

DOUBLE LINE SYMBOL	DESCRIPTION	SINGLE LINE SYMBOL
	DUCT- FIRST NUMBER IS VISIBLE DIMENSION. RADIUS ELBOW W/VANE(S) (1.5=R/D STANDARD)	
	DUCT SECTION, POSITIVE PRESSURE	
	DUCT SECTION, NEGATIVE PRESSURE	
	DUCT & AIRFLOW UP(LEFT) POSITIVE PRESSURE	
	DUCT & AIRFLOW DN(RIGHT) POSITIVE PRESSURE	
	DUCT & AIRFLOW UP(LEFT) NEGATIVE PRESSURE	
	DUCT & AIRFLOW DN(RIGHT) NEGATIVE PRESSURE	
	DUCT & AIRFLOW UP(LEFT) NEG./POS. PRESSURE	
	DUCT & AIRFLOW DN(RIGHT) NEG./POS. PRESSURE	
	CHANGE OF ELEVATION=RISE (R), DROP (D)	
	CEILING EXHAUST FAN WITH LIGHT	
	FD- FIRE DAMPER	
	MANUAL VOLUME DAMPER-SPECIFIC TYPE, NO LABEL-BUTTERFLY, OBD-OPPOSED BLADED DAMPER, PBD-PARALLEL BLADED DAMPER	
	BRANCH TAP-W/45 DEG. ENTRY	
	BRANCH TAP-CONICAL SPIN-IN	
	BRANCH TAP-STRAIGHT SPIN-IN	
	TRANSITION	
	HVAC - EQUIP AS NOTED	
RTU-# FCU-# XXX-#		
	AIR DEVICE, SUPPLY- CEILING, CLEAR	
A X"ø X CFM	AIR DEVICE TAC SPIN-IN DIMENSION AIRFLOW (CFM)	
	AIR DEVICE, SUPPLY- SIDEWALL.	
	AIR DEVICE, RETURN/EXHAUST- SIDEWALL.	

BD	BACKDRAFT DAMPER
CFM	CUBIC FEET OF AIR PER MINUTE
CD	CONDENSATE DRAIN PIPE
DN	DOWN
EER	ENERGY EFFICIENCY RATIO
FC	FLEXIBLE CONNECTION
AFUE	ANNUALIZED FUEL UTILIZATION EFFICIENCY
ISMRE	INTEGRATED SEASONAL MOISTURE REMOVAL EFFICIENCY
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
SEER	SEASONAL ENERGY EFFICIENCY RATIO
VD	VOLUME DAMPER
EF	EXHAUST FAN
KEF	KITCHEN EXHAUST FAN
MD	MOTORIZED DAMPER
MUA	MAKEUP AIR UNIT
FD	FIRE DAMPER
WMS	WIRE MESH SCREEN
CU	CONDENSING UNIT
AHU	AIR HANDLING UNIT

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

- ## SCOPE OF WORK

SCOPE OF WORK

1. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RF'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
2. 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 THEREFOR. 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.
3. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OF ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

3. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISCS OF RUNS. THE CONTRACTOR SHALL MAKE ALLOWANCE IN PRICING FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.
8. 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 PEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING FIRES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSURING CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
9. 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.

3. SEAL OPENINGS THROUGH DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
11. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
18. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
19. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
22. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
23. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
24. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
25. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
26. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
27. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY.

1. 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.
2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
3. 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.
4. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE MECHANICAL CONTRACTOR 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.
5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
6. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
7. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.

8. 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.
9. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.
10. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
11. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO, AND WITHIN 50 FT. OF, ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS) THROUGHOUT MECHANICAL EQUIPMENT ROOMS. DO THE SAME FOR SUPPORTS OF STEAM MAINS WITHIN 50 FT. OF BOILER OR PRESSURE-REDUCING VALVES.
12. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.

M0.1	GENERAL NOTES AND LEGEND
M0.2	SPECIFICATIONS
M0.3	SPECIFICATIONS
M1.0	MECHANICAL PLAN
M2.0	MECHANICAL ROOF PLAN
M4.0	MECHANICAL SCHEDULES
M5.0	MECHANICAL DETAILS
M5.1	MECHANICAL DETAILS
M5.2	MECHANICAL DETAILS
M6.0	ENERGY CALCULATIONS
M6.1	ENERGY CALCULATIONS
K5.1	HOOD DRAWING 1
K5.2	HOOD DRAWING 2
K5.3	HOOD DRAWING 3

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

- a. 2021 INTERNATIONAL BUILDING CODE WITH IBC AMENDMENTS
- b. 2021 INTERNATIONAL FIRE CODE WITH IFC AMENDMENTS
- c. 2021 INTERNATIONAL MECHANICAL CODE WITH IMC AMENDMENTS
- d. 2014 ILLINOIS PLUMBING CODE WITH ILLINOIS PLUMBING CODE AMENDMENTS
- e. 2021 INTERNATIONAL FUEL GAS CODE WITH IFGC AMENDMENTS
- f. 2021 INTERNATIONAL ENERGY CONSERVATION CODE
- g. 2020 NFPA 70 NATIONAL ELECTRIC CODE (NEC) WITH NEC AMENDMENTS



GUZMAN Y GOMEZ

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08/13/24	ISSUED FOR PERMIT
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REVISIONS

Drawing Title

GENERAL NOTES AND LEGEND

Job No

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13. 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.
14. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
15. 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.
16. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.
17. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.
18. 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.
19. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
20. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.
21. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT AND ROOFTOP UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.
22. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.
23. REINFORCEMENT, DETAILING, AND PLACEMENT OF CONCRETE SHALL CONFORM TO ASTM 315 AND ACI 318. CONCRETE SHALL CONFORM TO ASTM C94. CONCRETE WORK SHALL CONFORM TO ACI 318 PART ENTITLED "CONSTRUCTION REQUIREMENTS".COMPRESSIVE STRENGTH IN 28 DAYS SHALL BE 3,000 PSI. TOTAL AIR CONTENT OR EXTERIOR CONCRETE SHALL BE BETWEEN 5 AND 7 PERCENT BY VOLUME. SLUMP SHALL BE BETWEEN 3 AND 4 IN. CONCRETE SHALL BE CURED FOR 7 DAY AFTER PLACEMENT.
24. CONCRETE HOUSEKEEPING PADS TO SUIT MECHANICAL EQUIPMENT SHALL BE SIZED AND LOCATED BY THE MECHANICAL CONTRACTOR. MINIMUM CONCRETE PAD THICKNESS SHALL BE 6 IN. PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 6 IN. ON EACH SIDE. CONCRETE HOUSEKEEPING PADS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE THE SIZE AND LOCATION OF CONCRETE HOUSEKEEPING PADS WITH THE GENERAL CONTRACTOR.
25. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
26. 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.

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 078413–PENETRATION FIRE–STOPPING

1.1 QUALITY ASSURANCE

- A. INSTALLER QUALIFICATIONS: AN FM GLOBAL–APPROVED FIRE–STOP CONTRACTOR OR A UL–QUALIFIED FIRE–STOP CONTRACTOR.

- B. FIRE–TEST–RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL

1.2 PENETRATION FIRESTOPPING

- A. PENETRATIONS IN FIRE–RESISTANCE–RATED WALLS: F–RATINGS PER ASTM E 814 OR UL 1479.
- B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F– AND T–RATINGS PER ASTM E 814 OR UL 1479:
- C. PENETRATIONS IN SMOKE BARRIERS: L–RATINGS PER UL 1479.
- D. W–RATINGS: PER UL 1479.

1.3 INSTALLATION

- A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.

1.4 FIELD QUALITY CONTROL

- A. INSPECTION OF INSTALLED FIRE–STOPPING: BY OWNER–ENGAGED AGENCY ACCORDING TO ASTM E 2174.

1.5 THROUGH–PENETRATION FIRESTOP SYSTEM SCHEDULE

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

FOR THE FOLLOWING SYSTEMS:

METALLIC AND NON–METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED PIPES, GROUPINGS OF PENETRANTS, USE ON OR MORE THE FOLLOWING MATERIALS:

- a. LATEX SEALANT
- b. SILICONE SEALANT
- c. INTUMESCENT PUTTY
- d. MORTAR
- h. SILICONE FOAM
- i. PILLOWS/BAGS
- j. INTUMESCENT WRAP STRIPS
- k. INTUMESCENT COMPOSITE SHEET

1.6 MANUFACTURERS

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

END OF SECTION 078413

SECTION 230529 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1.1 PERFORMANCE REQUIREMENTS

- A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.

- B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.

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

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

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

1.4 COMPONENTS

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

END OF SECTION 230529

SECTION 230548 – VIBRATION CONTROLS FOR HVAC EQUIPMENT

PART 1 – GENERAL

1.1 PERFORMANCE REQUIREMENTS

A. SEISMIC–RESTRAINT LOADING:

1. SITE CLASS AS DEFINED IN THE IBC: A, B
2. ASSIGNED SEISMIC USE GROUP OR BUILDING CATEGORY AS DEFINED IN THE IBC: I II III
- a. COMPONENT IMPORTANCE FACTOR: 1.0
- b. COMPONENT RESPONSE MODIFICATION FACTOR: 2.5
- c. COMPONENT AMPLIFICATION FACTOR: 2.5.
3. DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (0.2 SECOND) 18%
4. DESIGN SPECTRAL RESPONSE ACCELERATION AT 1–SECOND PERIOD: 8%

1.2 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

1.3 FIELD QUALITY CONTROL

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

PART–2 PRODUCTS

1.4 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:

- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. COOPER B–LINE, INC.; A DIVISION OF COOPER INDUSTRIES.
5. HILTI, INC.
6. ISOLATION TECHNOLOGY, INC.
7. KINETICS NOISE CONTROL.
8. LOOS & CO.; CABLEWARE DIVISION.
9. MASON INDUSTRIES.
10. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
11. UNISTRUT; TYCO INTERNATIONAL, LTD.
12. VIBRATION ELIMINATOR CO., INC.
13. VIBRATION ISOLATION.
14. VIBRATION MOUNTINGS & CONTROLS, INC.

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.



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Drawing Title

SPECIFICATIONS

Job No.

Drawn
NYE

Sheet No.

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- D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
- G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
- H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
- I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
- J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.
- END OF SECTION 230593

SECTION 230713 – DUCT INSULATION

- 1.1 QUALITY ASSURANCE
- SURFACE–BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME–SPREAD INDEX OF 25, AND SMOKE–DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE–DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E 84.
- 1.2 FIELD QUALITY CONTROL
- A. FIELD INSPECTIONS: BY OWNER–ENGAGED AGENCY.
- 1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE;
- A. CONCEALED, RECTANGULAR, ROUND AND FLAT–OVAL, SUPPLY–RETURN, OUTDOOR–AND EXHAUST–AIR DUCT AND AIR PLENUM INSULATION:
- B. FLEXIBLE ELASTOMERIC, MINERAL–FIBER BLANKET, MINERAL–FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:
UNCONDITIONED SPACES WITHIN BUILDING: R–6
WITHIN BUILDING ENVELOPE ASSEMBLY: R–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 ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC IRON ALLOY–COATED (GALVANNEALED) BY HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENT FOR SHEET METALLIC–COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.
3. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30–03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30–02 AND COVERED WITH APPROVED SEALING TAPE.
4. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWS A5.2.
- C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:
- | USG | MAX. SIDE INCHES | TRANSVERSE JOINTS AND | BRACING |
|--------------|------------------|--------------------------------------|--------------|
| 22 ON 8 FOOT | UP TO 12 | S SLIP, DRIVE SLIP, ONE INCH CENTERS | POCKET LOCK |
| 22 | 13 TO 24 | 1"x1"x1/8" ANGLES ON 4 | FOOT CENTERS |
| 20 | 25 TO 35 | 1"x1"x1/8" ANGLES ON 2 | FOOT CENTERS |

- D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:
1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.
- E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS SHOWN IN FIG. 3–6 AND AS SHOWN IN FIG. 3–1 AND 3–2 FOR ROUND DUCTWORK.
- F. ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.
- 1.2 MATERIALS
- A. SINGLE–WALL RECTANGULAR DUCTS AND FITTINGS.
- B. DOUBLE–WALL RECTANGULAR DUCTS AND FITTINGS.
1. FIBROUS–GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION.
2. PERFORATED INNER DUCT.
- C. SINGLE–WALL ROUND AND FLAT–OVAL DUCTS AND FITTINGS.
- D. DOUBLE–WALL ROUND AND FLAT–OVAL DUCTS AND FITTINGS.
1. FIBROUS–GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION.
2. PERFORATED INNER DUCT.
- E. SHEET METAL MATERIALS:
1. GALVANIZED SHEET STEEL.
2. PVC–COATED, GALVANIZED SHEET STEEL.
3. CARBON–STEEL SHEETS.
4. STAINLESS–STEEL SHEETS.
5. ALUMINUM SHEETS.
6. FACTORY–APPLIED ANTI–MICROBIAL COATING.
- F. DUCT LINER:
1. FIBROUS GLASS, TYPE I, FLEXIBLE.
a. WITH ANTI–MICROBIAL EROSION–RESISTANT COATING.
2. FLEXIBLE ELASTOMERIC.
3. NATURAL FIBER.
- G. 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 SEISMIC–RESTRAINT DEVICES
- A. CHANNEL SUPPORT SYSTEM.
- B. STAINLESS–STEEL RESTRAINT CABLES.
- C. HANGER ROD STIFFENER: STEEL TUBE OR STEEL SLOTTED–SUPPORT–SYSTEM SLEEVE WITH INTERNALLY BOLTED CONNECTIONS OR REINFORCING STEEL ANGLE CLAMPED TO HANGER ROD.
- 1.4 DUCT CLEANING
- A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
- B. CLEAN THE FOLLOWING ITEMS:
1. AIR OUTLETS AND INLETS.
2. SUPPLY, RETURN, AND EXHAUST FANS.
3. AIR–HANDLING UNITS.
4. COILS AND RELATED COMPONENTS.
5. RETURN–AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
6. SUPPLY–AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
- 1.5 DUCT SCHEDULE
- A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:
1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.
- END OF SECTION 233113

9. PIPING INSULATION
- A. INSULATE ALL PIPING IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

INSULATION SCHEDULE – PIPING					
SERVICE	SIZE	THICKNESS	MATERIAL	FINISH	
HOT (105 TO 212 °F)	UP TO 1.5"	1.5"	P–1	F–1	
	ABOVE 1.5"	2"	P–1		
HOT FITTINGS & VALVES (100 TO 212 °F)	UP TO 1.5"	1.5"	P–4	F–1	
	ABOVE 1.5"	2"			
REFRIGERANT PIPING		1.5"	P–6		
CONDENSER DRAIN PIPING (IF RUNNING THROUGH EXTERIOR WALL)		1.0"	P–6		

- B. PIPING, VALVES AND FITTINGS TO BE INSULATED:
- 1) LOW TEMPERATURE PIPING SYSTEMS – 0 TO 55 DEG F INCLUDING:
a. CHILLED WATER SUPPLY AND RETURN.
b. CONDENSER WATER SUPPLY AND RETURN.
c. CONDENSATE DRAIN PIPING.
- 2) LOW TEMPERATURE PIPING SYSTEMS – 0 TO 55 DEG F INCLUDING:
a. GLYCOL WATER SUPPLY AND RETURN.
- 3) LOW TEMPERATURE HOT PIPING SYSTEMS – 100 TO 200 DEG F INCLUDING:
a. LOW TEMPERATURE HOT WATER SUPPLY AND RETURN.
b. PUMPED CONDENSATE DISCHARGE.

- 4) PROTECTIVE COVERINGS SHALL BE INSTALLED ON AREAS OF INSULATION THAT ARE EXPOSED TO WEATHER OR SUBJECT TO MECHANICAL DAMAGE. THE PROTECTIVE COVERING SHALL BE:
- I. ARMA–CHEK SILVER® MULTI–LAYER LAMINATE OF ALUMINUM, COATED WITH A UV PROTECTIVE FILM AND BACKED WITH A FLEXIBLE PVC FILM. THE MATERIAL SHOULD BE ADHERED WITH ARMAFLEX 520 ADHESIVE OR EQUIVALENT, AND ALL JOINS AND SEAMS SECURED WITH "ARMA–CHEK SILVER TAPE". INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS.
- OR
- J. HIGH DENSITY RUBBER CLADDING OF THE "ARMA–CHECK R" TYPE BONDED USING AN APPROPRIATE FULL CONTACT ADHESIVE WITH A MINIMUM 50 MM OVERLAP AT ALL BUTT JOINTS AND LONGITUDINAL SEAMS. A WEATHER–PROOF MASTIC SEALANT SHALL BE APPLIED OVER ALL SEAMS AND JOINTS. ALL MATERIAL SHALL BE OVERLAPPED AND STAGGERED IN SUCH A WAY AS TO ENSURE A WATERSHED IS ALWAYS PROVIDED. INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS. ALL EXCESS ADHESIVE VISIBLE ON THE SURFACE OF THE COMPLETED ASSEMBLY SHALL BE REMOVED USING AN APPROPRIATE CLEANING MATERIAL.
- OR
- K. METAL CLADDING, COMPRISED OF COATED SHEET METAL, WITH ALL EXTERNAL JOINTS AND FIXING MADE WEATHER–PROOF WITH SILICONE SEALANT.
- C. MATERIAL:
- 1) TYPE P–1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.24 K–FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY–APPLIED FIRE–RETARDANT FOIL–SKRIM–KRAFT FACING. ALL SERVICE JACKET. SIMILAR TO OWENS–CORNING 650 ASJ.
- 2) TYPE P–3: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS FITTING, MAXIMUM 0.23 K–FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO EPOLux HAMFAB MOLDED FITTINGS.
- 3) TYPE P–4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.27 K–FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO MANVILLE HI–LO TEMP INSULATION INSERTS.
- 4) TYPE P–6: MINIMUM 6 LB MOLDED, FOAMED PLASTIC, MAXIMUM 0.27 K–FACTOR AT 75 DEG F MEAN TEMPERATURE, MAXIMUM 0.17 PERMEANCE. SIMILAR TO ARMSTRONG ARMAFLEX II.
- D. FINISH:
- 1) TYPE F–1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.
- 2) TYPE F–2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS, POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO FOSTER TITE–FIT, UL LABEL.
- 3) TYPE F–4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN. WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.
- 4) TYPE F–6: WHITE FINISHING AND INSULATING CEMENT APPLIED OVER HEXAGONAL WIRE MESH. CEMENT SIMILAR TO KEENE SUPERSLICK.
- E. INSTALLATION:
- 3) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.
- 4) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.
- 5) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION AT ALL HANGINGS.
- 6) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.

GREASE DUCT SPECIFICATIONS

1. PROVIDE CLEAN OUT AT ALL ELBOWS AND BOTTOM OF RISER AND EVERY 20 FEET HORIZONTAL KITCHEN EXHAUST DUCT.
2. COMMERCIAL KITCHEN GREASE DUCTS SHALL BE DESIGNED FOR THE TYPE OF COOKING APPLIANCE AND HOOD SERVED. COMMERCIAL KITCHEN GREASE DUCTS SHALL BE OF 16 GAUGE MINIMUM BLACK IRON OR PREFABRICATED SINGLE WALL GREASE DUCT WITH UL 1978 AND UL 2221 LISTING.
3. JOINTS, SEAMS AND PENETRATIONS OF GREASE DUCTS SHALL BE MADE WITH A CONTINUOUS LIQUID TIGHT WELD OR BRAZE MADE IN THE EXTERNAL SURFACE IF THE DUCT SYSTEMS.
4. DUCT TO EXHAUST FAN CONNECTIONS SHALL BE FLANGED, GASKETED AND BOLTED TO THE INLET AND OUTLET OF THE FAN FOR INLINE FANS. APPROVED FLEXIBLE CONNECTIONS MAY BE PROVIDED.
5. A VIBRATION ISOLATION CONNECTOR FOR CONNECTING A DUCT TO A FAN SHALL CONSIST OF NON–COMBUSTIBLE PACKING IN A METAL SLEEVE JOINT OF APPROVED DESIGN OR SHALL BE A COATED–FABRIC FLEXIBLE DUCT CONNECTOR LISTED AND LABELED FOR THE APPLICATION. VIBRATION ISOLATION CONNECTORS SHALL BE INSTALLED ONLY AT THE CONNECTION OF A DUCT TO A FAN INLET OR OUTLET.
6. PRIOR TO THE USE OR CONCEALMENT OF ANY PORTION OF A GREASE DUCT SYSTEM, A LEAKAGE TEST SHALL BE PERFORMED AS PER 2021 INTERNATIONAL MECHANICAL CODE (2021 IMC) SECTION 506.3.2.5. DUCT SHALL BE CONSIDERED TO BE CONCEALED WHERE INSTALLED IN SHAFTS OR COVERED BY COATINGS OR WRAPS THAT PREVENT THE DUCTWORK FROM VISUALLY INSPECTED ON ALL SIDE. THE DUCT INSTALLER SHALL BE RESPONSIBLE FOR PROVIDING THE NECESSARY EQUIPMENT AND PERFORMING THE GREASE DUCT LEAKAGE TEST. THE DUCT LEAKAGE TEST SHALL BE PERFORMED FOR ALL THE DUCT SYSTEMS, INCLUDING THE DUCT–TO–DUCT CONNECTION. THE DUCTWORK SHALL BE PERMITTED TO BE TESTED IN SECTIONS, PROVIDED THAT EVERY JOINT IS TESTED (IF TEST IS FAILED, CONTRACTOR TO PROVIDE NEW KITCHEN EXHAUST DUCT).
7. PROVIDE SMOKE TEST TO PROOF TIGHTNESS OF THE GREASE DUCT.
8. GREASE DUCT BRACING AND SUPPORTS SHALL BE OF NON–COMBUSTIBLE MATERIAL SECURELY ATTACHED TO THE STRUCTURE AND DESIGNED TO CARRY GRAVITY AND SEISMIC LADS WITHIN THE STREET LIMITATIONS OF THE 2021 INTERNATIONAL BUILDING CODE(2021 IBC). BOLTS, SCREWS, RIVETS AND OTHER MECHANICAL FASTENERS SHALL NOT PENETRATE DUCT WALLS.
9. A RESIDUE TRAP SHALL BE PROVIDED AT THE BASE OF EACH VERTICAL RISER WITH PROVISION FOR CLEANOUT IN ACCORDANCE WITH NFPA 96.
10. CLEANOUT OPENINGS SHALL BE PROVIDED AT EVERY CHANGE IN DIRECTION, WITHIN 3 FEET OF THE EXHAUST FAN.
11. CLEANOUT OPENINGS SHALL BE EQUIPPED WITH TIGHT–FITTING DOORS CONSTRUCTED OF STEEL HAVING A THICKNESS NOT LESS THAN THAT REQUIRED FOR THE DUCT. DOORS SHALL BE EQUIPPED WITH A SUBSTANTIAL METHOD OF LATCHING, SUFFICIENT TO HOLD THE DOOR TIGHTLY CLOSED. DOOR ASSEMBLIES SHALL HAVE A GASKET OR SEALANT THAT IS NONCOMBUSTIBLE AND LIQUID TIGHT AND SHALL NOT HAVE FASTENERS THAT PENETRATED THE DUCT
12. A GREASE DUCT SERVING THE TYPE–1 HOOD THAT PENETRATED A CEILING, WALL OR FLOOR SHALL BE ENCLOSED FROM THE FIRE POINT OF PENETRATION TO THE DUCT. DOORS SHALL BE EQUIPPED WITH A FIRE–RESISTANCE RATING NOT LESS THAN THAT OF THE FIRE–RESISTANCE RATED ASSEMBLY PENETRATED BUT NEED NOT EXCEED 2 HOURS.
13. PROVIDE PROVIDE MINIMUM 2HR INSULATION COVERING OF 2 INCHES AND SUCH MATERIAL SHALL BE IN ACCORDANCE WITH ASTM E2336. FIELD APPLIED GREASE DUCT ENCLOSURE SHALL COMPLY ALL REQUIREMENTS PER 2021 INTERNATIONAL MECHANICAL CODE SECTION 506.3.11.2.



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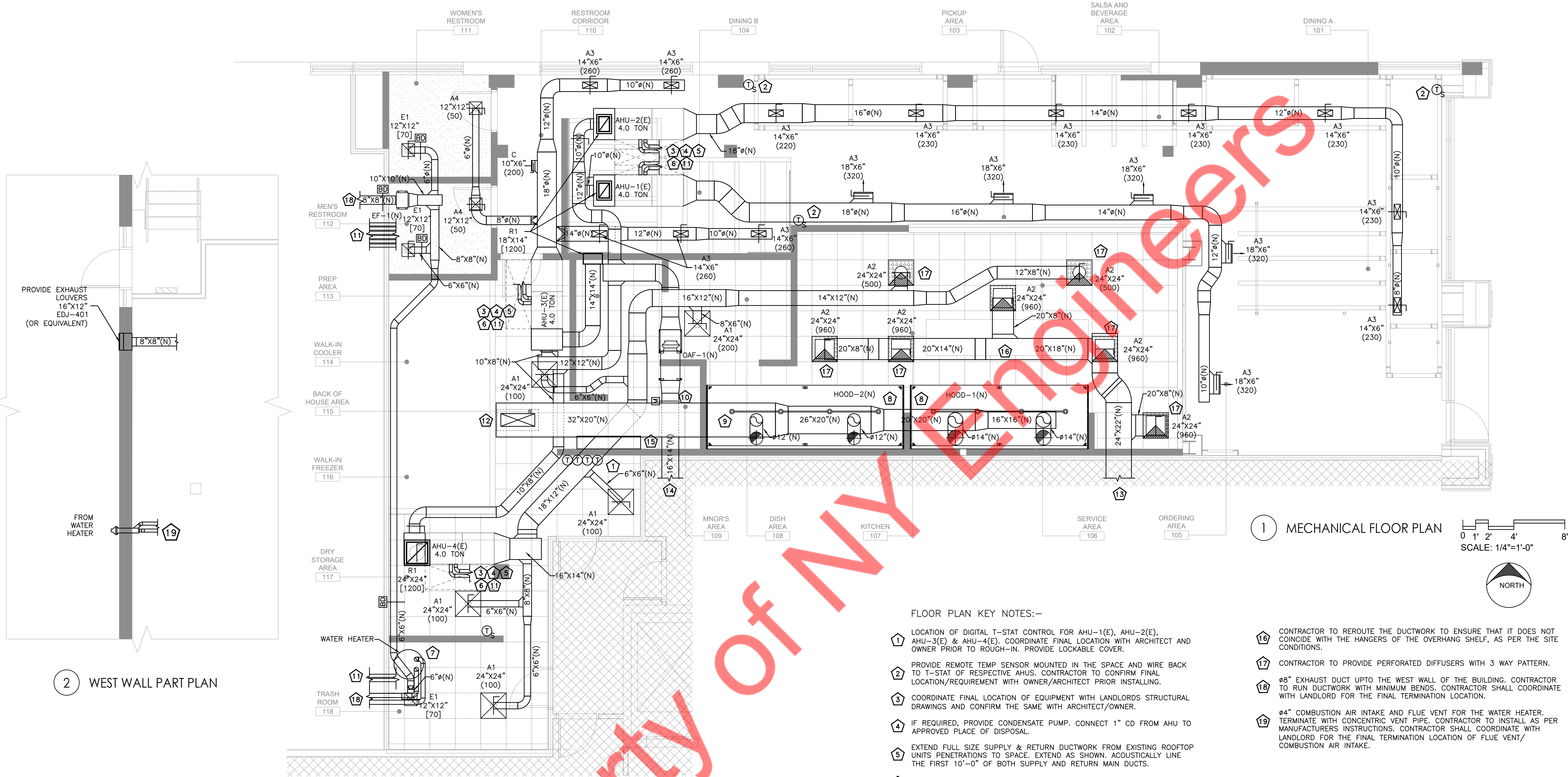
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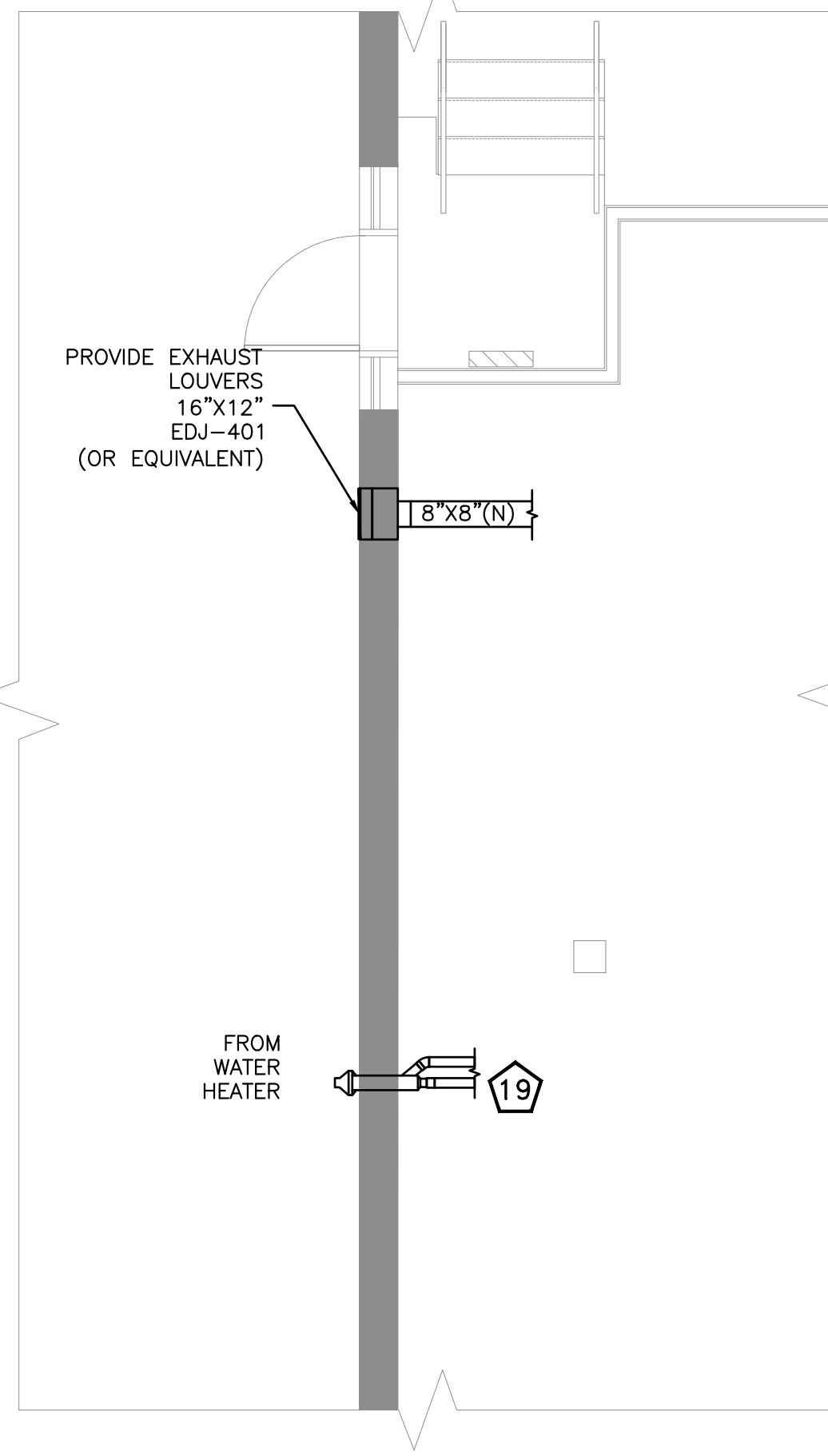
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MECHANICAL PLAN

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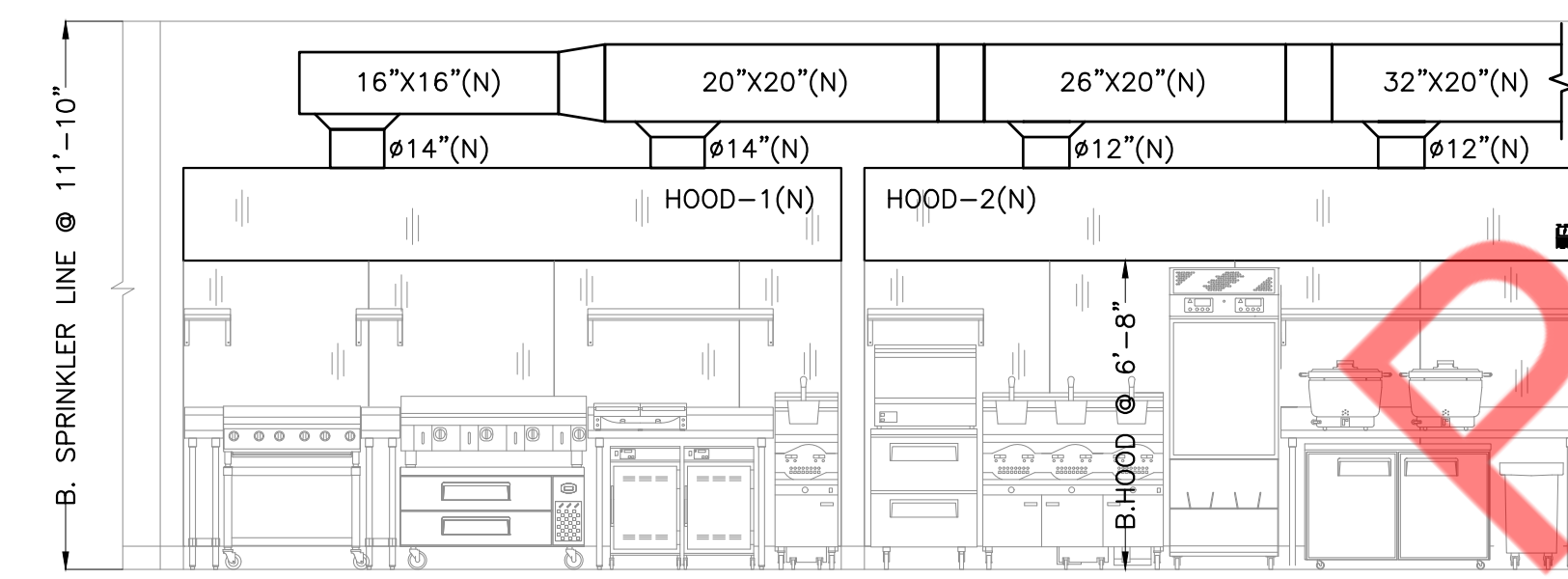
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M1.0



1 MECHANICAL FLOOR PLAN
0 1' 2' 4' 8'
SCALE: 1/4"=1'-0"



2 WEST WALL PART PLAN



3 KITCHEN DUCTWORK SECTION

MECHANICAL GENERAL NOTES

A. CONTRACTOR TO VISIT SITE TO VERIFY ON FIELD CONDITION ALONG WITH THE DRAWINGS & INFORM THE ENGINEER FOR ANY DISCREPANCIES FOUND BEFORE COMMENCING BIDS.

B. CONTRACTOR SHALL BALANCE EACH AIR DIFFUSER WITH THE CFM SHOWN PLAN.

C. 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.

D. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH LANDLORD AND LANDLORD'S STRUCTURAL ENGINEERS.

E. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED. VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.

F. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.

G. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.

H. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.

I. ALL EXPOSED ROUND DUCTWORK SHALL BE INTERNALLY INSULATED. ALL INTERNAL DUCTWORK SHALL BE EXTERNALLY INSULATED.

J. COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.

K. 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.

L. COORDINATE FINAL LOCATION OF EQUIPMENT WITH LANDLORD'S STRUCTURAL DRAWINGS.

M. TAKE NECESSARY PRECAUTIONS TO PREVENT DUST AND DIRT MIGRATING TO OCCUPIED AREAS OF THE BUILDING. THIS INCLUDES BLANKING OFF ANY RETURN AIR GRILLES/ DUCTS IN THE WORK AREA. PROVIDE TEMPORARY EXHAUST FANS, DUCTED DIRECTLY TO OUTDOORS, TO MAINTAIN NEGATIVE PRESSURE WITHIN THE WORK AREA.

N. KEEP ALL ADJOINING AREAS ADJACENT TO THE WORK AREAS CLEAN AND FREE OF DEBRIS.

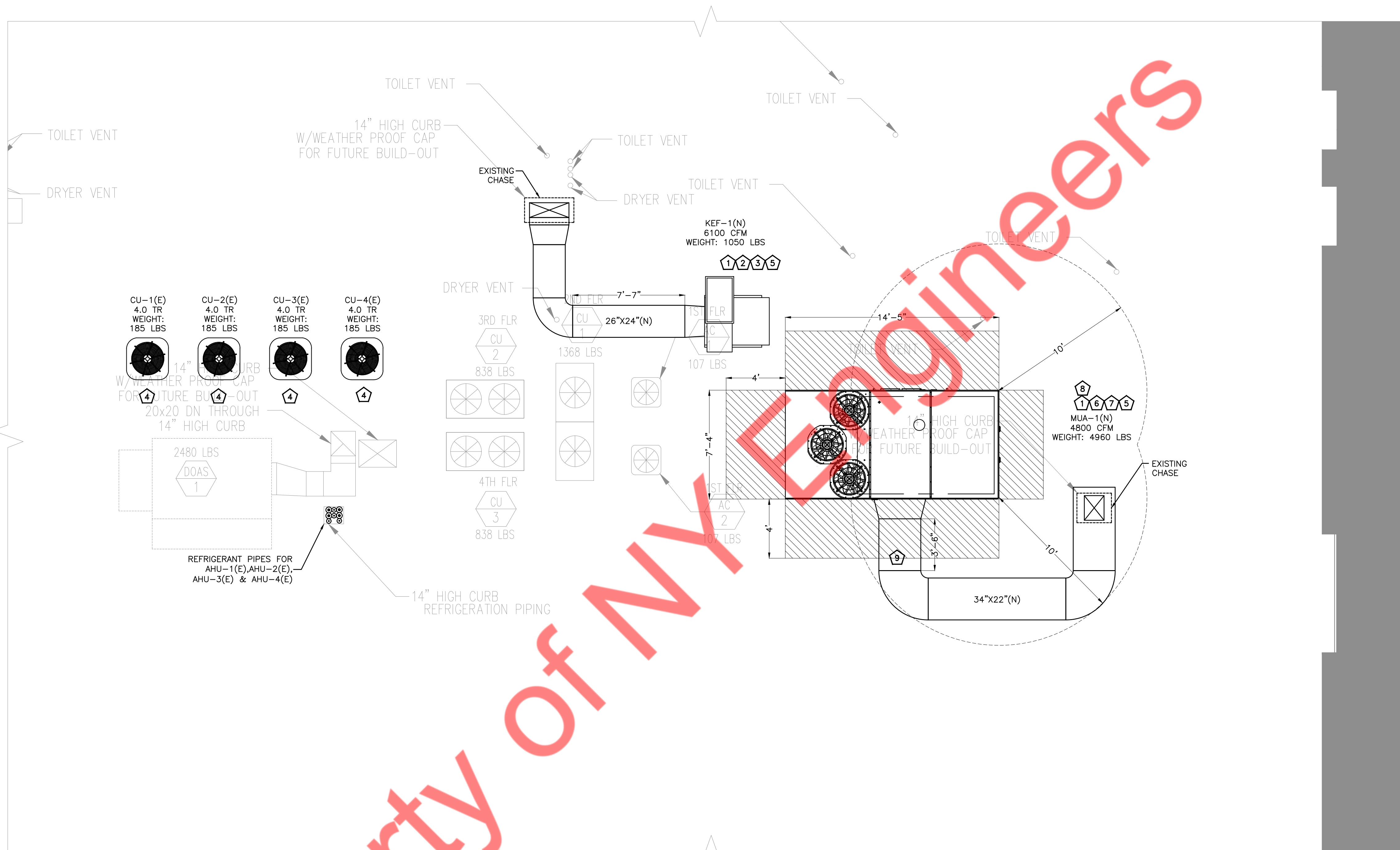
O. MECHANICAL CONTRACTOR TO COORDINATE ALL DUCT WORK, CROSSINGS, OVERLAPPING AND PENETRATIONS WITH SITE CONDITIONS AND AS PER EXISTING JOIST LAYOUT, SKYLIGHT AND BEAM IN FIELD. MODIFY DUCT WORK WHEREVER REQUIRED.

P. CONTRACTOR TO VERIFY ON SITE ALL OUTSIDE AIR & EXHAUST AIR WALL PENETRATION/TERMINATION. INFORM ENGINEER IF ANY DISCREPANCY FOUND.

Q. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS/SLABS/SHAFTS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.

FLOOR PLAN KEY NOTES:-

- 1 LOCATION OF DIGITAL T-STAT CONTROL FOR AHU-1(E), AHU-2(E), AHU-3(E) & AHU-4(E). COORDINATE FINAL LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN. PROVIDE LOCKABLE COVER.
- 2 PROVIDE REMOTE TEMP SENSOR MOUNTED IN THE SPACE AND WIRE BACK TO T-STAT OF RESPECTIVE AHUS. CONTRACTOR TO CONFIRM FINAL LOCATION/REQUIREMENT WITH OWNER/ARCHITECT PRIOR INSTALLING.
- 3 COORDINATE FINAL LOCATION OF EQUIPMENT WITH LANDLORDS STRUCTURAL DRAWINGS AND CONFIRM THE SAME WITH ARCHITECT/OWNER.
- 4 IF REQUIRED, PROVIDE CONDENSATE PUMP. CONNECT 1" CD FROM AHU TO APPROVED PLACE OF DISPOSAL.
- 5 EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM EXISTING ROOFTOP UNITS PENETRATIONS TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
- 6 PROVIDE SECONDARY DRIP PAN UNDER AC UNIT WITH WATER LEAKAGE SENSOR AND ALARM TO SHUT THE UNIT.
- 7 WATER HEATER PROVIDED BY PLUMBING CONTRACTOR. #4" VENT PIPE & 4" INTAKE FOR WATER HEATER TO THE WEST WALL OF THE BUILDING. CONTRACTOR TO RUN VENT AND INTAKE WITH MINIMUM BENDS.
- 8 INSTALL TYPE 1 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.
- 9 GREASE DUCT WITH FIRE WRAP AS PER LOCAL CODE REQUIREMENTS TO BE PROVIDED WITH KITCHEN EQUIPMENT AND INSTALLED BY MECHANICAL CONTRACTOR. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
- 10 MD TO BE INTERLOCKED WITH OAF-1(N).
- 11 VENT PIPE & COMBUSTION INTAKE FROM AHU-1(N), AHU-2(N), AHU-3(N) & AHU-4(N) TO BE PROVIDED BY LANDLORD.
- 12 32"x12" KITCHEN EXHAUST GREASE DUCT WITH FIRE WRAP AS PER LOCAL CODE REQUIREMENTS UP TO THE KEF-1(N) ON MAIN ROOF THROUGH EXISTING CHASE. CONTRACTOR TO FILED VERIFY/CONFIRM THE EXACT LOCATION AND SIZE OF THE EXISTING CHASE WITH LANDLORD PRIOR ORDERING DUCTWORK AND INFORM ARCHITECT / ENGINEER IN CHARGE IF ANY DISCREPANCY FOUND.
- 13 24"x22" MAKE-UP AIR DUCT UP TO THE EXISTING CHASE AND REDUCED TO 20"x16" TO RUN THROUGH THE CHASE. CONTRACTOR TO FILED VERIFY/CONFIRM THE EXACT LOCATION AND SIZE OF THE EXISTING CHASE WITH LANDLORD PRIOR ORDERING DUCTWORK AND INFORM ARCHITECT / ENGINEER IN CHARGE IF ANY DISCREPANCY FOUND.
- 14 16"x14" OUTSIDE AIR DUCT TO BE CONNECTED TO THE EXISTING DUCTWORK INSIDE THE ADJACENT SPACE BEING BROUGHT IN THROUGH THE BUILDING'S SOUTH FACADE.
- 15 REMOTE WALL MOUNTED FIRE SUPPRESSION SYSTEM FOR HOOD-1(N) & HOOD-2(N). CONTRACTOR TO INSTALL AS PER THE MANUFACTURERS INSTRUCTIONS.
- 16 CONTRACTOR TO REROUTE THE DUCTWORK TO ENSURE THAT IT DOES NOT COINCIDE WITH THE HANGERS OF THE OVERHANG SHELF, AS PER THE SITE CONDITIONS.
- 17 CONTRACTOR TO PROVIDE PERFORATED DIFFUSERS WITH 3 WAY PATTERN.
- 18 #8" EXHAUST DUCT UP TO THE WEST WALL OF THE BUILDING. CONTRACTOR TO RUN DUCTWORK WITH MINIMUM BENDS. CONTRACTOR SHALL COORDINATE WITH LANDLORD FOR THE FINAL TERMINATION LOCATION.
- 19 #4" COMBUSTION AIR INTAKE AND FLUE VENT FOR THE WATER HEATER. TERMINATE WITH CONCENTRIC VENT PIPE. CONTRACTOR TO INSTALL AS PER MANUFACTURERS INSTRUCTIONS. CONTRACTOR SHALL COORDINATE WITH LANDLORD FOR THE FINAL TERMINATION LOCATION OF FLUE VENT/ COMBUSTION AIR INTAKE.



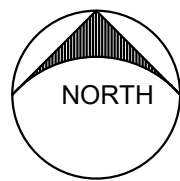
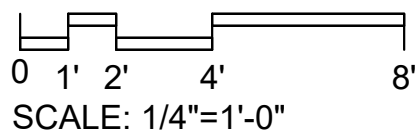
MECHANICAL GENERAL NOTES

- A. CONTRACTOR SHALL FIELD VERIFY THE EXHAUST LOCATION AND SIZE OF THE EXISTING CHASE.
- B. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT AT FIELD BEFORE FABRICATION OF DUCTWORK.
- C. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
- D. ALL SOURCE OF MECHANICAL INTAKE SHALL MAINTAIN 10 LINEAR FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.

ROOF PLAN KEY NOTES:-

1. CONTRACTOR TO CONFIRM THE FINAL LOCATION OF UNIT ON THE MAIN ROOF WITH ARCHITECT/ OWNER. CONTRACTOR TO COORDINATE THE LOCATION OF THE UNIT ON THE MAIN ROOF WITH THE STRUCTURAL ENGINEER.
2. INSTALL EXHAUST AIR UTILITY FAN ON THE ROOF AS PER MANUFACTURERS RECOMMENDATIONS. CONNECT EXHAUST DUCT FROM EXHAUST HOODS TO THE UTILITY FAN ON MAIN ROOF. RUN STRAIGHT DUCT OF LENGTH MINIMUM 72" BEFORE ANY FITTINGS.
3. TYPE-II KITCHEN EXHAUST SHALL TERMINATE 3 FEET AWAY FROM THE OPENING INTO THE BUILDING, 10 FEET FROM PROPERTY LINE, 10 FEET ABOVE GRADE, 10 FEET FROM ANY OUTSIDE AIR INTAKE AND TERMINATE MINIMUM 30 INCHES ABOVE ROOF.
4. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION OF THE CONDENSING UNITS ON THE MAIN ROOF PRIOR CONSTRUCTION / BASE BID.
5. CONTRACTOR TO FIELD VERIFY THE SLOPE OF THE ROOF AND COORDINATE WITH HOOD VENDOR FOR THE PITCHED CURB FOR INSTALLING MAKE UP AIR UNIT AND STAND FOR INSTALLING KITCHEN EXHAUST FANS.
6. ALL OUTSIDE AIR INTAKE ON THE ROOF SHALL BE MINIMUM 10 FEET AWAY FROM ANY EXHAUST SOURCE.
7. CONTRACTOR SHOULD FIELD VERIFY IF THE EXISTING VENTS ARE LOCATED AT LEAST 10 FEET AWAY FROM ANY OUTSIDE AIR IF THEY ARE NOT, THE VENT SHOULD BE EXTENDED TO ENSURE THERE IS A MINIMUM OF 3 FEET OF VERTICAL DISTANCE BETWEEN THE VENT TERMINATION AND ANY OUTSIDE AIR INTAKE.
8. ROUTE CONDENSATE DRAIN FROM MAU ON THE ROOF TO THE APPROVED PLACE OF DISPOSAL.
9. RUN STRAIGHT DUCT OF LENGTH MINIMUM 42" BEFORE ANY FITTINGS. ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED.

1 MECHANICAL ROOF PLAN



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NOTES :-

1. UNIT TO BE PROVIDED BY LANDLORD.
2. SUPPLY AIR CFM BASED ON HIGH SPEED. PROVIDE VARIABLE AIRFLOW ADJUSTMENT CONTROL FOR ALL UNITS.
3. REFRIGERANT R410A SHALL BE PROVIDED.
4. PROVIDE ALL ASSOCIATED ACCESSORIES.
5. ALL REFRIGERANT PIPING TO BE SIZED AS PER MANUFACTURERS RECOMMENDATIONS.
6. CONTRACTOR SHALL PROVIDE LOW LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEEDS THE STANDARD RECOMMENDED LENGTH. CONTRACTOR TO FIELD VERIFY THE EXACT TOTAL REFRIGERANT LENGTH AND COORDINATE WITH THE MANUFACTURER PRIOR ORDERING UNIT.
7. PROVIDE DRAIN PAN WITH WATER LEAK DETECTOR TO SHUT DOWN AHU.
8. PROVIDE DISCONNECT SWITCH.
9. HINGED ACCESS PANELS AND EXTERNAL GAUGE PORTS/PRESSURE RESETS.

NOTES :-

1. UNIT TO BE PROVIDED BY LANDLORD.
2. UNIT SHALL HAVE TEN YEAR EXTENDED WARRANTY FOR COMPRESSORS/PARTS.
3. PROVIDE LOW AMBIENT CONTROL FOR CONDENSING UNIT OPERATION DOWN TO -4°F.
4. PROVIDE COMPRESSOR CYCLE PROTECTOR.
5. CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEEDS THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH. CONTRACTOR TO FIELD VERIFY THE EXACT TOTAL REFRIGERANT LENGTH AND COORDINATE WITH THE MANUFACTURER PRIOR ORDERING UNIT.
6. ODOOR CONDENSING UNITS TO BE LOCATED WITH PROPER CLEARANCES AND MUST PREVENT RE-CIRCULATION OF AIR. COORDINATE WITH MANUFACTURER AND ARCHITECT.
7. CONDENSER UNIT SHALL NOT PRODUCE NOISE LEVELS IN EXCESS OF 42 DECIBELS FOR A SINGLE AIR CIRCULATING DEVICE AND 45 DECIBELS FOR THE CUMULATIVE NOISE LEVEL OF MULTIPLE AIR CIRCULATING DEVICES AS MEASURED 3 FEET FROM THE NOISE SOURCE AT AN OPEN DOOR OR WINDOW OF A NEARBY RESIDENCE.
8. CONDENSING UNIT TO BE SELECTED AT 95°F AMBIENT CONDITION.

NOTES FOR MUA-1(N)

1. INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
2. DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
3. INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER
4. REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
5. EC MOTOR CONDENSING FANS
6. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE
7. SUCTION LINE ACCUMULATOR
8. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER
9. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT)
10. 2" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA BASE
11. 81% EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 6:1 TURNDOWN WITH NG AND 5:1 TURNDOWN WITH LP
12. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
13. FULLY MODULATING HOT GAS REHEAT
14. SIDE DISCHARGE/NO RETURN

NOTES FOR DIFFUSERS

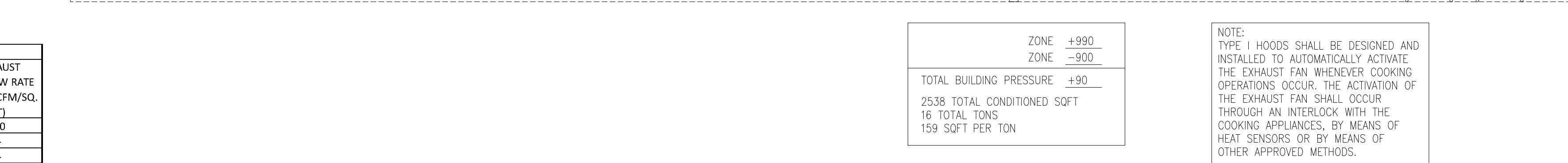
1. ALL GRILLES - CONTRACTOR SHALL COORDINATE WITH LATEST ARCHITECTURAL REFLECTED CEILING PLANS PLANS TO ENSURE PROPER AIR DEVICE BORDER SELECTION.
2. COORDINATE COLOR/FINISH WITH ARCHITECT.
3. MAX NC LEVEL 30 OR LESS.
4. ALL DIFFUSERS SHALL BE 4 WAY UNLESS OTHERWISE NOTED.

FOR ROUND NECK DIFFUSERS:

- 6"-100 CFM
- 8"-105-175 CFM
- 10"-180-275 CFM
- 12"-280-400 CFM
- 14"-410-540 CFM
- 16"-545 & ABOVE

NOTES:

- 1) PROVIDE THERMAL OVERLOAD PROTECTION, AMCA SEAL & UL CERTIFIED.
- 2) PROVIDE FACTORY MOUNTED AND INSTALLED WEATHER PROOF DISCONNECT SWITCH.
- 3) PROVIDE ALL NECESSARY ACCESSORIES AS PER MANUFACTURER'S RECOMMENDATIONS.
- 4) PROVIDE BACKDRIFT DAMPER.
- 5) PROVIDE MOTORIZED DAMPER.
- 6) INTERLOCK WITH TIMER CONTROL FOR CONTINUOUS OPERATION.
- 7) INTERLOCK WITH AHU-1(E), AHU-2(E), AHU-3(E) & AHU-4(E).
- 8) INTERLOCK WITH AHU-1(N) & HOOD-2(N).



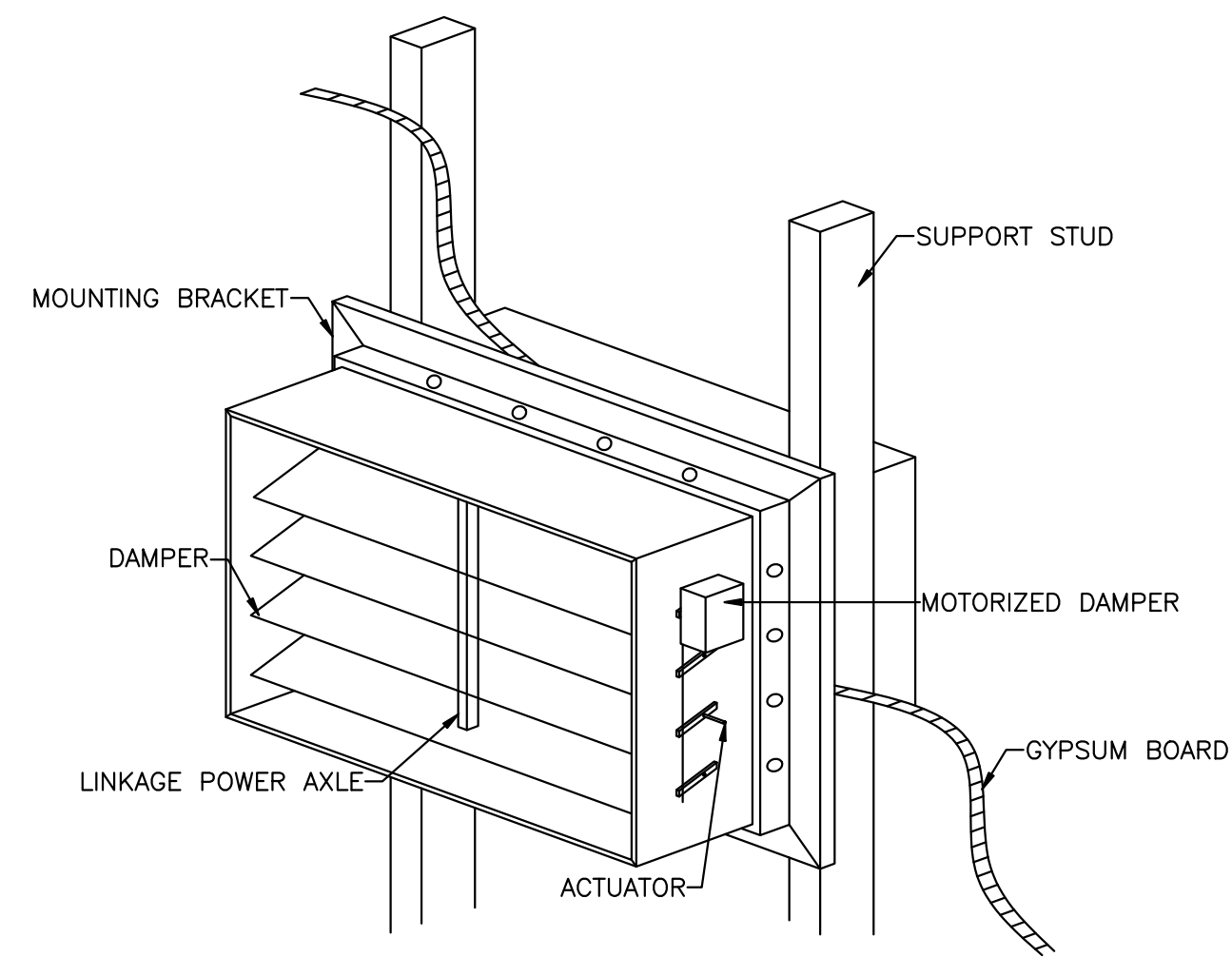
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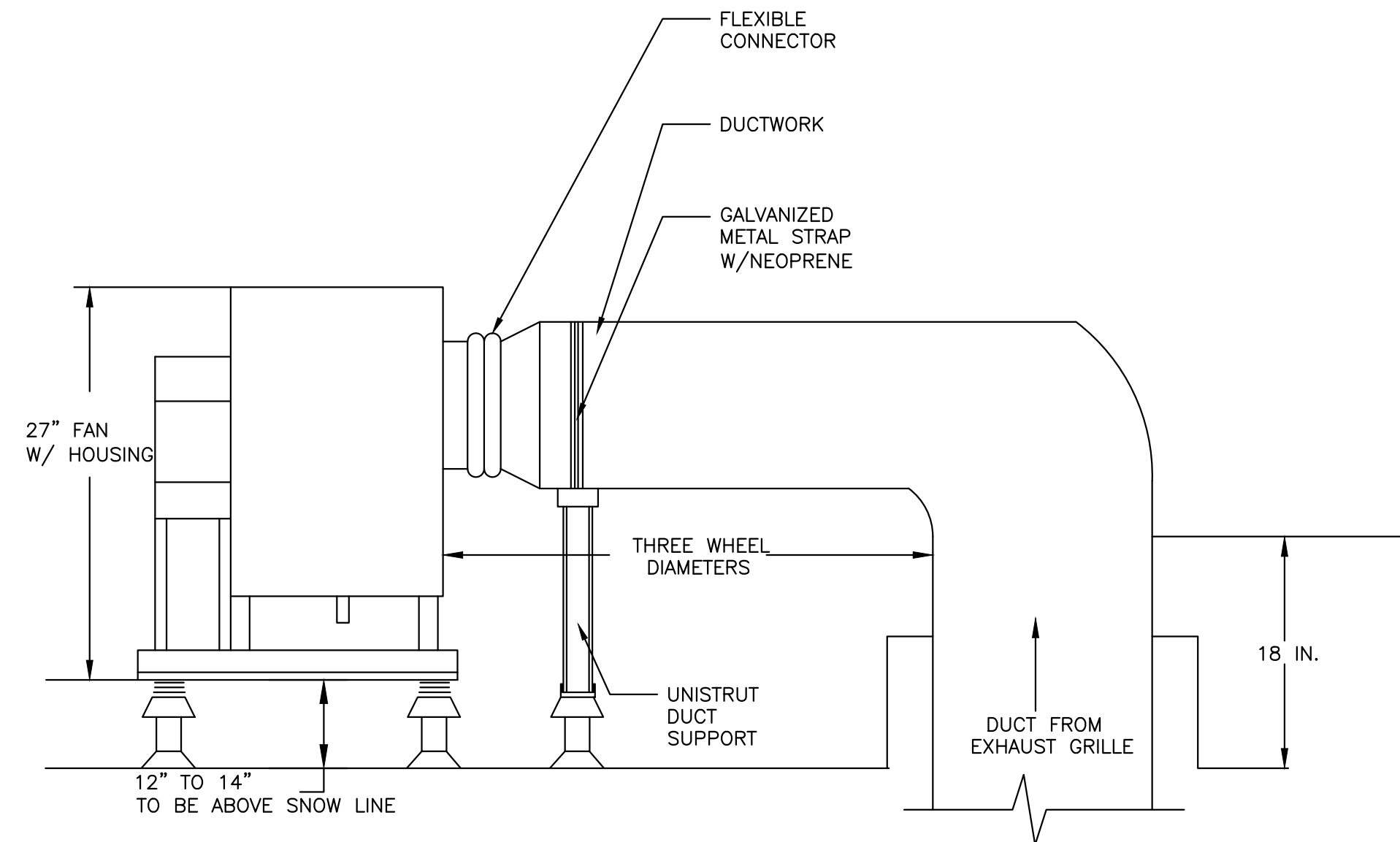
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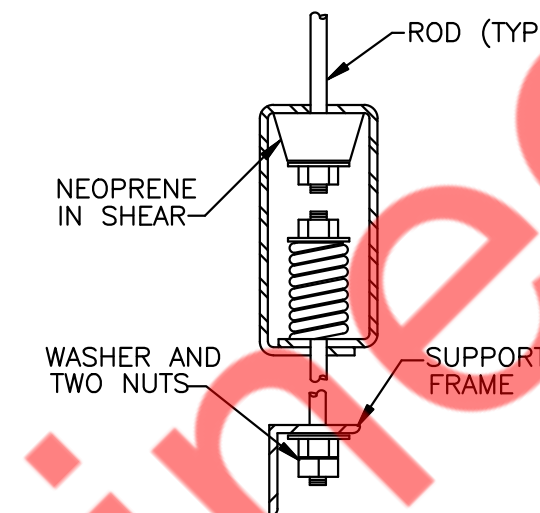
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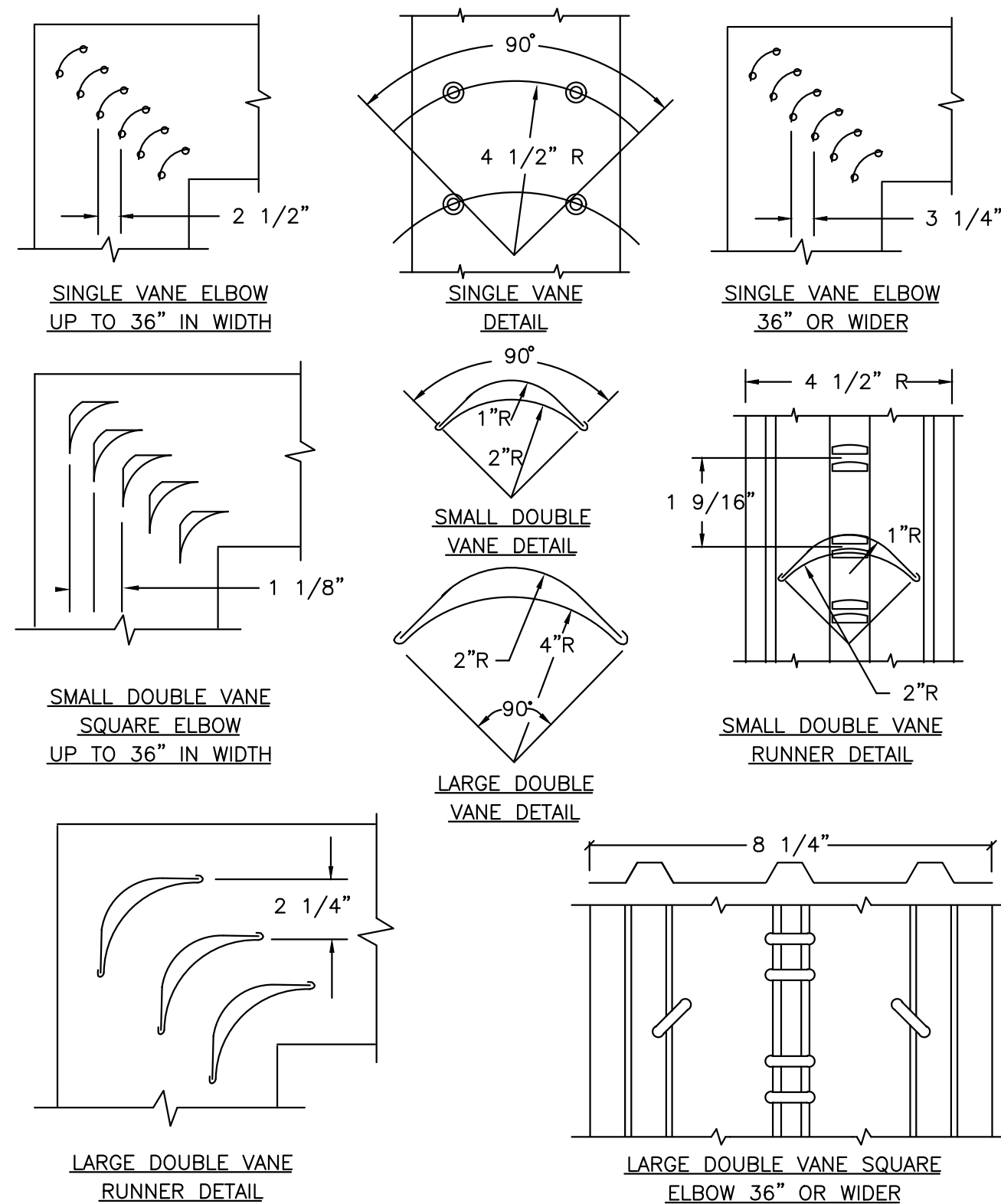
1 MOTORIZED DAMPER DETAIL
M5.0 N.T.S



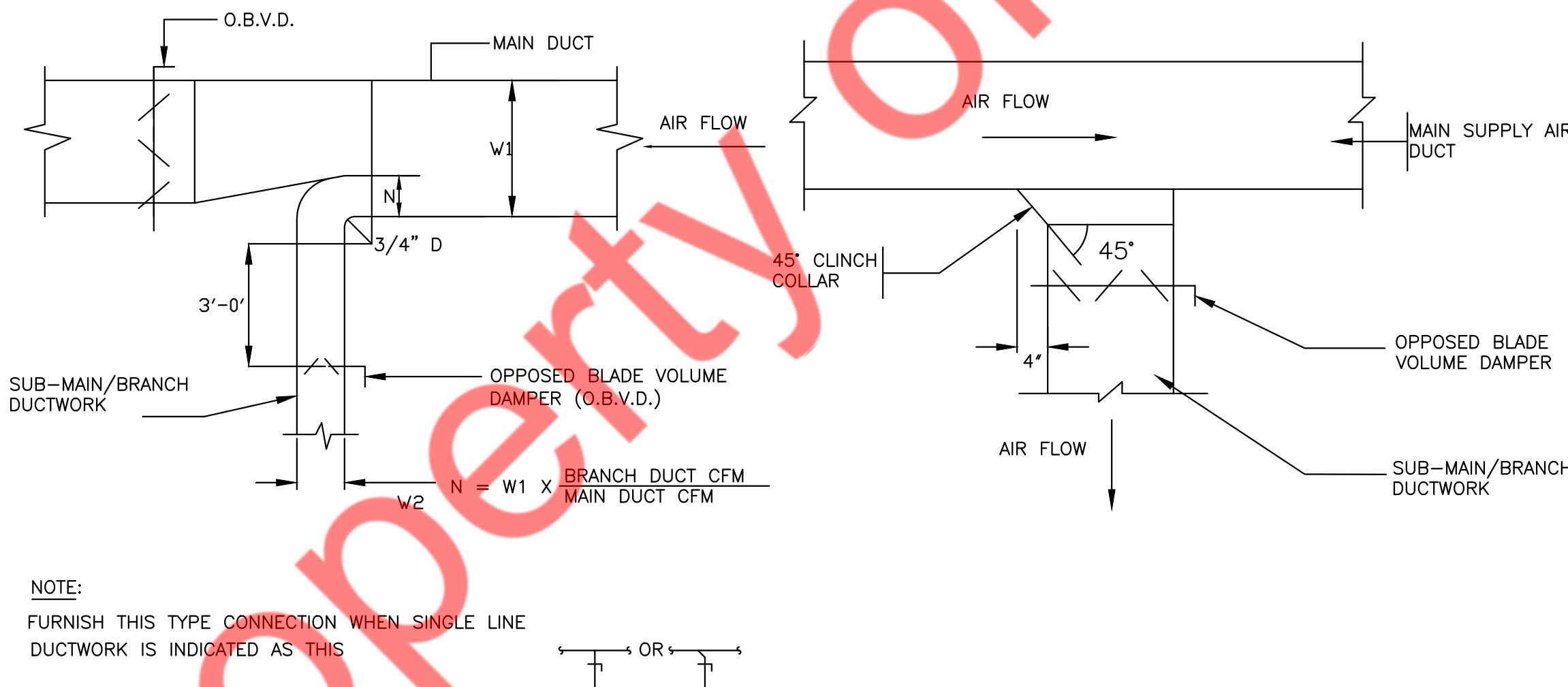
2 UTILITY VENT SET FAN DETAIL
M5.0 N.T.S



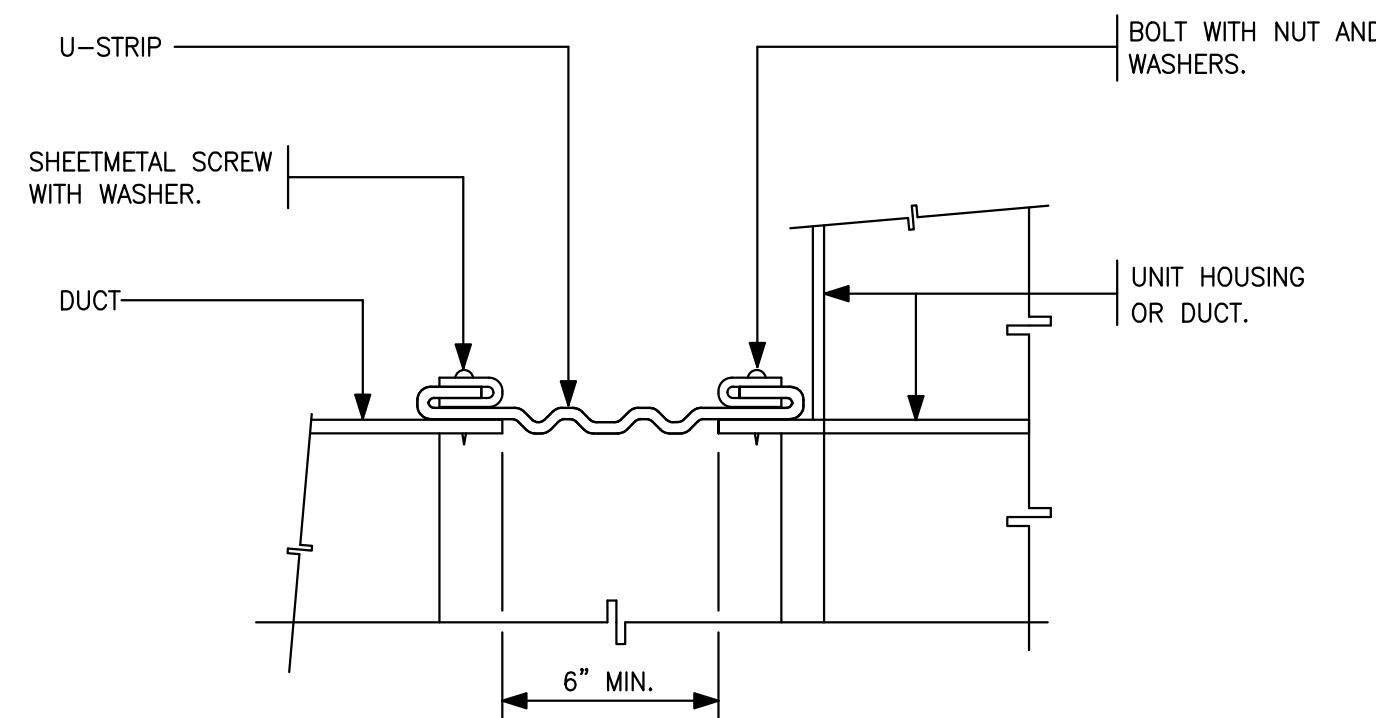
3 VIBRATION ISOLATOR DETAIL
M5.0 N.T.S



4 LOW VELOCITY DUCTWORK ELBOWS
M5.0 N.T.S



5 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION
M5.0 N.T.S



6 FLEXIBLE CONNECTION (DUCT-EQUIPMENT)
M5.0 N.T.S



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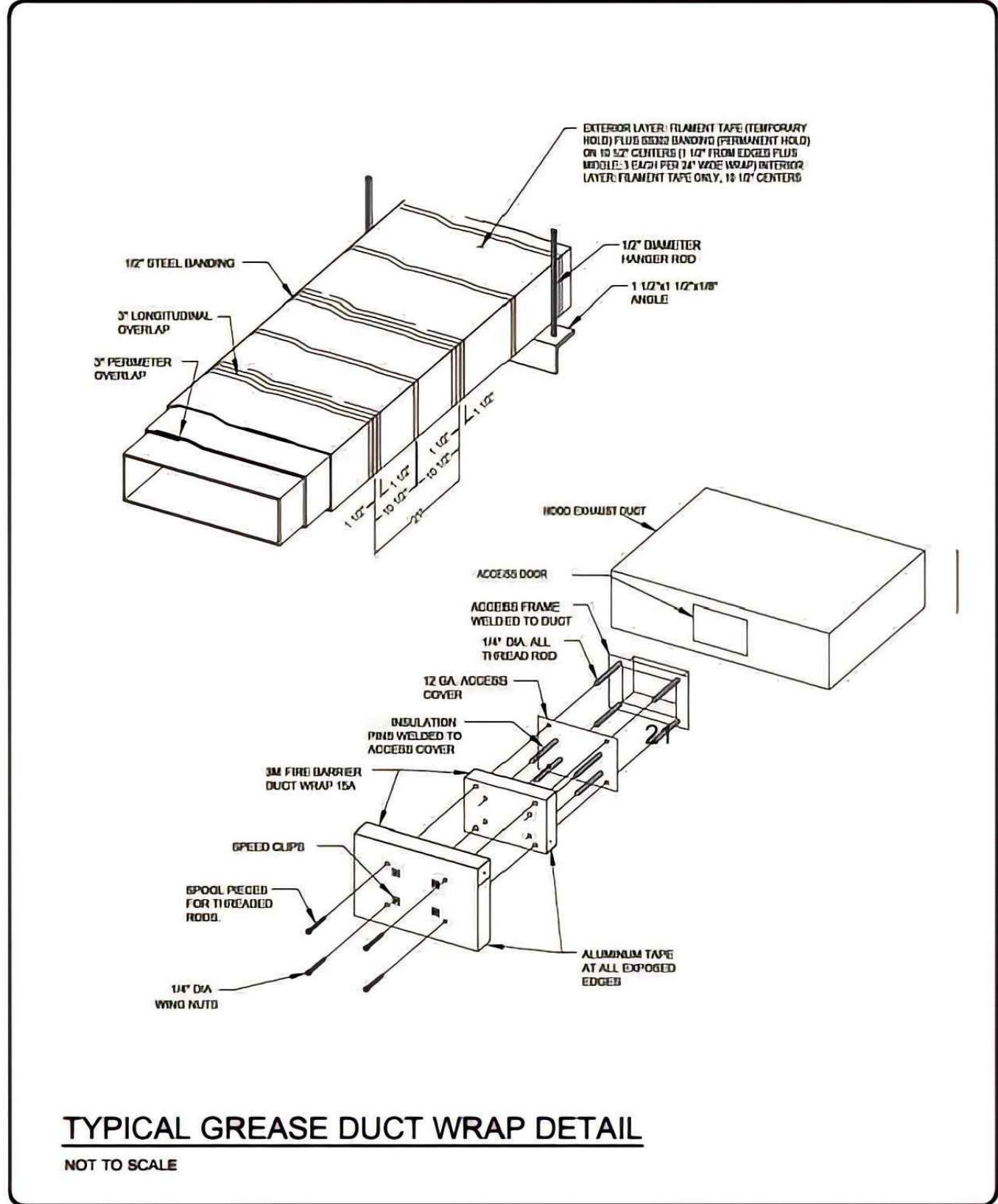
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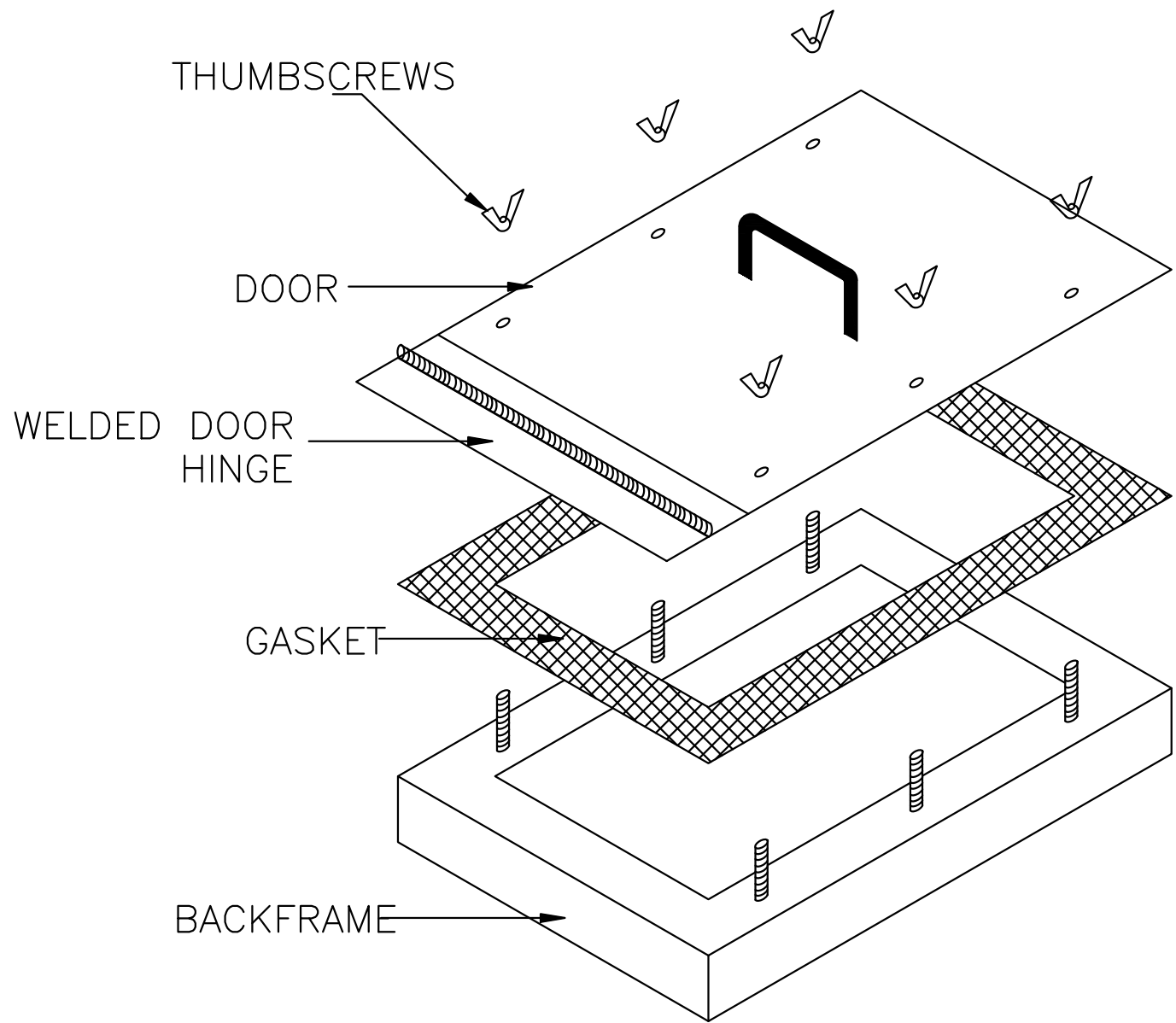
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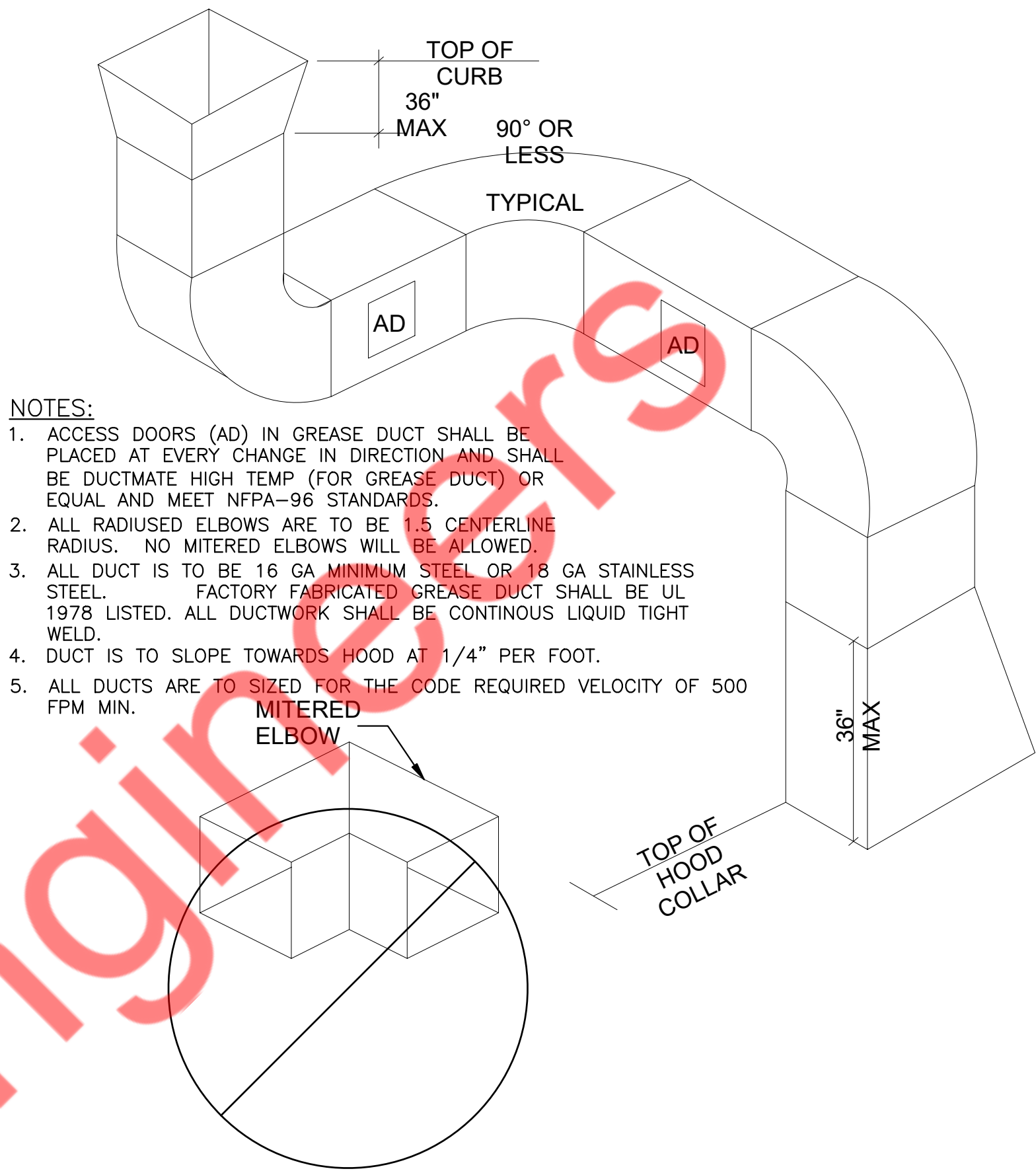


1 TYPICAL GREASE DUCT WRAP DETAIL
M5.2 N.T.S



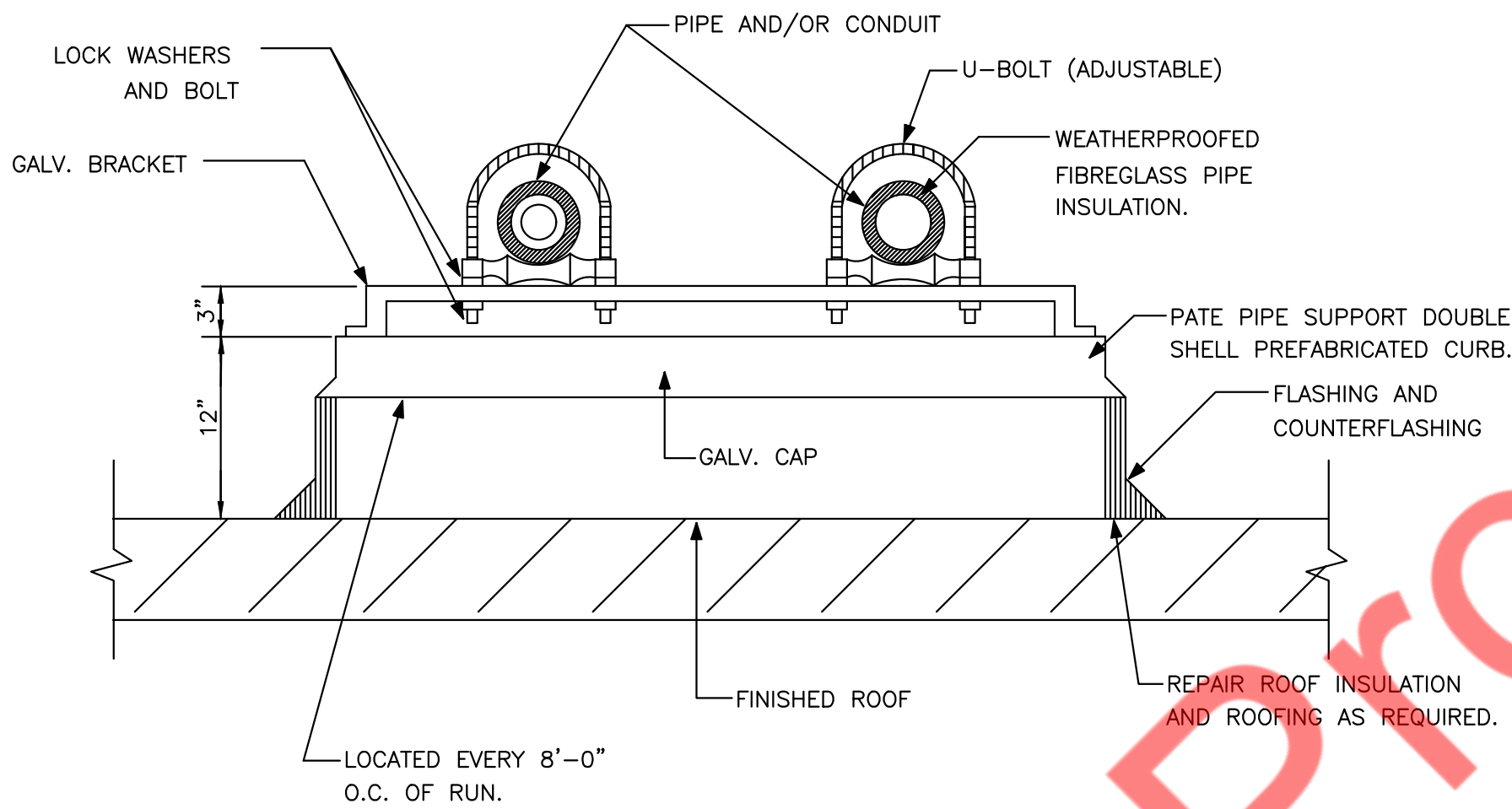
NOTES:
ACCESS DOOR IS TO BE DUCTMATE ULTIMATE DOOR II OR EQUAL.
ACCESS DOOR IS TO BE U.L. LISTED # 65X3.
ACCESS DOOR IS TO MEET OR EXCEED THE REQUIREMENTS OF NFPA 96, 2008 EDITION AT ALL LOCATIONS REQUIRED BY LOCAL CODE.

2 TYPICAL GREASE DUCT ACCESS DOOR DETAIL
M5.2 N.T.S

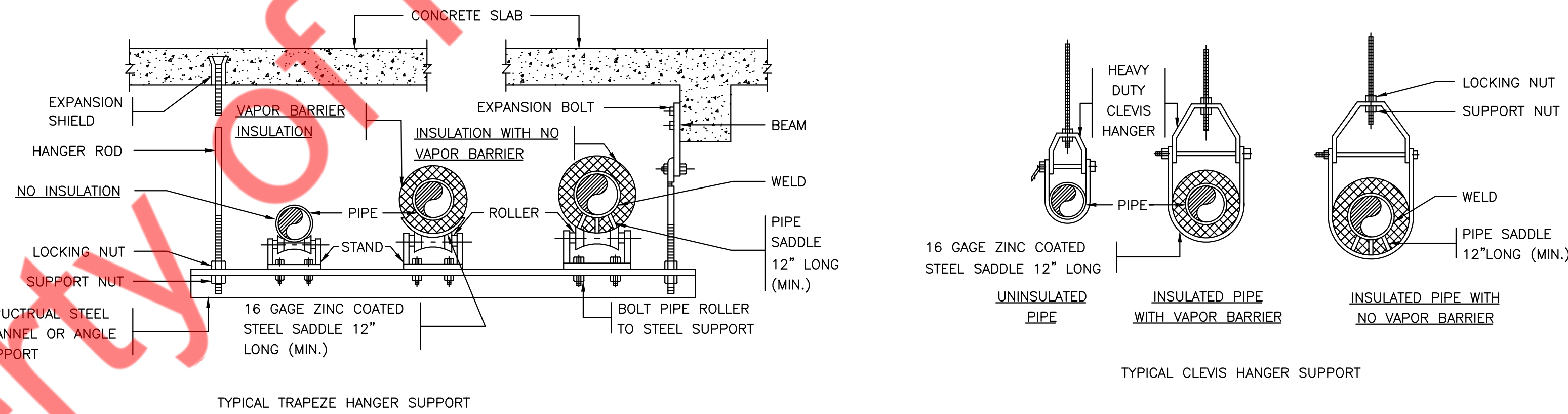


- NOTES:
1. ACCESS DOORS (AD) IN GREASE DUCT SHALL BE PLACED AT EVERY CHANGE IN DIRECTION AND SHALL BE DUCTMATE HIGH TEMP (FOR GREASE DUCT) OR EQUAL AND MEET NFPA-96 STANDARDS.
 2. ALL RADIUS ELBOWS ARE TO BE 1.5 CENTERLINE RADIUS. NO MITERED ELBOWS WILL BE ALLOWED.
 3. ALL DUCT IS TO BE 16 GA MINIMUM STEEL OR 18 GA STAINLESS STEEL. FACTORY FABRICATED GREASE DUCT SHALL BE UL 1978 LISTED. ALL DUCTWORK SHALL BE CONTINUOUS LIQUID TIGHT WELD.
 4. DUCT IS TO SLOPE TOWARDS HOOD AT 1/4" PER FOOT.
 5. ALL DUCTS ARE TO SIZED FOR THE CODE REQUIRED VELOCITY OF 500 FPM MIN.

3 TYPICAL GREASE DUCT DETAIL
M5.2 N.T.S



4 DETAIL OF PIPE AND CONDUIT SUPPORT ON ROOF
M-5.2 N.T.S



INDIVIDUAL PIPE HANGER ROD & SPACING SCHEDULE												
NOMINAL PIPE OR TUBE SIZE - INCHES	3/4	1	1 1/2	2	2 1/2	3	4	5	6	-	-	-
HANGER ROD SIZES - INCHES	3/8	3/8	3/8	3/8	1/2	1/2	5/8	5/8	7/8	-	-	-
MAXIMUM SPACING BETWEEN PIPE SUPPORTS - FEET	6	7	9	10	11	12	14	16	17	-	-	-
MAXIMUM SPACING BETWEEN CU. TUBE SUPPORTS - FEET	6	6	8	9	10	10	12	14	14	-	-	-

NOTES: TRAPEZE HANGER SPACING SHALL BE BASED ON SPACING OF SMALLEST PIPE ON TRAPEZE. TRAPEZE SHALL BE DESIGNED WITH A FACTOR OF SAFETY OF 5 FOR CENTER OF SPAN CONCENTRATED LOAD.

5 HANGER SUPPORTS DETAIL
M-5.2 N.T.S



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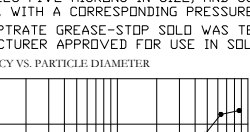
SPECIFICATION: CAPTRATE® GREASE-STOP® SOLID FILTER

The CAPTRATE GREASE-STOP SOLID FILTER is a SINGLE-STEP FILTER FEATURING A SOLID, 5-STEP DESIGN IN CONJUNCTION WITH A SLITTER ROOF-BATTLE DESIGN. THE FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD ROOF DRAIN UNITS.

UNITS ALONE INCLUDE STAINLESS STEEL HANDLES AND A FASTENING SYSTEM TO SECURE THE FILTER TO THE DRAIN UNIT.

GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMAIN AT LEAST 75% OF GREASE EXTRACTION EFFICIENCY PERFORMANCE OF THE PREVIOUSLY USED FILTER, AND SHALL BE LARGER, WITH A COMPRESSING PRESSURE SHIP NOT TO EXCEED 100 PSI OF WATER GAUGE.

THE CAPTRATE GREASE-STOP FILTER HAS TESTED TO NEW STANDARD ACTS FOR METAL-FILTERING APPROVED FOR USE IN SOLID FILT. APPLICATIONS AS A SPARK ARRESTER (SEE SECTION 05 11 00) OR EXHAUST.

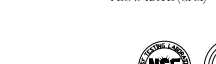


Pressure Drop (PSI)

Flow (GPM)

CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH:

- 1. STANDARD 10
- 2. STANDARD 15
- 3. NEW YORK STATE ENGINEERING

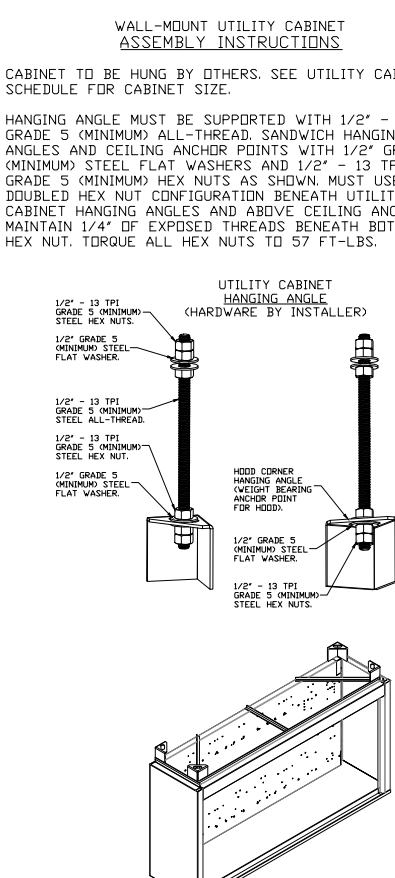
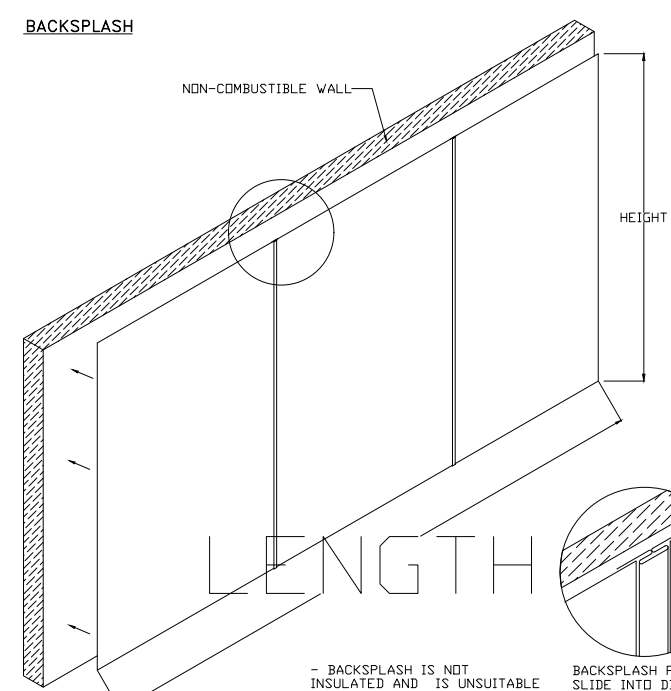


NSF

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Other certification logos

ANGLE MUST BE SUPPLIED
 GRADE 5 (MINIMUM) ALL-THREAD
 ANGLES AND CEILING ANCHOR PLATES
 MINIMUM STEEL FLAT WASHERS
 GRADE 5 (MINIMUM) HEX NUTS AND
 DOUBLED HEX NUT CONFIGURATION
 ANGLES AND ABOVE CEILING ANCHOR
 EXPOSED THREADS BENEATH BOTTOM
 ALL HEX NUTS TO 57 FT-LBS



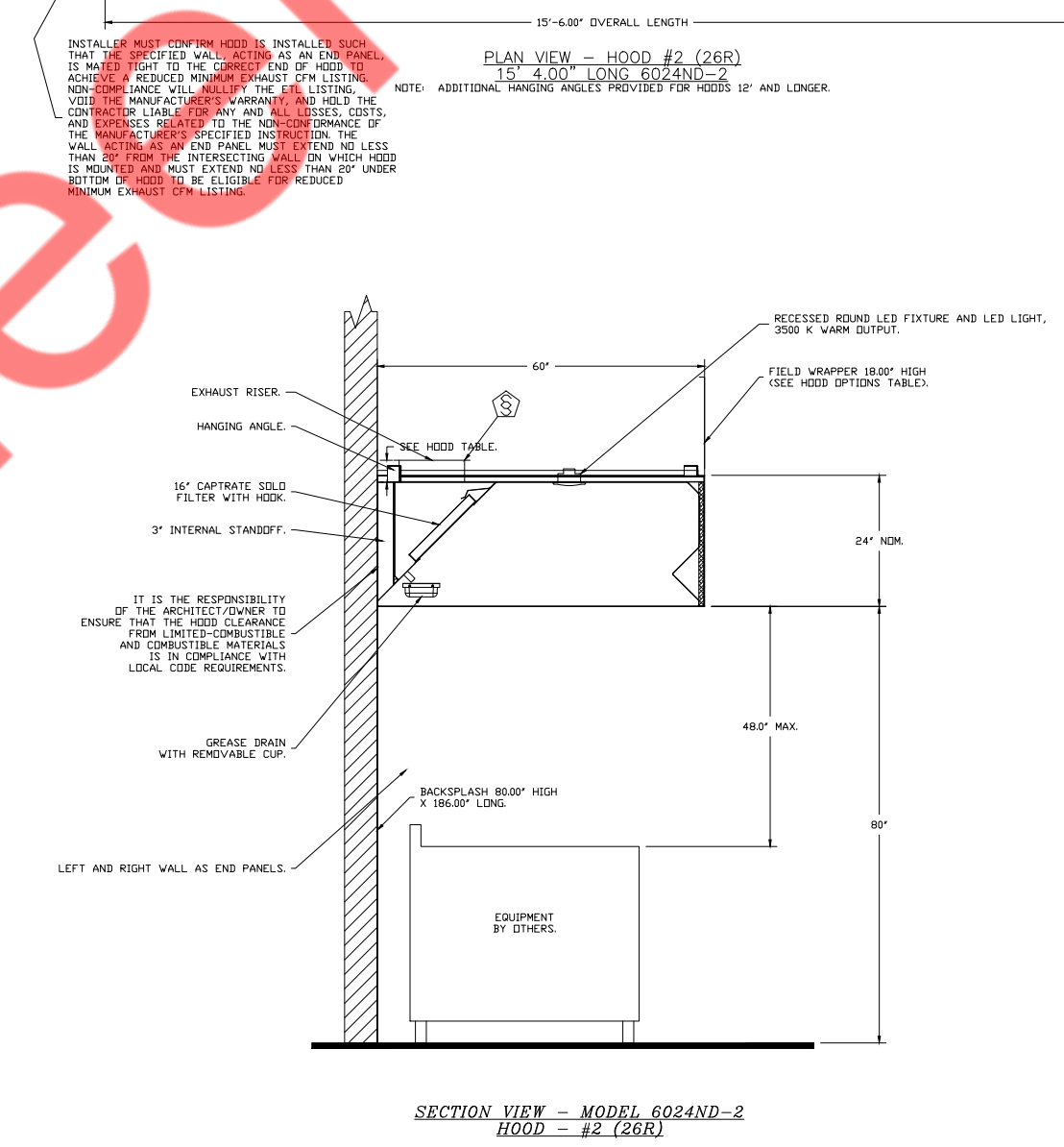
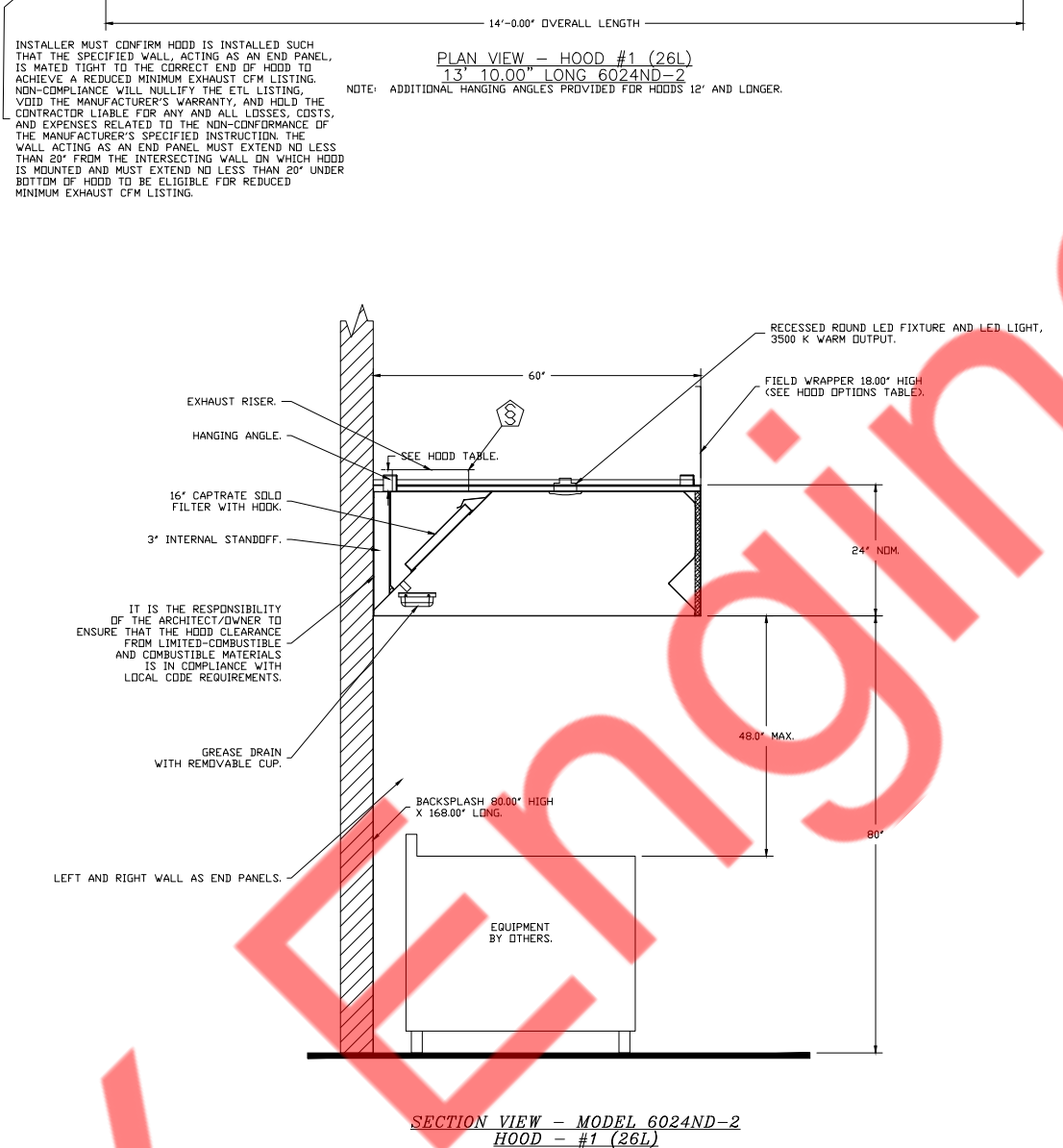
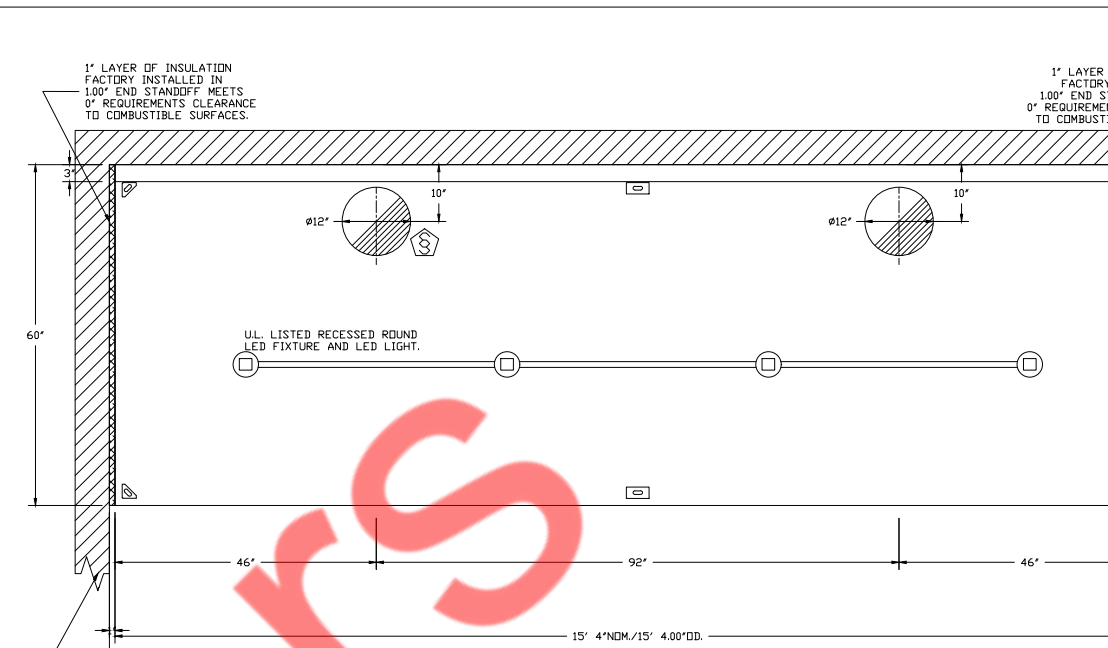
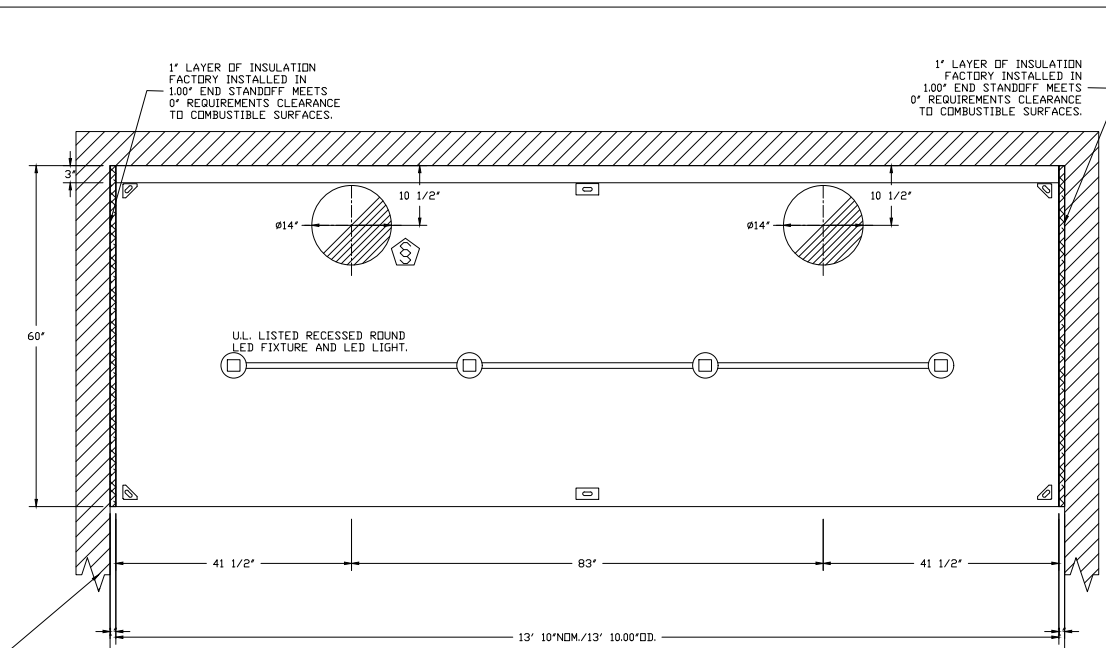
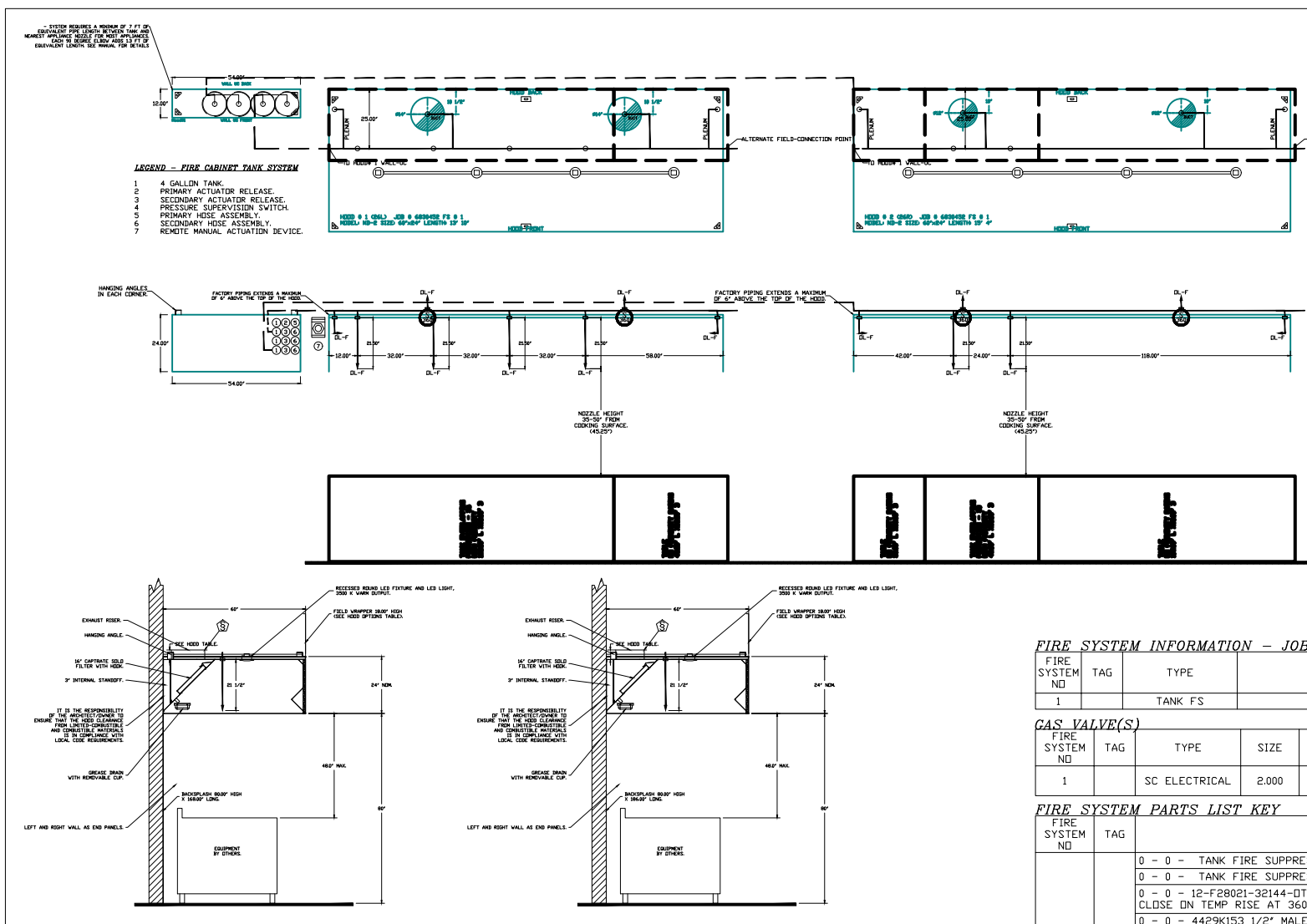
5) GREASE DUCT & CHIMNEY SPECIFICATIONS:
 PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW"
 ROUND 20 GAUGE 430 STAINLESS STEEL DUCT/WORK. MODEL "DW"
 IS LISTED TO UL-978 AND IS INSTALLED USING "V" CLAMP LOCKING
 CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW"
 DOES NOT REQUIRE SHELVEING PROVIDING IT HAS BEEN INSTALLED PER
 THE MANUFACTURES INSTALLATION GUIDE.
 PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER
 PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE
 SLOPED 1/16" PER 12' HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12'
 IF THE DUCT OR CHIMNEY IS 18" OR MORE IN DIAMETER. ACCUMULATION IN HORIZONTAL RUNS.
 IF THE DUCT OR CHIMNEY IS DOUBLE 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE
 UL-2221 OR UL-1038 LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY
 EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "2S, 2R TYPE HF, 3R, 3R, 32" ROUND 20 GAUGE
 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

CAPTIVEAIRE SYSTEMS RECOMMENDS THE USE OF LISTED, PRE-FABRICATED ROUND GREASE EXHAUST DUCT TO REDUCE STATIC PRESSURE IN THE SYSTEM, MINIMIZE INSTALLATION AND INSPECTION TIMES, AND ENSURE DUCT IS LIQUID TIGHT

HVAC DISTRIBUTION NOTE
HIGH VELOCITY DIFFUSERS OR HVAC RETURN SHOULD NOT BE PLACED WITHIN TEN (10) FEET OF THE EXHAUST HOOD. PERFORATED DIFFUSERS ARE RECOMMENDED.

CUSTOMER APPROVAL TO MANUFACTURE	
APPROVED AS NOTED	☐
APPROVED WITH NO EXCEPTION TAKEN	☐
REVISE AND RESUBMIT	☐
SIGNATURE _____	
YOUR TITLE _____	DATE _____

    	REVISIONS REVISION NO. _____ DATE _____	
	PROJECT NO. _____	
	DRAWING NO. _____	
	SCALE: _____	
DATE: 7/22/2024		
DWD: 6932166		
DRAWN BY: _____		
SCALE: 3/4" = 1'-0"		
MASTER DRAWING		
SHEET NO. _____		

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		REVISIONS 1. 3/24/2024 2. 3/24/2024 3. 3/24/2024 4. 3/24/2024		1. 3/24/2024 2. 3/24/2024 3. 3/24/2024 4. 3/24/2024
				
		CAPTIVE WIRE www.captivewire.com		Southern California Office 3002 Dover Ave., Suite 202, Torrance, CA 90503-2926 (714) 897-1000 FAX (310) 209-0171 EMAIL: info@captivewire.com
		DATE: 7/22/2024 DWG. #: 6010166		
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- DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:**
- CONTROLS SHALL BE LISTED BY ETL, UL, ICC-ES AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.7.5 (2021).
 - THE CONTROL ENCLOSURE SHALL BE NEW, 1-WATER 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 ROSSER(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 507.2.1.
 - A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HISTORISIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCE 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 (VFD) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFD 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. PREVENTION 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 BRY CONTACT EXTERNAL CONTROL. SHALL NOT OVERIDE FAN OPERATION LOGIC AS REQUIRED BY CODES.
 - AN LED INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
 - A. DRIFT-PROOF BUTTON ON A LIGHT SWITCH ACTIVATION.
 - B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES AND RESET RELAY REQUIRED.
 - C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - E. RES-WIRED DUCT TEMPERATURE SENSING DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
 - G. AN ENERGY SAVING INDICATOR THAT UTILIZES PERIODIC KWH FROM THE VFD'S.

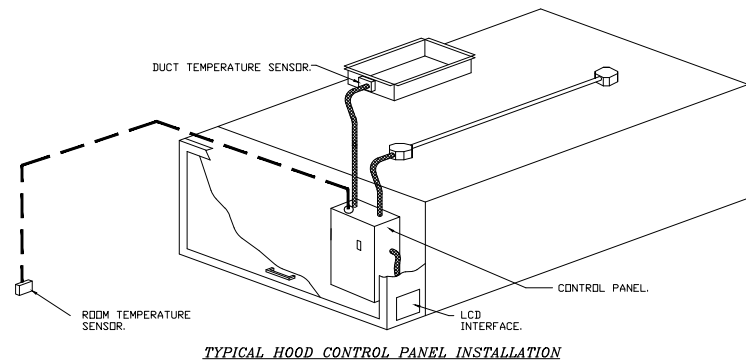
SYSTEM DESIGN VERIFICATION (SDV)

IF ORDERED, CAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE.

ANY FIELD RELATED DISCREPANCIES THAT ARE DISCOVERED DURING THE SDV WILL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR AND CORRESPONDING TRADES ON SITE. THESE ISSUES WILL BE DOCUMENTED AND FORWARDED TO THE APPROPRIATE SALES OFFICE. IF CAS SERVICE HAS TO

RESOLVE A DISCREPANCY THAT IS A FIELD ISSUE, THE GENERAL CONTRACTOR WILL BE NOTIFIED AND BILLED FOR THE WORK. SHOULD A RETURN TRIP BE REQUIRED DUE TO ANY FIELD RELATED DISCREPANCY THAT CANNOT BE RESOLVED DURING THE SDV, THERE WILL BE ADDITIONAL TRIP CHARGES.

DURING THE SDV, CAS SERVICE WILL ADDRESS ANY DISCREPANCY THAT IS THE FAULT OF THE MANUFACTURER. SHOULD A RETURN TRIP BE REQUIRED, THE GENERAL CONTRACTOR AND APPROPRIATE SALES OFFICE WILL BE NOTIFIED. THERE WILL BE NO ADDITIONAL CHARGES FOR MANUFACTURER DISCREPANCIES.



- 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 KITCHEN TEMPERATURE AND THE TEMPERATURE AT THE HOOD EXHAUST OR EXHAUST DUCT COL. FAN(S) WILL ACTIVATE AT A CONTROLLABLE TEMPERATURE DIFFERENTIAL. THE SCHEDULE DEPENDING ON THE JOB OR OPERATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR SPEED AS A MOTOR OR VFD DRIVEN MOTOR(S) 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. PANEL(S) EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS "STATIC", FANS WILL RUN AT A SET SPEED CALCULATED FOR THE SPECIFIC DEMAND CONTROL VENTILATION SYSTEM ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.7.5 (2021).
 - 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 SETPOINT TO PREVENT UNWANTED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
 - IDDED: THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (BMS, BMS OR HARDWIRED INTERLOCKS).
 - 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/ELECTRIC GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

REVISIONS

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CAPTIVE
Southern California Office

3842 Shaw Ave., Suite 202, Van Nuys, CA 91411-3426
TEL: 818.709.9191 FAX: 818.709.9192
WWW.CAPTIVEENGINEERS.COM

DATE: 7/22/2024

DWG.#: 0920166

DRAWN BY:

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 9



GUZMAN Y GOMEZ

NY ENGINEERS

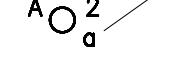
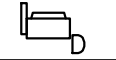
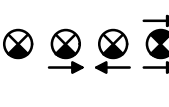
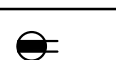
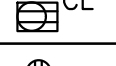
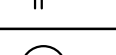
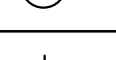
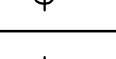
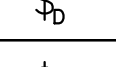
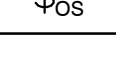
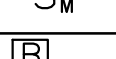
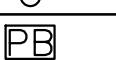
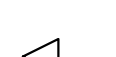
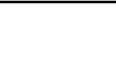
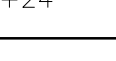
NY ENGINEERS
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MIAMI, FL 33179

98/1324 ISSUED FOR PERMIT
REVISIONS

Drawing Title
HOOD DRAWING 3

Job No.
Drawn
NYE

Sheet No.
K5.3

ELECTRICAL SYMBOLS LIST				GENERAL NOTES (APPLY TO ALL "E" DRAWINGS)				
LIGHTING		POWER AND TELECOMMUNICATION		ABBREVIATIONS				
     	LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.	MOTORS AND CONTROLS		A	AMPERES	EA	EACH	
				DISCONNECT (SAFETY) SWITCH "200/3/150" DENOTES AMPERES/POLE/FUSE, "NF" DENOTES NON-FUSED, "N3R" DENOTES NEMA 3R	A/C, AC	AIR CONDITIONING UNIT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
				30A/240V NON FUSED DISCONNECT SWITCH	AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
				60A/240V NON FUSED DISCONNECT SWITCH	AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
				100A/240V NON FUSED DISCONNECT SWITCH	AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
				200A/240V NON FUSED DISCONNECT SWITCH	AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
 		RECEPTACLES AND OUTLETS		AT	AMP TRIP	ER	EXISTING TO BE RELOCATED	
			DUPLEX CONVENIENCE RECEPTACLE	ATS	AUTOMATIC TRANSFER SWITCH	ETR	EXISTING TO REMAIN	
			DEDICATED POWER OUTLET "D" DENOTES DEDICATED POWER OUTLET, "GFI" DENOTES GROUND FAULT INTERRUPTER, "WP" DENOTES WEATHERPROOF,	AUTO	AUTOMATIC	EWF	ELECTRIFIED WORKSTATION FURNITURE	
			CENTER SHADING IN RECEPTACLE DENOTES ISOLATED GROUNDING	AWG	AMERICAN WIRE GAUGE	EWH	ELECTRIC WATER HEATER	
			SPECIAL PURPOSE RECEPTACLE	C	CONDUIT	FA	FIRE ALARM	
			CEILING MOUNTED DUPLEX OUTLET	C/B,CB	CIRCUIT BREAKER	FBO	FURNISHED BY OTHERS, INSTALLED & WIRED BY EC	
WIRING SYSTEMS			QUAD OUTLET	CKT	CIRCUIT	FDR	FEEDER	
			JUNCTION BOX	CLG	CEILING	FIBO	FURNISHED & INSTALLED BY OTHERS, WIRED BY EC	
			20A WALL SWITCH U.O.N.	COMM	COMMUNICATION	FIXT	FIXTURE	
			DIMMER SWITCH WALL-LUTRON-DVTV/EQUIVALENT	CT	CURRENT TRANSFORMER	FL	FLOOR	
			WALL OCCUPANCY SENSOR	CU	COPPER	FLUOR	FLUORESCENT	
			MOTOR SWITCH	°C	DEGREE CELSIUS	G	GROUND	
ELECTRICAL DRAWING LIST			BUZZER	°F	DEGREE FAHRENHEIT	GFI	GROUND FAULT INTERRUPTER	
			PUSH BOTTON FOR BUZZER	DIA	DIAMETER	GP	GENERAL PURPOSE	
		POWER DISTRIBUTION		DISC	DISCONNECT	HC	HUNG CEILING	
			DISTRIBUTION PANELBOARD, SURFACE OR FLUSH MOUNTED.	DN	DOWN	HP	HORSEPOWER	
		COMMUNICATIONS		DP	DISTRIBUTION PANEL	HWH	HOW WATER HEATER	
			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.	DWH	DOMESTIC WATER HEATER	HZ	HERTZ	
ANNOTATION			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	DWG	DRAWING	IC	INTERRUPTING CAPACITY	
		POWER DISTRIBUTION		JB	JUNCTION BOX	PP	POWER PANEL	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	KCMIL	ONE THOUSAND CIRCULAR MILS	PVC	POLYVINYL CHLORIDE	
		COMMUNICATIONS		KV	KILOVOLT	PWR	POWER	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	KVA	KILOVOLT-AMPERES	R	REMOVE	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	KW	KILOWATTS	RE	RELOCATED EXISTING	
CODE COMPLIANCE		COMMUNICATIONS		LP	LIGHTING PANEL	REC	RECEPTACLE	
		ANNOTATION		LTG	LIGHTING	RGS	RIGID GALVANIZED STEEL	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	MAX	MAXIMUM	RR	REMOVE & RELOCATE	
		COMMUNICATIONS		MC	MOTOR CONTROLLER	SECT	SECTION	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	MCB	MAIN CIRCUIT BREAKER	SPDT	SINGLE POLE DOUBLE THROW	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	MER	MECHANICAL EQUIPMENT ROOM	SPST	SINGLE POLE SINGLE THROW	
CODE COMPLIANCE		ANNOTATION		MIN	MINIMUM	SPEC	SPECIFICATION	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	MLO	MAIN LUGS ONLY	SW	SWITCH	
		COMMUNICATIONS		MTD	MOUNTED	SWBD	SWITCHBOARD	
		ANNOTATION		MTS	MANUAL TRANSFER SWITCH	SYM	SYMMETRICAL	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	N	NEUTRAL	SYS	SYSTEMS	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	NE	NEW DEVICE TO REPLACE EXISTING	TELE	TELEPHONE	
CODE COMPLIANCE		COMMUNICATIONS		NIC	NOT IN CONTRACT	TEMP	TEMPERATURE	
		ANNOTATION		NL	NIGHT LIGHT	TXF	TOILET EXHAUST FAN	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	NTS	NOT TO SCALE	TYP	TYPICAL	
		COMMUNICATIONS		OC	ON CENTER	UON	UNLESS OTHERWISE NOTED	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	P	POLES	V	VOLT/VOLTAGE	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	PB	PULLBOX	VA	VOLT AMPERE	
CODE COMPLIANCE		COMMUNICATIONS		PC	PERSONAL COMPUTER	VAV	VARIABLE AIR VOLUME	
		ANNOTATION		ø	PHASE	VFD	VARIABLE FREQUENCY DRIVE	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	PNL	PANEL	VP	VAPORPROOF	
		COMMUNICATIONS		W	WATT	WP	WEATHER PROOF	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	W	WIRE	XFMR	TRANSFORMER	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING	WH	WALL HEATER	ZRT	ZONE REGISTER TERMINALS	
CODE COMPLIANCE		COMMUNICATIONS		E	EXISTING	IG	ISOLATED GROUND	
		ANNOTATION		TR	TAMPER RESISTANCE	RTU	ROOF TOP UNIT	
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING					
		COMMUNICATIONS						
		ANNOTATION						
			DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING TO ABOVE CEILING					

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE 2020 NFPA 70 NATIONAL ELECTRICAL CODE, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.

2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.

3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.

4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.

5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.

6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.

7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR 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.

8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.

10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.

11. MINIMUM SIZE OF CONDUIT SHALL BE ¾", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.

12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.

13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVIDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CONCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.

14. SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.

15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.

16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAINIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.

17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.

19. ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.

20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.

21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE-RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE-RATED BOXES OR PUTTY PADS ARE UTILIZED.

22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITHR THE ENGINEER AND OWNER BEFORE INSTALLATION.

23. COORDINATE THE MOUNTING HEIGHT AND LOCATION OF RACEWAYS, COMMUNICATIONS OUTLETS, AND RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND DETAILS.

24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.

25. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.

26. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS AND INDICATED WITH SWITCH CONTROL SHALL BE WIRED WITH BATTERY CHARGING/SENSING CIRCUIT WIRED AHEAD OF SWITCH CONTROL.

27. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANELBOARD.



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REVISIONS	

Drawing Title
**ELECTRICAL SYMBOLS &
ABBREVIATION**

Job No.
Drawn
NYE

Sheet No.
E0.0

ELECTRICAL SPECIFICATIONS

1. GENERAL:

- A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
- B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN HEADROOM AND SPACE CONDITIONS.
- C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSIDERED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS, REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
- D. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.
- E. 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.
- F. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, UNLESS OTHERWISE NOTED.
- G. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT, PROVIDE EQUIPMENT CURBS AS REQUIRED.
- H. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT ND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE. ARCHITECT OR AS NOTED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
- I. 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 DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- J. UNLESS OTHERWISE SPECIFICALLY NOTED OR 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.
- K. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- L. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- M. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF INSPECTION AND APPROVAL.

2. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. DEFINITIONS:

- 1) "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE, AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
- 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
- 5) "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED ITEMS.
- 6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
- 7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
- 8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.
- B. TEMPORARY LIGHT AND POWER: PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT EARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES AS HEREIN DESCRIBED. EXTEND SYSTEMS TO NEW CONSTRUCTION AS SOON AS PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING OWNER. PROVIDE ALL REQUIRED MAINTENANCE, INCLUDING LAMPS AND SOCKETS.
- C. QUALITY ASSURANCE
- 1) QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
- 2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.
- 3) CURRENT CHARACTERISTICS:
- a. SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.
- b. DISTRIBUTION: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

4) HEIGHTS OF OUTLETS:

- a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:
- RECEPTACLES AND TELEPHONES: 1 FT-6 IN.
- WALL SWITCHES: 4 FT-0 IN.
- WALL FIXTURES: 7 FT-0 IN.
- MOTOR CONTROLLERS: 5 FT-0 IN.
- CLOCKS: 7 FT 6 IN
- b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.

D. PRODUCT DELIVERY, STORAGE AND HANDLING

- 1) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
- 2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED. CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

E. MATERIALS

- 1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.
- 2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.
- 3) INSERTS AND SUPPORTS:
- a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.
- SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
- MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
- CLIP FORM NAILS FLUSH WITH INSERTS.
- MAXIMUM LOADING 75 PERCENT OF RATING.
- b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.
- c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.
- d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

- F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES. AFTER FABRICATION, UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARKED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC-BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

- G. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

- H. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.

- I. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

3. SCOPE OF WORK:

- A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.
- B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLIED OR SPECIFIED HEREIN.
- C. 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 BE PROVIDED THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR
- D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, 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.
- E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE FLORIDA BUILDING CODE, SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.
- F. AREAS WITH NO ELECTRICAL WORK SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS TO ALL AREAS NOT COVERED BY THIS RENOVATION AND SHALL PROVIDE 48 HOUR NOTICE TO LANDLORD OF ANY PLANNED POWER INTERRUPTIONS OR SIGNAL SYSTEM OUTAGES.

4. SHOP DRAWINGS

- A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:

- 1) PROJECT NAME AND LOCATION
- 2) NAME OF ARCHITECT AND ENGINEER
- 3) ITEM IDENTIFICATION
- 4) APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

- 1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.

- 2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

- 1) SAFETY/DISCONNECT SWITCHES
- 2) FUSES
- 3) CIRCUIT BREAKERS
- 4) PANELBOARDS/LOADCENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).
- 5) RACEWAYS
- 6) WIRE AND CABLE
- 7) WALL SWITCHES
- 8) INSERTION RECEPTACLES
- 9) MOMENTARY CONTACT SWITCHES
- 10) TIME SWITCHES
- 11) LIGHTING FIXTURES.

- E. ASSIST AND PROVIDE ALL NECESSARY INFORMATION, DIAGRAMS, SKETCHES, ETC. TO THE HVAC CONTRACTOR, FOR THE PREPARATION OF COORDINATED SHOP DRAWINGS INDICATING ROUTING OF FEEDERS, CONTROL CONDUITS, RECESSED FIXTURES AND ADJACENT NEARBY PIPING AND DUCTWORK WHERE APPLICABLE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT FOUR(4) BOOKBOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL SHOP DRAWING, PROVIDE SHOP DRAWINGS FOR PANELS, FIXTURES, WIRING DEVICES, CONDUIT, CABLE, DISCONNECT SWITCH, RELAYS, CONTRACTORS, AND OTHER SYSTEMS AS DIRECTED BY THE ENGINEER.

5. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

- A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND 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. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

- C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

- D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

6. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

- A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.
- B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.
- C. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F. KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE- QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

7. FUSES:

- A. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.
- B. MOTOR CIRCUITS – ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.
- C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.
- D. PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.

- E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT-TRIPPING, OPEN AND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:

- 1) 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE.
- 2) 120/240 VOLTS, 225-AMP FRAME: 22,000 AMPS MINIMUM

B. DISTRIBUTION PANELBOARDS, SWITCH AND FUSE:

- A. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.
- B. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS. COVERS TO BE PAD-LOCKABLE.
- C. PANELBOARD SHALL BE CONSTRUCTED OF CODE-GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.
- D. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE).
- E. DISTRIBUTION PANELBOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. APPLICATIONS.
- F. DISCONNECTS

- 1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.
- 2) SWITCHING MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANICALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.

- 3) SWITCHES SHALL BE OF THE DOUBLE STATIONARY CONTACT TYPE.

- 4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.

G. INSTALLATION

- 1) DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.

H. IDENTIFICATION

- 1) PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD SERVED.
- 2) NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF-TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF ¼" HIGH WHITE LETTERING.

- I. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

- J. POWER PANELBOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "QMR", AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.

- K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.

- L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE. BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).

B. MATERIALS

1) RACEWAYS:

- a. RIGID STEEL CONDUIT: FULL-WEIGHT PIPE, GALVANIZED, THREADED.
- b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADED.
- c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.
- d. WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
- e. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.

2) FITTINGS AND ACCESSORIES:

- a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.
- b. ELECTROMETALLIC TUBING: COMPRESSION TYPE, GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.
- c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT.
- d. BUSHINGS: METALLIC INSULATED TYPE.



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ELECTRICAL SPECIFICATIONS (CONT.)

3) BOXES:

- a. 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, PUSHED 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.

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 CLAMPS 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.

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.

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.

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.

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. 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.

CUT CONDUIT ENDS SQUARE, REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.

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.

RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

d. 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.

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).

- a. 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.
- d. 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 OPENING 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.
- e. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.
- f. 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 OTHER 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.

- c. 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.

10. 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,

- e. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.

- f. COLORS: COORDINATE COLORS WITH ARCHITECT.

- g. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.

11. 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.
- g. EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED FOR USE. AC POWERED WITH PREMIUM LONG-LIFE NICKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3-HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.

12. GROUNDING AND BONDING:

- a. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH (2020) NATIONAL ELECTRICAL 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 AT 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.

13. PANEL BOARDS:

- a. PANEL BOARDS 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 KEYED 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.



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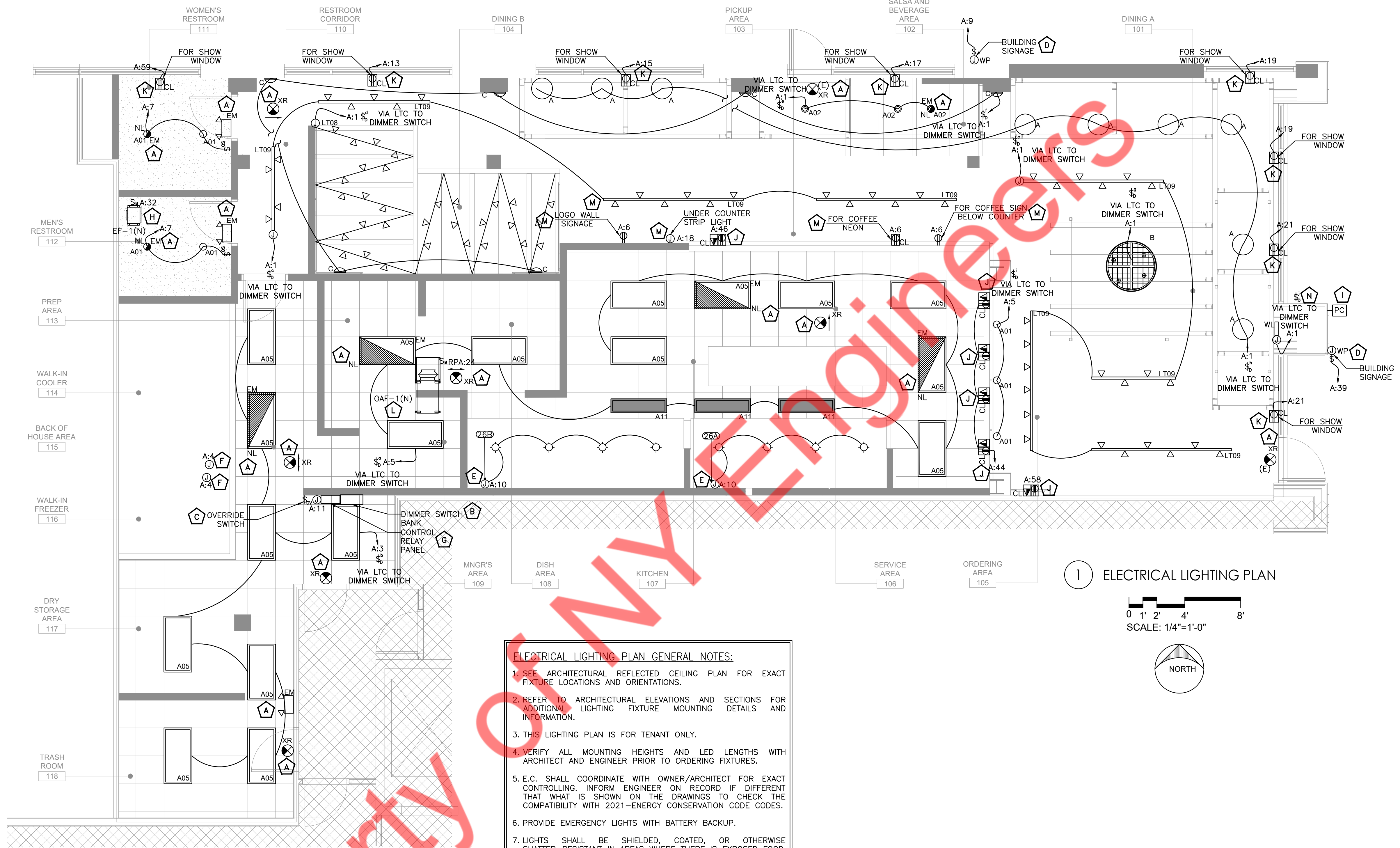
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ELECTRICAL LIGHTING PLAN KEYED WORK NOTES:

- A. CONNECT ALL EMERGENCY EGRESS AND NIGHT LIGHTING(24X7 ON) FIXTURES TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES.
- B. E.C. SHALL COORDINATE EXACT LOCATION OF DIMMER SWITCH BANK WITH ARCHITECT/OWNER. E.C. SHALL CONFIRM CLEAR SPACE FOR SWITCH, NO OBJECT INFRONT ON SWITCH LOCATION.
- C. ELECTRICAL CONTRACTOR TO PROVIDE OVERRIDE SWITCH. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- D. PROVIDE A DISCONNECT SWITCH AT FEEDER OR BRANCH CIRCUIT ENTERS THE SIGN PER NEC, VERIFY EXACT MOUNTING HEIGHT AND LOCATION FOR SIGNAGE POWER WITH ARCHITECTURAL ELEVATIONS, SIGN VENDOR, AND LANDLORD. ROUTE CIRCUIT TO PANEL VIA TIME CLOCK.
- E. PROVIDE 120V DEDICATED CIRCUIT FOR NEW HOOD LIGHTING. COORDINATE FOR LIGHTING CONNECTION & ALL OTHER REQUIREMENT WITH CAPTIVE AIRE HOOD DRAWINGS/MANUFACTURER IN FIELD.
- F. E.C. SHALL PROVIDE JUNCTION BOX AND CIRCUIT FOR WALK-IN BOX FREEZER/COOLER. LIGHTING TO BE PROVIDED BY WALK IN BOX MANUFACTURER. COORDINATE WITH WALK IN BOX MANUFACTURER FOR LIGHTING CONNECTIONS AND OTHER REQUIREMENTS BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- G. PROVIDE CONTROL RELAY PANEL AS SPECIFIED BY THE LIGHTING VENDOR. E.C. SHALL VERIFY EXACT LOCATION AND MOUNTING HEIGHT OF THE CONTROL RELAY PANEL WITH OWNER/ ARCHITECT. BASE BID ACCORDINGLY.
- H. EXHAUST FAN EF-1(N), OAF-1(N) SHALL BE INTERLOCKED WITH KITCHEN LIGHTS. E.C. TO COORDINATE WITH MECHANICAL CONTRACTOR IN FIELD. PRIOR TO ROUGH IN.
- I. ALL EXTERIOR SIGNAGE SHALL BE CONTROLLED WITH EXTERIOR MOUNTED PHOTOCELL. PHOTOCELL SHALL NOT BE MOUNTED 10' ABOVE GROUND. E.C. TO VERIFY EXACT LOCATION IN FIELD PRIOR TO ROUGH-IN.
- J. PROVIDE (1) DUPLEX RECEPTACLE AND (1) CAT6 DATA CABLE AND CONNECTION FOR EACH DIGITAL MENU BOARD. COORDINATE WITH OWNER/ARCHITECT IN FIELD FOR FINAL LOCATION, MOUNTING HEIGHT BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- K. PROVIDE SHOW WINDOW RECEPTACLE AS PER NEC 210.62. VERIFY EXACT LOCATION WITH ARCHITECT/OWNER.
- L. EXHAUST FAN OAF-1(N) SHALL BE INTERLOCKED WITH AHU-1(E), AHU-2(E), AHU-3(E) & AHU-4(E). E.C. TO COORDINATE WITH MECHANICAL CONTRACTOR IN FIELD. PRIOR TO ROUGH IN.
- M. E.C. SHALL COORDINATE WITH THE ARCHITECT/ OWNER/ VENDOR FOR THE EXACT LOCATION, MOUNTING HEIGHT, ACCESSORIES AND POWER REQUIREMENT OF CAFE HOLA SIGN, LED GYG SIGN, SOFFIT COFFEE SIGN, UNDER COUNTER LED STRIP LIGHT & INTERIOR SIGNS BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- N. E.C. SHALL COORDINATE WITH THE ARCHITECT/ OWNER/ LIGHTING VENDOR FOR THE EXACT LOCATION, MOUNTING HEIGHT, CONTROLS, ACCESSORIES AND POWER REQUIREMENT OF FLOOR MOUNTED LIGHT BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.

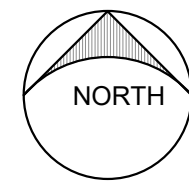


ELECTRICAL LIGHTING PLAN GENERAL NOTES:

1. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT FIXTURE LOCATIONS AND ORIENTATIONS.
2. REFER TO ARCHITECTURAL ELEVATIONS AND SECTIONS FOR ADDITIONAL LIGHTING FIXTURE MOUNTING DETAILS AND INFORMATION.
3. THIS LIGHTING PLAN IS FOR TENANT ONLY.
4. VERIFY ALL MOUNTING HEIGHTS AND LED LENGTHS WITH ARCHITECT AND ENGINEER PRIOR TO ORDERING FIXTURES.
5. E.C. SHALL COORDINATE WITH OWNER/ARCHITECT FOR EXACT CONTROLLING. INFORM ENGINEER ON RECORD IF DIFFERENT THAT WHAT IS SHOWN ON THE DRAWINGS TO CHECK THE COMPATIBILITY WITH 2021-ENERGY CONSERVATION CODE CODES.
6. PROVIDE EMERGENCY LIGHTS WITH BATTERY BACKUP.
7. LIGHTS SHALL BE SHIELDED, COATED, OR OTHERWISE SHATTER-RESISTANT IN AREAS WHERE THERE IS EXPOSED FOOD; CLEAN EQUIPMENT, UTENSILS, AND LINENS; OR UNWRAPPED SINGLE-SERVICE.
8. CONTRACTOR ADVISED TO UPDATE THE EMERGENCY LIGHT FIXTURES LOCATIONS/QUANTITY PER SITE REQUIREMENT UP ON FINAL INSPECTION OR PER LOCAL AHJ REQUIREMENT.

1 ELECTRICAL LIGHTING PLAN

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



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ELECTRICAL LIGHTING PLAN

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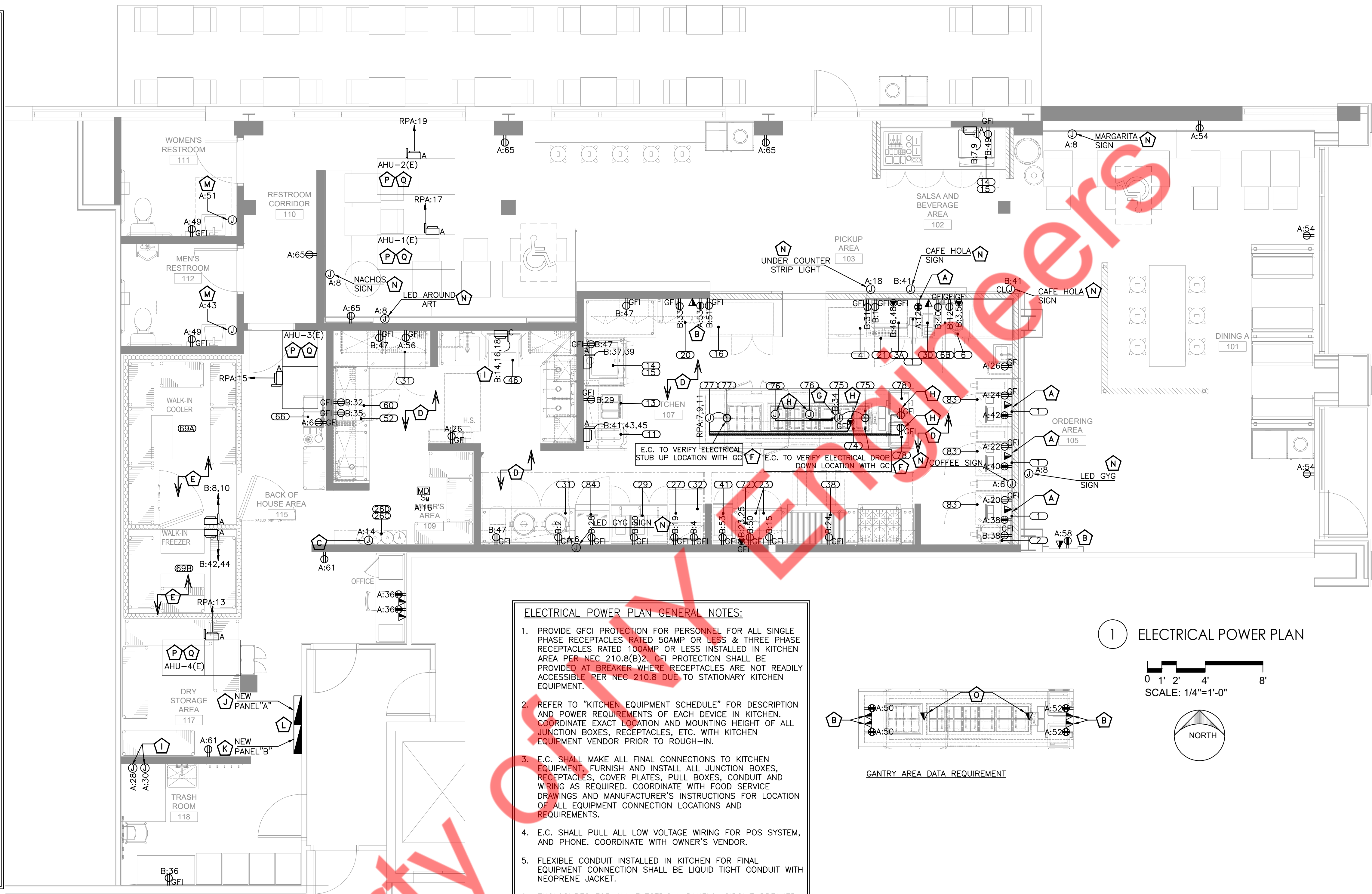
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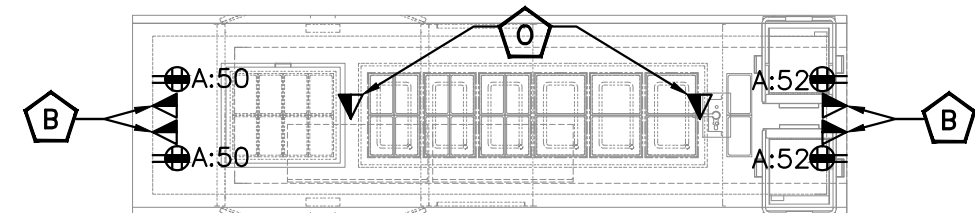
ELECTRICAL POWER PLAN KEYED WORK NOTES:

- A. PROVIDE (2) CAT 6 HOME RUN TO EACH POS STATION AND ONE (1) QUAD 20 AMPS RECEPTACLE FOR POS. COORDINATE WITH OWNER PRIOR TO ROUGH-IN FOR EXACT HEIGHT.
- B. PROVIDE (1) DUPLEX RECEPTACLE AND (1) CAT6 DATA CABLE AND CONNECTION FOR EACH DIGITAL BOARD/KDS. COORDINATE WITH OWNER/ARCHITECT IN FIELD FOR FINAL LOCATION, MOUNTING HEIGHT BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- C. E.C TO COORDINATE WITH FIRE SUPPRESSION SYSTEM VENDOR FOR ITS POWER REQUIREMENTS AND OTHER DETAILS BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- D. E.C TO COORDINATE WITH KITCHEN EQUIPMENT VENDOR/MANUFACTURER FOR EXACT POWER REQUIREMENTS, EXACT MOUNTING HEIGHT, LOCATION BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- E. ELECTRICAL CONTRACTOR TO COORDINATE EXACT POWER REQUIREMENT WITH WALK-IN COOLER & WALK-IN FREEZER MANUFACTURER AND MAKE POWER PROVISION ACCORDINGLY. BASE BID ACCORDINGLY.
- F. CONDUIT SHALL BE STUBBED UP UNDER TABLE FOR CONNECTION TO FACTORY INSTALLED LOAD CENTER. UTILIZE GALVANIZED RIGID CONDUIT ABOVE GRADE AND CHANGE OVER TO LIQUID TIGHT FLEXIBLE METAL CONDUIT FOR FINAL CONNECTION. COORDINATE EXACT STUB-UP LOCATION WITH GC/ PRIOR TO ROUGH-IN. REFER TO KITCHEN EQUIPMENT VENDOR DRAWINGS FOR EXACT PLACEMENT OF HEART SIGN BASE BID ACCORDINGLY.
- G. GANTRY POWER JUNCTION BOXES SHALL BE CEILING MOUNTED. BASE BID ACCORDINGLY.
- H. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH #74_DROP-IN HOT WELLS, #76_CHEESEMELTER, ELECTRIC & #78_SANDWICH/PANINI GRILL VENDOR/MANUFACTURER FOR EXACT MOUNTING HEIGHT, LOCATION OF ELECTRICAL OUTLET & ANY OTHER ACCESSORIES REQUIREMENT AS PER SITE CONDITION WITH ARCHITECT AND OWNER PRIOR TO COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- I. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE PLUMBING CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT OF THE PLUMBING EQUIPMENT IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
- J. NEW 200A(M.C.B) 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A". E.C SHALL COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT.
- K. NEW 200A(M.C.B) 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B". E.C SHALL COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT.
- L. ELECTRICAL CONTRACTOR SHALL VERIFY THE INSTALLATION OF ELECTRICAL PANELS IN COMPLIANCE WITH N.E.C. ARTICLE 110.26(A) AND (B). E.C. SHALL FIELD VERIFY THAT THE PANELS ARE UNOBSTRUCTED AND THE AREA WHERE THE PANELS ARE PLACED SHALL NOT BE USED AS A STORAGE SPACE.
- M. E.C SHALL COORDINATE WITH THE ARCHITECT/ OWNER FOR THE EXACT LOCATION AND POWER REQUIREMENT FOR HAND DRYER BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- N. E.C SHALL COORDINATE WITH THE ARCHITECT/ OWNER/ VENDOR FOR THE EXACT LOCATION, MOUNTING HEIGHT, ACCESSORIES AND POWER REQUIREMENT OF CAFE HOLA SIGN, LED GYG SIGN, SOFFIT COFFEE SIGN, UNDER COUNTER LED STRIP LIGHT & INTERIOR SIGNS BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
- O. GANTRY DATA DROPS SHALL BE CEILING MOUNTED.
- P. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
- Q. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR EXACT LOCATION OF THE MECHANICAL UNITS IN THE FIELD.



ELECTRICAL POWER PLAN GENERAL NOTES:

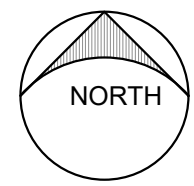
1. PROVIDE GFCI PROTECTION FOR PERSONNEL FOR ALL SINGLE PHASE RECEPTACLES RATED 50AMP OR LESS & THREE PHASE RECEPTACLES RATED 100AMP OR LESS INSTALLED IN KITCHEN AREA PER NEC 210.8(B)2. GFI PROTECTION SHALL BE PROVIDED AT BREAKER WHERE RECEPTACLES ARE NOT READILY ACCESSIBLE PER NEC 210.8 DUE TO STATIONARY KITCHEN EQUIPMENT.
2. REFER TO "KITCHEN EQUIPMENT SCHEDULE" FOR DESCRIPTION AND POWER REQUIREMENTS OF EACH DEVICE IN KITCHEN. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF ALL JUNCTION BOXES, RECEPTACLES, ETC. WITH KITCHEN EQUIPMENT VENDOR PRIOR TO ROUGH-IN.
3. E.C. SHALL MAKE ALL FINAL CONNECTIONS TO KITCHEN EQUIPMENT, FURNISH AND INSTALL ALL JUNCTION BOXES, RECEPTACLES, COVER PLATES, PULL BOXES, CONDUIT AND WIRING AS REQUIRED. COORDINATE WITH FOOD SERVICE DRAWINGS AND MANUFACTURER'S INSTRUCTIONS FOR LOCATION OF ALL EQUIPMENT CONNECTION LOCATIONS AND REQUIREMENTS.
4. E.C. SHALL PULL ALL LOW VOLTAGE WIRING FOR POS SYSTEM, AND PHONE. COORDINATE WITH OWNER'S VENDOR.
5. FLEXIBLE CONDUIT INSTALLED IN KITCHEN FOR FINAL EQUIPMENT CONNECTION SHALL BE LIQUID TIGHT CONDUIT WITH NEOPRENE JACKET.
6. ENCLOSURES FOR ALL ELECTRICAL PANELS, CIRCUIT BREAKER ENCLOSURES, DISCONNECT SWITCHES, WALL SWITCHES, CONTRACTOR ENCLOSURES, PUSHBUTTONS, ETC WITHIN KITCHEN AREA SHALL BE FOOD GRADE, RECESSED MOUNTED, UNLESS OTHERWISE NOTED.
7. E.C. SHALL COORDINATE WITH THE OWNER/KITCHEN EQUIPMENT VENDOR FOR THE EXACT MOUNTING HEIGHT/LOCATIONS OF THE RECEPTACLES FOR THE KITCHEN EQUIPMENT PRIOR TO ROUGH-IN.
8. COORDINATE POWER REQUIREMENTS FOR SECURITY SYSTEM WITH OWNER/SECURITY VENDOR.
9. COORDINATE POWER REQUIREMENTS FOR MUSIC SYSTEM WITH OWNER/L.V. VENDOR.



GANTRY AREA DATA REQUIREMENT

1 ELECTRICAL POWER PLAN

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



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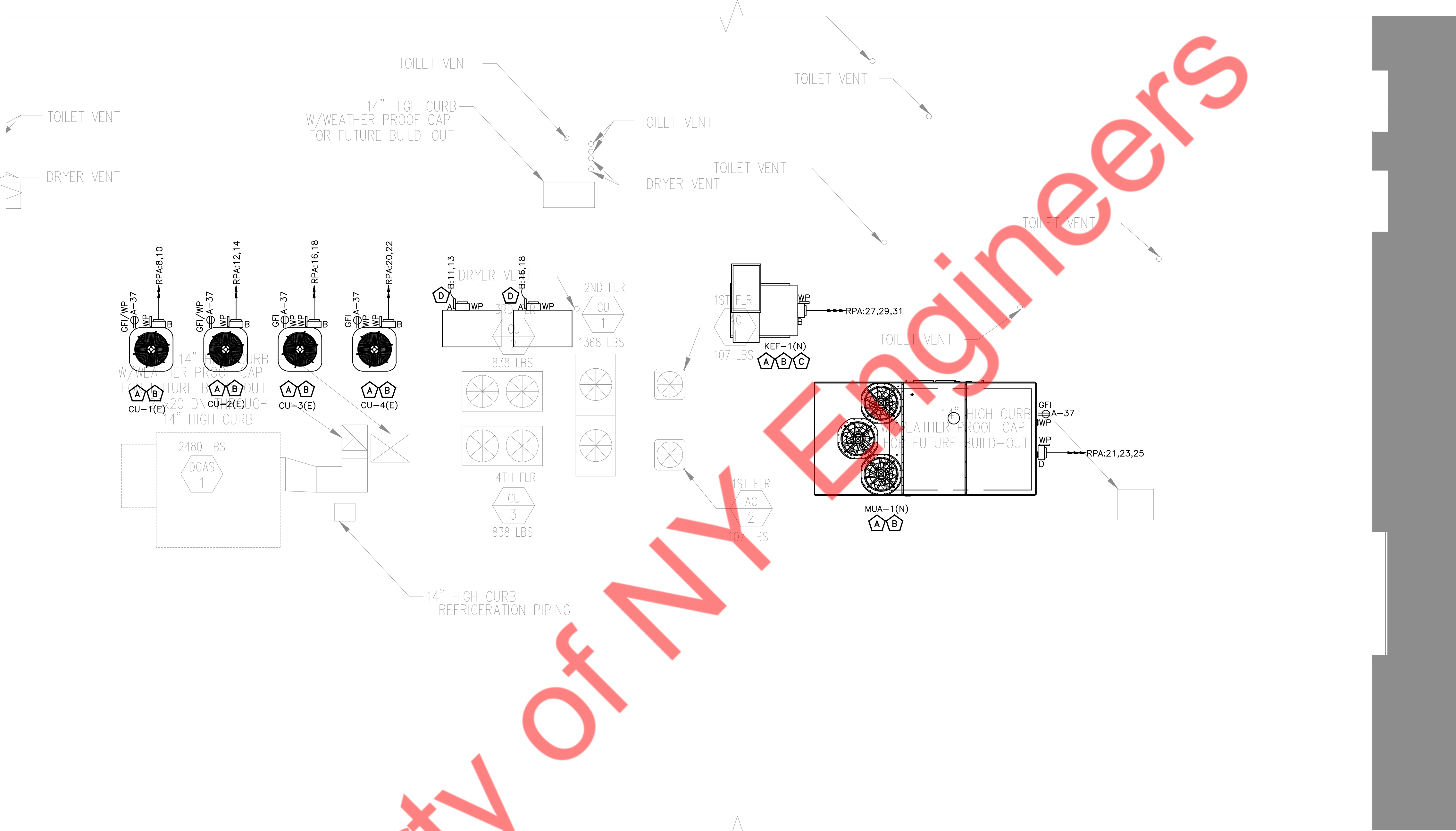
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ELECTRICAL POWER PLAN

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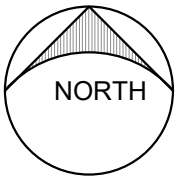
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- ELECTRICAL POWER PLAN KEYED WORK NOTES:**
- A. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. COORDINATE LOCATION OF DISCONNECT WITH OWNER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
 - B. ELECTRICAL CONTRACTOR SHALL COORDINATE FOR EXACT LOCATION OF MECHANICAL EQUIPMENTS WITH MECHANICAL DRAWINGS.
 - C. INTERCONNECT KEF-1(N), WITH HOOD-1(N) & HOOD-2(N). E.C TO COORDINATE WITH MECHANICAL DRAWINGS.
 - D. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH LANDLORD FOR EXACT LOCATION, POWER REQUIREMENT OF EQUIPMENT #14A_REMOTE CONDENSER WITH EQUIPMENT VENDOR PRIOR TO BID. BASE BID ACCORDINGLY.

1 ELECTRICAL ROOF PLAN

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



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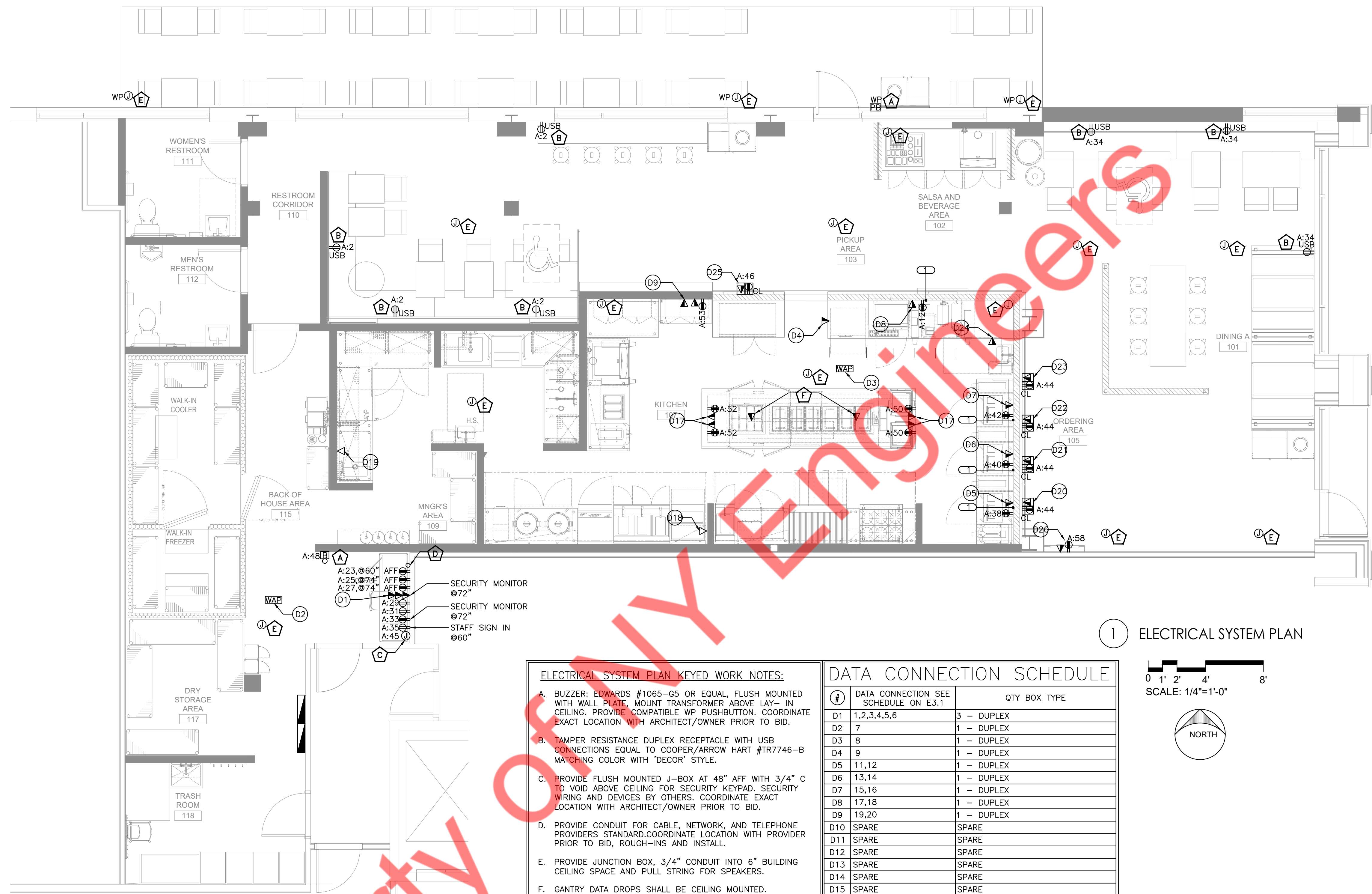
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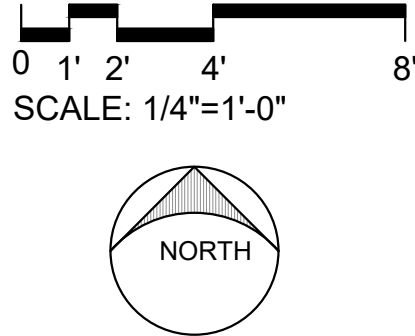
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1 ELECTRICAL SYSTEM PLAN



- ELECTRICAL SYSTEM PLAN KEYED WORK NOTES:**
- A. BUZZER: EDWARDS #1065-G5 OR EQUAL, FLUSH MOUNTED WITH WALL PLATE. MOUNT TRANSFORMER ABOVE LAY- IN CEILING. PROVIDE COMPATIBLE WP PUSHBUTTON. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER PRIOR TO BID.
 - B. TAMPER RESISTANCE DUPLEX RECEPTACLE WITH USB CONNECTIONS EQUAL TO COOPER/ARROW HART #TR7746-B MATCHING COLOR WITH 'DECOR' STYLE.
 - C. PROVIDE FLUSH MOUNTED J-BOX AT 48" AFF WITH 3/4" C TO VOID ABOVE CEILING FOR SECURITY KEYPAD. SECURITY WIRING AND DEVICES BY OTHERS. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER PRIOR TO BID.
 - D. PROVIDE CONDUIT FOR CABLE, NETWORK, AND TELEPHONE PROVIDERS STANDARD.COORDINATE LOCATION WITH PROVIDER PRIOR TO BID, ROUGH-INS AND INSTALL.
 - E. PROVIDE JUNCTION BOX, 3/4" CONDUIT INTO 6" BUILDING CEILING SPACE AND PULL STRING FOR SPEAKERS.
 - F. GENTRY DATA DROPS SHALL BE CEILING MOUNTED.

- ELECTRICAL SYSTEM PLAN GENERAL NOTES:**
1. LOW VOLTAGE WIRING SHALL BE CAT-6 BLACK WIRE. CONTRACTOR SHALL UTILIZE 16-2 UNSHIELDED CABLE FOR SPEAKERS AND 16-3 SHILED CABLE FOR VOLUME CONTROL.
 2. E.C SHALL COORDINATE WITH ARCHITECT/OWNER/LY VENDOR FOR EXACT LOCATION, REQUIREMENT & QUANTITY OF DATA AND PROVIDE ACCORDINGLY.

DATA CONNECTION SCHEDULE		
#	DATA CONNECTION SEE SCHEDULE ON E3.1	QTY BOX TYPE
D1	1,2,3,4,5,6	3 - DUPLEX
D2	7	1 - DUPLEX
D3	8	1 - DUPLEX
D4	9	1 - DUPLEX
D5	11,12	1 - DUPLEX
D6	13,14	1 - DUPLEX
D7	15,16	1 - DUPLEX
D8	17,18	1 - DUPLEX
D9	19,20	1 - DUPLEX
D10	SPARE	SPARE
D11	SPARE	SPARE
D12	SPARE	SPARE
D13	SPARE	SPARE
D14	SPARE	SPARE
D15	SPARE	SPARE
D16	SPARE	SPARE
D17	38,39,40,41,42,43,44,45,46,47	4 - DUPLEX
D18	48,49	1 - DUPLEX
D19	50	1 - DUPLEX
D20	51,52	1 - DUPLEX
D21	53,54	1 - DUPLEX
D22	55,56	1 - DUPLEX
D23	57,58	1 - DUPLEX
D24	61	1 - DUPLEX
D25	62,63	1 - DUPLEX
D26	64,65	1 - DUPLEX

PROVIDE 1" CONDUIT 6" WITHIN BUILDING CEILING SPACE, UNLESS NOTED OTHERWISE FOR ALL DATA CONNECTIONS



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DATA SCHEDULE									
#	PRIMARY COLUMN	DEVICE NAME	INTERNAL/ EXTERNAL	LOCATION	END USER	INSTALLED HEIGHT	MOUNTING	COLOR	GYG IT COMMENTS
1	OFFICE – INTERNET CONNECTION	INTERNET CONNECTION	INTERNAL	OFFICE – RACK	GYG IT	IN RACK	WALL MOUNT	WHITE	
2	OFFICE	BOH	INTERNAL	OFFICE – BELOW DESK	GYG IT	29.5" AFFL	WALL MOUNT	WHITE	
3	OFFICE	PHONE	INTERNAL	OFFICE – BELOW DESK	GYG IT	29.5" AFFL	WALL MOUNT	WHITE	
4	OFFICE	SPARE OR OFFICE PRINTER	INTERNAL	OFFICE – BELOW DESK	GYG IT	29.5" AFFL	WALL MOUNT	WHITE	
5	OFFICE	CCTV	INTERNAL	OFFICE – CCTV	GYG IT	70" AFFL	WALL MOUNT	WHITE	
6	OFFICE	CCTV	INTERNAL	OFFICE – CCTV	GYG IT	70" AFFL	WALL MOUNT	WHITE	
7	BOH – NEAR PAYMENT WINDOW	AP2	INTERNAL	WIRELESS ACCESS POINT (WAP)	GYG IT	CEILING MOUNT	CEILING MOUNT	WHITE	
8	MENU BULKHEAD	AP1	INTERNAL	WIRELESS ACCESS POINT (WAP)	GYG IT	CEILING MOUNT	CEILING MOUNT	WHITE	ON CEILING NEAR BACK OF BULKHEAD (TOWARDS KITCHEN)
9	MENU BULKHEAD	MG – 4G BACKUP	INTERNAL	4G ROUTER EXTENDER	GYG IT	CEILING MOUNT	CEILING MOUNT	WHITE	ON CEILING NEAR BACK OF BULKHEAD (TOWARDS KITCHEN)
10	EXTERNAL BIN AREA	AP3 EXTERNAL	INTERNAL	WIRELESS ACCESS POINT (WAP)	GYG IT	WALL MOUNT	WALL MOUNT	WHITE	EXTERNAL NEAR DT CDDS HIGH ON WALL
11	FRONT COUNTER	TILL 1	INTERNAL	POS 1	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
12	FRONT COUNTER	EFTPOS 1	INTERNAL	POS 1	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
13	FRONT COUNTER	TILL 2	INTERNAL	POS 2	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
14	FRONT COUNTER	EFTPOS 2	INTERNAL	POS 2	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
15	FRONT COUNTER	TILL 3	INTERNAL	POS 3	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
16	FRONT COUNTER	EFTPOS 3	INTERNAL	POS 3	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
17	FRONT COUNTER	TILL 4	INTERNAL	POS 4	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
18	FRONT COUNTER	EFTPOS 4	INTERNAL	POS 4	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
19	CAFÉ HOLA	LABEL PRINTER – COFFEE	INTERNAL	COFFEE 1	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
20	CAFÉ HOLA	SPARE	INTERNAL	COFFEE 2 – SPARE	GYG IT	IN FRAMING BELOW COUNTER	MOUNTED TO SUPPLIED CHASE	WHITE	
21	DELIVERY STATION	WEB PRINTER (OPTION A)	INTERNAL	DELIVERY STATION	GYG IT	75" AFFL	WALL MOUNT	BLACK	
22	DELIVERY STATION	SPARE	INTERNAL	DELIVERY STATION –SPARE	GYG IT	75" AFFL	WALL MOUNT	BLACK	
23	SPARE								
24	SPARE								
25	SPARE								
26	SPARE								
27	SPARE								
28	SPARE								
29	SPARE								
30	SPARE								
31	SPARE								
32	SPARE								
33	SPARE								
34	SPARE								
35	SPARE								
36	SPARE								
37	SPARE								
38	GANTRY – LABEL PRINTER 1	LABEL PRINTER – LABEL 1	INTERNAL	GANTRY LEFT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
39	GANTRY – LABEL PRINTER 2	LABEL PRINTER – LABEL 2	INTERNAL	GANTRY LEFT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
40	GANTRY – LABEL PRINTER 4	LABEL PRINTER – LABEL 4	INTERNAL	GANTRY LEFT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
41	GANTRY – LABEL PRINTER 5	LABEL PRINTER – LABEL 5	INTERNAL	GANTRY LEFT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
42	GANTRY – INSTORE BUMP	KDS INSTORE	INTERNAL	GANTRY RIGHT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
43	GANTRY – LABEL 3	LABEL PRINTER – LABEL 3	INTERNAL	GANTRY RIGHT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
44	GANTRY – DT BUMP SLAVE	KDS DT SLAVE	INTERNAL	GANTRY RIGHT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
45	GANTRY – WEB/SPARE	WEB PRINTER (OPTION B)	INTERNAL	GANTRY RIGHT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
46	GANTRY – SPARE	SPARE / CCTV	INTERNAL	GANTRY RIGHT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
47	GANTRY – SPARE	SPARE	INTERNAL	GANTRY RIGHT	GYG IT	FROM CEILING – INSTALLED TO GANTRY	GANTRY COMES WITH DATA PLATE PRE INSTALLED	WHITE	
48	FRIES STATION	LABEL PRINTER – FRIES	INTERNAL	FRIES PRINTER	GYG IT	75" AFFL	WALL MOUNT	BSL STAINLESS STEEL	
49	FRIES STATION	SPARE – DUMMY PLUG TO PROTECT DATA POINT	INTERNAL	FRIES PRINTER	GYG IT	75" AFFL	WALL MOUNT	BSL STAINLESS STEEL	
50	PREP BENCH	AVERY DENNISON BLUE LABEL PRINTER – PREP	INTERNAL	LABEL PRINTER	GYG IT	60" AFFL	WALL MOUNT	BSL STAINLESS STEEL	
51	MENU BULKHEAD	MEDIA PLAYER 1	INTERNAL	MENU BOARD 1	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR 1ST MENU BOARD
52	MENU BULKHEAD	SCREEN 1	INTERNAL	MENU BOARD 1	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR 1ST MENU BOARD
53	MENU BULKHEAD	MEDIA PLAYER 2	INTERNAL	MENU BOARD 2	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR 2ND MENU BOARD
54	MENU BULKHEAD	SCREEN 2	INTERNAL	MENU BOARD 2	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR 2ND MENU BOARD
55	MENU BULKHEAD	MEDIA PLAYER 3	INTERNAL	MENU BOARD 3	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR 3RD MENU BOARD
56	MENU BULKHEAD	SCREEN 3	INTERNAL	MENU BOARD 3	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR 3RD MENU BOARD
57	MENU BULKHEAD	MEDIA PLAYER 4	INTERNAL	MENU BOARD 4	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR 4TH MENU BOARD
58	MENU BULKHEAD	SCREEN 4	INTERNAL	MENU BOARD 4	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR 4TH MENU BOARD
59	DIGITAL SCREEN	DIGITAL SCREEN MEDIA PLAYER	INTERNAL	DIGITAL SCREEN	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR DIGITAL SCREEN BOARD
60	DIGITAL SCREEN	DIGITAL SCREEN	INTERNAL	DIGITAL SCREEN	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	BY POWER FOR DIGITAL SCREEN BOARD
61	MENU BULKHEAD	MINI PC – DASHBOARD	INTERNAL	KPI SCORE BOARD	COATES	WITHIN MENUBOARD BULKHEAD	ON MOUNTING BLOCK	WHITE	
62	SPARE								
63	SPARE								
64	FOH	MARKETING MEDIA PLAYER	INTERNAL	MARKETING SCREEN – IF APPLICABLE	COATES	BEHIND SCREEN	WALL MOUNT	WHITE	
65	FOH	MARKETING SCREEN	INTERNAL	MARKETING SCREEN – IF APPLICABLE	COATES	BEHIND SCREEN	WALL MOUNT	WHITE	
66	SPARE								
67	SPARE								
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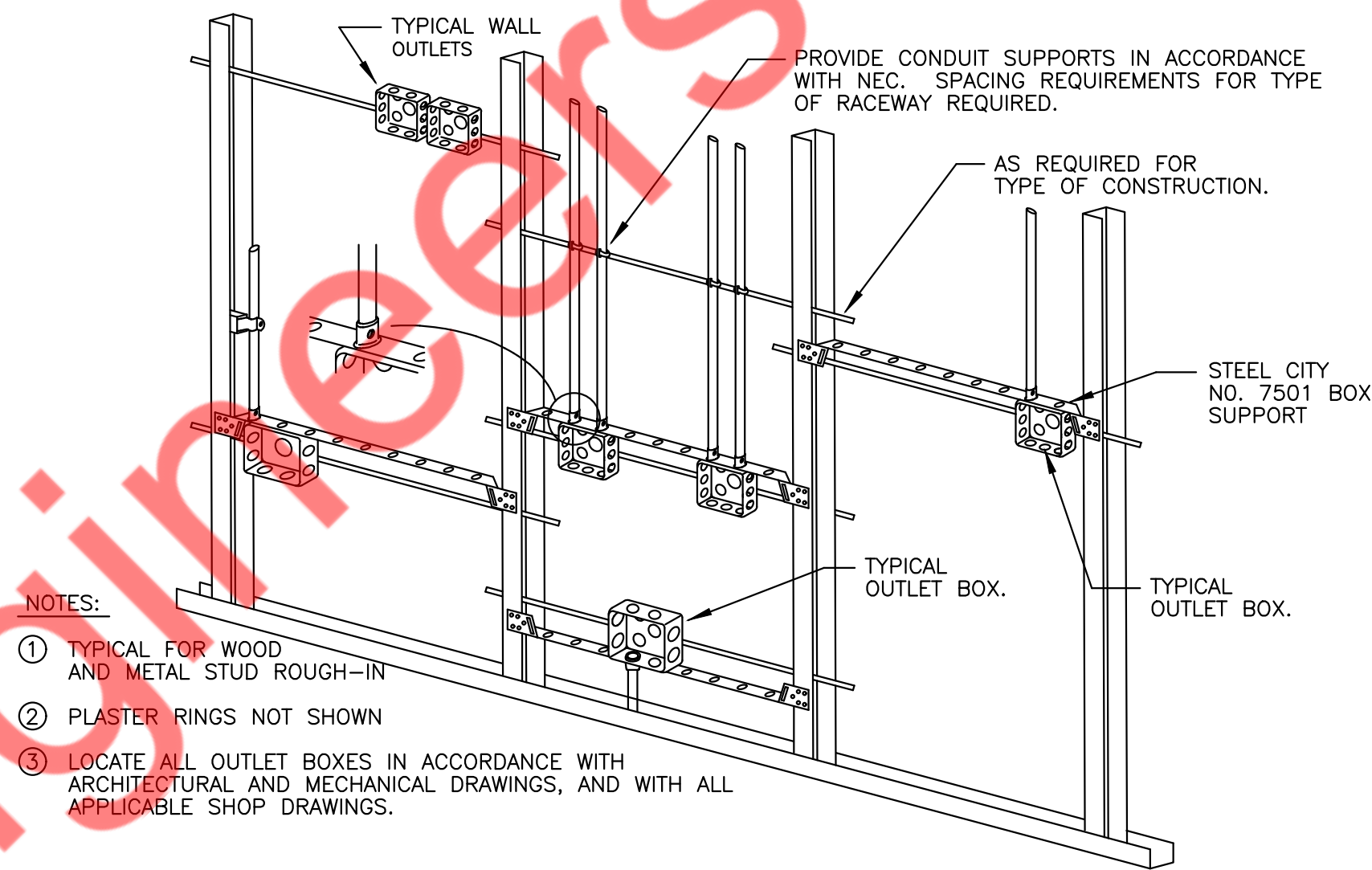
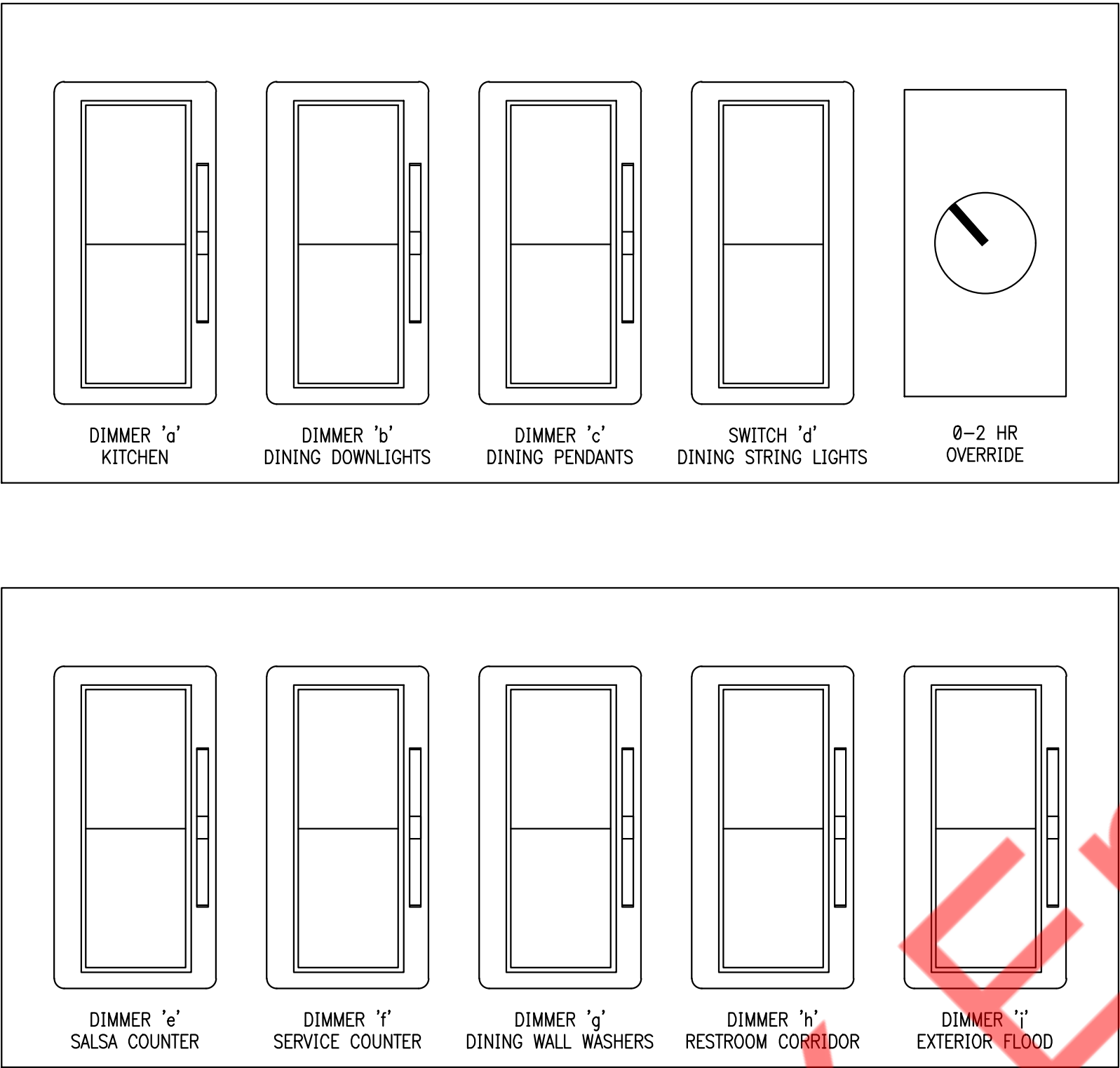
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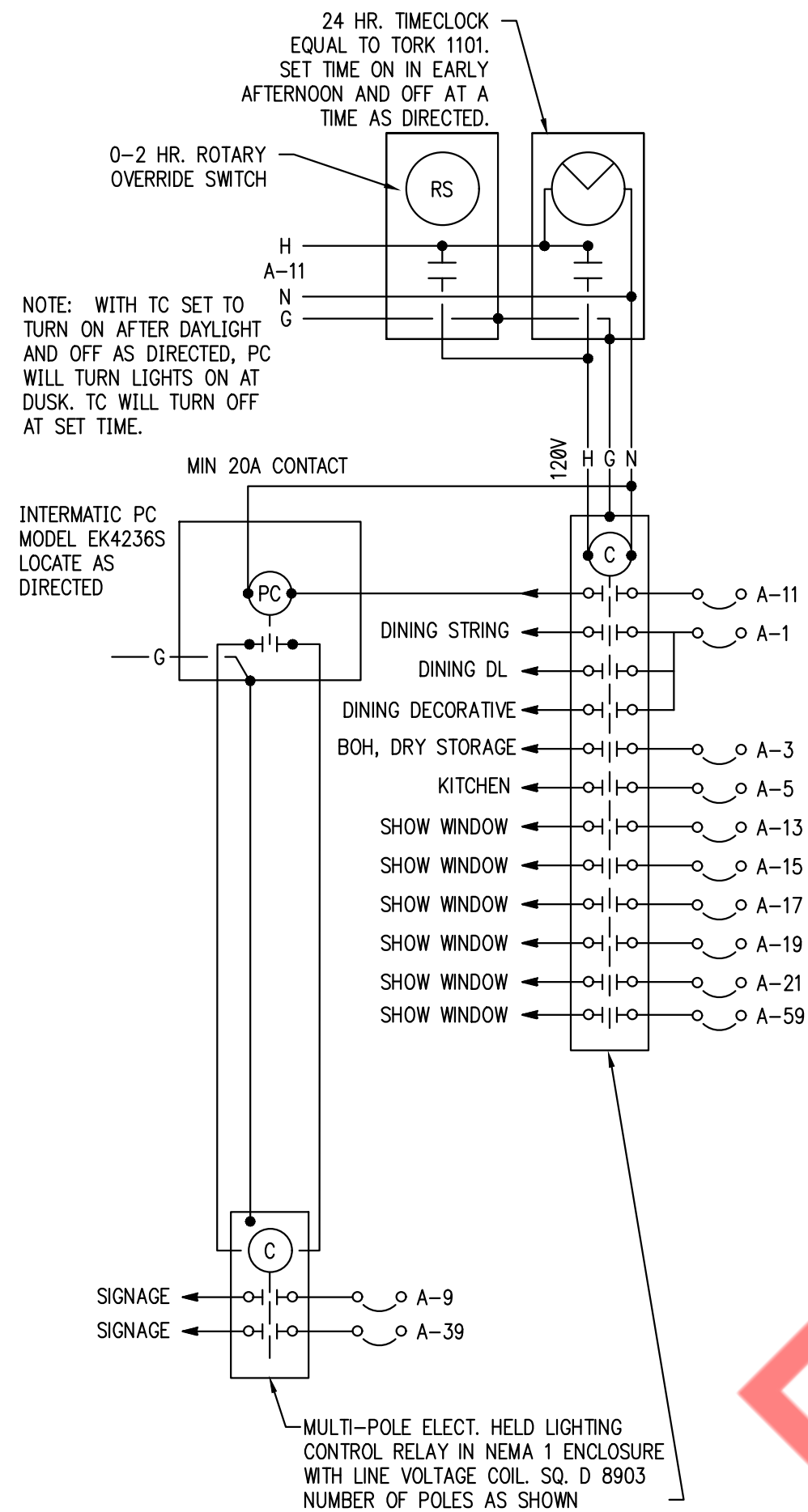
NOTE:
COORDINATE DIMMER COMPATIBILITY WITH FIXTURE TYPE.



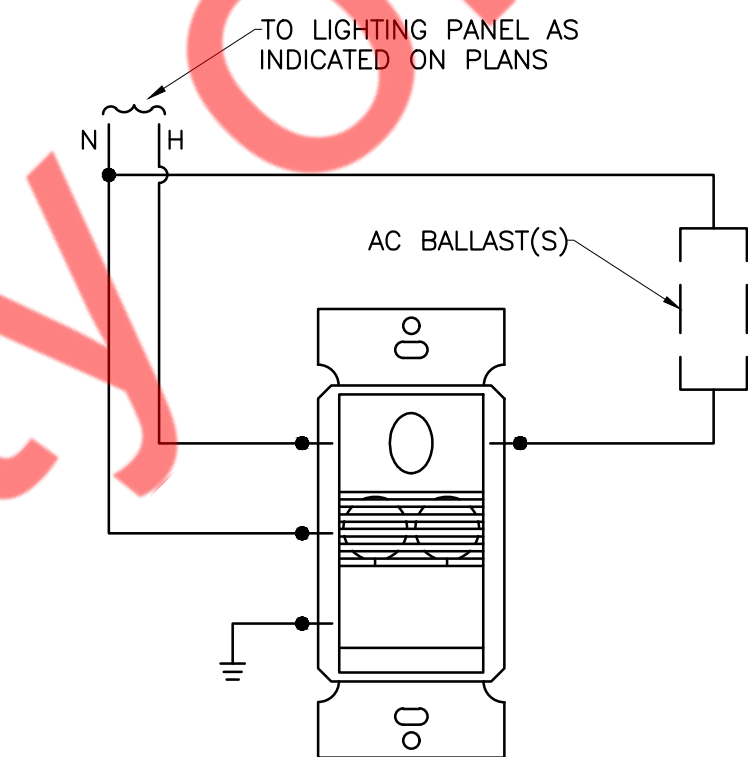
- NOTES:
- ① TYPICAL FOR WOOD AND METAL STUD ROUGH-IN
 - ② PLASTER RINGS NOT SHOWN
 - ③ LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.

4 DETAIL TYPICAL DIMMER BANK
E4.0 N.T.S

2 DETAIL TYPICAL ROUGH-IN REQUIREMENTS
E4.0 N.T.S

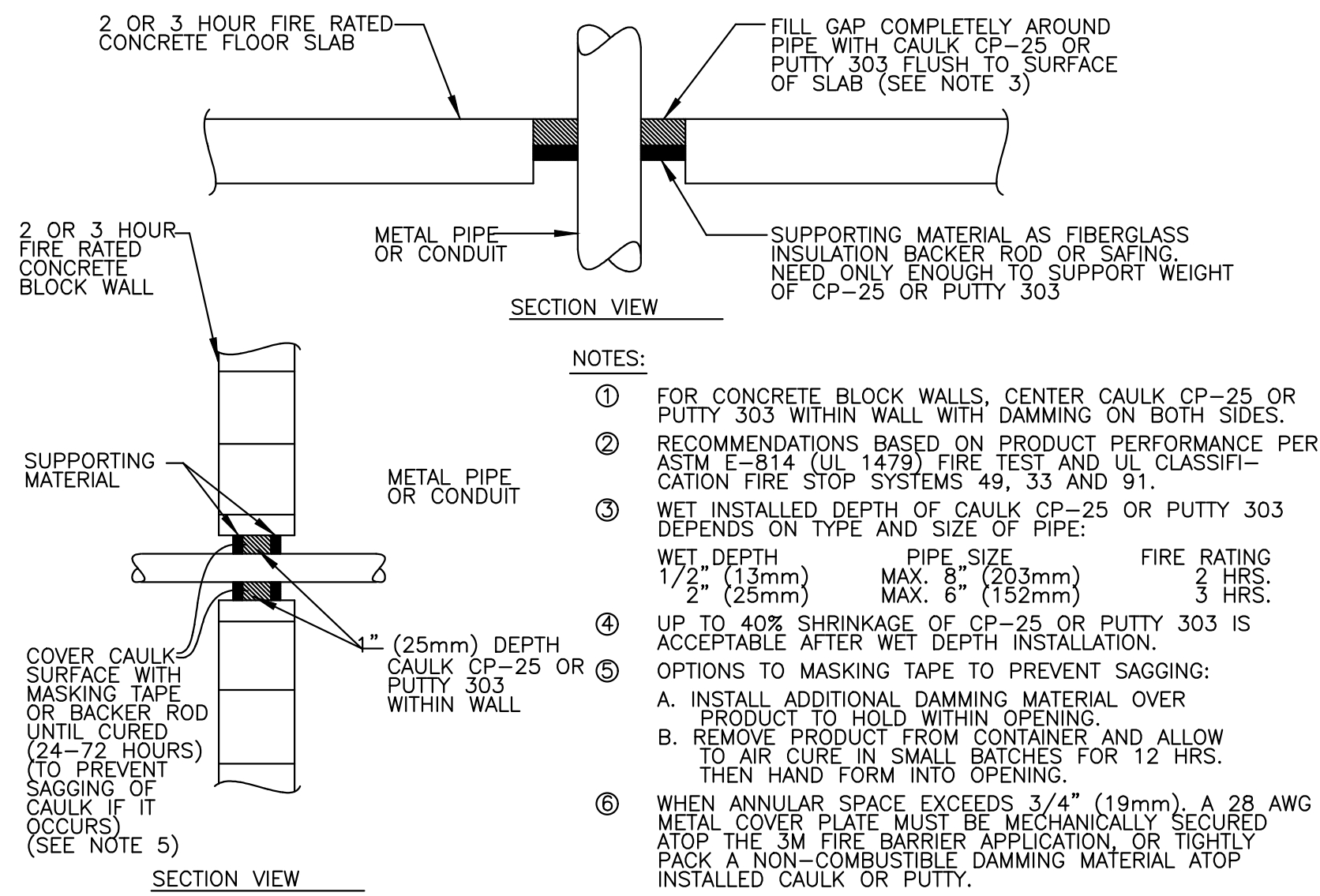


5 LIGHTING CONTACTOR PANEL DETAIL
E4.0 N.T.S



- OCCUPANCY SENSOR SWITCH WIRING DIAGRAM
SCALE: N.T.S.
- NOTES:
1. ALL LOW VOLTAGE WIRING AND TERMINATIONS TO BE BY ELECTRICAL CONTRACTOR.
 2. OCCUPANCY/VACANCY SENSOR SHALL BE "SENSOR SWITCH" OF APPROVED MAKES. ALL EXPOSED CONTROL WIRING SHALL BE IN CONDUIT.

3 OCCUPANCY SENSOR SWITCH DETAIL
E4.0 N.T.S



1 FIRE STOP DETAILS
E4.0 N.T.S



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ELECTRICAL DETAILS

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EQUIPMENT SCHEDULE:

EQUIPMENT SCHEDULE					
ITEM NO.	DESCRIPTION	VOLTAGE	PHASE	AMPS	KVA
2	FROZEN DRINK MACHINE	120	1	7.5	0.90
3A	ESPRESSO CAPPUCCINO MACHINE	208	1	16	3.33
3D	ESPRESSO GRINDER	120	1	12	1.44
4	WARMING DRAWER	120	1	14.4	1.73
6	COFFEE TEA BREWER	208	1	13.5	2.81
6B	COFFEE GRINDER	120	1	9.4	1.13
11	SOFT SERVE MACHINE	208	3	18	6.48
13	BEVERAGE DISPENSER	120	1	8.5	1.02
14	ICE MAKER	208	1	10.7	2.23
14A	ICE MAKER REMOTE CONDENSER	208	1	1	0.21
15	SODA ICE & BEVERAGE DISPENSER	120	1	3.5	0.42
16	UNDERCOUNTER REFRIGERATOR	120	1	2.3	0.28
20	HEATED SHELVING UNIT	120	1	15	1.80
21	UNDERCOUNTER REFRIGERATOR	120	1	2.2	0.26
23	HEATED LOW TEMP HOLDING CABINET	120	1	8.4	1.01
27	FRY WARMER	120	1	10	1.20
29	GAS FRYER	120	1	9	1.08
31	UNDERCOUNTER REFRIGERATOR	120	1	2.5	0.30
32	REACH-IN UNDERCOUNTER FREEZER	120	1	2.5	0.30
38	REFRIGERATED CHEF BASE	120	1	3	0.36
46	DISHWASHER, DOOR TYPE, VENTLESS	120	1	11.4	2.37
52	FOOD PROCESSOR	120	1	3	0.36
66	BIB/CARBONATOR	120	1	3	0.36
69A	COOLER EVAPORATOR	120	1	1.6	0.19
69B	FREEZER EVAPORATOR	208	1	16	3.33
69C	COOLER CONDENSER	208	1	7.4	1.54
69D	FREEEZER CONDENSER	208	1	10.2	2.12
72	SANDWICH/PANNINI GRILL	208	1	16	3.33
74	HOT FOOD WELL UNIT	208	1	29	6.03
75	GANTRY SHELF	120	1	12	1.44
76	CHEESEMELTER	120	1	14	1.68
77	HEART LOAD CENTER	208	3	100	36.03
78	SANDWITCH/PANINI GRILL	120	1	15	1.80
83	UNDERCOUNTER REFRIGERATOR	120	1	6.6	0.79
84	DUAL DISPENSER, FROZEN FOOD TO FRY BASKET	120	1	11	1.32

LIGHTING SCHEDULE:

LIGHTING FIXTURE SCHEDULE							
TYPE	DESCRIPTION	MANUFACTURE R	CATALOGUE#	MOUNTING	VOLTAGE	WATTAGE (W)	REMARK
A01	6" RECESSED LED DOWNLIGHT	HALO	HC420-D010-HM412830	RECESSED	120	21.4	
A02	SAMLL PENDANT LIGHTING	LITELINE	FLX22-30-TP-BK	SURFACE	120	22	
A05	2X4 LED SUSPENDED LIGHT FIXTURE	METALUX	24FP3130C	RECESSED	120	28.6	
A11	LED UTILITY STRIP	METALUX	25T1L10040R	RECESSED	120	9.8	
A	18" PENDENT LIGHT	TBD	TBD	RECESSED	120	25	
B	LARGE DECORATIVE LIGHT	TBD	TBD	SUSPENDED	120	50	
C	WALL SCONCE	TBD	TBD	WALL MOUNT	120	18	
LT08	STRING LIGHTS	CELESTIAL LIGHTING	HYA-STL-GC-12	SURFACE	120	2	
LT09	TRACK LIGHTS	JUNO	259HOH	TRACK	120	10	
WL	WALL LIGHT	TBD	TBD	WALL MOUNT	120	10	
EM	EMERGENCY LIGHT FIXYURE	TBD	TBD	WALL MOUNT	120	2	EMERGENCY FIXTURE
XR	EMERGENCY EXIT LIGHT	TBD	TBD	WALL MOUNT	120	2	EMERGENCY FIXTURE

LIGHTING FIXTURE SCHEDULE NOTES:

1. E.C. SHALL COORDINATE WITH ARCHITECT FOR MAKE, MODEL AND WATTAGES WITH ARCHITECT/OWNER.
2. COORDINATE EXACT CONTROL REQUIREMENTS WITH OWNER.
3. E.C SHALL COORDINATE WITH LIGHT FIXTURE VENDOR/MANUFACTURER FOR EXACT COMPATIBILITY OF THE DIMMER REQUIRED FOR RESPECTIVE LIGHT FIXTURE PRIOR TO BID.



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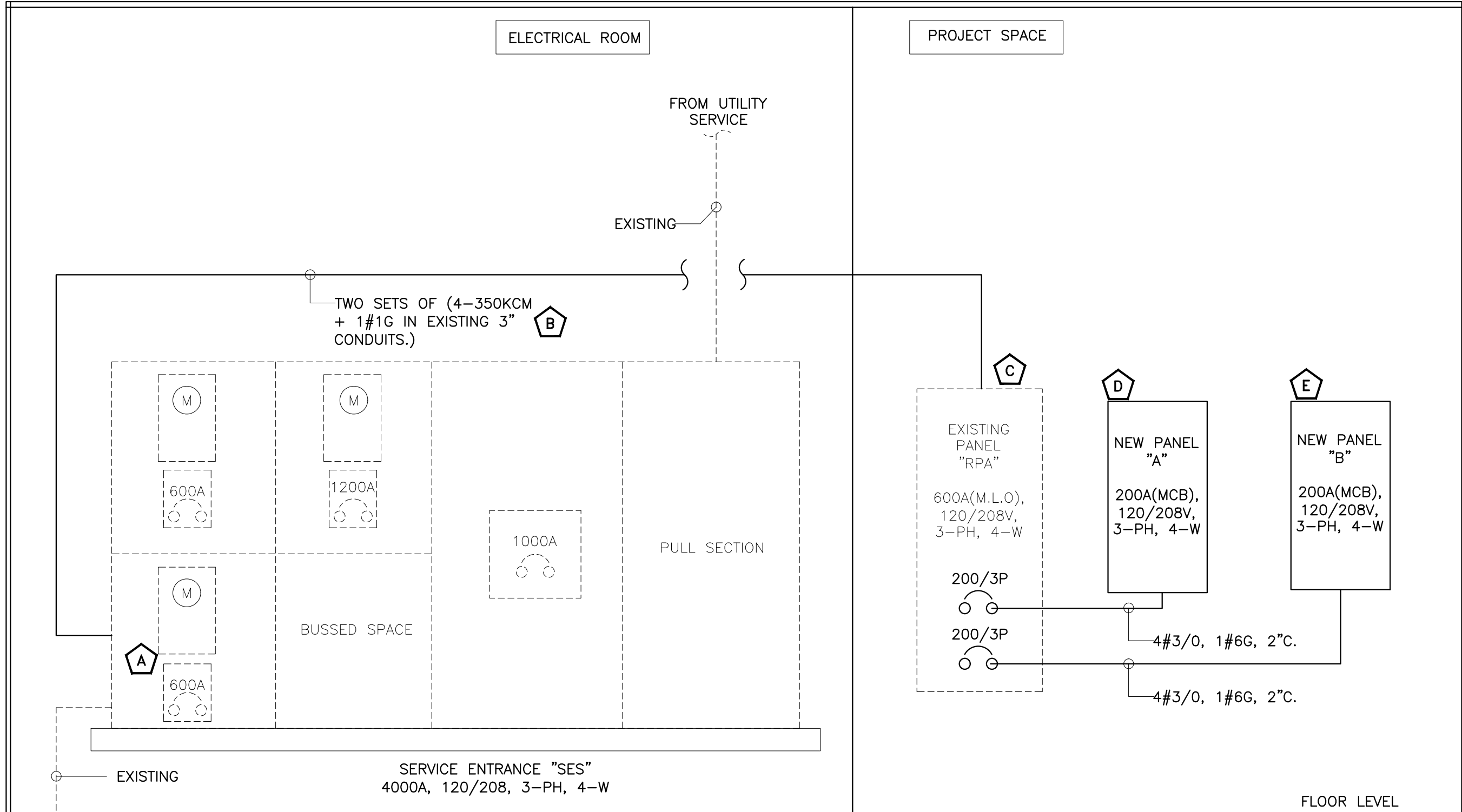
ELECTICAL SCHEDULES

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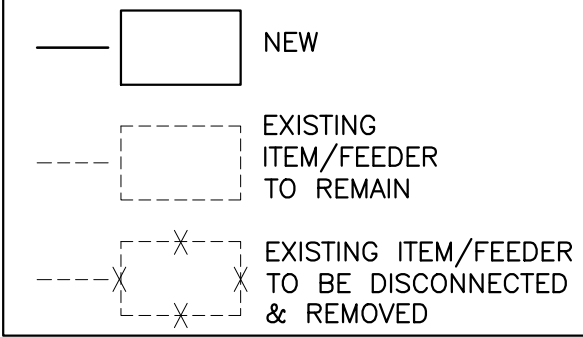
ELECTRICAL RISER KEYED NOTES:

- A** EXISTING 600A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL METER AND BREAKER SWITCH FOR THE PROJECT SPACE SHALL REMAIN. E.C. SHALL COORDINATE WITH BASE BUILDING/LANDLORD/OWNER FOR THE EXACT LOCATION OF THE EXISTING METER AND EXACT POWER DISTRIBUTION IN THE FIELD. E.C. SHALL VERIFY THE OPERABLE CONDITION OF EXISTING ELECTRICAL METER AND BREAKER SWITCH, REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- B** EXISTING ELECTRICAL CONDUITS (PROVIDED BY LANDLORD) SHALL REMAIN. E.C. TO VERIFY EXACT SIZE, LENGTH AND OPERABLE CONDITION OF CONDUITS IN FIELD AND COORDINATE WITH OWNER/LANDLORD FOR EXACT SCOPE OF WORK/LIABILITIES BEFORE COMMENCING ANY WORK. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCIES. BASE BID ACCORDINGLY.
- C** EXISTING 600A(M.L.O.), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "RPA" TO REMAIN. E.C. TO VERIFY LOCATION, RATING AND OPERABLE CONDITION OF PANEL IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- D** NEW 200A(MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A" FOR PROJECT SPACE TO REMAIN. E.C TO FIELD VERIFY EXACT SIZE, LOCATION AND OPERABLE CONDITION OF PANEL. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- E** NEW 200A(MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B" FOR PROJECT SPACE TO REMAIN. E.C TO FIELD VERIFY EXACT SIZE, LOCATION AND OPERABLE CONDITION OF PANEL. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

ELECTRICAL GENERAL NOTE:

- ABOVE 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.
- ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.
- E.C. TO VERIFY OPERABLE CONDITIONS OF EXISTING DEVICES IN FIELD. REPLACE/RECTIFY IF FOUND IN OPERABLE. BASE BID ACCORDINGLY.
- EXISTING ELECTRICAL DISTRIBUTION TO BE MAINTAINED AND UTILIZED TO SERVE PROJECT SPACE. POWER RISER DIAGRAM INDICATED FOR REFERENCE PURPOSES ONLY.
- ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER/LANDLORD/BASE BUILDING FOR THE EXACT SCOPE OF WORK/LIABILITIES.

ELECTRICAL RISER SYMBOLS:



PANEL: RPA(E)										MOUNTING:		RECESSED					
208Y/120		VOLTS,		3		PHASE,		4		WIRE		PANEL LOCATION:		ELECTRICAL ROOM			
MAIN CB		NA		MLO:		600A		BUS:		EXISTING		MIN,		FED FROM:		EXISTING METER/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	200/3P	PANEL-A(N) 	O	11.89	4#3/0, 1#6G, 2" C	23.18			4#3/0, 1#6G, 2" C	11.29	O	PANEL-B(N) 	200/3P	2			
3			O	11.89			23.18			11.29	O			4			
5			O	11.89				23.18			11.29			O	6		
7	125/3P	HEART LOAD CENTER (#77) 	E	12.00	4#1, #6G, 1 1/4" C	15.41			2#8, #10G, 3/4" C	3.41	H	CU-1(E) 	50/2P	8			
9			E	12.00			15.41			3.41	H			10			
11			E	12.00				15.41			3.41			H	12		
13	20	AHU-1(E) 	H	1.38	2#10, #10G, 3/4" C	4.79			2#8, #10G, 3/4" C	3.41	H	CU-2(E) 	50/2P	14			
15	20	AHU-2(E) 	H	1.38	2#10, #10G, 3/4" C		4.79		2#8, #10G, 3/4" C	3.41	H	CU-3(E) 	50/2P	16			
17	20	AHU-3(E) 	H	1.38	2#10, #10G, 3/4" C			4.79	2#8, #10G, 3/4" C	3.41	H	CU-3(E) 	50/2P	18			
19	20	AHU-4(E) 	H	1.38	2#10, #10G, 3/4" C	4.79			2#8, #10G, 3/4" C	3.41	H	CU-4(E) 	50/2P	20			
21	150/3P	MUA-1(N) 	H	16.93	3#1/0, 1#6G, 1 1/4" C		20.34		2#10, #10G, 3/4" C	3.41	H	OAF-1(N) 	20	22			
23			H	16.93				18.06		1.13	M			24			
25			H	16.93			16.93								26		
27	30/3P	KEF-1(N) 	M	2.68	3#10, #12G, 3/4" C		2.68					SPACE		28			
29			M	2.68			2.68			SPACE	30						
31			M	2.68			2.68			SPACE	32						
33		SPACE					0.00					SPACE		34			
35		SPACE						0.00				SPACE		36			
37		SPACE				0.00						SPACE		38			
39		SPACE					0.00					SPACE		40			
41		SPACE						0.00				SPACE		42			
TOTAL CONNECTED LOAD (KVA)						67.79	66.41	64.12									

PANEL: A(N)										MOUNTING:		SURFACE					
208Y/120		VOLTS,		3		PHASE,		4		WIRE		PANEL LOCATION:		BACK OF HOUSE			
MAIN CB		200A		MLO:		NA		BUS:		225A		MIN,		FED FROM:		EXISTING PANEL RPA	
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	LIGHTING - SEATING, HALLWAY & DINING	L	1.00	2#12, #12G, 3/4" C	1.54			2#12, #12G, 3/4" C	0.54	R	RECEPTACLE- USB	20	2			
3	20	LIGHTING - BOH & DRY STORAGE	L	1.00	2#12, #12G, 3/4" C		1.50		2#12, #12G, 3/4" C	0.50	L	WALKING COOLER/FREEZER LIGHTING	20	4			
5	20	LIGHTING- PREP. AREA, SERVICE & KITCHEN AREA	L	1.00	2#12, #12G, 3/4" C			2.50	2#12, #12G, 3/4" C	1.50	L	SOFT COFFEE SIGN, LED GYG SIGN & CAFÉ HOLA SIGN	20	6			
7	20	LIGHTING- RESTROOM	L	0.50	2#12, #12G, 3/4" C	1.00			2#12, #12G, 3/4" C	0.50	L	INTERIOR SIGNAGES	20	8			
9	20	EXTERIOR SIGNAGE	R	1.00	2#12, #12G, 3/4" C		1.50		2#12, #12G, 3/4" C	0.50	O	HOOD LIGHTING	20	10			
11	20	TIMER/LIGHTING CONTROL PANEL	L	0.50	2#12, #12G, 3/4" C			0.86	2#12, #12G, 3/4" C	0.36	R	POS	20	12			
13	20	SHOW WINDOW	R	1.60	2#12, #12G, 3/4" C	2.10			2#12, #12G, 3/4" C	0.50	O	HOOD FIRE SUPPRESSION SYSTEM/CONTROL PANEL	20	14			
15	20	SHOW WINDOW	R	1.60	2#12, #12G, 3/4" C		2.80		2#12, #12G, 3/4" C	1.20	M	MOTORISED DAMPER	20	16			
17	20	SHOW WINDOW	R	1.60	2#12, #12G, 3/4" C			2.10	2#12, #12G, 3/4" C	0.50	L	UNDERCOUNTER LED STRIP LIGHT	20	18			
19	20	SHOW WINDOW	R	1.00	2#12, #12G, 3/4" C	1.76			2#12, #12G, 3/4" C	0.76	E	UNDERCOUNTER REFRIGERATOR_(#83)	20	20			
21	20	SHOW WINDOW	R	1.00	2#12, #12G, 3/4" C		1.76		2#12, #12G, 3/4" C	0.76	E	UNDERCOUNTER REFRIGERATOR_(#83)	20	22			
23	20	RECEPTACLE- OFFICE	R	1.00	2#12, #12G, 3/4" C			1.76	2#12, #12G, 3/4" C	0.76	E	UNDERCOUNTER REFRIGERATOR_(#83)	20	24			
25	20	RECEPTACLE- OFFICE	R	1.00	2#12, #12G, 3/4" C	1.36			2#12, #12G, 3/4" C	0.36	R	AUTOMATIC FUCET	20	26			
27	20	RECEPTACLE- OFFICE	R	1.00	2#12, #12G, 3/4" C		1.48		2#12, #12G, 3/4" C	0.48	O	WH-1	20	28			
29	20	RECEPTACLE- OFFICE	R	1.00	2#12, #12G, 3/4" C			1.09	2#12, #12G, 3/4" C	0.09	O	RCP-1	20	30			
31	20	RECEPTACLE- OFFICE	R	1.00	2#12, #12G, 3/4" C	1.17			2#12, #12G, 3/4" C	0.17	M	EF-1 (N)	20	32			
33	20	RECEPTACLE- OFFICE	R	1.00	2#12, #12G, 3/4" C		1.54		2#12, #12G, 3/4" C	0.54	R	RECEPTACLE- USB	20	34			
35	20	RECEPTACLE- OFFICE	R	1.00	2#12, #12G, 3/4" C			1.72	2#12, #12G, 3/4" C	0.72	R	RECEPTACLE - OFFICE	20	36			
37	20	ROOF RECEPTACLE	R	0.90	2#12, #12G, 3/4" C	1.26			2#12, #12G, 3/4" C	0.36	R	POS	20	38			
39	20	BUILDING SIGNAGE	L	1.00	2#12, #12G, 3/4" C		1.36		2#12, #12G, 3/4" C	0.36	R	POS	20	40			
41	20	INTERIOR SIGNAGES	L	0.50	2#12, #12G, 3/4" C			0.86	2#12, #12G, 3/4" C	0.36	R	POS	20	42			
43	20*	HAND DRYER	O	0.50	2#12, #12G, 3/4" C	1.22			2#12, #12G, 3/4" C	0.72	R	DIGITAL MEANU BOARD	20	44			
45	20	SECURITY PANEL	O	1.00	2#12, #12G, 3/4" C		1.18		2#12, #12G, 3/4" C	0.18	R	DIGITAL MEANU BOARD	20	46			
47	20	KITCHEN GENERAL PURPOSE	R	0.54	2#12, #12G, 3/4" C			0.72	2#12, #12G, 3/4" C	0.18	O	BUZZER	20	48			
49	20	RECEPTACLE- RESTROOM	R	0.36	2#12, #12G, 3/4" C	1.08			2#12, #12G, 3/4" C	0.72	R	RECEPTACLE GANTRY TABLE	20	50			
51	20*	HAND DRYER	O	0.50	2#12, #12G, 3/4" C		1.22		2#12, #12G, 3/4" C	0.72	R	RECEPTACLE GANTRY TABLE	20	52			
53	20	KITCHEN DISPLAY UNIT	R	0.18	2#12, #12G, 3/4" C			0.54	2#12, #12G, 3/4" C	0.36	R	GENERAL PURPOSE RECEPTACLE	20	54			
55	20	SHOW WINDOW	R	1.00	2#12, #12G, 3/4" C	1.30			2#12, #12G, 3/4" C	0.30	E	UNDERCOUNTER REFRIGERATOR_(#31)	20	56			
57	20	RECEPTACLE - FLY LIGHT	R	0.18	2#12, #12G, 3/4" C		0.36		2#12, #12G, 3/4" C	0.18	R	DIGITAL MARKETING SCREEN	20	58			
59	20	SHOW WINDOW	R	1.00	2#12, #12G, 3/4" C			1.00				SPARE	20	60			
61	20	GENERAL PURPOSE RECEPTACLE	R	0.36	2#12, #12G, 3/4" C		0.36					SPARE	20	62			
63	20	SPARE					0.00					SPARE	20	64			
65	20	GENERAL PURPOSE RECEPTACLE	R	0.72	2#12, #12G, 3/4" C			0.72				SPARE	20	66			
67	20	SPARE				0.00						SPARE	20	68			
69	20	SPARE					0.00					SPARE	20	70			
71	20	SPARE						0.00				SPARE	20	72			
TOTAL CONNECTED LOAD (KVA)						12.49	14.34	12.14									

PANEL SCHEDULE GENERAL NOTES:

- ALL THE CIRCUITING SHOWN FOR THE EXISTING PANEL "RPA" IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES IN FIELD, REARRANGE IF NEEDED AND INFORM ENGINEER FOR ANY DISCREPANCIES. ALL THE NEWLY ADDED CIRCUIT BREAKERS IN THE EXISTING ELECTRICAL PANEL "RPA" SHALL BE COMPATIBLE WITH THE PANEL.
- ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
- E.C. SHALL PROVIDE NEW CIRCUIT BREAKERS IN PLACE OF EXISTING CIRCUIT BREAKERS WHEREVER NECESSARY TO BE IN LINE WITH THE PANEL SCHEDULE
- CHECK COMPATIBILITY OF NEWLY ADDED BREAKER WITH THE EXISTING PANEL BEFORE PURCHASING. BASE BID ACCORDINGLY.
- CONTRACTOR TO VERIFY THAT ALL BREAKERS SHOWN AS EXISTING MATCHES THE DESCRIPTIONS AND SPECIFICATIONS SHOWN ON SCHEDULES. IF DIFFERENT, NOTIFY ARCHITECT/ENGINEER BEFORE BIDDING, ORDERING, OR PROCEEDING WITH WORK.

PANEL SCHEDULE KEY NOTES:

- PROVIDE (1) 200A/3P BREAKER IN PLACE OF (3) SPACE.
- PROVIDE (1) 125A/3P BREAKER IN PLACE OF (3) SPACE.
- PROVIDE (1) 150A/3P BREAKER IN PLACE OF (3) SPACE.
- PROVIDE (1) 30A/3P BREAKER IN PLACE OF (3) SPACE.
- PROVIDE (1) 50A/2P BREAKER IN PLACE OF (2) SPACE.
- PROVIDE (1) 20A/1P BREAKER IN PLACE OF (1) SPACE.
- E.C. TO COORDINATE ON FIELD WITH MECHANICAL CONTRACTOR FOR THE EXACT BREAKER RATING.



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ELECTRICAL RISER DIAGRAM
& PANEL SCHEDULE

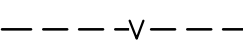
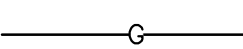
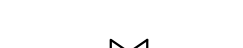
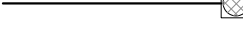
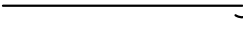
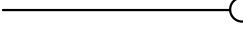
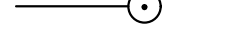
Job No.

Drawn

NYE

Sheet No.

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PLUMBING LEGEND	
SYMBOL	DESCRIPTION
	SANITARY WASTE (UNDERFLOOR)
	GREASE WASTE (UNDERFLOOR)
	EXISTING SANITARY WASTE
	VENT PIPING
	GAS PIPING
	COLD WATER
	HOT WATER
	HOT WATER RETURN PIPING
	ISOLATION VALVE
	BALANCING VALVE
	FLOOR DRAIN
	PIPE DOWN
	PIPE UP
	CLEANOUT
	REDUCED PRESSURE ZONE ASSEMBLY
	POINT OF NEW CONNECTION
	FLOOR SINK
	GAS SHUTOFF VALVE

PLUMBING DRAWING LIST

- P0.1 PLUMBING SPECIFICATIONS, SYMBOLS & ABBREVIATIONS
P0.2 PLUMBING SPECIFICATIONS
P1.0 PLUMBING DRAINAGE & VENT PLAN
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CODE COMPLIANCE

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

- 2021 INTERNATIONAL BUILDING CODE WITH IBC AMENDMENTS
- 2021 INTERNATIONAL FIRE CODE WITH IFC AMENDMENTS
- 2021 INTERNATIONAL MECHANICAL CODE WITH IMC AMENDMENTS
- 2014 ILLINOIS PLUMBING CODE WITH ILLINOIS PLUMBING CODE AMENDMENTS
- 2021 INTERNATIONAL FUEL GAS CODE WITH IFGC AMENDMENTS
- 2021 INTERNATIONAL ENERGY CONSERVATION CODE
- 2020 NFPA 70 NATIONAL ELECTRIC CODE (NEC) WITH NEC AMENDMENTS

PLUMBING ABBREVIATIONS

CO-1	CLEANOUT
EX.CO	EXISTING CLEANOUT
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
GSAN	GREASE SANITARY
SAN	SANITARY
EX.SAN	EXISTING SANITARY
WH-1	WATER HEATER
ET-1	EXPANSION TANK
RCP-1	CIRCULATION PUMP
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
EXIST.	EXISTING
AFF	ABOVE FINISH FLOOR
FD	FLOOR DRAIN
BFP	BACK FLOW PREVENTER
SV	SHUTOFF VALVE
FS	FLOOR SINK
TMV	THERMOSTATIC MIXING VALVE
GI	GREASE TRAP

PLUMBING SPECIFICATIONS:

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

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

1.02 SUBMITTALS

- SUBMITTAL REQUIREMENTS SHALL BE COORDINATED WITH THE ARCHITECT AND AUTHORITIES HAVING JURISDICTION, UNLESS OTHERWISE DIRECTED. CONTRACTOR SHALL PROVIDE SUBMITTALS AS LISTED BELOW.
 - PIPE AND FITTINGS
 - VALVES
 - HANGERS AND SUPPORTS
 - PLUMBING PIPING LAYOUT
 - TESTS
 - PLUMBING FIXTURES
 - WATER HEATERS & ACCESSORIES
 - FLOOR DRAINS
 - MIXING VALVES
 - ALL SCHEDULED PLUMBING EQUIPMENT
- SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED.
- THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS STAMP.
- SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.
- SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.
- FOR ALL BELOW GRADE PIPING WHERE ACTUAL INSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.
- RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.

1.03 SUBSTITUTIONS

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

1.04 DEFINITIONS

- FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.
- INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES.
- PROVIDE: TO FURNISH AND INSTALL.
- PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS.
- REFER TO THE 2014 ILLINOIS PLUMBING CODE FOR ADDITIONAL DEFINITIONS.

1.04 DRAWINGS

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

1.05 PRODUCTS

A. SANITARY AND VENT PIPING:

- ABOVE GRADE/ UNDERGROUND PIPING SHALL BE CAST IRON PIPE WHICH SHOULD COMPLY WITH ASTM A74; ASTM A883; STANDARD/CISPI 301.
- 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.
- ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

- ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE.
- FITTINGS IN DOMESTIC WATER PIPING SHALL BE COPPER OR COPPER ALLOY AS PER TABLE 604.1, 2014 ILLINOIS PLUMBING CODE
- JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
- THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
- COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
- ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH 2018 INTERNATIONAL ENERGY CONSERVATION CODE. REFER BELOW C404.4 TABLE FOR MINIMUM PIPE INSULATION THICKNESS.

MINIMUM PIPE INSULATION THICKNESS					
FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)		
	CONDUCTIVITY BTU IN./ (H FT2 °F)	MEAN RATING TEMPERATURE, °F	< 1	1 to 1½	1½ to 4
105-140	0.21-0.28	100	1.0	1.0	1.5
40-60	0.21-0.27	75	0.5	0.5	1.0

- AS PER IECC 2018 EDITION, C404.6.1, HEATED WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH CIRCULATION PUMP. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE 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.
- AS PER IECC 2018 EDITION, C404.7 WATER DISTRIBUTION SYSTEM HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM.PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
 - THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE,SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE.
 - THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F(40°C).
- HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2018 C404.5, THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

NOMINAL PIPE SIZE (INCHES)	MIXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAV	OTHER FIXTURES
½"	2'	43'
¾"	0.5'	21'
1"	0.5'	13'
1¼"	0.5'	8'
1½"	0.5'	6'
2" OR LARGER	0.5'	4'

C. GAS WATER HEATER

- TANKS SHALL 60 GALLON CAPACITY AND SHALL HAVE 160 PSI WORKING PRESSURE AND BE EQUIPPED WITH GLASS LINING PERMANENTLY BONDED TO TANK INTERIOR SURFACE.
- BURNER SHALL BE ALUMINIZED STEEL OR CAST IRON, ADJUSTABLE, OR SELF-ADJUSTING AIR-GAS MIXTURE CONTROL.
- INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH NFPA 54, NFPA 211, AND THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.

D. GAS PIPING

- THE OUTER JACKET SHALL BE STEEL WITH BAKED ENAMEL/ACRYLIC FINISH AND SHALL BE PROVIDED WITH ACCESS DOOR FOR SERVICING CONTROLS AND BURNER
- THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.
- ALL GAS PIPING WORK SHALL COMPLY WITH INTERNATIONAL FUEL GAS CODE 2021, LOCAL UTILITY GAS REQUIREMENTS.
- FURNISH AND INSTALL ALL NECESSARY GAS PIPING TO ALL EQUIPMENT REQUIRING GAS SUPPLY.
- PROVIDE A LUBRICATED GAS VALVE AT ALL CONNECTIONS TO EQUIPMENT.
- ALL GAS PIPING AND INSTALLATION SHALL BE IN ACCORDANCE WITH RULES AND REGULATIONS OF LOCAL UTILITY GAS COMPANY AND OTHER AUTHORITIES HAVING JURISDICTION.
- PROVIDE ADEQUATE SUPPORT FOR ALL PIPING.
- GAS PIPING SHALL BE BLACK STEEL SCHEDULE 40 THREADED PIPE CONFORMING TO ANSI B36-20.
- FITTINGS SHALL BE MALLEABLE IRON.

G. HOT WATER RE-CIRCULATING PUMP

- IN-LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD-FREE BRONZE IMPELLER.
- 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.
- 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.
- 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.

E. MIXING VALVES

- VALVE BODY SHALL BE MADE OF CAST BRASS. THE INTERNAL COMPONENTS SHALL BE MADE OF BRASS OR STAINLESS STEEL.
- 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 105°F MAXIMUM DELIVERY TEMPERATURE. IF ONE SUPPLY SHOULD FAIL, THE OTHER WILL AUTOMATICALLY AND INSTANTLY SHUT DOWN. DELIVERY CAPACITY IS 15GPM @ 45 PSIG DIFFERENTIAL.
- TYPES OF VALVES: TYPE A- THERMOSTATICALLY OPERATED BY MEANS OF BI-METALLIC STRIP, OR EXPANSION BELLOWS; 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.
- 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.

F. HOT WATER RE-CIRCULATING PUMP

- IN-LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD-FREE BRONZE IMPELLER.
- 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.
- 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.
- 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.



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G. HANGERS AND SUPPORTS:

- HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.
- SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.
- ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS..
- SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

H. VALVES:

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

H. SLEEVES AND ESCUTCHEONS:

- 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. USE THERMAFIBER SAFING INSULATION SHALL BE INSTALLED BETWEEN PIPE AND SLEEVE.
- 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.

I. DRAINAGE ACCESSORIES

1. GENERAL:

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

2. 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.

c. CLEANOUT DECK PLATE

- IT SHOULD BE STANDARD DUTY FLOOR CLEANOUT FITTING WITH COATED CAST IRON BODY; ROUND, POLISHED NICKEL BRONZE SCORIATED 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.

3. INDIRECT WASTE FUNNEL

- 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.

J. 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.

K. VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES.

L. 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.

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

N. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL. REMOVE PROTECTIVE COATINGS PRIOR TO INSTALLATION.

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

P. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

R. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

T. 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.

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

V. 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.

W. 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.

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

Y. ALL PIPING INSTALLED ON THE ROOF SHALL BE SUPPORTED BY "PILLOW BLOCK" PIPE STANDS AS MANUFACTURED BY MIRO INDUSTRIES, OR APPROVED EQUAL. WOOD PIPE SUPPORTS SHALL NOT BE ACCEPTABLE. PROVIDE TRAFFIC/WALK PADS BELOW ALL PIPE STANDS.

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 FLUSHOMETER 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. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL. THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY MANAGER IS REQUIRED.

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

PIPING FROM A WATER HEATER TO THE TERMINATION OF THE HEATED WATER FIXTURE SUPPLY PIPE SHALL BE INSULATED IN ACCORDANCE WITH TABLE C403.2.10, ON BOTH THE INLET AND OUTLET PIPING OF A STORAGE WATER HEATER OR HEATED WATER STORAGE TANK. THE PIPING TO A HEAT TRAP OR THE FIRST 8 FEET (2438MM) OF PIPING, WHICHEVER IS LESS, SHALL BE INSULATED.

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.

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

M. TESTING REQUIREMENTS

- TEST ALL DOMESTIC WATER PIPING HYDROSTATICALLY TO 125 PSIG.
- HYDROSTATIC TEST PRESSURES SHALL REMAIN CONSTANT WITH NO VARIATION FOR 120 MINUTES.
- TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.
- 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.

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

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

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.



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PLUMBING SPECIFICATIONS

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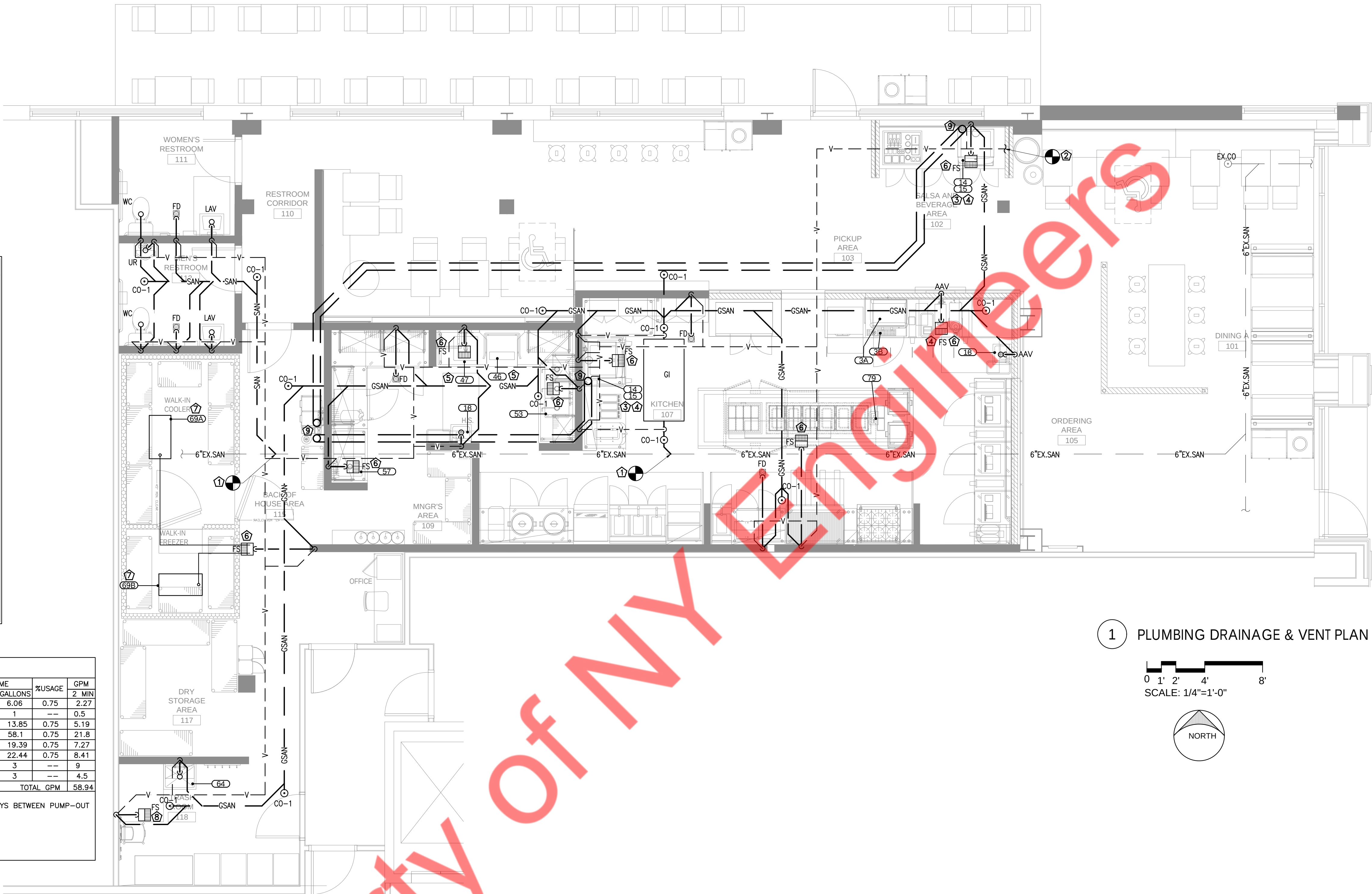
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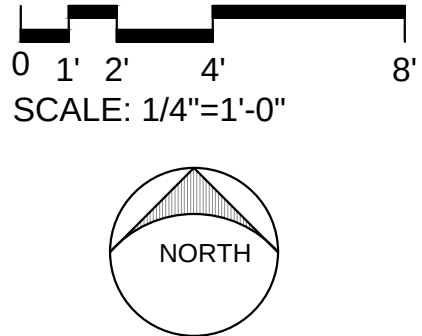
- GENERAL NOTES
1. PROVIDE TRAP PRIMER FOR ALL FLOOR DRAINS.
 2. CONTRACTOR TO FIELD VERIFY THE EXISTING SANITARY AND VENT PIPING SIZE, LOCATION & INVERT ON SITE.
 3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.

- WASTE AND VENT PLAN KEY NOTES
1. CONNECT NEW 4" SANITARY PIPING TO EXISTING 6" SANITARY PIPING. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION AND SIZE OF EXISTING SANITARY PIPING AND MAKE NECESSARY CHANGES IF REQUIRED.
 2. CONNECT NEW 4" VENT PIPE TO EXISTING VENT PIPE IN SPACE. CONTRACTOR TO FIELD VERIFY EXACT SIZE AND LOCATION OF EXISTING VENT PIPE IN SPACE AND MAKE NECESSARY CHANGES / UPGRADE IF REQUIRED.
 3. ROUTE INDIRECT WASTE FROM DRINK DISPENSER AND ICE MACHINE THROUGH CABINET TO FLOOR SINK BELOW AS PER LOCAL CODE REQUIREMENTS.
 4. FLOOR SINKS RECEIVING SODA/COFFEE WASTE SHALL BE ACID RESISTANT. WASTE PIPING FROM THESE FLOOR SINKS SHALL BE ACID RESISTANT PIPING TO THE POINT THEY CONNECT WITH THE MAIN WASTE LINE AND ARE DILUTED BY OTHER LIQUID WASTES.
 5. ROUTE INDIRECT WASTE FROM DISH TABLE AND WAREWASHER MACHINE TO THE NEAREST FLOOR SINK WITH APPROVED AIR GAP AS PER LOCAL CODE REQUIREMENTS.
 6. REFER TO KITCHEN DRAWINGS FOR KITCHEN SINK INDIRECT WASTE PIPING ROUTING TO FLOOR SINK.
 7. ROUTE WALK IN COOLER/FREEZER CONDENSATE DRAIN WITH APPROVED AIR GAP INTO THE NEARBY FLOOR SINK AS PER LOCAL CODE REQUIREMENTS.
 8. ROUTE WATER HEATER DRAIN WITH APPROVED AIR GAP INTO THE NEARBY FLOOR SINK AS PER LOCAL CODE REQUIREMENTS.
 9. REFER TO FOOD SERVICE DRAWINGS FOR BEVERAGE CONDUITS SIZES, LOCATIONS, AND DETAILS, COORDINATE LOCATION, ROUTING, AND ELEVATION OF UNDERSLAB AND ABOVE FLOOR BEVERAGE CONDUIT WITH ALL TRADES.

GREASE INTERCEPTOR SIZING									
TAG	DESCRIPTION	QTY	DIMENSIONS			VOLUME		%USAGE	GPM 2 MIN
			LENGTH	WIDTH	DEPTH	CU.IN	GALLONS		
18	HAND SINK	02	14	10	5	1400	6.06	0.75	2.27
46	DISHWASHER (DOOR TYPE)	01	--	--	--	--	1	--	0.5
47	PREP RINSE SINK	01	20	20	8	3200	13.85	0.75	5.19
53	3-COMPARTMENT SINK	01	20	16	14	13440	58.1	0.75	21.8
57	PREP SINK	01	20	16	14	4480	19.39	0.75	7.27
64	MOP SINK	01	24	18	12	5184	22.44	0.75	8.41
FS	FLOOR SINK	06	--	--	--	--	3	--	9
FD	FLOOR DRAIN	03	--	--	--	--	3	--	4.5
GB-250 GREASE TRAP							TOTAL GPM		
							58.94		
GREASE PRODUCTION: NUMBER OF SEATS x 4 TURNS PER SEAT x GREASE PRODUCTION VALUE x DAYS BETWEEN PUMP-OUT = GREASE OUTPUT									
NUMBER OF SEATS IN FACILITY : 51 GREASE PRODUCTION VALUE : 0.035 LBS PER SERVING DAYS BETWEEN PUMP-OUTS : 90 = 51 x 4 x 0.035 x 90 = 642.6 LBS OF FOG									



1 PLUMBING DRAINAGE & VENT PLAN



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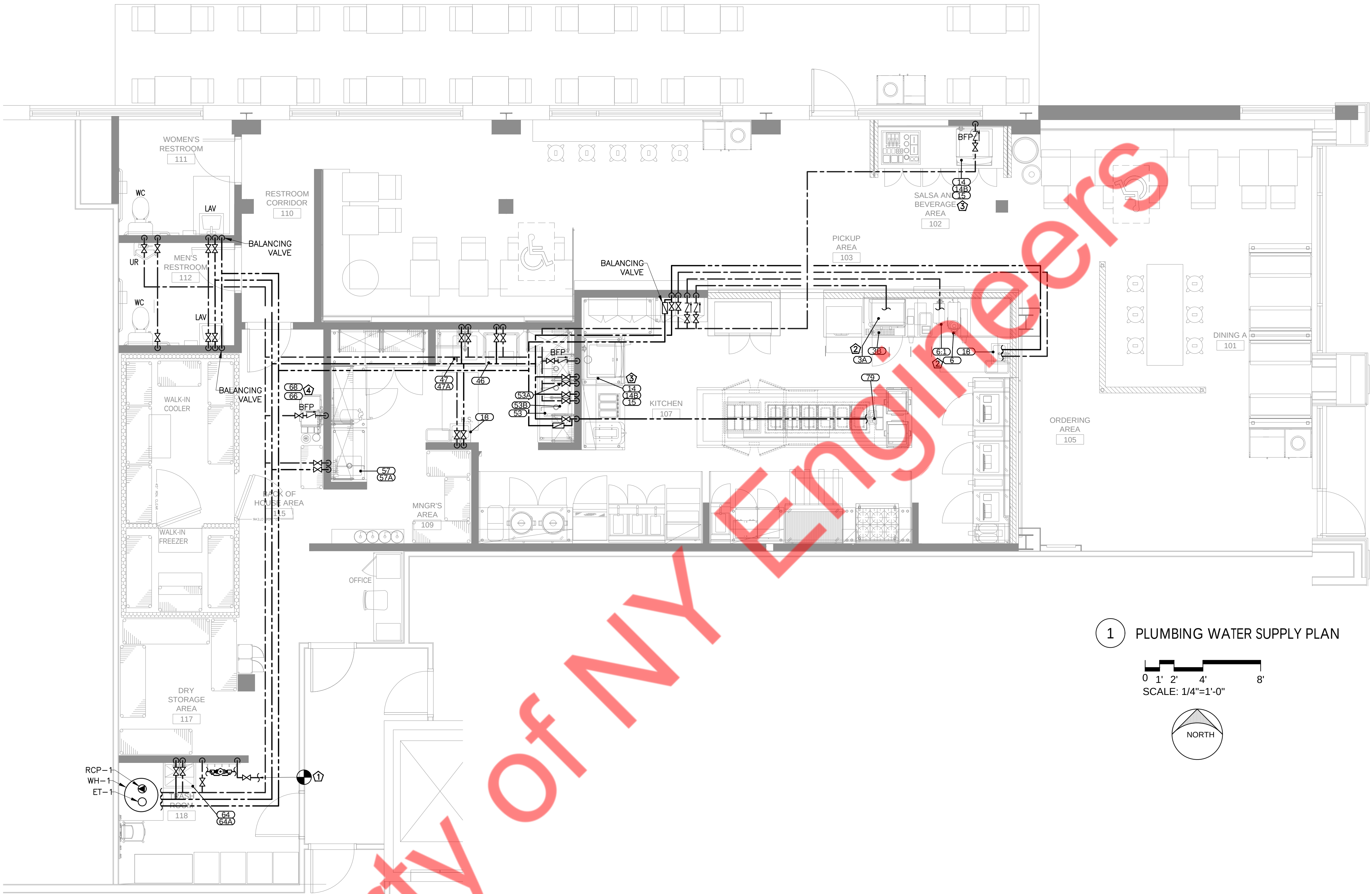
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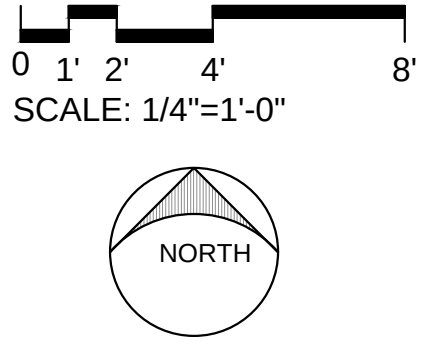
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- GENERAL NOTES
1. CW/HW/HWR PIPING TO BE PROVIDED WITH INSULATION AS PER 2021 INTERNATIONAL ENERGY CONSERVATION CODE (REFER SHEET P0.1).
 2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
 3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 4. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, SHUT-OFF VALVES AS REQUIRED.
 5. REFER RISER DIAGRAM FOR WATER PIPE SIZING.
 6. ROUTE BFP DRAIN TO MOP SINK.

- WATER PLAN KEY NOTES
1. CONNECT NEW 1-1/4" CW LINE TO EXISTING WATER MAIN LINE IN SPACE OF ADEQUATE SIZE WITH NEW WATER METER AND BFP AS SHOWN. CONTRACTOR TO FIELD VERIFY SIZE AND LOCATION OF EXISTING PIPING. CONTRACTOR TO MAKE SURE THAT NO TAP OFF TO BE TAKEN BEFORE BFP.
 2. PROVIDE FILTERED WATER TO COFFEE/TEA BREWER AND ESPRESSO MACHINE.
 3. PROVIDE FILTERED WATER TO ICE MAKER / SODA AND ICE DISPENSER.
 4. PROVIDE FILTERED WATER TO BAG-IN-BOX / CARBONATOR.



1 PLUMBING WATER SUPPLY PLAN



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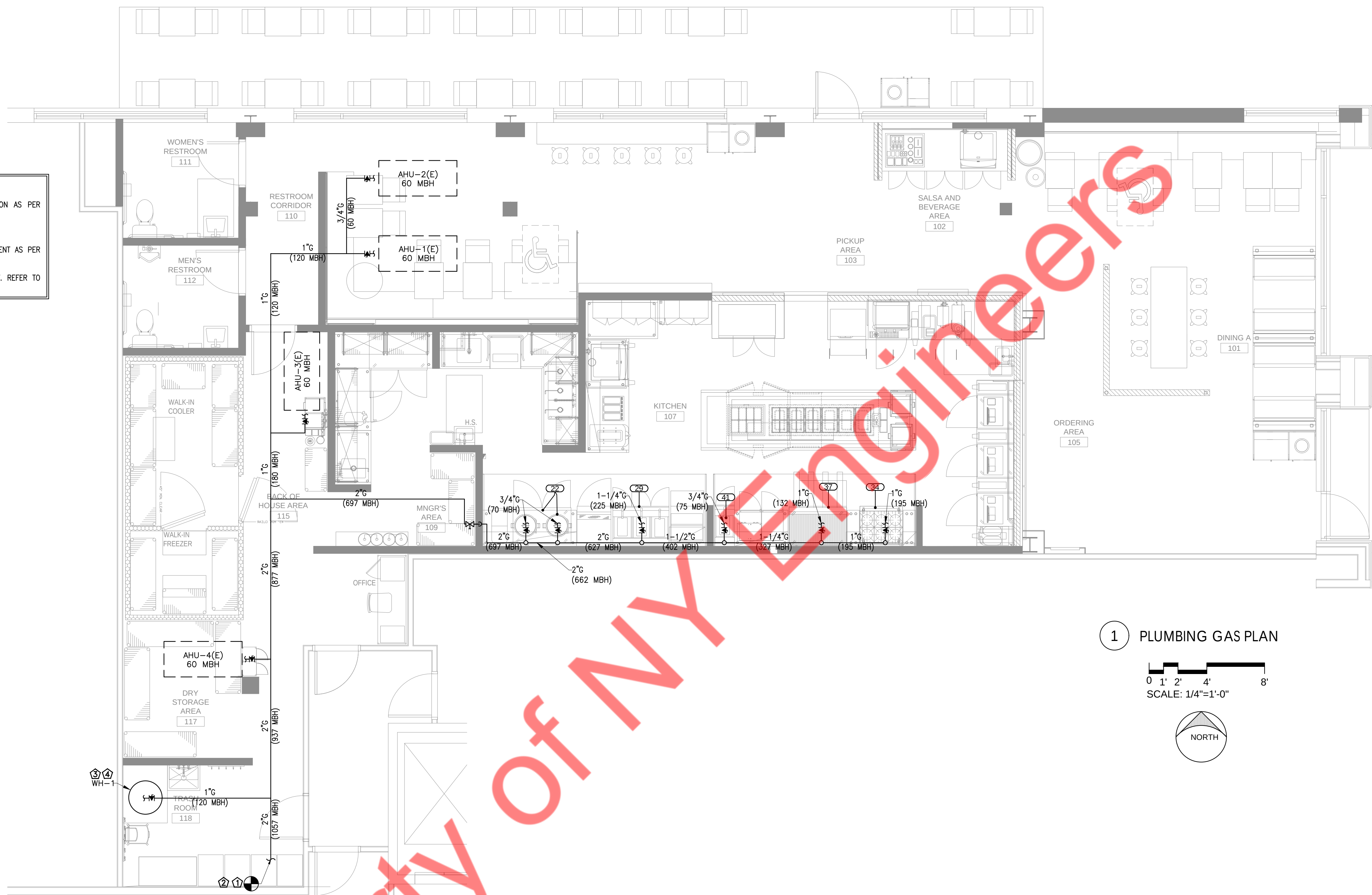
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SUPPLY PLAN

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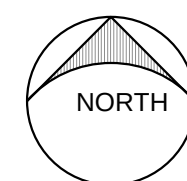
- PLUMBING WATER AND GAS GENERAL NOTES:
1. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 2. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
 3. CONTRACTOR TO MAKE ALL FINAL GAS CONNECTIONS TO EQUIPMENT AS PER MANUFACTURER'S SPECIFICATIONS.
 4. ALL CONNECTIONS SHOWN RELATE TO KITCHEN EQUIPMENT ONLY. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL REQUIREMENTS.

- GAS PLAN KEY NOTES
1. CONNECT NEW 2" GAS LINE TO EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY SIZE, PRESSURE AND LOCATION OF EXISTING GAS METER WITH LANDLORD/UTILITY COMPANY. CONTRACTOR TO MAKE SURE THAT EXISTING METER IS OF 1800 MBH AND UPGRADE IF REQUIRED.
 2. CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR ALL MECHANICAL EQUIPMENTS, KITCHEN EQUIPMENT AND GAS FIRED WATER HEATER. PROVIDE PRESSURE REGULATOR IF REQUIRED.
 3. PROVIDE WATER HEATER IN THIS AREA PER WATER HEATER DETAIL ON PLUMBING DETAIL SHEET P5.0.
 4. PROVIDE GAS CONNECTION TO WATER HEATER. SEE GAS ISOMETRIC RISERS FOR SIZING INFORMATION ON PLUMBING SHEET P6.0. SEE DETAIL SHEETS P5.0 FOR ADDITIONAL INFORMATION.



1 PLUMBING GAS PLAN

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



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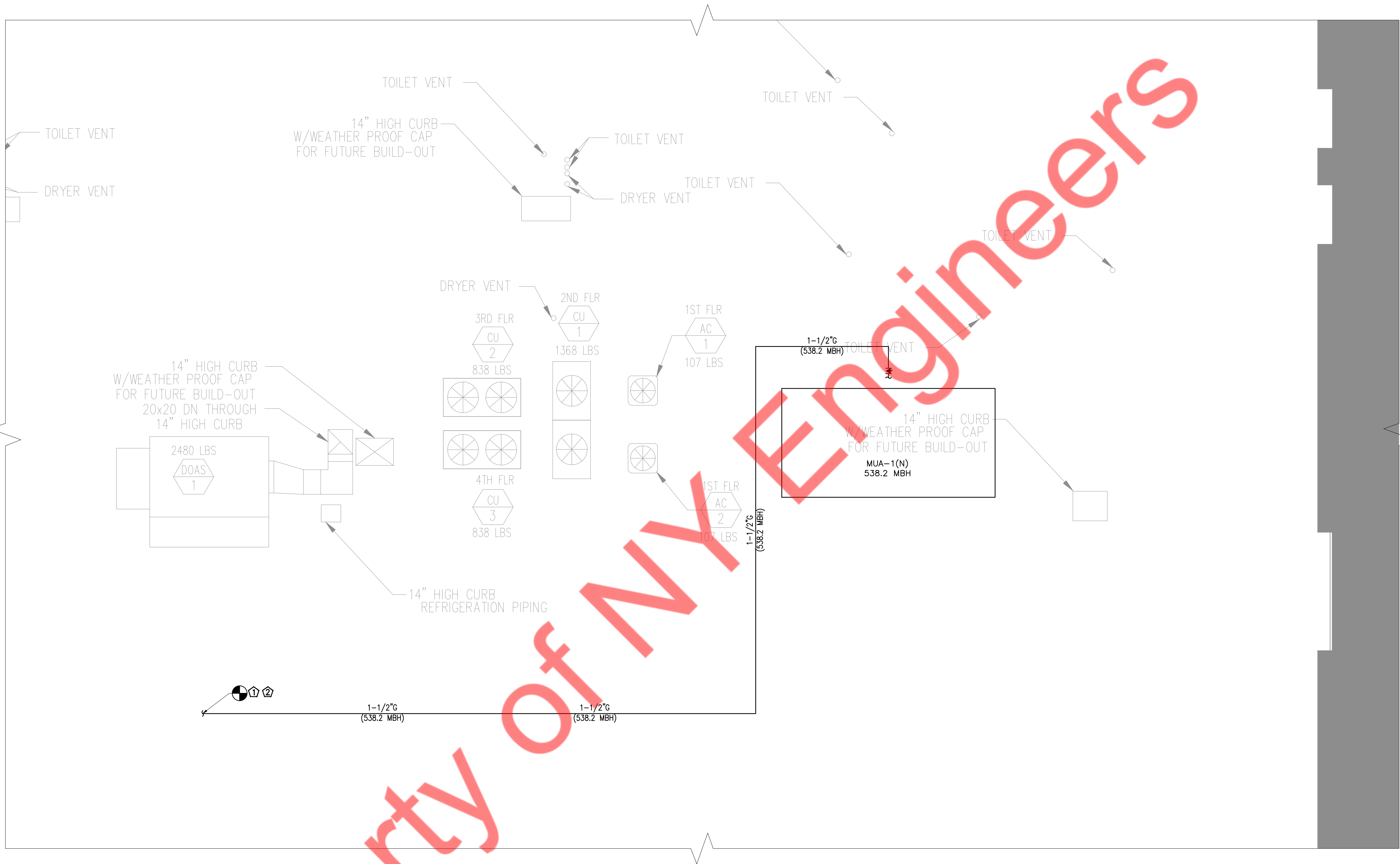
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PLUMBING GAS PLAN

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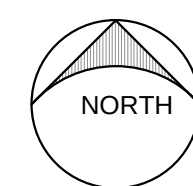
- PLUMBING WATER AND GAS GENERAL NOTES:
1. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 2. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
 3. CONTRACTOR TO MAKE ALL FINAL GAS CONNECTIONS TO EQUIPMENT AS PER MANUFACTURER'S SPECIFICATIONS.
 4. ALL CONNECTIONS SHOWN RELATE TO KITCHEN EQUIPMENT ONLY. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL REQUIREMENTS.

- GAS PLAN KEY NOTES
- CONNECT NEW 1-1/2" GAS LINE TO EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY SIZE, PRESSURE AND LOCATION OF EXISTING GAS METER WITH LANDLORD/UTILITY COMPANY. CONTRACTOR TO MAKE SURE THAT EXISTING METER IS OF 1600 MBH AND UPGRADE IF REQUIRED.
 - CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR MECHANICAL EQUIPMENT. PROVIDE PRESSURE REGULATOR IF REQUIRED.



1 PLUMBING GAS ROOF PLAN

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



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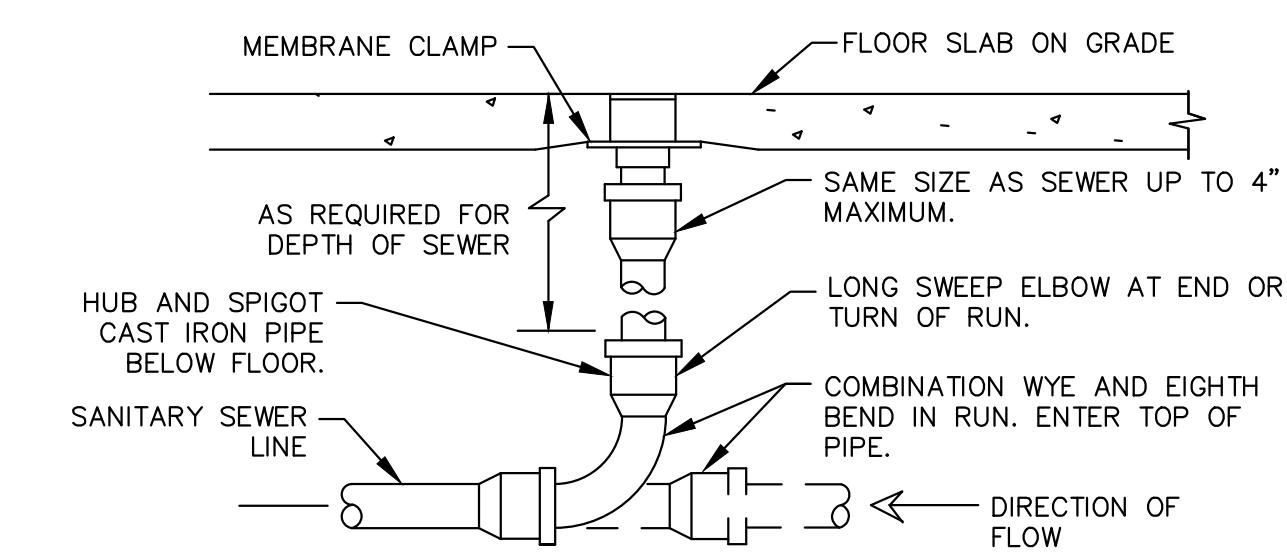
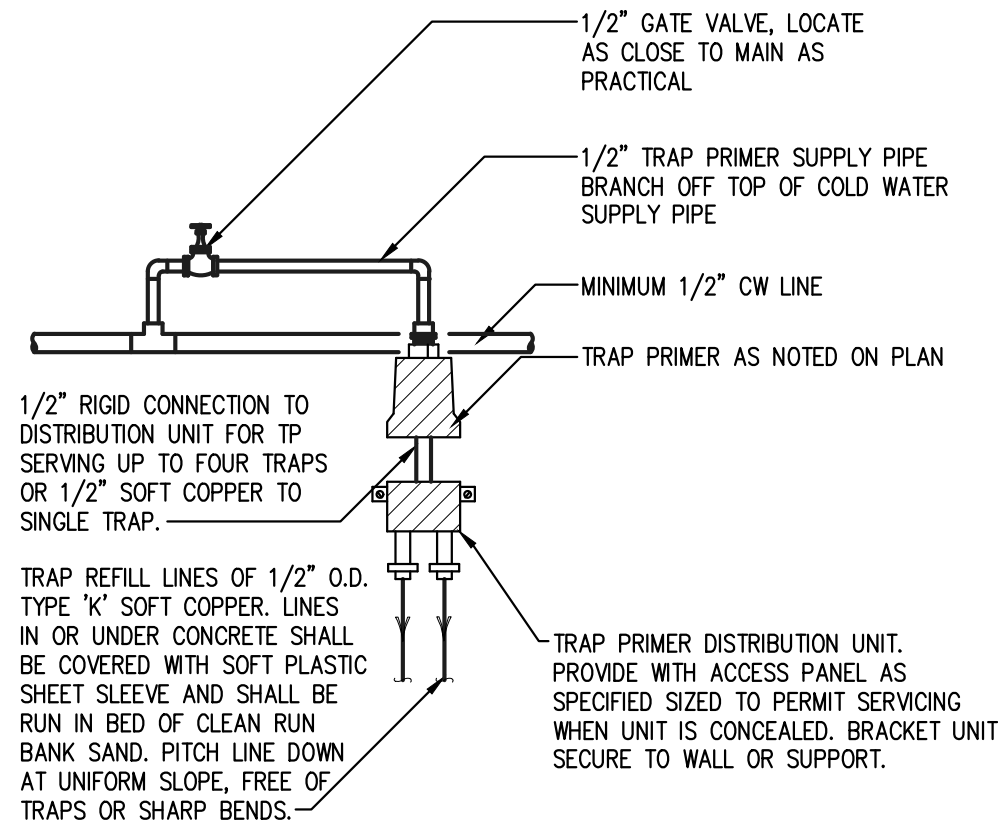
PLUMBING GAS ROOF PLAN

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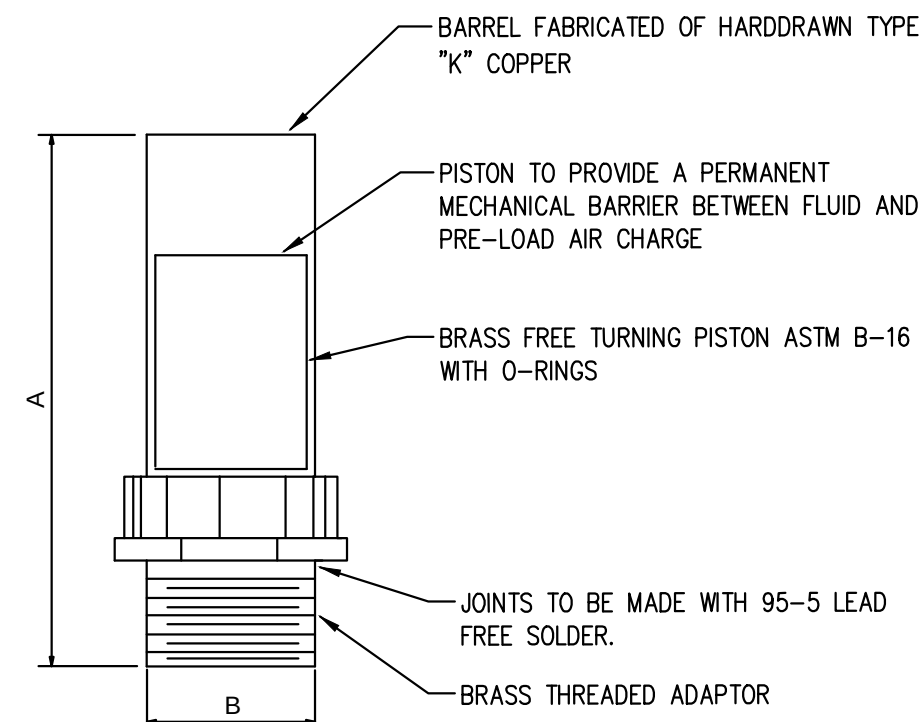
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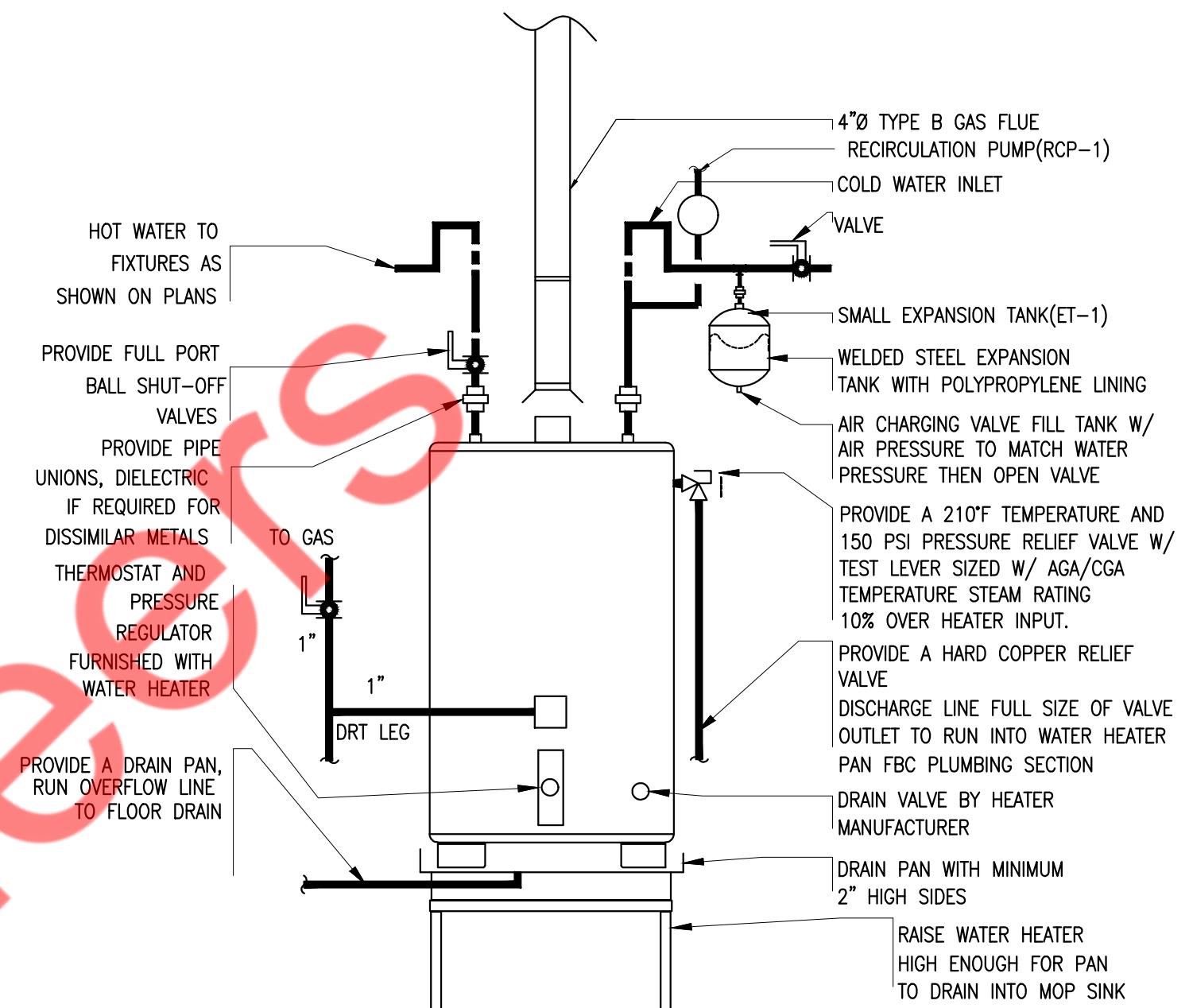
COMMENTS:

1. LOCATE AT BUILDING EXIT, AT ENDS OF RUNS, AT TURNS OF PIPE GREATER THAN 45 DEGREES, AT 50' INTERVALS ON STRAIGHT RUNS, AND/OR WHERE SHOWN ON PLANS. PROVIDE BACKFILL PER ARCHITECTURAL SPECIFICATIONS. LOCATE CLEANOUTS WHERE THERE IS 18" CLEAR AROUND. CONSULT LOCAL CODES FOR OTHER FCO REQUIREMENTS.
2. ROUND SECURED GASKETED NICKEL BRONZE ADJUSTABLE TOP WITH "OO" CAST IN COVER. PROVIDE CLEANOUT TOP WITH VARIATIONS SUITABLE FOR FLOOR COVERING (CARPET MARKER, RECESSED FOR TILE, SCORIFIED FOR UNFINISHED FLOORS). PROVIDE GASKETED PLASTIC PLUG IN CAST IRON BODY. USE TEFLON JOINT COMPOUND ON PLUG THREADS. CLEAN THE TOP OF EXPOSED FCO AFTER INSTALLATION.



PIPE SIZE	P.D.I. SYMBOL	FIXTURE UNIT RATINGS	A SIZE	B SIZE
1/2"	A	1 - 11	5"	1/2"
3/4"	B	12 - 32	5"	3/4"
1"	C	33 - 60	7"	1"
1-1/4"	D	61 - 113	7"	1-1/4"
1-1/2"	E	114 - 154	9"	1-1/2"
2"	F	155 - 330	9"	2"

NOTE: LOCATE ONE FOR EACH BANK OF FLUSHMETER FIXTURES AT LAST FIXTURE PROVIDE A STAINLESS STEEL ACCESS DOOR FOR EACH SUFFICIENT IN SIZE TO ALLOW REPLACEMENT OF ARRESTOR AT A FUTURE DATE.

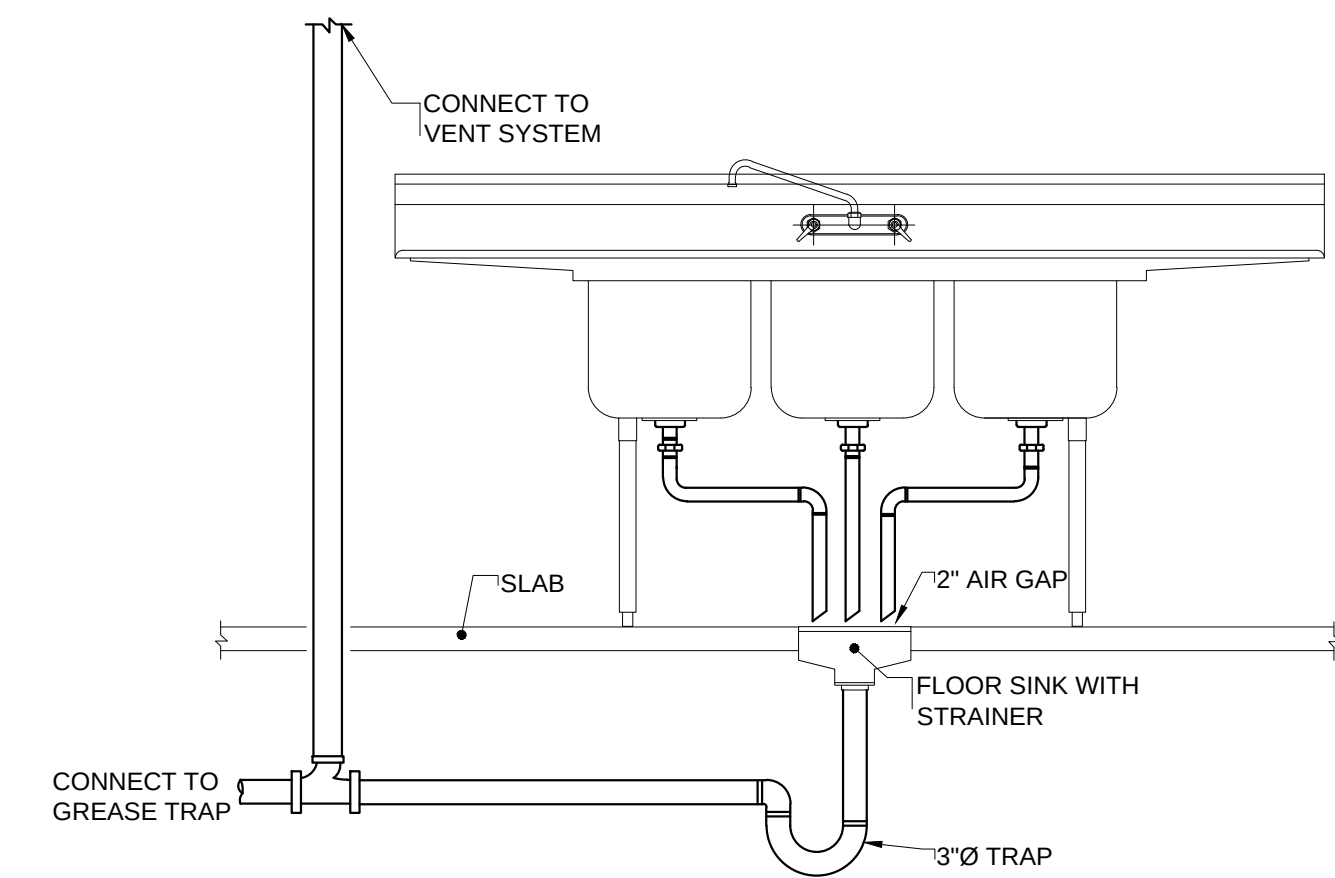


WATER HEATER DETAIL NOTES

- 1) PIPING ARRANGEMENT SHOWN IS SCHEMATIC
- 2) ADJUST TO SUIT FIELD CONDITIONS
- 3) REFER ISOMETRIC RISER FOR PIPES SIZES
- 4) SET HEATER THERMOSTAT AT 140° F
- 5) GAS WATER HEATER SHALL BE 60 GALLONS

4 WATER HEATER DETAILS

NTS

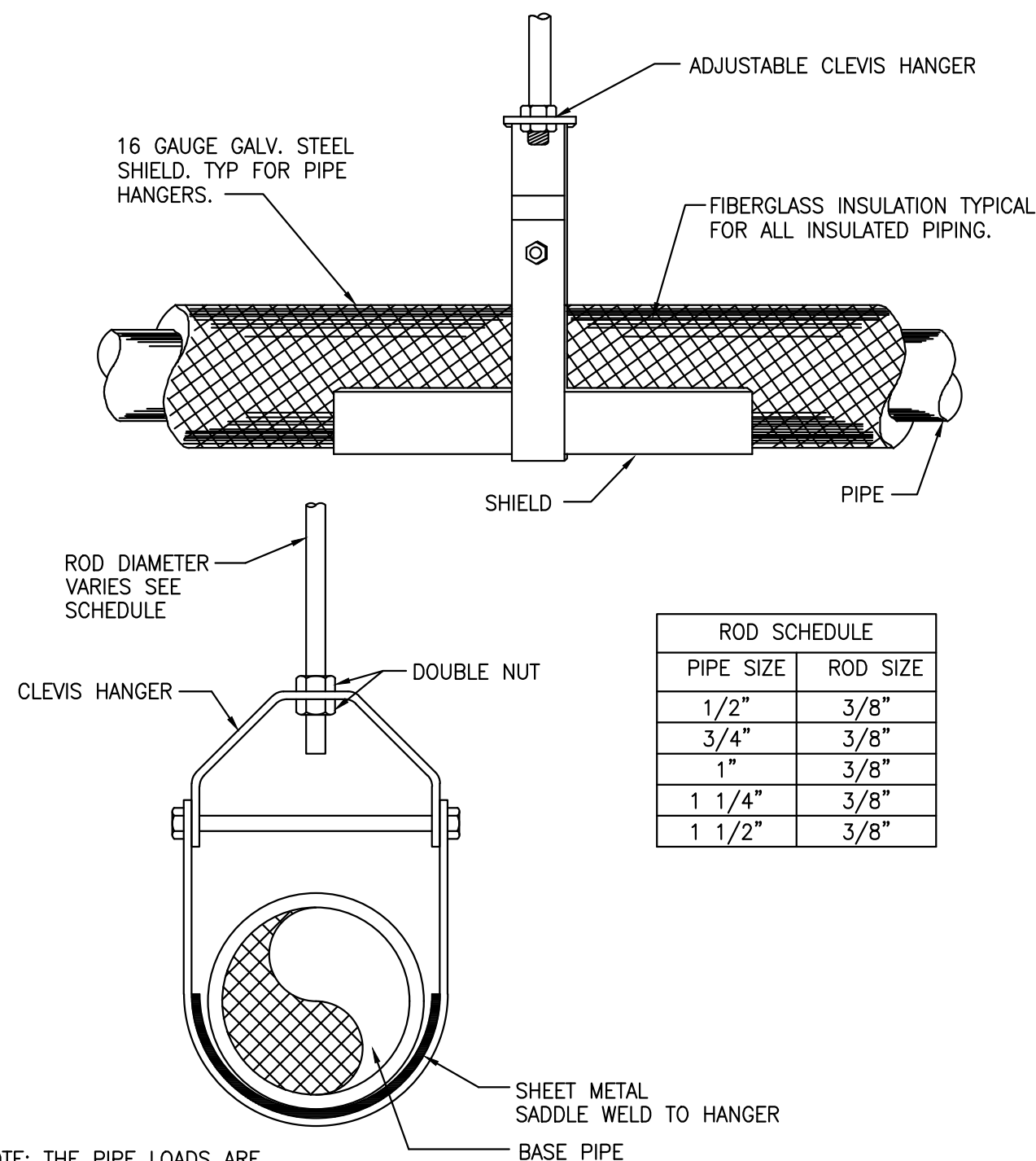


8 RECESSED FLUSH WITH FLOOR SINK

NTS

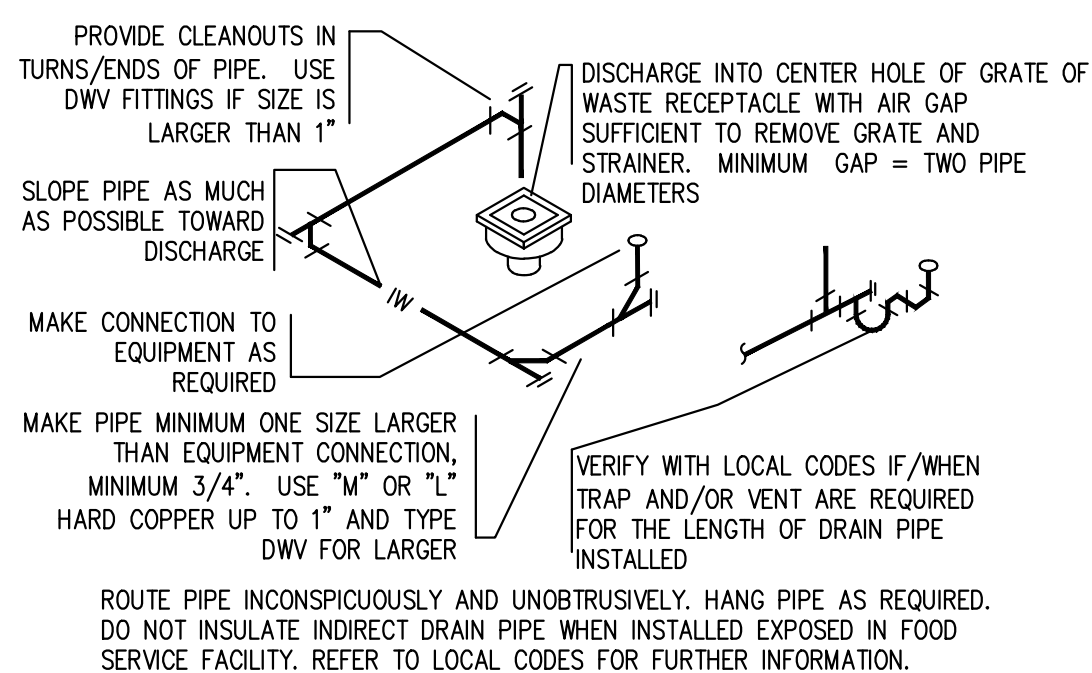
1 TRAP PRIMER DETAIL

NTS



5 HANGER DETAILS

NTS

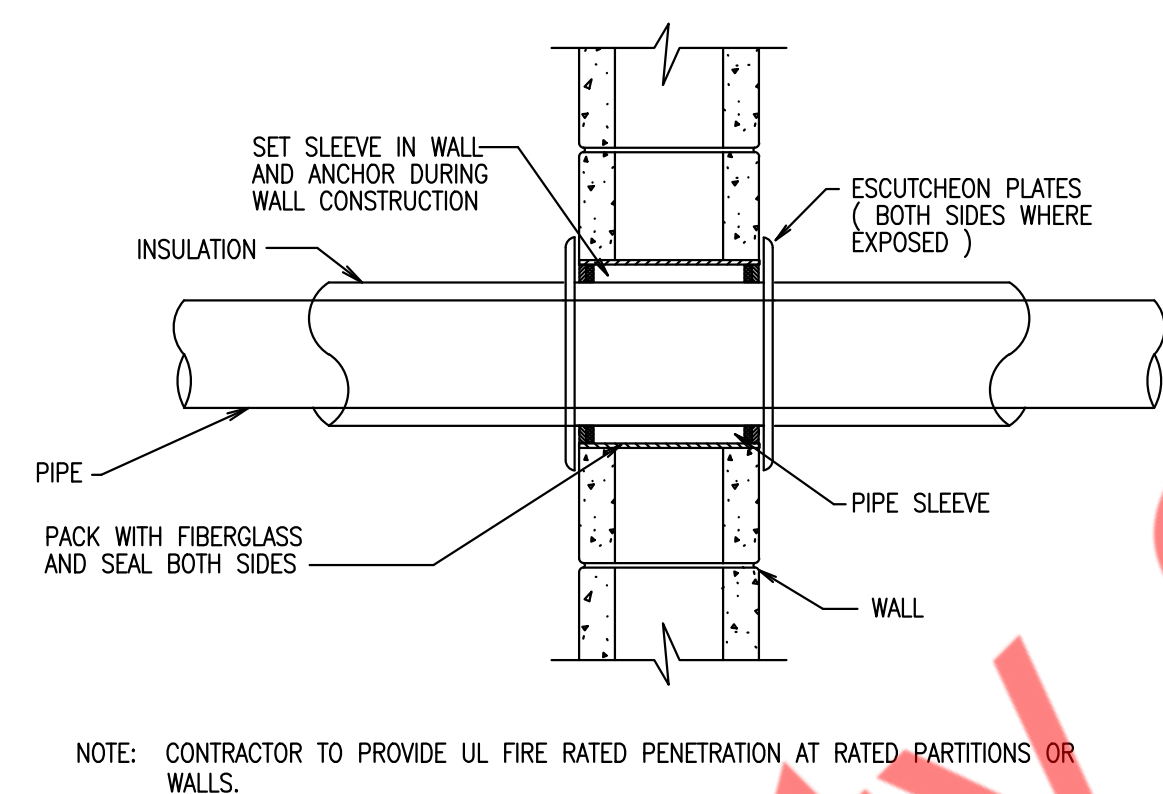


9 INDIRECT WASTE DETAIL

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2 FLOOR CLEANOUT DETAIL

NTS

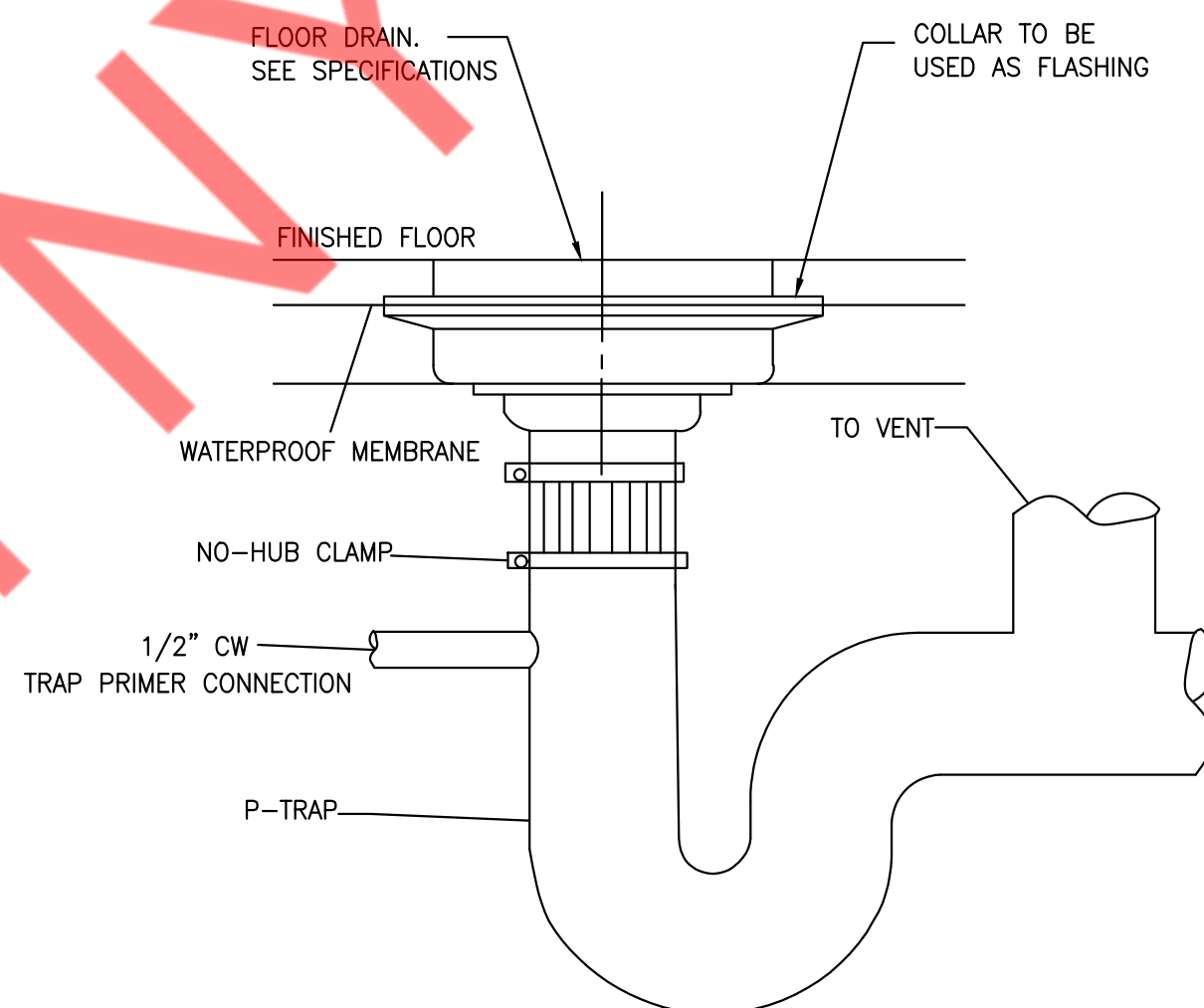


6 PIPE SLEEVE THROUGH INTERIOR WALL DETAIL

NTS

3 WATER HAMMER ARRESTOR DETAILS

NTS



7 FLOOR DRAIN DETAILS

NTS



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PLUMBING FIXTURE SCHEDULE								
LEGEND	PLUMBING FIXTURE	CONNECTION SIZE -- INCHES						REMARKS
		TRAP	SOIL/WASTE	VENT	COLD WATER	HOT WATER	THERMOSTATIC MIXING VALVE	
WC	WATER CLOSET	—	4"	2"	¾"	—	—	FLUSH TANK
LAV	LAVATORY	1½"	2"	1½"	½"	½"	PROVIDE	—
UR	URINAL	1½"	3"	2"	¾"	—	—	—
3A	ESPRESSO MACHINE	—	I.D.	—	½"	—	—	—
3B	GLASS RINSER	—	I.D.	—	½"	—	—	—
6	COFFEE/TEA BREWER	—	—	—	½"	—	—	—
6.1	FILTER SYSTEM, COFFEE/TEA BREWER	—	—	—	½"	—	—	—
14	ICE MAKER, REMOTE REFRIGERATION	—	I.D.	—	½"	—	—	—
14B	WATER FILTER, ICE MAKER	—	—	—	½"	—	—	—
15	SODA & ICE DISPENSER	—	I.D.	—	—	—	—	—
18	HAND SINK, WALL MOUNT	1½"	2"	1½"	½"	½"	PROVIDE	P—TRAP
46	WAREWASHER MACHINE, HIGH TEMP., VENTLESS	—	I.D.	—	¾"	¾"	PROVIDE	P—TRAP
47	SOILED DISH TABLE	—	I.D.	—	—	—	—	—
47A	PRE-RINSE FAUCET, SPLASH MOUNT	—	—	—	½"	½"	PROVIDE	—
53	3 COMPARTMENT SINK	—	I.D.	—	—	—	—	—
53A	FAUCET, SPLASH MOUNT	—	—	—	½"	½"	—	—
53B	PRE-RINSE FAUCET, SPLASH MOUNT	—	—	—	½"	½"	—	—
53C	LEVER WASTE DRAIN	—	—	—	—	—	—	—
57	PREP TABLE w/SINK	—	I.D.	—	—	—	—	—
57A	FAUCET, SPLASH MOUNT	—	—	—	½"	½"	PROVIDE	—
57B	LEVER WASTE DRAIN	—	—	—	—	—	—	—
64	MOP SINK	—	3"	2"	—	—	—	P—TRAP
64A	UTILITY FAUCET, WALL MOUNT	—	—	—	½"	½"	PROVIDE	—
66	BAG-IN BOX/ CARBONATOR	—	—	—	½"	—	—	—
68	WATER FILTER SYSTEM	—	—	—	½"	—	—	—
69	WALK-IN COOLER/FREEZER	—	I.D.	—	—	—	—	—
79	PANTRY FAUCET	—	I.D.	—	—	½"	—	—
FS	FLOOR SINK	3"	3"	2"	—	—	—	—
FD	FLOOR DRAIN	3"	3"	2"	—	—	—	—
NOTE: CONTRACTOR TO COORDINATE WITH ARCHITECTURAL DRAWINGS FOR ALL PLUMBING FIXTURES SPECIFICATIONS AND MOUNTING HEIGHT INSTALLATION.								

NEW GAS STORAGE WATER HEATER												
TAG No.	FIXTURES SERVING	STORAGE GALONS	RECOVERY CAP. (GPH @ RISE)	TYPE	GAS	ELECTRICAL				MANUFACTURER & MODEL NO.	REMARKS	
					MBH	VOLTS	PHASE	HERTZ	AMP.			
WH-1	ALL PLUMBING FIXTURES	60	138 GPH @ 100°F	GAS TANK WATER HEATER	120	120	1	60	<5	AO SMITH BTH-120(A)	-DIMENSIONS 27.75"DIA X 55.5"H -460 LBS -HEATERS SHALL HAVE 160PSI WORKING PRESSURE.	

NOTE:
1. VACUUM RELIEF VALVE SHALL CONFIRM WITH ANSI Z21.22.
2. PROVIDE EXPANSION TANK (ET-1) AMTROL MODEL THERM-X-TROL ST-5C-DD OR SIMILAR.

RECIRCULATING PUMP SCHEDULE										
MARK	MANUFACTURER	MODEL	GPM	TOTAL HEAD FT.	QUANTITY	VOLATAGE	PHASE	WATTS	AMPS	NOTES
RCP-1	GRUNDFOS	UP-18 B5	2	13	1	115	1	85	0.74A	1
NOTES: 1.RECIRCULATING PUMP: BRONZE BODY RECIRCULATING PUMP WITH AUTO ADAPT VARIABLE SPEED MOTOR. INSTALL NEAR WATER HEATER PER MANUFACTURERS INSTRUCTIONS. PROVIDE WIT ALPHA 3 PRONG PLUG AND COORDINATE WITH ELECTRICAL CONTRACTOR. PROVIDE WITH HONEYWELL L6006C SURFACE MOUNT AQUASTAT SET TO 5°F BELOW WATER OPERATING TEMPERATURE										

THERMOSTATIC MIXING VALVE								
ITEM	CAPACITY (GPM)	PRESSURE DROP (PSI)	MINIMUM FLOW (GPM)	MAKE	CW INLET	HIGH TEMP. INLET	LOW TEMP. OUTLET	REMARKS
TMV	90	5	2	ACORN MV17-3	1"	1"(140°F)	1-1/4"(110°F & 120°F)	-BRONZE BODY AND LEAD FREE CONSTRUCTION -ASSE CERTIFIED

GREASE INTERCEPTOR SCHEDULE					
LIQUID CAPACITY (GALLONS)	INLET/OUTLET CONNECTION	MAXIMUM OPERATING TEMP.-F	MAKE	GREASE CAPACITY (GALLONS)	MANUFACTURER & REMARKS
277	4"	150	SCHIER GB-250	1895 LBS. (260 GAL.) @100GPM	GB-250 GREASE INTERCEPTOR 100 GPM / 200 GPM, 4" INLET/OUTLET, H-20 RATED CAST IRON COVER 30.5"(H)X87"(L)X33"(W)
NOTE—CONTRACTOR TO PROVIDE ALL REQUIRED ACCESSORIES FOR SATISFACTORY WORKING OF GREASE TRAP AS PER SITE CONDITION					

BACKFLOW DEVICE SCHEDULE					
TAG	SERIES	SIZE	TYPE	USAGE	APPROVAL
BFP-1	009QT	1-1/2"	REDUCED PRESSURE BACKFLOW PREVENTER	DOMESTIC WATER CONNECTION	ASSE 1015, AWWA 1013
BFP-2	SD-3	3/8"	DUAL CHECK VALVE W/ ATMOSPHERIC VENT	CARBONATED BEVERAGE (DEVICE SHALL BE CONSTRUCTED OF, INTEGRAL STAINLESS-STEEL MATERIALS.)	ASSE 1022
BFP-3	9D	1/2"	BACKFLOW PREVENTER W/ ATMOSPHERIC VENT	TEA MAKER, COFFEE MACHINE, JUICE DISPENSER, ETC	ASSE 1012
BFP-4	007QTS	1/2"	DUAL CHECK VALVE	NON-CARBONATED BEVERAGE, SOFT SERVE ICE CREAM, WATER FILTER, HUMIDIFIER, EYE WASH, ETC	ASSE 1015
BFP-5	8	3/4"	VACUUM BREAKER	WALL HYDRANT CONNECT VACUUM BREAKER	ASSE 1011
BFP-6	008PCQT	1/2"	SPILL RESISTANT VACUUM BREAKER	SOAP DISPENSER, SPECIALTY SINK, CLEANING EQUIPMENT, DISHWASHER	ASSE 1056
CONTRACTOR TO VERIFY EXACT REQUIREMENTS OF ALL REQUIRED BACKFLOW DEVICES AND FIXTURES WITH AUTHORITIES HAVING JURISDICTION PRIOR TO BID					



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Drawing Title

PLUMBING SCHEDULES

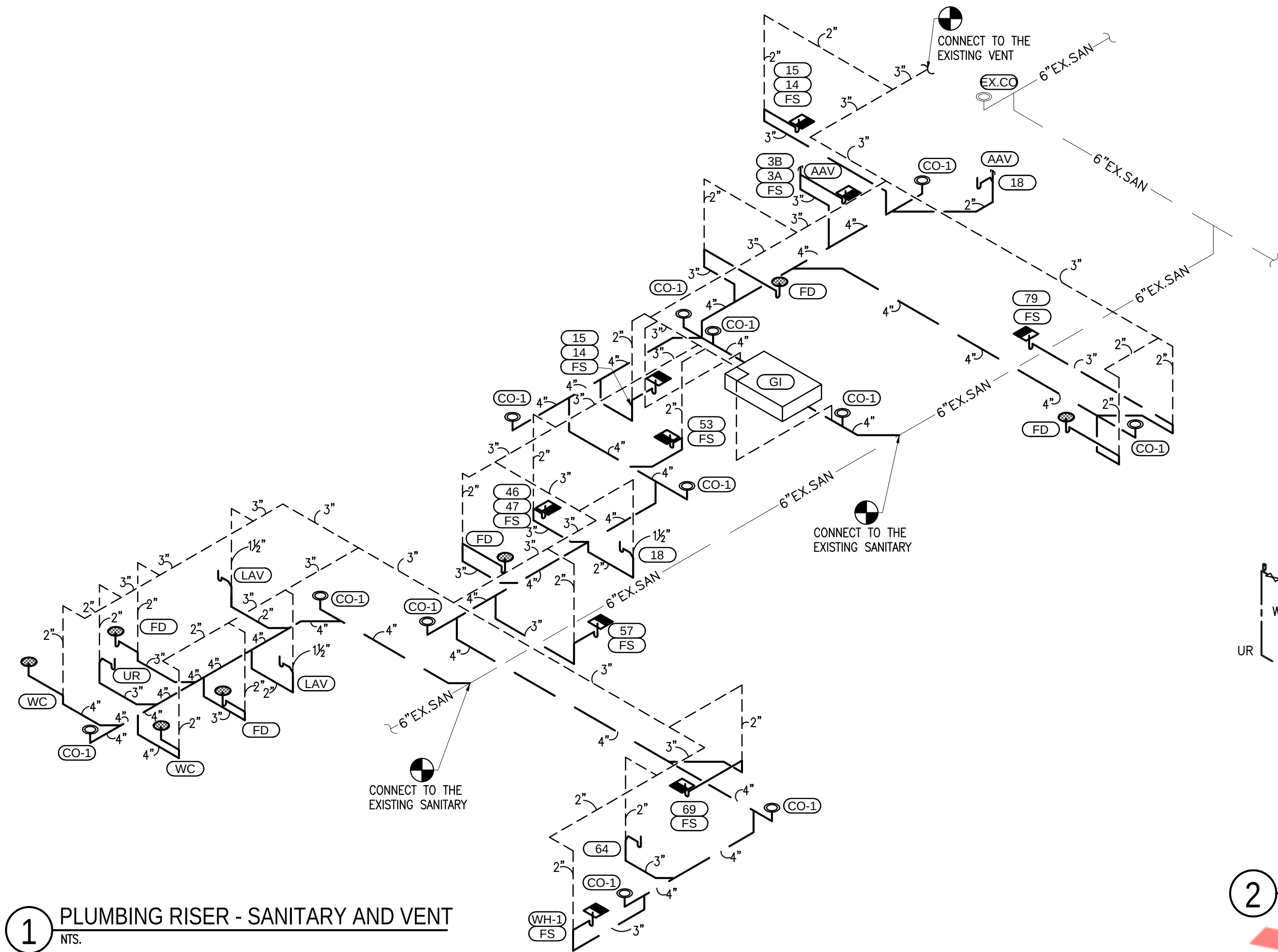
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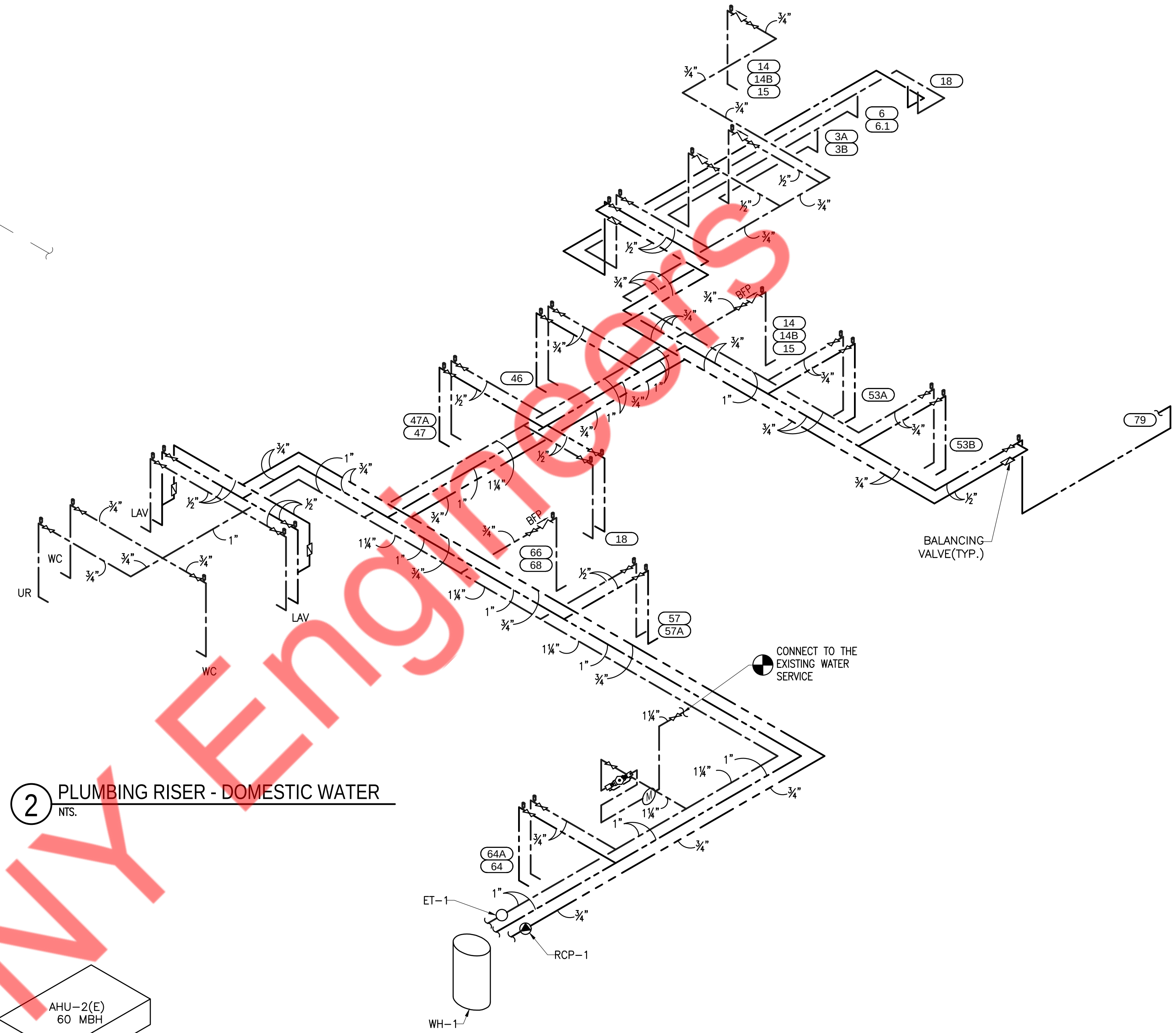
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1 PLUMBING RISER - SANITARY AND VENT
NTS.



2 PLUMBING RISER - DOMESTIC WATER
NTS.

GAS DEMAND SCHEDULE						
ITEM NO.	QTY.	DESCRIPTION	MANUFACTURER	MODEL	SIZE	BTU/HR.
22	2	RICE COOKER, GAS	THUNDER GROUP	RER55ASN	3/4"	35,000 @ EACH
29	1	FRYER, GAS	HENNY PENNY	EEG243.0	1-1/4"	225,000
34	1	HOT PLATE, COUNTERTOP, GAS	ELECTROLUX PROFESSIONAL	169132	1"	195,000
37	1	CHARBROILER, COUNTERTOP, GAS	ELECTROLUX PROFESSIONAL	169122	1"	132,000
41	1	FRYER, GAS	HENNY PENNY	EEG241.0	3/4"	75,000
WH-1	1	WATER HEATER	AO SMITH	BTH-120(A)	1"	120,000
AHU-1(E)	1	REFER MECHANICAL PLANS			3/4"	60,000
AHU-2(E)	1	REFER MECHANICAL PLANS			3/4"	60,000
AHU-3(E)	1	REFER MECHANICAL PLANS			3/4"	60,000
AHU-4(E)	1	REFER MECHANICAL PLANS			3/4"	60,000
MUA-1(N)	1	REFER MECHANICAL PLANS			1-1/2"	538,200
TOTAL DEMAND					=	1595,200

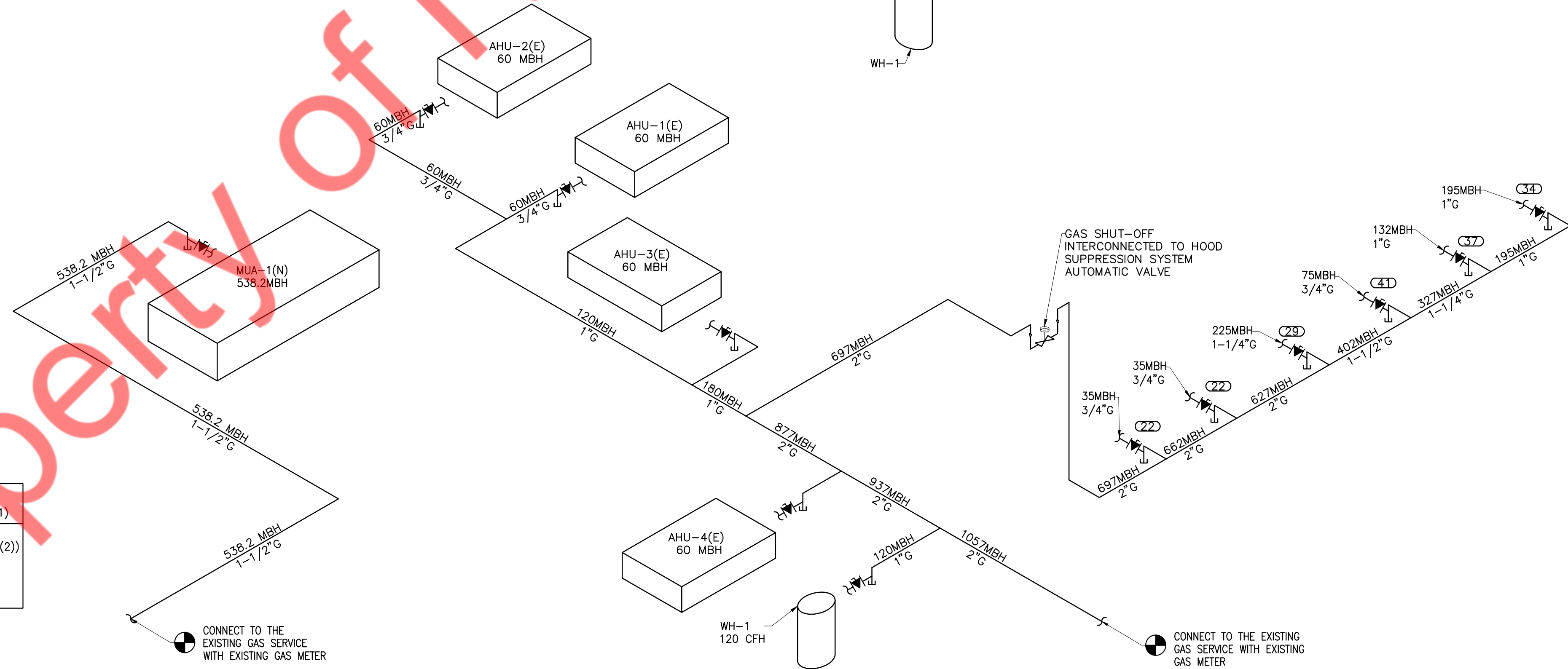
NOTE: COORDINATE GAS DEMAND REQUIREMENTS. DEVELOPED LENGTH = 100 FEET

NATURAL GAS PIPING SYSTEM
PROVIDE A COMPLETE GAS PIPING SYSTEM TO SERVE GAS EQUIPMENT FURNISHED BY OTHERS, AS NOTED ON THE DRAWINGS. PROVIDE EITHER THREADED STEEL OR MALLEABLE IRON PIPE WITH MALLEABLE FITTINGS OR WELDED STEEL. PROVIDE ALL UNIONS, SHUT-OFF VALVES AND DIRT LEGS REQUIRED BY NFPA-54 AND GOVERNING LOCAL CODES AND AT EACH GAS APPLIANCE CONNECTION. PROVIDE ALL TESTS, METERS, INSPECTIONS, HANGERS AND EQUIPMENT CONNECTIONS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

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 INTERNATIONAL FUEL GAS CODE, 2021, TABLES 402.4(2).

GAS PIPE SIZING PER
INTERNATIONAL FUEL GAS CODE (2021)
LOW PRESSURE SYSTEM
(AS PER INTERNATIONAL FGC TABLE 402.4(2))
INLET PRESSURE - <2 PSI
PRESSURE DROP - 0.5 PSI
LONGEST LENGTH - 100'(APPROX)



3 PLUMBING RISER - GAS
NTS.



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