

# MECHANICAL SYMBOLS LIST

EQUIPMENT SYMBOL		MECHANICAL ABBREVIATIONS	
	AC-1	AFF	ABOVE FINISHED FLOOR
	EF-1	AL	ACOUSTIC LINING
	POINT OF NEW CONNECTION TO EXISTING	BD	BACKDRAFT DAMPER
<b>AIR DEVICES</b>			
	CEILING DIFFUSER SUPPLY	CDS	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN	CDR	CEILING DIFFUSER RETURN
	ROUND DIFFUSER	CFM	CUBIC FEET OF AIR PER MINUTE
<b>DUCT ACCESSORIES</b>			
	BACKDRAFT DAMPER	CP	CONDENSATE PUMP
	MOTORIZED DAMPER W/ ACCESS DOOR	CD	CONDENSATE DRAIN PIPE
	VOLUME DAMPER W/ ACCESS DOOR	EF	EXHAUST FAN
<b>CONTROLS AND SENSORS</b>			
	THERMOSTAT	FC	FLEXIBLE CONNECTION
	TEMPERATURE SENSOR	FD/AD	FIRE DAMPER W/ACCESS DOOR
	DUCT SMOKE DETECTOR	FD	FIRE DAMPER W/FUSIBLE LINK
<b>DUCTWORK</b>			
	AIR DUCT W/ 1.5" ACOUSTICAL LINING	FSD	FIRE SMOKE DAMPER
	FLEXIBLE DUCT	MD	MOTORIZED DAMPER
	FLEXIBLE CONNECTION	OAI	OUTSIDE AIR INTAKE
	RECTANGULAR DUCT (WIDTH X DEPTH)	T-X	THERMOSTAT
	ROUND DUCT (DIAMETER)	VD	VOLUME DAMPER
	ROUND DUCT CROSS SECTION	W.M.S	WIRE MESH SCREEN
	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION	S.A.E	SAME AS EXISTING
	RETURN AIR RECTANGULAR DUCT CROSS SECTION	V.I.F	VERIFY IN FIELD
		WSHP	WATER SOURCE HEAT PUMP

## MECHANICAL DRAWING LIST

NO.	DESCRIPTION
M0.01	MECHANICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS
M0.02	MECHANICAL SPECIFICATIONS
M1.01	MECHANICAL FLOOR PLAN
M5.01	MECHANICAL DETAILS (1 OF 2)
M5.02	MECHANICAL DETAILS (2 OF 2)
M6.01	MECHANICAL SCHEDULES

## 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.

- 2023 FLORIDA BUILDING CODE (8<sup>th</sup> EDITION)
- 2023 FLORIDA MECHANICAL CODE (8<sup>th</sup> EDITION)
- 2023 FLORIDA PLUMBING CODE (8<sup>th</sup> EDITION)
- 2023 FLORIDA FIRE CODE (8<sup>th</sup> EDITION)
- 2023 FLORIDA ELECTRICAL CODE (8<sup>th</sup> EDITION)
- 2023 FLORIDA ENERGY CODE (8<sup>th</sup> EDITION)

## FLORIDA BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF FBC 2023 BASED ON 2021 IBC AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

- THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
- THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.
- TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE 2023 FMC - MECHANICAL, 8TH EDITION:
  - VENTILATION SYSTEM- 2023 FLORIDA BUILDING CODE, 8TH EDITION- MECHANICAL -SECTION 403.1
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
  - DUCT CONSTRUCTION AND INSTALLATION- 2023 FMC - MECHANICAL, 8TH EDITION - SECTION 603
  - AIR INTAKES, EXHAUSTS AND RELIEF - 2023 FMC - MECHANICAL, 8TH EDITION SECTION 401.5
  - STANDARDS OF HEATING - 2023 FLORIDA BUILDING CODE, 8TH EDITION- MECHANICAL SECTION 309.1
  - AIR FILTERS - 2023 FLORIDA BUILDING CODE, 8TH EDITION- MECHANICAL SECTION 605
  - MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS - 2023 FLORIDA BUILDING CODE, 8TH EDITION- MECHANICAL SECTION 606
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- VENTILATION FOR ALL AREA SHALL COMPLY WITH 2023 FMC - MECHANICAL, 8TH EDITION SECTION 401.
- A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2023 FMC - MECHANICAL, 8TH EDITION SECTION 403.3.
- REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
- SMOKE DETECTOR SHALL MEET UL268A.

## GENERAL NOTES

- CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
- ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS. AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER PRIOR TO SUBMITTING A PROPOSAL. OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.
- THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS, WHERE NECESSARY. EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- DUCTWORK IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES 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.
- SUPPORT ALL DUCTWORK FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADINGS INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.

- PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.
- SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).

- WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
- INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- ACCESS DOORS ARE REQUIRED FOR ALL BUILDING SERVICE VALVES THAT RUN THROUGH THE SPACE, AND ACCESS DOOR SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL. COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH THE ARCHITECT.
- REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION. PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
- THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
- ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
- SUBMIT SHOP DRAWINGS OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
- SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.
- INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
- SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES, WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
- WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY.

## DEFINITIONS:

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

## SCOPE OF WORK

### SCOPE OF WORK

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

DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

## GENERAL HVAC NOTES

### GENERAL:

- PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
- CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
- THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIBERGLASS INSULATION ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
- WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS, WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
- COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
- INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
- WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
- COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
- ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.
- PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
- MAINTAIN A MINIMUM 6'-8" CLEARANCE TO THE UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.
- LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
- NOTHING IS PERMITTED TO BE ATTACHED TO, SUSPENDED FROM, OR PENETRATE LANDLORD'S STRUCTURE, FLOOR DECK, OR ROOF DECK. TENANT MAY ATTACH, NON-DESTRUCTIVELY, TO OR SUSPEND FROM THE TOP CHORD OF THE JOIST OR THE STRUCTURAL STEEL WHICH EXISTS ABOVE THE TENANT SPACE. WHEN ATTACHING TO LANDLORD'S STRUCTURE, DO NOT DRILL, WELD, SCREW, OR SHOOT INTO STRUCTURE. ALTERNATIVE METHODS OF ATTACHMENT ONLY, NOTHING TO DAMAGE LANDLORD'S BASE BUILDING STRUCTURE. TENANT SHALL PROVIDE SIGNED AND SEALED STRUCTURAL DRAWINGS, BY A STRUCTURAL ENGINEER WITH LEGALLY ACTIVE REGISTRATION AS INDICATED BY ALL JURISDICTIONAL REQUIREMENTS, FOR ALL STRUCTURAL MODIFICATIONS FOR LANDLORD RECORDS.
- ALL PENETRATIONS TO ROOF MUST BE APPROVED BY LANDLORD. ALL RELATED ROOF WORK MUST BE DONE BY MALL'S DESIGNATED ROOFING CONTRACTOR, AT TENANT'S EXPENSE. COORDINATE ALL WORK WITH PROPERTY MANAGEMENT ON SITE.
- ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.
- MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.
- ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.
- ALL DUCTWORK, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.
- LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
- ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.
- TENANT MUST REMOVE ALL ABANDONED ROOFTOP AND/OR MECHANICAL EQUIPMENT ABOVE THE LEASED PREMISES AND WITHIN THE LEASED PREMISES, AT TENANT EXPENSE. PATCH AND REPAIR ROOF AS NEEDED.
- TENANT'S GC TO LABEL ALL ROOF TOP EQUIPMENT WITH TENANT NAME SPACE NUMBER AND EQUIPMENT IDENTIFICATION (RTU-1, EF-1), PER MALL SPECIFICATIONS/ STANDARDS.
- ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. CONDENSATE DRAIN PIPING SHALL BE COPPER. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.

- REFER TO TYPICAL DETAILS FOR DUCTWORK, AND EQUIPMENT INSTALLATION
- ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED. HVAC SYSTEM MUST BE TESTED & BALANCED BY A LICENSED CONTRACTOR. COPY OF BALANCE REPORT MUST BE PROVIDED TO THE PROPERTY MANAGEMENT OFFICE ON-SITE.
- 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.
- NO PITCH POCKETS ARE PERMITTED ON THE ROOF FOR ANY CONDENSATE AREA TO BE MADE INSIDE THE EQUIPMENT CURB OR THROUGH PRE-MANUFACTURED PIPING CURB.
- ALL UNEXPOSED SUPPLY AIR AND OUTSIDE AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 1 1/2" THICK FOIL FACE INSULATION INTERNALLY LINED DUCTWORK MAY BE USED FOR ACOUSTIC PURPOSES ONLY, NOT AS A SUBSTITUTE FOR EXTERNAL INSULATION.
- ALL DUCTWORK SHALL BE SHEET METAL. FLEX DUCT MAY BE ONLY USED IN RUNS OF 5'-0" OR LESS.
- AT CONCLUSION OF PROJECT, HVAC SYSTEM MUST BE TESTED AND BALANCED BY A LICENSED CONTRACTOR. COPY OF BALANCE REPORT MUST BE PROVIDED TO PROPERTY MANAGEMENT OFFICE ON-SITE.
- LANDLORD STRONGLY PREFERS TO USE OF ENERGY STAR PRODUCTS AND/OR EQUIPMENT WHENEVER POSSIBLE DURING TENANT BUILD OUT, WHICH CAN REDUCE ENERGY CONSUMPTION.

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 GENERAL CONTRACTOR.

C. THE BIDDER UNDERSTANDS THAT ANY PROPOSED SHUT-DOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE-ARRANGED WITH THE GENERAL CONTRACTOR 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 GENERAL CONTRACTOR 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. WITHIN 90 DAYS, 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. WITHIN 90 DAYS, 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. WITHIN 90 DAYS, 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 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

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

- 1. AIR/WATER SYSTEMS; CONSTANT AND VARIABLE VOLUME SYSTEMS.
2. MOTORS.

1.2 QUALITY ASSURANCE

A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.

1.3 EXECUTION

A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.

D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.

E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.

F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.

G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.

H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.

I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.

J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

1.1 QUALITY ASSURANCE

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 E84.

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:

Table with 3 columns: UNCONDITIONED SPACES WITHIN BUILDING, WITHIN BUILDING ENVELOPE ASSEMBLY, OUTSIDE OF BUILDING; and 2 columns: SUPPLY, RETURN with R-values.

1.4 ITEMS NOT INSULATED:

- 1. FIBROUS-GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANASHRAE/IESNA 90.1.
3. FACTORY-INSULATED FLEXIBLE DUCTS.
4. FACTORY-INSULATED PLENUMS AND CASINGS.
5. FLEXIBLE CONNECTORS.
6. VIBRATION-CONTROL DEVICES.
7. FACTORY-INSULATED ACCESS PANELS AND DOORS.
8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.

1.5 PRODUCTS

A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:

- 1. JOHNS-MANVILLE
2. OWENS-CORNING

1.6 ACOUSTICAL TREATMENT

- 1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED.

END OF SECTION 230713

SECTION 233113 - METAL DUCTS

1.1 CONSTRUCTION

A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 1 INCH WG PRESSURE, SEAL CLASS "A".

B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 1" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

- 1. CONSTRUCT SO THAT ALL INTERIOR SURFACES ARE SMOOTH. USE SLIP AND DRIVE OR FLANGED AND BOLTED CONSTRUCTION WHEN FABRICATING RECTANGULAR DUCTWORK. USE SPIRAL LOCK SEAM CONSTRUCTION WHEN FABRICATING ROUND SPIRAL DUCTWORK. SHEET METAL SCREWS MAY BE USED ON DUCT HANGERS, TRANSVERSE JOINTS AND OTHER SMACNA APPROVED LOCATIONS IF THE SCREW DOES NOT EXTEND MORE THAN 1/2 INCH INTO THE DUCT.
2. SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC IRON ALLOY-COATED (GALVANNEALED) BY HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENT FOR SHEET METALLIC-COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.
3. USE ELBOWS AND TEES WITH A CENTER LINE RADIUS TO WIDTH OR DIAMETER RATIO OF 1.5 WHEREVER SPACE PERMITS. WHEN A SHORTER RADIUS MUST BE USED DUE TO LIMITED SPACE, INSTALL SINGLE WALL SHEET METAL SPLITTER VANES IN ACCORDANCE WITH SMACNA PUBLICATIONS, TYPE RE 3. WHERE SPACE WILL NOT ALLOW AND THE C VALUE OF THE RADIUS ELBOW, AS GIVEN IN SMACNA PUBLICATIONS, EXCEEDS 0.31, USE RECTANGULAR ELBOWS WITH TURNING VANES AS SPECIFIED IN SECTION 23 33 00. SQUARE THROAT-RADIUS HEEL ELBOWS WILL NOT BE ACCEPTABLE. STRAIGHT TAPS OR BULLHEAD TEES ARE NOT ACCEPTABLE.
4. WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE TURNING VANES IN ACCORDANCE WITH SECTION 23 33 00.
5. PROVIDE EXPANDED TAKE-OFFS OR 45 DEGREE ENTRY FITTINGS FOR BRANCH DUCT CONNECTIONS WITH BRANCH DUCTWORK AIRFLOW VELOCITIES GREATER THAN 700 FPM. SQUARE EDGE 90-DEGREE TAKE-OFF FITTINGS OR TRIGHT TAPS WILL NOT BE ACCEPTED.
6. BUTTON PUNCH SNAP-LOCK CONSTRUCTION WILL NOT BE ACCEPTED ON ALUMINUM DUCTWORK.
7. ROUND DUCTS MAY BE SUBSTITUTED FOR RECTANGULAR DUCTS IF SIZED IN ACCORDANCE WITH ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY WRITTEN PERMISSION OF THE ENGINEER.

C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:

Table with 3 columns: USG, MAX. SIDE INCHES TRANSVERSE JOINTS AND BRACING, and 22, UP TO 12, S SLIP, DRIVE SLIP, ONE INCH POCKET LOCK ON 8 FOOT

Table with 3 columns: 22, 13 TO 24, CENTERS, 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.

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

- 1.3 DUCT CLEANING
A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
B. CLEAN THE FOLLOWING ITEMS:
1. AIR OUTLETS AND INLETS.
2. SUPPLY, RETURN, AND EXHAUST FANS.
3. AIR-HANDLING UNITS.
4. COILS AND RELATED COMPONENTS.
5. RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
6. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.

- 1.4 DUCT SCHEDULE
A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:
8. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

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

END OF SECTION 233713

THERMOSTATIC CONTROL NOTES:

C403.2.4.1 THERMOSTATIC CONTROLS

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

C403.2.4.1.1 HEAT PUMP SUPPLEMENTARY HEAT

HEAT PUMPS HAVING SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL HAVE CONTROLS THAT LIMIT SUPPLEMENTAL HEAT OPERATION TO ONLY THOSE TIMES WHEN:
1. THE VAPOR COMPRESSION CYCLE CANNOT PROVIDE THE NECESSARY HEATING ENERGY TO SATISFY THE THERMOSTAT SETTING.
2. THE HEAT PUMP IS OPERATING IN DEFROST MODE.
3. THE VAPOR COMPRESSION CYCLE MALFUNCTIONS, OR
4. THE THERMOSTAT MALFUNCTIONS.

C403.2.4.1.2 DEADBAND

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

C403.2.4.1.3 SETPOINT OVERLAP RESTRICTION

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

C403.2.4.2 OFF-HOUR CONTROLS

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

C403.2.4.2.1 THERMOSTATIC SETBACK

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

C403.2.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN

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

C403.2.4.2.3 AUTOMATIC START & STOP

AUTOMATIC START AND STOP CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE AUTOMATIC START CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY. AUTOMATIC STOP CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM WITH DIRECT DIGITAL CONTROL OF INDIVIDUAL ZONES. THE AUTOMATIC STOP CONTROLS SHALL BE CONFIGURED TO REDUCE THE HVAC SYSTEM'S HEATING TEMPERATURE SETPOINT AND INCREASE THE COOLING TEMPERATURE SETPOINT BY NOT LESS THAN 2°F [-16.6°C] BEFORE SCHEDULED UNOCCUPIED PERIODS BASED ON THE THERMAL LAG AND ACCEPTABLE DRIFT IN SPACE TEMPERATURE THAT IS WITHIN COMFORT LIMITS.

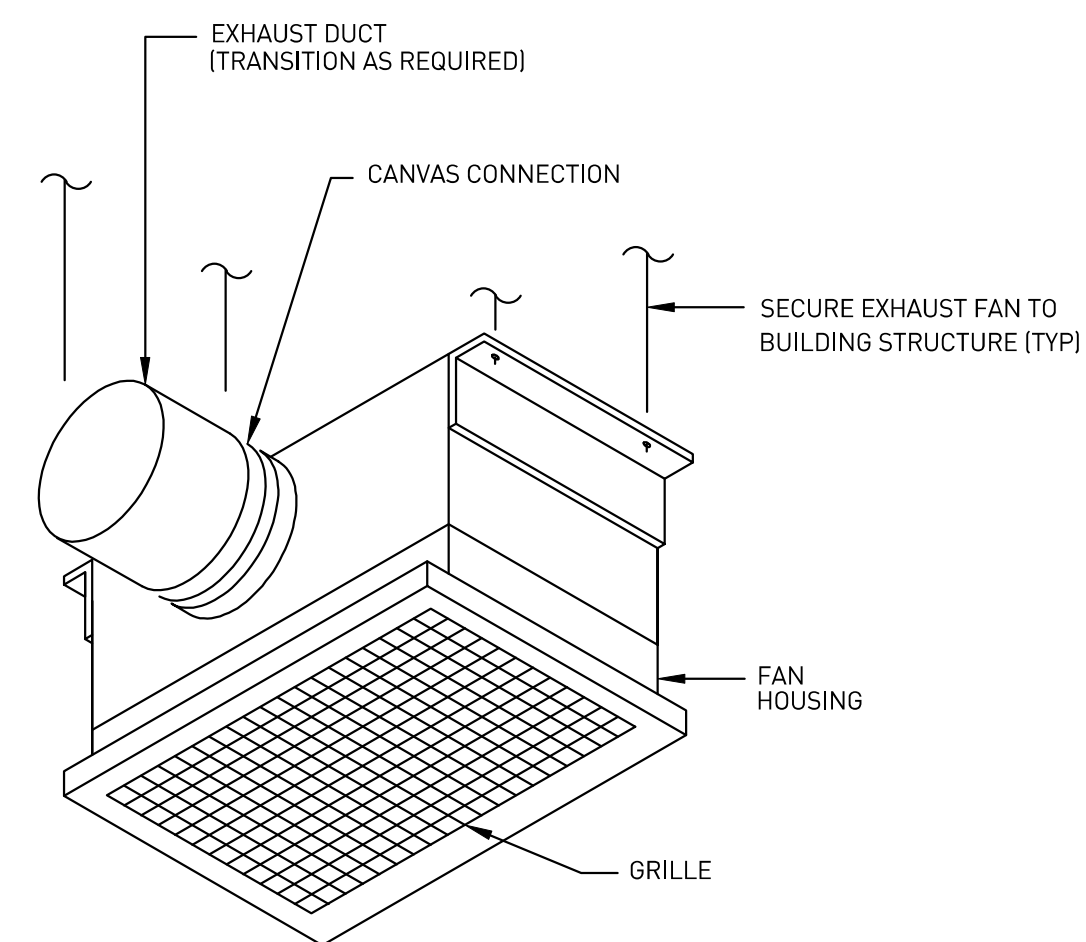
ISSUANCE NAME DATE

Table with 2 columns: ISSUANCE NAME, DATE. Multiple empty rows.

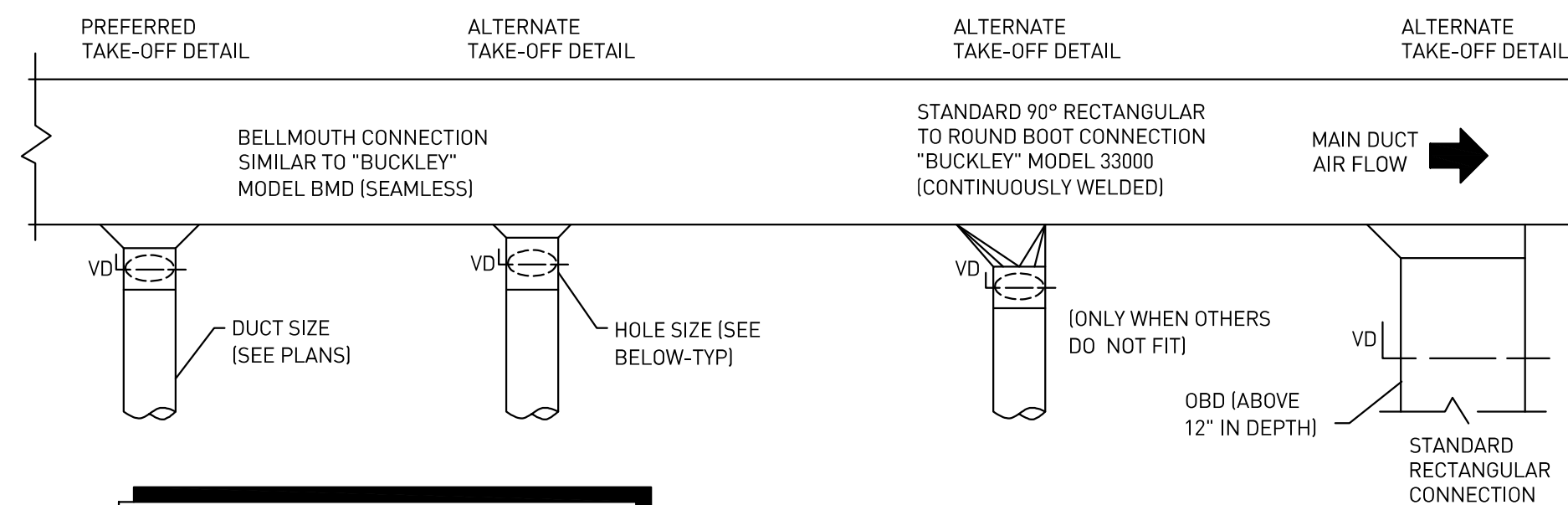
MECHANICAL SPECIFICATIONS







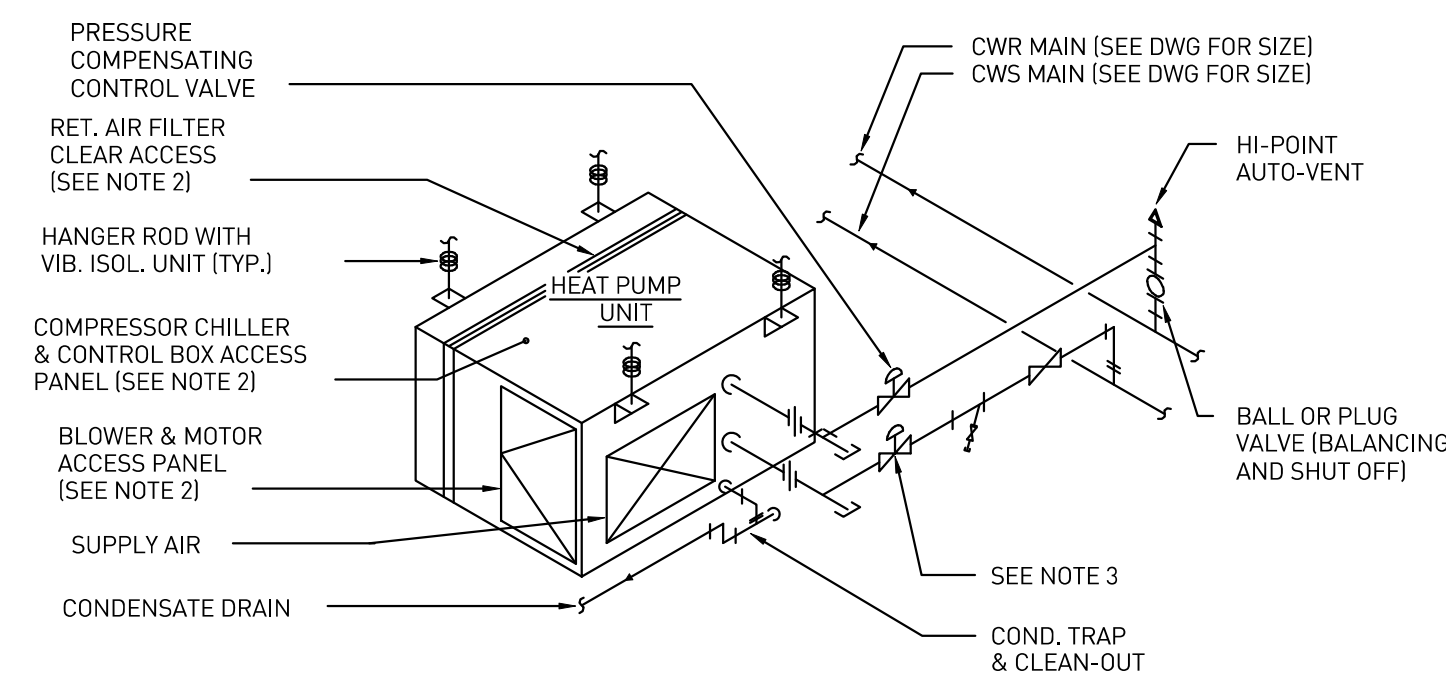
1  
M5.02 CEILING EXHAUST FAN  
N.T.S



THIS DETAIL APPLIES TO SINGLE TAKEOFFS TO DIFFUSER AS WELL AS BRANCH TAKEOFFS IT ALSO APPLIES TO TAKEOFFS IN THE HORIZONTAL AS WELL AS VERTICAL DIRECTION

NOTE: ALTERNATE FITTINGS SHALL BE USED WHEN DUCT HEIGHTS DOES NOT PERMIT THE USE OF THE PREFERRED FULL SIZE BELLMOUTH SUBMIT FITTINGS FOR REVIEW BY ENGINEER PRIOR TO INSTALLATION

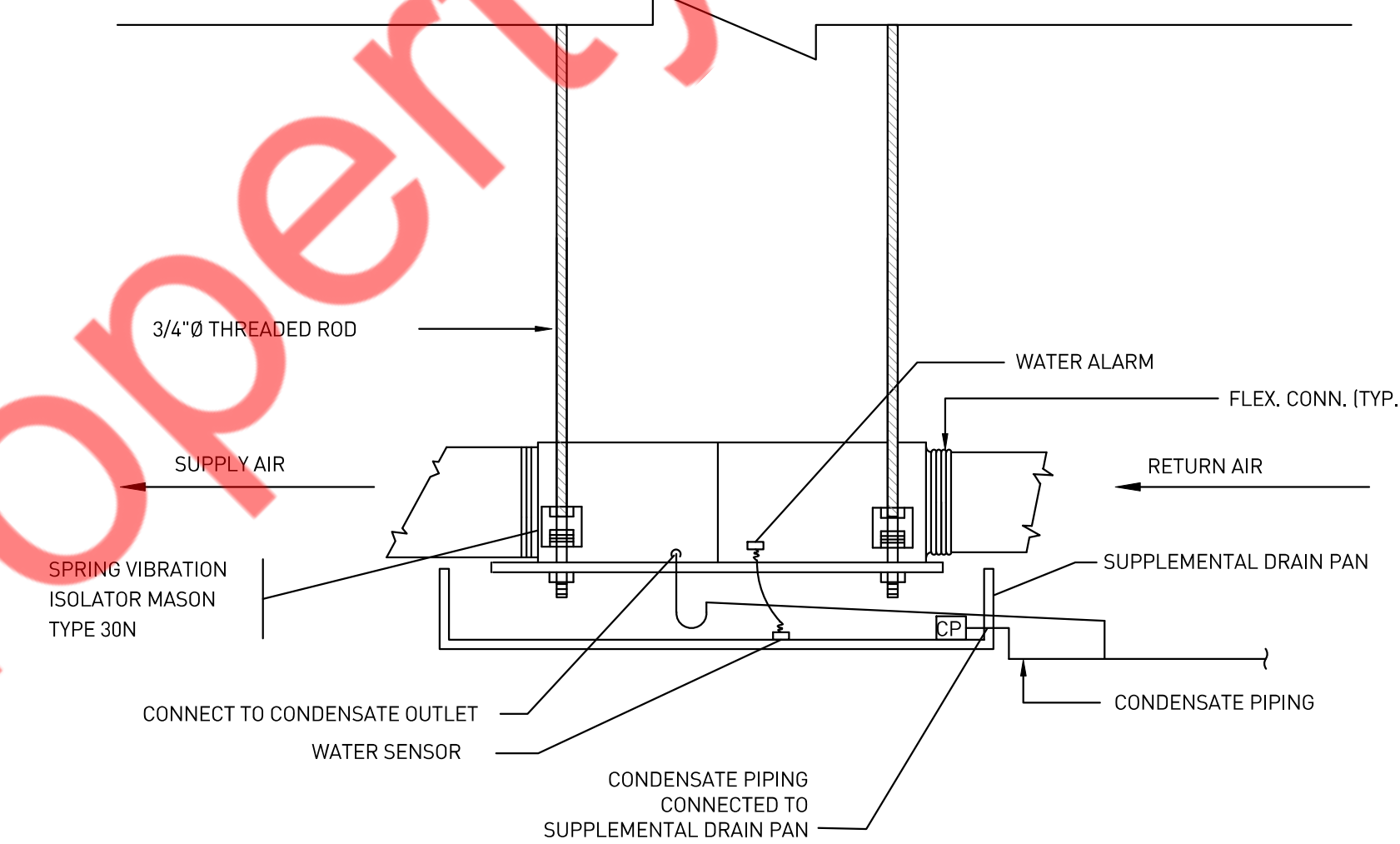
2  
M5.02 DUCT TAKEOFFS  
N.T.S



NOTES:

- UNIT TO BE INSTALLED AS HIGH AS POSSIBLE.
- UNIT SHALL BE LOCATED SO THAT ACCESS IS CLEAR TO FILTERS AND ACCESS PANELS.
- PROVIDE A 2-WAY REGULATING VALVE WITH BLEED PORT VALVE SHALL HAVE MAXIMUM 5 PSI PRESS. DROP
- AIR FILTERS SHALL BE SIZED FOR INSTALLATION & REMOVAL THRU CEILING ACCESS PANEL.
- PROVIDE LEAK DETECTOR, DRIP PAN AND CONDENSATE PUMP.

COORDINATE THE SUPPORT DETAILS WITH THE STRUCTURAL ENGINEERS & EXISTING SITE CONDITIONS.

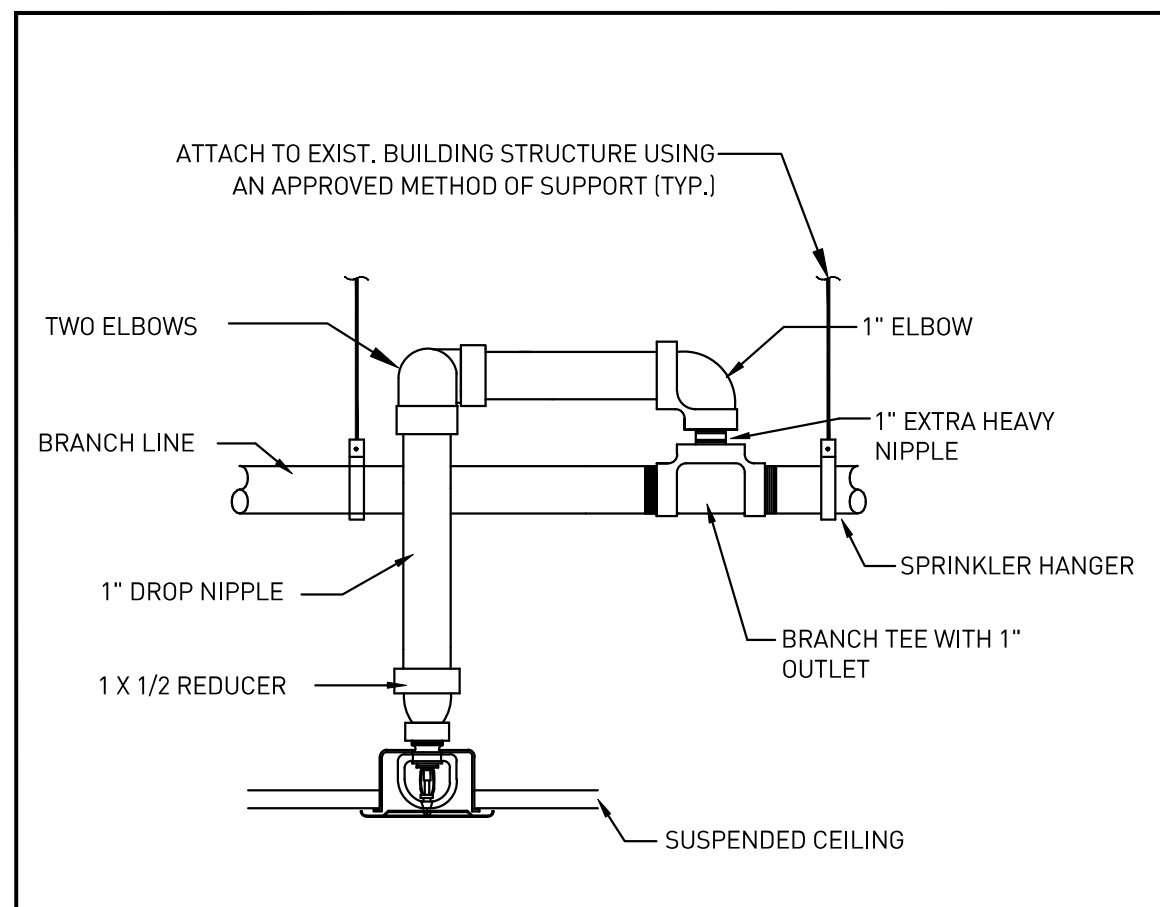


3  
M5.02 WATER SOURCE HEAT PUMP DETAIL  
N.T.S

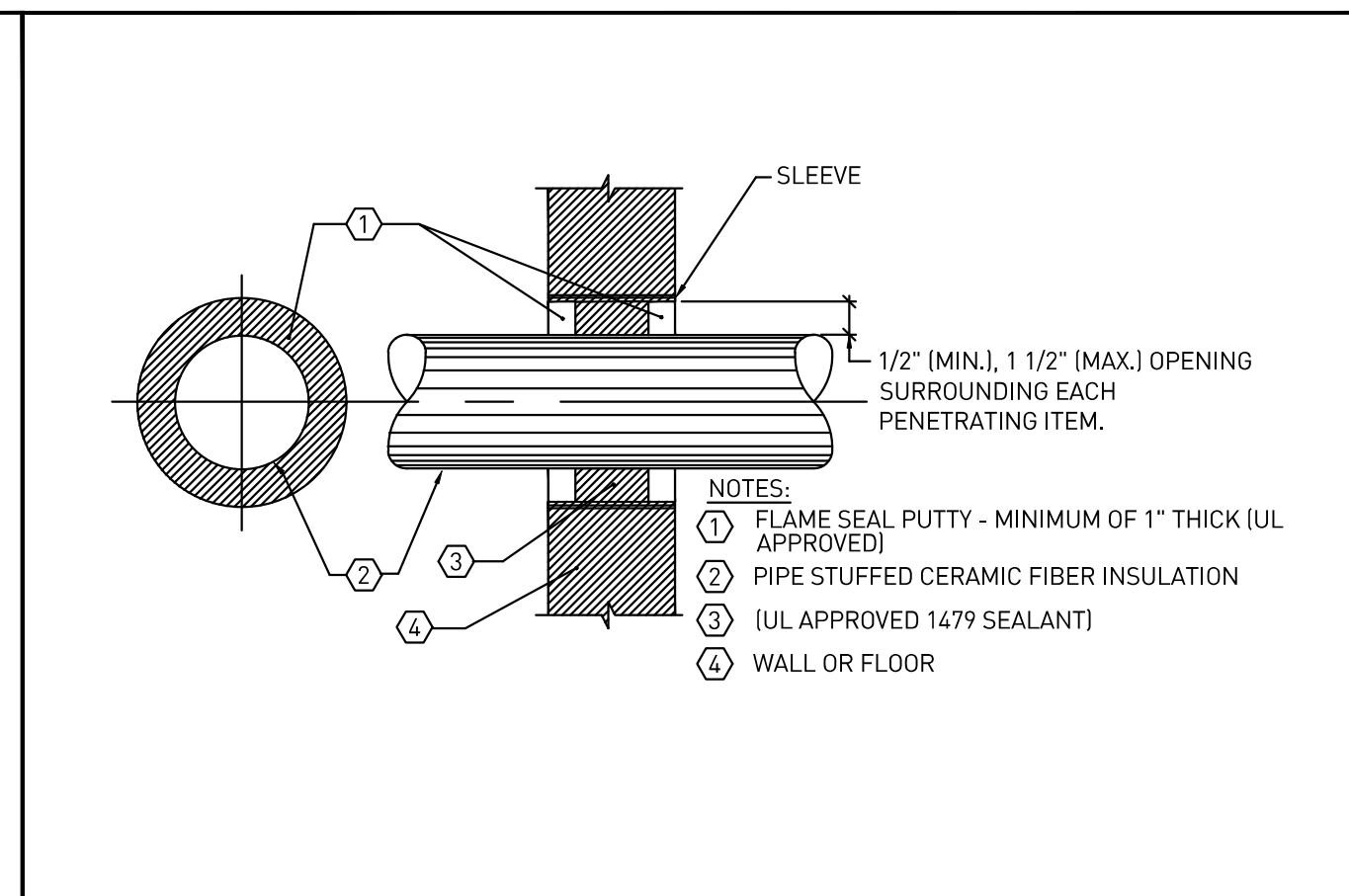




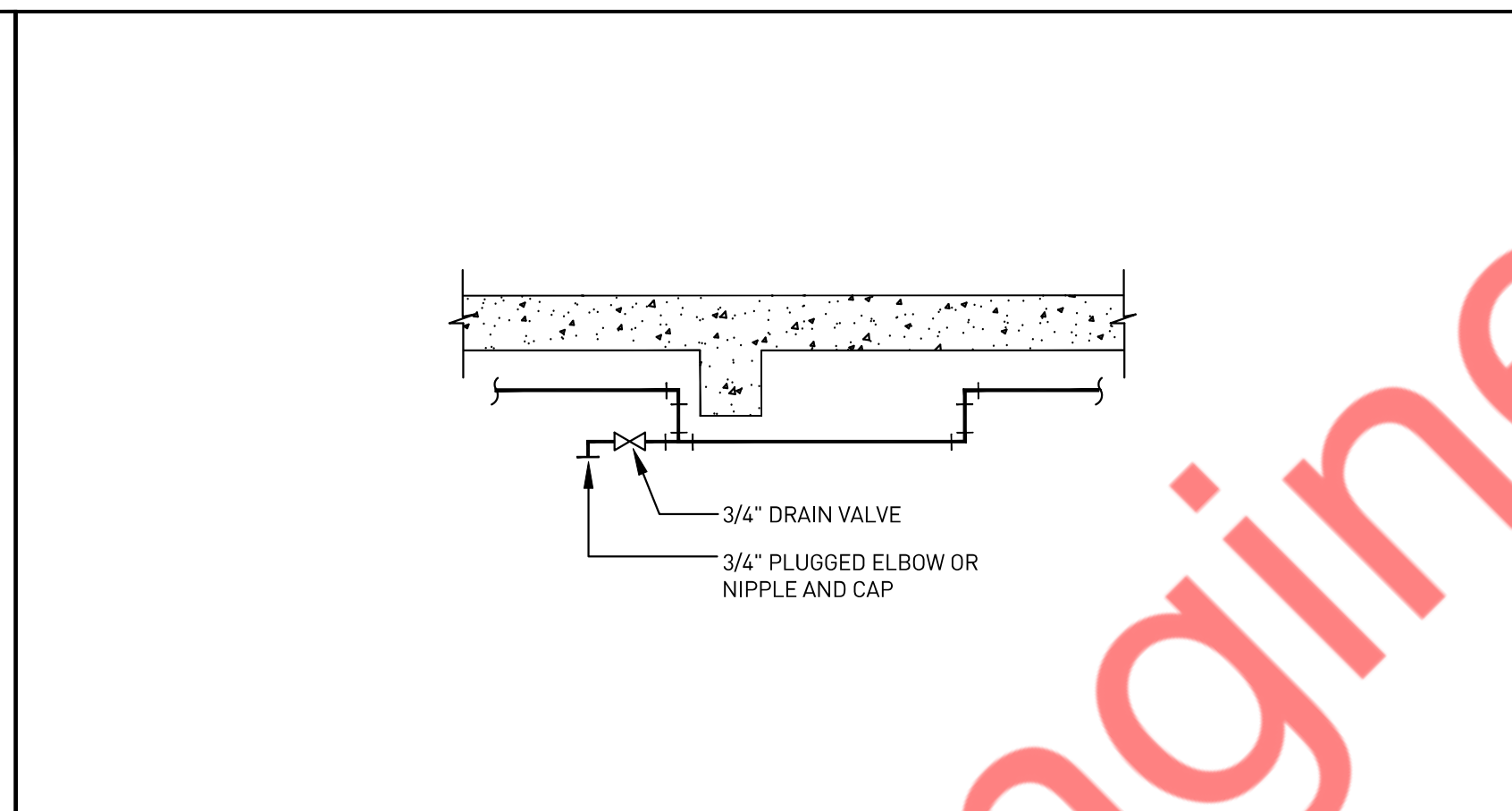




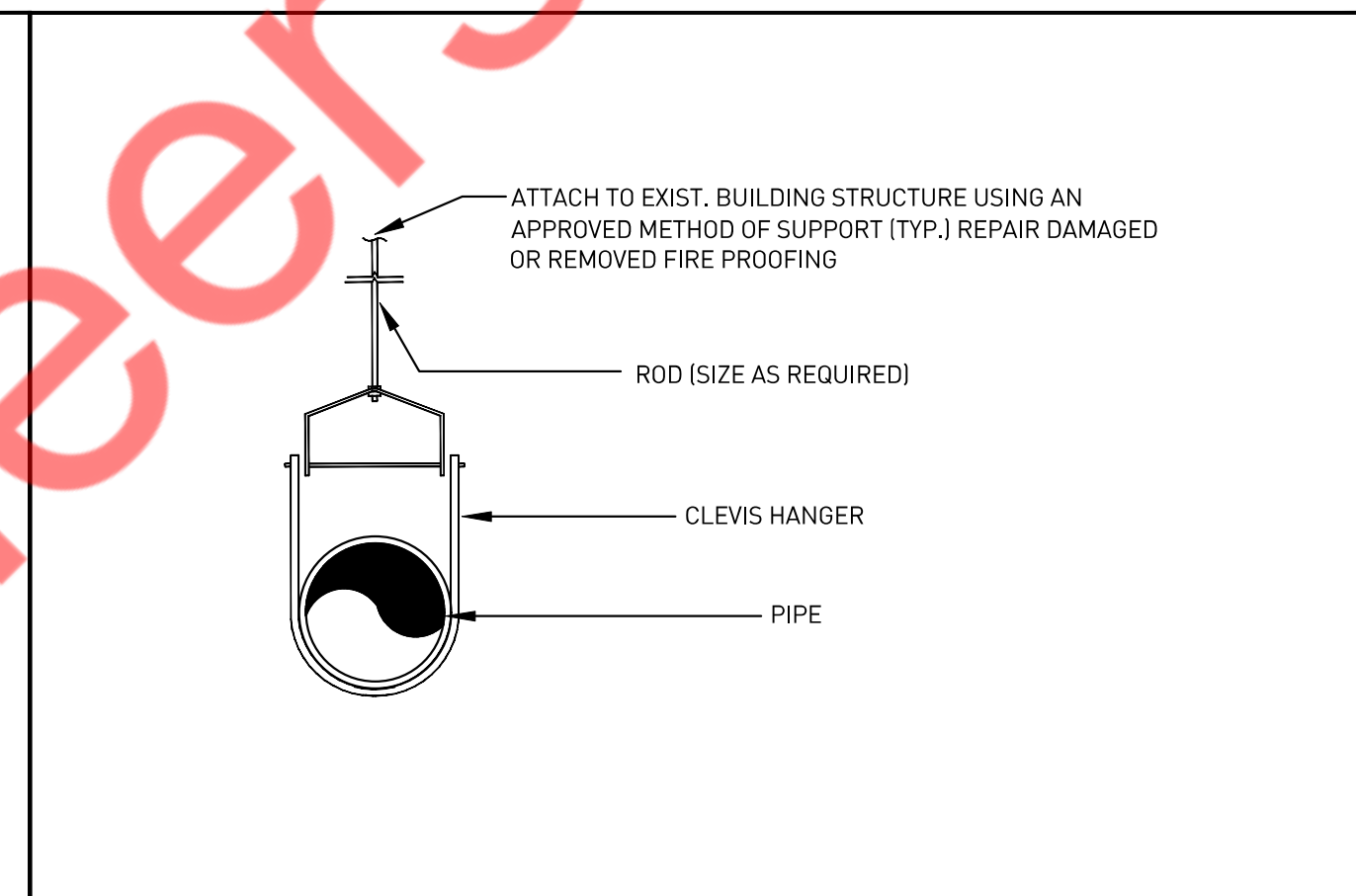
1 SCALE N.T.S. NEW CONCEALED PENDENT SPRINKLER HEAD DETAIL



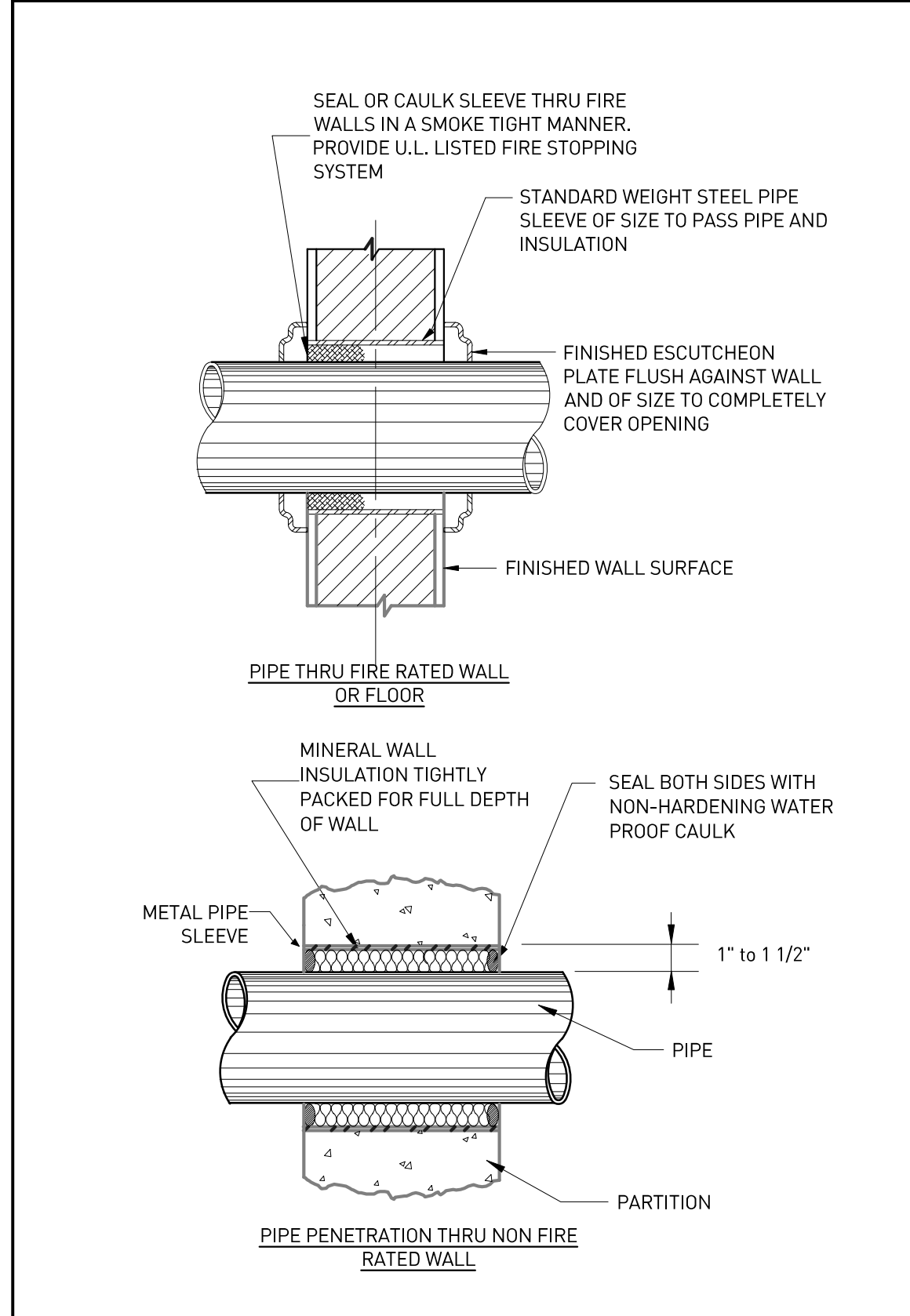
2 SCALE N.T.S. FIRE STOPPING DETAIL FOR FIRE/SMOKE RATED WALL/FLOOR OPENINGS



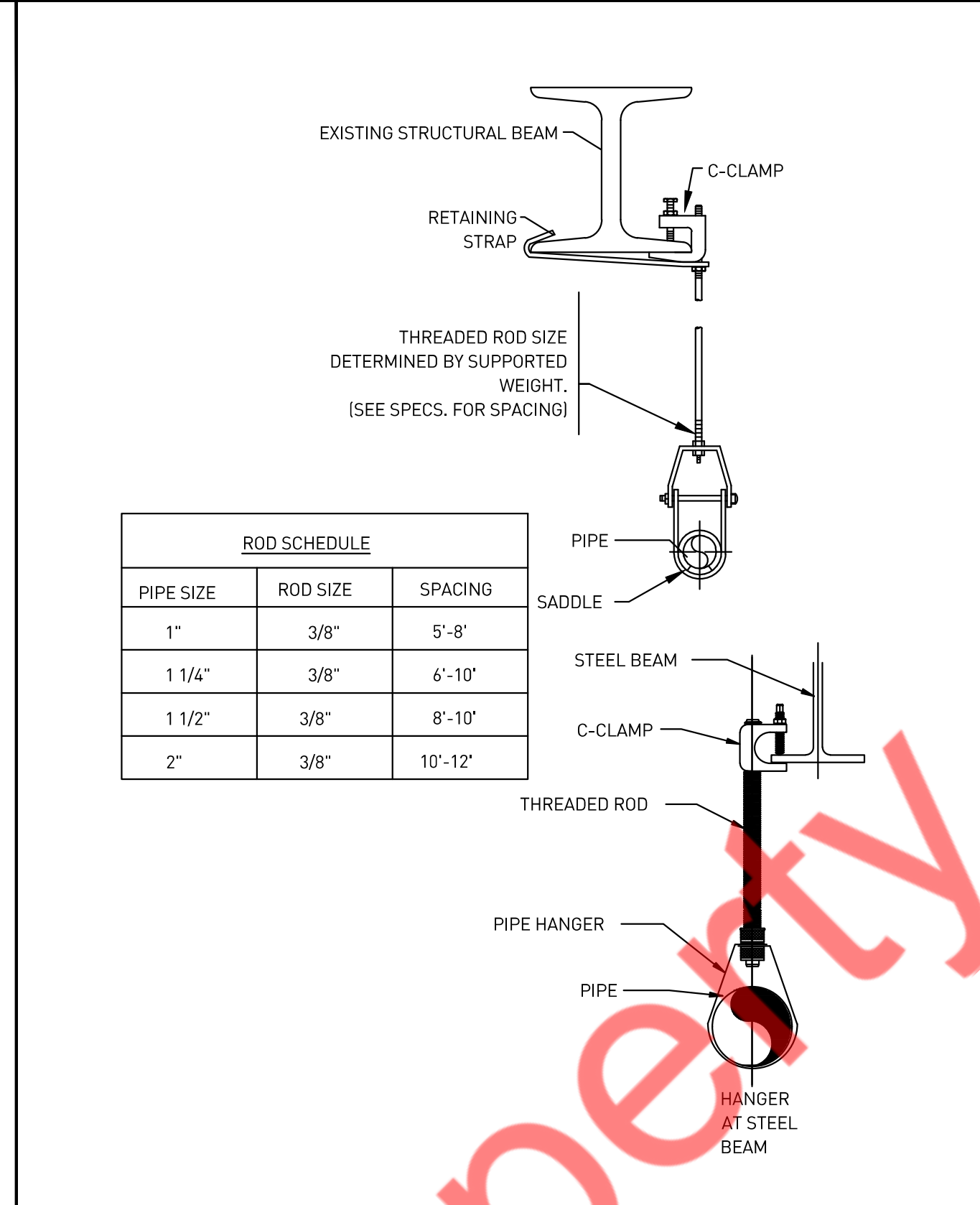
3 SCALE N.T.S. TYPICAL DRAIN CONNECTION FOR TRAPPED LINES ON WET PIPE SPRINKLER SYSTEMS



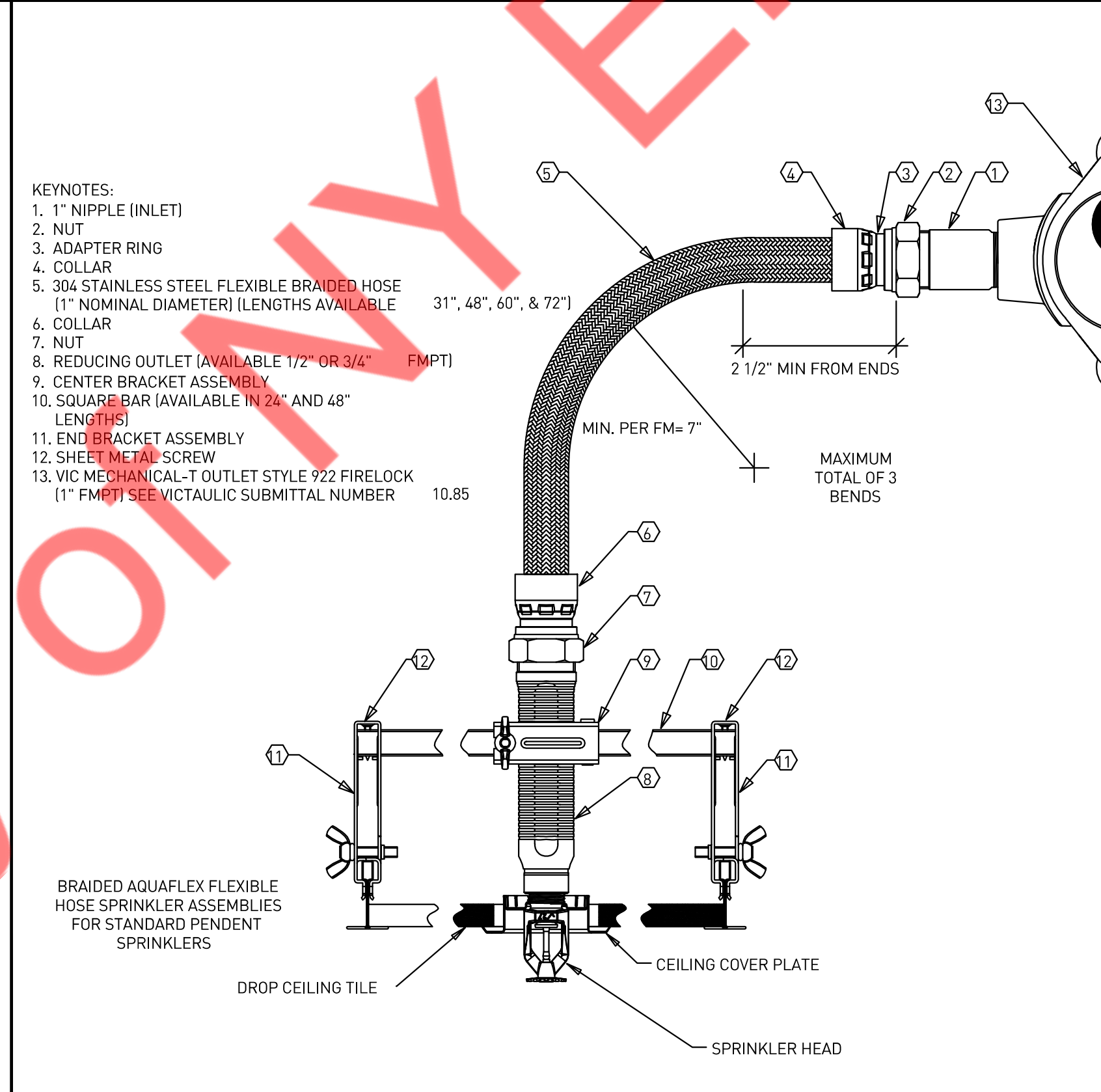
4 SCALE N.T.S. HANGER DETAILS TYPICAL



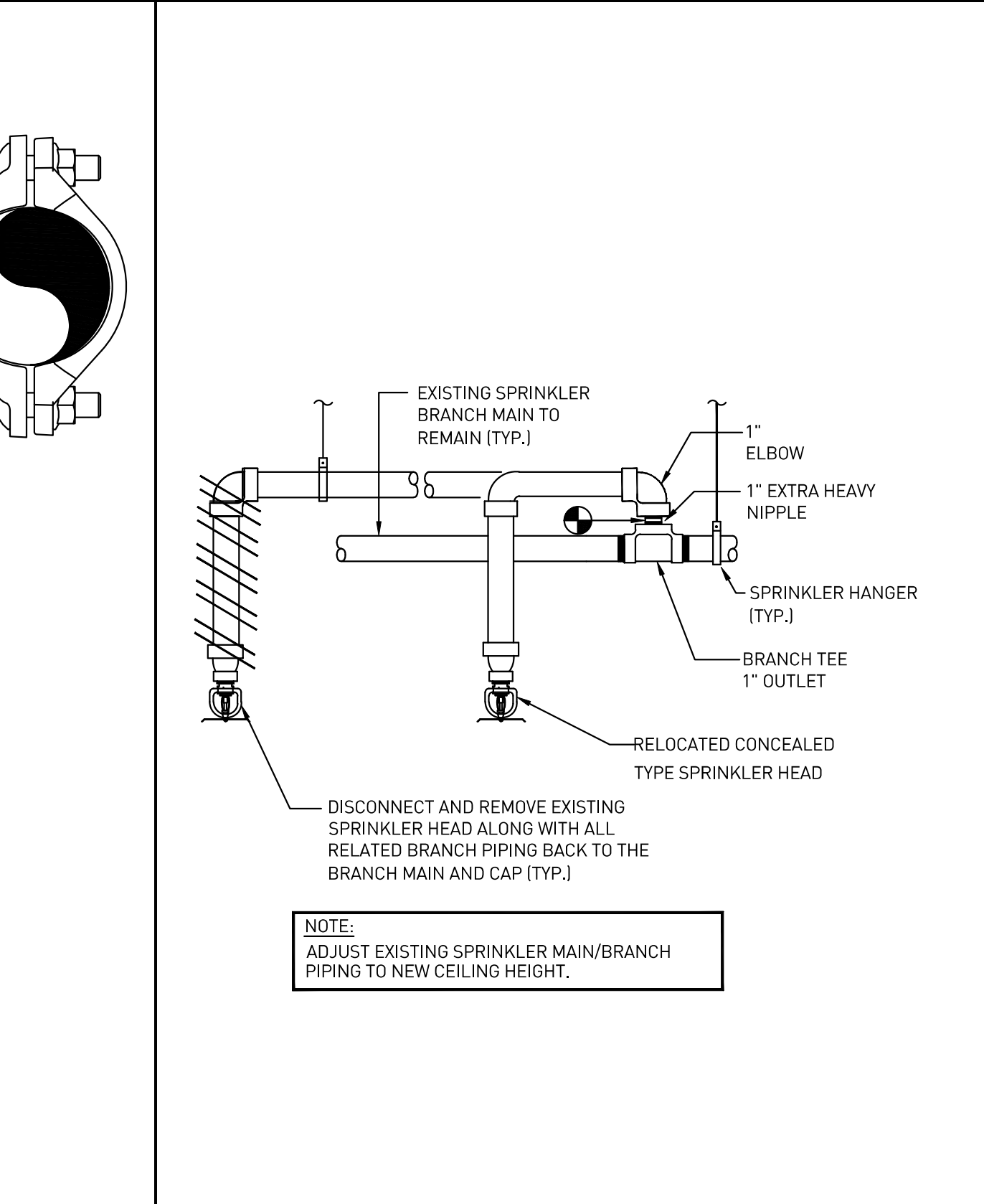
5 SCALE N.T.S. PIPE SLEEVE THRU WALL SECTION



6 SCALE N.T.S. TYPICAL HANGER DETAIL AND ROD SCHEDULE



7 SCALE N.T.S. TYPICAL FLEXIBLE BRAIDED HOSE DETAIL



9 SCALE N.T.S. CONCEALED SPRINKLER HEAD RELOCATION TO CONCEALED HEAD

LIGHTING PLAN LEGENDS	
	SWITCH TYPE (SUPERSCRIPIT IN UPPERCASE) 20A, 120V SPST WALL SWITCH (UON) SWITCH TAG (SUBSCRIPT IN LOWERCASE)
	WALL SWITCH WITH OCCUPANCY SENSOR
	WALL SWITCH WITH VACANCY SENSOR
	WALL SWITCH WITH TIMER
	WALL SWITCH WITH DIMMER & TIMER
	3 WAY WALL SWITCH (SPDT)
	4 WAY / INTERMEDIATE WALL SWITCH (DPDT)
	WALL SWITCH WITH SPEED REGULATOR
	MOTOR RATED WALL SWITCH
	THERMOSTAT WALL SWITCH
	MANUAL OVERRIDE WALL SWITCH
	PHOTOCELL WALL MOUNTED
	OCCUPANCY SENSOR WALL MOUNTED
	OCCUPANCY SENSOR CEILING MOUNTED
	VACANCY SENSOR CEILING MOUNTED
	DAY LIGHT SENSOR CEILING MOUNTED
	TIME CLOCK - DUAL CHANNEL
	LIGHTING CONTACTOR
	BUG EYE - EMERGENCY LIGHT WITH BATTERY
	ILLUMINATED EXIT SIGN
	ILLUMINATED DIRECTIONAL SIGN
	BUG EYE & EXIT SIGN COMBO WITH BATTERY

POWER AND COMMUNICATION PLAN LEGEND	
	WALL MOUNTED SIMPLEX RECEPTACLE, RATING SHALL BE SAME AS BREAKER OR AS NOTED
	20A, 120V WALL MOUNTED DUPLEX RECEPTACLE
	20A, 120V WALL MOUNTED RECEPTACLE WITH USB OUTLET
	20A, 120V WALL MOUNTED HALF SWITCHED DUPLEX RECEPTACLE WITH SWITCH
	20A, 120V WALL MOUNTED FULL SWITCHED DUPLEX RECEPTACLE WITH SWITCH
	20A, 120V WALL MOUNTED GFCI DUPLEX RECEPTACLE
	20A, 120V CEILING MOUNTED DUPLEX RECEPTACLE
	20A, 120V FLOOR MOUNTED DUPLEX RECEPTACLE
	20A, 120V WALL MOUNTED QUAD RECEPTACLE
	WALL MOUNTED SPECIAL RECEPTACLE, RATING SHALL BE SAME AS BREAKER OR AS NOTED
	DATA OUTLET - QUANTITY AS INDICATED
	TELEPHONE OUTLET - QUANTITY AS INDICATED
	DATA / TELEPHONE COMBINATION OUTLET - QUANTITY AS INDICATED
	DATA RACK - TELEPHONE DISTRIBUTION BOARD - AS REQUIRED
	CABLE TV OUTLET
	NON FUSED DISCONNECT SWITCH - RATING EQUAL TO OR MORE THAN BREAKER RATING
	FUSED DISCONNECT SWITCH - FUSE RATING AS NEEDED -

ELECTRICAL ABBREVIATIONS	
A	AMPERES
AF	AMPERE FRAME / AMP FUSE
AFF	ABOVE FINISHED FLOOR
AS	AMP SWITCH
AIC	AMPS INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
COMM	COMMUNICATION
CT	CURRENT TRANSFORMER
CU	COPPER
°C	DEGREE CELSIUS
CL	CURRENT LIMITER
DWG	DRAWING
DPSP	DOUBLE POLE SINGLE THROW
DPDT	DOUBLE POLE DOUBLE THROW
E	EXISTING
EF	EXHAUST FAN
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EQUIP	EQUIPMENT
ER	EXISTING TO BE RELOCATED
ETR	EXISTING TO REMAIN
EOR	ENGINEER OF RECORD
E.C.	ELECTRICAL CONTACTOR
FA	FIRE ALARM
G	GROUND
GF	GROUND FAULT INTERRUPTER
G.C.	GENERAL CONTRACTOR
HD	HAND DRYER
HP	HORSEPOWER
HZ	HERTZ
IG	ISOLATED GROUND
IC	INTERRUPTING CAPACITY
JB	JUNCTION BOX
KCMIL	ONE THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT-AMPERES
KW	KILOWATTS
LP	LIGHTING PANEL
LL	LANDLORD
LTO	LIGHTING
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MIN	MINIMUM
MLO	MAIN LUGS ONLY
N	NEUTRAL
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NTS	NOT TO SCALE
PP	POWER PANEL
PVC	POLYVINYL CHLORIDE
PWR	POWER
R	REMOVE
RE	RELOCATED EXISTING
RR	REMOVE & RELOCATE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
TR	TAMPER RESISTANT
TYP	TYPICAL
USB	USB JACK
UON	UNLESS OTHERWISE NOTED
VA	VOLT AMPERE
VF	VERIFY IN FIELD
WP	WEATHER PROOF
W	WIRE / WATT
XMER	TRANSFORMER

ELECTRICAL SHEET GENERAL NOTES	
A.	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.
B.	CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
C.	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.
D.	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.
E.	LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED. FURNISH FISH WIRE.
F.	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.
G.	CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
H.	ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
I.	CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
J.	MINIMUM SIZE OF CONDUIT SHALL BE 1/2", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.
K.	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.
L.	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.
M.	SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
N.	FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
O.	ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAIN-TIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
P.	ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
Q.	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.
R.	ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
S.	ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
T.	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.
U.	COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.
V.	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.
W.	REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINAIRES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
X.	REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
Y.	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.
Z.	NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANEL BOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANEL BOARD.

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 OR RUNS. THE CONTRACTOR SHALL ALLOW IN THEIR 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 SHALL BE CONSTRUED 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 AND SUCH AN EXAMINATION BEEN MADE.
D.	INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWING MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
E.	REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSAL.
F.	CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES, AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED. WHEN NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK, CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.
G.	DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.
H.	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.
I.	SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, UNLESS OTHERWISE NOTED.
J.	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.
K.	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 OR APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
L.	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.
M.	UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE ALL CUTTING AND PATCHINGS OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
N.	ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
O.	INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
P.	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 HOURS. 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)	HEIGHTS OF OUTLETS: REFER TO ARCHITECTURAL AND/OR INTERIOR DESIGNER'S PLANS FOR DEVICE HEIGHTS IN NON BOH SPACES.
a.	FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR: <ul style="list-style-type: none"> <li>RECEPTACLES AND TELEPHONES: 1 FT-6 IN.</li> <li>WALL SWITCHES: 4 FT-0 IN.</li> <li>WALL FIXTURES: 7 FT-0 IN.</li> <li>MOTOR CONTROLLERS: 5 FT-0 IN.</li> <li>CLOCKS: 7 FT 6 IN</li> </ul>
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.
c.	REFER TO ARCHITECTURAL AND/OR INTERIOR DESIGNER'S PLANS FOR DEVICE HEIGHTS IN NON BOH SPACES.
D.	PRODUCT DELIVERY, STORAGE AND HANDLING
a.	MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
b.	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 LAMACOID 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 ORIGIN AND TERMINATION OF THE CIRCUIT.
3)	INSERTS AND SUPPORTS: <ul style="list-style-type: none"> <li>INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED. <ul style="list-style-type: none"> <li>SINGLE ROD, SIMILAR TO GRINNELL FIG. 281.</li> <li>MULTI-ROD, SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.</li> <li>CLIP FORM NAILS FLUSH WITH INSERTS.</li> <li>MAXIMUM LOADING 75 PERCENT OF RATING.</li> </ul> </li> </ul>
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.	SUBMIT ELECTRICAL POWER SYSTEM STUDIES INCLUDING SUPPORTING DATA AND RECOMMENDATIONS FOR THE FOLLOWING: <ol style="list-style-type: none"> <li>SHORT CIRCUIT CURRENT AND PROTECTIVE DEVICE COMBINATION.</li> <li>ARC FLASH HAZARD ANALYSIS.</li> </ol> EQUIPMENT SHOP DRAWINGS SHALL NOT BE SUBMITTED UNTIL THESE STUDIES HAVE BEEN COMPLETED.
G.	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 MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.
H.	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.
I.	FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.
J.	ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

ELECTRICAL DRAWING LIST	
E0.01	ELEC. LEGEND, ABBREVI. & NOTES
E0.02	ELECTRICAL SPECIFICATIONS
E1.01	ELECTRICAL LIGHTING PLAN
E2.01	ELECTRICAL POWER PLAN
E3.01	ELECTRICAL RISER & PANEL SCHEDULE



LIGHT FIXTURE SCHEDULE						
TAG	QTY	FIXTURE DETAIL	MAKE	MODEL	LOAD IN VA	NOTES
EM1	8	EXISTING LED EMERGENCY LIGHT	EXISTING	-		1,2,6
LT01	14	EXISTING RECESSED 6" DOWNLIGHT	EXISTING	-	13.6	3, 4
LT06	21	SPY 90 92718 ADM B TRACK HEAD	DELTA LIGHT	19882 9231 B	23.2	3
LT03	5	17" STRAND OPEN PENDANT LAMP	MUUTO	22457	3.5	4
LT03A	4	17" STRAND CLOSED PENDANT LAMP	MUUTO	22458	6	4
LT11	7	MIRA 1 LARGE PENDANT LAMP	NUURA	3033007	3.5	4
LT12	9	SASI SMALL WALL LIGHT	NUURA	3085001	10.3	4
LT13	4	LILA 1 MEDIUM IP44 WALL LIGHT	NUURA	3046013	8.5	4
LT14	4	DUBLIN G9 PAINTING LAMP	MULLAN LIGHTING	MPL021	10	4
LT16	3	FLUID PENDANT LAMP	MUUTO	15402	3	4
LT28	4	RECESSED LED 2X2 PANEL	ORACLE LIGHTING	22-FPL-BL-LED	19	4

NOTES:  
1- COORDINATE EXACT MAKE/MODEL NUMBER WITH THE OWNER/ARCHITECT.  
2- EXISTING FIXTURE TO REMAIN. SCHEDULE IS FOR REFERENCE ONLY.  
3- COORDINATE REQUIREMENT OF THE CURRENT LIMITER WITH THE VENDOR AND PROVIDE AS NEEDED.  
4- SELECT DIMMABLE LAMP FOR THE LIGHT FIXTURE, COORDINATE WITH THE ARCHITECT.  
5- THE LIGHT FIXTURE SHALL HAVE MINIMUM OF 90 MINUTES OF BATTERY BACKUP.

### LIGHTING FIXTURE SCHEDULE GENERAL NOTES

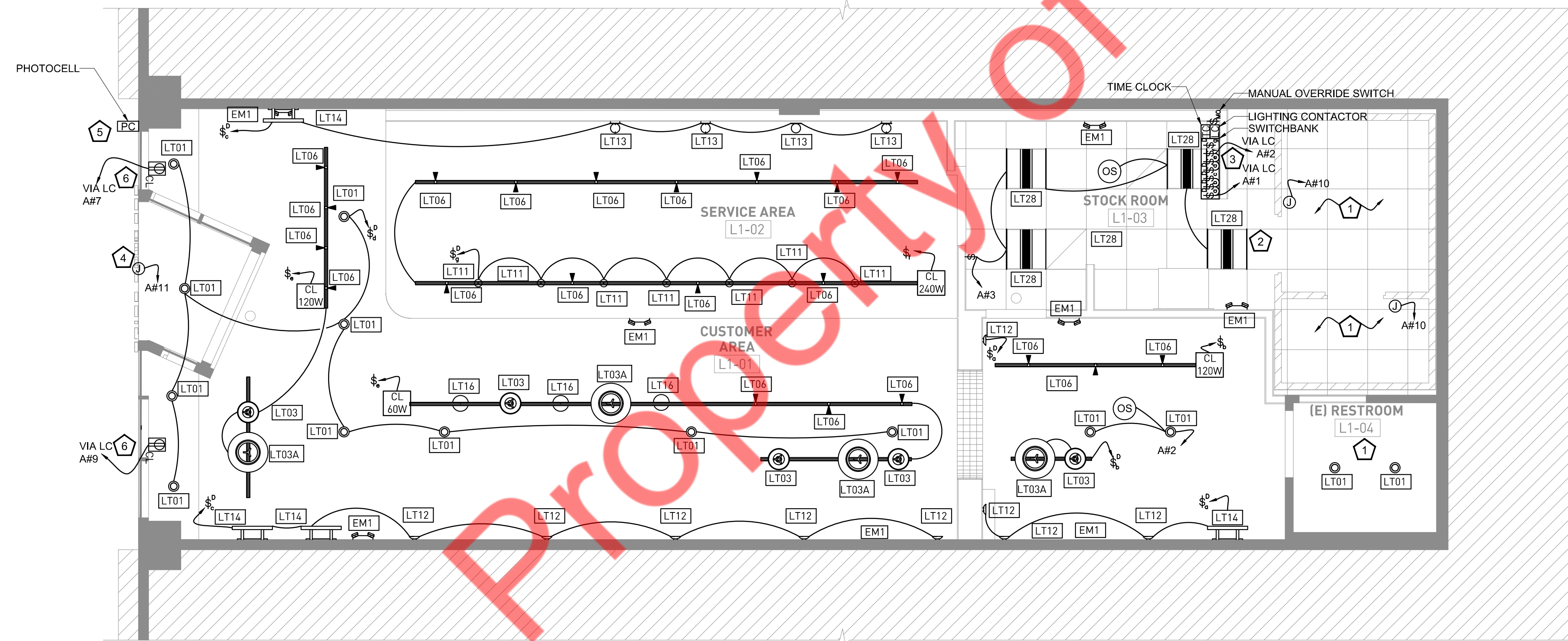
- ALL NEW LIGHTING FIXTURES SHOWN ON THE LIGHTING FIXTURES SCHEDULE ARE SUBJECT TO THE ARCHITECT'S APPROVAL. E.C. SHALL COORDINATE MAKE, MODEL, FINISHES, AND OTHER CRITICAL PARAMETERS WITH THE ARCHITECT BEFORE PURCHASING.
- THE ADDITIONAL ACCESSORIES (HOLDERS, TRACKS, ADAPTERS, DRIVERS, AND CURRENT LIMITERS) REQUIRED FOR THE PROPER WORKING OF THE LIGHTING FIXTURES SHALL BE PURCHASED SEPARATELY IF NOT PROVIDED ALONG WITH THE FIXTURES.
- ALL LIGHTING FIXTURES SHALL BE LED-TYPE OPERABLE AT 120V.
- ALL EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS SHALL HAVE A MINIMUM OF 90 MINUTES OF BATTERY BACKUP OR AS REQUIRED BY AHJ.
- WATTS PER FACE FOR EXIT SIGNS SHALL NOT EXCEED 5 WATTS.
- FIXTURES LOCATED IN SPECIFIC AREAS (WET OR DAMP LOCATIONS, VAPOR EXPOSED, COLD STORAGE, AND BUILDING EXTERIOR) SHALL BE RATED FOR THAT AREA.

### ELECTRICAL LIGHTING PLAN GENERAL NOTES

- ALL LIGHT FIXTURES NOT ON THE OCCUPANCY SENSOR / OTHER AUTOMATIC CONTROL SHALL BE CONTROLLED BY TIMER-CONTROLLED LIGHTING CONTACTOR(S). UNLESS OTHERWISE NOTED.
- THE OCCUPANCY SENSOR, TIMERS, AND OTHER APPROVED LIGHTING CONTROLS SHALL MATCH THE CONTROL FUNCTION REQUIREMENT SPECIFIED IN THE CALIFORNIA ENERGY CODE.
- THE OCCUPANCY SHALL BE SET TO TURN OFF THE LIGHTS WITHIN 20 MINUTES AFTER ALL OCCUPANTS LEAVE THE SPACE.
- THE TIME CLOCK (MINIMUM 2 CHANNEL) SHALL BE SET AS PER THE REQUIREMENT OF THE PROJECT SPACE.
- EMERGENCY LIGHT FIXTURES SHALL TURN ON DURING POWER FAILURE WHEREAS ALL EXIT SIGNS SHALL BE PERMANENTLY ON. E.C. TO WIRE THE FIXTURES ACCORDINGLY.
- THE EMERGENCY POWER SYSTEM SHALL PROVIDE POWER FOR NOT LESS THAN 90 MINUTES AND SHALL CONSIST OF STORAGE BATTERIES, UNIT EQUIPMENT, OR AN ON-SITE GENERATOR IIBC 1008.3.4).
- THE WATTAGE RATING POWER OF THE CURRENT LIMITERS USED SHALL NOT EXCEED THE WATTAGE RATING OF THE CURRENT LIMITER INDICATED ON THE PLAN.
- COORDINATE WITH ARCHITECT/OWNER EXACT LOCATION OF OCCUPANCY SENSOR IN THE FIELD.
- E.C. SHALL REARRANGE AND ADD (IF REQUIRED) THE EMERGENCY FIXTURES TO PROVIDE INITIAL ILLUMINATION THAT IS NOT LESS THAN AN AVERAGE OF 1 FOOTCANDLE (1 LUX) AND A MINIMUM AT ANY POINT OF 0.1 FOOTCANDLE (1 LUX) MEASURED ALONG THE PATH OF EGRESS AT FLOOR LEVEL. ILLUMINATION LEVELS SHALL BE PERMITTED TO DECLINE TO 0.6 FOOTCANDLE (6 LUX) AVERAGE AND A MINIMUM AT ANY POINT OF 0.06 FOOTCANDLE (0.6 LUX) AT THE END OF THE EMERGENCY LIGHTING TIME DURATION. A MAXIMUM-TO-MINIMUM ILLUMINATION UNIFORMITY RATIO OF 40 TO 1 SHALL NOT BE EXCEEDED.
- INSTALL THE JUNCTION BOX FOR THE SIGNAGE IN AN ACCESSIBLE LOCATION. CONNECT THE SIGNAGE TO THE INDICATED CIRCUIT THROUGH THE LIGHTING CONTACTOR (L.C). COORDINATE WITH THE OWNER OR LANDLORD TO DETERMINE THE EXACT LOCATION AND SCHEDULE FOR THE TIME CLOCK.
- ALL NEW & EXISTING EMERGENCY LIGHT & EXIT SIGNS SHALL BE CONNECTED TO THE NEAREST LIGHTING CIRCUIT AHEAD OF SWITCHING, UON.
- EXIT LIGHTS (EX) TAGGED WITH (E) ARE EXISTING TO REMAIN. E.C. TO FIELD VERIFY OPERABLE CONDITION, RELAMP OR PROVIDE NEW IF NEEDED.
- REUSE EXISTING EMERGENCY LIGHTS AND EXIT SIGNS WHEREVER FEASIBLE. E.C. TO FIELD VERIFY THE OPERABLE CONDITION OF THE LIGHTS, RELAMP OR REWIRE AND RELOCATE AS NEEDED.
- COORDINATE THE EXACT LOCATION OF THE CCTV AND SPEAKER CONTROL CABINET IN THE FIELD. PROVIDE COMPLETE CONNECTION AS NEEDED IN COORDINATION WITH THE LV VENDOR.

### ELECTRICAL LIGHTING PLAN KEY NOTES

- REUSE EXISTING LIGHT FIXTURES ALONG WITH EXISTING CIRCUITS WHERE POSSIBLE. PROVIDE NEW IF EXISTING IS INOPERABLE.
- PROVIDE NEW LIGHTING CONTACTOR AND MANUAL OVERRIDE SWITCH IN COORDINATION WITH ARCHITECT FOR EXACT LOCATION. REFER TO THE LIGHTING CONTACTOR DETAIL IN THE DETAIL SHEET FOR MORE INFORMATION.
- SWITCHBANK FOR LIGHTING CONTROL. COORDINATE THE EXACT LOCATION WITH THE ARCHITECT. REPORT ANY FIELD DISCREPANCIES TO THE ARCHITECT/OWNER.
- JUNCTION BOX FOR SIGNAGE. CONTROL VIA TIMER CONTROLLED LIGHTING CONTACTOR. COORDINATE EXACT LOCATION WITH THE ARCHITECT AND POWER REQUIREMENTS WITH THE SIGNAGE VENDOR.
- E.C. SHALL PROVIDE NEW PHOTOCELL, COORDINATE EXACT LOCATION WITH THE ARCHITECT.
- EXISTING SHOW WINDOW RECEPTACLES TO REMAIN ALONG WITH EXISTING CIRCUIT AND CONTROLS ADHERING TO NEC 210.62. E.C. TO FIELD VERIFY OPERABLE CONDITION. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY. COORDINATE WITH THE ARCHITECT/OWNER FOR REQUIREMENT OF NEW SHOW WINDOW RECEPTACLES, PROVIDE ACCORDINGLY.

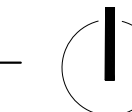


JOE & THE JUICE

ISSUANCE NAME DATE

ELECTRICAL LIGHTING PLAN

E1.01



ELECTRICAL EQUIPMENT SCHEDULE										
TAG	QTY	DESCRIPTION	MAKE	MODEL	LOAD IN VA	VOLTS	PHASE	AMPS	CONNECTION	NOTES
1	1	TILL COUNTER MODULE	CUSTOM	TCM-30	-	120	1	-	-	1
1	2	POS	STAR	TSP-100	1034	110	1	9.4	5-15P	DATA REQUIRED
1.1	1	GLASS DISPLAY CABINET, SELF CONTAINED	CHAR	CP-CDC-24-C	1200	120	1	10	5-15P	-
2.1	1	ESPRESSO TAMPER, AUTOMATIC	PUOPRESS	Q2 GEN5	60	110	1	10	5-15P	-
2.2	1	ESPRESSO GRINDER	MAHLKONIG	E80S	845	110	1	7.04	5-15P	-
2.4	1	ESPRESSO MACHINE, TRADITIONAL	LA MARZOCCO	LINEA PB-2-AV	4600	208-220	1	28	16-30P	LOCKING PLUG
2.5	1	UNDERCOUNTER, REFRIGERATOR	TRUE	TUC-24-HC	240	115	1	2	5-15P	-
2.7	1	UNDERCOUNTER BOILER	MARCO	1001880	1400	220	1	12.75	5-15P	-
3.2	1	JUICE REFRIGERATION	CONTINENTAL	SW72N/QUARTER	300	115	1	2.5	5-15P	-
3.12	2	BLENDERS	BNLENDTEC	S885C2901-A1DA1D	1800	120	1	15	5-20P	-
3.21	1	JUICER, ELECTRIC	OMCAN	39684	1300	120	1	10.8	5-20P	-
4.3	1	SALAD REFRIGERATION	CONTINENTAL	SW72N/QUARTER	300	115	1	2.5	5-15P	-
6	1	SANDWICH REFRIGERATION	CONTINENTAL	SW72N/12+9	732	115	1	2.5	5-15P	-
6.3	3	PANINI GRILL	WARING	WPG250	1800	120	1	15	5-15P	-
7	1	ICE MAKER	MANITOWOC ICE	IDT0620A	1464	115	1	12.2	-	3
8.2	2	BLENDERS (PESTO)	BNLENDTEC	S885C2901-A1DA1D	1800	120	1	15	5-20P	-
8.3	1	COFFEE BREWER	FETCO	CBS-1231	1500	220	1	20	L14-20P	5
8.31	1	COFFEE GRINDER	MAHLKONIG	EK43	1300	208	1	7	5-15P	-
9.2	1	DISHWASHER, UNDERCOUNTER	ELECTROLUX	502716	6850	208	1	33	-	-
15	1	WALK-IN, FREEZER	KOLPAK	TBD	-	120	1	10	-	-
15.1	1	WALK-IN, FREEZER EVAPORATOR COIL	KOLPAK	TBD	-	120	1	10	-	-
15.2	1	WALK-IN, FREEZER COMPRESSOR	KOLPAK	TBD	-	208	1	20	-	-
16	1	WALK-IN, COOLER	KOLPAK	TBD	-	120	1	10	-	-
16.1	1	WALK-IN, COOLER EVAPORATOR COIL	KOLPAK	TBD	-	120	1	10	-	-
16.2	1	WALK-IN, COOLER COMPRESSOR	KOLPAK	TBD	-	208	1	20	-	-
22	1	IT RACK	TBD	TBD	-	-	-	-	-	-

1 - COORDINATE EXACT MAKE/MODEL NUMBER WITH THE OWNER/ARCHITECT.  
2 - COORDINATE EXACT POWER REQUIREMENT WITH THE EQUIPMENT VENDOR.  
3 - COORDINATE EXACT CONNECTION TYPE WITH THE VENDOR PRIOR TO ROUGH IN.  
4 - PROVIDE CIRCUIT BREAKER, WIRING, JUNCTION BOX, RECEPTACLES, DISCONNECTS AS REQUIRED.  
5 - SELECT EQUIPMENT RATED FOR SERVICE VOLTAGE ELSE PROVIDE THE ADAPTER/TRANSFORMER AS NEEDED.

### EQUIPMENT SCHEDULE GENERAL NOTES

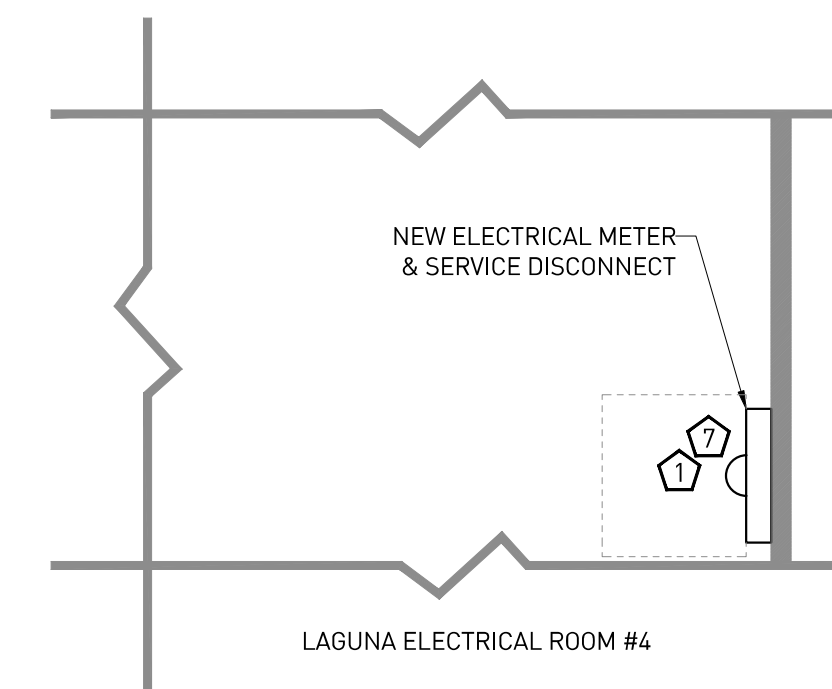
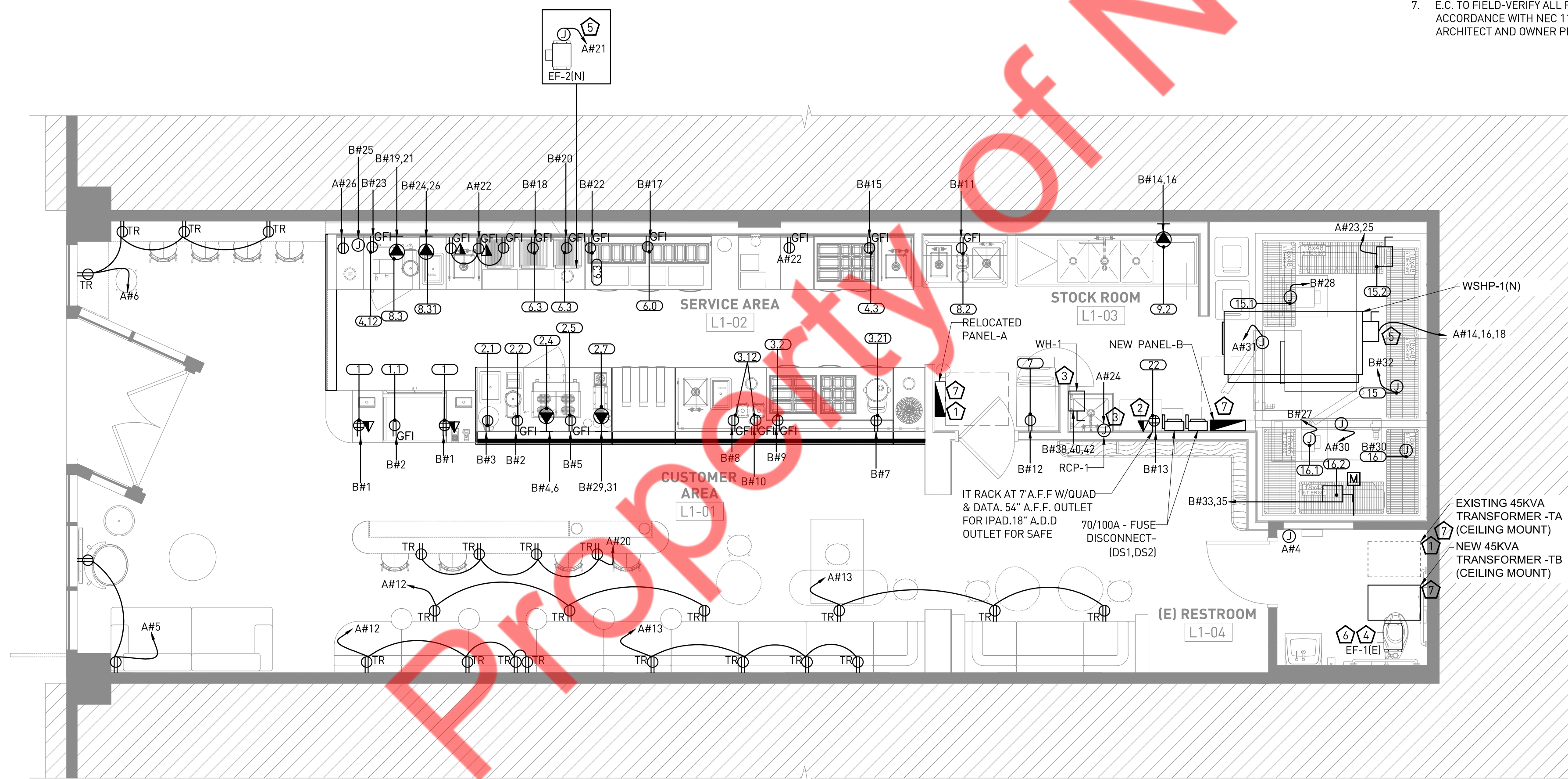
- FOR EQUIPMENT RATED FOR OTHER THAN THE SERVICE VOLTAGE, THE CONTRACTOR SHALL EITHER PROVIDE EQUIVALENT EQUIPMENT AT SERVICE VOLTAGE IN COORDINATION WITH OWNER/ARCHITECT OR PROVIDE AN ADAPTER/TRANSFORMER FOR THAT EQUIPMENT.
- VERIFY ALL MCA, MOC, CONNECTION TYPE, AND OTHER INSTALLATION REQUIREMENTS WITH FOOD SERVICE CONSULTANT AND EQUIPMENT MANUFACTURER BEFORE BID.
- LOCATIONS OF DISCONNECTS FOR EACH PIECE OF EQUIPMENT MAY NOT BE SHOWN ON PLANS. IF DISCONNECT FOR EQUIPMENT IS NOT SHOWN, THE CONTRACTOR TO FIELD COORDINATE LOCATION PER CODE.
- FUSED DISCONNECTS SHALL HAVE FUSES SIZED AS LISTED ON THE EQUIPMENT NAMEPLATE; OTHERWISE, MATCH THE UPSTREAM OVERCURRENT DEVICE IF NO MAXIMUM OVER-CURRENT SIZE IS LISTED ON THE EQUIPMENT UNLESS NOTED OTHERWISE.
- THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING ALL CONDUITS, WIRE, SUPPORT SYSTEM, DISCONNECTS, AND OUTLETS TO ALLOW FOR A COMPLETE CODE-COMPLIANT KITCHEN INSTALLATION.
- CONTRACTOR SHALL LIMIT THE AMOUNT OF EXPOSED CONDUIT. ANY EXPOSED CONDUIT SHALL BE LIQUID-TIGHT FLEXIBLE METAL CONDUIT OR RIGID GALVANIZED STEEL CONDUIT. COORDINATE THE EXACT LOCATION OF ALL REMOTE CONDENSING UNITS WITH HVAC AND FOOD SERVICE DRAWINGS.
- ALL ELECTRICAL EQUIPMENT LOCATED ON WALLS OF PRODUCTION KITCHEN AREAS SHALL BE A MINIMUM OF 48" AFF UNLESS NOTED OTHERWISE. ALL ELECTRICAL EQUIPMENT LOCATED ABOVE COUNTERS OF KITCHEN AREAS SHALL BE 6" ABOVE THE COUNTER UNLESS NOTED OTHERWISE. ALL ELECTRICAL EQUIPMENT LOCATED BELOW COUNTERS AND WITHIN THE CASEWORK OF KITCHEN AREAS SHALL BE 6" BELOW THE TOP OF COUNTERS UNLESS NOTED OTHERWISE.
- ALL RECEPTACLES IN THE KITCHEN AREA SHALL BE GFCI-PROTECTED. E.C. SHALL PROVIDE AND INSTALL GFCI CIRCUIT BREAKERS FOR ALL CIRCUITS FEEDING KITCHEN EQUIPMENT REQUIRING GFCI PROTECTION THAT ARE INACCESSIBLE, BEFORE OR AFTER APPLIANCE HAS BEEN INSTALLED, IF RECEPTACLE DOESN'T PROVIDE GFCI PROTECTION. NEC 210.8 AND 422.5(A).

### ELECTRICAL POWER PLAN KEY NOTES

- E.C. TO COORDINATE AND VERIFY WITH ARCHITECT/OWNER FOR EXACT LOCATION, CONNECTION REQUIREMENTS AND OPERABLE CONDITION. REPORT ANY DISCREPANCIES OR NON-COMPLIANT CONDITIONS TO THE ARCHITECT AND OWNER PRIOR TO COMMENCING WORK.
- E.C. SHALL COORDINATE WITH ARCHITECT/ EQUIPMENT VENDOR FOR POWER REQUIREMENT OF IT RACK IN THE FIELD. PROVIDE AS REQUIRED.
- E.C. SHALL COORDINATE WITH THE PLUMBING CONTRACTOR FOR THE EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENT OF THE UNIT IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
- EXISTING EXHAUST FAN (EF-1) SHALL REMAIN. E.C. TO FIELD-VERIFY THAT THE EXISTING FAN CONTROLS ARE TIED TO AN OCCUPANCY SENSOR; PROVIDE NEW OCCUPANCY SENSOR CONTROL IF EXISTING NOT FOUND.
- E.C. SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR THE EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENT OF THE UNIT IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
- E.C. TO PROVIDE ALL REQUIRED ELECTRICAL INTERCONNECTIONS BETWEEN EF-1 (E), EF-2 (N), AND WSH-1 (N). COORDINATE CONTROL WIRING, POWER REQUIREMENTS, AND START/STOP INTERLOCKS WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER.
- E.C. TO FIELD-VERIFY ALL REQUIRED WORKING CLEARANCES FOR EQUIPMENT IN ACCORDANCE WITH NEC 110.26. REPORT ANY NON-COMPLIANT CONDITIONS TO THE ARCHITECT AND OWNER PRIOR TO INSTALLATION.

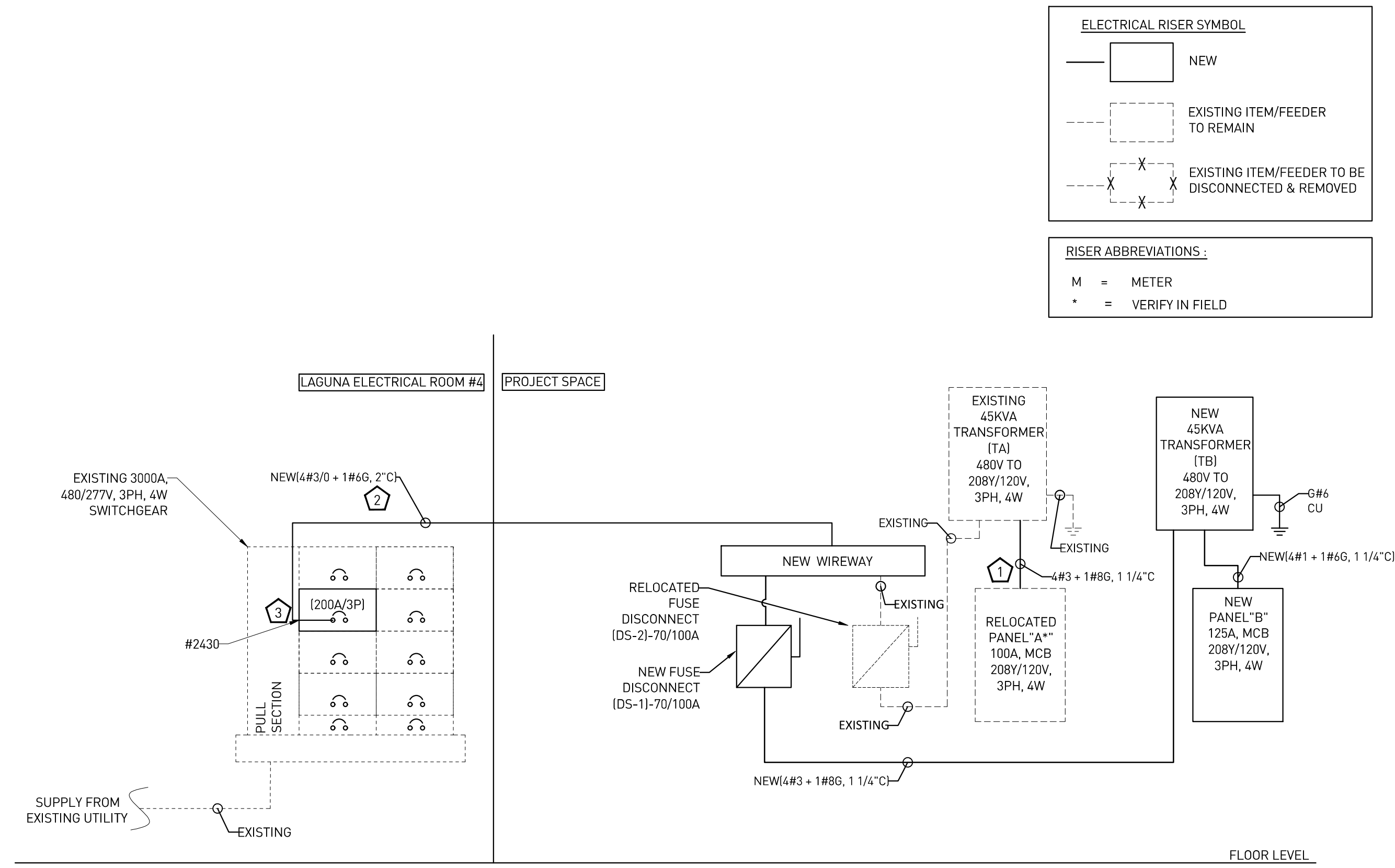
### ELECTRICAL POWER PLAN GENERAL NOTES

- THE LOCATION OF ALL ELECTRICAL EQUIPMENT (NOT PROVIDED IN THE ARCHITECTURAL PLAN) SHALL BE VERIFIED WITH THE ARCHITECT/OWNER BEFORE BID.
- POWER AND LOCATION OF ALL THE MECHANICAL AND PLUMBING UNITS SHALL BE COORDINATED WITH THE RESPECTIVE CONTRACTORS BEFORE BID.
- THE DISCONNECT SWITCHES FOR THE BRANCH CIRCUIT SHOWN ON THE PLAN SHALL BE RATED EQUAL TO OR HIGHER THAN THE BREAKER RATING. REFER BREAKER RATING IN THE PANEL SCHEDULE AND PROVIDE DISCONNECT AS REQUIRED.
- GFI MARKED ON THE PLAN INDICATES THAT THE CIRCUIT SHALL BE GFI PROTECTED. E.C. SHALL PROVIDE A GFI RECEPTACLE DISCONNECT IN THE READILY ACCESSIBLE LOCATION. PROVIDE GFI BREAKER IN THE PANEL IF EITHER THE RECEPTACLE IS NOT AVAILABLE OR NOT ACCESSIBLE WHEN INSTALLED IN THE DESIRED LOCATION.
- COORDINATE EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENTS OF THE DUCT SMOKE DETECTOR, MOTORIZED DAMPERS, AND THERMOSTATS IN THE FIELD WITH THE MECHANICAL DRAWING. PROVIDE WIRING AS REQUIRED.
- ELECTRICAL OUTLETS AND DEVICES LOCATED IN DEMISING WALLS TO HAVE FIRE PUTTY AROUND THE BOX TO MAINTAIN PARTITION FIRE RATING.
- A QUAD AND DATA/TELEPHONE OUTLETS ARE TO BE PROVIDED ON THE PLYWOOD BACKING DESIGNED FOR THE L.V. RACK. EXTEND THE CONDUIT FROM THE L.V. RACK UP TO THE LOCATION DECIDED BY THE LANDLORD/OWNER/L.V. VENDOR OR SERVICE PROVIDER.
- THE ARCHITECTURAL PLAN SHALL TAKE PRECEDENCE OVER THE ELECTRICAL DRAWING FOR EQUIPMENT LOCATION AND MOUNTING. THE LOCATION OF ALL ELECTRICAL EQUIPMENT NOT PROVIDED IN THE ARCHITECTURAL PLAN SHALL BE VERIFIED WITH THE ARCHITECT/OWNER BEFORE BID.
- PROVIDE BOLLARD IN FRONT OF THE ELECTRICAL EQUIPMENT AS REQUIRED BY CODE.
- COORDINATE THE EXACT LOCATION OF THE LOW VOLTAGE EQUIPMENT IN THE FIELD. PROVIDE WIRING AS NEEDED, IN COORDINATION WITH THE LOW VOLTAGE VENDOR AND THE ARCHITECT.
- COORDINATE WITH ARCHITECT/OWNER FOR DINNING AREA GENERAL RECEPTACLES.
- COORDINATE THE EXACT LOCATION OF THE CCTV AND SPEAKER CONTROL CABINET IN THE FIELD. PROVIDE COMPLETE CONNECTION AS NEEDED IN COORDINATION WITH THE LV VENDOR.



ELECTRICAL RISER DIAGRAM

ELECTRICAL PANEL SCHEDULE



RISER DIAGRAM KEY NOTES :

- E.C. TO RELOCATE EXISTING PANEL "A" AS SHOWN ON FLOOR POWER PLAN E2.01. EXTEND FEEDER TO THE NEW LOCATION. INFORM EOR OF ANY DISCREPANCIES PRIOR TO BID AND BASE BID ACCORDINGLY.
- E.C. SHALL VERIFY EXISTING CONDUIT AVAILABILITY & SIZE FOR NEW FEEDER. IF UNSUITABLE, PROVIDE NEW CONDUIT AS SHOWN. BASE BID ACCORDINGLY.
- E.C. TO VERIFY AVAILABLE SERVICE CAPACITY AND EXACT SWITCHGEAR TAPPING LOCATION WITH LANDLORD. REPLACE EXISTING 70A/3P BREAKER IN LANDLORD PANEL WITH NEW 200A/3P BREAKER. REPORT ANY DISCREPANCIES TO ARCHITECT/OWNER PRIOR TO BID.

RISER DIAGRAM GENERAL NOTES

- E.C. SHALL VERIFY/COORDINATE THE FOLLOWING INFORMATION IN THE FIELD WITH THE UTILITY/LANDLORD/OWNER AND INFORM THE ENGINEER OF RECORD OF ANY DISCREPANCY BEFORE BID.
- THE ELECTRICAL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE NEC, LOCAL CODES AND AHJ.
- THE EXACT POWER DISTRIBUTION AND SCOPE OF WORK WITH THE LANDLORD/OWNER BEFORE BID.
- ENSURE THE COMBINED VOLTAGE DROP OF THE FEEDER AND BRANCH CIRCUIT SHALL NOT EXCEED 5% PER CODE.
- IF REQUIRED BY OWNER THE EXISTING ELECTRICAL SERVICE, METER, DISCONNECT AND ELECTRICAL PANELS CAN BE RELOCATED AND REUSED. E.C. SHALL INFORM EOR OF ANY CHANGES PRIOR TO BID.
- THE PART OF RISER MARKED AS EXISTING IS FOR REFERENCE PURPOSES ONLY. E.C. SHALL VERIFY THE AVAILABILITY, LOCATION, RATING, OPERABLE CONDITION AND EXACT POWER FLOW IN FIELD. INFORM EOR OF ANY DISCREPANCY BEFORE BID.
- THE VOLTAGE AND FREQUENCY FLUCTUATION IN THE ELECTRICAL UTILITY SERVICE AT THE SERVICE ENTRY SHALL NOT BE MORE THAN +/- 5% AND +/- 1%, RESPECTIVELY. PROVIDE THE REGULATORS IF SUCH CASE IS OBSERVED.
- REUSE OF THE EXISTING EQUIPMENT IS SUBJECT TO THE VERIFICATION OF THE AVAILABILITY, LOCATION, RATING, OPERABLE CONDITION, AND FAULTY CURRENT IN THE FIELD. REPLACE THE EXISTING EQUIPMENT WITH THE EQUIPMENT OF SAME RATING, IF THE EXISTING EQUIPMENT CAN NOT BE REUSED DUE TO ANY OF THE REASONS MENTIONED EARLIER.
- ADDITION OR ALTERATION TO THE EXISTING SYSTEM SHALL NOT BE DONE WITHOUT THE WRITTEN CONSENT OF THE OWNER.
- THE EXISTING ELECTRICAL EQUIPMENT NOT INTENDED TO BE REUSED (WHETHER OR NOT SHOWN ON THE ELECTRICAL PLAN) SHALL BE DEMOLISHED. E.C. SHALL COORDINATE WITH THE OWNER/ARCHITECT IN THE FIELD BEFORE DEMOLITION.
- E.C. TO ENSURE THAT THE SPARE AMPS AVAILABLE IN THE EXISTING ELECTRICAL SERVICE IS MORE THAN THE NEWLY ADDED DEMAND AMPS.
- E.C. SHALL VERIFY THE EXACT LOCATION, RATING, AND OPERABLE CONDITION OF EVERY PIECE OF EQUIPMENT MARKED AS EXISTING IN THE FIELD. INFORM THE ENGINEER OF THE RECORD OF ANY DISCREPANCY BEFORE BIDDING.
- COORDINATE EXACT LOCATION OF ALL NEW EQUIPMENTS WITH ARCHITECT/OWNER IN THE FIELD.

PANEL: A (RELOCATED)		3 PHASE		DEMAND LOAD (in kVA)		32.68		MOUNTING: SURFACE					
208Y/120 VOLTS		4 WIRE		DEMAND CURRENT (in Amps)		90.81		PANEL LOCATION: CUSTOMER AREA					
100 AMP		MCB - MAIN CIRCUIT BREAKER						FED FROM: X'MER-TA					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	NOTES	PER PHASE (KVA)			LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C					
1	20/1P	CUSTOMER AREA LIGHTING	L	0.50	RWC	1.00			0.50	L	ENTRY DOWNLIGHTS	15/1P	2
3	20/1P	STOCK ROOM LIGHTS	L	0.50	RWC		2.00		1.50	O	RESTROOM HANDDRYER	20/1P	4
5	20/1P	SPARE						1.08	1.08	R	CUSTOMER AREA GENERAL RECP.	20/1P	6
7	20/1P	SHOW WINDOW	L	0.60	ETR	0.60					SPARE	20/1P	8
9	20/1P	SHOW WINDOW	L	1.65	ETR		2.15		0.50	L	W/C GENERAL RECP.	20/1P	10
11	20/1P	EXTERNAL SIGNAGE	L	1.20	RWC			2.46	1.26	R	CUSTOMER AREA GENERAL RECP.	20/1P	12
13	20/1P	CUSTOMER AREA GENERAL RECP.	R	1.26	RWC	6.63			5.37	H		14	
15	20/1P	SPARE					5.37		5.37	H	WSHP-1 (N)	60/3P*	16
17	20/1P	POWER BOOSTER	E	0.50	RWC			5.87	5.87	H		18	
19	20/1P	FA	O	0.50	RWC	1.22			0.72	R	CUSTOMER AREA GENERAL RECP.	20/1P	20
21	20/1P	EF-2(N)	M	0.37	RWC		1.09		0.72	R	SERVICE AREA RECP. (FUTURE)	20/1P	22
23	20/2P	15.2_WALK-IN, FREEZER COMPRESSOR	E	1.00	RWC			1.50	0.50	M	CIRCULATING PUMP (RCP-1)	20/1P	24
25	20/1P	SPARE				1.00					SPARE	20/1P	26
27		SPACE					0.00				SPACE		28
29		SPACE						0.00			SPACE		30
31		SPACE									SPACE		32
33		SPACE						0.00			SPACE		34
35		SPACE						0.00			SPACE		36
37		SPACE						0.00			SPACE		38
39	100/3P*	MAIN DISCONNECT						0.00			SPACE		40
41								0.00			SPACE		42
						10.45	10.61	10.91					

PANEL: B (NEW)		3 PHASE		DEMAND LOAD (in kVA)		40.93		MOUNTING: RECESSED					
208Y/120 VOLTS		4 WIRE		DEMAND		113.73		PANEL LOCATION: STOCK ROOM					
125 AMP		MCB - MAIN CIRCUIT BREAKER						FED FROM: X'MER-TB					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	NOTES	PER PHASE (KVA)			LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C					
1	20/1P	1_POS	E	0.36	RWC	1.36			1.00	E	1.1_GLASS DISPLAY CABINET	15/1P	2
3	20/1P	2.1_ESPRESSO TAMPER, AUTOMATIC	E	0.60	RWC		2.90		2.30	E	2.4_ESPRESSO MACHINE	30/2P	4
5	20/1P	2.5_UNDERCOUNTER, REFRIGERATOR	E	0.24	RWC			2.54	2.30	E			6
7	20/1P	3.21_JUICER, ELECTRIC	E	1.30	RWC	3.10			1.80	E	3.12_BLENDERS	20/1P	8
9	20/1P	3.2_JUICE REFRIGERATION	E	0.36	RWC		2.16		1.80	E	3.12_BLENDERS	20/1P	10
11	20/1P	8.2_BLENDERS (PESTO)	E	1.80	RWC			3.27	1.47	E	7_ICE MAKER	20/1P	12
13	20/1P	22_IT RACK	R	0.36	RWC	3.79			3.43	E	9.2_DISHWASHER, UNDERCOUNTER	35/2P	14
15	20/1P	4.3_SALAD REFRIGERATION	E	0.73	RWC		4.16		3.43	E		16	
17	20/1P	6_SANDWICH REFRIGERATION	E	0.73	RWC			2.53	1.80	E	6.3_PANINI GRILL	20/1P	18
19	20/1P		E	1.50	RWC	3.30			1.80	E	6.3_PANINI GRILL	20/1P	20
21	20/2P	8.3_COFFEE BREWER	E	1.50	RWC		3.30		1.80	E	6.3_PANINI GRILL	20/1P	22
23	20/1P	4.12_UNDERCOUNTER, FREEZER	E	0.28	RWC			0.93	0.65	E		24	
25	20/1P	SERVICE AREA JUNCTION BOX	O	1.20	RWC	1.85			0.65	E	8.31_COFFEE GRINDER	20/2P	26
27	20/1P	16.1_WALK-IN, COOLER EVAPORATOR COIL	E	1.20	RWC		2.40		1.20	E	15.1_WALK-IN, FREEZER EVAPORATOR	20/1P	28
29	20/2P	2.7_UNDER COUNTER BOILER	O	1.40	RWC			1.90	0.50	O	16_WALK IN COOLER	20/1P	30
31	20/2P		O	1.40	RWC	1.90			0.50	O	15_WALK IN FREEZER	20/1P	32
33	20/2P	16.2_WALK-IN, COOLER COMPRESSOR	O	1.00	RWC		1.00				SPACE		34
35	20/1P	SPARE				3.34			3.34	O	SPACE		36
37	20/1P	SPARE							3.34	O	SPACE		38
39		SPACE					3.34		3.34	O	WATER HEATER (WH_1)	35/3P	40
41		SPACE						3.34	3.34	O			42
						18.64	19.26	15.51					

PANEL SCHEDULE ABBREVIATIONS AND NOTES	
TAG	DESCRIPTION
L	LIGHTING
R	RECEPTACLE
H	HVAC
E	ELECTRICAL EQUIPMENT
M	LARGEST MOTOR
O	OTHER
N	NON COINCIDENT
X	LINKED CELL
*	VERIFY/COORDINATE IN FIELD
RWC	REFER TO THE WIRING CHART FOR WIRE SIZE
RRF	REFER RISER FOR FEEDER SIZE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
AFCI	ARC FAULT CIRCUIT INTERRUPTER
NBEP	NEW BREAKER IN THE EXISTING PANEL
HACR	HEAT AIR CONDITIONING AND REFRIGERATION
PAN	PROVIDE ADDITIONAL WIRE FOR NEUTRAL
LO	LOCKOUT BREAKER
STB	SHUNT TRIP BREAKER
SB	SPLIT BREAKER
ETR	EXISTING TO REMAIN
SAE	SAME AS EXISTING
VIF	VERIFY IN FIELD
LC	WIRE THROUGH LIGHTING CONTACTOR
NCL	NON COINCIDENT LOAD
DFB	DUAL FUNCTION BREAKER (AFCI+GFCI)
CB	COMBINATION BREAKER (5/P)

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

ELECTRICAL SERVICE LOAD CALCULATION						
LOAD DESCRIPTION	LOAD TAG	CONNECTED LOAD (KVA)		TOTAL KVA	D.F.	DEMAND (KVA)
		PANEL A	PANEL B			
TOTAL LIGHTING	L	5.45	0.00	5.45	125%	6.81
TOTAL RECEPTACLE	R	5.04	0.72	5.76	#	5.76
TOTAL EQUIPMENT	E	2.50	35.67	38.17	65%	24.81
TOTAL OTHER	O	2.00	17.02	19.02	100%	19.02
TOTAL HVAC	H	16.11	0.00	16.11	100%	16.11
NON COINCIDENT	N	0.00	0.00	0.00	0%	0.00
TOTAL MOTOR	M	0.87	0.00	0.00	100%	0.00
LARGEST MOTOR					25%	0.00
# = Demand factor 100% for first 10kVA and 50% for rest of the receptacle load						
72.51						
# = SERVICE VOLTAGE (Volts) 480Y/277						
DEMAND (KVA) 72.51						
DEMAND (AMPS) 87.32						
SPARE (%) 37.63						
Std. E SERVICE AMPS 140.00						
NEW SERVICE @ 200A, 480Y/277V, 3PH, 4W						

PANEL SCHEDULE GENERAL NOTES

- CONTRACTOR SHALL VERIFY BREAKER AND BRANCH CIRCUIT REQUIREMENTS FOR THE EQUIPMENT IN THE FIELD.
- THE ELECTRICAL LOAD IS BALANCED WITHIN 10% FOR ALL 3 PHASES.
- THE VOLTAGE DROP FOR THE BRANCH CIRCUIT SHALL NOT EXCEED 3% OR 5% IN COMBINATION WITH THE FEEDER CIRCUIT.
- GFI MARKED ON THE PLAN INDICATES THAT THE CIRCUIT SHALL BE GFI PROTECTED. E.C. SHALL PROVIDE A GFCI BREAKER IN THE PANEL FOR THE INDICATED CIRCUIT IF EITHER THE RECEPTACLE IS NOT AVAILABLE OR NOT READILY ACCESSIBLE.
- COORDINATE AVAILABLE FAULT CURRENT (AIC RATING) WITH UTILITY/LANDLORD/OWNER. CALCULATE THE EXACT AIC RATING OF EACH PANEL IN THE FIELD. AIC RATING SHALL BE WRITTEN ON EACH PANEL AS PER STANDARD.
- PROVIDE BREAKER LOCKING DEVICES IN THE PANELS, WHERE EVER REQUIRED BY CODE. INCLUDING BUT NOT LIMITED TO EMERGENCY LIGHTING, FIRE ALARM CIRCUITS, AND HARD-WIRED EQUIPMENT.
- THE CONTRACTOR IS TO PROVIDE A CIRCUIT DIRECTORY FOR EACH PANEL BOARD AS PER 408.4 (A).
- REFER TO THE BRANCH CIRCUIT WIRING CHART FOR WIRE SIZES. THE WIRE SIZES HAVE BEEN SELECTED BASED ON THE 75-DEGREE COLUMN OF NEC 310.15 B 16 FOR COPPER CONDUCTOR. THE WIRE SIZE MIGHT CHANGE IF THE TEMPERATURE, MATERIAL, OR VOLTAGE DROP IS DIFFERENT. E.C. SHALL SIZE THE BRANCH CIRCUIT ACCORDINGLY.
- THE CONTRACTOR SHALL MODIFY THE BREAKERS OF THE EXISTING PANEL (WHEREVER REQUIRED) TO BE IN LINE WITH THE PANEL SCHEDULE PROVIDED IN THE ELECTRICAL DRAWING.

JOE & THE JUICE

ISSUANCE NAME DATE

ELECTRICAL RISER AND PANEL SCHEDULE

E3.01













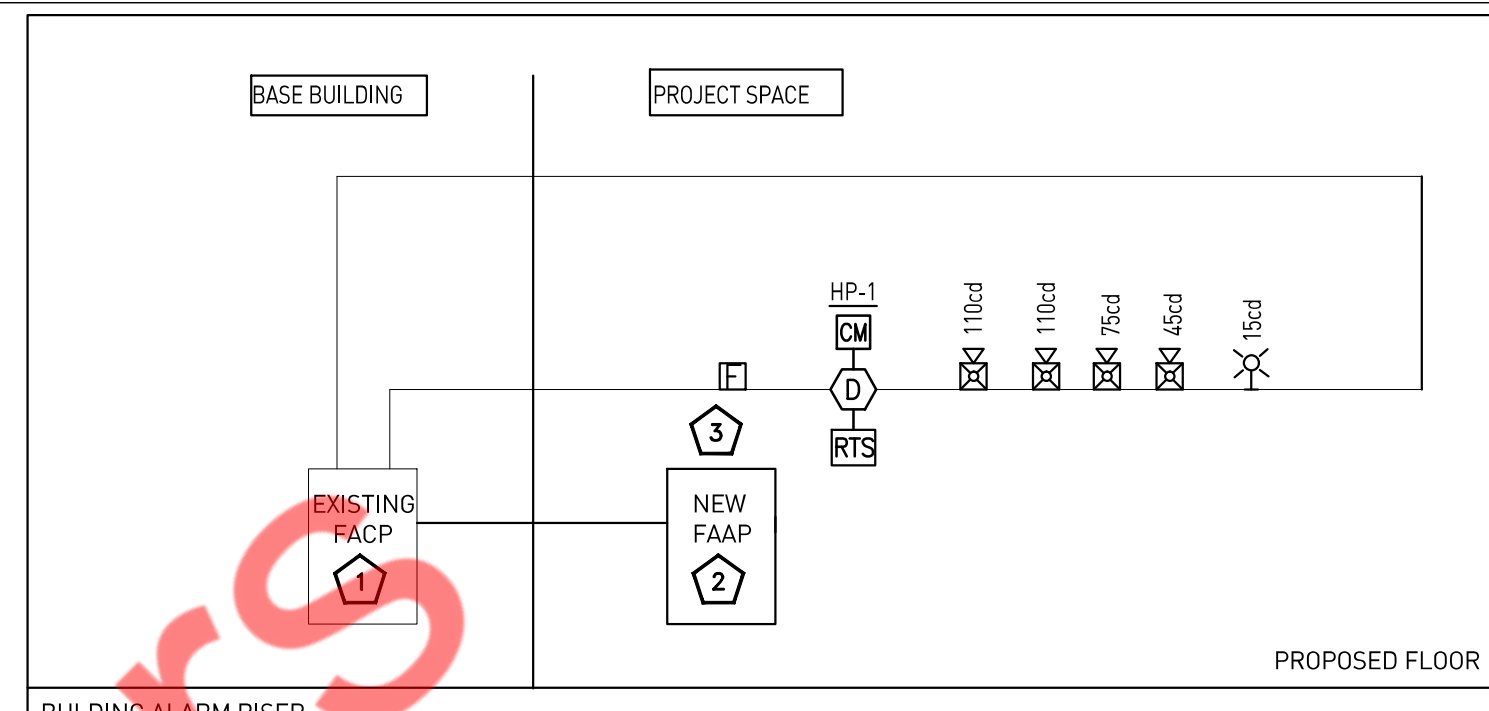
**FIRE ALARM SYSTEM**

- A. DESCRIPTION**
- THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND PLACE IN OPERATING CONDITION, A COMPLETE FIRE ALARM SYSTEM AS SPECIFIED IN THIS SECTION, TO INCLUDE THE FURNISHING OF ALL LABOR, EQUIPMENT, MATERIALS AND THE PERFORMANCE OF ALL OPERATIONS ASSOCIATED WITH THE INSTALLATION OF THE FIRE ALARM SYSTEM, AS SHOWN ON THE CONTRACT DRAWINGS AND HEREIN SPECIFIED.
  - THE COMPLETE SYSTEM INSTALLATION SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE NATIONAL FIRE SAFETY CODE, THE (ADA) AMERICAN DISABILITIES ACT, THE NATIONAL ELECTRICAL CODE, REQUIREMENTS, AND ALL THE REQUIREMENTS OF THE LOCAL FIRE DEPARTMENT.
  - THE REQUIREMENTS OF THE GENERAL CONDITIONS AND THE SUPPLEMENTARY CONDITIONS OF THE CONTRACT DOCUMENTS SHALL APPLY TO ALL WORK SPECIFIED IN THIS SECTION.
  - THE WORK COVERED UNDER THIS SECTION OF THE CONTRACT SPECIFICATIONS SHALL BE COORDINATED WITH ALL OTHER WORK SPECIFIED IN THE OTHER SECTIONS OF THE CONTRACT SPECIFICATIONS.
  - THE FIRE ALARM SYSTEM DESCRIBED HEREIN AND AS SHOWN ON THE PLANS, SHALL BE WIRED, CONNECTED, TESTED AND LEFT IN FIRST CLASS OPERATING CONDITION. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE PROPER CONTROL EQUIPMENT, CONTROL INTERFACE ANNUNCIATORS, ALARM INITIATING DEVICES, ALARM NOTIFICATION APPLIANCES, WIRING, TERMINATIONS, ELECTRICAL BOXES, AND ALL OTHER NECESSARY MATERIALS FOR A COMPLETE OPERATING SYSTEM.
- B. SYSTEM OPERATION**
- THE SYSTEM OPERATION SUBSEQUENT TO THE ACTIVATION OF ANY MANUAL OR AUTOMATIC ALARM INITIATING DEVICE SHALL BE AS FOLLOWS:
    - A. ALL AUDIBLE VISUAL ALARM INDICATING APPLIANCES SHALL SOUND AT NEW FIRE ALARM PANEL AND AT THE REMOTE ANNUNCIATOR UNTIL SILENCED BY THE ALARM SILENCE SWITCH.
    - B. THE ALARM SHALL BE DISPLAYED ON AN 80-CHARACTER LCD DISPLAY. THE TOP LINE OF 40 CHARACTERS SHALL BE THE POINT LABEL, AND THE SECOND LINE SHALL BE THE DEVICE TYPE IDENTIFIER. THE SYSTEM ALARM LED SHALL FLASH ON THE CONTROL PANEL UNTIL THE ALARM HAS BEEN ACKNOWLEDGED. ONCE ACKNOWLEDGED, THIS SAME LED SHALL LATCH ON. A SUBSEQUENT ALARM RECEIVED FROM ANOTHER ZONE SHALL FLASH THE SYSTEM ALARM LED ON THE CONTROL PANEL. THE LCD DISPLAY SHALL SHOW THE NEW ALARM INFORMATION, AT THE CONTROL PANEL.
    - C. TRANSMIT A SIGNAL FROM THE CONTROL PANEL VIA AN RS232 SERIAL PORT, TO PRINT THE SYSTEM STATUS CHANGES ON THE REMOTE SYSTEM PRINTER.
    - D. ACTIVATE THE MUNICIPAL CONNECTION VIA THE RADIO MASTER BOX.
    - E. ACTIVATE CONTROL RELAYS LOCATED WITHIN AN EXTERNAL CONTROL CABINET LOCATED NEXT TO THE FIRE ALARM CONTROL PANEL SPECIFIED. IN ADDITION TO BUILDING EVACUATION THE FOLLOWING AUXILIARY CONTROL AND INTERFACE FUNCTIONS SHALL BE PROVIDED BY THE SPECIFIED SYSTEM:
      - RELEASE OF MAGNETIC DOOR HOLDERS UPON ALARM.
      - SHUT DOWN OF THE HVAC FAN SHUTDOWN AND MANUAL (HOA) OVERRIDE.
      - ELEVATOR RECALL OPERATION IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE REQUIREMENTS FOR ELEVATORS.
- C. SYSTEM SUPERVISION**
- THE SYSTEM SHALL BE PROVIDED WITH STYLE 6 (SLC) ADDRESSABLE DEVICE COMMUNICATION CIRCUITS, STYLE D (IDCI) INITIATING DEVICE CIRCUITS AND STYLE Z1 NOTIFICATION APPLIANCE CIRCUITS. ALL SYSTEM FAULTS SHALL BE INDICATED AND DISPLAYED AT THE CONTROL PANEL.
  - THE SYSTEM SHALL BE PROVIDED WITH A STANDBY BATTERY SET OR SETS, WITH SUFFICIENT CAPACITY TO OPERATE THE ENTIRE SYSTEM UPON LOSS OF NORMAL OPERATING POWER, FOR A TIME PERIOD OF RHODE ISLAND: (60) HOURS IN SUPERVISORY MODE, WITH (15) MINUTES OF ALARM AT THE END OF THE (60) HOUR TIME PERIOD. THE STANDBY BATTERY SET SHALL BE CHARGED, LOAD TESTED AND MONITORED FOR EITHER A DISCONNECTED OR LOW BATTERY STATUS CONDITION BY THE SYSTEM. ANY FAULT DETECTED WITH THE STANDBY BATTERIES SHALL BE INDICATED AND DISPLAYED AT THE CONTROL PANEL.

- D. ISOLATE MODULES**
- PROVIDE FIELD MOUNTED ISOLATE MODULES FOR EVERY 20 DEVICES TO PROTECT CIRCUIT INTEGRITY IN THE EVENT OF A WIRING FAULT & ENSURE STYLE 6 WIRING CONVENTIONS.
- E. RESET SYSTEM**
- THE SYSTEM RESET BUTTON SHALL BE USED TO RETURN THE SYSTEM TO ITS NORMAL STATE AFTER AND ALARM CONDITION HAS BEEN REMEDIED. THE LCD DISPLAY SHALL STEP THE USER THROUGH THE RESET PROCESS WITH SIMPLE ENGLISH LANGUAGE MESSAGES. "SYSTEM RESET IN PROGRESS" WILL FIRST BE DISPLAYED, FOLLOWED BY THE MESSAGE "SYSTEM RESET COMPLETED," AND FINALLY "SYSTEM IS NORMAL," SHOULD ALL ALARM CONDITIONS BE CLEARED. IN ORDER TO MAINTAIN CONSISTENCY WITH OTHER EXISTING PANELS, NO DEVIATION FROM THESE MESSAGES CAN BE ACCEPTED.
  - SHOULD AN ALARM CONDITION CONTINUE TO EXIST, THE MESSAGE "SYSTEM RESET IN PROGRESS" WILL BE FOLLOWED BY THE MESSAGE "SYSTEM RESET ABORTED," AND THE SYSTEM WILL REMAIN IN AN ABNORMAL STATE. SYSTEM CONTROL RELAYS SHALL NOT RESET. THE SONALERT AND THE ALARM LED WILL BE ON. THE DISPLAY WILL INDICATE THE TOTAL NUMBER OF ALARMS AND TROUBLES PRESENT IN THE SYSTEM, ALONG WITH A PROMPT TO USE THE ACK KEYS TO REVIEW THE POINTS. THESE POINTS WILL NOT REQUIRE ACKNOWLEDGEMENT IF THEY WERE PREVIOUSLY ACKNOWLEDGED.
- F. H.O.A. SWITCHES**
- PROVIDE KEY PAD POSITION SWITCH AS SHOWN ON CONTRACT DRAWINGS.
- G. SILENT WALKTEST WITH HISTORY LOGGING**
- THE SYSTEM SHALL BE CAPABLE OF BEING TESTED BY ONE PERSON, WHILE IN THE TESTING MODE, THE ALARM ACTIVATION OF AN INITIATING DEVICE CIRCUIT SHALL BE SILENTLY LOGGED AS AN ALARM CONDITION IN THE HISTORICAL DATA FILE. THE PANEL SHALL AUTOMATICALLY RESET ITSELF AFTER LOGGING OF THE ALARM. THE SYSTEM SHALL SIGNAL THE DEVICE ZONE NUMBER THROUGH THE BUILDING AUDIBLE UNITS, FOR IMMEDIATE VERIFICATION BY THE TEST TECHNICIAN. DUE TO THE CRITICAL NATURE OF THE TEST PROCEDURES, NO DEVIATION FROM THIS SECTION CAN BE ACCEPTED.
- H. LED SUPERVISION**
- ALL SLAVE MODULE LEDES SHALL BE SUPERVISED FOR BURNOUT OR DISARRANGEMENT. SHOULD A PROBLEM OCCUR, THE LCD SHALL DISPLAY THE MODULE AND LED LOCATION NUMBERS TO FACILITATE LOCATION OF THE LED. DUE TO THE CRITICAL NATURE OF THE PANEL LED FUNCTIONS, NO DEVIATION FROM THIS REQUIREMENT CAN BE ACCEPTED.
- I. SYSTEM TROUBLE REMINDER**
- A TROUBLE REMINDER FUNCTION SHALL BE PRESENT WITH THE SYSTEM AND WHEN THE INITIAL TROUBLE SIGNAL SILENCED, THE TROUBLE SIGNAL SHALL BE RE-SOUNDED AT PROGRAMMABLE TIME INTERVALS TO ACT AS REMINDER THAT THE INITIAL TROUBLE SIGNAL IS NOT 100% OPERATIONAL. BOTH THE AUDIBLE FEEDBACK AND THE TROUBLE REMINDER SIGNALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING CODE AND NFPA.
- J. DESCRIPTION**
- PROVIDE A VGA COLOR TOUCH SCREEN LCD ANNUNCIATOR AND STATIC GRAPHIC PLOT PLAN AS SHOWN ON THE CONCEPT DRAWINGS. SUBMIT A LAYOUT OF THIS UNIT TO THE ENGINEER FOR APPROVAL.
  - PROVIDE TIE-IN CONNECTIONS TO THE LOCAL FIRE DEPARTMENT.
- K. ADDRESSABLE DUCT DETECTOR HEAD**
- PROVIDE REMOVABLE DETECTOR HEADS WHERE INDICATED OR REQUIRED.
  - DETECTOR HEADS SHALL MEET UL LISTED. SHALL BE A COMBINATION HEAT (155°F) AND FIXED TEMPERATURE (135°F) TYPE, WHERE INDICATED.
  - PROVIDE REMOTE LED ALARM INDICATORS, AS INDICATED ON PLANS.
- L. STROBE LIGHT**
- PROVIDE A MULTI-CANDELA STROBE APPLIANCE.
- M. MAGNETIC DOOR HOLDERS**
- PROVIDE SEMI-FLUSH WALL MOUNTED, 120 V.A.C AND 24 V.D.C. WITH LONG CATCH PLATE.

- N. PHOTOELECTRIC DETECTOR HEAD**
- PROVIDE PHOTOELECTRIC TYPE DETECTORS, WHERE INDICATED OR REQUIRED. THEY SHALL BE A PLUG-IN UNIT WHICH MOUNTS TO A TWISTLOCK BASE, AND SHALL BE UL APPROVED.
  - THE DETECTORS SHALL BE OF THE SOLID STATE PHOTOELECTRIC TYPE AND SHALL CONTAIN NO RADIOACTIVE MATERIAL. THEY WILL USE A REFRACTED INFRARED LED LIGHT SOURCE AND BE SEALED AGAINST REAR AIR FLOW ENTRY.
  - THE DETECTOR SHALL FIT INTO A BASE THAT IS COMMON WITH BOTH THE HEAT DETECTOR AND IONIZATION TYPE DETECTOR AND SHALL BE COMPATIBLE WITH OTHER ADDRESSABLE DETECTORS, ADDRESSABLE MANUAL STATIONS, AND ADDRESSABLE ZONE ADAPTER MODULES ON THE SAME CIRCUIT. DEVICE ADDRESSES SHALL BE CONTAINED IN THE BASE OF THE DETECTOR. THOSE SYSTEMS WHICH PROVIDE ADDRESSING IN THE HEAD, SHALL PROVIDE AN ADDRESSABLE MONITOR MODULE AND A CONVENTIONAL DETECTOR ASSEMBLY TO ALLOW THE OWNER TO REPLACE A DETECTOR HEAD WITHOUT THE NEED OF VERIFYING DETECTOR ADDRESS.
  - THERE SHALL BE NO LIMIT TO THE NUMBER OF DETECTORS OR ZONE ADAPTER MODULES WHICH MAY BE ACTIVATED OR "IN ALARM" SIMULTANEOUSLY.
  - DUE TO THE REQUIREMENT FOR IMMEDIATE CHANGE OUT OF DETECTOR HEADS ADDRESS SETTING SWITCHES, JUMPERS ETC., MAY BE PROVIDED IN THE HEAD OR BEHIND THE DETECTOR BASE. DETECTORS WHICH USE DIP SWITCHES ARE NOT ACCEPTABLE.
  - PROVIDE A DUCT HOUSING WITH SENSOR, WITH RELAY. THE RELAY SHALL BE SOFTWARE PROGRAMMABLE TO ALLOW THE UNIT IN WHICH THE DETECTOR IS MOUNTED IN TO BE SHUT DOWN, OR ANY OTHER DEVICE TO BE CONTROLLED BY THIS PROGRAMMABLE RELAY. THE RELAY MAY BE A SEPARATE UNIT FROM THE DUCT HOUSING TO ALLOW FOR TROUBLESHOOTING AND DISCONNECTS.
  - PROVIDE SAMPLING TUBE AS REQUIRED FOR UNIT SIZE.
  - PROVIDE A REMOTE TEST UNIT FOR EACH DUCT SMOKE DETECTOR WITH LED ALARM INDICATOR AND TEST KEY SWITCH.
- O. AUDIBLE/VISUAL UNIT (XENON STROBE)**
- PROVIDE MULTI-CANDELA HORN/STROBE UNITS COMPRISED OF A HORN AND XENON FLASH TUBE ENTIRELY SOLID STATE. THE UNIT TO CONFORM TO ITS REQUIREMENTS.
  - VISUAL FLASHING LAMPS (XENON STROBE)
  - VISUAL INDICATING APPLIANCES SHALL BE COMPRISED OF A XENON FLASH TUBE AND BE ENTIRELY SOLID STATE. THIS UNIT SHALL MOUNT TO A SINGLE GANG BOX AND PLATE FOR SURFACE MOUNT. MINIMUM OF 75 CD LIGHT OUTPUT TO CONFORM TO A.D.A. ALL STROBES SHALL BE SYNCHRONIZED.
- P. MINI-HORNS**
- WHITE WIRED LETTERING MINI HORN WHERE INDICATED ON CONTRACT DRAWINGS. THE UNIT SHALL MOUNT TO A SINGLE E, DEEP GANG BOX.
- Q. STROBE LIGHT**
- PROVIDE A MULTI-CANDELA STROBE APPLIANCE.
- R. MAGNETIC DOOR HOLDERS**
- PROVIDE SEMI-FLUSH WALL MOUNTED, 120 V.A.C AND 24 V.D.C. WITH LONG CATCH PLATE.
- S. BATTERIES AND BATTERY CABINET**
- PROVIDE MAINTENANCE-FREE BATTERIES.
- T. RELAY MODULE**
- PROVIDE ADDRESSABLE RELAY TO PROVIDE SUPERVISED CONTROL OF AUXILIARY CIRCUITS (AHU's, DOOR HOLDERS, ETC) VIA SLC ADDRESSABLE LOOP. RELAY SHALL PROVIDE SUPERVISED OUTLET FOR 3 AMPS @ 30VDC OR 0.5 AMPS AT 120VAC, WHERE CURRENT EXCEEDS LIMITATIONS PROVIDE ISOLATION RELAY RATED FOR REQUIRED LOAD.
- U. INSTALLATION FIRE ALARM WIRING**
- ALL FIRE ALARM WIRING SHALL CONFORM TO THE APPLICABLE STATE AND LOCAL FIRE SAFETY CODES.

- T. SHUTDOWNS OF ANY EXISTING SYSTEMS**
- THIS CONTRACTOR SHALL COORDINATE ALL REQUIRED SHUTDOWNS OF THE EXISTING FIRE ALARM SYSTEM DURING THE DURATION OF THIS CONTRACT. ALL SYSTEM SHALL BE COORDINATED WITH THE OWNER AND THE FIRE DEPARTMENT. THE FIRE ALARM SYSTEMS SHALL BE RETURNED TO A NORMAL MODE OF OPERATION BY THE END OF EACH WORKDAY. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL COSTS INCURRED FOR A FIRE WATCH IF THE SYSTEM IS NOT OPERATIONAL AT THE END OF A WORKDAY.
- U. TRAINING**
- THE ELECTRICAL CONTRACTOR AND SYSTEM MANUFACTURER SHALL PROVIDE A MINIMUM OF ONE (1) ON-SITE TRAINING SESSIONS FOR THE OWNER'S FIRE SAFETY OFFICIALS. EACH SESSION SHALL BE A MINIMUM OF 1 HOUR.
- SEQUENCE OF OPERATION**
- UPON CHANGE IN STATUS OF ANY DEVICE ON THE SYSTEM, THE FIRE ALARM CONTROL PANEL SHALL ACTIVATE AUDIBLE AND VISIBLE CHANGE INDICATORS AND DISPLAY THE SYSTEM POINT NUMBER, POINT DESCRIPTION, AND MESSAGE ASSOCIATED WITH THE POINT.
  - ACTIVATION OF ANY MANUAL STATION, KITCHEN HOOD EXTINGUISHING SYSTEM, WATER FLOW DEVICE, SMOKE DETECTOR, HEAT DETECTOR, SUPERVISORY DEVICE OR OTHER INITIATING DEVICE WILL CAUSE THE FOLLOWING FUNCTIONS TO OCCUR:
    - a. ACTIVATE AUDIBLE AND VISIBLE STATUS CHANGE INDICATORS AND DISPLAY THE SYSTEM POINT NUMBER, POINT DESCRIPTION, AND ANY MESSAGE ASSOCIATED WITH THE POINT ON THE PANEL.
    - b. TRANSMIT AN ALARM SIGNAL TO A UL LISTED SIGNAL STATION.
    - c. ACTIVATE THE AUDIBLE AND VISIBLE NOTIFICATION APPLIANCES ON THE FLOOR.
    - d. RELEASE THE DOOR LOCKING SYSTEM.
- WATERFLOW SWITCH OPERATION SHALL:**
- ACTIVATE AUDIBLE AND VISIBLE STATUS CHANGE INDICATORS AND DISPLAY THE SYSTEM POINT NUMBER, POINT DESCRIPTION, AND ANY MESSAGE ASSOCIATED WITH THE POINT ON THE PANEL.
  - TRANSMIT AN ALARM SIGNAL TO A UL LISTED SIGNAL STATION.
  - ACTIVATE THE AUDIBLE AND VISIBLE NOTIFICATION APPLIANCES ON THE FLOOR.
- SMOKE DETECTOR OR HEAT DETECTOR OPERATION SHALL:**
- ACTIVATE AUDIBLE AND VISIBLE STATUS CHANGE INDICATORS AND DISPLAY THE SYSTEM POINT NUMBER, POINT DESCRIPTION, AND ANY MESSAGE ASSOCIATED WITH THE POINT ON THE PANEL.
  - TRANSMIT AN ALARM SIGNAL TO A UL LISTED SIGNAL STATION.
  - ACTIVATE THE AUDIBLE AND VISIBLE NOTIFICATION APPLIANCES ON THE FLOOR.
  - SHUT DOWN AHU'S.
- DUCT SMOKE DETECTOR ACTIVATION SHALL:**
- ACTIVATE AUDIBLE AND VISIBLE STATUS CHANGE INDICATORS AND DISPLAY THE SYSTEM POINT NUMBER, POINT DESCRIPTION, AND ANY MESSAGE ASSOCIATED WITH THE POINT ON THE PANEL.
  - TRANSMIT SUPERVISORY SIGNAL TO A UL LISTED SIGNAL STATION.
  - SHUT DOWN AHU'S.
- SUPERVISORY DEVICE ACTIVATION, INCLUDING VALVE SUPERVISORY DEVICES SHALL:**
- ACTIVATE AUDIBLE AND VISIBLE STATUS CHANGE INDICATORS AND DISPLAY THE SYSTEM POINT NUMBER, POINT DESCRIPTION, AND ANY MESSAGE ASSOCIATED WITH THE POINT ON THE PANEL.
  - TRANSMIT SUPERVISORY SIGNAL TO A UL LISTED SIGNAL STATION. THIS SIGNAL SHALL BE DISTINCTLY DIFFERENT THAN A TROUBLE SIGNAL.
  - SHUT DOWN AHU'S.
- REMOVAL OF ANY DEVICE, WIRING DISARRANGEMENT, OR SYSTEM COMPONENT FAILURE SHALL DISPLAY ON THE OPERATOR TERMINAL, THE CHANGE OF STATUS, TIME, DATE, POINT DESCRIPTION ON A POINT BY POINT BASIS, AND ANY MESSAGE ASSOCIATED WITH THE POINT AND TRANSMIT A TROUBLE SIGNAL TO A UL LISTED CENTRAL STATION.**



**FIRE ALARM KEYED NOTES:**

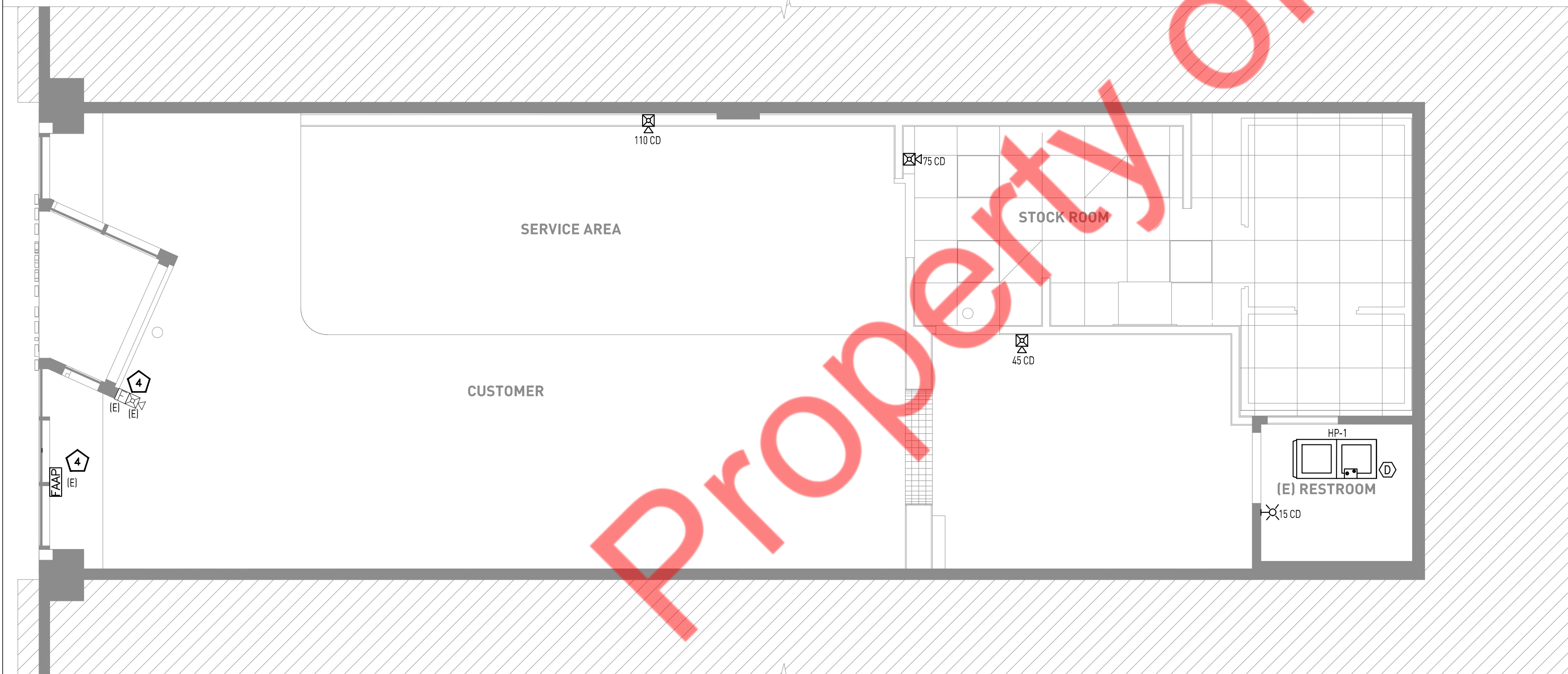
- CONTRACTOR TO VERIFY THE AVAILABILITY OF AND SPARE CAPACITY IN FACP PANEL WITH THE BASE BUILDING. PROVIDE NEW FACP IF NEEDED. INFORM EOR OR ANY DISCREPANCY BEFORE BID.
- NEW FIRE ALARM ANNUNCIATOR PANEL (FAFP) TO BE COMPATIBLE WITH THE NEW FIRE ALARM CONTROL PANEL. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION.
- PROVIDE NEW SPRINKLER FLOW AND TAMPER SWITCHES, INCLUDING ADDRESSABLE MONITOR MODULES, WIRING, CONDUIT, AND CONNECTION TO EXISTING FIRE ALARM SYSTEM. COORDINATE FINAL CONNECTION POINTS, SUPERVISION, AND REPORTING REQUIREMENTS WITH AHJ AND BUILDING FIRE ALARM VENDOR.
- E.C. TO FIELD-VERIFY THE LOCATION, CONNECTION REQUIREMENTS, AND OPERABLE CONDITION OF ALL EXISTING EQUIPMENT. PROVIDE NEW EQUIPMENT IF ANY EXISTING UNIT IS FOUND INOPERABLE. NOTIFY ARCHITECT / OWNER OF ANY DISCREPANCIES PRIOR TO COMMENCING WORK.

**FIRE ALARM RISER GENERAL NOTES:**

- REFER TO FLOOR PLAN FOR EXACT QUANTITIES AND LOCATIONS OF ALL DEVICES.
- THE FIRE ALARM SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 72, FLORIDA BUILDING CODE, AND LOCAL AHJ REQUIREMENTS.
- ALL FIRE ALARM DEVICES AND FAAP SHOWN ON THE PLAN SHALL BE COMPATIBLE WITH THE BASE BUILDING FACP.
- ALL FIRE ALARM WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF NFPA, STATE, AND LOCAL BUILDING CODES AND THE AMERICANS WITH DISABILITIES ACT (ADA).
- PROVIDE REMOTE BOOSTER POWER SUPPLY PANELS AS REQUIRED.
- PROVIDE FAULT ISOLATION MODULES ON THE SIGNAL LINE CIRCUIT TO PROTECT THE SYSTEM FROM LINE TO LINE FAULTS. MODULES SHALL BE PROVIDED AS REQUIRED, WITH A MINIMUM OF (1) MODULE PER EVERY 25 DEVICES.

**FIRE ALARM SYSTEM LEGENDS**

	MANUAL PUL STATION		VISIBLE ONLY (STROBE) - WALL MOUNT CD- CANDELA RATING/SETTING.
	FIRE ALARM CONTROL PANEL		HORN ONLY (AUDIBLE).
	FIRE ALARM ANNUNCIATOR PANEL		COMBINATION HORN/VISIBLE CD- CANDELA RATING/SETTING.
	DUCT SMOKE DETECTOR		CONTROL MODULE
	WATER FLOW SWITCH		TAMPER SWITCH
	REMOTE TEST SWITCH		MONITOR MODULE



**I/O MATRIX:**

SYSTEM INPUTS INITIATING DEVICES	CONTROL UNIT ANNUNCIATION				NOTIFICATION					
	A	B	C	D	E	F	G	H	I	J
1 FIRE ALARM AC POWER FAILURE		●	●	●				●		
2 FIRE ALARM SYSTEM LOW BATTERY		●	●	●				●		
3 OPEN CIRCUIT		●	●	●				●		
4 GROUND CIRCUIT		●	●	●				●		
5 NOTIFICATION APPLIANCE CIRCUIT SHORT		●	●	●				●		
6 DUCT SMOKE DETECTOR	●	●	●	●	●					●
7 SPRINKLER CONTROL VALVE/TAMPER SWITCH		●	●	●						●
8 MANUAL PULL STATION	●	●	●	●	●	●				●