

MECHANICAL SYMBOLS LIST

AC-1	TXF-1	EQUIPMENT SYMBOL
AIR DEVICES		
		CEILING DIFFUSER SUPPLY
		CEILING DIFFUSER RETURN
		LINEAR SLOT DIFFUSER
DUCT ACCESSORIES		
		BACKDRAFT DAMPER
		VOLUME DAMPER W/ ACCESS DOOR
CONTROLS AND SENSORS		
		THERMOSTAT
		HUMIDISTAT
		DUCT SMOKE DETECTOR
		HUMIDITY-SENSOR
		TEMPERATURE SENSOR
DUCTWORK		
		AIR DUCT W/ 1.5" ACOUSTICAL LINING
		FLEXIBLE DUCT
		FLEXIBLE CONNECTION
		RECTANGULAR DUCT (WIDTH X DEPTH)
		SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
		RETURN AIR RECTANGULAR DUCT CROSS SECTION
		ROUND DUCT (DIAMETER)
		ROUND DUCT CROSS SECTION

ABBREVIATIONS

AL	ACOUSTIC LINING
BD	BACKDRAFT DAMPER
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
CFM	CUBIC FEET OF AIR PER MINUTE
SG	SUPPLY GRILLE
FC	FLEXIBLE CONNECTION
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
EER	ENERGY EFFICIENCY RATIO
RTU	ROOF TOP UNIT
DN	DOWN
TEF	TOILET EXHAUST FAN
VD	VOLUME DAMPER
KEF	KITCHEN EXHAUST FAN
MUA	MAKE UP AIR UNIT

MECHANICAL DRAWING LIST

M0.1	MECHANICAL GENERAL NOTES, SYMBOLS LIST & ABBREVIATIONS
M0.2	MECHANICAL SPECIFICATIONS
M1.0	MECHANICAL FLOOR AND ROOF PLANS
M5.1	MECHANICAL DETAILS (1 OF 2)
M5.2	MECHANICAL DETAILS (2 OF 2)
M6.1	MECHANICAL SCHEDULES
H1.0	KITCHEN HOOD DRAWINGS (1 OF 5)
H1.1	KITCHEN HOOD DRAWINGS (2 OF 5)
H1.2	KITCHEN HOOD DRAWINGS (3 OF 5)
H1.3	KITCHEN HOOD DRAWINGS (4 OF 5)
H1.4	KITCHEN HOOD DRAWINGS (5 OF 5)

APPLICABLE CODES

IBC	INTERNATIONAL BUILDING CODE 2021
IFC	INTERNATIONAL FIRE CODE 2021
IMC	INTERNATIONAL MECHANICAL CODE 2021
IPC	INTERNATIONAL PLUMBING CODE 2021
IECC	INTERNATIONAL ENERGY CONSERVATION CODE 2021
NEC	NATIONAL ELECTRICAL CODE 2020

LITTLETON BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2021-LITTLETON BUILDING CODE AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

- THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
- TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2021 INTERNATIONAL BUILDING CODE REQUIREMENTS AS OUTLINES IN SECTION [BC 1704].
- 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.
- SMOKE DETECTOR SHALL MEET UL268A.
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
 - STANDARDS OF HEATING – 2021 IMC SECTION 309.1
 - DUCT CONSTRUCTION AND INSTALLATION– 2021 IMC SECTION 603
 - AIR INTAKES, EXHAUSTS AND RELIEF – 2021 IMC SECTION 401.5
 - AIR FILTERS – 2021 IMC SECTION 605
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- VENTILATION FOR ALL AREA SHALL COMPLY WITH 2021 IMC SECTION 401.
- A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2021 IMC SECTION 403.3.1.1
- REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.

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 FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
- THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE

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 OR GUTTER OR DOWN SPOUT PROVIDED THAT DOWNSPOUT DOES NOT DISCHARGE ONTO PAVEMENT. 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.

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, RFI'S, 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 OR 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.

SPECIFICATIONS

SECTION 0001 - NOTICE TO BIDDERS

1.1 BIDDERS REPRESENTATIONS

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

1.2 EXISTING CONDITIONS AND COORDINATION

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

1.3 RESPONSIBILITIES

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

END OF SECTION 0001

SECTION 0101 - QUALITY OF WORK

1.1 WORKMANSHIP

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

1.2 CODE COMPLIANCE

- A. ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.

END OF SECTION 0101

SECTION 0102 -REQUIRED DOCUMENTS

1.1 SHOP DRAWINGS

- A. A SET OF PRINTS FOR ANY MECHANICAL WORK INCLUDING BUT NOT LIMITED TO, DUCTWORK AND PIPING LAYOUT SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO CONSTRUCTION OR PURCHASE OF MATERIALS.

1.2 SUBMITTALS

- A. EQUIPMENT SUBMITTALS OF ALL PROPOSED MECHANICAL AND ANCILLARY EQUIPMENT INCLUDING ALL ACCESSORIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL PERTINENT MODELS, SIZES, ACCESSORIES AND CHOICES SHALL BE CLEARLY CHECKED, PRINTED OR OTHERWISE INDICATED ON THE SUBMITTALS.

1.3 RECORD DRAWINGS

- A. UPON COMPLETION OF THE WORK, A RECORD DRAWING SHALL BE SUBMITTED TO THE OWNER DEPICTING ALL SUBSEQUENT CHANGES, ADDITIONS AND OR CORRECTIONS TO THE CONTRACT DRAWINGS AND OR CONTRACT SCOPE MADE DURING CONSTRUCTION. THIS DRAWING SHALL REPRESENT A COMPLETE RECORD OF THE WORK INSTALLED.

1.4 EQUIPMENT OPERATING INSTRUCTIONS

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

END OF SECTION 0102

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

1.1 SLEEVE-SEAL SYSTEMS

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

1.2 SLEEVE-SEAL FITTINGS

- A. MANUFACTURED PLASTIC, SLEEVE-TYPE, PLASTIC OR RUBBER WATER-STOP ASSEMBLY MADE FOR IMBEDDING IN CONCRETE SLAB OR WALL.

1.3 GROUT

- A. NON-SHRINK, FACTORY PACKAGED.

1.4 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. USE SLEEVES AND SLEEVE SEALS FOR THE FOLLOWING PIPING-PENETRATION APPLICATIONS:
 1. INTERIOR PARTITIONS:
 - a. PIPING SMALLER THAN NPS 6 (DN 150): GALVANIZED-STEEL-PIPE SLEEVES, PVC-PIPE SLEEVES.
 - b. PIPING NPS 6 (DN 150) AND LARGER: GALVANIZED-STEEL-SHEET SLEEVES.

END OF SECTION 230517

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. ONE-PIECE, CAST-BRASS TYPE: WITH POLISHED, CHROME-PLATED AND ROUGH-BRASS FINISH AND SETSCREW FASTENER.
- B. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-DRAWN, BOX-SHAPED BRASS WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
- C. ONE-PIECE, STAMPED-STEEL TYPE: WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.

2.2 FLOOR PLATES

- A. ONE-PIECE FLOOR PLATES: CAST-IRON FLANGE WITH HOLES FOR FASTENERS.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS.
- B. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.

1. ESCUTCHEONS FOR NEW PIPING:

- a. PIPING WITH FITTING OR SLEEVE PROTRUDING FROM WALL: ONE-PIECE, DEEP-PATTERN TYPE.
- b. INSULATED PIPING: ONE-PIECE, STAMPED-STEEL TYPE.
- c. BARE PIPING AT WALL AND FLOOR PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
- d. BARE PIPING AT CEILING PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.

3.2 FIELD QUALITY CONTROL

- A. REPLACE BROKEN AND DAMAGED ESCUTCHEONS AND FLOOR PLATES USING NEW MATERIALS.

END OF SECTION 230518

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1.1 PERFORMANCE REQUIREMENTS

- A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
- B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.

1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.

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

- A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER

1.3 QUALITY ASSURANCE

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

1.4 COMPONENTS

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

END OF SECTION 230529

SECTION 230548 - VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 COMPONENTS

- A. VIBRATION ISOLATORS:

1. ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
2. MOUNTS: DOUBLE-DEFLECTION TYPE.
3. RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
4. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
5. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
6. HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
7. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
8. SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
9. SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
10. PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
11. RESILIENT PIPE GUIDES.

B. AIR-MOUNTING SYSTEMS:

1. AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWES.
2. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWES.

- C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR-AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.

D. VIBRATION ISOLATION EQUIPMENT BASES:

1. STEEL BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS.
2. INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE

1.2 FIELD QUALITY CONTROL

- A. TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.

PART-2 PRODUCTS

1.1 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES

- A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
 1. ACE MOUNTINGS CO., INC.
 2. AMBER/BOOTH COMPANY, INC.
 3. CALIFORNIA DYNAMICS CORPORATION.
 4. HILTI, INC.
 5. ISOLATION TECHNOLOGY, INC.
 6. KINETICS NOISE CONTROL.
 7. LOOS & CO.; CABLEWARE DIVISION.
 8. MASON INDUSTRIES.
 9. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
 10. UNISTRUT; TYCO INTERNATIONAL, LTD.

END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

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

1. AIR SYSTEMS: CONSTANT VOLUME.

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. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.

1.3 EXECUTION

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

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

1.1 QUALITY ASSURANCE

- A. 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:
 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.
- B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:

UNCONDITIONED SPACES WITHIN BUILDING:	R-6
WITHIN BUILDING ENVELOPE ASSEMBLY:	R-12
OUTSIDE OF BUILDING:	R-12

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 ASTM653 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 METAL-COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.
 3. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30-03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30-02 AND COVERED WITH APPROVED SEALING TAPE.
 4. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.

END OF SECTION 233113

SECTION 233713 - DIFFUSERS AND GRILLES

1.1 PRODUCTS

- A. DIFFUSERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.
- B. MANUFACTURERS: TITUS

1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:

- a. CARNES.
- b. HART & COOLEY INC.
- c. KRUEGER.
- d. METALAIR, INC.
- e. NAILOR INDUSTRIES INC.

- C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.
- D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

END OF SECTION 233713

THERMOSTATIC CONTROLS:

C403.4.1 THERMOSTATIC CONTROLS (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.

USG	MAX. SIDE INCHES	TRANSVERSE JOINTS AND BRACING
22	UP TO 12"	S SLIP, DRIVE SLIP, ONE INCH POCKET TAB ON 8 FOOT CENTERS
22	13 TO 24"	1"x1"x1/8" ANGLES ON 4 FOOT CENTERS
20	25 TO 35"	1"x1"x1/8" ANGLES ON 2 FOOT CENTERS

- D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:

1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.

- E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU OF 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 MEET SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.

1.2 MATERIALS

- A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
- B. SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS.
- C. SHEET METAL MATERIALS:

1. GALVANIZED SHEET STEEL.
2. STAINLESS-STEEL SHEETS.
3. ALUMINUM SHEETS.
4. FACTORY-APPLIED ANTI-MICROBIAL COATING.

D. DUCT LINER:

1. FIBROUS GLASS, TYPE I, FLEXIBLE.
 - a. WITH ANTI-MICROBIAL EROSION-RESISTANT COATING.
2. FLEXIBLE ELASTOMERIC.
3. NATURAL FIBER.

E. SEALANT MATERIALS:

1. TWO-PART TAPE SEALING SYSTEM.
2. WATER-BASED JOINT AND SEAM SEALANT.
3. SOLVENT-BASED JOINT AND SEAM SEALANT.
4. FLANGED JOINT SEALANT.
5. FLANGE GASKETS.
6. ROUND DUCT JOINT O-RING SEALS.

1.3 DUCT CLEANING

- A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
- B. CLEAN THE FOLLOWING ITEMS:

1. AIR OUTLETS AND INLETS.
2. SUPPLY, RETURN, AND EXHAUST FANS.
3. AIR HANDLING UNIT.

C403.4.2.3 AUTOMATIC START AND STOP (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.

4. COILS AND RELATED COMPONENTS.
5. RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
6. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.

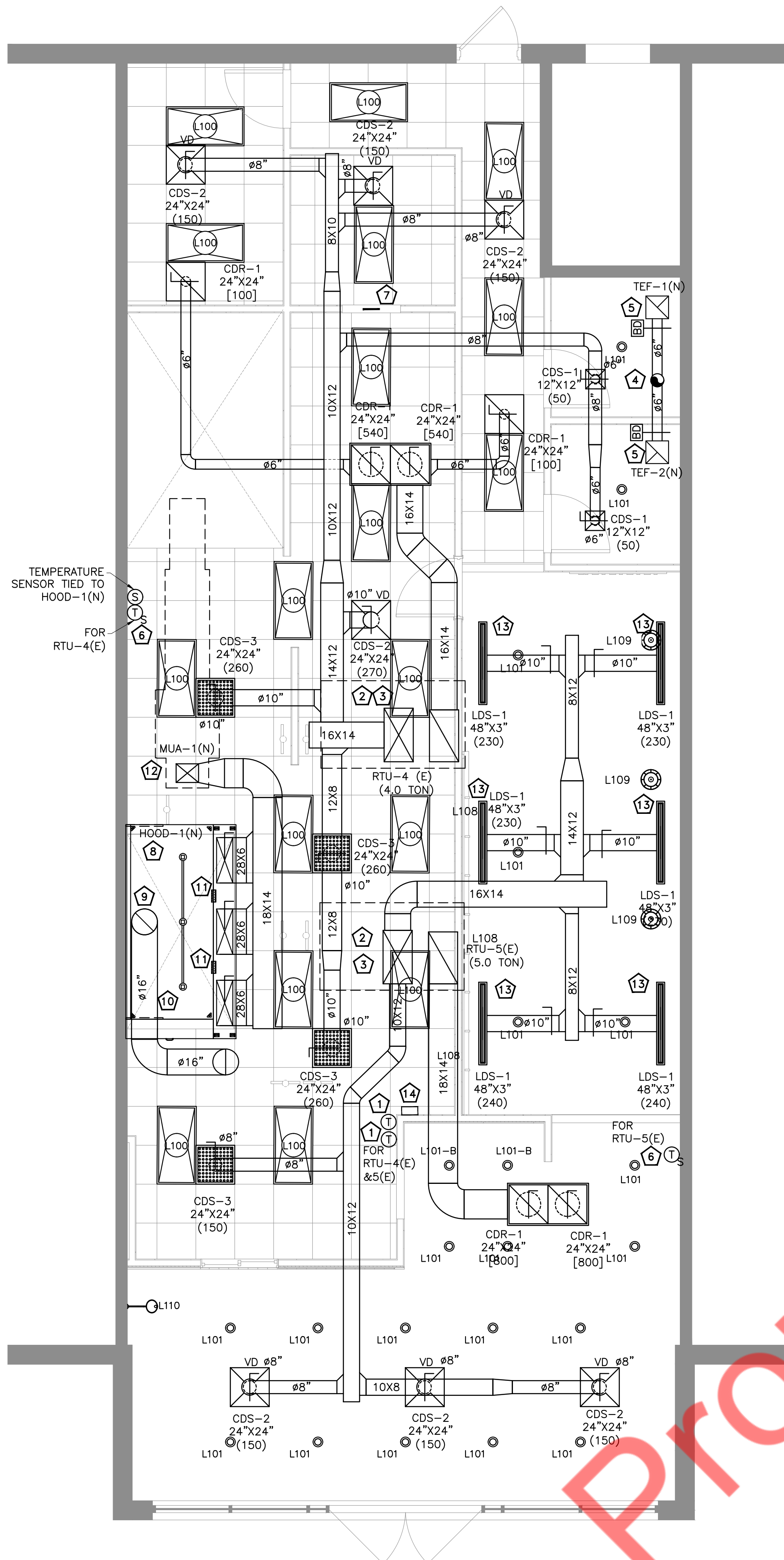
1.4 DUCT SCHEDULE

- A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:

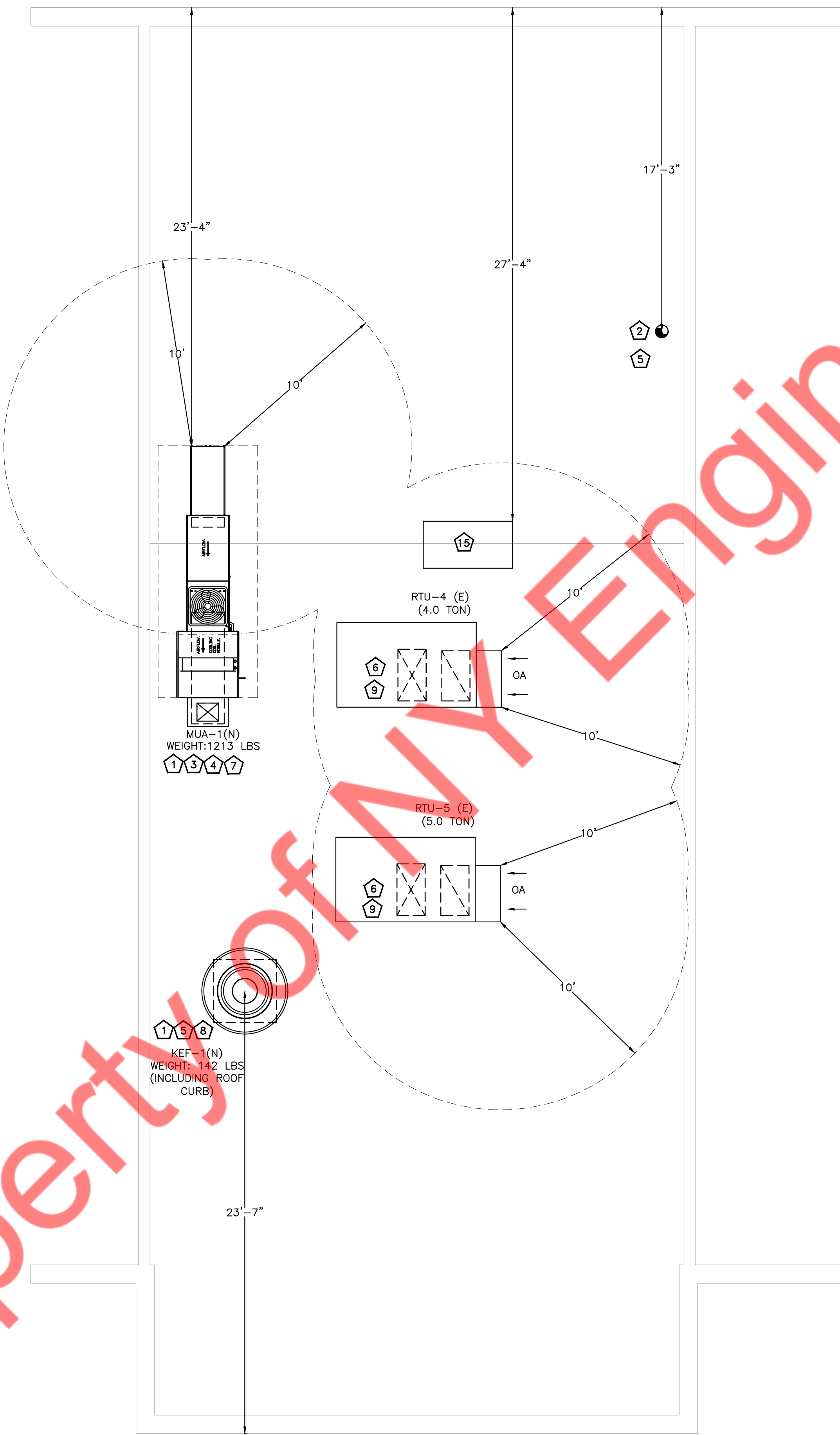
1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233713

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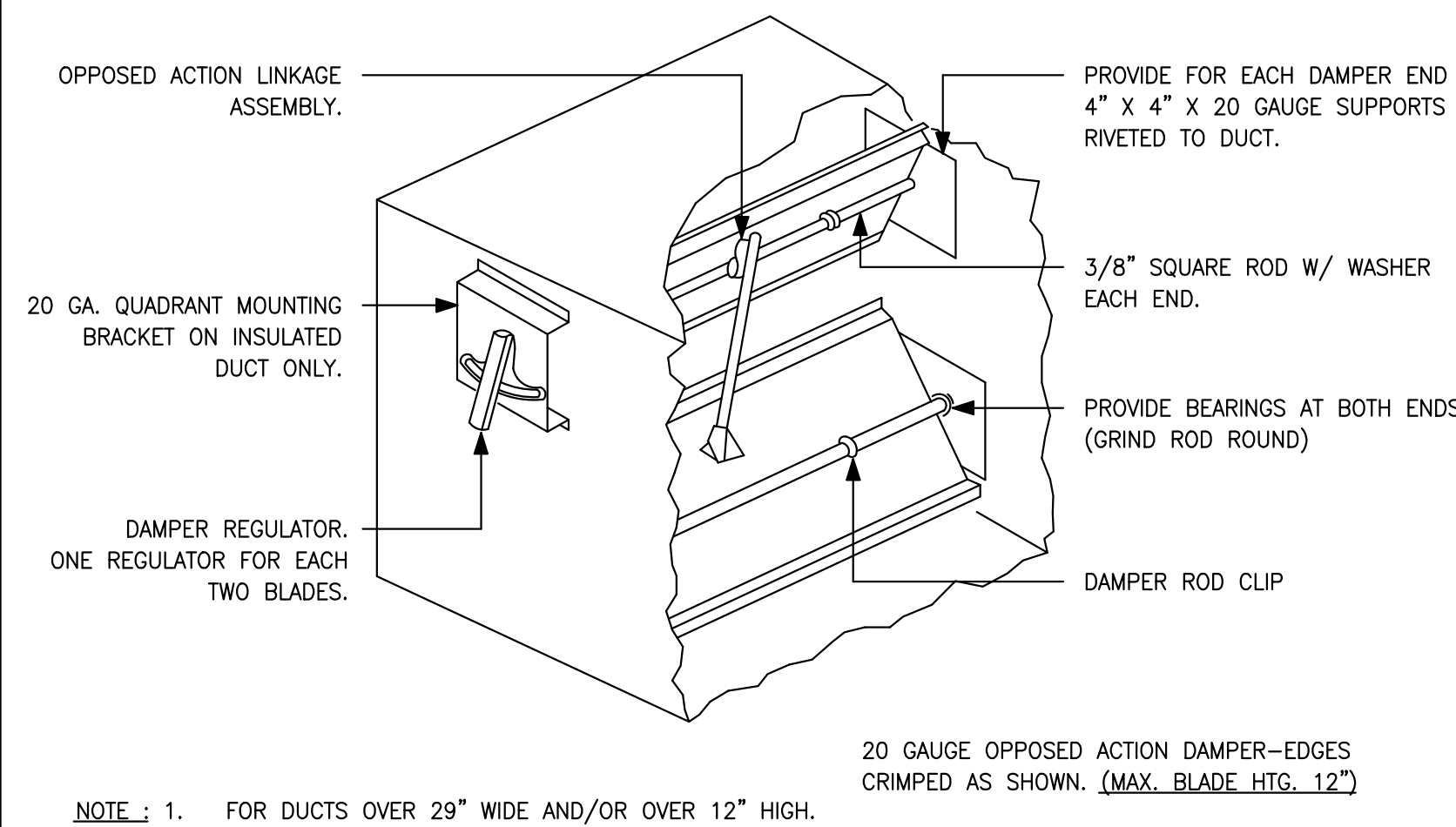
1 MECHANICAL FLOOR PLAN
1/4"=1'-0"



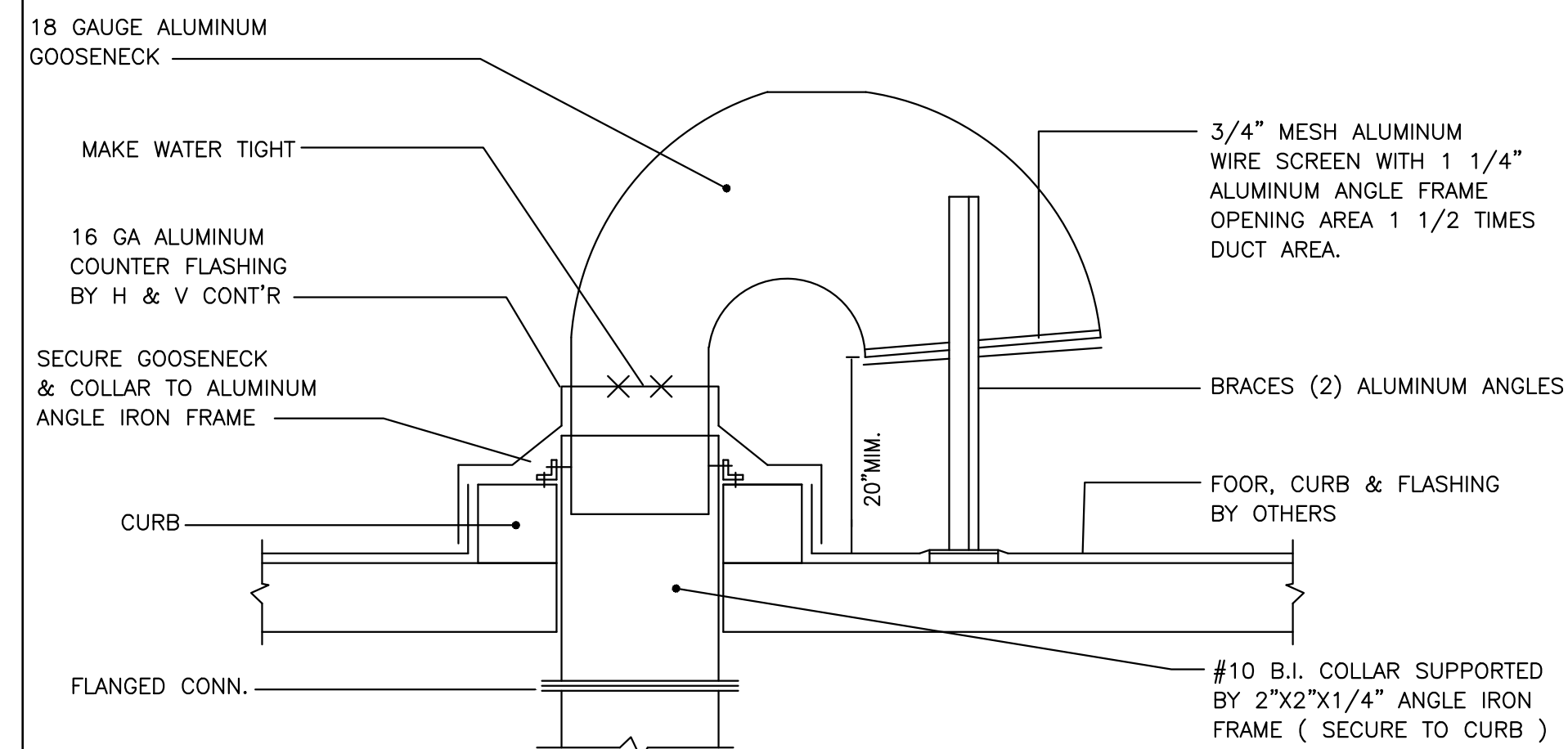
2 MECHANICAL ROOF PLAN
1/4"=1'-0"

- 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.
 - COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
 - 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.
 - PROVIDE MINIMUM R-12 INSULATION (EXTERNAL) FOR OUTSIDE AIR INTAKE DUCTS. PROVIDE MINIMUM R-6 INSULATION (INTERNAL FOR EXPOSED DUCTS AND EXTERNAL FOR CONCEALED DUCTS) FOR SUPPLY & RETURN AIR DUCTS. PROVIDE ACOUSTIC INSULATION ON MAIN SUPPLY AND RETURN DUCTS UP TO 10 FT. FROM HVAC UNIT.
 - PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS/SLABS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.
- MECHANICAL FLOOR PLAN KEY NOTES:**
- REUSE AND RELOCATE EXISTING THERMOSTAT IF IT IS IN GOOD CONDITION. IF NOT OPERABLE, PROVIDE 7-DAY PROGRAMMABLE THERMOSTATS AND RELATED WIRING TO CONTROL RTU. MOUNT 48" A.F.F. PROVIDE LOCKABLE COVER.
 - 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.
 - PROVIDE FLEXIBLE CONNECTORS ON SUPPLY AND RETURN DUCT CONNECTIONS. SET OUTSIDE AIR AS INDICATED ON ROOFTOP UNIT SCHEDULES. MECHANICAL CONTRACTOR SHALL SCRIBE INTO UNIT POSITION OF OUTSIDE AIR DAMPER AND LABEL OUTSIDE AIR VOLUME AND PERCENT OF OUTSIDE AIR. TRANSITION AND CONNECT SUPPLY AND RETURN DUCTWORK FROM BELOW. COORDINATE ROUTING THROUGH STRUCTURAL TRUSSES AND OFFSET AS REQUIRED IN CURB SPACE.
 - TERMINATE Ø8" EXHAUST DUCT UP THROUGH ROOF. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AIR INTAKES.
 - CEILING MOUNTED EXHAUST FAN. TRANSITION FROM FAN DISCHARGE TO DUCT SIZE SHOWN.
 - TEMPERATURE SENSOR FOR THERMOSTAT AND HUMIDISTAT SERVING DESIGNATED EXISTING RTU.
 - PROVIDE 1" DOOR UNDERCUT/DOOR GRILLE FOR AIR TRANSFER.
 - INSTALL TYPE-I GREASE 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. THE HOOD AND DUCT SHALL HAVE AN APPROVED FIRE PROTECTION. THE FIRE-EXTINGUISHING SYSTEM SHALL BE INTERCONNECTED TO THE FUEL OR CURRENT SUPPLY SO THAT THE FUEL OR CURRENT SUPPLY IS AUTOMATICALLY SHUT OFF TO ALL EQUIPMENT UNDER THE HOOD WHEN THE SYSTEM IS ACTUATED.
 - GREASE DUCT TO BE PROVIDED WITH KITCHEN EQUIPMENT AND INSTALLED BY MECHANICAL CONTRACTOR. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
 - 16" GREASE EXHAUST DUCT FROM HOOD UP THRU ROOF TO KEF-1(N).
 - EXTEND MAKE-UP AIR DUCT FROM HOOD COLLAR UP TO MOUNTED MAKE-UP AIR UNIT ON ROOF MUA-1(N).
 - MAKEUP DUCT UP THRU ROOF TO MUA-1(N).
 - LINEAR SLOT DIFFUSERS WITH PLENUM.
 - LOCATION OF KITCHEN HOOD MANUAL ACTIVATION DEVICE. MOUNTED AT 48" ABOVE FINISHED FLOOR. IT SHALL BE LOCATED ALON PATH OF EGRESS AND SHALL CLEARLY IDENTIFY THE HAZARD PROTECTED, MINIMUM OF 10' AND MAXIMUM OF 20' FROM EXHAUST SYSTEM.
 - ICE MAKER REMOTE CONDENSER UNIT MOUNTED ON THE ROOF. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

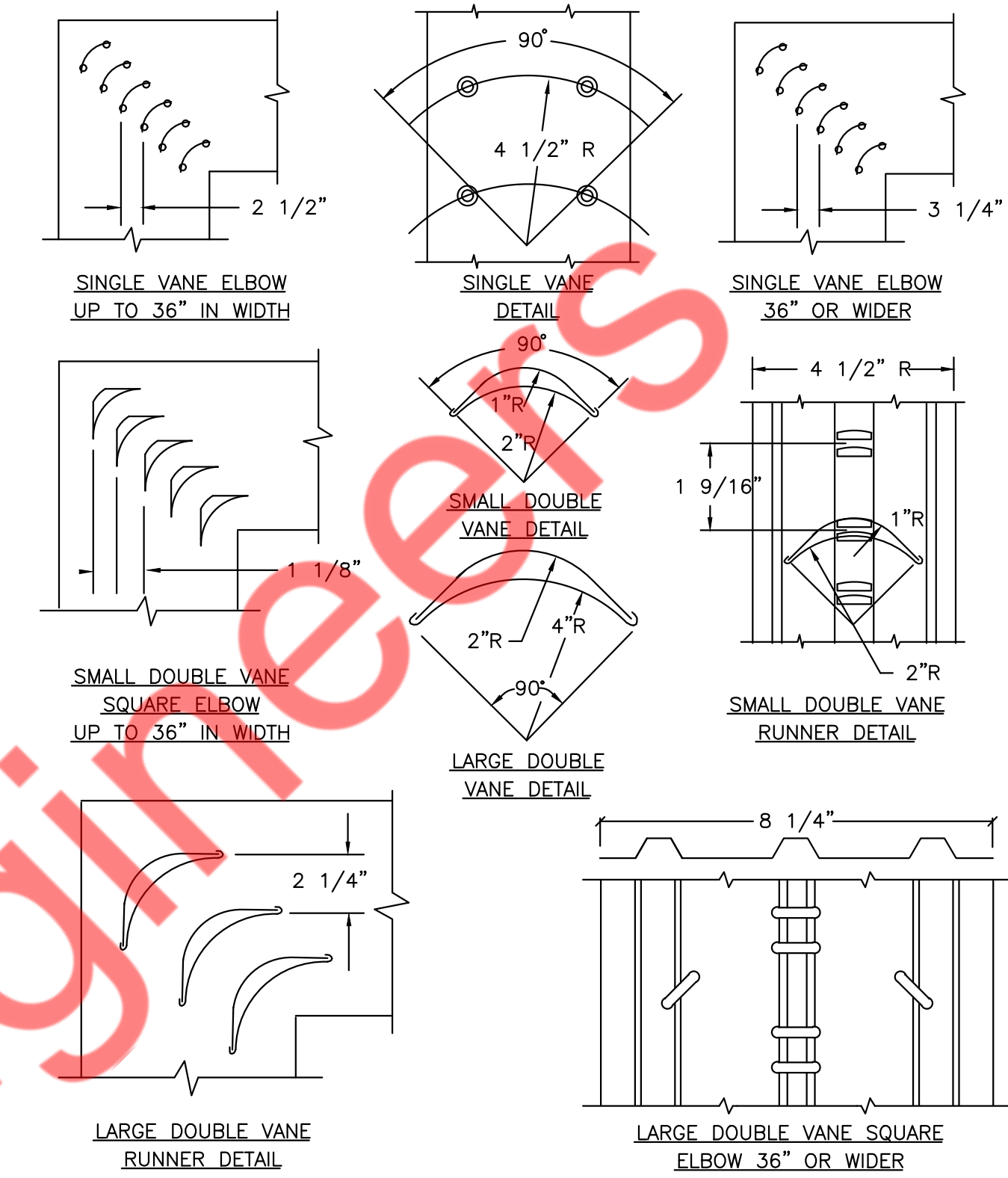
- MECHANICAL GENERAL NOTES**
- COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
 - EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
 - CONTRACTOR SHALL 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.
 - PROVIDE WEATHER-PROOF COATING FOR ALL PIPES AND DUCTS RUNNING ON THE ROOF AND EXPOSED TO THE AMBIENT.
- MECHANICAL ROOF PLAN KEY NOTES:**
- COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL REQUIREMENT.
 - TERMINATE Ø8" EXHAUST DUCT UP THROUGH ROOF WITH GOOSENECK & BIRDSCREEN. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AIR INTAKES.
 - CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY EXHAUST SOURCE FROM ADJACENT TENANTS SHOULD BE AT LEAST 10' AWAY FROM RTU-4(E) & 5(E) AND MUA-1(N).
 - CONTRACTOR TO RUN CONDENSATE DRAIN FROM MUA TO NEAREST ROOF DRAIN.
 - CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY OUTSIDE AIR INTAKE SOURCE FROM ADJACENT TENANTS SHOULD BE AT LEAST 10' AWAY FROM THE KEF-1(N) AND OTHER EXHAUST DUCT TERMINATING ON ROOF.
 - PROVIDE FLEXIBLE CONNECTORS ON SUPPLY AND RETURN DUCT CONNECTIONS. SET OUTSIDE AIR AS INDICATED ON ROOFTOP UNIT SCHEDULES. MECHANICAL CONTRACTOR SHALL SCRIBE INTO UNIT POSITION OF OUTSIDE AIR DAMPER AND LABEL OUTSIDE AIR VOLUME AND PERCENT OF OUTSIDE AIR.
 - MAKE-UP AIR UNIT AND ROOF CURB ARE OWNER PROVIDED. COORDINATE LOCATION OF UNIT WITH LANDLORD AND EXISTING CONDITIONS. ADJUST DUCTWORK ROUTING ACCORDINGLY. PROVIDE FLEXIBLE CONNECTION ON THE SUPPLY DUCT CONNECTION TRANSITION TO DUCT SIZE INDICATED. FIELD VERIFY EXISTING CONDITIONS PRIOR TO BID.
 - ROOF MOUNTED GREASE EXHAUST FAN AND FAN CURB ARE OWNER PROVIDED. COORDINATE INSTALLATION OF FAN WITH LANDLORD AND EXISTING CONDITIONS TO ENSURE THAT FAN IS NOT INSTALLED WITHIN 10 FEET OF ANY OUTSIDE AIR INTAKE.
 - CONTRACTOR TO FIELD VERIFY EXISTING DRAIN LINE FROM RTU-4(E)&5(E) AND KEEP IT AS IS.



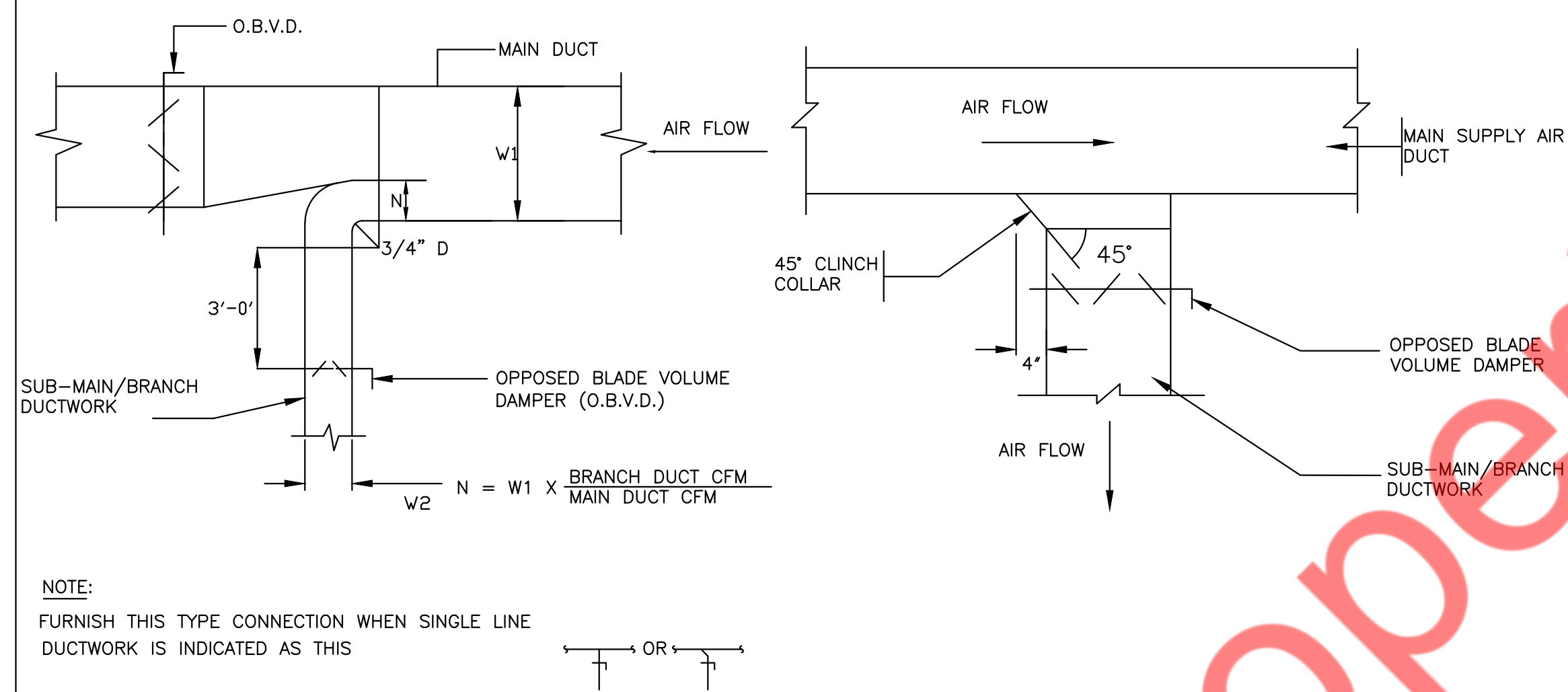
1 LOW PRESSURE BALANCING DAMPER
M5.1 N.T.S



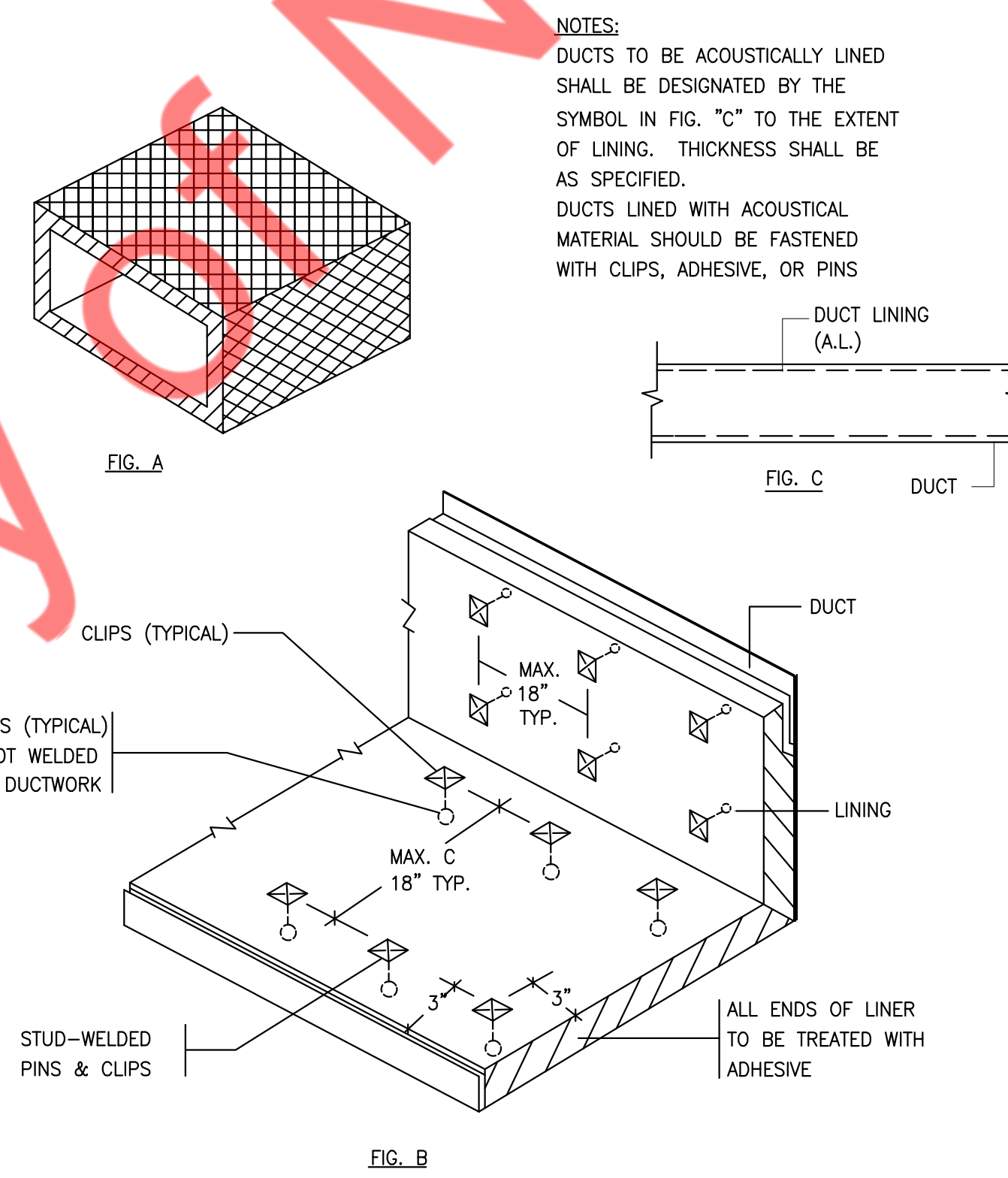
2 TYPICAL DETAIL OF ROOF GOOSENECK
M5.1 N.T.S



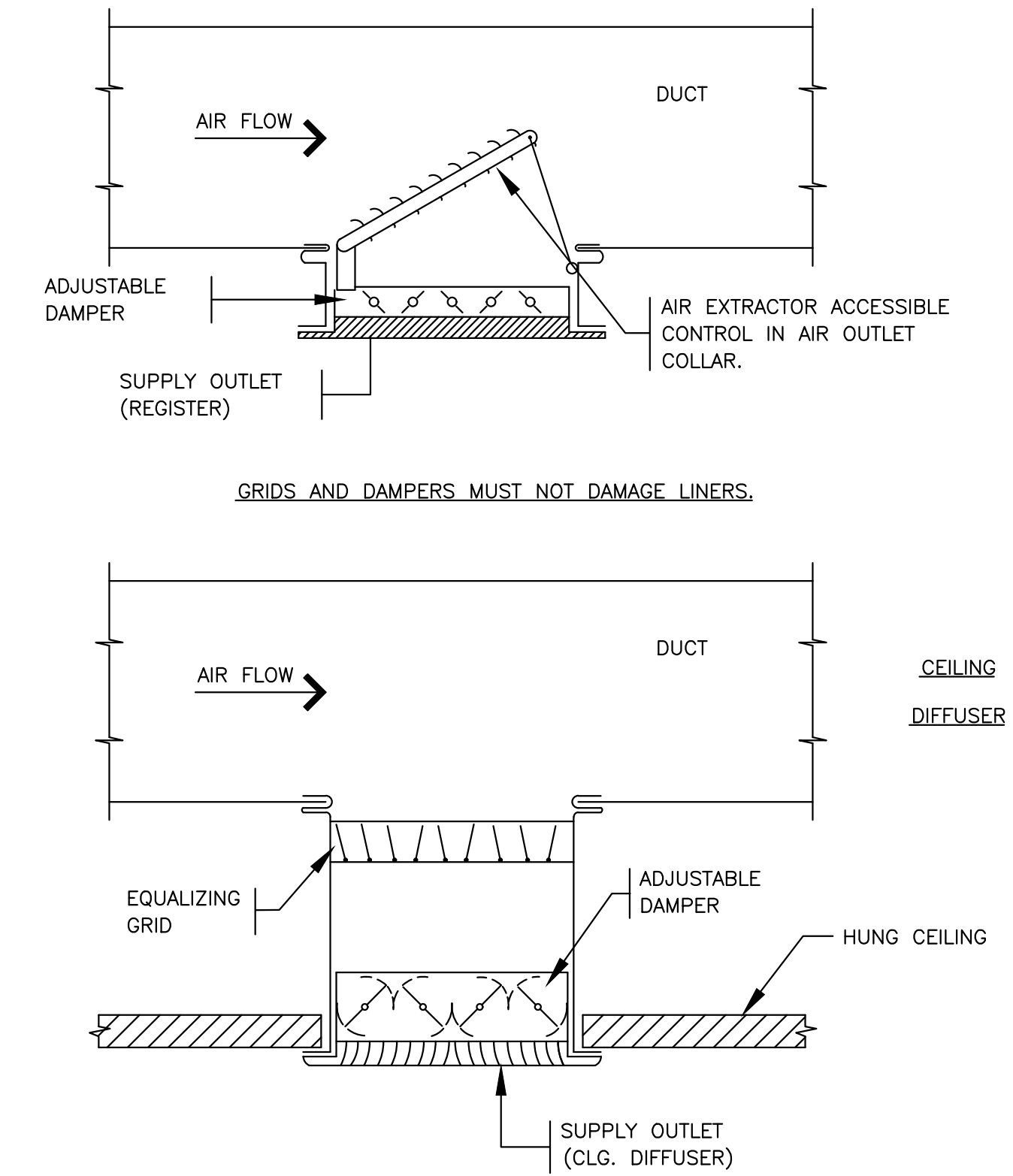
3 LOW VELOCITY DUCTWORK ELBOWS
M5.1 N.T.S



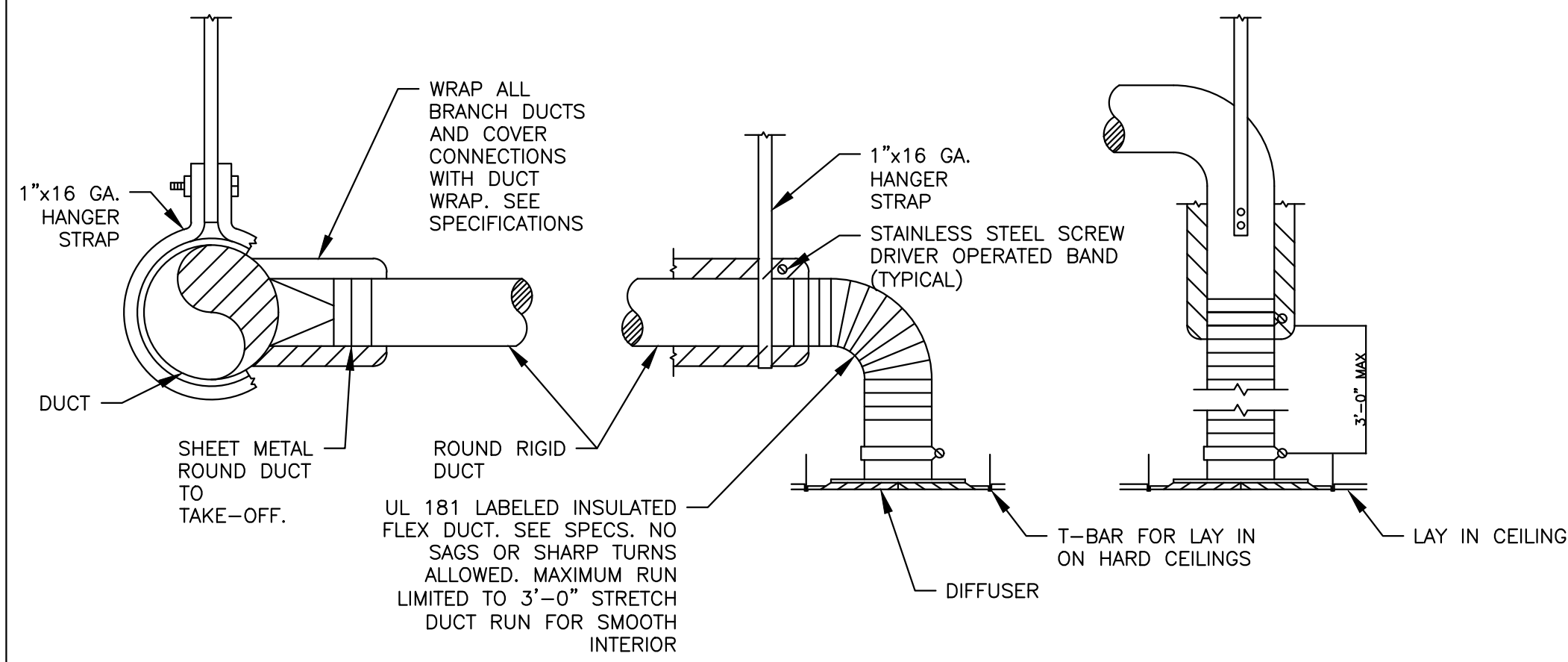
4 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION
M5.1 N.T.S



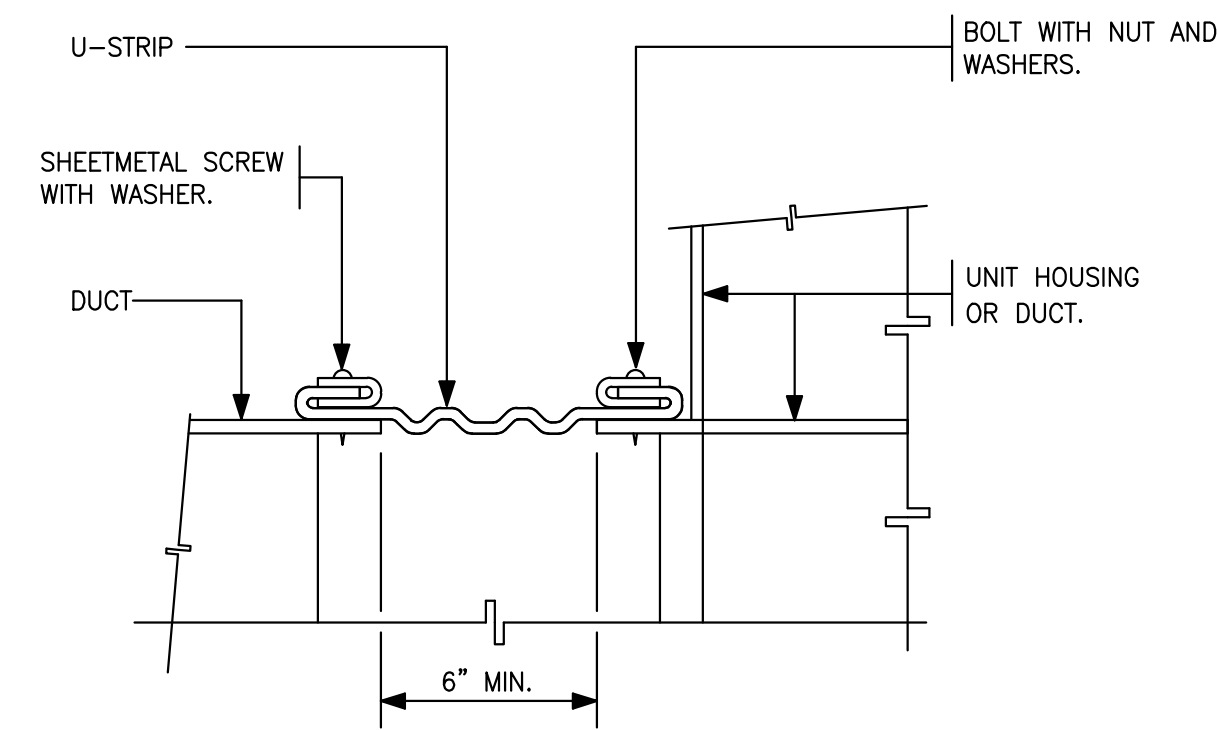
5 ACOUSTICAL TREATMENT DUCT LINING
M5.1 N.T.S



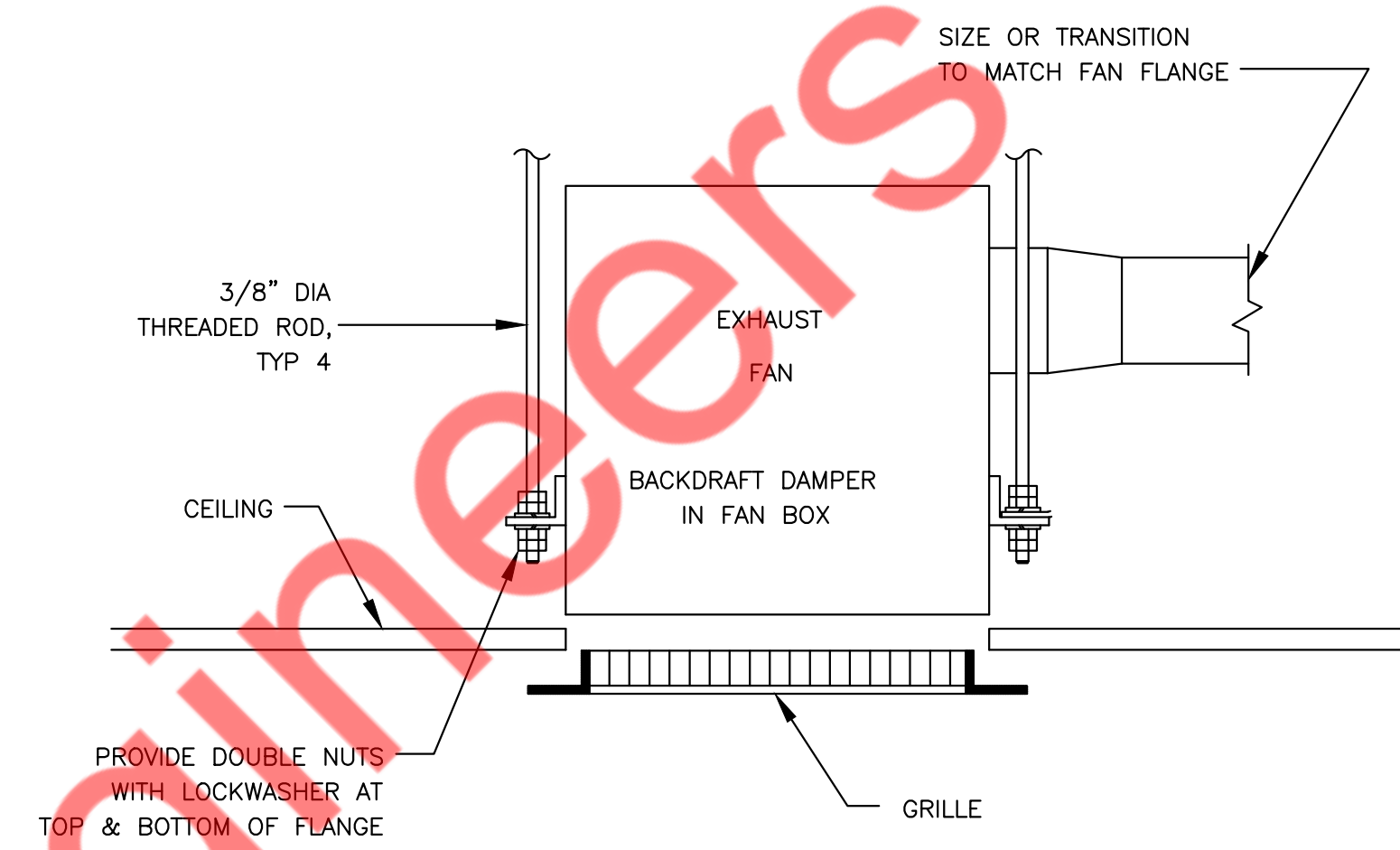
6 DIFFUSER AND GRILLE REGISTER CONNECTIONS
M5.1 N.T.S



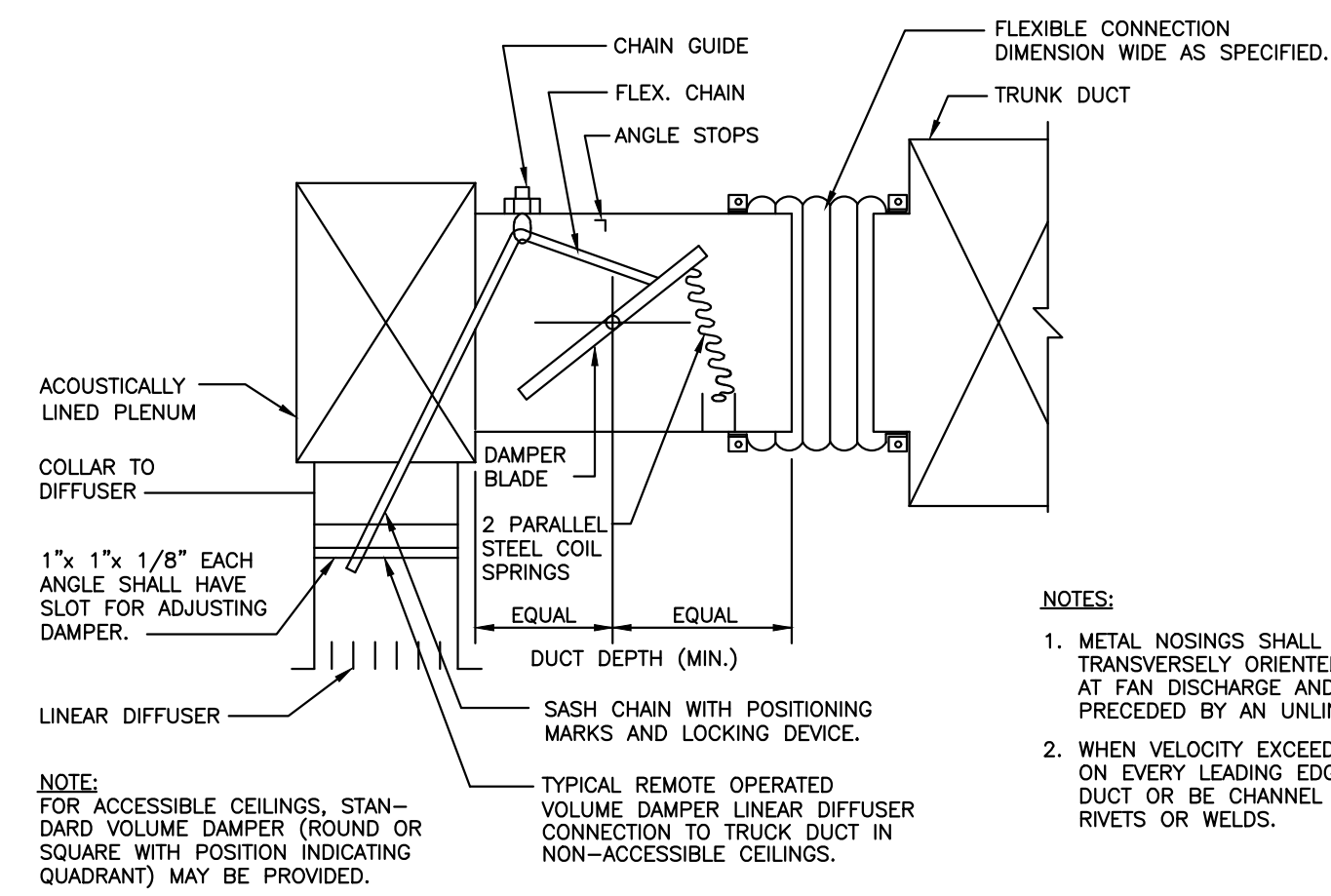
1 TYPICAL DIFFUSER CONNECTION DETAIL
M5.2 N.T.S



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



3 CEILING MOUNTED EXHAUST FAN
M5.2 N.T.S



NOTES:

1. METAL NOSINGS SHALL BE SECURELY INSTALLED OVER TRANSVERSELY ORIENTED LINER EDGES FACING AIRSTREAM AT FAN DISCHARGE AND AT ANY INTERVAL OF LINED DUCT PRECEDED BY AN UNLINED DUCT.
2. WHEN VELOCITY EXCEEDS 4000 FPM USE METAL NOSING ON EVERY LEADING EDGE. NOSING MAY BE FORMED ON DUCT OR BE CHANNEL OR ZEE ATTACHED BY SCREWS, RIVETS OR WELDS.

4 LINEAR SLOT DIFFUSER DETAILS
M5.2 N.T.S

EXISTING ROOF TOP UNIT SCHEDULE																					
UNIT ID	MANUFACTURER	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN			HEATING CAPACITY				COOLING CAPACITY				ELECTRICAL				EER/SEER	MAX OPERATING WEIGHT (LBS.)
					SUPPLY AIR CFM	OUTSIDE AIR CFM	MAX. ESP (IN. OF W.G.)	INPUT MBH	OUTPUT MBH	TOTAL MBH	SENSIBLE MBH	AMBIENT TEMP. DB (°F)	ENTERING TEMP. DB / WB (°F)	STAGES	VOLTS	PHASE	MCA (A)	MOCP (A)			
RTU-5 (E)	TRANE	SAE	SEE PLAN	5	2000	400	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	208	3	30	45	SAE	SAE
RTU-4 (E)	TRANE	SAE	SEE PLAN	4	1600	320	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	208	3	27.2	40	SAE	SAE

NOTES FOR EXISTING RTU

- 1 PROVIDE IECC COMPLIANT THERMOSTAT FOR EACH RTU. THERMOSTAT SHALL BE CALIBRATED TO DISPLAY SPACE TEMPERATURE AT +/- 1°F. THE CONTROL SYSTEM SHALL CONTROL ECONOMIZER, DISCHARGE AIR TEMPERATURE CONTROL, SPACE TEMPERATURE.
- 2 S.A.E. - SAME AS EXISTING.
- 3 RTU IS AN EXISTING. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND OPERATING CONDITION, INFORM TO ENGINEER/LANDLORD IF RTU IS NOT OPERATING AT ITS 100% RATED CAPACITY.
- 4 REPLACE FILTERS WITH NEW ONES.
- 5 SET OUTSIDE AIR DAMPER AS PER AIRFLOW MENTIONED IN THE TABLE ABOVE.

MAKE UP AIR UNIT SCHEDULE - GAS HEAT																					
MARK	MANUFACTURER	MODEL	SERVICE	DRIVE TYPE	MOTOR HP	COOLING				HEATING				FAN		ELECTRICAL			ACCESSORIES	MAX WEIGHT (LBS)	
						ENTERING G DBT DEG F	TONS	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	EFFICIENCY	SEER	FUEL TYPE	INPUT CAPACITY MBH	OUTPUT CAPACITY MBH	AIR (CFM)	E.S.P (IN. W.G.)	V/P	MCA (A)			MOCP (A)
MUA-1(N)	CAPTIVEAIRE	A1-D.250-16Z-MPU	HOOD-1	DIRECT	1.75	92	3	28.8	28.8	92%	14	NATURAL GAS	113.779	104.677	1760	1.25	208 / 1	7.80	15.00	RC,FSC,GDC,WP	1213

NOTES:

1. PROVIDE WITH MOTORIZED BACKDRAFT DAMPER.
2. PROVIDE WITH WEATHER HOOD AND BIRDSCREEN.
3. PROVIDE WITH DOWNFLOW DISCHARGE.
4. PROVIDE WITH MANUFACTURER FABRICATED 20" HIGH ROOF CURB.
5. PROVIDE WITH 3 TON SINGLE CIRCUIT CONDENSING UNIT. CONDENSING UNIT SHALL HAVE SEPARATE POWER CONNECTION AT 208V-3PH, 14.5 MCA, AND MOCP OF 20.
6. PROVIDE WITH COOLING/HEATING INTERLOCK RELAY FOR MUA-1(N).
7. REFER TO CAPTIVE-AIRE DRAWINGS FOR SPECIFICATIONS AND MORE DETAILS. SCHEDULES SHOWN FOR REFERENCE ONLY.

KITCHEN EXHAUST FAN SCHEDULE												
MARK	MANUFACTURER	MODEL	TYPE	SERVICE	DRIVE TYPE	MOTOR HP	EXHAUST		ELECTRICAL		ACCESSORIES	MAX WEIGHT (LBS)
							AIR (CFM)	E.S.P (IN. W.G.)	VOLTAGE	PHASE		
KEF-1(N)	CAPTIVEAIRE	DU85HFA	UPBLAST	HOOD-1	DIRECT	1	2200	1.15	208	1	RC,FSC,GDC,WP	142

ACCESSORIES:
FSC - FACTORY MOUNTED AND WIRED VARIABLE SPEED CONTROL, GDC - GREASE DRAIN CUPRC-FACTORY FURNISHED 18" ROOF CURB, WP - NEMA 3R DISCONNECT SWITCH

NOTES:

1. FAN SHALL BE CONTROLLED BY HOOD CONTROLS. INTERLOCK RTU-4(E) TO OPERATE IN OCCUPIED MODE WHILE KITCHEN EXHAUST FAN IS ENERGIZED.
2. REFER TO CAPTIVE-AIRE DRAWINGS FOR SPECIFICATIONS AND MORE DETAILS. SCHEDULES SHOWN FOR REFERENCE ONLY.

HOOD SCHEDULE									
UNIT ID	MANUFACTURER	LENGTH (FT. INCH.)	TYPE	MODEL	SERVICE	COOKING TEMPERATURE (DEG F)	EXHAUST AIR (CFM)	CONSTRUCTION	WEIGHT (LBS)
HOOD-1	CAPTIVEAIRE	10'-0"	1	5424ND-2-PSP-F	KITCHEN	600	2200	430 SS WHERE EXPOSED	887

NOTES:

1. REFER TO CAPTIVE-AIRE DRAWINGS FOR SPECIFICATIONS AND MORE DETAILS. SCHEDULES SHOWN FOR REFERENCE ONLY.

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 WATT	MCA (AMPS)		MANUFACTURER	MODEL		
TEF-1 (N) & 2(N)	2	70	0.5	916	120/1/60	35	1	36	COOK	GC-148	20	1,2,3,4

NOTES:

- 1) PROVIDE FACTORY MOUNTED AND INSTALLED WEATHER PROOF DISCONNECT SWITCH.
- 2) PROVIDE THERMAL OVERLOAD PROTECTION, BACKDRAFT DAMPER, AMCA SEAL & UL CERTIFIED.
- 3) PROVIDE ALL NECESSARY ACCESSORIES AS PER MANUFACTURER'S RECOMMENDATIONS.
- 4) INTERLOCK TOILET EXHAUST FAN TEF-1(N) & 2(N) WITH RTU-4(E). COORDINATE WITH ELECTRICAL CONTRACTOR.

VENTILATION CALCULATION											
ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000 SQ.FT. AS PER IMC 2021	NUMBER OF PEOPLE AS PER IMC 2021	NUMBER OF CHAIRS	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER IMC 2021 CFM/PEOPLE	CFM/SQ.FT.	REQ. OSA (CFM)	PROVIDED OSA (CFM)	EXHAUST AIRFLOW RATE (CFM/FIXTURE OR CFM/SQ.FT.)	TOTAL EXHAUST (CFM)
DINING	708	70	50	38	40	7.5	0.18	428	400	0	0
ORDER	171	50	9	2	3	7.5	0.06	33	0	0	0
KITCHEN	592	20	12	0	4	7.5	0.12	102	0	0.7	414.4
CORRIDOR	116	0	0	0	0	0	0.06	7	0	0	0
STORAGE	105	30	4	1	1	7.5	0.12	21	320	0	0
OFFICE	100	5	1	0	1	5	0.06	11	0	0	0
TOILET-1	42	0	0	0	0	0	0	0	0	70	70
TOILET-2	42	0	0	0	0	0	0	0	0	70	70
TOTAL	1876	-	-	-	49	-	-	602	720	-	554.4

AIR BALANCE					
UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-5 (E)	SEE PLAN	2000 CFM	400 CFM	1600 CFM	0 CFM
RTU-4 (E)	SEE PLAN	1600 CFM	320 CFM	1280 CFM	0 CFM
KEF-1 (N)	SEE PLAN	-	-	-	2200 CFM
MUA-1 (N)	SEE PLAN	1760 CFM	1760 CFM	-	0 CFM
TEF-1 (N)	RESTROOM	-	-	-	70 CFM
TEF-2 (N)	RESTROOM	-	-	-	70 CFM
TOTAL:		5360 CFM	2480 CFM	2880 CFM	2340 CFM
BUILDING PRESSURE:			140 CFM		POSITIVE

1) CONTRACTOR TO BALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON RTUS 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	12X12	SQUARE CONE DIFFUSER	ALUMINUM	WHITE	PER PLAN	TITUS (OR EQUIVALENT)	TMS-AA	1,2,3,4,5,6	
CDS-2	24X24	SQUARE CONE DIFFUSER	ALUMINUM	WHITE	PER PLAN	TITUS (OR EQUIVALENT)	TMS-AA	1,2,3,4,5,6	
CDS-3	24X24	PERFORATED DIFFUSER	ALUMINUM	WHITE	PER PLAN	TITUS (OR EQUIVALENT)	PAR-AA	1,2,3,4,5,6	
LDS-1	48X3	1" LINEAR SLOT DIFFUSER, 2 SLOTS, HIGH THROW PATTERN	ALUMINUM	WHITE	-	TITUS (OR EQUIVALENT)	FL-10-HT	1,2,3,4,5,6	
CDR-1	24X24	ALUMINUM LOUVERED RETURN GRILLE, 3/4" BLADE SPACING, 35 DEGREE DEFLECTION, LONG BLADES	ALUMINUM	WHITE	PER PLAN	TITUS (OR EQUIVALENT)	50F	1,2,3,4,5,6	

NOTES:

- 1) PROVIDE STANDARD WHITE FINISH FOR ALL AIR DEVICES UNLESS NOTED OTHERWISE ON PLAN.
- 2) PAINT ALL SURFACES VISIBLE THROUGH FACE OF RETURN AIR GRILLE FLAT BLACK. THIS SHALL INCLUDE PIPING, CONDUIT, DUCTWORK AND STRUCTURAL.
- 3) PROVIDE FRAME FOR MOUNTING AIR DEVICES IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING. IN AREAS WITH HARD CEILING, UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.
- 4) UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.
- 5) COORDINATE FINAL COLOR/FINISH WITH ARCHITECT/OWNER.
- 6) 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: 401-600 CFM
- 10" DIA: 201-400 CFM
- 8" DIA: 101-200 CFM
- 6" DIA: 0-100 CFM

FOR QUESTIONS, CALL THE
Southwest Florida Office
REGION 61
PHONE: (813) 448-7884
EMAIL: reg6@captiveware.com

PATENT NUMBERS
AC-PSP (UNITED STATES) - US PATENT 7963830 B2.
AC-PSP WALL (CANADA) - CA PATENT 2820509.
AC-PSP ISLAND (CANADA) - CA PATENT 2520330.

HOOD INFORMATION - JOB#5847084

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S)				TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIG				
										WIDTH	LENG	HEIGHT	DIA			CFM	VEL	SP	END TO END	RDW
1		5424 ND-2-PSP-F	CAPTIVEAIRE	10' 0"	600 DEG	I	HEAVY	220	2200			4'	16'	2200	1576	-0.704"	1760	430 SS WHERE EXPOSED	ALONE	ALONE

HOOD INFORMATION

HOOD NO	TAG	FILTER(S)				LIGHT(S)				UTILITY CABINET(S)				FIRE SYSTEM PIPING	HOOD HANGING WEIGHT		
		TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	WIRE GUARD	LOCATION	SIZE	FIRE SYSTEM	SIZE			ELECTRICAL MODEL #	SWITCHES QUANTITY
1		CAPTRATE SOLID FILTER	7	20"	16'	85% SEE FILTER SPEC	3	RECESSED ROUND	NO	LEFT	12"x54"x24"	TANK FS	4.0/4.0	DCV-1111	1 LIGHT 1 FAN	YES	887 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1		FIELD WRAPPER 18.00" HIGH FRONT, LEFT, RIGHT. BACKSPASH 80.00" HIGH X 132.00" LONG 430 SS VERTICAL. RIGHT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS. LEFT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS.

PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S)			
							WIDTH	LENG	DIA	CFM
1		Front	132"	14"	6"	MUA	10"	28"	586	0.159"
						MUA	10"	28"	586	0.159"
						MUA	10"	28"	586	0.159"

SPECIFICATION: CAPTRATE® GREASE-STOP® SOLID FILTER

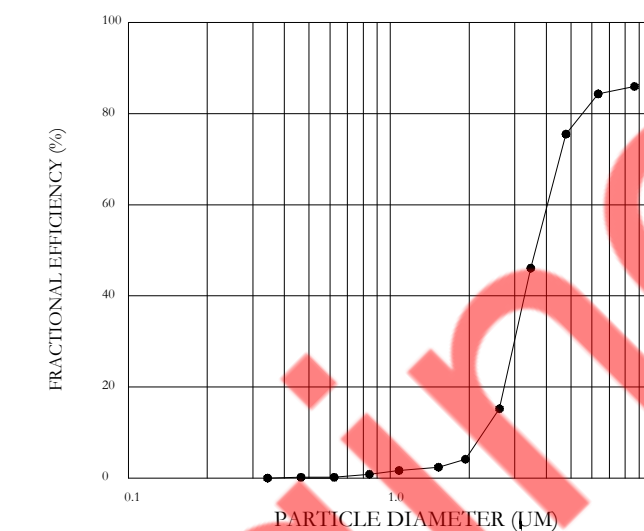
THE CAPTRATE GREASE-STOP SOLID FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-Baffle DESIGN IN CONJUNCTION WITH A SLOTTED REAR Baffle DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

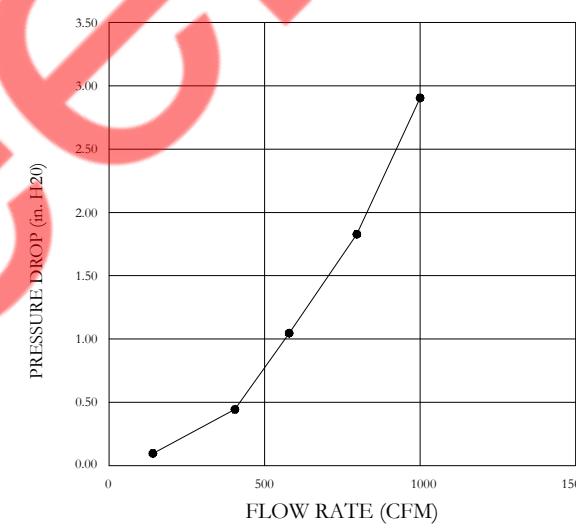
UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE. THE CAPTRATE GREASE-STOP SOLID WAS TESTED TO ASTM STANDARD ASTM F2519-05. MANUFACTURER APPROVED FOR USE IN SOLID FUEL APPLICATIONS AS A SPARK ARRESTER.

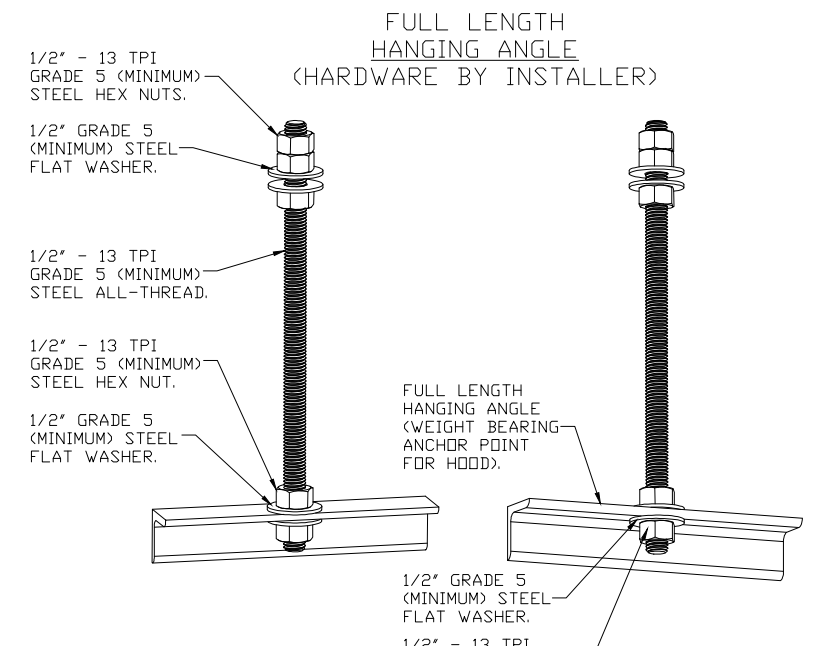
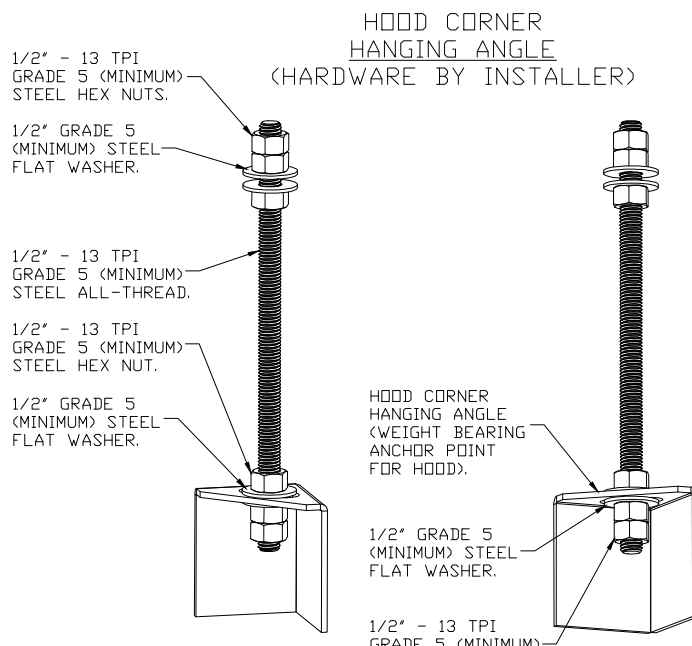
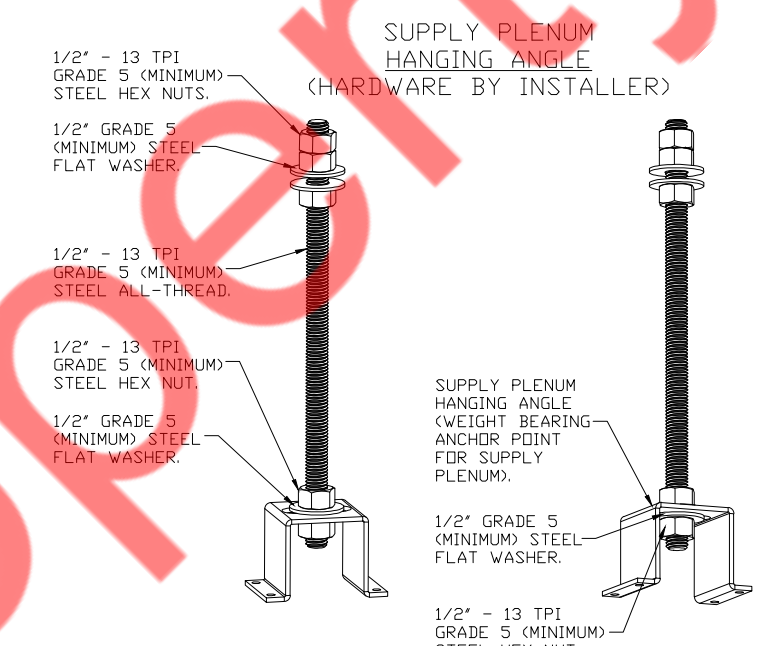
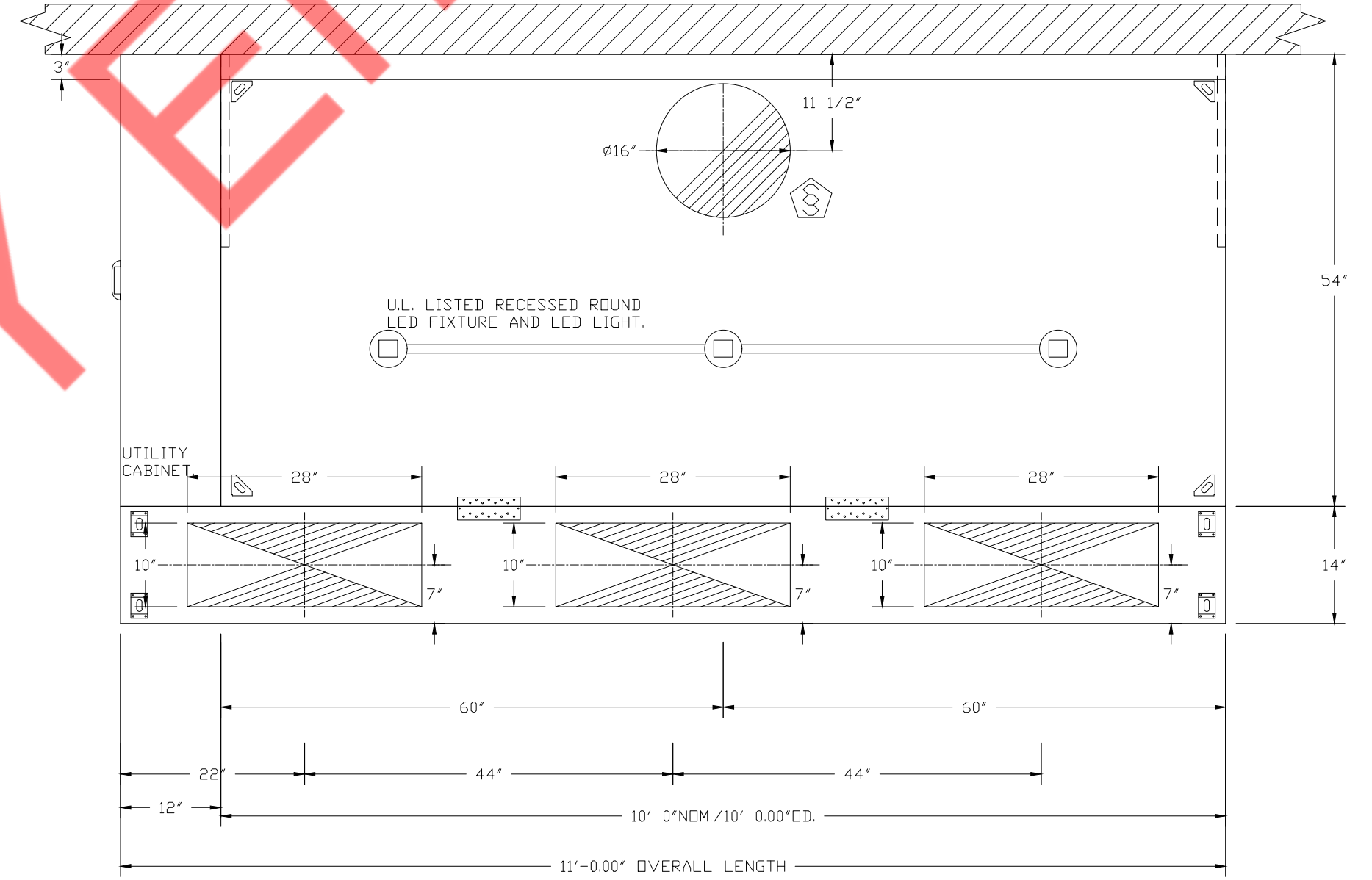
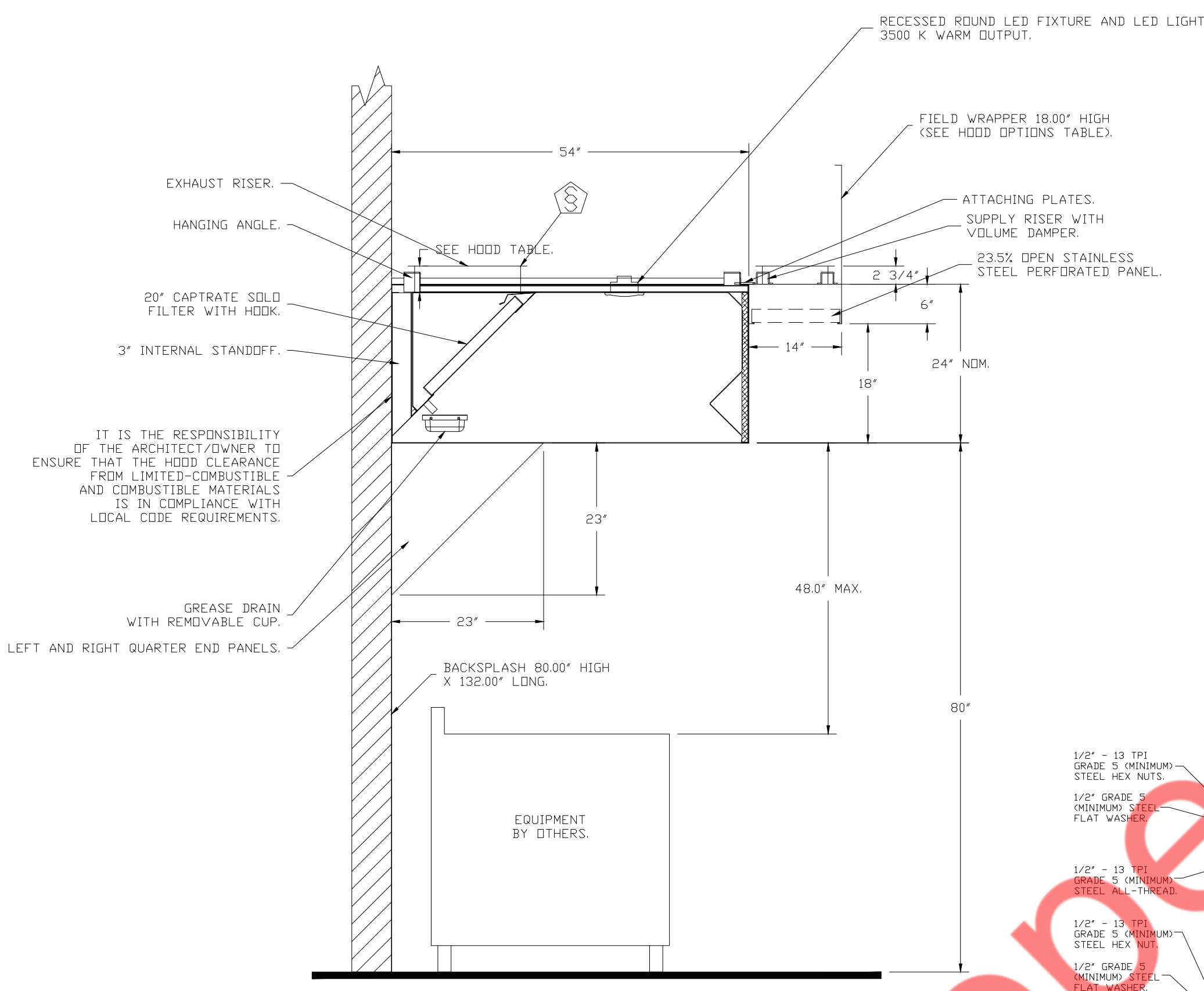
EFFICIENCY VS. PARTICLE DIAMETER



PRESSURE DROP VS. FLOW RATE



CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH:
NFPA #96,
NSF STANDARD #2,
UL STANDARD #1046,
INT. MECH. CODE (IMC),
ULC-S649.



HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD, SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR PSP HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD, SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

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REVISIONS

DESCRIPTION	DATE

CAPTIVEAIRE
Southwest Florida Office
4519 George Rd. Ste 150, Tampa, FL 33634
PHONE: (813) 448-7884 FAX: (813) 227-5920 EMAIL: reg6@captiveware.com
www.captiveware.com

Daddy's Chicken Shack

DATE: 2/7/2023
DWG.#: 5847084
DRAWN BY:
SCALE: 3/4" = 1'-0"
MASTER DRAWING

SHEET NO. 1

FIRE SYSTEM INFORMATION - JOB#5847084

FIRE SYSTEM NO	TAG	TYPE	SIZE	FLOW POINTS	INSTALLATION	
					SYSTEM	LOCATION ON HOOD
1		TANK FS	4.0/4.0	28	FIRE CABINET LEFT	LEFT, HOOD 1

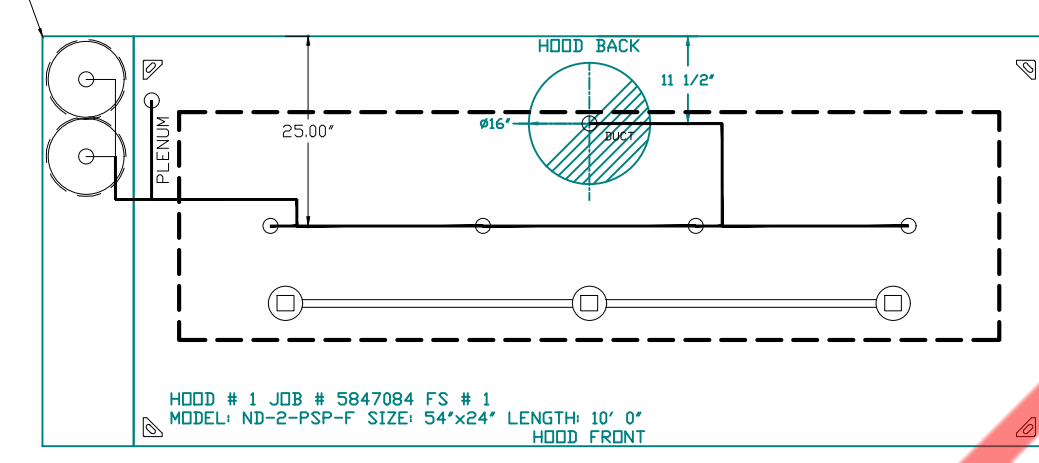
GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		SC ELECTRICAL	2.000	CAPTIVEAIRE SYSTEMS

FIRE SYSTEM PARTS LIST KEY

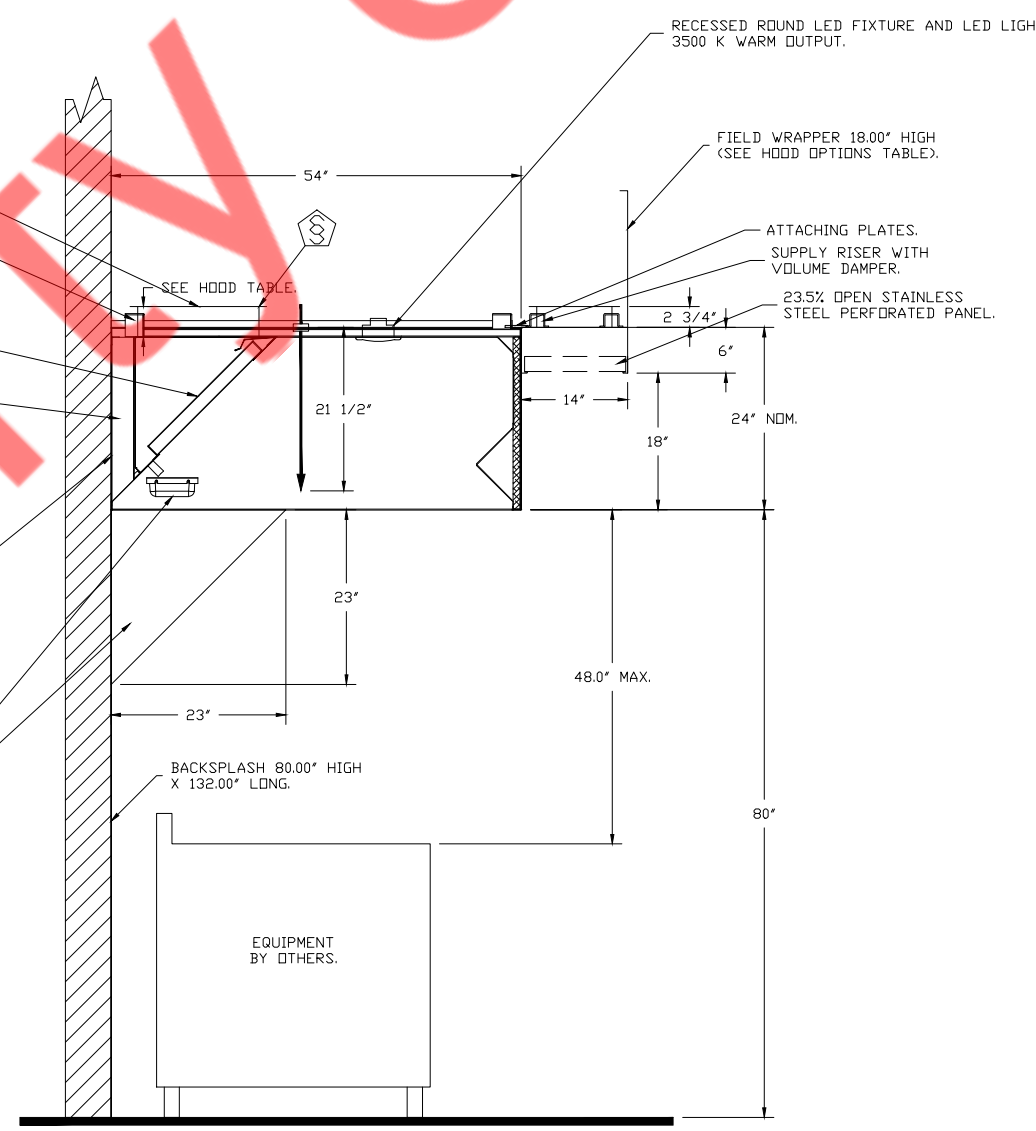
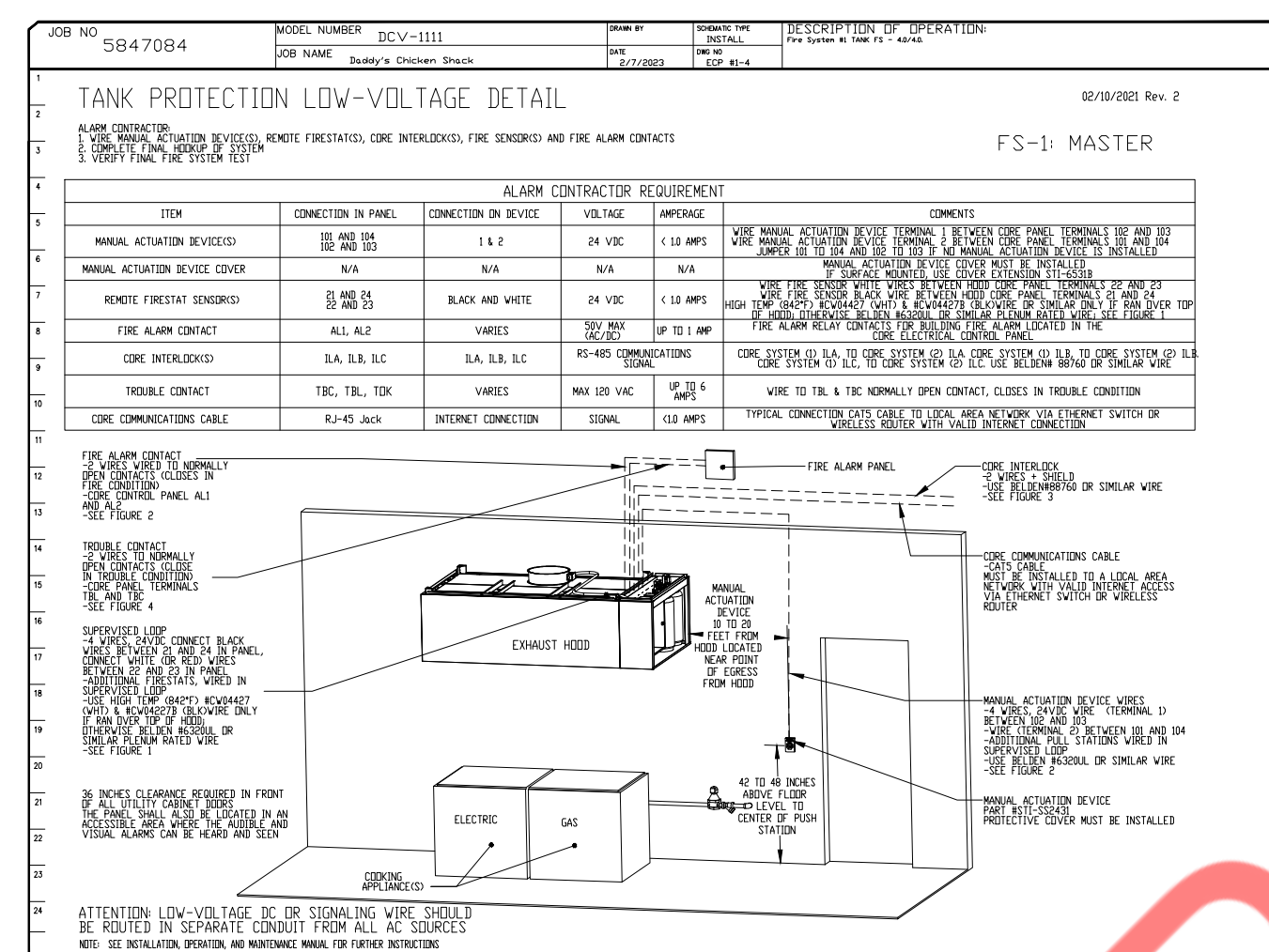
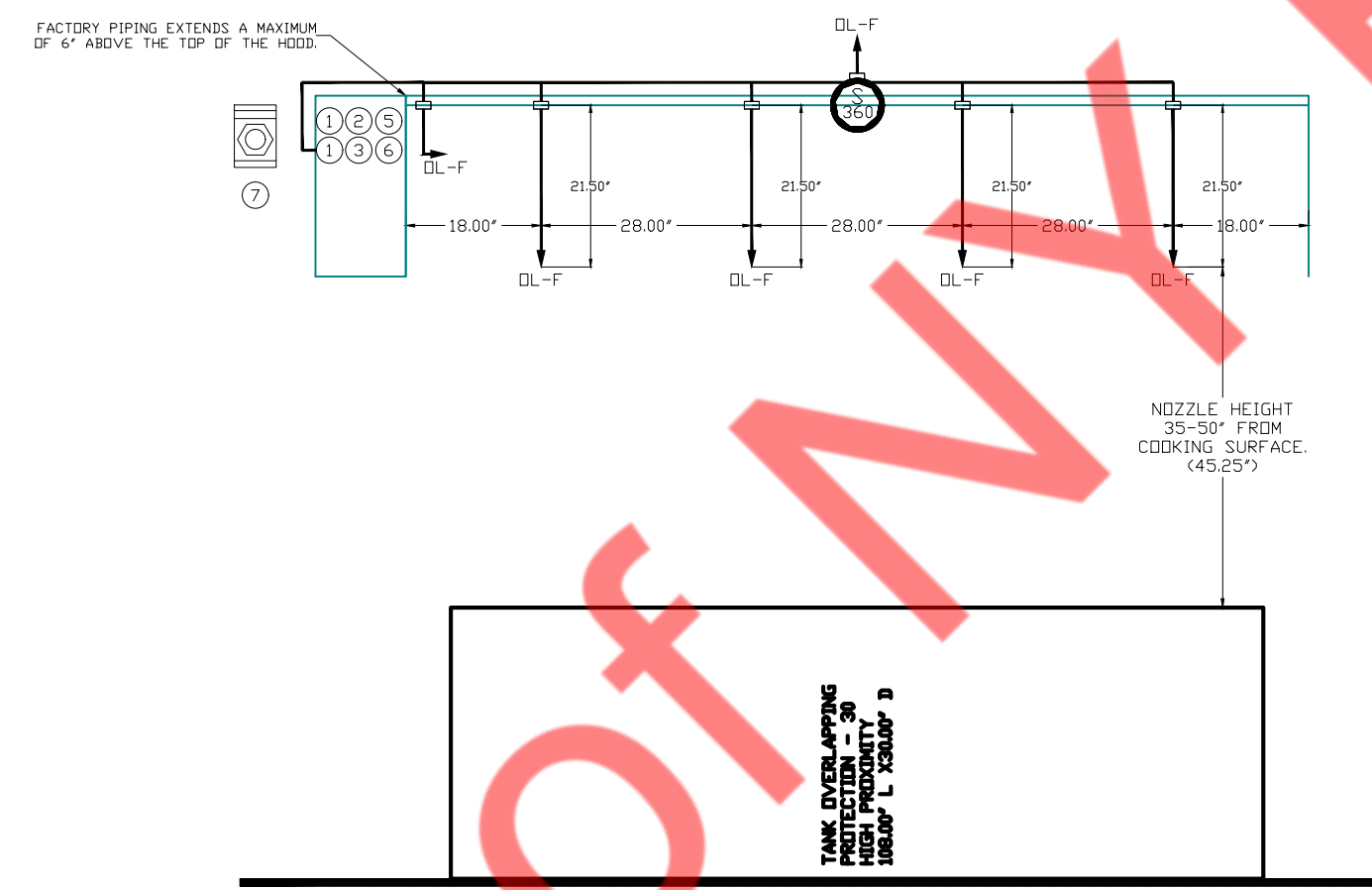
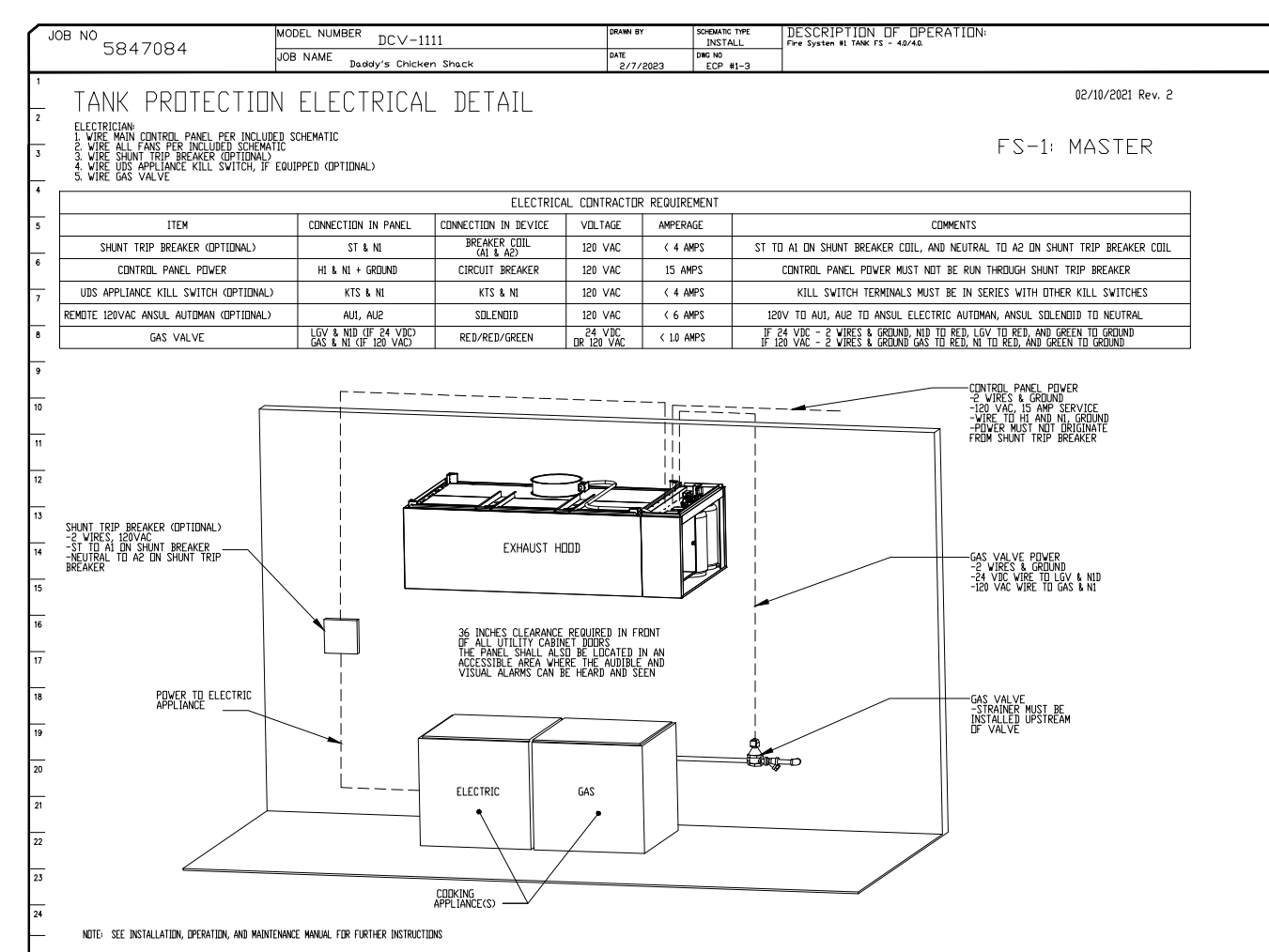
FIRE SYSTEM NO	TAG	KEY NUMBER - PART DESCRIPTION	QTY BY FACTORY	QTY BY DIST
0	-	TANK FIRE SUPPRESSION POST-DISCHARGE PROCEDURE UTILITY CABINET LABEL SHEET.	1	0
0	-	TANK FIRE SUPPRESSION MAINTENANCE GUIDE UTILITY CABINET LABEL SHEET.	1	0
0	-	12-FB021-20144-OT-360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. NO. CLOSURE ON TEMP RISE AT 360°F.	1	0
0	-	4429K153 1/2" MALE NPT TO 1/2" FEMALE NPT ELBOW, BRASS.	2	0
0	-	4429K422 1/2" X 1/4" BRASS REDUCING BUSHING.	1	0
0	-	7952S 1/2" 90 DEG PRESSURE ELBOW WITH 1/2" NPT FEMALE CONNECTION, VIEGA.	1	0
0	-	79580 1/2" X 1/2" NPT PRESSURE TEE X 1/2" NPT FEMALE CONNECTION, VIEGA.	2	0
0	-	87-120042-001 SECONDARY ACTUATOR VALVE (SVA) - SINGLE ACTUATOR, REQUIRES PRIMARY RELEASE ACTUATOR, TANK FIRE SUPPRESSION.	1	0
0	-	87-120045-001 HOSE, SECONDARY ACTUATOR HOSE, 7.5' BRAIDED STAINLESS STEEL, TANK FIRE SUPPRESSION.	1	0
0	-	87-30000-001 TANK - PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION.	2	0
0	-	87-30000-001 PRIMARY ACTUATOR KIT (PAK) - ACTUATOR AND RELEASE, SOLENOID ASSEMBLY, ONE, MOUNTED FOR FIRE SYSTEM SUPERVISED, TANK FIRE SUPPRESSION.	1	0
0	-	87-300152-001 HARDWARE, SVA BOLTS, TANK FIRE SUPPRESSION.	8	0
0	-	88694115 HARDWARE, DATANKLOCK LOCKING BRACKET SQUARE NUTS 5/16" ZINC, TANK FIRE SUPPRESSION.	4	0
0	-	A0034332 JUNCTION BOX FOR MANUAL PULL STATION, 1.5" DEEP BACK BOX, RED COLOR.	1	0
0	-	A31484 1/4" NPT SCHROEDER VALVE AND CAP, JB INDUSTRIES, 1/4" FLARE X 1/4" MET HALF UNION USED ON TANK SERVICE PORT.	1	0
0	-	DATANKLOCK DISCHARGE ADAPTER TANK LOCKING PLATE FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	2	0
0	-	TANK STRAP TANK STRAP - USED FOR TANK FIRE SUPPRESSION.	6	0
0	-	T5-UCTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	2	0
0	-	W4-020752-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION.	2	0
34	-	A0034331 24VDC SINGLE ACTION MANUAL ACTUATION DEVICE (PUSH/PULL STATION) WITH PROTECTIVE COVER, ONE (1) NORMALLY OPEN CONTACT, RED COLOR.	1	0

THIS SYSTEM REQUIRES A MINIMUM OF 7 FT OF EQUIVALENT PIPE LENGTH BETWEEN TANK AND NEAREST APPLIANCE NOZZLE FOR MOST APPLIANCES. EACH 90 DEGREE ELBOW ADDS 13 FT OF EQUIVALENT LENGTH. SEE MANUAL FOR DETAILS.



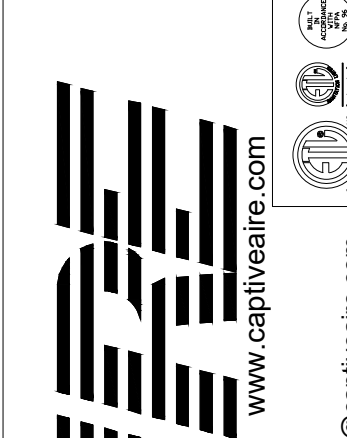
NOTES
 - FIELD PIPE DROPS AS SHOWN.
 - PIPING, ELBOWS, TEES AND NOZZLES SUPPLIED BY GAS.
 - FIELD INSTALLED DROP FACTORY WILL PROVIDE QTY 2 60IN LONG PIECES OF CHROME PLATED PIPING SHIPPED LOOSE TO BE FIELD-INSTALLED.
 - SHIP LOOSE DROP FACTORY SHALL PROVIDE THE EXACT CHROME PIPE LENGTH NEEDED SHIPPED LOOSE TO BE FIELD-INSTALLED.
 - RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
 - OVERLAPPING COVERAGE SHALL NOT BE USED ON ANY APPLIANCE WITH AN OBSTRUCTION.
 - IF APPLICABLE, EXTENDED PRE-PIPED DROPS ARE SHIPPED LOOSE.
 - FACTORY PIPING EXTENDS A MAXIMUM OF 6' ABOVE THE TOP OF THE HOOD.
 - APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.
 - THIS FIRE SYSTEM COMPLIES WITH UL 300 REQUIREMENTS.
 - DL-F NOZZLE PART NUMBER REPLACES 3070-3/8H-10-SS
 - JOB # 5847084.
 - JOB NAME: DADDY'S CHICKEN SHACK.
 - SYSTEM SIZE: TANK-SP-2. TOTAL FP REQUIRED: 28.
 - HOOD # 1 10' 000" LONG X 54" WIDE X 24" HIGH.
 - RISER # 1 SIZE: 16" DIA.
 - HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.
 - HEAVY-DUTY APPLIANCES (RATED 600°F) WILL REQUIRE AN ADDITIONAL DOWNSTREAM FIRESTAT IN THE EVENT THAT THE DUCTWORK CONTAINS ANY HORIZONTAL RUNS OVER 25 FT IN LENGTH.
 - MEDIUM TO LIGHT-DUTY APPLIANCES (RATED 450°F) WILL NOT REQUIRE ANY ADDITIONAL DOWNSTREAM DETECTION.
LEGEND - FIRE CABINET TANK SYSTEM

- 4 GALLON TANK.
- PRIMARY ACTUATOR RELEASE.
- SECONDARY ACTUATOR RELEASE.
- PRESSURE SUPERVISION SWITCH.
- PRIMARY HOSE ASSEMBLY.
- SECONDARY HOSE ASSEMBLY.
- REMOTE MANUAL ACTUATION DEVICE.



REVISIONS

DESCRIPTION	DATE



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Daddy's Chicken Shack
 DATE: 2/7/2023
 DWG.#: 5847084
 DRAWN BY:
 SCALE: 1/2" = 1'-0"
 MASTER DRAWING

SHEET NO. 2

EXHAUST FAN INFORMATION - JOB#5847084

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SDNES
1	KEF	1	DUB5HFA	CAPTIVEAIRE	2200	1.150	1642	TEAD-ECM	1.000	0.6560	1	208	6.9	696 FPM	98	18.3

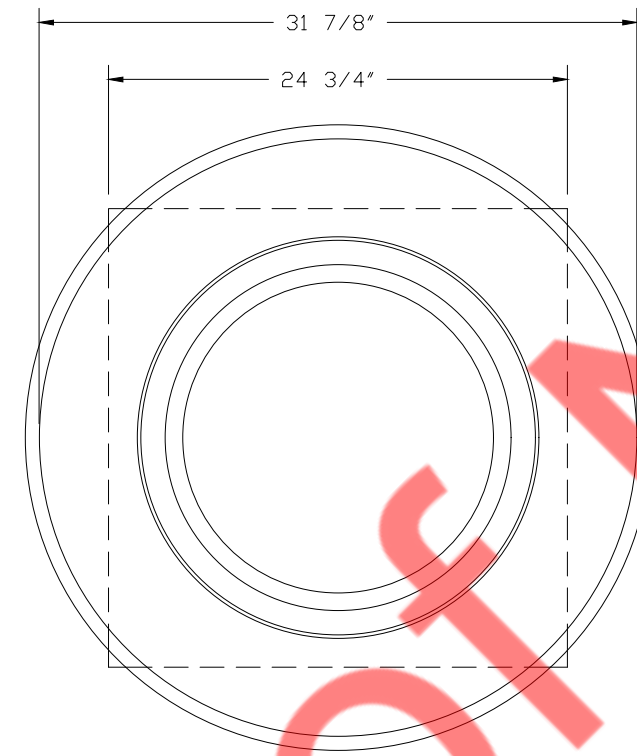
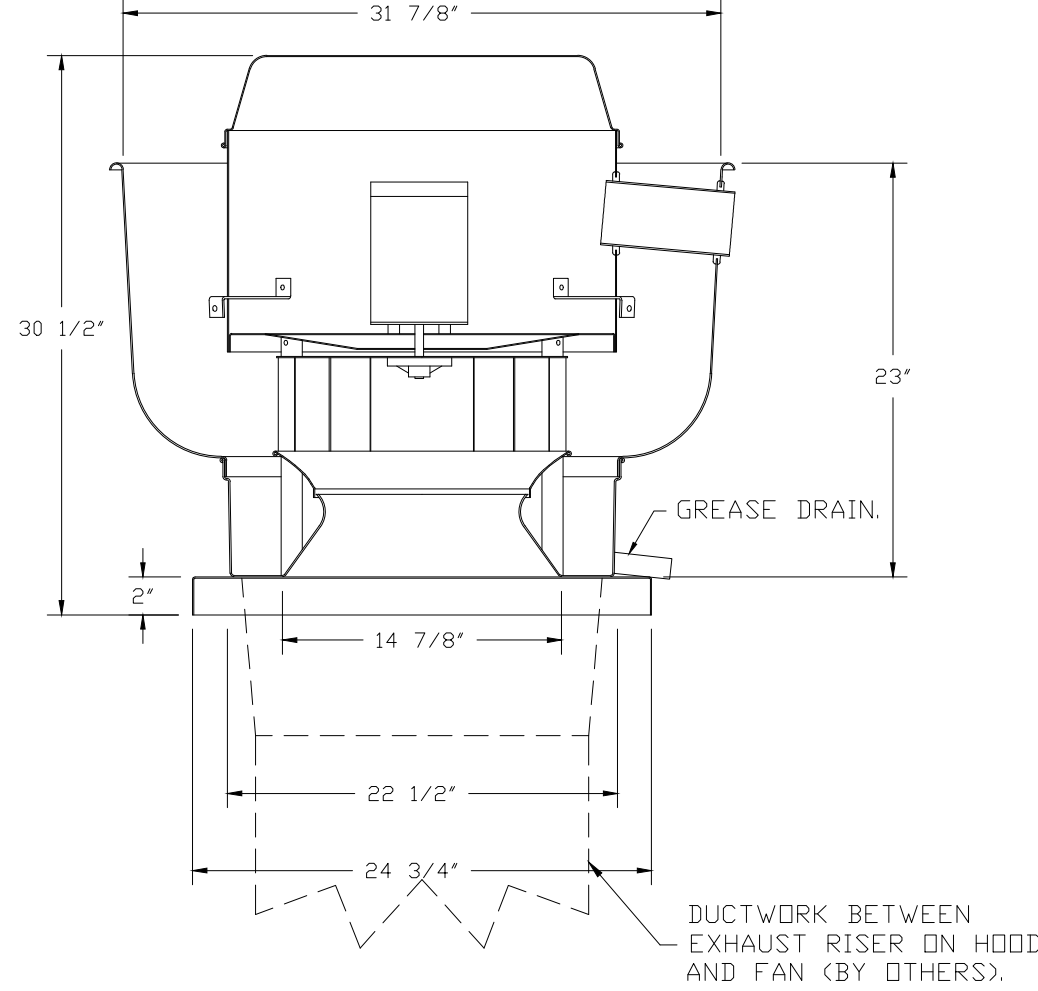
FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	KEF	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - INSTALLED AT PLANT - FOR GREASE DUCTS
2	KSF	1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION
		1	2 YEAR PARTS WARRANTY
		1	INLET PRESSURE GAUGE, 0-35"
		1	MANIFOLD PRESSURE GAUGE, -5 TO 15" WC
		1	SHIP LOOSE GAS STRAINER 3/4"
		1	MOTORIZED BACKDRAFT DAMPER FOR AI-D HOUSING - MEETS AMCA CLASS 1A RATING
		1	COMMERCIAL SMOKE DETECTOR/ALARM INTERLOCK - ALARM SUPPLIED BY OTHERS
		1	ECM WIRING PACKAGE-SUPPLY - PWM SIGNAL FROM ECPM03 PREWIRE (1 - PHASE ZIEHL MOTOR)
		1	3 TON SINGLE CIRCUIT MODULAR PACKAGED COOLING OPTION FOR SIZE 1 DF/EH MUA (1,100 TO 1,800 CFM), 208V/230V, 3 PHASE, COOLING THERMOSTAT OR PROGRAMMABLE STAT REQUIRED FOR PROPER OPERATION
		1	DOWNTURN PLENUM FOR SIZE 1 DX COIL MODULE
1	2 YEAR PARTS WARRANTY		

CURB ASSEMBLIES

NO	DN FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF	44 LBS	CURB	23.000"W X 23.000"L X 26.000"H ALONG LENGTH, RIGHT VENTED HINGED.
2	# 2		85 LBS	RAIL	6.000"W X 21.000"L X 20.000"H RIGHT.
2	# 2	KSF	85 LBS	CURB	21.000"W X 71.000"L X 20.000"H ALONG WIDTH, RIGHT INSULATED.

FAN #1 DUB5HFA - EXHAUST FAN (KEF)



FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST

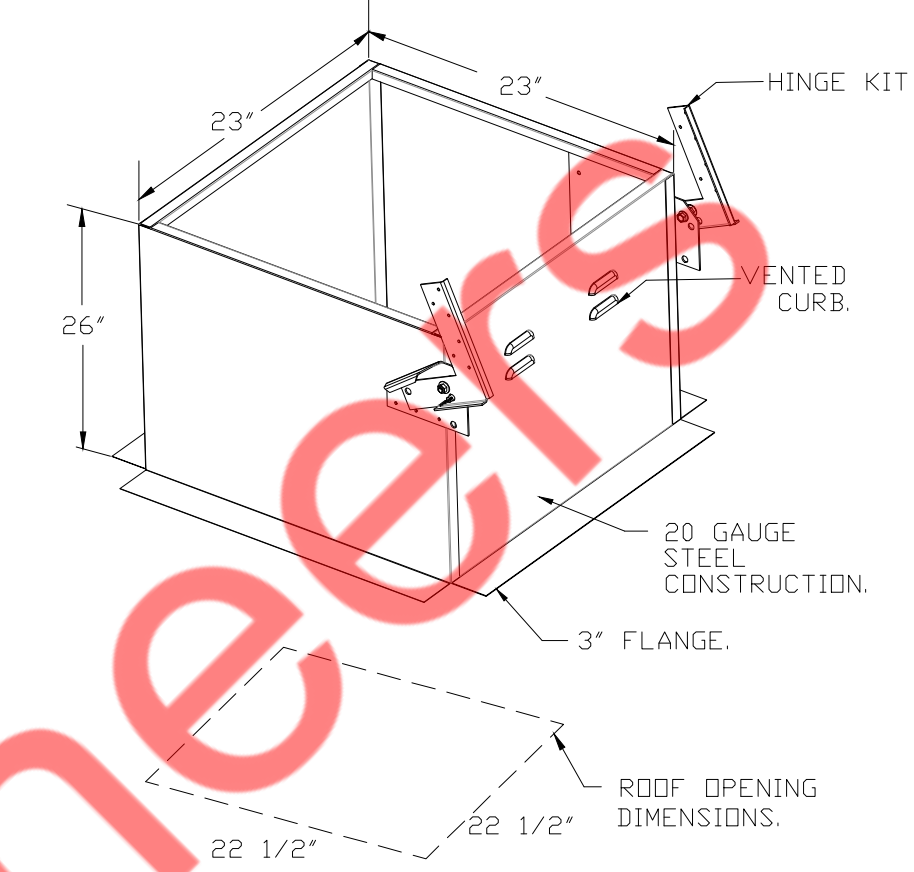
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST

EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS

- GREASE BOX
- FAN BASE CERAMIC SEAL - INSTALLED AT PLANT - FOR GREASE DUCTS
- ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION
- 2 YEAR PARTS WARRANTY.



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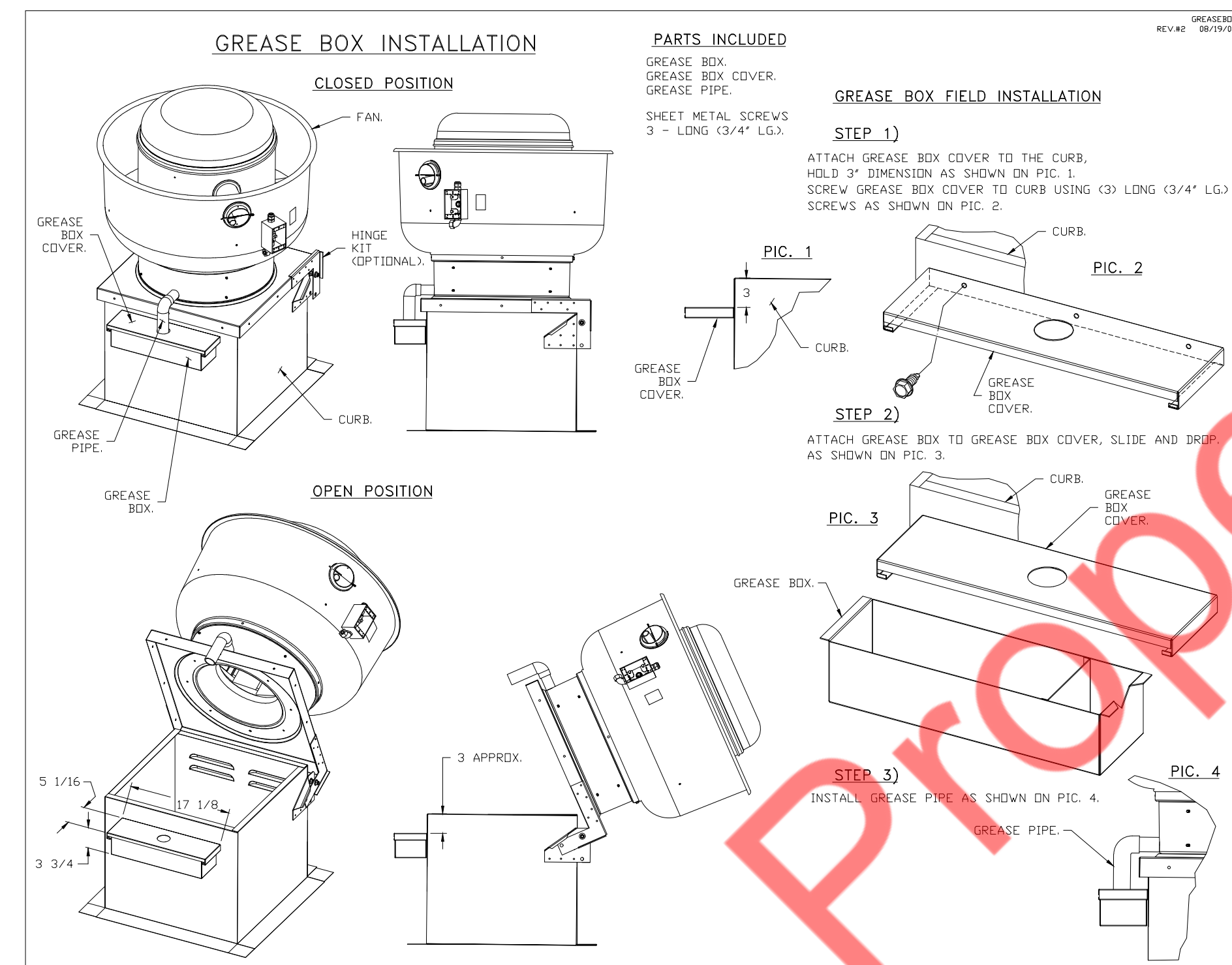
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Daddy's Chicken Shack

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 DRAWN BY:
 SCALE: 3/4" = 1'-0"
 MASTER DRAWING

SHEET NO. 3



NOTE: UL 705 INSTALL.

CONDENSER DETAILS

Table with 12 columns: FAN UNIT NO., TAG, FAN UNIT MODEL #, CONDENSER NO., TONNAGE, VOLTAGE, PHASE, FREQUENCY, MCA, RLA, MAX FUSE SIZE, MIN WIRE SIZE, SECR.

MUA FAN INFORMATION - JOB#5847084

Table with 12 columns: FAN UNIT NO., TAG, QTY, FAN UNIT MODEL #, BLOWER HOUSING, MIN CFM, DESIGN CFM, ESP, RPM, MOTOR ENCL, HP, BHP, PHASE, VOLT, FLA, MCA, MSCP, WEIGHT (LBS), SIDES.

COILS - JOB#5847084

Table with 20 columns: FAN UNIT NO., TAG, COIL TYPE, DESIGN CFM, ENTERING DB TEMP, ENTERING WB TEMP, LEAVING DB TEMP, LEAVING WB TEMP, ENTERING FLUID TEMP, LEAVING FLUID TEMP, FLUID FLOW RATE, PERCENT GLYCOL, TOTAL CAPACITY, SENSIBLE CAPACITY, LATENT CAPACITY, ENTERING DB TEMP, LEAVING DB TEMP, ENTERING FLUID TEMP, LEAVING FLUID TEMP, FLUID FLOW RATE, PERCENT GLYCOL, STEAM PRESSURE, TOTAL CAPACITY, SENSIBLE CAPACITY.

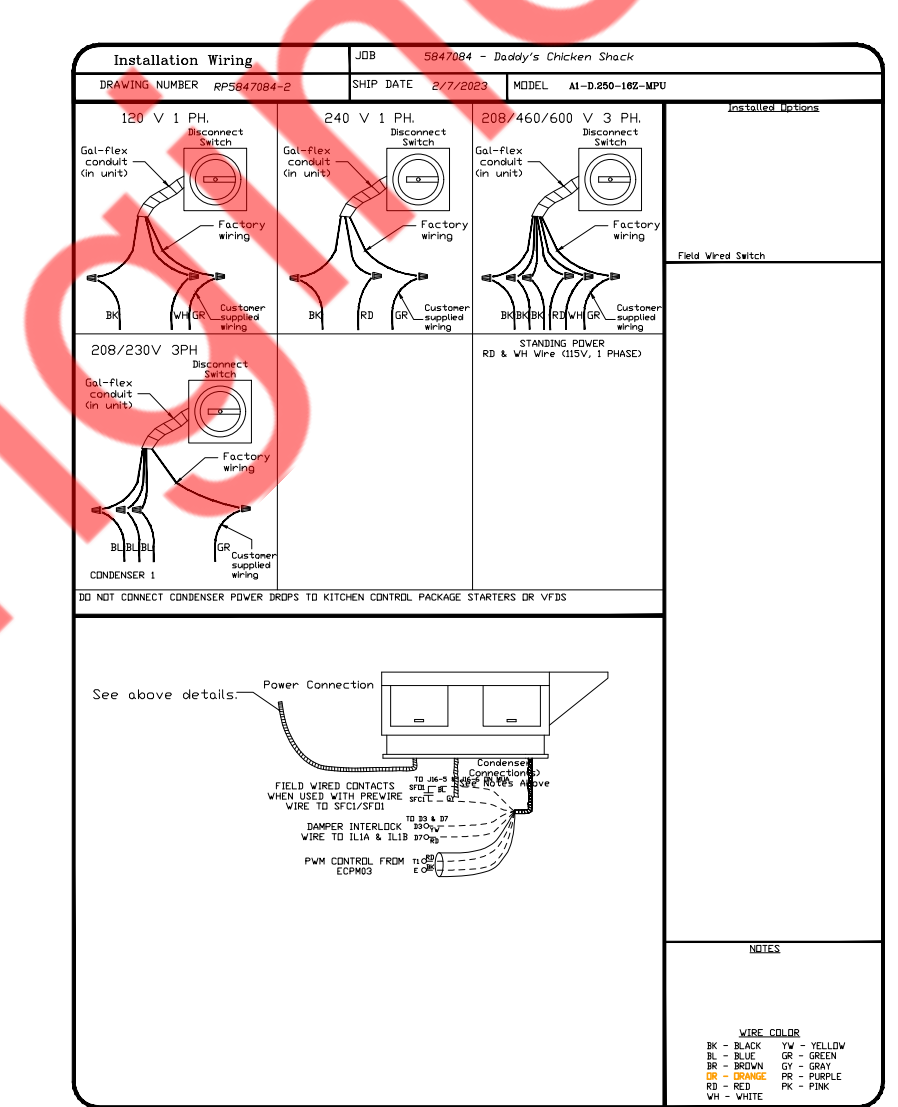
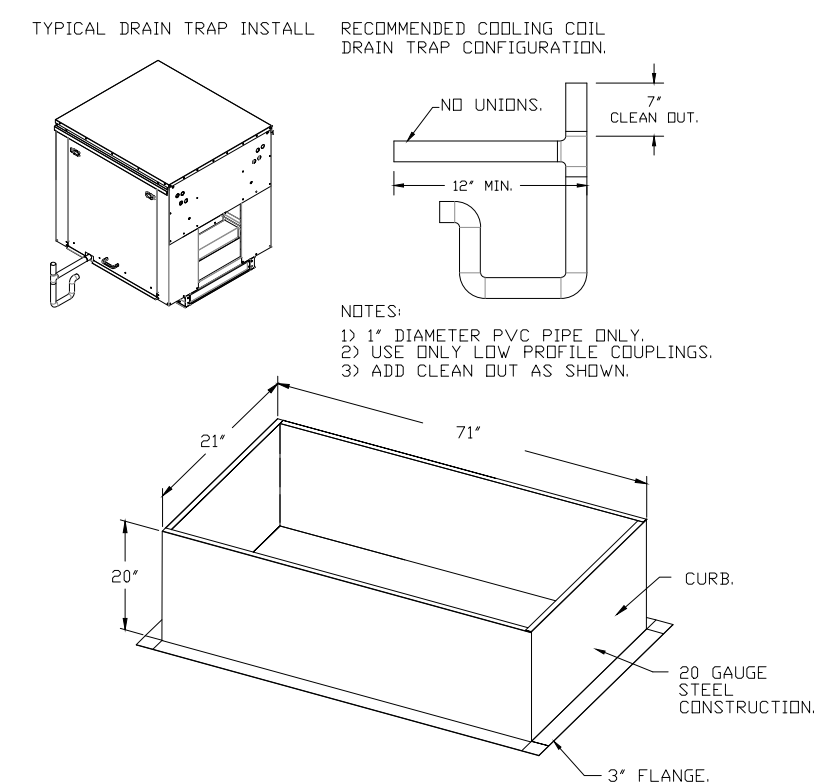
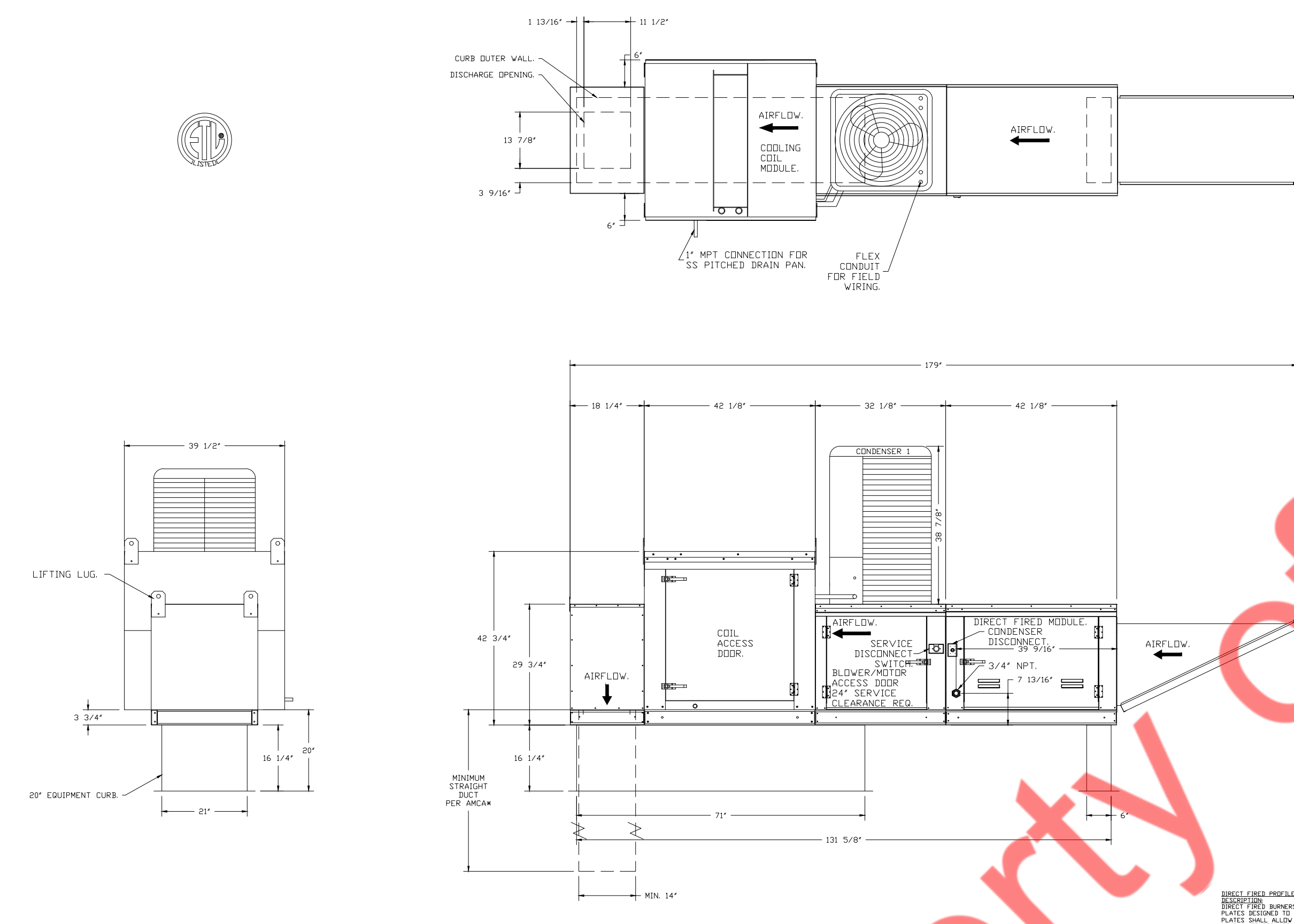
GAS FIRED MAKE-UP AIR UNIT(S)

Table with 7 columns: FAN UNIT NO., TAG, INPUT BTUH, OUTPUT BTUH, TEMP RISE, REQUIRED INPUT GAS PRESSURE, GAS TYPE, BURNER EFFICIENCY(%).

- FAN #2 AI-D250-16Z-MPU - HEATER (KSF)
1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 16" DIRECT DRIVE FAN
2. STRAINER WITH LE FILTERS
3. BURNER DISCHARGE - AIR FLOW RIGHT TO LEFT
4. GAS PRESSURE GAUGE, 1/2" DIA. 1/4" NPT CONNECTION
5. GAS PRESSURE GAUGE, 1/2" DIA. 1/4" NPT CONNECTION
6. SHIP LOSS GAS STRAINER TO BE INSTALLED UPSTREAM OF UNIT CONNECTION 3/4" CONNECTION
7. MOTORIZED SHUT OFF DAMPER 16" X 18" FOR SIZE 1 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHFT. STANDARD GALVANIZED CONSTRUCTION 3/4" NPT FLANGE, LOW LEAKAGE, 1/2" BORE ACTUATOR INCLUDED
8. COMBUSTION SMOKE DETECTION INTERLOCK - DETECTOR BY OTHERS
9. ECM WIRING PACKING FOR SINGLE PHASE 208V SUPPLY MOTORS WITH PWM SIGNAL FROM ECM202 PROVIDE
10. 3 TON, SINGLE CIRCUIT MODULAR PACKAGED COILING SECTION FOR SIZE 1 OF ECM MODULAR PACKAGED UNIT INCLUDES CONDENSER, DR. COIL, 1/2" BURNER, HEATING & HUMIDIFIER VALVE, FLUE REVERSEMENT AND RE-HEATING FIPING, 0.180 TO 1.800 CFM WHEN OPERATED WITH OPPOSITE AIRFLOW CONDENSERS ACCESS AND COIL FIPING WILL REMAIN IN STANDARD POSITION DRAIN AND SLEGS WILL MOVE TO THE OPPOSITE SIDE ANY OTHER CHANGE WILL REQUIRE C.I. CONDENSERS REQUIRE SEPARATE DRW. 3 PHASE POWER SUPPLY UNLESS ORDERED WITH SINGLE POINT CONNECTION, COIL = SECTION
11. CONDENSUR CLEANUP TOP SIZE 1 COILING COIL MODULE - REQUIRED FOR DRW DISCHARGE COILING COIL APPLICATIONS
12. HINGED DOUBLE WALL INSULATED DOOR ASSEMBLY (BURNER/BLOWER/MPU SECTION)
13. 5 YEAR PARTS WARRANTY

NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS DETAILED IN AREA PUBLICATION 208. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THREAT, RADIUS BACK WITH TURNING VANES, FLEXIBLE, DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED ANY THROUGHOUT AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT SYSTEM EFFECT WILL DRAGTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT. SUGGESTED STRAIGHT DUCT SIZE IS 14" X 14".

SUPPLY SIDE HEATER INFORMATION
WINTER TEMPERATURE = 7°F TEMP RISE = 60°F
BTUH CALCULATED OFF ACTUAL AIR DENSITY
OUTPUT BTUH AT ALTITUDE OF 60 FT = 129269
INPUT BTUH AT ALTITUDE OF 60 FT = 138977
OUTPUT BTUH AT ALTITUDE OF 5438 FT = 129477
INPUT BTUH AT ALTITUDE OF 5438 FT = 133779



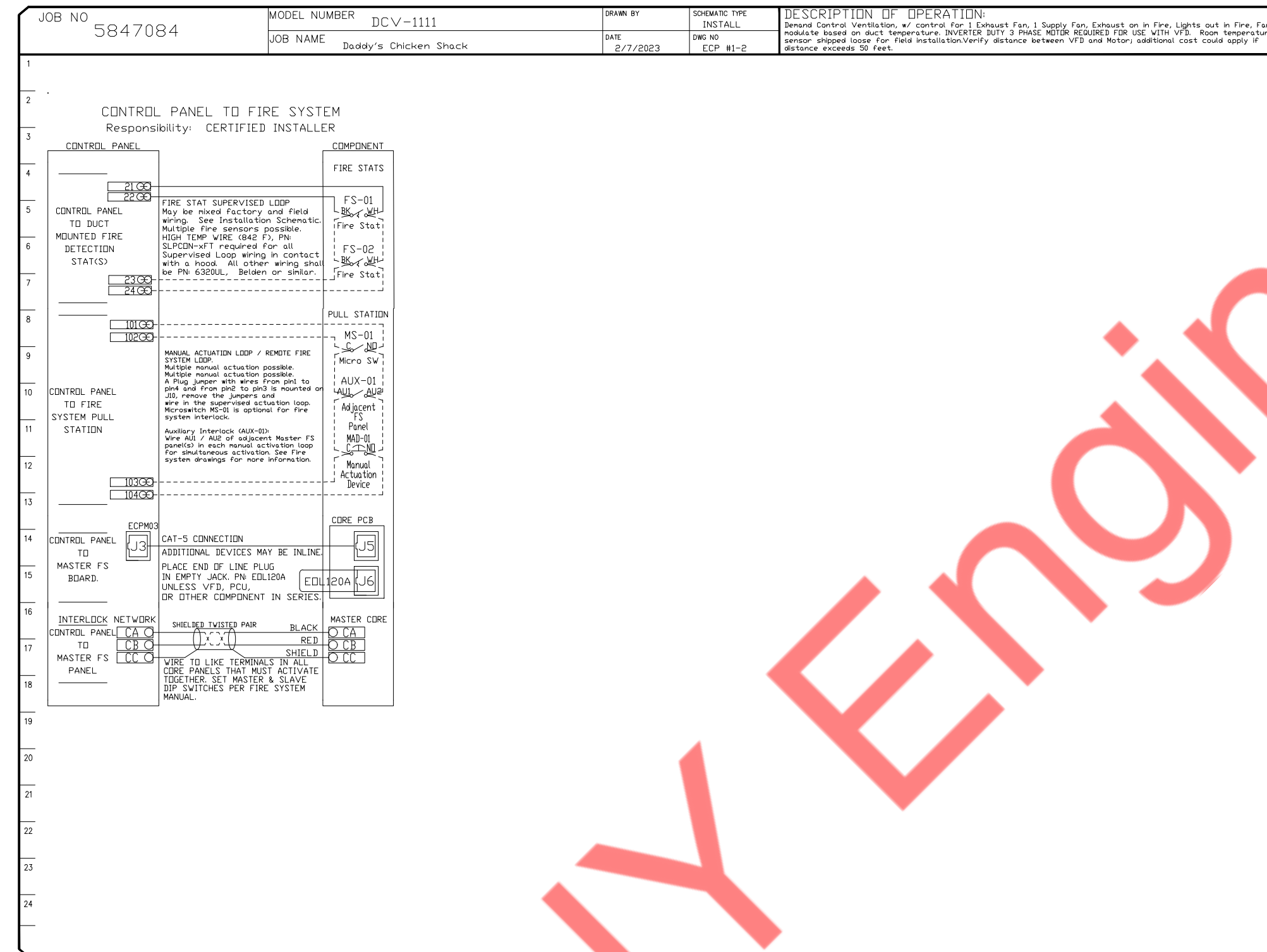
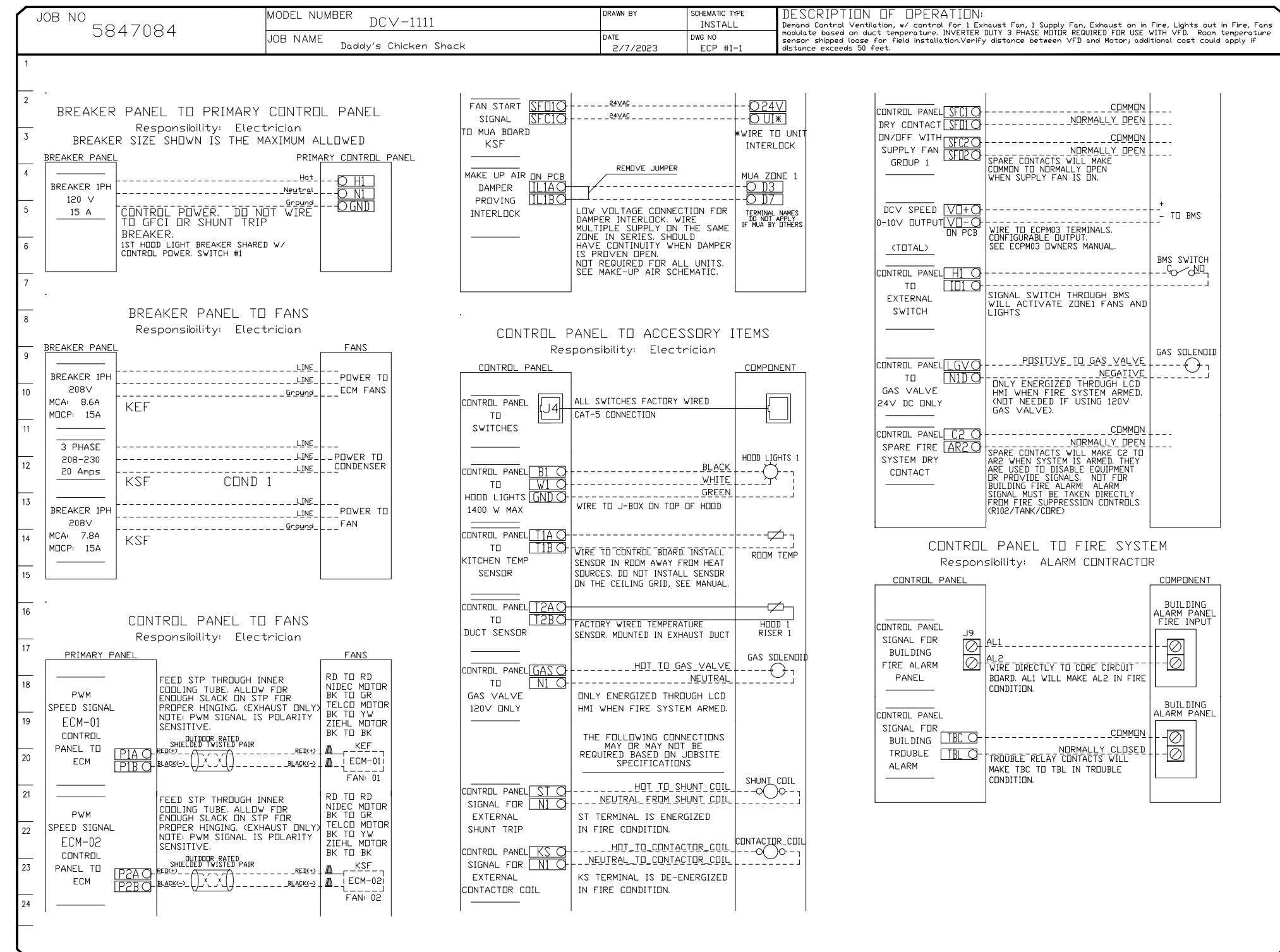
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REVISIONS table with columns for DESCRIPTION and DATE.
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Daddy's Chicken Shack
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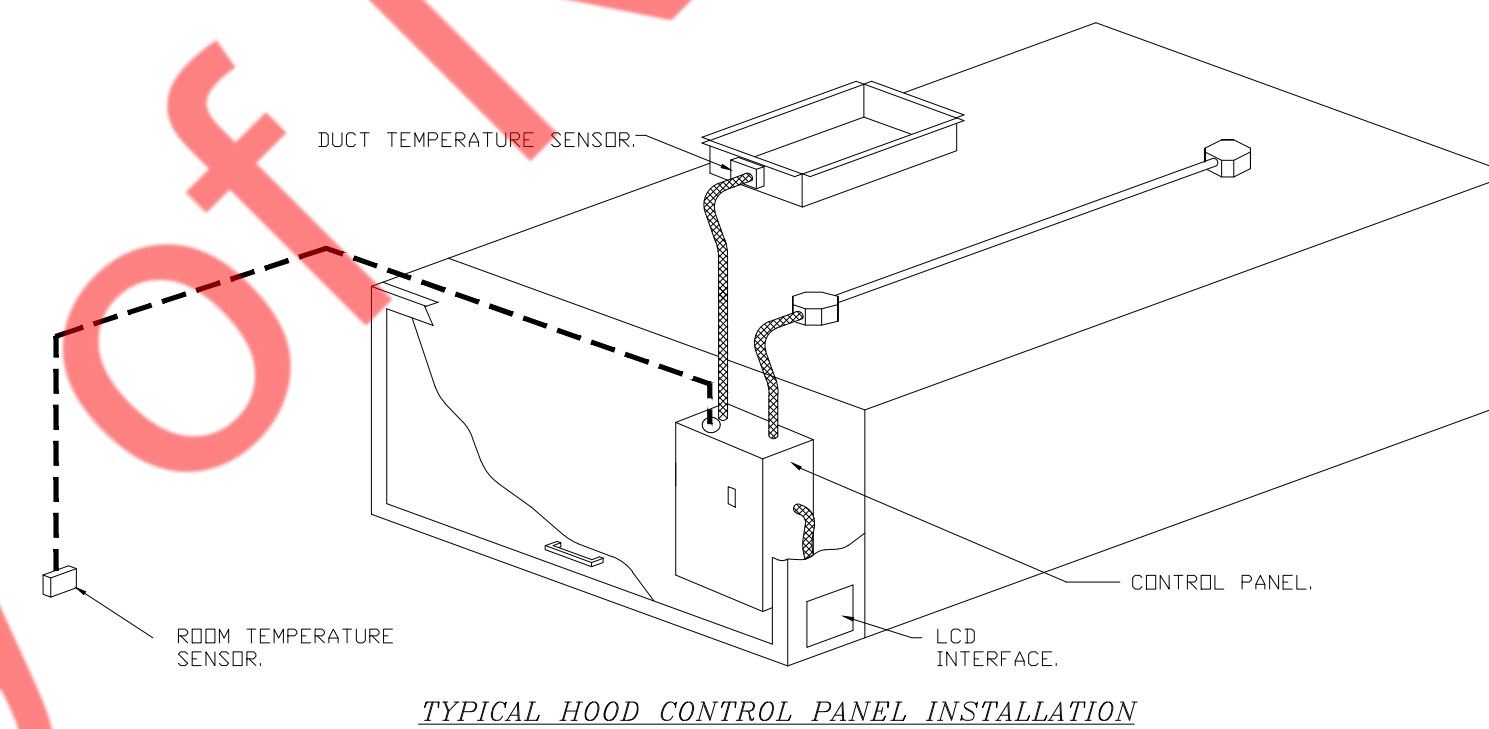
ELECTRICAL PACKAGE - JOB#5847084

NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED					
				LOCATION	QUANTITY		FAN TAG	TYPE	HP	VOLT	FLA	
1		DCV-1111	UTILITY CABINET LEFT	UTILITY CABINET LEFT	1 LIGHT	SMART CONTROLS DCV	KEF	EXHAUST	1	1000	208	6.9
				HOOD # 1	1 FAN		KSF	SUPPLY	1	1750	208	6.2



DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.2.8 (2015).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURES SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMC 507.1.1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFDs) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDs BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED. OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
 - ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
 - INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
 - VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - A SINGLE LDW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
 - AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDs.



SEQUENCE OF OPERATIONS:

- THE HOOD CONTROL PANEL IS CAPABLE OF OPERATING IN ONE OR MORE OF THE FOLLOWING STATES AT ANY GIVEN TIME:
 - AUTOMATIC:** THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS EC MOTORS OR VFD DRIVEN MOTORS) MODULATE WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS 'DYNAMIC', THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS 'STATIC', FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.2.8.
 - MANUAL:** THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
 - SCHEDULE:** A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
 - DIHER:** THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARD-WIRED INTERLOCK).
 - FIRE:** UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

REVISIONS

NO.	DESCRIPTION	DATE

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MASTER DRAWING

SHEET NO. 5

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ELECTRICAL SYMBOLS LIST

GENERAL NOTES (APPLY TO ALL "E" DRAWINGS)

LIGHTING	
	LED LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.
	LUMINAIRE TYPE : INDICATE BY LIPPERCASE LETTER SEE LIGHTING EXTURE SCHEDULE.
	CIRCUIT NUMBER : INDICATED BY NUMBER
	SWITCHING INDICATED BY LOWER CASE LETTERS.
	EM DENOTES LUMINAIRE ON EMERGENCY CIRCUIT.
	NL DENOTES FIXTURES DESIGNATED AS NIGHTLIGHT, WIRED TO 24 HOURS UNSWITCHED CIRCUIT.
	CEILING/WALL MOUNTED EXIT SIGN WITH DIRECTIONAL ARROWS AS INDICATED. SHADED AREA DENOTES FACE(S).
	EMERGENCY BATTERY UNIT

POWER AND TELECOMMUNICATION	
	JUNCTION BOX WITH BLANK COVER PLATE, FLUSH IN FLOOR.
	SIMPLEX RECEPTACLE, +18" AFF OR AS NOTED. SUFFIXE DENOTES FOLLOWING: A- NEMA 5-15R B- NEMA 6-15R C- NEMA 14-30R D- NEMA 14-50R
	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.
	DUPLEX CONVENIENCE RECEPTACLE, ABOVE COUNTER OR AS NOTED.
	DUPLEX CONVENIENCE RECEPTACLE - 20A-1P, 125V, NEMA 5-20R MOUNTED FLUSH IN CELING.
	QUAD. CONVENIENCE RECEPTACLE - 20A-1P, 125V, NEMA 5-20R MOUNTED FLUSH IN CELING.
	QUAD. RECEPTACLE - 20A-1P, 125V, NEMA 5-20R.
	SPECIAL RECEPTACLE AS NOTED
	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.
	DATA OUTLET - (1) PORT U.O.N. 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.

ELECTRICAL ABBREVIATIONS			
A	AMPERES	EA	EACH
A/C, AC	AIR CONDITIONING UNIT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
AT	AMP TRIP	ER	EXISTING TO BE RELOCATED
ATS	AUTOMATIC TRANSFER SWITCH	ETR	EXISTING TO REMAIN
AUTO	AUTOMATIC	EWf	ELECTRIFIED WORKSTATION FURNITURE
AWG	AMERICAN WIRE GAUGE	EWH	ELECTRIC WATER HEATER
C	CONDUIT	FA	FIRE ALARM
C/B,CB	CIRCUIT BREAKER	FBO	FURNISHED BY OTHERS, INSTALLED & WIRED BY EC
CKT	CIRCUIT	FDR	FEEDER
CLG	CEILING	FIBO	FURNISHED & INSTALLED BY OTHERS, WIRED BY EC
COMM	COMMUNICATION	FIXT	FIXTURE
CT	CURRENT TRANSFORMER	FL	FLOOR
CU	COPPER	FLUOR	FLUORESCENT
°C	DEGREE CELSIUS	G	GROUND
°F	DEGREE FAHRENHEIT	GFI	GROUND FAULT INTERRUPTER
DIA	DIAMETER	GP	GENERAL PURPOSE
DISC	DISCONNECT	HC	HUNG CEILING
DN	DOWN	HP	HORSEPOWER
DP	DISTRIBUTION PANEL	HWH	HOW WATER HEATER
DWH	DOMESTIC WATER HEATER	HZ	HERTZ
DWG	DRAWING	IC	INTERRUPTING CAPACITY
JB	JUNCTION BOX	PP	POWER PANEL
KCMIL	ONE THOUSAND CIRCULAR MILS	PVC	POLYVINYL CHLORIDE
KV	KILOVOLT	PWR	POWER
KVA	KILOVOLT-AMPERES	R	REMOVE
KW	KILOWATTS	RE	RELOCATED EXISTING
LP	LIGHTING PANEL	REC	RECEPTACLE
LTG	LIGHTING	RGS	RIGID GALVANIZED STEEL
MAX	MAXIMUM	RR	REMOVE & RELOCATE
MC	MOTOR CONTROLLER	SECT	SECTION
MCB	MAIN CIRCUIT BREAKER	SPDT	SINGLE POLE DOUBLE THROW
MER	MECHANICAL EQUIPMENT ROOM	SPST	SINGLE POLE SINGLE THROW
MIN	MINIMUM	SPEC	SPECIFICATION
MLO	MAIN LUGS ONLY	SW	SWITCH
MTD	MOUNTED	SWBD	SWITCHBOARD
MTS	MANUAL TRANSFER SWITCH	SYM	SYMMETRICAL
N	NEUTRAL	SYS	SYSTEMS
NE	NEW DEVICE TO REPLACE EXISTING	TELE	TELEPHONE
NIC	NOT IN CONTRACT	TEMP	TEMPERATURE
NL	NIGHT LIGHT	TXF	TOILET EXHAUST FAN
NTS	NOT TO SCALE	TYP	TYPICAL
OC	ON CENTER	UON	UNLESS OTHERWISE NOTED
P	POLES	V	VOLT/VOLTAGE
PB	PULLBOX	VA	VOLT AMPERE
PC	PERSONAL COMPUTER	VAV	VARIABLE AIR VOLUME
∅	PHASE	VFD	VARIABLE FREQUENCY DRIVE
PNL	PANEL	VP	VAPORPROOF
W	WATT	WP	WEATHER PROOF
W	WIRE	XFMR	TRANSFORMER
WH	WALL HEATER	ZRT	ZONE REGISTER TERMINALS
E	EXISTING	IG	ISOLATED GROUND

SWITCHES AND CONTROLS	
	20A SPST TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED.
	20A 3-WAY TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED
	WALL BOX DIMMER SWITCH, LUTRON MAESTRO SERIES. "a" DENOTES LIGHTING FIXTURE CONTROLLED.
	WALL MOUNTED VACANCY SENSOR SWITCH, WATTSTOPPER CS-50PIR SERIES.
	WALL MOUNTED PHOTOCCELL MOUNTED IN NEMA 3R ENCLOSURE.

MOTORS AND CONTROLS	
	AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.
	NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.
	30A/240V NON FUSED DISCONNECT SWITCH
	60A/240V NON FUSED DISCONNECT SWITCH
	100A/240V NON FUSED DISCONNECT SWITCH
	200A/240V NON FUSED DISCONNECT SWITCH
	THERMAL OVERLOAD SWITCH AT MOTOR. PROVIDE THERMAL ELEMENTS AS PER MOTOR RATING.
	MANUAL MOTOR SWITCH
	ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING

WIRING SYSTEMS	
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 ∅, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 ∅, 2#12 N. & 2#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 ∅, 3#12 N. & 3#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	CONDUIT TURNING UP, SEE FLOOR PLANS FOR CONDITIONS.
	CONDUIT TURNING DOWN, SEE FLOOR PLANS FOR CONDITION.
	UNDERGROUND
	NEW

ANNOTATION	
	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.
	KEYED NOTE REFERENCE
	DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM

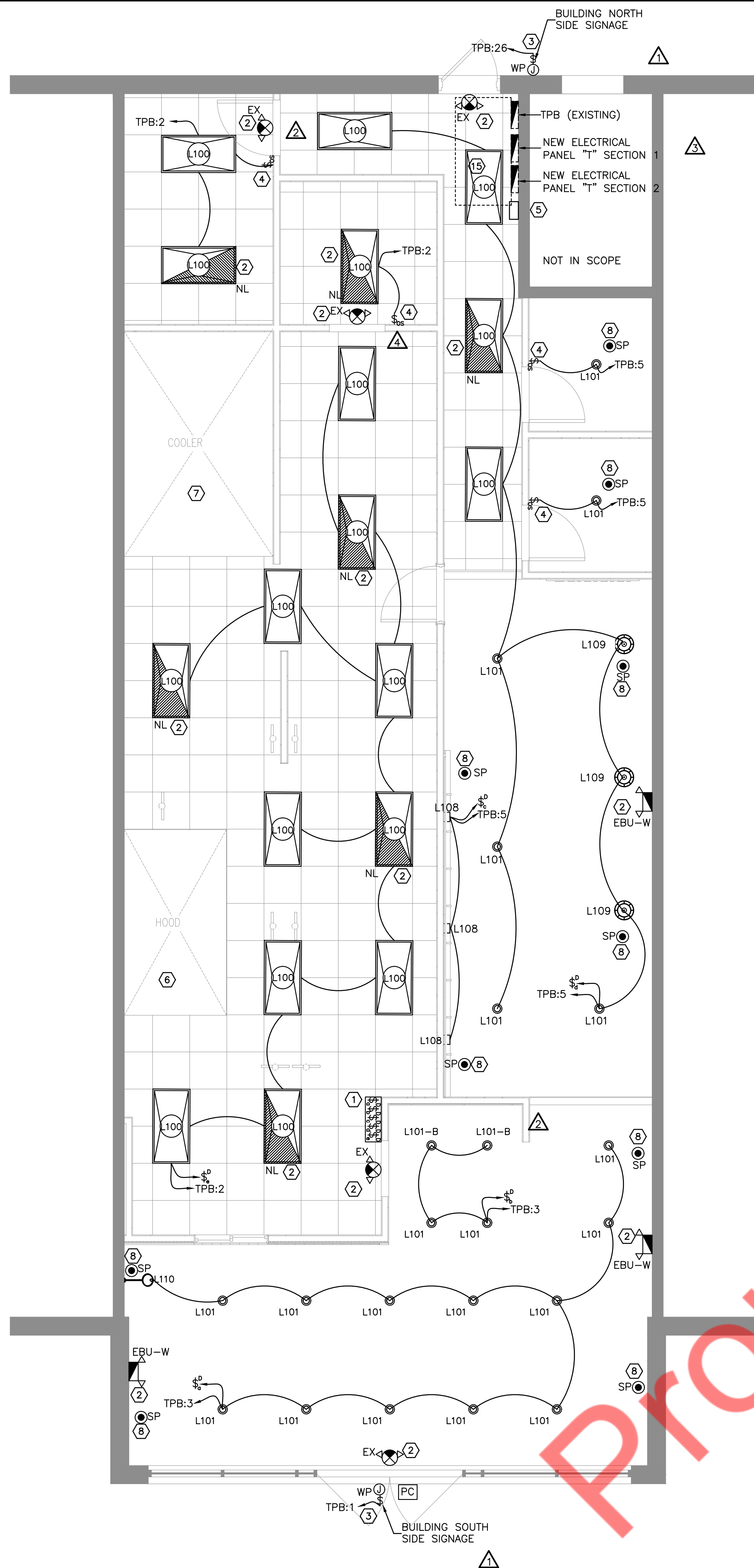
POWER DISTRIBUTION	
	MAJOR ELECTRICAL COMPONENT OR DEVICE. VOLTAGE AND AMPERAGE AS NOTED.
	DISTRIBUTION PANELBOARD, 208Y/120V-SURFACE OR FLUSH MOUNTED.

ELECTRICAL DRAWING LIST	
E0.1	ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES
E0.2	ELECTRICAL SPECIFICATIONS SHEET 1 OF 2
E0.3	ELECTRICAL SPECIFICATIONS SHEET 2 OF 2
E1.1	LIGHTING PLAN - FIRST FLOOR
E2.1	POWER PLAN - FIRST & ROOF FLOOR
E2.2	POWER PLAN - FIRST FLOOR DIMENSION DETAILS
E3.1	POS COMMUNICATION PLAN
E4.1	KITCHEN EQUIPMENT & FIXTURE SCHEDULE
E5.1	ELECTRICAL RISER & PANEL SCHEDULE
E6.1	ELECTRICAL DETAILS (SHEET 01 OF 02)
E6.2	ELECTRICAL DETAILS (SHEET 02 OF 02)

- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE 2020, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- 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.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
- 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.
- 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.
- LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
- 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 OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
- CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
- ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
- CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
- 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.
- 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.
- 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.
- SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
- FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
- ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAIN-TIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
- ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
- 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.
- ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
- ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
- 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.
- COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.
- 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.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOACTIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
- 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.
- NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANELBOARD.

ELECTRICAL SPECIFICATIONS (CONT.)

- 3) BOXES:
- o. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.
- b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. TELEPHONE: BUSHED HOLE. POWER: DUPLEX RECEPTACLE OR OTHER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING FOR TELEPHONE AND FLUSH DUAL FLAP COVER WITH DUPLEX RECEPTACLE FOR POWER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY.
- c. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.
- d. PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMP AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB. FOR THROUGH-THE-FLOOR SYSTEMS, UTILIZE AN ASSEMBLY SIMILAR TO HUBBELL FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS: TELEPHONE SHALL BE BUSHED HOLE AND POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN POWER AND TELEPHONE COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR.
- e. SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK, MACHINE SCREWS ON METAL, BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK, NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.
- f. EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.
- g. MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.
- h. EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.
- i. RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS. CRC-COLD GALVANIZED, EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS.
- j. FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.
- k. CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.
- l. ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.
- m. EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.
- n. RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.
- o. PROVIDE CABLE SUPPORTS IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 300.19. CABLE SUPPORTS SHALL UTILIZE A ONE-PIECE PLUG WITH POZI-GRIP WEDGING PLUG AS MANUFACTURED BY OZ-GEDNEY. TYPE SF SHALL BE USED FOR ARMORED CABLE.
- p. INSTALL CABLE SUPPORTS AT THE TOP OF A VERTICAL RISE AND PROVIDE INTERMEDIATE ADDITIONAL SUPPORTS AS REQUIRED TO LIMIT SUPPORTED CONDUCTOR LENGTHS TO NOT GREATER THAN THOSE SPECIFIED IN TABLE 300.19(A).
- q. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING
- AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.
- r. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENINGS CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.
- s. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.
- t. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.
9. WIRE AND CABLE:
- A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.
- B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.
- C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.
- D. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).
- E. ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS. WHEN USED IN lieu OF WIRING IN CONDUIT, STATE IN PROPOSAL THAT PRICE IS BASED UPON THE USE OF HOSPITAL GRADE 'BX'.
- F. COLOR CODING SHALL BE AS FOLLOWS:
- 120/208 VOLT SYSTEM:
BLACK FOR A PHASE
RED FOR B PHASE
BLUE FOR C PHASE
- 1) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.
- WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.
- G. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.
- H. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.
- I. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 265/460 VOLT SYSTEMS. EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.
- J. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.
- K. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.
- PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.
11. WIRING DEVICES:
- A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.
- B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/208 VOLT, AC, SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).
- C. STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.
- 1) SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2-POLE, 3-WIRE GROUNDING, 15A, 125V, NEMA 5-20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
- 2) USB CHARGER/ DUPLEX TAMPER-RESISTANT RECEPTACLE: TAMPER RESISTANT.
- D. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.
- E. COLORS: COORDINATE COLORS WITH ARCHITECT.
- F. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.
12. LIGHTING FIXTURES:
- A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.
- B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.
- C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED, ENERGY SAVING TYPE. TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH, TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.
- D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAYS OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.
- E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE. DIMMABLE LED DRIVERS SHALL BE 0-10V WHERE NOT INDICATED.
- F. CONTINUOUS ROW, TWO LAMP STRIP FIXTURES SHALL BE STAGGERED TYPE.
13. TELEPHONE CONDUIT SYSTEM:
- A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.
- B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.
- C. OUTLETS SHALL BE:
- 1) WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.
- D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.
- E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.
- F. FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.
14. GROUNDING AND BONDING:
- A. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH NATIONAL ELECTRIC CODE, AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM. WHERE FLEXIBLE CONDUIT IS USED FOR PART OF A CONDUIT RUN, EXCEPT LIGHTING BRANCH CIRCUITS, AN INSULATED GROUNDING CONDUCTOR SHALL BE PROVIDED IN THE CONDUIT AND CONNECTED TO GROUNDING BUSHINGS AT EACH END OF THE RUN.
- B. USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS.
- C. EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.
- D. WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.
- E. IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS:
- 1) CIRCUITS SERVING ANY WALL BOX DIMMER.
- 2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES. TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE, OR AS OTHER WISE NOTED ON DRAWINGS.
- 3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES
- 4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.
15. PANELBOARDS:
- A. PANELBOARDS SHALL BE OF THE DEAD FRONT TYPE
- MANUFACTURED IN CODE GAUGE AND SIZE BOXES FOR MOUNTING AS INDICATED ON PLANS COMPLETE WITH TRIM, DOORS AND LOCKS. ALL LOCKS SHALL BE KEYPED ALIKE.
- B. CIRCUIT BREAKERS SHALL BE OF THE BOLT-ON THERMAL MAGNETIC MOLDED CASE TYPE, AND SHALL HAVE THE TRIP RATINGS AND NUMBER OF POLES SHOWN IN SCHEDULES ON THE CONTRACT DRAWINGS. FOR BLANK (SPACE) COMPARTMENTS, PROVIDE FULL RATED BUS. MINIMUM GUTTER SPACES SHALL BE 5-3/4". SIDES, TOP AND BOTTOM, INCREASE FOR THROUGH FEEDERS. PROVIDE 25% COPPER GROUND BUS AND 100% COPPER NEUTRAL BUS AND INCREASE NEUTRAL BUS INDICATED.
- C. LOCKING TABS SHALL BE PROVIDED ON ALL CIRCUIT BREAKERS SERVING EMERGENCY LIGHTING, FIRE ALARM SYSTEM, SECURITY SYSTEMS AND OTHER EMERGENCY OR CRITICAL EQUIPMENT AND AS NOTED ON THE CONTRACT DRAWINGS. A TOTAL OF 5 SPARE LOCKING TABS SHALL BE FURNISHED TO THE OWNER.
- D. BUSES SHALL BE HARD DRAWN COPPER OF 98 PERCENT CONDUCTIVITY AND SHALL HAVE CROSS SECTIONAL AREAS LARGE ENOUGH TO LIMIT THE TEMPERATURE RISE, WHEN CARRYING FULL LOAD, TO 35 DEGREES C. ABOVE AN AMBIENT INSIDE THE ENCLOSURE OF 55 DEGREES C. AS DEFINED IN IEEE STANDARD RULES. MAIN BUS CAPACITY SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS.
- E. ENCLOSURES SHALL BE SURFACE OR FLUSH AS INDICATED. TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS. COVERS SHALL BE HINGED DOOR-IN-DOOR CONSTRUCTION WITH CYLINDER LOCKS AND CATCHES. LOCKS MUST BE COMPATIBLE WITH BUILDING STANDARD KEY SYSTEM AND WHEN NONE EXISTS, THEY SHALL BE SIMILAR TO A YALE NO. 911 KEY.
- F. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARD SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.
- G. ALL STANDARD PANELBOARDS SHALL BE A MINIMUM OF 20" WIDE AND 5 3/4" DEEP.
- H. FURNISH ALL PANELBOARDS WITH FEED-THRU LUGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- I. ALL NEW PANELBOARDS SHALL BE PROVIDED WITH AN ENGRAVED WHITE CORE LAMACOID NAMEPLATE, WITH 3/4 IN. WHITE LETTERING ON A BLACK BACKGROUND, WITH DESIGNATION LISTED (PANELBOARD NAME), FASTENED WITH EPOXY CEMENT OR OVAL HEAD CHROME PLATED MACHINE SCREWS.
- J. THE CIRCUIT DIRECTORY SHALL BE TYPEWRITTEN AND PROVIDED INSIDE EACH PANEL DOOR TO INDICATE EQUIPMENT AND/OR AREA SERVED. DIRECTORY HOLDER SHALL BE METAL FRAME WITH CLEAR PLASTIC, TRANSPARENT COVER. THE TYPEWRITTEN LIST INDICATING CIRCUIT NUMBERS, OUTLETS SUPPLIED AND THEIR LOCATIONS SHALL BE PROVIDED.
- K. TIE-BARS SHALL NOT BE USED TO CREATE MULTI-POLE CIRCUITS. MAXIMUM 42 CIRCUITS ALLOWED.
- L. ONLY ONE WIRE SHALL BE INSTALLED UNDER EACH CIRCUIT BREAKER LUG.
- M. SHORT CIRCUIT RATING OF PANELBOARDS SHALL NOT BE LESS THAN AS INDICATED ON THE CONTRACT DRAWINGS OR SPECIFIED HEREIN. WHERE NOT INDICATED OR SPECIFIED THE MINIMUM SHORT CIRCUIT RATING SHALL BE EQUAL TO THE INTERRUPTING CAPACITY OF THE LOWEST RATED CIRCUIT BREAKER IN THE PANELBOARD, BUT IN NO CASE LESS THAN 10,000 AMPERES R.M.S. SYMMETRICAL FOR 208Y/120 VOLT SYSTEM. SERIES RATED PANELBOARDS SHALL BE USED TO ACHIEVE REQUIRED SHORT CIRCUIT RATINGS.
- N. FOR ALL EXISTING PANELBOARDS, CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS TO REPLACE EXISTING AS REQUIRED AS INDICATED ON DRAWINGS.



GENERAL NOTES:

- A. CONTRACTOR SHALL PROVIDE ARCHITECT WITH LIGHT FIXTURE CUT SHEETS FOR ARCHITECT'S APPROVAL, PRIOR TO ORDERING. NO SUBSTITUTIONS SHALL BE SUBMITTED UNLESS AVAILABILITY OF FIXTURE IS PROHIBITIVE TO MEETING THE PROJECT SCHEDULE.
- B. CENTER ALL MECHANICAL AND ELECTRICAL ITEMS WITHIN EACH CEILING GRID, UNLESS OTHERWISE SPECIFIED. USE ARCHITECTURAL SET FOR PLACEMENT COORDINATION.
- C. PROVIDE FIXTURES AS LISTED IN SCHEDULE. PROVIDE NECESSARY MOUNTING HARDWARE FOR A COMPLETE INSTALLATION. PROVIDE LAMPS, BALLASTS AND SPECIAL CONTROLS.
- D. CONTRACTOR IS ADVISED THAT ADJUSTMENTS TO EMERGENCY AND EXIT LIGHT FIXTURE LOCATIONS/QUANTITIES MAY BE REQUIRED BY AHJ UPON FINAL INSPECTION.
- E. CEILING MOUNTED OCCUPANCY SENSOR SHALL BE CONNECTED AHEAD OF ANY LOCAL SWITCHING OR DIMMING SHOWN IN THAT RESPECTIVE AREA. WHERE MORE THAN ONE CEILING OCCUPANCY IS SHOWN IN A GIVEN SPACE, PROVIDE LOW VOLTAGE WIRING BETWEEN SENSORS FOR INTERCONNECTED OPERATION ON A SINGLE POWER PACK.
- F. UNLESS OTHERWISE NOTED, LIGHT SWITCHES SHALL BE GANGED TOGETHER UNDER A COMMON FACEPLATE.
- G. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR LIGHT FIXTURE QUANTITY, HEIGHTS AND LOCATION PRIOR TO ROUGH-IN.
- H. E.C. SHALL COORDINATE FINAL FIXTURE MAKE AND MODEL WITH ARCHITECT.
- I. ALL EXTERIOR LIGHTS TO BE TIMECLOCK CONTROLLED.
- J. PROVIDE WOOD BLOCKING BEHIND ALL EXTERIOR LIGHTING FIXTURES COORDINATE WITH GENERAL CONTRACTOR.
- K. FOR LIGHT FIXTURE SCHEDULE REFER TO E4.1 SHEET.

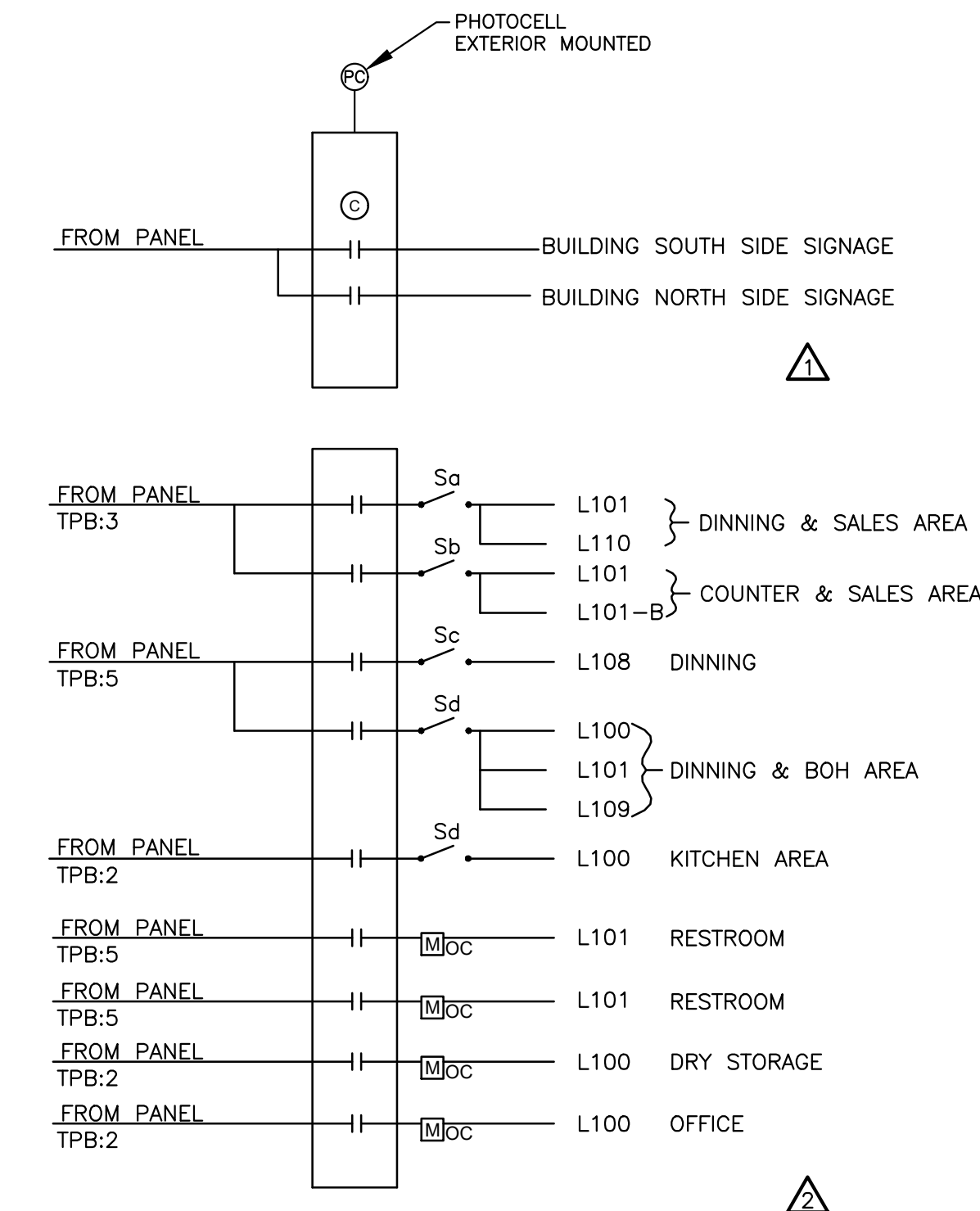
KEYED NOTES:

- 1. PROVIDE DIMMER LIGHTING SWITCH BANK (IN A FLUSH MOUNTED BOX WITH CONCEALED CONDUITS) SEE LIGHTING CONTROL DIAGRAM (DIMMER SWITCH BANK DETAILS) PER THIS SHEET. COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN.
- 2. ALL EMERGENCY AND EXIT FIXTURES SHALL BE CONNECTED TO NEAREST LIGHTING CIRCUIT AHEAD OF ANY SWITCHING. PROVIDE ADDITIONAL FIXTURES AS NEEDED TO MEET THE CODE REQUIREMENTS PER LOCAL AHJ.
- 3. ELECTRICAL CONTRACTOR SHALL PROVIDE JUNCTION BOX WITH TOGGLE DISCONNECTION AS PER NEC FOR CONNECTION TO THE EXTERIOR BUILDING SIGNAGE. THE SIGNS SHOULD BE SUPPLIED WITH WHIPS FOR FINAL CONNECTION TO THIS JUNCTION BOX. E.C. TO COORDINATE WITH THE SIGN VENDOR ON THE QUANTITY AND LOCATION OF THE REQUIRED JUNCTION BOXES. THE CONTRACTOR SHALL PROPERLY SIZE THE JUNCTION BOX BASED ON THE QUANTITY OF CONNECTIONS REQUIRED. VERIFY LOCATION WITH ARCHITECTURAL DRAWINGS AND SIGN VENDOR PRIOR TO INSTALLING. ALL SIGNS SHALL BE CONTROLLED VIA TIME CLOCK/PHOTOCELL.
- 4. INSTALL SWITCH HEIGHT MOUNTED OCCUPANCY SENSOR, HUBBELL MODEL LHRS1.
- 5. PROVIDE CONTROL RELAY PANEL AS SPECIFIED BY THE LIGHTING VENDOR. PROVIDE AND INSTALL DIMMER SWITCH AS REQUIRED. COORDINATE AND VERIFY LOCATIONS WITH ARCHITECT/OWNER.
- 6. HOOD LIGHTS PROVIDED BY HOOD MANUFACTURER. CONNECT HOOD LIGHTS TO ADJACENT LIGHTING CIRCUIT AND COORDINATE WITH HOOD MANUFACTURER FOR THE CONTROLS OF THE HOOD LIGHTS.
- 7. COOLER LIGHTING CONTROL PROVIDE WITH COOLER. EC TO PROVIDE CONNECTION FROM NEAREST LIGHTING CIRCUIT.
- 8. TERMINATE SPEAKER WIRE AT NETWORK CABINET IN OFFICE ROOM. COORDINATE WITH ARCHITECT/OWNER FOR LOCATING THE VOLUME CONTROLS. VERIFY LOCATION AND QUANTITY OF SPEAKERS WITH ARCHITECT/OWNER.

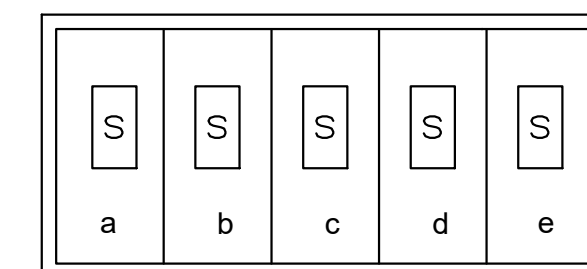
LIGHTING NOTE

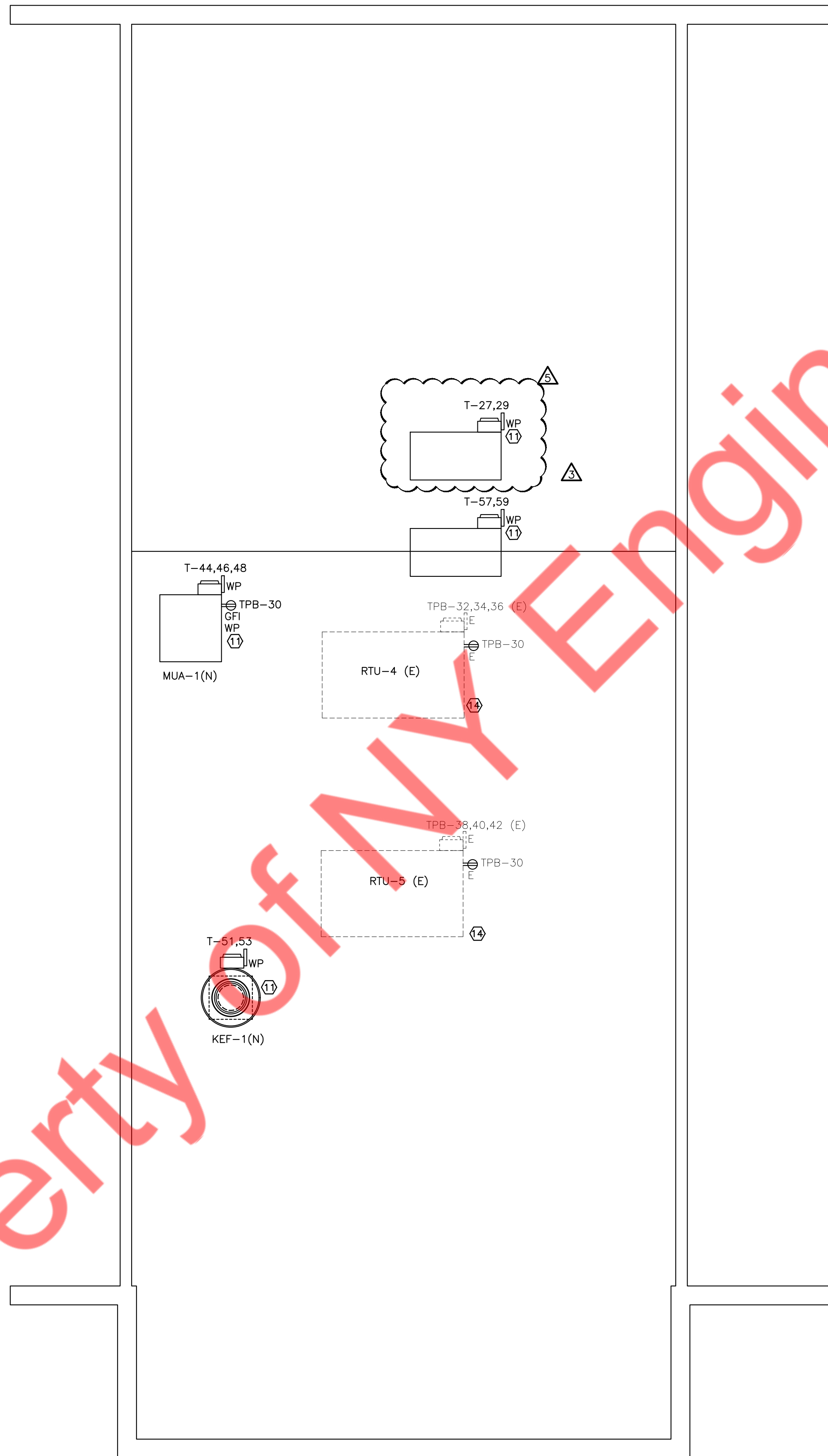
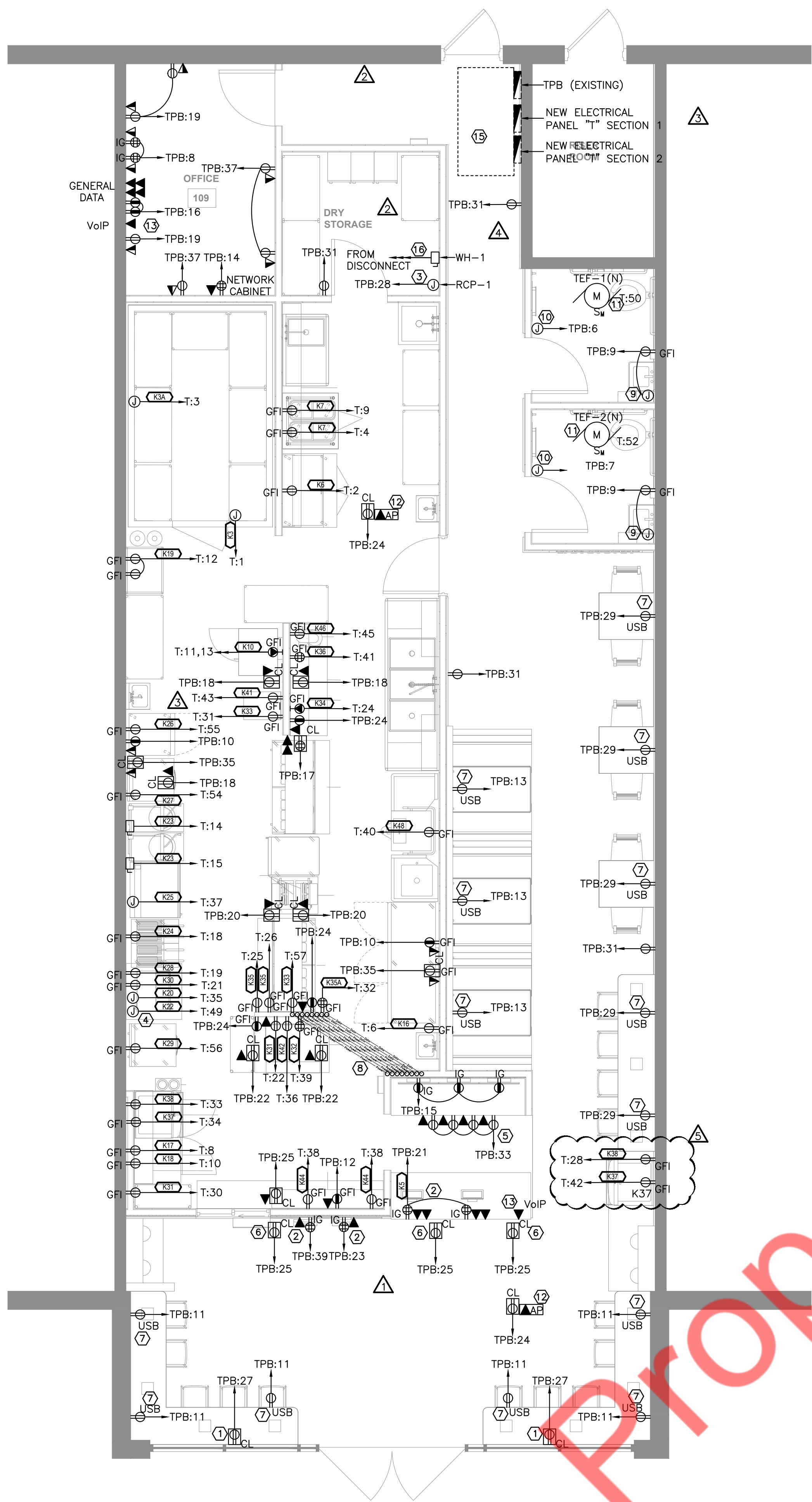
ALL FIXTURES OVER COUNTERTOP SERVICES AREA SHALL BE EQUIPPED WITH SHUTTER RESISTANT LAMPS.

CONTROL RELAY PANEL SCHEDULE



DIMMER SWITCH BANK DETAIL





POWER GENERAL NOTES:

- A. CONTRACTOR SHALL REFER TO MECHANICAL DRAWINGS FOR ALL MECHANICAL EQUIPMENT AND CONTROLS (QUANTITIES AND LOCATION) AND REQUIRED CONTROL WIRING.
- B. ALL CONNECTIONS TO FANS, AC UNITS, MOTORS, ETC. SHOULD BE MADE WITH LIQUID TIGHT FLEXIBLE CONDUITS.
- C. E.C TO VERIFY THE EXISTENCE OF A SERVICES OUTLET WITHIN 25' OF ANY MECHANICAL EQUIPMENT AND IT SHALL BE WP/WR/HEAVY DUTY/GFCI.
- D. VERIFY THE HEIGHT OF ALL RECEPTACLES WITH ARCHITECTURAL PLANS.
- E. ALL MEP EQUIPMENTS, DUCTWORK, CONDUITS, PIPING AND LOW VOLTAGE SHALL BE WITHIN SUBGRADE, BELOW SLAB AND VAPOR BARRIER AND SHALL NOT BE WITHIN SLAB DEPTH.
- F. E.C. TO PROVIDE CATEGORY 5E OR CATEGORY 6 NETWORK CABLE AT ALL DATA DROPS WITH 12" COIL AT EACH JACK. ROUTE ALL CABLES BACK TO I.T. CABINET SHOWN OWN PLANES WITH 7" COIL, PROVIDE UNIQUE NUMBERED ID LABEL AT BOTH ENDS AND LEAVE FOR I.T VENDOR TERMINATIONS. COORDINATE EXACT LOCATION OF I.T. RACK WITH I.T PROVIDER PRIOR TO ROUGH-IN.
- G. GFI NEAR 2 POLE RECEPTACLE SPECIFY THAT THE CIRCUIT TO BE GFI PROTECTED.
- H. FOR LOW VOLTAGE EQUIPMENT REFER SHEET E3.1.

KITCHEN EQUIPMENT NOTES:

- A. FINAL CONNECTION TO ALL HARD WIRED EQUIPMENT SHALL BE MADE WITH "SEAL-TIGHT" FLEXIBLE CONDUIT.
- B. THE ELECTRICAL CONTRACTOR SHALL MAKE FINAL ELECTRICAL CONNECTIONS TO ALL RELATED EQUIPMENT.
- C. "CALL OUT" - INDICATES EQUIPMENT IDENTIFICATION NUMBER. REFER TO EQUIPMENT SCHEDULE. COORDINATE WITH EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.
- D. THE ELECTRICAL CONTRACTOR SHALL VERIFY ROUGH-IN REQUIREMENTS, LOCATIONS, MOUNTING HEIGHTS, VOLTAGE, PHASE, AMPS, HP, KW, ETC. FOR ALL EQUIPMENT PRIOR TO ROUGH-IN.
- E. PROVIDE SEAL-OFF'S FOR ALL CONDUITS ENTERING OR LEAVING WALK-IN BOXES.
- F. KITCHEN HOOD EXHAUST FAN AND MAKE-UP AIR UNIT SHALL BE INTERLOCKED AND THE CONTROL CIRCUIT SHALL BE ROUTED THROUGH DRY CONTACTS PROVIDED.
- G. IN THE FIRE PROTECTION SYSTEM, THE MAKE-UP AIR UNIT FAN(S) SHALL SHUT DOWN UPON ACTIVATION OF THE FIRE PROTECTION SYSTEM. (PROVIDE RELAY IF REQUIRED).
- H. ALL CIRCUIT BREAKERS PROVIDED WITH SHUNT TRIPPING DEVICES SHALL HAVE THE CONTROL CIRCUIT ROUTED THROUGH DRY CONTACTS PROVIDED IN THE FIRE PROTECTION SYSTEM. UPON ACTIVATION OF FIRE PROTECTION SYSTEM THOSE CIRCUIT BREAKERS SHALL BE AUTOMATICALLY TRIPPED.
- I. ALL CIRCUITS SHALL HAVE AN INSULATED GROUND WIRE (BOND) SIZED PER N.E.C. #250.122, #12 MINIMUM GROUND, WIRE NOT SHOWN ON DRAWINGS.
- J. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL DISCONNECT SWITCHES, CONDUIT, WIRE AND INSTALL UNDER SUPERVISION OF THE EQUIPMENT SUPPLIER.
- K. THE ELECTRICAL CONTRACTOR SHALL VERIFY PLUG CONFIGURATIONS FOR APPLICABLE EQUIPMENT WITH SUPPLIER PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.
- L. PROVIDE GFCI PROTECTION FOR ALL EQUIPMENT/KITCHEN RECEPTACLES PER NEC 210.8 (B)(2). AND MUST BE READILY ACCESSIBLE OR PROVIDE GFI BREAKER.
- M. ALL EQUIPMENT UNDER HOOD SHALL BE WITH SHUNT BREAKER. E.C TO COORDINATE WITH EQUIPMENT VENDOR FOR EXACT LOCATION OF SHUNT TRIP COIL AND TERMINATE CONNECTION ACCORDINGLY.

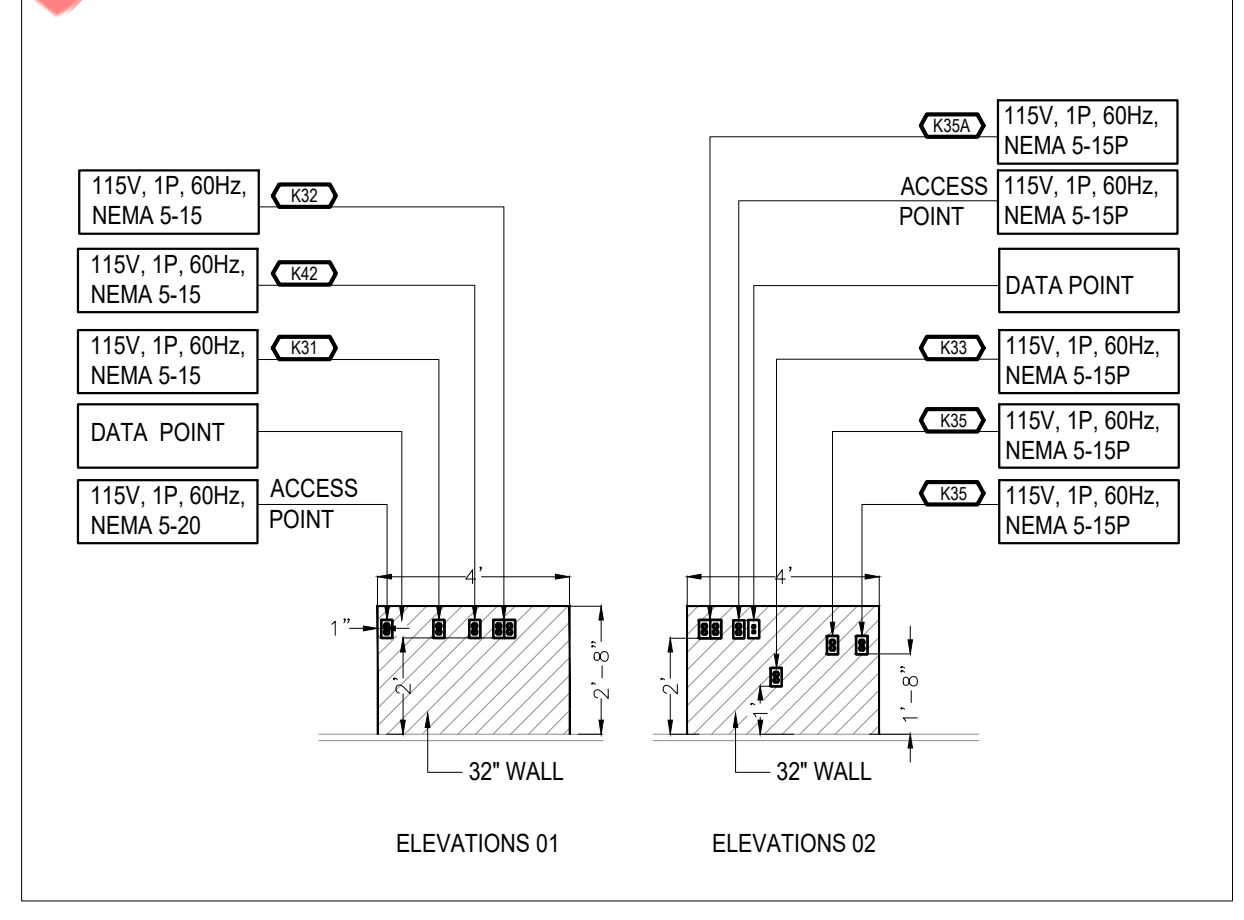
FLOOR PLAN - POWER KEYED WORK NOTES:

- 1. E.C. TO INSTALL SHOW WINDOW RECEPTACLES AS PER NEC 210.62.
- 2. PROVIDE RECEPTACLES FOR POS SYSTEM. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN. VERIFY WITH MILLWORK FOR EXACT POWER CONNECTION.
- 3. PROVIDE JUNCTION BOX FOR RE-CIRCULATION PUMP. MOUNT RECEPTACLE NEXT TO WATER HEATER.
- 4. PROVIDE 120V DEDICATED CIRCUIT FOR NEW HOOD LIGHTING & CONTROL PANEL ALL REQUIREMENTS WITH CAPTIVE AIRE HOOD DRAWINGS. THE FIXTURES ARE FURNISHED AND PRE-WIRED WITH HOOD. VERIFY LAMP CHARACTERISTICS WITH HOOD SUPPLIER. THE HOOD CONTROL PANEL SHALL BE CONNECTED TO FACP AS REQUIRED.
- 5. C SHALL PROVIDE POWER AND DATA OUTLETS 2 INCHES BELOW THE TOP (INSIDE) OF THE MOUNT. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.
- 6. PROVIDE RECEPTACLE CONNECTION FOR SIGNAGE. VERIFY EXACT LOCATION IN FIELD WITH OWNER REPRESENTATIVE/ARCHITECT PRIOR TO START OF WORK.
- 7. PROVIDE RECEPTACLE FOR GUEST USE. VERIFY EXACT LOCATION IN FIELD WITH OWNER REPRESENTATIVE/ARCHITECT PRIOR TO START OF WORK. BUILD INTO MILLWORK IF NEEDED.
- 8. PROVIDE UNDER FLOOR 1" CONDUIT RUNS PER DRAWINGS. SAW-CUT AS NEEDED AND PATCH AREA AFTER WORK ACCEPTED BY INSPECTOR AND OWNER REPRESENTATIVE AND ARCHITECT. PROVIDE PULL-ROPE AS NEEDED. (6 CONDUITS FOR POWER, 2 DATA).
- 9. POWER FOR AUTOMATIC FAUCET SENSOR ELECTRICAL CONTRACTOR TO COORDINATE EXACT POWER REQUIREMENT WITH ARCHITECT/OWNER PRIOR TO INSTALLATION
- 10. VERIFY EXACT LOCATION AND REQUIREMENTS FOR HAND DRYERS WITH ARCHITECT PRIOR TO START OF WORK.
- 11. E.C. TO COORDINATE THE EXACT LOCATION AND ELECTRICAL REQUIREMENT OF MECHANICAL EQUIPMENTS WITH MECHANICAL CONTRACTOR. PROVIDE THE ELECTRICAL CONNECTION AS PER MECHANICAL EQUIPMENTS REQUIREMENT IN FIELD. INFORM ENGINEERS FOR ANY DISCREPANCY FOUND.
- 12. PROVIDE CEILING RECEPTACLE IF REQUIRED FOR ACCESS POINT. EC TO COORDINATE WITH LOW VOLTAGE VENDOR FOR ACCESS POINT.
- 13. VOIP BEING UTILIZED AT THIS LOCATION INSTEAD OF TRADITIONAL TELEPHONE MOUNTING BOARD "TMB". PROVIDE 6# CU. TO COMPLY WITH NEC 800-100. PROVIDE CONDUIT WITH PULL STRING CONNECTED TO THE BUILDING MAIN TELEPHONE ROOM/INTERNET ACCESS POINT. COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT PRIOR TO INSTALLATION.
- 14. EXISTING DISCONNECT SHALL REMAIN. E.C. SHALL VERIFY RATING AND OPERABLE CONDITION OF DISCONNECTS IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- 15. CLEARANCE SHALL BE PROVIDED FOR THE PANELS AS PER NEC 110.26 (A).
- 16. E.C. TO COORDINATE THE EXACT LOCATION AND ELECTRICAL REQUIREMENT OF PLUMBING EQUIPMENTS WITH PLUMBING CONTRACTOR. PROVIDE THE ELECTRICAL CONNECTION AS PER PLUMBING EQUIPMENTS REQUIREMENT IN FIELD. INFORM ENGINEERS FOR ANY DISCREPANCY FOUND.
- 17. ALL EQUIPMENT UNDER HOOD SHALL BE WITH SHUNT BREAKER. E.C TO COORDINATE WITH EQUIPMENT VENDOR FOR EXACT LOCATION OF SHUNT TRIP COIL AND TERMINATE CONNECTION ACCORDINGLY.



01 FIRST FLOOR- DIMENSION PLAN

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



02 KITCHEN KNEE WALL ELEVATIONS

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

NOTES:

A. ALL DIMENSIONS GIVEN ARE FOR REFERENCE ONLY. E.C TO FIELD VERIFY ALL EQUIPMENT RECEPTACLES DIMENSIONS WITH ARCHITECT/EQUIPMENT VENDOR PRIOR TO COMMENCING OF WORK. ANY DISCREPANCY SHALL BE COMMUNICATED WITH THE ENGINEER ON RECORD PRIOR TO ROUGH-IN.

- FLOOR PLAN - POWER KEYED WORK NOTES:**
- E.C. TO INSTALL SHOW WINDOW RECEPTACLES AS PER NEC 210.62.
 - PROVIDE RECEPTACLES FOR POS SYSTEM. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN. VERIFY WITH MILLWORK FOR EXACT POWER CONNECTION.
 - PROVIDE JUNCTION BOX FOR RE-CIRCULATION PUMP. MOUNT RECEPTACLE NEXT TO WATER HEATER.
 - PROVIDE 120V DEDICATED CIRCUIT FOR NEW HOOD LIGHTING & CONTROL PANEL ALL REQUIREMENTS WITH CAPTIVE AIRE HOOD DRAWINGS. THE FIXTURES ARE FURNISHED AND PRE-WIRED WITH HOOD. VERIFY LAMP CHARACTERISTICS WITH HOOD SUPPLIER. THE HOOD CONTROL PANEL SHALL BE CONNECTED TO FACP AS REQUIRED.
 - C SHALL PROVIDE POWER AND DATA OUTLETS 2 INCHES BELOW THE TOP (INSIDE) OF THE MOUNT. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.
 - PROVIDE RECEPTACLE CONNECTION FOR SIGNAGE. VERIFY EXACT LOCATION IN FIELD WITH OWNER REPRESENTATIVE/ARCHITECT PRIOR TO START OF WORK.
 - PROVIDE RECEPTACLE FOR GUEST USE. VERIFY EXACT LOCATION IN FIELD WITH OWNER REPRESENTATIVE/ARCHITECT PRIOR TO START OF WORK. BUILD INTO MILLWORK IF NEEDED.
 - PROVIDE UNDER FLOOR 1" CONDUIT RUNS PER DRAWINGS. SAW-CUT AS NEEDED AND PATCH AREA AFTER WORK ACCEPTED BY INSPECTOR AND OWNER REPRESENTATIVE AND ARCHITECT. PROVIDE PULL-ROPE AS NEEDED. (6 CONDUITS FOR POWER, 2 DATA).
 - POWER FOR AUTOMATIC FAUCET SENSOR ELECTRICAL CONTRACTOR TO COORDINATE EXACT POWER REQUIREMENT WITH ARCHITECT/OWNER PRIOR TO INSTALLATION
 - VERIFY EXACT LOCATION AND REQUIREMENTS FOR HAND DRYERS WITH ARCHITECT PRIOR TO START OF WORK.
 - E.C. TO COORDINATE THE EXACT LOCATION AND ELECTRICAL REQUIREMENT OF MECHANICAL EQUIPMENTS WITH MECHANICAL CONTRACTOR. PROVIDE THE ELECTRICAL CONNECTION AS PER MECHANICAL EQUIPMENTS REQUIREMENT IN FIELD. INFORM ENGINEERS FOR ANY DISCREPANCY FOUND.
 - PROVIDE CEILING RECEPTACLE IF REQUIRED FOR ACCESS POINT. EC TO COORDINATE WITH LOW VOLTAGE VENDOR FOR ACCESS POINT.
 - VOIP BEING UTILIZED AT THIS LOCATION INSTEAD OF TRADITIONAL TELEPHONE MOUNTING BOARD "TMB". PROVIDE 6# CU. TO COMPLY WITH NEC 800-100. PROVIDE CONDUIT WITH PULL STRING CONNECTED TO THE BUILDING MAIN TELEPHONE ROOM/INTERNET ACCESS POINT. COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT PRIOR TO INSTALLATION.
 - EXISTING DISCONNECT SHALL REMAIN. E.C. SHALL VERIFY RATING AND OPERABLE CONDITION OF DISCONNECTS IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
 - CLEARANCE SHALL BE PROVIDED FOR THE PANELS AS PER NEC 110.26 (A).
 - E.C. TO COORDINATE THE EXACT LOCATION AND ELECTRICAL REQUIREMENT OF PLUMBING EQUIPMENTS WITH PLUMBING CONTRACTOR. PROVIDE THE ELECTRICAL CONNECTION AS PER PLUMBING EQUIPMENTS REQUIREMENT IN FIELD. INFORM ENGINEERS FOR ANY DISCREPANCY FOUND.
 - ALL EQUIPMENT UNDER HOOD SHALL BE WITH SHUNT BREAKER. E.C TO COORDINATE WITH EQUIPMENT VENDOR FOR EXACT LOCATION OF SHUNT TRIP COIL AND TERMINATE CONNECTION ACCORDINGLY.

GENERAL NOTES:

- A. FINAL POS DRAWINGS NEED TO BE PROVIDED TO POS VENDOR THAT IS SELECTED.
- B. POS VENDORS REQUIRE DEDICATED ISOLATED GROUNDED (DIG) OUTLETS ON A 20 AMP CIRCUIT DEDICATED ONLY TO POS EQUIPMENT. 60HZ, 120+/-10%. ALL POS TERMINALS AND VIDEO DISPLAY DEVICES REQUIRE A DUPLEX OUTLET. THE BACK OFFICE CONTROLLER REQUIRES A QUAD OUTLET. THE NETWORK SWITCH REQUIRES A DUPLEX. IF FEDERAL, STATE, AND LOCAL WIRING CODES DO NOT MEET THIS REQUIREMENT, CONTACT THE POS VENDOR FOR INFORMATION ON ADDITIONAL EQUIPMENT THAT CAN BE PURCHASED TO MEET THIS REQUIREMENT. IF THIS REQUIREMENT IS NOT MET, THE POS SYSTEM WARRANTY IS INVALID..
- C. ALL LOW VOLTAGE WIRE SHALL BE CATEGORY 5e/CATEGORY 6 UNLESS OTHERWISE INDICATED.
- D. ALL LOW VOLTAGE CABLE TERMINATIONS SHALL BE BY THE ELECTRICAL CONTRACTOR.
- E. LOW VOLTAGE CABLE RUN IN 1/2" CONDUIT FOR POS EQUIPMENT ONLY, AND MUST BE TERMINATED WITH RJ45 JACKS. ALL POS EQUIPMENT LINES TERMINATE AT THE FRONT COUNTER CHASE.
- F. A 12" MINIMUM SEPARATION MUST BE MAINTAINED BETWEEN LOW VOLTAGE WIRES AND POWER WIRING (TO AVOID ELECTRICAL INTERFERENCE).
- G. A CEILING MOUNTED VDU'S TO BE SUSPENDED FROM UNISTRUT BY THREADED ROD W/ WHITE PVC SLEEVE. CONNECT UNISTRUT TO ROOF STRUCTURE. VDU BY POS VENDOR; UNISTRUT & THREADED ROD BY G.C. UNISTRUT TO SUPPORT MINIMUM 50 LB. WEIGHT

POS LEGEND

- POS POINT OF SALES TERMINAL
- VDU VIDEO DISPLAY UNIT
- AP ACCESS POINT
- CAM CAMERA LOCATION
- KSD KITCHEN DISPLAY

LOW VOLTAGE EQUIPMENT SCHEDULE

SR NO	QTY.	DESCRIPTION	LOCATION	REQUIREMENTS
1	2	VoIP PHONES	(1) FRONT COUNTERS (1) OFFICE	1 X CAT6
2	2	WIRELESS ACCESS POINT	(1) DINNING (1) KITCHEN	1 X CAT6
3	2	POS TERMINALS	(2) FRONT COUNTERS	2 X CAT6, 1 X QUAD RECP.
4	16	CAMERAS	(5) DINNING (1) FRONT COUNTER (2) EXTERIOR (5) KITCHEN (1) DRY STORAGE (1) OFFICE (1) BOH CORRIDOR	1 X CAT6 (COORDINATE REQUIREMENT WITH CCTV VENDOR. BASE BID ACCORDINGLY.)
5	2	KIOSK	(2) FRONT COUNTERS	2 X CAT6, 1 X QUAD RECP.
6	1	NETWORK CABINET	(1) OFFICE	1 X QUAD RECP.
7	10	SPEAKERS (REFER LIGHTING PLAN)	(8) DINNING (2) RESTROOMS	-
8	7	KITCHEN DISPLAY (KDS)	(2) EXPO ST. (2) SANDWICH ST. (2) SALAD ST. (1) FRY (8) DINNING (2) RESTROOMS	1 X CAT6, 1 X DUPLEX RECP.
9	3	KITCHEN PRINTER	(1) EXPO ST. (1) SANDWICH ST. (1) SALAD ST.	1 X CAT6, 1 X DUPLEX RECP.
10	1	GENERAL DATA	(1) OFFICE	4 X CAT6, 2 X DUPLEX RECP.

TRIPHEN STRUCTURED CABLING SPECIFICATIONS :-

A PROPERLY DESIGNED AND INSTALLED STRUCTURED CABLING SYSTEM PROVIDES CABLING INFRASTRUCTURE THAT DELIVERS PREDICTABLE PERFORMANCE AS WELL AS THE FLEXIBILITY TO ACCOMMODATE MOVES, ADDS, AND CHANGES IN THE FUTURE.

ACCEPTABLE CABLE TYPES:

- CAT5E, CAT6, OR CAT6A UTP OR STP
- USE SOLID 100% COPPER CABLE ONLY. DO NOT USE COPPER CLAD ALUMINUM (CCA)
- USE RISER CABLE WHERE REQUIRED BY CODE
- USE PLENUM RATED CABLE WHERE REQUIRED BY CODE
- USE OUTDOOR CABLE WHEN THE CABLE WILL BE EXPOSED TO THE ELEMENTS
- USE DIRECT BURIAL CABLE WHEN THE CABLE WILL BE BURIED IN THE SOIL
- PATCH CABLES OR STRANDED CABLES ARE NOT TO BE USED FOR IN-WALL CABLING

CABLE HANDLING AND ROUTING:

- J HOOKS OR SIMILAR MOUNTS/TIES SHOULD BE USED TO SUSPEND THE CABLE WHERE NECESSARY AT THE APPROPRIATE LENGTHS.
- CABLES SHOULD AVOID BEING NEAR FLUORESCENT LIGHTING, EXTREME HEAT, OR DIRECT SUNLIGHT.
- CABLE SHOULD ENTER THE PATCH PANEL/SERVER CABINET AREA IN A NEAT AND ORGANIZED FASHION. (I.e. THE LOOM OF CABLE SHOULD BE "GROOMED")
- IF A CABLE SPLICE IS NECESSARY, IT SHOULD BE DONE USING PROPER DATA SPLICING HARDWARE.

CABLE TERMINATION AND TESTING:

- 568B RJ45 KEYSTONE JACK TERMINATIONS ON BOTH SIDES
- 568B RJ45 PLUG TERMINATIONS ON BOTH SIDES FOR IP SECURITY CAMERAS
- DO NOT USE 568A!
- ALL TERMINATED CABLES SHOULD BE TESTED WITH FLUKE, LANSCOUT, OR SIMILAR TESTING DEVICE

CABLE SLACK:

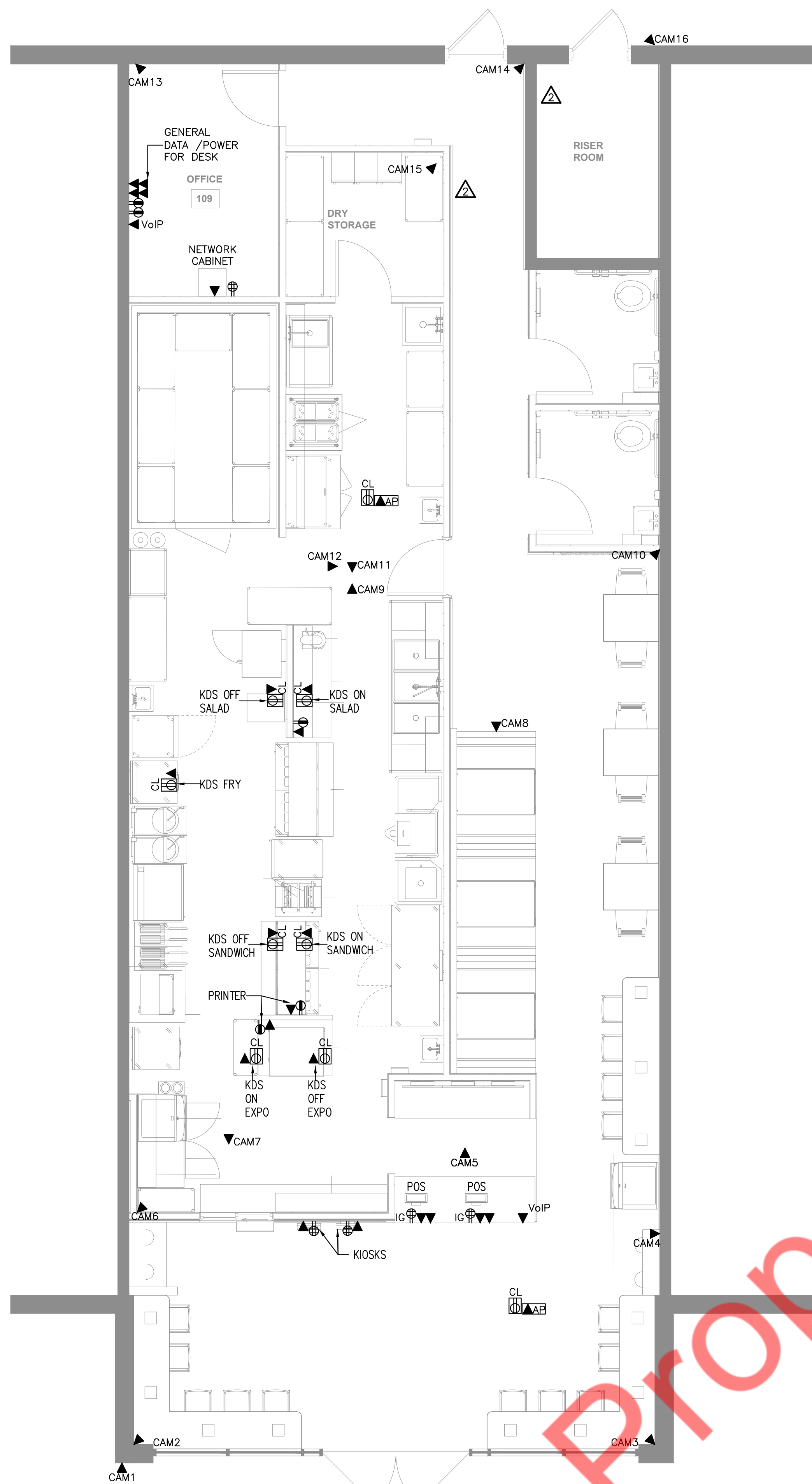
- MINIMUM OF 18 INCHES SLACK ON THE DEVICE SIDE
- MINIMUM OF 15 FEET SLACK ON THE OFFICE (MDF/IDF) SIDE. MORE SLACK IS BETTER IF UNSURE OF EQUIPMENT PLACEMENT.

CABLE LABELING:

- CLEARLY LABEL ALL CABLES ON BOTH ENDS USING A LABEL MAKER










ALL CABLES TO THE FOLLOWING DEVICES NEED TO BE "HOME RUNS" TO THE OFFICE (MDF/IDF).

- COMPUTERS
- SERVERS
- POS TERMINALS
- PAYMENT DEVICE (PINPAD)
- REMOTE ORDER PRINTER
- KITCHEN DISPLAY SYSTEM
- BACK OFFICE COMPUTER
- WIRELESS ACCESS POINT
- IP CAMERA
- VOIP TELEPHONE
- AUDIO SYSTEM



SCHEDULE - KITCHEN EQUIPMENT						
CALLOUT	DESCRIPTION	VOLTS	AMPS	MOC	NOTE	REMARK
K3	WALK-IN COOLER	120V 1P 2W	4	20	-	
K3A	WALK-IN COOLER, COOLER UNIT	120V 1P 2W	1.6	20	(+80") A.F.F	
K3B	WALK-IN COOLER, REMOTE CONDENSOR	208V 2P 2W	7.4	20	-	
K5	POS STATION	120V 1P 2W	15	20	(+50") A.F.F	
K6	REFRIGERATED PREP TABLE	120V 1P 2W	5.8	20	(+12") A.F.F, NEMA 5-15P	
K7	WORK TABLE (UTILITY OUTLET)	120V 1P 2W	15	20	(+50") A.F.F	
K10	CONVECTION OVEN	208V 2P 2W	35	50	(+24") A.F.F	E.C TO PROVIDE CORD AND PLUG
K16	REACH-IN FREEZER	120V 1P 2W	14	20	(+12") A.F.F, NEMA 5-15P	
K17	WORKTOP REFRIGERATOR	120V 1P 2W	3	20	(+12") A.F.F, NEMA 5-15P	
K18	WORK TABLE (UTILITY OUTLET)	120V 1P 2W	15	20	(+50") A.F.F	
K19	BAG N BOX SODA SYSTEM (CARBONATORS)	120V 1P 2W	5	20	(+72") A.F.F	
K20	EXHAUST HOOD LIGHTS	120V 1P 2W	2.5	15	-	
K22	FIRE SUPPRESSION SYSTEM	120V 1P 2W	3	15	-	
K23	PRESSURE FRYER	120V 1P 2W	10	20	(+12") A.F.F	
K24	FRYER	120V 1P 2W	12	20	(+12") A.F.F, NEMA 5-15P	
K25	2 BURNER RANGE				-	
K26	REACH-IN REFRIGERATOR	120V 1P 2W	2.2	20	(+12") A.F.F, NEMA 5-15P	
K27	WORKTOP REFRIGERATOR W/ DRAWERS	120V 1P 2W	2.4	20	(+12") A.F.F, NEMA 5-15P	
K28	WORK TABLE (UTILITY OUTLET)	120V 1P 2W	15	20	(+50") A.F.F	
K29	WORKTOP FREEZER W/ DRAWERS (U/C FREEZER)	120V 1P 2W	2.6	20	(+12") A.F.F, NEMA 5-15P	
K30	FRY DUMB STATION	120V 1P 2W	10	15	(+50") A.F.F, NEMA 5-15P	
K31	HEATED SHELVES	120V 1P 2W	3.4	15	(+12") A.F.F. & (+24") A.F.F, NEMA 5-15P	
K32	WORK TABLE (UTILITY OUTLET)	120V 1P 2W	15	20	(+50") A.F.F	
K33	REFRIGERATED PREP TABLE	120V 1P 2W	8.9	20	(+12") A.F.F, NEMA 5-15P	
K34	FULL HEIGHT HOLDING CABINET	120V 1P 2W	24	30	(+12") A.F.F	
K35	TOASTER	120V 1P 2W	12.5	20	(+18") A.F.F. & (+24") A.F.F, NEMA 5-15P	
K35A	WORK TABLE W/ BUN STORAGE BELOW	120V 1P 2W	15	20	(+50") A.F.F	
K36	WORK TABLE (UTILITY OUTLET)	120V 1P 2W	15	20	(+50") A.F.F	
K37	BEVERAGE DISPENSER	120V 1P 2W	15	20	(+50") A.F.F	
K38	ICE MACHINE (ICE MAKER)	120V 1P 2W	1.1	20	(+84") A.F.F	
K38a	ICE MACHINE (ICE MAKER) - REMOTE COMPRESSOR	208V 2P 2W	11.6	20		
K41	WORK TABLE (UTILITY OUTLET)	120V 1P 2W	15	20	(+50") A.F.F	
K42	COUNTER DISPLAY WARMER	120V 1P 2W	7.8	15	(+24") A.F.F	
K44	WORK TABLE (UTILITY OUTLET)	120V 1P 2W	15	20	(+50") A.F.F	
K46	COUNTER TOP MIXER	120V 1P 2W	5	15	(+50") A.F.F, NEMA 5-15P	
K48	DISHMACHINE	120V 1P 2W	5	15	-	

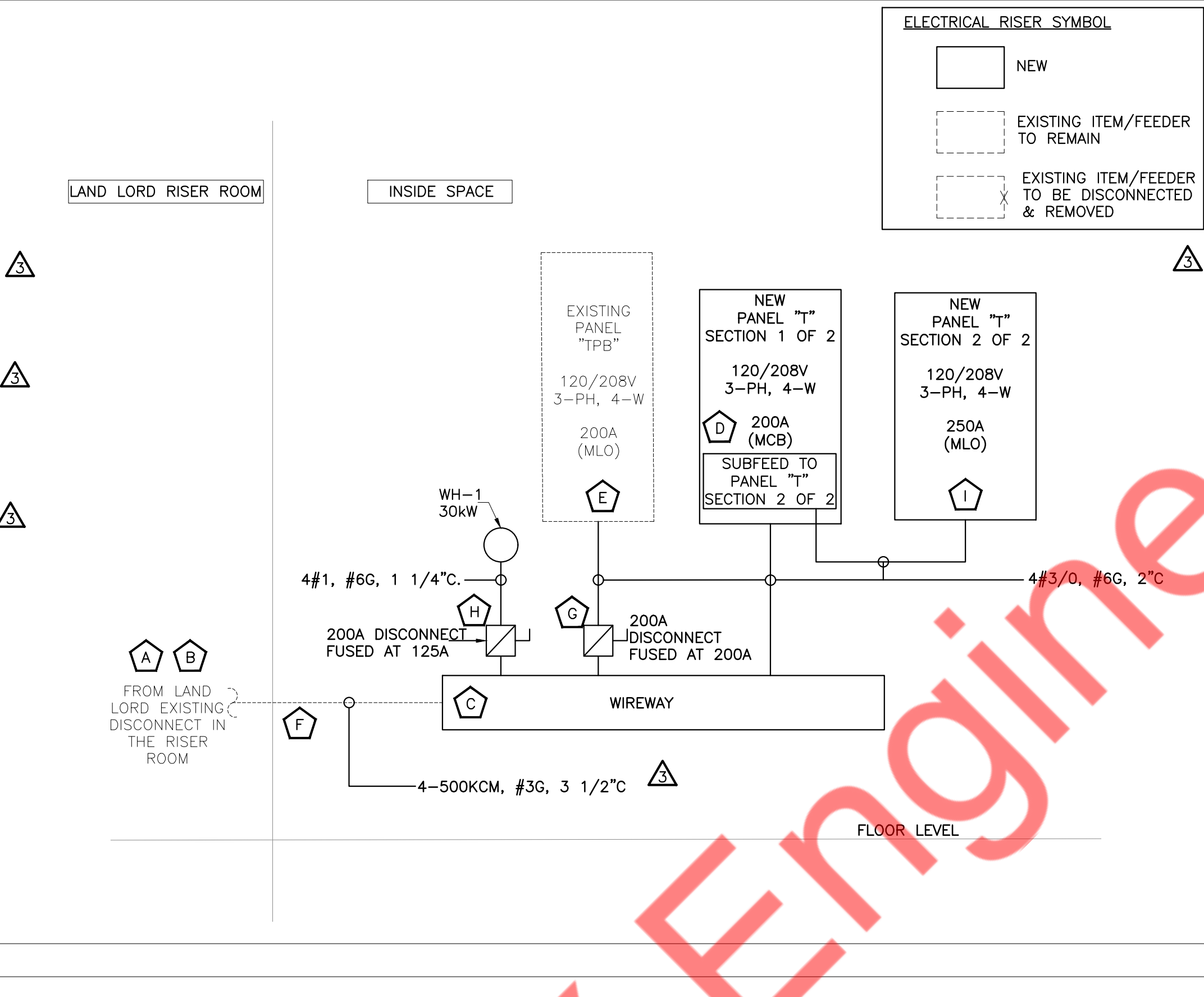
NOTE- ABOVE RECEPTACLE TYPE IS FOR REFERENCE ONLY. E.C TO COORDINATE WITH KITCHEN EQUIPMENT VENDOR FOR EXACT REQUIRMENT OF THE RECETACLE TYPE FOR EACH EQUIPMENT .

SCHEDULE - LIGHT FIXTURE					
TAG	SYMBOL	TYPE/DISCRPTION	MANUFACTURER	MODEL NUMBER	FIXTURE MOUNTING TYPE
L100		2 X 4 LED TROFFER RECESSED	COLUMBIA LIGHTING	LIT24	RECESSED
L100_NL/EM		2 X 4 LED TROFFER RECESSED WITH BATTERY BACK	COLUMBIA LIGHTING	LIT24	RECESSED
L101		LED DOWNLIGHT 4" ACROBAT / ROUND / FLANGED / FLOOD (50 DEGREE) DIMMABLE	CREATIVE SYSTEM LIGHTING (CSL)	4" ACROBAT / ROUND / FLANGED / FLOOD (50 DEGREE)	RECESSED/PENDANT (SEE LIGHTING PLAN)
L101-B		LED DOWNLIGHT 4" ACROBAT / ROUND / FLANGED / FLOOD (10 DEGREE) DIMMABLE	CREATIVE SYSTEM LIGHTING (CSL)	4" ACROBAT / ROUND / FLANGED / FLOOD (10 DEGREE)	RECESSED/PENDANT (SEE LIGHTING PLAN)
L108		DINING ROOM WALL SCONCE	LUMEN ART	ACL09.1	WALL MOUNTED
L109		CARSON 12" PLUG-IN PENDANT WITH CAGE DIMMABLE	REJUVENATION	CARSON 12" PLUG-IN PENDANT W/ CAGE #A4686	PENDANT
L110		WALL SCONCE DIMMABLE	REJUVENATION	CARSON GOOSENECK #A2949	WALL MOUNTED
EX		EXIT LIGHT	COMPASS	CER	WALL MOUNTED
EBU-W		2-HEAD EMERGENCY BATTERY PACK (WHITE)	EXITRONIX	EBU-W-LED-51-52	WALL MOUNTED

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- ### RISER DIAGRAM KEYED WORK NOTES
- EXISTING 400A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL SERVICE PROVIDED BY LANDLORD FROM THE EXISTING BUILDING SERVICE DISTRIBUTION SHALL REMAIN FOR THE SPACE. E.C. TO FIELD VERIFY THE OPERABLE CONDITION OF EXISTING ELECTRICAL SERVICE. INFORM ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK.
 - EXISTING 400A, 120/208V, 3PH, ELECTRICAL METER, CT CABINET AND DISCONNECT SWITCH PROVIDED BY LANDLORD FOR THE PROJECT SPACE SHALL REMAIN. E.C. SHALL VERIFY RATING AND OPERABLE CONDITION OF EXISTING ELECTRICAL METER AND CT CABINET IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY. INFORM ENGINEER FOR ANY DISCREPANCY PRIOR TO BID.
 - NEW 400A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL "WIRE WAY" FOR PROJECT SPACE. E.C. TO COORDINATE WITH ARCHITECT/OWNER FOR FINAL LOCATION OF ELECTRICAL "WIRE WAY" IN FIELD.
 - NEW 200A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "T" (SECTION 01 OF 02) FOR PROJECT SPACE. E.C. TO COORDINATE WITH ARCHITECT/OWNER FOR FINAL LOCATION OF ELECTRICAL PANEL IN FIELD.
 - EXISTING 200A, 120/208V, 4-WIRE ELECTRICAL PANEL "TPB" FOR PROJECT SPACE SHALL REMAIN. E.C. SHALL VERIFY RATING AND OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "TPB" IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
 - EXISTING 500MCM SERVICE FEEDER SHALL REMAIN. E.C. TO FIELD VERIFY OPERABLE CONDITION OF THE EXISTING 500MCM SERVICE FEEDER, REPLACE IF FOUND INOPERABLE. ALSO E.C. TO FIELD VERIFY THE EXACT LENGTH OF THE CABLE AND CHECK THE VOLTAGE DROP IS UNDER LIMIT PER NEC BEFORE INSTALLATION.
 - NEW 200A MCB, 120/208V, 3-PHASE, FUSED DISCONNECT SWITCH FOR EXISTING ELECTRICAL PANEL "TPB".
 - NEW 125A, 120/208V, 3-PHASE, FUSED DISCONNECT SWITCH FOR EXISTING ELECTRICAL PANEL "WH-1".
 - NEW 250A, MLO 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "T" (SECTION 02 OF 02) FOR PROJECT SPACE. E.C. TO COORDINATE WITH ARCHITECT/OWNER FOR FINAL LOCATION OF ELECTRICAL PANEL IN FIELD.

- ### RISER DIAGRAM GENERAL NOTES
- RISER DIAGRAM IS FOR REFERENCE PURPOSES ONLY. E.C. SHALL VERIFY EXACT POWER DISTRIBUTION IN FIELD AND INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY.
 - E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION IN FIELD COORDINATION WITH OWNER/ARCHITECT.
 - ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.
 - E.C. SHALL VERIFY THE RATING, SIZE, LOCATION AND OPERABLE CONDITION OF ALL THE EXISTING PANELS AND ELECTRICAL CONNECTION IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK.
 - E.C. SHALL VERIFY THE EXACT POWER DISTRIBUTION & INCOMING CONNECTION TO ALL PANELS IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND.
 - E.C. SHALL COORDINATE WITH LANDLORD/OWNER/ARCHITECT FOR THE EXACT LOCATION OF EXISTING ELECTRICAL SERVICE IN THE LANDLORD RISER ROOM. BASE BID ACCORDINGLY.
 - E.C. TO VERIFY SCOPE OF WORK WITH LANDLORD/OWNER PRIOR TO BID.



- ### ELECTRICAL WIRING METHOD
- ALL CONDUIT SHALL BE RUN CONCEALED IN SO FAR AS IS PRACTICABLE. CONDUITS SHALL BE EXPOSED ONLY WHERE SO INDICATED ON THE DRAWINGS OR IN UNFINISHED AREAS SUCH AS ELECTRICAL AND BOILER ROOMS.
 - MINIMUM CONDUIT SIZE SHALL BE 3/4" UNLESS NOTED OTHERWISE ON THE PLANS.
 - RIGID METAL CONDUIT: HOT DIPPED GALVANIZED, MILD STEEL PIPE, ZINC COATED THREADS WITH AN OUTER COATING OF ZINC BICHROMATE, AS MANUFACTURED BY TRIANGLE, REPUBLIC, WHEATLAND OR EQUAL.
 - INTERMEDIATE METAL CONDUIT (IMC): HOT DIPPED GALVANIZED, MILD STEEL PIPE, ZINC COATED THREADS WITH AN OUTER COATING OF ZINC BICHROMATE AS MANUFACTURED BY TRIANGLE, REPUBLIC, WHEATLAND OR EQUAL.
 - FLEXIBLE METAL CONDUIT: GALVANIZED OR ZINC METALIZED STEEL, SINGLE STRIP INTERLOCKED CONSTRUCTION AS MANUFACTURED BY TRIANGLE, ANACONDA, AMERICAN FLEXIBLE CONDUIT, ELECTRIC-FLEX, OR EQUAL.
 - ELECTRIC METALLIC TUBING (EMT): HOT DIPPED GALVANIZED, MILD STEEL TUBE, ZINC COATED, AS MANUFACTURED BY TRIANGLE, REPUBLIC, WHEATLAND OR EQUAL.
 - RIGID NONMETALLIC CONDUIT: SCHEDULE 40 PVC AS MANUFACTURED BY CARLON OR EQUAL.
 - METAL CLAD CABLE: TYPE MC, COPPER CONDUCTOR, 600 VOLT THERMOPLASTIC INSULATION, 90 DEG. C, INTERLOCKED STEEL TAPE ARMOR.
 - ARMORED CABLE: TYPE AC, COPPER CONDUCTOR, 600 VOLT THERMOPLASTIC INSULATION, 90 DEG. C.
 - ANY EXPOSED RACEWAY SHALL BE RUN TRUE, PLUMB AND PARALLEL OR PERPENDICULAR TO BUILDING LINES.
 - ALL CONDUCTORS SHALL BE COPPER.
 - RACEWAYS SHALL BE SEALED WHERE ENTERING PULL BOXES OR STRUCTURES.
 - SINGLE CONDUCTOR CABLES SHALL BE USED FOR FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT WHERE AC AND MC CABLE IS USED). MINIMUM SIZE WIRE SHALL BE #12 AWG UNLESS OTHERWISE INDICATED AND SHALL BE SIZED TO CONFORM TO NORMAL NEC VOLTAGE DROPS. WIRE SIZES #10 AWG AND SMALLER SHALL BE SOLID, #8 AWG AND LARGER SHALL BE STRANDED.
 - FEEDERS AND ALL WIRING IN MOIST OR WET LOCATIONS UNDERGROUND OR UNDER THE SLAB SHALL BE 600 VOLT CODE TYPE THHN-THWN. BRANCH CIRCUIT WIRING IN DRY LOCATIONS, ABOVE GRADE, IN THE INTERIOR OF THE BUILDING SHALL BE 600 VOLT CODE TYPE THHN-THWN OR XHHW.
 - WIRING TO RECESSED FIXTURE AND WITHIN FIXTURE RACEWAYS SHALL BE TYPE THHN, #12 AWG MINIMUM.
 - EQUIPMENT GROUND: GREEN CONDUCTOR SHALL BE USED.

1 ELECTRICAL RISER DIAGRAM

ELECTRICAL PANEL SCHEDULES

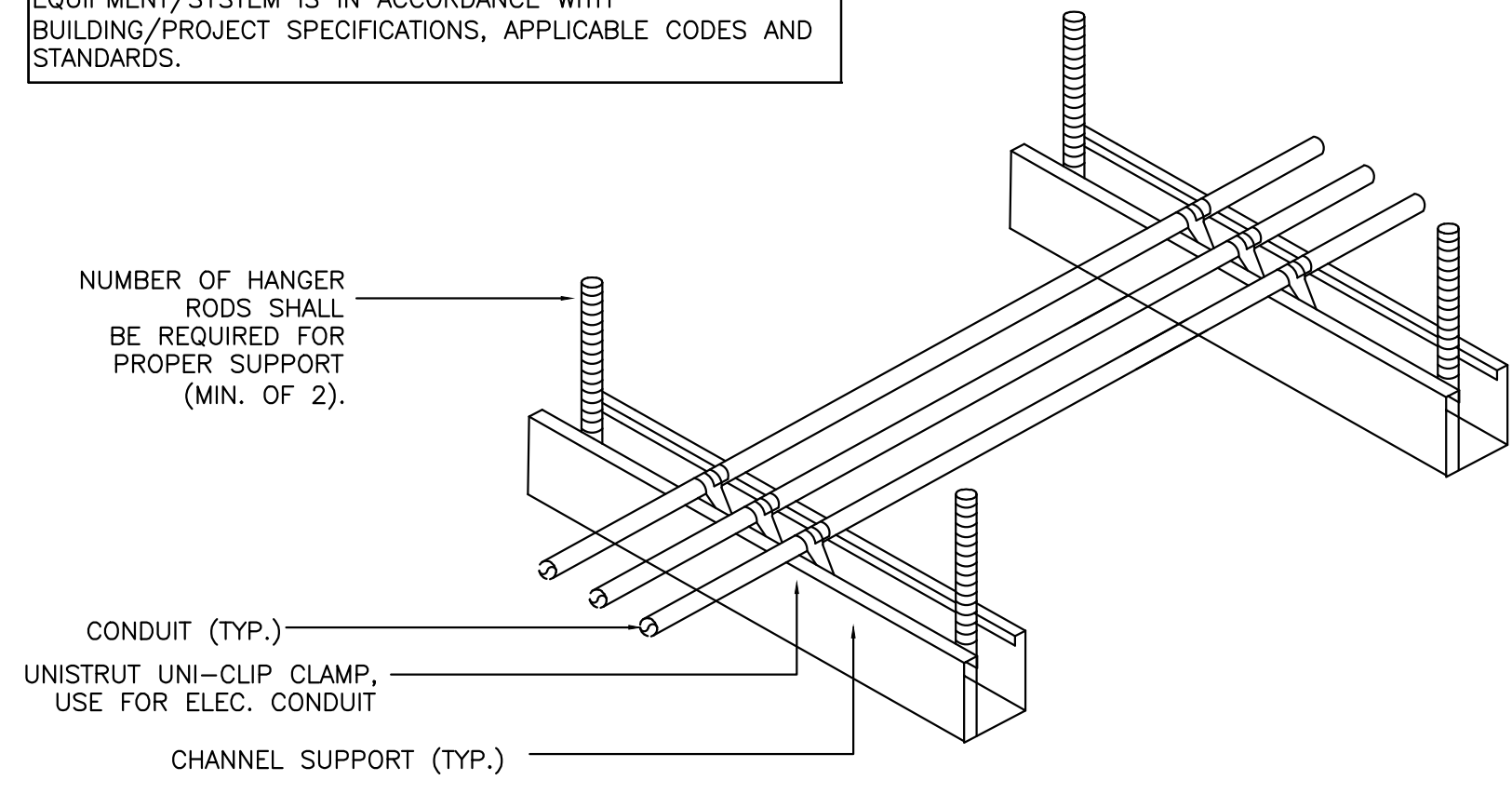
PANEL: T-NEW (SECTION 1 OF 2)														MOUNTING: SURFACE	
208Y/120 VOLTS, 3 PHASE, 4 WIRE														PANEL LOCATION: BOH AREA	
MAIN CB: 200A BUS: 250A MIN.														FED FROM: WIREWAY	
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL)															
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	K3_WALK IN COOLER LIGHTS	H	0.48	2#12, #12G, 3/4"C	1.18			2#12, #12G, 3/4"C	0.70	E	K6_REFRIGERATED PREP TABLE	20	2	
3	20	K3A_WALL-IN COOLER, COOLER UNIT	H	0.19	2#12, #12G, 3/4"C		1.99		2#12, #12G, 3/4"C	1.80	E	K7_WORK TABLE (UTILITY OUTLET)	20	4	
5	2P-20	K3B_WALL-IN COOLER, REMOTE CONDENSER	H	0.77	2#12, #12G, 3/4"C			2.45	2#12, #12G, 3/4"C	1.68	E	K16_REACH-IN FREEZER	20	6	
7	20	K7_WORK TABLE (UTILITY OUTLET)	H	0.77	2#12, #12G, 3/4"C	1.13			2#12, #12G, 3/4"C	0.36	E	K17_WORKTOP REFRIGERATOR	20	8	
9	20	K7_WORK TABLE (UTILITY OUTLET)	E	1.80	2#12, #12G, 3/4"C		3.60		2#12, #12G, 3/4"C	1.80	E	K18_WORK TABLE (UTILITY OUTLET)	20	10	
11	2P-50	K10_CONVECTION OVEN	E	3.64	2#8, #10G, 3/4"C			4.84	2#12, #12G, 3/4"C	1.20	E	K19_BAG N BOX SODA SYSTEM (CARBONATORS)	20	12	
13	20	K23_PRESSURE FRYER	E	3.64	2#12, #12G, 3/4"C	4.84			2#12, #12G, 3/4"C	1.20	E	K23_PRESSURE FRYER	20	14	
15	20	SHUNT BREAKER	E	1.20	2#12, #12G, 3/4"C		1.20		2#12, #12G, 3/4"C	1.44	E	SHUNT BREAKER	20	16	
17	20	SHUNT BREAKER	E	1.20	2#12, #12G, 3/4"C		1.44		2#12, #12G, 3/4"C	1.44	E	K24_FRYER	20	18	
19	20	K28_WORK TABLE (UTILITY OUTLET)	E	1.80	2#12, #12G, 3/4"C	1.80			2#12, #12G, 3/4"C	0.40	E	SHUNT BREAKER	20	20	
21	20	K28_WORK TABLE (UTILITY OUTLET)	E	1.20	2#12, #12G, 3/4"C		1.60		2#12, #12G, 3/4"C	1.80	E	K31_HEATED SHELVES	20	22	
23	20	SHUNT BREAKER	E	1.20	2#12, #12G, 3/4"C		1.80		2#10, #10G, 3/4"C	1.80	E	K34_FULL HEIGHT HOLDING CABINET	30	24	
25	20	K35_TOASTER	E	1.50	2#12, #12G, 3/4"C	3.00			2#12, #12G, 3/4"C	1.50	E	K35_TOASTER	20	26	
27	2P-20	K38A_ICE MACHINE REMOTE COMPRESSOR	E	1.21	2#12, #12G, 3/4"C	2.67			2#12, #12G, 3/4"C	1.46	E	K38_ICE MACHINE (ICE MAKER)	20	28	
29	2P-20	K38A_ICE MACHINE REMOTE COMPRESSOR	E	1.21	2#12, #12G, 3/4"C		1.61		2#12, #12G, 3/4"C	0.40	E	K31_HEATED SHELVES	20	30	
TOTAL CONNECTED LOAD (KVA)						11.95	11.06	12.14							

PANEL: TPB (EXISTING)														MOUNTING: SURFACE	
208Y/120 VOLTS, 3 PHASE, 4 WIRE														PANEL LOCATION: BOH AREA	
MLO 200 BUS: 200A MIN.														FED FROM: DISCONNECT	
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL)															
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	EXTERIOR BUILDING SOUTH SIDE SIGNAGE	L	1.20	2#12, #12G, 3/4"C	1.95			2#12, #12G, 3/4"C	0.75	L	LIGHTING KITCHEN & BOH	20	2	
3	20	LIGHTING IN SALE & DINING AREA	L	0.75	2#12, #12G, 3/4"C		1.50		2#12, #12G, 3/4"C	0.75	L	LIGHTING CONTROL PANEL	20	4	
5	20	LIGHTING IN SALE DINING AREA, RESTROOMS	L	0.75	2#12, #12G, 3/4"C			1.75	2#12, #12G, 3/4"C	1.00	M	WOMEN'S TOILET HANDDRYER	20	6	
7	20	MENS TOILET HANDDRYER	M	1.00	2#12, #12G, 3/4"C	1.72			2#12, #12G, 3/4"C	0.72	R	MANAGER DESK'S QUAD RECEPTACLE	20	8	
9	20	MENS AND WOMEN'S TOILET RECEPTACLE	R	0.72	2#12, #12G, 3/4"C			1.08	2#12, #12G, 3/4"C	0.36	R	ABOVE COUNTER RECEPTACLE NEAR REFRIGERATOR	20	10	
11	20	USB RECEPTACLE	R	1.08	2#12, #12G, 3/4"C			1.26	2#12, #12G, 3/4"C	0.18	R	ABOVE COUNTER RECEPTACLE NEAR PICK UP	20	12	
13	20	USB RECEPTACLE	R	0.54	2#12, #12G, 3/4"C	0.90			2#12, #12G, 3/4"C	0.36	R	NETWORK CABINET QUAD RECEPTACLE	20	14	
15	20	BACK COUNTER RECEPTACLE	R	0.54	2#12, #12G, 3/4"C		0.90		2#12, #12G, 3/4"C	0.36	R	RECEPTACLE NEAR GENERAL DATA	20	16	
17	20	CEILING QUAD RECEPTACLE	R	0.36	2#12, #12G, 3/4"C			0.90	2#12, #12G, 3/4"C	0.54	R	CEILING REC. KDS ON SALAD & OFF SALAD	20	18	
19	20	OFFICE RECEPTACLE	R	0.54	2#12, #12G, 3/4"C	0.90			2#12, #12G, 3/4"C	0.36	R	CEILING REC. KDS ON SANDWICH & OFF SANDWICH	20	20	
21	20	K5_POS STATION	R	0.72	2#12, #12G, 3/4"C		1.08		2#12, #12G, 3/4"C	0.36	R	CEILING REC. KDS ON EXPO & OFF EXPO	20	22	
23	20	KIOSK	R	0.36	2#12, #12G, 3/4"C			0.72	2#12, #12G, 3/4"C	0.36	R	CEILING REC. FOR ACCESS POINT	20	24	
25	20	PICK UP AND ORDER AREA CEILING RECEPTACLE	R	0.90	2#12, #12G, 3/4"C	2.10			2#12, #12G, 3/4"C	1.20	L	EXTERIOR BUILDING NORTH SIDE SIGNAGE	20	26	
27	20	SHOW WINDOW CEILING RECEPTACLE	R	0.36	2#12, #12G, 3/4"C		0.54		2#12, #12G, 3/4"C	0.18	M	RECR. PUMP	20	28	
29	20	USB RECEPTACLE	R	0.90	2#12, #12G, 3/4"C			1.26	EXISTING	0.36	R	RECEPTACLE-ROOF	20	30	
31	20	GENERAL RECEPTACLE	R	0.72	2#12, #12G, 3/4"C	3.35			EXISTING	2.63	H		32		
33	20	MENU BOARD TV RECEPTACLE	R	0.72	2#12, #12G, 3/4"C		3.35		EXISTING	2.63	H	RTU-4(E)	3P-40	34	
35	20	CEILING RECEPTACLE NEAR REACH IN FREEZE & REACH IN REFRIGERATOR	R	0.36	2#12, #12G, 3/4"C			2.99	EXISTING	2.63	H		36		
37	20	OFFICE RECEPTACLE	R	0.54	2#12, #12G, 3/4"C	3.44			EXISTING	2.90	H		38		
39	20	KIOSK	R	0.36	2#12, #12G, 3/4"C		3.26		EXISTING	2.90	H	RTU-5(E)	3P-50	40	
41	20	SPARE						2.90	EXISTING	2.90	H		42		
TOTAL CONNECTED LOAD (KVA)						14.36	11.71	11.78							

GENERAL NOTES:

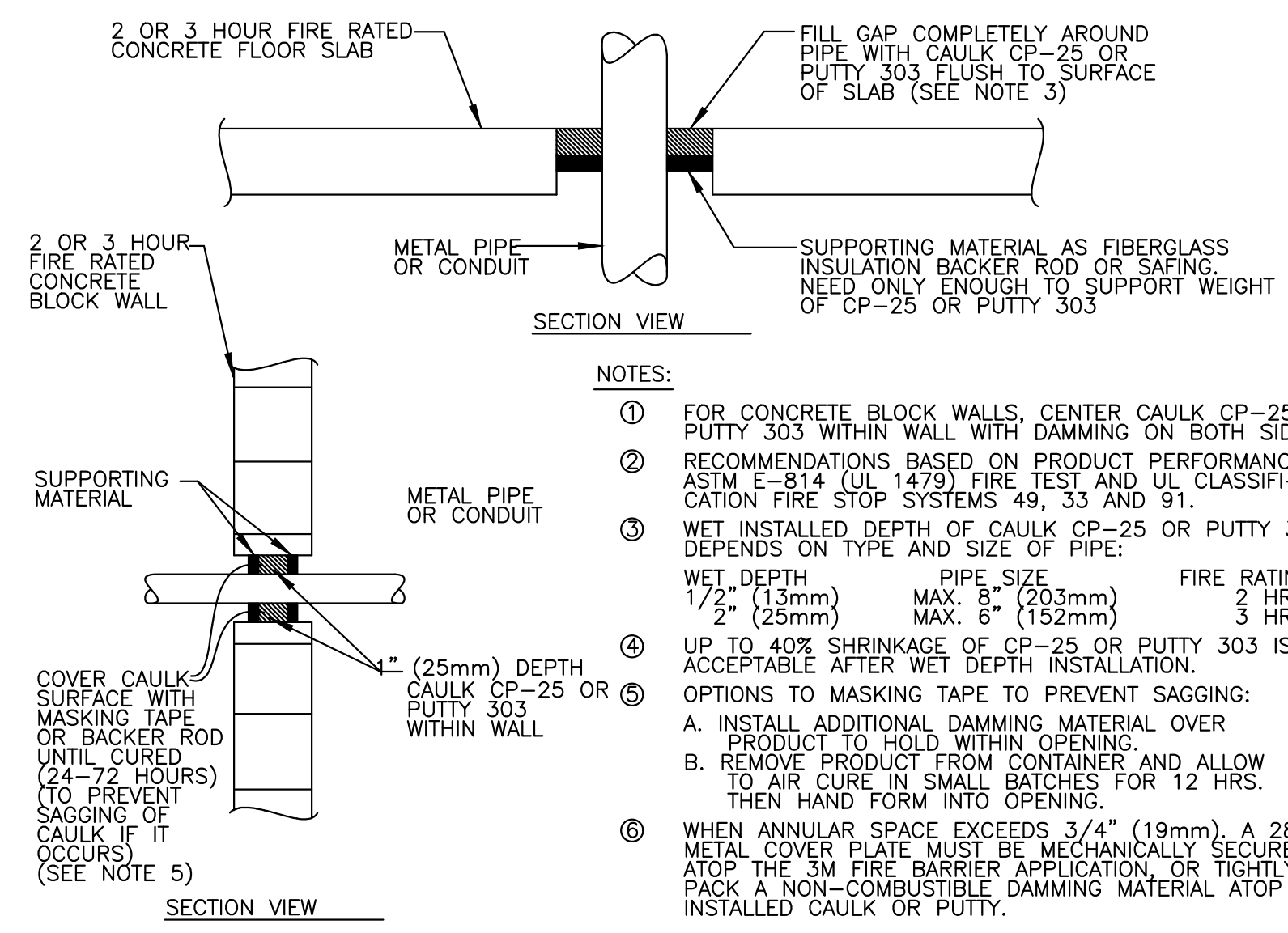
- PROVIDE GFCI PROTECTION FOR ALL EQUIPMENT/KITCHEN RECEPTACLES PER NEC 210.8 (B)(2). MUST BE READILY ACCESSIBLE OR PROVIDE GFI BREAKER.
- ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES IN FIELD AND INFORM ENGINEER FOR ANY DISCREPANCIES.
- ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
- ELECTRICAL CONTRACTOR SHALL VERIFY EXACT CIRCUIT NUMBER & BREAKER SIZE OF EXISTING DEVICES IN FIELD.
- E.C. SHALL PROVIDE NEW CIRCUIT BREAKERS IN PLACE OF EXISTING CIRCUIT BREAKERS WHEREVER NECESSARY TO BE IN LINE WITH THE PANEL SCHEDULE.
- E.C. SHALL VERIFY THE EXISTING EQUIPMENT LOAD & RATINGS IN FIELD AND ACCORDINGLY CONSIDER THE ELECTRICAL LOAD IN PANEL BOARD SCHEDULE.

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.



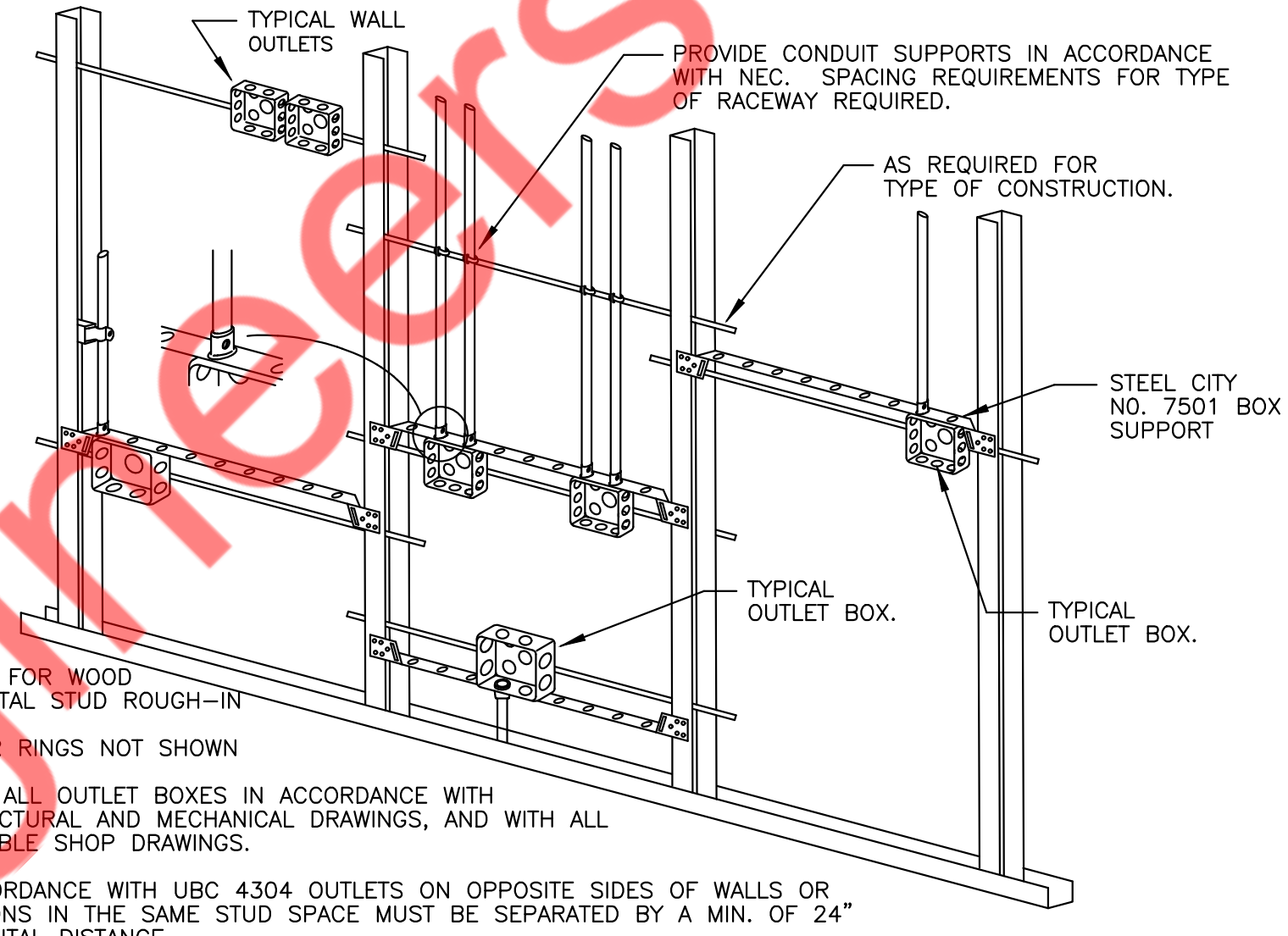
- NOTES:
1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
 2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
 3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
 4. UNISTRUT AND CONDUIT INSTALLATION MAY BE REVERSED.

1 CONDUIT SUPPORT DETAIL
E6.1 N.T.S.



- NOTES:
1. FOR CONCRETE BLOCK WALLS, CENTER CAULK CP-25 OR PUTTY 303 WITHIN WALL WITH DAMMING ON BOTH SIDES.
 2. RECOMMENDATIONS BASED ON PRODUCT PERFORMANCE PER ASTM E-814 (UL 1479) FIRE TEST AND UL CLASSIFICATION FIRE STOP SYSTEMS 49, 33 AND 91.
 3. WET INSTALLED DEPTH OF CAULK CP-25 OR PUTTY 303 DEPENDS ON TYPE AND SIZE OF PIPE:
- | WET DEPTH | PIPE SIZE | FIRE RATING |
|-------------|-----------------|-------------|
| 1/2" (13mm) | MAX. 8" (203mm) | 2 HRS. |
| 2" (25mm) | MAX. 6" (152mm) | 3 HRS. |
4. UP TO 40% SHRINKAGE OF CP-25 OR PUTTY 303 IS ACCEPTABLE AFTER WET DEPTH INSTALLATION.
 5. OPTIONS TO MASKING TAPE TO PREVENT SAGGING:
A. INSTALL ADDITIONAL DAMMING MATERIAL OVER PRODUCT TO HOLD WITHIN OPENING.
B. REMOVE PRODUCT FROM CONTAINER AND ALLOW TO AIR CURE IN SMALL BATCHES FOR 12 HRS. THEN HAND FORM INTO OPENING.
 6. WHEN ANNULAR SPACE EXCEEDS 3/4" (19mm), A 28 AWG METAL COVER PLATE MUST BE MECHANICALLY SECURED ATOP THE 3M FIRE BARRIER APPLICATION, OR TIGHTLY PACK A NON-COMBUSTIBLE DAMMING MATERIAL ATOP INSTALLED CAULK OR PUTTY.

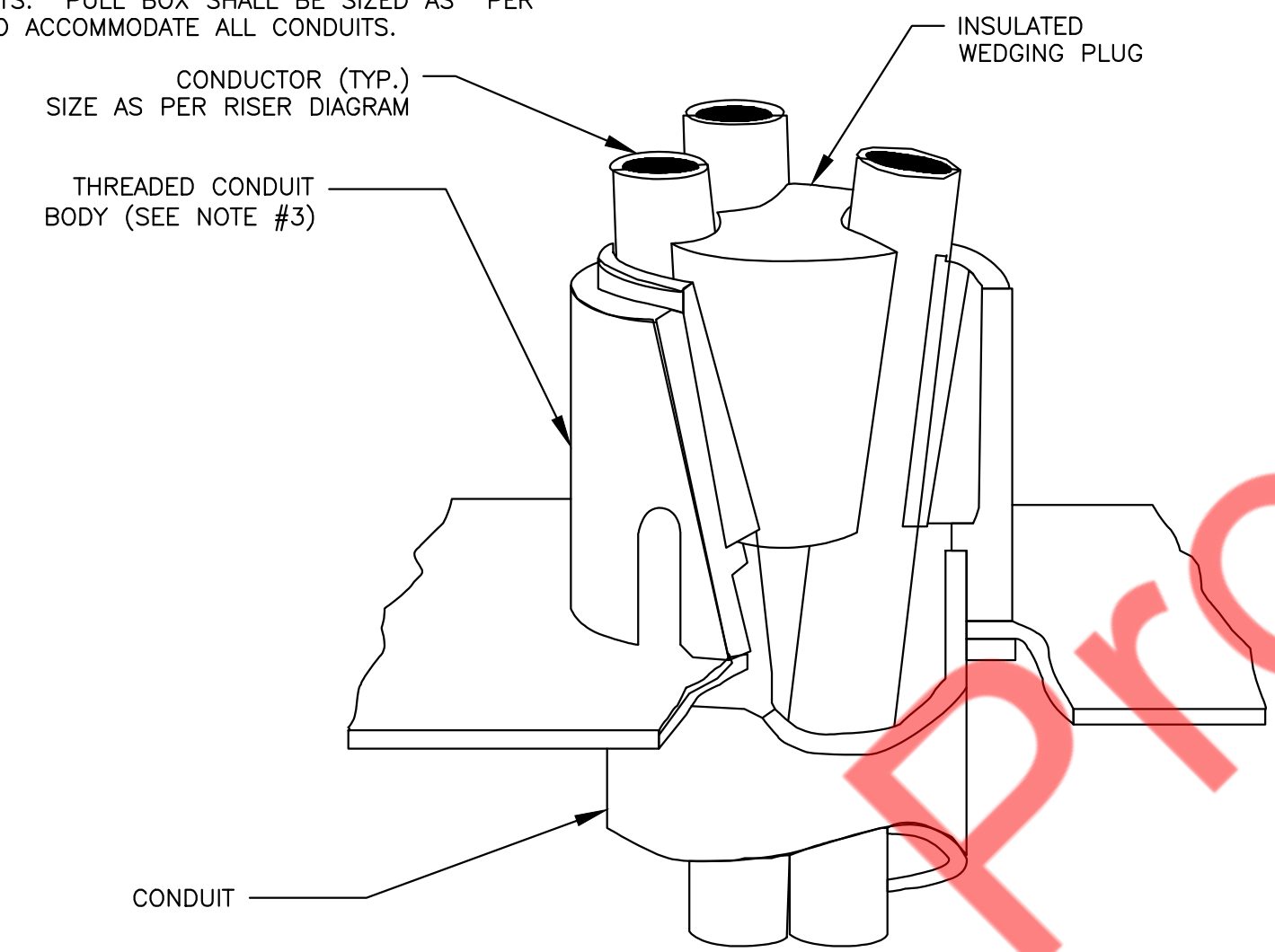
2 FIRE STOP DETAIL
E6.1 N.T.S.



- 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.

3 DETAIL TYPICAL ROUGH-IN REQUIREMENTS
E6.1 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.



4 VERTICAL CABLE SUPPORT DETAIL
E6.1 N.T.S.

PLUMBING SYMBOLS LIST

— — — — —	VENT PIPING
— SAN — — —	UNDERGROUND SANITARY PIPING
— G.SAN — — —	UNDERGROUND GREASE WASTE PIPING
— EX.V — — —	EXISTING VENT PIPING
— EX.SAN — — —	EXISTING UNDERGROUND SANITARY PIPING
— EX.G.SAN — — —	EXISTING GREASE WASTE PIPING
— — — — —	COLD WATER PIPING
— — — — —	HOT WATER PIPING
— — — — —	HOT WATER RETURN PIPING
— EX.CW — — —	EXISTING COLD WATER PIPING
— — — — —	GAS PIPING
— — — — —	EXISTING GAS PIPING
— — — — —	P-TRAP
— — — — —	PIPE UP
— — — — —	PIPE DROP
— — — — —	PIPE CAP
— — — — —	CONTROL VALVE
— — — — —	GAS VALVE
— — — — —	BACKFLOW PREVENTER
— — — — —	FLOOR SINK
— — — — —	FLOOR DRAIN
— — — — —	POINT OF CONNECTION
— — — — —	CLEANOUT
— — — — —	BALANCING VALVE

PLUMBING ABBREVIATIONS

CO	CLEANOUT
SAN	SANITARY
GSAN	GREASE SANITARY
V	VENT
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
EX.	EXISTING
FD	FLOOR DRAIN
MS	MOP SINK
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
TYP.	TYPICAL
DN	DOWN
AFF	ABOVE FINISH FLOOR
BFP	BACK FLOW PREVENTER
WH-1	WATER HEATER
ET-1	EXPANSION TANK
RCP-1	RECIRCULATION PUMP
TP	TRAP PRIMER

PLUMBING DRAWING LIST

P1.0	PLUMBING SYMBOL & SPECIFICATIONS
P1.1	PLUMBING SPECIFICATIONS
P2.0	PLUMBING FLOOR PLAN
P3.0	PLUMBING DETAILS (1 OF 2)
P3.1	PLUMBING DETAILS (2 OF 2)
P4.0	PLUMBING RISERS
P4.1	PLUMBING SCHEDULES

GENERAL PLUMBING NOTES

- A. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE TO OBSERVE THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY OWNER'S CONSTRUCTION MANAGER OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
- B. PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE OWNER'S CONSTRUCTION MANAGER REFLECTING ANY VARIANCES OF INSTALLED PIPING LOCATIONS OR EQUIPMENT CONTRARY TO THE CONSTRUCTION DOCUMENTS, REFER TO SPECIFICATIONS.
- C. PROVIDE TO THE OWNER'S CONSTRUCTION MANAGER A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS, REFER TO SPECIFICATIONS.
- D. INSTALLATION SHALL COMPLY WITH LEGALLY CONSTITUTED CODES AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION AND ALSO MEET ALL REQUIREMENTS OF THE LANDLORD. OBTAIN A COPY OF THE LANDLORD'S REQUIREMENTS AND REVIEW PRIOR TO SUBMITTING BID.
- E. PLANS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE REQUIREMENTS.
- F. VERIFY LOCATION AND DEPTH OF UTILITIES AT POINTS OF CONNECTION BEFORE START OF PIPING INSTALLATION.
- G. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES.
- H. DO NOT SCALE FLOOR PLANS FOR EXACT HORIZONTAL LOCATION OF PIPE ROUTING.
- I. INSTALL CONCEALED PIPING TIGHT TO THE STRUCTURE AND AS HIGH AS POSSIBLE. INSTALL EXPOSED PIPING TIGHT TO THE STRUCTURE, WALL OR CEILING AND AS HIGH AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS.
- J. VALVES SHALL BE LINE SIZE UNLESS OTHERWISE NOTED.
- K. PIPING IN FINISHED AREAS SHALL BE ROUTED CONCEALED; EXPOSED PIPING, WHERE NECESSARY, SHALL BE ROUTED AS HIGH AS POSSIBLE AND TIGHT TO WALLS.
- L. COORDINATE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
- M. COORDINATE PIPING INSTALLATION WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THROUGH GRADE BEAMS, FOOTING, ETC. WHERE REQUIRED AND AS NOTED ON PLANS. COORDINATE SLEEVE INSTALLATIONS WITH THE ARCHITECT, STRUCTURAL ENGINEER, STRUCTURAL CONTRACTOR AND GENERAL CONTRACTOR BEFORE CONCRETE IS INSTALLED.
- N. CLEAN FAUCET AERATORS AND PIPE STRAINERS PRIOR TO TURNING BUILDING OVER TO THE OWNER.
- O. PROVIDE TRAP PRIMERS WHERE REQUIRED BY LOCAL AUTHORITIES.
- P. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS.
- Q. PAINT ALL EXPOSED GAS AND WATER PIPING USING RUST INHIBITOR PAINT. PAINT AND COLOR SHALL BE COORDINATED WITH THE ARCHITECT AND / OR OWNER.
- R. COORDINATE ALL ROOF PENETRATIONS WITH OTHER TRADES. MAINTAIN 10' MINIMUM CLEARANCE FROM ALL AIR INTAKES. MAINTAIN 2' CLEARANCE FROM ALL OTHER EQUIPMENT.
- S. INSULATE PIPING ROUTED IN EXTERIOR BUILDING WALLS WITH MINIMUM 2" BATT INSULATION TO PREVENT FREEZING.
- T. SEAL ALL PENETRATIONS THROUGH RATED WALLS AND CEILING.
- U. EXAMINE THE CONTRACT DRAWINGS AND ALL AVAILABLE INFORMATION CONCERNING EXISTING INSTALLATION, STRUCTURE, AND LOCAL CONDITIONS. VISIT THE SITE TO UNDERSTAND THE NATURE AND SCOPE OF ALL WORK TO BE PERFORMED AND VERIFY EXISTING CONDITIONS. THE SUBMISSION OF A BID WILL BE TAKEN AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND THAT ALL EXISTING CONDITIONS HAVE BEEN CONSIDERED. NO ALLOWANCES WILL BE MADE AFTER THE PROJECT HAS BEEN AWARDED FOR FAILURE TO VERIFY EXISTING CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THAT OF THESE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
- V. PLUMBING CONTRACTOR MUST PROVIDE CAMERA VERIFICATION OF EXACT LOCATION OF WASTE LINE TO GC DURING BID. VERIFICATION MUST BE MADE PRIOR TO ISSUANCE OF PERMIT AND AFTER ACCEPTANCE OF CONTRACT TO PROCEED.
- W. CONTRACTOR TO FIELD VERIFY EXISTING DOMESTIC WATER SYSTEM IS PROVIDED WITH A REDUCED PRESSURE BACKFLOW PREVENTER (RPBP). IF NOT EXISTING, PROVIDE AN APPROVED RPBP ASSEMBLY SIZED TO MATCH BUILDING WATER METER. INSTALL NEW RPBP BETWEEN THE WATER METER AND THE BUILDING PER LOCAL JURISDICTION'S REQUIREMENTS.

BUILDING DEPARTMENT PLUMBING NOTES

1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, WATER) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2021 INTERNATIONAL PLUMBING CODE.
2. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION IPC 702.2
3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION IPC 305.
4. TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION IPC 306.
5. RODENT PROOFING AS PER IPC 304.
6. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION IPC 303, IPC 605, IPC 702, IPC 902.
7. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF IPC CHAPTERS 4, 5, 6, 7, 8 AND 9.
8. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER IPC 1002, AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION IPC 708.
9. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION IPC 308.
10. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 6 SECTION IPC 601, 602, 603, 604, 606, 607, 608, 610, 611 AND 613.
11. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 SECTION IPC 701, 704, 705, 706, 707, 708, 709 AND 710.
12. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTIONS IPC 901 THROUGH IPC 919.
13. INSPECTION AND TESTING OF PLUMBING PIPING SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION IPC 107 AND 312.
14. GAS PIPING INSTALLATION SHALL IN ACCORDANCE WITH INTERNATIONAL FUEL GAS CODE CHAPTER 4.

PLUMBING SPECIFICATIONS

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

- A. PROVIDE ALL MATERIAL, TOOLS, SUPERVISION AND LABOR INCLUDING ALL MISCELLANEOUS AND INCIDENTAL ITEMS REQUIRED FOR COMPLETE AND OPERABLE PLUMBING INSTALLATIONS AS SHOWN OR DESCRIBED ON THE DRAWINGS AND IN THESE SPECIFICATIONS.
- B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL NEW CONDITIONS AND MATERIALS WITHIN THE CONSTRUCTION AREA. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE OWNER'S SATISFACTION.
- C. OBTAIN ALL PERMITS, PAY ALL PERMIT FEES AND SCHEDULE ALL REQUIRED INSPECTIONS. COPIES OF ALL PERMITS AND INSPECTION CERTIFICATES SHALL BE FORWARDED TO THE OWNER FOR RECORD.
- D. THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISION 1 REQUIREMENTS APPLY TO THE WORK OF THIS SECTION.
- E. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO DETERMINE CONDITIONS AND THE EXTENT OF THE WORK. BY COMMENCING WORK, THE CONTRACTOR ACKNOWLEDGES HIS CONFIRMATION OF ALL CONDITIONS AS ACCEPTABLE WITH REFERENCE TO HIS CONTRACT, SCOPE OF WORK AND BID PRICE SUCH THAT NO ADDITIONAL COMPENSATION SHALL BE FORTHCOMING FOR UNFORESEEN EXISTING CONDITIONS.
- F. IN ALL AREAS SUBJECT TO FREEZING CONDITIONS, THE CONTRACTOR SHALL PROVIDE FREEZE PROTECTION FOR ALL DOMESTIC WATER PIPING INSTALLED UNDER HIS CONTRACT.
- G. ALL ELECTRICAL REQUIREMENTS SHALL BE COORDINATED WITH THE CONTRACTOR FOR ELECTRICAL WORK. THIS CONTRACTOR IS RESPONSIBLE FOR ALL LOW VOLTAGE WIRING FOR EQUIPMENT INSTALLED UNDER HIS CONTRACT. THE CONTRACTOR FOR ELECTRICAL WORK IS RESPONSIBLE FOR LINE VOLTAGE POWER WIRING ONLY.
- H. COLOR AND FINISH SELECTIONS FOR ALL MATERIALS, INCLUDING PAINTING OF PIPING, SHALL BE AS DIRECTED AND/OR APPROVED BY THE ARCHITECT.
- I. MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED AS IF SPECIFIED OR INDICATED ON THE DRAWINGS.
- J. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS FOR THE INSTALLATION, CONNECTION, EXTENSION OR MODIFICATION TO ALL UTILITY SERVICES WITH RESPECTIVE PROVIDERS INCLUDING PAYMENT OF ALL ASSOCIATED FEES.
- K. THE CONTRACTOR IS RESPONSIBLE FOR ALL PAINTING ASSOCIATED WITH CUTTING AND PATCHING. ALL PAINTING IN AREAS WITH COMPLETE FINISH RENOVATIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.

1.02 SUBMITTALS

- A. SUBMITTAL REQUIREMENTS SHALL BE COORDINATED WITH THE ARCHITECT AND AUTHORITIES HAVING JURISDICTION, UNLESS OTHERWISE DIRECTED, CONTRACTOR SHALL PROVIDE SUBMITTALS AS LISTED BELOW.
 1. PIPE AND FITTINGS
 2. VALVES
 3. HANGERS AND SUPPORTS
 4. PLUMBING PIPING LAYOUT
 5. TESTS
 6. PLUMBING FIXTURES
 7. WATER HEATERS & ACCESSORIES
 8. FLOOR DRAINS
 9. MIXING VALVES
 10. BACKFLOW PREVENTER
 11. ALL SCHEDULED PLUMBING EQUIPMENT
- B. SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED.
- C. THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS STAMP.
- D. REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL BE LIMITED TO THE INITIAL REVIEW AND A SECOND REVIEW OF ANY REQUIRED RESUBMITTED DATA. IF THE ENGINEER IS REQUIRED TO REVIEW SHOP DRAWINGS FOR A THIRD (OR MORE) SUBMISSION OF THE SAME ITEM, THE CONTRACTOR SHALL BE LIABLE FOR COMPENSATING THE ENGINEER FOR THESE SUBSEQUENT REVIEWS AS PER THE ENGINEER'S CURRENT HOURLY RATE SCHEDULE.
- E. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.
- F. SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.
- G. FOR ALL BELOW GRADE PIPING WHERE ACTUAL INSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.
- H. RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.

1.03 SUBSTITUTIONS

- A. ALL EQUIPMENT SHALL BE PRODUCTS OF THE SPECIFIED MANUFACTURER OR MANUFACTURERS. ALL BIDS SHALL BE BASED ON THE SPECIFIED MANUFACTURER OR MANUFACTURER'S EQUIPMENT. FOR SUBSTITUTIONS OF OTHER MANUFACTURER'S EQUIPMENT TO BE CONSIDERED, THE SUBSTITUTION MUST BE INDICATED PRIOR TO BIDDING WITH THE REASON FOR THE PROPOSED SUBSTITUTION IDENTIFIED, AND THE PROPOSED CREDIT TO THE OWNER INDICATED. THE ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF ANY PROPOSED SUBSTITUTIONS.
- B. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS.

1.04 DEFINITIONS

- A. FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.
- B. INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES.
- C. PROVIDE: TO FURNISH AND INSTALL.
- D. PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS.
- E. REFER TO THE INTERNATIONAL PLUMBING CODE FOR ADDITIONAL DEFINITIONS.

1.05 DRAWINGS

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

1.06 PRODUCTS

- A. SANITARY AND VENT PIPING:
 1. ABOVE GRADE PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM NO. OF BANDS PER COUPLING AS PER CISPI 301.
 2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN. THE DRAINAGE PIPING OF GREASE INTERCEPTOR, THE SLOPE OF THE PIPING SHALL BE NOT LESS THAN 1/4" PER FOOT.
 3. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.
- B. DOMESTIC WATER PIPING:
 1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE.
 2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
 3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
 4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
 5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
 6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH INTERNATIONAL ENERGY CONSERVATION CODE 2021, SECTION C403.12.3 REFER BELOW TABLE.
 7. AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2021, C404.6.1.1 DEMAND RECIRCULATION WATER SYSTEM SHALL HAVE CONTROLS THAT START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF USER OF FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF USER OF FIXTURE, OR SENSING THE FLOW OF HOT TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
 8. AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2021, C404.6.1 HEATED-WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH A CIRCULATION PUMP. THE SYSTEM RETURN PIPE SHALL BE A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE PUMP BASED ON THE IDENTIFICATION OF A DEMAND FOR HOT WATER WITHIN THE OCCUPANCY. THE CONTROLS SHALL AUTOMATICALLY TURN OFF THE PUMP WHEN THE WATER IN THE CIRCULATION LOOP IS AT THE DESIRED TEMPERATURE AND WHEN THERE IS NO DEMAND FOR HOT WATER. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).
 9. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2021 C404.5.1. THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

MINIMUM PIPE INSULATION THICKNESS						
FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)			
	CONDUCTIVITY BTU·IN./ (H²FT²°F)	MEAN RATING TEMPERATURE, °F	<1	1 to < 1½	1½ to < 4	4 to < 8
141-200	0.25-0.29	125	1.5	1.5	2	2
105-140	0.21-0.28	100	1.0	1.0	1.5	1.5
40-60	0.21-0.27	75	0.5	0.5	1.0	1.0

NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAW	OTHER FIXTURES
½"	2'	43'
¾"	0.5'	21'
1"	0.5'	13'
1½"	0.5'	8'
1½" OR LARGER	0.5'	4'

C. MIXING VALVES

1. VALVE BODY SHALL BE MADE OF CAST BRASS. THE INTERNAL COMPONENTS SHALL BE MADE OF BRASS OR STAINLESS STEEL.
2. TYPES A, C & D VALVES: VALVE SHUTS OFF IN FULL COLD POSITION AND MUST PASS THROUGH COLD RANGE BEFORE DELIVERING WARM AND/OR HOT WATER. TEMPERATURE LIMIT SET AT 110°F MAXIMUM DELIVERY TEMPERATURE. IF ONE SUPPLY SHOULD FAIL, THE OTHER WILL AUTOMATICALLY AND INSTANTLY SHUT DOWN. DELIVERY CAPACITY IS 50GPM @ 45 PSIG DIFFERENTIAL.
3. TYPES OF VALVES: TYPE A- THERMOSTATICALLY OPERATED BY MEANS OF BI-METALLIC STRIP, OR EXPANSION BELLOW. TYPE B-SINGLE HANDLE MECHANICAL MIXER, OR INDIVIDUAL HOT AND COLD CONTROL VALVES; TYPE C- PRESSURE BALANCING SHOWER VALVE/PISTON OPERATED MIXING VALVE; TYPE D- BALANCED PRESSURE OPERATION, WITH INTEGRAL DIAL THERMOMETER INDICATING DELIVERED WATER TEMPERATURE.
4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT-OFF SWITCH. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.

D. HANGERS AND SUPPORTS:

1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.
2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.
3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.
4. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
5. UNLESS OTHERWISE INDICATED OR REQUIRED BY AUTHORITIES HAVING JURISDICTION THE FOLLOWING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS AS REQUIRED BY THE BOCA NATIONAL BUILDING CODE, SECTION 1610.6.4: ALL EQUIPMENT AND MACHINERY, ALL NEW PIPING 2-1/2" AND LARGER (1-1/4" AND LARGER IN BOILER/MECHANICAL ROOMS) WITH HANGERS GREATER THAN 12" IN LENGTH FROM THE TOP OF PIPE TO THE STRUCTURE.
6. SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

E. GAS PIPING

5. ALL GAS PIPING WORK SHALL COMPLY WITH INTERNATIONAL FUEL GAS CODE 2021, LOCAL UTILITY GAS REQUIREMENTS.
6. FURNISH AND INSTALL ALL NECESSARY GAS PIPING TO ALL EQUIPMENT REQUIRING GAS SUPPLY.
7. PROVIDE A LUBRICATED GAS VALVE AT ALL CONNECTIONS TO EQUIPMENT.
8. ALL GAS PIPING AND INSTALLATION SHALL BE IN ACCORDANCE WITH RULES AND REGULATIONS OF LOCAL UTILITY GAS COMPANY AND OTHER AUTHORITIES HAVING JURISDICTION.
9. PROVIDE ADEQUATE SUPPORT FOR ALL PIPING.
10. GAS PIPING SHALL BE BLACK STEEL SCHEDULE 40 THREADED PIPE CONFORMING TO ANSI B36-20.
11. FITTINGS SHALL BE MALLEABLE IRON.

F. HOT WATER RE-CIRCULATING PUMP

1. IN-LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD-FREE BRONZE IMPELLER.
2. THE PUMP SHALL HAVE A GROUND AND POLISHED STEEL SHAFT WITH A HARDENED INTEGRAL THRUST COLLAR. THE SHAFT SHALL BE SUPPORTED BY TWO HORIZONTAL SLEEVE BEARINGS DESIGNED TO CIRCULATE OIL. THE PUMPS ARE TO BE EQUIPPED WITH A MECHANICAL SEAL WITH CARBON SEAL FACE ROTATING AGAINST CERAMIC SEAT. THE MOTOR SHALL BE NON-OVERLOADING AT ANY POINT ON PUMP CURVE.
3. DIRECT CONNECT PUMP TO ELECTRIC MOTOR WITH FLEXIBLE COUPLING. THE MOTOR SHALL BE OF THE DRIP-PROOF, SLEEVE BEARING, QUIET OPERATING, RUBBER-MOUNTED CONSTRUCTION. EQUIPMENT MOTOR WITH BUILT-IN THERMAL OVERLOAD PROTECTION.
4. INSTALL IN-LINE CIRCULATING PUMPS BETWEEN PIPE FLANGES IN PIPING SYSTEMS. INSTALL OVERHEAD PIPE SUPPORTS, BOTH SIDES OF IN-LINE PUMPS, INSTALLED IN HORIZONTAL PIPING RUNS.

H. VALVES:

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

I. SLEEVES AND ESCUTCHEONS:

1. SLEEVES THROUGH STRUCTURAL CONCRETE MEMBERS AND SLEEVES FOR WALLS BELOW GRADE AND FLOORS ON GRADE SHALL BE STANDARD WEIGHT GALVANIZED SCHEDULE 40 STEEL PIPE. SLEEVES THROUGH OTHER THAN STRUCTURAL COMPONENTS OF THE BUILDING SHALL BE 20 GAGE GALVANIZED SHEET METAL WITH LOCK SEAM JOINTS. USG THERMAFIBER SAFING INSULATION SHALL BE INSTALLED BETWEEN PIPE AND SLEEVE.
2. PIPE ESCUTCHEON PLATES SHALL BE INSTALLED WHERE EXPOSED PIPING PASSES THROUGH WALLS, CEILINGS, AND FLOORS AND SHALL BE MINIMUM 20 GAGE STEEL. PROVIDE CHROME PLATED ESCUTCHEON PLATES IN FINISHED AREAS.

J. DRAINAGE ACCESSORIES

1. GENERAL:

- a. INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.
- b. SECURE EXTERNAL COMPONENTS IN PLACE WITH VANDAL RESISTANT FASTENERS OR DEVICES WHICH CANNOT BE REMOVED WITHOUT SPECIAL TOOLS.

K. DEVICES:

- a. CLEANOUT & CLEANOUT PLUG
 - THREADED PIPE FITTING OR CAST IRON FERRULE WITH GAS TIGHT CLEANOUT PLUG
 - PLUG SHOULD BE CAST BRASS OR BRONZE, WITH THREADED END, AND RAISED OR COUNTERSUNK HEAD.
 - LUBRICATE THREADS OF CLEANOUT PLUG WITH ANTI-SEIZE LUBRICANT BEFORE FINAL INSTALLATION.
- b. CLEANOUT WALL PLATE
 - IT SHOULD BE ROUND, STAINLESS STEEL OR POLISHED CHROME PLATED BRONZE COVER PLATE WITH STAINLESS STEEL VANDAL RESISTANT FASTENER TO SECURE TO CLEANOUT PLUG.
 - CLEANOUT DECK PLATE
 - IT SHOULD BE STANDARD DUTY FLOOR CLEANOUT FITTING WITH COATED CAST IRON BODY; ROUND, POLISHED NICKEL BRONZE SCORRIATED TOP SECURED TO CLEANOUT PLUG WITH STAINLESS STEEL VANDAL RESISTANT FASTENER; THREADED HEIGHT ADJUSTMENT, CAST IRON HEAD, GAS TIGHT CLEANOUT PLUG, AND CONNECTION TO MATCH PIPING OPTION SELECTED.
- c. GRILLE FREE AREA SHOULD BE AT LEAST EQUAL TO CROSS-SECTION AREA OF PIPE TO WHICH CONNECTION MADE AND MADE OF POLISHED NICKEL BRONZE, WITH REMOVABLE GRATE, EITHER PERFORATED OR BAR TYPE. GRATE ATTACHED TO GRILLE BODY WITH VANDAL RESISTANT FASTENER.

L. INDIRECT WASTE FLOOR SINK

- a. IT SHOULD BE COMBINATION OF FUNNEL DRAIN AND P TRAP WITH POLISHED CHROME PLATED CAST BRASS CONSTRUCTION WITH 4" TOP DIA., 4" DEEP WITH THREADED OUTLET.

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

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

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

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

Q. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

S. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

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

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

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

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

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

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

AA. PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL FLUSHMETER VALVES AND QUICK-CLOSING VALVES.

AB. UNLESS OTHERWISE INDICATED, TRAPS SEALS AT ALL FLOOR DRAINS SHALL BE MAINTAINED BY AN APPROVED TRAP PRIMING DEVICE.

AC. MAINTAIN ALL REQUIRED AND RECOMMENDED CLEARANCES FOR ALL PLUMBING SYSTEM COMPONENTS AND EQUIPMENT.

AD. MAINTAIN MINIMUM 10'-0" CLEARANCE BETWEEN ALL PLUMBING V.T.R.S AND ALL OUTDOOR AIR INTAKES. OFFSET VENT STACKS AND STACK VENTS IF AND AS REQUIRED BELOW ROOF TO MAINTAIN SUCH CLEARANCE. WHETHER OR NOT SUCH OFFSET IS INDICATED ON THE DRAWINGS. PROVIDE ALL REQUIRED SEISMIC SUPPORTS.

2. INSTALLATION

2.01 GENERAL

A. ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF WARRANTIES.

B. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.

C. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.

D. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.

E. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN AND FERROUS END PIPE.

F. REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND OUTSIDE, BEFORE ASSEMBLY.

G. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND UNIONS.

H. COORDINATION WITH THE WORK OF OTHER TRADES IS REQUIRED. PROVIDE OFFSETS IN PIPING SYSTEMS OR MINOR DEVIATIONS TO THE INDICATED PIPE ROUTING IN ORDER TO COORDINATE THE PLUMBING WORK WITH THE WORK OF ALL OTHER TRADES AND THE GENERAL BUILDING CONDITIONS.

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

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

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

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

2.02 ABOVE GRADE

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

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

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

2.03 INSULATION (PIPE AND FITTINGS)

A. PIPING

COVER ALL HOT WATER PIPE WITH 1" THICK FOR PIPE SIZE UP TO 1 1/4" AND 1 1/2" THICK FOR PIPE SIZE 1 1/2" AND GREATER WITH MANVILLE MICRO-LOK AP-T PLUS FIBERGLASS INSULATION. COVER ALL COLD WATER PIPE WITH 1/2" THICK FOR PIPE SIZE UP TO 1 1/4" AND 1" THICK FOR PIPE SIZE 1 1/2" AND GREATER WITH 1" MANVILLE MICRO-LOK AP-T PLUS FIBERGLASS INSULATION. FITTINGS AND VALVES SHALL BE INSULATED. INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL INSULATION MATERIAL SHALL COMPLY WITH THE 2021 INTERNATIONAL BUILDING CODE REQUIREMENT OF A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50. ALL PIPE INSULATION SHALL COMPLY WITH 2021 INTERNATIONAL ENERGY CONSERVATION CODE.

3. TESTING

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

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

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

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

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

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

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

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

I. ALL EQUIPMENT WILL BE FACTORY TESTED.

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

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

L. TESTING REQUIREMENTS

- a. WATER SYSTEM SHALL BE TESTED AND PROVED TIGHT UNDER PRESSURE NOT LESS THAN THE WORKING PRESSURE OF THE SYSTEM.
- b. TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.
- c. THE PLUMBING CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FAILURES AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.

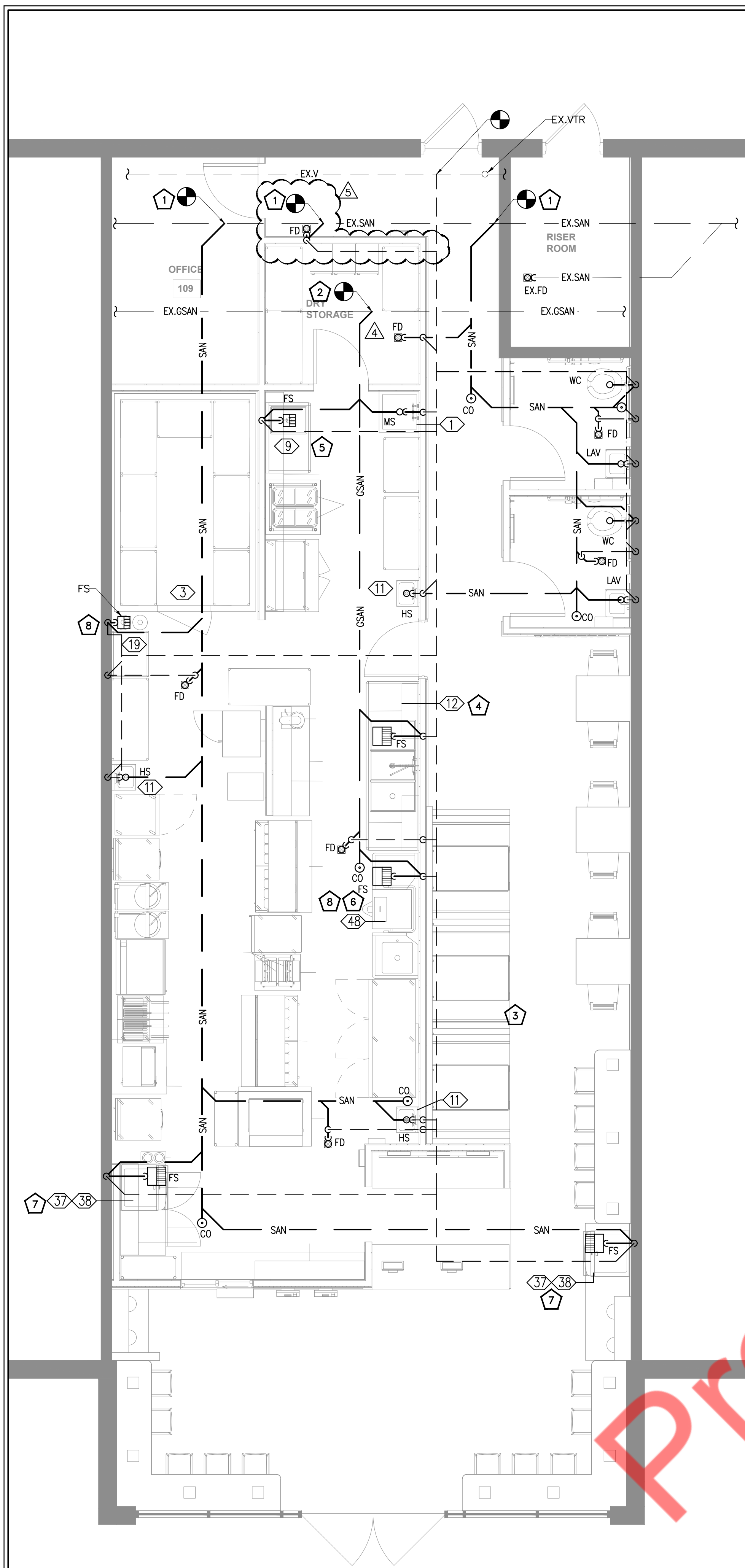
M. REFILL ENTIRE POTABLE HOT AND COLD WATER SUPPLY SYSTEM WITH CHLORINE SOLUTION (HTH OLIN CHEMICAL CORP.) AT A STRENGTH TO MEET STANDARDS OF THE DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION AS STIPULATED.

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

O. INSPECTION & TESTING SHALL BE AS PER 2021 INTERNATIONAL PLUMBING CODE SECTION 312.

4. WARRANTY

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



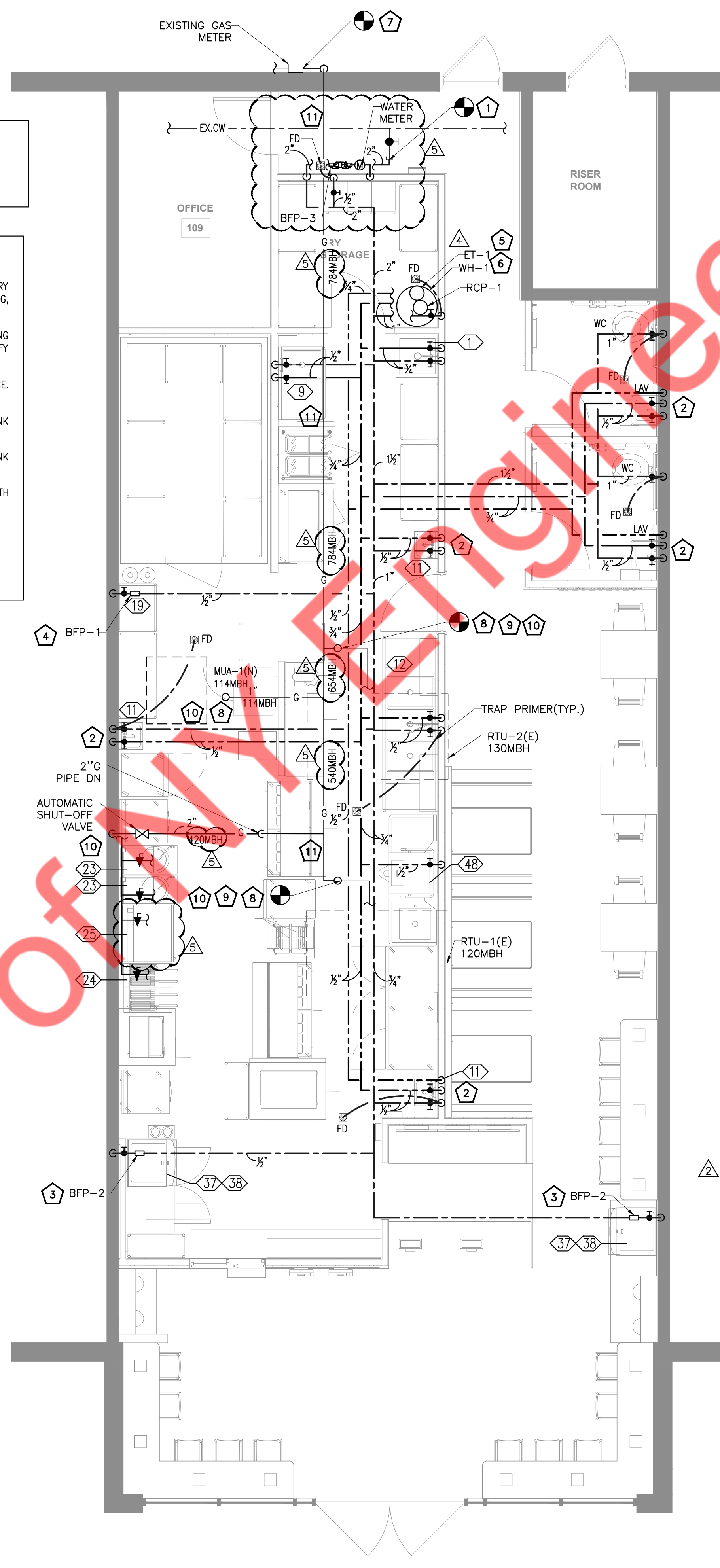
1 PLUMBING SANITARY AND VENT FLOOR PLAN
1/4" = 1'-0"

GENERAL NOTES:

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

SANITARY AND VENT KEYED NOTES:

- 1 CONNECT NEW 4" SANITARY WASTE PIPING TO EXISTING SANITARY LINE IN SPACE. CONTRACTOR TO FIELD VERIFY SIZE, ROUTING, LOCATION AND INVERT.
- 2 CONNECT NEW 4" GREASE SANITARY WASTE PIPING TO EXISTING GREASE SANITARY LINE IN SPACE. CONTRACTOR TO FIELD VERIFY SIZE, ROUTING, LOCATION AND INVERT.
- 3 CONNECT NEW 3" VENT PIPE TO EXISTING VENT LINE IN SPACE. CONTRACTOR TO FIELD VERIFY SIZE, ROUTING AND LOCATION.
- 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 WASTE FROM DISHWASHER TO FLOOR SINK WITH APPROVED AIR GAP.
- 7 INDIRECT WASTE FROM ICE MACHINE AND BEVERAGE DISPENSER TO FLOOR SINK WITH APPROVED AIR GAP.
- 8 CONDENSATE DRAIN PIPE FROM WALK IN COOLER EVAPORATOR DISCHARGE TO FLOOR SINK WITH APPROVED AIR GAP.



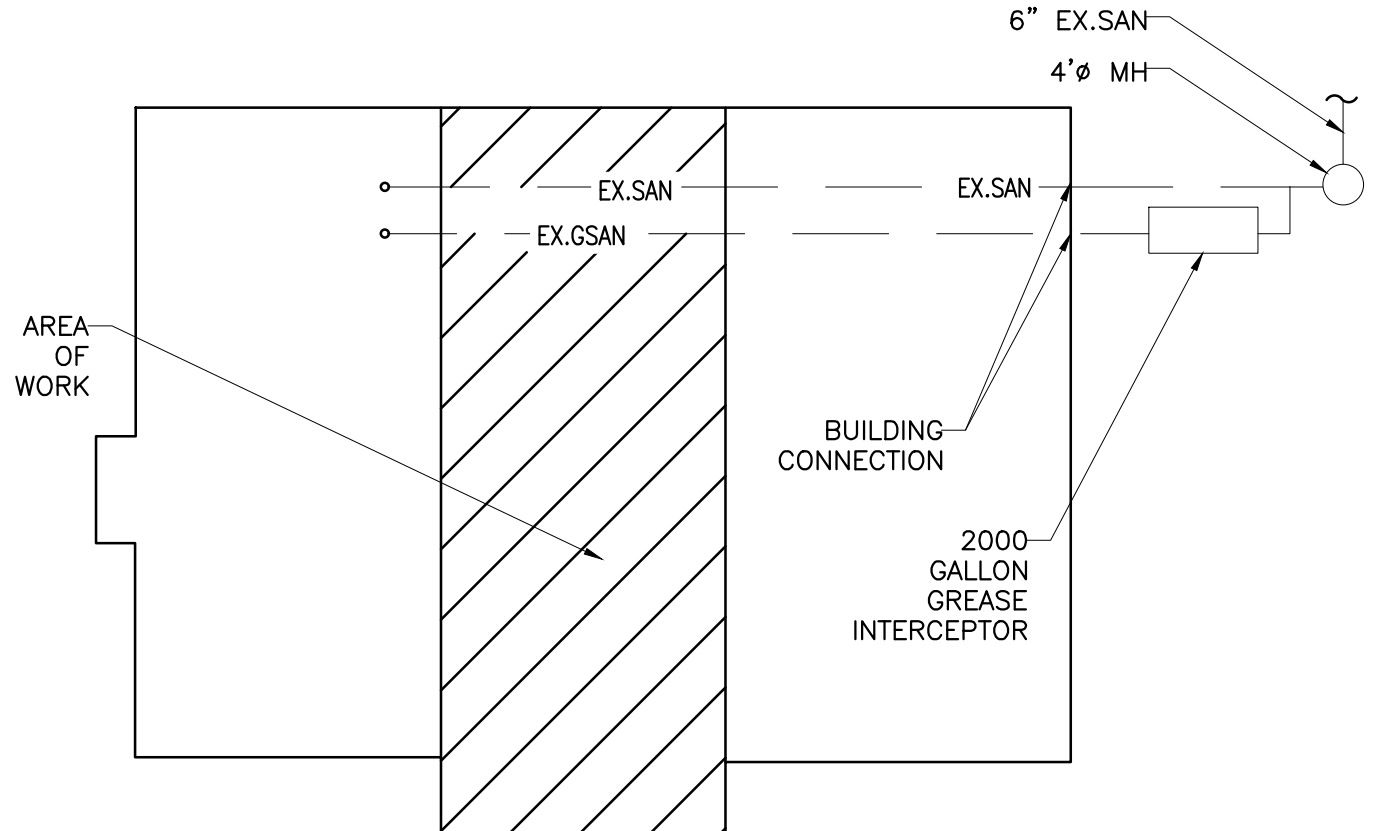
2 PLUMBING WATER AND GAS FLOOR PLAN
1/4" = 1'-0"

GENERAL NOTES:

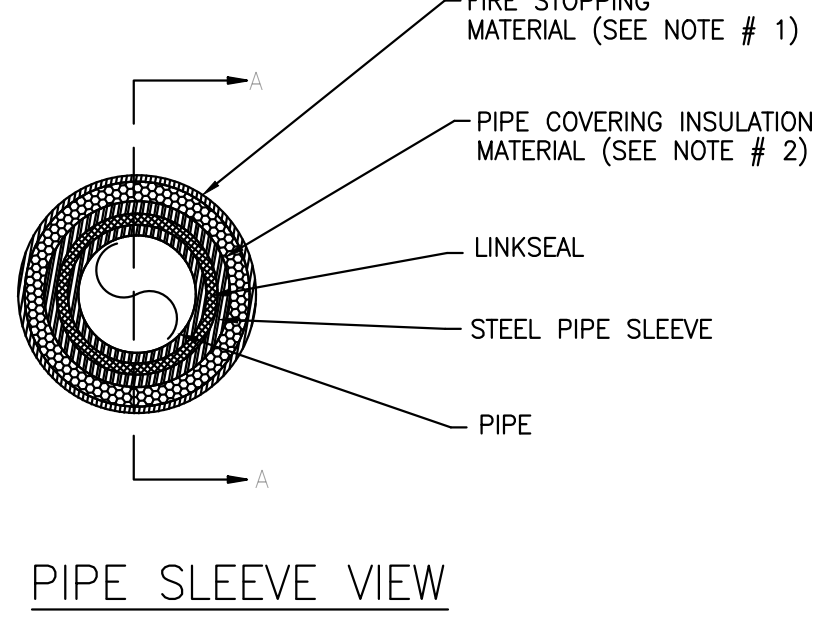
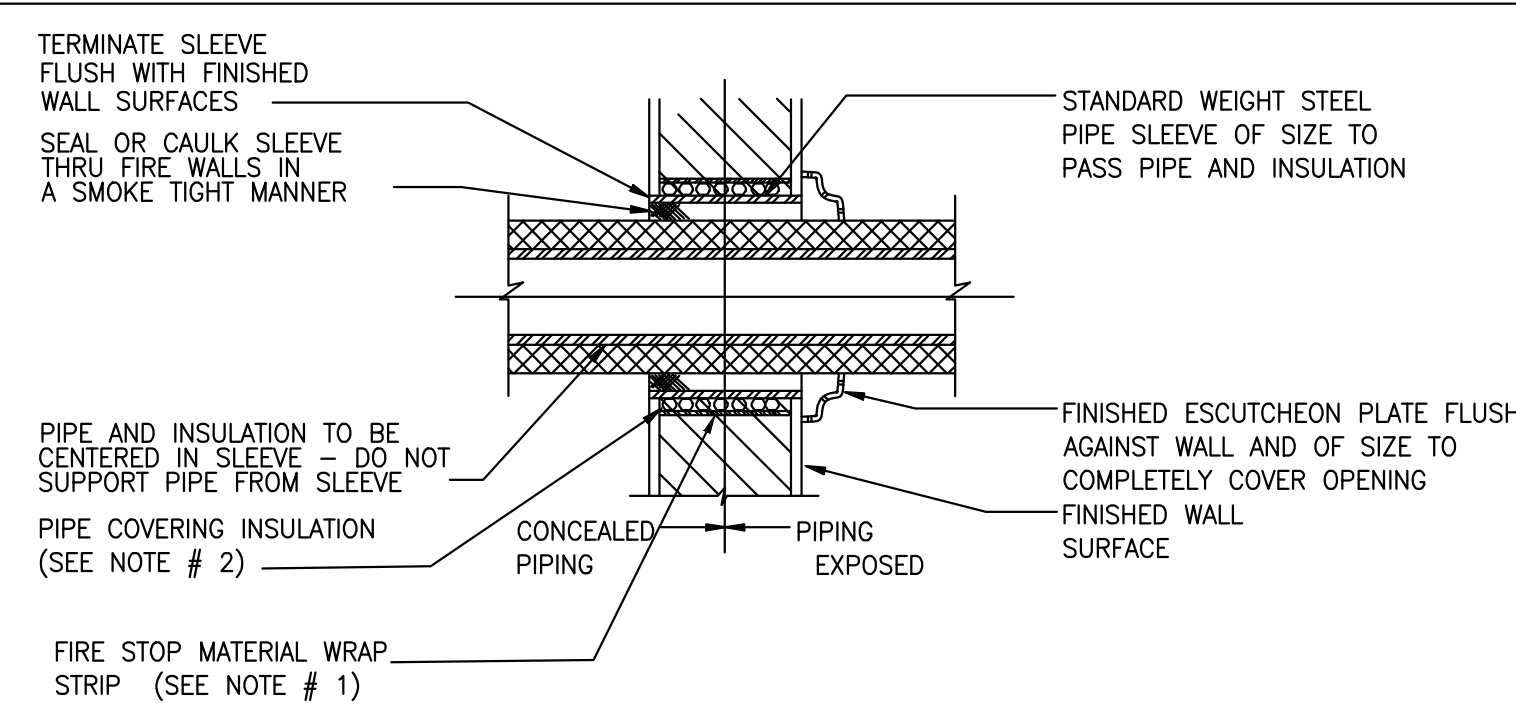
1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER 2021 INTERNATIONAL ENERGY CONSERVATION CODE (REFER SHEET P1.0)
2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
4. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
6. PROVIDE TRAP PRIMER FOR FLOOR DRAIN AS PER LOCAL JURISDICTION

DOMESTIC WATER AND GAS KEYED NOTES:

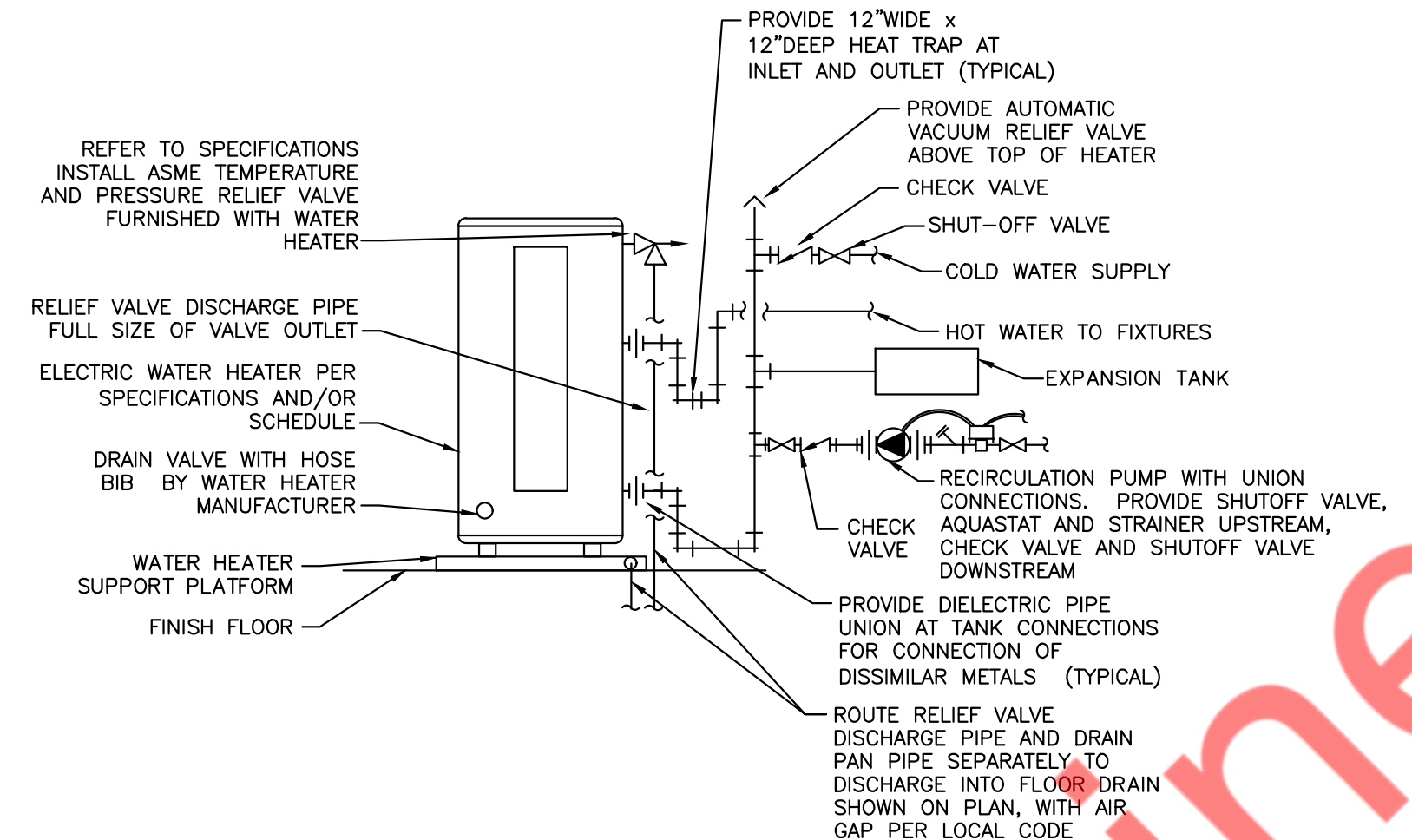
- 1 ROUTE NEW 2" CW PIPING WITH SHUT OFF VALVE AND TIE-INTO THE EXISTING 2" WATER STUB-OUT IN SPACE. CONTRACTOR TO FIELD VERIFY EXISTING WATER SERVICE SIZE, ROUTING AND LOCATION.
- 2 PROVIDE A TEMPERING VALVE FOR LAVATORIES AND HAND SINK. POWER HYDROGUARD SERIES LFLM495, ASSE. 1070 OR EQUAL. SET TEMPERATURE TO A MAXIMUM OF 110° F.
- 3 PROVIDE ASSE 1012 WATTS LF9D BACKFLOW PREVENTER OR EQUIVALENT FOR ICE MACHINE.
- 4 PROVIDE ASSE 1022 WATTS SD-3 BACKFLOW PREVENTER OR EQUIVALENT FOR BAG IN BOX SODA SYSTEM.
- 5 ROUTE T&P RELIEF TO DRAIN IN FLOOR DRAIN.
- 6 FLOOR MOUNTED ELECTRIC STORAGE TANK WATER HEATER. CONTRACTOR TO FIELD VERIFY AVAILABLE SPACE AND PROVIDE ALL ACCESSORIES REQUIRED FOR SATISFACTORILY WORKING AS PER SITE CONDITION.
- 7 CONNECT NEW 2" GAS LINE TO EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY EXISTING GAS METER CAPACITY IS EQUAL TO OR GREATER THAN (784 CFH) UPGRADE GAS METER IF REQUIRED. COORDINATE ALL WORK WITH UTILITY COMPANY AND LANDLORD.
- 8 EXTEND GAS LINE TO MUA-1(N), RTU-1(E) AND RTU-2(E) PROVIDE SHUTOFF VALVE, UNION AND DIRTLEG.
- 9 CONNECT NEW 1" GAS LINE TO THE EXISTING GAS LINE. CONTRACTOR FIELD VERIFY CONDITION OF EXISTING GAS PIPING AND EXISTING CONNECTION RTU-1(E) AND RTU-2(E) REPLACED IF REQUIRED.
- 10 CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR GAS FIRED MUA-1(N), RTU-1(E), RTU-2(E) MUA-1. GAS-FIRED KITCHEN EQUIPMENT.
- 11 NATURAL GAS PIPE RUNNING ON ROOF.



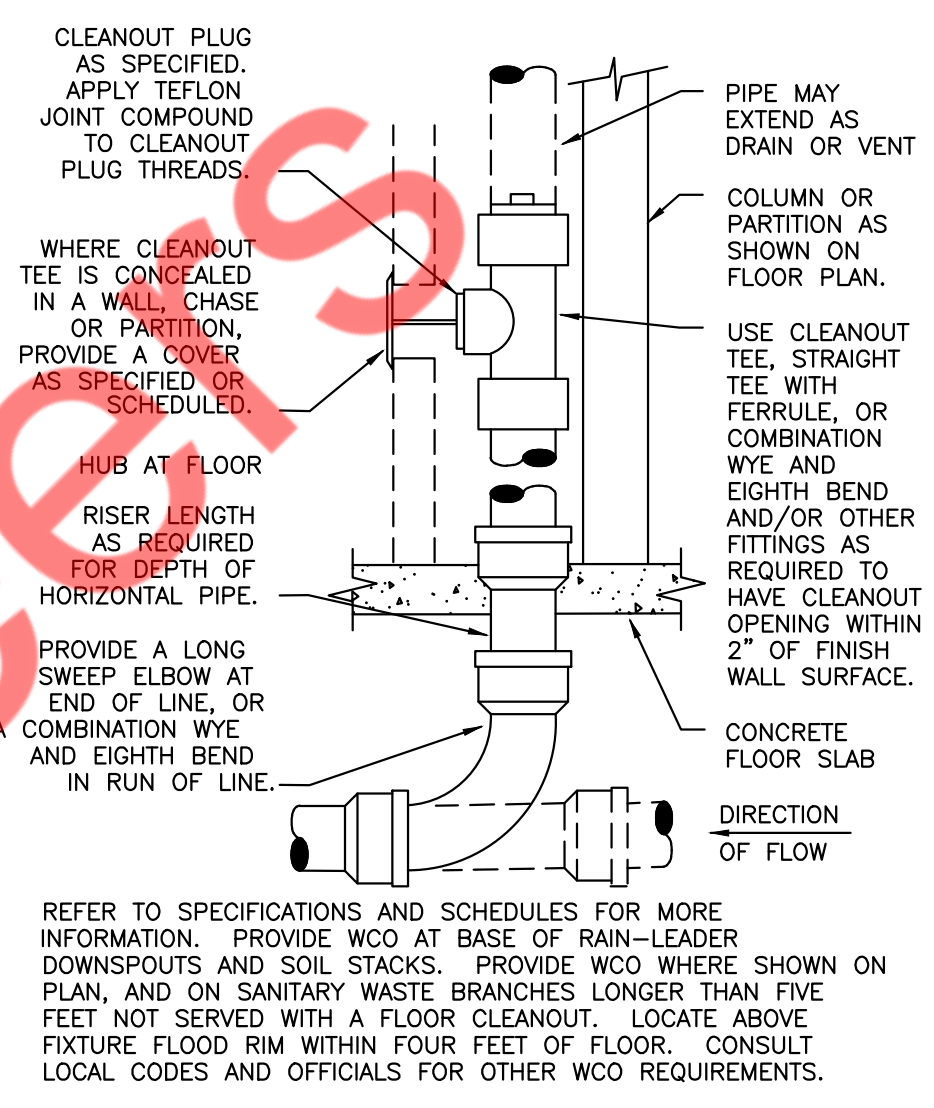
3 PLUMBING SITE PLAN
NTS



- NOTES:**
- FIRESTOP MATERIAL WRAP STRIP SHALL BE 1/4" THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL SUPPLIED IN 2 IN. WIDE STRIPS AND WRAP AROUND THE PIPE AS PER UL MATERIAL LISTED 3M COMPANY FS-195+ OR FILL CAVITY WITH CAULK OR SEALANT MIN. 1/4" DIA. CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED OF THE WRAP STRIP LAYER APPROX. 3/4" FROM WALL SURFACE. AS PER UL LISTED 3M COMPANY CP25WB+, IC 15WB+, FIRE DAM 150+CAULK.
 - PIPE COVERING INSULATION SHALL BE 2" THICK HOLLOW CYLINDRICAL HEAVY DENSITY GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKETED. AS PER UL CLASSIFICATION AND MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.
 - DETAILS ARE ONLY DIAGRAMMATIC WITH RESPECT TO PENETRATION PROTECTION REQUIRED IN ACCORDANCE WITH SECTION 714 OF 2020 FLORIDA BUILDING CODE, 7TH EDITION. A LISTED PENETRATION FIRESTOP SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THE LISTING CRITERIA.



REFER TO SPECIFICATIONS, SCHEDULES AND NOTES FOR MORE INFORMATION. PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. VERIFY CONNECTION SIZES AND LOCATIONS PER MANUFACTURER'S REQUIREMENTS. REFER TO FLOOR PLANS FOR PIPE SIZES. PROVIDE SEISMIC STRAP OR BRACING IF/AS REQUIRED BY LOCAL AUTHORITIES AND/OR SEPARATE DETAIL. POWER WIRING AND DISCONNECT SWITCH ARE SPECIFIED BY ELECTRICAL. INTERLOCK OF AQUASTAT WITH RECIRCULATION PUMP IS SPECIFIED BY ELECTRICAL IF REQUIRED.

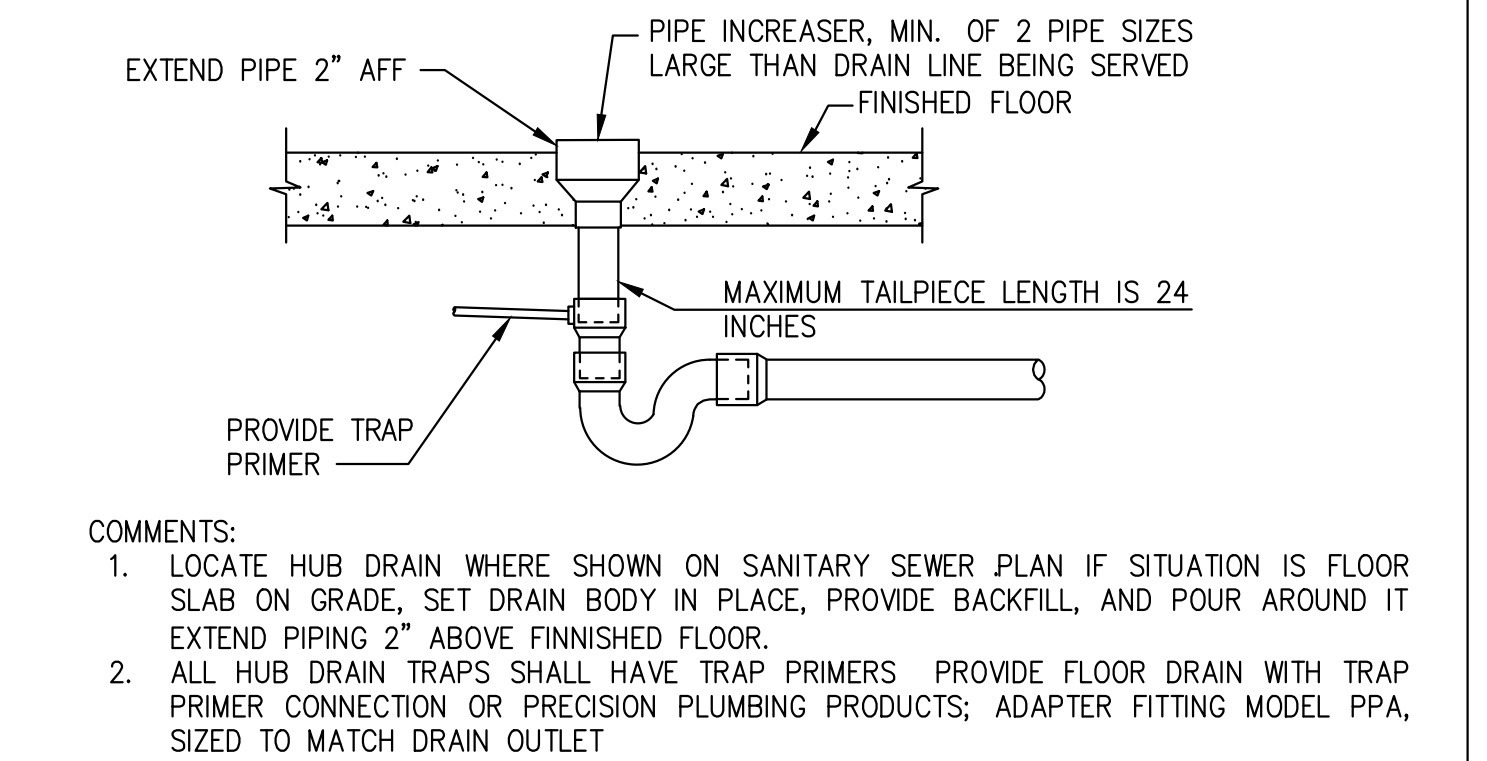


REFER TO SPECIFICATIONS AND SCHEDULES FOR MORE INFORMATION. PROVIDE WCO AT BASE OF RAIN-LEADER DOWNSPOUTS AND SOIL STACKS. PROVIDE WCO WHERE SHOWN ON PLAN, AND ON SANITARY WASTE BRANCHES LONGER THAN FIVE FEET NOT SERVED WITH A FLOOR CLEANOUT. LOCATE ABOVE FIXTURE FLOOR RIM WITHIN FOUR FEET OF FLOOR. CONSULT LOCAL CODES AND OFFICIALS FOR OTHER WCO REQUIREMENTS.

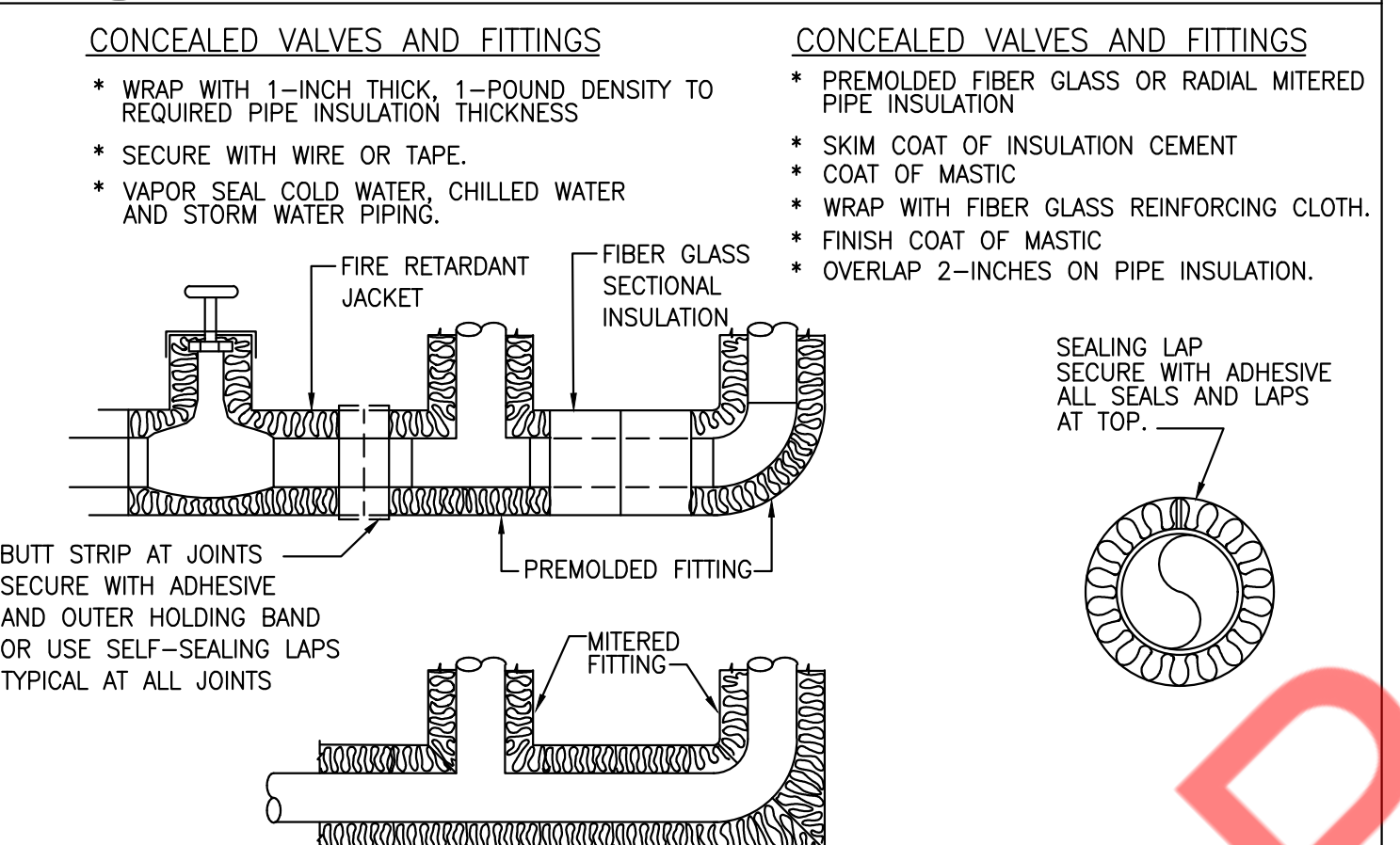
1 PIPE SLEEVE THRU WALL SECTION
P3.0 N.T.S

2 ELECTRIC WATER HEATER (FLOOR MOUNTED) DETAILS
P3.0 N.T.S

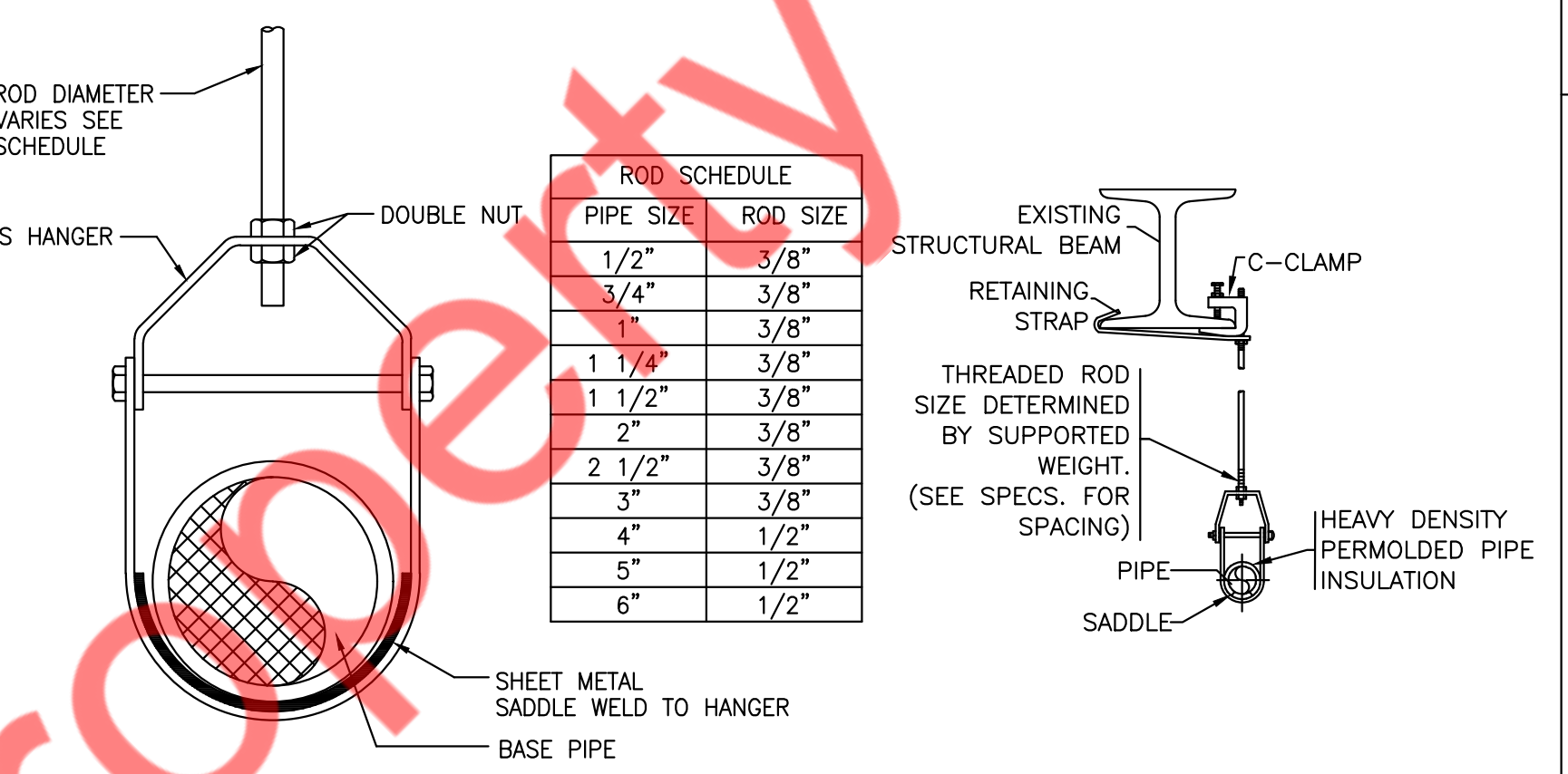
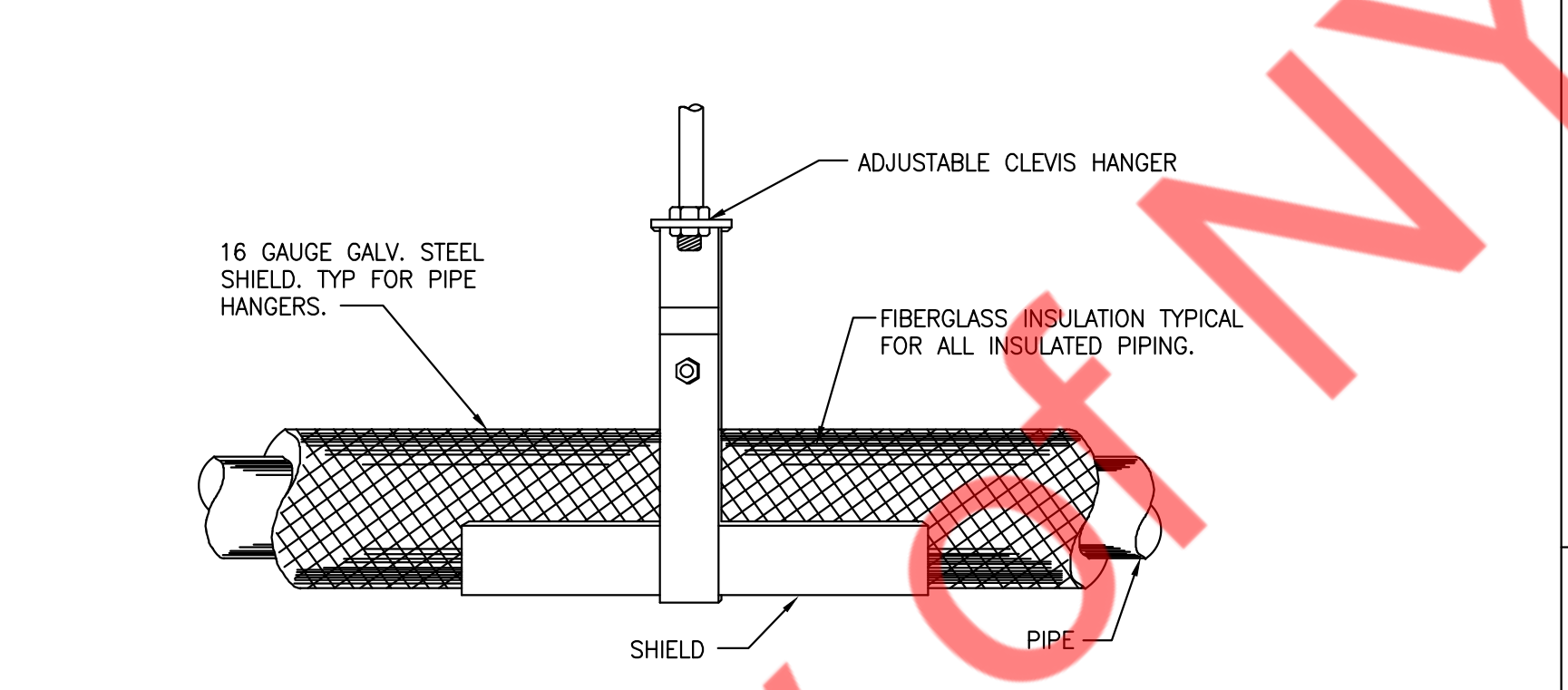
3 WALL CLEANOUT DETAIL
P3.0 N.T.S



4 HUB DRAIN DETAILS
P3.0 N.T.S

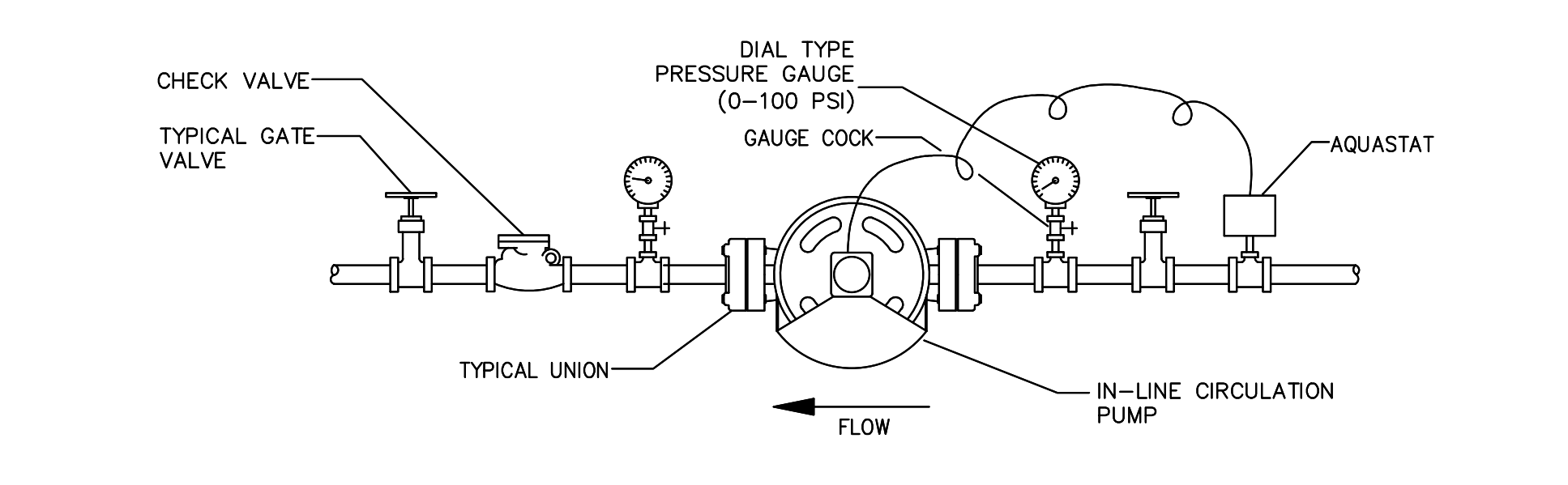


5 INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS
P3.0 N.T.S

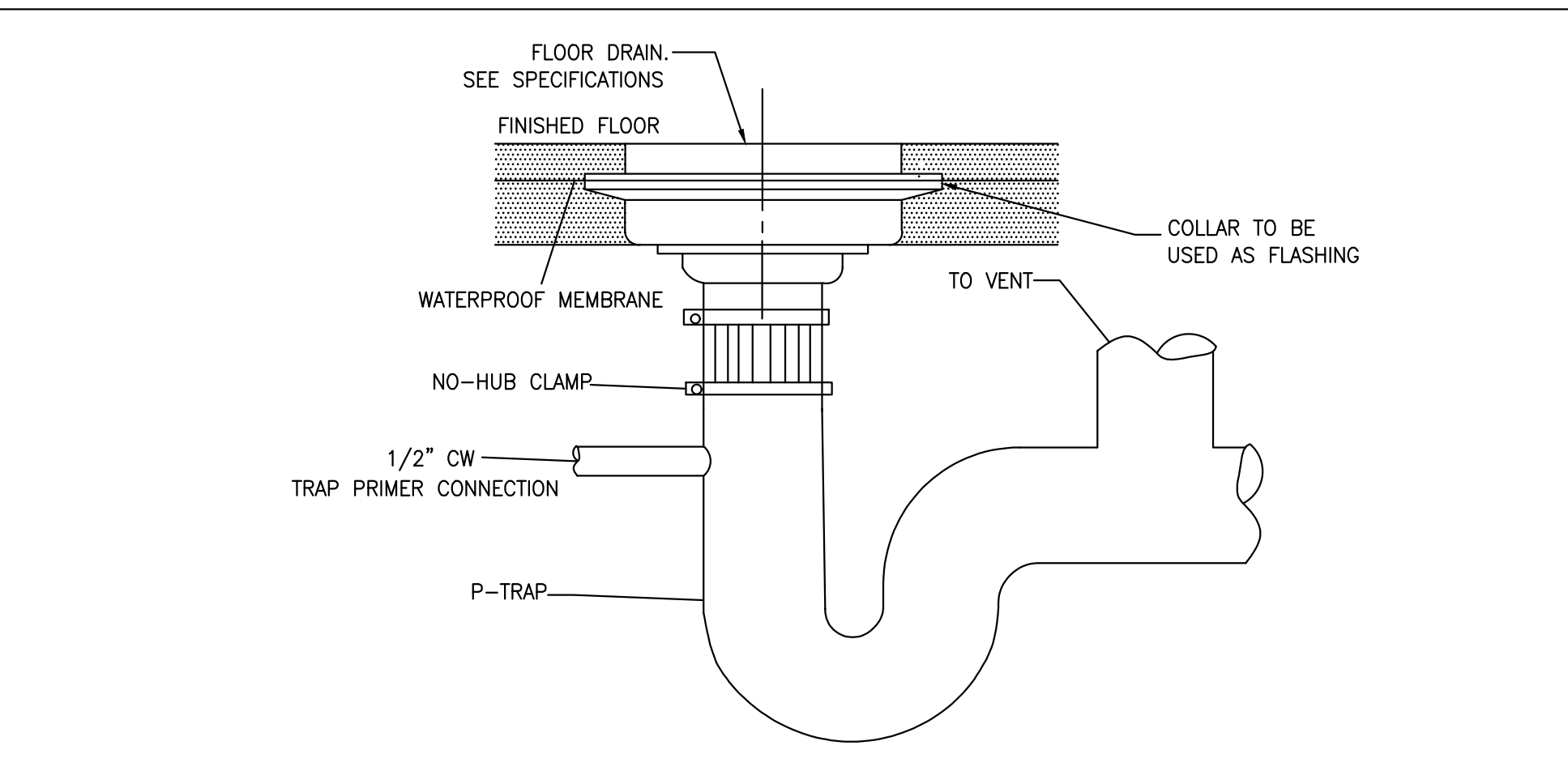


ROD SCHEDULE	
PIPE SIZE	ROD SIZE
1/2"	3/8"
3/4"	3/8"
1"	3/8"
1 1/4"	3/8"
1 1/2"	3/8"
2"	3/8"
2 1/2"	3/8"
3"	3/8"
4"	1/2"
5"	1/2"
6"	1/2"

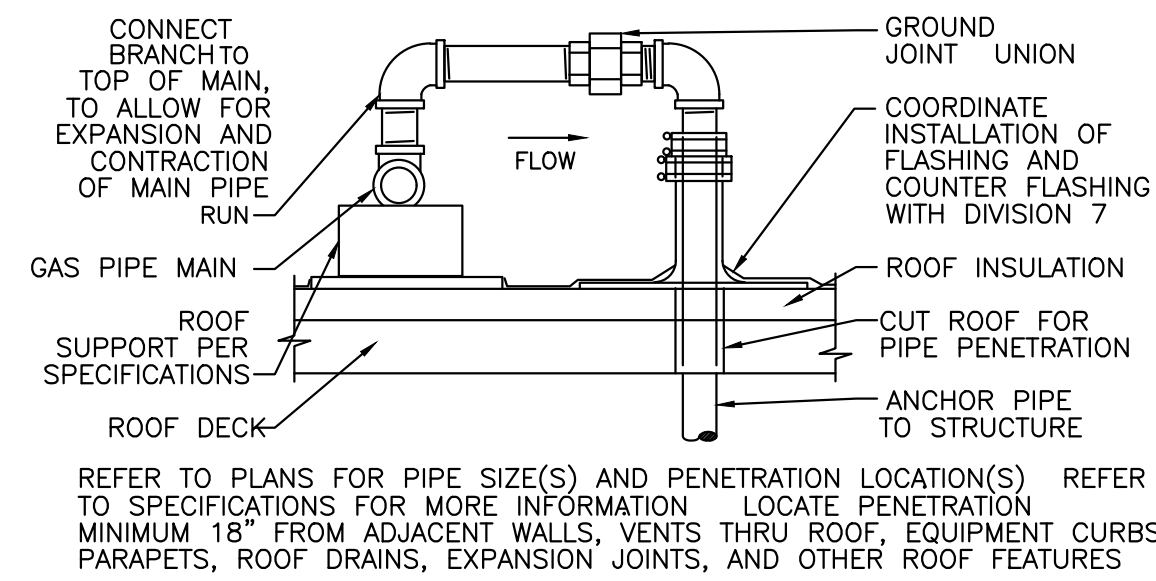
6 HANGER DETAIL
P3.0 N.T.S



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

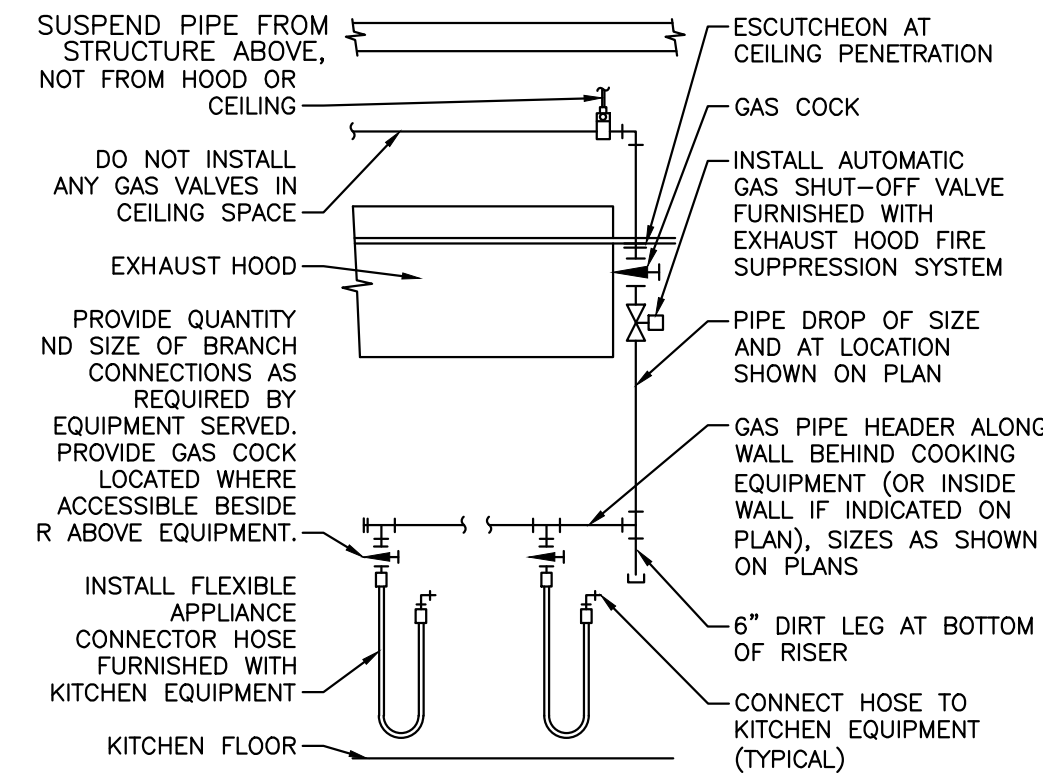


8 FLOOR DRAIN DETAIL
P3.0 N.T.S



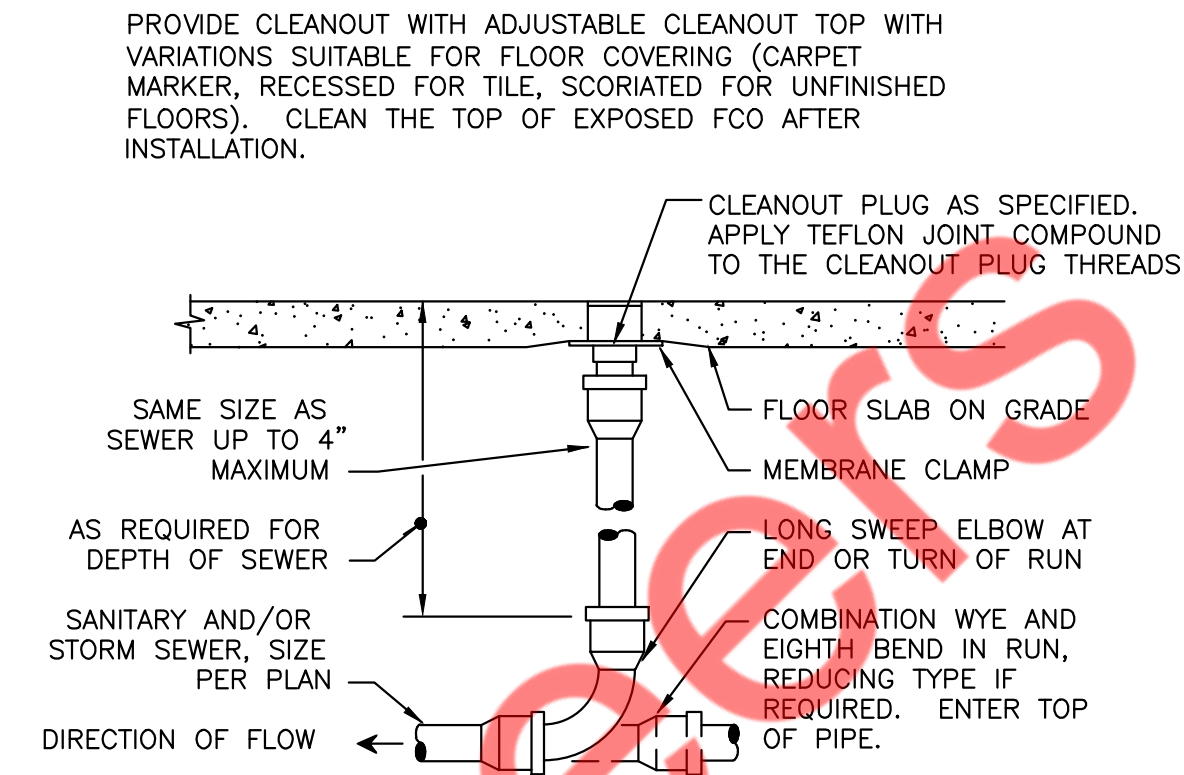
REFER TO PLANS FOR PIPE SIZE(S) AND PENETRATION LOCATION(S). REFER TO SPECIFICATIONS FOR MORE INFORMATION. LOCATE PENETRATION MINIMUM 18" FROM ADJACENT WALLS, VENTS THRU ROOF, EQUIPMENT CURBS, PARAPETS, ROOF DRAINS, EXPANSION JOINTS, AND OTHER ROOF FEATURES.

1 GAS PIPE ROOF PENETRATION
P3.1 N.T.S.



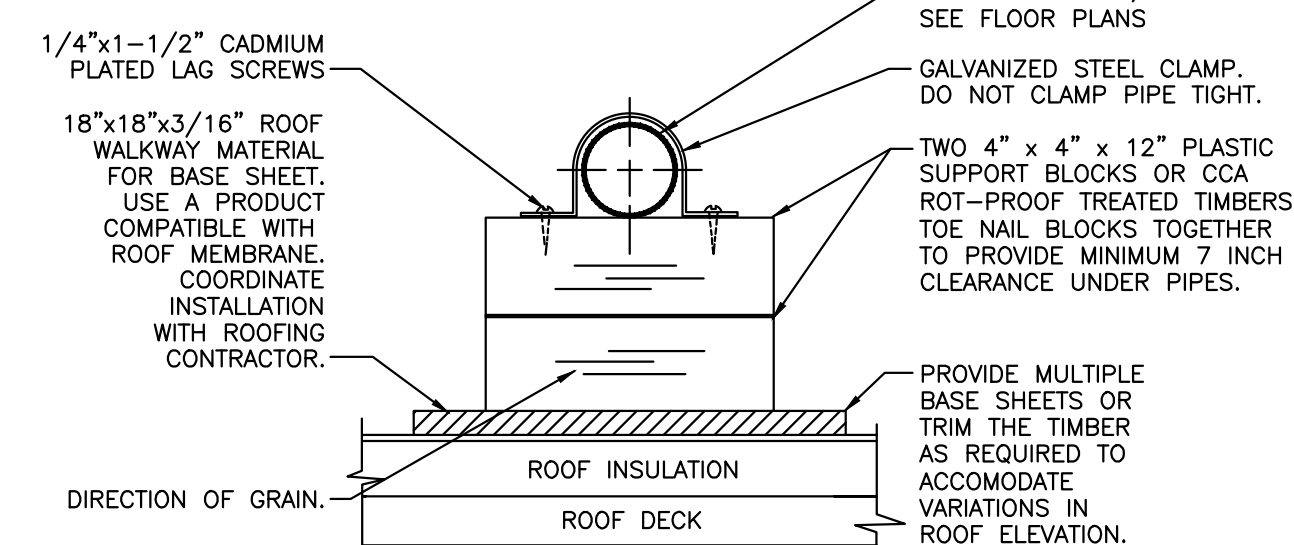
REFER TO SPECIFICATIONS FOR MORE INFORMATION ABOUT PIPE, FITTINGS, AND CONNECTIONS. PIPING ARRANGEMENT SHOWN IS SCHEMATIC; ADJUST TO SUIT FIELD CONDITIONS. IF EXPOSED, ATTACH RISER AND HEADER TO WALL WITH 1" CLEARANCE BEHIND PIPE (UNLESS INSTALLED INSIDE WALL AS SHOWN ON PLANS). MAKE FINAL CONNECTION TO EQUIPMENT AS RECOMMENDED BY MANUFACTURER. INSTALL ANY GAS PRESSURE REGULATORS FURNISHED BY FOOD SERVICE EQUIPMENT CONTRACTOR.

2 COOKING APPLIANCE GAS PIPE
P3.1 N.T.S.



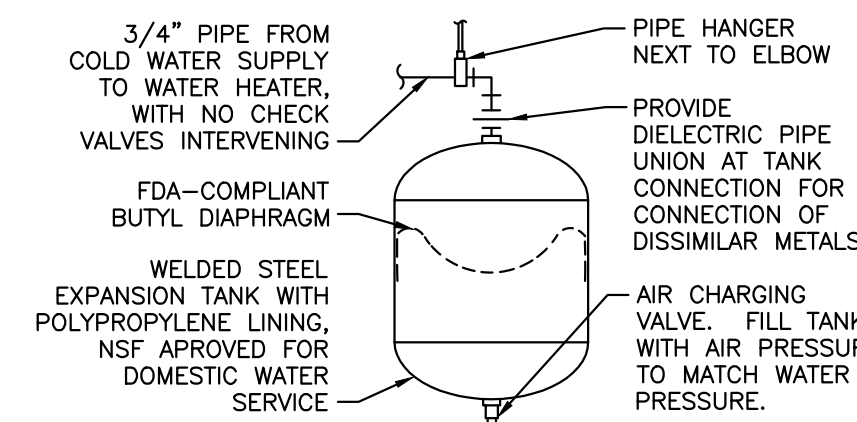
REFER TO SPECIFICATIONS AND SCHEDULE FOR MORE INFORMATION. LOCATE AT BUILDING EXIT, AT ENDS OF RUNS, AT TURNS OF PIPE GREATER THAN 45° AT 50' INTERVALS ON STRAIGHT RUNS, AND/OR WHERE SHOWN ON PLANS AND RISERS. PROVIDE BACKFILL PER ARCHITECTURAL SPECIFICATIONS. LOCATE CLEANOUT WHERE THERE IS 18" CLEAR AROUND, FOR ACCESSIBILITY. CONSULT LOCAL CODES AND OFFICIALS FOR OTHER REQUIREMENTS.

3 FLOOR CLEANOUT
P3.1 N.T.S.



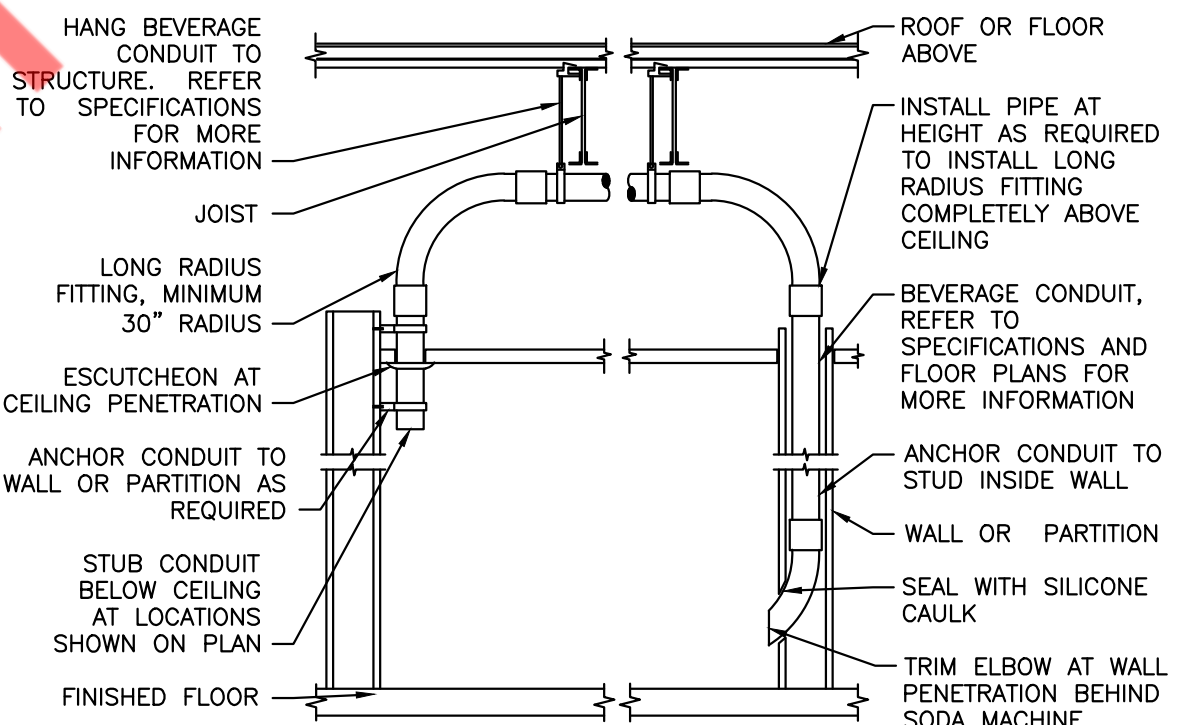
LOCATE SUPPORTS AT 4' SPACING FOR PLASTIC PIPE, & AT FOLLOWING SPACING FOR METAL PIPE: 5"=16' 4"=14' 3"=12' 2-1/2"=11' 2"=10' 1-1/2"=9' 1-1/4"=8' 1"=7' 3/4"=6'. PLACE A SUPPORT AS CLOSE AS POSSIBLE TO EACH ELBOW AND TEE. PLACE BASE SHEETS ON ROOFING BEFORE GRAVEL IF ANY. SET BLOCKS FREE ON BASE SHEETS. STACK BLOCKS AND NAIL THEM TOGETHER WHERE REQUIRED TO ELEVATE PIPING. INSTALL PIPE TO ALLOW FOR EXPANSION AND CONTRACTION.

4 SUPPORT OF PIPE ON ROOF
P3.1 N.T.S.



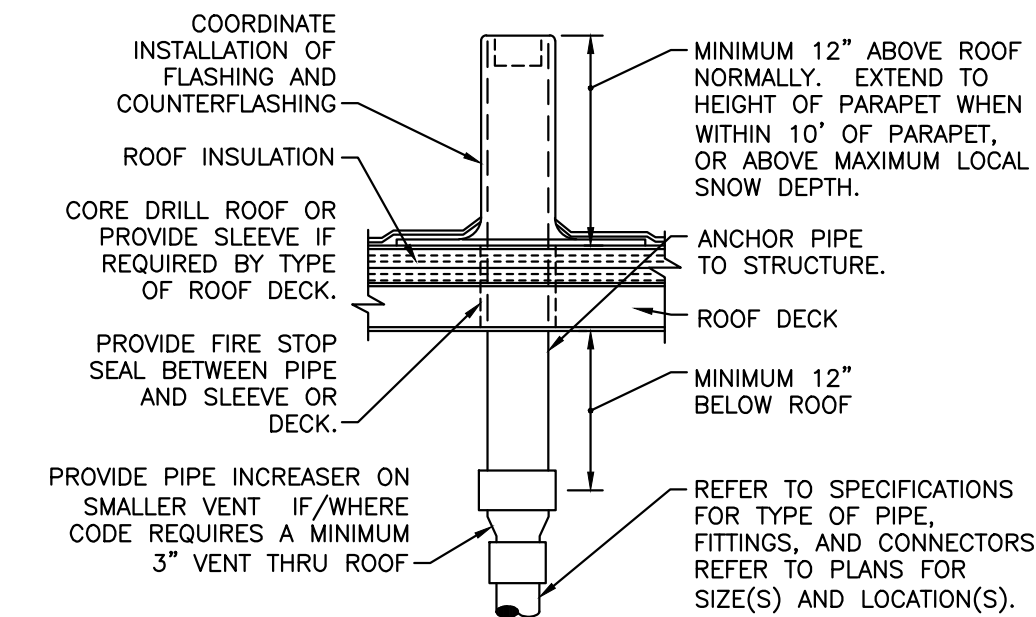
PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION PROCEDURE. VERIFY PROPER OPERATION WHEN INSTALLED. PROVIDE SEISMIC STRAP OR BRACING WHEN REQUIRED BY LOCAL AUTHORITIES.

5 EXPANSION TANK
P3.1 N.T.S.



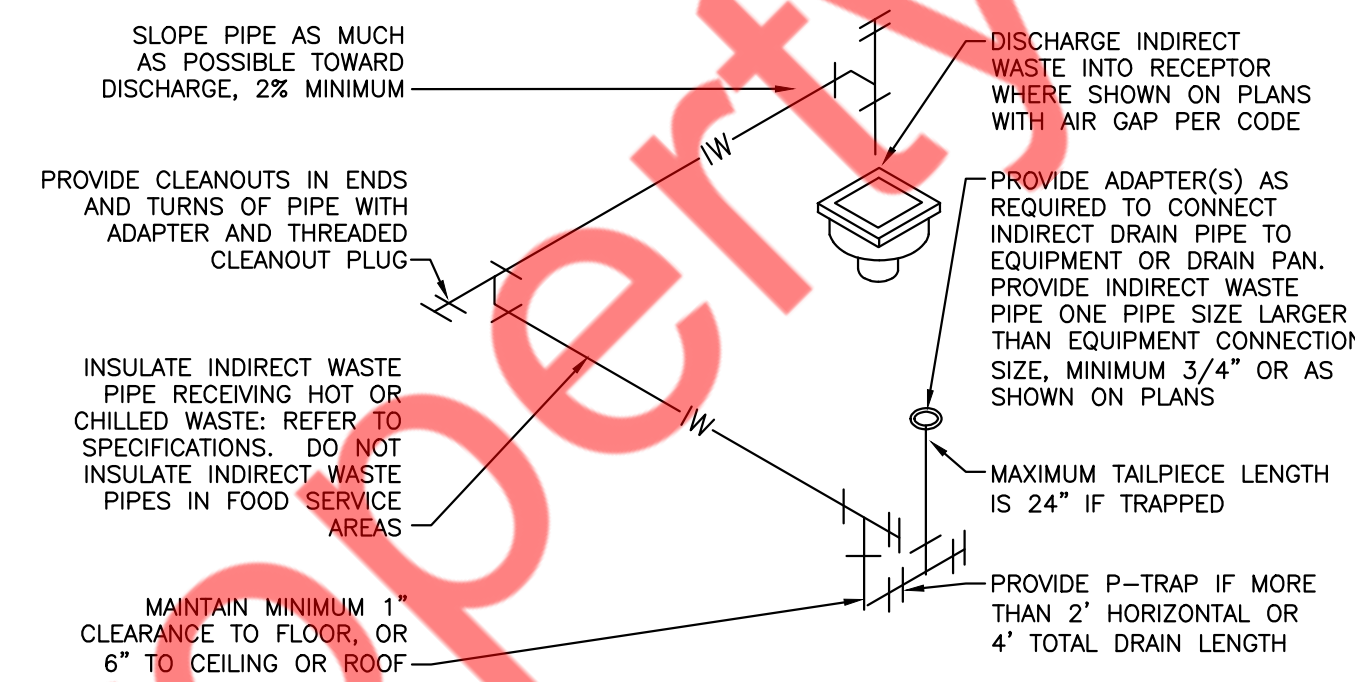
REFER TO SPECIFICATIONS FOR CONDUIT MATERIAL. REFER TO SCHEDULES AND NOTES FOR MORE INFORMATION. PIPING ARRANGEMENT SHOWN IN SCHEMATIC. VERIFY ALL CONNECTION SIZES AND LOCATIONS WITH KITCHEN EQUIPMENT MANUFACTURER'S DRAWINGS. ADJUST TO SUIT FIELD CONDITIONS. COORDINATE INSTALLATION IN CEILING WITH OTHER TRADES. REFER TO FLOOR PLANS FOR CONDUIT SIZES. USE MINIMUM QUANTITY OF FITTINGS REQUIRED TO RUN CONDUIT AS DIRECTLY AS POSSIBLE. BEVERAGE TUBE BUNDLE WILL BE FURNISHED AND INSTALLED BY OTHERS.

6 BEVERAGE CONDUIT ABOVE CEILING
P3.1 N.T.S.



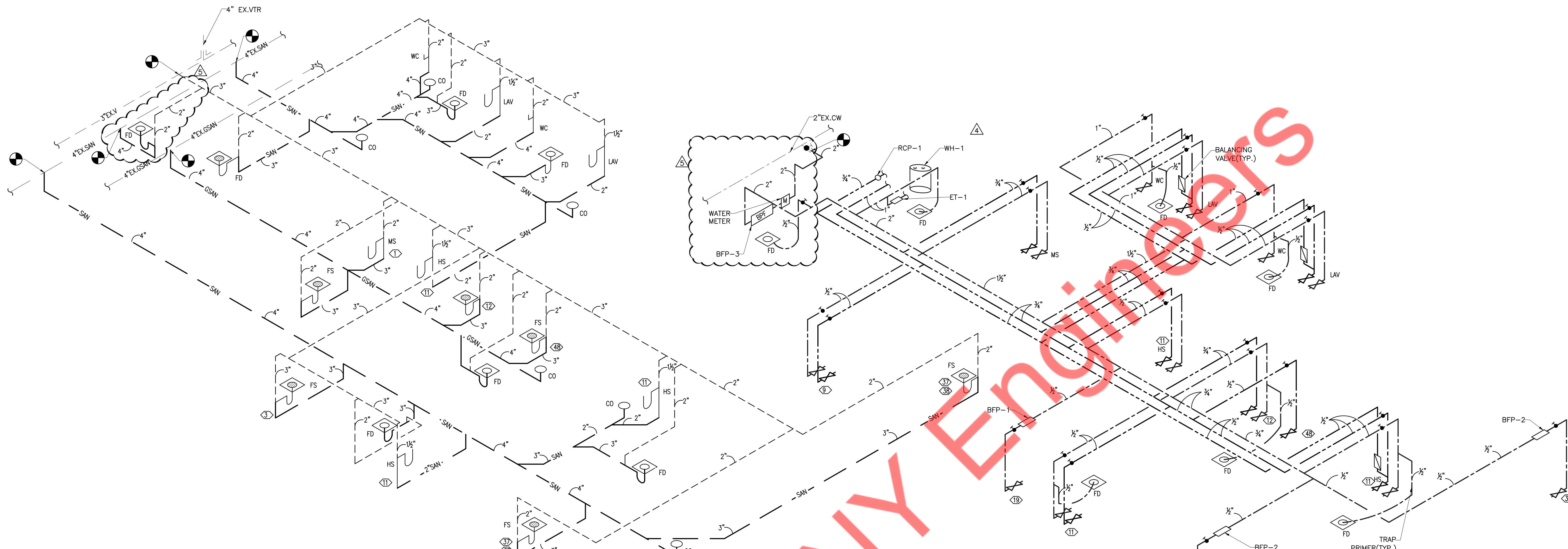
LOCATE VTR MINIMUM THREE FEET FROM PROPERTY LINE, TEN FEET HORIZONTAL OR THREE FEET VERTICAL ABOVE ANY BUILDING OPENING OR FRESH AIR INTAKE, TWENTY FIVE FEET FROM ANY OPENING OR FRESH AIR INTAKE IN MEDICAL FACILITIES AND ONE FOOT FROM ANY VERTICAL SURFACE. REFER TO LOCAL CODES FOR OTHER VENT TERMINATION REQUIREMENTS. LOCATE VTR MINIMUM 18" FROM ADJACENT WALL, PARAPET, EXPANSION JOINT, ROOF DRAIN, EQUIPMENT CURB, OR OTHER ROOF FEATURE. OFFSET IN CEILING SPACE WHERE REQUIRED TO MEET THESE CONDITIONS. INSULATE LAST SIX FEET OF VENT PIPE INSIDE BUILDING PER SPECIFICATIONS.

7 VENT THROUGH ROOF DETAILS
P3.1 N.T.S.

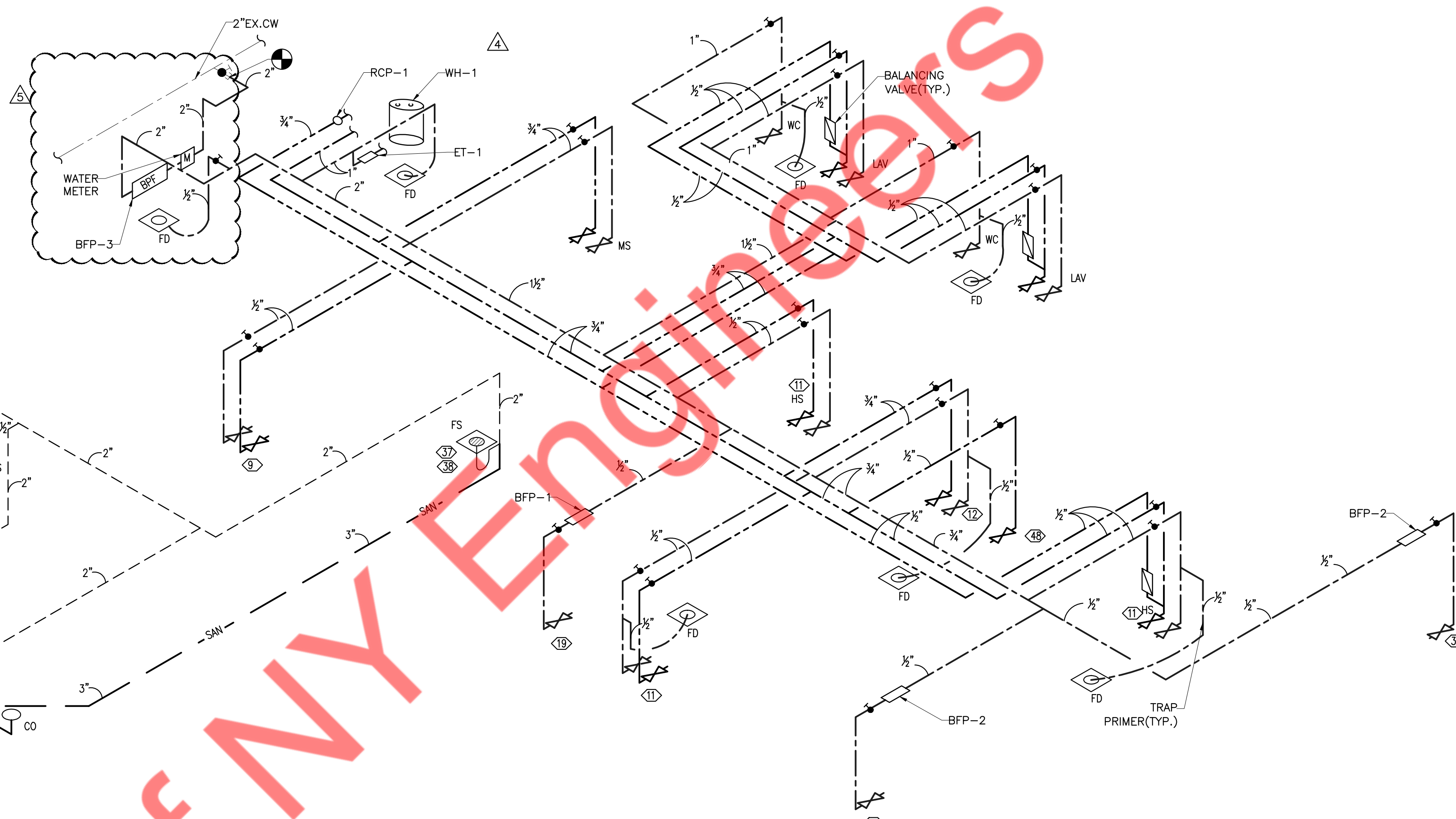


ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. PROVIDE CONNECTIONS SHOWN IN EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFER TO SPECIFICATIONS FOR PIPE AND FITTING MATERIALS, AND INSTALLATION OF HANGERS AND SUPPORTS. PROVIDE DIELECTRIC UNION IF CONNECTING DISSIMILAR METALS. DO NOT COMBINE INDIRECT DRAIN PIPES WITH CONDENSATE DRAIN PIPES. DO NOT PROVIDE TRAP OR VENT ON INDIRECT DRAINS RECEIVING DISCHARGE UNDER PRESSURE. PROVIDE CLEANOUT IN TRAP FOR NON-CLEAR LIQUID WASTE ONLY. FOOD SERVICE EQUIPMENT INDIRECT WASTE: INSTALL SEPARATE INDIRECT WASTE FROM DIFFERENT EQUIPMENT. DO NOT COMBINE. SECURELY ATTACH INDIRECT DRAINS TO THEIR EQUIPMENT WITH BRACKETS OR SPLIT RING PIPE CLAMPS. REFER TO SPECIFICATIONS. LOOSE, DANGLING, OR PIPES ON THE FLOOR SHALL NOT BE ACCEPTED. INSTALL INDIRECT DRAINS HIGH AS POSSIBLE TO FACILITATE CLEANING UNDER KITCHEN EQUIPMENT.

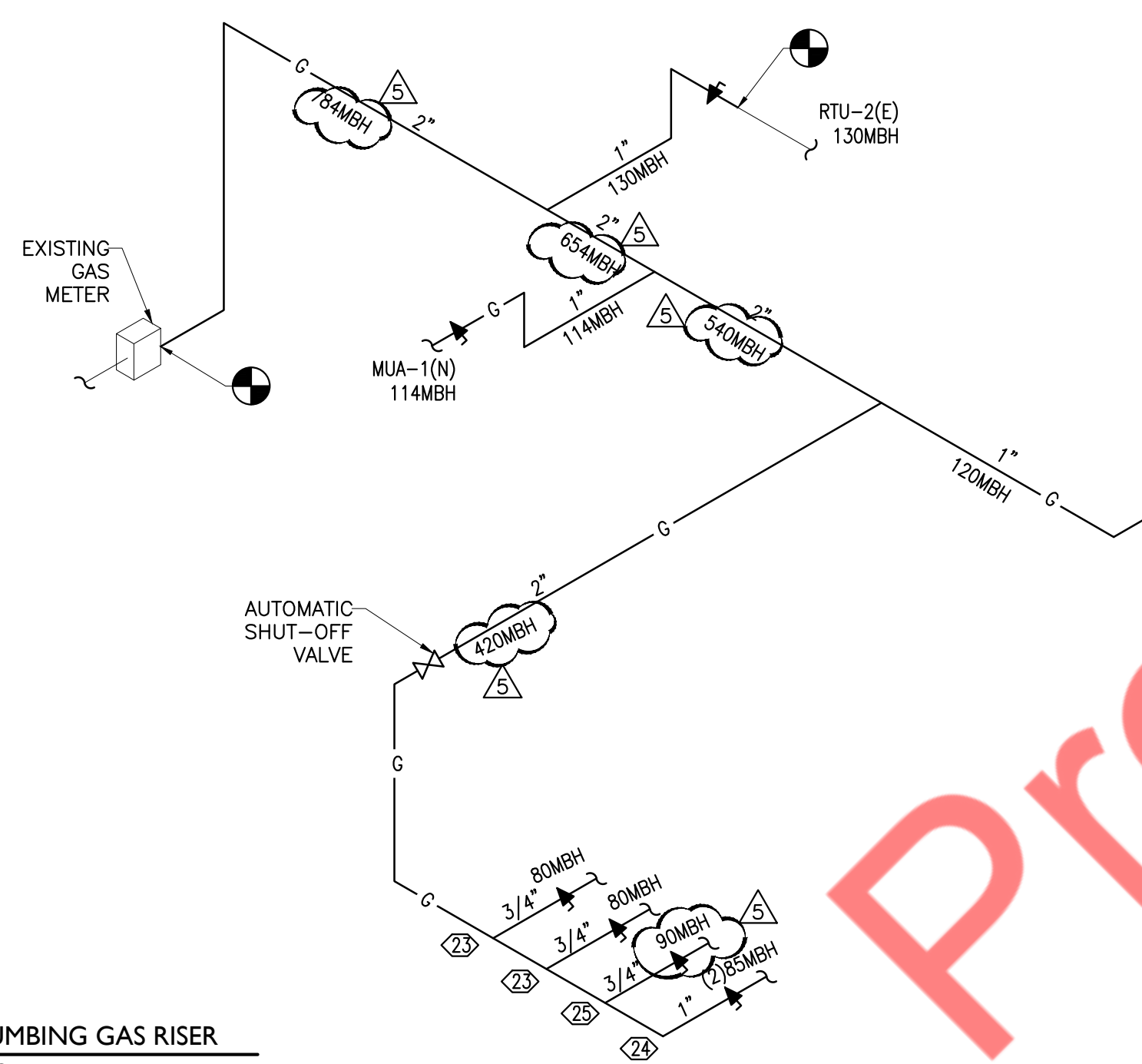
8 INDIRECT WASTE INSTALLATION - IPC
P3.1 N.T.S.



1 PLUMBING SANITARY AND VENT RISER
N.T.S



2 PLUMBING WATER RISER
N.T.S



3 PLUMBING GAS RISER
N.T.S

- NOTES:**
1. GAS PIPING TO BE SCHEDULE 40 STEEL PIPE W/125 CAST IRON SCREWD FITTINGS
 2. GAS SYSTEM TO BE INSTALLED BY QUALIFIED LICENSED CONTRACTOR.
 3. VERIFY ALL EQUIPMENT BTU'S PRIOR TO INSTALLATION. ADJUST PIPE SIZE ACCORDING 2014 INDIANA FUEL GAS CODE (IFGC 2021) TABLE 402.4(2)
 4. CONTRACTOR TO FIELD VERIFY FINAL TOTAL EQUIVALENT LENGTH AND SIZE.
 5. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF EXISTING GAS METER LOCATION, PRESSURE AND CAPACITY. UPGRADE IF REQUIRED.
 6. PROVIDE SHUT-OFF VALVE AN ACCESSIBLE LOCATION. PROVIDE GAS PRESSURE REGULATOR FOR GAS FIRED EQUIPMENT IF REQUIRED.

GAS DEMAND LOAD CALCULATIONS					
MARK	FIXTURE/EQUIPMENT	QUANTITY	UNIT DEMAND BTUH	TOTAL DEMAND BTUH	TOTAL CFH
MUA-1(N)	MAKEUP AIR UNIT	1	114,000	114,000	114
RTU-1(E)	ROOFTOP UNIT	1	120,000	120,000	120
RTU-2(E)	ROOFTOP UNIT	1	130,000	130,000	130
#23	PRESSURE FRYER	2	80,000	160,000	160
#24	FRYER	2	85,000	170,000	170
#25	GRIDDLE	1	90,000	90,000	90
TOTAL			784,000	784,000	784

2" GAS LINE REQUIRED BASED ON 100'-0" TOTAL LENGTH OF PIPE AT LESS THAN 2 PSI
 GAS LOAD BASED ON 2021 INTERNATIONAL FUEL GAS CODE, SECTION 402 (IFGS) PIPE SIZING, 402.2 MAXIMUM GAS DEMAND, TABLE 402.4(2) SCHEDULE 40 METALLIC PIPE.
 GAS PRESSURE CONSIDERED AT METER MINIMUM OF 12" WC. CONTRACTOR SHALL VERIFY ACTUAL GAS PRESSURE AND LONGEST LENGTH OF RUN FROM METER TO FARTHEST APPLIANCE PRIOR TO INSTALLATION AND NOTIFY ENGINEER IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLAN.

SIZE	GAS LOAD(CFH)
3/4"	104
1"	195
1-1/4"	400
1-1/2"	600
2"	1160

KITCHEN FIXTURE CONNECTION SCHEDULE											
EQ. TAG #	QTY	FIXTURE/EQUIPMENT	MANUFACTURER/MODEL	HOT WATER (IN.)	COLD WATER (IN.)	WASTE			GAS LOAD (MBH)	GAS (IN)	NOTES
						INDIRECT	DIRECT	VENT			
1	2	MOP SINK & FAUCET	--	3/4"	3/4"	--	3"	2"	--	--	--
3	1	WALK IN COOLER	--	--	--	3/4"	--	--	--	--	DRAIN TO FS
9		1-COMP SINK & FAUCET	JOHN BOOS 1B18244-1D24L-X	1/2"	1/2"	2"	--	2"	--	--	DRAIN TO FS
11	2	HAND SINK & FAUCET	JOHN BOOS PBHS-W-1410-SSLR-X	1/2"	1/2"	--	2"	1-1/2"	--	--	THERMOSTATIC MIXING VALVE
12		3-COMP SINK & FAUCET	3B-2D B-SERIES	3/4"	3/4"	2"	--	2"	--	--	DRAIN TO FS
19		BAG N BOX SODA	--	1/2"	--	--	--	--	--	--	--
23	2	PRESSURE FRYER	HENNY PENNY PFG600.0	--	--	--	--	--	80	3/4"	--
24	2	FRYER	HENNY PENNY OFG 322	--	--	--	--	--	85	3/4"	--
25	1	GRIDDLE	IMPERIAL ITG-36	--	--	--	--	--	90	3/4"	--
37	2	BEVERAGE DISPENSER	--	--	--	1"	--	--	--	--	DRAIN TO FS
38	2	ICE MACHINE	--	--	1/2"	1"	--	--	--	--	DRAIN TO FS
48	1	DISH MACHINE	--	1/2"	--	2"	--	2"	--	--	DRAIN TO FS

- NOTE:
 1. ALL FIXTURE OR EQUIPMENTS MAY BE SUBSTITUTED WITH APPROVED EQUAL CONTACT OWNER FOR APPROVAL.
 2. REFER TO KITCHEN EQUIPMENT PLAN AND COORDINATED WITH KITCHEN CONSULTANT FOR MORE DETAILS.

FIXTURE BRANCH CONNECTION SCHEDULE					
FIXTURE TYPE	MANUFACTURER/MODEL	COLD WATER	HOT WATER	WASTE	VENT
WATER CLOSET (FLUSH VALVE)	AMERICAN STANDARD #3641001.020	1"	--	4"	2"
LAVATORY	KOHLER #CAXTON K-2000	1/2"	1/2"	2"	1-1/2"
MOP SINK	STERN-WILLIAMS #MTB-24.24	3/4"	3/4"	3"	2"
FLOOR SINK	ZURN #FD2378	--	--	3"	2"
FLOOR DRAIN	ZURN #FD2290-R6	--	--	3", 4"	2"
FLOOR CLEANOUT	JAY R. SMITH #4051L	--	--	--	--
ACCESS PANEL	JAY R. SMITH #4767	--	--	--	--
WALL CLEANOUT	JAY R. SMITH #4530S	--	--	--	--
THERMOSTATIC MIXING VALVE	POWERS #LF6480	--	--	--	--
WATER HAMMER ARRESTER	PRECISION PLUMBING PRODUCT, ASSE 1010	--	--	--	--
TRAP PRIMER	PRECISION PLUMBING PRODUCT, #PR-500, CORROSION RESISTANT BRASS BODY	1/2"	--	--	--

WATER HEATER SCHEDULE									
TAG No.	MAX INPUT (KW)	CAPACITY (GALLONS)	FIXTURES SERVING	QUANTITY	RECOVERY CAP. (GPH @100°F RISE)	TYPE	THERMAL EFFICIENCY %	MANUFACTURER & MODEL NO.	REMARKS
WH-1	30KW (3#,208V)	80	3-COMPARTMENT SINK, PREP SINK, MOP SINK, HAND SINK, LAVATORY, DISHWASHER	1	123 GPH	ELECTRIC STORAGE TYPE WATER HEATER (SHELF MOUNTED)	96	STATE CSB-82	-DIMENSIONS 60.25"H X 25.5"DIA -FLOOR MOUNTED

RECIRCULATION PUMP SCHEDULE						
MARK	SERVICE	QTY	GPM	TOTAL HEAD FT.	ELECTRICAL DATA	MANUFACTURER & REMARKS
RCP-1	HW RECIRCULATION	1	2	11.5	55 WATTS, 115V	BELL & GOSSET #NBF-12U/LM W/AQUASTAT + TIMER

EXPANSION TANK SCHEDULE					
ITEM	SERVICE	QTY	GALLONS	MAKE	REMARKS
EXPANSION TANK (ET-1)	HOT WATER	1	3.2	AMTROL ST-8	DIMENSIONS- 15"(H)x9"(DIA.) SHIPPING WEIGHT- 7 LBS

BACKFLOW PREVENTER SCHEDULE				
ITEM	SERVICE	QTY	STANDARD	MAKE
BFP-1	BAG IN BOX	1	ASSE 1022	WATTS SD-3
BFP-2	ICE MACHINE	2	ASSE 1012	WATTS LF9D
BFP-3	DOMESTIC WATER	1	ASSE 1013	WATTS LF009

Property of NY ENGINEERS

MANUAL MODE OPERATION:

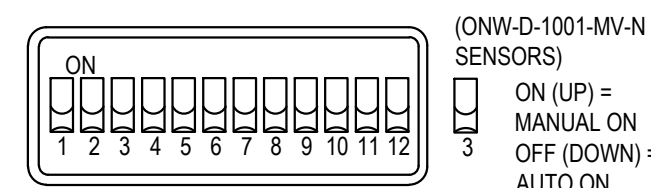
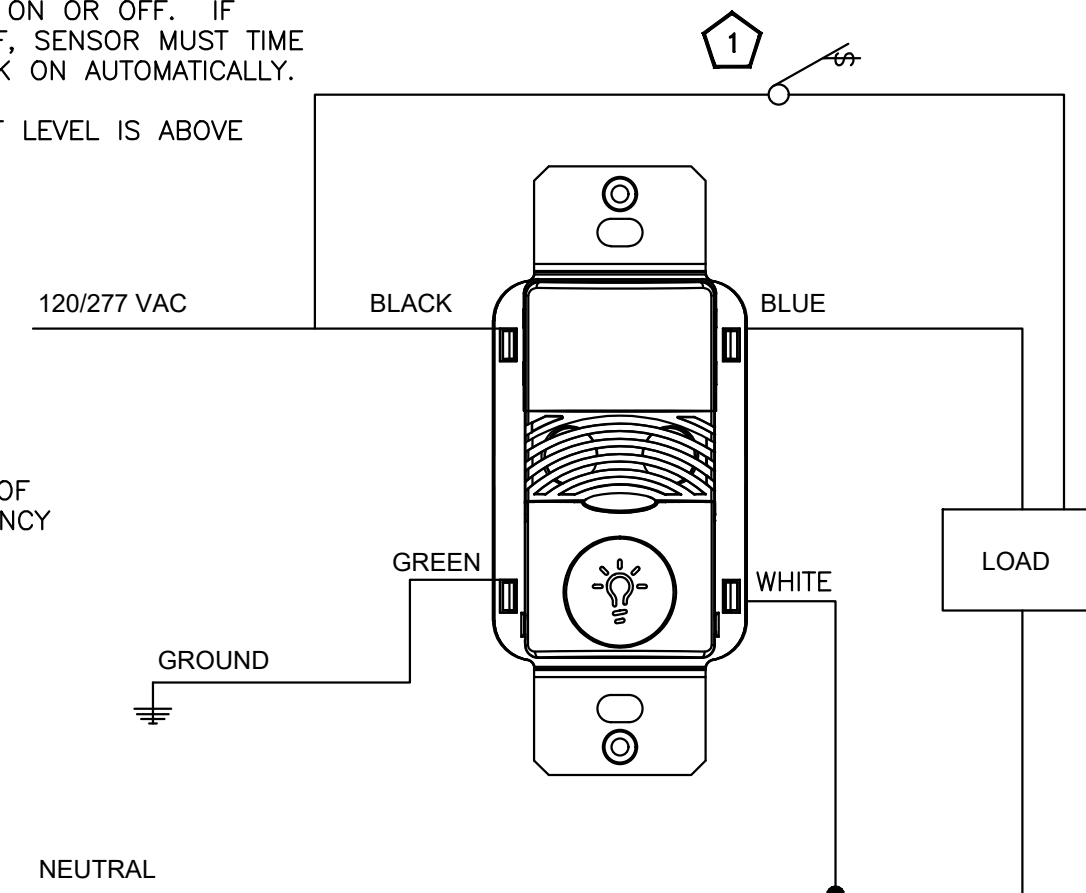
1. PUSHBUTTON PRESS IS REQUIRED TO TURN LOAD ON.
2. LOAD TURNS OFF WHEN SENSOR TIMES OUT OR BY PRESSING PUSH BUTTON.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

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



AUTOMATIC MODE OPERATION

1. WHEN SENSOR ACTIVATES, LOAD TURNS ON.
2. LOAD TURNS OFF, WHEN SENSOR TIMES OUT.

RECOMMENDED WIRE

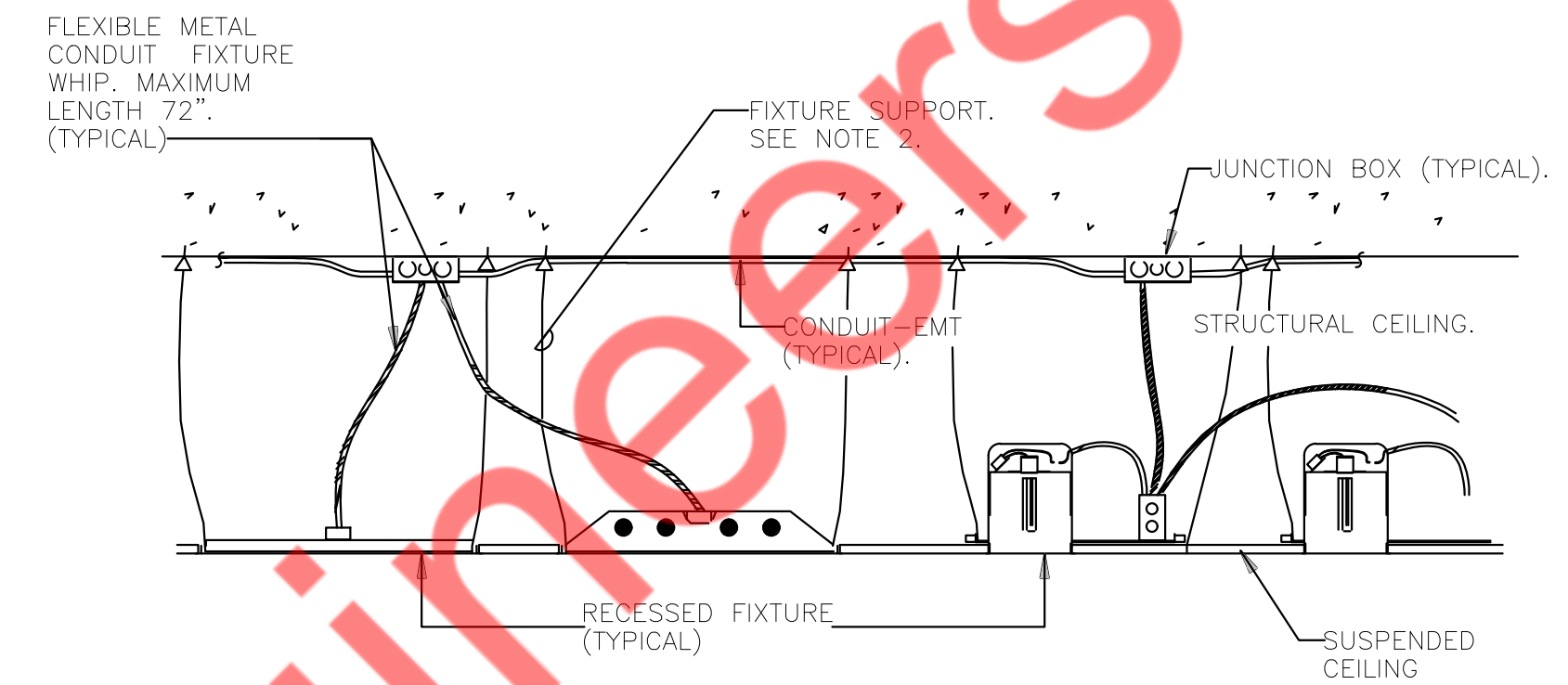
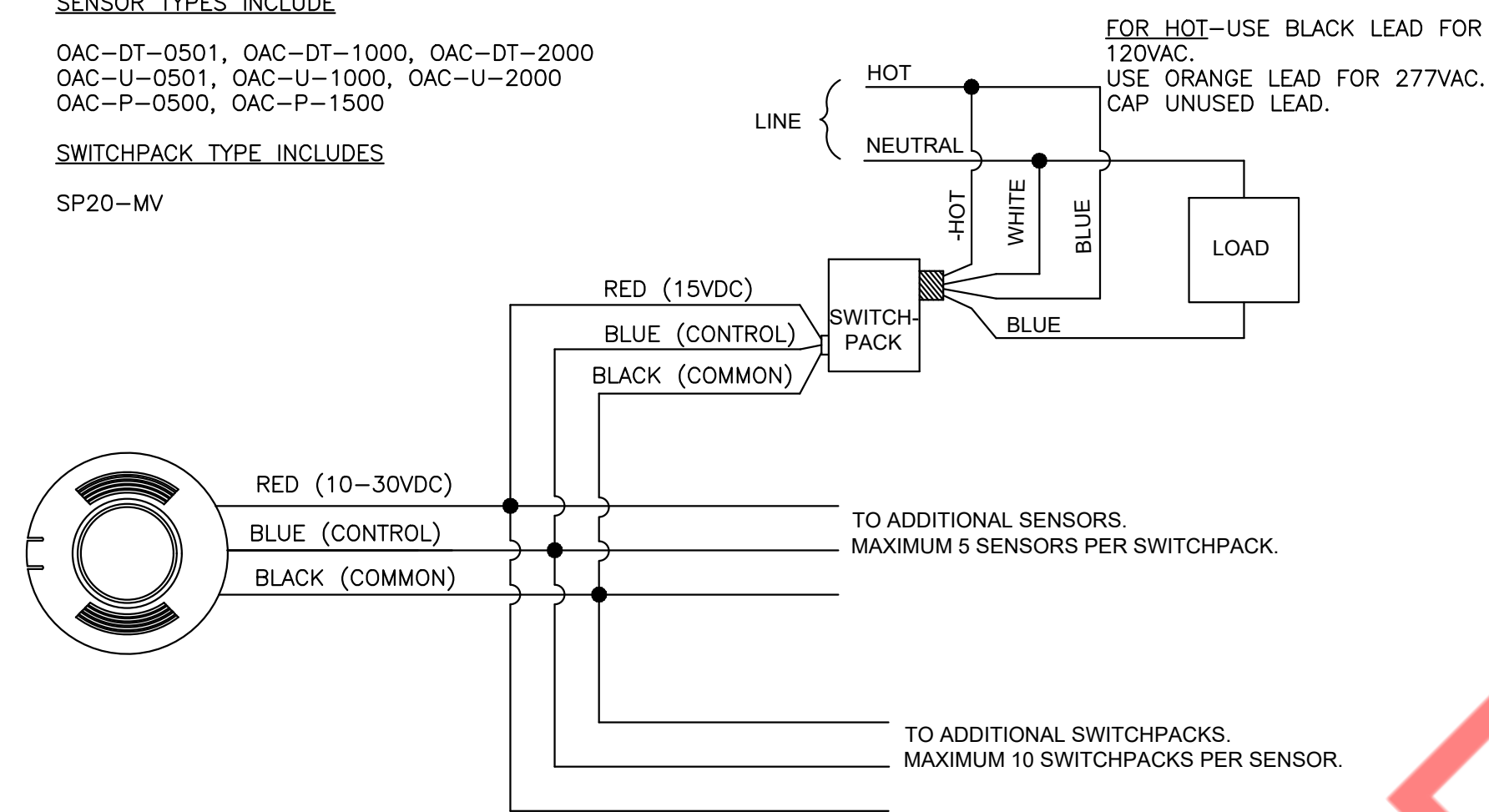
18-3 AWG STRANDED WIRE SHIELDED OR NON-SHIELDED

SENSOR TYPES INCLUDE

OAC-DT-0501, OAC-DT-1000, OAC-DT-2000
OAC-U-0501, OAC-U-1000, OAC-U-2000
OAC-P-0500, OAC-P-1500

SWITCHPACK TYPE INCLUDES

SP20-MV

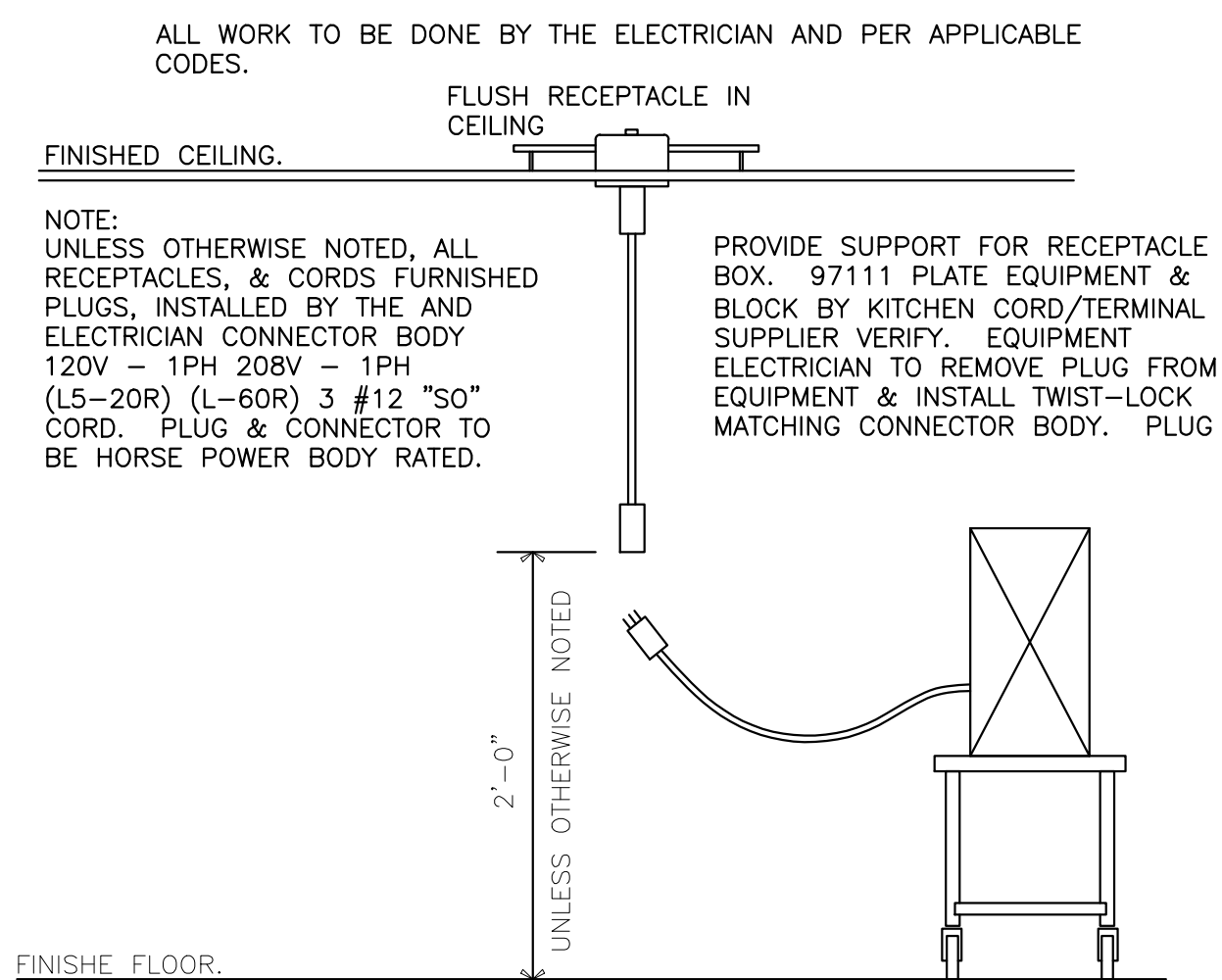


- NOTES:**
1. MC CABLE IS ACCEPTABLE WHERE CONCEALED ABOVE CEILINGS OR IN WALLS. MC CABLE SHALL NOT ENTER PANELBOARDS.
 2. SUPPORT FIXTURES DIRECTLY FROM STRUCTURE.
 - A. FOR LINEAR FIXTURES: MINIMUM TWO 2.5mm (0.1") #10AWG GALVANIZED STEEL WIRES AT DIAGONAL CORNERS (WITHIN 4" OF FIXTURE CORNER) DIRECTLY FROM STRUCTURE.
 - B. FOR DOWNLIGHTS: WIRE FROM STRUCTURE.

1 CONNECTION) OCCUPANCY/VACANCY-SINGLE LEVEL WIRING DIAGRAM-LOW VOLTAGE WALL SWITCH SENSOR(NEUTRAL) E6.2 N.T.S

2 OCCUPANCY - AUTO ON/OFF. WIRING DIAGRAM - LOW VOLTAGE CEILING SENSOR E6.2 N.T.S

3 TYPICAL RECESSED FIXTURE INSTALLATION DETAIL E6.2 N.T.S



4 CORD DROP DETAIL E6.2 N.T.S