

## MECHANICAL SYMBOLS LIST

AC-1 (TXF-1)	EQUIPMENT SYMBOL	CONTROLS AND SENSORS
	POINT OF NEW CONNECTION TO EXISTING	Ⓢ THERMOSTAT
AIR DEVICES		DUCTWORK
	CEILING DIFFUSER SUPPLY	===== AIR DUCT W/ 1.5" ACOUSTICAL LINING
	CEILING DIFFUSER RETURN	~ FLEXIBLE DUCT
DUCT ACCESSORIES		FC FC FLEXIBLE CONNECTION
	BACKDRAFT DAMPER	24X12 RECTANGULAR DUCT (WIDTH X DEPTH)
	VOLUME DAMPER W/ ACCESS DOOR	⊠ SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
	FIRE DAMPER W/ ACCESS DOOR	⊠ RETURN AIR RECTANGULAR DUCT CROSS SECTION

### MECHANICAL ABBREVIATIONS

AL	ACOUSTIC LINING
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
CFM	CUBIC FEET OF AIR PER MINUTE
COP	COEFFICIENT OF PERFORMANCE
EER	ENERGY EFFICIENCY RATIO
EN	ENERGY ANALYSIS
FC	FLEXIBLE CONNECTION
HSPF	HEATING SEASONAL PERFORMANCE FACTOR
EF	EXHAUST FAN
SEER	SEASONAL ENERGY EFFICIENCY RATIO
TEF	TOILET EXHAUST FAN
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
FD	FIRE DAMPER
MD	MOTORIZED DAMPER
OA	OUTSIDE AIR
RTU	ROOF TOP UNIT
RG	RETURN AIR GRILLE

### MECHANICAL DRAWING LIST

MO.1	MECHANICAL GENERAL NOTES, SYMBOLS LIST & ABBREVIATIONS
MO.2	MECHANICAL SPECIFICATIONS (1 OF 2)
MO.3	MECHANICAL SPECIFICATIONS (2 OF 2)
M1.1	MECHANICAL FLOOR & ROOF PLANS
M5.1	MECHANICAL DETAILS (1 OF 3)
M5.2	MECHANICAL DETAILS (2 OF 3)
M5.3	MECHANICAL DETAILS (3 OF 3)
M6.1	MECHANICAL SCHEDULES
M7.1	HOOD DATA
M8.1	HEAT LOAD CALCULATIONS REPORT (1 OF 2)
M8.2	HEAT LOAD CALCULATIONS REPORT (2 OF 2)

### 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:

- 2020 FLORIDA BUILDING CODE, BUILDING 7TH EDITION
- 2020 FLORIDA BUILDING CODE, MECHANICAL 7TH EDITION
- 2020 FLORIDA BUILDING CODE, PLUMBING 7TH EDITION
- 2020 FLORIDA BUILDING CODE, ENERGY CONSERVATION 7TH EDITION
- 2020 FLORIDA BUILDING CODE, FUEL GAS 7TH EDITION

## FLORIDA BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2020 FLORIDA BUILDING CODE; BASE CODE IBC 2018, AND ALL RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

- ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
- VENTILATION FOR ALL AREA SHALL COMPLY WITH 2020 FLORIDA MECHANICAL CODE, CHAPTER 4.
- AS PER C408.2.5 OF FLORIDA BUILDING CODE; BASE CODE FECC 2020, CONSTRUCTION DOCUMENT SHALL REQUIRE THAT, WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION BE PROVIDED TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER.
- AS PER C408.3.2 OF FLORIDA BUILDING CODE; BASE CODE FECC 2020, CONSTRUCTION DOCUMENT SHALL REQUIRE THAT AN OPERATING MANUAL AND A MAINTAINED MANUAL BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE 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 FLORIDA BUILDING CODE; BASE CODE FBC 2020, REQUIREMENTS AS OUTLINES IN SECTION.
- 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 THE FOLLOWING SECTIONS OF FLORIDA BUILDING CODE; BASE CODE FMC 2020 CHAPTER 4 AND CHAPTER 5:
  - MECHANICAL VENTILATION – SECTION 403.
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
  - STANDARDS OF HEATING – FLORIDA BUILDING CODE; BASE CODE FMC 2020.
  - DUCT CONSTRUCTION AND INSTALLATION—SECTION 603 OF FLORIDA BUILDING CODE; BASE CODE FMC 2020.
  - AIR INTAKES, EXHAUSTS AND RELIEF—SECTION 401 OF FLORIDA BUILDING CODE; BASE CODE FMC 2020.
  - AIR FILTERS –SECTION 605 OF FLORIDA BUILDING CODE; BASE CODE FMC 2020.
  - MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS –SECTION 513 OF FLORIDA BUILDING CODE; BASE CODE FMC 2020.
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- 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.

## 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.
- 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 SHUTDOWN TIME.

- 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. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. 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 (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
- WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
- 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 FLOW 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.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
- SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
- ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.
- INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
- SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES, WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
- WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY.

### DEFINITIONS:

- "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- "FURNISH" OR "SUPPLY": TO PURCHASE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

## 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 PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RF'IS, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A 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 WORK SHALL BE DONE AS DIRECTED BY THE OWNER. 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.

### THERMOSTATIC CONTROLS:

#### C403.2.4.1 GENERAL (MANDATORY):

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:

- 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).
- 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 (MANDATORY)
 

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.
  - C403.2.4.1.2 DEADBAND (MANDATORY)
 

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:

- THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
- OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.
  - C403.2.4.1.3 SETPOINT OVERLAP RESTRICTION (MANDATORY)
 

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 C403.4.1.2.
  - C403.2.4.2 OFF-HOUR CONTROLS (MANDATORY)
 

EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.

### EXCEPTIONS:

- ZONES THAT WILL BE OPERATED CONTINUOUSLY.
- ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.
  - C403.2.4.2.1 THERMOSTATIC SETBACK (MANDATORY)
 

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 (MANDATORY)
 

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 (MANDATORY)
 

AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

## GENERAL HVAC 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.
- 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.
- LOCATE ALL TEMPERATURE, 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.
- 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 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.
- 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.
- ALL CONDENSATE DRAIN LINES FROM EACH ROOF TOP UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.
- REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.
- ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
- TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.

### HVAC DUCTWORK - SHEET METAL

- CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.
- CONTRACTOR TO CHECK AND CORRECT ANY AND ALL DEFICIENCIES IN EXISTING DUCTS. ALL NEW DUCTWORK WILL COMPLY WITH THE LATEST SMACNA GUIDELINES AND CONFORM WITH REQUIREMENTS OF THE LATEST HANDBOOKS PUBLISHED BY ASHRAE.
- PROVIDE VOLUME DAMPER AT EACH TAP TO MAIN DUCT AND WHERE NECESSARY TO PROPERLY BALANCE SYSTEM.
- SUPPLY AND RETURN DUCTWORK 20' FROM ALL HVAC UNITS SHALL BE LINED WITH 1.5" ACOUSTICAL LINING.
- RE-INSULATE ALL DUCTWORK AND PIPING IN WHICH INSULATION HAS BEEN REMOVED OR DAMAGED WITH INSULATION EQUAL TO THE EXISTING INSULATION.
- CONTRACTOR SHALL SUPPLY AND INSTALL ALL NECESSARY SUPPLY DIFFUSERS AND RETURN AIR REGISTERS WHERE INDICATED ON THE DRAWING. COORDINATE LOCATION OF DIFFUSERS AND REGISTERS WITH REFLECTED CEILING PLAN.
- IN CORRIDORS WHERE CEILING SPEAKERS AND AIR DIFFUSERS ARE INDICATED BETWEEN THE SAME LIGHT FIXTURES, INSTALL BOTH DEVICES AT THE QUARTER POINTS BETWEEN THE FIXTURES.
- UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 4'-0" (CENTER LINE) ABOVE THE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE PRECEDING LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.
- ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.
- ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.
- PROVIDE ALL 90-DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN DISHWASHER, KITCHEN, AND LAUNDRY EXHAUSTS SHALL BE OF UN-VANED SMOOTH RADIUS CONSTRUCTION WITH A RADIUS EQUAL TO 1-1/2 TIMES THE WIDTH OF THE DUCT. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.
- COORDINATE DIFFUSER, REGISTER, AND GRILL LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.
- ALL AIR HANDLING UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.
- LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVING.
- PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN, AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS, AND OTHER EQUIPMENT THAT REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.
- UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF NEEDED.
- RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FT.
- ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.
- PROVIDE ACCESS DOORS IN DUCTWORK FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.
- ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING STRAPS. GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.
- SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MOUNTING THE SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.
- SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

## SPECIFICATIONS

### SECTION 0001 - NOTICE TO BIDDERS

- BIDDERS REPRESENTATIONS
  - 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.
    - THE BID IS MADE IN COMPLIANCE WITH THE BIDDING DOCUMENTS.
    - 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.
    - 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.
    - THE BID IS BASED UPON THE MATERIALS, EQUIPMENT AND SYSTEMS REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION.
- EXISTING CONDITIONS AND COORDINATION
  - 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.
  - THE BIDDER SHALL PROPOSE COORDINATION OF WORK SUCH THAT CONFLICTS WITH OTHER TRADES AND SPACE ALLOCATIONS ARE AVOIDED.
- RESPONSIBILITIES
  - 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.
  - 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.
  - 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

- WORKMANSHIP
  - ALL WORK SHALL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.
  - 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.
  - UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL REMOVE FROM THE SITE, ALL TOOLS, DEMOLISHED APPLIANCES AND ANY SURPLUS MATERIAL.
- CODE COMPLIANCE
  - ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.

### END OF SECTION 0101

### SECTION 0102 - REQUIRED DOCUMENTS

- SHOP DRAWINGS
  - 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.
- SUBMITTALS
  - 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.
- RECORD DRAWINGS
  - 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.
- EQUIPMENT OPERATING INSTRUCTIONS
  - 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.
  - 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.
  - 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 078413 - PENETRATION FIRE-STOPPING

- QUALITY ASSURANCE
  - INSTALLER QUALIFICATIONS: AN FM GLOBAL-APPROVED FIRE-STOP CONTRACTOR OR A UL-QUALIFIED FIRE-STOP CONTRACTOR.
  - FIRE-TEST-RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL
- PENETRATION FIRESTOPPING
  - PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: F-RATINGS PER ASTM E 814 OR UL 1479.
  - PENETRATIONS IN HORIZONTAL ASSEMBLIES: F- AND T-RATINGS PER ASTM E 814 OR UL 1479:
  - PENETRATIONS IN SMOKE BARRIERS: L-RATINGS PER UL 1479.
  - W-RATINGS: PER UL 1479.
- INSTALLATION
  - IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.
- FIELD QUALITY CONTROL
  - INSPECTION OF INSTALLED FIRE-STOPPING: BY OWNER-ENGAGED AGENCY ACCORDING TO ASTM E 2174.
- THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

WHERE UL-CLASSIFIED SYSTEMS ARE INDICATED, THEY REFER TO SYSTEM NUMBERS IN UL'S "FIRE RESISTANCE DIRECTORY" UNDER PRODUCT CATEGORY XHEZ.

### FOR THE FOLLOWING SYSTEMS:

- METALLIC AND NON-METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED PIPES, GROUPINGS OF PENETRANTS, USE ON OR MORE THE FOLLOWING MATERIALS:
- LATEX SEALANT
  - SILICONE SEALANT
  - INTUMESCENT PUTTY
  - MORTAR
  - SILICONE FOAM
  - PILLOWS/BAGS
  - INTUMESCENT WRAP STRIPS
  - INTUMESCENT COMPOSITE SHEET

### 1.6 MANUFACTURERS

- HILTI CONSTRUCTION CHEMICAL, INC
- TREMCO INC.
- 3M FIRE PROTECTION PRODUCTS

### END OF SECTION 078413

### SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

#### 1.1 PERFORMANCE REQUIREMENTS

- 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.
- 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.
  - DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
  - DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND 3.DESIGN SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.

#### 1.2 SUBMITTALS

- SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER

#### 1.3 QUALITY ASSURANCE

- AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE - STEEL."

#### 1.4 COMPONENTS

- METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL
- TRAPEZE PIPE HANGERS: CARBON OR STAINLESS STEEL
- FIBERGLASS PIPE HANGERS: -CLEVIS, CENTURY COMPOSITES, COOPER B-LINE
- METAL FRAMING SYSTEMS: MFMA MANUFACTURER
- FIBERGLASS STRUT SYSTEMS: COOPER B-LINE
- THERMAL-HANGER SHIELD INSERTS:
- FASTENER SYSTEMS: POWDER-ACTUATED FASTENERS OR MECHANICAL-EXPANSION ANCHORS
- PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB-MOUNTED TYPE
- EQUIPMENT SUPPORTS.

### END OF SECTION 230529

### SECTION 230548 - VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

#### PART 1 - GENERAL

##### 1.1 COMPONENTS

- VIBRATION ISOLATORS:

- ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
- MOUNTS: DOUBLE-DEFLECTION TYPE.
- RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
- SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
- RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
- HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
- ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
- SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
- SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
- PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
- RESILIENT PIPE GUIDES.
  - AIR-MOUNTING SYSTEMS:
    - AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWES.
    - RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWES.
  - 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 SNUBBER BUSHINGS.
  - VIBRATION ISOLATION EQUIPMENT BASES:
    - STEEL BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS.
    - INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE
- FIELD QUALITY CONTROL
  - TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.

#### PART-2 PRODUCTS

##### 1.1 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES

- 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:
  - ACE MOUNTINGS CO., INC.
  - AMBER/BOOTH COMPANY, INC.
  - CALIFORNIA DYNAMICS CORPORATION.
  - HILTI, INC.
  - ISOLATION TECHNOLOGY, INC.
  - KINETICS NOISE CONTROL.
  - LOOS & CO.; CABLEWARE DIVISION.
  - MASON INDUSTRIES.
  - TOLCO INCORPORATED; A BRAND OF NIBCO INC.
  - UNISTRUT; TYCO INTERNATIONAL, LTD.

### END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

- 1.1 SUMMARY
A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
1. AIR SYSTEMS: CONSTANT VOLUME.
2. MOTORS.

- 1.2 QUALITY ASSURANCE
A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS.

- 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.
B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE.
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.
F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER.
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:
SUPPLY RETURN
UNCONDITIONED SPACES WITHIN BUILDING: R-6 R-4.2
WITHIN BUILDING ENVELOPE ASSEMBLY: R-6 R-4.2
OUTSIDE OF BUILDING: R-6 R-4.2

- 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 230713

SECTION 233113 - METAL DUCTS

- 1.1 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. USE ELBOWS AND TEES WITH A CENTER LINE RADIUS TO WIDTH OR DIAMETER RATIO OF 1.5 WHEREVER SPACE PERMITS. WHEN A SHORTER RADIUS MUST BE USED DUE TO LIMITED SPACE, INSTALL SINGLE WALL SHEET METAL SPLITTER VANES IN ACCORDANCE WITH SMACNA PUBLICATIONS, TYPE RE 3. WHERE SPACE WILL NOT ALLOW AND THE C VALUE OF THE RADIUS ELBOW, AS GIVEN IN SMACNA PUBLICATIONS, EXCEEDS 0.31, USE RECTANGULAR ELBOWS WITH TURNING VANES AS SPECIFIED IN SECTION 23 33 00. SQUARE THROAT-RADIUS HEEL ELBOWS WILL NOT BE ACCEPTABLE. STRAIGHT TAPS OR BULLHEAD TEES ARE NOT ACCEPTABLE.
4. WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE TURNING VANES IN ACCORDANCE WITH SECTION 23 33 00.
5. PROVIDE EXPANDED TAKE-OFFS OR 45 DEGREE ENTRY FITTINGS FOR BRANCH DUCT CONNECTIONS WITH BRANCH DUCTWORK AIRFLOW VELOCITIES GREATER THAN 700 FPM. SQUARE EDGE 90-DEGREE TAKE-OFF FITTINGS OR TRIGHT TAPS WILL NOT BE ACCEPTED.
6. BUTTON PUNCH SNAP-LOCK CONSTRUCTION WILL NOT BE ACCEPTED ON ALUMINUM DUCTWORK.
7. ROUND DUCTS MAY BE SUBSTITUTED FOR RECTANGULAR DUCTS IF SIZED IN ACCORDANCE WITH ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY WRITTEN PERMISSION OF THE ENGINEER.

- 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:

Table with 4 columns: USG, MAX. SIDE INCHES, TRANSVERSE JOINTS AND BRACING, and a description of the duct size and bracing requirements.

- 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 UNITS.
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:
B. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

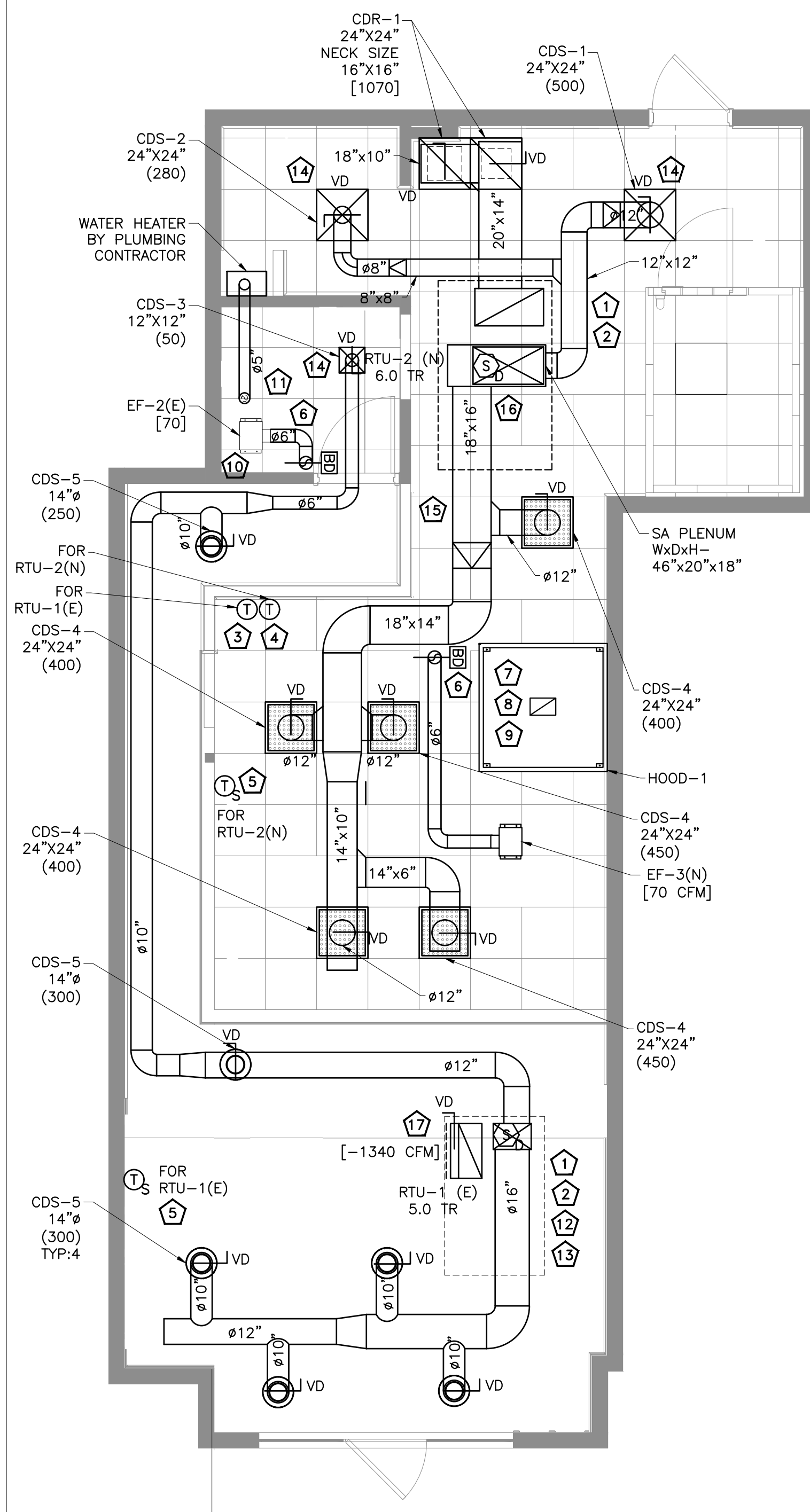
SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS

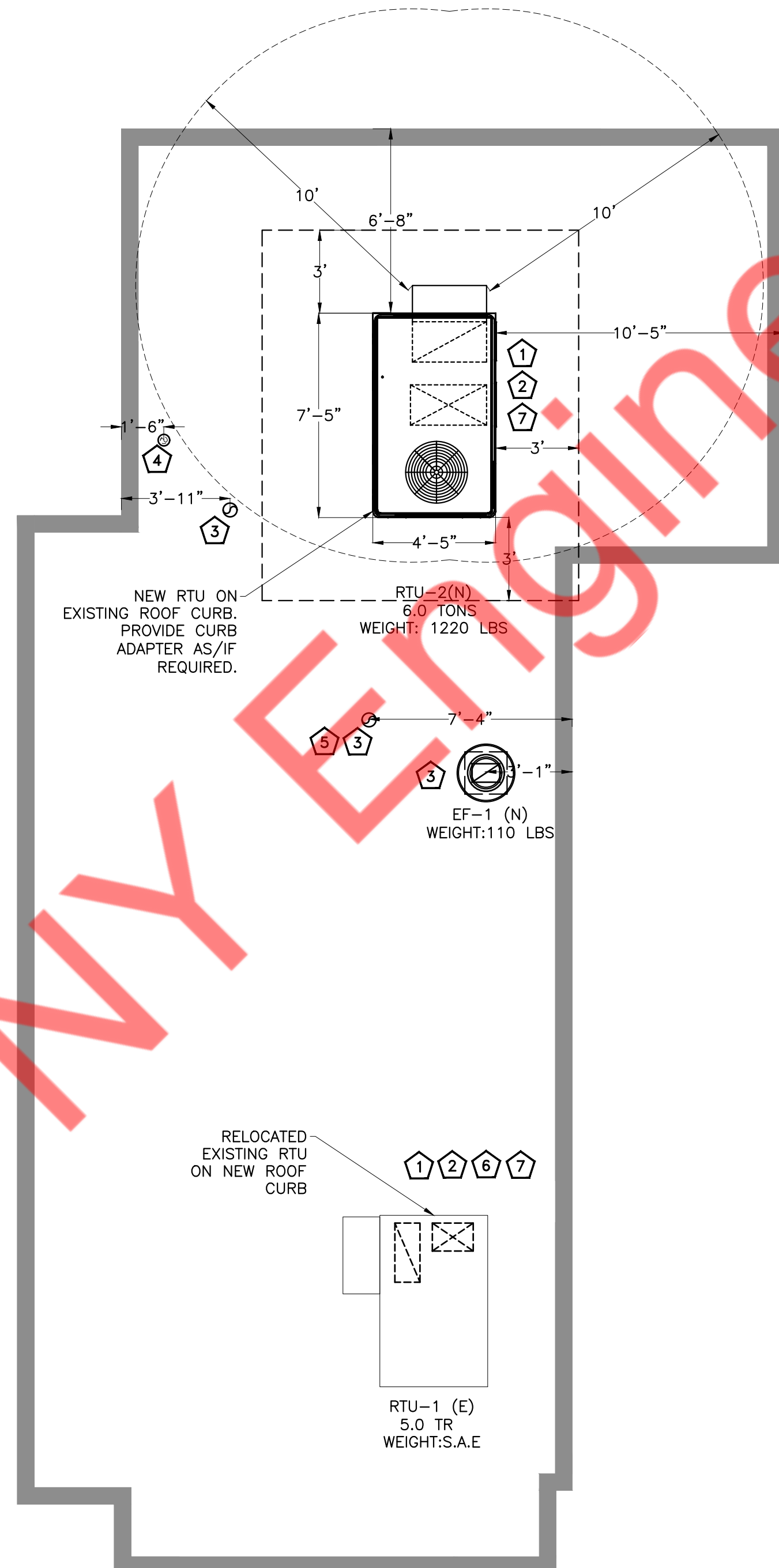
- A. DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.
B. MANUFACTURERS: TITUS
1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:
a. CARNES.
b. HART & COOLEY INC.
c. KRUEGER.

END OF SECTION 233713

- 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.



- MECHANICAL GENERAL NOTES**
- CONTRACTOR SHALL BALANCE EACH AIR DIFFUSER WITH THE CFM SHOWN ON PLANS.
  - DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR DUCTWORK ROUTING, OFFSET AND RUN DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.
  - EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
  - DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
  - CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
  - CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
  - ALL EXPOSED DUCTWORK SHALL BE AS SHOWN, DOUBLE WALL, INSULATED METAL, PRIMED FOR PAINTING. ALL CONCEALED DUCTWORK SHALL BE INSULATED METAL RECTANGULAR UNLESS OTHERWISE ALLOWED IN WRITING BY THE ENGINEER OF RECORD. COORDINATE FINAL FINISH WITH ARCHITECT.
  - 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.
  - FOR EXPOSED DUCTWORK, PROVIDE INTERNAL INSULATION. FOR CONCEALED DUCTWORK PROVIDE EXTERNAL INSULATION.
  - PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATINGS OF THE WALLS.
- MECHANICAL FLOOR PLAN KEYNOTES:**
- COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL REQUIREMENTS.
  - EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM ROOFTOP UNITS TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE. THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
  - RELOCATE AND REUSE EXISTING THERMOSTAT. IF EXISTING THERMOSTAT IS NOT PRESENT, THEN INSTALL AND WIRE NEW 7-DAY PROGRAMMABLE THERMOSTAT. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
  - INSTALL AND WIRE NEW 7-DAY PROGRAMMABLE THERMOSTAT. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
  - TEMPERATURE SENSOR FOR THERMOSTAT SERVING DESIGNATED RTU.
  - ROUTE 6" EXHAUST DUCT UP THROUGH ROOF WITH TALL CONE FLASHING, WEATHER SKIRT, AND VENT CAP. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AIR INTAKES AND TERMINATES.
  - INSTALL EXHAUST HOOD. SUPPORT HOOD PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE TRAPEZE HANGERS FOR ALL THREAD SUPPORT UNDER DUCTWORK AS REQUIRED. TRANSITION FROM HOOD CONNECTION TO WELDED KITCHEN EXHAUST DUCT SIZES SHOWN.
  - DUCT TO BE PROVIDED WITH KITCHEN EQUIPMENT AND INSTALLED BY MECHANICAL CONTRACTOR. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
  - 12"x8" GREASE EXHAUST DUCT FROM HOOD UP THRU ROOF TO EF-1(N).
  - CEILING MOUNTED EXHAUST FAN INTERLOCKED WITH RTU-2(N).
  - 3"/85" CONCENTRIC VENT FROM HOT WATER HEATERS. TERMINATE VENT AT LEAST 36" ABOVE ROOF. INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS.
  - EXISTING EQUIPMENT TO REMAIN SAME AND TO BE REUSED WITH ALL ITS EXISTING ACCESSORIES. CONTRACTOR TO FIELD VERIFY LOCATION OF THE EQUIPMENT ON SITE & INFORM TO ARCHITECT IF ANY ACCESSORIES NOT WORKING OR NOT IN GOOD CONDITION.
  - RELOCATE AND REUSE EXISTING SMOKE DETECTOR. IF IT IS NOT PRESENT THEN, PROVIDE NEW ONE. SMOKE DETECTOR SHALL BE FURNISHED/INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR TO SHUT DOWN CORRESPONDING RTU UNDER ALARM CONDITIONS. ALL WIRING SHALL BE IN CONDUIT PER N E C SMOKE DETECTOR SHALL BE SYSTEM SENSOR MODEL DH100ACDCLP OR EQUAL.
  - EXISTING DIFFUSER TO BE RELOCATED AND REUSED.
  - CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK, ASSOCIATED ACCESSORIES, REUSE EXISTING DUCTWORK AS MUCH AS POSSIBLE. IF DAMAGED REPLACE WITH SIMILAR KIND OR AS PER DRAWING.
  - SMOKE DETECTOR SHALL BE FURNISHED/INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR TO SHUT DOWN CORRESPONDING RTU UNDER ALARM CONDITIONS. ALL WIRING SHALL BE IN CONDUIT PER N E C.
  - FULL SIZE RETURN AIR DUCT WITH W.M.S.

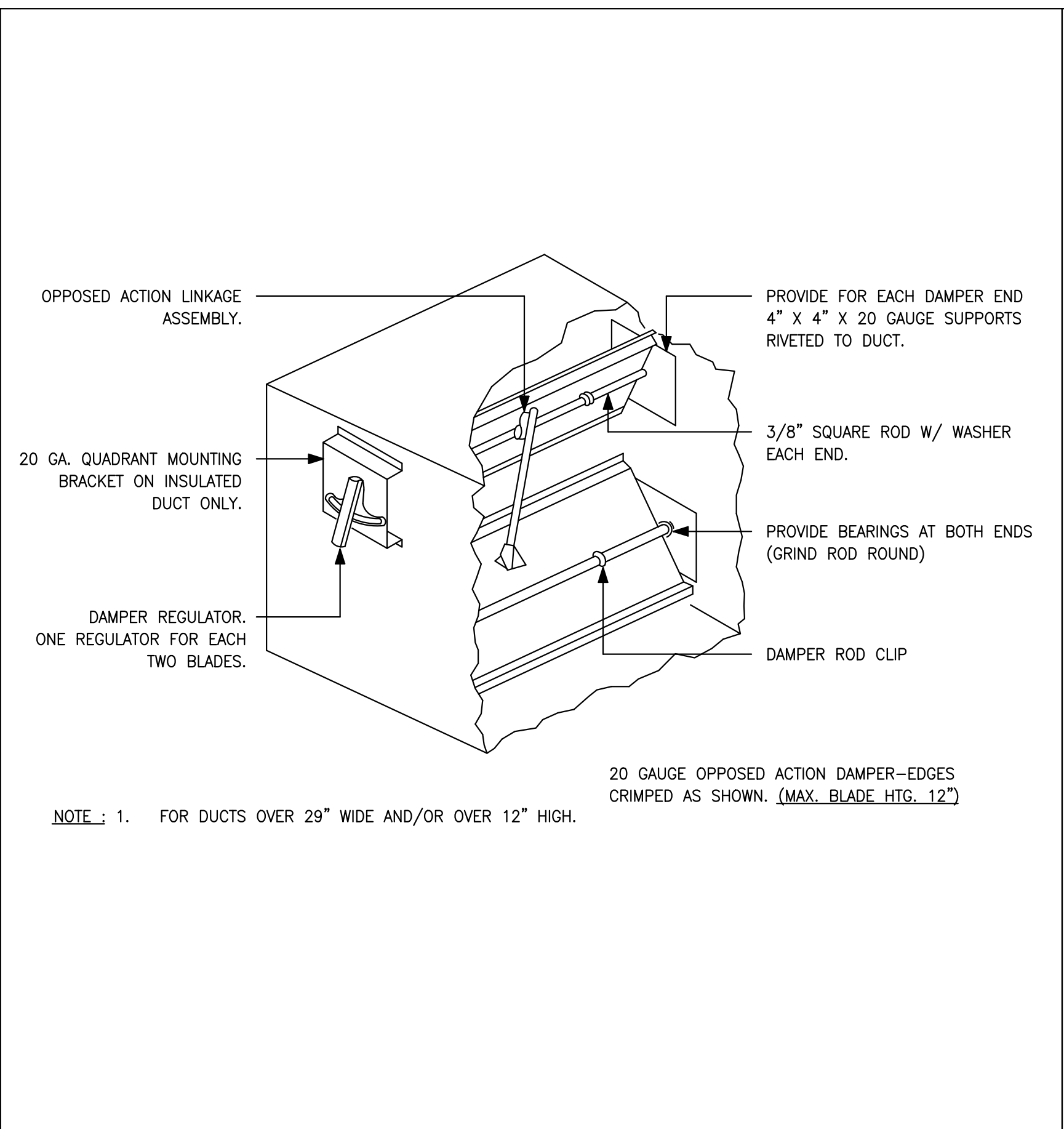


- MECHANICAL GENERAL NOTES**
- COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
  - ALL ITEMS TO BE RE-USED OR RELOCATED SHALL BE CLEANED, REPAIRED, AND RESTORED TO LIKE NEW CONDITION PRIOR TO RE-USE.
  - EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
  - CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
  - CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
  - COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.
  - 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.

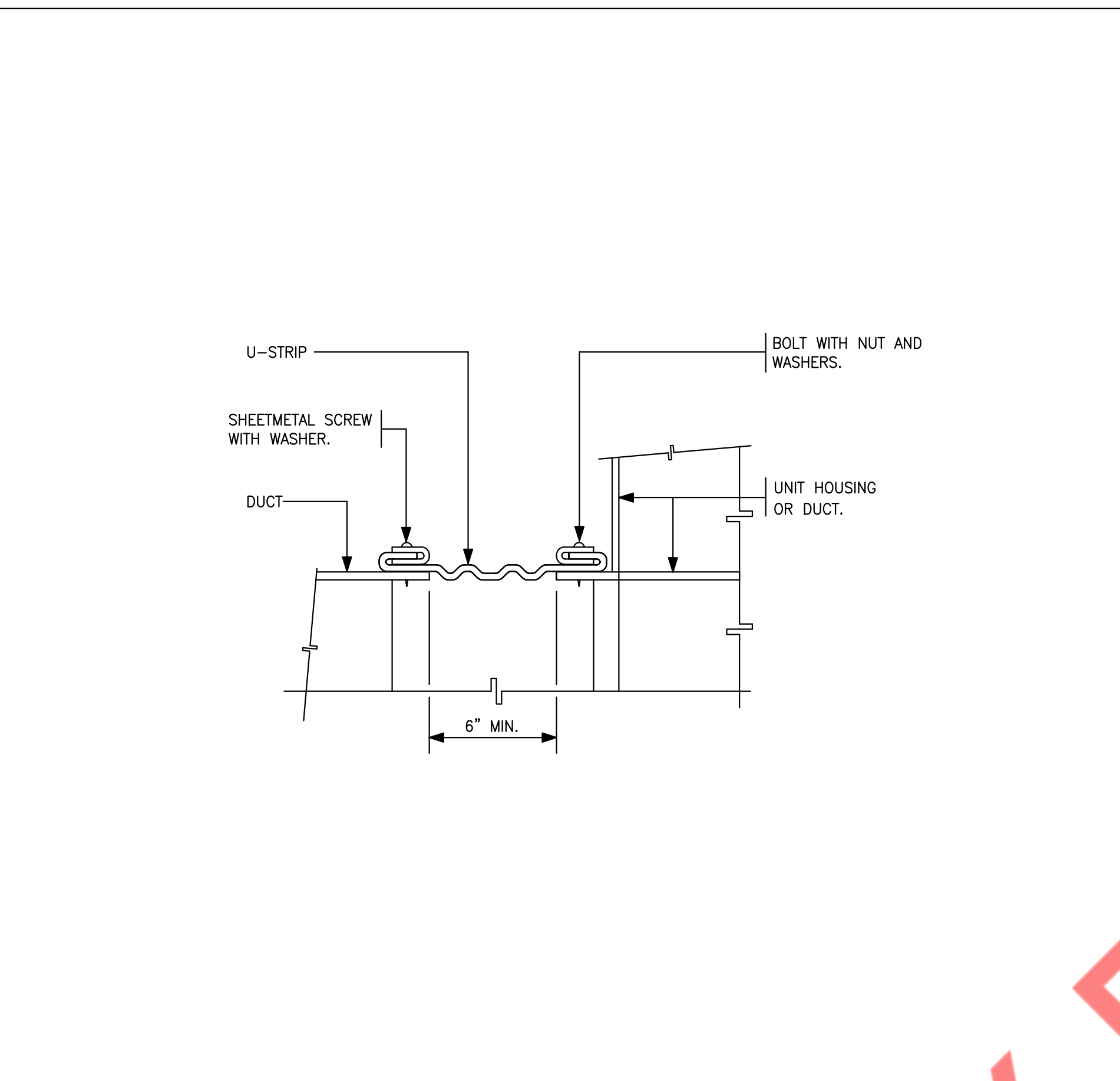
- MECHANICAL ROOF PLAN KEYNOTES:**
- COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL DRAWINGS/ENGINEER OR LANDLORD/CLIENT.
  - CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY EXHAUST SOURCE FROM ADJACENT TENANTS SHOULD BE AT LEAST 10' AWAY FROM THE RTU-2(N) & RTU-1(E).
  - CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY INTAKE SOURCE FROM ADJACENT TENANTS SHOULD BE AT LEAST 10' AWAY FROM THE EXHAUST DUCT TERMINATING ON ROOF.
  - 3"/85" CONCENTRIC VENT FROM HOT WATER HEATERS. TERMINATE VENT AT LEAST 36" ABOVE ROOF. INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS.
  - 6" EXHAUST DUCT UP THROUGH ROOF WITH TALL CONE FLASHING, WEATHER SKIRT, AND VENT CAP. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AIR INTAKES.
  - EXISTING EQUIPMENT TO REMAIN SAME AND TO BE REUSED WITH ALL ITS EXISTING ACCESSORIES. CONTRACTOR TO FIELD VERIFY LOCATION OF THE EQUIPMENT ON SITE & INFORM TO ARCHITECT IF ANY ACCESSORIES NOT WORKING OR NOT IN GOOD CONDITION.
  - CONTRACTOR TO RUN CONDENSATE DRAIN FROM RTU'S TO SINK TAIL PIECE CONNECTION OR NEAREST ROOF DRAIN.

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

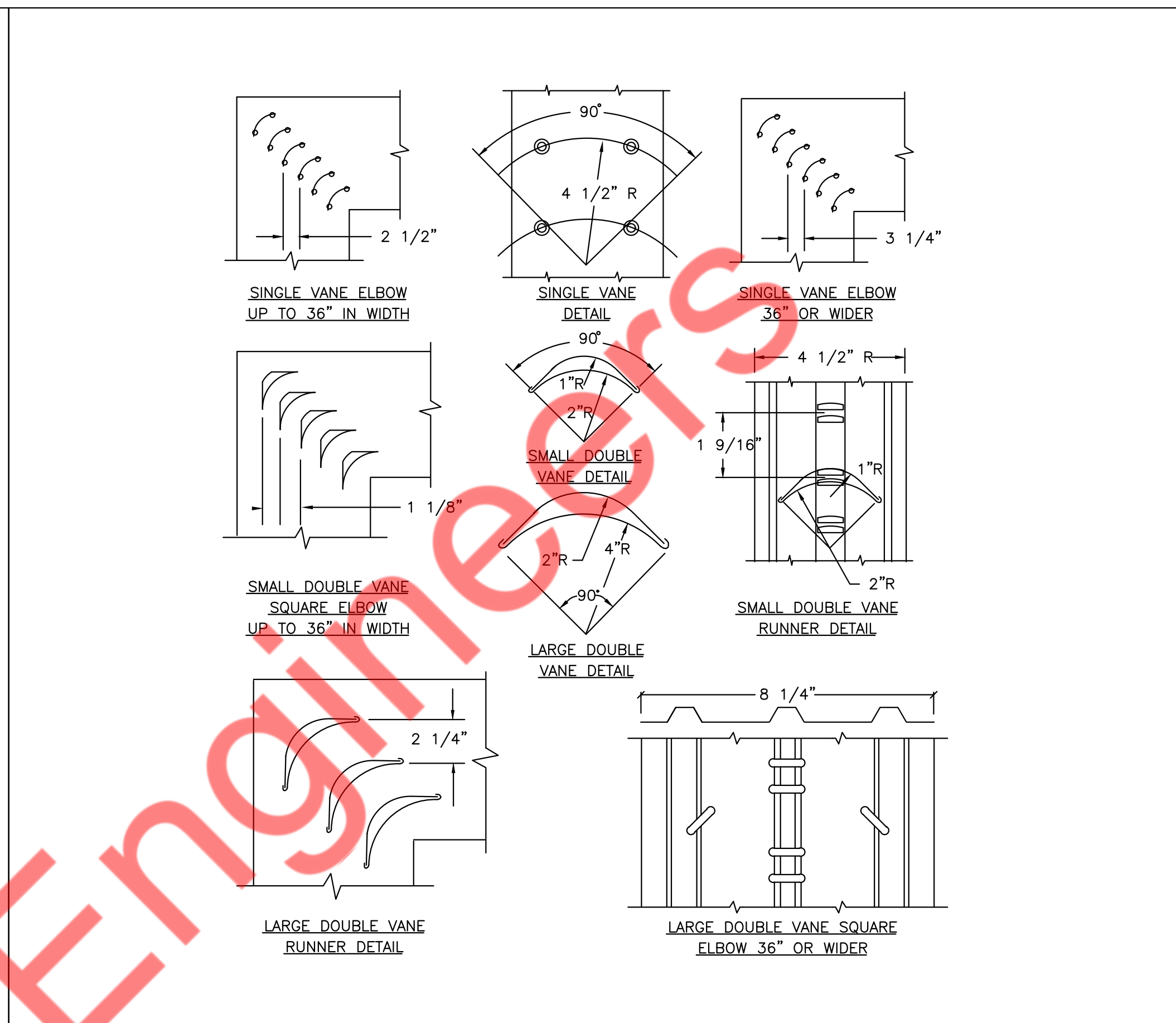
2 MECHANICAL ROOF PLAN  
1/4"=1'-0"



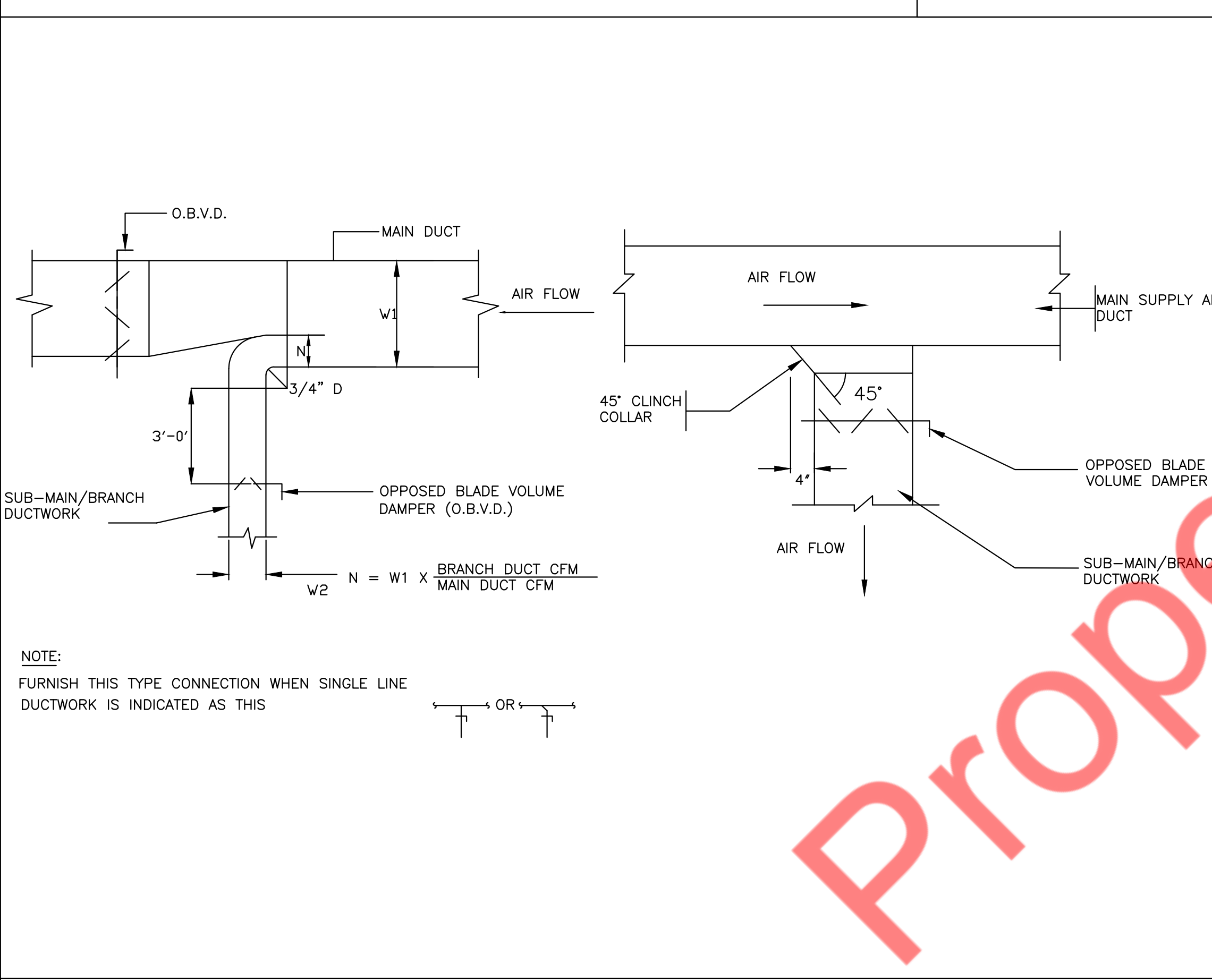
1 LOW PRESSURE BALANCING DAMPER  
M5.1 N.T.S



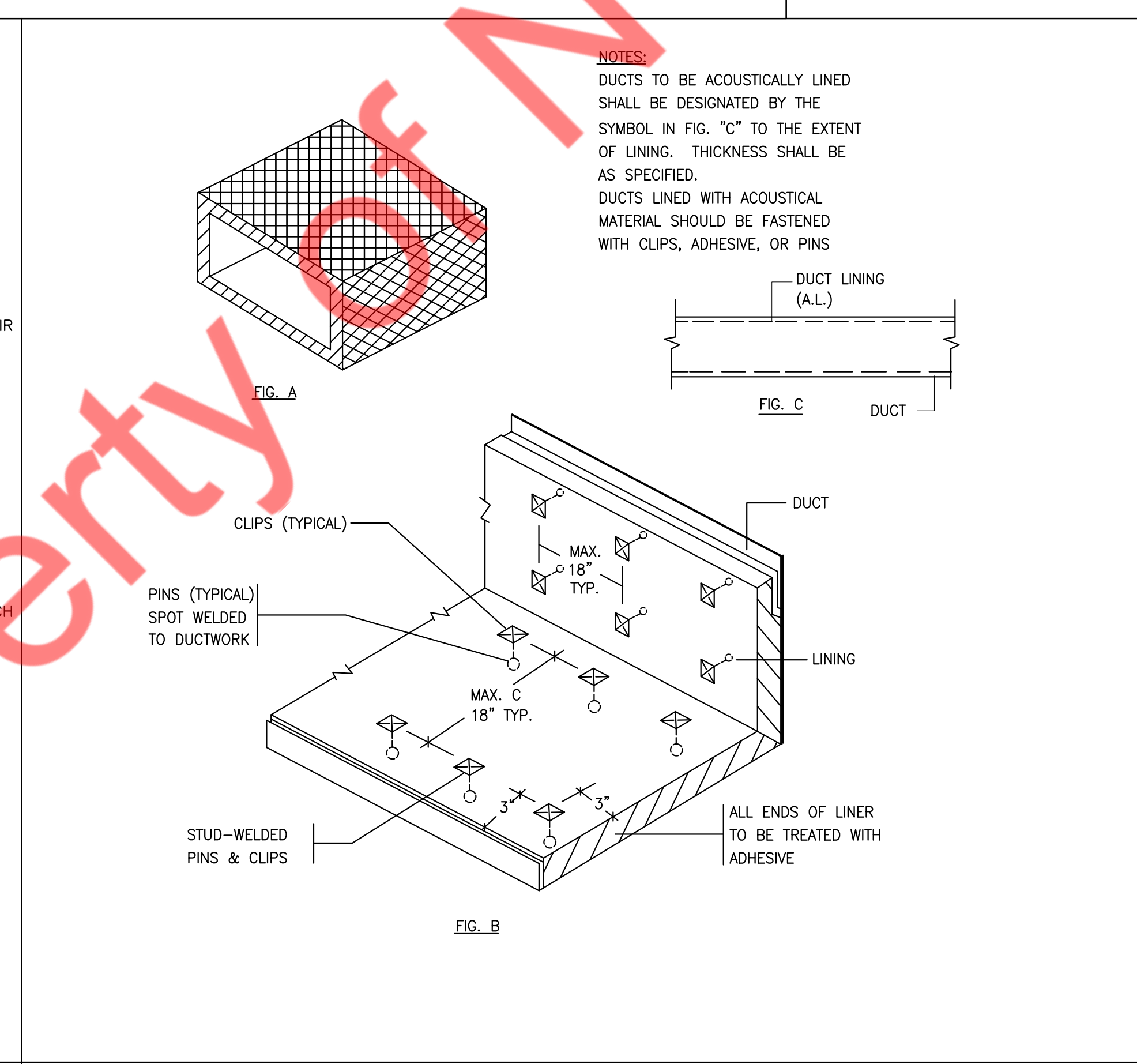
2 FLEXIBLE CONNECTION (DUCT-EQUIPMENT)  
M5.1 N.T.S



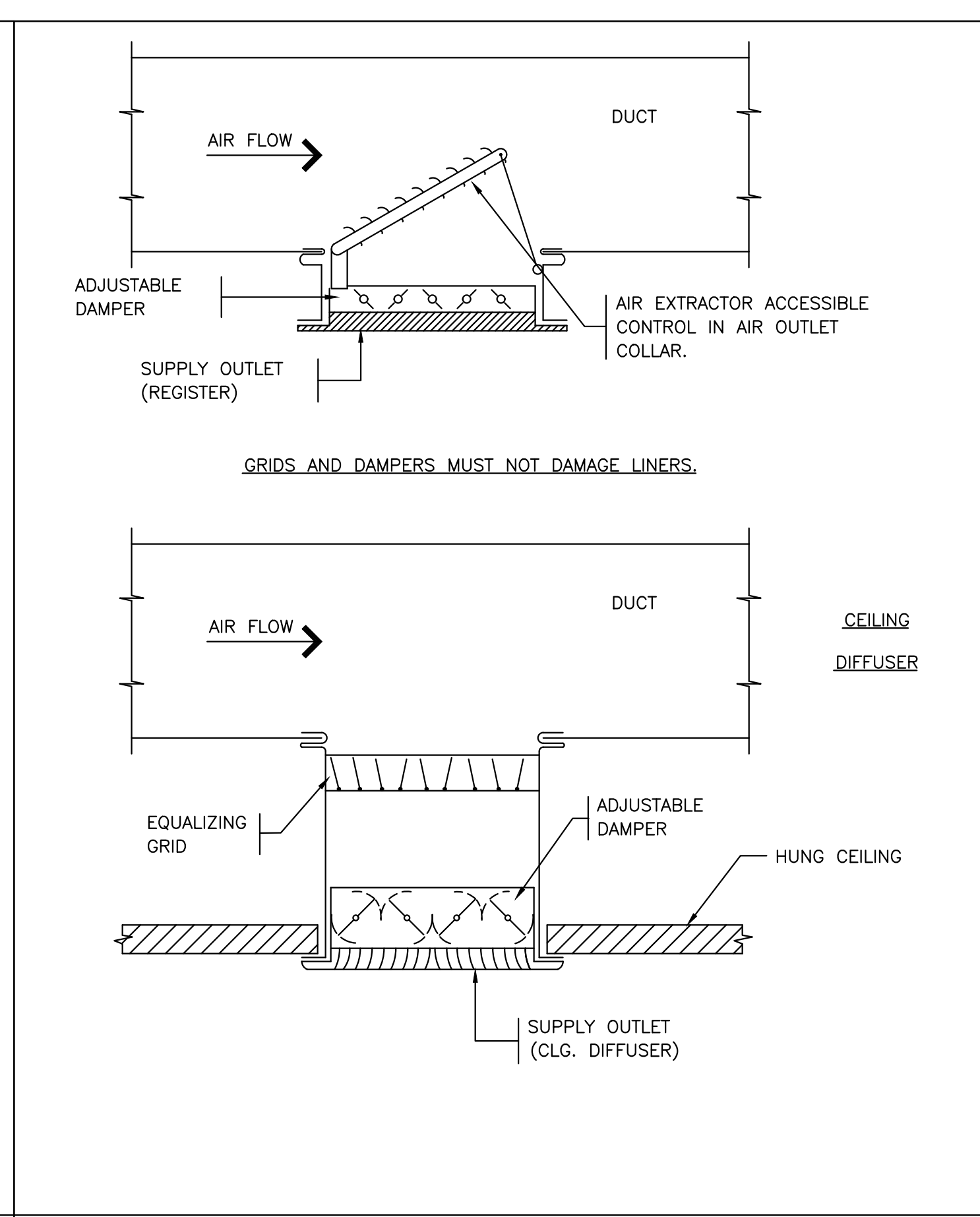
3 LOW VELOCITY DUCTWORK ELBOWS  
M5.1 N.T.S



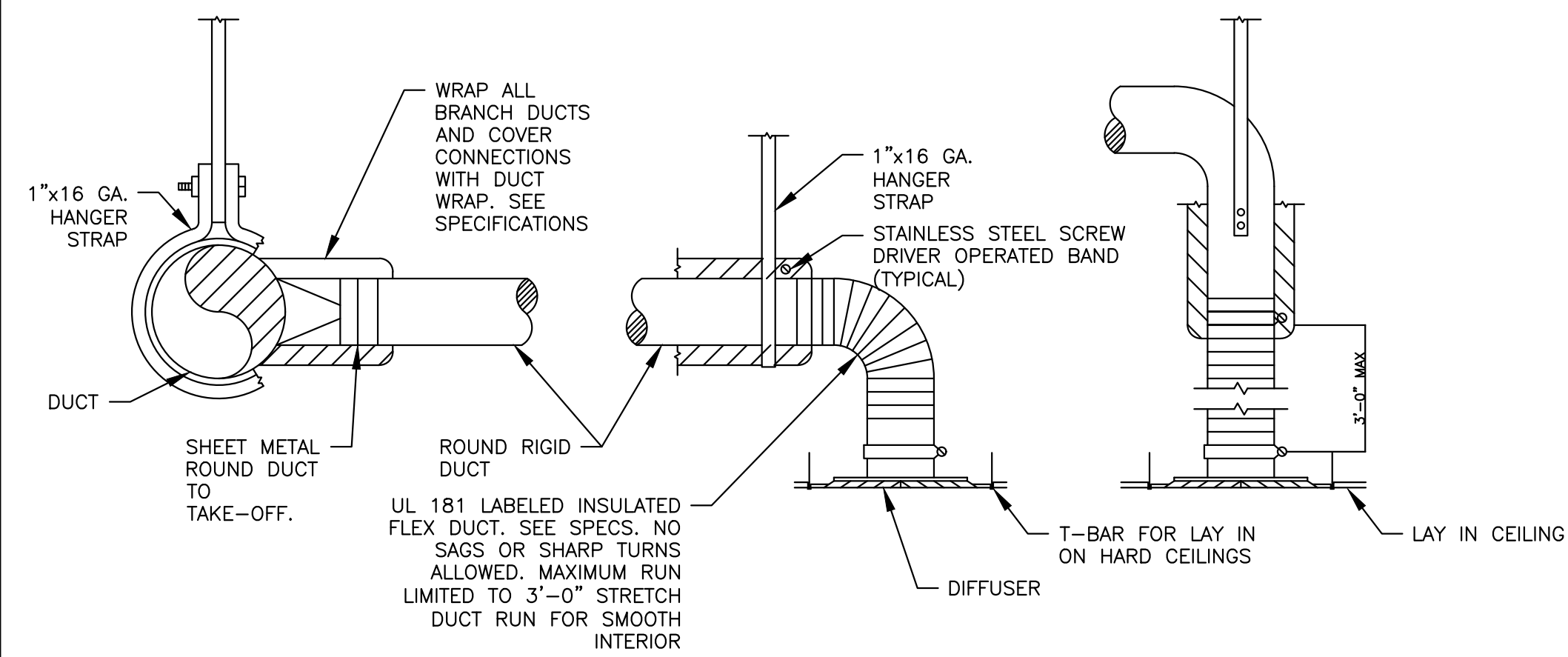
4 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION  
M5.1 N.T.S



5 ACOUSTICAL TREATMENT DUCT LINING  
M5.1 N.T.S



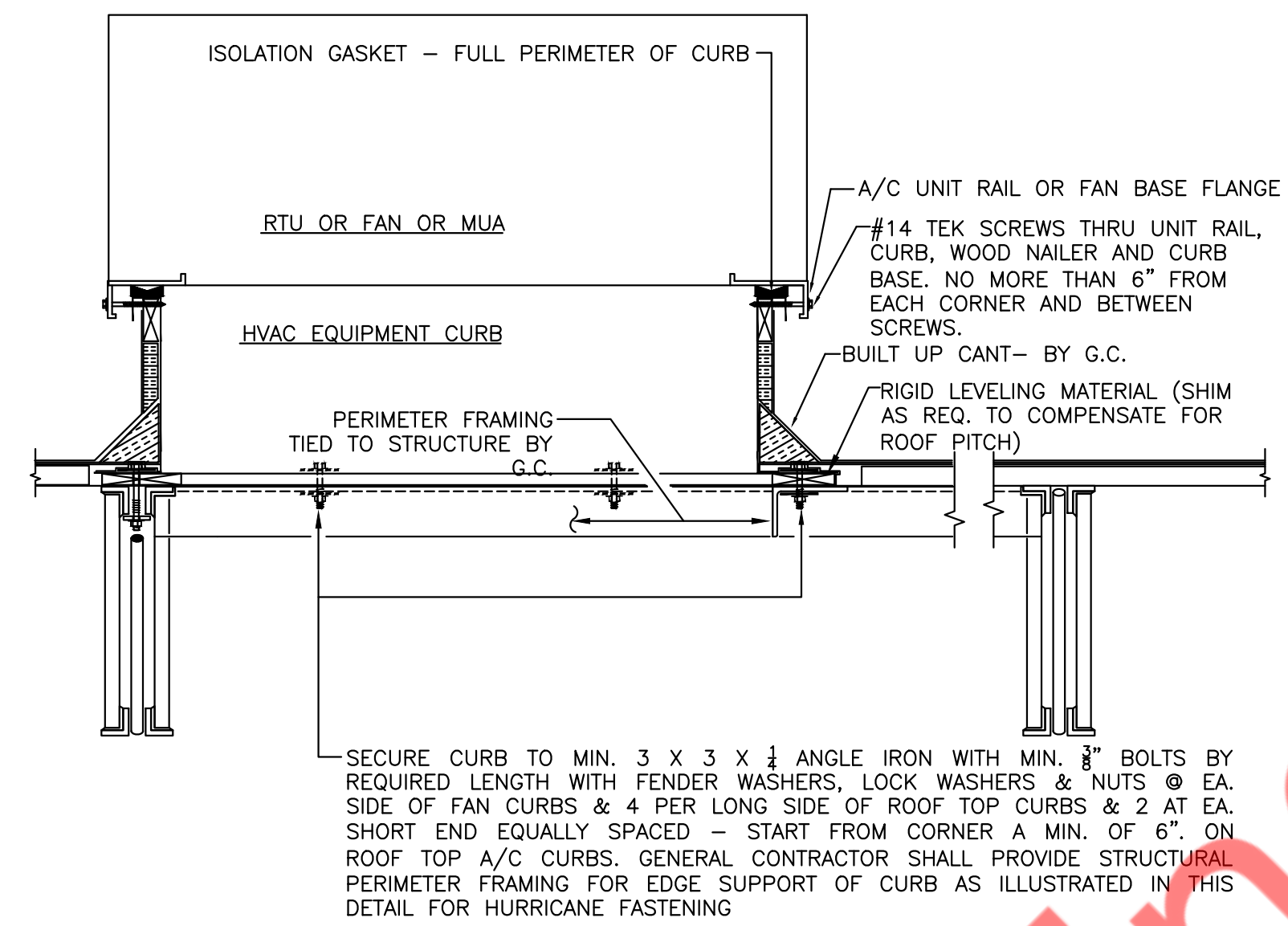
6 DIFFUSER AND GRILLE REGISTER CONNECTIONS  
M5.1 N.T.S



NOTES:

1. ALL JOINTS, SEAMS AND CONNECTIONS FOR DUCTS WILL BE IN ACCORDANCE WITH SECTION C403.2.9 OF FBCEC 2020 AND SECTION 603 OF FBCEC 2020

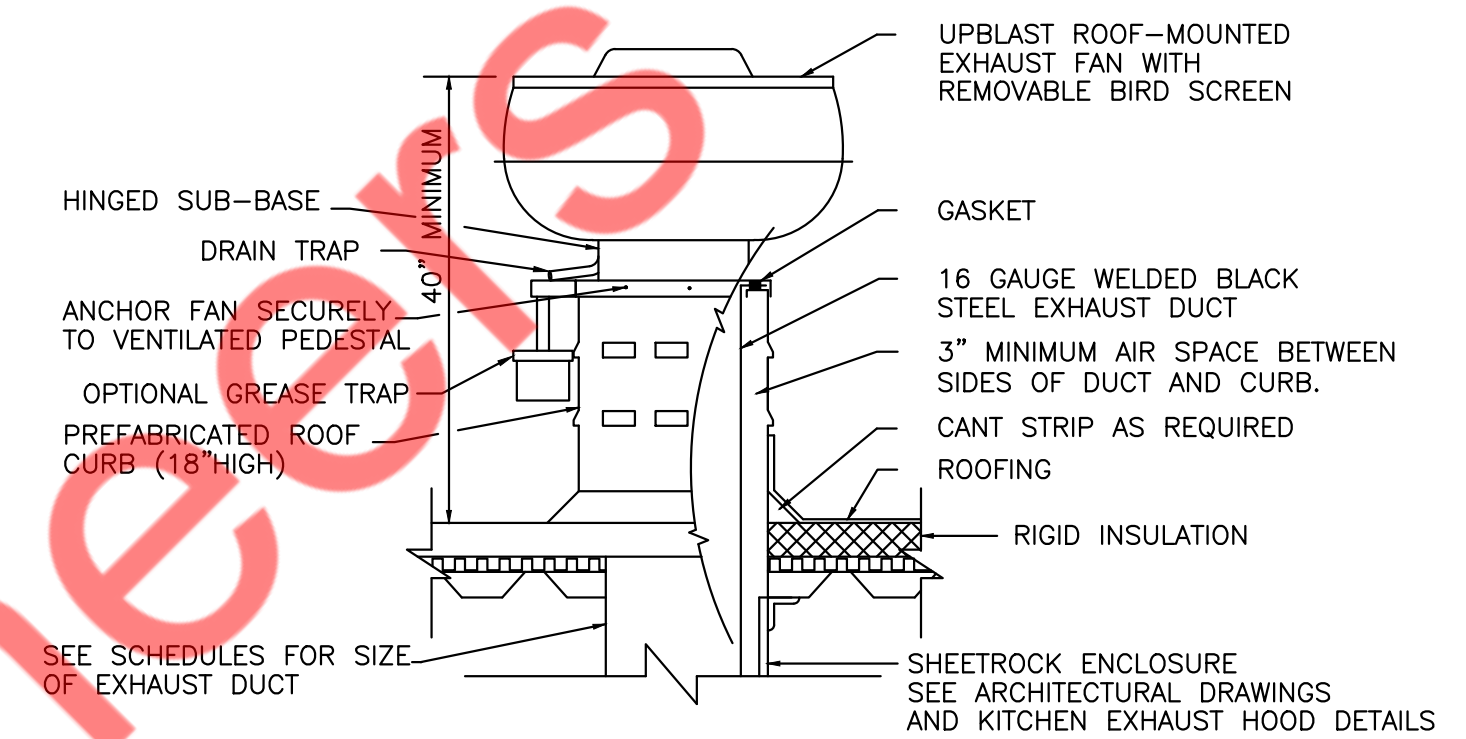
1 TYPICAL DIFFUSER CONNECTION DETAIL  
M5.2 N.T.S



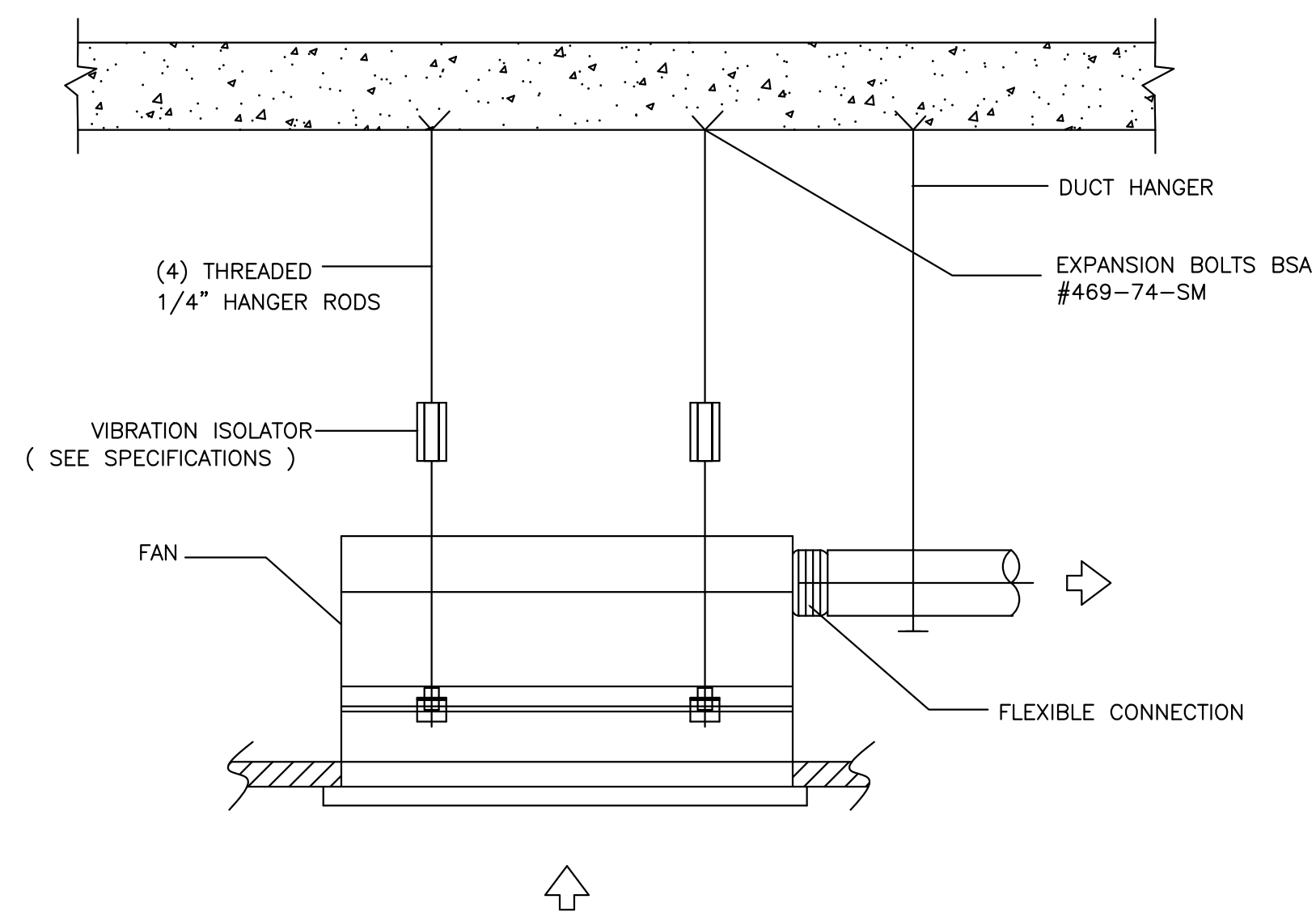
ACCEPTABLE FOR 170 MPH ZONE

VERIFY ON SITE WITH GENERAL CONTRACTOR

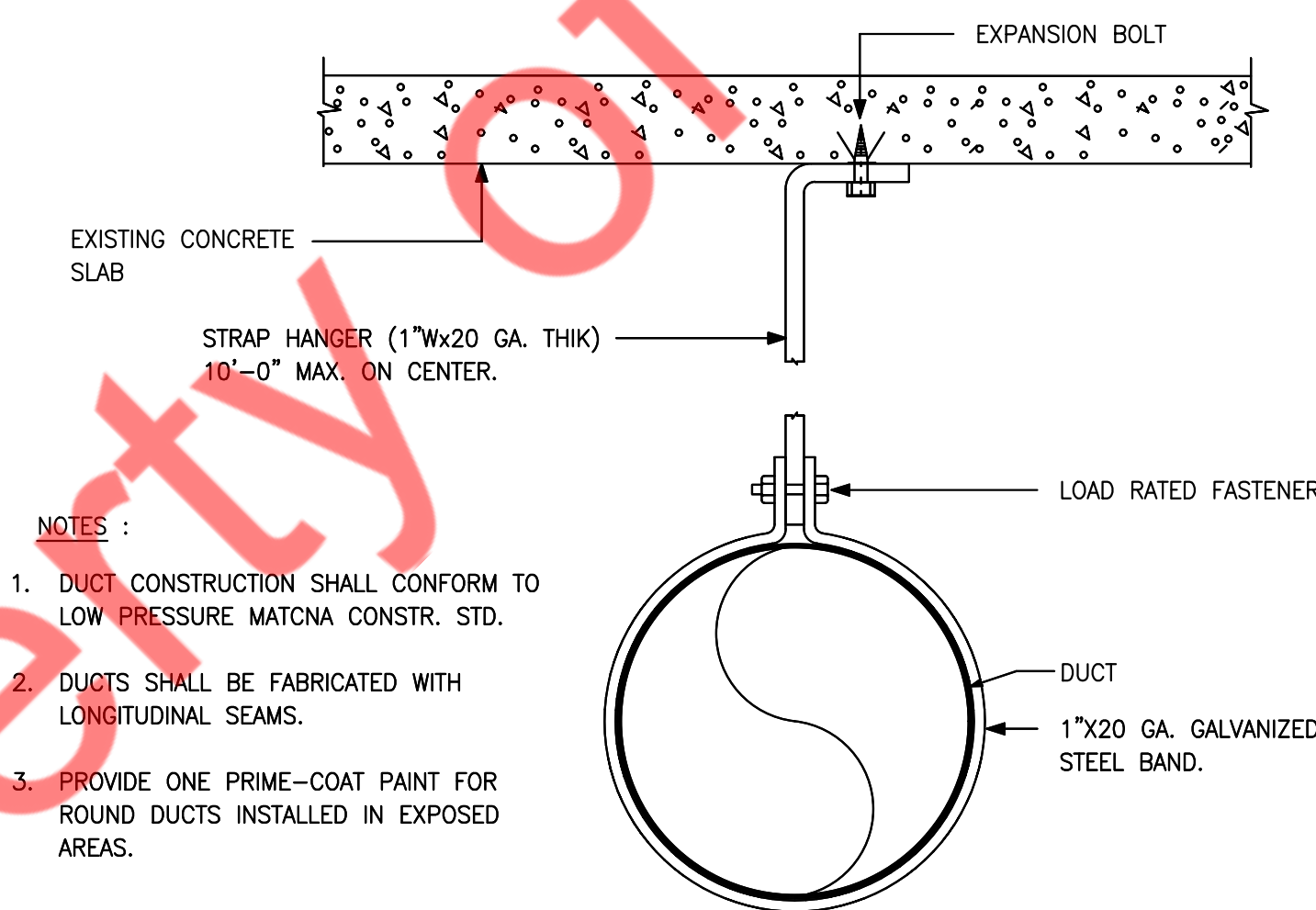
2 ROOF TOP UNIT INSTALLATION ON ROOF  
M5.2 N.T.S



3 ROOF MOUNTED EXHAUST FAN DETAIL  
M5.2 N.T.S



4 CEILING FAN HANGING SUPPORT DETAIL  
M5.2 N.T.S

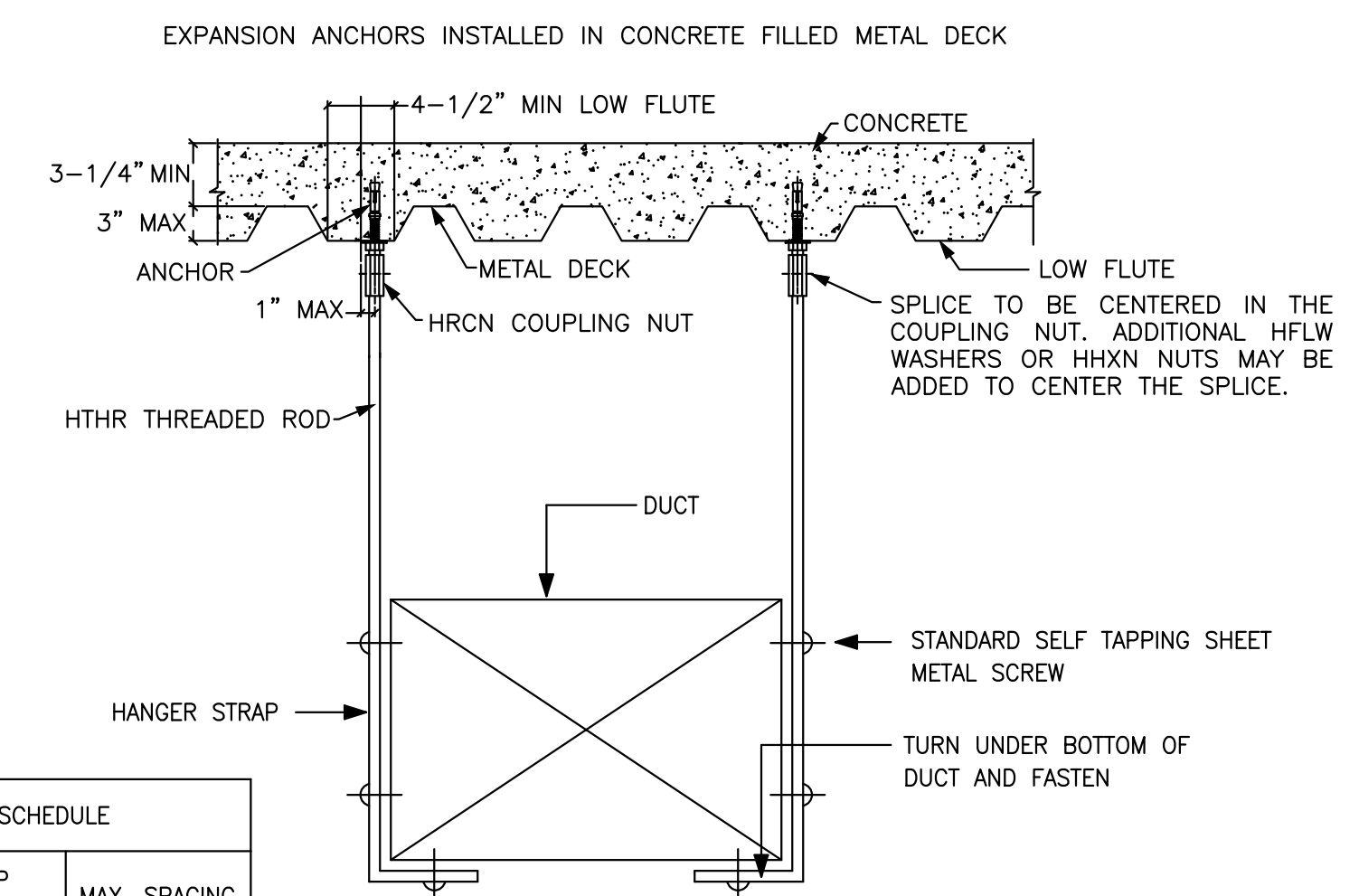


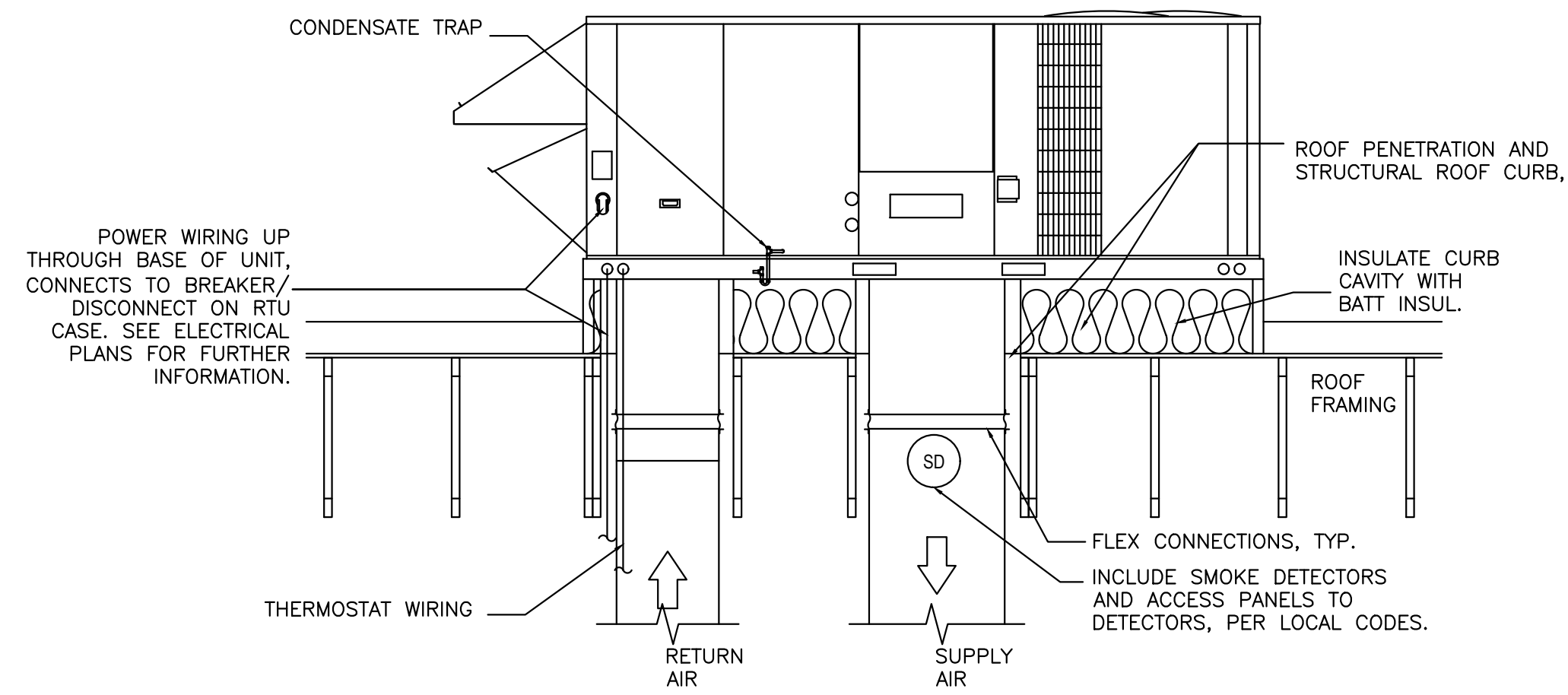
NOTES :

1. DUCT CONSTRUCTION SHALL CONFORM TO LOW PRESSURE MATCHA CONSTR. STD.
2. DUCTS SHALL BE FABRICATED WITH LONGITUDINAL SEAMS.
3. PROVIDE ONE PRIME-COAT PAINT FOR ROUND DUCTS INSTALLED IN EXPOSED AREAS.

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.

5 METHOD OF HANGING DUCTWORK  
M5.2 N.T.S





1  
M5.3 TYPICAL ROOF TOP UNIT DETAILS  
N.T.S

Property of NY Engineers

ROOF TOP UNIT SCHEDULE																					
UNIT ID	MANUFACTURER	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN			HEATING CAPACITY IN HEAT PUMP MODE (MBH)	COOLING CAPACITY				VOLTS	PH	HZ	MCA (A)	MOCP (A)	COP	SEER	OPERATING WEIGHT (LBS.)	REMARK
					SUPPLY AIR CFM	OUTSIDE AIR CFM	MAX. ESP (IN. OF W.G.)		TOTAL SENSIBLE	AMBIENT TEMP. DB (°F)	ENTERING TEMP. DB / WB (°F)										
RTU-1 (E)	S.A.E	S.A.E	SEE PLAN	5.0	1800	460	S.A.E	S.A.E	S.A.E	S.A.E	208(V)F	3(V)F	60(V)F	43(V)F	45(V)F	S.A.E	S.A.E	S.A.E	15 to 19		
RTU-2 (N)	TRANE	WHC074H3 (OR EQUIVALENT)	SEE PLAN	6.0	2880	740	0.5	65	81.48	66.31	95	80/67	208	3	60	42	50	3.5	15.5	1220	1 to 14

**NOTES:**

- 1) ALL EQUIPMENT MUST BE MEETING OR EXCEEDING THE BRANDS MINIMUM REQUIREMENTS.
- 2) ELECTRICAL CONNECTION TO BE SINGLE POINT AND TO BE THROUGH THE BOTTOM OF THE UNIT.
- 3) PROVIDE DISCONNECT SWITCH AND AN UNPOWERED GFCI RECEPTACLE.
- 4) 14" ROOF CURB - CONTRACTOR SHALL FIELD INSULATE. SHIP ASAP AHEAD OF THE UNIT.
- 5) CONDENSATE DRAIN WITH 2" DEEP VENTED TRAP DISCHARGE TO NEAREST DRAIN OR GUTTER OR DOWN SPOUT.
- 6) CABINET WITH 1/2" FIBERGLASS INSULATION.
- 7) PROVIDE 8-WIRE, 24 VAC, AUTOMATIC CHANGEOVER, 2-STAGE HEAT / COOL, REMOTELY PROGRAMMABLE THERMOSTAT.
- 8) REMOTE SENSORS SHALL BE PROVIDED IN SPACE WIRED BACK TO PROGRAMMABLE, 24 HOUR, 7 DAY, THERMOSTATS.
- 9) ANTI SHORT CYCLE TIMER.
- 10) THROWAWAY 2" FILTERS (MERV 8).
- 11) WHERE REQUIRED, PROVIDE LOW AMBIENT COOLING CAPABILITY DOWN TO 0 DEGREES F.
- 12) DRY BULB & ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF / 25% MANUAL OUTSIDE AIR DAMPER ASSEMBLY WITH HOOD (ZONE 'E' ONLY). PROVIDE ECONOMIZER WITH FDD.
- 13) PROVIDE ALL COMPRESSORS WITH 5 YEAR WARRANTY.
- 14) SUPPLY AIR SMOKE DETECTOR - UNIT MOUNTED
- 15) S.A.E - SAME AS EXISTING, V.I.F - VERIFY IN FIELD
- 16) EXISTING RTU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
- 17) CONTRACTOR TO CONFIRM IF EXISTING RTU IS WORKING AT ITS 100% RATED CAPACITY.
- 18) CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF RTU ON SITE.
- 19) CONTRACTOR TO REBALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE.

EXHAUST FAN SCHEDULE												
TAG	QUANTITY	FLOW RATE CFM	EXTERNAL STATIC PRESSURE IN W.G.	SPEED RPM	ELECTRIC DATA			MAXIMUM LOUDNESS DBA	BASIS OF DESIGN		WEIGHTS (LBS)	REMARK
					V/PH/HZ	MOTOR HP	FLA (AMPS)		MANUFACTURER	MODEL		
EF-1 (N)	1	1050	0.9	1725	115/1/60	0.25	5.8	-	ACCUREX	XCUE-100-VG	110	1,2
EF-2 (E)	1	70	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	3,4,5
EF-3 (N)	1	70	0.5	900	115/1/60	0.6(MCA)	0.46	48	GREENHECK	SP-A200	30	6,7

**NOTES:**

- 1) PROVIDE ALL NECESSARY ACCESSORIES AS PER MANUFACTURER'S RECOMMENDATIONS.
- 2) PROVIDE ROOF CURB, WEATHER PROOF DISCONNECT SWITCH, AMCA SEAL & UL CERTIFIED, THERMAL OVERLOAD PROTECTION.
- 3) S.A.E - SAME AS EXISTING.
- 4) EXISTING FAN WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
- 5) CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF FANS ON SITE.
- 6) DISCONNECT SWITCH, AMCA SEAL & UL CERTIFIED, THERMAL OVERLOAD PROTECTION.
- 7) INTERLOCK WITH OVEN.

AIR BALANCE					
UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-1 (E)	SEE PLAN	1800 CFM	460 CFM	1340 CFM	-
RTU-2 (N)	SEE PLAN	2880 CFM	740 CFM	2140 CFM	-
EF-1 (N)	KITCHEN	-	-	-	1050 CFM
EF-2 (E)	RESTROOM	-	-	-	70 CFM
EF-3 (N)	OVEN	-	-	-	70 CFM
TOTAL:		4680 CFM	1200 CFM	3480 CFM	1190 CFM
BUILDING PRESSURE:		10 CFM		POSITIVE	

1) CONTRACTOR TO REBALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE.

AIR TERMINAL DEVICES SCHEDULE								
TAG	SIZE (IN.)	DESCRIPTION	CONSTRUCTION	FINISH	NECK SIZE (IN.)	BASIS OF DESIGN		NOTES
						MANUFACTURER	MODEL	
CDS-1	24X24	SUPPLY AIR DIFFUSER	ALUMINUM	WHITE	12	TITUS	OMNI-AA	ALL
CDS-2	24X24	SUPPLY AIR DIFFUSER	ALUMINUM	WHITE	8	TITUS	OMNI-AA	ALL
CDS-3	12X12	SUPPLY AIR DIFFUSER	ALUMINUM	WHITE	6	TITUS	OMNI-AA	ALL
CDS-4	24X24	PERFORATED SUPPLY AIR DIFFUSER	ALUMINUM	WHITE	12	TITUS	PAR	ALL
CDS-5	Ø14	ROUND CEILING DIFFUSERS	ALUMINUM	WHITE	10	TITUS	TMRA-AA	ALL
CDR-1	24X24	EGGCRATE GRILLE	ALUMINUM	WHITE	16X16	TITUS	50F	ALL

**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) COORDINATE FINAL COLOR/FINISH WITH ARCHITECT/OWNER.
- 4) AIR DEVICE SHALL BE OF GALVANIZED FINISH WHEN INSTALLED ON EXPOSED DUCTWORK.
- 5) MAXIMUM NOISE CRITERION RATING < 35 DBA.

FOR ROUND NECK DIFFUSERS: NECK SIZES SHALL BE:-

- 15" DIA: 901-1100 CFM
- 14" DIA: 601-900 CFM
- 12" DIA: 376-600 CFM
- 10" DIA: 226-375 CFM
- 8" DIA: 101-225 CFM
- 6" DIA: 0-100 CFM

VENTILATION CALCULATIONS											
ROOM NAME	AREA	NUMBER OF PEOPLE/1000sq.ft AS PER FMC 2020	NUMBER OF PEOPLE FMC 2020	FINAL PEOPLE NO.	CFM AS PER FMC 2020		CALCULATED VENT CFM	PROVIDED OAI	EXHAUST CFM		PROVIDED EXHAUST CFM
					CFM/PERS ON	CFM/SQ.FT			CFM/SQFT/FIXTURE	CALCULATED CFM	
KITCHEN	526	20	11	4	7.5	0.12	95	1200	0.7	368	1120
SCULLERY	48	0	0	1	0	0.12	10		-	-	-
DINING	206	70	14	11	7.5	0.18	120		-	-	0
CORRIDOR	128	0	0	0	0	0.06	10		-	-	-
TOILET	46	0	0	0	0	0	0		70	0	70
<b>TOTAL</b>	<b>954</b>	<b>-</b>	<b>-</b>	<b>16</b>	<b>-</b>	<b>-</b>	<b>235</b>	<b>1200</b>	<b>-</b>	<b>-</b>	<b>1190</b>



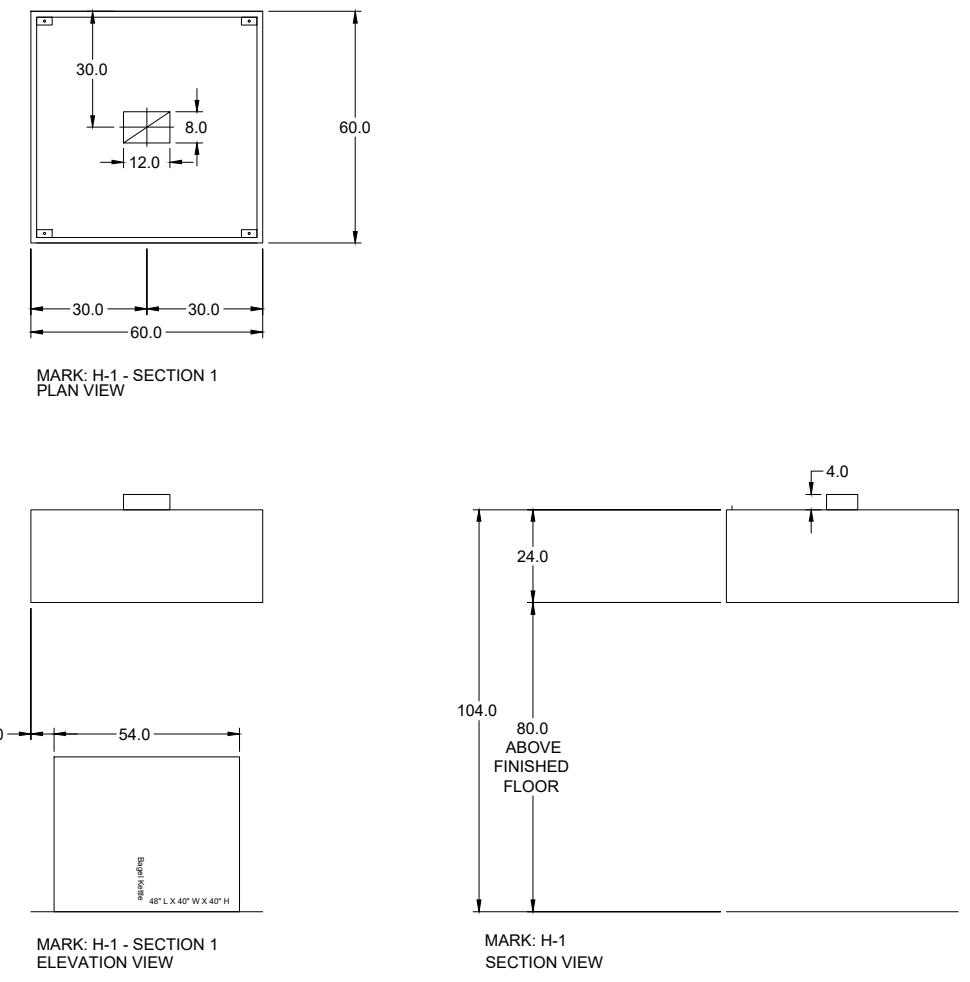
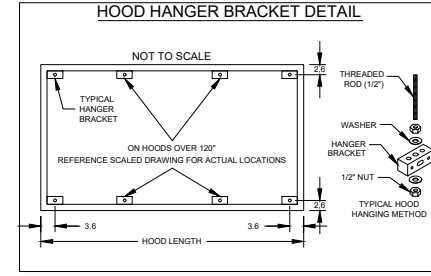
HOOD INFORMATION				HOOD DIMENSIONS (IN.)				EXHAUST				SUPPLY		TOTAL	SECTION	
HOOD NO.	MARK	MODEL	CONSTR.	LENGTH	WIDTH	HEIGHT	HOOD CONSTR.	LOAD CAP. (LBS)	TOTAL CFM	COLLARS	CFM	S.P.	MA	AG	WEIGHT (LBS)	LOCATION
1	H-1	XO-60-S		60.0	60.0	24.0	402 SS 100%	1050	8"	12"	1500	0.25H			131	SINGLE

HOOD INFORMATION				LIGHTING DETAILS				BAFFLE FILTRATION DETAILS				UTILITY CABINETS			
HOOD NO.	MARK	FIXTURE TYPE	QTY	FOOT CANDLES	TYPE / MODEL	SIZE (IN.)	LOCATION	FIRE SYSTEM	TYPE	SIZE	MODEL	INTERFACE	CONTROL	MODEL	INTERFACE
1	H-1														

HOOD OPTIONS	
FACTORY MOUNTED EXHAUST COLLARS	



PROJECT: 02/2023  
 MARK: JEFF BAGEL RUN

ACCUREX MAMI  
 AUSTIN, TX | WWW.ACCUREX.COM  
 (505) 942-5332

ACCUREX

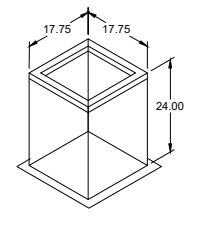
Direct Drive Upblast Centrifugal Roof Exhaust Fan

MARK INFORMATION				FAN INFORMATION				MOTOR INFORMATION				
QTY	MARK	MODEL	SIZE (HP)	VOLUME (CFM)	TOTAL EXTERNAL SP (IN WS)	FAN RPM	OPERATING POWER (HP)	WEIGHT (LB.)	SIZE (HP)	VICP ENCLOSURE	MOTOR RPM	W/PHOS REC FLA*
1	KEF-1	XCLE-100-VG	1.500	3,937	17.25	5,28	59	0.25	115/60/1	TH	1725	1 5.8

\*NEC FLA - Based on table 430.250 or 430.245 of National Electrical Code 2020. Actual motor FLA may vary for sizing thermal overload, consult factory"

KEF-1 - SELECTED OPTIONS AND ACCESSORIES

One piece fully welded windband  
 Tapered ducting sheet hub  
 Weather tube outlet area min. 4.4 sq. ft. (sizes 99-480), 2.0 sq. ft. (sizes 60-90)  
 Min. windband material thickness: 0.051" aluminum (600-240), 0.064" aluminum (240-99, 2400P)  
 0.007" aluminum (size 300-480)  
 Standard Curb Size - 19 Square  
 ULULU, T20 Listed "Power Ventilation"  
 Switch, NEMA-3R, Toggle, Shipped with Unit  
 High Wind Rated (w/150 PSF Rating)  
 Florida Product Approval #FL 13325, 5 & Miami-Dade NCA #22-0606.03  
 Hinge, Factory Installed  
 Foam Curb Seal (Factory Applied)



PROJECT: 02/2023  
 MARK: JEFF BAGEL RUN

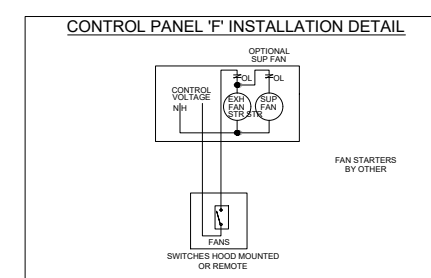
ACCUREX MAMI  
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CONTROL INFORMATION				CONTROL FEATURES	
MARK	ELECTRICAL CONTROL PACKAGE	USER INTERFACE	LOCATION	TYPE	LOCATION
CTRL-1 (Switch)	SWITCHES	SWITCHES	Ship Locker		

CONTROL FEATURES	
2 Position Fan Switch - Qty 1	



PROJECT: 02/2023  
 MARK: JEFF BAGEL RUN

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Property of NY Engineers

# System Checksums

By Trial

RTU-1 (E)

Single Zone

COOLING COIL PEAK				CLG SPACE PEAK				HEATING COIL PEAK			TEMPERATURES			
Peaked at Time:		Mo/Hr: 8 / 17		Mo/Hr: Sum of		Mo/Hr: Heating Design			Cooling		Heating	SADB	Ra Plenum	Return
Outside Air:		OADB/WB/HR: 90 / 78 / 129		OADB: Peaks		OADB: 38						Ret/OA	Fn MtrTD	Fn BidTD
Space Sens. + Lat.	Plenum Sens. + Lat.	Net Total	Percent Of Total (%)	Space Sensible	Percent Of Total (%)	Space Peak	Coil Peak	Percent Of Total (%)	Space Sens	Tot Sens	Percent Of Total (%)	Fn Frict		
Btu/h	Btu/h	Btu/h	(%)	Btu/h	(%)	Btu/h	Btu/h	(%)	Btu/h	Btu/h	(%)			
<b>Envelope Loads</b>														
Skylite Solar	0	0	0	0	0	0	0	0.00	0	0	0.00	0.0	0.0	0.0
Skylite Cond	0	0	0	0	0	0	0	0.00	0	0	0.00	0.0	0.0	0.0
Roof Cond	0	1,233	1,233	3	0	0	-493	2.12	0	-493	2.12	0.0	0.0	0.0
Glass Solar	4,209	0	4,209	9	7,021	38	0	0.00	0	0	0.00	0.0	0.0	0.0
Glass/Door Cond	915	0	915	2	419	2	-1,798	7.72	-1,798	-1,798	7.72	0.0	0.0	0.0
Wall Cond	1,296	13	1,309	3	1,739	9	-729	3.16	-729	-729	3.16	0.0	0.0	0.0
Partition/Door	0	0	0	0	0	0	0	0.00	0	0	0.00	0.0	0.0	0.0
Floor	0	0	0	0	0.00	0	-460	1.98	-460	-460	1.98	0.0	0.0	0.0
Adjacent Floor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Infiltration	4,642	0	4,642	10	624	3	-2,835	12.18	-2,835	-2,835	12.18	0.0	0.0	0.0
<b>Sub Total ==&gt;</b>	<b>11,063</b>	<b>1,245</b>	<b>12,308</b>	<b>26</b>	<b>9,803</b>	<b>52</b>	<b>-5,822</b>	<b>27.15</b>	<b>-5,822</b>	<b>-6,322</b>	<b>27.15</b>			
<b>Internal Loads</b>														
Lights	934	233	1,167	2	934	5	0	0.00	0	0	0.00	0	0	0
People	1,936	0	1,936	4	1,180	6	0	0.00	0	0	0.00	0	0	0
Misc	1,167	0	1,167	2	1,167	6	0	0.00	0	0	0.00	0	0	0
<b>Sub Total ==&gt;</b>	<b>4,037</b>	<b>233</b>	<b>4,271</b>	<b>9</b>	<b>3,281</b>	<b>18</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0.00</b>			
<b>Ceiling Load</b>	126	-126	0	0	107	1	-43	0.00	-43	0	0.00			
<b>Ventilation Load</b>	0	0	25,407	54	0	0	0	73.75	0	-17,171	73.75			
<b>Adj Air Trans Heat</b>	0	0	0	0	0	0	0	0	0	0	0			
<b>Dehumid. Ov Sizing</b>	0	0	0	0	0	0	0	0.00	0	0	0.00			
<b>Ov/Undr Sizing</b>	5,499	0	5,499	12	5,499	29	211	-0.91	0	211	-0.91			
<b>Exhaust Heat</b>	0	-623	-623	-1	0	0	0	0.00	0	0	0.00			
<b>Sup. Fan Heat</b>	0	0	0	0	0	0	0	0.00	0	0	0.00			
<b>Ret. Fan Heat</b>	0	0	0	0	0	0	0	0.00	0	0	0.00			
<b>Duct Heat Pkup</b>	0	0	0	0	0	0	0	0.00	0	0	0.00			
<b>Underflr Sup Ht Pkup</b>	0	0	0	0	0	0	0	0.00	0	0	0.00			
<b>Supply Air Leakage</b>	0	0	0	0	0	0	0	0.00	0	0	0.00			
<b>Grand Total ==&gt;</b>	<b>20,725</b>	<b>730</b>	<b>46,862</b>	<b>100.00</b>	<b>18,690</b>	<b>100.00</b>	<b>-5,864</b>	<b>100.00</b>	<b>-5,864</b>	<b>-23,282</b>	<b>100.00</b>			

AIRFLOWS		
	Cooling	Heating
Diffuser	1,087	1,087
Terminal	1,087	1,087
Main Fan	1,087	1,087
Sec Fan	0	0
Nom Vent	460	460
AHU Vent	460	460
Infil	76	76
MinStop/Rh	0	0
Return	1,163	1,163
Exhaust	536	536
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS		
	Cooling	Heating
% OA	42.3	42.3
cfm/ft²	2.85	2.85
cfm/ton	278.29	
ft²/ton	97.56	
Btu/hr-ft²	123.00	-76.38
No. People	11	

COOLING COIL SELECTION										
	Total Capacity		Sens Cap. MBh	Coil Airflow cfm	Enter DB/WB/HR			Leave DB/WB/HR		
	ton	MBh			°F	°F	gr/lb	°F	°F	gr/lb
Main Clg	3.9	46.9	25.4	1,087	82.0	70.0	91.5	59.5	57.1	66.1
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>3.9</b>	<b>46.9</b>								

AREAS			
	Gross Total	Glass ft²	(%)
Floor	381		
Part	0		
Int Door	0		
ExFlr	19		
Roof	380	0	0
Wall	253	108	43
Ext Door	0	0	0

HEATING COIL SELECTION				
	Capacity MBh	Coil Airflow cfm	Ent Lvg	
			°F	°F
Main Htg	-29.1	1,087	57.6	76.9
Aux Htg	0.0	0	0.0	0.0
Preheat	0.0	1,087	57.6	59.5
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
<b>Total</b>	<b>-29.1</b>			

Project Name: Celebration, FL  
Dataset Name: CELEBRATION FL COPY.TRC

TRACE® 700 v6.3.4 calculated at 08:25 PM on 08/02/2023  
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# System Checksums

By Trial

RTU-2 (N)

Single Zone

COOLING COIL PEAK				CLG SPACE PEAK				HEATING COIL PEAK			TEMPERATURES			
Peaked at Time:		Mo/Hr: 8 / 16		Mo/Hr: Sum of		Mo/Hr: Heating Design			Cooling		Heating	SADB	Ra Plenum	Return
Outside Air:		OADB/WB/HR: 91 / 78 / 127		OADB: Peaks		OADB: 38			Ret/OA		Fn MtrTD	Fn BidTD	Fn Frict	
Space Sens. + Lat.	Plenum Sens. + Lat.	Net Total	Percent Of Total (%)	Space Sensible	Percent Of Total (%)	Space Peak	Coil Peak	Percent Of Total (%)	Space Sens	Tot Sens	Percent Of Total (%)			
Btu/h	Btu/h	Btu/h	(%)	Btu/h	(%)	Btu/h	Btu/h	(%)	Btu/h	Btu/h	(%)			
<b>Envelope Loads</b>				<b>Envelope Loads</b>				<b>Envelope Loads</b>			<b>AIRFLOWS</b>			
Skylite Solar	0	0	0	0	0	Skylite Solar	0	0.00	0	0	0.00	Diffuser	1,828	1,828
Skylite Cond	0	0	0	0	0	Skylite Cond	0	0.00	0	0	0.00	Terminal	1,828	1,828
Roof Cond	0	1,799	2	0	0	Roof Cond	0	2.10	0	-746	2.10	Main Fan	1,828	1,828
Glass Solar	0	0	0	0	0	Glass Solar	0	0.00	0	0	0.00	Sec Fan	0	0
Glass/Door Cond	327	0	0	339	1	Glass/Door Cond	-625	1.76	-625	-625	1.76	Nom Vent	740	740
Wall Cond	1,385	452	2	1,693	5	Wall Cond	-1,443	5.42	-1,443	-1,926	5.42	AHU Vent	740	740
Partition/Door	0	0	0	0	0	Partition/Door	0	0.00	0	0	0.00	Infil	121	121
Floor	0	0	0	0.00	0	Floor	0	0.00	-558	-558	1.57	MinStop/Rh	0	0
Adjacent Floor	0.00	0.00	0.00	0.00	0.00	Adjacent Floor	0.00	0.00	0.00	0.00	0.00	Return	1,949	1,949
Infiltration	6,494	6,494	8	2,436	7	Infiltration	-4,522	12.74	-4,522	-4,522	12.74	Exhaust	861	861
<i>Sub Total ==&gt;</i>	8,207	2,251	10,458	13	4,468	13	<i>Sub Total ==&gt;</i>	23.60	-7,148	-8,376	23.60	Rm Exh	0	0
<b>Internal Loads</b>				<b>Internal Loads</b>				<b>Internal Loads</b>			<b>ENGINEERING CKS</b>			
Lights	1,415	354	2	1,415	4	Lights	0	0.00	0	0	0.00	% OA	40.5	40.5
People	1,138	0	1	1,045	3	People	0	0.00	0	0	0.00	cfm/ft²	3.16	3.16
Misc	15,499	0	20	15,499	47	Misc	0	0.00	0	0	0.00	cfm/ton	281.37	
<i>Sub Total ==&gt;</i>	18,052	354	18,406	24	17,959	54	<i>Sub Total ==&gt;</i>	0.00	0	0	0.00	ft²/ton	89.15	
Ceiling Load	201	-201	0	189	1	Ceiling Load	-96	0.00	-96	0	0.00	Btu/hr-ft²	134.61	-76.64
Ventilation Load	0	0	39,641	51	0	Ventilation Load	0	77.81	0	-27,623	77.81	No. People	5	
Adj Air Trans Heat	0	0	0	0	0	Adj Air Trans Heat	0	0	0	0	0			
Dehumid. Ov Sizing	0	0	0	0	0	Ov/Undr Sizing	0	0.00	0	0	0.00			
Ov/Undr Sizing	10,498	10,498	13	10,498	32	Exhaust Heat	501	-1.41	501	-1.41	-1.41			
Exhaust Heat	-1,063	-1,063	-1	0	0	OA Preheat Diff.	0	0.00	0	0	0.00			
Sup. Fan Heat	0	0	0	0	0	RA Preheat Diff.	0	0.00	0	0	0.00			
Ret. Fan Heat	0	0	0	0	0	Additional Reheat	0	0.00	0	0	0.00			
Duct Heat Pkup	0	0	0	0	0	Underflr Sup Ht Pkup	0	0.00	0	0	0.00			
Underflr Sup Ht Pkup	0	0	0	0	0	Supply Air Leakage	0	0.00	0	0	0.00			
Supply Air Leakage	0	0	0	0	0	<i>Grand Total ==&gt;</i>	-7,244	100.00	-7,244	-35,498	100.00			
<i>Grand Total ==&gt;</i>	36,958	1,341	77,940	100.00	33,114	100.00	<i>Grand Total ==&gt;</i>							

COOLING COIL SELECTION										AREAS			HEATING COIL SELECTION			
Total Capacity	Sens Cap.	Coil Airflow	Enter DB/WB/HR		Leave DB/WB/HR		Gross Total	Glass		Capacity	Coil Airflow	Ent	Lvg			
ton	MBh	MBh	cfm	°F	°F	gr/lb	°F	°F	(%)	MBh	cfm	°F	°F			
Main Clg	6.5	77.9	46.1	1,828	82.3	70.4	93.3	58.7	57.7	70.2	Floor	579				
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Part	0				
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	Int Door	0				
<i>Total</i>	6.5	77.9									ExFlr	23				
											Roof	578	0			
											Wall	381	0			
											Ext Door	23	0			
											<i>Total</i>	-44.4				
											Main Htg	-44.4	1,828			
											Aux Htg	0.0	0			
											Preheat	0.0	1,828			
											Humidif	0.0	0			
											Opt Vent	0.0	0			

Project Name: Celebration, FL  
Dataset Name: CELEBRATION FL COPY.TRC

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# ELECTRICAL SYMBOLS LIST

## GENERAL NOTES (APPLY TO ALL "E" DRAWINGS)

SWITCHES AND CONTROLS		POWER AND TELECOMMUNICATION		ELECTRICAL ABBREVIATIONS			
\$0	20A SPST TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED.		JUNCTION BOX WITH BLANK COVER PLATE, FLUSH IN FLOOR.	A	AMPERES	EA	EACH
\$3	20A 3-WAY TOGGLE SWITCH U.N.O. "a" DENOTES LIGHTING FIXTURE CONTROLLED		JUNCTION BOX WITH BLANK COVER PLATE, WALL MOUNTED, +18" AFF OR AS NOTED.	A/C, AC	AIR CONDITIONING UNIT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
\$4	20A 4-WAY TOGGLE SWITCH U.N.O. "a" DENOTES LIGHTING FIXTURE CONTROLLED		JUNCTION BOX WITH BLANK COVER PLATE, CEILING MOUNTED..	AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
\$0	WALL BOX INCANDESCENT DIMMER SWITCH, LUTHRON MAESTRO SERIES. "a" DENOTES LIGHTING FIXTURE CONTROLLED.		DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.	AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
(OS)	WALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE.		DUPLEX DEDICATED RECEPTACLE, +18" AFF OR AS NOTED.	AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
\$5	WALL MOUNTED VACANCY SENSOR SWITCH, WATTSTOPPER CS-50PIR SERIES.		DUPLEX CONVENIENCE RECEPTACLE -- 20A-1P, 125V, NEMA 5-20R MOUNTED FLUSH IN CEILING.	AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
\$0	WALL MOUNTED SPRING WOUND TIME SWITCH TORK		DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.	AT	AMP TRIP	ER	EXISTING TO BE RELOCATED
\$	DIMMER SWITCH		DUPLEX DEDICATED GFI RECEPTACLE, +18" AFF OR AS NOTED.	ATS	AUTOMATIC TRANSFER SWITCH	ETR	EXISTING TO REMAIN
\$os	OCCUPANCY SENSOR SWITCH		ELECTRICAL FLOOR BOX	AUTO	AUTOMATIC	EFW	ELECTRIFIED WORKSTATION FURNITURE
\$os	COMBINATION OF DIMMER AND OCCUPANCY SENSOR SWITCH		RECEPTACLE FOR DRYER	AWG	AMERICAN WIRE GAUGE	EPH	ELECTRIC WATER HEATER
ASCO	ASCO CONTACTOR C-25 TORK TIMER T-25 STACKED.		NETWORK INTERFACE DEVICE. NID IS 'ONT' BOX WHICH INCLUDES BOTH 'ONT' AND ITS SISTER BOX AS PER VERIZON STANDARDS.	C	CONDUIT	FA	FIRE ALARM
[D]	DOOR SWITCH		QUAD RECEPTACLE	C/B,CB	CIRCUIT BREAKER	FBO	FURNISHED BY OTHERS, INSTALLED & WIRED BY EC
[PC]	PHOTOCELL IN NEMA 3R ENCLOSURE.		TELEPHONE/DATA OUTLET, 4" SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. PROVIDE 3/4" E.C., U.O.N., UP TO HUNG CEILING AND TERMINATE WITH 90° ELBOW, BUSHING AND DRAG WIRE.	CKT	CIRCUIT	FDR	FEEDER
[BP]	BELL PUSH		TELEPHONE OUTLET, WALL-MOUNTED +48" AFF UNO TEL / DATA OUTLET TO BE PROVIDED WITH 1" CONDUIT U.O.N. TO H.C. AND TERMINATED WITH 90 DEGREE REE ELBOW AND BUSHING. TEL / DATA OUTLET PLATE SHALL BE PROVIDED WITH 1 1/4" DIAMETER GROMMETED OPENING.	CLG	CEILING	FIBO	FURNISHED & INSTALLED BY OTHERS, WIRED BY EC
[OS]A	CEILING OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE. 'A' LETTER REFERS TO WIRING DIAGRAM.		DATA OUTLET -- (1) PORT UNO, +18" AFF, UNO TEL / DATA OUTLET TO BE PROVIDED WITH 1" CONDUIT U.O.N. TO H.C. AND TERMINATED WITH 90 DEGREE ELBOW AND BUSHING. TEL / DATA OUTLET PLATE SHALL BE PROVIDED WITH 1 1/4" DIAMETER GROMMETED OPENING.	COMM	COMMUNICATION	FIXT	FIXTURE
(OS)	WALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE.		CABLE TV OUTLET, WALL-MOUNTED AT 18" AFF UNO.	CT	CURRENT TRANSFORMER	FL	FLOOR
(VS)	WALL VACANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE.	<b>MOTORS AND CONTROLS</b>					
(VS)	CEILING VACANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE.		AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.	CU	COPPER	FLUOR	FLUORESCENT
(DS)	CEILING MOUNTED DAYLIGHT SENSOR.		AC OUTDOOR UNIT MOTOR AS NOTED WITH CONTROLLER AND DISCONNECT SWITCH WITH WEATHER PROOF.	*C	DEGREE CELSIUS	G	GROUND
<b>WIRING SYSTEMS</b>			NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.	*F	DEGREE FAHRENHEIT	GFI	GROUND FAULT INTERRUPTER
3 UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 Ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.		30A NON FUSED DISCONNECT SWITCH	DIA	DIAMETER	GP	GENERAL PURPOSE
3 5 UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 Ø, 2#12 N. & 2#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.		60A NON FUSED DISCONNECT SWITCH	DISC	DISCONNECT	HC	HUNG CEILING
3 5 7 UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 Ø, 3#12 N. & 3#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.		100A NON FUSED DISCONNECT SWITCH	DN	DOWN	HP	HORSEPOWER
—○	CONDUIT TURNING UP, SEE FLOOR PLANS FOR CONDITIONS.		200A NON FUSED DISCONNECT SWITCH	DP	DISTRIBUTION PANEL	HWH	HOW WATER HEATER
—●	CONDUIT TURNING DOWN, SEE FLOOR PLANS FOR CONDITION.		COMBINATION MAGNETIC STARTER AND DISCONNECT SWITCH, FURNISHED BY HVAC/CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.	DWH	DOMESTIC WATER HEATER	HZ	HERTZ
	CONDUIT AND WIRE TO BUILDING GROUND.		FUSED DISCONNECT SWITCH AND FUSE AMPERAGE AS INDICATED. TOP NUMBER DENOTS SWITCH SIZE AND BOTTOM NUMBER DENOTES FUSE.	DWG	DRAWING	IC	INTERRUPTING CAPACITY
	CABLE TRAY, WIDTH AND MOUNTING AS NOTED.		COMBINATION SOLID-STATE MOTOR STARTER.	JB	JUNCTION BOX	PP	POWER PANEL
---	UNDERGROUND		MOTORIZED DAMPER.	KCMIL	ONE THOUSAND CIRCULAR MILS	PVC	POLYVINYL CHLORIDE
---	EXISTING		FIRE SMOKE DAMPER	KV	KILOVOLT	PWR	POWER
(S)	CEILING MOUNTED SMOKE DETECTOR.		DUPLEX PUMP. NUMBER INDICATES HP RATING OF PUMP.	KVA	KILOVOLT-AMPERES	R	REMOVE
(S/CO)	COMBINATION OF SMOKE AND CO DETECTOR.		THERMAL OVERLOAD SWITCH AT MOTOR. PROVIDE THERMAL ELEMENTS AS PER MOTOR RATINGS.	KW	KILOWATTS	RE	RELOCATED EXISTING
<b>ELECTRICAL DRAWING LIST</b>			MANUAL MOTOR SWITCH	LP	LIGHTING PANEL	REC	RECEPTACLE
E1.0	ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES		ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING	LTG	LIGHTING	RGS	RIGID GALVANIZED STEEL
E1.1	ELECTRICAL SPECIFICATIONS SHEET 1 OF 2		INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.	MAX	MAXIMUM	RR	REMOVE & RELOCATE
E1.2	ELECTRICAL SPECIFICATIONS SHEET 2 OF 2		KEYED NOTE REFERENCE	MC	MOTOR CONTROLLER	SECT	SECTION
E2.0	ELECTRICAL LIGHTING AND POWER PLAN	<b>ANNOTATION</b>					
E3.0	ELECTRICAL DETAILS		DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP, DRAWING NUMBER INDICATED ON BOTTOM	MCB	MAIN CIRCUIT BREAKER	SPDT	SINGLE POLE DOUBLE THROW
E4.0	ELECTRICAL RISER DIAGRAM AND PANEL SCHEDULE	<b>POWER DISTRIBUTION</b>					
			MAJOR ELECTRICAL COMPONENT OR DEVICE. VOLTAGE AND AMPERAGE AS NOTED.	MER	MECHANICAL EQUIPMENT ROOM	SPST	SINGLE POLE SINGLE THROW
			BRANCH PANELBOARD, 208Y/120V-SURFACE OR FLUSH MOUNTED TRANSFORMER, SIZE AS NOTED.	MIN	MINIMUM	SPEC	SPECIFICATION
			DISTRIBUTION PANELBOARD, 208Y/120V-SURFACE OR FLUSH MOUNTED.	MLO	MAIN LUGS ONLY	SW	SWITCH

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRIC CODE(NEC) WITH AMENDMENTS, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVER-HEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT. VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILING AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
11. MINIMUM SIZE OF CONDUIT SHALL BE 3/4", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.
12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVIDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CONCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
14. SUPPORT PANEL, JUNCTION AND PULL BOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKET FOR A COMPLETE RAIN TIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
19. ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILING SHALL BE APPROVED FOR THAT APPLICATION.
21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE-RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE-RATED BOXES OR PUTTY PADS ARE UTILIZED.
22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.
23. COORDINATE THE MOUNTING HEIGHT AND LOCATION OF RACEWAYS, COMMUNICATIONS OUTLETS, AND RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND DETAILS.
24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
25. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
26. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS AND INDICATED WITH SWITCH CONTROL SHALL BE WIRED WITH BATTERY CHARGING/SENSING CIRCUIT WIRED AHEAD OF SWITCH CONTROL.
27. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANEL BOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANEL BOARD.



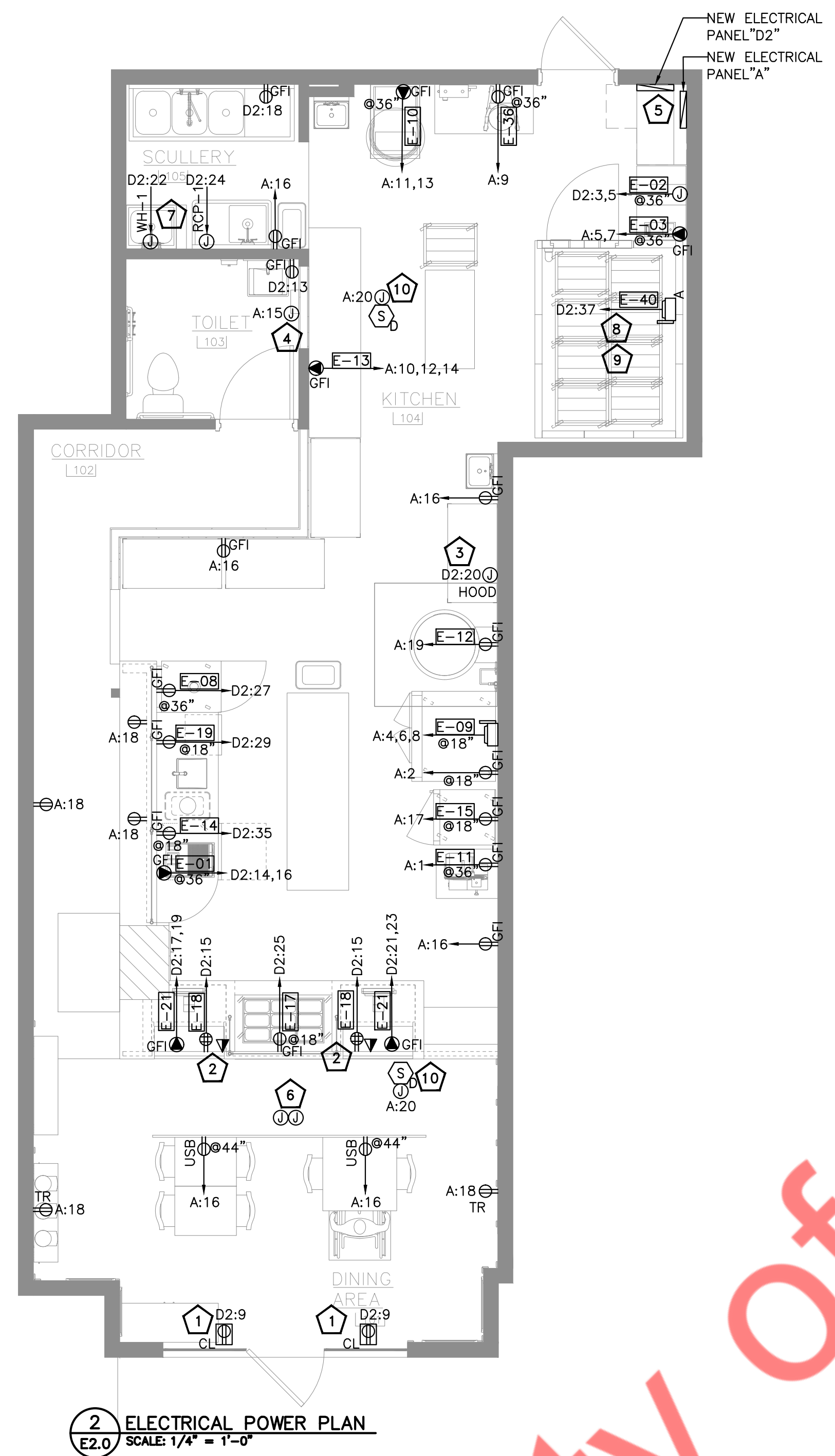


**POWER PLAN GENERAL NOTES:**

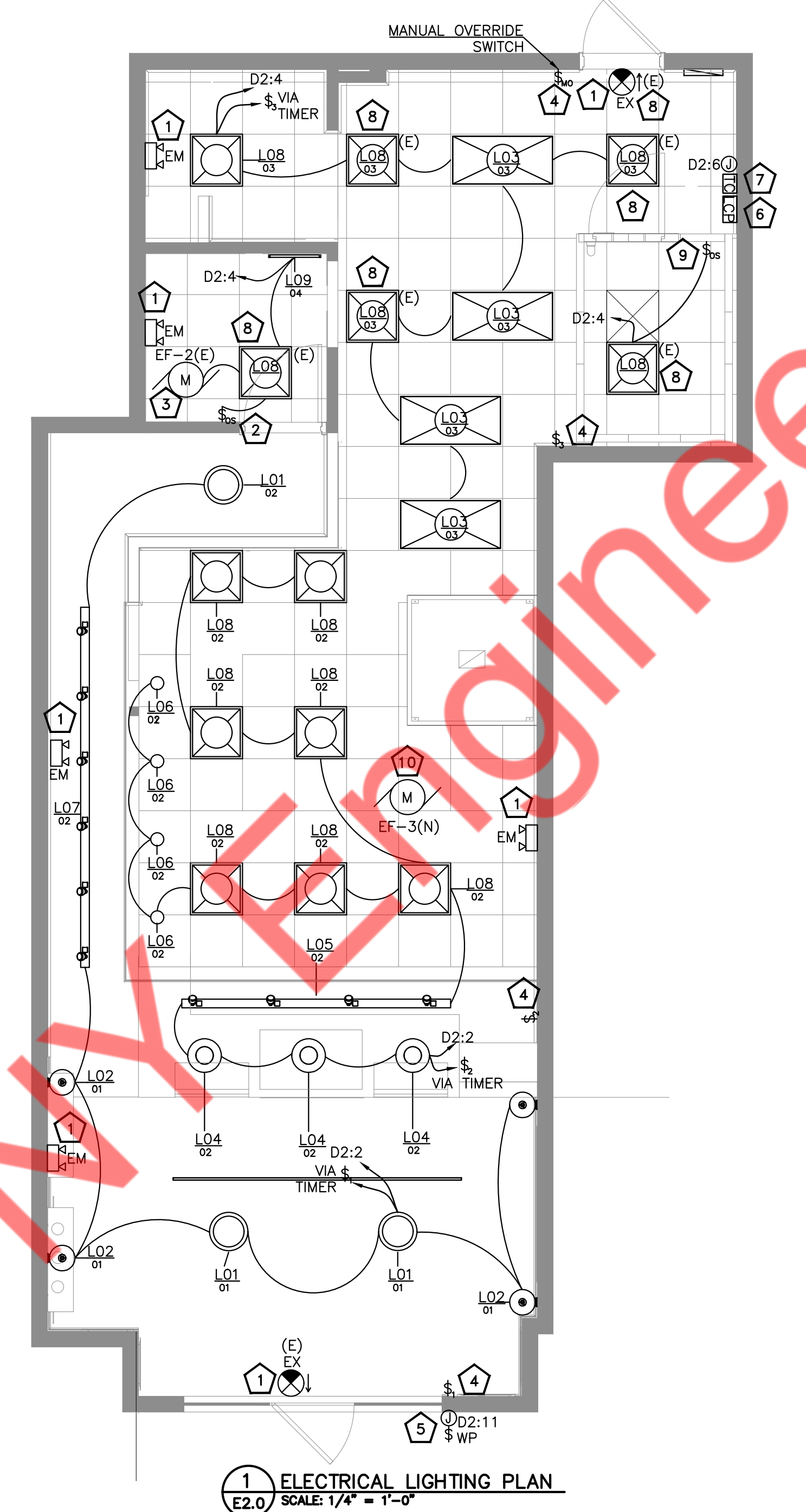
- A. EXACT LOCATION OF MECHANICAL, PLUMBING, KITCHEN, FURNITURE SYSTEMS, OWNER FURNISHED EQUIPMENT ETC. THAT REQUIRE ELECTRICAL CONNECTIONS ARE SHOWN ON THE MECHANICAL, PLUMBING, AND/OR ARCHITECTURAL DRAWINGS. E.C. TO COORDINATE EXACT LOCATIONS WITH RESPECTIVE CONTRACTORS AND/OR VENDORS PRIOR TO ANY ROUGH-INS.
- B. REVIEW AND COORDINATE WITH ALL TRADES CONTRACT DOCUMENTS TO DETERMINE SPECIFIC MOUNTING LOCATIONS FOR EQUIPMENT WITH ELECTRICAL CONNECTIONS. COORDINATE EXACT MOUNTING LOCATIONS WITH THE SPECIFIC TRADE AND ARCHITECT.
- C. MINIMUM CONDUCTOR SIZE FOR 120V BRANCH CIRCUITS SHALL BE 12-AWG. FOR 120V BRANCH CIRCUITS WITH HOME-RUN OVER 100 LINEAR FEET, A MINIMUM WIRE SIZE OF 10-AWG SHALL BE PROVIDED FROM FIRST JUNCTION/OUTLET BOX TO BRANCH CIRCUIT PANEL BOARD. FOR 120V BRANCH CIRCUITS WITH HOME RUN OVER 150 LINEAR FEET, A MINIMUM OF 8-AWG SHALL BE PROVIDED FROM FIRST JUNCTION/OUTLET BOX TO BRANCH CIRCUIT PANEL BOARD.
- D. ALL WIRING SHALL BE IDENTIFIED BY PANEL BOARD AND CIRCUIT NUMBERS IN ALL CABINETS, JUNCTION BOXES, WIRING TROUGHS, ENCLOSURES, SPLICE OR TERMINATION POINTS ETC.
- E. ALL 120V, 15A AND 20A RECEPTACLES IN KITCHEN AREA SHALL BE "GFCI" IN ACCORDANCE WITH NEC ARTICLE 210.8(B).
- F. GFI SHOWN WITH THE RECEPTACLE INDICATES THAT THE CIRCUIT SHALL BE GFI PROTECTED. E.C. SHALL PROVIDE GFI BREAKER ON CIRCUIT SHOWN ON PLAN. IF RECEPTACLE IS NOT AVAILABLE OR IT IS NOT ACCESSIBLE.
- G. ELECTRICAL CONDUCTORS FOR FEEDERS AND BRANCH CIRCUITS COMBINED SHALL BE SIZED FOR A MAXIMUM OF 5 PERCENT VOLTAGE DROP.
- H. EXISTING CIRCUIT CONNECTIONS FOR EXISTING MECHANICAL UNIT SHALL REMAIN. E.C. TO VERIFY OPERABLE CONDITIONS OF CIRCUIT CONNECTION AND BREAKER IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

**POWER PLAN KEYED NOTES:**

- 1. PROVIDE CEILING MOUNTED RECEPTACLE FOR SHOW WINDOW AS REQUIRED BY CODE. VERIFY WITH LOCAL ENERGY AGENCY. VERIFY EXACT LOCATION WITH ARCHITECT.
- 2. ELECTRICAL CONTRACTOR TO VERIFY THE MOUNTING HEIGHT, LOCATION & DETAILS FOR POS RECEPTACLES WITH ARCHITECT/OWNER PRIOR TO ROUGH IN.
- 3. ELECTRICAL CONTRACTOR TO COORDINATE EXACT LOCATION & DETAILS OF KITCHEN HOOD CONTROL PANEL WITH KITCHEN HOOD MANUFACTURER.
- 4. ELECTRICAL CONTRACTOR TO PROVIDE JUNCTION BOX FOR HAND DRYER AT LOCATION SPECIFIED BY OWNER'S REPRESENTATIVE.
- 5. E.C. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANELS IN THE FIELD. 3' CLEAR SPACE SHALL BE PROVIDED IN FRONT OF THE PANEL AS PER CODE.
- 6. ELECTRICAL CONTRACTOR SHALL PROVIDE BACK BOX AND CONDUIT WITH PULL STRING FOR MECHANICAL UNIT. CONFIRM FINAL LOCATION WITH MECHANICAL DRAWING PRIOR TO ROUGH-IN.
- 7. PROVIDE JUNCTION BOX FOR WH-1 AND RCP-1. E.C. TO COORDINATE EXACT REQUIREMENT WITH PLUMBING CONTRACTOR & MAKE POWER PROVISION ACCORDINGLY.
- 8. ELECTRICAL CONTRACTOR TO COORDINATE EXACT POWER REQUIREMENT WITH WALK-IN BOX MANUFACTURER AND MAKE POWER PROVISION ACCORDINGLY.
- 9. ELECTRICAL CONTRACTOR TO FIELD VERIFY LOCATION OF CONDENSING UNIT AND PROVIDE POWER CONNECTION WITH NECESSARY ELECTRICAL FIXTURES/ DISCONNECTS AS PER MANUFACTURER REQUIREMENTS.
- 10. JUNCTION BOX FOR SMOKE DETECTOR. E.C. TO FIELD VERIFY EXACT LOCATION OF SMOKE DETECTOR WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.



**2 ELECTRICAL POWER PLAN**  
SCALE: 1/4" = 1'-0"



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

**ELECTRICAL LIGHTING PLAN GENERAL NOTES:**

- A. COORDINATE FINAL FIXTURE MAKE AND MODEL WITH ARCHITECT.
- B. COORDINATE FINAL REQUIREMENT / MODEL / QUANTITY OF DIMMER WITH ARCHITECT/OWNER.
- C. CONTRACTOR TO PROVIDE MANUAL SWITCHING AS PER FBC 2020, C405.2.5 AND LIGHTING CONTROL PER C405.2.2.
- D. VERIFY ALL EXISTING EXTERIOR LIGHTS ON BUILDING, WALKWAYS AND IN PARKING AREAS ARE WORKING PROPERLY. REPLACE IF FOUND INOPERABLE BASE BID ACCORDINGLY.

**ELECTRICAL LIGHTING PLAN KEYED NOTES:**

- 1. CONNECT ALL EMERGENCY EGRESS LIGHTING AND EXIT SIGN FIXTURES TO NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES. EXIT SIGNS SHALL NOT EXCEED 5 WATTS PER FACE.
- 2. WALL MOUNTED OCCUPANCY SENSOR. E.C. TO COORDINATE EXACT LOCATION IN FIELD.
- 3. EXHAUST FAN SHALL BE CIRCUITED & CONTROLLED ALONG WITH THE LIGHT FIXTURES IN THE SAME ROOM.
- 4. SWITCHES FOR LIGHTING CONTROL. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- 5. JUNCTION BOX FOR EXTERIOR SIGNAGE CONTROLLED WITH TIMECLOCK. ALSO COORDINATE EXACT LOCATION WITH SIGNAGE PROVIDER.
- 6. E.C. CO-ORDINATE LOCATION OF LIGHTING CONTACTOR PANEL 'LCP' WITH ARCHITECT/OWNER. SEE SCHEDULE ON THIS DRAWING FOR ADDITIONAL INFORMATION.
- 7. CO-ORDINATE LOCATION OF ET1125C SERIES 24-HOUR ELECTRONIC TIME SWITCH (3.1"x5.3"x8") WITH ARCHITECT/OWNER. SEE SCHEDULE ON THIS DRAWING FOR ADDITIONAL INFORMATION.
- 8. EXISTING LIGHTING FIXTURES TO REMAIN. CONNECT EXISTING LIGHTING FIXTURES TO NEW CONTROLS AS SHOWN.
- 9. INSTALL SWITCH HEIGHT MOUNTED OCCUPANCY SENSOR SUITABLE FOR WALK-IN COOLER/FREEZER ROOM. E.C. TO COORDINATE WITH WALK-IN COOLER/FREEZER MANUFACTURER
- 10. EXHAUST FAN SHALL BE INTERLOCKED WITH THE OVEN, CIRCUIT TO BE EXISTING.
- 11. NOT IN USED.

KITCHEN EQUIPMENT SCHEDULE							
ITEM NO.	QTY	DESCRIPTION	VOLTAGE	PHASE	AMPS	KW	CONN. TYPE NEMA
E01	01	ESPRESSO MACHINE	208	1	14	2.91	CORD & PLUG 6-30
E02	01	HOT COFFEE BREWER	208	1	25.5	5.30	TERMINAL BOX
E03	01	ESPRESSO GRINDER	208	1	2.11	0.44	CORD & PLUG 6-30
E08	01	DUAL TEMPERATURE WINE DISPENSER	115	1	4.4	0.51	CORD & PLUG 5-15
E09	01	MINI ROTATING RACK CONVECTION OVEN -ELECTRIC	208	3	50	17.99	DISCONNECT
E10	01	40 QT. TWO-SPEED SPIRAL DOUGH MIXER	208	1	14.5	3.02	CORD & PLUG 6-20
E11	01	BAGEL AND BUN SLICER	120	1	3.75	0.45	CORD & PLUG 5-20
E12	01	BAGGIE KETTLE	115	1	4	0.46	CORD & PLUG 5-15
E13	01	SINGLE BAGEL DIVIDER FORMER	208	3	4.7	1.69	CORD & PLUG 6-20
E14	01	UNDERCOUNTER REFRIGERATOR	115	1	6.6	0.76	CORD & PLUG 5-15
E15	01	FULL SIZE INSULATED HEATED CABINET WITH CLEAR DOOR	120	1	12	1.44	CORD & PLUG 5-20
E17	01	BUFFET DISPLAY TABLE	115	1	3.8	0.44	CORD & PLUG 5-15
E18	02	POS	115	1	1.6	0.18	CORD & PLUG 5-20
E19	01	ICE MACHINE U.C.	115	1	5	0.58	CORD & PLUG 5-15
E21	02	REFRIGERATED COUNTER CASE, SELF-SERVE	208	1	1.12	0.23	CORD & PLUG 6-20
E36	01	PLANETARY MIXER STAINLESS STEEL 20 QT.	120	1	9	1.08	CORD & PLUG 5-20
E40	01	12"x10" FOOD WALK-IN	120	1	8.5	1.02	CORD & PLUG 5-20

NOTE : E.C. TO COORDINATE WITH ARCHITECT / KITCHEN EQUIPMENT SPECIALIST FOR CONNECTION TYPE AND HEIGHT PRIOR TO ROUGH IN.

**KITCHEN EQUIPMENT SCHEDULE GENERAL NOTE:**

- A. E.C. TO VERIFY EXACT VOLTAGE, NUMBER OF WIRES, BREAKER & RECEPTACLE RATING AND POWER CONNECTION REQUIREMENT OF THE EQUIPMENT WITH KITCHEN EQUIPMENT SPECIALIST. ANY DISCREPANCIES SHALL BE COMMUNICATED WITH ENGINEER ON RECORD PRIOR TO BIDDING/ROUGH-IN.

**LIGHT FIXTURE SCHEDULE**

No.	DESCRIPTION	MANUFACTURER	MODEL	QUANTITY	WATTAGE
L01	LENS LARGE PENDANT LIGHT	ZERO	LED 973LM BLACK HFF	3	21W
L02	MARLIN WALL LAMP	FARO BARCELONA	65133	4	15W
L03	24" x 48" TROFFER	LITHONIA	EPANL-24-48L-35K	4	45W
L04	HALF DOME PENDANT LIGHT	BASELITE	HD14/38/LBLC	3	35W
L05	LED TRACK LIGHTING (4 LAMPS)	JUNO	R605-35K-80CRI-WFL-BL	4	11W/L
L06	6" CAN LIGHT	LITHONIA	LDN6-L06-WR-LD-MVOLT-D1	4	45W
L07	LED TRACK LIGHTING (6 LAMPS)	JUNO	R605-35K-80CRI-WFL-BL	6	11W/L
L08	24" x 24" TROFFER	LITHONIA	EPANL-24-24L-35K	13	45W
L09	VANITY SCONCE	LITHONIA	FMVCSLS-24IN-MVOLT-35K-90CRI-BN-M6	1	TBD
L10	CHICAGO EDGE LIT EXIT SIGN	BIG BEAM	ERCL-EDGE 2WRWS	02	5W
EX	EXIT SIGN	-	-	-	5W

**LIGHT FIXTURE SCHEDULE GENERAL NOTE:**

- A. VERIFY FINAL SELECTION WITH ARCHITECT/OWNER PRIOR TO BID.
- B. ALL THE FIXTURE SHALL BE LED TYPE.
- C. FIXTURES SELECTED SHALL BE OPERABLE AT 120V.

GENERAL ROOF POWER PLAN NOTES:

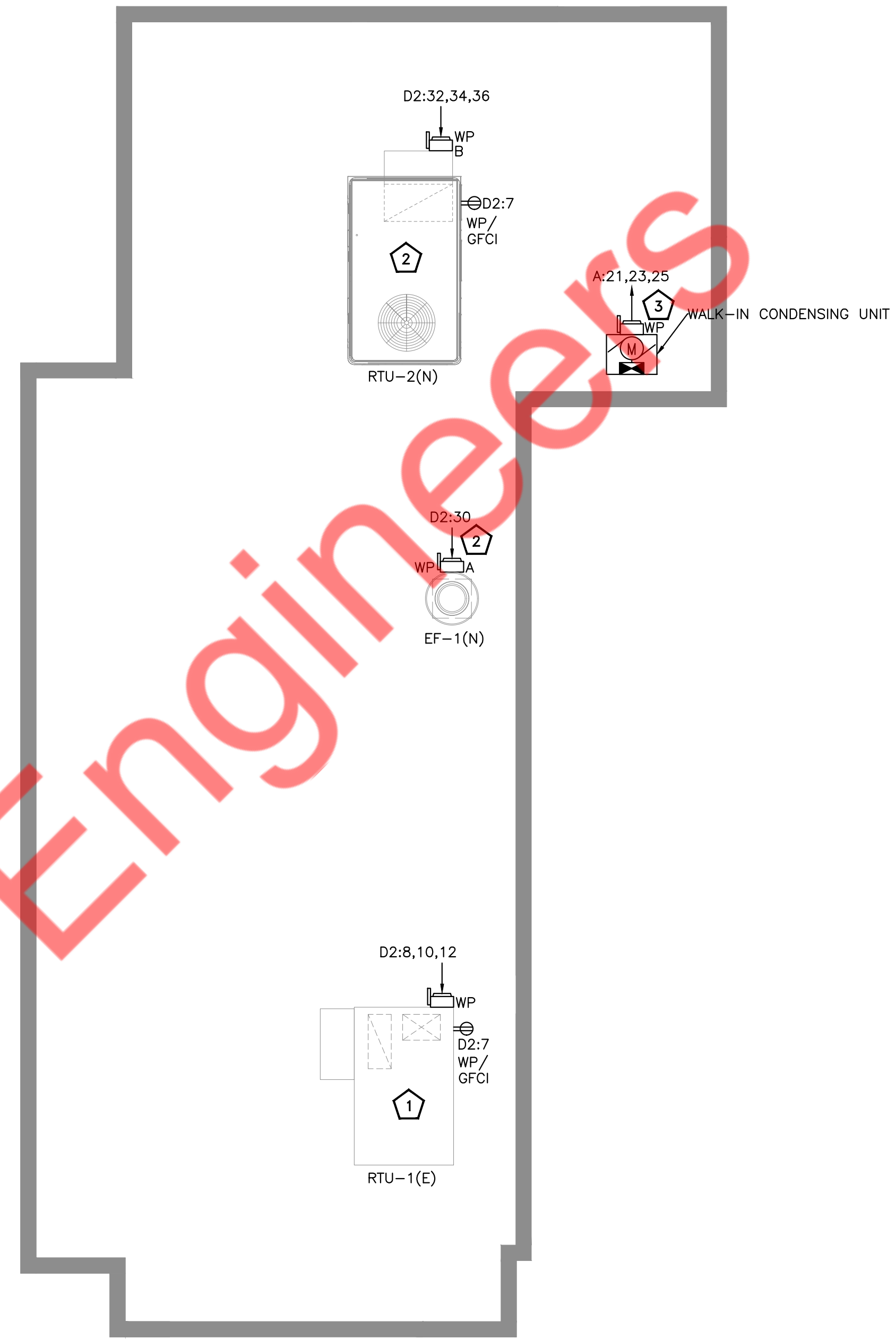
A. E.C. SHALL VERIFY WITH THE OWNER FOR RATING AND OPERABLE CONDITION OF THE EXISTING ELECTRICAL CIRCUITS AND CONTROLS OF THE EXISTING MECHANICAL UNITS IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

ELECTRICAL POWER PLAN KEYED WORK NOTES: #

1 EXISTING MECHANICAL EQUIPMENT WITH ITS ELECTRICAL CONNECTION AND ELECTRICAL FIXTURE TO REMAIN. E.C. SHALL VERIFY OPERABLE CONDITION OF ELECTRICAL CONNECTION AND ELECTRICAL FIXTURE ON FIELD. REPLACE IF INOPERABLE. BASE BID ACCORDINGLY. E.C. SHALL COORDINATE WITH LANDLORD FOR THE EXACT LOCATION OF RTU AND ITS ELECTRICAL CONNECTIONS ON FIELD.

2 ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. COORDINATE LOCATION OF DISCONNECT WITH OWNER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

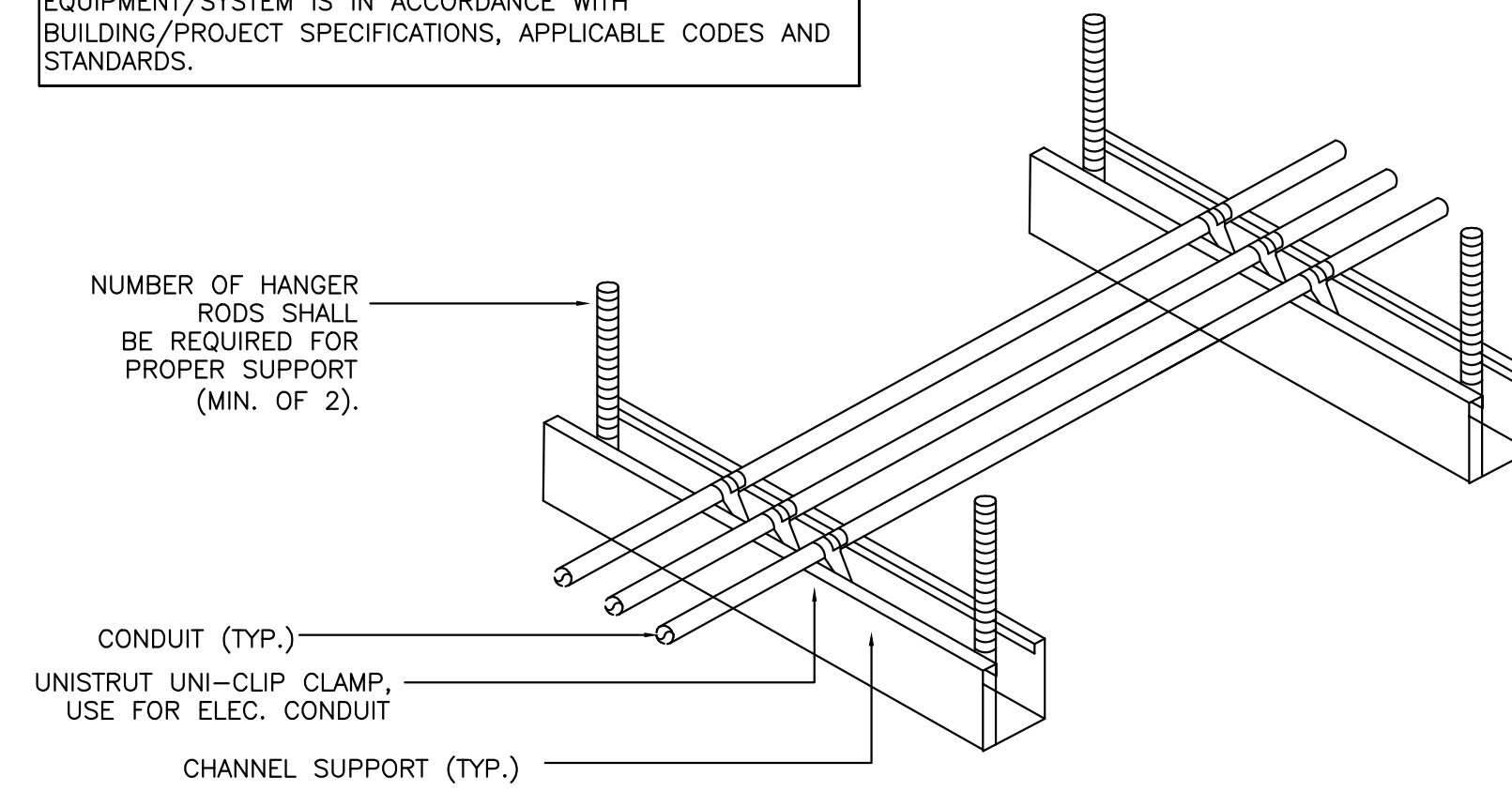
3 E.C. SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.



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

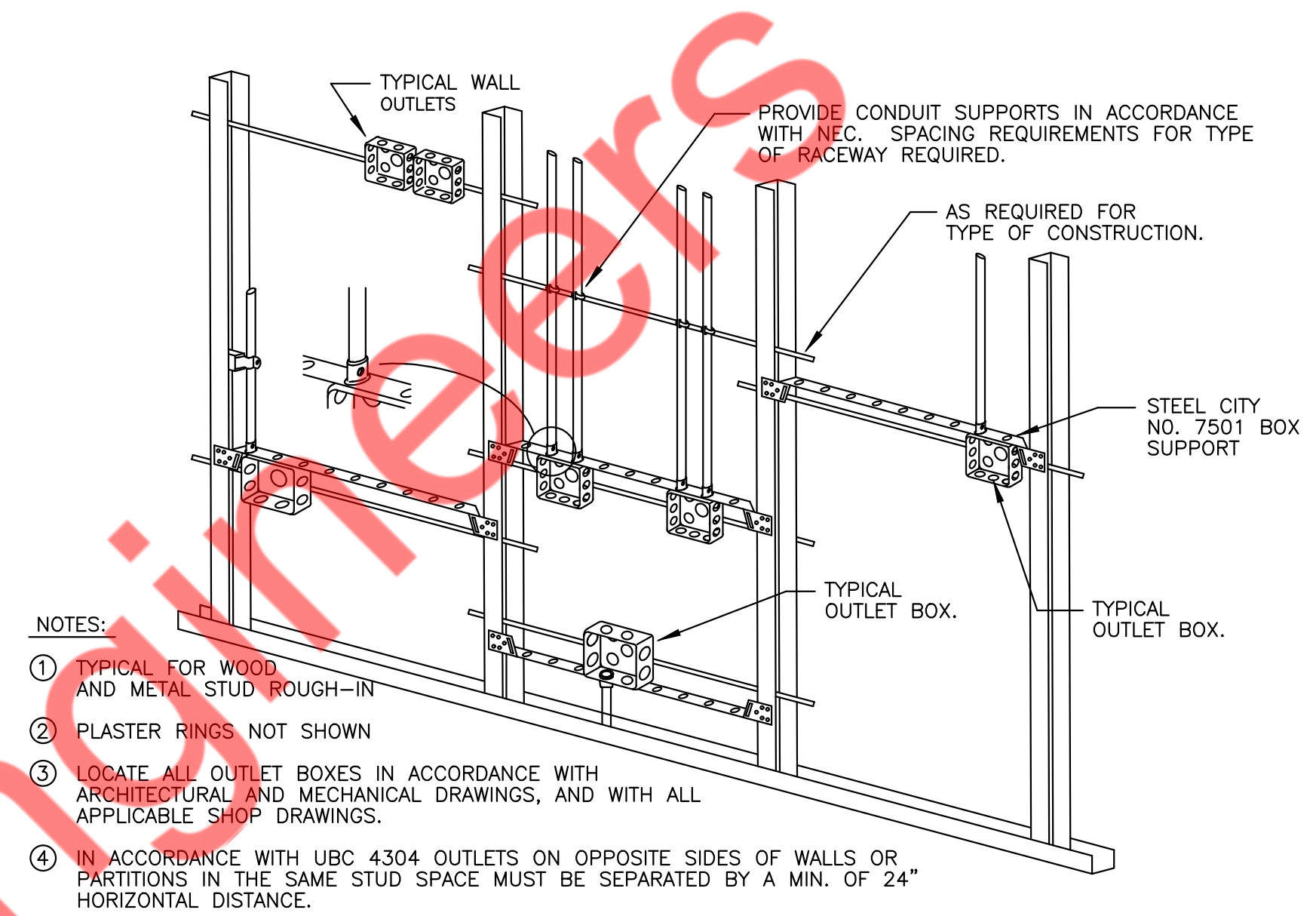


**NOTE:**  
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.



**NOTES:**

1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
4. UNISTRUT AND CONDUIT INSTALLATION MAY BE REVERSED.



**NOTES:**

1. TYPICAL FOR WOOD AND METAL STUD ROUGH-IN
2. PLASTER RINGS NOT SHOWN
3. LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.
4. IN ACCORDANCE WITH UBC 4304 OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 24" HORIZONTAL DISTANCE.

4 CONDUIT SUPPORT DETAIL  
E3.0 N.T.S

2 DETAIL TYPICAL ROUGH-IN REQUIREMENTS  
E3.0 N.T.S

**MANUAL MODE OPERATION:**

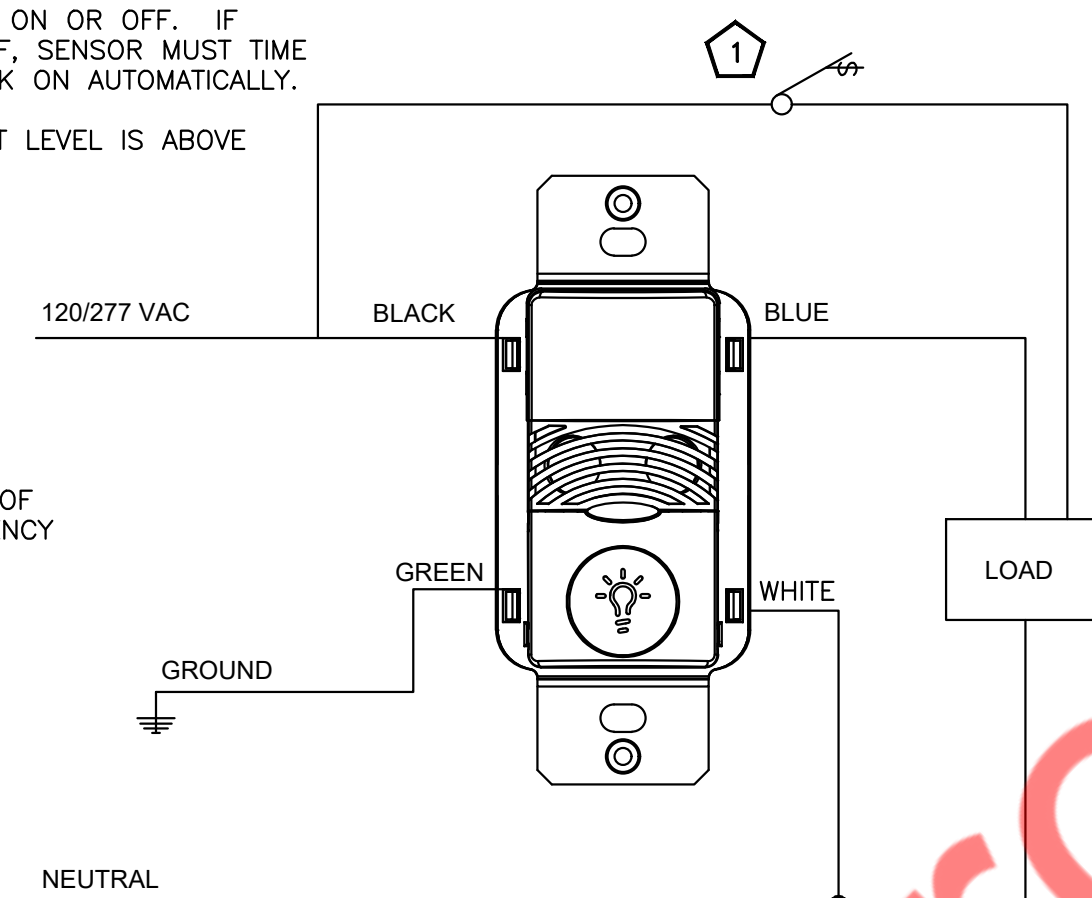
1. PUSHBUTTON PRESS IS REQUIRED TO TURN LOAD ON.
2. LOAD TURNS OFF WHEN SENSOR TIMES OUT OR BY PRESSING PUSH BUTTON.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

**AUTOMATIC MODE OPERATION:**

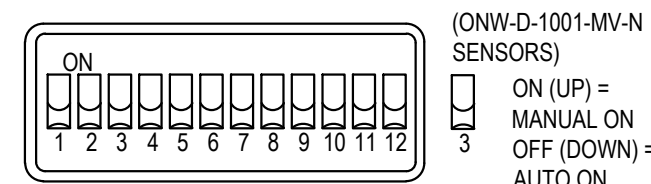
1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. PUSHBUTTON CAN BE USED TO TURN LOAD ON OR OFF. IF PUSHBUTTON IS USED TO TURN LOAD OFF, SENSOR MUST TIME OUT FIRST, BEFORE LOAD CAN TURN BACK ON AUTOMATICALLY.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

**SENSOR TYPES INCLUDE:**

ONW-D-1001-MV-N



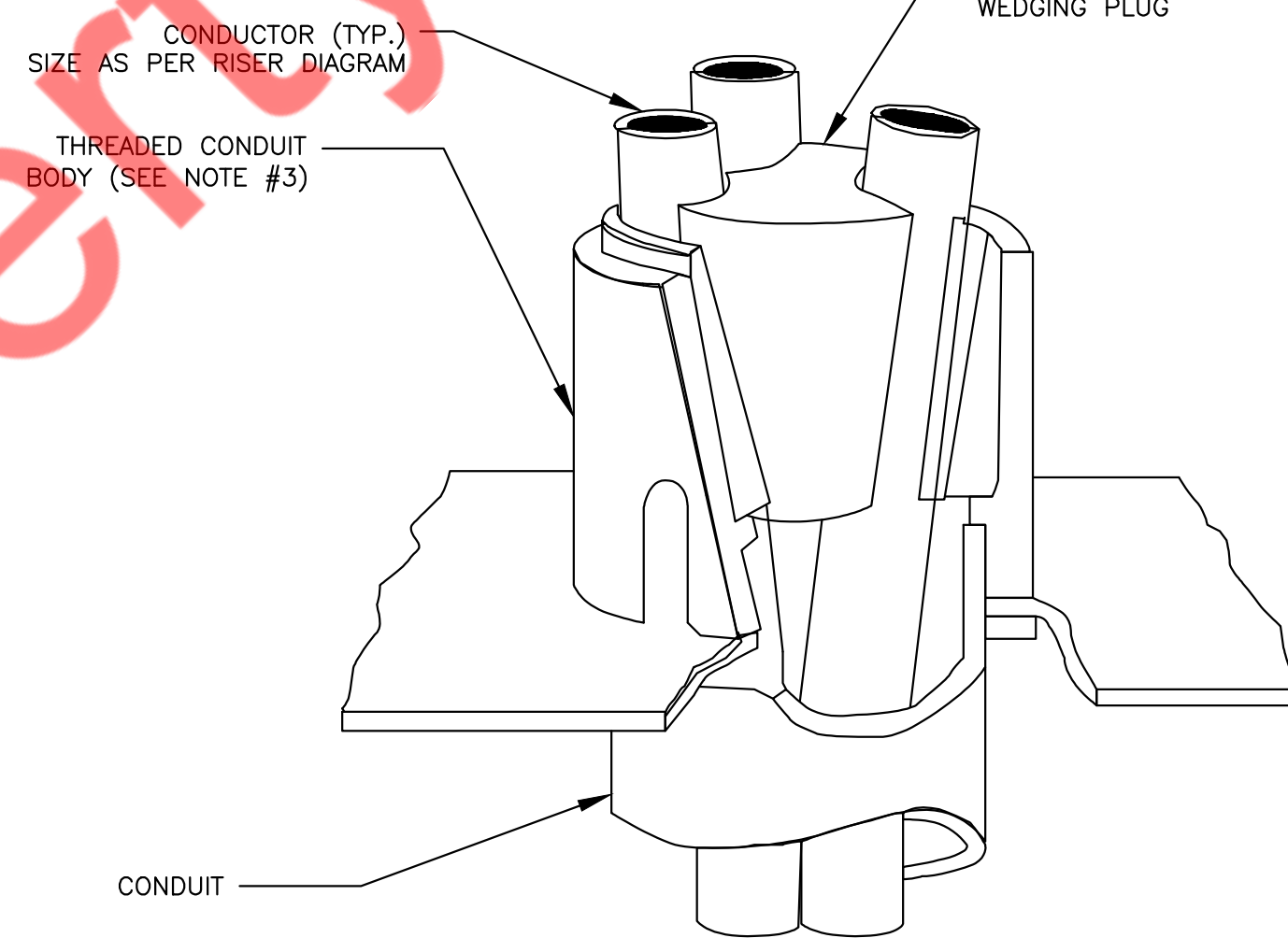
1 PROVIDE SENSING CONDUCTOR TAPPED AHEAD OF ANY SWITCHES WHERE SWITCH SERVES EMERGENCY FIXTURES.



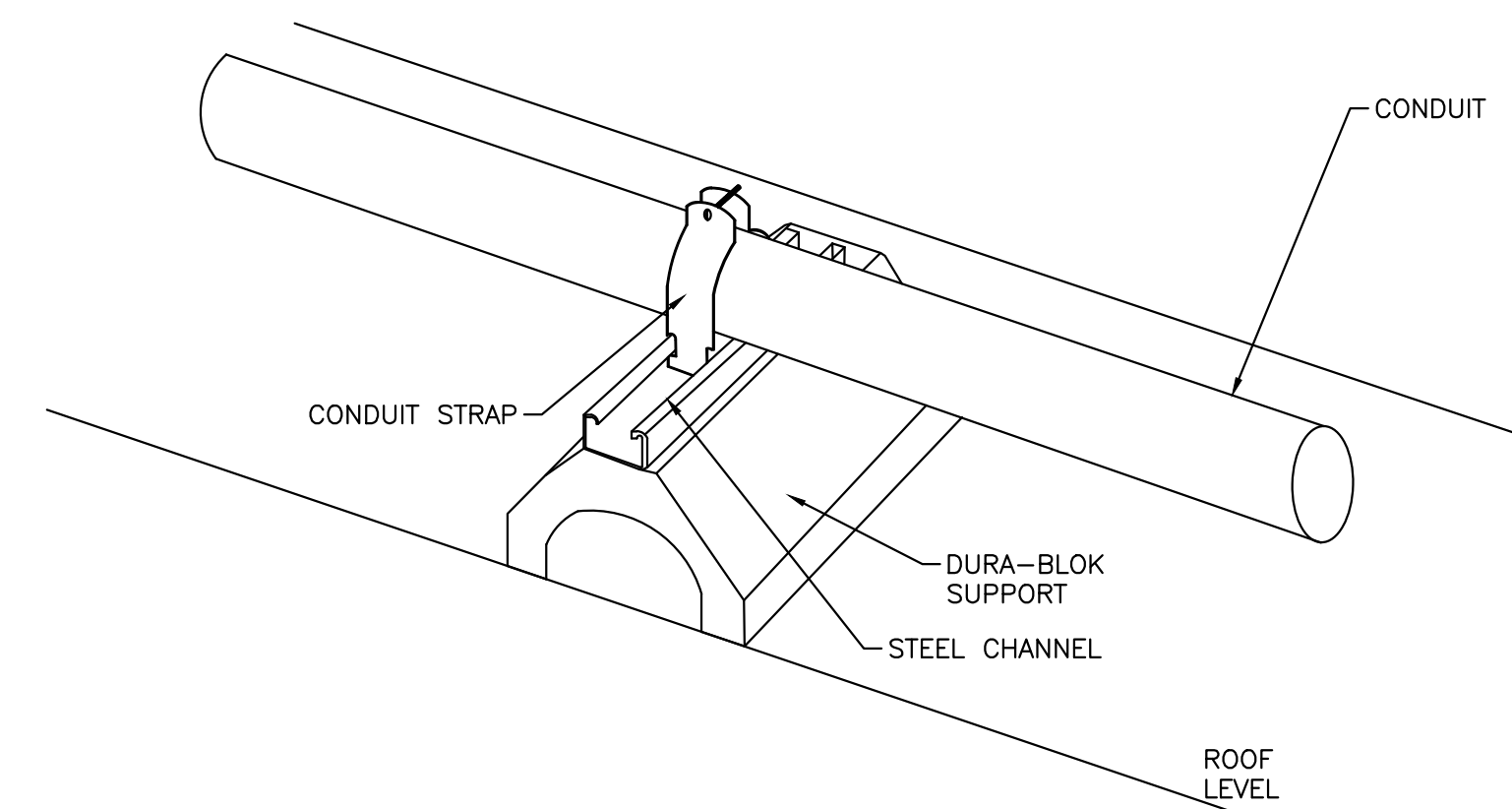
5 WIRING DIAGRAM—LINE VOLTAGE WALL SWITCH SENSOR(NEUTRAL CONNECTION) OCCUPANCY/VACANCY—SINGLE LEVEL  
E3.0 N.T.S

**NOTES:**

1. ALL CONDUCTORS IN VERTICAL RACEWAYS SHALL BE SUPPORTED IN ACCORDANCE WITH ARTICLE 300.19 OF NEC. CABLE SUPPORTS SHALL BE LOCATED AT THE INTERVALS REQUIRED BY THE NEC.
2. CABLE SUPPORT SYSTEM SHALL BE AS MANUFACTURED BY O-Z GEDNEY WITH POZI-GRIP "S-STYLE" WEDGING PLUG OR APPROVED EQUAL.
3. FOR THREADLESS CONDUIT (RIGID, IMC OR EMT), ATTACH CONDUIT BODY TO MALE THREADS OF A SET SCREW OR COMPRESSION CONNECT, AS PERMITTED BY SPECIFICATIONS.
4. PROVIDE PULL BOX AT EACH LOCATION OF CABLE SUPPORTS. PULL BOX SHALL BE SIZED AS PER CODE TO ACCOMMODATE ALL CONDUITS.



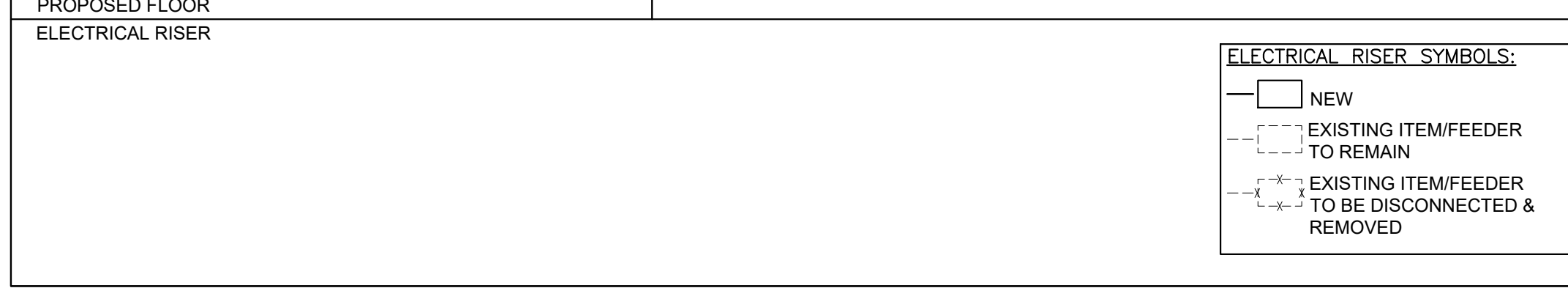
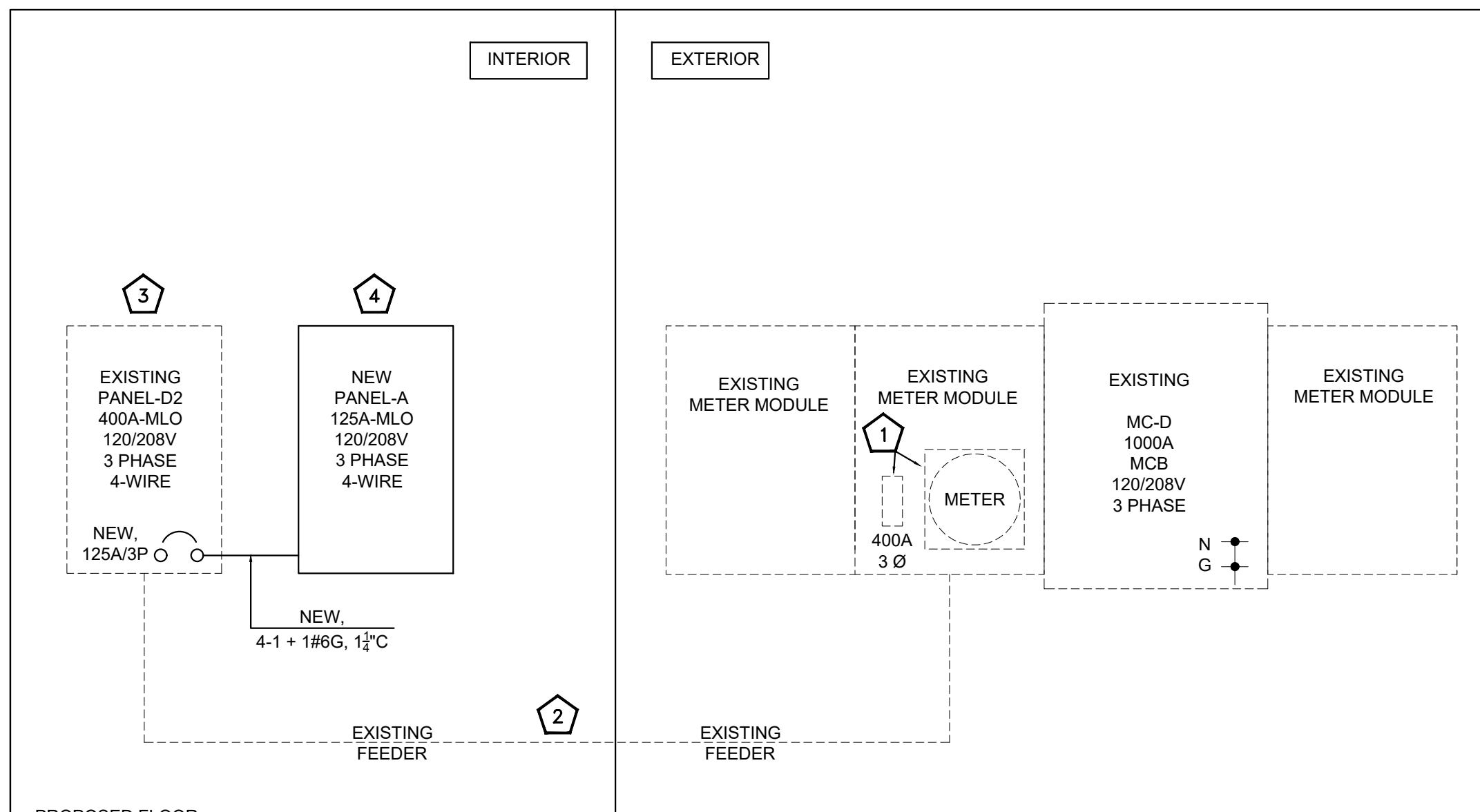
3 VERTICAL CABLE SUPPORT DETAIL  
E3.0 N.T.S



**NOTES:**

1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".

1 CONDUIT SUPPORT DETAIL ON ROOF  
E3.0 N.T.S



**RISER DIAGRAM GENERAL NOTE:**

- E.C. SHALL COORDINATE WITH UTILITY FOR THE AVAILABLE FAULT CURRENT AND VERIFY AIC RATING OF THE EXISTING DEVICES IN FIELD ACCORDINGLY.
- E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.
- E.C. SHALL VERIFY THE EXISTING POWER DISTRIBUTION IN FIELD AND INFORM ENGINEER FOR ANY DISCREPANCY BEFORE COMMENCING ANY WORK.

**ELECTRICAL RISER KEYED WORK NOTES:**

- EXISTING 400A, 120/208V, 3PH, 4W ELECTRICAL METER AND BREAKER FOR THE PROJECT SPACE SHALL REMAIN. E.C TO VERIFY EXACT LOCATION, RATING AND OPERABLE CONDITION OF THE EXISTING METER & BREAKER IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- EXISTING 400A, 120/208V, 3PH, 4W FEEDER SHALL REMAIN. E.C. SHALL VERIFY THE EXACT RATING AND OPERABLE CONDITION OF THE FEEDER IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- EXISTING 400A, 120/208V 3PH, 4W ELECTRICAL PANEL "D2" FOR THE PROJECT SPACE SHALL REMAIN. E.C. SHALL VERIFY EXACT LOCATION, RATING & OPERABLE CONDITION OF THE PANEL IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- NEW 125A, 120/208V 3PH, 4W ELECTRICAL PANEL "A". E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.

**PANEL SCHEDULE ABBREVIATIONS:**

L = LIGHTING  
R = RECEPTACLE  
H = HVAC  
M = MOTOR  
E = KITCHEN EQUIPMENT  
O = OTHER

\* GFCI CIRCUIT BREAKER.  
\*\* NEW CIRCUIT BREAKER IN EXISTING PANEL.

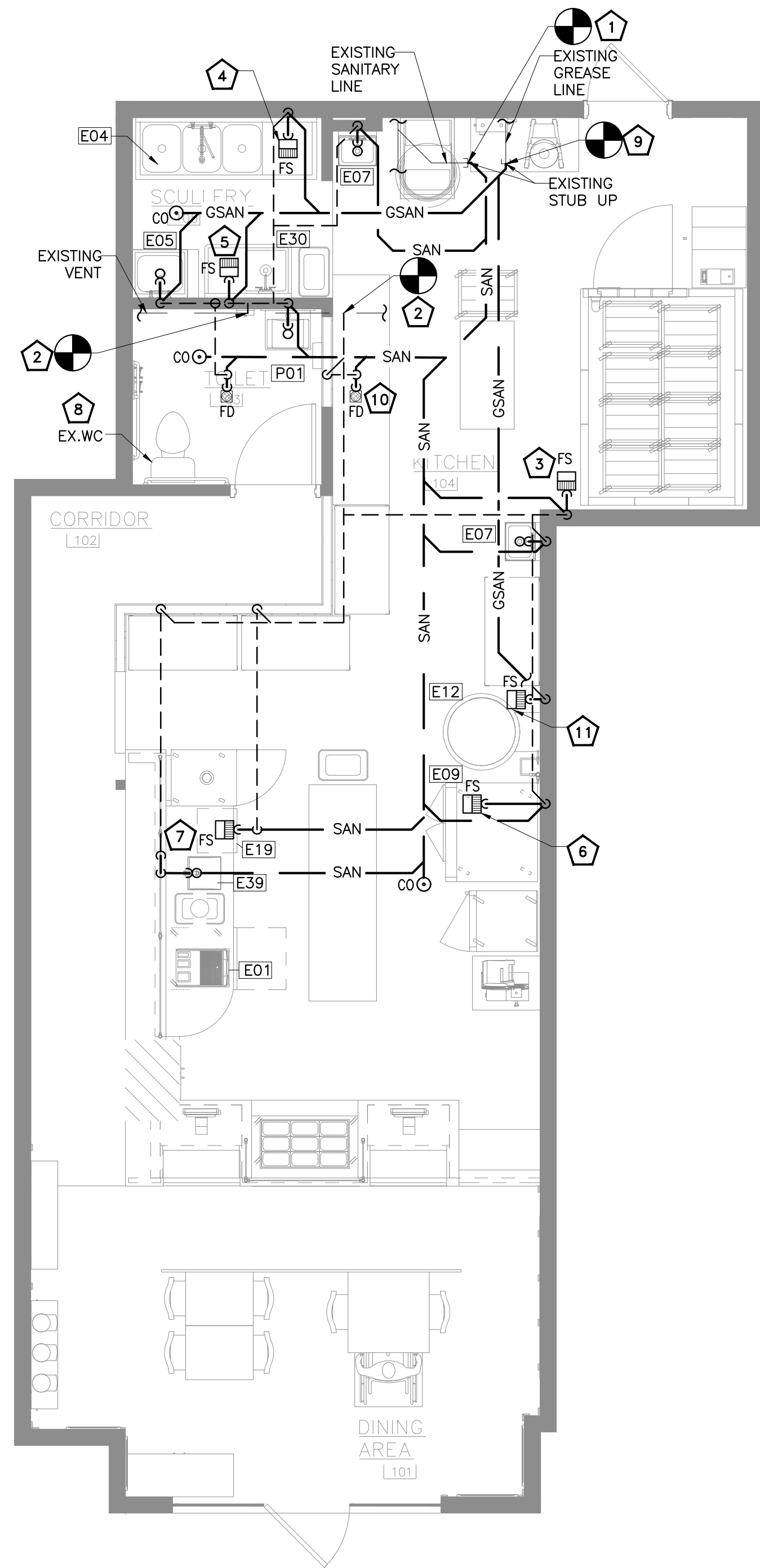
**PANEL SCHEDULE GENERAL NOTE:**

- ALL CIRCUITING SHOWN IN THE EXISTING PANEL IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES IN FIELD AND INFORM ENGINEER FOR DISCREPANCIES.
- ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY BEFORE BID.
- E.C. SHALL REPLACE OR PROVIDE NEW CIRCUIT BREAKERS IN PLACE OF EXISTING CIRCUIT BREAKERS WHEREVER NECESSARY TO BE IN LINE WITH THE PANEL SCHEDULE.
- E.C. SHALL VERIFY OPERABLE CONDITION OF EXISTING PANEL, CABLE, FEEDERS, CIRCUIT BREAKER ETC. IN FIELD. REPLACE IN FOUND INOPERABLE.

PANEL: D2 (EXISTING)											MOUNTING: SURFACE			
120/208	VOLTS,	3	PHASE,	4	WIRE	PANEL LOCATION: BOH								
MLO: 400 A			BUS: 400A			MIN,		FED FROM: EXISTING METER CENTER						
<b>NOTE:</b>														
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C						
1	20	SPARE				0.90			2#12, #12G, 3/4"C	0.90	L	LIGHTING FOH	20	2
3	30/2P	E02_HOT COFFEE BREWER	E	2.65	3#10, #10G, 3/4"C		3.55		2#12, #12G, 3/4"C	0.90	L	LIGHTING FOH	20	4
5			E	2.65				3.15	2#12, #12G, 3/4"C	0.50	O	TIME CLOCK	20	6
7	20	ROOF RECEPTACLE	R	0.36	2#12, #12G, 3/4"C	5.46				5.10	H			8
9	20	REC SHOW WINDOW	R	0.36	2#12, #12G, 3/4"C		5.46		3#8, #10G, 3/4"C	5.10	H	RTU-1 ( E )	45/3P	10
11	20	SIGNAGE POWER	L	1.20	2#12, #12G, 3/4"C			6.30		5.10	H			12
13	20	RESTROOM GFCI	R	0.36	2#12, #12G, 3/4"C	1.82			2#10, #10G, 3/4"C	1.46	E	E01_ESPRESSO MACHINE	30/2P	14
15	20	E18_POS RECEPTACLES	R	0.90	2#12, #12G, 3/4"C		2.36			1.46	E			16
17	20/2P	E21_REFRIGERATED COUNTER CASE, SELF-SERVE	E	0.15	2#12, #12G, 3/4"C			1.15	2#12, #12G, 3/4"C	1.00	R	REC_SECURITY	20	18
19			E	0.15			0.65		2#12, #12G, 3/4"C	0.50	O	JUNCTION BOX FOR HOOD	20	20
21	20/2P	E21_REFRIGERATED COUNTER CASE, SELF-SERVE	E	0.15	2#12, #12G, 3/4"C			0.25	2#12, #12G, 3/4"C	0.10	O	WH-1	20	22
23			E	0.15				0.65	2#12, #12G, 3/4"C	0.50	O	RCP-1	20	24
25	20	E17_ICE CREAM DIPPING CABINET	E	0.53	2#12, #12G, 3/4"C	0.53						SPARE	20	26
27	20	E08_PORTABLE COFFEE DISPENSER	E	0.16	2#12, #12G, 3/4"C			0.16				SPARE	20	28
29	20	E19_U.C.REFRIGERATOR	E	0.58	2#12, #12G, 3/4"C			1.28	2#12, #12G, 3/4"C	0.70	H	EF-1(N)	20	30
31	20	SPARE				4.04				4.04	H			32
33	20	SPARE					4.04		3#6, #10G, 3/4"C	4.04	H	RTU-2 ( N )	50/3P	34
35	20	E14_U.C.REFRIGERATOR	E	0.76	2#12, #12G, 3/4"C			4.80		4.04	H			36
37	20	E40_FOOD WALK-IN	H	1.00	2#12, #12G, 3/4"C	8.81				7.81	O			38
39							7.81		4#1, #6G, 1 1/4" C	7.81	O	TO PANEL "A"	125/3P	40
41	40/2P	SPARE						7.81		7.81	O			42
<b>TOTAL CONNECTED LOAD (KVA)</b>						<b>22.20</b>	<b>23.62</b>	<b>25.13</b>						

PANEL: A (NEW)											MOUNTING: SURFACE			
120/208	VOLTS,	3	PHASE,	4	WIRE	PANEL LOCATION: BOH								
MLO: 125 A			BUS: 125 A			MIN,		FED FROM: EXISTING PANEL "D2"						
<b>NOTE:</b>														
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C						
1	20	E11_12" MANUAL GRAVITY FEED MEAT SLICER	E	0.45	2#12, #12G, 3/4"C	1.65			2#12, #12G, 3/4"C	1.20	E	CONVECTION OVEN CONTROLS (E09)	20	2
3	20	E15_FULL SIZE INSULATED HEATED CABINET	E	1.44	2#12, #12G, 3/4"C		7.44			6.00	E			4
5	30/2P	E03_ESPRESSO GRINDER	E	0.22	2#10, #10G, 3/4"C	6.22		6.22	3#6, #10G, 3/4"C	6.00	E	E09_CONVECTION OVEN-ELECTRIC	60/3P	6
7			E	0.22						6.00	E			8
9	20	E36_PLANETARY MIXER STAINLESS STEEL 20 QT.	E	1.08	2#12, #12G, 3/4"C			1.65		0.57	E			10
11	20/2P	E10_40 QT. TWO-SPEED SPIRAL DOUGH MIXER	E	1.51	2#12, #12G, 3/4"C			2.08	3#12, #12G, 3/4"C	0.57	E	E13_SINGLE BAGEL DIVIDER FORMER	20/3P	12
13			E	1.51			2.08			0.57	E			14
15	20	HAND DRYER	M	1.00	2#12, #12G, 3/4"C	1.90			2#12, #12G, 3/4"C	0.90	R	KITCHEN GENERAL RECEPTACLE	20	16
17	20	E15_HEATED ACABINET	E	1.44	2#12, #12G, 3/4"C			2.34	2#12, #12G, 3/4"C	0.90	R	GENERAL RECEPTACLE	20	18
19	20	E12_BAGGLE KETTLE	E	0.50	2#12, #12G, 3/4"C	0.60			2#12, #12G, 3/4"C	0.10	R	SMOKE DETECTOR	20	20
21			H	0.50			0.50					SPARE	20	22
23	20/3P	WALK-IN CONDENSING UNIT	H	0.50	2#12, #12G, 3/4"C			0.50				SPARE	20	24
25			H	0.50				0.50				SPARE	20	26
27	20	SPARE						0.00				SPARE	20	28
29	20	SPARE						0.00				SPARE	20	30
31	20	SPARE						0.00				SPARE	20	32
33	20	SPARE						0.00				SPARE	20	34
35	20	SPARE						0.00				SPARE	20	36
37	20	SPARE						0.00				SPARE	20	38
39	20	SPARE						0.00				SPARE	20	40
41	20	SPARE						0.00				SPARE	20	42
<b>TOTAL CONNECTED LOAD (KVA)</b>						<b>11.05</b>	<b>11.49</b>	<b>11.14</b>						





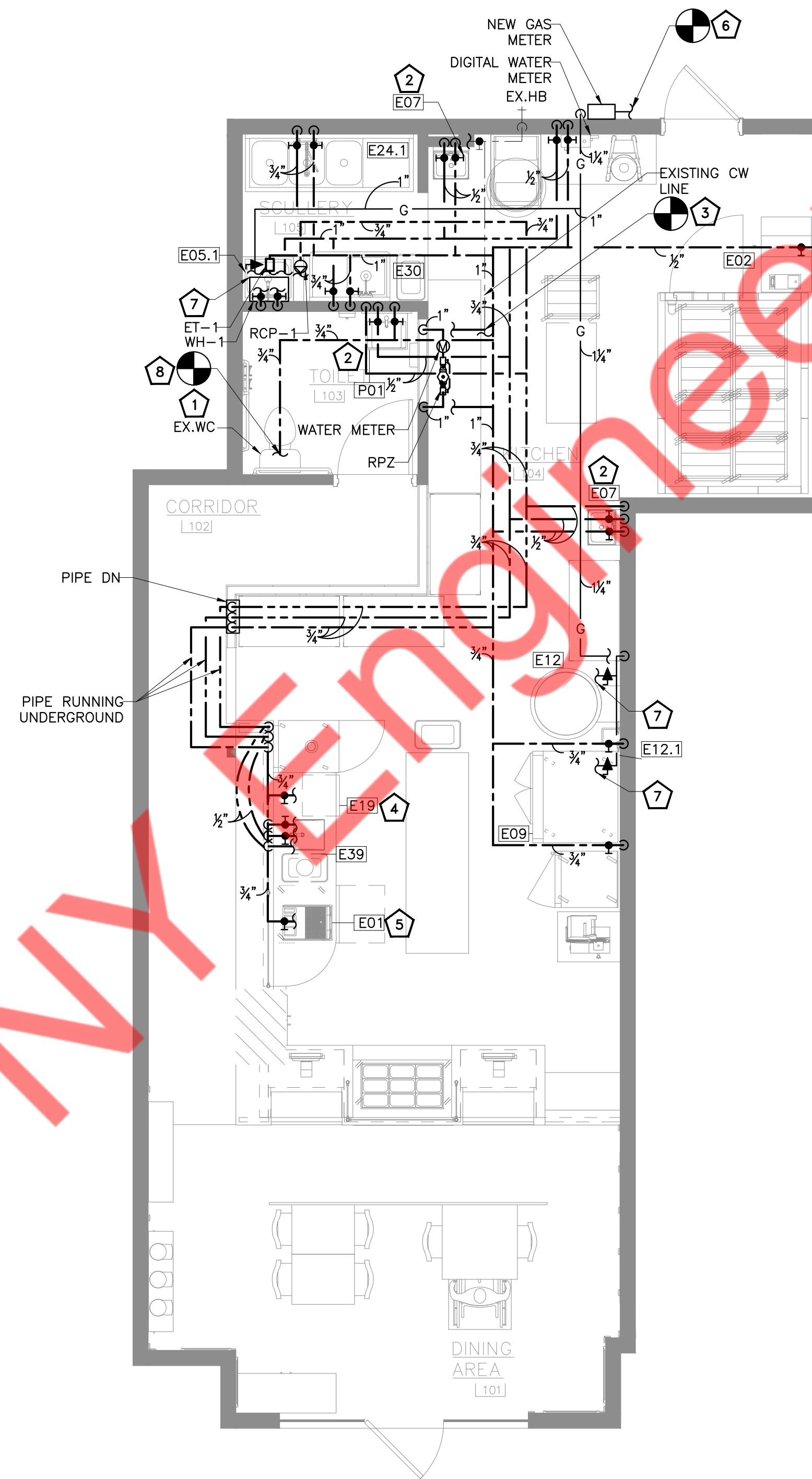
**GENERAL NOTES:**

1. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
2. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.

**SANITARY KEYED NOTES:**

1. CONNECT NEW 4" SANITARY WASTE PIPING TO EXISTING SANITARY STUB UP IN SPACE. CONTRACTOR TO FIELD VERIFY SIZE, ROUTING AND INVERT.
2. CONNECT NEW 3" VENT LINE TO EXISTING VENT LINE IN SPACE. CONTRACTOR VERIFY EXISTING VTR EXACT LOCATION AND SIZE.
3. CONDENSATE DRAIN PIPE FROM WALK IN COOLER EVAPORATOR DISCHARGE TO FLOOR SINK WITH APPROVED AIR GAP.
4. INDIRECT WASTE FROM 3 COMPARTMENT SINK TO FLOOR SINK WITH APPROVED AIR GAP.
5. INDIRECT WASTE FROM 1 COMPARTMENT SINK TO FLOOR SINK WITH APPROVED AIR GAP.
6. INDIRECT DRAIN FROM THE OVEN TO FLOOR SINK WITH APPROVED AIR GAP.
7. INDIRECT WASTE FROM ICE MACHINE AND ESPRESSO MACHINE TO FLOOR SINK WITH APPROVED AIR GAP.
8. EXISTING WATER CLOSET WITH EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE REPLACED IF REQUIRED.
9. CONNECT NEW 4" GREASE SANITARY WASTE PIPING TO EXISTING GREASE SANITARY STUB UP IN SPACE. CONTRACTOR TO FIELD VERIFY SIZE, ROUTING AND INVERT.
10. INDIRECT DRAIN FROM THE RPZ TO FLOOR DRAIN WITH APPROVED AIR GAP.
11. INDIRECT DRAIN FROM THE BAGEL KETTLE TO FLOOR SINK WITH APPROVED AIR GAP.

**2 SANITARY PIPING PLAN**  
P1.1 SCALE: 1/4" = 1'-0"



**GENERAL NOTES:**

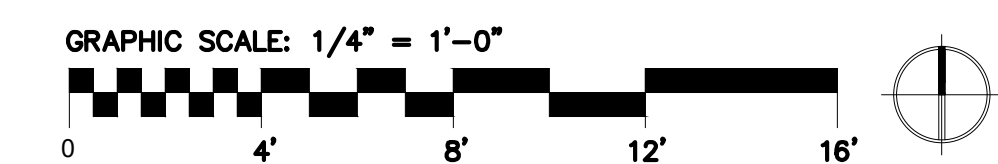
1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER 2020 FLORIDA ENERGY CONSERVATION CODE, 7TH EDITION (REFER SHEET P001)
2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
4. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.

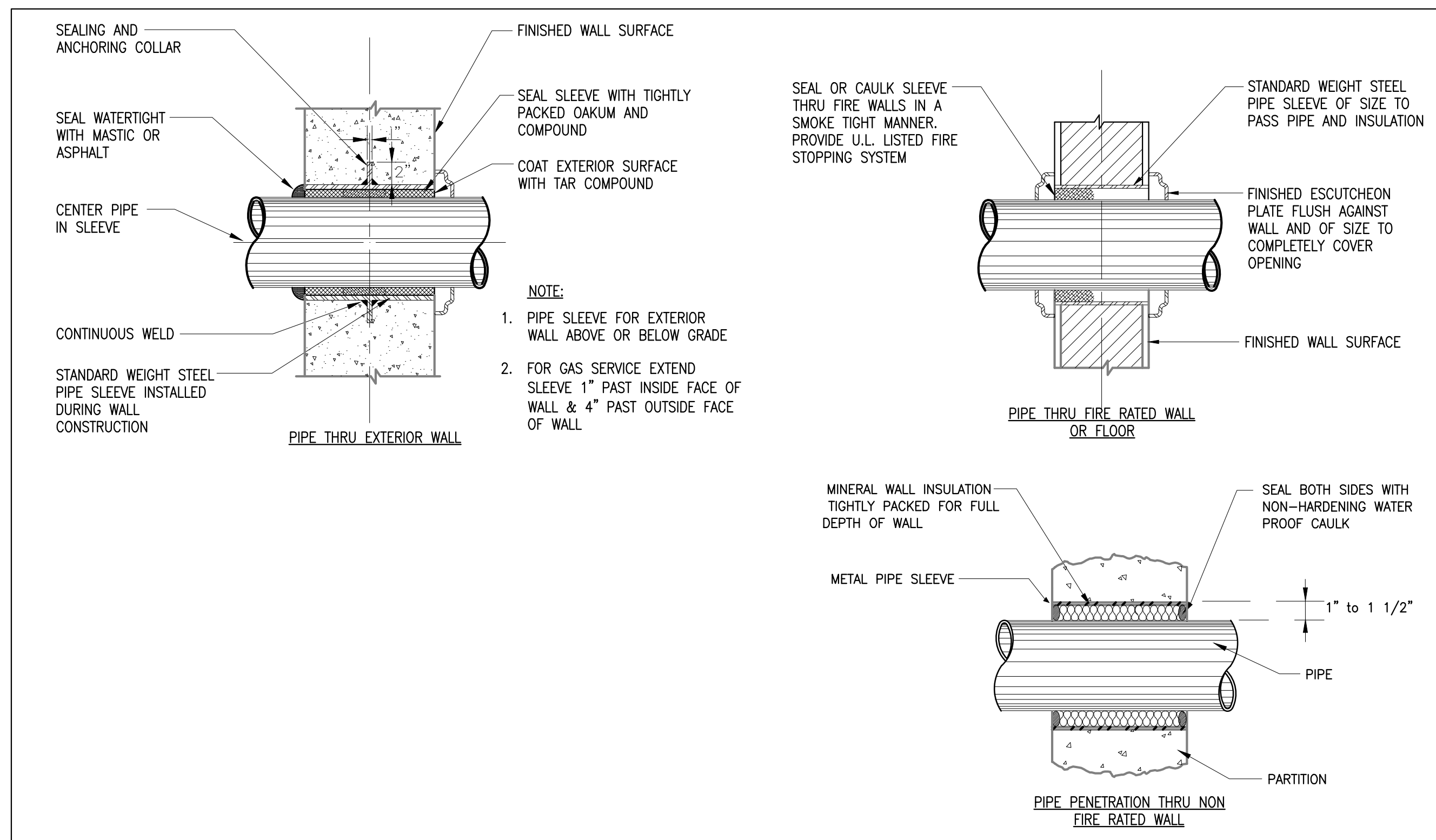
**WATER AND GAS KEYED NOTES:**

1. EXISTING WATER CLOSET WITH EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE REPLACED IF REQUIRED.
2. PROVIDE A TEMPERING VALVE FOR HAND SINK AND LAVATORIES. POWER HYDROGUARD SERIES LFLM495, ASSE. 1070 OR EQUAL. SET TEMPERATURE TO A MAXIMUM OF 110° F.
3. CONNECT NEW 1" CW LINE TO EXISTING CW LINE IN SPACE. CONTRACTOR TO FIELD VERIFY EXISTING WATER LINE LOCATION AND SIZE.
4. PROVIDE ASSE 1012 BACKFLOW PREVENTER FOR ICE MACHINE.
5. CONTRACTOR TO INSTALL APPROVED WATER SOFTENER FOR ESPRESSO MACHINE AS PER MANUFACTURER RECOMMENDATION.
6. CONNECT NEW 1-1/4" GAS LINE WITH NEW GAS METER TO EXISTING GAS LINE IN THIS AREA FOR THE TENTANT. CONTRACTOR TO FIELD VERIFY EXISTING GAS SIZE AND LOCATION OF EXISTING GAS MAIN. CONTRACTOR TO COORDINATE ALL WORK AND FINAL GAS METER LOCATION WITH UTILITY COMPANY AND LANDLORD.
7. CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR BAGEL KETTLE, OVEN AND GAS WATER HEATER.
8. CONNECT NEW 3/4" CW LINE TO EXISTING WATER LINE IN SPACE. CONTRACTOR TO FIELD VERIFY EXISTING WATER LINE AND SIZE.

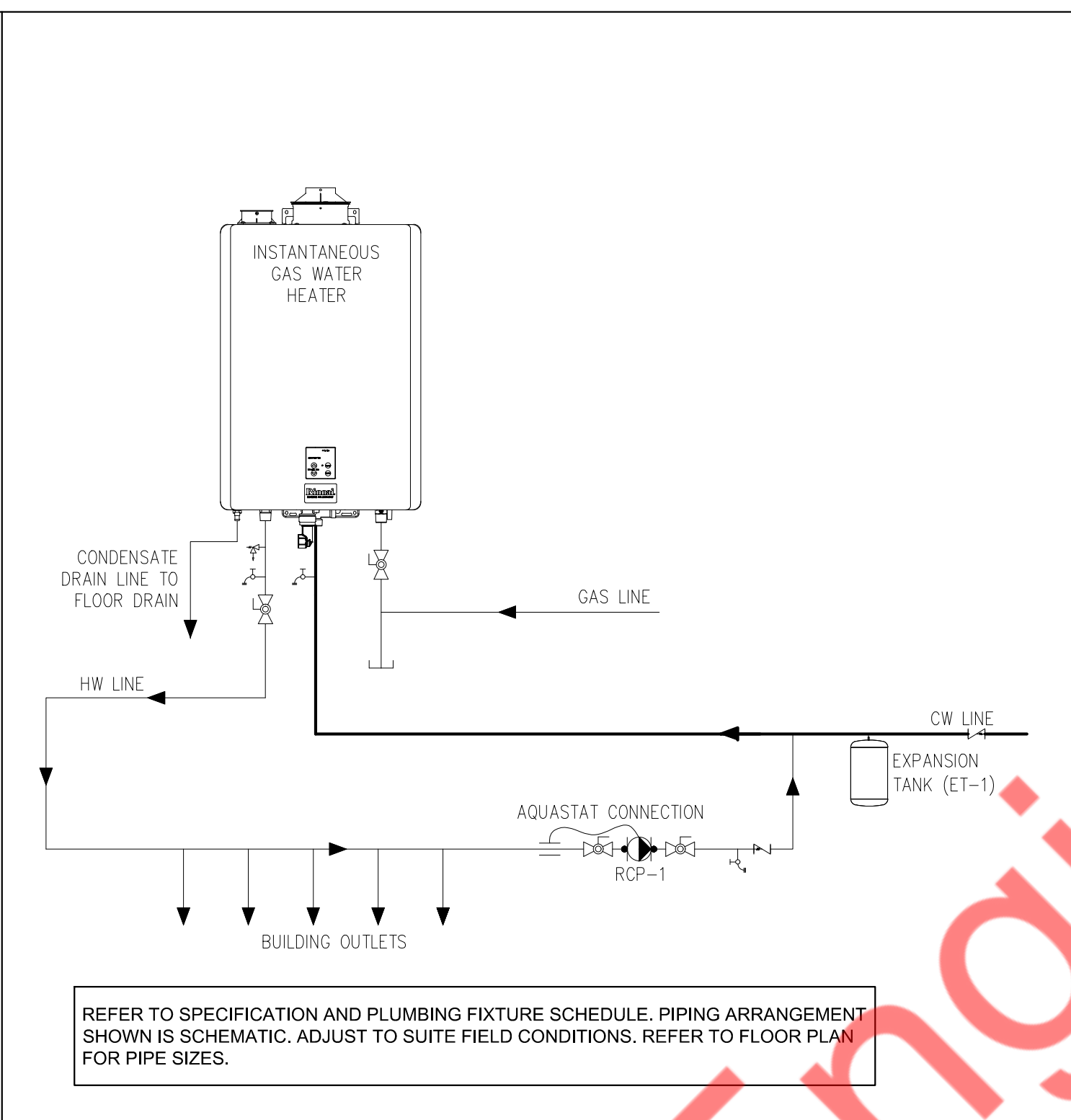
**1 DOMESTIC WATER AND GAS PIPING PLAN**  
P1.1 SCALE: 1/4" = 1'-0"

Property of NY Engineers

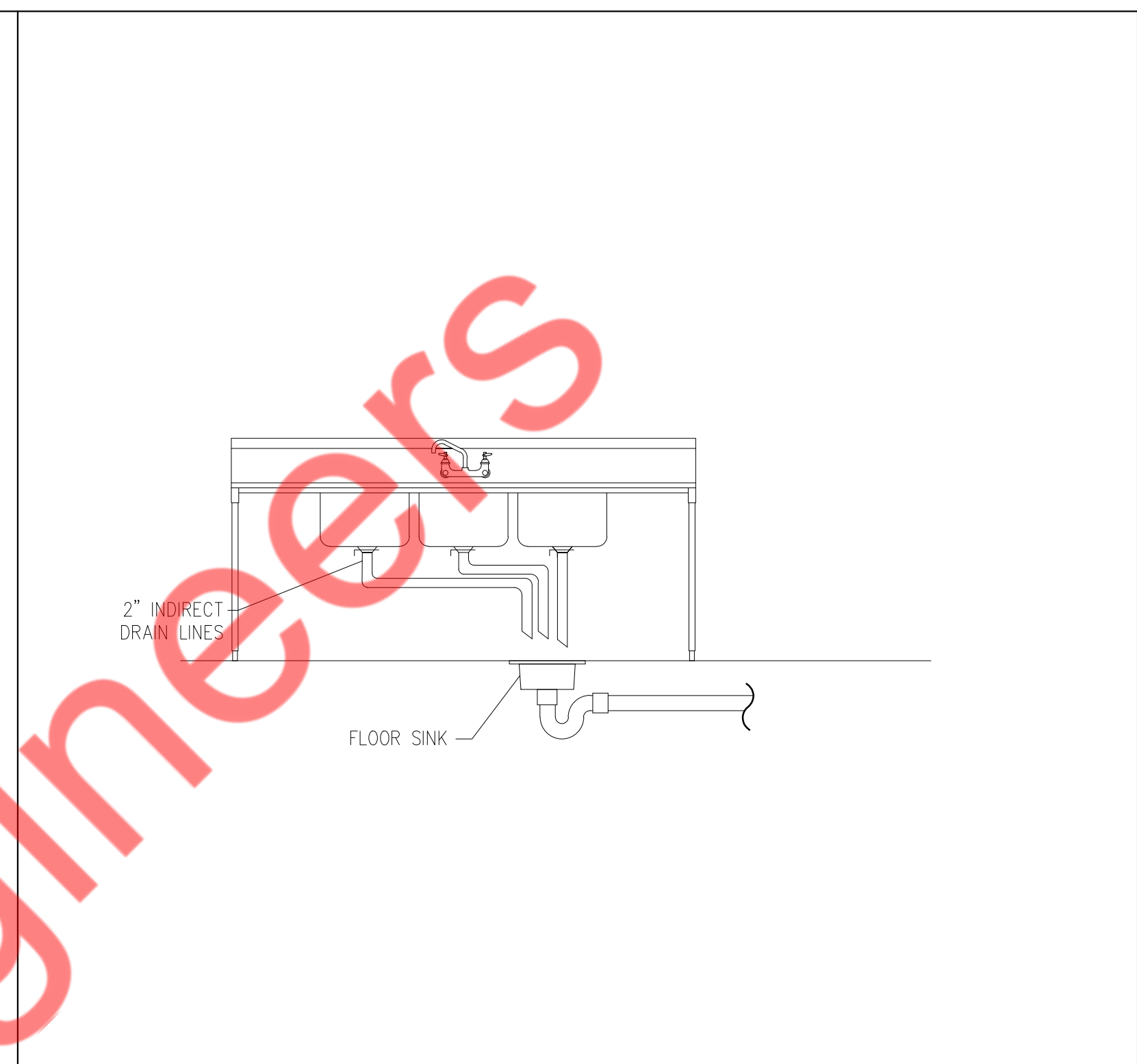




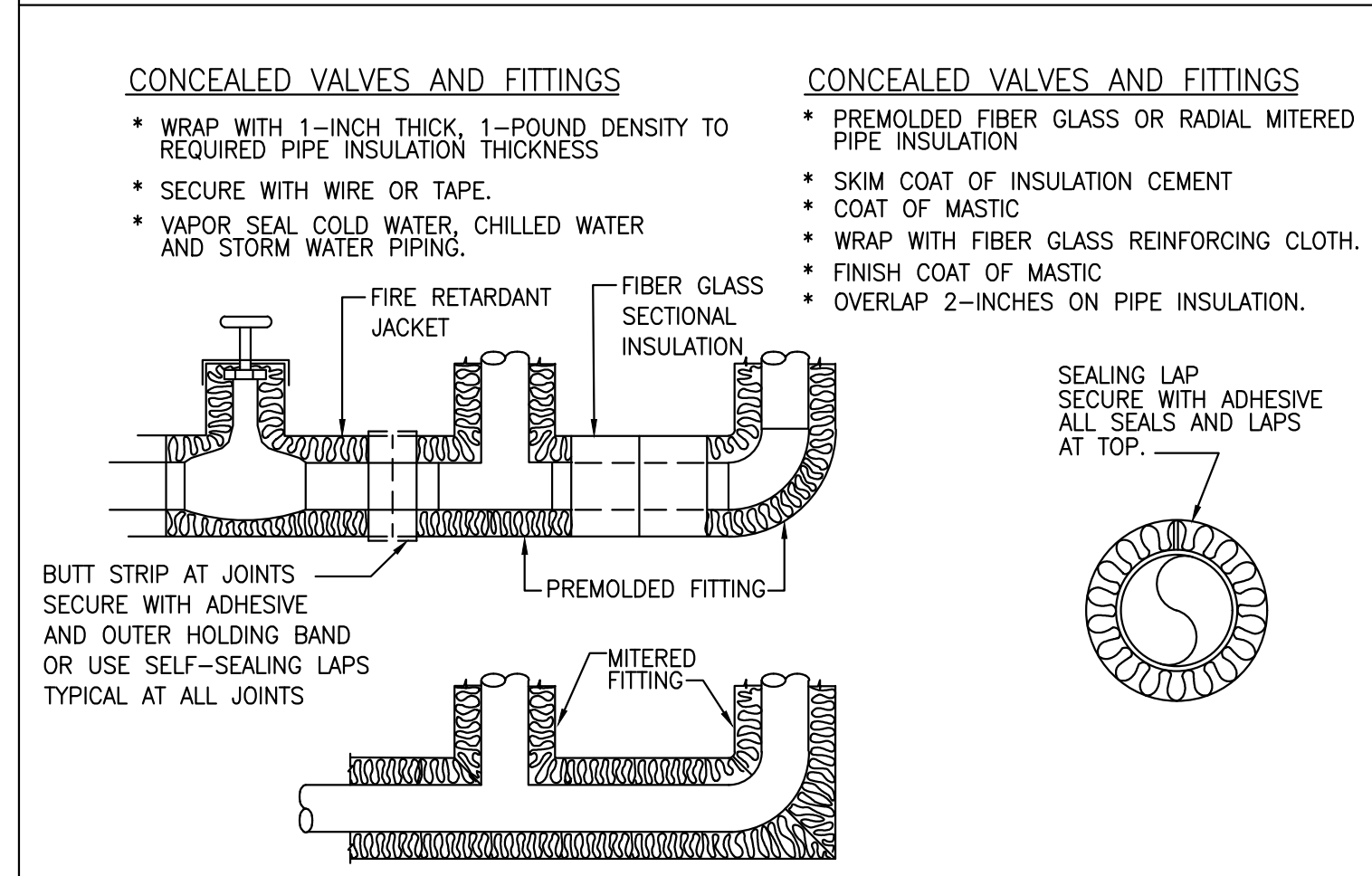
1 PIPE SLEEVE THRU WALL SECTION  
P2.1 N.T.S



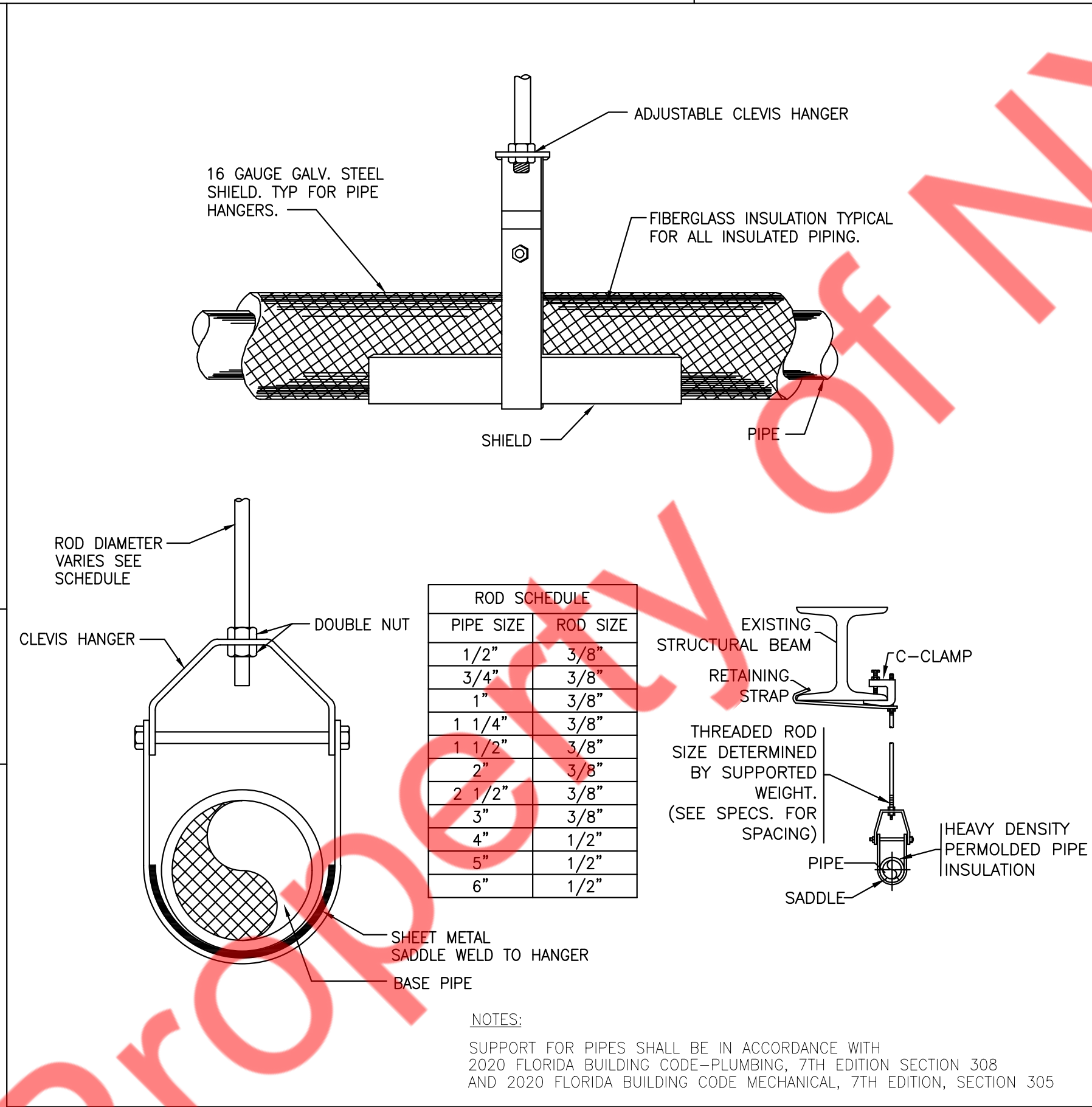
2 TANKLESS GAS WATER HEATER DETAILS  
P2.1 N.T.S



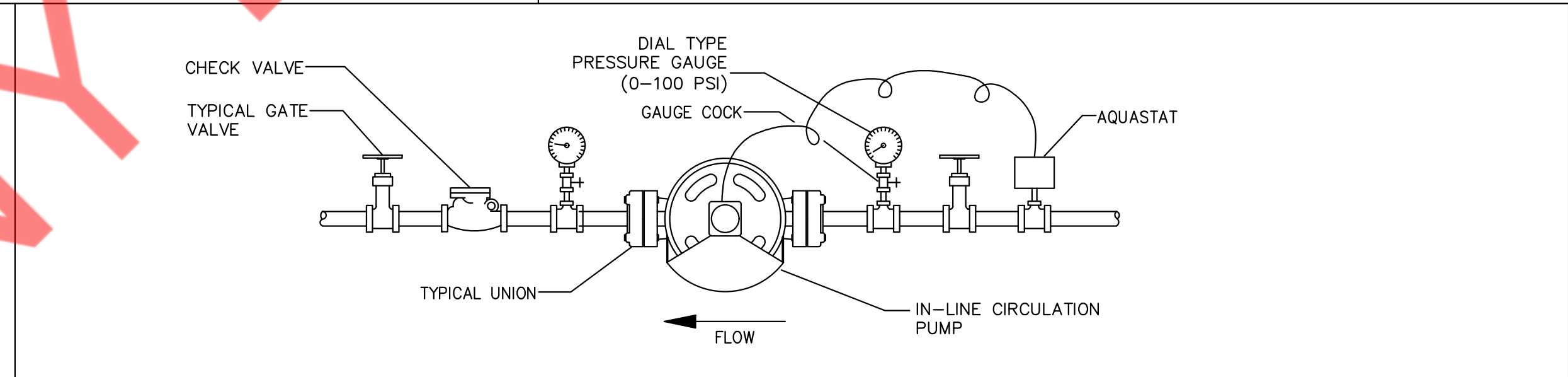
3 3 COMPARTMENT SINK DETAIL  
P2.1 N.T.S



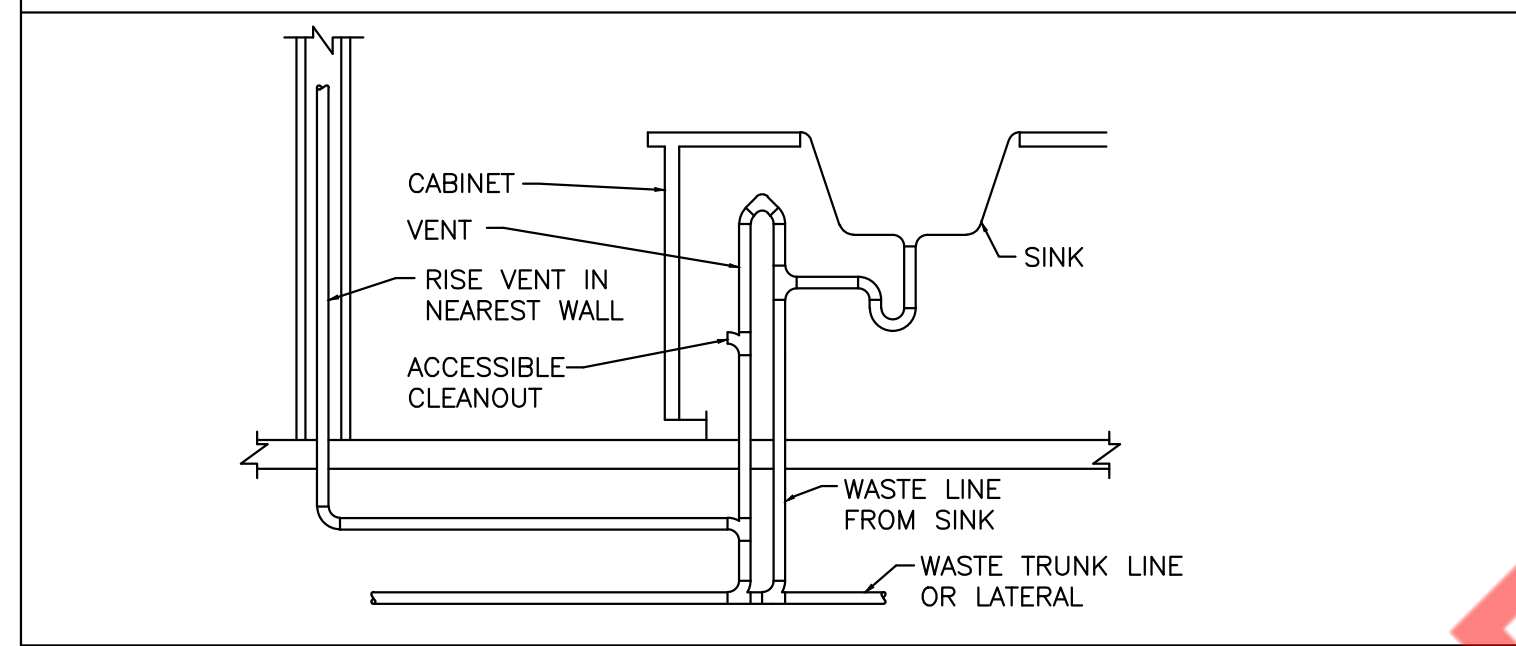
4 INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS  
P2.1 N.T.S



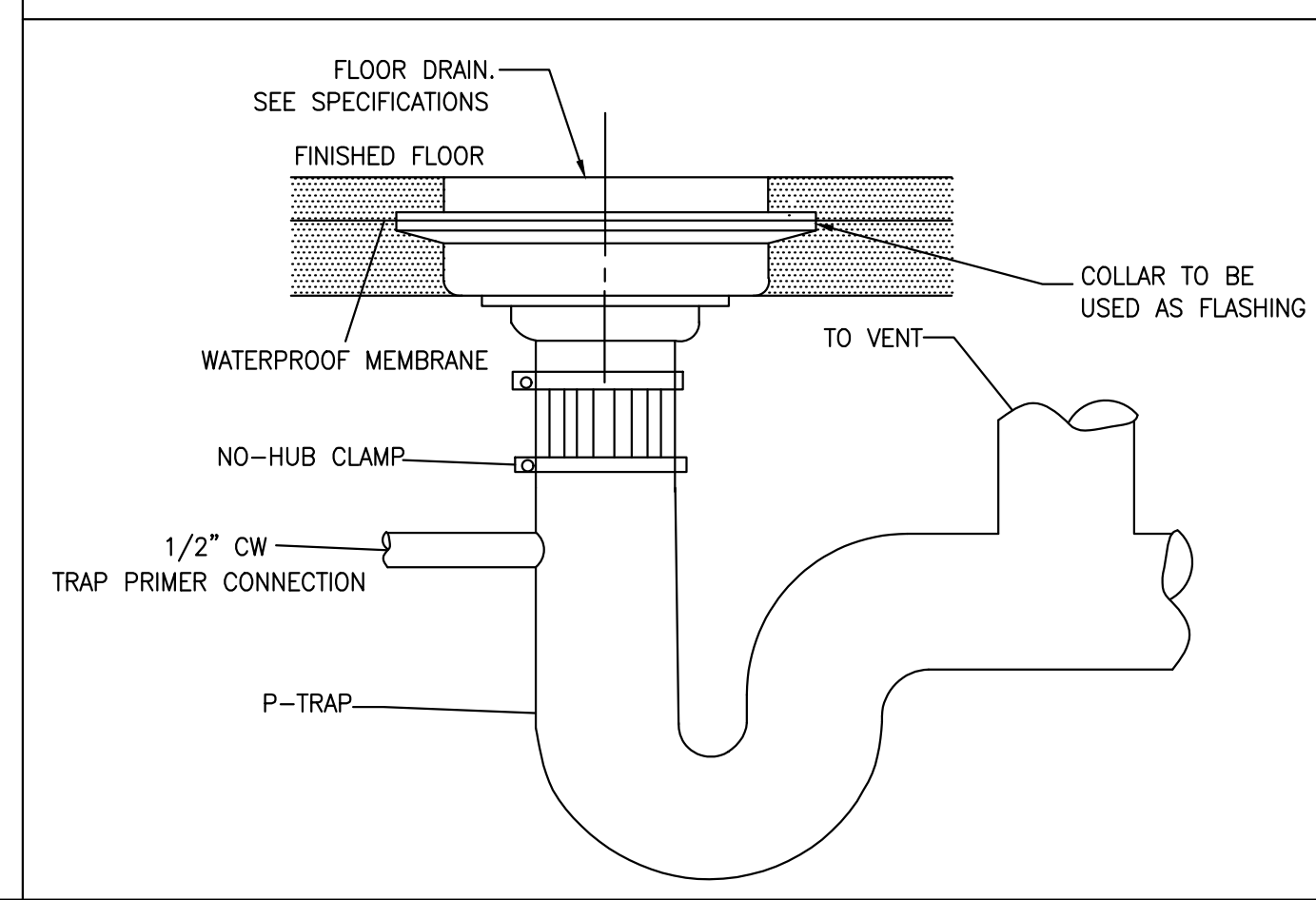
6 HANGER DETAIL  
P2.1 N.T.S



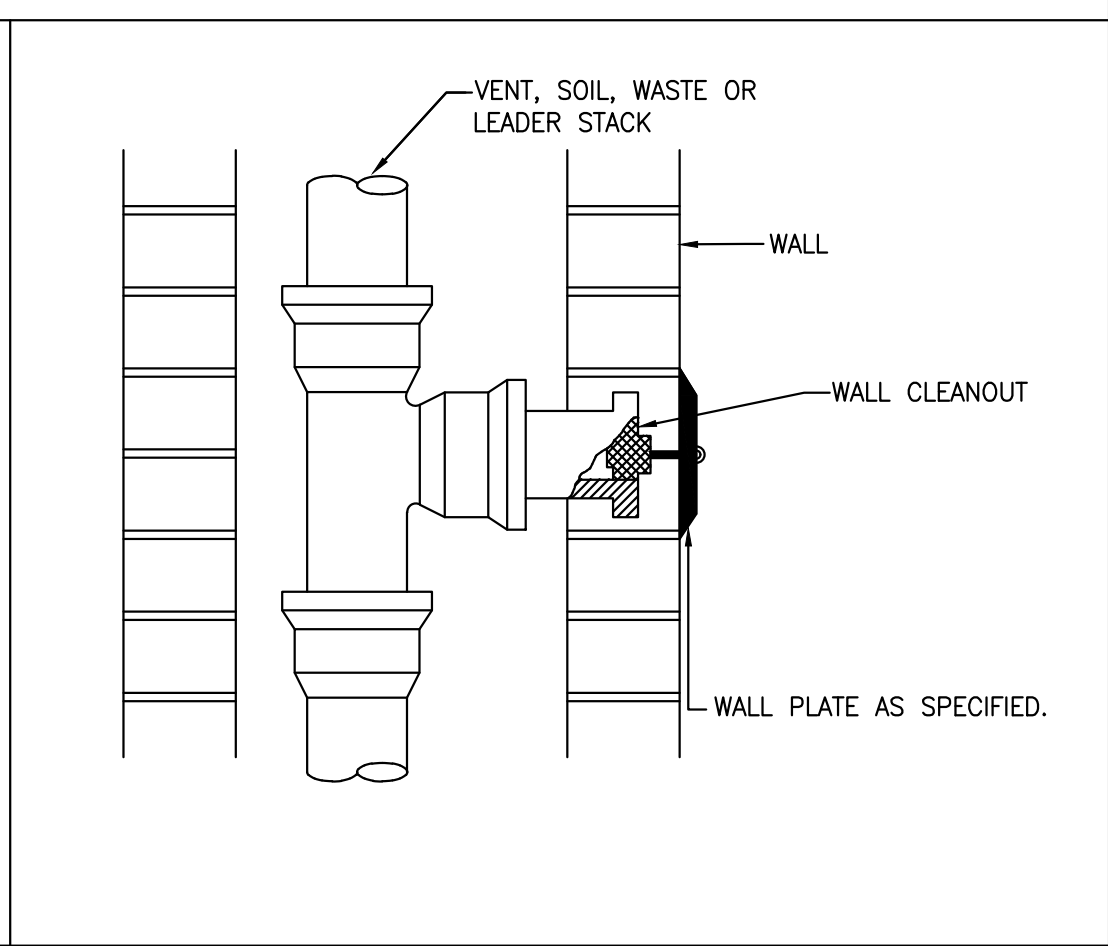
7 INLINE RECIRCULATING PUMP DETAIL  
P2.1 N.T.S



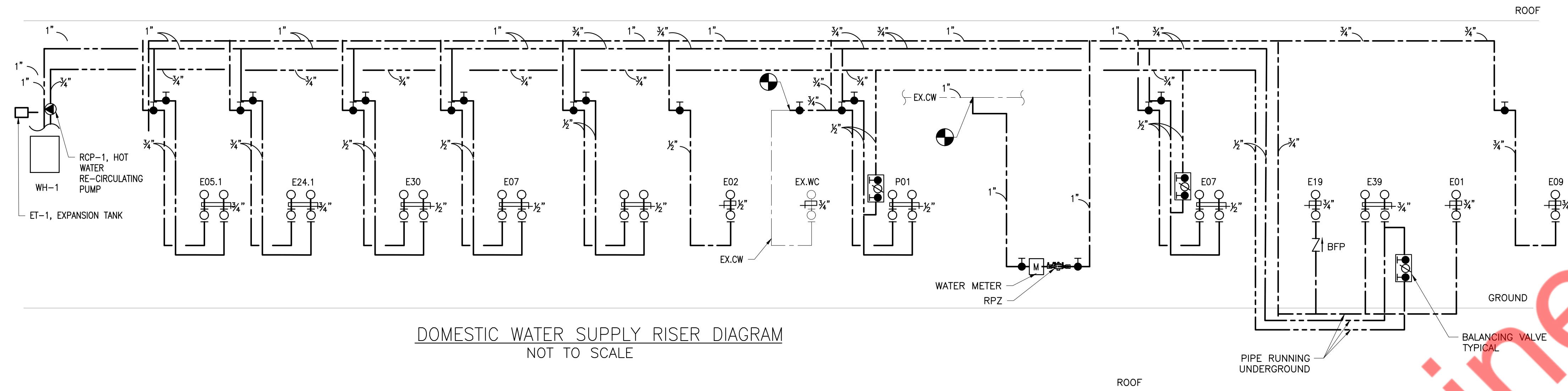
5 TYPICAL ISLAND SINK PLUMBING CONNECTIONS  
P2.1 N.T.S



8 FLOOR DRAIN DETAIL  
P2.1 N.T.S

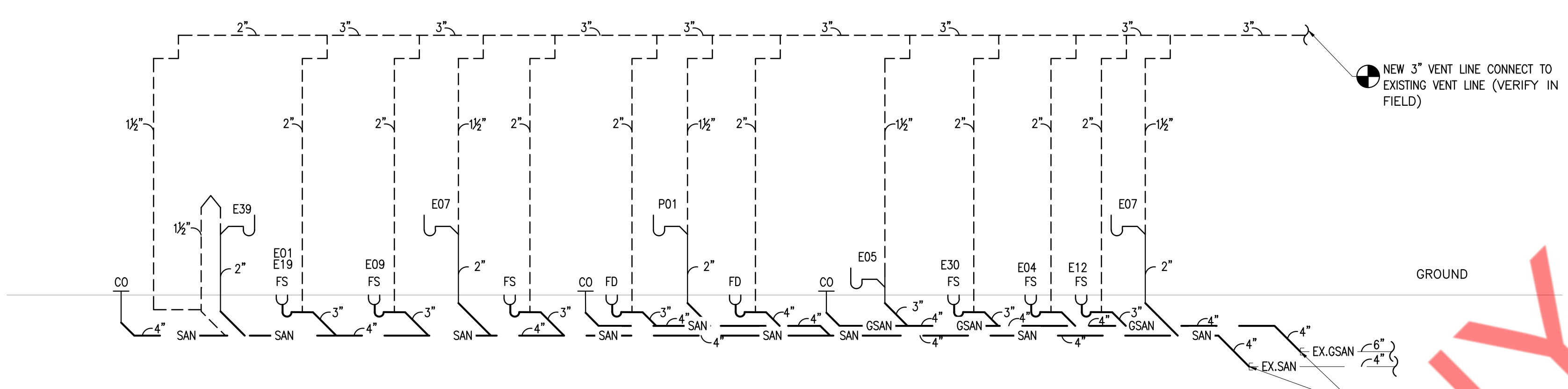


9 WALL CLEANOUT DETAIL  
P2.1 N.T.S

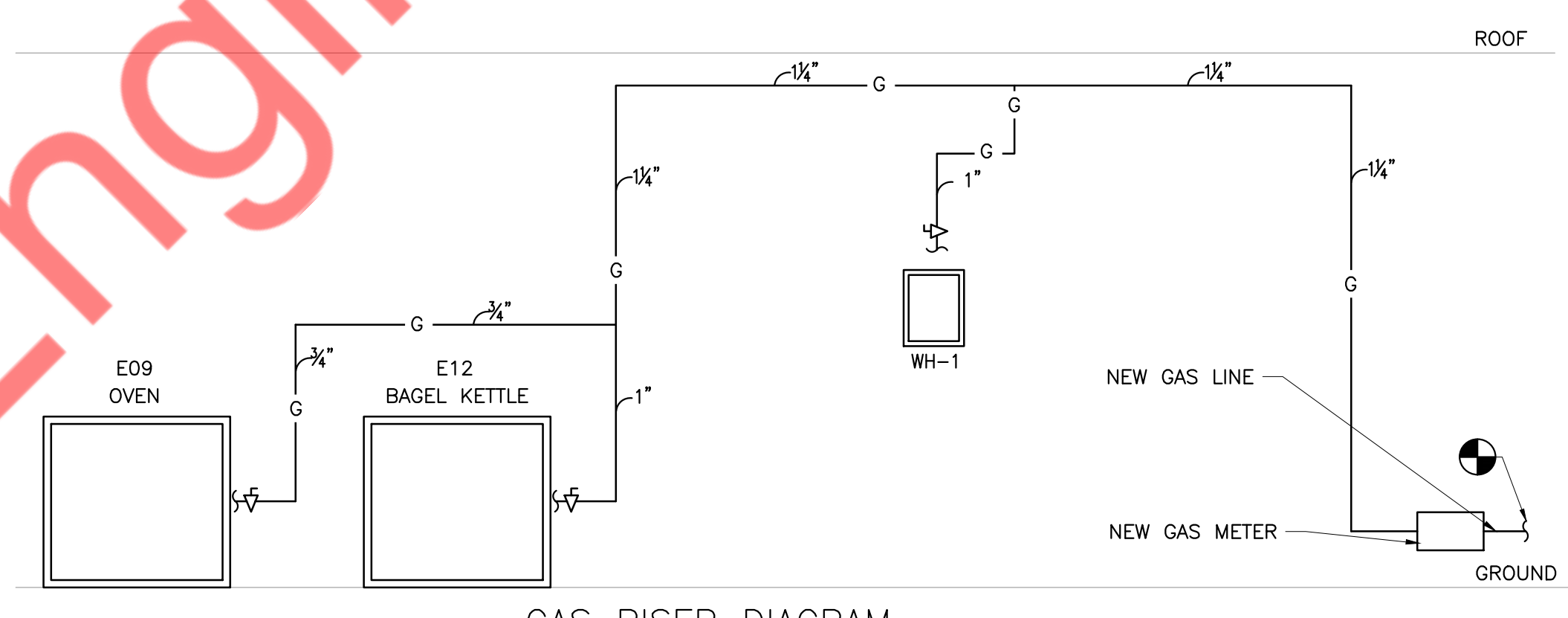


DOMESTIC WATER SUPPLY RISER DIAGRAM  
NOT TO SCALE

- NOTES:
- AS PER SECTION 604.9, 2020 FLORIDA BUILDING CODE- PLUMBING WATER HAMMER ARRESTOR SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. WATER HAMMER ARRESTORS SHALL CONFORM TO ASSE 1010.
  - VALVES SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 606.1 2020 FLORIDA BUILDING CODE- PLUMBING
  - WATER TEMPERATURE LIMITING DEVICE SHALL BE INSTALLED WHERE REQUIRED IN ACCORDANCE WITH SECTION 607 OF 2020 FLORIDA BUILDING CODE- PLUMBING, TO LIMIT TEMPERED WATER TO A MAXIMUM OF 110° F
  - BACK FLOW PREVENTER APPLICATIONS SHALL BE INSTALLED AS PER TABLE 608.1 OF 2020 FLORIDA BUILDING CODE- PLUMBING, 7TH EDITION.
  - CLEARDUTS SHALL BE PROVIDED FOR DRAINAGE PIPING IN ACCORDANCE WITH SECTION 708, 2020 FLORIDA BUILDING CODE- PLUMBING, 7TH EDITION.



SANITARY RISER DIAGRAM  
NOT TO SCALE



GAS RISER DIAGRAM  
NOT TO SCALE

GAS PIPE SIZING PER  
TABLE 402.4(2), FLORIDA FUEL GAS CODE, 2020.  
GAS INLET PRESSURE- LESS THAN 2 PSI.  
PRESSURE DROP- 0.5\"/>

GAS NOTE:  
PROVIDE SHUT-OFF VALVE AN ACCESSIBLE LOCATION. PROVIDE GAS PRESSURE REGULATOR FOR ALL GAS EQUIPMENT IF REQUIRED.  
CONTRACTOR SHALL VERIFY ACTUAL GAS PRESSURE AND LONGEST LENGTH OF RUN TO FARTHEST APPLIANCE PRIOR TO INSTALLATION AND NOTIFY ENGINEER IF CONDITION DIFFER THAN SHOWN ON THIS PLAN.

PLUMBING FIXTURE SCHEDULE								
FIXTURE	EQUIPMENT CATEGORY	MANUFACTURER	MODEL	SAN		VENT	CW	HW
				DIRECT	INDIRECT			
EX.WC	WATER CLOSET	E	E	E	-	E	E	-
P01	LAVATORY	AMERICAN STANDARD	9024901EC.020	2"	-	1-1/2"	1/2"	1/2"
E05	MOP SINK	SERVE-WARE	BKMS2-1620-6-KIT	3"	-	2"	-	-
E05.1	MOP SINK FAUCET	SERV-WARE	SF1000	-	-	-	3/4"	3/4"
E01	ESPRESSO MACHINE	EVERSYS	C'2-M-TEMPEST	-	1-1/4"	-	3/4"	-
E02	HOT COFFEE BREWER	GROUND CONTROL	CYCLOPS	-	1"	-	1/2"	-
E04	3 COMP SINK	EAGLE GROUP	314-16-3-24R	-	2"	-	-	-
E24.1	PRE-RINSE FAUSET	T&S BRASS	B-0133-12-CR-B	-	-	-	3/4"	3/4"
E07	HAND SINK	REGENCY	600HS17SP	2"	-	1-1/2"	1/2"	1/2"
E09	OVEN	LBC	LMO-G8-N-P	-	1/2"	-	3/4"	-
E12	BAGEL KETTLE	DAVRIK	BK40	-	1-1/2"	-	-	-
E12.1	POT FILLER	KROWNE METAL	20-203L	-	-	-	1/2"	-
E19	ICE MACHINE	AVANTCO	UC-F-120-A 19"	-	1"	-	3/4"	-
E30	1-COMP SINK	ADVANCE TABCO	FC-1-1818-18R	-	2"	-	3/4"	3/4"
E39	UNDER COUNTER BASIN	KADO	LUX	2"	-	1-1/2"	1/2"	1/2"
	DIGITAL WATER METER	DOMIX	DOMIX 45A	-	-	-	1/2"	1/2"
FS	FLOOR SINK	-	-	3"	-	2"	-	-
FD	FLOOR DRAIN	-	-	4"	-	2"	-	-

NOTE: ALL FIXTURE MAY BE SUBSTITUTED WITH APPROVED EQUAL. CONTACT OWNER FOR APPROVAL.

FIXTURE UNIT CALCULATION								
FIXTURE	QTY	EQUIPMENT CATEGORY	UNITS PER FIXTURE			TOTAL		
			CW	HW	TOTAL	CW	HW	TOTAL
EX.WC	1	WATER CLOSET	5	0	5	5	0	5
P01	1	LAVATORY	1.5	1.5	2	1.5	1.5	2
E05	1	MOP SINK	2.25	2.25	3	2.25	2.25	3
E30	1	1-COMP SINK	3	3	4	3	3	4
E07	2	HAND SINK	0.5	0.5	0.7	1	1	1.4
E39	1	UNDER COUNTER BASIN	0.5	0.5	0.7	0.5	0.5	0.7
E24.1	1	3 COMP SINK	3	3	4	3	3	4
E19	1	ICE MACHINE	0.25	0	0.25	0.25	0	0.25
E02	1	HOT COFFEE BREWER	0.25	0	0.25	0.25	0	0.25
E01	1	ESPRESSO MACHINE	0.25	0	0.25	0.25	0	0.25
E09	1	OVEN	0.25	0	0.25	0.25	0	0.25
TOTAL FIXTURE UNITS			17.25	11.25	21.1			
TOTAL FIXTURE UNITS			21.1 = 21.5 GPM					

WSPFU VALUES AS PER FLORIDA PLUMBING CODE 2020 TABLE E103.3(2)  
PER FLORIDA PLUMBING CODE 2020 TABLE E103.3(3) FOR 21.5 GPM CALCULATED PIPE SIZE IS 1"

GAS LOAD SUMMARY						
ITEM NO.	QTY.	DESCRIPTION	MANUFACTURER	MODEL	SIZE	BTU/HR.
WH-1	1	WATER HEATER	RINNAI	CU199I	1"	199,000
E12	1	BAGEL KETTLE	DAVRIK	BK40	1"	180,000
E09	1	OVEN	LBC	LMO-G8-N-P	3/4"	90,000
TOTAL LOAD						469,000

GREASE INTERCEPTOR CALCULATION				
S	GS	HR	LF	= GALLONS
40	25	11	0.75	690
REQUIRED CAPACITY (GAL) = 690				
BASE EQUATION: (S) x (GS) x (HR/12) x (LF) = Effective capacity of grease interceptor in gallons				
LEGEND				
S	NUMBER OF MEALS PER SEAT(4X10)			
GS	GALLONS OF WASTEWATER PER SEAT (USE 25 GALLONS FOR ORDINARY RESTAURANTS; USE 10 GALLONS FOR SINGLE SERVICE ARTICLE RESTAURANTS.)			
HR	NUMBER OF HOURS ESTABLISHMENT IS OPEN			
LF	LOADING FACTOR (2.0 INTERSTATE HIGHWAYS, 1.5 OTHER FREEWAYS, 1.25 RECREATIONAL USE AREAS, 1.0 MAIN HIGHWAYS, 0.75 OTHER HIGHWAYS)			
EXISTING GREASE INTERCEPTOR CAPACITY IS 1250 GALLONS				

TANKLESS WATER HEATER SCHEDULE							
HEATER TAG	LOCATION	FLOW RATE @75° F	FUEL TYPE	INPUT BTU/HR	TYPE	MANUFACTURER & MODEL NO.	REMARKS
WH-1	SCULLERY 105	5	NATURAL GAS	199,000	TANKLESS WATER HEATER	RINNAI CU199I	-DIMENSION 18.5" W X 31.3" H

RECIRCULATING PUMP SCHEDULE					
ITEM	QUANTITY	GPM	TOTAL HEAD(FT)	MOTOR HP	MANUFACTURER & MODEL NO
RCP-1	1	2	10	0.115	GRUNDFOS UP 15-18

EXPANSION TANK SCHEDULE							
TAG	LOCATION	SERVICE	CAPACITY (GALLONS)	MANUFACTURER & MODEL	DIMENSION (DIA X HEIGHT)	WEIGHT (LBS)	NO. OF EXPANSION TANK
ET-1	REFER FLOOR PLANS	HW	2	THERM-X-TROL ST-5	8" X 13"	5	1