

STANDARD ABBREVIATIONS

AC	AIR CONDITIONING UNIT	EWT	ENTERING WATER TEMPERATURE	OBD	OPPOSED BLADE DAMPER
AD	ACCESS DOOR	EXH	EXHAUST	PD	PRESSURE DROP
AFF	ABOVE FINISHED FLOOR	FPM	FEET PER MINUTE	PSI	POUNDS/SQUARE INCH
AHU	AIR HANDLING UNIT	FT	FEET OR FOOT	RA	RETURN AIR
AMB	AMBIENT	GPM	GALLONS PER MINUTE	RH	RELATIVE HUMIDITY
APD	AIR PRESSURE DROP	HC	HEATING COIL	RT	ROOFTOP UNIT
APPROX	APPROXIMATE	HP	HORSEPOWER	SA	SUPPLY AIR
AVG	AVERAGE	HWR	HOT WATER RETURN	FSD	FIRE/SMOKE DAMPER
BDD	BACK DRAFT DAMPER	HWS	HOT WATER SUPPLY	SP	STATIC PRESSURE
BHP	BRAKE HORSE POWER	HX	HEAT EXCHANGER	SPEC	SPECIFICATIONS
BOD	BOTTOM OF DUCT	IN	INCHES	SL	SEA LEVEL
BTUH	BRITISH THERMAL UNIT/HOUR	INWG	INCHES IN WATER GAUGE	SQ	SQUARE
CAP	CAPACITY	INWC	INCHES IN WATER COLUMN	SS	STAINLESS STEEL
CFM	CUBIC FEET PER MINUTE	LAT	LEAVING AIR TEMPERATURE	T.A.B.	TEST AND BALANCING
CJ	CONDENSING UNIT	LWT	LEAVING WATER TEMPERATURE	TCP	TEMPERATURE CONTROL PANEL
CP	CONDENSATE PUMP	MAU	MAKEUP AIR UNIT	TEMP	TEMPERATURE
CJH	CABINET UNIT HEATER	MAX	MAXIMUM	TSP	TOTAL STATIC PRESSURE
CC	COOLING COIL	MBH	BTU'S PER HOUR (THOUSAND)	T-STAT	THERMOSTAT
DDIA	DIAMETER	MD	MOTORIZED DAMPER	TYP	TYPICAL
DB	DRY BULB TEMPERATURE	MFR	MANUFACTURER	UH	UNIT HEATER
DEG.	DEGREES	MIN	MINIMUM	VAV	VARIABLE AIR VOLUME
D.L.	DUCT LINER	MVD	MANUAL VOLUME DAMPER	VEL	VELOCITY
(E)	EXISTING	(N)	NEW	VFD	VARIABLE FREQUENCY DRIVE
EAT	ENTERING AIR TEMPERATURE	NA	NOT APPLICABLE	WI	WITH
EDB	ENTERING DRY BULB	NC	NOT IN CONTRACT	WB	WET BULB
EFF	EFFICIENCY	NC	NORMALLY CLOSED	WPD	WATER PRESSURE DROP
ELECT	ELECTRICAL	NO	NORMALLY OPENED	WMS	WIRE MESH SCREEN
ELEV	ELEVATION	NOM	NOMINAL		
ESP	EXTERNAL STATIC PRESSURE	NTS	NOT TO SCALE		
ET	EXPANSION TANK	OA	OUTSIDE AIR		
EWB	ENTERING WET BULB				

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CONDENSATE DRAIN		ELBOW UP DIMENSION DESCRIPTION: 14'0" = ROUND DUCT 24x12 FO = FLAT OVAL DUCT
	HEATING WATER SUPPLY		ELBOW DOWN
	HEATING WATER RETURN		LONG RADIUS ELBOW RADIUS (R) = 1.5 TIMES DIAMETER OF DUCT DIMENSION DESCRIPTION: 1ST FIGURE = SIDE SHOWN 2ND FIGURE = SIDE NOT SHOWN
	HEAT PUMP WATER SUPPLY		SUPPLY AIR ELBOW UP
	HEAT PUMP WATER RETURN		SUPPLY AIR ELBOW DOWN
	CONDENSER WATER SUPPLY		EXHAUST/RETURN AIR ELBOW UP
	CONDENSER WATER RETURN		EXHAUST/RETURN AIR ELBOW DOWN
	REFRIGERANT SUCTION LINE		DOUBLE SIDE TRANSITION TRANSITION SLOPE SPECIFICATION: MINIMUM SLOPE = 15° MAXIMUM SLOPE = 45°
	REFRIGERANT LIQUID LINE		SINGLE SIDE TRANSITION
	REFRIGERANT HOT GAS LINE		TOP TRANSITION (SLOPE ON TOP)
	CHILLED WATER SUPPLY		BOTTOM TRANSITION (SLOPE ON BOTTOM)
	CHILLED WATER RETURN		ACOUSTICALLY LINED SHEET METAL DUCT
	LOW PRESSURE STEAM		MANUAL BALANCING DAMPER
	LOW PRESSURE CONDENSATE		FLEX CONNECTOR
	GATE (SHUT OFF) VALVE		ACCESS DOORS
	BALL VALVE		FIRE DAMPER, FIRE/SMOKE DAMPER, SMOKE DAMPER
	BUTTERFLY VALVE		MOTORIZED DAMPER
	GLOBE VALVE		TURNING VANE ELBOW
	TRIPLE DUTY VALVE		45° LOW-LOSS TAKE-OFF FITTING W/ DAMPER & FLEX DUCT
	SWING CHECK VALVE		45° LOW-LOSS TAKE-OFF FITTING W/ DAMPER & RIGID DUCT
	STRAINER		90° TEE TAKE-OFF FITTING
	FLEX CONNECTOR		CONICAL 90° TEE TAKE-OFF FITTING
	PRESSURE REDUCING VALVE		45° TEE TAKE-OFF FITTING
	SAFETY RELIEF VALVE		LOW LOSS TAKE-OFF FITTING
	UNION		SUPPLY AIR DUCT (SINGLE LINE)
	MOTORIZED T.C. VALVE/2-WAY		RETURN AIR DUCT (SINGLE LINE)
	MOTORIZED T.C. VALVE/3-WAY		EXHAUST AIR DUCT (SINGLE LINE)
	VALVE IN RISER (SPECIFY TYPE)		RETURN/EXHAUST AIR GRILLE
	TEE UP		SIDE WALL SUPPLY AIR REGISTER
	TEE DOWN		DIFFUSER, REGISTER OR GRILLE
	ELBOW UP		AS BRANCH DUCT. NECK SIZE SAME 4-WAY THROW PATTERN UNLESS SHOWN OTHERWISE ON DRAWINGS
	ELBOW DOWN		THERMOSTAT - CONTROLLED EQUIPMENT NOTED
	MANUAL FLOW BALANCING VALVE (CIRCUIT SETTER)		
	AUTOMATIC FLOW BALANCING VALVE		
	PIPE ALIGNMENT GUIDE		
	PIPE ANCHOR		
	PRESSURE/TEMP. TEST PLUG		
	DIAL THERMOMETER		
	PRESSURE GAUGE W/ SNUBBER		
	CONNECT NEW WORK TO EXISTING		
	REDUCER		
	FLOW INDICATOR		
NOTE: NOT ALL SYMBOLS MAY BE USED			

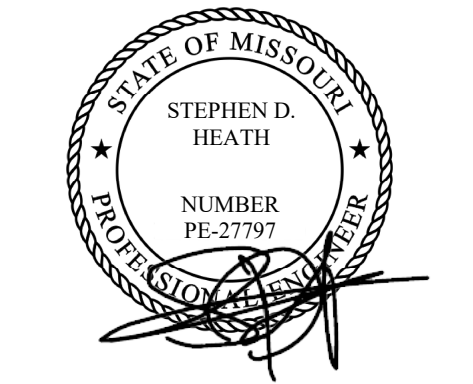
SHEET INDEX

No.	SHEET NAME
MECHANICAL	
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KD

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NOT FOR CONSTRUCTION

THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. APPROVAL FROM THE ARCHITECT AND GOVERNING JURISDICTIONS MUST BE ATTAINED PRIOR TO THE ISSUANCE OF CONSTRUCTION DOCUMENTS. THE ARCHITECT AND HIS CONSULTANTS ASSUME NO RESPONSIBILITY FOR CONSTRUCTION BID'S OR CONSTRUCTION PERFORMED FROM THESE DRAWINGS.

REVISIONS		
No.	DATE	DESCRIPTION
CLIENT INFORMATION		



NEKTER - LEE'S SUMMIT, MO  
940 NW PRYOR ROAD, RETAIL SPACE 5,  
LEE'S SUMMIT, MISSOURI 64081

PROJECT NAME

SHEET NAME

MECHANICAL GENERAL NOTES

DRAWN	CHECKED
R.H.	
DATE	07/30/21
SCALE	AS NOTED
PROJECT NUMBER	
SHEET	

M001



MECHANICAL SPECIFICATIONS

PART I - GENERAL

A. CONDITIONS

1. GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, SPECIAL CONDITIONS, AND OTHER RELATED PORTIONS OF DIVISION 1, APPLY TO THIS SECTION.

B. SUMMARY OF WORK

1. THE WORK INCLUDED CONSISTS OF FURNISHING LABOR, MATERIALS AND EQUIPMENT FOR THE INSTALLATION. IT ALSO INCLUDES PLACING INTO OPERATION A COMPLETE AND OPERABLE HEATING, VENTILATING AND AIR CONDITIONING SYSTEM AS SPECIFIED AND SHOWN. THIS INCLUDES, BUT IS NOT LIMITED TO: HVAC UNITS, EXHAUST FANS, DUCTLESS SPLIT-SYSTEMS, DUCTWORK, AIR DISTRIBUTION, CONTROLS AND ACCESSORIES, EXCEPT AS OTHERWISE NOTED.

C. REGULATIONS, CODES, PERMITS AND INSPECTIONS

1. COMPLY WITH NATIONAL, STATE, COUNTY, AND CITY CODES, ORDINANCES, ETC., HAVING JURISDICTION. THIS INCLUDES RULES AND REQUIREMENTS OF UTILITY SERVING AGENCIES.

2. INCORPORATE CODES, ORDINANCES, ETC., INTO THE BASE BID AND INSTALLATION OF WORK. NO ADDITIONAL FUNDS WILL BE ALLOCATED FOR WORK REQUIRED TO CONFORM TO REGULATIONS AND REQUIREMENTS OR TO OBTAIN APPROVAL OF WORK.
3. OBTAIN AND PAY FOR REQUIRED PERMITS AND LICENSES. WHEN REQUIRED BY CODE, WORK MUST BE INSPECTED AND APPROVED BY LOCAL AUTHORITIES. PRIOR TO FINAL APPROVAL, FURNISH ARCHITECT WITH CERTIFICATES OF INSPECTION AND APPROVALS BY LOCAL AUTHORITIES.

4. IN ADDITION, THE LATEST ADOPTED EDITION OF THE FOLLOWING CODES AND PUBLISHED STANDARDS SHALL BE ADHERED TO:

- 2018 INTERNATIONAL BUILDING CODE (IBC)
- 2018 INTERNATIONAL MECHANICAL CODE (IMC)
- 2018 INTERNATIONAL PLUMBING CODE (IPC)
- 2018 UNIFORM PLUMBING CODE (UPC)
- 2018 INTERNATIONAL FUEL GAS CODE (IFGC)
- 2018 UNIFORM ENERGY CONSERVATION CODE (IECC)
- 2018 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
- 2012 INTERNATIONAL GREEN CONSTRUCTION CODE(IGCC)-OPTIONAL
- 2017 NATIONAL ELECTRICAL CODE (NEC)
- SMACNA DUCT CONSTRUCTION STANDARDS
- 2010 ADA GUIDELINES & 2017 ICC/ANSI A117.1 FAIR HOUSING ACT

D. DESIGN DRAWINGS

1. DESIGN DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED ONLY TO DEFINE THE BASIC FUNCTIONS REQUIRED. PROVIDE LABOR, MATERIAL, ETC., NECESSARY TO ACCOMPLISH THESE REQUIREMENTS. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED A PART OF THE WORK INCLUDED. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE PERMITTED. DO NOT SCALE THE DESIGN DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS.
2. IF A CONFLICT OCCURS BETWEEN THE DESIGN DRAWINGS AND SPECIFICATIONS, PROMPTLY NOTIFY THE ARCHITECT AND/OR ENGINEER. AT THAT POINT, AN INTERPRETATION WILL BE MADE BY THE ARCHITECT AND/OR ENGINEER AND SAID DECISION SHALL BE CONSIDERED PART OF THE CONTRACT DOCUMENTS.

E. QUALIFICATIONS OF CONTRACTOR AND WORKMEN

1. CONTRACTOR SHALL BE PROPERLY LICENSED TO PERFORM THE WORK.

F. BASE BID

1. BASE BID SHALL INCLUDE MATERIALS AND EQUIPMENT SPECIFIED OR SCHEDULED ON THE DRAWINGS. REQUESTS FOR SUBSTITUTION OF MATERIALS AND EQUIPMENT SHALL BE BY ADDITIVE OR DEDUCTIVE ALTERNATE BID ONLY. THE FOLLOWING DATA MUST BE CLEARLY WRITTEN AT THE BEGINNING OF THE ALTERNATE PROPOSAL:

- A. ADDITIVE OR DEDUCTIVE AMOUNT CLEARLY WRITTEN IN WORDS AND NUMERALS.
- B. INCREASED OR REDUCED CONSTRUCTION TIME IN DAYS.
- C. OTHER DEMONSTRABLE BENEFIT, FOR WHICH THE SUBSTITUTION OF SUCH ONLY WHEN THE SUBSTITUTION OF MATERIALS OR EQUIPMENT IS AN ALTERNATE BID, WHICH ARE ACCOMPANIED BY THE SUPPORTING DATA INDICATED BELOW WILL BE REVIEWED AND CONSIDERED.

G. SUBSTITUTIONS

1. MATERIALS AND EQUIPMENT THAT ARE A SUBSTITUTE FROM THE LISTED MANUFACTURER MAY BE CONSIDERED. PRIOR TO PROPOSING ANY SUBSTITUTE ITEM, CONTRACTOR SHALL SATISFY HIMSELF THAT THE ITEM PROPOSED IS, IN FACT, EQUAL TO THAT SPECIFIED, THAT SUCH ITEM WILL FIT INTO THE SPACE ALLOCATED, THAT SUCH ITEM AFFORDS COMPARABLE EASE FOR OPERATION, MAINTENANCE AND SERVICE, THAT THE APPEARANCE, LONGEVITY, CAPACITY, SUITABILITY, AND ELECTRICAL CHARACTERISTICS ARE COMPARABLE, THAT BY REASON OF COST SAVINGS, REDUCED CONSTRUCTION TIME, OR SIMILAR DEMONSTRABLE BENEFIT, THE SUBSTITUTION OF SUCH ITEM WILL BE IN THE OWNER'S INTEREST.
2. THE BURDEN OF PROOF OF EQUALITY OF A PROPOSED SUBSTITUTION FOR A SPECIFIED ITEM SHALL BE UPON THE CONTRACTOR. CONTRACTOR SHALL SUPPORT HIS REQUEST WITH SUFFICIENT TEST DATA AND OTHER MEANS TO PERMIT THE ENGINEER TO MAKE A FAIR AND EQUITABLE DECISION ON THE MERITS OF THE PROPOSED SUBSTITUTION. INSUFFICIENT SUBMITTAL DATA WILL RESULT IN REJECTION OF THE PROPOSED SUBSTITUTION. ANY ITEM BY A MANUFACTURER OTHER THAN THOSE SPECIFIED, OR OF BRAND NAME, MODEL NUMBER, OR OF GENERIC SPECIES OTHER THAN THOSE SPECIFIED, WILL BE CONSIDERED A SUBSTITUTION. ENGINEER WILL BE THE SOLE JUDGE OF WHETHER OR NOT THE SUBSTITUTION IS EQUAL IN QUALITY, UTILITY AND ECONOMY TO THAT SPECIED.
3. APPROVAL OF A SUBSTITUTION SHALL NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR COMPLIANCE WITH ALL REQUIREMENTS OF THE CONTRACT. CONTRACTOR SHALL BEAR THE EXPENSE FOR ANY CHANGES IN OTHER PARTS OF THIS WORK OR OTHER WORK CAUSED BY THE PROPOSED SUBSTITUTION, INCLUDING BUT NOT LIMITED TO STRUCTURAL, ELECTRICAL, PLUMBING, AND ACCESS REQUIREMENTS.
4. IF ENGINEER REJECTS CONTRACTOR'S SUBSTITUTE ITEM ON THE FIRST SUBMITTAL, CONTRACTOR MAY MAKE ONLY ONE ADDITIONAL REQUEST FOR SUBSTITUTION IN THE SAME CATEGORY.
5. ANY EQUIPMENT SUBSTITUTED WITHOUT THE ENGINEER'S WRITTEN APPROVAL WILL BE REMOVED AND REPLACED WITH THE SPECIFIED EQUIPMENT AT THE CONTRACTOR'S EXPENSE AND AT NO ADDITIONAL COST TO THE OWNER.

H. SUBMITTALS

1. EQUIPMENT AND MATERIALS:

- A. CONTRACTOR SHALL HAVE APPROVED SUBMITTALS PRIOR TO FABRICATION OR DELIVERY OF ANY MATERIAL AND/OR EQUIPMENT TO THE JOB SITE. SUBMIT A MINIMUM OF 8 (EIGHT) COPIES, COMPREHENSIVELY INDEXED SUBMITTAL IN A 3-RING BINDER, COMPLETELY DESCRIBING EACH MAJOR SYSTEM, MATERIAL AND EQUIPMENT PROPOSED TO BE USED. ANY PIECE OF EQUIPMENT PLACED ON THE JOB WITHOUT PRIOR APPROVAL WILL BE SUBJECT TO REMOVAL AT THE SOLE EXPENSE OF THE CONTRACTOR.
- B. SUBMITTALS ARE FOR INFORMATION AND COORDINATION ONLY. REVIEW OF MATERIAL AND/OR EQUIPMENT SUBMITTALS SHALL IN NO WAY RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO COMPLY WITH PLANS AND SPECIFICATIONS REQUIREMENTS. POINTS OF NON-COMPLIANCE WHICH ARE NOT NOTED SHALL NOT BE CONSTRUED TO BE AN APPROVAL OF THE NON-COMPLIANCE. SUBMITTALS SHALL CLEARLY STATE WHERE EQUIPMENT DOES NOT AGREE WITH THE CONTRACT DOCUMENTS.
- C. SUBMITTALS SHALL INCLUDE MANUFACTURER'S SPECIFICATIONS, PHYSICAL DIMENSIONS, WEIGHTS AND RATINGS OF EQUIPMENT SUBMITTED. INDICATE EQUIPMENT LAYOUTS, ELECTRICAL CHARACTERISTICS, WIRING AND CONTROL DIAGRAMS, SIZES AND LOCATIONS OF PIPING, DUCT, CONDUITS, AND OTHER CONNECTION SIZES AND LOCATIONS.

2. SHOP DRAWINGS: CONTRACTOR SHALL PREPARE AND SUBMIT DETAILED 1/4"=1'-0" SCALE DRAWINGS THAT HAVE BEEN PROPERLY COORDINATED WITH OTHER TRADES. INDICATE LOCATION AND SIZES OF ACCESS PANELS IN HARD CEILINGS FOR EQUIPMENT AND DAMPER ACCESS.

3. AS BUILT DRAWINGS: MAINTAIN ACCURATE RECORDS OF ANY CHANGES FROM THE CONTRACT DOCUMENTS AND SHOP DRAWINGS. UPON COMPLETION OF THE PROJECT, DELIVER TO THE ENGINEER ONE (1) SET OF LEGIBLE REPRODUCIBLES AND (3) BLUELINE SETS OF THESE RECORD DRAWINGS.

4. WARRANTY: UNLESS SPECIFIED OTHERWISE BY ARCHITECT, ENGINEER, OWNER OR OWNER'S REPRESENTATIVE, UPON COMPLETION OF THE PROJECT, DELIVER TO THE OWNER A WRITTEN ONE (1) YEAR WARRANTY ON THE SYSTEMS, MATERIALS AND ALL WORK PERFORMED. THIS INCLUDES THE ENTIRE COST, INCLUDING MATERIALS AND/OR LABOR, OF CORRECTIVE WORK REQUIRED AND NECESSITATED BY DEFECTS IN MATERIALS AND/OR WORKMANSHIP. CONTRACTOR SHALL ALSO PRESENT THE OWNER WITH A COPY OF ALL MANUFACTURER'S WARRANTIES THAT EXCEED THE WARRANTY PERIOD, SUCH AS AC UNIT COMPRESSORS.

5. OPERATION AND MAINTENANCE INSTRUCTIONS: UPON THE COMPLETION OF THE PROJECT, DELIVER TO THE OWNER THE REQUIRED NUMBER OF COPIES OF HARD BOUND O & M MANUALS. INCLUDE IN THE MANUAL INSTRUCTIONS PREPARED SPECIFICALLY FOR THE SYSTEMS PROVIDED, ALONG WITH DESCRIPTIONS, PARTS LIST, INSTRUCTIONS, AND WARRANTIES. START-UP REPORTS FOR ALL EQUIPMENT WILL BE DELIVERED WITH THE MATERIALS AND EQUIPMENT UTILIZED IN THE PROJECT. IDENTIFY EACH ITEM BY THE DESIGNATION APPEARING ON THE DRAWINGS.

6. OWNER TRAINING: AT A TIME DESIGNATED BY THE OWNER, PROVIDE A SUITABLE TECHNICIAN, MECHANIC OR ENGINEER TO REVIEW THE SYSTEMS WITH OWNERS REPRESENTATIVE TO THOROUGHLY FAMILIARIZE HIM WITH THE OPERATIONS AND MAINTENANCE OF THE SYSTEMS. UP TO (8) EIGHT HOURS TOTAL TRAINING TIME SHALL BE REQUIRED WITHOUT ADDITIONAL COST TO THE OWNER. PRIOR TO TRAINING THE OWNER SHALL HAVE TAKEN POSSESSION OF THE O & M MANUALS, AND SHALL HAVE HAD A REASONABLE AMOUNT OF TIME FOR THE PERSONNEL TO FAMILIARIZE THEMSELVES WITH THE CONTENTS OF THE MANUALS.

PART II - PRODUCTS

A. GENERAL PRODUCTS

1. SEISMIC RESTRAINTS:

- A. WHERE REQUIRED BY THE BUILDING OFFICIALS/BUILDING CODES, FURNISH AND INSTALL SEISMIC RESTRAINTS FOR DUCTWORK, PIPING, AND EQUIPMENT. SEISMIC RESTRAINTS SHALL BE DESIGNED TO RESIST SEISMIC FORCES PRESCRIBED IN THE BUILDING CODES FOR THE PROJECT LOCATION.
- B. WHERE REQUIRED BY THE BUILDING OFFICIAL, PROVIDE STRUCTURAL CALCULATIONS SEALED AND SIGNED BY A LICENSED STRUCTURAL ENGINEER.
- C. REFERENCE THE LATEST EDITION OF THE SMACNA SEISMIC RESTRAINT MANUAL FOR GUIDELINES.

2. FURNISH AND INSTALL NEW PRODUCTS OF ESTABLISHED AND REPUTABLE MANUFACTURERS. SEE LIST OF ACCEPTABLE MANUFACTURERS ELSEWHERE IN THESE SPECIFICATIONS. MAKE NO EQUIPMENT SUBSTITUTIONS THAT WOULD LEAVE INADEQUATE OPERATING OR SERVICING SPACE. REFER TO 'SUBSTITUTIONS' SECTION OF THE SPECIFICATION.

3. ACCESSORIES REQUIRED FOR PROPER OPERATION OF THE SYSTEMS, EVEN THOUGH NOT SPECIFICALLY INDICATED, SHALL BE INCLUDED AND INSTALLED, SUCH ACCESSORIES MAY INCLUDE, BUT ARE NOT LIMITED TO, FILTERS, CONDENSATE DRAINS, RELIEF VALVES, SERVICE VALVES, THERMOSTATS, VIBRATION ISOLATORS, ETC. MOTOR STARTERS FOR PREWIRED EQUIPMENT AND OTHER PROTECTION AND CONTROL DEVICES ARE TO BE FURNISHED UNDER THE MECHANICAL CONTRACTOR'S SCOPE OF WORK. STARTERS FOR NON-PREWIRED EQUIPMENT, I.E., FANS, PUMPS ETC., ARE UNDER THE ELECTRICAL CONTRACTOR'S SCOPE OF WORK, UNLESS NOTED OTHERWISE.
4. SPECIFIC REFERENCE TO A MANUFACTURER'S PRODUCT IS ONLY TO ESTABLISH TYPE, QUALITY, AND PERFORMANCE REQUIRED. THESE QUALIFICATIONS ARE IN ADDITION TO THE REQUIREMENTS SHOWN ON THE PLANS AND ELSEWHERE IN THESE SPECIFICATIONS. LISTING OF ALTERNATE EQUIPMENT MANUFACTURERS SHALL NOT BE CONSTRUED AS AN UNCONDITIONAL APPROVAL OF THE PRODUCTS OF THOSE MANUFACTURERS.

B. AIR CONDITIONING UNITS

1. FURNISH AND INSTALL HEATING/COOLING UNITS WITH CAPACITIES AS SCHEDULED. UNITS SHALL BE COMPLETE WITH HERMETICALLY SEALED COMPRESSOR WITH HIGH AND LOW PRESSURE CUT-OFFS, COILS, HEATING SECTION, BLOWERS, NECESSARY REFRIGERANT PIPING, INSULATED COMPRESSOR COMPARTMENT, AIR COOLED CONDENSER, CONDENSER BLOWER OR FAN, AUTOMATIC CONTROLS, CONTROL PANEL WITH STARTERS, RELAYS, ETC. FOR SINGLE POINT POWER CONNECTION, WITHIN A WEATHERPROOF, INSULATED DECORATIVE CASING. UNITS SHALL BE FURNISHED WITH (1) ONE CONSTRUCTION SET OF FILTERS, INSTALLED PRIOR TO START-UP. REPLACE FILTERS AT SUBSTANTIAL COMPLETION BEFORE TEST AND BALANCE ACTIVITIES COMMENCE. FURNISH ONE COMPLETE SET OF SPARE FILTERS TO OWNER. FURNISH ONE COMPLETE SET OF BELTS.
2. UNITS SHALL BE COMPLETELY FACTORY WIRED FOR TERMINAL CONNECTIONS OF THERMOSTAT WITH A FAN-AUTOMANUAL SWITCH AND A SYSTEM HEAT/OFF/COOL/AUTO SWITCH. UNITS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS, COMPLETE WITH ALL SCHEDULED AND NECESSARY ACCESSORIES FOR EFFICIENT AND PROPER OPERATION.

D. DUCTWORK

1. PROVIDE A COMPLETE SYSTEM OF DUCTWORK FABRICATED AND INSTALLED IN STRICT ACCORDANCE WITH LATEST VERSIONS OF THE ASHRAE FUNDAMENTALS HANDBOOK AND SMACNA DUCT CONSTRUCTION STANDARDS. DUCT SYSTEM SHALL BE CONSTRUCTED AS REPRESENTED ON THESE DRAWINGS AND AS COORDINATED IN DETAIL ON THE APPROVED DUCTWORK SHOP DRAWINGS. IF ADDITIONAL CHANGES IN DUCT ARRANGEMENT OR IN DUCT SIZES ARE REQUIRED, THEY SHALL BE MADE ONLY AFTER WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER.
2. MAIN AND BRANCH DUCTS SHALL BE RECTANGULAR, ROUND, OR FLAT-OVAL, AND SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL UNLESS NOTED OTHERWISE. DUCT SIZES SHOWN ON THE DRAWINGS ARE NET OPENINGS AND SHALL BE INCREASED TO ACCOMMODATE DUCT LINING WHERE APPLICABLE.
3. FLEXIBLE DUCT SHOWN AT CONNECTION TO AIR DISTRIBUTION DEVICES SHALL BE A FABRICATED ASSEMBLY WITH AN ACOUSTICALLY-RATED CORE CONSISTING OF AN INNER SLEEVE, 2-INCH THICK FIBERGLASS INSULATION, WITH AN R-6.0 MINIMUM AND AN OUTER VAPOR BARRIER COVERING EQUAL TO THERMAFLEX M-KE.
4. WHETHER SHOWN ON PLANS OR NOT, PROVIDE MANUAL VOLUME DAMPERS IN EACH RUNOUT TO EACH SUPPLY DIFFUSER OR REGISTER, RETURN AND EXHAUST GRILLE AND ALSO AS REQUIRED FOR A PROPERLY BALANCED SYSTEM. PROVIDE ACCESS PANELS TO DAMPERS LOCATED ABOVE HARD CEILINGS.
5. VOLUME DAMPERS FOR RECTANGULAR DUCTS SHALL BE CONSTRUCTED OF 16 GAUGE GALVANIZED STEEL, BE OF THE OPPOSED BLADE TYPE AND BE FURNISHED WITH LOCKING AND INDICATING QUADRANTS. DAMPERS FOR ROUND DUCTS SHALL BE SINGLE-BLADE TYPE UP TO 30". USE CONTINUOUS ROD ON 2" W.G. CLASS DAMPERS FROM 12"-28"Ø, AND RECTANGULAR DUCTS FROM 18"-48" WIDE.

6. ROUND TAPS FOR FACTORY-MADE AIR DUCTS IN SECTIONS OF ROUND SHEET METAL DUCTS SHALL BE MADE WITH ANY OF THE FITTINGS LISTED BELOW:

- A. CONICAL TEE.
- B. CONICAL SADDLE TAP.
- C. ELBOW (IF LAST FITTING).
- D. 45° TEE OR SADDLE TAP.

7. ROUND TAPS FOR FACTORY-MADE AIR DUCTS IN SECTIONS OF RECTANGULAR SHEET METAL DUCTS SHALL BE MADE WITH ANY OF THE FITTINGS LISTED BELOW:

- A. COLLAR (CONICAL).
- B. COLLAR (STRAIGHT, ONLY WHEN SHOWN ON DRAWINGS).

8. DOVETAILED CUTOFFS ARE NOT ACCEPTABLE. DUCT TAPE OR OTHER PRESSURE SENSITIVE TAPES ARE NOT ACCEPTABLE.

9. TAPS IN SECTIONS OF ROUND FACTORY-MADE FLEXIBLE AIR DUCTS (WHEN ALLOWED) SHALL BE MADE BY INSERTING, IN THE FLEXIBLE DUCT SECTION, ANY OF THE SHEET METAL FITTINGS LISTED BELOW:

- A. 90 DEGREE CONICAL STRAIGHT TEE.
- B. 45 DEGREE STRAIGHT LATERAL.
- C. 45 DEGREE STRAIGHT LATERAL WITH 45 DEGREE ELBOW.
- D. 45 DEGREE STRAIGHT LATERAL CROSS.
- E. Y BRANCH WITH 45 DEGREE ELBOW.

E. DUCT INSULATION

1. THERMAL INSULATION:

- A. CONCEALED SUPPLY DUCTS AND RETURN DUCTS ABOVE CEILING OR IN FURRED SPACES SHALL BE THERMALLY INSULATED.
- B. THERMAL INSULATION SHALL BE FLEXIBLE BLANKET GLASS FIBER INSULATION WITH FACTORY APPLIED FLAME RETARDANT, FOIL-SCRM-KRAFT VAPOR BARRIER (FSK), MAXIMUM K OF 0.30 AT 75 DEGREES F MEAN TEMPERATURE MINIMUM .75 POUND DENSITY. INSULATION SHALL BE 2" THICK.
- C. INSULATION SHALL BE APPLIED OVER SURFACES WHICH HAVE BEEN WIPED CLEAN AND DRY AND SHALL HAVE 3-INCH MINIMUM OVERLAP ON BOTH LONGITUDINAL AND TRANSVERSE SEAMS.
- D. SUPPLY AND RETURN DUCTS LOCATED OUTSIDE SHALL BE LINED WITH 2" ACOUSTICAL LINER AND SEALED WATER TIGHT, OR INSULATED EXTERNALLY WITH 2" RIGID BOARD AND ALUMINUM LAGGING SEALED WATER TIGHT.

F. AIR FILTERS

1. REPLACEABLE (THROWAWAY) PANEL FILTERS:

- A. PROVIDE FACTORY-FABRICATED, VISCOUS-COATED, FLAT PANEL TYPE REPLACEABLE AIR FILTERS WITH HOLDING FRAMES AS INDICATED, IN SIZES I INDICATED, WITH 2" THICK UL CLASS 2 THROWAWAY MEDIA MATERIAL, CONSTRUCT MEDIA OF INTERLACED GLASS FIBERS, SPRAY WITH NON-FLAMMABLE ADHESIVE, FRAME IN THROWAWAY FIBERBOARD CASINGS, AND SANDWICH BETWEEN PERFORATED METAL GRILLES.
- B. CONSTRUCT DUCTWORK-HOLDING FRAMES OF 20-GA. GALVANIZED STEEL, CAPABLE OF HOLDING MEDIA AND MEDIA FRAME IN PLACE, AND GASKETED TO PREVENT UNFILTERED AIR BY-PASSING BETWEEN MEDIA FRAMES AND HOLDING MEMBERS.
- C. PROVIDE FILTERS WITH RATED FACE VELOCITY OF 500 FPM, INITIAL RESISTANCE OF OT GREATER THAN 0.30" W.G., FINAL RATED RESISTANCE OF 0.50" W.G., AND AVERAGE ARRESTANCE OF 80%.

C. EXHAUST FAN AND VENT UNITS

1. FURNISH AND INSTALL DIRECT DRIVE CENTRIFUGAL ROOF EXHAUST FANS WITH CAPACITIES AS SCHEDULED. UNITS SHALL BE COMPLETE WITH ALUMINUM HOUSING, BACKWARD INCLINED WHEEL, ALUMINUM CURB CAP WITH PREPUNCHED MOUNTING HOLES, BIRDSCREEN, BALL BEARING MOTORS, SLEEVE BEARING MOTORS, MOTOR ISOLATED ON SHOCK MOUNTS, CORROSION RESISTANT FASTENERS, ETC.
2. FURNISH AND INSTALL BELT DRIVE UPBLAST CENTRIFUGAL ROOF EXHAUST FANS WITH CAPACITIES AS SCHEDULED. UNITS SHALL BE COMPLETE WITH ALUMINUM HOUSING, BACKWARD INCLINED ALUMINUM WHEEL, MOTOR AND DRIVES ISOLATED ON SHOCK MOUNTS, DRAIN TROUGH, ADJUSTABLE MOTOR PULLEY, ADJUSTABLE MOTOR PLATE, FAN SHAFT MOUNTED IN BALL BEARING PILLOW BLOCKS, BEARINGS THAT MEET OR EXCEED TEMPERATURE RATING OF FAN, STATIC RESISTANT BELTS, CURB CAP WITH PREPUNCHED MOUNTING HOLES, BALL BEARING MOTORS, CORROSION RESISTANT FASTENERS, ETC.
3. UNITS SHALL BE COMPLETELY FACTORY WIRED AND INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS, COMPLETE WITH ALL SCHEDULED AND NECESSARY ACCESSORIES FOR EFFICIENT AND PROPER OPERATION.

F. LIST OF ACCEPTABLE MANUFACTURERS

1. FOLLOWING IS A LIST OF MANUFACTURES WHOSE EQUIPMENT IS ACCEPTABLE AS TO MANUFACTURE, SUBJECT TO CONFORMANCE WITH THE DRAWINGS AND SPECIFICATIONS. CAREFUL CHECKING MUST BE MADE TO VERIFY THAT EQUIPMENT WILL MEET CAPACITIES, REQUIREMENTS, SPACE AND WEIGHT ALLOCATIONS.

- A. HVAC PACKAGED EQUIPMENT: CARRIER OR APPROVED EQUAL BY ARCHITECT/ENGINEER
- B. FANS: GREENHECK, COOK, ACME, PENN, PRICE
- C. AIR DEVICES: TITUS, KREUGER, METAL-AIRE, PRICE
- D. INSULATION: CERTANTEED, OWENS-CORNING, MANVILLE, KNAUF
- E. UNIT HEATERS: CHROMOLOX, REZNOR, Q-MARK, MARKEL
- F. DUCT SEALANT: DESIGN POLYMERICS, MCGILL AIRFLOW, CANVAS TAPE AND ARABOL
- G. VARIABLE FREQUENCY DRIVE: ALLEN-BRADLEY, ASEA BROWN BOVERI (ABB), CUTLER-HAMMER, SQUARE D, TOSHIBA
- H. SPRING ISOLATION RAILS: MICRO-METAL
- I. SPLIT SYSTEM HEAT PUMP UNITS: CARRIER, TRANE, SANYO
- J. AIR FILTERS: AFF, FARR OR FLANDERS.

2. APPROVAL FOR SUBSTITUTIONS MUST BE MADE IN ACCORDANCE WITH PART 1, SECTION G "SUBSTITUTIONS" OF THESE SPECIFICATIONS.

PART III - EXECUTION

A. GENERAL

1. INSTALL MATERIALS AND EQUIPMENT IN AN ARRANGEMENT THAT WILL GIVE THE GREATEST PRACTICAL EASE OF OPERATION AND SERVICE TO THE OWNER.
2. INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.
3. PERFORM WORK IN ACCORDANCE WITH THE BEST TRADE PRACTICES. INSTALL MATERIALS AND EQUIPMENT SQUARELY WITH THE BUILDING LINES. PROVIDE RIGID PERMANENT BASES AND SUPPORTS FOR WORK.
4. CONSTRUCT AND BRACE EQUIPMENT, PIPING, ETC., SO THAT THERE WILL BE NO VIBRATION AND/OR RATTLING WHEN THE SYSTEM IS IN OPERATION.
5. COVER AND PROTECT EQUIPMENT AND MATERIALS FROM WEATHER, THEFT, ETC., UNTIL DATE OF COMPLETION. PLUG AND/OR CAP OPEN ENDS OF INSTALLED PIPING AND/OR DUCTWORK PENDING EXTENSION OR FINAL CONNECTION.

B. DUCTWORK

1. CONSTRUCT DUCTWORK WITH MATERIAL, GAUGES, JOINTS, BRACING AND SUPPORTS IN ACCORDANCE WITH LATEST SMACNA STANDARDS.
2. DUCTWORK SHALL BE RIGIDLY CONSTRUCTED AND SUBSTANTIALLY AIR-TIGHT. SEAL ALL DUCTWORK WITH A WATER BASED DUCT SEALANT (DESIGN POLYMERICS DP-1010 OR EQUAL) OR ARABOL AND CANVAS TAPE. DO NOT UTILIZE PRESSURE SENSITIVE TAPES. SEAL DUCTWORK IN ACCORDANCE WITH TABLE 4-1 "APPLICABLE LEAKAGE CLASSES" OF THE LATEST SMACNA HVAC LEAKAGE TEST MANUAL.
3. MAKE CONNECTIONS BETWEEN FLEXIBLE DUCTS AND RIGID TRUNK DUCTS WITH FACTORY FABRICATED FITTINGS WITH DAMPER. SECURE FLEX DUCT TO FITTING WITH CLAMPS OR PANDUIT STRAPS INSTALLED TO FACTORY RECOMMENDED TENSION. INSTALL CLAMPS ON LINER AND SECOND CLAMP OVER JACKET. JOB INSPECTION MAY REQUIRE REMOVAL AND REPLACEMENT OF A RANDOM SAMPLING OF CONNECTIONS.
4. ELBOWS SHALL HAVE A THROAT RADIUS EQUAL TO 1-1/2 TIMES THE DUCT WIDTH. SQUARE ELBOWS SHALL HAVE TURNING VANES OR SPLITTER. TRANSITIONS SHALL NOT EXCEED 4 TO 1 ASPECT RATIO.

C. AUTOMATIC TEMPERATURE CONTROLS & SHUTOFF

1. ROOFTOP AC UNITS SHALL BE TURNED ON/OFF WITH PROGRAMMABLE 7-DAY THERMOSTATS. THERMOSTATS SHALL BE SET FOR CONTINUOUS FAN OPERATION.
2. EXHAUST FANS ARE CONTROLLED AS SPECIFIED IN THE EXHAUST FAN SCHEDULE.
3. AIR CONDITIONING UNITS SHALL BE EQUIPPED WITH IONIZATION TYPE DUCT DETECTOR, UNLESS INDICATED OTHERWISE.
4. DUCT SMOKE DETECTOR SHALL BE LOCATED IN THE MAIN SUPPLY AND RETURN - AIR DUCT AHEAD OF ANY BRANCH TAKE-OFFS, AND INSTALLED PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
5. WHERE REQUIRED BY BUILDING OFFICIALS, ACTIVATION OF ANY SMOKE DETECTOR SHALL CAUSE THE AIR-MOVING EQUIPMENT TO AUTOMATICALLY SHUT DOWN. WHERE A SYSTEM CONSISTS OF MORE THAN ONE AIR CONDITIONER, ACTIVATION OF ANY OF THE SMOKE DETECTORS IN ANY OF THE AIR CONDITIONERS SERVING THE COMMON AREA SHALL CAUSE ALL AIR-MOVING EQUIPMENT SERVING THAT COMMON AREA TO SHUT DOWN.
6. WIRING OF THE SMOKE DETECTORS SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR AND SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEC AND ELECTRICAL SECTIONS OF THE SPECIFICATION.
7. FIRE ALARM CONTRACTOR SHALL CONNECT ALL FIRE/SMOKE DAMPERS TO THE FIRE CONTROL SYSTEM, AS REQUIRED BY LOCAL BUILDING AUTHORITY. THE FIRE ALARM CONTRACTOR SHALL PROVIDE AND INSTALL THE CEILING MOUNTED SMOKE DETECTOR STATUS LIGHTS.

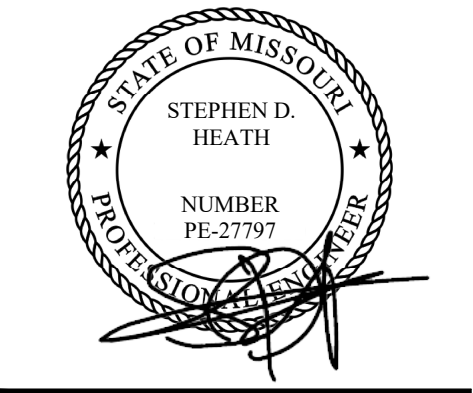
D. TESTING AND BALANCING

1. THE HVAC SYSTEM AND COMPONENTS SHALL BE TESTED, ADJUSTED AND BALANCED IN ACCORDANCE WITH ONE OF THE FOLLOWING STANDARDS.
- A. TABB CONSTRUCTION SPECIFICATION INSTITUTE MASTER FORMAT (23 05 93 AND 15990)
- B. NEBB STANDARDS FOR TESTING, ADJUSTMENT AND BALANCING OF ENVIRONMENTAL SYSTEM (7TH EDITION)
- C. AABC NATIONAL STANDARD FOR TOTAL SYSTEM BALANCING (6TH EDITION).
2. A COMPLETE BALANCING REPORT SHALL BE SUBMITTED TO THE ENGINEER UPON COMPLETION. THE BALANCING REPORT SHALL INCLUDE DESIGN QUANTITIES AND ACTUAL (MEASURED) QUANTITIES FOLLOWING BALANCING. BALANCING SHALL BE COMPLETED TO THE SATISFACTION OF THE ENGINEER. T.A.B. CONTRACTOR SHALL BE A.A.B.C. OR N.E.E.B. CERTIFIED, OR COMPANY APPROVED BY ENGINEER.
3. INCLUDE IN BID, AS PART OF THE WORK IN THIS CONTRACT, ANY ADJUSTMENTS TO OR REPLACEMENT OF PULLEYS, BELTS, MOTORS, DAMPERS, ETC., REQUIRED FOR CORRECT BALANCING OF SYSTEMS. CONTRACTOR OR EQUIPMENT SUPPLIER TO FURNISH THE ABOVE LISTED ITEMS TO T.A.B. CONTRACTOR TO INSTALL.
4. TEST AND ADJUST AIR DEVICES TO WITHIN PLUS OR MINUS 5 PERCENT OF DESIGN REQUIREMENTS.
5. T.A.B. CONTRACTOR SHALL ADJUST THE DEFLECTION OF ALL APPLICABLE SUPPLY AIR DISTRIBUTION FOR PROPER AIR FLOW DIRECTION AND CHARACTERISTICS AS RECOMMENDED BY THE MANUFACTURER AND/OR TO THE SATISFACTION OF THE ENGINEER AND OWNER.

KD

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REVISIONS		
No.	DATE	DESCRIPTION
CLIENT INFORMATION		



PROJECT NAME

NEKTER - LEE'S SUMMIT, MO

940 NW PRYOR ROAD, RETAIL SPACE 5,  
LEE'S SUMMIT, MISSOURI 64081

SHEET NAME

MECHANICAL SPECIFICATION

DRAWN	R.H.	CHECKED
DATE		07/30/21
SCALE		AS NOTED
PROJECT NUMBER		
SHEET		

M002

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SPLIT SYSTEM HEAT PUMP SCHEDULE

ITEM		LOCATION (OUTDOOR / INDOOR )	SERVICE	MANUFACTURER/ MODEL (OUTDOOR / INDOOR UNIT)	NOM. TONS OUTDOOR/ INDOOR	COOLING COIL						HEATING				AIR HANDLING UNIT							CONDENSING UNIT				NOTES	
AIR HANDLING UNIT	CONDENSER					TOTAL (MBH)	SENSIBLE (MBH)	ESP	HP	AMBIENT TEMP (°F)	SEER (EER)	AMBIENT TEMP (°F)	CAPACITY (MBH)	HEAT CAP.	AFUE	AIRFLOW (CFM)	OSA (CFM)	ESP (IN WC)	UNIT MCA (A)	UNIT MOCP (A)	V/PH	MAX OPER. WEIGHT (LBS)	UNIT MCA (A)	UNIT MOCP (A)	V/PH	MAX OPER. WEIGHT (LBS)		
(E) <div>FC R5</div>	(E) <div>CU R5</div>	ROOF/ CEILING	STORE	GOODMAN GSX14-0601/ ARUF61D14	5/5	57.5	41.0	0.5	0.75	--	14.0	--	45.5	11.4	--	1850	-	0.5	6.5	15	208/1	150	32.8	50	208/230/1	185	1, 2, 3, 4, 5	
NOTES: 1. FIELD VERIFY EXISTING SPLIT SYSTEM LOCATION AND SIZE. 2. PROVIDE PLENUM BOX ON RETURN SIDE. 3. FURNISHED WITH 2" PLEATED FILTER MERV 13 AND PROGRAMMABLE T-STAT WITH SETBACK FEATURE. 4. PROVIDE 4" PAD FOR CONDENSING UNIT. 5. INSTALL CONTROL SYSTEM PER HVAC MANUFACTURE RECOMMENDATION.  6. R5 REFER TO RETAIL # 5.																												

AIR DISTRIBUTION SCHEDULE

MANUFACTURER / MODEL	SIZE	CFM	MAX NECK VEL.	MAX N.C.	MAX S.P. DROP	REMARKS
PRICE MODEL MODEL SCDA  <div>SA-1 -</div>	6"Ø	0 - 125	400	20	.08	PANEL SIZE: 24"X24" PAINT INSIDE OF CAN FLAT BLACK, FOR LAY-IN CEILING.  FURNISH WITH SECTORIZING BAFFLE (SB) FOR THROW PATTERN CONTROL.
	8"Ø	126 - 250		20	.08	
	10"Ø	251 - 400		20	.08	
	12"Ø	401 - 600		20	.08	
	14"Ø	601 - 800		20	.08	
	16"Ø	801 - 1000		20	.08	
	18"Ø	1001 - 1200		20	.08	
PRICE MODEL 80  <div>RA-1 -</div>	6"Ø	0 - 125	400	20	.08	PANEL SIZE: 24"X24" 1/2" GRID, PAINT INSIDE OF CAN FLAT BLACK, FOR LAY-IN CEILING.
	8"Ø	126 - 250		20	.08	
	10"Ø	251 - 400		20	.08	
	12"Ø	401 - 600		20	.08	
	14"Ø	601 - 800		20	.08	
	16"Ø	801 - 1000		20	.08	
	22x22	1001 - 2000		20	.08	
PRICE MODEL SCDA  <div>SA-2 -</div>	6"Ø	0 - 125	400	20	.08	PANEL SIZE: 12"X12" PAINT INSIDE OF CAN FLAT BLACK, FOR SURFACE MOUNTING. PROVIDE CABLE OPERATED DAMPER.
	8"Ø	126 - 250		20	.08	
	10"Ø	251 - 400		20	.08	
	12"Ø	401 - 600		20	.08	
	14"Ø	601 - 800		20	.08	
	16"Ø	801 - 1000		20	.08	
	18"Ø	1001 - 1200		20	.08	
PRICE MODEL S  <div>SA-3 -</div>	6"Ø	0 - 125	400	20	.08	PANEL SIZE: 16"X10" PAINT INSIDE OF CAN FLAT BLACK, FOR SURFACE MOUNTING. PROVIDE CABLE OPERATED DAMPER.
	8"Ø	126 - 250		20	.08	
	10"Ø	251 - 400		20	.08	
	12"Ø	401 - 600		20	.08	
	14"Ø	601 - 800		20	.08	
	16"Ø	801 - 1000		20	.08	
	18"Ø	1001 - 1200		20	.08	
<div>LEGEND</div> <div><div>SA-1 -</div><div>AIR DISTRIBUTION DEVICE</div><div>CFM</div><div>SA - SUPPLY AIR DIFFUSER RA - RETURN AIR GRILLE EG - EXHAUST GRILLE TG - TRANSFER GRILLE</div></div>						

EXHAUST FAN SCHEDULE

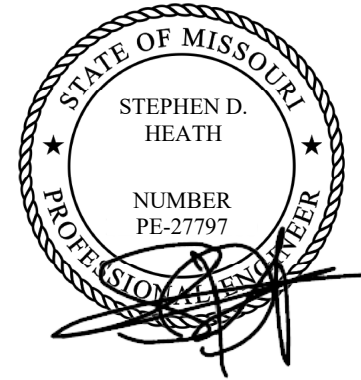
ITEM	LOCATION	SERVICE	MANUFACTURER/ MODEL	TYPE	AIRFLOW (CFM)	ESP (IN WG)	RPM	BHP	MOTOR		MAX OPERATING WEIGHT (LBS)	SONES	NOTES
									HP (W)	V/PH			
EF 1	CEILING	RESTROOM	GREENHECK SP-110-VG	DIRECT DRIVE CENTRIFUGAL	110	0.25	940	-	(8.4W)	115/1	10	1.4	1, 2, 4, 5
EF 2	CEILING	BACK OF HOUSE MOP SINK	GREENHECK SP-110-VG	DIRECT DRIVE CENTRIFUGAL	75	0.50	940	-	(8.4W)	115/1	10	1.4	1, 2, 3, 4
NOTES: 1. PROVIDE BACKDRAFT DAMPER 2. PROVIDE NEOPRENE VIBRATION ISOLATORS 3. FAN SHALL BE UTILIZED FOR CONTINUOUS OPERATION 4. INSTALL APPROVED EQUAL FAN 5. FAN INTERLOCK WITH LIGHT SWITCH.													

VENTILATION AIR SCHEDULE

DESCRIPTION	AREA (Ft <sup>2</sup> ) Az	AREA OUTDOOR AIR RATE Ra	AREA OUTDOOR RaAz	OCCUPANT DENSITY RATE (PEOPLE/1000FT <sup>3</sup> )	OCCUPANCY C°F/1000 Pz	OCCUPANT OUTDOOR AIR RATE Rp	OCCUPANT OUTDOOR AIR RpPz	BREATHING ZONE OUTDOOR AIR Vbz = RpPz + RaAz	ZONE AIR DISTRIBUTION EFFECTIVNESS Ez	ZONE OUTDOOR AIR Voz = Vbz/Ez	SUPPLY AIR DESIGN
STORE	790	0.18	142	70	25	7.5	188	330	1.0	330	1850
TOTAL REQUIRED OUTDOOR AIR:										330	1850
PERCENTAGE OF OUTDOOR AIR:										17.8%	

AIR BALANCE SCHEDULE

SERVICE	MARK	SUPPLY (CFM)	RETURN (CFM)	OUTSIDE AIR (CFM)	EXHAUST (CFM)	RESULTING PRESSURE (CFM)
NEKTER SPACE						
	FC-1	1850	1850	292	-	330
	EF-1	-	-	-	110	-110
	EF-2	-	-	-	75	-75
	TOTAL	1850	1850	255	185	145



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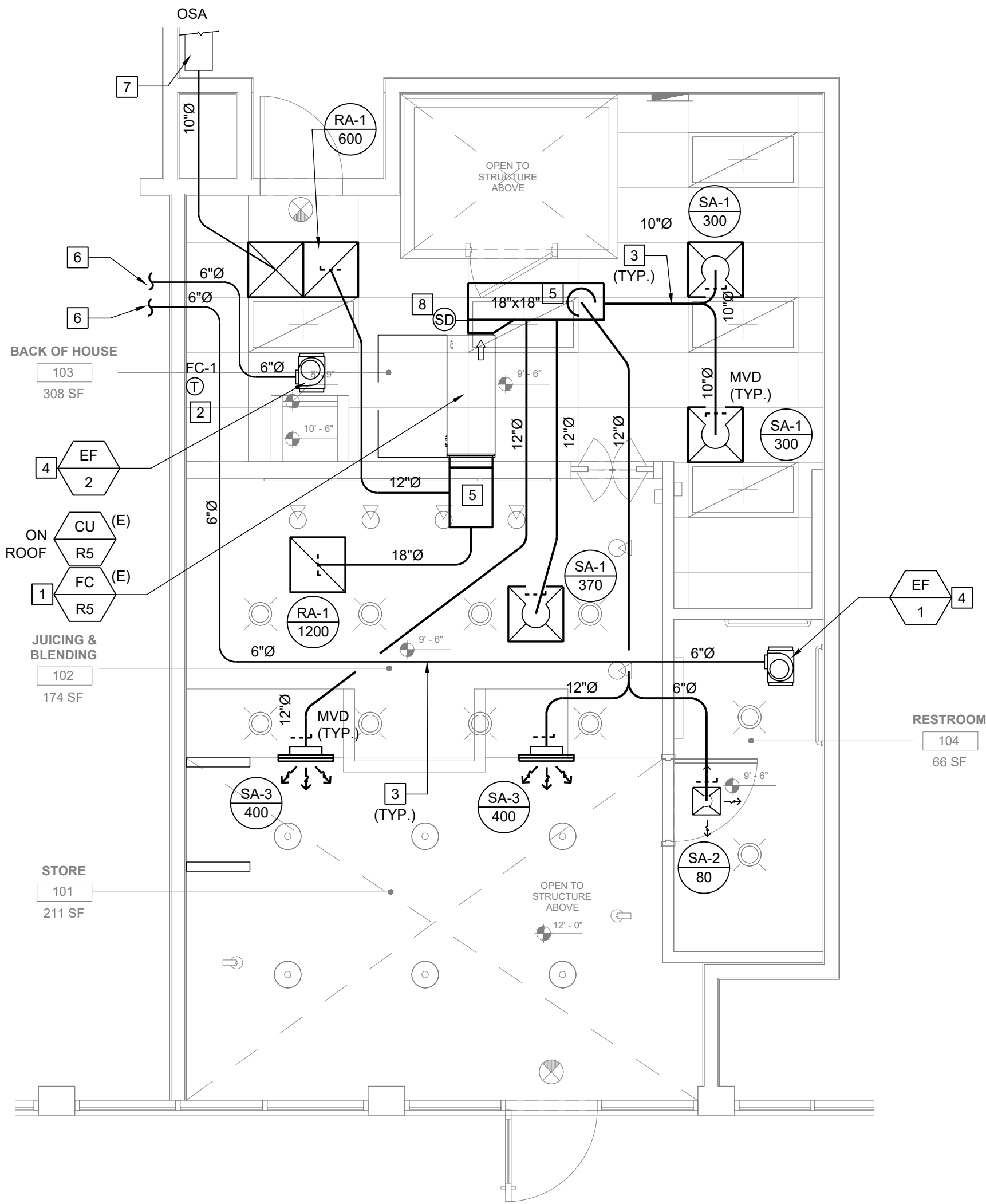
NEKTER - LEE'S SUMMIT, MO  
940 NW PRYOR ROAD, RETAIL SPACE 5,  
LEE'S SUMMIT, MISSOURI 64081

MECHANICAL SCHEDULES

PROJECT NAME	PROJECT NUMBER
DRAWN	CHECKED
DATE	07/30/21
SCALE	AS NOTED
PROJECT NUMBER	
SHEET	

M003

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



GENERAL NOTES

- A. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES PRIOR TO COMMENCING HIS WORK.
- B. COORDINATE DUCT ROUTING INSTALLATION HEIGHTS AND CLEARANCES WITH GENERAL CONTRACTOR.
- C. ALL DUCT DIMENSIONS SHOWN ON PLANS ARE CLEAR INSIDE DIMENSIONS.
- D. ALL PIPING, DUCTS, VENTS, ETC. EXITING THROUGH THE ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
- E. ALL PIPING INSULATION SHALL RUN CONTINUOUSLY THROUGH ROOF, FLOORS, WALLS, AND PARTITIONS.
- F. ALL EQUIPMENT, DUCTWORK, AND PIPING SHALL BE SEISMICALLY RESTRAINED IN ACCORDANCE WITH THE LATEST APPLICABLE CODES.
- G. DO NOT ATTACH ANYTHING TO DECK ABOVE. HANGERS AND SUPPORTS SHALL ONLY BE ATTACHED TO STRUCTURAL MEMBERS.
- H. HVAC CONTRACTOR SHALL REPLACE ALL FILTERS WITH NEW ONES PRIOR TO TURNOVER OF PROJECT TO THE OWNER.
- I. PLENUM RETURN SHALL BE USED AS IS.
- J. SMOKE EVACUATION SYSTEM BY OTHERS.
- K. ALL DUCT SHALL BE TIGHT TO THE DECK.

MECHANICAL PLAN KEYNOTES

- 1 EXISTING HVAC SPLIT SYSTEM TO REMAIN. CONTRACTOR TO VERIFY OF LOCATION OF UNITS PRIOR OF ANY MECHANICAL WORK.
- 2 HVAC PROGRAMMABLE THERMOSTAT FOR SPLIT SYSTEM WITH CLEAR LOCK BOX. COORDINATE RECESSED "J" BOX WITH ALL FINISH WALL MATERIALS/DEVICES.
- 3 MECHANICAL CONTRACTOR TO COORDINATE INSTALLATION DUCT WORK WITH LIGHT FIXTURES.
- 4 INSTALL NEW EXHAUST FAN. SEE SHEET M003 FOR MORE INFORMATION.
- 5 PROVIDED 1" EXTERNALLY INSULATED FOR SUPPLY AND RETURN AIR DUCT. COORDINATE ROUTING WITH EXISTING STRUCTURE, PIPING, ETC.
- 6 6"Ø EXHAUST DUCT TOWARD EXISTING EXHAUST AIR DUCT. CONTRACTOR TO VERIFY OF LOCATION OF EXISTING EXHAUST AIR DUCT PRIOR OF ANY MECHANICAL WORK.
- 7 EXISTING OUTSIDE AIR. TO CONNECT TO HVAC UNIT. CONTRACTOR TO VERIFY OF LOCATION OF EXISTING OUTSIDE AIR DUCT PRIOR OF ANY MECHANICAL WORK.
- 8 PROVIDE DUCT SMOKE DETECTOR IN SUPPLY AIR DUCT DOWNSTREAM OF FILTER FOR AUTOMATIC SHUTOFF. HVAC CONTRACTOR TO VERIFY TYPE OF DUCT SMOKE DETECTOR TO BE INSTALLED WITH FIRE PROTECTION CONTRACTOR.



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REVISIONS

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CLIENT INFORMATION



PROJECT NAME  
**NEKTER - LEE'S SUMMIT, MO**  
940 NW PRYOR ROAD, RETAIL SPACE 5,  
LEE'S SUMMIT, MISSOURI 64081

SHEET NAME  
**MECHANICAL FLOOR PLAN**

PROJECT NAME

DRAWN

R.H.

CHECKED

DATE

07/30/21

SCALE

AS NOTED

PROJECT NUMBER

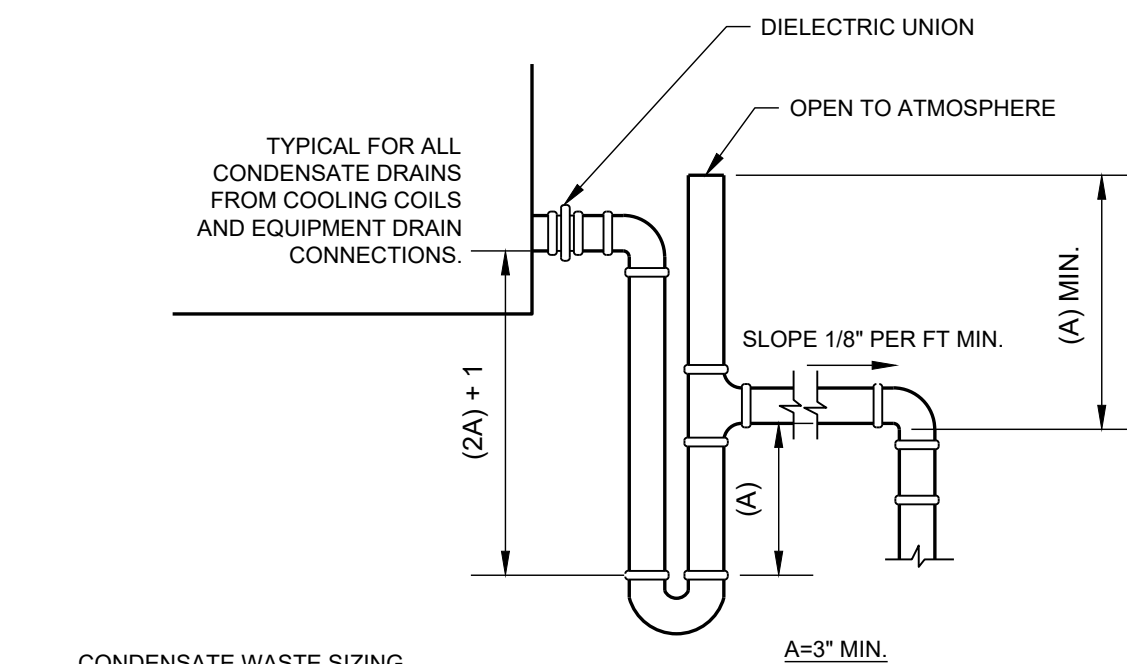
SHEET

M200

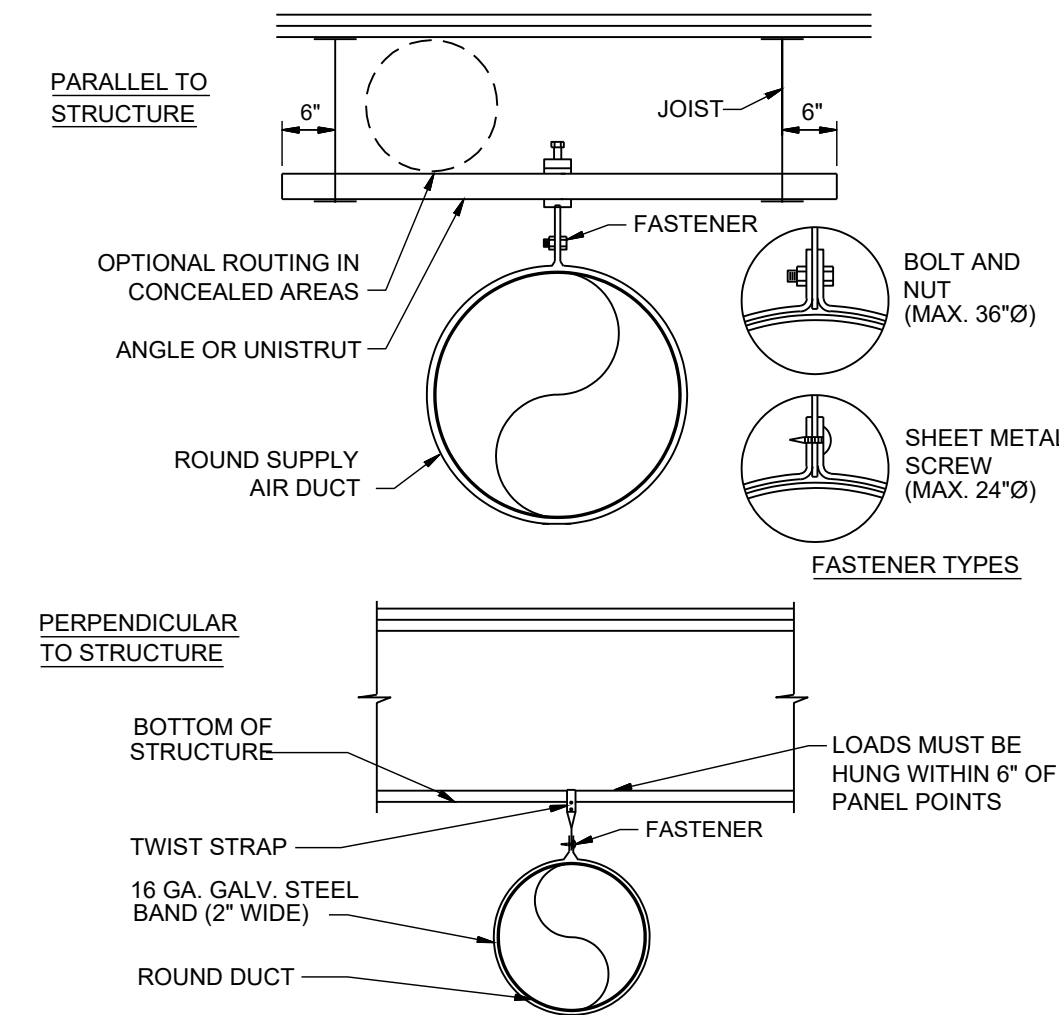
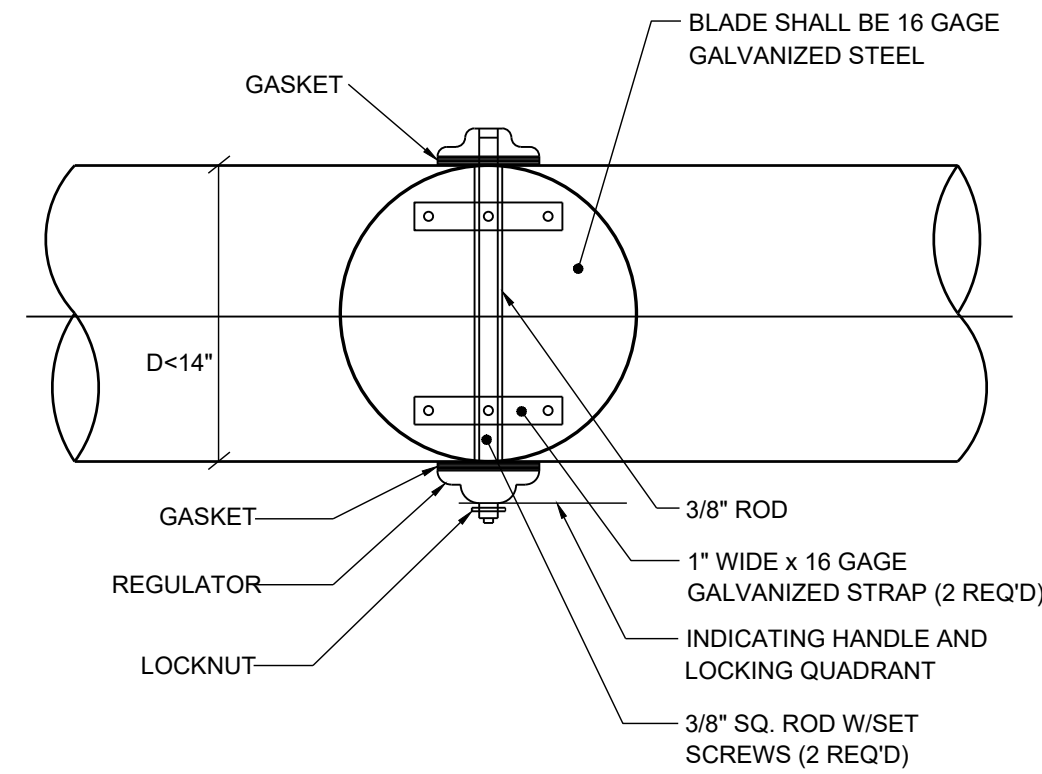
NOTES:

- IT IS REQUIRED THAT THE MECHANICAL CONTRACTOR MUST VISIT THE JOB SITE TO FAMILIARIZE HIMSELF WITH MAJOR ITEMS SUCH AS STRUCTURAL ELEMENTS, PLUMBING LOCATIONS AND ELECTRICAL RUNS. ADDITIONALLY, MECHANICAL CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND DIMENSIONS OF SUCH ITEMS AS HVAC UNIT, DUCTWORK, ETC. FAILURE TO VISIT THE SITE DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY IN PERFORMANCE OF HIS WORK.
- PRIOR TO START OF REMOVAL WORK, VERIFY ALL EQUIPMENT CONNECTION AND CONTROLS. MEASURE CFM EACH AIR DEVICE KEEP RECORDS FOR FUTURE USE AND BENCH MARKING.
- CAP/PLUG AND SEAL OPEN PIPE AND DUCT, AND WALL. OPENING RESULTING FROM REMOVAL WORK. FINISH TO MATCH ADJACENT SURFACE.
- PROVIDE REMOTE CABLE CONTROL FOR ALL VOLUME DAMPERS LOCATED ON A HARD CEILING.
- PROVIDE ACCESS PANEL FOR SMOKE DUCT DETECTOR. COORDINATE WITH THE ARCHITECTURAL DRAWINGS.
- CONTRACTOR TO HANG DUCTS WITHIN 12" OF THE BOTTOM OF THE STRUCTURAL SUPPORTS. CONTRACTOR SHALL VERIFY IN FIELD.





<u>CONDENSATE WASTE SIZING</u>	
EQUIPMENT COOLING CAPACITY	MIN. PIPE DIAMETER
UP TO 20 TONS	3/4 INCH
21 TO 40 TONS	1 INCH
41 TO 90 TONS	1-1/4 INCH



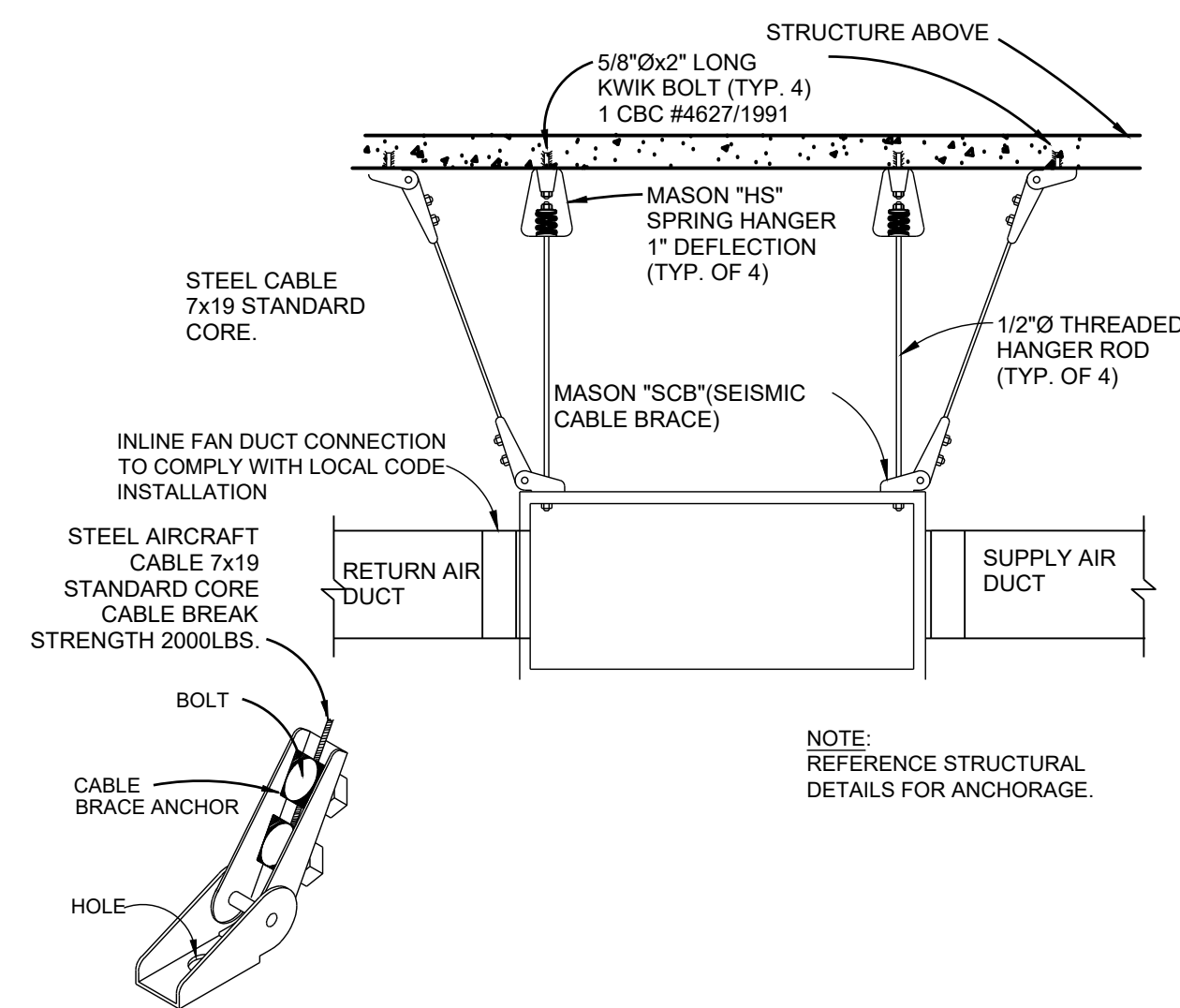
NOTES:

1. FOR DUCTS LARGER THAN 36"Ø, USE TWO HANGER RODS, WIRES OR STRAPS TO SUPPORT DUCT FROM EACH SIDE.

### TYPICAL CONDENSATE DRAIN DETAIL

SCALE:	NONE
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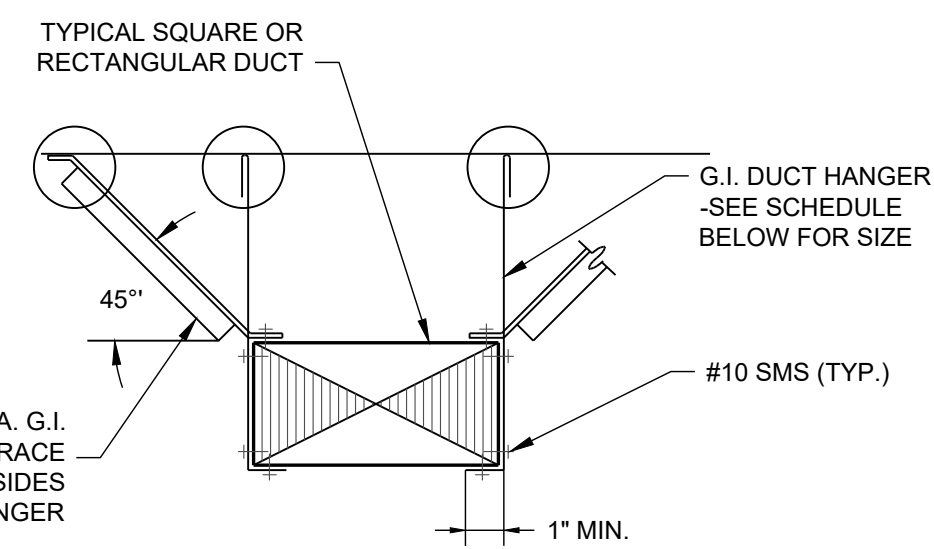
7



### MECHANICAL UNIT MOUNTING DETAIL

SCALE:	NONE
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8



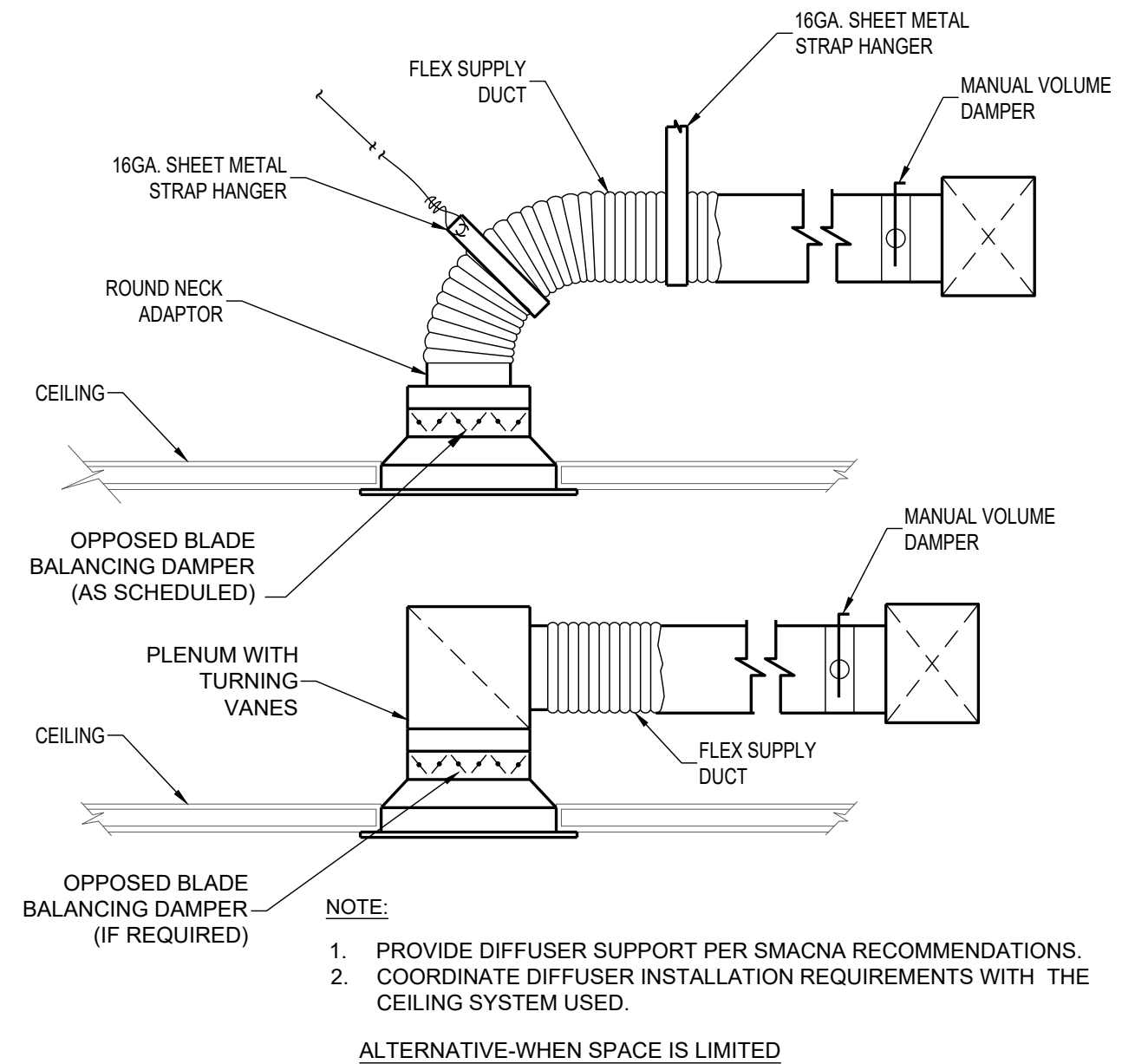
NOTE: WHERE DUCT IS 6 SF. OR LARGER IN CROSS SECTIONAL AREA - USE  
2 1/2 x 2 1/2 x 16 GA. VERTICAL ANGLE IN PLACE OF HANGER AT  
SEISMIC BRACE.

MAX. HALF OF DUCT PERIMETER	MAX. LOAD EACH HANGER	HANGER SIZE	HANGER SPACING
P/2 = 30"	260 LBS	1" x 22 GA.	10'-0" O/C
P/2 = 72"	420 LBS	1" x 18 GA.	10'-0" O/C
P/2 = 96"	700 LBS	1" x 16 GA.	10'-0" O/C
P/2 = 120"	1100 LBS	1 1/2" x 16 GA.	10'-0" O/C

## ROUND DUCT DAMPER DETAIL

SCALE:	NONE
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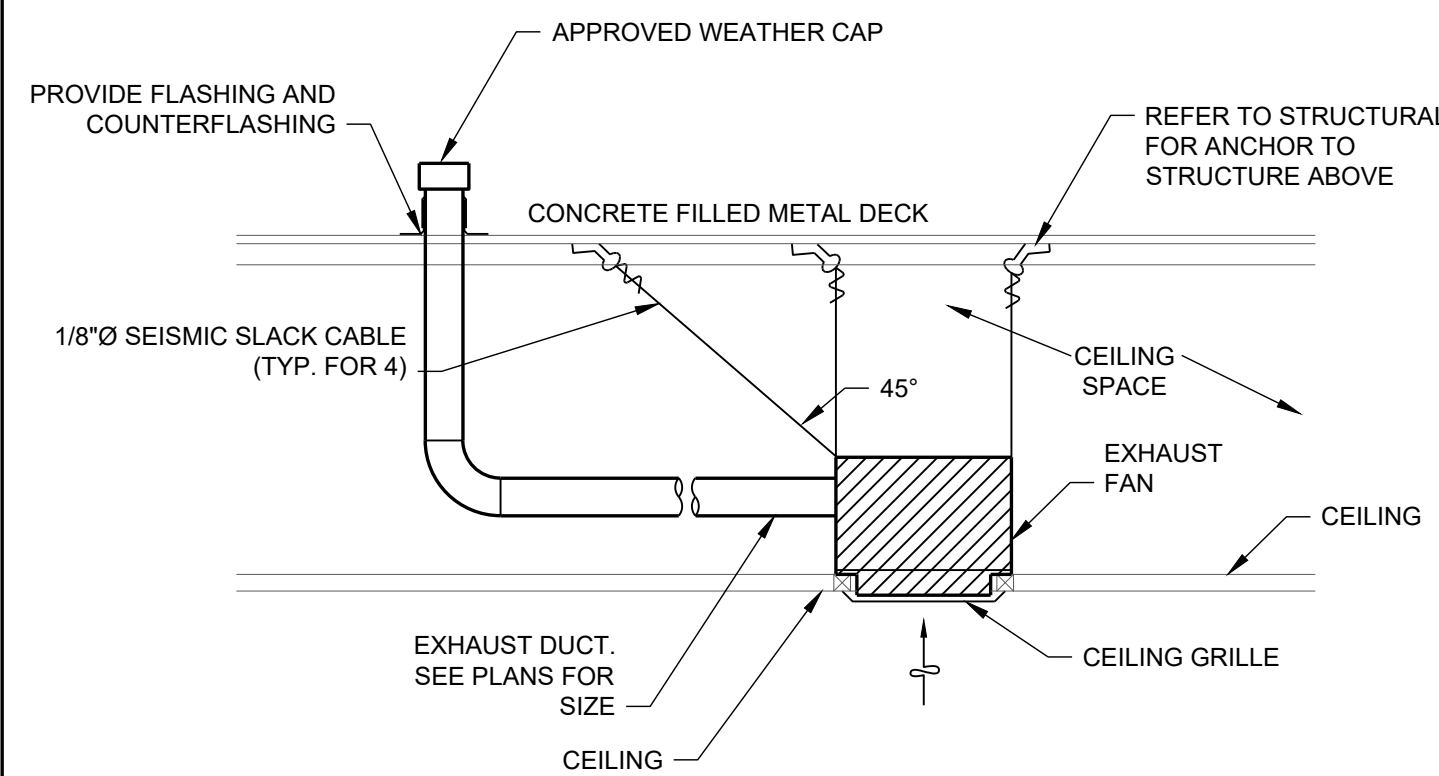
4



CEILING DIFFUSER TAKE-OFF DETAIL

SCALE:	NONE
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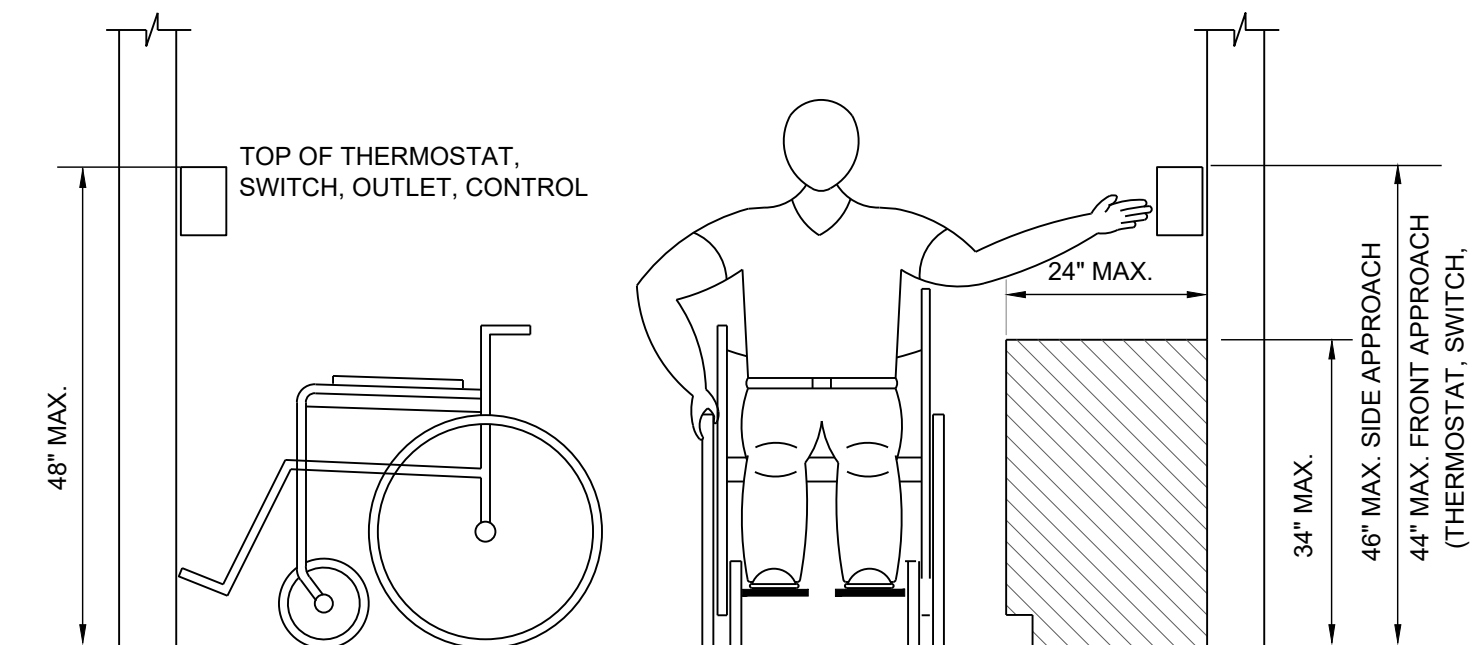
2



## TYPICAL CEILING MOUNTED EXHAUST FAN DETAIL

SCALE:	NONE
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6



### ADA CONTROL DEVICE MOUNTING HEIGHT DETAIL

SCALE:	NONE
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3