH FINISH.

2. INSTALLATION

2.01 GENERAL

- ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF WARRANTIES.
- EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.
- CUTTER MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.
- COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.
- REAM PIPE AND TUBE ENDS. REMOVE BURRS, BEVEL PLAIN AND FERROUS END PIPE.
- REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND OUTSIDE, BEFORE ASSEMBLY.
- PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND UNIONS.
- COORDINATION WITH THE WORK OF OTHER TRADES IS REQUIRED. PROVIDE OFFSETS IN PIPING SYSTEMS OR MINOR DEVIATIONS TO THE INDICATED PIPE ROUTING IN ORDER TO COORDINATE THE PLUMBING WORK WITH THE WORK OF ALL OTHER TRADES AND THE GENERAL BUILDING CONDITIONS.

- NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED SPACES.

- PRIOR TO DISCONNECTING AND CONNECTING NEW WORK TO EXISTING SYSTEMS, THE PLUMBING CONTRACTOR SHALL NOTIFY THE PROPERTY MANAGER AND OFFER A PROPOSED SCHEDULE OF WORK. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL. THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY MANAGER IS REQUIRED.

- THE PLUMBING CONTRACTOR IS ADVISED THAT DUE TO THE NATURE OF THE OPERATIONS AND TENANT REQUIREMENTS, CONNECTIONS TO EXISTING SYSTEMS MAY HAVE TO BE MADE AFTER REGULAR WORKING HOURS. THE PROPERTY MANAGER WILL ADVISE THE PLUMBING CONTRACTOR OF THE TIME CONSTRAINTS UPON RECEIPT AND APPROVAL OF THE PLUMBING CONTRACTOR'S REQUEST FOR SHUT DOWN AND CONNECTION TO EXISTING SYSTEMS.

- WHEN CONNECTING TO EXISTING STACKS AND RISERS, PROVISION IS TO BE MADE FOR FUTURE CONNECTIONS BY PROVIDING CAPPED AND VALVED OUTLETS ON DOMESTIC WATER RISERS AND PLUGGED OUTLETS ON THE SANITARY AND VENT STACKS.

2.02 ABOVE GRADE

- INSTALL PLUMBING PIPING IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PIPING COMPLIES WITH REQUIREMENTS AND SERVICES INTENDED PURPOSES.

- ROUTE PIPING IN AN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT, SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN. IN DOMESTIC WATER SYSTEMS, PROVIDE DRAIN VALVES AT MAIN SHUT-OFF VALVES AND ALL LOW POINTS IN PIPING.

- USE EXISTING CONNECTIONS AT MAINS WHERE AVAILABLE FOR NEW BRANCH PIPING. LOCATE ALL RISERS AND PIPING BEFORE CONSTRUCTION COMMENCES AND TAKE CARE NOT TO DAMAGE SAME. ANY DAMAGE OCCURRING TO THE EXISTING PIPING WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

3. TESTING

- AT THE COMPLETION OF THE PLUMBING WORK, COMPLETELY TEST THE ENTIRE INSTALLATION OF ALL SYSTEMS FOR PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND LOCAL REQUIREMENTS. CORRECT ALL DEFICIENCIES FOUND.

- TESTING OF THE INSTALLED SYSTEMS SHALL BE MADE BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER.

- THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM, OR PORTION OF THE SYSTEM, HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING. EXCEPT PIPING PASSING THROUGH FLOORS, WALLS, PARTITIONS, OR BEAMS, FOR DISTANCES EQUAL TO THE THICKNESS OF SUCH FLOOR, WALL, PARTITION OR BEAM.

- THIS CONTRACTOR SHALL NOTIFY THE VARIOUS DEPARTMENTS, BUREAUS AND INDIVIDUALS AT LEAST TWO WEEKS IN ADVANCE OF THE TIME THAT THE TESTS ARE TO BE CONDUCTED.

- ALL DEFECTIVE PARTS SHALL BE REPLACED OR CORRECTED BY THIS CONTRACTOR AND AN EXTRA TEST OR TESTS SHALL BE MADE UNTIL THE OPERATION IS SATISFACTORY. ALL ARRANGEMENTS AND EXPENSES NECESSARY TO CONDUCT ALL TESTS REQUIRED BY THESE SPECIFICATIONS AND THE VARIOUS AGENCIES HAVING JURISDICTION OVER THE WORK INSTALLED UNDER THIS CONTRACT SHALL BE MADE BY THIS CONTRACTOR. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THESE TESTS, THE COST THEREOF BEING INCLUDED IN THE LUMP SUM BID FOR THIS CONTRACT.

- WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING OR EQUIPMENT, THIS CONTRACTOR SHALL DISCONNECT, CLEAN, REPAIR AND RECONNECT ALL OBSTRUCTED PIPING OR EQUIPMENT AND SHALL ALSO PAY FOR ALL NECESSARY CUTTING AND REPAIRS TO ADJOINING WORK.

- ALL PIPING AND EQUIPMENT SHALL BE THOROUGHLY CLEANED INSIDE AND OUT, OF DIRT, CUTTINGS, OILS AND OTHER FOREIGN SUBSTANCES AND SHALL BE LEFT CLEAN.

- ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL AUTHORITIES AND THE OWNER'S REPRESENTATIVE.

- ALL EQUIPMENT WILL BE FACTORY TESTED.

- CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ANY LEAKS OR DAMAGE THAT OCCURS AS A RESULT OF SYSTEM TESTING. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO LIMIT ANY POTENTIAL DAMAGE. CORRECTIVE ACTION REQUIRED AS A RESULT OF TESTING SHALL BE PERFORMED IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE.

- REPORT IN WRITING TO AUTHORITIES HAVING JURISDICTION, THE ARCHITECT AND THE OWNER THE RESULTS OF ALL TESTING.

L. TESTING REQUIREMENTS

- UPON COMPLETION OF SECTION OF OR THE ENTIRE SUPPLY SYSTEM, THE SYSTEM OR THE PORTION COMPLETED, SHALL BE TESTED AND PROVED TIGHT UNDER A WATER PRESSURE NOT LESS THAN THE WORKING PRESSURE OF THE SYSTEM.
- TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.
- THE PLUMBING CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FLUENTS AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.

- REFILL ENTIRE POTABLE HOT AND COLD WATER SUPPLY SYSTEM WITH CHLORINE SOLUTION (HTH OLIN CHEMICAL CORP.) AT A STRENGTH TO MEET STANDARDS OF THE DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION AS STIPULATED.

- THOROUGHLY FLUSH PIPING SYSTEM WITH FRESH WATER IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.

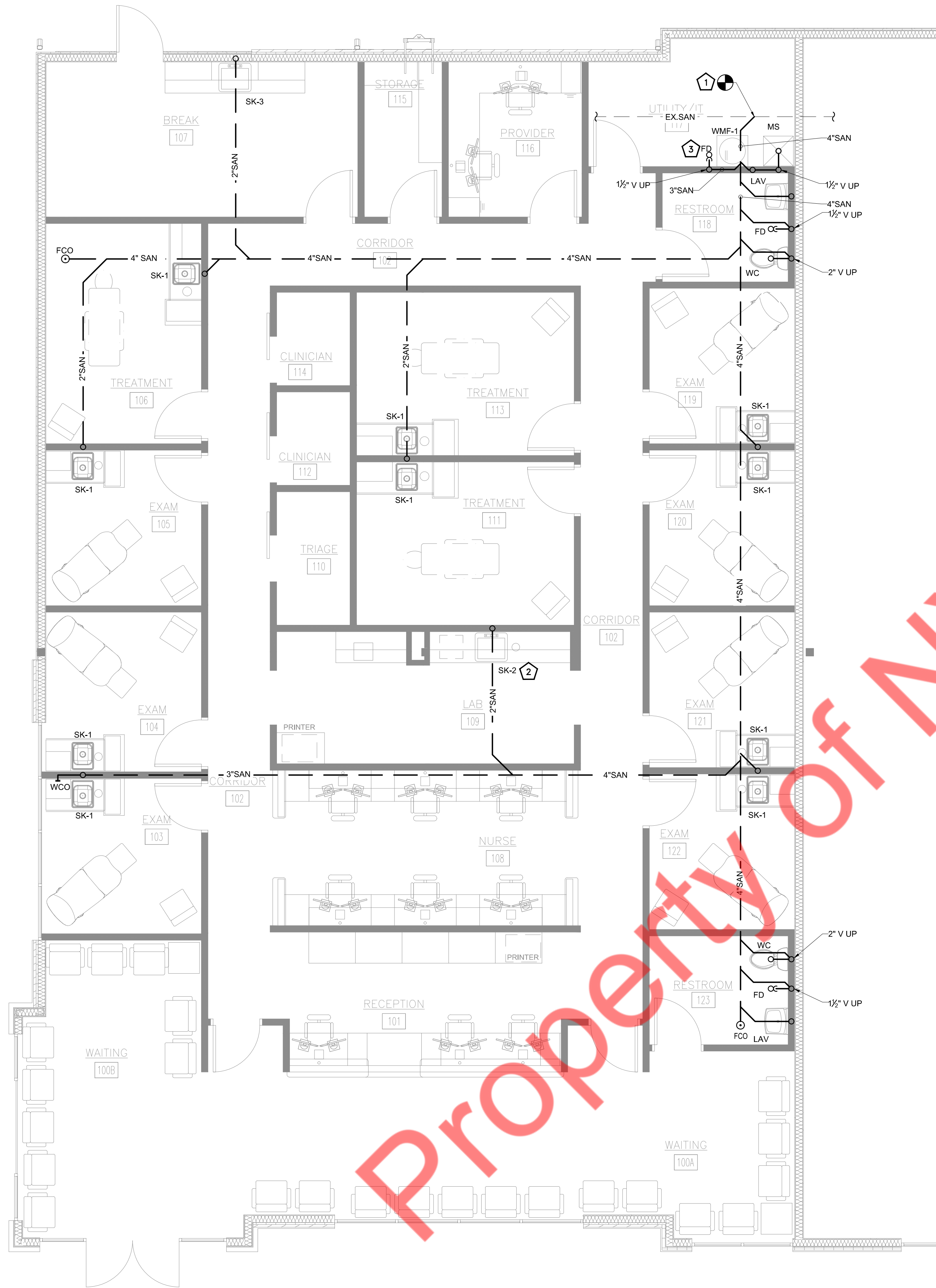
- WARRANTY
 - EQUIPMENT, MATERIALS AND WORKMANSHIP FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. THE CONTRACTOR SHALL KEEP THE WORK IN GOOD REPAIR FOR ONE YEAR AFTER THE DATE OF FINAL APPROVAL. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROMPTLY CORRECT AND REPAIR ANY AND ALL BREAKS, FAILURES OR WEAR DUE TO FAULTY MATERIALS, WORKMANSHIP OR EQUIPMENT. ALL SETTLEMENTS OF SURFACES THAT MAY OCCUR WITHIN THAT PERIOD SHALL ALSO BE PROMPTLY REPAIRED.

DRAWING ISSUE

NO	DESCRIPTION	DATE
1	OWNER REVISION COMMENTS	07/08/2025
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FOREFRONT DERMATOLOGY

P0.1 PLUMBING SPECIFICATION



GENERAL NOTES:

- UNLESS OTHERWISE NOTED, SLOPE OF DRAINAGE SYSTEM TO BE 1/8" PER FOOT OF RUN FOR PIPE 3" OR LARGER AND 1/4" PER FOOT FOR PIPE SMALLER THAN 3".
- CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
- REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
- ALL MATERIAL INDICATED AND IMPLIED ON THESE DRAWINGS SHALL BE NEW UNLESS OTHERWISE NOTED.
- ALL CLEANOUTS TO BE ACCESSIBLE.
- ANY ROOF PENETRATION SHALL BE PERFORMED BY LANDLORD'S ROOFERS AT LANDLORD OPTION, A BONDED ROOFER APPROVED IN ADVANCE BY LANDLORD.
- PROVIDE TRAP PRIMER/ SEAL ON FLOOR DRAIN AS PER LOCAL JURISDICTION.
- CONTRACTOR TO CO-ORDINATE WITH MECHANICAL CONTRACTOR FOR CONDENSATE DRAIN. EXTEND AND SPILL THE CONDENSATE DRAIN TO NEAREST STORM LINE.

SANITARY KEYED NOTES:

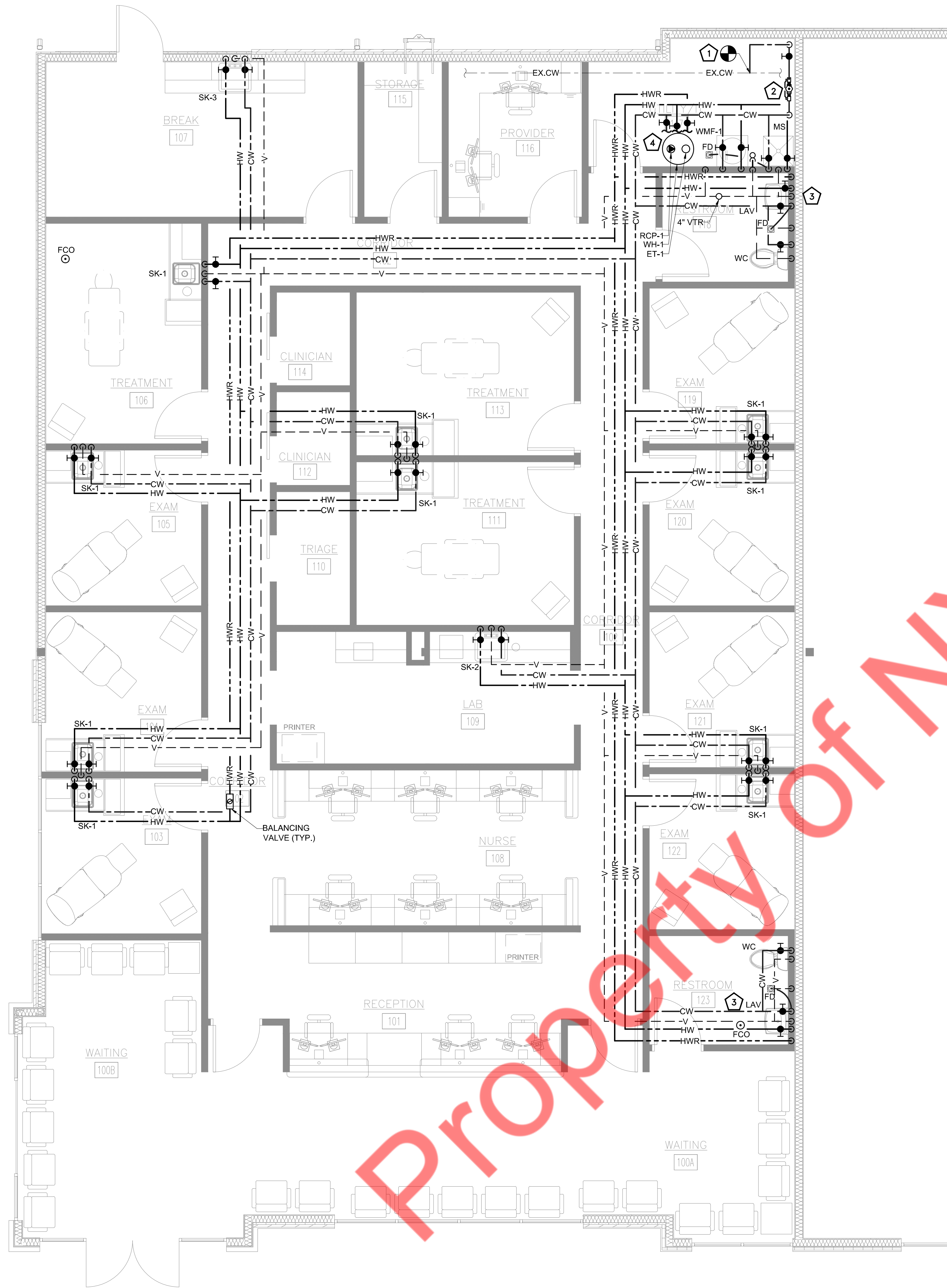
- CONNECT NEW 4" SANITARY LINE TO EXISTING SANITARY LINE. CONTRACTOR TO FIELD VERIFY EXISTING SANITARY SIZE, ROUTING AND INVERT ON SITE.
- IF REQUIRED EXTEND AND CONNECT AUTOCLAVE SYSTEM & ULTRASONIC CLEANER SYSTEM DRAIN TO NEAREST SINK DRAIN WITH DRAIN SADDLE VALVE AS PER CODE COMPLIANCE. CONTRACTOR TO COORDINATE WITH ARCHITECT & MANUFACTURER FOR LOCATION & ALL NECESSARY PIPING ACCESSORIES PRIOR TO CONNECTION.
- ROUTE INDIRECT WASTE FROM WATER HEATER TO NEAREST FLOOR DRAIN WITH APPROVED AIR GAP.

1 UNDERGROUND PLAN - PLUMBING
SCALE 1/4"=1'-0"

**FOREFRONT
DERMATOLOGY**

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1	OWNER REVISION COMMENTS	07/08/2025
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P1.0
UNDERGROUND
PLAN



- GENERAL NOTES:**
1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER 2015 INTERNATIONAL ENERGY CONSERVATION CODE (REFER SHEET P0).
 2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
 3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 4. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, & SHUT-OFF VALVES AS REQUIRED.
 5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
 6. ANY ROOF PENETRATION SHALL BE PERFORMED BY LANDLORD'S ROOFERS AT LANDLORD OPTION. A BONDED ROOFER APPROVED IN ADVANCE BY LANDLORD.
 7. PROVIDE TRAP PRIMER/ SEAL ON FLOOR DRAIN AS PER LOCAL JURISDICTION.

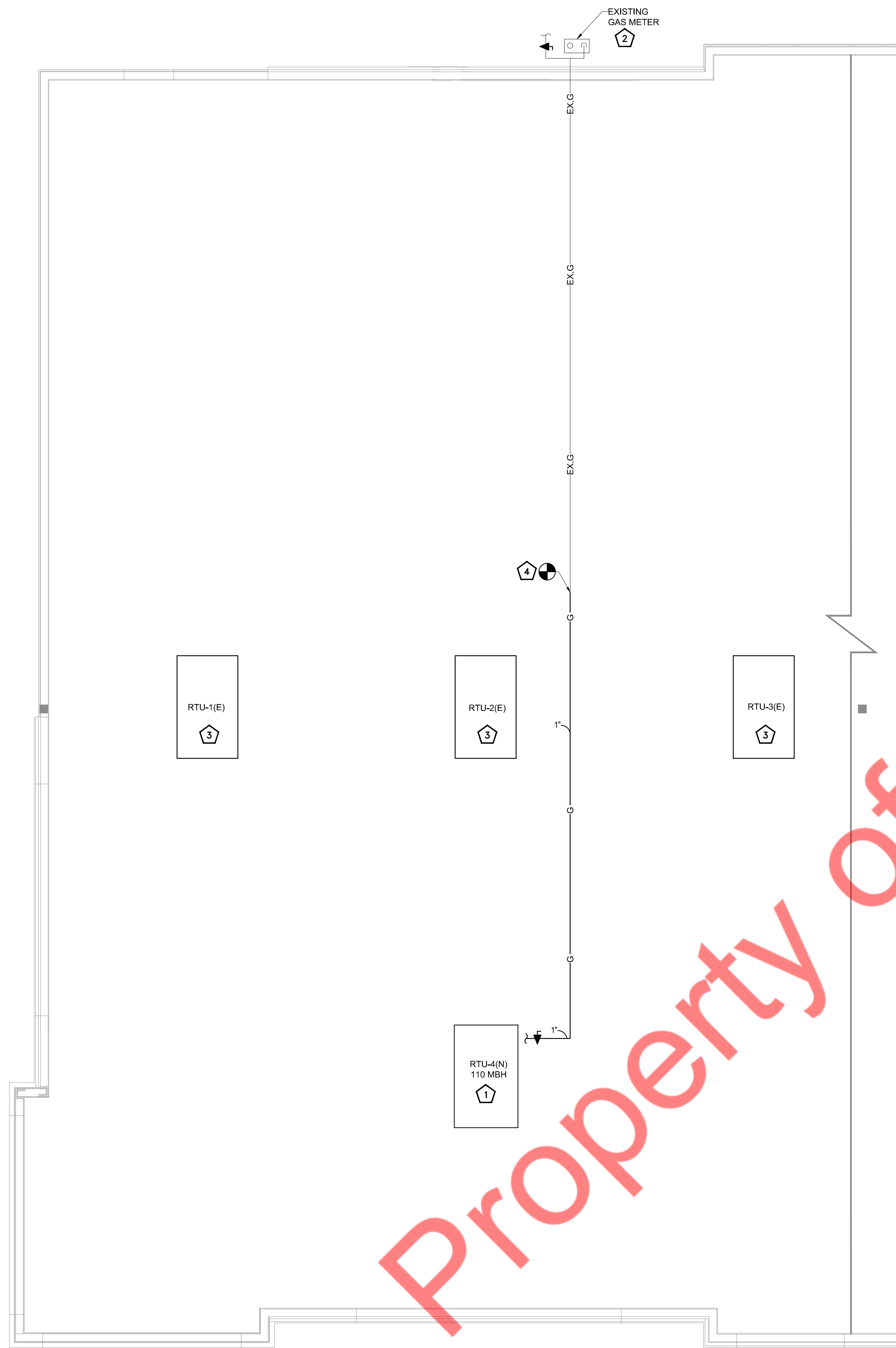
- WATER PIPING KEYED NOTES:**
1. CONNECT NEW 1/2" CW LINE WITH SHUT OFF VALVE TO EXISTING CW LINE IN SPACE. CONTRACTOR TO FIELD VERIFY THE SIZE, LOCATION AND ROUTING OF EXISTING CW LINE. BID ACCORDINGLY.
 2. NEW 1/2" WATER METER. 1/2" WATTS LF009 BACK FLOW PREVENTER STACKED ONE ABOVE.
 3. PROVIDE ASSE 1070 OR SIMILAR APPROVED TEMPERING VALVE FOR LAVATORIES. SET AT TEMPERATURE TO A MAXIMUM 110 °F.
 4. NEW FLOOR MOUNTED ELECTRIC STORAGE WATER HEATER WITH ASSOCIATED ACCESSORIES, EXPANSION TANK (ET-1), AND HOT WATER RE-CIRCULATION PUMP (RCP-1). REFER SCHEDULE.

1 GROUND FLOOR PLAN - PLUMBING
 P1.1 SCALE 1/4"=1'-0"

FOREFRONT
 DERMATOLOGY

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1	OWNER REVISION COMMENTS	
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P1.1
 GROUND FLOOR PLAN



GENERAL NOTES:

1. ARCHITECTURAL LAYOUT AND DIMENSIONS FOR FITNESS EQUIPMENT TO TAKE PRECEDENCE OVER MEP.
2. PROVIDE PRESSURE REGULATOR AND GAS SHUT-OFF VALVE AT AN ACCESSIBLE LOCATION.

GAS PIPING KEYED NOTES:

- 1 CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR MECHANICAL EQUIPMENT.
- 2 CONTRACTOR TO FIELD VERIFY EXISTING GAS METER CAPACITY. UPDATE IF REQUIRED.
- 3 EXISTING RTU'S WITH EXISTING ACCESSORIES, FITTING AND GAS PIPING TO REMAIN. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING GAS PIPING. REPLACE IF REQUIRED.
- 4 EXTEND AND CONNECT NEW 1" GAS PIPE TO EXISTING GAS PIPE AVAILABLE ON THE ROOF. CONTRACTOR TO FIELD VERIFY EXISTING GAS PIPE SIZE AND LOCATION. UPGRADE IF REQUIRED.

LOW PRESSURE SYSTEM
 INLET PRESSURE < 2.0 PSI
 PRESSURE DROP -0.5 IN WC
 LONGEST LENGTH - APPROX. 50'

GAS LOAD SUMMARY	
EQUIPMENT TAG	CFH LOAD
RTU-4(N)	110
TOTAL	110

GAS SIZING BASED ON CHAPTER 4 TABLE 402.4(2) 2015 INTERNATIONAL FUEL GAS CODE.

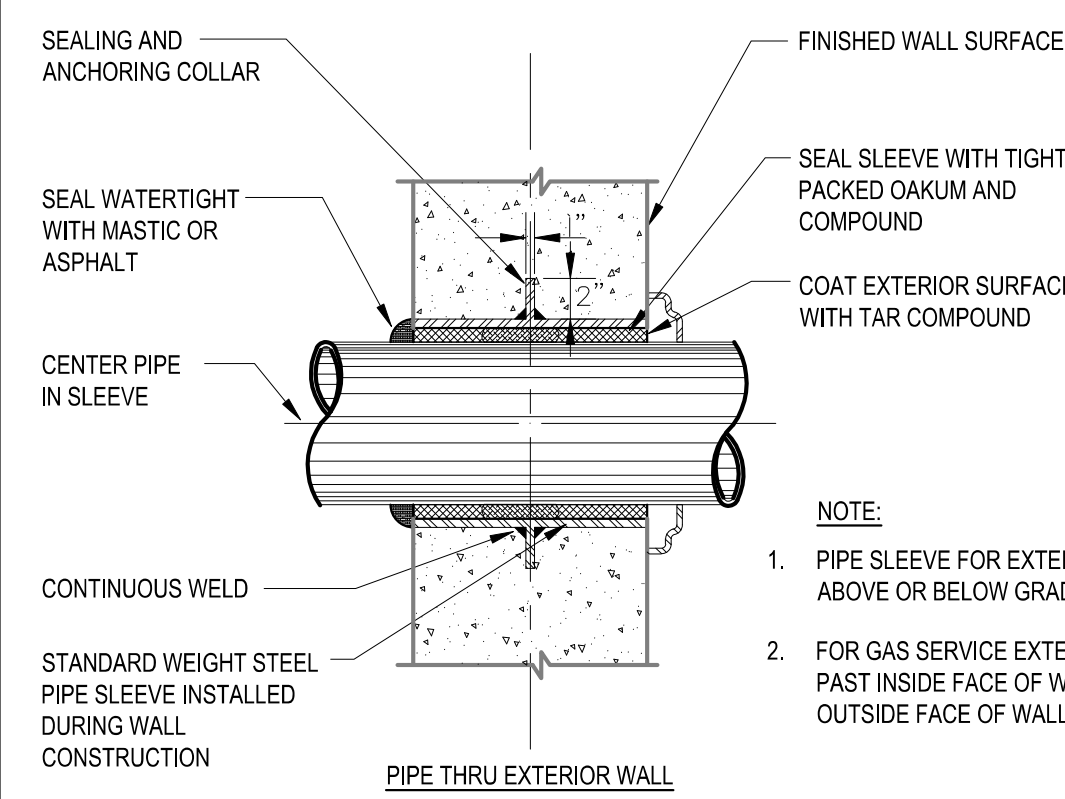
CONTRACTOR TO VERIFY EXACT TOTAL DEVELOPED LENGTH AND GAS SUPPLY PRESSURE IN FIELD AND NOTIFY ENGINEER IF DIFFERENT THAN SHOWN ON THIS PLAN

1 ROOF FLOOR PLAN - PLUMBING
 P1.2 SCALE 1/4"=1'-0"

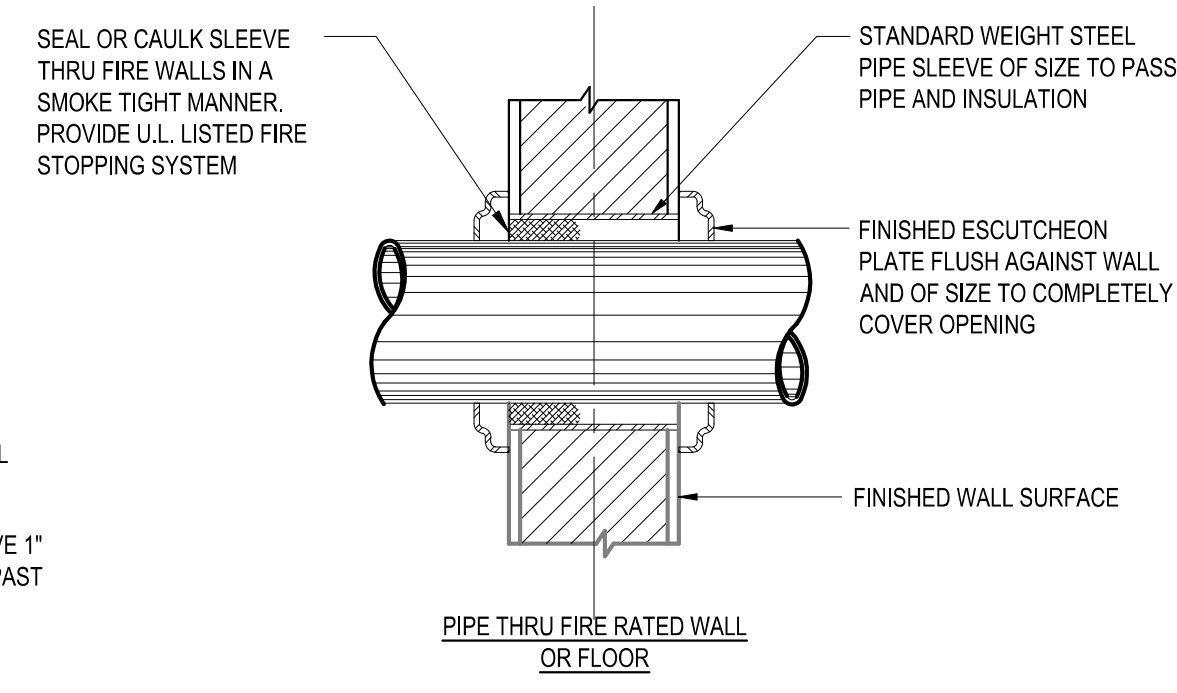
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P1.2
 ROOF
 FLOOR PLAN

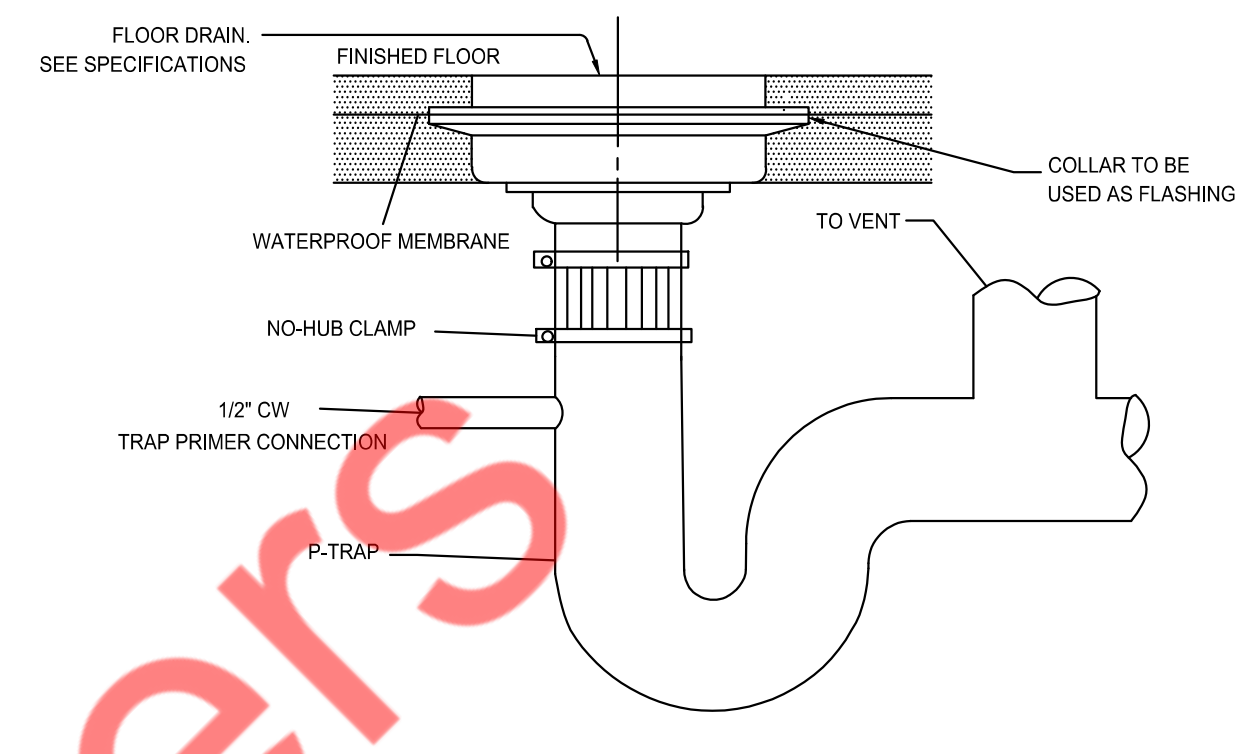


1 PIPE SLEEVE THRU WALL SECTION
P3.0 N.T.S

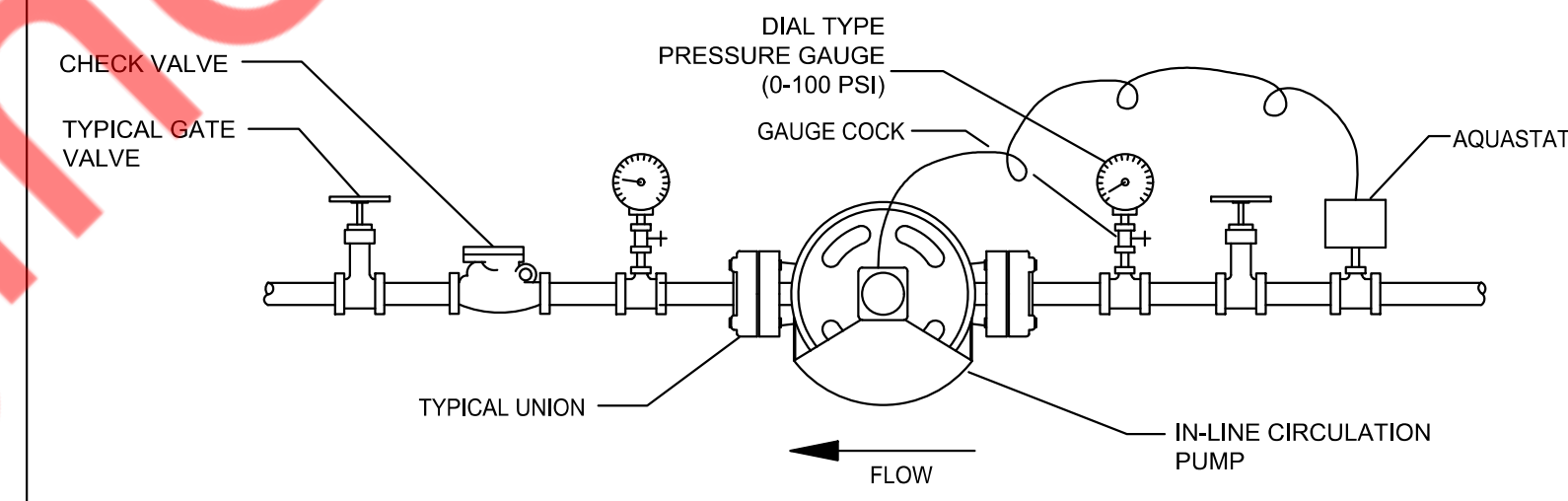


2 HANGER DETAIL
P3.0 N.T.S

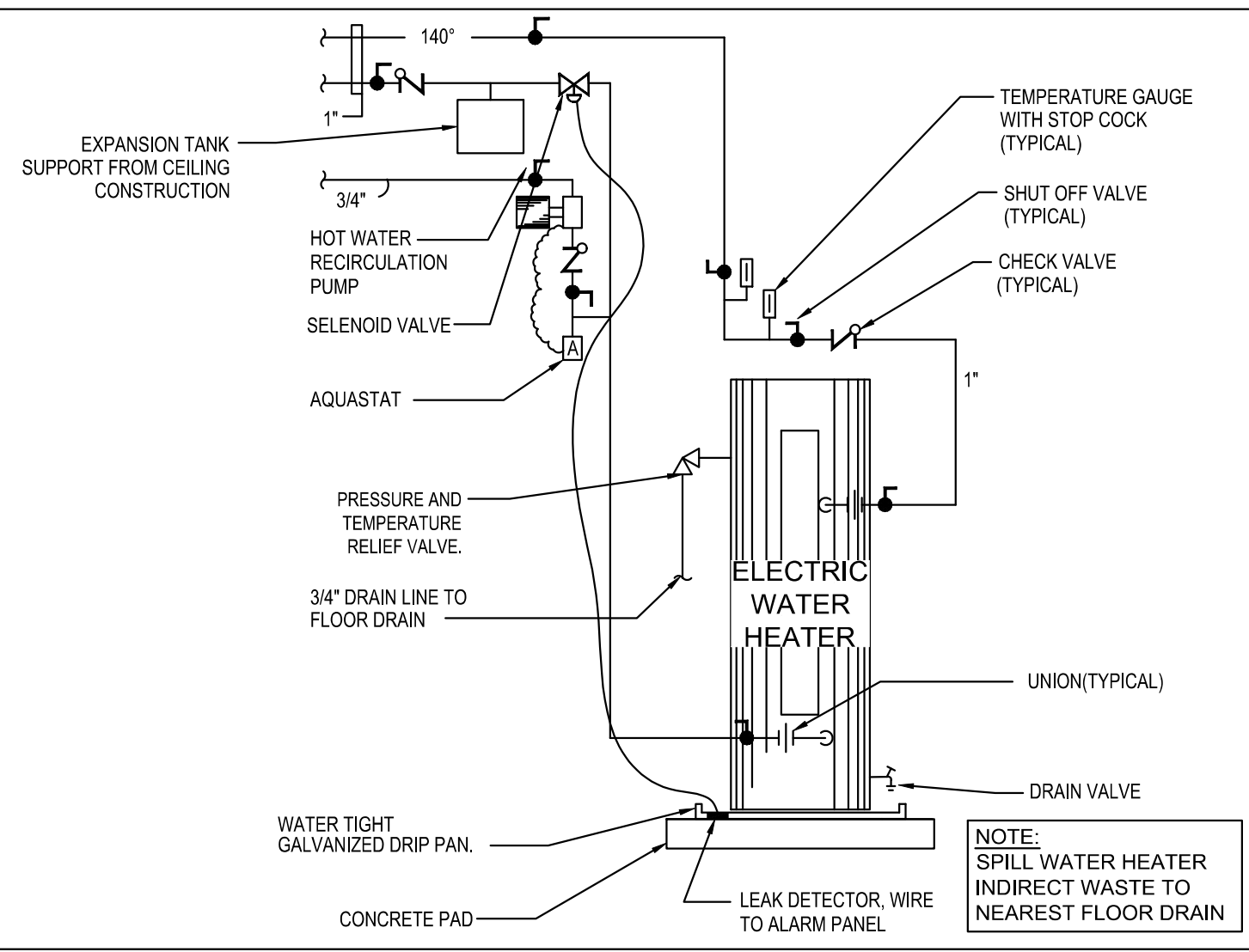
PIPE SIZE	ROD SIZE
1/2"	3/8"
3/4"	3/8"
1"	3/8"
1 1/4"	3/8"
1 1/2"	3/8"
2"	3/8"
2 1/2"	3/8"
3"	3/8"
4"	1/2"
5"	1/2"
6"	1/2"



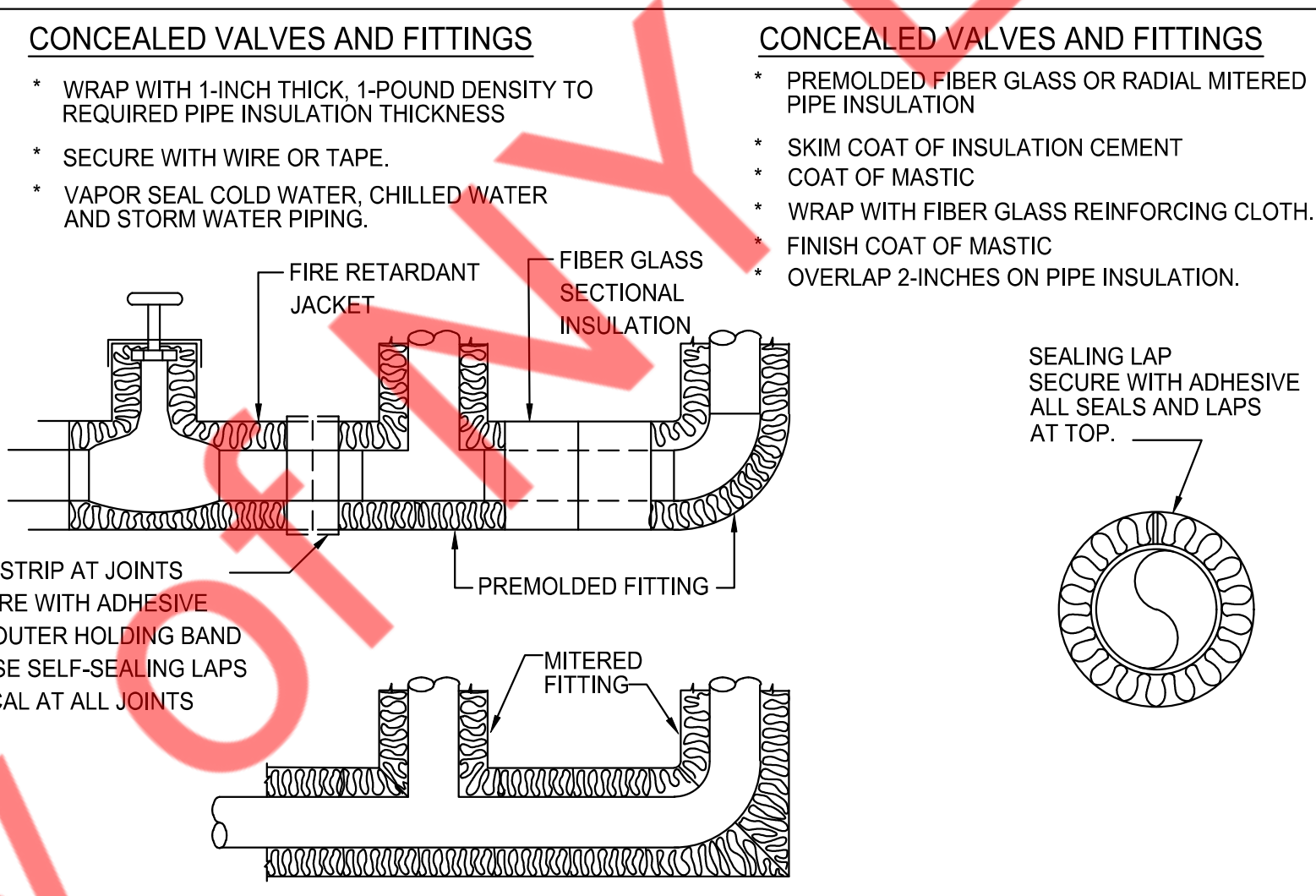
3 FLOOR DRAIN DETAILS
P3.0 N.T.S



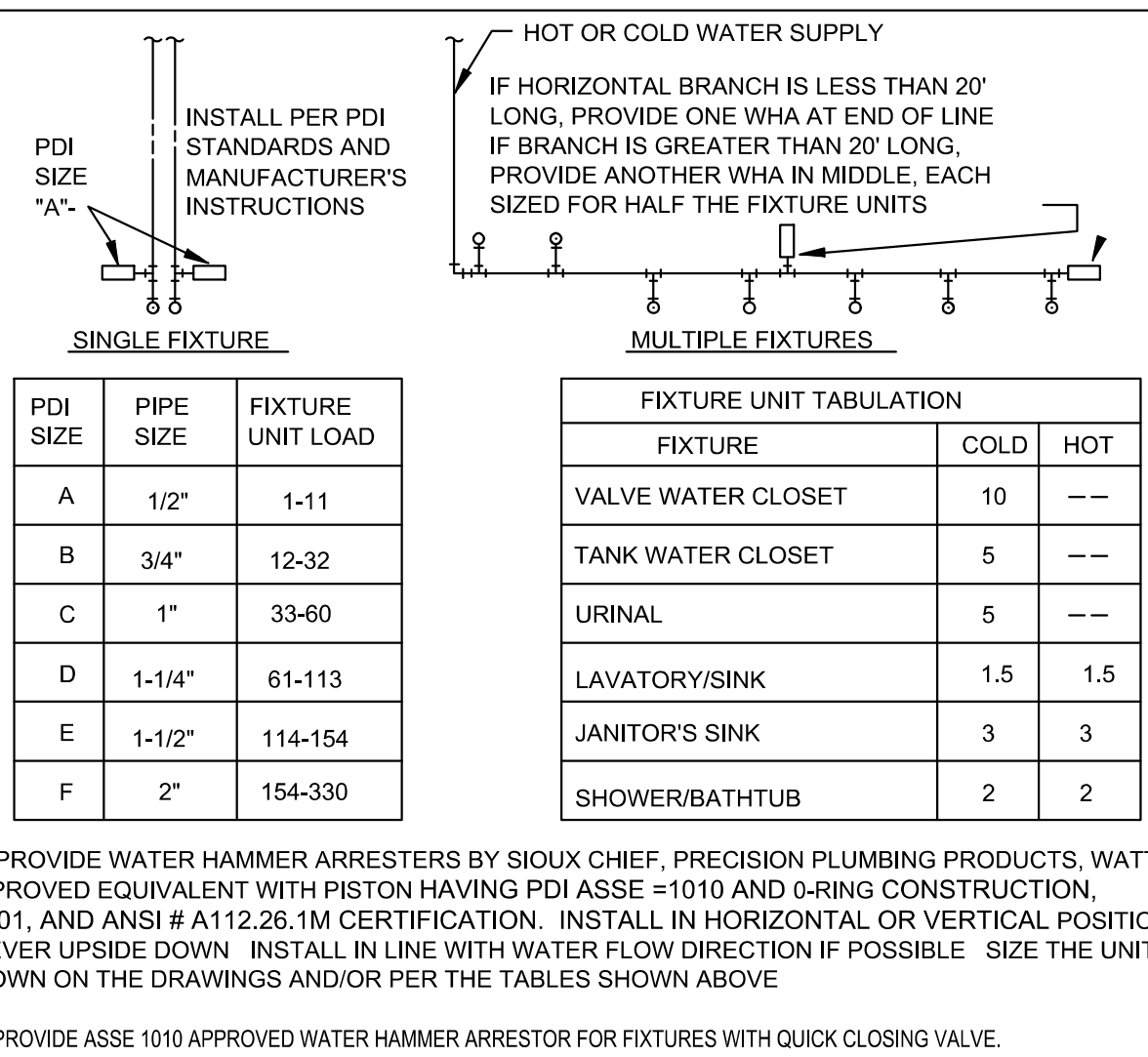
4 INLINE RECIRCULATING PUMP DETAIL
P3.0 N.T.S



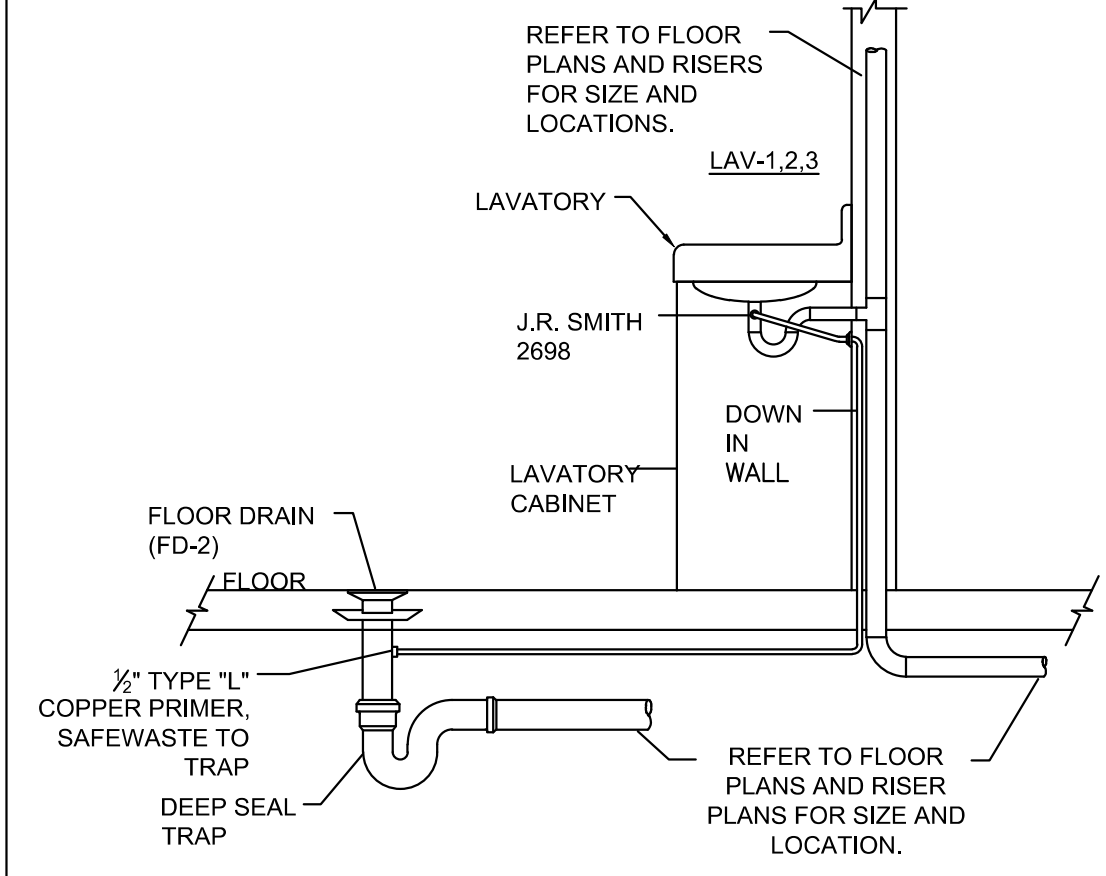
5 FLOOR MOUNTED ELECTRIC WATER HEATER INSTALLATION DETAIL
P3.0 N.T.S



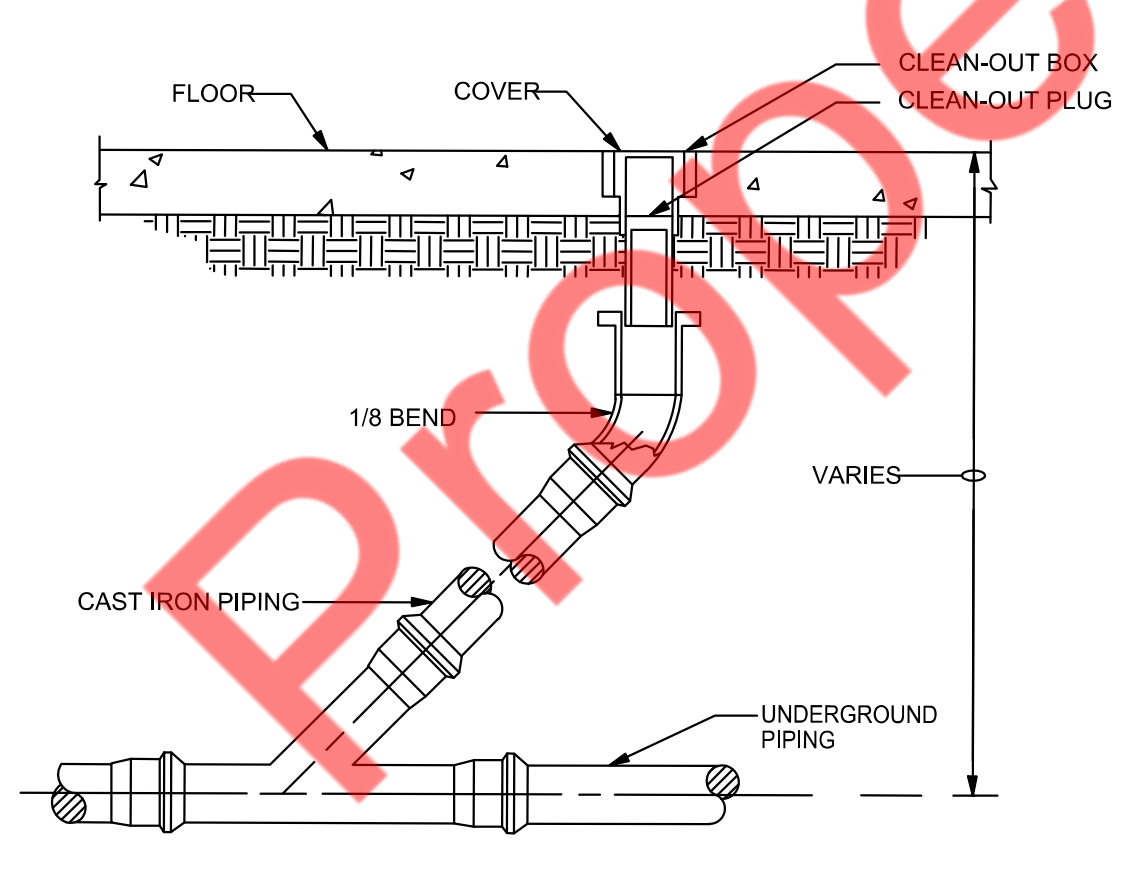
6 INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS
P3.0 N.T.S



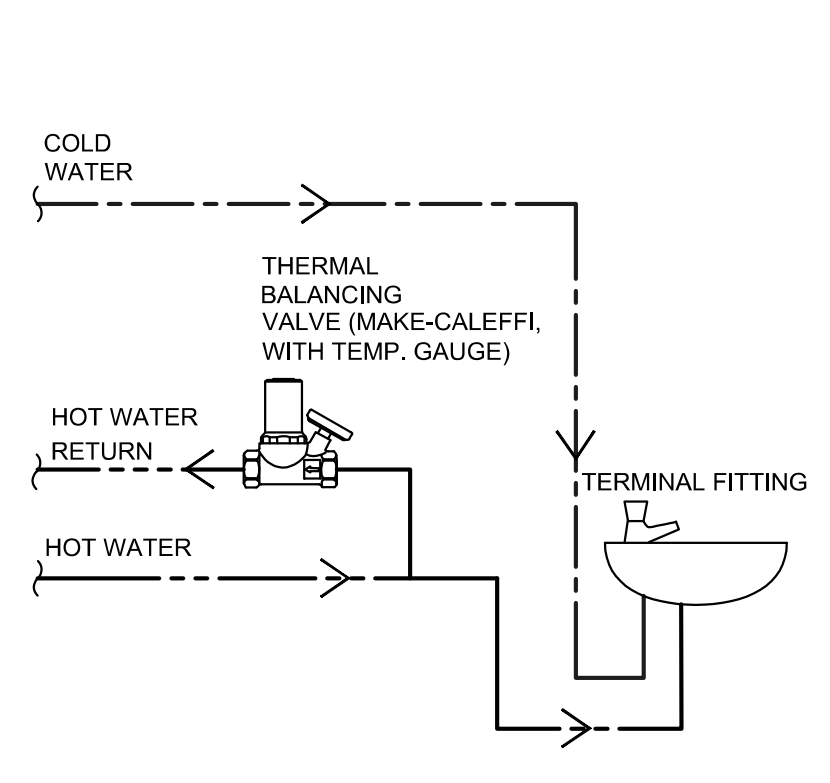
7 WATER HAMMER ARRESTORS
P3.0 N.T.S



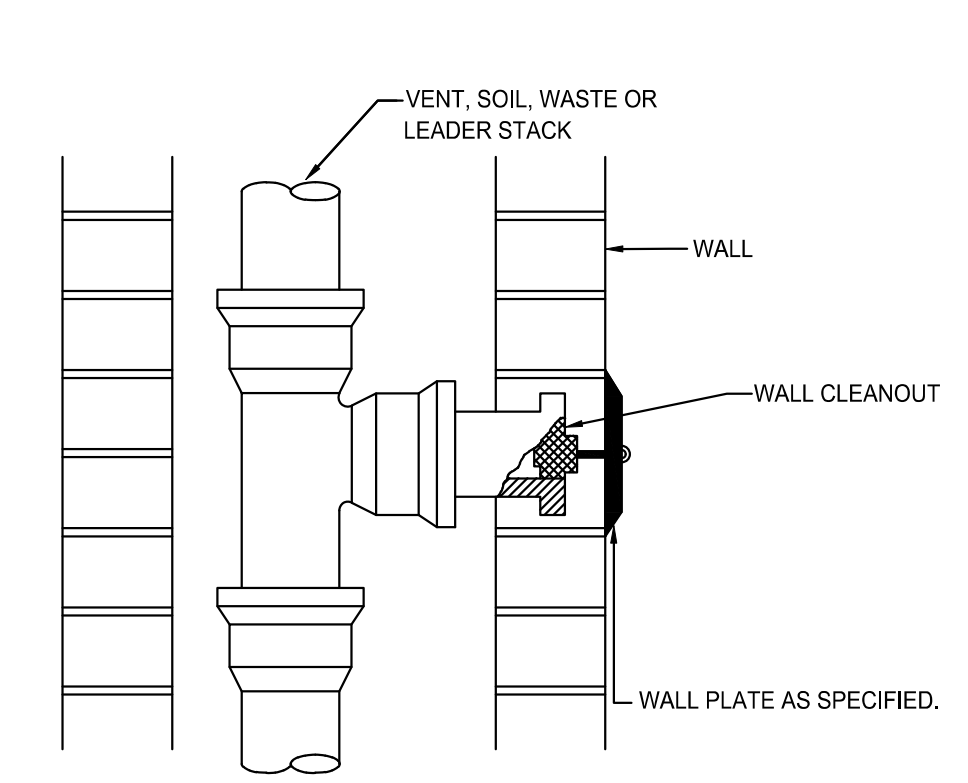
8 FLOOR DRAIN TRAP PRIMER DETAIL
P3.0 N.T.S



9 FLOOR CLEANOUT DETAIL
P3.0 N.T.S



10 HOT WATER HEATER BALANCING VALVE PIPING DETAIL
P3.0 N.T.S



11 WALL CLEANOUT DETAIL
P3.0 N.T.S

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PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
CP-1	CIRCULATING PUMP - LEAD FREE BRONZE CONSTRUCTION, PERMANENTLY LUBRICATED SEALED BEARINGS, MECHANICAL SEAL, OIL LUBRICATED, OPEN DRIP-PROOF NON OVERLOADING MOTOR WITH THERMAL OVERLOAD PROTECTION, FLANGED CONNECTIONS, RATED FOR 125 PSIG AT 225°F, UL LISTED. 3 GPM @ 5 FEET OF HEAD. MOTOR SHALL BE 1/6 HP OPERATING AT 3300 RPM. AQUASTAT - LINE VOLTAGE, ADJUSTABLE SETTING OF 90-180°F WITH STRAP-ON REMOTE SENSOR BULB, UL LISTED. PROVIDE WITH TRANSFORMER IF REQUIRED. INSTALL PER MANUFACTURERS INSTRUCTIONS. ELECTRICAL REQUIREMENTS - 120V-1 PHASE (HARD-WIRE)	PUMP - B&G (PL SERIES), TACO (OO SERIES), GRUNDFOS (JP SERIES) AQUASTAT - HONEYWELL, WHITE-RODGERS, JOHNSON CONTROLS, SAME AS PUMP MANUFACTURER
ET-1	EXPANSION TANK - WELDED STEEL CONSTRUCTION, GUARANTEED AIRTIGHT AND LEAKPROOF, STAINLESS STEEL SYSTEM CONNECTION, HEAVY DUTY BUTYL DIAPHRAGM AND RIGID POLYPROPYLENE LINER MECHANICALLY BONDED TO TANK TO PROVIDE A 100% NON-CORROSIVE WATER RESERVOIR, DIAPHRAGM AND LINER SHALL BE APPROVED FOR USE IN POTABLE WATER SYSTEMS, ALL WETTED COMPONENTS OF FDA APPROVED MATERIALS, PROVIDE STANDARD SCHRAEDER AIR VALVE FOR FIELD CHARGING. TANK SHALL COMPLY WITH FEDERAL ACT S.3874. MINIMUM TANK VOLUME TO BE 4 GALLONS MINIMUM ACCEPTING VOLUME TO BE 3 GALLONS TANK SHALL HAVE A WORKING TEMPERATURE OF 200°F AND A WORKING PRESSURE OF 125 PSIG. FACTORY PRE-CHARGED FOR SHIPPING. FIELD CHARGE TANK TO 55 PSIG.	EXPANSION TANK - AMTROL (THERM-X-TROL ST-C), B&G (PTA), ELBI (DTS, DTL), TACO (PAX SERIES), WATTS (DETA), WESSELS (TTA)
FCO	FLOOR CLEANOUT - ADJUSTABLE, CAST IRON HOUSING, ANCHOR FLANGE, TAPERED THREAD PLUG, SECURED NICKEL BRONZE TOP. TOP STYLE SHALL MATCH FLOOR FINISH AS FOLLOWS: UNFINISHED FLOOR - ROUND SOLID SCORIATED TOP TILE OR TERRAZZO - ROUND RECESSED TOP CARPET - ROUND TOP WITH CARPET MARKER.	ZURN (Z1400), JOSAM (55000), MIFAB (C1100), SMITH (4000), WADE (6000), WATTS (CO-200)
FD	FLOOR DRAIN - CAST IRON BODY, NICKEL BRONZE ADJUSTABLE TOP, 5" ROUND, 3" BOTTOM OUTLET, FLASHING COLLAR. TRAP SEAL - 3". PLASTIC HOUSING WITH FLEXIBLE DIAPHRAGM, SEALING GASKETS, RECLOSERS AND SEALS WHEN DISCHARGE IS COMPLETED, ASSE 1072.	FLOOR DRAIN - ZURN (Z-415), SMITH (2005), WADE (1100), JOSAM (3000), WATTS (FD-100), MIFAB (F1100), SUN (FD1000) TRAP SEAL - SURE SEAL (SS), PROVENT (TRAP GUARD), SMITH (QUAD CLOSE), GREEN DRAIN, MIFAB (MI-GARD), ZURN (Z1072)

PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
LAV-1	LAVATORY - ACCESSIBLE, WALL MOUNTED, WHITE VITREOUS CHINA, 20"x18", 4" HIGH CONTOURED BACKSPASH, FAUCET HOLES ON 4" CENTERS, DRILLED FOR CONCEALED ARM CARRIER. LAVATORY TRIM - SINGLE HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, CONVENTIONAL SPOUT WITH AERATOR, WASHERLESS PUSH-PULL LEVER HANDLE WITH SUPPLIES AT 4" CENTERS, CERAMIC DISC CARTRIDGE, PERFORATED GRID STRAINER WITH 1-1/4" 17 GAUGE TAILPIECE. MAXIMUM FLOW TO BE 0.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AS REQUIRED.	LAVATORY - AMERICAN STANDARD (0355.012), KOHLER (K-2005), SLOAN (SS-3003), TOTO (LT307), ZURN (Z5364) LAVATORY TRIM - DELTA (22C131), AMERICAN STANDARD (7385), CHICAGO FAUCET (420), KOHLER (K-15597), MOEN (8413), SPEAKMAN (S-3551), SYMMONS (S-20), ZURN (Z7440-XL) MIXING VALVE- WATTS (LFJSG-8), LEONARD (170-LF), ACORN (TMM-1070T), ACORN CONTROLS (S770), APOLLO (34DLF), POWERS (LFE480), SLOAN (MIX-135-A), SYMMONS (8210CK), WILKINS (ZV3870XL) INSULATION KIT - PRE-MANUFACTURED FOR P-TRAP, STOP VALVES AND SUPPLY LINES. ACCESSORIES - QUARTER-TURN 3/8" CHROME PLATED HEAVY BRASS ANGLE SUPPLY LOOSE KEY STOPS, CHROME PLATED SOFT COPPER SUPPLY LINES, DRAIN AND OFFSET TAILPIECE, 1-1/4" 17 GAUGE CAST BRASS P-TRAP, SUPPORT CARRIER. MOUNT LAVATORY WITH SUPPORT CARRIER BOLTED SECURELY TO FLOOR. TOP OF RIM SHALL BE AT 34" ABOVE FLOOR IN COMPLIANCE WITH LATEST ADA STANDARD. PROVIDE 29" MINIMUM CLEARANCE FROM FLOOR TO BOTTOM OF APRON IN COMPLIANCE WITH LATEST ANSI A117.1 AND ADA STANDARDS.
MS	MOP BASIN - MOLDED STONE, WHITE WITH BLACK ACCENTS, 24"x24"x10", STAINLESS STEEL DRAIN WITH COMBINATION DOME STRAINER AND LINT BASKET, 3" OUTLET, VINYL BUMPER GUARD ON EXPOSED SIDES. TRIM - EXPOSED TWO HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, SINGLE WING HANDLES, 1/4 TURN CERAMIC DISC CARTRIDGE, 3/4" HOSE THREAD SPOUT WITH ASSE 1053 RATED INTEGRAL VACUUM BREAKER, WALL BRACE, PAIL HOOK, CHECK STOPS OR INLINE CHECK VALVES TO PREVENT THERMAL CROSSOVER. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. ACCESSORIES - MOP HANGER, HOSE AND HOSE BRACKET, TRAP.	MOP BASIN - FIAT (MSB), WILLIAMS (MTB), SWAN (MS), ZURN (Z-1996), MUSTEE (63M) TRIM - DELTA (28C2383), AMERICAN STANDARD (8344.012), CHICAGO FAUCETS (897-CP), MOEN (8124), SPEAKMAN (SG-5812), SYMMONS (S-2490), ZURN (Z841M1-XL) VACUUM BREAKER - WATTS (8A), OR APPROVED EQUAL
SK-1	SINK - ACCESSIBLE, SELF-RIMMING SINGLE COMPARTMENT WITH FAUCET DECK, 18 GAUGE TYPE 300 SERIES STAINLESS STEEL, 17" (SIDE-TO-SIDE) 21-1/4" (FRONT-TO-BACK) OVERALL SIZE, 14" x 15-3/4" x 6-1/2" DEEP BOWL, 3-1/2" DIAMETER DRAIN OUTLET LOCATION OFF-CENTERED REAR IN BOWL, PERFORATED TYPE 300 SERIES STAINLESS STEEL GRID STRAINER. SINK TRIM - TWO HANDLE MIXING FAUCET, BRASS CONSTRUCTION, INTEGRAL CAST BODY, CHROME-PLATED FINISH, GOOSENECK SWING SPOUT, NOMINAL 6" REACH, AERATOR, 4" WRISTBLADE HANDLES AT 8" CENTERS, 1/4-TURN OPERATION CERAMIC DISC CARTRIDGE. MAXIMUM FLOW TO BE 2.2 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AND ESCUTCHEON PLATE AS REQUIRED. ACCESSORIES - OFFSET 1-1/2" 17 GAUGE CHROME-PLATED BRASS TAILPIECE AND P-TRAP, QUARTER-TURN BALL VALVE TYPE 3/8" CHROME-PLATED BRASS ANGLE SUPPLIES WITH LOOSE KEY STOPS, CHROME-PLATED SOFT COPPER SUPPLY LINES. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE ARRANGEMENT FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, UNION/THREADED INLETS WITH STRAINERS, COMBINATION CHECK STOPS OR SEPARATE SUPPLY CHECK VALVES AND SHUT OFF VALVES. RATED FOR 2.2 GPM OUTPUT AND 0.5 GPM OUTPUT MINIMUM. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874.	SINK - ELKAY (D11721), 3 HOLE DRILLING CONFIGURATION SINK TRIM - T&S BRASS AND BRONZE WORKS, INC (B-1142-04A-QT) MIXING VALVE- LEONARD (170-LF/270-LF/370-LF), ACORN CONTROLS (S77069), APOLLO (34BLF), BRADLEY (S59 SERIES), LAWLER (310/570), POWERS (SERIES LFLM495), SYMMONS (8210CK MAXLINE SERIES), WATTS (LFMMV), WILKINS (ZV1070XL) ACCESSORIES - OFFSET 1-1/2" 17 GAUGE CHROME-PLATED BRASS TAILPIECE AND P-TRAP, QUARTER-TURN BALL VALVE TYPE 3/8" CHROME-PLATED BRASS ANGLE SUPPLIES WITH LOOSE KEY STOPS, CHROME-PLATED SOFT COPPER SUPPLY LINES. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE ARRANGEMENT FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, UNION/THREADED INLETS WITH STRAINERS, COMBINATION CHECK STOPS OR SEPARATE SUPPLY CHECK VALVES AND SHUT OFF VALVES. RATED FOR 0.5 GPM OUTPUT AND 0.5 GPM OUTPUT MINIMUM. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874.

PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
SK-2	SINK - ACCESSIBLE, SELF-RIMMING SINGLE COMPARTMENT WITH FAUCET DECK, 18 GAUGE TYPE 304 STAINLESS STEEL, 25" (SIDE-TO-SIDE) x 22" (FRONT-TO-BACK) OVERALL SIZE, 21" x 15-3/4" x 5-5/8" DEEP BOWL, SOUND DEADENING ON BOTTOM OF BASIN, 3-1/2" DIAMETER DRAIN OUTLET LOCATION OFF-CENTERED REAR IN BOWL, PERFORATED TYPE 304 STAINLESS STEEL GRID STRAINER. SINK TRIM - TWO HANDLE MIXING FAUCET, BRASS CONSTRUCTION, INTEGRAL CAST BODY, CHROME-PLATED FINISH, GOOSENECK SWING SPOUT, NOMINAL 6" REACH, AERATOR, 4" WRISTBLADE HANDLES AT 8" CENTERS, 1/4-TURN OPERATION CERAMIC DISC CARTRIDGE. MAXIMUM FLOW TO BE 2.2 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AND ESCUTCHEON PLATE AS REQUIRED. ACCESSORIES - OFFSET 1-1/2" 17 GAUGE CHROME-PLATED BRASS TAILPIECE AND P-TRAP, QUARTER-TURN BALL VALVE TYPE 3/8" CHROME-PLATED BRASS ANGLE SUPPLIES WITH LOOSE KEY STOPS, CHROME-PLATED SOFT COPPER SUPPLY LINES. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE ARRANGEMENT FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, UNION/THREADED INLETS WITH STRAINERS, COMBINATION CHECK STOPS OR SEPARATE SUPPLY CHECK VALVES AND SHUT OFF VALVES. RATED FOR 0.5 GPM OUTPUT AND 0.5 GPM OUTPUT MINIMUM. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874. EMERGENCY EYEWASH- THERMOSTATICALLY-CONTROLLED FAUCET MOUNTED EYEWASH. HALF-TURN OPERATED, LAMINAR FLOW. EYEWASH SHALL BE ASME 112.18.1 AND ANSI Z358.1 CERTIFIED.	SINK- ELKAY (LRAD252260) 3 HOLE DRILLING CONFIGURATION SINK TRIM- T&S BRASS AND BRONZE WORKS, INC (B-1142-04A-QT) MIXING VALVE- LEONARD (170-LF/270-LF/370-LF), ACORN CONTROLS (S77069), APOLLO (34BLF), BRADLEY (S59 SERIES), LAWLER (310/570), POWERS (SERIES LFLM495), SYMMONS (8210CK MAXLINE SERIES), WATTS (LFMMV), WILKINS (ZV1070XL) EMERGENCY EYEWASH-AXION (EYEWOD)
SK-3	SINK - ACCESSIBLE, SELF-RIMMING SINGLE COMPARTMENT WITH FAUCET DECK, 18 GAUGE TYPE 304 STAINLESS STEEL, 25" (SIDE-TO-SIDE) x 22" (FRONT-TO-BACK) OVERALL SIZE, 21" x 15-3/4" x 5-5/8" DEEP BOWL, SOUND DEADENING ON BOTTOM OF BASIN, 3-1/2" DIAMETER DRAIN OUTLET LOCATION OFF-CENTERED REAR IN BOWL, REMOVABLE TYPE 304 STAINLESS STEEL BASKET STRAINER WITH NEOPRENE STOPPER. SINK TRIM - SINGLE HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, CERAMIC CARTRIDGE, NOMINAL 9" REACH, PULL DOWN SPRAY HOSE WITH AERATOR STREAM / SPRAY SELECTOR, LEVER HANDLE. MAXIMUM FLOW TO BE 2.2 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AND ESCUTCHEON PLATE AS REQUIRED. ACCESSORIES - OFFSET 1-1/2" 17 GAUGE CHROME-PLATED BRASS TAILPIECE AND P-TRAP, QUARTER-TURN BALL VALVE TYPE 3/8" CHROME-PLATED BRASS ANGLE SUPPLIES WITH LOOSE KEY STOPS, CHROME-PLATED SOFT COPPER SUPPLY LINES. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE ARRANGEMENT FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, UNION/THREADED INLETS WITH STRAINERS, COMBINATION CHECK STOPS OR SEPARATE SUPPLY CHECK VALVES AND SHUT OFF VALVES. RATED FOR 0.5 GPM OUTPUT AND 0.5 GPM OUTPUT MINIMUM. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874.	SINK- ELKAY (LRAD252260) 3 HOLE DRILLING CONFIGURATION SINK TRIM- KOHLER (K-15160) 3 HOLE DRILLING CONFIGURATION MIXING VALVE- LEONARD (170-LF/270-LF/370-LF), ACORN CONTROLS (S77069), APOLLO (34BLF), BRADLEY (S59 SERIES), LAWLER (310/570), POWERS (SERIES LFLM495), SYMMONS (8210CK MAXLINE SERIES), WATTS (LFMMV), WILKINS (ZV1070XL) WATER CLOSET -AMERICAN STANDARD (2467.016), GERBER (21-318), ZURN (Z5560) SEAT - BEMIS (3155SSCT), CHURCH (315SC), BENEKE (533PC), OLSONITE (95), SAME AS WATER CLOSET MANUFACTURER
WC-1	WATER CLOSET - ACCESSIBLE, FLOOR MOUNTED, TANK TYPE, PRESSURE ASSISTED, SIPHON JET, WHITE VITREOUS CHINA, CLOSE COUPLED, ELONGATED BOWL, BOLT CAPS, 12" ROUGH-IN, CHROME PLATED TRIP LEVER, 1.6 GALLONS PER FLUSH (MAXIMUM) IN COMPLIANCE WITH ENERGY POLICY ACT OF 1992. SEAT - WHITE, EXTRA HEAVY, OPEN FRONT, INJECTION MOLDED SOLID ANTI-MICROBIAL PLASTIC, SELF-SUSTAINING HINGE, STAINLESS STEEL OR PLATED STEEL POSTS AND NUTS. ACCESSORIES - QUARTER-TURN 3/8" CHROME-PLATED HEAVY BRASS ANGLE SUPPLY WITH LOOSE-KEY STOP, CHROME-PLATED SOFT COPPER SUPPLY LINE. TOP OF SEAT SHALL BE AT 17"-19" ABOVE FINISHED FLOOR. FLUSH HANDLE SHALL BE LOCATED ON THE WIDE SIDE OF THE TOILET STALL AND OPERATE WITH NO GREATER THAN A 5 LB FORCE IN COMPLIANCE WITH LATEST ADA STANDARDS. VERIFY EQUIPMENT REQUIREMENTS AND ROUGH-IN LOCATIONS.	WATER CLOSET -AMERICAN STANDARD (2467.016), GERBER (21-318), ZURN (Z5560) SEAT - BEMIS (3155SSCT), CHURCH (315SC), BENEKE (533PC), OLSONITE (95), SAME AS WATER CLOSET MANUFACTURER
WH-1	WATER HEATER - ELECTRIC, VERTICAL, METAL CABINET, BAKED ENAMEL FINISH, GLASS-LINED ASME STAMPED WELDED STEEL TANK, 150 PSI WORKING PRESSURE, FIBERGLASS OR FOAM INSULATION, BRASS WATER CONNECTIONS AND DRAIN VALVE, ASME APPROVED T&P RELIEF VALVE, MAGNESIUM ANODE ROD, INDIVIDUAL FLANGE-MOUNTED IMMERSION HEATING ELEMENTS SHEATHED WITH CORROSION-RESISTANT METAL ALLOY, EXTERNALLY ADJUSTABLE AUTOMATIC IMMERSION WATER THERMOSTAT, MANUAL RESET HIGH TEMPERATURE CUTOFF SWITCH, ENCLOSED CONTROLS, VENTILATED CONTROL CABINET, PILOT LIGHTS INDICATING MAIN POWER AND HEATING STEPS, CONTROL CIRCUIT TOGGLE SWITCH, SEQUENCING STEP CONTROLLER, CONTROL TRANSFORMER, POWER CIRCUIT FUSES, MAGNETIC CONTACTORS, CERAMIC TERMINAL BLOCK, FACTORY ASSEMBLED AND WIRED, 3-YEAR WARRANTY, UL LISTED, NEC COMPLIANT ELECTRICAL COMPONENTS, COMPLIANT TO NAECA, ASHRAE 90.1 AND ASHRAE 90A. 55 GALLON CAPACITY, 6.0 KW ELEMENT(S), 30 GPH RECOVERY RATE AT 80°F TEMPERATURE RISE. HEATING ELEMENTS RATED FOR LESS THAN 75 WATTS PER SQUARE INCH. ELECTRICAL REQUIREMENTS - 208V-3 PHASE HEATING CIRCUIT, 120V CONTROL CIRCUIT. DISCONNECTS BY EC. SET WATER TEMPERATURE AT 140°F.	A.O. SMITH (DEN-52), AMERICAN (ITCE31), BOCK (F SERIES), BRADFORD WHITE (M-II), RHEEM/RUUD (E SERIES), STATE (SSE), HTP (CGE SERIES HEAVY DUTY)
WHA-1	WATER HAMMER ARRESTOR - BELLOWS TYPE, PRE-CHARGED, ALL LEAD FREE STAINLESS STEEL CONSTRUCTION, ASSE 1010 APPROVED, PDI CERTIFIED, RATED FOR 1-11 FIXTURE UNITS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.	ZURN (Z1700), JR SMITH (5005-5050), WADE (W5-100), JOSAM (75000 SERIES), WATTS (SS), MIFAB (WHB)
WMF-1	WASHING MACHINE FIXTURE - PVC/PLASTIC ENCLOSURE, 2" CENTER DRAIN AND TRAP (LOCATED 18"-30" BELOW BOX) - TWO QUARTER-TURN ANGLE VALVES WITH 1/2" THREADED OUTLETS AND INTEGRAL WATER HAMMER ARRESTORS. PROVIDE FLEXIBLE WATER AND WASTE LINES FOR FINAL CONNECTION TO EQUIPMENT.	WATER-TITE (4700 HA SERIES), OATEY (38000 SERIES), SYMMONS (LM600A), GUY GRAY

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