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POWER PLAN

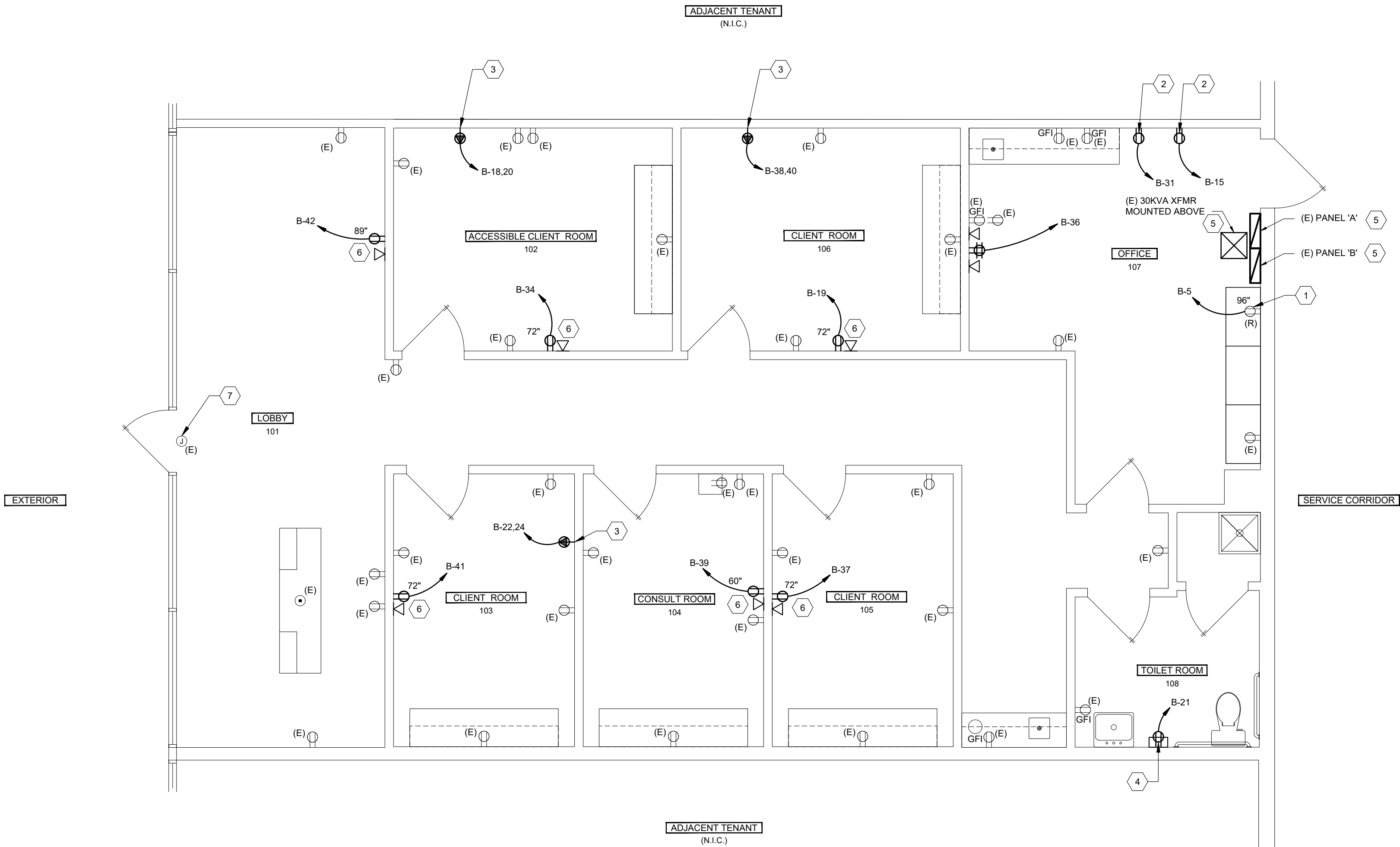
POWER PLAN GENERAL NOTES

- DESIGN DRAWINGS ARE SCHEMATIC. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THE CONTRACTOR SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.
- THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR TENANT PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN THIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR TENANT AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT THE CONTRACTORS COST.
- BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES. THE PLANS AND SPECIFICATIONS NOT WITHSTANDING, THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR TENANT OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.
- REFER TO MECHANICAL PLAN FOR LOCATION OF MECHANICAL EQUIPMENT. FIELD VERIFY EXACT LOCATIONS. PROVIDE CONVENIENCE RECEPTACLES, SAFETY SWITCHES, WIRING, AND OTHER EQUIPMENT TO ENSURE A COMPLETE AND OPERABLE HVAC SYSTEM.
- ALL CEILING MOUNTED RECEPTACLES AND COVERPLATES IN WHITE CEILING SHALL BE WHITE.
- ALL WALL MOUNTED RECEPTACLES, SWITCHES, AND COVERPLATES SHALL BE WHITE.
- FOR DATA/TELEPHONE AND SPEAKER OUTLETS, PROVIDE CONDUITS FROM OUTLET BOX TO ACCESSIBLE CEILING. IF A FULL CONDUIT SYSTEM IS REQUIRED, PROVIDE A PULL/JUNCTION BOX AFTER EACH SET OF THREE 90 DEGREE BENDS.
- LABEL ALL COVERPLATES ON INSIDE FACE OF PLATE WITH CIRCUIT NUMBER AND PANEL DESIGNATION. I.E. 'A-1'. CIRCUIT SHALL BE WRITTEN WITH PERMANENT MARKER IN A CONTRASTING COLOR.
- GENERAL CONTRACTOR SHALL PROVIDE ALL REQUIRED TELEPHONE, DATA, LOW VOLTAGE CABLING AND MAKE NECESSARY CONNECTIONS PER RESPONSIBILITY SCHEDULE.
- FOR SPEAKER, TELEPHONE, AND DATA CABLING TRANSITIONS TO/FROM CONDUIT, PROVIDE A BUSHING TO PROTECT THE CABLE FROM THE EDGES OF THE CONDUIT.
- ALL HORIZONTAL CABLING FOR VOICE AND DATA SHALL BE CATEGORY 6 RATED.
- ALL THE WIRING IN PLENUM CEILING SHALL BE IN CONDUIT OR PLENUM RATED.
- REFER TO SPECIFICATIONS SECTIONS 26 27 26 WIRING DEVICES, FOR EXACT MODEL NUMBER OF DEVICES TO BE USED.
- FIELD VERIFY ALL CONDITIONS.
- FIRE ALARM PLANS MUST BE ENGINEERED AND WET SIGNED AND SEALED BY A LANDLORD APPROVED, LICENSED, REGISTERED FIRE ALARM CONTRACTOR IN THE LOCAL JURISDICTION. GENERAL CONTRACTOR SHALL FIELD VERIFY AND COORDINATE REQUIREMENTS WITH LANDLORD PRIOR TO BID AND INCLUDE THE COST OF THIS WORK IN THIS BID.
- OWNER TO TERMINATE ALL NETWORK CABLING TO DEVICES.
- CLIENT ROOMS TO BE PROVIDED WITH HOSPITAL GRADE MC CABLE WITH SECONDARY GROUNDING FOR ALL RECEPTACLES. RECEPTACLES SHALL BE HOSPITAL GRADE WITH SECONDARY GROUNDING.

H

POWER PLAN CODED NOTES

D



VERIFY ALL CONDITIONS
IN FIELD PRIOR TO BIDS.

1/4" = 1'-0"

A

ELECTRICAL POWER PLAN

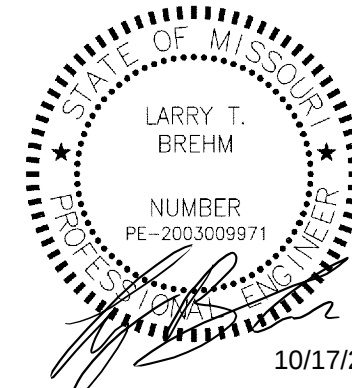
LASERAWAY

LEE'S SUMMIT
880 NW BLUE PKWY
SUITE H
LEE'S SUMMIT, MO 64086

SAI# 250422

DRAWING NUMBER:

E1.0



10/17/2025

DRAWN BY: ASE CHECKED BY: TAV

REVISIONS:

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THE ARCHITECT / ENGINEER ASSUMES NO RESPONSIBILITY OR LIABILITY FOR THE USE OF THESE PLANS FOR ANY PROJECT OTHER THAN SPECIFICALLY AUTHORIZED BY THEM AND SIGNED AND SEALED FOR SUCH SPECIFIC LOCATION IN THE STATE, PROVINCE OR TERRITORY SHOWN ON THE SEAL. THIS BUILDING USE IS ONLY APPLICABLE IN AREAS MEETING THE STATED DESIGN CRITERIA.

DATE ISSUED:
09/22/2025

* INDICATES NO REVISION TO THIS SHEET

● PLOTTED: 10/17/2025 2:06 PM

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ELECTRICAL SYMBOLS LIST

A

NOT USED

ELECTRICAL RESPONSIBILITY SCHEDULE

G

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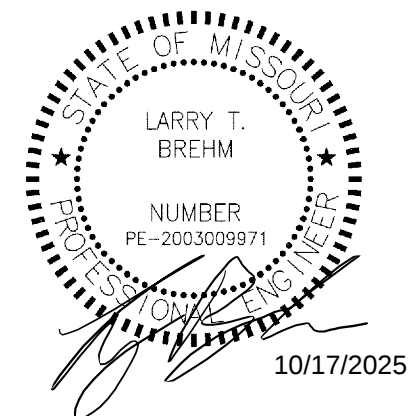
RESPONSIBILITY SCHEDULE

CSI DIVISION	DESCRIPTION	CONTRACTOR		VENDOR/OWNER		LANDLORD		SUBMITTAL REQUIRED	NOTES
		N/A	EXIST	FURN.	INST.	FURN.	INST.		
26	ELECTRICAL								
	ELECTRICAL STEP-DOWN TRANSFORMER		●						
	ELECTRICAL PANEL AND BREAKERS		●	●	●				EXISTING PANELS TO REMAIN. PROVIDE NEW BREAKERS AS SCHEDULED
	ELECTRICAL CONDUIT, WIRING & EQUIP		●	●	●				WIRING IN CONDUIT OR MC CABLE AS REQUIRED BY LOCAL CODE.
	ELECTRICAL STUB-IN TO SPACE		●						
	DISCONNECT, METER AND METER BOXES		●						
	LIGHTING PACKAGE		●						EXISTING TO REMAIN
	EMERGENCY LIGHTING		●						EXISTING TO REMAIN
	REAR DOOR BUZZER	●							
	LIGHTING DEVICES, CONTROLS & PANELS		●						EXISTING TO REMAIN
	POS EQUIPMENT					●	●		
	POS SYSTEM & PRE-CHECK					●	●		PULLED BY VENDOR. OWNER TO MAKE FINAL CONNECTION
27	COMMUNICATIONS								
	AUDIO SOUND SYSTEM		●						EXISTING TO REMAIN
	AUDIO SYSTEM WIRING		●						EXISTING TO REMAIN
	TELEPHONE CONDUIT STUB-IN TO SPACE		●	●	●				
	TELEPHONE SYSTEM, INSIDE JACKS, WIRING, CONDUITS		●	●	●	●	●		CONDUITS AND PULL STRINGS BY G.C. VENDOR INSTALLED WIRING, JACKS AND WIRES FROM D-MARK TO TERMINAL BRD.
	CAT6 CABLES					●	●		
	COMPUTERS, IT RACK & PATCH PANEL					●	●		CONDUIT AND PULLSTRINGS (WHERE INDICATED/REQ'D) BY GC
	CAT6 AND AUDIO SYSTEM CONDUIT			●	●				CONDUIT AND PULLSTRINGS BY GC
28	ELECTRONIC SAFETY AND SECURITY								
	SECURITY SYSTEM		●						EXISTING TO REMAIN
	FIRE ALARM SYSTEM		●						EXISTING TO REMAIN
	SMOKE DETECTORS/REMOTE TEST STATIONS	●							
NOTES: 1. THE WORK OF THIS CONTRACT IS NOT DEFINED EXCLUSIVELY BY THE RESPONSIBILITY SCHEDULE 2. TO DETERMINE THE FULL SCOPE OF WORK OF THE CONTRACT, REVIEW ALL DRAWINGS, SPECIFICATIONS AND CONTRACT DOCUMENTS. 3. G.C. TO CONFIRM WITH ALL OWNER VENDORS AND LOCAL JURISDICTION WITH ANY REQUIREMENTS FOR INSTALL OF CONDUIT, ADDITIONAL POWER, AND JUNCTION BOXES RELATED TO LOW VOLTAGE INSTALLATIONS. 4. REFER TO COVER SHEET FOR SPECIFIC VENDOR INFORMATION FOR VENDOR FURNISHED ITEMS. 5. TENANT G.C. TO PROVIDE UNLOADING AND STORAGE (AS REQUIRED) 6. ALL CONDUITS THAT ARE NOT DEDICATED FOR POWER OR LIGHTING SHALL HAVE PULL STRINGS INSTALLED AND BE LABELED FOR INTENDED USE.									

SYMBOL	DESCRIPTION	MOUNTING HEIGHT TO CENTERLINE UNLESS NOTED OTHERWISE
	SINGLE RECEPTACLE, 3 WIRE GROUND TYPE	18"
	DUPLEX RECEPTACLE, 3 WIRE GROUND TYPE	18"
	DUPLEX RECEPTACLE, 3 WIRE GROUND TYPE, CONTROL W/OCCUPANCY	18"
	L6-30 TWIST LOCK RECEPTACLE	18"
	DUPLEX RECEPTACLE, MOUNTED ABOVE STOREFRONT WINDOW	---
	DUPLEX RECEPTACLE, CEILING MOUNTED	---
	DUPLEX RECEPTACLE, WEATHERPROOF	18"
	GROUND FAULT PROTECTED DUPLEX RECEPTACLE	18"
	DOUBLE DUPLEX (QUADRUPLX) RECEPTACLE	18"
	RECEPTACLE (FLOOR MOUNTED)	---
	120V DUPLEX RECEPTACLE WITH DUAL USB PORTS	18"
	ELECTRIC PANEL	6'-0" TO TOP
	TRANSFORMER	AS REQUIRED
	SAFETY SWITCH (NON-FUSED)	AS REQUIRED
	SAFETY SWITCH (FUSED)	AS REQUIRED
	3-PHASE MAGNETIC MOTOR STARTER	AS REQUIRED
	COMBINATION STARTER/SAFETY SWITCH	AS REQUIRED
	SINGLE POLE SWITCH WITH OR WITHOUT PILOT LIGHT	48"
	DOUBLE POLE SWITCH WITH OR WITHOUT PILOT LIGHT	48"
	3 WAY SWITCH	48"
	4 WAY SWITCH	48"
	MOTOR - 1 PHASE	AS REQUIRED
	MOTOR - 3 PHASE	AS REQUIRED
	TIME CLOCK/SWITCH	AS REQUIRED
	TELEPHONE OUTLET	18"
	COMBINATION TELEPHONE/DATA OUTLET	18"
	DATA OUTLET	18"
	TELEPHONE OUTLET (FLOOR MOUNTED)	---
	COMBINATION TELEPHONE/DATA OUTLET (FLOOR MOUNTED)	---
	DATA OUTLET (FLOOR MOUNTED)	---
	LOW VOLTAGE PUSH BUTTON	48"
	COMBINATION BUZZER/BELL	AS REQUIRED
	LOW VOLTAGE TRANSFORMER	AS REQUIRED
	SPEAKER	---
	VOLUME CONTROL	48"
	TIMECLOCK	---
	WIRELESS ACCESS POINT (WAP)	---
	CAMERA	---
	JUNCTION BOX (JB)	AS REQUIRED
	THERMOSTAT	48"
	SENSOR	48"
	ZONE DAMPER (MOTORIZED)	---
	WALL MOUNTED OCCUPANCY SENSOR	44"
	WALL MOUNTED VACANCY SENSOR	44"
	CEILING MOUNTED OCCUPANCY SENSOR	---
	DAYLIGHT SENSOR	---
	DIMMER	---
	PHOTOCELL	---
	POWER PACK	---
	FIRE ALARM MANUAL PULL STATION	48"
	FIRE ALARM AUDIO/VISUAL SIGNAL DEVICE	80"
	FIRE ALARM VISUAL SIGNAL DEVICE	80"
	FIRE ALARM AUDIO SIGNAL DEVICE	80"
	FIRE ALARM SPEAKER/VISUAL SIGNAL DEVICE	80"
	FIRE ALARM SPEAKER SIGNAL DEVICE	80"
	MAGNETIC DOOR HOLDER VIA FIRE ALARM SYSTEM	48"
	FIRE ALARM CONTROL PANEL	AS REQUIRED
	FIRE ALARM REMOTE ANNUNCIATOR PANEL	AS REQUIRED
	FIRE ALARM BOOSTER PANEL	AS REQUIRED
	FIRE ALARM DUCT MOUNTED SMOKE DETECTOR	---
	REMOTE ALARM/TEST SWITCH FOR DUCT DETECTOR	AS REQUIRED
	CEILING MOUNTED SMOKE DETECTOR	---
	FIRE ALARM WATER FLOW SWITCH	AS REQUIRED
	FIRE ALARM TAMPER SWITCH	AS REQUIRED
	FIRE ALARM RELAY	AS REQUIRED
	BURGLAR ALARM SECURITY KEYPAD	4'-0" A.F.F.
	SECURITY MOTION DETECTOR	12'-0" TO B.O. J-BOX
	GLASS BREAK SENSOR	---
	DOOR CONTACTS	---
	BURGLAR PANEL	---
	SECURITY CAMERA PANEL	---
	EXISTING	---
	RELOCATED	---
	CEILING MOUNTED	---

NOTE: NOT ALL SYMBOLS USED

ELECTRICAL SYMBOLS &
RESPONSIBILITY SCHEDULE.



SAI# 250422

DRAWING NUMBER:

E2.0

LASERAWAY

LEE'S SUMMIT
880 NW BLUE PKWY
SUITE H
LEE'S SUMMIT, MO 64086

REVISIONS:

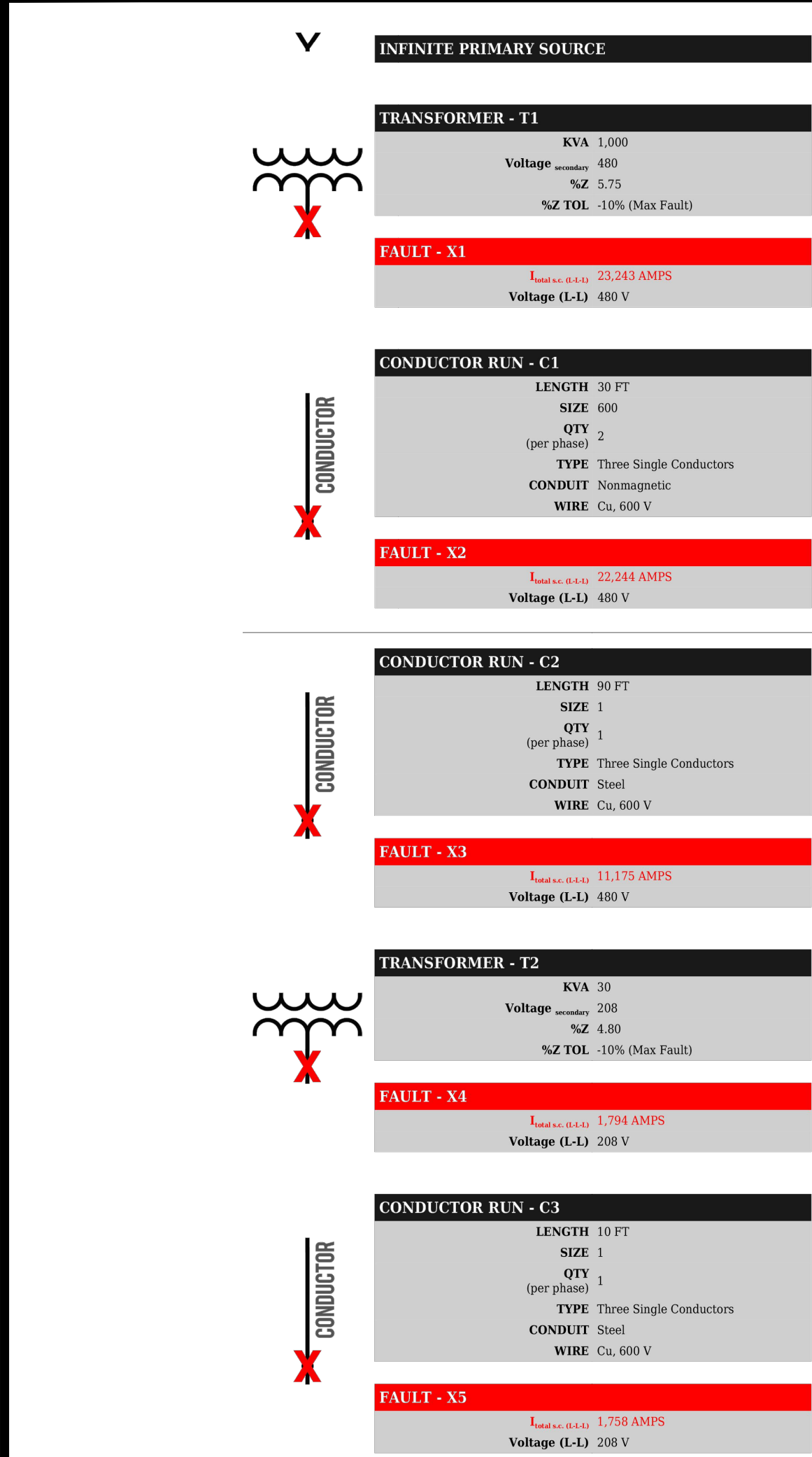
SHREMSHOCK

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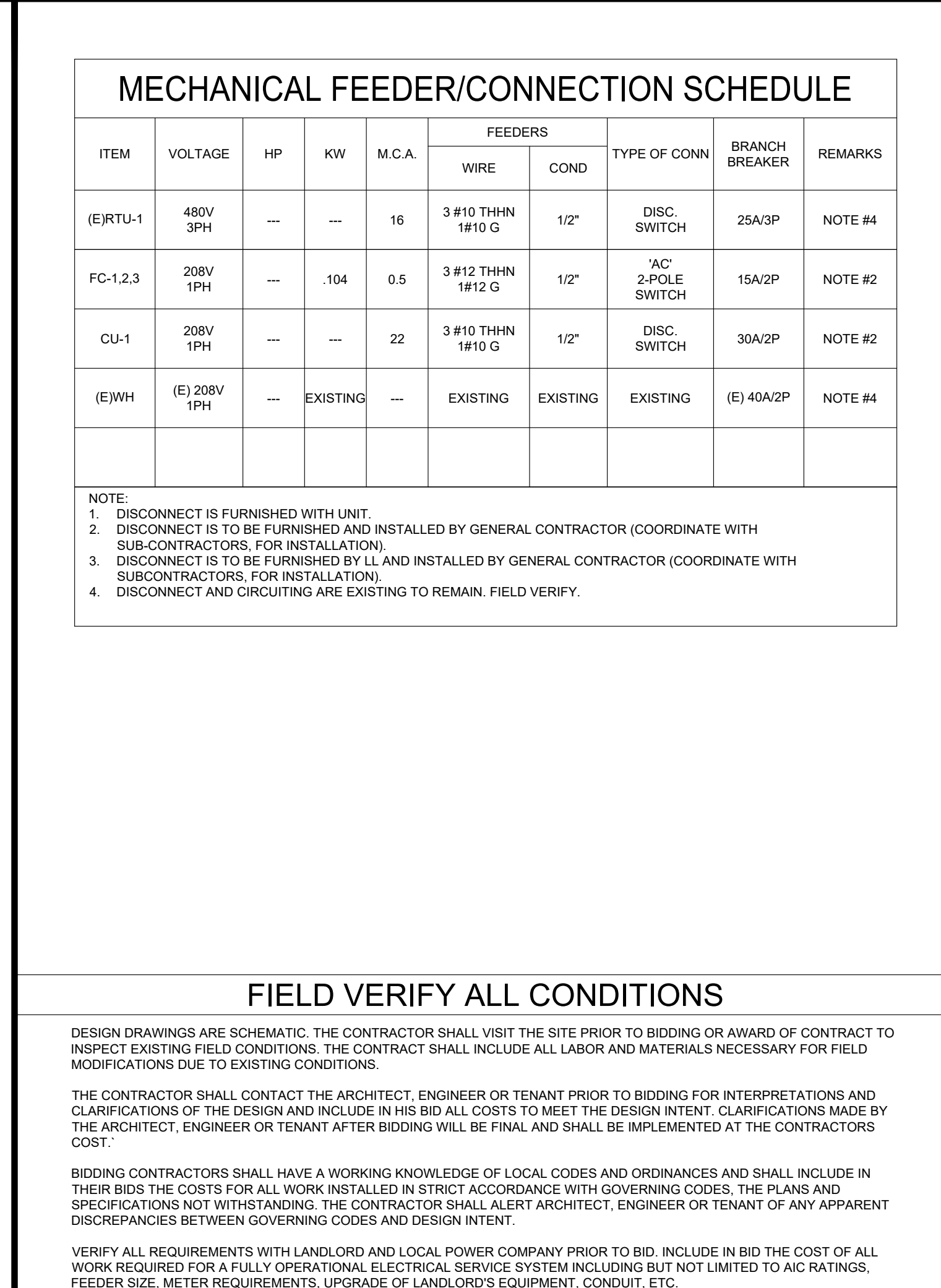
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DRAWN BY: ASE CHECKED BY: TAV

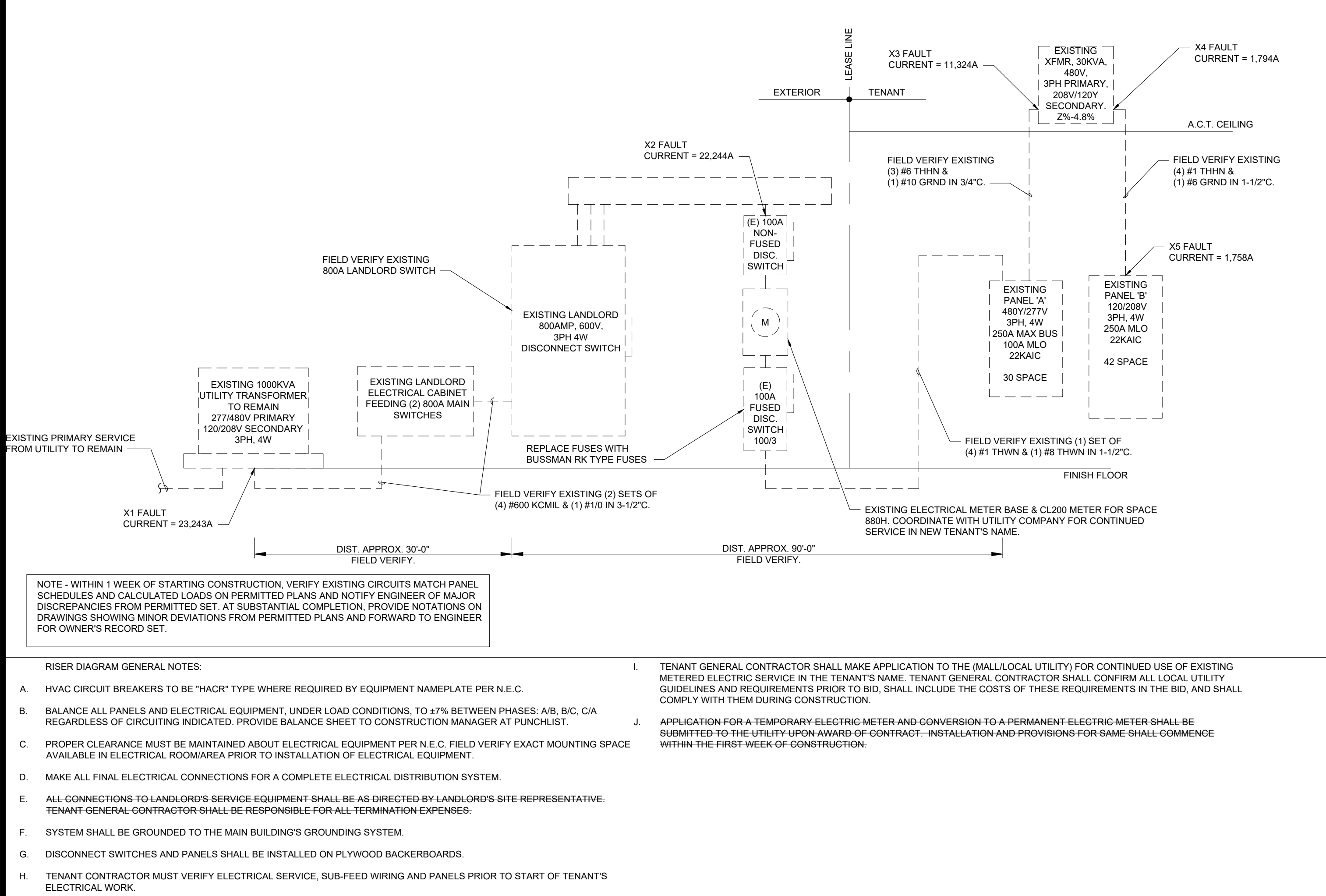
DATE ISSUED:
09/22/2025



FAULT CURRENT CALCULATIONS



MECHANICAL FEEDER SCHEDULE



ELECTRICAL RISER AND NOTES

Circuit Breaker Panelboard Schedule (3-phase). Table with columns for Ckt No, Zone/Note, Load Description, Equip #, Brkr Opts, Amps/Poles, Conn. kVA, Phase, Conn. kVA, Amps/Poles, Brkr Opts, Equip #, Load Description, Zone/Note, Ckt No. Includes a detailed demand summary table.

Circuit Breaker Panelboard Schedule (3-phase). Table with columns for Ckt No, Zone/Note, Load Description, Equip #, Brkr Opts, Amps/Poles, Conn. kVA, Phase, Conn. kVA, Amps/Poles, Brkr Opts, Equip #, Load Description, Zone/Note, Ckt No. Includes a detailed demand summary table.

Form for calculating voltage drop and estimated resistance. Includes input fields for wire material, size, voltage, phase, number of conductors, distance, and load current, along with a calculation button.

PANEL SCHEDULES AND LOAD SUMMARIES

REVISIONS: SHREMSHOCK LASERAWAY. Includes electrical load summary tables for 30KVA and 480V/277V systems, and a detailed drawing number E3.0.

26 05 00 COMMON WORK RESULTS FOR ELECTRICAL

1. ANY REFERENCE TO TENANT OR TENANTS' CONSTRUCTION MANAGER OR FURNISHED BY ANY OF THE ABOVE REFERS TO LASERAWAY.

2. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND OTHER SPECIFICATIONS SECTIONS, APPLY TO THIS AND THE OTHER SECTIONS OF DIVISION 26 THROUGH 27.

3. THE CONTRACTOR FOR THIS WORK IS REQUIRED TO READ THE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL DIVISIONS OF WORK AND IS RESPONSIBLE FOR THE WORK OF THE SUBCONTRACTORS WITHIN THE DIVISIONS OF WORK.

4. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE SUBCONTRACTORS WITH A COMPLETE SET OF BID DOCUMENTS.

4. THIS CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THE COMPLETION AND INSPECTION OF THIS WORK AND THE WORK OF THE SUBCONTRACTORS TO COMPLY WITH THE TENANT'S SCHEDULE AND THE PROJECT COMPLETION DATE.

5. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID SUBMISSION TO DETERMINE CONDITIONS AFFECTING THE WORK, ANY ITEMS WHICH ARE NOT COVERED IN THE BID DOCUMENTS OR ANY PROPOSED SUBSTITUTIONS SHALL BE LISTED SEPARATELY AND QUALIFIED IN THE CONTRACTOR'S BID. BID SUBMISSION SHALL SERVE AS EVIDENCE OF KNOWLEDGE OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. FAILURE TO VISIT THE SITE DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY IN PERFORMANCE OF WORK.

6. REFER TO RESPONSIBILITY SCHEDULE ON THE ARCHITECTURAL DRAWINGS FOR INFORMATION IN REGARD TO RESPONSIBILITY OF WORK OR ITEMS WHICH MAY AFFECT BID.

7. PROVIDE MATERIALS AND EQUIPMENT AND PERFORM LABOR REQUIRED TO INSTALL NEW COMPLETE ELECTRICAL SYSTEM AS INDICATED ON DRAWINGS, AS REQUIRED BY CODE AND AS SPECIFIED HEREIN, IN DIVISIONS 26 AND 27. WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

1. TEMPORARY SERVICE AS REQUIRED.

2. EMERGENCY AND EXIT LIGHTING SYSTEMS.

3. CONDUIT AND CABLES FOR TELEPHONE AND DATA SYSTEMS AS SHOWN ON THE DRAWINGS.

4. ELECTRICAL PANEL AND BRANCH CIRCUIT WIRING.

5. WIRING DEVICES AND PLATES.

6. LIGHTING FIXTURES AND LAMPS, INSTALLATION AND WIRING.

7. LIGHTING CONTROLS.

8. ELECTRICAL CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS, SIGNS, CORNICE LIGHTING, CASE LIGHTING, ETC., AS SHOWN ON DRAWINGS.

9. INSTALLATION OF CONDUIT AND CABLES FOR SOUND SYSTEM AS SHOWN ON DRAWINGS.

10. SMOKE/FIRE ALARM WIRING, DEVICES AND CONDUIT, AS SHOWN OR DESCRIBED ON DRAWINGS OR AS NECESSARY TO MEET LANDLORD, STATE, LOCAL, INSURANCE AND FIRE DEPARTMENT REQUIREMENTS.

11. INSTALLATION OF CONDUITS STUBBED TO ABOVE CEILING FOR HVAC, ALSO ANY ADDITIONAL CONDUIT FOR INVAC CONDUIT EQUIPMENT WHERE PLENUM RATED CABLES ARE NOT PERMITTED.

12. THE GENERAL CONTRACTOR SHALL PAY FOR ALL ELECTRICITY PRIOR TO STORE MERCHANDISING, AND INCLUDE COST IN BID.

13. WORK WHICH SHALL BE PERFORMED BY OTHERS, UNLESS NOTED OTHERWISE, INCLUDES THE FOLLOWING:

1. TEMPERATURE CONTROL WIRING THAT IS FURNISHED BY OTHERS PER-WIRED IN UNITS.

2. TELEPHONES AND FINAL CONNECTION OF WIRING HERETO.

3. INTERNAL WIRING OF EQUIPMENT FURNISHED AND PRE-WIRED BY OTHERS.

4. SECURITY SYSTEM FURNISHED AND INSTALLED BY SECURITY CONTRACTOR.

14. ELECTRICAL EQUIPMENT FURNISHED BY OTHER TRADES OR BY TENANT AND SPECIFIED IN OR SHOWN ON CONTRACT DOCUMENTS SHALL BE INSTALLED AND CONNECTED BY GENERAL CONTRACTOR, EXCEPT AS OTHERWISE NOTED. PROVIDE BRANCH CIRCUIT CONNECTIONS TO ELECTRICALLY-OPERATED EQUIPMENT FURNISHED BY OTHERS AS SPECIFIED IN OR SHOWN ON THE CONTRACT DOCUMENTS.

15. TEMPORARY WIRING FOR OTHER CONTRACTORS SHALL BE INSTALLED BY THE GENERAL CONTRACTOR WHO SHALL BE ENTIRELY RESPONSIBLE TO THE TENANT FOR THE SAFE AND SATISFACTORY OPERATION OF SAID TEMPORARY WIRING. CONTRACTOR REQUIRING SUCH TEMPORARY WIRING SHALL PAY FOR DAMAGES TO PROPERTY RESULTING FROM ITS USE. COMPLY WITH LATEST REQUIREMENTS OF OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA). PROVIDE PERSONNEL GROUND-FAULT PROTECTION ON TEMPORARY POWER AND LIGHTING CIRCUITS 30 AMPERES OR LESS. GROUND-FAULT CIRCUIT INTERRUPTERS (GFCI) ON CONSTRUCTION CIRCUITS ARE NOT REQUIRED WHERE CIRCUIT IS A PERMANENT CIRCUIT TO BE A PART OF THE COMPLETED BUILDING. HOWEVER, CONTRACTOR SHALL PROVIDE APPROVED CORD SETS INCORPORATING GFCI PROTECTION FOR PERSONNEL. USE THE LOCALLY-ADOPTED EDITION OF THE N.E.C. FINISH PAINTING IS TO BE PERFORMED BY GENERAL CONTRACTOR EXCEPT THAT THIS CONTRACTOR SHALL RESTORE TO ORIGINAL CONDITION ANY PAINTING DEFACED BY THIS CONTRACTOR AFTER ORIGINAL PAINTING.

16. GENERAL CONTRACTOR SHALL PERFORM CUTTING, CHASING, OR CHANNELING AND PATCHING REQUIRED FOR WORK UNDER THIS DIVISION. CUTTING SHALL HAVE PRIOR APPROVAL BY TENANT'S CONSTRUCTION MANAGER AND THE LANDLORD. PATCHING IS TO BE 'AS NEW' CONDITION.

17. INSTALL ELECTRICAL WORK AS TO BE READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING AND REPAIRING. THIS CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT SERVICE ACCESS TO ALL EQUIPMENT.

18. ANY ACCESS PANELS REQUIRED, BUT NOT SPECIFIED OR SHOWN ON DRAWINGS, SHALL BE FURNISHED BY GENERAL CONTRACTOR WITH DESIGN TO BE APPROVED BY ARCHITECT BEFORE STARTING INSTALLATION.

19. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE PROVIDED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS NECESSARY TO COMPLETE THE WORK OR WHICH IS USUALLY INCLUDED IN WORK OF SIMILAR CHARACTER, SHALL BE PROVIDED AS PART OF CONTRACT.

20. PERFORM WORK IN ACCORDANCE WITH:

1. THE NATIONAL ELECTRICAL CODE (N.E.C.).

2. STATE, CITY, AND COUNTY BUILDING CODES AND ORDINANCES.

3. NATIONAL BOARD OF FIRE UNDERWRITERS.

4. CERTAIN CODES AND STANDARDS AS SET UP BY VARIOUS TECHNICAL SOCIETIES SUCH AS UL, NEMA, NECA, IEEE, ASTM, IES, IPCEA, AND ANSI.

5. THIS WORK SHALL BE GOVERNED ALSO BY LOCAL INSPECTOR'S REQUIREMENTS.

6. FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT STANDARDS.

7. AMERICANS WITH DISABILITIES ACT.

21. GENERAL CONTRACTOR SHALL INQUIRE INTO AND COMPLY WITH APPLICABLE CODES, ORDINANCES, AND REGULATIONS. THIS CONTRACTOR SHALL INCLUDE CHANGES REQUIRED BY CODES IN THE BID AND IF THESE CHANGES ARE NOT INCLUDED IN THE BID, THEY MUST BE QUALIFIED AS A SEPARATE LINE ITEM IN THE BID. AFTER CONTRACT IS ISSUED, NO ADDITIONAL COST DUE TO CODE ISSUES SHALL BE REIMBURSED BY TENANT TO THE CONTRACTOR.

22. WHERE THE DRAWINGS OR SPECIFICATIONS CALL FOR ITEMS WHICH EXCEED CODE OR THE LANDLORD OR TENANT CRITERIA, THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING THE SYSTEM WITH THE MOST STRINGENT REQUIREMENTS AS DESIGNED AND DESCRIBED ON THESE DRAWINGS, UNLESS NOTED OTHERWISE.

23. UNLESS SPECIFICALLY NOTED OTHERWISE, MATERIALS, PRODUCTS, AND EQUIPMENT, INCLUDING COMPONENTS THEREOF, SHALL BE NEW, UNDERWRITERS LABORATORIES LISTED AND LABELED AND SIZED IN CONFORMITY WITH REQUIREMENTS OF THE N.E.C., STATE, AND LOCAL CODES, WHICHEVER IS MORE STRINGENT.

24. PERMITS REQUIRED BY LAWS, ORDINANCES AND BUILDING CODES HAVING JURISDICTION SHALL BE OBTAINED AT PROPER TIME AND AT THE EXPENSE OF THE GENERAL CONTRACTOR.

25. ELECTRICAL WORK SHALL BE INSPECTED BY THE GOVERNMENTAL AGENCY HAVING JURISDICTION, INCLUDING LOCAL INSPECTION AUTHORITIES.

26. WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM FOR THE BASIC BID. MANUFACTURERS CONSIDERED AS AN EQUAL OR BETTER IN ALL ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO APPROVAL IN WRITING, THROUGH SHOP DRAWING SUBMITTAL PROCESS, BY TENANT'S CONSTRUCTION MANAGER PRIOR TO ACCEPTANCE. THE USE OF UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

27. GENERAL CONTRACTOR SHALL SUBMIT ONLY SUBSTITUTION REQUESTS TO TENANT'S CONSTRUCTION MANAGER FOR APPROVAL. SUBSTITUTIONS SHALL BE MADE EARLY ENOUGH IN THE PROJECT TO ALLOW SEVEN (7) WORKING DAYS FOR TENANT'S CONSTRUCTION MANAGER'S REVIEW WITHOUT CAUSING DELAYS OR CONFLICTS TO THE JOB'S PROGRESS. SUBMITTALS SHALL BEAR THE STAMP OF THE GENERAL CONTRACTOR AND/OR SUB-CONTRACTOR SHOWING THAT THEY HAVE REVIEWED AND CONFIRMED THAT THE SUBMITTALS ARE IN CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS OR INDICATE WHERE EXCEPTIONS HAVE BEEN TAKEN.

28. FOR PHASED STORE CONSTRUCTION, THIS CONTRACTOR IS TO INCLUDE IN THE BID THE NECESSARY ELECTRICAL SERVICE CHANGES REQUIRED TO KEEP THE OPERATING PHASE OF THE STORE'S ELECTRIC SERVICE IN OPERATION. CONTRACTOR MUST SCHEDULE WITH TENANT'S CONSTRUCTION MANAGER AND LANDLORD (IN WRITING) ONE WEEK PRIOR TO SHUT DOWN OF THE P.O.S., CASH REGISTERS, ELECTRICAL, TELEPHONE OR FIRE ALARM SYSTEMS. ADVISE GENERAL CONTRACTOR AND TENANT AT TIME OF BID IF CONFLICTS EXIST.

29. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE DEMOLITION OF EXISTING WORK. COORDINATE EXISTING EQUIPMENT TO BE LEFT INTACT AND ADVISE TENANT'S CONSTRUCTION MANAGER AT TIME OF BID.

30. THIS CONTRACTOR SHALL INCLUDE, AND WILL BE HELD RESPONSIBLE FOR, THE REMOVAL OF EXISTING CONDUIT, FIRE ALARM SYSTEM, SWITCH GEAR, PITCH POCKETS AND EQUIPMENT, ETC. UNLESS SPECIFICALLY NOTED OTHERWISE. CONTRACTOR MUST VERIFY WITH THE LANDLORD ALL PRESUMED ABANDONED EQUIPMENT. CONDUIT AND SWITCH GEAR PRIOR TO REMOVAL. PITCH POCKETS SHALL BE REMOVED AND THE ROOF PATCHED BY THE LANDLORD. EXTRANEOUS ITEMS IN THE SPACE OR ON THE ROOF NOT APPLICABLE TO THE NEW WORK SHALL BE REMOVED AND ROOF/WALL/FLOOR PATCHED/REPAIRED TO LIKE NEW CONDITION. EXISTING ABANDONED CONDUIT OR EQUIPMENT IN THE FLOOR, EMBEDDED IN CONCRETE, OR OTHERWISE INACCESSIBLE, ARE TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR WALL LEVEL. WHEN THEY ARE NOT TO BE REUSED IN THIS PROJECT, IF REQUIRED BY LANDLORD OR CODES, ABANDONED CONDUIT MUST BE REMOVED TO POINT OF ORIGIN, CONFIRM EXISTOR AS DEMOLITION PRIOR TO BID AND INCLUDE IN PROPOSAL.

31. PROVIDE SLEEVES TO PROTECT EQUIPMENT OR FACILITIES IN THE INSTALLATION. EACH SLEEVE SHALL EXTEND THROUGH ITS RESPECTIVE FLOOR, WALL OR PARTITION AND SHALL BE CUT FLUSH WITH EACH SURFACE EXCEPT SLEEVES THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 2" ABOVE THE FLOOR.

32. FIRE SEAL SLEEVES AND OPENINGS THROUGH FIRE-RATED WALLS AND FLOORS WITH CALCIUM SILICATE, SILICONE, "RTV" FOAM, "3M" FIRE RATED SEALANTS OR EQUAL, SO AS TO RETAIN THEIR FIRE RATING.

33. SLEEVES IN BEARING AND MASONRY WALLS, FLOORS AND PARTITIONS SHALL BE STANDARD-WEDGE STEEL PIPE FINISHED WITH SMOOTH EDGES. FOR OTHER THAN MASONRY PARTITIONS, THROUGH SUSPENDED CEILINGS, OR FOR CONCEALED VERTICAL CONDUIT, SLEEVES SHALL BE NO. 22 U.S.G. GALVANIZED STEEL, MINIMUM.

34. HANGERS SHALL INCLUDE MISCELLANEOUS STEEL SUCH AS ANGLE IRON, WIRE, UNISTRUT, C-CLAMPS WITH RETAINING CLIPS, CHANNELS, HANGER RODS, ETC., NECESSARY FOR THE INSTALLATION OF WORK.

35. FASTEN HANGERS TO BUILDING STEEL, CONCRETE, OR MASONRY, BUT NOT TO OTHER CONDUIT OR PIPING. HANGERS UPPER ATTACHMENT MUST BE SUPPORTED FROM THE TOP OF THE BAR JOIST. HANGING FROM METAL DECK IS NOT PERMITTED, WHERE INTERFERENCES OCCUR. IN ORDER TO SUPPORT CONDUIT, THE CONTRACTOR MUST INSTALL TRAPEZ-TYPE HANGERS OR SUPPORTS WHICH SHALL BE LOCATED WHERE THEY DO NOT INTERFERE WITH ACCESS TO FIRE DAMPER VALVES, JUNCTION BOXES, ACCESS DOORS, OTHER EQUIPMENT SERVICE REQUIREMENTS AND/OR OTHER TRADES. HANGER TYPES AND INSTALLATION METHODS ARE SUBJECT TO LANDLORD CRITERIA.

36. UPON COMPLETION OF THE WORK, GENERAL CONTRACTOR SHALL FURNISH TO THE ARCHITECT A CERTIFICATE OF INSPECTION AND APPROVAL FROM THE ABOVE DEPARTMENT BEFORE FINAL PAYMENT ON CONTRACT WILL BE ALLOWED.

37. TEST WIRING AND CONNECTIONS FOR CONTINUITY AND GROUNDS BEFORE EQUIPMENT IS CONNECTED, WHEN DIRECTED BY ARCHITECT. DEMONSTRATE BY PROPER VOLTAGE MEGGER TEST OF INSULATION RESISTANCE OF CONDUCTORS AND REPLACE CONDUCTORS WHICH FAIL. SAID TESTS UNTIL CONDUCTORS ARE FREE FROM INSULATION FAULTS.

38. ELECTRICAL LAYOUTS ARE SCHEMATIC. EXACT LOCATIONS ARE DETERMINED BY EXACT LOCATION OF EQUIPMENT, ETC., AND MAY BE REVISED TO SUIT THE CONSTRUCTION CONDITIONS AND AID IN COORDINATION WITH WORK OF OTHER CONTRACTORS. WHERE DRAWINGS, EXISTING SITE CONDITIONS, SPECIFICATIONS OR OTHER TRADES CONFLICT OR ARE UNCLEAR, ADVISE THE GENERAL CONTRACTOR IN WRITING PRIOR TO SUBMITTAL OF BID. THE GENERAL CONTRACTOR IS RESPONSIBLE TO ADVISE TENANT'S CONSTRUCTION MANAGER IN WRITING OF ANY VARIATIONS TO CONTRACT DOCUMENTS PRIOR TO SUBMISSION OF THE BID. OTHERWISE, TENANT'S CONSTRUCTION MANAGER'S INTERPRETATION OF CONTRACT DOCUMENTS OR CONDITIONS SHALL BE FINAL WITH NO ADDITIONAL COMPENSATION PERMITTED.

39. ELECTRICAL DRAWINGS ARE INTENDED TO INDICATE APPROXIMATE LOCATIONS OF SWITCHES, RECEPTACLES, LIGHTING FIXTURES AND OTHER ITEMS OF VARIOUS ELECTRICAL SYSTEMS OF PROJECT. EXACT LOCATIONS AND ROUGH-IN DIMENSIONS FOR WORK AND EQUIPMENT SHALL BE OBTAINED FROM ARCHITECT OR ARCHITECT'S REPRESENTATIVE AS WORK PROGRESSES. SHOULD THE GENERAL CONTRACTOR FAIL TO PROPERLY OBTAIN SUCH LOCATIONS OR DIMENSIONS, THE GENERAL CONTRACTOR SHALL CHARGE THIS WORK AT THE GENERAL CONTRACTOR'S EXPENSE WHEN REQUESTED BY ARCHITECT. ARCHITECT RESERVES THE RIGHT TO MAKE MINOR CHANGES IN LOCATION OF ELECTRICAL WORK OR EQUIPMENT PRIOR TO ROUGHING-IN WITH NO ADDITIONAL COST TO TENANT. TENANT'S CONSTRUCTION MANAGER RESERVES THE RIGHT TO RELOCATE OUTLETS OR FIXTURES BEFORE THEY ARE INSTALLED WITHOUT ADDITIONAL COST.

40. THE ARCHITECT RESERVES THE RIGHT TO DIRECT REMOVAL AND REPLACEMENT OF ITEMS WHICH, IN THE ARCHITECT'S OPINION, DO NOT PRESENT AN ORDERLY OR REASONABLY NEAT OR WORKMANLIKE APPEARANCE, PROVIDED THAT SUCH ITEMS CAN BE PROPERLY INSTALLED IN SUCH ORDERLY WAY BY METHODS USUAL IN SUCH WORK, OR WHICH DOES NOT COMPLY WITH CONTRACT DRAWINGS OR SPECIFICATIONS. SUCH REMOVALS OR REPLACEMENTS SHALL BE DONE BY CONTRACTOR AT CONTRACTOR'S EXPENSE WHEN SO DIRECTED IN WRITING BY ARCHITECT.

41. MAINTAIN ONE COPY OF DRAWINGS ON THE JOB SITE TO RECORD DEVIATIONS FROM CONTRACT DRAWINGS, SUCH AS: LOCATION OF JUNCTION BOXES AND RECEPTACLES.

42. REVISIONS, ADDENDUMS, AND CHANGE ORDERS.

43. IF ANY FIELD CONDITIONS, APPROVED EQUIPMENT SUBSTITUTIONS, AND CONTRACTOR'S COORDINATION WITH OTHER TRADES.

44. AT COMPLETION OF PROJECT AND BEFORE FINAL APPROVAL, MAKE FINAL CORRECTIONS TO DRAWINGS AND CERTIFY THE ACCURACY OF EACH PRINT BY SIGNATURE THEREON. PLACE ONE COPY OF DRAWINGS STAMPED "DO NOT REMOVE" IN DRAWING TUBE LOCATED NEXT TO THE ELECTRICAL PANELS (SEE ARCHITECTURAL DRAWINGS FOR LOCATION). A SECOND AS-BUILT SET SHALL BE SENT TO TENANT'S OFFICES.

45. MATERIALS AND EQUIPMENT INSTALLED AS A PART OF THE WORK SHALL MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

46. SUBMIT SHOP DRAWINGS PER THE DOCUMENTS PROVIDED BY THE TENANT.

47. MANUFACTURER'S CATALOG CUTS MAY BE SUBMITTED FOR STANDARD CATALOG LIGHTING FIXTURES AND OTHER EQUIPMENT. CATALOG CUTS MAY BE MARKED UP TO MEET THE PROJECT SPECIFICATIONS. CUTS SHALL BE MARKED TO INDICATE MODEL, NUMBER, SIZE, TYPE, COLOR, RATING, ETC., OF THE ITEM TO BE FURNISHED.

48. PROVIDE INSTRUCTION TO TENANT'S OPERATING PERSONNEL AS NECESSARY, SHOWING LOCATIONS AND PROPER OPERATION OF MAJOR ITEMS OF EQUIPMENT AND SYSTEM COMPONENTS AND REFERRING TO THE OPERATING INSTRUCTION MANUAL DESCRIBED BELOW AS A GUIDE.

49. GENERAL CONTRACTOR SHALL GUARANTEE WORKMANSHIP AND MATERIALS, EXCEPT FOR TENANT-SUPPLIED MATERIALS, FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE (IN WRITING) OF THE INSTALLATION BY TENANT'S CONSTRUCTION MANAGER/ENGINEERING MANAGER AND LEAVE THIS WORK IN PERFECT ORDER AT COMPLETION.

50. SHOULD DEFECTS DEVELOP WITHIN GUARANTEE PERIOD, GENERAL CONTRACTOR SHALL, UPON NOTICE OF SAME, REMEDY SUCH SHOWN ON DRAWINGS OR BY OTHERS OR FURNISHINGS CAUSED BY DEFECTS OR WORK OR CORRECTIONS TO SAME REPAIRED AND/OR REPLACED AT THIS EXPENSE TO CONDITION BEFORE SUCH DEFECTS OR DAMAGE.

51. COMPLETION (2) WRITTEN MANUALS OF OPERATING INSTRUCTIONS INCLUDING COPIES OF SHOP DRAWINGS AND A LISTING OF EQUIPMENT SUPPLIERS. ASSEMBLE IN 8-1/2" X 11" HARD BACKED INDEXED BINDER. MATERIAL SHALL BE AS FOLLOWS:

1. TITLE PAGE: TITLE OF JOB, LANDLORD, TENANT'S ADDRESS, DATE OF SUBMISSION, CONTRACTOR, AND ENGINEER.

2. INDEX.

3. LIST OF MAJOR EQUIPMENT USED IN PROJECT ACCOMPANIED BY CONTRACTOR PURCHASE ORDER NUMBERS AND SUPPLIERS' NAMES AND ADDRESSES.

4. ONE COPY OF EACH SHOP DRAWING GROUPED BY TYPES OF EQUIPMENT, I.E., LIGHTING FIXTURES, PANELBOARDS, ETC.

5. SECTION FOR EACH SYSTEM, INCLUDING:

a. BRIEF DESCRIPTION OF SYSTEM OPERATION WITH LOCATION OF MAJOR COMPONENTS.

b. LIST OF ITEMS IN SYSTEM REQUIRED PERIODIC SERVICE, REQUIRES SEPARATE SECTION FOR EACH OF: ELECTRICAL DISTRIBUTION SYSTEM FROM THE SERVICE ENTRANCE TO EACH LIGHTING AND POWER PANEL AND OTHER SYSTEMS (I.E. CONTROL SYSTEMS AND ANY OTHER GENERAL CONTRACTOR SYSTEM LISTED IN THESE SPECIFICATIONS).

52. TENANT SHALL PROVIDE A COMPLETE 12-MONTH WARRANTY FOR PARTS ON EQUIPMENT PROVIDED BY TENANT AND TENANT'S VENDORS. THIS CONTRACTOR SHALL NOT BEAR ADDITIONAL WARRANTIES BEYOND A COMPLETE WORKING SYSTEM, AND AS SUCH, NO ADDITIONAL MONIES SHOULD BE INCLUDED IN THE BID.

53. AT THE END OF THE PROJECT, CLEAN EQUIPMENT, INCLUDING LIGHT FIXTURES, TO THE SATISFACTION OF TENANT'S CONSTRUCTION MANAGER. REMOVE DUST, DIRT, DEBRIS, PAINT AND FOREIGN MATTER FROM EQUIPMENT.

54. LOW VOLTAGE ELECTRICAL POWER CONDUCTORS

55. CONDUCTORS SHALL BE COPPER - ALUMINUM CONDUCTORS ARE NOT PERMITTED UNLESS NOTED OTHERWISE ON THE DRAWINGS.

56. MINIMUM COPPER WIRE SIZES FOR WET AND DRY AREAS AS DEFINED BY THE N.E.C. SHALL BE AS FOLLOWS:

20 AMP CKT BKR OR FUSE = #12 AWG, THHN/THWN

30 AMP CKT BKR OR FUSE = #10 AWG, THHN/THWN

40 AMP CKT BKR OR FUSE = #8 AWG, THHN/THWN

50 AMP CKT BKR OR FUSE = #6 AWG, THHN/THWN

100 AMP CKT BKR OR FUSE = #3 AWG, THHN/THWN

125 AMP CKT BKR OR FUSE = #1 AWG, THHN/THWN

200 AMP CKT BKR OR FUSE = #3/4 AWG, THHN/THWN

57. ADJUST MINIMUM WIRE SIZES FOR 20A BRANCH CIRCUITS FOR DISTANCE, MEASURED FROM THE PANELBOARD CIRCUIT BREAKER TO THE FURTHEST OUTLET, AS FOLLOWS:

LESS THAN 70 FT. - #12

BETWEEN 71 AND 110 FEET - #10

BETWEEN 111 AND 175 FEET - #8

OVER 176 FEET - #6

58. CONDUCTORS USED FOR EMERGENCY LIGHTING CIRCUITS SHALL BE #10 AWG, MINIMUM, AND SHALL BE RUN IN SEPARATE CONDUIT USED FOR NO OTHER PURPOSE.

59. CONDUCTORS MAY BE STRANDED FOR SIZES #10 AWG AND LARGER. CONDUCTORS SIZE #12 AND SMALLER SHALL BE SOLID (NOT STRANDED).

60. 20 AMP BRANCH CIRCUIT CONDUCTORS LARGER THAN #10 AWG SHALL BE REDUCED TO #10 AWG WITHIN 10 FEET OF PANELBOARD AND DEVICES IN JUNCTION BOXES ON RATED TERMINAL STRIPS.

61. THE FOLLOWING COLOR CODE SHALL BE USED:

PHASE A

PHASE B

PHASE C

NEUTRAL

GROUND

208/120 VOLT

BLACK

RED

BLUE

GREEN

62. CIRCUIT BREAKER/FUSE AND WIRE SIZE COMBINATIONS NOT SHOWN ABOVE SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

26 05 26 GROUNDING AND BONDING

63. FURNISH AND INSTALL A COMPLETE GROUNDING SYSTEM IN COMPLIANCE WITH ALL REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

64. PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR, MINIMUM SIZE PER NEC TABLE 250.122, IN EACH CONDUIT ALONG WITH FEEDERS, BRANCH CIRCUITS AND CONTROL CIRCUITS. CONDUCTOR INSULATION SHALL BE GREEN.

65. CONDUIT SYSTEM SHALL BE ELECTRICALLY CONTINUOUS, GROUND ENCLOSURES AND NON-CURRENT CARRYING METALS. LOCK NUTS SHALL CUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES, WHERE ENCLOSURES AND NON-CURRENT CARRYING METALS ARE ISOLATED FROM THE CONDUIT SYSTEM, USE BONDING JUMPERS WITH APPROVED CLAMPS.

66. BOND RECEPTACLES TO GROUND CONDUCTORS USING #12 AWG MINIMUM BONDING JUMPERS BETWEEN RECEPTACLE TERMINALS AND GROUND CONDUCTORS. METAL-TO-METAL CONTACT BETWEEN THE DEVICE YOKE AND THE OUTLET BOX IS NOT ACCEPTABLE FOR EITHER SURFACE-MOUNTED BOXES OR FLUSH-TYPE BOXES.

67. PROVIDE GROUNDING ELECTRODE CONDUCTORS FOR SEPARATELY-DERIVED SYSTEMS, SUCH AS DRY-TYPE TRANSFORMERS, N NON-METALLIC (PVC) CONDUIT TO MINIMIZE GROUND IMPEDANCE.

68. GROUND LIGHTING FIXTURES BY THE USE OF A PIGTAIL, FASTENED ON BARE METAL, THAT IS FREE OF PAINT.

69. BOND STRUCTURAL STEEL TO EARTH, GROUND RODS OR PLATES, OR WATER SYSTEM.

70. BOND ROOF-MOUNTED EQUIPMENT TO ACCEPTABLE GROUNDS PER THE N.E.C.

26 05 29 DISTRIBUTION

71. FURNISH LABOR, MATERIALS AND EQUIPMENT NECESSARY TO INSTALL THE ELECTRICAL SERVICE INCLUDING (AS INDICATED ON SHEET E4.0) BUT NOT LIMITED TO THE SECONDARY CABLES, CONDUIT, PULL WIRE AND GROUND ROD AND SLEEVE AS REQUIRED. COORDINATE ALL REQUIREMENTS WITH LANDLORD PRIOR TO BID. THE GENERAL CONTRACTOR SHALL COORDINATE INSTALLATION OF THE DISCONNECT SWITCHES AND PANELBOARD WITH THIS WORK.

72. COORDINATE WORK PROVIDED BY LANDLORD PRIOR TO BID AND INCLUDE THE COST OF SUCH WORK AS DIRECTED BY LANDLORD. WIRING OF METERING EQUIPMENT SHALL BE BY GENERAL CONTRACTOR AS DIRECTED BY THE ELECTRIC COMPANY.

73. METERING EQUIPMENT SHALL BE FURNISHED BY GENERAL CONTRACTOR AND INSTALLED TO THE UTILITY REQUIREMENTS.

74. DISCONNECT SWITCHES SHALL BE HEAVY-DUTY TYPE, UL LISTED.

75. DISCONNECT SWITCHES SHALL BE BY SQUARE D, SIEMENS, CUTLER HAMMER, OR GENERAL ELECTRIC.

76. SWITCHES SHALL HAVE SWITCH BLADES WHICH ARE FULLY VISIBLE IN THE "OFF" POSITION WHEN THE SWITCH DOOR IS OPEN. SWITCHES SHALL HAVE REMOVABLE ARC SUPPRESSORS WHERE NECESSARY TO PROVIDE EASY ACCESS TO LINE SIDE LUGS. LUGS SHALL BE FRONT REMOVABLE, AND UL LISTED FOR 75 DEGREES C, ALUMINUM OR COPPER WIRES.

77. SWITCHES SHALL BE QUICK-BREAK, QUICK-BREAK. THE OPERATING HANDLE SHALL BE AN INTEGRAL PART OF THE BOX, NOT THE COVER. PROVIDE A DUAL COVER INTERLOCK TO PREVENT UNAUTHORIZED OPENING OF THE SWITCH DOOR WHEN THE HANDLE IS IN THE "ON" POSITION, AND TO PREVENT CLOSING OF THE SWITCH MECHANISM WITH THE DOOR OPEN. THE HANDLE POSITION SHALL INDICATE WHETHER THE SWITCH IS "ON" OR "OFF".

78. SWITCHES SHALL BE FURNISHED IN NEMA 1 GENERAL PURPOSE ENCLOSURE EXCEPT SWITCHES LOCATED OUTDOORS SHALL BE NEMA 3R WEATHERPROOF (WP), NEMA 3R GENERAL PURPOSE SHALL BE MANUFACTURED FROM GALVANIZED STEEL. ENCLOSURES SHALL HAVE A GRAY BAKED ENAMEL FINISH, ELECTRODEPOSITED, ON CLEANED, PHOSPHATIZED STEEL.

79. SWITCHES SHALL BE RATED FOR CLASS A FUSIBLE SWITCHES MUST ACCEPT CLASS R FUSES AND HAVE PROVISIONS TO REJECT FUSES EXCEPT CLASS R. THE UL LISTED SHORT CIRCUIT RATING OF THE SWITCHES SHALL BE 200,000 RMS SYMMETRICAL AMPERES WHEN CLASS R FUSES ARE USED.

80. NAMEPLATES SHALL INDICATE FUNCTION OF EACH DEVICE. NAMEPLATES SHALL BE LAMINATED PHENOLIC WITH A WHITE SURFACE AND BLACK CORE. USE 1/16" THICK MATERIAL FOR NAMEPLATES UP TO 2" X 4" AND USE 1/8" THICK MATERIAL FOR LARGER SIZES. ALL NAMEPLATES SHALL BE FURNISHED AND INSTALLED BY GENERAL CONTRACTOR. GENERAL CONTRACTOR TO COORDINATE WITH THE LOCAL BUILDING AUTHORITY OR BUILDING INSPECTOR ON WHICH ITEMS SHOULD HAVE A NAMEPLATE.

81. FUSES SHALL BE BUSSMANN, SIZES AS NOTED ON DRAWINGS.

82. FUSES SHALL BE UL LISTED, CURRENT-LIMITING TYPE, MINIMUM 200,000 AMPS INTERRUPTING CAPACITY.

83. FUSES 1 AMP AND ABOVE SHALL BE BUSSMANN "LOW PEAK" RK-1, 250 VOLT FUSES SHALL BE USED ON 240/120 VOLT SYSTEMS.

84. CONTROL FUSES FOR MOTOR STARTERS, CONTACTORS, AND CONTROL PANEL TRANSFORMERS SHALL BE BUSSMANN FNQ-R SIZED AT 80% RATED CURRENT.

85. FURNISH SPARE FUSES TO THE TENANT IN THE FOLLOWING QUANTITIES: 10% OF TOTAL PROJECT QUANTITY (BUT NOT LESS THAN THREE (3) FOR EACH TYPE AND RATING OF FUSES).

86. PROVIDE A TYPED LIST OF SPARES FUSES.

87. CIRCUIT BREAKERS SHALL BE QUICK-BREAK, QUICK-BREAK, THERMAL-MAGNETIC-TRIP (ENCLOSURE COMPENSATED), MOLDED CASE TYPE, UL LISTED, 15 AND 20 AMP SINGLE-POLE BREAKERS SHALL CARRY THE UL "SWD" MARKING. LINE SIDE TERMINALS SHALL BE BOLTED TO MAIN BUSBARS. BREAKER RATINGS SHALL BE PER DRAWINGS.

88. PANELBOARDS ARE EXISTING TO REMAIN - PROVIDE MODIFICATIONS AS INDICATED ON THE DRAWINGS.

89. PANELBOARDS SHALL BE LISTED UNDER UL-67 AND SHALL HAVE APPROPRIATE LABELING-BUSING SHALL BE SOLID COPPER.

90. PANELBOARDS FOR USE ON 480Y/277V SYSTEM SHALL HAVE A MINIMUM INTEGRATED EQUIPMENT-SHORT-CIRCUIT CURRENT RATING OF 14,000 AMPS RMS SYMMETRICAL. PANELBOARDS FOR USE ON 208/120V VOLT SYSTEM SHALL HAVE A MINIMUM INTEGRATED EQUIPMENT SHORT CIRCUIT CURRENT RATING OF 22,000 AMPS RMS SYMMETRICAL. EXACT RATING SHALL BE DETERMINED BY AVAILABLE FAULT CURRENT FROM UTILITY. GENERAL CONTRACTOR SHALL FURNISH PANELS BASED ON UTILITY COMPANY INFORMATION.

91. PANELBOARD FRONT ASSEMBLY SHALL INCLUDE A HINGED DOOR WITH A FLUSH MOUNTED CYLINDER LOCK TYPE SPRING LOADED LATCH. LOOKS SHALL BE KEVED ALIKE. DOOR SHALL INCLUDE A TYPED CIRCUIT DIRECTORY CARD MOUNTED IN A FRAME WITH A CLEAR PLASTIC PROTECTIVE COVER.

92. EACH PANELBOARD SHALL HAVE A FULL-CAPACITY SOLID COPPER NEUTRAL SUBASSEMBLY.

93. EACH PANELBOARD SHALL INCLUDE A SOLID COPPER GROUND BUS SUBASSEMBLY, SIMILAR IN CONSTRUCTION TO THE NEUTRAL SUBASSEMBLY, FACTORY-MOUNTED AND BONDED TO THE BOX.

94. EXTERIOR LABELING SHALL INCLUDE A CONNECTION DIAGRAM AND LABELS INDICATING PROPER TORQUE AND WIRE TYPES FOR MAIN INPUT CONNECTIONS AND BOTH LINE AND LOAD SIDE CIRCUIT BREAKER CONNECTIONS.

95. TERMINALS FOR CONNECTION OF THE FEEDER TO THE PANELBOARD MAINS OR MAIN BREAKER SHALL BE UL RECOGNIZED AS SUITABLE FOR THE TYPE OF CONDUCTORS SPECIFIED.

96. MANUFACTURER-GENERAL ELECTRIC TYPE AQ FOR 208Y/120V APPLICATIONS-GENERAL ELECTRIC TYPE AE FOR 480Y/277V APPLICATIONS-EQUAL EQUIPMENT BY SQUARE D, SIEMENS, OR CUTLER HAMMER WILL BE ACCEPTED.

97. INSTALL EACH PANELBOARD WITH TOP CIRCUIT BREAKER AT 6'-0" ABOVE FLOOR, FLUSH-OR SURFACE-MOUNTED AS INDICATED ON THE DRAWINGS.

98. NAMEPLATES AS SCHEDULED ON DRAWINGS SHALL INDICATE FUNCTION OF EACH DEVICE. NAMEPLATES SHALL BE LAMINATED PHENOLIC WITH A WHITE SURFACE AND BLACK CORE. USE 1/16" THICK MATERIAL FOR PLATES UP TO 2" X 4". FOR LARGER SIZE, USE 1/8" THICK MATERIAL.

99. CONNECTIONS AT PANELS AND SWITCHES ARE TO BE MADE, SPICES COMPLETE, FUSES IN PLACE, CIRCUITS CONTINUOUS FROM POINT OF SERVICE CONNECTION TO FINAL DESTINATIONS, COVERS AND PLATES INSTALLED, AND FINAL ELECTRICAL INSPECTION COMPLETED PRIOR TO THE TIME OF FINAL INSPECTION BY TENANT'S CONSTRUCTION MANAGER.

26 05 33 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

100. FURNISH AND INSTALL OUTLET BOXES FOR DEVICES AS REQUIRED, (RECEPTACLES, LIGHTING FIXTURES, MOTORS, SYSTEMS EQUIPMENT CONNECTIONS, SPECIAL OUTLETS AND AS OTHERWISE REQUIRED).

101. OUTLET BOXES SHALL BE GALVANIZED PRESSED STEEL OF THE STANDARD KNOCKOUT TYPE. NO ROUND OUTLET BOXES SHALL BE PERMITTED, EXCEPT AS SPECIFICALLY NOTED ON DRAWINGS. CONCEALED BOXES SHALL NOT BE LESS THAN 4" SQUARE AND 1-1/2" DEEP, WITH PLASTER RINGS.

102. OUTLET BOXES UPON WHICH LIGHTING FIXTURES ARE TO BE INSTALLED SHALL BE EQUIPPED WITH 3/8" FIXTURE STUDS.

103. RECESSED OUTLET BOXES SHALL BE STAMPED STEEL SUITABLE FOR THE DEVICE INSTALLED. SURFACE MOUNTED OUTLET BOXES SHALL BE CAST IRON SUITABLE FOR THE DEVICE INSTALLED.

104. EXTERIOR BOXES SHALL BE CAST RUST-RESISTING METAL WITH GASKETED COVERS.

105. INSTALL BOXES RIGIDLY FROM BUILDING STRUCTURE AND SUPPORT INDEPENDENTLY OF THE CONDUIT SYSTEM. ALSO PROVIDE SUITABLE BOX EXTENSIONS TO EXTEND BOXES TO FINISHED FACES OF FLOORS, CEILINGS, WALLS ETC. PROVIDE OUTLET BOXES WITH CADDY "QUICK-MOUNT BOX SUPPORT" TO MINIMIZE THE DEFLECTION THAT OCCURS WHEN PLUGGING/UNPLUGGING INTO THESE DEVICES.

106. ENCLOSE ELECTRICAL CONDUCTORS IN CONTINUOUS GROUND RACEWAY SYSTEM EXCEPT AS OTHERWISE NOTED (I.E. LOW-VOLTAGE PLENUM-RATED WIRE).

107. RACEWAY AND ENCLOSURE SIZES SHALL BE AS SHOWN ON DRAWINGS OR, IF NOT SHOWN, SHALL BE SIZED TO COMPLY WITH N.E.C. FILL REQUIREMENTS FOR CONDUCTORS ENCLOSED.

108. PROVIDE PULL OR JUNCTION BOXES IN RACEWAY SYSTEMS AT MAXIMUM OF 100 FOOT INTERVALS AND WHERE REQUIRED TO AVOID EXCESSIVE NUMBER OF BENDS. TO FACILITATE ACCESS TO RACEWAY SYSTEM, BOXES AND COVERS SHALL BE GALVANIZED STEEL OF CODE GAUGE SIZE, TO THE EXTENT POSSIBLE, AVOID THE USE OF JUNCTION BOXES IN INACCESSIBLE LOCATIONS. THE USE OF JUNCTION BOXES ABOVE DRYWALL CEILINGS SHALL BE LIMITED TO LOCATIONS NEAR ACCESS FRAMES USED FOR DIFFUSERS AND RETURN AIR GRILLS OR OUTLET PANELS AS LOCATED ON PLANS. JUNCTION AND PULL BOXES MUST BE LABELED WITH CIRCUIT NUMBER IDENTIFICATION AND SYSTEM TYPE ON COVER.

109. RACEWAYS AND ENCLOSURES SHALL BE ADEQUATELY SUPPORTED FROM BUILDING STRUCTURE WITH APPROVED SUPPORT RODS AND ANCHOR CLAMPS.

110. CONDUIT SHALL BE RIGID HEAVYWALL GALVANIZED STEEL OR THIN WALL EMT WHERE PERMITTED BY CODE OR AS HEREINAFTER SPECIFIED. PVC SCHEDULE 80 CONDUIT MAY BE USED UNDER FLOOR SLAB, ROMEX, BX OR AC, ETC., ARE NOT PERMITTED.

111. MINIMUM SIZE OF CONDUIT SHALL BE 1/2" FOR INDIVIDUAL LIGHTING FIXTURE CONNECTIONS OR TO INDIVIDUAL LIGHT SWITCHES (IF ACCEPTABLE BY THE LANDLORD AND LOCAL CODE OFFICIALS) AND 3/4" FOR OTHER LOCATIONS. IF HVAC CONDUIT, WIRING IS REQUIRED TO BE RUN IN CONDUIT, IT SHALL BE A MINIMUM OF 1/2", UNLESS NOTED OTHERWISE ON DRAWINGS. IN UNDER FLOOR CONDUIT SHALL BE OF MINIMUM 1" SIZE.

112. EMT THIN WALL CONDUIT MAY BE USED INSIDE HOLLOW PARTITIONS, AND ABOVE SUSPENDED CEILINGS AND EXPOSED ABOVE 8'-0" ABOVE FINISHED FLOOR OR ABOVE PANELBOARDS. EMT CONDUIT MAY NOT BE USED BURIED IN EARTH OR FILL, IN OR UNDER CONCRETE FLOOR OR IN POURED CONCRETE CONSTRUCTION.

113. PVC CONDUIT USED UNDER FLOOR SLABS SHALL HAVE RIGID GALVANIZED STEEL ELLS AND METALLIC CONDUIT ABOVE FLOOR SLAB.

114. FLEXIBLE METAL CONDUIT (FMC) SHALL BE USED ONLY FOR ABOVE CEILING APPLICATIONS, CONNECTIONS INSIDE CASEWORK, AS THE FINAL CONNECTION TO RECESSED FIXTURES, MOTORS, AND ELECTRICAL EQUIPMENT THAT MAY GENERATE VIBRATION THROUGH THE CONDUIT SYSTEM. EMT SHALL BE USED FOR ALL CONNECTIONS TO PANELBOARDS AND RUN TO WIREWAY ABOVE CEILING WHERE FMC MAY BE USED. FMC ABOVE CEILING SHALL BE CLIPPED TO CEILING FRAMING OR SUPPORT WIRING AND RAN TO A TROUGH AND RAN TO PANEL IN EMT. FMC SHALL BE APPROVED, AND BOTH THE CONDUIT AND FITTINGS SHALL BE LISTED FOR GROUNDING. FMC SHALL BE MINIMUM ONE-HALF INCH (1/2") ELECTRICAL TRADE SIZE, WHEN CONNECTED TO HARD CONDUIT, THE FMC MUST BE THE SAME SIZE AS THE HARD CONDUIT IT IS CONNECTED TO. AN EQUIPMENT GROUNDING CONDUCTOR MUST BE INSTALLED IN ALL RUNS OF FMC.

115. LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LFMC) AND LIQUID-TIGHT FITTINGS SHALL BE USED IN AREAS EXPOSED TO THE WEATHER OR EXCESSIVE MOISTURE AS THE FINAL CONNECTION TO MOTORS, AND ELECTRICAL EQUIPMENT THAT MAY GENERATE VIBRATION THROUGH THE CONDUIT SYSTEM. LFMC SHALL BE USED FOR ALL CONNECTIONS TO PANELBOARDS AND RUN TO WIREWAY ABOVE CEILING WHERE LFMC SHALL BE KEPT TO SIX FEET (6'-0") MAXIMUM LENGTH AND SHALL BE MINIMUM ONE-HALF INCH (1/2") ELECTRICAL TRADE SIZE, WHEN CONNECTED TO HARD CONDUIT, THE LFMC MUST BE THE SAME SIZE AS THE HARD CONDUIT IT IS CONNECTED TO. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN RUNS OF LFMC.

116. METAL CLAD (MC) CABLE MAY BE USED IN LIEU OF CONDUIT AND WIRE FOR BRANCH AND FEEDER CIRCUITS FOR ALL INTERIOR, DRY, CONCEALED LOCATIONS. IT MAY ALSO BE USED FOR INTERIOR, DRY, EXPOSED LOCATIONS UP TO 6' FOR FIXTURES AND MOTORIZED UTILIZATION EQUIPMENT. DOES NOT APPLY TO SERVICE ENTRANCE CONDUCTORS, OR FOR EXTERIOR OR UNDERGROUND LOCATIONS. ALL PRODUCTS SHALL BE INSTALLED AS LISTED AND AS PERMITTED BY NEC 330 AND AS INTERPRETED BY THE LOCAL AUTHORITY.

117. CONDUIT SHALL GENERALLY BE CONCEALED WHERE POSSIBLE. NO CONDUIT SHALL BE RUN IN SLAB, EXCEPT AS REQUIRED FOR FLOOR-MOUNTED DEVICES. PROVIDE PROPERLY LABELED PULL STRING IN EMPTY CONDUITS.

118. EXPOSED CONDUIT PERMITTED IN ELECTRIC ROOMS, AND SIMILAR UNFINISHED SPACES, OVERHEAD IN AREAS WITHOUT CEILINGS AND ELSEWHERE AT THE DISCRETION OF THE ARCHITECT.

119. CONDUIT FITTINGS SHALL BE GALVANIZED MALLEABLE IRON OR STEEL. CONNECTORS AND COUPLINGS SHALL BE THREADED OR CLIPPED SET SCREW TYPE FOR EMT, WITH CADIUM FINISH AND CADIUM PLATED SHEET STEEL COVERS. SYNTHETIC RUBBER GASKETS SHALL BE USED UNDER BODY COVERS EXPOSED TO WEATHER. EMT CONNECTORS SHALL BE INSULATED THROAT TYPE.

120. INSTALL EXPANSION FITTINGS AT LOCATIONS WHERE CONDUITS CROSS BUILDING EXPANSION JOINTS OR TRAVERSE FROM ONE INDEPENDENT STRUCTURE TO ANOTHER. INSTALL WHEREVER CONDUITS TRAVERSE STRUCTURES HAVING SEPARATE FOUNDATIONS OR WHERE EXISTING BUILDINGS ARE JOINED TO A NEW STRUCTURE.

121. DURING ROUGH-IN, CAP CONDUITS WHICH MAY BECOME FOULED WITH FOREIGN MATERIAL.

122. NO MORE THAN THREE (3) 90 DEGREE BENDS WILL BE ALLOWED IN ANY ONE CONDUIT RUN. WHERE MORE BENDS ARE NECESSARY IN ANY SINGLE RUN, A PULL BOX SHALL BE INSTALLED. ALL CONDUIT EXCEPT IN CONCRETE SLAB OR EARTH SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO THE LINES OF THE BUILDING, AND NO OUT-OF-PLUMB OR DIAGONAL LINES WILL BE ACCEPTED.

26 09 23 LIGHTING CONTROLS

123. WHERE LIGHTING CONTACTORS ARE INDICATED ON THE DRAWINGS, THEY WILL BE FURNISHED AND INSTALLED BY THE GENERAL CONTRACTOR COMPLETE WITH CONDUIT. THE GENERAL CONTRACTOR WILL BE RESPONSIBLE TO INSTALL THE CONTACTORS AND PULL WIRES AS DETAILED ON THESE DRAWINGS AND CIRCUITED EXACTLY AS DIAGRAMMED ON THE ELECTRICAL DETAIL DRAWINGS. NO VARIATIONS TO THE CIRCUITING ARE ALLOWED.

26 22 00 LOW VOLTAGE TRANSFORMERS

124. TRANSFORMERS ARE EXISTING TO REMAIN UNLESS NOTED OTHERWISE - PROVIDE MODIFICATIONS AS INDICATED ON THE DRAWINGS.

125. TRANSFORMER KVA CAPACITIES SHALL BE AS INDICATED ON DRAWINGS.

126. PRIMARY VOLTAGE-480V, 3-PHASE DELTA, UNLESS NOTED OTHERWISE ON THE DRAWINGS.

127. SECONDARY VOLTAGE-208Y/120V, 3-PHASE, 4-WIRE, UNLESS NOTED OTHERWISE ON THE DRAWINGS.

128. TRANSFORMER-S+ SHALL BE UL LISTED AND MANUFACTURED IN ACCORDANCE WITH NEMA STANDARD 5T-20.

129. TRANSFORMER-S+ SHALL HAVE SIX (6) FULL-CAPACITY PRIMARY TAPS AT 2-1/2% INCREMENTS, TWO (2) ABOVE NOMINAL RATED VOLTAGE AND FOUR (4) BELOW NOMINAL.

130. SOUND LEVELS SHALL NOT EXCEED 45 DB FOR TRANSFORMERS RATED UP TO 50 KVA, 50 DB FOR TRANSFORMERS RATED 51 TO 150 KVA, AND 55 DB FOR TRANSFORMERS RATED ABOVE 150 KVA, MEASURED PER NEMA STANDARDS.

131. TRANSFORMER-S+ SHALL BE 150 DEGREE C TEMPERATURE RISE ABOVE 40 DEGREE C AMBIENT-INSULATING MATERIALS SHALL BE IN ACCORDANCE WITH STANDARDS FOR A 250 DEGREE C UL COMPARTMENT RECOGNIZED INSULATION SYSTEM. THE MAXIMUM TEMPERATURE OF THE TOP OF THE ENCLOSURE SHALL NOT EXCEED 150 DEGREE C, RISE ABOVE A 40 DEGREE C AMBIENT.

132. TRANSFORMER OILS SHALL BE OF CONTINUOUS WOUND COPPER CONSTRUCTION AND SHALL BE IMPREGNATED WITH NON-HYDROSCOPIC THERMOSETTING VARNISH.

133. TRANSFORMER GORES SHALL BE CONSTRUCTED OF HIGH GRADE, NON-AGING, GRAIN-ORIENTED SILICON STEEL. MAGNETIC FLUX DENSITIES ARE TO BE KEPT WITHIN LINEAR OPERATING RANGE. THE CORE LAMINATIONS SHALL BE CLAMPED TOGETHER WITH STRUCTURAL STEEL ANGLES AND BE BOLTED TO THE BASE OF THE ENCLOSURE. THE ENCLOSURE SHALL BE ISOLATED FROM THE ENCLOSURE BY MEANS OF RUBBER, VIBRATION-ABSORBING MOUNTS. THERE SHALL BE NO METAL-TO-METAL CONTACT BETWEEN THE CORE AND COIL AND THE ENCLOSURE. ON TRANSFORMERS 500 KVA AND SMALLER, THE VIBRATION ISOLATING SYSTEM SHALL BE DESIGNED TO PROVIDE A PERMANENT FASTENING OF THE CORE AND COIL TO THE ENCLOSURE. SOUND ISOLATING SYSTEMS REQUIRING THE COMPLETE REMOVAL OF FASTENING DEVICES WILL NOT BE ACCEPTABLE.

134. ENCLOSE TRANSFORMER-S+ IN HEAVY-GAUGE, SHEET STEEL, VENTILATED ENCLOSURE-S+ WITH VENTILATING OPENINGS-DESIGNED TO PREVENT ACCIDENTAL ACCESS TO LIVE PARTS IN ACCORDANCE WITH UL, NEMA, AND NATIONAL ELECTRICAL CODE STANDARDS FOR VENTILATED ENCLOSURES.

135. TRANSFORMER ENCLOSURE-S+ SHALL BE DEGREASED, CLEANED PHOSPHATIZED, PRIMERED, AND FINISHED WITH A GRAY, BAKED ENAMEL.

136. TRANSFORMER GORES SHALL BE VISIBLY GROUND-TO THE ENCLOSURE BY MEANS OF A FLEXIBLE GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH APPLICABLE NEMA, IEEE, AND ANSI STANDARDS.

137. LOW-VOLTAGE DRY-TYPE TRANSFORMERS SHALL BE GENERAL ELECTRIC, EQUAL PRODUCT BY SQUARE D, CUTLER HAMMER OR SIEMENS MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

138. FURNISH AND INSTALL ADEQUATE QUANTITY OF LUGS TO TERMINATE THE QUANTITY AND SIZE OF CONDUCTORS AS SHOWN ON THE DRAWINGS-SUITABLE FOR TYPE OF CONDUCTORS SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS-LUGS SHALL BE RATED FOR 75

139. TRANSFORMERS WHICH ARE NOT FLOOR MOUNTED SHALL BE SECURELY MOUNTED FROM THE BUILDING STRUCTURE, REINFORCED WALLS, OR AS NOTED ON DRAWINGS. PROVIDE VIBRATION ISOLATORS AT MOUNTING POINTS TO REDUCE VIBRATION NOISES. PROVIDE FLEXIBLE METAL LUGS CONDUIT WITH GROUNDING BUSHINGS-S+ FOR PRIMARY AND SECONDARY CONNECTIONS TO TRANSFORMERS. TRANSFORMERS SHALL BE LOCATED, SET, MOUNTED AND CONNECTED IN SUCH A MANNER AS TO KEEP NOISE LEVELS WITHIN THE ADJUTING AMBIENT NOISE LEVELS AND MAINTAIN CODE REQUIRED CLEARANCES.

140. SURGE TAPS IN EACH TRANSFORMER TO PROVIDE A SECONDARY VOLTAGE OF 120V MINIMUM TO 125 VOLTS MAXIMUM ONCE THE FINAL CONNECTIONS HAVE BEEN MADE TO THE LOW VOLTAGE PANELBOARD-S+ PROVIDE FINAL VOLTAGE REPORT TO TENANT'S CONSTRUCTION MANAGER AT TIME OF PUNCH-OUT.

141. (ELECTRICAL SPECIFICATIONS CONTINUED ON SHEET E5.1)

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SHREM SHOCK

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THE ARCHITECT/ENGINEER ASSUMES NO RESPONSIBILITY OR LIABILITY FOR THE USE OF THESE PLANS FOR ANY PROJECT OTHER THAN THAT FOR WHICH THEY WERE SPECIFICALLY DESIGNED AND SPECIALLY FOR SUCH SPECIFIC LOCATION IN THE STATE, AND SHALL NOT BE RESPONSIBLE FOR THE SEAL. THIS BUILDING USE IS ONLY APPLICABLE IN AREAS MEETING THE STATED DESIGN CRITERIA.

LARRY T. BREHM
PE-2002009971
10/17/2025

CHECKED BY: TAV
DRAWN BY: ASE

26 05 00 COMMON WORK RESULTS FOR ELECTRICAL

1. ANY REFERENCE TO TENANT OR TENANTS' CONSTRUCTION MANAGER OR FURNISHED BY ANY OF THE ABOVE REFERS TO LASERAWAY.

2. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND OTHER SPECIFICATIONS SECTIONS, APPLY TO THIS AND THE OTHER SECTIONS OF DIVISION 26 THROUGH 27.

3. THE CONTRACTOR FOR THIS WORK IS REQUIRED TO READ THE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL DIVISIONS OF WORK AND IS RESPONSIBLE FOR THE WORK OF THE SUBCONTRACTORS WITHIN THE DIVISIONS OF WORK.

4. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE SUBCONTRACTORS WITH A COMPLETE SET OF BID DOCUMENTS.

4. THIS CONTRACTOR IS

● PLOTTED: 10/17/2025 2:04 PM

ELECTRICAL SPECIFICATIONS

A

26 27 26 WIRING DEVICES

- A. INSTALL WIRING DEVICES, INCLUDING SWITCHES, RECEPTACLES AND POWER RECEPTACLES, TELEPHONE OUTLET BOXES, COVER PLATES AND BLANK OUTLET PLATES AS SHOWN OR DESCRIBED ON DRAWINGS.
- B. UNLESS OTHERWISE NOTED ON DRAWINGS OR OTHERWISE REQUIRED BY THE NATIONAL ELECTRICAL CODE, ACCESSIBILITY CODES OR LOCAL CODES, OUTLET HEIGHTS SHALL BE AS FOLLOWS:
1. SWITCH HEIGHT 48" FROM FINISHED FLOOR TO CENTERLINE OF OUTLET.
 2. CONVENIENCE OUTLETS:
 - a. SALES: 16" FROM FINISHED FLOOR TO BOTTOM OF OUTLET.
 - b. NON-SALES: 16" FROM FINISHED FLOOR TO BOTTOM OF OUTLET
 3. TELEPHONE OUTLETS SHALL BE LOCATED AS NOTED ON DRAWINGS.
- C. DUPLEX RECEPTACLES SHALL BE A MINIMUM OF 20 AMPERE RATING.
- D. COLOR OF DEVICES AND PLATES SHALL BE WHITE UNLESS NOTED OTHERWISE. THE DEVICES SHALL BE OF THE TYPES AND RATINGS LISTED, OR EQUALS BY ARROW HART, GENERAL ELECTRIC OR PASS AND SEYMOUR. WEATHERPROOF GFCI RECEPTACLES SHALL BE INSTALLED WHERE SHOWN ON DRAWINGS OR AS REQUIRED BY CODE. DEVICES SHALL BE OF THE FOLLOWING SPECIFICATIONS, UNLESS OTHERWISE INDICATED SPECIFICALLY ON PLANS.
- SINGLE POLE SWITCHES: 20AMP - 120-277V; HUBBELL "HBL1221PL"
DOUBLE POLE SWITCHES: 20AMP - 120-277V; HUBBELL "HBL1222PL"
DUPLEX RECEPTACLES: 20AMP - 125V; HUBBELL "HBL53R2"
GFCI RECEPTACLES: 20AMP - 125V; HUBBELL "GF53R2A"
FLOOR BOXES: HUBBELL "B-2527/29 WITH S-3925 BRASS COVER"
- E. DEVICE COVER PLATES SHALL BE PASS AND SEYMOUR SERIES "RP" OR EQUAL BY EAGLE ELECTRIC MFG. CO. OTHER EQUIVALENT DEVICES WITH MATCHING COVER PLATES MAY BE FURNISHED AS APPROVED BY TENANT.
- F. WIRING DEVICES, UNLESS OTHERWISE PROPERLY AUTHORIZED, SHALL BE SAME MANUFACTURERS ONLY: NO ADDITIONAL MANUFACTURERS SHALL BE PERMITTED UNLESS SPECIFICALLY AUTHORIZED BY TENANT OR TENANT'S REPRESENTATIVE.
- G. LOW VOLTAGE CONTROL DEVICES SHALL BE AS NOTED ON DRAWINGS OR AS REQUIRED.

26 29 13 MOTOR CONTROLLERS

- A. FURNISH AND INSTALL MOTOR CONTROLS, INCLUDING STARTERS, SAFETY DEVICES AND REMOTE CONTROL STATIONS, UNLESS FURNISHED BY EQUIPMENT MANUFACTURER IN PRE-WIRED ASSEMBLIES.
- B. FURNISH AND INSTALL MANUAL MOTOR STARTERS WITH OVERLOAD RELAYS IN EACH LINE CONDUCTOR FOR FRACTIONAL HORSEPOWER MOTORS NOT EQUIPPED WITH BUILT-IN RUNNING OVERCURRENT PROTECTION, NOT REQUIRING AUTOMATIC CONTROLLERS.
- C. MANUAL MOTOR STARTERS SHALL INCLUDE OVERLOAD RELAYS IN EACH LINE POLE, SIZED TO TRIP SWITCH AT 125% OF MOTOR FULL LOAD RUNNING CURRENT, NEON PILOT LIGHTS, AND NEMA ENCLOSURES, AS MANUFACTURED BY GENERAL ELECTRIC, ALLEN BRADLEY, CUTLER HAMMER, SIEMENS, OR SQUARE-D.
- D. FURNISH AND INSTALL AUTOMATIC MOTOR STARTERS FOR ONE (1) HP OR LARGER SINGLE PHASE AND THREE PHASE MOTORS OR MOTORIZED EQUIPMENT FURNISHED WITHOUT STARTERS, REQUIRING AUTOMATIC STARTERS FOR CONTROL REGARDLESS OF HORSEPOWER RATING. THREE PHASE STARTERS SHALL HAVE ANTI-SINGLE PHASING, UNDERVOLTAGE PROTECTION, AND PHASE REVERSAL PROTECTION RELAYS EITHER INCLUDED IN STARTERS OR WIRED TO STARTER CONTROL CIRCUIT.
- E. PROTECTIVE RELAYS SHALL HAVE ADJUSTABLE TIME DELAY RELAY IN CIRCUIT TO AVOID NUISANCE SHUT DOWNS. TIME MARK OR SIMILAR EQUIPMENT IS ACCEPTABLE, IF PROTECTION IS NOT PART OF STARTER, DO NOT RELY ON PROPERLY-SIZED FUSES AND MOTOR STARTER OVERLOAD HEATERS ALONE TO AVOID SINGLE-PHASING BURNOUTS.
- F. FURNISH AND INSTALL CONTACTORS, CONTROL RELAYS, PUSHBUTTON STATIONS, SELECTOR SWITCHES, PILOT LIGHTS, FUSES AND SIMILAR CONTROL AUXILIARIES AS SHOWN ON DRAWINGS AND/OR REQUIRED TO PROVIDE PROPER CONTROL AND ISOLATION BETWEEN VARIOUS AUTOMATIC CONTROLLERS AND EQUIPMENT SHOWN ON THE DRAWINGS.
- G. CIRCUIT BREAKERS FEEDING MOTOR LOADS SHALL BE HACR TYPE.
- H. EQUIPMENT SHALL BE SAME MAKE AS MOTOR STARTERS, PUSHBUTTON STATIONS, SELECTOR SWITCHES, PILOT LIGHTS: HEAVY DUTY, OIL TIGHT, STANDARD SIZE, WITH TRANSFORMER TYPE PILOT LIGHTS, FLUSH MOUNTED WHERE PRACTICAL.
- I. OVERLOAD DEVICES, INCLUDING EQUIPMENT FURNISHED UNDER OTHER CONTRACTS, SHALL BE SET AND ADJUSTED TO SUIT THE LOAD CONDITIONS.

26 51 00 INTERIOR LIGHTING

- A. FURNISH AND INSTALL U.L.-LISTED LIGHTING FIXTURES COMPLETE WITH LAMPS AND REQUIRED MOUNTING ACCESSORIES, AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN:
- B. REFER TO THE LIGHTING FIXTURE SCHEDULE ON THE DRAWINGS FOR FIXTURE TYPES, DESCRIPTIONS, AND LAMP AND BALLAST REQUIREMENTS:
- C. BALLASTS:
1. MANUFACTURERS: OSRAM SYLVANIA, GENERAL ELECTRIC, UNIVERSAL.
 2. PROVIDE U.L.-LISTED, NON-PB BALLASTS COMPLYING WITH ANSI, IEEE, AND FCC STANDARDS WHERE APPLICABLE.
 3. PROVIDE DIMMING, LOW-TEMPERATURE OPERATION, AND OTHER SPECIALTY BALLASTS WHENEVER SPECIFIED OR REQUIRED.
 4. FLUORESCENT BALLASTS SHALL BE HIGH-FREQUENCY ELECTRONIC TYPE, NORMAL LIGHT OUTPUT, WITH A CLASS "A" NOISE RATING, MINIMUM POWER FACTOR OF 0.95, A BALLAST FACTOR GREATER THAN 0.97, AND 10 PERCENT OR LESS TOTAL HARMONIC DISTORTION (THD). FLUORESCENT ELECTRONIC BALLASTS SHALL CARRY A FIVE-YEAR WARRANTY FROM DATE OF MANUFACTURE.
 - a. PROVIDE NEMA PREMIUM BALLASTS COMPLYING WITH THE CONSORTIUM FOR ENERGY EFFICIENCY (CEE) HIGH-PERFORMANCE TB SPECIFICATION FOR 4' LONG, 32 WATT, T8 FLUORESCENT LAMPS.
- D. LAMPS:
1. MANUFACTURERS: OSRAM SYLVANIA, GENERAL ELECTRIC, PHILIPS.
 2. 4' LONG, T8 FLUORESCENT LAMPS SHALL COMPLY WITH THE CONSORTIUM FOR ENERGY EFFICIENCY (CEE) HIGH-PERFORMANCE TB SPECIFICATION.
- E. LIGHT EMITTING DIODE (LED) LIGHT SOURCES (IN OTHER THAN LISTED AND LABELED EXIT AND EMERGENCY LIGHTING EQUIPMENT):
1. PROVIDE U.L.-LISTED LED LIGHT SOURCES CONSISTING OF LED MODULES/ARRAYS, SOLID-STATE ELECTRONIC DRIVERS, AND THERMAL MANAGEMENT SYSTEMS, DESIGNED TO MAINTAIN LED LIFE AND LUMEN MAINTENANCE.
 2. LED LIGHT SOURCES SHALL PROVIDE THE NOMINAL LUMEN OUTPUT, COLOR TEMPERATURE, AND COLOR RENDERING INDEX (CRI) INDICATED ON THE DRAWINGS.
 3. TEST LED LUMINAIRES IN ACCORDANCE WITH IES STANDARD LM-79 FOR DELIVERED LUMEN OUTPUT AND IES STANDARDS LM-80 AND TM-21 FOR AVERAGE LED LIFE.
 4. LEDs SHALL BE BINNED TO INSURE COLOR AND LUMEN OUTPUT CONSISTENCY AMONG THE FURNISHED LIKE LIGHTING FIXTURES.
 5. LED DRIVERS SHALL BE U.L.-LISTED WITH CLASS A SOUND RATINGS, CLASS P THERMAL PROTECTION, MINIMUM POWER FACTOR (PF) OF 0.95, 10 PERCENT OR LESS TOTAL HARMONIC DISTORTION (THD), AND SHALL COMPLY WITH FCC RULES AND REGULATIONS.
 6. WHERE INDICATED ON THE DRAWINGS, PROVIDE DIMMABLE LED LIGHT SOURCES.
- F. LIGHTING INSTALLATION:
1. INSTALL LIGHTING FIXTURES AND ACCESSORIES IN ACCORDANCE WITH THE N.E.C., U.L., AND MANUFACTURER'S RECOMMENDATIONS.
 2. SUPPORT LIGHTING FIXTURES IN ACCORDANCE WITH THE N.E.C., SECURELY MOUNTED TO ELEMENTS OF THE BUILDING STRUCTURE SUCH THAT FIXTURES ARE SQUARE, PLUMB, AND RIGID, AND WILL NOT FALL OR SAG - ADJUST MOUNTING HEIGHT OF SUSPENDED LIGHTING FIXTURES TO SUIT CONDITIONS OF EXPOSED BEAMS, ELECTRICAL AND MECHANICAL EQUIPMENT, AND AIR DUCTS.
 3. SUPPORT LIGHTING FIXTURES INSTALLED IN OR ON SUSPENDED CEILING SYSTEMS TO THE BUILDING STRUCTURE INDEPENDENT OF THE CEILING SYSTEM - DO NOT SUPPORT OR ATTACH LIGHTING FIXTURES TO SUSPENDED CEILING SYSTEMS.
 4. WIRE LIGHTING FIXTURES INSTALLED IN OR ON SUSPENDED CEILING SYSTEMS WITH FLEXIBLE METAL CONDUIT TO AN OUTLET ON THE CONDUIT SYSTEM ABOVE, SUCH THAT THE CONDUIT SYSTEM SHALL NOT INTERFERE WITH THE REMOVAL OF CEILING PANELS OR LIGHTING FIXTURES.
 5. PROVIDE LAMPS IN LIGHTING FIXTURES - LAMPS SHALL BE NEW AND UNUSED PRIOR TO INSTALLATION AND IN WORKING ORDER AT THE TIME OF FINAL ACCEPTANCE OF THE WORK.
 6. AT COMPLETION OF INSTALLATION AND BEFORE TURNING OVER TO THE OWNER, CLEAN AND REMOVE DIRT AND SMUDGES FROM LIGHTING FIXTURES.

27 00 00 GENERAL REQUIREMENTS

- A. PROVIDE MATERIALS, LABOR, TOOLS, TRANSPORTATION INCIDENTALS AND APPURTENANCES TO COMPLETE IN EVERY DETAIL AND LEAVE IN WORKING ORDER WORK CALLED FOR HEREIN AND AS INDICATED ON THE DRAWINGS.
- B. MATERIAL AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF THE FOLLOWING STANDARDS:
1. TELECOMMUNICATIONS INDUSTRY ASSOC./ELECTRONIC INDUSTRIES ALLIANCE (TIA/EIA):
 - a. TIA/EIA 568A 1, 2, AND 3 TELECOMMUNICATION CABLEING STANDARD.
 - b. TIA/EIA 569 TELECOMMUNICATION PATHWAYS AND SPACES.
 - c. TIA/EIA 606 ADMINISTRATION OF INFRASTRUCTURE.
 - d. TIA/EIA 607 GROUNDING AND BONDING.
 - e. COMPLY WITH TIA/EIA 568, 569, AND BIC STANDARDS.
 - f. COMPLY WITH NEPA 70.
- C. FURNISH NEW AND UN-DETERIORATED MATERIALS OF A QUALITY NOT LESS THAN SPECIFIED HEREIN. NEW MATERIAL SHALL HAVE MANUFACTURER'S NAME, MODEL NUMBER, OR OTHER IDENTIFICATION MARKING.
- D. THE CONTRACTOR SHALL BEAR THE COSTS OF PERMITS, INSPECTIONS TESTS, AND APPROVALS.
- E. PROVIDE ON-SITE PERSONNEL TO TROUBLESHOOT AND REPAIR ANY PROBLEMS THAT ARISE DURING CUTOVER AS THEY RELATE TO THEIR INSTALLED SYSTEM.
- F. UPON COMPLETION OF THE WORK, FURNISH A WARRANTY FOR COMPONENTS, PARTS, AND ASSEMBLIES AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP. WARRANTY SERVICES SHALL BE PROVIDED BY A CERTIFIED, FACTORY TRAINED REPRESENTATIVE OF THE EQUIPMENT MANUFACTURER FOR A MINIMUM OF ONE YEAR OR AS SPECIFIED IN EACH INDIVIDUAL SECTION.

27 05 10 TELEPHONE AND DATA CONDUIT SYSTEM

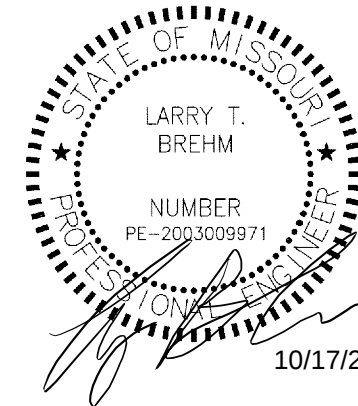
- A. FURNISH AND INSTALL A SYSTEM OF CONDUIT RACEWAYS, OUTLET BOXES, PULL WIRES, AND TERMINAL BOARDS AS SHOWN ON THE DRAWINGS. TELEPHONE SWITCHING APPARATUS, CONDUCTORS, INSTRUMENTS, MISCELLANEOUS EQUIPMENT AND APPURTENANCES ARE NOT PART OF THIS CONTRACT AND WILL BE PROVIDED AND INSTALLED BY OTHERS.
- B. CONDUITS FOR TELEPHONE WALL OUTLETS AND DATA WIRING SHALL BE A MINIMUM OF 1" UNLESS NOTED OTHERWISE.
- C. FURNISH AND INSTALL A 3/4" THICK, FIRE-TREATED, PLYWOOD TELECOM BACKBOARD AT LOCATION SHOWN ON THE DRAWINGS. PAINT WITH FIRE RETARDANT "P-1B" OR AS DIRECTED BY TENANT'S CONSTRUCTION MANAGER. THE PLYWOOD BACKBOARD SHALL BE SECURELY ATTACHED TO THE BUILDING WALLS TO SUPPORT RELAY PANELS, TERMINAL BLOCKS AND OTHER HARDWARE WEIGHING APPROXIMATELY 10 POUNDS PER SQUARE FOOT.
- D. CONDUIT RUNS FOR DATA AND TELEPHONE SHALL BE CONTINUOUS WITH NO JUNCTION BOXES EXCEPT AS NOTED ON DRAWINGS. THIS INCLUDES BUT IS NOT LIMITED TO RUNS BETWEEN TELEPHONE BOARD, MANAGER'S OFFICE, SOUND SYSTEM, CASHWRAPS AND TELEPHONE SETS.
- E. FURNISH AND INSTALL PULL STRING IN EMPTY CONDUITS. LABEL CONDUITS FOR PURPOSE DESIGNATED.
- F. FURNISH AND INSTALL #6 COPPER GROUND WIRE FROM TELECOM BACKBOARD TO RESPECTIVE 120/208 VOLT TENANT PANELBOARD - GROUND PER TELEPHONE COMPANY'S REQUIREMENTS.
- G. OUTLET BOXES TO BE 4" SQUARE MINIMUM WITH SINGLE DEVICE COVER AND TELEPHONE PLATE.

27 05 15 INTERIOR COMMUNICATIONS PATHWAYS

- A. INTERIOR COMMUNICATIONS PATHWAYS SHALL BE FURNISHED AND INSTALLED BY THE GENERAL CONTRACTOR AND BY THE TELECOMMUNICATIONS CONTRACTOR AS SPECIFIED HEREIN.
- B. INSTALL CONDUITS AS DETAILED IN DRAWINGS.
- 27 11 00 HORIZONTAL CABLEING AND CONNECTIVITY
- A. PROVIDE A 10/100/1000 MBPS FULL-DUPLEX TRANSMISSION ETHERNET NETWORK OVER 4-PAIR, CATEGORY 6 UTP HORIZONTAL CABLEING. THE SYSTEM SHALL BE A CERTIFIED SOLUTION BY THE CONNECTIVITY MANUFACTURER. THE HORIZONTAL INFRASTRUCTURE SHALL SUPPORT BOTH VOICE AND DATA APPLICATIONS.
- B. THIS SECTION INCLUDES WIRE, CABLE, CONNECTING DEVICES, INSTALLATION, AND TESTING FOR WIRING SYSTEMS TO BE USED AS SIGNAL PATHWAYS FOR VOICE, VIDEO, AND DATA TRANSMISSION. THE SYSTEM SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
1. MOUNTING ELEMENTS
 2. UNSHIELDED TWISTED-PAIR CABLE
 3. PATCH STATION, AND CROSS CONNECT CORDS
 4. JACKS AND FACEPLATES
 5. TERMINATION AND PATCH PANELS
- C. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. COPPER CABLES (UTP):
 - a. BERK-TEK, INC.
 - b. BELDEN
 - c. MOHAWK
 - d. GENERAL
 - e. UNIPRISE
 2. MODULAR JACKS & FACEPLATES:
 - a. LEVITON
 - b. HUBBELL
 - c. ORTRONICS
 - d. PANDUIT
 - e. UNIPRISE
- D. HORIZONTAL CABLES FOR VOICE/DATA/VIDEO INFRASTRUCTURE:
1. LISTED AS COMPLYING WITH CATEGORY 6 OF TIA/EIA-568-C.
 2. CONDUCTORS: NO. 23 AWG, SOLID COPPER, THERMOPLASTIC-INSULATED.
 3. UTP CABLE- FOUR-PAIR, INDIVIDUALLY TWISTED PAIRS OF CONDUCTORS, COLOR-CODED, ENCLOSED IN A JACKET.
 4. CABLE RATING: PLENUM - LISTED FOR USE IN AIR-HANDLING SPACES, NON-PLENUM IN OTHER AREAS.
 5. CABLE COLOR CODING: BLUE FOR DATA, YELLOW FOR VOICE, AND WHITE FOR VIDEO.
- E. WORKSTATION OUTLETS: SINGLE CATEGORY 6 JACK CONNECTOR MOUNTED IN FACEPLATE.
1. FACEPLATE: HIGH IMPACT PLASTIC; COLOR TO BE WHITE.
 2. MOUNTING: FLUSH, UNLESS OTHERWISE INDICATED.
 3. LABELING: SHALL HAVE INTEGRAL LABEL WITH LABEL COVER.
 4. JACK SPACES: AS INDICATED ON THE DRAWINGS WITH ANY NECESSARY BLANKS.
 5. BLANKS SHALL MATCH FACEPLATE COVER.
- F. WIRING METHOD: INSTALL HORIZONTAL CABLEING IN RACEWAY EXCEPT WITHIN RACKS AND ENCLOSURES, IN ACCESSIBLE CEILING SPACES, AND ROUTED VERTICALLY IN GYPSUM BOARD PARTITIONS, WHERE OPEN-CABLE WIRING METHOD MAY BE USED. CONCEAL RACEWAY AND CABLEING EXCEPT IN UNFINISHED SPACES. IN ACCESSIBLE CEILINGS, USE APPROPRIATELY SIZED J-HOOKS TO SUPPORT THE CABLEING EVERY FOUR FEET (MAXIMUM).
- G. INSTALL CABLE USING TECHNIQUES, PRACTICES, AND METHODS THAT ARE CONSISTENT WITH CATEGORY 6 RATING OF COMPONENTS AND THAT INSURE CATEGORY 6 PERFORMANCE OR COMPLETED AND LINKED SIGNAL PATHS, END TO END.
- H. DO NOT BEND CABLE IN HANDLING OR IN INSTALLING TO SMALLER RADII THAN MINIMUMS RECOMMENDED BY MANUFACTURER.
- I. HORIZONTAL CABLES: LABEL CABLES AT THE WORK AREA END AND AT THE CLOSET END WITH THE PATCH PANEL PORT NUMBER. LABEL EACH CABLE WITHIN 3 INCHES OF EACH TERMINATION, WHERE IT IS ACCESSIBLE IN A CABINET OR JUNCTION OR OUTLET BOX, AND ELSEWHERE AS INDICATED.
- J. WORKSTATION: LABEL CABLES WITHIN OUTLET BOXES AND NEATLY TYPED ON THE INTEGRAL LABEL IN THE FACEPLATE WITH THE PATCH PANEL PORT NUMBER.
- K. WARRANTY PERIOD FOR COMMUNICATIONS CONNECTIVITY (INCLUDING COPPER): MANUFACTURER'S STANDARD, BUT NOT LESS THAN 25 YEARS FROM DATE OF CONTRACT COMPLETION.

(END OF ELECTRICAL SPECIFICATIONS)

ELECTRICAL SPECIFICATIONS



SA# 250422

DRAWING NUMBER:

E4.1

REVISIONS:

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THE ARCHITECT/ENGINEER ASSUMES NO RESPONSIBILITY OR LIABILITY FOR THE USE OF THESE PLANS FOR ANY PROJECT OTHER THAN SPECIFICALLY AUTHORIZED BY THEM AND SIGNED AND SEALED FOR SUCH SPECIFIC LOCATION IN THE STATE. PROVIDE ON THERETO SHOWN ON THE SEAL. THIS BUILDING USE IS ONLY APPLICABLE IN AREAS MEETING THE STATED DESIGN CRITERIA.

LASERAWAY
LEE'S SUMMIT
880 NW BLUE PKWY
SUITE H
LEE'S SUMMIT, MO 64086

DRAWN BY: ASE CHECKED BY: TAY

① THERMOSTAT
② SENSOR
③ CARBON DIOXIDE SENSOR
SD DUCT SMOKE DETECTOR
UNDERCUT DOOR
DUCT OFFSET
SUPPLY DUCT - UP
SUPPLY DUCT - DN
RA OR EXH. DUCT UP
RA OR EXH. DUCT DN
ELBOW TURNING VANES
FIRE DAMPER (F DPR)
MANUAL BALANCE DPR
TRANSITION
DUCTWORK
(E) DUCTWORK
COND PIPE
HYDRONIC PIPE
(E) HYDRONIC PIPE
(E) WATER PIPE
(E) SANITARY PIPE
SPRINKLER PIPE
CONCEALED SPRINKLER HEAD
UPRIGHT SPRINKLER HEAD

CONNECT TO EXISTING
SUPPLY DIFFUSER
RETURN GRILLE
EXHAUST GRILLE/FAN
ACCESS DOOR
SPIN-IN FITTING
SPIN-IN FITTING W/
MANUAL BALANCE DPR
FLEX DUCT CONNECTION
DUCT UP
DUCT DOWN
(E) EX.
(R) RELOCATED
X'D ROUND DUCT
AB ABOVE
ACCU AIR-COOLED CONDENSING UNIT
AD ACCESS DOOR
AFF ABOVE FINISHED FLOOR
AHU AIR HANDLING UNIT
ARCH ARCHITECT
BDD BACKDRAFT DAMPER
BEL BELOW
BLDG BUILDING
BTM BOTTOM
CFM CUBIC FEET PER MINUTE
CLG CEILING

COND CONTINUATION
CONTR CONTRACTOR
COORD COORDINATE
CS CONDENSER WATER SUPPLY
CR CHILLED WATER RETURN
CWS CHILLED WATER SUPPLY
DCW DOMESTIC COLD WATER
DIFF DIFFUSER
DISC DISCONNECT
DN DOWN
DPR DAMPER
EA EACH
EXH EXHAUST
F DPR FIRE DAMPER
FC FAN COIL
FLEX FLEXIBLE
FLR FLOOR
GC GENERAL CONTRACTOR
HP HORSEPOWER
MAX MAXIMUM
MCA MIN CIRCUIT AMPACITY
MIN MINIMUM
MTD MOUNTED
NTS NOT TO SCALE
OA OUTSIDE AIR
RA RETURN AIR
RTU ROOFTOP UNIT
SA SUPPLY AIR
TV TURNING VANES
TYP TYPICAL
WSPH WATER-SOURCE HEAT PUMP
W WITH

NOT ALL SYMBOLS AND ABBREVIATIONS ARE USED. REFER TO THE MECHANICAL PLAN.

- CONTRACTOR TO INSTALL AND LASERAWAY TO FURNISH EACH UNIT WITH A MANUAL DIGITAL THERMOSTAT: VISONPRO 8000 RELINK SKU: THU8110R1008. COORDINATE EXACT MODEL AND SKU NUMBER WITH LASERAWAY'S OPERATIONS TEAM. COORDINATE EXACT MOUNTING LOCATION WITH OWNER. CONTRACTOR SHALL PROVIDE PLENUM RATED CONTROL WIRING BETWEEN EACH DEVICE AND HVAC UNIT. REFER TO THE SEQUENCE OF OPERATIONS ON SHEET M2.0 FOR MORE INFORMATION. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS PRIOR TO BID. ALIGN THERMOSTAT WITH OTHER WALL ELEMENTS.
- FC-1 THRU FC-3: CONTRACTOR TO INSTALL AND LASERAWAY TO FURNISH WALL MOUNTED DUCTLESS FAN COIL UNIT(S) AS SCHEDULED ON SHEET M2.0. REFER TO M1.1 FOR THE MECHANICAL PIPING PLAN FOR CONDENSATE AND REFRIGERANT ROUTING. UNIT TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS. FOR FC-2 CENTER THE FC ON THE WALL BETWEEN THE INSIDE OF THE DOOR FRAME AND THE CORNER OF THE WALL. FOR FC-1 AND FC-3 CENTER ON WALL. COORDINATE LOCATIONS WITH ARCHITECTURAL PLANS AND AND OWNER REPRESENTATIVE. LOCATION SHOWN ON PLAN IS SCHEMATIC. CONTRACTOR SHALL NOT SCALE DRAWINGS TO DETERMINE PLACEMENT. COORDINATE EXACT MOUNTING LOCATION WITH LASERAWAY'S OPERATION TEAM PRIOR TO INSTALLATION.
- (E)RTU-1: CONTRACTOR TO REUSE EXISTING ROOFTOP UNIT. CONTRACTOR SHALL FURNISH AND INSTALL THREE SETS OF FILTERS. CHANGE FILTERS AFTER FINAL STORE CLEANING AND AGAIN PRIOR TO AIR BALANCE. REBALANCE FAN AND REPLACE BELTS. REPLACE/REPAIR ANY DEFECTIVE PARTS. GREASE FAN BEARINGS. CHECK CONTROLS FOR PROPER OPERATION AND MOTOR AND DRIVE FOR PROPER FAN PERFORMANCE. CLEAN AND/OR REPLACE CONDENSATE LINE AS REQUIRED. RE-LABEL ROOFTOP UNIT PER LANDLORD REQUIREMENTS AND PER SPECIFICATIONS. FIELD VERIFY EXACT LOCATION AND ALL REQUIREMENTS.
- CONTRACTOR SHALL REUSE EXISTING TOILET EXHAUST FAN IN EXISTING RESTROOM. CLEAN AND ADJUST AS REQUIRED FOR PROPER OPERATION. REPLACE/REPAIR ANY DEFECTIVE PARTS. FIELD VERIFY EXACT LOCATION AND ALL REQUIREMENTS.
- CONTRACTOR SHALL REUSE EXISTING AIR DEVICE. CLEAN AND ADJUST AS REQUIRED FOR PROPER OPERATION. FIELD VERIFY EXACT LOCATION AND ALL REQUIREMENTS.
- CONTRACTOR TO REUSE EXISTING DUCTWORK. CAP ANY UNUSED OPENINGS IN EXISTING DUCT WITH SAME GAUGE SHEET METAL AND SEAL AIR-TIGHT. REPAIR INSULATION AND VAPOR BARRIER TO MATCH EXISTING. VERIFY EXISTING SUPPORTS AND PROVIDE NEW AS REQUIRED. FIELD VERIFY EXACT LOCATION AND ALL REQUIREMENTS.
- EXISTING PLUMBING FIXTURES TO REMAIN. CLEAN, REPAIR/REPLACE AS NECESSARY TO ENSURE "LIKE-NEW" CONDITION.
- CONTRACTOR SHALL CLEAN AND ADJUST AS REQUIRED FOR PROPER OPERATION. REPAIR/REPLACE ANY DEFECTIVE PARTS. FURNISH AND INSTALL ALL ITEMS REQUIRED TO MAKE SYSTEM FULLY FUNCTIONAL. FIELD VERIFY EXACT LOCATION AND ALL REQUIREMENTS

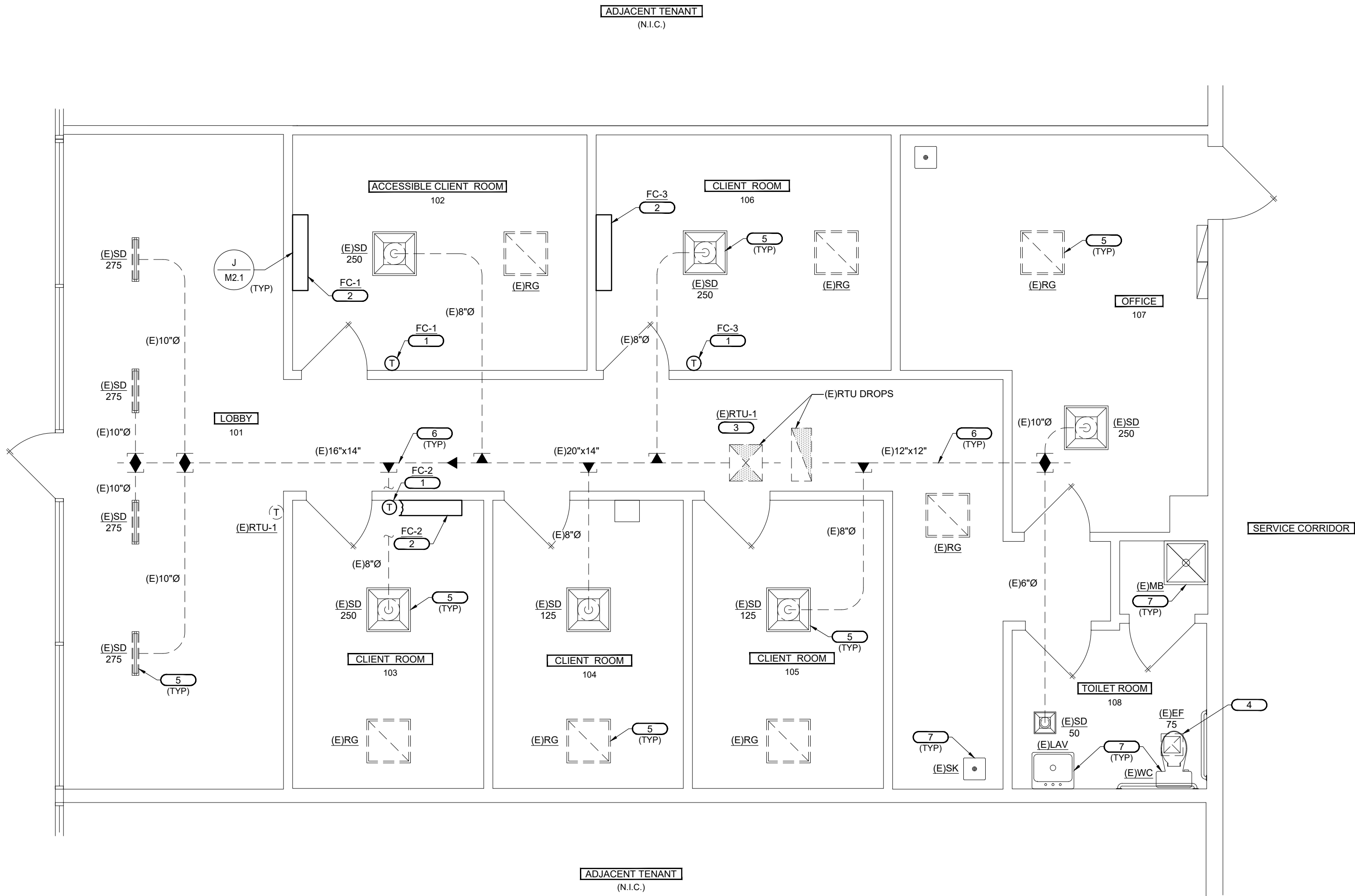
HVAC LEGEND AND ABBREVIATIONS

N.T.S.

S

MECHANICAL PLAN CODED NOTES

D



DO NOT SCALE

REFER TO SHEET M1.1 FOR THE MECHANICAL GENERAL NOTES.

VERIFY ALL CONDITIONS IN FIELD PRIOR TO BIDS.

MECHANICAL PLAN

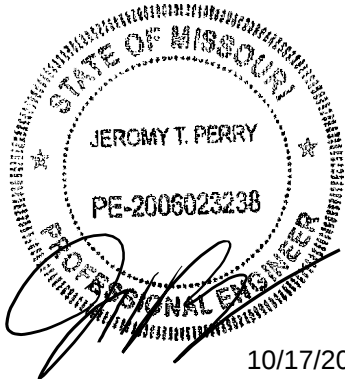
1/4" = 1'-0"

A

LASERAWAY

LEE'S SUMMIT
880 NW BLUE PKWY
SUITE H
LEE'S SUMMIT, MO 64086

MECHANICAL PLAN



10/17/2025

SAI# 250422

DRAWING NUMBER:

M1.0

REVISIONS:

DATE ISSUED:
09/22/2025

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THE ARCHITECT / ENGINEER ASSUMES NO RESPONSIBILITY OR LIABILITY FOR THE USE OF THESE PLANS FOR ANY PROJECT OTHER THAN SPECIFICALLY AUTHORIZED BY THEM AND SIGNED AND SEALED FOR SUCH SPECIFIC LOCATION IN THE STATE, PROVINCE OR TERRITORY SHOWN ON THE SEAL. THIS BUILDING USE IS ONLY APPLICABLE IN AREAS MEETING THE STATED DESIGN CRITERIA.

1. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INCIDENTALS AND DETAILS NECESSARY TO PROVIDE A COMPLETE AND FULLY OPERATIONAL MECHANICAL SYSTEM AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS AND AS REQUIRED BY THE JOB CONDITIONS. ALL WORK NOT SPECIFICALLY NOTED AS BEING PROVIDED BY THE LANDLORD SHALL BE PROVIDED BY THE CONTRACTOR. ALL WORK (MATERIALS, FABRICATION, INSTALLATION, ETC.) SHALL COMPLY WITH THE APPLICABLE SECTIONS OF ALL STATE AND LOCAL CODES (MECHANICAL CODE, BUILDING CODE, ENERGY CODE, ETC.) AND THE LATEST EDITION OF SMACNA.
2. READ THE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL DIVISIONS OF WORK. COORDINATE AND SCHEDULE ALL WORK WITH AND BETWEEN ALL CONTRACTORS AND PROVIDE ALL SUBCONTRACTORS WITH A COMPLETE SET OF BID DOCUMENTS. FIELD VERIFY AND COORDINATE WORK BETWEEN ALL TRADES, LANDLORD REQUIREMENTS, CEILING HEIGHTS AND EXISTING CONDITIONS PRIOR TO THE START OF WORK OR ORDERING OF EQUIPMENT.
3. VERIFY ALL CONDITIONS IN FIELD PRIOR TO BID. VISIT JOB SITE AND BE FAMILIAR WITH LANDLORD REQUIREMENTS AND EXISTING CONDITIONS. NO ALLOWANCE WILL BE MADE FOR EXTRAS DUE TO FAILURE TO VISIT THE JOB SITE AND/OR FAILURE TO PREDETERMINE ALL REQUIREMENTS IMPOSED BY THE LANDLORD, EXISTING CONDITIONS OR OTHER AUTHORITIES.
4. VERIFY DUCT ROUTING AS EARLY IN THE JOB PROCESS AS POSSIBLE. IF MINOR CHANGES ARE REQUIRED, NOTIFY TENANT CONSTRUCTION MANAGER IMMEDIATELY. DUCT DIMENSIONS ARE NOMINAL CLEAR INSIDE DIMENSIONS. DUCT LAYOUTS ARE SCHEMATIC. FIELD COORDINATE ALL DUCT RUNS PRIOR TO DUCT FABRICATION. NO EXTRAS SHALL BE AWARDED FOR DUCT REVISIONS CAUSED BY LACK OF COORDINATION. REFER TO SPECIFICATIONS FOR MORE INFO.
5. ALIGNMENT/PLACEMENT OF HVAC DEVICES IS CRITICAL. COORDINATE ALIGNMENT WITH THE ARCHITECTURAL REFLECTED CEILING PLAN AND LIGHTING PLAN. COORDINATE BOX-OUT LOCATIONS FOR ALL DRYWALL MOUNTED AIR DEVICES WITH CEILING FRAMING. ORIENT ALL AIR DEVICES TO MINIMIZE VIEW INTO PLENUM/DUCT. CEILING AIR DEVICES TO HAVE BLADE OPENINGS FACING WALL OR SOFFIT AND WALL AIR DEVICES TO HAVE OPENINGS FACING UP.
6. SPIN-IN FITTINGS WITHOUT MANUAL BALANCING DAMPERS TO BE USED FOR ALL ROUND BRANCH TAPS AT INACCESSIBLE LOCATIONS WITH BALANCING REQUIRED WITHIN TWO (2) FEET OF DIFFUSER WITH PLASTER FRAME. FLEX DUCT TO BE A MAXIMUM OF 5'-0" LONG AND SHALL BE INSULATED.
7. PROVIDE AS-BUILT DRAWINGS ALONG WITH ALL EQUIPMENT SHOP DRAWINGS, INFORMATION ON THERMOSTATS, CONTROL WIRING DIAGRAMS AND OTHER PERTINENT INFORMATION TO LANDLORD AND TENANT AT COMPLETION OF PROJECT.
8. FURNISH AND INSTALL STRUCTURAL STEEL REQUIRED TO SUPPORT EQUIPMENT AND COORDINATE LOCATIONS AND REQUIREMENTS WITH THE LANDLORD REPRESENTATIVE. COST OF THIS WORK AND ANY STRUCTURAL ENGINEERING FEES REQUIRED SHALL BE INCLUDED IN THIS BID.

9. ALL EQUIPMENT, PIPING AND/OR DUCTWORK NOT BEING USED OR SHOWN TO REMAIN IS FULLY REMOVED AND NOT ABANDONED. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
10. ANY EXISTING WALL, FLOOR OR CEILING SURFACE THAT IS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO MATCH NEW AND/OR EXISTING CONDITIONS.
11. COMPLETELY INSTALL ALL ACCESSORIES PER EQUIPMENT MANUFACTURER RECOMMENDATIONS, INCLUDING ALL TEMPERATURE CONTROL, CONNECTIONS. PROVIDE ALL MISCELLANEOUS MATERIALS AND LABOR REQUIRED TO COMPLETE THIS WORK PER MANUFACTURER PROVIDED INSTRUCTIONS.
12. CONTRACTOR SHALL UTILIZE A THIRD-PARTY TEST AND BALANCE AGENT. BALANCE ALL HVAC SYSTEMS TO AIRFLOW VALUES (CFM) NOTED ON PLANS AND PROVIDE AIR BALANCING REPORT TO TENANT FOR ALL HVAC SYSTEMS. CAREFULLY FOLLOW SPECIFICATIONS FOR AIR BALANCE WORK. CONTRACTOR SHALL FIELD VERIFY AND COORDINATE REQUIREMENTS PRIOR TO BID AND INCLUDE THE COST OF THIS WORK IN THIS BID.
13. FURNISH AND INSTALL ACCESS PANELS AS DIRECTED AND AS SPECIFIED BY TENANT FOR ALL EQUIPMENT OR OTHER ITEMS REQUIRING ACCESS. VERIFY AND COORDINATE PLACEMENT OF ACCESS WITH EQUIPMENT SERVICE CLEARANCES AND WITH TENANT CONSTRUCTION MANAGER.
14. PRIOR TO MAKING ANY PIPE OR DUCT PENETRATIONS OR POSITIONING ANY EQUIPMENT ONIN THE STRUCTURE, ALL PROPOSED LOCATIONS AND/OR PENETRATIONS SHALL MATCH LOCATIONS INDICATED ON THE LANDLORD APPROVED PLANS AND SHALL BE FIELD VERIFIED AND APPROVED BY LANDLORD FIELD REPRESENTATIVE.
15. ALL EQUIPMENT TO BE SUPPORTED FROM STRUCTURAL MEMBERS. NO WEIGHT CAN BE PLACED ON THE ROOFING MATERIALS OR INSULATION.
16. FURNISH AND INSTALL TEMPORARY WEATHERPROOFING OF ALL ROOF PENETRATIONS, UNTIL LANDLORD APPROVED ROOFING CONTRACTOR HAS MADE THE FINAL PATCH. VERIFY REQUIREMENTS WITH LANDLORD.
17. ALL ROOF CUTTING, PATCHING AND FLASHING REQUIRED SHALL BE BY A LANDLORD APPROVED ROOFING CONTRACTOR AT THIS CONTRACTOR'S EXPENSE. COORDINATE ROOF PENETRATIONS WITH LANDLORD'S REPRESENTATIVE. FIELD VERIFY AND COORDINATE REQUIREMENTS WITH LANDLORD PRIOR TO BID AND INCLUDE THE COST OF THIS WORK IN THIS BID.

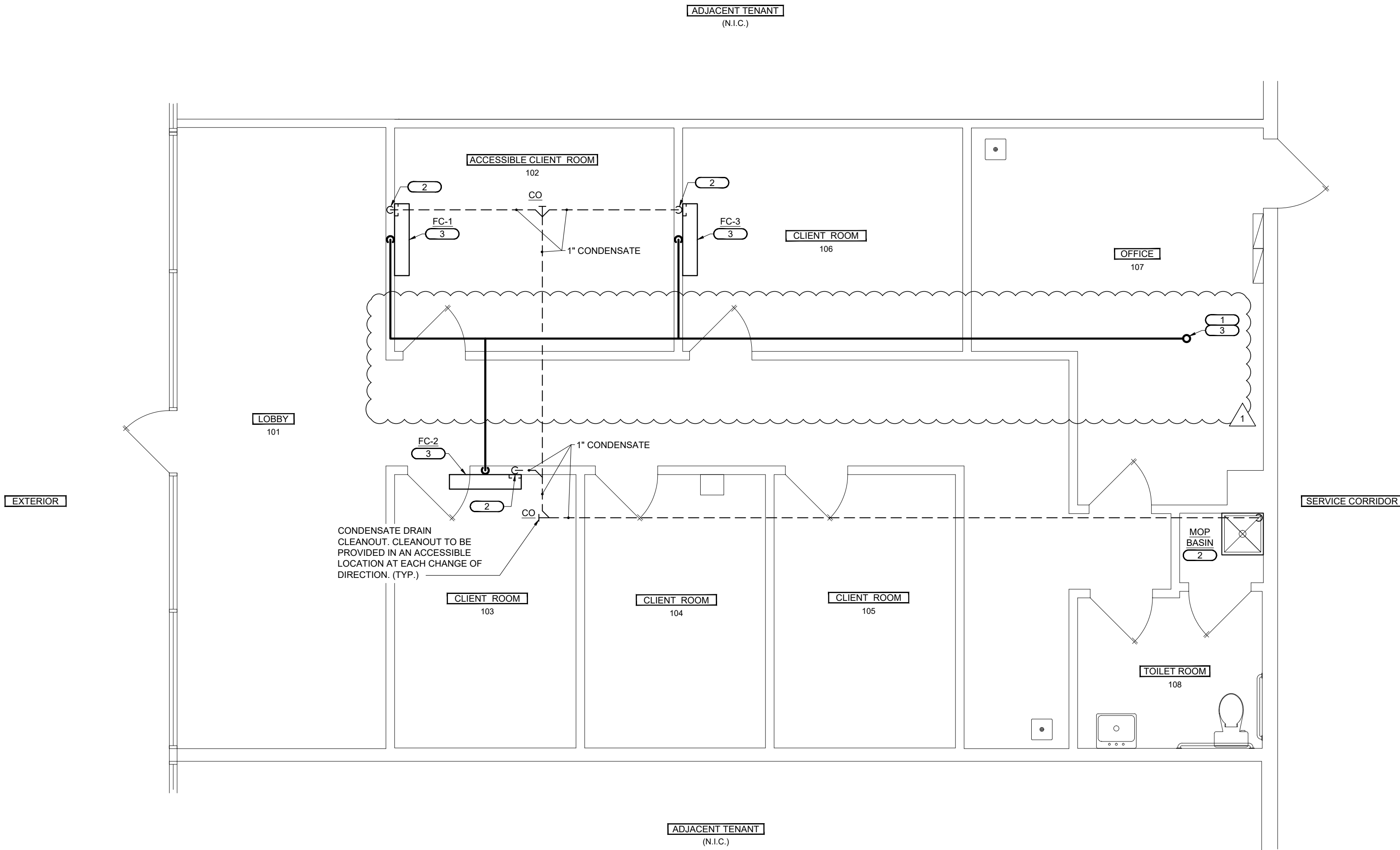
18. ALL MECHANICAL EQUIPMENT, PIPES AND DUCTS, PENETRATING AND/OR LOCATED ON ROOF SHALL BE PAINTED TO MATCH COLOR OF ROOF. USE THE APPROPRIATE COATS OF PRIMER PRETREATMENT, PRIOR TO FINAL COAT. THE FINAL COAT OF THE ROOF MATCHING COLOR SHALL BE APPROVED BY LANDLORD CONSTRUCTION COORDINATOR. SPACE NUMBER SHALL BE PERMANENTLY MARKED ON ALL EQUIPMENT.
19. FURNISH AND INSTALL IDENTIFICATION ON ALL EQUIPMENT MOUNTED OUTSIDE OF SPACE (ON ROOF OR GRADE); PROVIDE PLASTIC LAMINATED PLATE OR STENCIL WITH A MINIMUM OF 4" HIGH BLACK LETTERS, INDICATING TENANTS NAME AND SPACE NUMBER. VERIFY REQUIREMENTS WITH LANDLORD.
20. REFER TO STRUCTURAL SHEETS FOR STRUCTURAL SUPPORT DETAILS.
21. CONTRACTOR SHALL PERFORM STARTUP ON ALL HVAC EQUIPMENT AND CONTROL SYSTEM. PRIOR TO ENERGIZING ANY HVAC UNIT FOR PERMANENT OR TEMPORARY HEATING OR COOLING, CONTRACTOR MUST HAVE APPROVAL FROM TENANT CONSTRUCTION MANAGER AND IS REQUIRED TO HAVE COMPLETED STARTUP PROCEDURES AS OUTLINED IN THE MANUFACTURER PROVIDED INSTALLATION AND STARTUP MANUALS FOR EACH PIECE OF HVAC EQUIPMENT.
22. CONTRACTOR SHALL PROVIDE A FIRE WATCH AND PORTABLE FIRE EXTINGUISHER (MINIMUM SIZE 2A:20BC), WHENEVER ANY WELDING IS DONE WITHIN THE DEMISED PREMISES, THE PERSON PERFORMING THE FIRE WATCH SHALL REMAIN IN THE SPACE FOR AT LEAST ONE (1) HOUR AFTER THE COMPLETION OF ANY WELDING. THIS SHALL BE COORDINATED THROUGH THE LOCAL FIRE DEPARTMENT.
23. FURNISH AND INSTALL FIRE-RATED PIPE SLEEVES AND SEALS ON ALL PIPING THAT PENETRATES A FIRE-RATED PARTITION.
24. FIRE PROTECTION PLANS MUST BE ENGINEERED AND WET SIGNED AND SEALED BY A LANDLORD APPROVED, LICENSED, REGISTERED FIRE PROTECTION CONTRACTOR IN THE LOCAL JURISDICTION. CONTRACTOR SHALL FIELD VERIFY AND COORDINATE REQUIREMENTS WITH LANDLORD PRIOR TO BID AND INCLUDE THE COST OF THIS WORK IN THIS BID.
25. FIRE PROTECTION CONTRACTOR SHALL MODIFY SPRINKLER HEADS AND PIPING FOR NEW OWNER STORE LAYOUT. RUN HYDRAULIC CALCULATIONS AS REQUIRED. REFER TO SPECIFICATIONS. DESIGN NEW LAYOUT TO MEET NFPA 13, LOCAL AUTHORITY HAVING JURISDICTION AND LANDLORD REQUIREMENTS.

1. CONTRACTOR SHALL PROVIDE REFRIGERANT PIPING BETWEEN EACH PIECE OF EQUIPMENT AND MAKE FINAL CONNECTIONS. PROVIDE SHUT-OFF VALVES, CHARGING PORTS, FILTER DRYERS, SIGHT GLASSES, 24 VOLT SOLENOID VALVES, AND ALL ITEMS REQUIRED FOR A COMPLETE AND FUNCTIONING REFRIGERATION SYSTEM. INSTALL TXV AND CLAMP-ON PIPE TEMPERATURE SENSOR AS FURNISHED BY MANUFACTURER. INSULATE SUCTION LINE AND SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS FOR DISTANCE, NUMBER OF FITTINGS AND HEIGHT OF LIQUID LIFT. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS WITH EXISTING CONDITIONS. SEE HVAC EQUIPMENT SCHEDULE FOR MORE INFORMATION. ROUTE REFRIGERANT LINES TIGHT TO STRUCTURE WHEN POSSIBLE AND RUN PARALLEL OR PERPENDICULAR TO STRUCTURE IN AN ORDERLY MANNER. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS PRIOR TO BID.
2. PROVIDE A CONDENSATE DRAIN FROM EACH PIECE OF HVAC EQUIPMENT. CONTRACTOR SHALL PROVIDE AN ASPEN WHITE CONDENSATE PUMP FOR EACH 'FC' WALL HUNG FAN COIL UNIT. INSTALL CONDENSATE PUMP TIGHT TO THE BOTTOM OF THE FC WITH NO GAP. MINIMUM DRAIN SIZE SHALL BE 1" PIPING TO SLOPE TOWARD OUTLET AT A MINIMUM OF 1/8" PER FOOT AND SHALL BE WROUGHT COPPER TUBING AND FITTINGS WITH FULLY SOLDERED JOINTS. ROUTE DRAINS AS INDICATED ON PLAN TO MOP BASIN AND PROVIDE CODE REQUIRED AIR GAP. ROUTE CONDENSATE LINES TIGHT TO STRUCTURE WHEN POSSIBLE AND RUN IN AN ORDERLY MANNER. FIELD VERIFY AND COORDINATE ROUTING, SLOPE, MATERIALS, OUTLET AND ALL OTHER REQUIREMENTS.
3. ROUTE REFRIGERANT PIPING FROM CONDENSING UNITS DOWN THRU ROOF TO NEW FAN COIL UNITS.

MECHANICAL GENERAL NOTES

H MECHANICAL PIPING PLAN CODED NOTES

D



DO NOT SCALE

REFER TO SHEET M1.0 FOR THE MECHANICAL PLAN. VERIFY ALL CONDITIONS IN FIELD PRIOR TO BIDS.

MECHANICAL PIPING PLAN

1/4" = 1'-0"

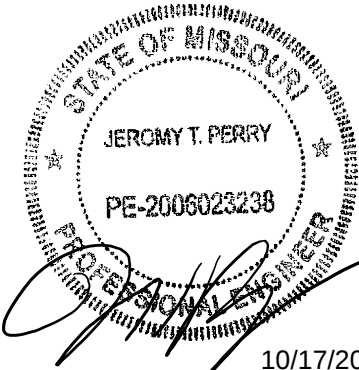
A

LASERAWAY

LEE'S SUMMIT
880 NW BLUE PKWY
SUITE H
LEE'S SUMMIT, MO 64086

MECHANICAL PIPING PLAN

DRAWN BY: EXC CHECKED BY: JTP



10/17/2025

SAI# 250422

DRAWING NUMBER:

M1.1

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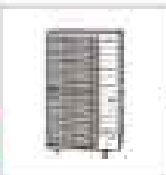


DATE ISSUED:
09/22/2025

1. (E)RTU-1: CONTRACTOR TO REUSE EXISTING ROOFTOP UNIT. CONTRACTOR SHALL FURNISH AND INSTALL THREE SETS OF FILTERS. CHANGE FILTERS AFTER FINAL STORE CLEANING AND AGAIN PRIOR TO AIR BALANCE. REBALANCE FAN AND REPLACE BELTS. REPLACE/REPAIR ANY DEFECTIVE PARTS. GREASE FAN BEARINGS. CHECK CONTROLS FOR PROPER OPERATION AND MOTOR AND DRIVE FOR PROPER FAN PERFORMANCE. CLEAN AND/OR REPLACE CONDENSATE LINE AS REQUIRED. RE-LABEL ROOFTOP UNIT PER LANDLORD REQUIREMENTS AND PER SPECIFICATIONS. FIELD VERIFY EXACT LOCATION AND ALL REQUIREMENTS.
2. CU-1: CONTRACTOR TO INSTALL AND LASERAWAY TO FURNISH VRF UNIT(S) AS SCHEDULED ON SHEET M2.0. UNITS ARE TO BE MOUNTED ON EQUIPMENT RAILS ON THE ROOF. CONTRACTOR TO PROVIDE SUPPORT FOR UNIT(S). ALL ROOF WORK TO BE PERFORMED BY A LANDLORD APPROVED ROOFING CONTRACTOR AT THE CONTRACTOR'S EXPENSE. REFER TO M1.1 FOR THE MECHANICAL PIPING PLAN FOR REFRIGERANT ROUTING. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS PRIOR TO BID AND INCLUDE ALL MATERIAL AND LABOR COSTS FOR THIS WORK IN BID.
3. ROUTE REFRIGERANT PIPING FROM CONDENSING UNIT DOWN THRU ROOF TO NEW FAN COIL UNITS. PROVIDE PIPE BOOT AND SEAL. ROOF PENETRATION. ALL ROOF WORK TO BE PERFORMED BY LANDLORD APPROVED ROOFING CONTRACTOR AT THIS CONTRACTOR'S EXPENSE.
4. CONTRACTOR SHALL PROVIDE REFRIGERANT PIPING BETWEEN EACH PIECE OF EQUIPMENT AND MAKE FINAL CONNECTIONS. PROVIDE SHUT-OFF VALVES, CHARGING PORTS, FILTER DRYERS, SIGHT GLASSES, 24 VOLT SOLENOID VALVES, AND ALL ITEMS REQUIRED FOR A COMPLETE AND FUNCTIONING REFRIGERATION SYSTEM. INSTALL TXV AND CLAMP-ON PIPE TEMPERATURE SENSOR AS FURNISHED BY MANUFACTURER. INSULATE SUCTION LINE AND SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS FOR DISTANCE, NUMBER OF FITTINGS AND HEIGHT OF LIQUID LIFT. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS WITH EXISTING CONDITIONS. SEE HVAC EQUIPMENT SCHEDULE FOR MORE INFORMATION. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS PRIOR TO BID.
5. DASHED LINE AROUND HVAC EQUIPMENT REPRESENTS MANUFACTURER'S RECOMMENDED CLEARANCES FOR EQUIPMENT MAINTENANCE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN SERVICE CLEARANCES THE FULL HEIGHT OF THE UNIT IN THIS AREA.
6. CONTRACTOR TO PROVIDE RESTRAINED SPRING ISOLATORS FROM KINETICS NOISE CONTROL FLS-2 SERIES, OR EQUAL, FOR UNIT MOUNTING.
7. CONTRACTOR TO PROVIDE EQUIPMENT RAILS TO SUPPORT CU-1. FIELD VERIFY EXACT LOCATION AND SPACING OF EXISTING JOIST. EQUIPMENT RAILS TO SPAN ACROSS 2 JOISTS.

R
118.11

CU1
AM060FCMDCG/AA
65425Btu/h | 71394Btu/h



MXJ-YA2512M
3/8" [3/4"] (in)
50.00ft [0EA]

3/8" [5/8"] (in)
25.00ft [0EA]

AM024FEVDCG/AA | FC_1
21808Btu/h | 15798Btu/h | 23798Btu/h

MXJ-YA1509M
3/8" [5/8"] (in)
10.00ft [0EA]

3/8" [5/8"] (in)
25.00ft [0EA]

AM024FEVDCG/AA | FC_2
21808Btu/h | 15798Btu/h | 23798Btu/h

3/8" [5/8"] (in)
25.00ft [0EA]

AM024FEVDCG/AA | FC_3
21808Btu/h | 15798Btu/h | 23798Btu/h

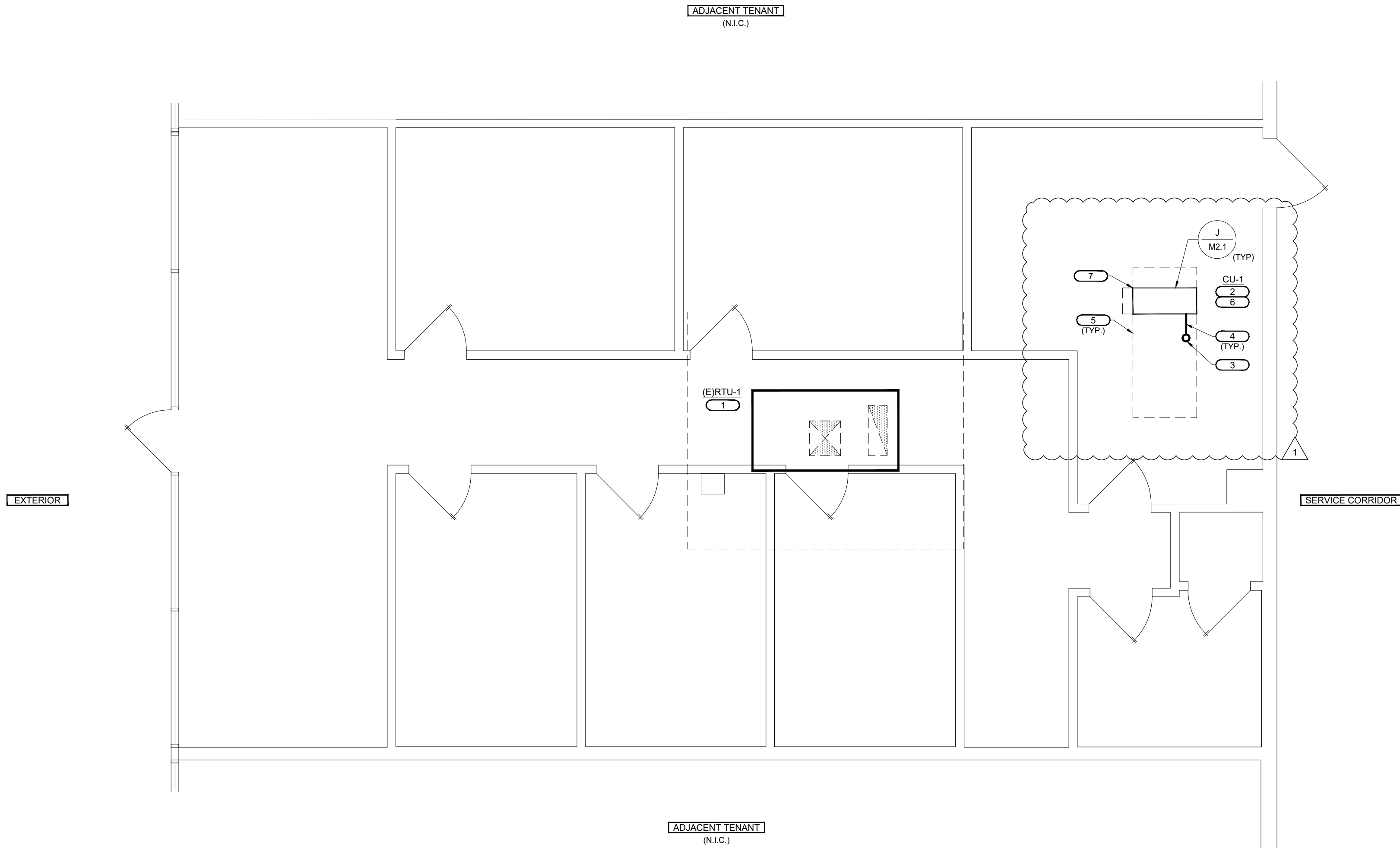
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MECHANICAL ROOF PLAN CODED NOTES

M

CU-1 REFRIGERANT PIPING DIAGRAM

D



REFER TO SHEET M1.0 FOR THE
MECHANICAL PLAN. VERIFY ALL CONDITIONS
IN FIELD PRIOR TO BIDS.

MECHANICAL ROOF PLAN

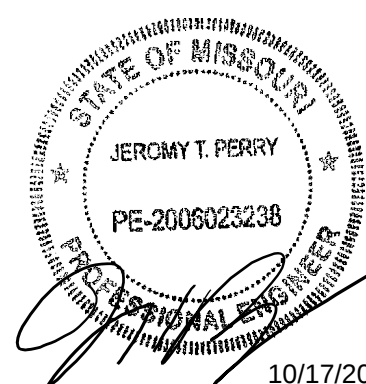
1/4" = 1'-0"
-

A

LASERAWAY

LEE'S SUMMIT
880 NW BLUE PKWY
SUITE H
LEE'S SUMMIT, MO 64086

MECHANICAL ROOF PLAN



10/17/2025

SAI# 250422

DRAWING NUMBER:

M1.2

REVISIONS:



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DATE ISSUED:
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L = LANDLORD G = GENERAL CONTRACTOR O = OWNER / LASERAWAY E = EXISTING N/A = NOT APPLICABLE		SUPPLIED	INSTALLED	KEYNOTES	PROPRIETARY VENDOR / COMMENTS
ITEM					
DIVISION 21 - FIRE SUPPRESSION SPRINKLER SYSTEMS / DIVISION 23 - HVAC					
SPRINKLER STUB		N/A	N/A		
SPRINKLER MAIN		N/A	N/A		
SPRINKLER GRID		N/A	N/A	1	CONTRACTOR TO USE LANDLORD'S PREFERRED FIRE PROTECTION CONTRACTOR FOR ALL FIRE PROTECTION WORK. FIELD VERIFY AND COORDINATE PRIOR TO BID.
SPRINKLER MODIFICATIONS		N/A	N/A	1	CONTRACTOR TO USE LANDLORD'S PREFERRED FIRE PROTECTION CONTRACTOR FOR ALL FIRE PROTECTION WORK. FIELD VERIFY AND COORDINATE PRIOR TO BID.
FCU		O	G	1,2,5, 6	LASERAWAY TO FURNISH AND CONTRACTOR TO INSTALL VRF UNITS. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS PRIOR TO BID.
FCU COND PUMP		G	G		
STRUCTURAL SUPPORT FOR FCUS		G	G		
RTU		E	E		
ROOF CURBS		E	E		
STRUCTURAL SUPPORT FOR RTU		E	E		
CONDENSING UNITS / HEAT PUMPS		O/G	G	1,2,5, 6	LASERAWAY TO FURNISH CUS. CONTRACTOR PROVIDE SUPPORTS AND TO INSTALL VRF UNITS. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS PRIOR TO BID.
CURBS / STRUCTURAL SUPPORT FOR CONDENSING UNITS / HEAT PUMPS		G	G		
ERV UNIT		N/A	N/A	1,2,5, 6	LASERAWAY TO FURNISH AND CONTRACTOR TO INSTALL ERV. FIELD VERIFY AND COORDINATE ALL REQUIREMENTS PRIOR TO BID.
STRUCTURAL SUPPORT FOR ERV		N/A	N/A		
VAV BOXES		N/A	N/A		
ALL DUCTWORK (LOW AND MEDIUM PRESSURE,FLEXIBLE DUCT, ETC.)		E	E		
AIR DEVICES - DIFFUSERS GRILLES AND BAFFLES		E	E		
FIRE DAMPERS - WALL AND/OR CEILING		N/A	N/A		
MANUAL BALANCING DAMPER AND MOTORIZED DAMPERS		G	G		
HVAC PIPING		G	G		
CHILLED WATER / HOT WATER PIPING VALVES		N/A	N/A		
OUTSIDE AIR INTAKE HOOD / FAN		N/A	N/A		
OUTSIDE AIR ACCESS AND DUCTWORK		G	G		
RELIEF AIR HOOD / FAN		N/A	N/A		
RELIEF AIR / MAKEUP AIR		N/A	N/A		
EXHAUST AIR ACCESS AND DUCTWORK		E	E		
SMOKE EVAC AND CONTROLS		N/A	N/A		
DUCT SMOKE DETECTORS		E	E		
ZONE DAMPERS		N/A	N/A		
UNIT HEATERS		N/A	N/A		
DUCT HEATERS		N/A	N/A		
TEMPERATURE CONTROL SYSTEM		E	E		
HUMIDISTAT		N/A	N/A		
RETURN AIR FAN		N/A	N/A		
TOILET EXHAUST FAN		E	E		
TOILET EXHAUST DUCTWORK AND ROOF CAPWALL OUTLET		E	E		
AIR BALANCE REPORT		G	G		G.C. TO COORDINATE DATE OF REPORT DUE WITH THE PROJECT MANAGER
AS-BUILT DRAWINGS		G	G		
GENERAL NOTES 1. THIS RESPONSIBILITY MATRIX DELINEATES: OWNER AND LANDLORD SUPPLIED ITEMS. EXISTING LANDLORD WORK TO BE VERIFIED BY G.C. G.C. TO REFER TO OSM FOR CONTACT NAME AND PHONE NUMBER. 2. SEE M.E.P. DRAWINGS FOR ADDITIONAL INFORMATION. 3. NO SUBSTITUTIONS OF ANY MATERIALS OR ITEMS SPECIFIED IN THE DOCUMENTS ARE PERMITTED, U.N.O. AND APPROVED BY THE OWNER. 4. ALL ITEMS NOT FOUND IN THIS MATRIX ARE TO BE SUPPLIED AND INSTALLED BY GENERAL CONTRACTOR. DEFINITIONS 1. SUPPLIED - MEANS PROVIDE AND DELIVER TO PROJECT. FREIGHT ON BOARD TRUCK UNLESS OTHERWISE DEFINED IN GREATER DETAIL. 2. INSTALLED - DESCRIBES OPERATIONS AT PROJECT FROM INSPECTION AND UNLOADING TO COMPLETION IN PLACE, READY FOR INTENDED USE. KEYNOTES 1. G.C. TO VERIFY EXISTING CONDITION IS ACCEPTABLE FOR ALL NEW WORK. 2. G.C. IS RESPONSIBLE FOR UNLOADING OWNER SUPPLIED CONSTRUCTION ITEMS. G.C. TO COORDINATE SCHEDULE AND DELIVERY WITH SUPPLIER. STANDARD SHIPPING PROVIDED BY OWNER. G.C. IS RESPONSIBLE FOR ANY EXPEDITED SHIPPING COSTS AND PROVIDING LABOR AND EQUIPMENT ITEMS. ALL DELIVERIES REQUIRED TO HAVE LIFT GATES BY INTERIOR DEFINE. G.C. REQUIRED TO NOTIFY OWNER WITHIN 24 HOURS IF DAMAGED PARTS ARE RECEIVED OR IF PARTS ARE MISSING. 3. G.C. REQUIRED TO PURCHASE FROM SPECIFIED VENDOR AND RESPONSIBLE FOR COORDINATION AND DELIVERY. 4. G.C. TO PROVIDE CONDUIT AND J-BOXES AS REQUIRED - REFER TO ELECTRICAL DRAWINGS. 5. NO SUBSTITUTIONS OF ANY MATERIALS OR ITEMS SPECIFIED IN THE DOCUMENTS ARE PERMITTED, U.N.O. AND APPROVED BY THE OWNER. 6. G.C. IS REQUIRED TO UNWRAP AND INSPECT ALL OWNER SUPPLIED MATERIAL, FIXTURES & HARDWARE IMMEDIATELY UPON RECEIPT & REPORT DAMAGES, IMPERFECTIONS OR MISSING ITEMS WITHIN 24 HOURS OF RECEIPT. FAILURE TO DO SO CAN RESULT IN BACK-CHARGE. 7. UTILITY SET-UP BY G.C. REQUIRED TO BE COMPLETED BY WEEK 1 OF POSSESSION. ALL UTILITIES INCLUDING GAS MUST BE TURNED ON PRIOR TO C.O.					
RESPONSIBILITY SCHEDULE					

RESPONSIBILITY SCHEDULE

N

HVAC SEQUENCE OF OPERATIONS

J

MECHANICAL SCHEDULES

A

DESIGN WEATHER PARAMETERS

Design Parameters:	
City Name	Kansas City
Location	Missouri
Latitude	39.3 Deg.
Longitude	94.7 Deg.
Elevation	1024.0 ft
Summer Design Dry-Bulb	96.0 °F
Summer Coincident Wet-Bulb	75.0 °F
Summer Daily Range	18.8 °F
Winter Design Dry-Bulb	-1.0 °F
Winter Design Wet-Bulb	-2.5 °F
Atmospheric Clearness Number	1.00
Average Ground Reflectance	0.20
Soil Conductivity	0.800 BTU/(hr ft² F)
Local Time Zone (GMT +/- N hours)	6.0 hours
Consider Daylight Savings Time	No
Simulation Weather Data	N/A
Current Data is	2001 ASHRAE Handbook
Design Cooling Months	January to December

Air System Information		
Air System Name	Total	Number of zones
Equipment Class	PKG ROOF	Floor Area
Air System Type	SZCAV	Location
		Kansas City, Missouri

Sizing Calculation Information		
Calculation Months	Jan to Dec	Zone CFM Sizing
Sizing Data	Calculated	Sum of space airflow rates
		Individual peak space loads

Central Cooling Coil Sizing Data		
Total coil load	5.3 Tons	Load occurs at
Total coil load	63.1 MBH	OA DB / WB
Sensible coil load	62.2 MBH	Entering DB / WB
Coil CFM at Aug 1500	3990 CFM	Leaving DB / WB
Max block CFM	3990 CFM	Coil ADP
Sum of peak zone CFM	3990 CFM	Bypass Factor
Sensible heat ratio	0.890	Resulting RH
CFM/Ton	768.8	Design supply temp.
ft³/Ton	305.2	Zone Total Check
BTU/(hr-ft²)	39.3	Max zone temperature deviation
Water flow @ 10.0 °F rise	N/A	

Central Heating Coil Sizing Data		
Max coil load	28.4 MBH	Load occurs at
Coil CFM at Des Htg	3948 CFM	Des Htg
Max coil CFM	3990 CFM	Ent. DB / Lvg DB
Water flow @ 20.0 °F drop	N/A	

Supply Fan Sizing Data		
Actual max CFM	3990 CFM	Fan motor BHP
Standard CFM	3948 CFM	
Actual max CFM/ft²	2.49 CFM/ft²	Fan static
		1.09 BHP
		1.00 in wg

ZONE LOADS	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB	Sensible (BTU/hr)	Latent (BTU/hr)	HEATING OA DB / WB	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	62 ft²	2617	-	62 ft²	-	-
Wall Transmission	228 ft²	220	-	228 ft²	705	-
Roof Transmission	1605 ft²	4545	-	1605 ft²	5223	-
Window Transmission	62 ft²	700	-	62 ft²	2343	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	42 ft²	453	-	42 ft²	759	-
Floor Transmission	1538 ft²	0	-	1538 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	772 W	2274	-	0	0	-
Task Lighting	215 W	675	-	0	0	-
Electric Equipment	6650 W	21289	-	0	0	-
People	14	2443	2870	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	3525	287	10%	903	0
>> Total Zone Loads	-	38771	3157	-	9934	0
Zone Conditioning	-	44918	3157	-	9906	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	3990 CFM	0	-	3990 CFM	0	-
Ventilation Load	265 CFM	6357	3756	265 CFM	19066	0
Supply Fan Load	3990 CFM	2958	-	3990 CFM	-2958	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	5%	1939	-	5%	497	-
>> Total System Loads	-	56172	6913	-	26411	0
Central Cooling Coil	-	56172	6924	-	0	0
Central Heating Coil	-	0	-	-	26411	-
>> Total Conditioning	-	56172	6924	-	26411	0
Key:	Positive values are ckg loads			Positive values are htg loads		
	Negative values are htg loads			Negative values are ckg loads		

HVAC LOAD CALCULATIONS

K

HVAC SYSTEM SEQUENCE OF OPERATIONS:	
COOLING SEASON	HEATING SEASON
TIMER CONTROL PREPROGRAMMED MORNING EQUIPMENT STARTUP SEQUENCE: INDIVIDUAL AIR CONDITIONING UNITS START IN SEQUENCE ACCORDING TO SYSTEM PREPROGRAMMED SCHEDULE. 1. MORNING COOLDOWN (STORE CLOSED/UNOCCUPIED) OUTSIDE AIR INTAKE MOTORIZED DAMPERS REMAIN CLOSED AND ERV-1 OFF. UNTIL COOLDOWN OPERATION IS COMPLETED, WHEN AIR TEMPERATURE COOLS DOWN TO SENSOR SETPOINT, RESPECTIVE OUTSIDE AIR DAMPERS OPEN AND ERV-1 INDEXES ON. 2. NORMAL OPERATION (STORE OPEN/OCCUPIED) UNIT RESPONDS TO UNIT TEMPERATURE SENSORS FOR HEATING OR COOLING TO MAINTAIN SPACE SETPOINT. 3. NIGHT SHUTDOWN (STORE CLOSED/UNOCCUPIED) ACCORDING TO TIMER CONTROL PREPROGRAMMED SHUTDOWN SCHEDULE, ALL HVAC EQUIPMENT SHUTS OFF, INCLUDING ERV-1 AND OUTSIDE AIR DAMPERS CLOSE.	TIMER CONTROL PREPROGRAMMED MORNING EQUIPMENT STARTUP SEQUENCE: INDIVIDUAL AIR CONDITIONING UNITS OPERATE ON MORNING WARM-UP CYCLE. 1. MORNING WARM-UP CYCLE MORNING - WARM-UP CYCLE STARTS 2 HOURS BEFORE STORE OPENS FOR BUSINESS. - OUTSIDE AIR MOTORIZED DAMPERS REMAIN CLOSED AND ERV-1 REMAINS OFF. - SPACE TEMPERATURE SENSORS CONTROL HEATING IN RESPECTIVE AIR CONDITIONING UNITS. 2. NORMAL OPERATION (STORE OPEN/OCCUPIED) - AFTER COMPLETION OF WARM-UP CYCLE, AIR CONDITIONING UNITS MAINTAIN SET POINT TEMPERATURE. ERV-1 FANS ENERGIZE. 3. NIGHT TEMPERATURE SETBACK (STORE CLOSED/UNOCCUPIED) - AFTER PREPROGRAMMED TIMER AUTOMATIC SHUTDOWN, SYSTEM OPERATES ON NIGHT SETPOINT CYCLE TO PROVIDE OVERNIGHT HEATING AS REQUIRED BY BPT SETPOINT OF NIGHT SPACE TEMPERATURE SENSOR. - OUTSIDE AIR MOTORIZED DAMPERS REMAIN CLOSED AND ERV-1 REMAINS IF THE OVERNIGHT SPACE TEMPERATURE DROPS TO 50° F. AFTER THE SUPPLY FAN AND HEATING HAVE BEEN ENERGIZED, A LOW TEMPERATURE ALARM SHALL BE INDICATED AT THE CENTRAL MONITORING STATION AND THE SPACE LIGHTING SHALL BE ENERGIZED TO PROVIDE HEAT TO THE AFFECTED AREAS.
INTERMEDIATE SEASONS	
1. OUTDOOR AIR TEMPERATURE BELOW 65°F. - MORNING STARTUP, COOLDOWN CYCLE, NORMAL BUILDING OCCUPIED OPERATION AND NIGHT SHUTDOWN, SAME AS COOLING SEASON OPERATION. 2. OUTDOOR TEMPERATURE BELOW 60°F. - AC UNITS OPERATE ON MECHANICAL COOLING WITH COMPRESSOR OPERATION SAME AS COOLING SEASON, OR HEATING IS ENERGIZED AS NECESSARY TO MAINTAIN SPACE SET POINT.	

MECHANICAL VENTILATION OUTSIDE AIR CALCULATION												
GENERAL INFORMATION			2021 MISSOURI MECHANICAL CODE									
			CALCULATED									
UNIT MARKS	ROOM NAME - NUMBER	OCCUPANCY CLASS	FLOOR AREA (SQFT)	PEOPLE PER 1000 SQFT (NET AREA)	# OF PEOPLE IN SPACE	REQUIRED OUTDOOR AIR (CFM / SQFT)	CFM / PERSON	CFM / PERSON * # OF PEOPLE IN SPACE	CFM / SQFT * FLOOR AREA	BREATHING ZONE OUTDOOR AIR (CFM)	AIR DISTRIBUTION EFFECTIVENESS (Ez)	ZONE OUTSIDE AIR RATE (Vav = Vav(Ez))
			(A2)	(A2)	(P2)	(R2)	(R2)	(R2 * P2)	(R2 * Az)	(Vbr = R2*P2+R2*Az)		(Vav = Vav(Ez))
(ERTU-1)	LOBBY - 101	RECEPTION AREAS	318	30	4	0.06	5	20	20	40	1.0	40
(ERTU-1)	CLIENT ROOM - 105	OFFICE SPACES	196	5	1	0.06	5	5	10	15	1.0	15
(ERTU-1)	CLIENT ROOM - 106	OFFICE SPACES	194	5	1	0.06	5	5	10	15	1.0	15
(ERTU-1)	OFFICE - 107	OFFICE SPACES	233	5	2	0.06	5	10	14	24	1.0	24
(ERTU-1)	TOILET ROOM - 108	TOILET ROOMS - PUBLIC	92	0	0	0.00	0	0	0	0	1.0	0
(ERTU-1)	CORRIDOR	CORRIDORS	276	0	0	0.06	0	0	17	17	1.0	17
(ERTU-1)	CLIENT ROOM - 102	PATIENT ROOMS	195	10	2	0.00	25	50	0	50	1.0	50
(ERTU-1)	CLIENT ROOM - 103	PATIENT ROOMS	125	10	2	0.00	25	50	0	50	1.0	50
(ERTU-1)	CLIENT ROOM - 104	PATIENT ROOMS	125	10	2	0.00	25	50	0	50	1.0	50
TOTAL			1634									480

NOTE: WHEN THE #* (NUMBER WITH ASTERISK) IS INDICATED IN THE # OF PEOPLE IN SPACE CALCULATION THE VALUE LISTED IS BASED UPON THE MAX OCCUPANCY LISTED FOR THAT AREA. REFER TO SHEET G1.0 FOR THE OCCUPANCY COUNT AND STATEMENT REGARDING THE MAX ALLOWABLE OCCUPANCY.

VERIFY ALL CONDITIONS IN FIELD PRIOR TO BIDS.

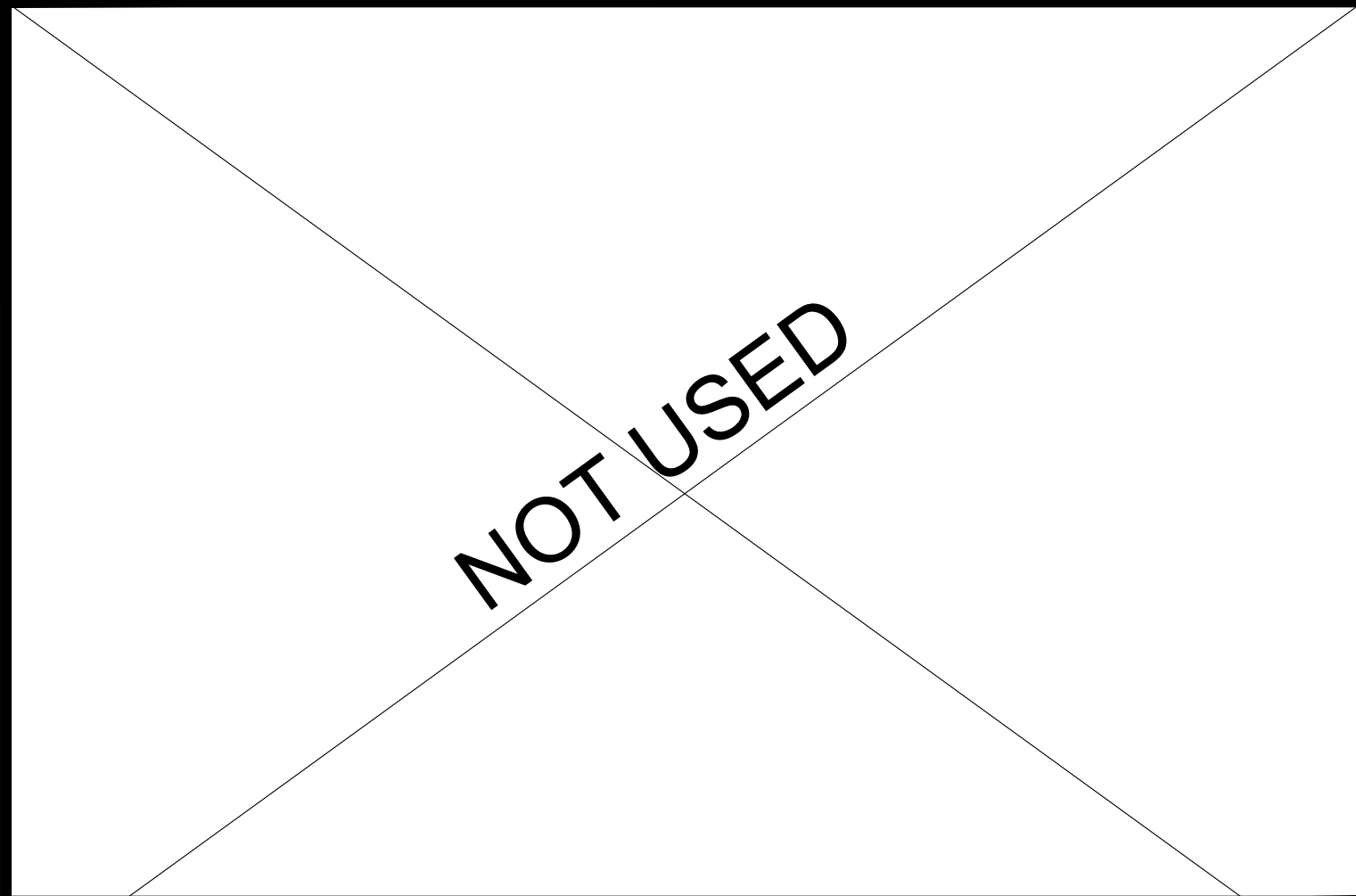
VRF OUTDOOR UNIT SCHEDULE

MARK	CU-1	
MANUFACTURER	SAMSUNG	
MODEL #	AM060FCMDCG/AA	
PAIRED WITH	FC-1, 2 & 3	
COOLING		
AMBIENT OAT (°FBD)	92.0	
EAT (°FBD / WB)	73.6 / 61.7	
NOMINAL TOTAL CAPACITY (MBH)	60.0	
NOMINAL SENSIBLE CAPACITY (MBH)	58.4	
HEATING		
HEATING CAPACITY @ 47°F (MBH)	66.0	
EFFICIENCY FOR A NON-DUCTED SYSTEM		
SEER / EER	17.1 / 10.9	
HSPF	10.9	
PHYSICAL DATA		
NUMBER OF FANS	2	
NO. OF COMPRESSORS	1	
ELECTRICAL		
VOLTS/Ø/Hz	208 / 1 / 60	
MCA (AMPS)	22	
MOCP (AMPS)	30	
WEIGHT (LBS.)	243	
ACCESSORIES	1 - 6	
NOTES	A - F	

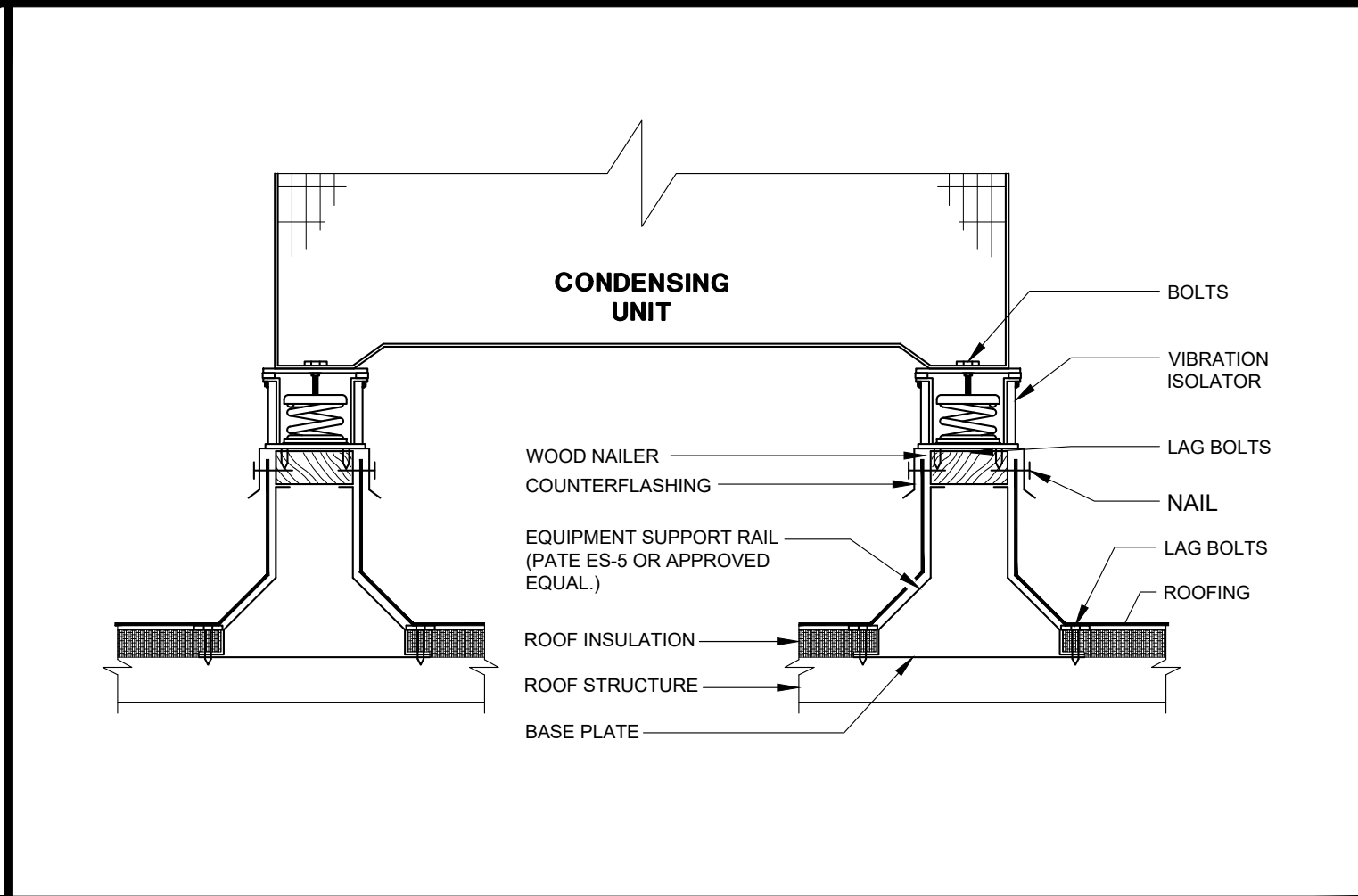
ACCESSORIES:	
1. UNIT TO BE PROVIDED WITH THERMAL SWITCH. SOME FIELD INSTALLATION MAY BE REQUIRED. CONTRACTOR TO VERIFY.	
2. UNIT TO BE PROVIDED WITH CRANKCASE HEATER. SOME FIELD INSTALLATION MAY BE REQUIRED. CONTRACTOR TO VERIFY.	
3. UNIT TO BE PROVIDED WITH BASEPAN HEATERS. SOME FIELD INSTALLATION MAY BE REQUIRED. CONTRACTOR TO VERIFY.	
4. CONTRACTOR PROVIDED DISCONNECT SWITCH.	
5. CONTRACTOR PROVIDED REFRIGERANT SPECIALTIES.	
6. CONTRACTOR PROVIDED RESTRAINED SPRING ISOLATORS.	
NOTES:	
A. CONTRACTOR INSTALLING THE EQUIPMENT SHALL BE CERTIFIED FOR INSTALLING SAMSUNG EQUIPMENT BY SAMSUNG - NO EXCEPTIONS WITHOUT WRITTEN PRIOR CONSENT FROM LASERAWAY.	
B. WIRING OF CONTROLS TO BE BY CONTRACTOR.	
C. REFER TO CONTROL WIRING SCHEMATICS FOR ANY FIELD INSTALLED CONTROL DEVICES NOT NOT FACTORY INSTALLED.	
D. UNIT FURNISHED BY LASERAWAY AND INSTALLED BY CONTRACTOR.	
E. CONTRACTOR TO PROVIDE ALL SUPPORT. REFER TO THE STRUCTURAL DRAWINGS FOR MORE INFORMATION.	
F. COORDINATE ALL REQUIREMENTS WITH LASERAWAY OPERATIONS TEAM PRIOR TO BID.	

EXISTING ROOFTOP UNIT SCHEDULE - GAS

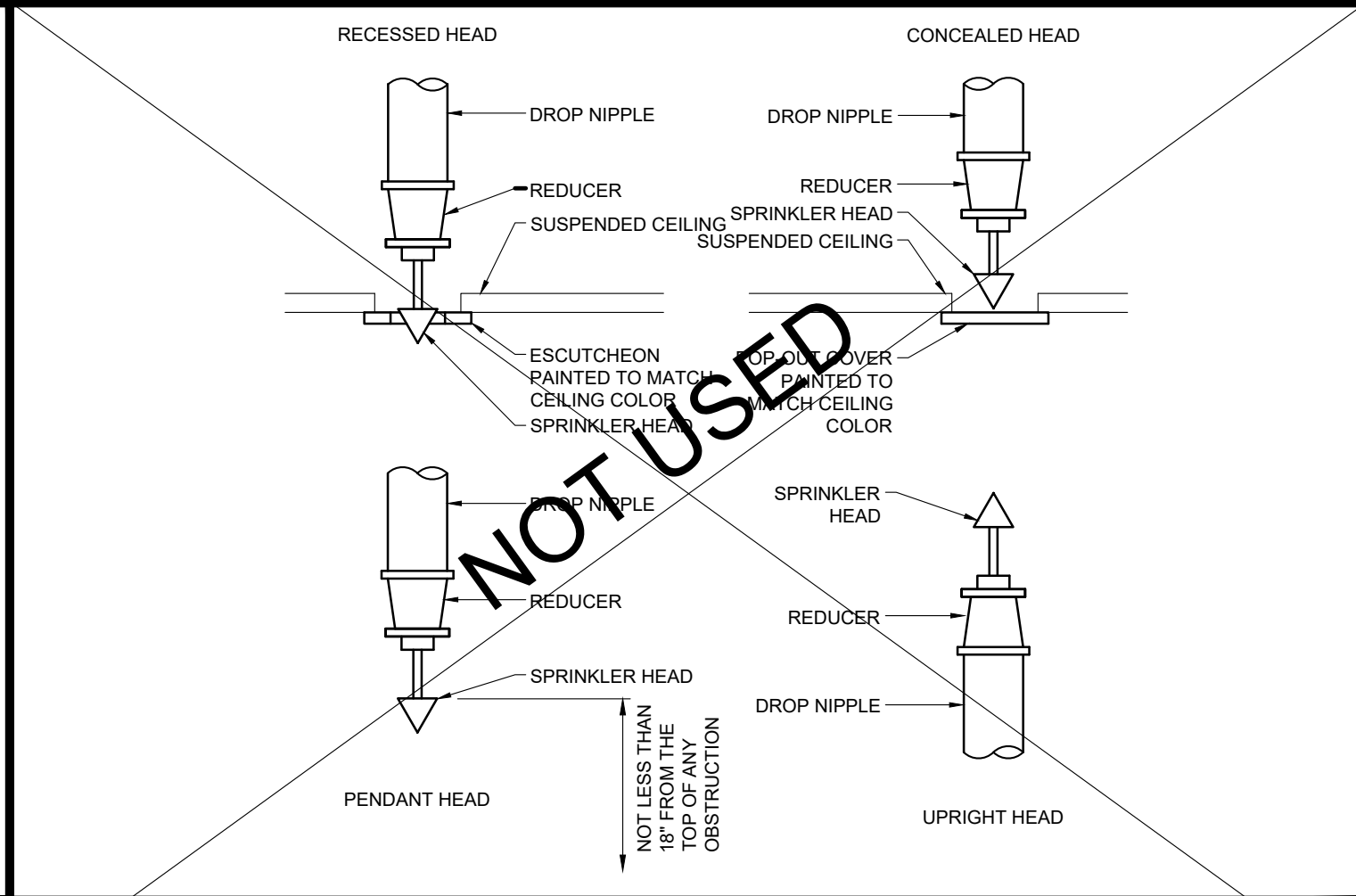
MARK	(ERTU-1)		
MANUFACTURER	LENNOX		
MODEL #	TGA072		
NOMINAL TONNAGE	6		
EER	10.1		
SUPPLY AIR FLOW (CFM)	2400		
OUTSIDE AIR FLOW (CFM)	480		
AMBIENT OAT (°FDB)	96.0		
EXT. S.P. (IN. W.C.)	0.1		
DX COOLING COIL			
EAT (°FDB/WB)	74.5 / 65.2		
TOTAL (MBH)	72.0		
SENSIBLE (MBH)	57.6		
NATURAL GAS HEAT			
INPUT (MBH)	150.0		
OUTPUT (MBH)	120.0		
ELECTRICAL			
VOLTS/ØHZ	460 / 3 / 60		
MOTOR (HP)	2.0		
MCA (AMPS)	16.0		
MOCP (AMPS)	25		
MAX. WEIGHT (LBS.)	EXISTING		
ACCESSORIES	EXISTING		
NOTES	EXISTING		
ACCESSORIES:			
1.	FACTORY PROVIDED NON-FUSED DISCONNECT & THRU THE BASE ELEC.		
2.	CONTRACTOR PROVIDED DUCT SMOKE DETECTOR IN SUPPLY AIR.		
3.	FACTORY FURNISHED (FIELD INSTALLED) 14" HIGH ROOF CURB.		
4.	FACTORY FURNISHED (FIELD INSTALLED) ENTHALPY ECONOMIZER, HOOD WITH BIRDSCREEN AND GABRIEL RELIEF (SOME FIELD ASSEMBLY REQUIRED).		
5.	FACTORY PROVIDED (FIELD WIRED) NON-POWERED GFI OUTLET.		
6.	FACTORY FURNISHED (FIELD INSTALLED) 14" HIGH ROOF CURB.		
7.	FACTORY PROVIDED HINGED ACCESS DOORS.		
8.	FACTORY FURNISHED POWER EXHAUST FAN BELIEF AIR (SOME FIELD ASSEMBLY REQUIRED).		
9.	FACTORY PROVIDED WITH COASTAL CONDENSER COIL COATING.		
10.	FACTORY FURNISHED POWER EXHAUST FAN BELIEF AIR (SOME FIELD ASSEMBLY REQUIRED).		
11.	FACTORY PROVIDED WITH HOT GAS REHEAT FOR DEHUMIDIFICATION.		
12.	FACTORY PROVIDED WITH 2" FILTER RACK.		
NOTES:			
A.	WIRING OF CONTROLS TO BE BY CONTRACTOR.		
B.	REFER TO CONTROL WIRING SCHEMATICS FOR ANY FIELD INSTALLED CONTROL DEVICES NOT FACTORY INSTALLED.		
C.	FACTORY FURNISHED MINIMUM OUTSIDE AIR AS SPECIFIED ABOVE. OUTSIDE AIR DAMPER SHALL FULLY CLOSE ON UNIT SHUTDOWN.		
D.	UNIT FURNISHED AND INSTALLED BY CONTRACTOR.		
E.	CONTRACTOR TO PROVIDE ALL STRUCTURAL SUPPORT.		



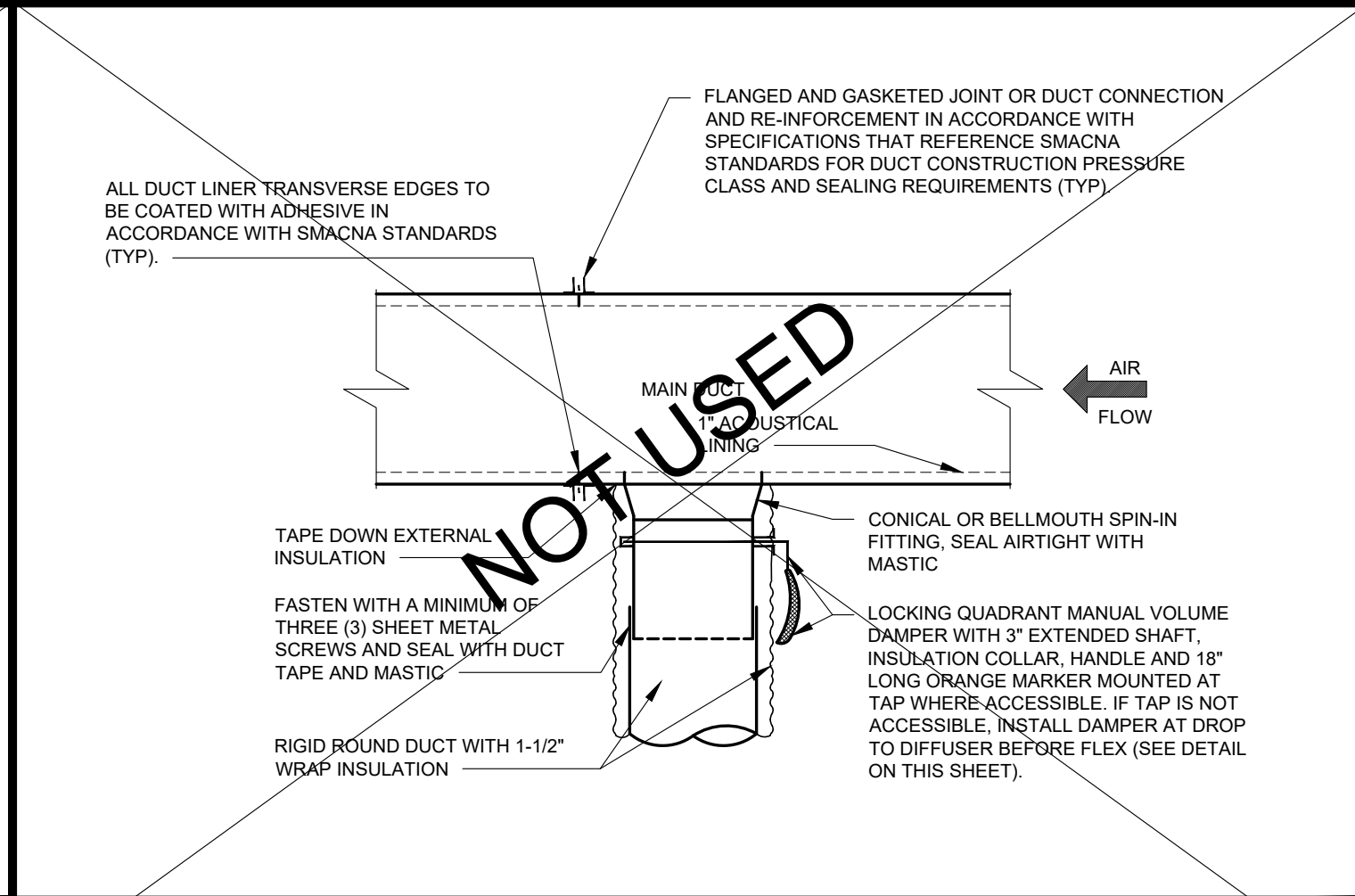
NOT USED



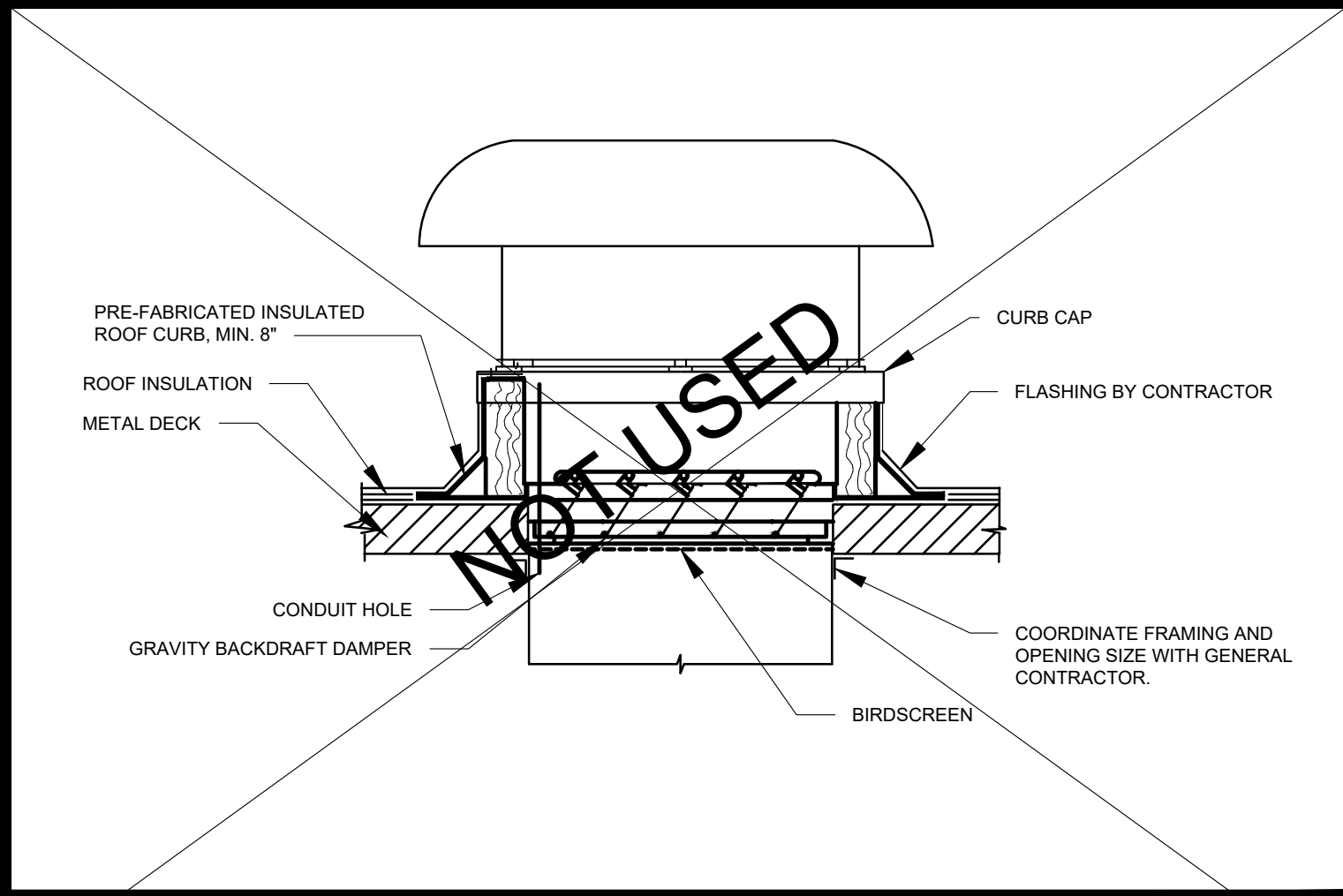
CONDENSING UNIT MOUNTING DETAIL



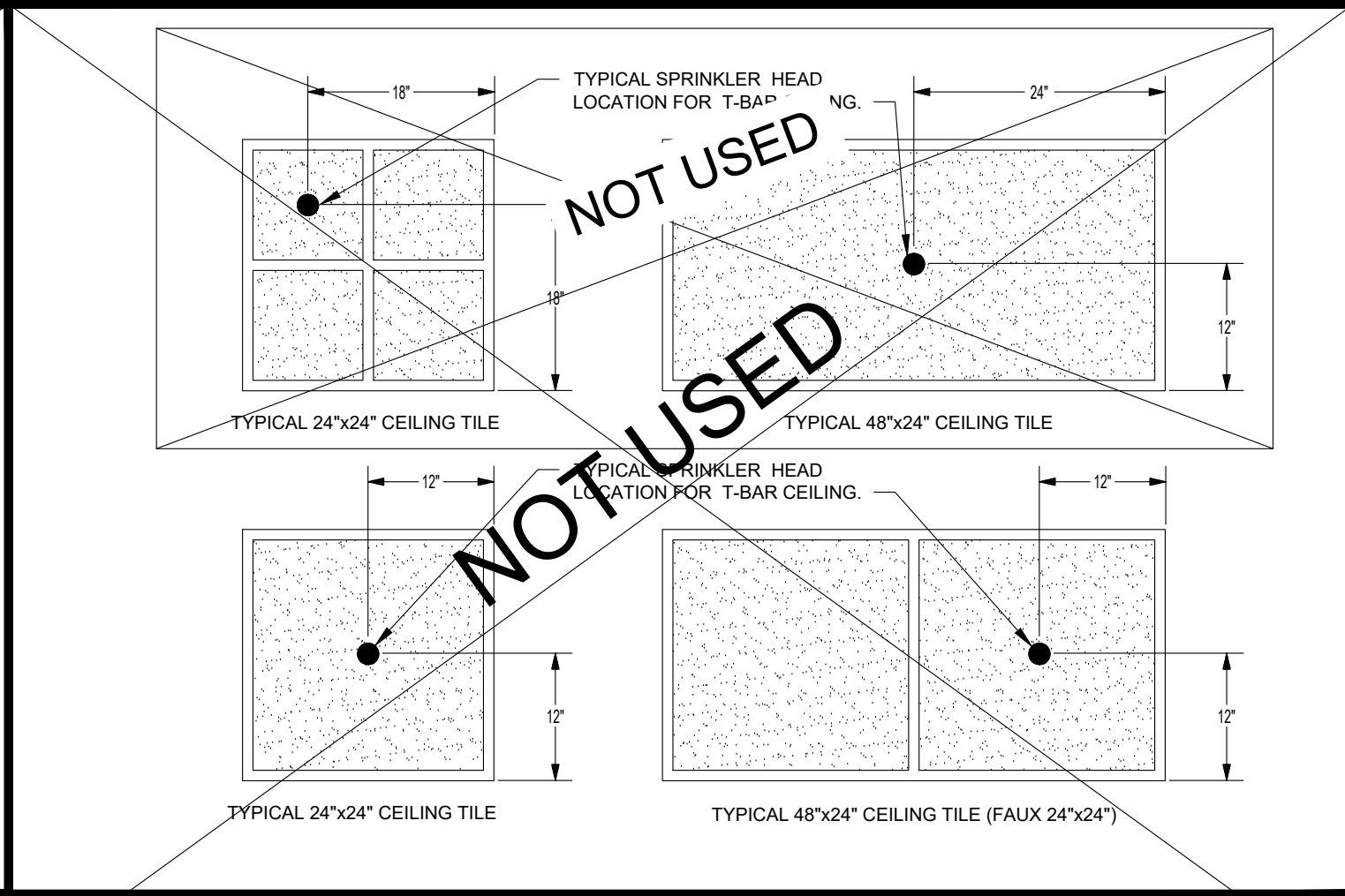
SPRINKLER HEAD TYP MOUNTING



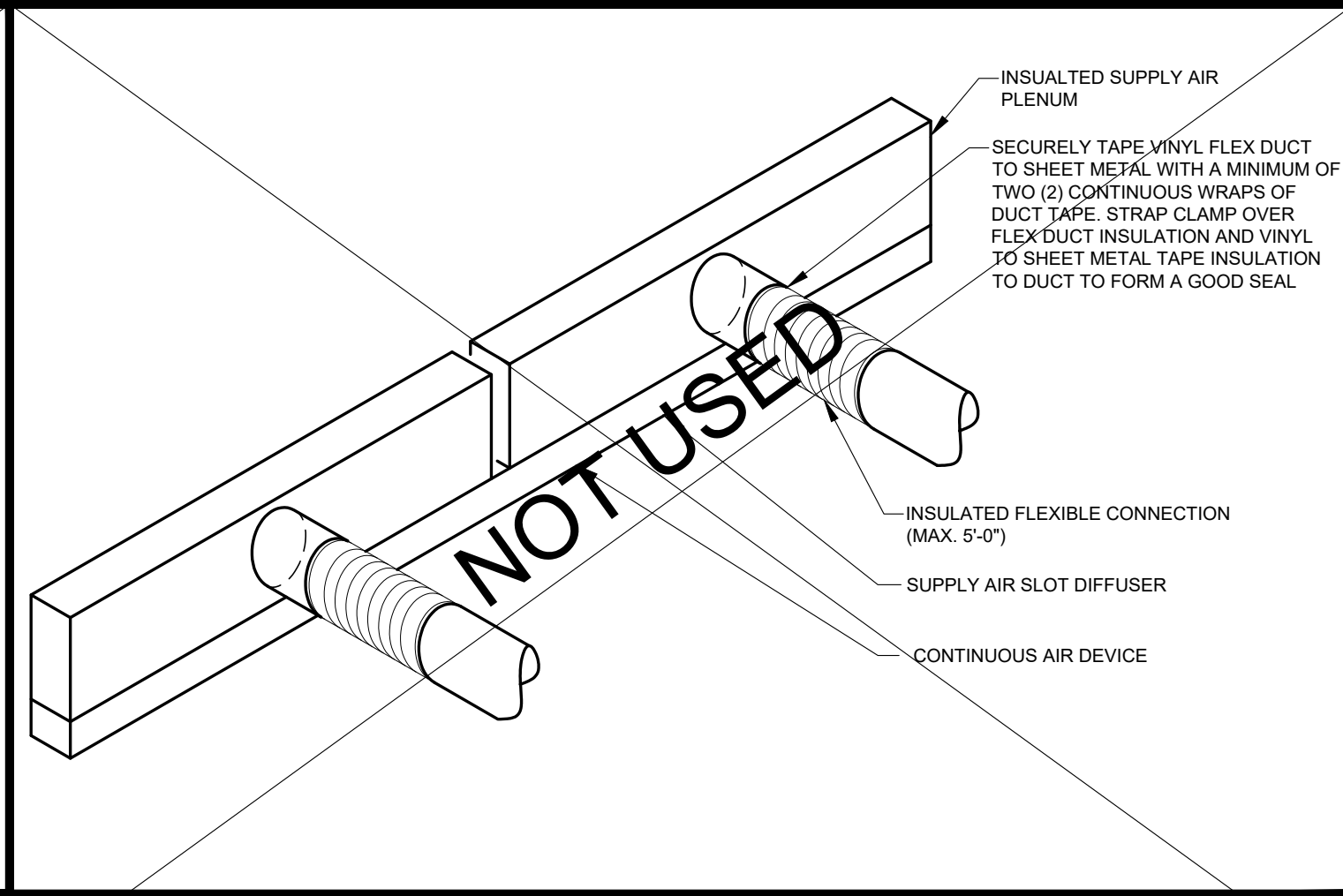
ROUND DUCT TAKE-OFF



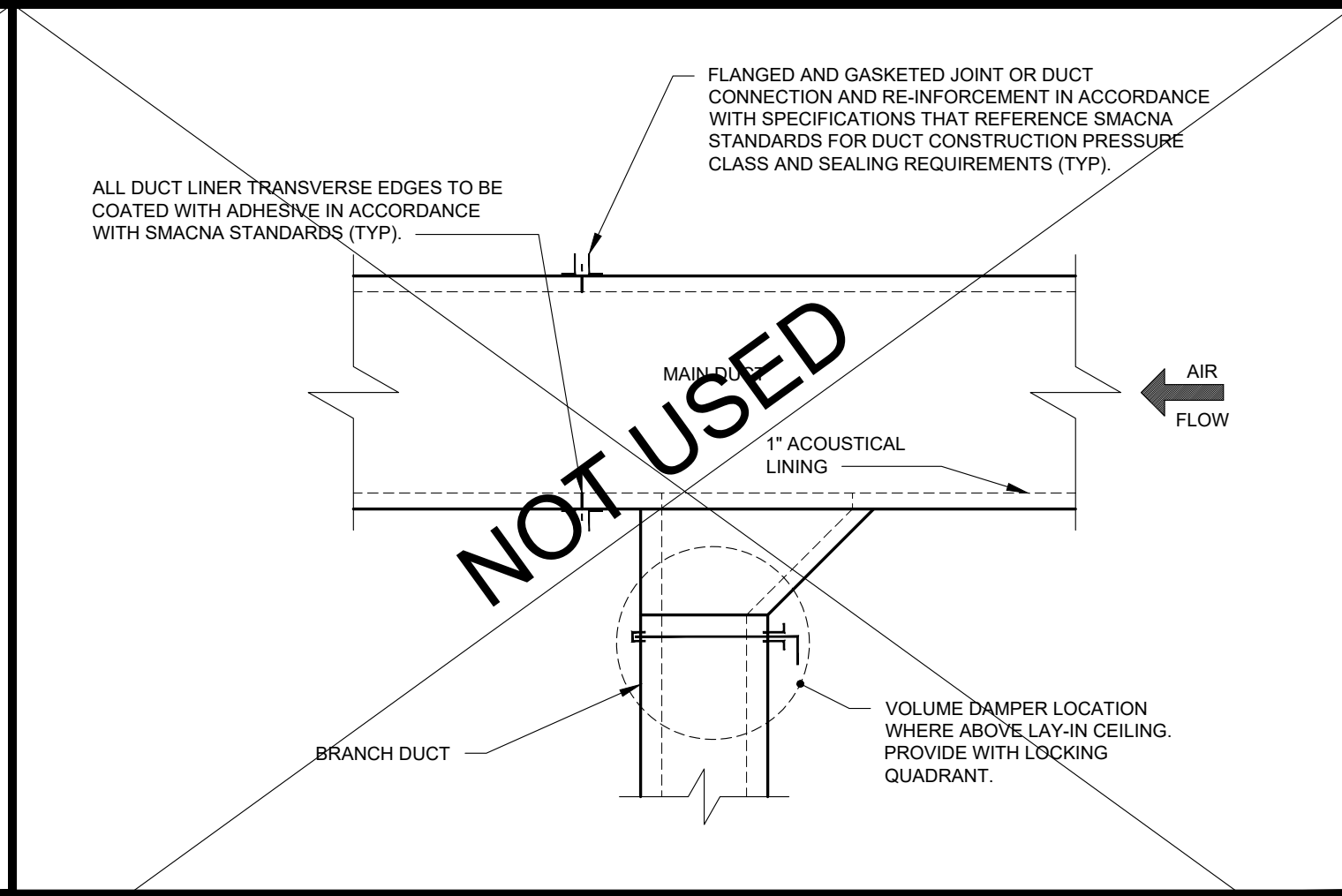
ROOF DUCT PENETRATION ASSEMBLY



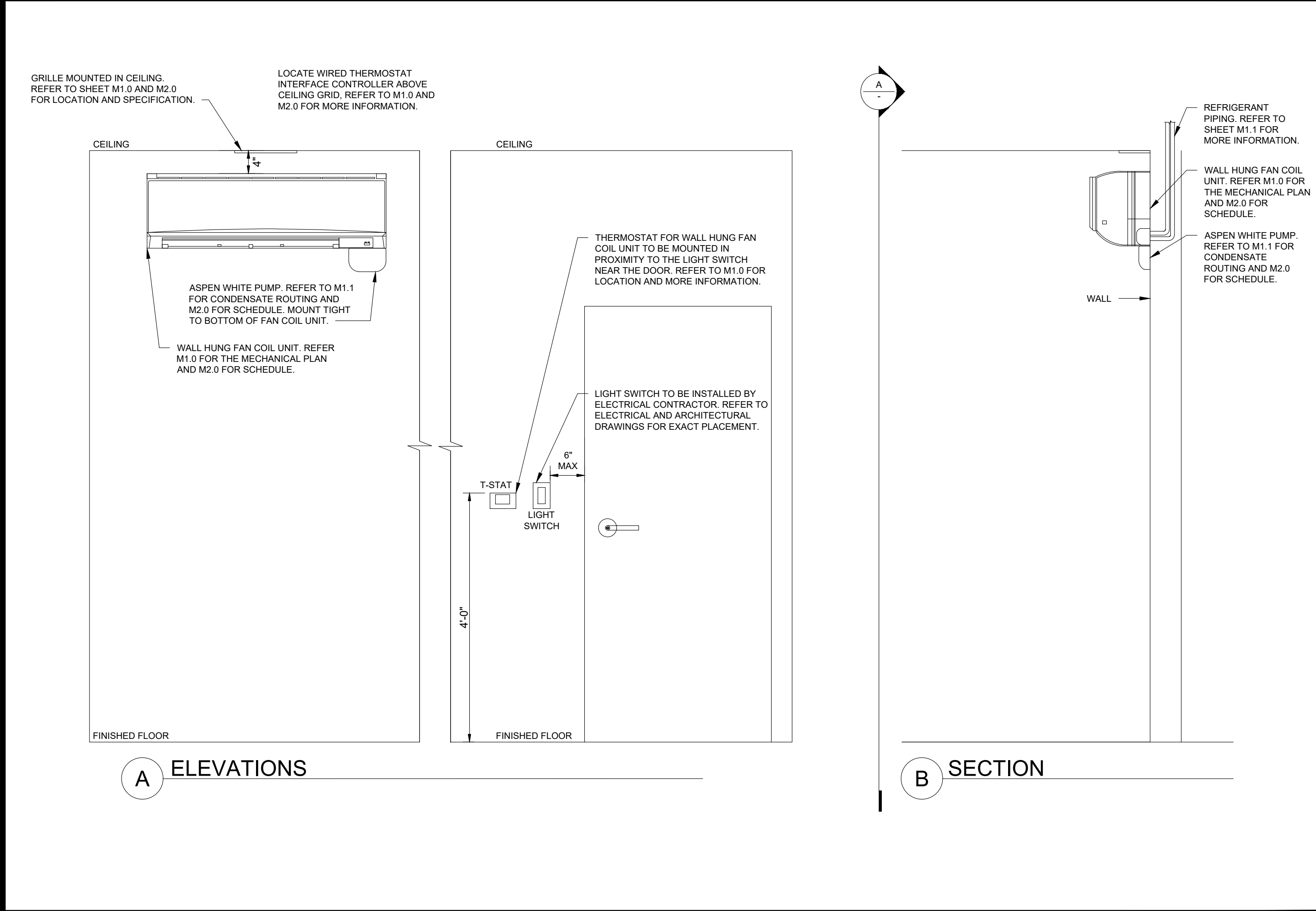
SPRINKLER CEILING TILE LAYOUT



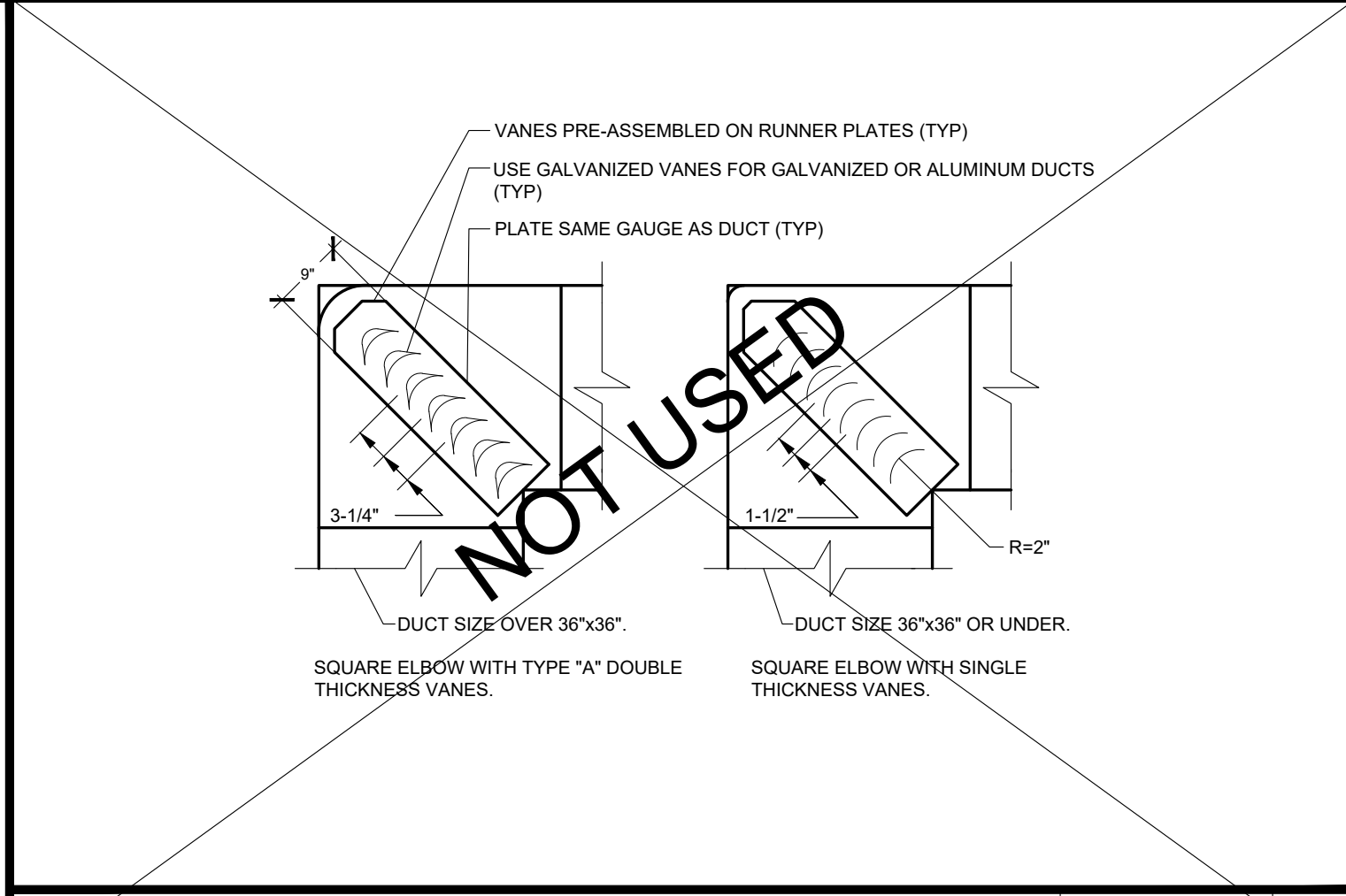
LINEAR AIR DEVICE DETAIL



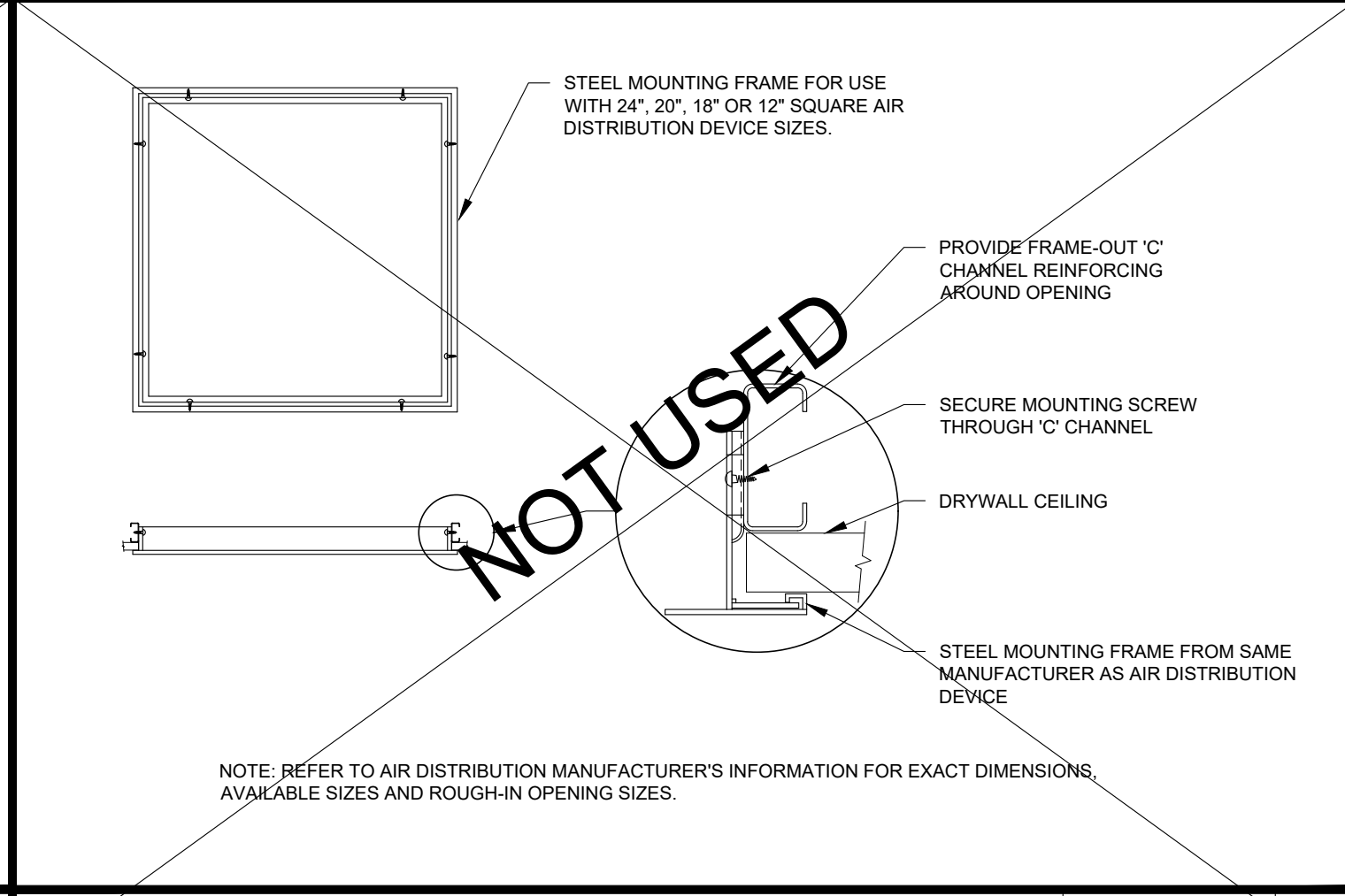
RECTANGULAR AIR DUCT TAKE-OFF



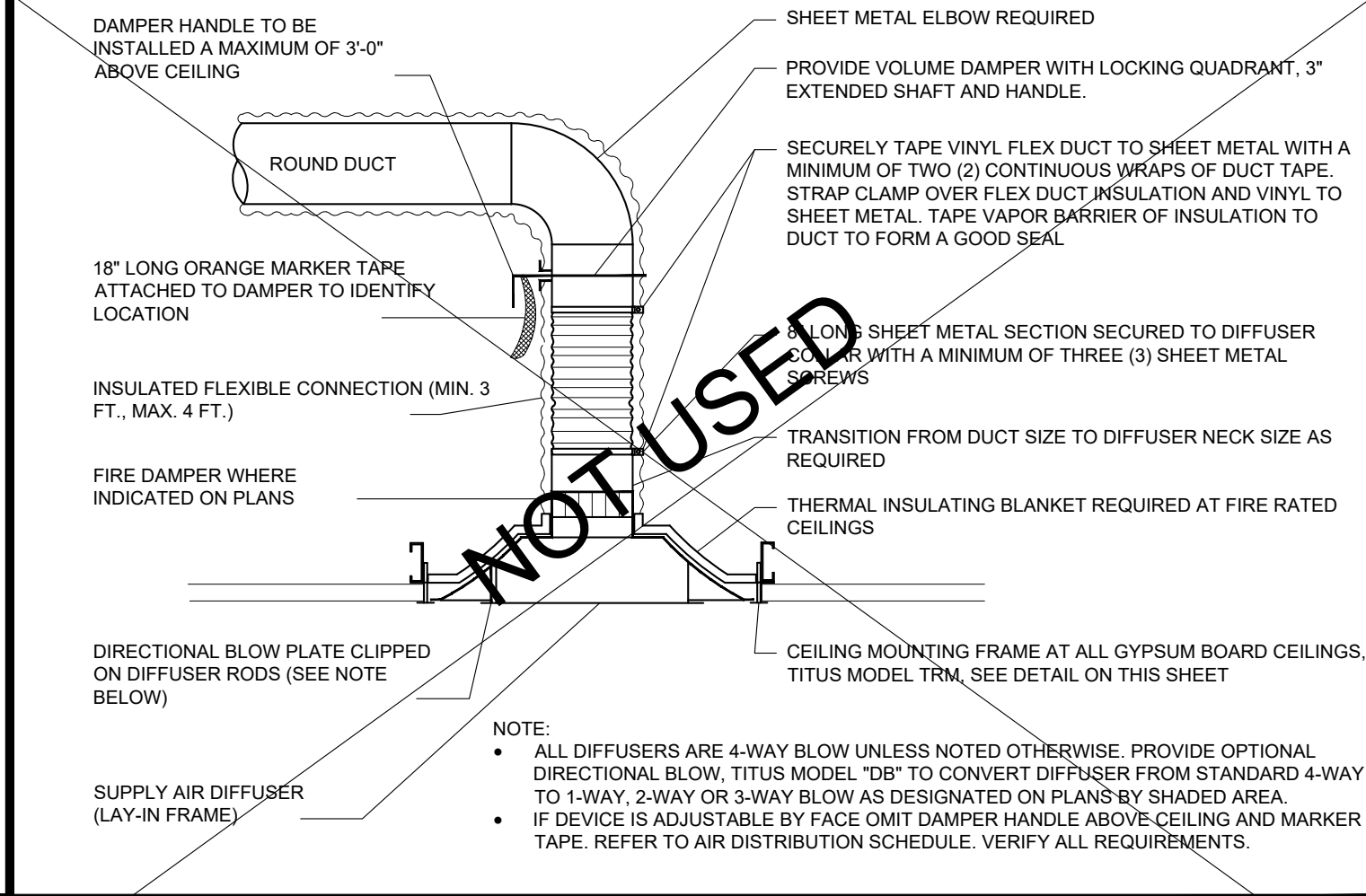
WALL HUNG FAN COIL DETAIL



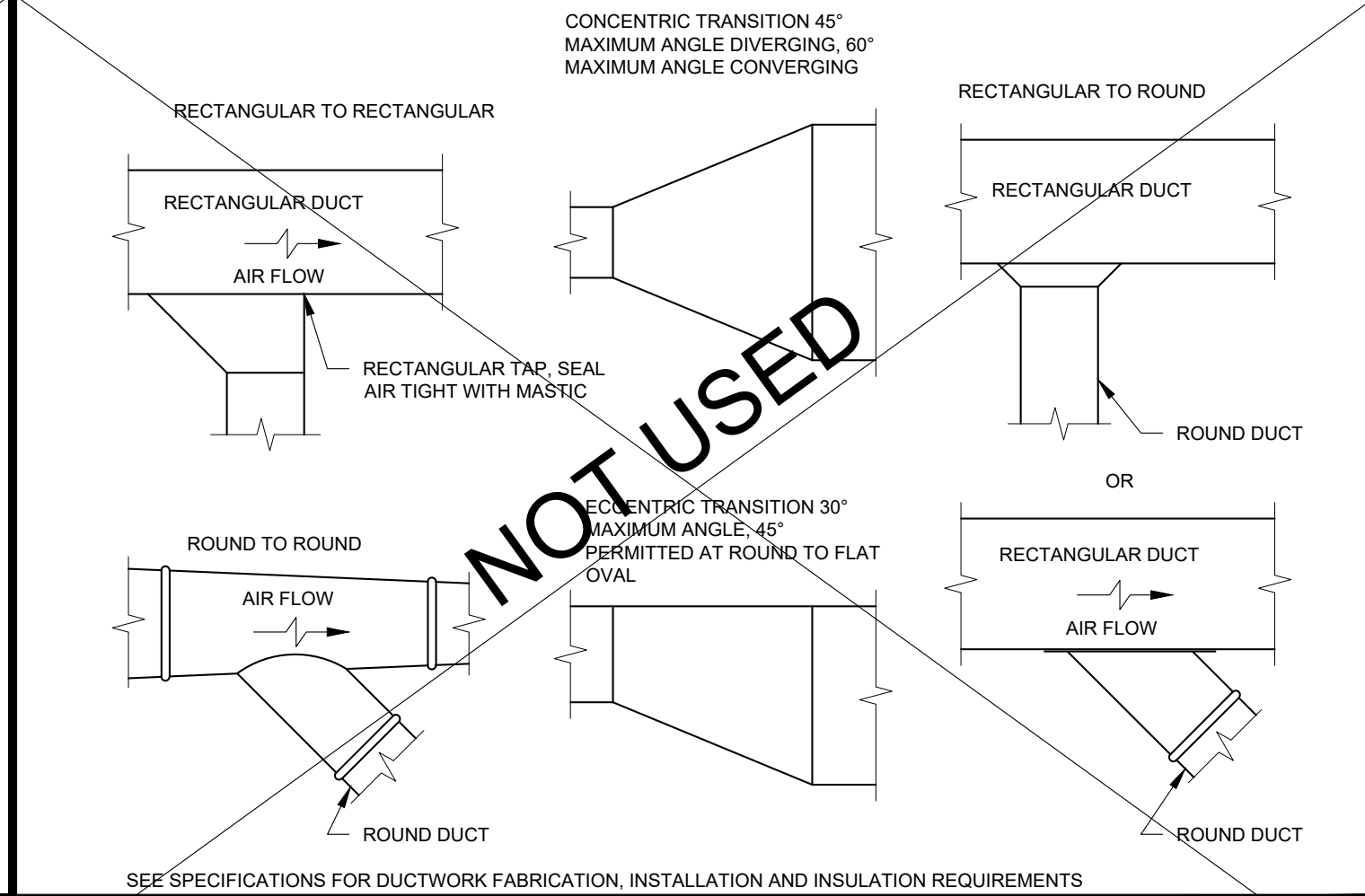
TURNING VANE DETAIL



DRYWALL FRAME MOUNTING DETAIL



DIFFUSER MOUNTING DETAIL



DUCT DETAILS

REVISIONS:

DATE ISSUED: 09/22/2025

SHREMESHOCK

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LASERAWAY

LEE'S SUMMIT
880 NW BLUE PKWY
SUITE H
LEE'S SUMMIT, MO 64086

MECHANICAL DETAILS

DATE OF REVISION: 10/17/2025
JEREMY T. PERRY
PE-2008023238
10/17/2025

SAI# 250422

DRAWING NUMBER: M2.1

● PLOTTED: 10/17/2025 2:04 PM

NOT USED

NOT USED

23 05 00 GENERAL PROVISIONS FOR HVAC

- A. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL A HEATING, VENTILATING, AIR CONDITIONING SYSTEM, COMPLETE AS INDICATED ON THE DRAWINGS, AS REQUIRED BY CODE AND AS SPECIFIED HEREIN.
- B. THE GENERAL CONTRACTOR, UNLESS OTHERWISE NOTED IS TO PROVIDE POWER WIRING FOR EACH ITEM OF ELECTRICAL EQUIPMENT AND MAKE FINAL CONNECTIONS TO MOTORS.
- C. ALL FINISH PAINTING IS TO BE PERFORMED BY THE CONTRACTOR, EXCEPT AS NOTED ELSEWHERE. CONTRACTOR, AT THIS CONTRACTOR'S EXPENSE, SHALL RESTORE TO ORIGINAL CONDITION ANY PAINTING DEFACED DURING CONSTRUCTION AND AFTER ORIGINAL PAINTING.
- D. ALL WORK SHALL CONFORM TO CODES, RULES, AND REGULATIONS:
1. NATIONAL ELECTRICAL CODE.
 2. STANDARD FOR INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS, NFPA 90A.
 3. CODE FOR SAFETY TO LIFE FROM FIRE IN BUILDINGS AND STRUCTURES, NFPA 101.
 4. FEDERAL OCCUPATIONAL SAFETY AND HEALTH STANDARDS.
 5. STATE MECHANICAL CODE.
 6. STATE BUILDING CODE.
 7. STATE INDUSTRIAL COMMISSION REQUIREMENTS.
 8. LOCAL BUILDING CODE REQUIREMENTS.
 9. BUILDING INSURING AGENCY REQUIREMENTS.
 10. STATE PLUMBING CODE.
 11. NFPA.
- E. ALL PERMITS REQUIRED BY LAWS, ORDINANCES AND BUILDING CODES HAVING JURISDICTION SHALL BE OBTAINED AT THE PROPER TIME BY AND AT THE EXPENSE OF THIS CONTRACTOR.
- F. THIS CONTRACTOR SHALL OBTAIN ALL INSPECTIONS REQUIRED BY ALL LAWS, ORDINANCES AND PUBLIC AUTHORITY HAVING JURISDICTION AND SHALL OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO THE ARCHITECT AND SHALL PAY ALL FEES, CHARGES, ASSESSMENTS AND OTHER EXPENSES IN CONNECTION THEREWITH.
- G. PIPING AND EQUIPMENT LAYOUT IS SCHEMATIC, EXACT LOCATIONS ARE DETERMINED BY STRUCTURAL AND OTHER CONDITIONS. DESIGN OF SYSTEM MAY NOT BE CHANGED, ONLY EXACT LOCATION OF PIPING AND DUCTS MAY BE REVISED TO SUIT CONSTRUCTION CONDITIONS AND AID IN COORDINATION WITH WORK OF OTHER CONTRACTORS.
- H. THE MATERIALS AND EQUIPMENT INSTALLED IN THE WORK SHALL MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND NO MATERIALS OR EQUIPMENT SHALL BE ORDERED UNTIL REVIEWED BY THE ENGINEER, LANDLORD AND/OR ARCHITECT.
- I. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS PER THE DOCUMENTS PROVIDED BY THIS CONTRACTOR.
- J. CATALOG DATA FOR EQUIPMENT REVIEWED BY THE ARCHITECT SHALL NOT SUPERSEDE THE ENGINEER'S CONTRACT DOCUMENTS. THE REVIEW OF THE ENGINEER SHALL NOT RELIEVE THIS CONTRACTOR FROM RESPONSIBILITY FOR DEVIATIONS FROM DRAWINGS OR SPECIFICATIONS, PROVIDING PROPER CLEARANCE, FABRICATION PROCESS AND COORDINATION WITH OTHER TRADES.
- K. WHEN SUBMITTED FOR THE ARCHITECT'S REVIEW, SHOP DRAWINGS SHALL BEAR THIS CONTRACTOR'S CERTIFICATION THAT THE CONTRACTOR HAS REVIEWED, CHECKED AND APPROVED THE SHOP DRAWINGS, THAT THEY ARE IN HARMONY WITH THE REQUIREMENTS OF THE PROJECT AND WITH THE PROVISIONS OF THE CONTRACT DOCUMENTS AND THAT THIS CONTRACTOR HAS VERIFIED ALL FIELD MEASUREMENTS AND CONSTRUCTION CRITERIA, MATERIALS, CATALOG NUMBERS AND SIMILAR DATA. CONTRACTOR SHALL ALSO CERTIFY THAT THE WORK REPRESENTED BY THE SHOP DRAWINGS AS RECOMMENDED BY THIS CONTRACTOR AND THE CONTRACTOR'S GUARANTEE WILL FULLY APPLY.
- L. ALL CONTRACTORS SUBMITTING PROPOSALS FOR THIS WORK SHALL FIRST EXAMINE THE SITE AND ALL CONDITIONS THEREIN. ALL PROPOSALS SHALL TAKE INTO CONSIDERATION ALL SUCH CONDITIONS AS MAY AFFECT THE WORK UNDER THIS CONTRACT. THE SUBMITTING OF A BID AUTOMATICALLY IMPLIES THAT THIS EXAMINATION OF SITE HAS BEEN DONE.
- M. CONTRACTOR SHALL VERIFY LOCATION OF UTILITIES AND NOTE CONDITIONS WHICH WOULD AFFECT THE WORK. ALL DISCREPANCIES SHALL THEN BE REPORTED PRIOR TO THE BID AWARD.
- N. PROVIDE INSTRUCTION TO LANDLORD'S OPERATING PERSONNEL AS NECESSARY, SHOWING LOCATIONS AND PROPER OPERATION OF MAJOR ITEMS OF EQUIPMENT AND SYSTEM COMPONENTS AND REFERRING TO THE OPERATING INSTRUCTION MANUAL DESCRIBED BELOW AS A GUIDE.
- O. COMPILE WRITTEN MANUAL OF OPERATING INSTRUCTIONS INCLUDING COPIES OF SHOP DRAWINGS AND A LISTING OF EQUIPMENT SUPPLIERS. ASSEMBLE IN 8-1/2" X 11" HARD BACKED INDEXED BINDER. MATERIAL SHALL BE AS FOLLOWS:
1. TITLE PAGE: TITLE OF JOB, LANDLORD/TENANT, ADDRESS, DATE, SUBMISSION, CONTRACTOR AND ENGINEER.
 2. INDEX.
 3. LIST OF MAJOR EQUIPMENT USED IN PROJECT ACCOMPANIED BY GENERAL CONTRACTOR PURCHASE ORDER NUMBERS AND SUPPLIERS NAMES AND ADDRESSES.
 4. ONE COPY OF EACH SHOP DRAWING GROUPED BY TYPES OF EQUIPMENT (I.E., ROOFTOP UNITS, FANS, ETC.)
 5. SECTION FOR EACH SYSTEM INCLUDING:
 - a. BRIEF DESCRIPTION OF SYSTEM OPERATION WITH LOCATION OF MAJOR COMPONENTS.
 - b. HVAC SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS AND SCHEMATICS.
- P. SUBMIT A COMPLETED COPY TITLED "HVAC OPERATING INSTRUCTION MANUAL" ON THE BINDING EDGE OF BINDER TO ARCHITECT FOR APPROVAL. AFTER ARCHITECT'S REVIEW AND ANY CORRECTIONS REQUIRED ARE COMPLETED, SUBMIT A COPY OF THE MANUAL TO THE LANDLORD.
- Q. WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION SHALL BE PROVIDED TO THE BUILDING LANDLORD. RECORD DRAWINGS SHALL INCLUDE AS A MINIMUM THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF DUCT DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE AIR DESIGN FLOW RATES.
- R. ANY REFERENCE TO TENANT OR TENANT CONSTRUCTION MANAGER, OR FURNISHED BY ANY OF THE ABOVE, REFERS TO LASERAWAY
- S. REFER TO RESPONSIBILITY SCHEDULE ON SHEET M2.0 FOR INFORMATION IN REGARD TO RESPONSIBILITY OF WORK OR ITEMS WHICH MAY AFFECT BID.
- T. TRADE NAMES, MANUFACTURERS AND SHOP DRAWINGS
1. WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED. THOSE OF ANY UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THIS CONTRACTOR'S EXPENSE.
 2. CONTRACTOR SHALL SUBMIT ONLY SUBSTITUTION REQUESTS TO TENANT CONSTRUCTION MANAGER FOR APPROVAL. SUBMISSIONS SHALL BE MADE EARLY ENOUGH IN PROJECT TO ALLOW FOUR (4) WORKING DAYS FOR TENANT CONSTRUCTION MANAGER'S REVIEW WITHOUT CAUSING DELAYS OR CONFLICTS TO THE JOB'S PROGRESS. SUBMITTALS SHALL BEAR THE STAMP OF THE CONTRACTOR AND THE SUB-CONTRACTOR SHOWING THAT THEY HAVE REVIEWED AND CONFIRMED THAT THE SUBMITTALS ARE IN CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS OR INDICATE WHERE EXCEPTIONS HAVE BEEN TAKEN.
- U. DEMOLITION
1. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DEMOLITION AND REMOVAL OF EXISTING WORK. FIELD VERIFY AND COORDINATE ANY EXISTING EQUIPMENT REQUIRED TO BE LEFT INTACT AND PROTECT EQUIPMENT TO REMAIN DURING CONSTRUCTION.
- V. FINAL HVAC INSPECTIONS
1. ASIDE FROM NORMAL INTERIM INSPECTIONS OF WORK IN PLACE, TENANT SHALL HAVE AN INDEPENDENT CONTRACTOR INSPECT THE FINISHED INSTALLATION UPON COMPLETION FOR COMPLIANCE WITH THE PLANS, SPECIFICATIONS AND CODES. THE INSTALLING CONTRACTOR WILL BE RESPONSIBLE TO BRING ALL ITEMS REPORTED BY THE INDEPENDENT CONTRACTOR UP TO PLANS AND SPECIFICATION REQUIREMENTS.
- W. WARRANTY AND GUARANTEE
1. CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND LABOR PROVIDED UNDER THIS CONTRACT AND SHALL MAKE GOOD, REPAIR OR REPLACE AT NO ADDITIONAL COST ANY DEFECTIVE WORK, MATERIAL, OR EQUIPMENT DISCOVERED WITHIN 12 MONTHS FROM THE DATE OF CERTIFICATE OF OCCUPANCY. THIS GUARANTEE SHALL EXTEND TO LABOR AND MISCELLANEOUS MATERIALS REQUIRED FOR THE INSTALLATION OF EQUIPMENT, BUT SHALL NOT OVERLAP WITH WARRANTY PROVIDED BY MANUFACTURER. THE CONTRACTOR IS RESPONSIBLE TO VERIFY, COORDINATE AND FOLLOW ALL PROPER HANDLING AND INSTALLATION TECHNIQUES WITH MANUFACTURER(S) IN ORDER TO MAINTAIN MANUFACTURER'S WARRANTY.

23 05 01 HVAC BASIC MATERIALS AND METHOD

- A. THIS CONTRACTOR IS TO BECOME INFORMED OF THE EXACT DIMENSIONS OF FINISHED WORK WHERE PIPES, DUCTS AND EQUIPMENT ARE TO BE PLACED AND WILL ARRANGE THE WORK ACCORDINGLY, ASSUMING ALL RESPONSIBILITY FOR PROPER LOCATION AND COORDINATION OF THE WORK.
- B. IN THE ERECTION OF THE DUCTWORK, SPECIAL CARE SHALL BE USED PROVIDING SUPPORT.
- C. ALL DUCTWORK SHALL BE PLACED SO AS TO AVOID INTERFERENCE WITH PLUMBING PIPES, ELECTRIC CONDUITS OR PIPES OF OTHER CONTRACTORS.
- D. ALL DUCTWORK MUST BE PROVIDED WITH SUFFICIENT DISTANCE FROM WALLS, PIPES AND OTHER OBSTACLES TO PERMIT THE APPLICATION OF FULL THICKNESS OF INSULATION SPECIFIED.
- E. THIS CONTRACTOR SHALL PERFORM AN ACCURATE AND COMPLETE BALANCE OF AIR SYSTEMS AS PART OF THIS CONTRACT, WHICH SHALL BE COMPLETED BEFORE FINAL ACCEPTANCE OF THE WORK OF THIS CONTRACT. AIR BALANCE SHALL BE SUBCONTRACTED TO A CERTIFIED MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU.
- F. VIBRATION ISOLATION DEVICES
1. VIBRATION ISOLATION DEVICES SHALL BE FURNISHED AND INSTALLED WITH SUPPORTS BETWEEN VIBRATING EQUIPMENT AND THE STRUCTURE (FANS, AIR HANDLERS, ETC.) BY THIS CONTRACTOR.
 2. VIBRATING EQUIPMENT HUNG FROM STRUCTURE SHALL BE ISOLATED WITH RUBBER AND SPRING DEVICES. VIBRATING EQUIPMENT SUPPORTED FROM FLOOR OR DECK SHALL BE ISOLATED WITH HOUSED SPRING MOUNT DEVICES.
 3. EXAMINE DEAD LOAD AND OPERATING LOAD CONDITIONS WHEN SELECTING DEVICES; ADJUST FOR PROPER ALIGNMENT AND LOADING. AVOID "GROUNDING" THE ISOLATOR.
 4. CHECK HANGER ROD SIZE FOR ALLOWABLE LOADS AT THE ISOLATING DEVICE AND AT THE UPPER AND LOWER ATTACHMENTS TO STRUCTURES, DUCTS, EQUIPMENT, ETC.
 5. CONSULT MANUFACTURER FOR APPLICATION DATA.

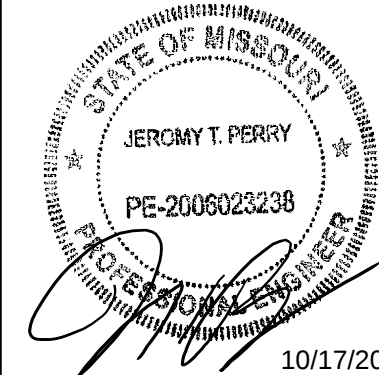
23 05 93 TESTING, ADJUSTING AND BALANCING FOR HVAC

- A. ALL AIR DISTRIBUTION SYSTEMS ARE TO BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS BY AN INDEPENDENT AISC FIRM OR CERTIFIED CONTRACTOR. DUCTED AIR RATES ARE TO BE MEASURED AND ADJUSTED TO DELIVER FINAL FLOW RATES WITHIN 10% OF DESIGN RATES. CONTRACTOR TO DO ALL ADJUSTMENTS REQUIRED TO BALANCE THE SYSTEM WITHIN THE DESIGN PARAMETERS. UNIT RATES ARE TO BE ADJUSTED FIRST TO GET THE UNIT TO THE LOWEST RPM'S TO DELIVER THE REQUIRED CFM TO THE DIFFUSERS, THEN THE DAMPERS TO THE DIFFUSERS ARE TO BE ADJUSTED TO BALANCE THE SYSTEM. CONTRACTOR IS TO PROVIDE ALL LABOR AND MATERIALS REQUIRED TO BALANCE THE SYSTEM. CONTRACTOR SHALL FIELD VERIFY AND COORDINATE REQUIREMENTS AND INCLUDE THE COST OF THIS WORK IN THIS BID.
- B. AFTER CORRECTING BALANCE OF ALL AIR SYSTEMS TO WITHIN 10% OF DESIGNED VALUES, SUBMIT FINAL AIR BALANCE REPORTS TO ARCHITECT, ENGINEER AND THE TENANT. FINAL BALANCE REPORT MUST INDICATE AIR VALUES WITHIN 10% OF DESIGN, OR MUST STATE THE REASON THAT THE APPROPRIATE BALANCE COULD NOT BE ACHIEVED.
- C. CONTRACTOR SHALL REVIEW AIR BALANCE REPORT PRIOR TO SUBMISSION OF REPORT TO ENGINEER AND ARCHITECT. IF ENGINEER OR ARCHITECT REVIEW THE AIR BALANCE REPORT M2.0 TITLE TIMES DUE TO THE CONTRACTOR NOT FOLLOWING THESE GUIDELINES OR SENDING A PRELIMINARY REPORT FOR REVIEW IN LIEU OF THE FINAL REPORT, THE CONTRACTOR WILL BE BACKCHARGED FOR ALL REVIEWS BEYOND THE FIRST.
- D. VERIFY CONTROLS DURING BALANCING, INCLUDING HUMIDITY CONTROLS WHERE APPLICABLE.
- E. AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT FINAL AIR/WATER BALANCE REPORT TO LANDLORD AND AUTHORITY HAVING JURISDICTION AS REQUIRED.

23 76 10 REFRIGERANT PIPING SYSTEM

- A. PIPE TYPE L-ACR HARD DEHYDRATED SCALE FREE COPPER TUBING. ALL FITTINGS AND JOINTS SHALL BE WROUGHT COPPER OR CAST BRONZE.
- B. SHUT-OFF VALVES IN REFRIGERANT LINES SHALL BE SIMILAR TO HENRY, BALANCED-ACTING DIAPHRAGM TYPE WITH BRASS BODY WITH SOLDER TYPE ENDS.
- C. PROPERLY CLEAN ENDS OF ALL TUBING BEFORE BRAZING. ALL COPPER TO COPPER JOINTS SHALL BE BRAZED WITH COPPER-PHOSPHORUS ALLOY AND ALL OTHER JOINTS SHALL BE BRAZED WITH "SILCOS-6" ALLOY.
- D. DURING CONSTRUCTION, THIS CONTRACTOR SHALL TAKE PRECAUTION TO MINIMIZE CONTAMINATION OF SYSTEM BY DIRT, SCALE, MOISTURE OR OTHER FOREIGN MATTER. ALL FOREIGN MATERIAL OR MOISTURE IN THE SYSTEM SHALL BE REMOVED.
- E. THIS CONTRACTOR SHALL PROVIDE OIL FOR COMPRESSOR AND PROPER REFRIGERANT CHARGE FOR THE SYSTEM.

MECHANICAL SPECIFICATIONS



10/17/2025

SAI# 250422

DRAWING NUMBER:

M3.0

LASERAWAY

LEE'S SUMMIT
880 NW BLUE PKWY
SUITE H
LEE'S SUMMIT, MO 64086

MECHANICAL AND FIRE
PROTECTION SPECIFICATIONS

DRAWN BY: EXC CHECKED BY: JTP

REVISIONS:

SHREMSHOCK

Shremshock Engineering, Inc.
7775 Walton Parkway Ste. 250 New Albany, OH 43054
t: 614 545 4550 | f: 614 545 4555
info@shremshock.com
www.shremshock.com

THE ARCHITECT / ENGINEER ASSUMES NO RESPONSIBILITY OR LIABILITY FOR THE USE OF THESE PLANS FOR ANY PROJECT OTHER THAN SPECIFICALLY AUTHORIZED BY THEM AND SIGNED AND SEALED FOR SUCH SPECIFIC LOCATION IN THE STATE, PROVINCE OR TERRITORY SHOWN ON THE SEAL. THIS BUILDING USE IS ONLY APPLICABLE IN AREAS MEETING THE STATED DESIGN CRITERIA.

DATE ISSUED:
09/22/2025

Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.4.4.1.4 [ME41] ¹	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.4.4.2.1 [ME10] ¹	Ducts and plenums having pressure class ratings are Seal Class A construction.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.8.1-15, 6.8.1-16 [ME110] ²	Electrically operated DX-DOAS units meet requirements per Tables 6.8.1-15 or 6.8.1-16.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.4.4.2.2 [ME11] ¹	Ductwork operating >3 in. water column requires air leakage testing.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.5.2.3 [ME19] ¹	Dehumidification controls provided to prevent reheating, recooling, mixing of hot and cold airstreams or concurrent heating and cooling of the same airstream.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.2.4.1 [ME68] ¹	Humidifiers with airstream mounted preheating jackets have preheat auto-shutoff value set to activate when humidification is not required.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.5.2.4.2 [ME69] ¹	Humidification system dispersion tube hot surfaces in the airstreams of ducts or air-handling units insulated >= R-0.5.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.2.5 [ME70] ¹	Preheat coils controlled to stop heat output whenever mechanical cooling, including economizer operation, is active.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.2.6 [ME106] ¹	Units that provide ventilation air to multiple zones and operate in conjunction with zone heating and cooling systems are prevented from using heating or heat recovery to warm supply air above 60°F when representative building loads or outdoor air temperature indicate that most zones demand cooling.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.4.7 [ME107] ¹	Chilled-water cooling coils provide a 15°F or higher temperature difference between leaving and entering water temperatures and a minimum of 57°F leaving water temperature at design conditions			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.

1 High Impact (Tier 1)

2 Medium Impact (Tier 2)

3 Low Impact (Tier 3)

Project Title: LSA_250422_Lees Summit

Report date: 09/17/25

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Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.5.3.6 [ME72] ²	Motors for fans >= 1/12 hp and < 1 hp are electronically commutated motors or have a minimum motor efficiency of 70%. These motors are also speed adjustable for either balancing or remote control.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.3.4 [ME108] ¹	Parallel-flow fan-powered VAV air terminals have automatic controls to a) turn off the terminal fan except when space heating is required or if required for ventilation; b) turn on the terminal fan as the first stage of heating before the heating coil is activated; and c) during heating for warmup or setback temperature control, either operate the terminal fan and heating coil without primary air or reverse the terminal damper logic and provide heating from the central air handler through primary air.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.5.3.7 [ME109] ²	Required minimum outdoor air rate is the larger of minimum outdoor air rate or minimum exhaust air rate required by Standard 62.1, Standard 170, or applicable codes or accreditation standards. Outdoor air ventilation systems shall comply with one of the following: a) design minimum system outdoor air provided < 135% of the required minimum outdoor air rate; b) dampers, ductwork, and controls allow the system to supply <= the required minimum outdoor air rate with a single set-point adjustment; or c) system includes exhaust air energy recovery complying with Section 6.5.6.1.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.3.3 [ME42] ¹	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.5.4.2 [ME25] ¹	HVAC pumping systems with >= 3 control valves designed for variable fluid flow (see section details).			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.7.1 [ME100] ²	Conditioned supply air to space with mechanical exhaust <= the greater of criteria of supply flow, required ventilation rate, exhaust flow mini the available transfer air (see section details).			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.7.2.1 [ME32] ²	Kitchen hoods >5,000 cfm have make up air >=50% of exhaust air volume.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.

1 High Impact (Tier 1)

2 Medium Impact (Tier 2)

3 Low Impact (Tier 3)

Project Title: LSA_250422_Lees Summit

Report date: 09/17/25

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Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
6.4.3.7 [FO9] ¹	Freeze protection and snow/ice melting system sensors for future connection to controls.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1)

2 Medium Impact (Tier 2)

3 Low Impact (Tier 3)

Project Title: LSA_250422_Lees Summit

Report date: 09/17/25

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Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.4.1.4, 6.4.1.5 [ME1] ²	HVAC equipment efficiency verified. Non-NASCA HVAC equipment labeled as meeting 90.1.	Efficiency: _____	Efficiency: _____	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	See the Mechanical Systems list for values.
6.4.3.4.1 [ME3] ¹	Stair and elevator shaft vents have motorized dampers that automatically close.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.4.3.4.2, 6.4.3.4.3 [ME4] ¹	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.3.4.5 [ME39] ¹	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.4.3.4.4 [ME5] ¹	Ventilation fans >0.75 hp have automatic controls to shut off fan when not required.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.3.8 [ME6] ¹	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.5.3.2.1 [ME40] ¹	DX cooling systems >= 75 kBtu/h (>= 65 kBtu/h effective 1/2016) and chilled-water and evaporative cooling fan motor hp >= ¼ designed to vary supply fan airflow as a function of load and comply with operational requirements.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. See the Mechanical Systems list for values.
6.4.4.1.1 [ME7] ¹	Insulation exposed to weather protected from damage. Insulation outside of the conditioned space and associated with cooling systems is vapor retardant.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.4.1.2 [ME8] ¹	HVAC ducts and plenums insulated per Table 6.8.2. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	R-_____	R-_____	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.4.1.3 [ME9] ²	HVAC piping insulation thickness. Where piping is installed in or under a slab, verification may need to occur during Foundation Inspection.	____ in.	____ in.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

1 High Impact (Tier 1)

2 Medium Impact (Tier 2)

3 Low Impact (Tier 3)

Project Title: LSA_250422_Lees Summit

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Mechanical Compliance Certificate

Project Information

Energy Code: 90.1 (2019) Standard

Project Title: LSA_250422_Lees Summit

Location: Lees Summit, Missouri

Climate Zone: 4a

Project Type: Alteration

Construction Site: 3056 NJ-10
Denville, New Jersey 07834

Owner/Agent: LaserAway
225 W. Plaza St., Suite 202
Solana Bach, California 92075

Designer/Contractor: Shremshock Engineering Inc.
7775 Walton Parkway, Suite 250
New Albany, Ohio 43054
6145454550

Mechanical Systems List

QuantitySystem Type & Description

- CU-1
VRF Condensing Unit, Air Cooled w/ Heat Recovery Heat Pump
Heating Mode: Capacity = 66 kBtu/h,
Proposed Efficiency = 8.80 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 60 kBtu/h,
Proposed Efficiency = 17.50 SEER, Required Efficiency = 13.00 SEER
Proposed Part Load Efficiency = 0.00 , Required Part Load Efficiency = 0.00
Fan System: None

SYSTEM VERIFICATION REQUIRED.
- FC-1, FC-2, FC-3
Cooling: 3 each - VRF Zone Fan Unit, Capacity = 23 kBtu/h
No minimum efficiency requirement applies
Fan System: FC (2-ton) -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FC (2-ton) Supply, Constant Volume, 530 CFM, 0.1 motor nameplate hp, 10.00 fan energy index , fan exception:
Single fan < 1 HP or < 0.89 kW

SYSTEM VERIFICATION REQUIRED.

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 90.1 (2019) Standard requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Jeromy T. Perry - PE
Name - Title

Signature

Date 10/17/25

Project Title: LSA_250422_Lees Summit

Report date: 09/17/25

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Inspection Checklist

Energy Code: 90.1 (2019) Standard

Requirements: 100.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
4.2.2, 6.4.4.2.1, 6.7.2 [PR2] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
4.2.2, 8.4.1.1, 8.4.1.2, 8.7 [PR6] ²	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the electrical systems and equipment and document where exceptions are claimed. Feeder connectors sized in accordance with approved plans and branch circuits sized for maximum drop of 3%.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
4.2.5.2 [PRS] ¹	Commissioning shall be performed as stated in Sections 5.9.2, 6.9.2, 7.9.2, 8.9.2, 9.9.2, 10.9.2, 11.2(d), and G1.2.1(c). Commissioning must utilize ASHRAE/IES Standard 202 or other generally accepted engineering standards acceptable to the building official. FPT and verification requirements for commissioning are as stated in Section 4.2.5.1. Commissioning shall document compliance of the building systems, controls, and building envelope with required provisions of this standard. Commissioning requirements shall be incorporated into the construction documents.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Buildings, additions, or alterations with less than 10,000 ft2 of conditioned space and combined heating, cooling, and service water heating equipment totaling less than 960,000 Btu/h in capacity.

Additional Comments/Assumptions:

1 High Impact (Tier 1)

2 Medium Impact (Tier 2)

3 Low Impact (Tier 3)

Project Title: LSA_250422_Lees Summit

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Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
6.4.3.1.2 [F13] ¹	Thermostatic controls have a 5 °F deadband.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.3.2 [F120] ¹	Temperature controls have setpoint overlap restrictions.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.3.3.1 [F121] ¹	HVAC systems equipped with at least one automatic shutdown control.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.3.3.2 [F122] ¹	Setback controls allow automatic restart and temporary operation as required for maintenance.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.3.5 [F15] ¹	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.4.3.6 [F16] ¹	When humidification and dehumidification are provided to a zone, simultaneous operation is prohibited. Humidity control prohibits the use of fossil fuel or electricity to produce RH > 30% in the warmest zone humidified and RH < 60% in the coldest zone dehumidified.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.7.2.1 [F17] ¹	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.7.2.2 [F18] ¹	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
6.7.2.3 [F19] ¹	An air and/or hydronic system balancing report is provided for HVAC systems serving zones >5,000 ft2 of conditioned area.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
10.4.3 [F124] ²	Elevators are designed with the proper lighting, ventilation power, and standby mode.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.

Additional Comments/Assumptions:

1 | High Impact (Tier 1)
 2 | Medium Impact (Tier 2)
 3 | Low Impact (Tier 3)

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Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.5.7.2.4 [ME49] ¹	Approved field test used to evaluate design air flow rates and demonstrate proper capture and containment of kitchen exhaust systems.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.5.8.1 [ME34] ²	Unenclosed spaces that are heated use only radiant heat.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.4.3.9 [ME63] ²	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
6.5.10 [ME73] ¹	Doors separating conditioned space from the outdoors have controls that disable/reset heating and cooling system when open.			☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Building entrances have automatic closing devices.

Additional Comments/Assumptions:

1 | High Impact (Tier 1)
 2 | Medium Impact (Tier 2)
 3 | Low Impact (Tier 3)

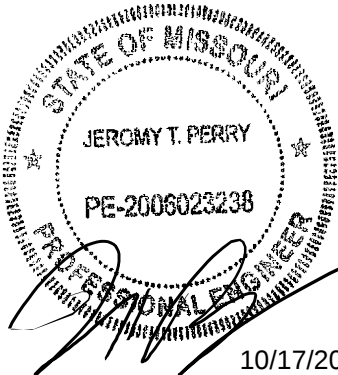
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Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
8.4.2 [EL10] ¹	At least 50% of all 125 volt 15- and 20-Amp receptacles are controlled by an automatic control device.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
8.4.3 [EL11] ²	New buildings have electrical energy use measurement devices installed. Where tenant spaces exist, each tenant is monitored separately. In buildings with a digital control system the energy use is transmitted to to control system and displayed graphically.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
10.4.1 [EL9] ²	Electric motors meet requirements where applicable.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 | High Impact (Tier 1)
 2 | Medium Impact (Tier 2)
 3 | Low Impact (Tier 3)

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