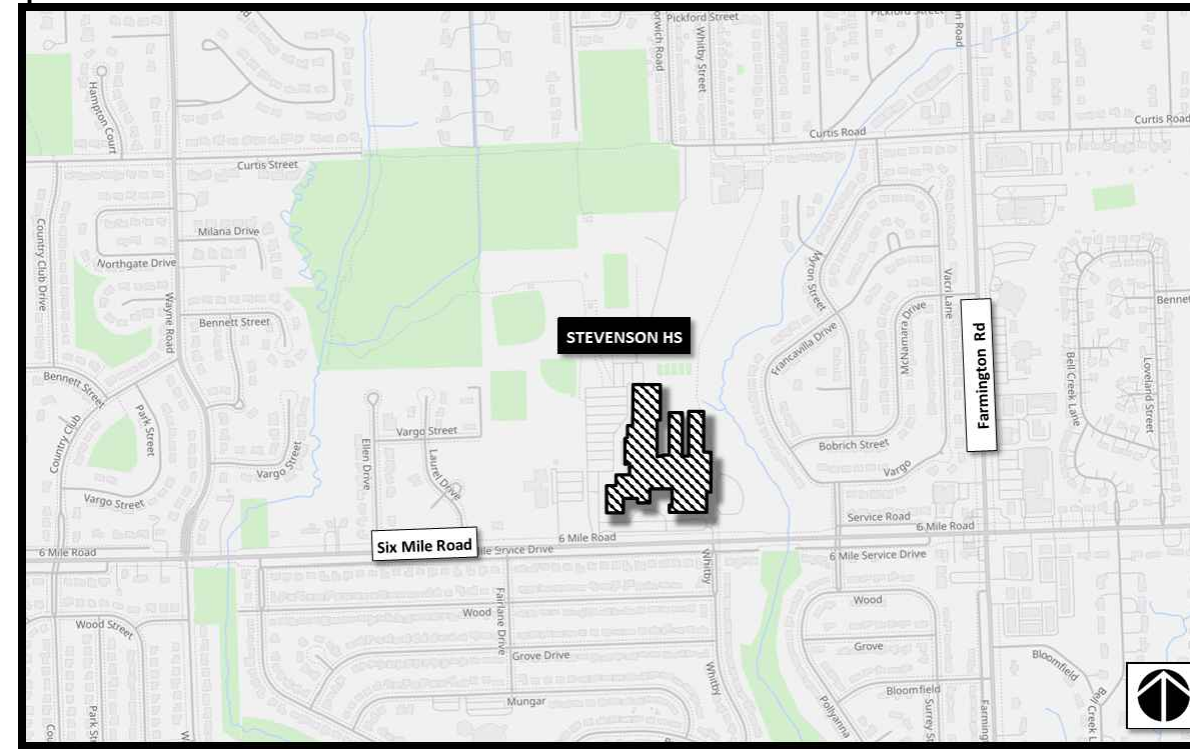


LIVONIA PUBLIC SCHOOLS - STEVENSON HIGH SCHOOL AUTO SHOP, WOOD / SCENE SHOP AC REPLACEMENT



LOCATION MAP



PROJECT ADDRESS

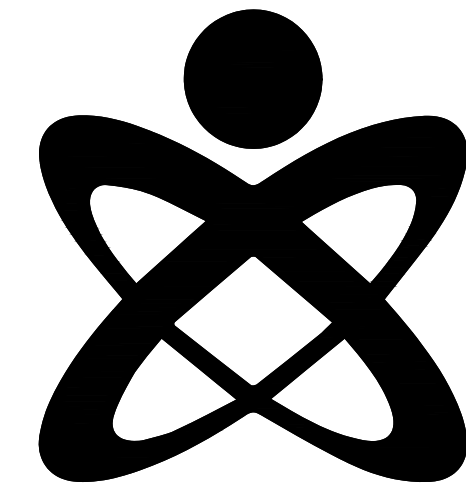
STEVENSON HIGH SCHOOL
33500 SIX MILE ROAD
LIVONIA, MI 48152



OWNER NAME AND ADDRESS

LIVONIA PUBLIC SCHOOLS
15125 FARMINGTON RD.
LIVONIA, MI 48154

MEP ENGINEERS



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UBS PROJECT 001.24.01 - CH



PROJECT SHEET INDEX

STRUCTURAL DRAWING INDEX

SHT NO	DESCRIPTION
S100	ROOF FRAMING PLAN
S200	GENERAL NOTES

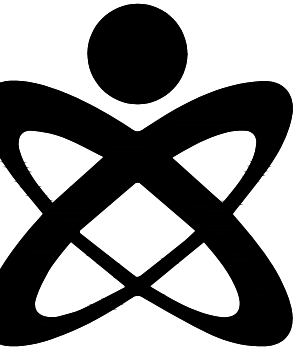
MECHANICAL DRAWING INDEX

SHT NO	DESCRIPTION
M0.00	MECHANICAL GENERAL INFORMATION
M1.00	MECHANICAL DEMOLITION AND NEW WORK PLANS
M8.00	MECHANICAL DETAILS, SCHEDULES, AND TEMPERATURE CONTROLS

ELECTRICAL DRAWING INDEX

SHT NO	DESCRIPTION
E0.00	ELECTRICAL GENERAL INFORMATION
EP1.00	ELECTRICAL POWER DEMOLITION AND NEW WORK PLANS
E5.00	ELECTRICAL DETAILS, SCHEDULES, AND DIAGRAMS

BID SET: 11/15/2024



CLIENT:
LIVONIA PUBLIC SCHOOLS
15125 FARMINGTON RD.
LIVONIA, MI 48154

PROJECT:
**STEVENSON HIGH
SCHOOL AUTO SHOP,
WOOD / SCENE SHOP - AC
REPLACEMENT**



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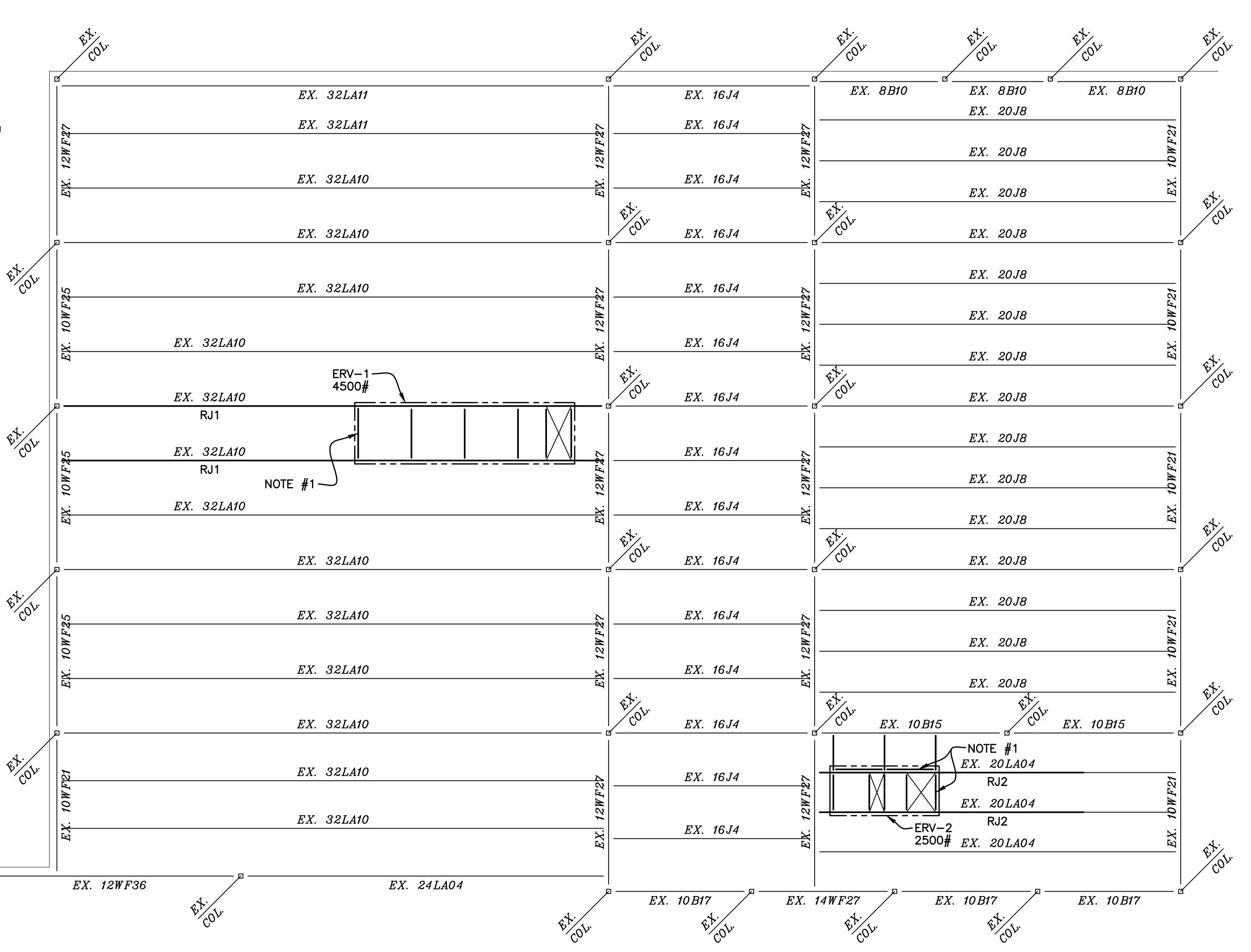
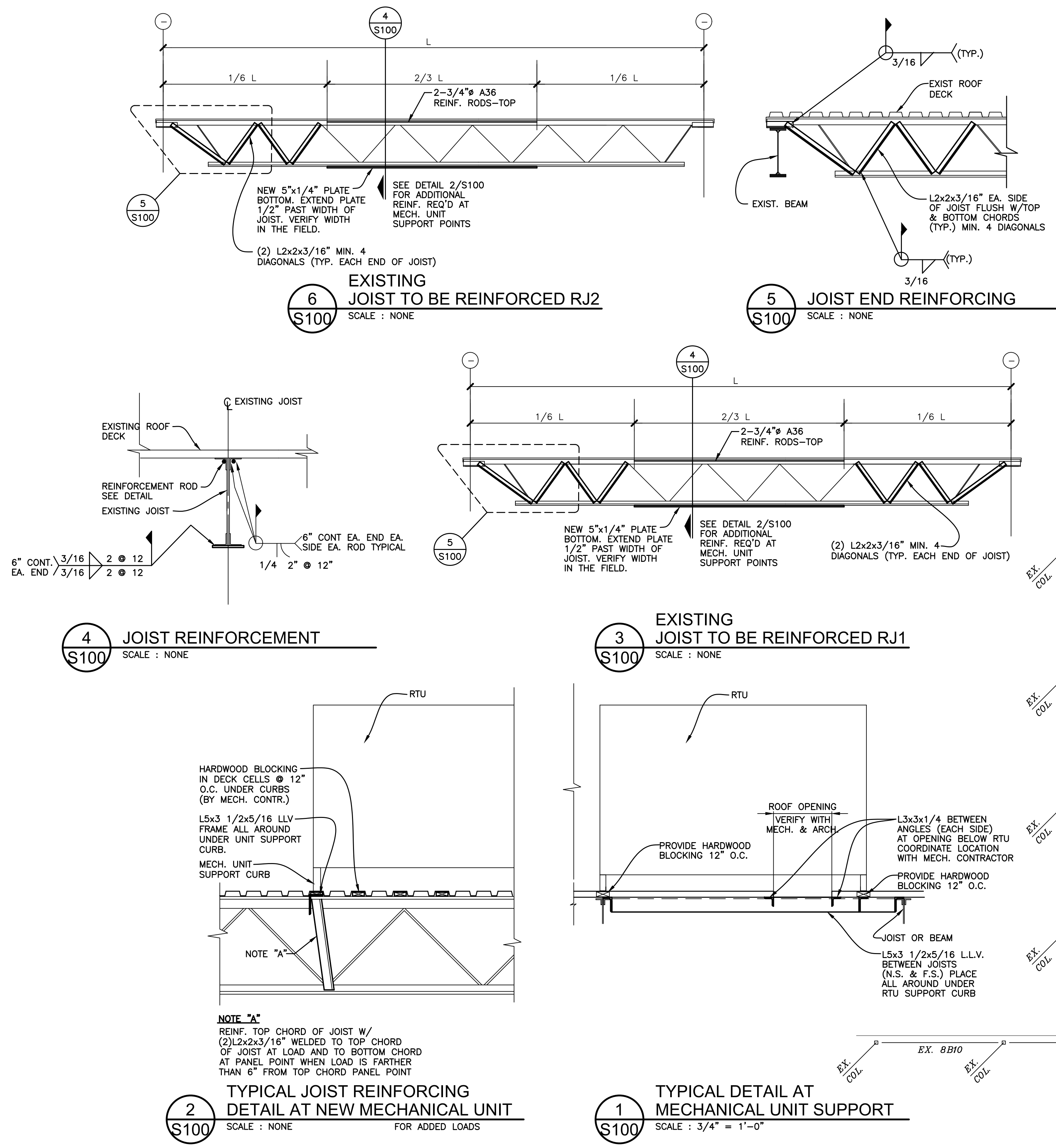
11/15/2024

ISSUANCE:
BIDS

DRAWN: RC
APPROVED: TS

**ROOF FRAMING
PLAN**

S100



**PARTIAL
ROOF FRAMING PLAN**
SCALE: 1/8" = 1'-0"

NOTE #1: PROVIDE L4x3 1/2x5/16 LLV ALL AROUND BELOW NEW RTU SUPPORT CURB. COORDINATE LOCATION OF RTU WITH MECH. CONTRACTOR. SEE 1 & 2/S100

RJ1: INDICATES EXISTING JOIST TO BE REINFORCED SEE DETAILS 3, 4, & 5/S100

RJ2: INDICATES EXISTING JOIST TO BE REINFORCED SEE DETAILS 4, 5, & 6/S100

GENERAL NOTES
GENERAL CONDITIONS

- 1. IF ANY GENERAL NOTE CONFLICTS WITH ANY DETAIL OR NOTE ON THE PLANS OR IN THE SPECIFICATIONS, THE STRICTEST PROVISION SHALL GOVERN.
2. THE STRUCTURAL DRAWINGS ARE FOR THE PLACEMENT AND SIZE OF STRUCTURAL COMPONENTS ONLY. O.S.H.A., LOCAL GOVERNMENT CODES AND SAFETY CODE REQUIREMENTS SHALL BE ADHERED TO BY THE CONTRACTOR.
3. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER IT IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES PROVIDING TEMPORARY BRACING, SHORING, GUYS OR TIE-DOWNS. THESE TEMPORARY SUPPORTS WILL REMAIN IN PLACE UNTIL ALL STRUCTURAL COMPONENTS ARE IN PLACE AND COMPLETED.
4. USE OF ENGINEERING DRAWINGS AS ERECTION DRAWINGS BY THE CONTRACTOR IS STRICTLY PROHIBITED. DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR BUILDING LAYOUT AND LOCATION. SEE ARCHITECTURAL DRAWINGS AND SITE PLAN FOR THESE PURPOSES.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AT THE RATE OF NO MORE THAN 80 DRAWINGS PER WEEK. THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF SHOP DRAWINGS PRIOR TO SUBMITTAL. THE CONTRACTOR SHALL CHECK SHOP DRAWINGS PRIOR TO SUBMITTAL AND IS SOLELY RESPONSIBLE FOR ERRORS & OMISSIONS IN THE PREPARATION OF SHOP DRAWINGS TO CONFORM TO THE DESIGN DRAWINGS. SUBMIT ELECTRONIC SHOP DRAWINGS FOR ENGINEER REVIEW.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS AGAINST PURCHASED MANUFACTURER'S CERTIFIED EQUIPMENT DRAWINGS. DIMENSIONS THAT DEPEND UPON SPECIFIC EQUIPMENT SUCH AS ELEVATOR OPENINGS, MECHANICAL EQUIPMENT SUPPORTS, ETC. SHOULD BE COORDINATED BY THE CONTRACTOR PRIOR TO SUBMITTAL TO THE ARCHITECT/ENGINEER. SUCH DIMENSIONS SHALL BE PROVIDED ON THE SHOP DRAWINGS BY THE CONTRACTOR PRIOR TO SUBMITTAL TO THE ARCHITECT/ENGINEER.

EXISTING CONDITIONS

- 1. VERIFY ALL EXISTING ASSUMED DIMENSIONS AND CONDITIONS (I.E. EXISTING MATERIALS; FRAMING MEMBER SIZES AND LOCATIONS; METHODS OF CONSTRUCTION; ETC.) AT THE SITE PRIOR TO CONSTRUCTION AND FABRICATION. IF DISCREPANCIES ARE FOUND, NOTIFY ARCHITECT BEFORE PROCEEDING WITH WORK.

STRUCTURAL STEEL

- 1. STEEL DESIGN, FABRICATION AND ERECTION TO BE IN ACCORDANCE WITH THE LATEST A.I.S.C. MANUAL AND SPECIFICATION FOR STRUCTURAL STEEL FOR BUILDINGS. ALL WIDE FLANGE BEAMS AND COLUMNS SHALL CONFORM TO THE LATEST ASTM. SERIAL DESIGNATION A992, GR50; ALL MISCELLANEOUS STEEL PLATES, BARS, ANGLES, ETC., SHALL CONFORM TO ASTM A36; STEEL TUBING TO BE ASTM A500, GRADE B; STEEL PIPE ASTM A-53, GRADE B. ANCHOR BOLTS TO BE ASTM F1554 GRADE 36 KSI MINIMUM UNLESS OTHERWISE NOTED
2. UNLESS OTHERWISE NOTED OR SHOWN, ALL BEAM CONNECTIONS TO HSS 5 X 5 OR SMALLER COLUMN, 5'0" OR SMALLER COLUMN, OR ANY TUBE COLUMN REGARDLESS OF SIZE WITH A WALL THICKNESS LESS THAN 3/8" SHALL BE MADE WITH THRU PLATES WELDED TO BOTH WALLS OF COLUMN.
3. ALL WELDED CONNECTIONS SHALL BE IN ACCORDANCE WITH THE LATEST AWS CODE, E70XX ELECTRODES, WITH WELDING PERFORMED BY QUALIFIED WELDERS.
4. BOLTED CONNECTIONS SHALL BE MADE WITH A-325 OR A-490 BOLTS. ALL BOLTS ARE TO BE INSTALLED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS FOR "STRUCTURAL JOINTS USING A.S.T.M. A-325 OR A-490 BOLTS." TYPICAL BOLTED CONNECTIONS ARE "BEARING TYPE" UNLESS NOTED OTHERWISE.
5. DESIGN CONNECTIONS FOR MINIMUM ONE-HALF THE TOTAL ALLOWABLE UNIFORM LOAD PER A.I.S.C. BEAM LOAD TABLES, UNLESS OTHERWISE NOTED. (MIN. 2 BOLTS EACH CONNECTION).
9. THE DESIGN, CONFIGURATION & ERECTION SAFETY OF ALL STRUCTURAL STEEL CONNECTIONS SHALL BE THE RESPONSIBILITY OF THE STRUCTURAL STEEL FABRICATOR. REVIEW AND ACCEPTANCE OF THE SHOP DRAWINGS BY THE ENGINEER SHALL CONSTITUTE APPROVAL OF THE LOAD CARRYING ADEQUACY ONLY.
10. TYPE OF CONSTRUCTION PER ASCE A2.2 IS TYPE 2 "SIMPLE FRAMING" UNLESS NOTED OTHERWISE.
17. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL ANGLES, PLATES, BARS, CLIPS, ETC., ATTACHED TO STRUCTURAL STEEL.
18. UNLESS OTHERWISE NOTED, ALL ROOF OPENINGS SHALL BE FRAMED WITH L 5 X 3-1/2 X 5/16 L.L.V. VERIFY EXACT SIZE AND LOCATION OF ALL ROOF OPENINGS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND WITH CONTRACTOR INVOLVED.
21. THE CONTRACTOR SHALL FURNISH ALL ACCESSORIES INCLUDING CLOSURES, "Z" CLOSURES, COLUMN CLOSURES, SCREED ANGLES AND GIRDER FILLERS AS REQUIRED.
23. NO LOADS SHALL BE PERMITTED TO BE HUNG FROM ANY ROOF DECK. ALL HANGERS FOR CEILINGS, DUCTWORK, ELECTRICAL CONDUIT, PIPING, ETC., SHALL BE HUNG DIRECTLY FROM STRUCTURAL STEEL WORK OR SUPPLEMENTARY MEMBERS.

JOIST OR BEAM REINFORCEMENT

- 1. GENERAL: FABRICATE MATERIAL IN LENGTHS MANAGEABLE AT THE SITE SPLICES OF MATERIAL SHALL BE MADE WITH FULL PENETRATION WELDS OR OTHER AS REVIEWED IN ADVANCE BY THE ENGINEER OF RECORD.
2. COORDINATE MATERIAL LENGTHS WITH ACCESS LOGISTICS. HEADROOM OR OTHER ACCESS LIMITATIONS MAY REQUIRE SUBSTITUTIONS OF PLATES OR SHAPES WITH OTHER PLATES OR SHAPES OF NOMINALLY EQUAL WEIGHT. SUBSTITUTIONS MUST BE REVIEWED BY THE ENGINEER OF RECORD PRIOR TO FABRICATION.
2.1 FIELD VERIFY WEB AND CHORD CONFIGURATIONS OF EXISTING JOISTS TO BE REINFORCED. CONFIGURATIONS INDICATED ON THE DRAWINGS ARE REINFORCEMENT. OTHER CONFIGURATIONS MAY EXIST, I.E. PANEL DIMENSIONS MAY BE DIFFERENT AND THERE MAY BE MORE VERTICALS AND DIAGONALS THAN SHOWN ON THE DRAWINGS, BUT NONETHELESS ALL WEB MEMBERS WITHIN THE ZONE INDICATED ARE TO BE REINFORCED.
3. THE SHAPE OF THE EXISTING CHORDS OR WEB MEMBERS MAY REQUIRE SUBSTITUTIONS OF PLATES OR SHAPES WITH OTHER PLATES OR SHAPES OF NOMINALLY EQUAL WEIGHT. SUBSTITUTIONS MUST BE REVIEWED BY THE ENGINEER OF RECORD PRIOR TO FABRICATION.
4. INSTALLING JOIST AND BEAM REINFORCEMENT:
4.1 INSTALL REINFORCEMENT MATERIAL TO COMPLY WITH STRENGTHENING REQUIREMENTS INDICATED ON THE DESIGN DRAWINGS.
4.1.1 PRIOR TO WELDING NEW MATERIAL TO EXISTING SURFACES, THOROUGHLY CLEAN ALL SURFACES TO REMOVE RUST, PAINT, DIRT, MILL SCALE OR OTHER FOREIGN MATTER IN THE WELD AREA
4.1.2 ALL FIELD WELDS SHALL BE CLEANED OF SLAG AND SCALE AND INSPECTED BY THE SITE QUALITY ASSURANCE INSPECTOR.
4.1.3 PRIME PAINT WELDS AFTER WELDING PASSES INSPECTION WITH MINIMUM TWO COATS OF ZINC RICH RUST INHIBITIVE PAINT.
5. PRIOR TO REINFORCING OF JOIST ALL SNOW AND ICE LOADS SHALL BE REMOVED FROM THE ROOF IF JOIST ARE BEING REINFORCED FOR NEW EQUIPMENT. JOIST ARE TO BE REINFORCED PRIOR TO ADDING NEW EQUIPMENT.

SHORING

- 1. SHORE SHORING AS REQUIRED TO MAINTAIN STRUCTURAL INTEGRITY.
2. ALL SHORING, UNDERPINNING, ETC., SHALL BE PERFORMED BY EXPERIENCED CONTRACTORS.
3. SHORE, UNDERPIN, ETC., ALL QUESTIONABLE AREAS PRIOR TO REMOVAL OF ANY STRUCTURAL SUPPORT TO INSURE STRUCTURAL INTEGRITY.
4. MAINTAIN SHORING UNTIL NEW PERMANENT STRUCTURE IS IN PLACE AND SECURE TO MAINTAIN STRUCTURAL INTEGRITY.
5. REMOVE SHORING AFTER NEW WORK IS IN PLACE AND CONNECTED.

SPECIAL INSPECTION

- 1. WORK CONSTRUCTED SHALL BE INSPECTED BY AN INDEPENDENT TESTING AGENCY TO ENSURE COMPLIANCE WITH THE REQUIREMENTS SHOWN ON THE DRAWINGS. INSPECTIONS REQUIRED BY CHAPTER 17 OF THE MICHIGAN BUILDING CODE; LOCAL BUILDING DEPARTMENTS AND THE CONTRACT DOCUMENTS SHALL BE PERFORMED BY AN INDEPENDENT TESTING AGENCY. SITE VISITS BY THE DESIGN ENGINEER DO NOT CONSTITUTE OR REPLACE INSPECTION
2. THE FOLLOWING ITEMS SHALL BE INSPECTED IN ACCORDANCE WITH MBC 2015 SEC. 1704 & 1705 BY A CERTIFIED SPECIAL INSPECTOR UNLESS NOTED OTHERWISE IN REMARKS COLUMN. ALL INSPECTION SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. ALL PRODUCTS WITH ICC APPROVALS SHALL BE INSTALLED PER THE APPROVAL AND PER MANUFACTURER'S RECOMMENDATIONS. FOR MATERIAL TESTING REQUIREMENTS, SEE SPECIFICATIONS AND/OR GENERAL NOTES. TESTING AGENCY SHALL SEND COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS DIRECTLY TO THE ARCHITECT.

INSPECTION OF FABRICATOR'S (SEC. 1704.2.5) *

FABRICATION AND IMPLEMENTATION PROCEDURES 1704.2.5.1

*SPECIAL INSPECTION IS NOT REQUIRED FOR FABRICATOR SHOP IF CERTIFICATE OF APPROVAL SUBMITTED BY FABRICATOR'S INSPECTION AGENCY PER EXCEPTION 1704.2.5.1

TABLE 1705.2.2
REQUIRED VERIFICATION AND
INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

Table with 5 columns: VERIFICATION AND INSPECTION, CONTINUOUS, PERIODIC, NOT APPLICABLE, REFERENCED STANDARD. Rows include material verification of cold-formed steel deck, inspection of welding, and verification of weldability of reinforcing steel.

SPECIAL INSPECTION (CONT.)

TABLE N5.4-1
INSPECTION TASKS PRIOR TO WELDING

Table with 4 columns: INSPECTION TASKS PRIOR TO WELDING, QC, QA, NOT APPLICABLE. Rows include welding procedure specifications, manufacturer certification, material identification, welder identification system, fit-up of groove welds, configuration and finish of access holes, fit-up of fillet welds, and check welding equipment.

TABLE N5.4-2
INSPECTION TASKS DURING WELDING

Table with 4 columns: INSPECTION TASKS DURING WELDING, QC, QA, NOT APPLICABLE. Rows include use of qualified welders, control and handling of welding consumables, no welding over cracked tack welds, environmental conditions, HPS followed, and welding techniques.

TABLE N5.4-3
INSPECTION TASKS AFTER WELDING

Table with 4 columns: INSPECTION TASKS AFTER WELDING, QC, QA, NOT APPLICABLE. Rows include welds cleaned, size, length and location of welds, welds meet visual acceptance criteria, arc strikes, K-area, backing removed and weld tabs removed, repair activities, and document acceptance or rejection of welded joint or member.

TABLE N5.6-1
INSPECTION TASKS PRIOR TO BOLTING

Table with 4 columns: INSPECTION TASKS PRIOR TO BOLTING, QC, QA, NOT APPLICABLE. Rows include manufacturer's certifications available for fastener materials, fasteners marked in accordance with ASTM requirements, proper fasteners selected for joint detail, proper bolting procedure selected for joint detail, connecting elements, pre-installation verification testing, and proper storage provided for bolts, nuts, washers and other fastener components.

TABLE N5.6-2
INSPECTION TASKS DURING BOLTING

Table with 4 columns: INSPECTION TASKS DURING BOLTING, QC, QA, NOT APPLICABLE. Rows include fasteners assemblies, joint brought to the snug-tight condition, fastener component not turned by the wrench, and fasteners are pretensioned in accordance with the NCSO specification.

TABLE N5.6-3
INSPECTION TASKS AFTER BOLTING

Table with 4 columns: INSPECTION TASKS AFTER BOLTING, QC, QA, NOT APPLICABLE. Row includes fastener component not turned by the wrench.

0 - OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.

P - PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER.

SPECIAL INSPECTION (CONT.)

Table with 2 columns: DESIGN CRITERIA, CODE REFERENCE. Rows include code, A. AMERICAN CONCRETE INSTITUTE BUILDING CODE, B. MANUAL OF STEEL CONSTRUCTION, C. LATEST MASONRY STANDARDS JOINT COMMITTEE, D. AMERICAN INSTITUTE OF TIMBER CONSTRUCTION, E. NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION.

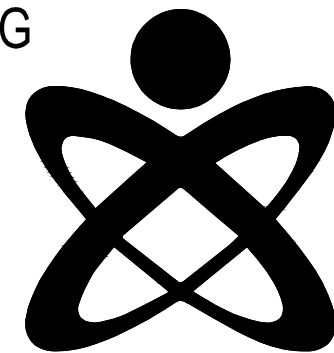
Table with 2 columns: SNOW LOADS/ROOF LIVE LOADS, CODE REFERENCE. Rows include snow criteria, ground snow load, flat roof snow load, exposure factor, importance factor, thermal factor, and roof live loads.

Table with 2 columns: WIND LOADS, CODE REFERENCE. Rows include wind criteria, basic wind speed, risk category, exposure category, internal pressure coefficient, and wind analysis procedure.

Table with 2 columns: SEISMIC LOADS, CODE REFERENCE. Rows include seismic criteria, seismic risk category, seismic importance factor, 0.2 SEC MAPPED SPECTRAL RESPONSE ACCELERATION, 1.0 SEC MAPPED SPECTRAL RESPONSE ACCELERATION, short period spectral response acceleration, soil site class, seismic design category, seismic force resisting system, response modification factor, reflection amplification factor, and analysis procedure.

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11/15/2024

ISSUANCE:
BIDS

DRAWN: RC
APPROVED: TS

GENERAL NOTES

S200

MECHANICAL ABBREVIATIONS

ABBREV.	DESCRIPTION
AAV	AUTOMATIC AIR VENT / AIR ADMITTANCE VALVE
AD	ACCESS DOOR
AE	AIR EXTRACTOR
AFF	ABOVE FINISHED FLOOR
APD	AIR PRESSURE DROP
ASR	AUTOMATIC SPRINKLER RISER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BWW	BACKWATER VALVE
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CIRC	CIRCULATING
CLG	COOLING
CO	CLEAN OUT
CONT	CONTINUATION OR CONTINUED
CONV	CONNECTOR
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DEG	DEGREES
DDC	DIRECT DIGITAL CONTROL
DN	DOWN
DTC	DRAIN TILE CONNECTION
DWH	DOMESTIC WATER HEATER
(E)	EXISTING
EA/EXH	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB TEMPERATURE
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELECT	ELECTRICAL
EMS	ENERGY MANAGEMENT SYSTEM
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB TEMPERATURE
EWC	ELECTRIC WATER COOLER
°F	DEGREES FAHRENHEIT
FA	FACE AREA (COLL) / FREE AREA (LOUVER)
FC	FLEXIBLE CONNECTION
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FHV	FIRE HOSE VALVE
FLA	FULL LOAD AMPS
FLR	FLOOR
FPM	FEET PER MINUTE
FFD	FUNNEL FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FS	FLOOR SINK
FT	FEET
FURN	FURNISHED
FV	FACE VELOCITY
FVC	FIRE VALVE CABINET
GAL	GALLON
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HO	HUB OUTLET
HP	HORSEPOWER

MECHANICAL ABBREVIATIONS

ABBREV.	DESCRIPTION
HR	HOUR
HTG	HEATING
HYD	HYDRANT
HZ	HERTZ
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INST	INSTALLED
INV	INVERT
ISP	INTERNAL STATIC PRESSURE
IW	INDIRECT WASTE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LBS/HR	POUNDS PER HOUR
LDB	LEAVING DRY BULB TEMPERATURE
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB TEMPERATURE
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	1000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MOD	MOTOR OPERATED DAMPER (AUTOMATIC)
MOP	MAXIMUM OVER-CURRENT PROTECTION
N.C.	NOISE CRITERIA
NIC	NOT IN CONTRACT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NOM	NOMINAL
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER / CENTER TO CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
ORS	OVERFLOW ROOF SUMP
OS&Y	OUTSIDE SCREW AND YOKE
PD	PRESSURE DROP (FEET OF WATER)
PRV	PRESSURE REDUCING VALVE
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
PT	PRESSURE / TEMPERATURE PORT
RA	RETURN AIR
RH	RELATIVE HUMIDITY
REQD	REQUIRED
REL.A	RELIEF AIR
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
RS	ROOF SUMP
SA	SUPPLY AIR
SH	SHOWER
SP	STATIC PRESSURE
SqFt / SF	SQUARE FOOT/SQUARE FEET
SS	SERVICE SINK
TC	TEMPERATURE CONTROL
T & P	TEMPERATURE AND PRESSURE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE

MECHANICAL ABBREVIATIONS

ABBREV.	DESCRIPTION
UR	URINAL
VD	VOLUME DAMPER (MANUALLY ADJUSTABLE)
VTR	VENT THRU ROOF
W	WASTE
W&V	WASTE AND VENT
WB	WET BULB TEMPERATURE
WC	WATER CLOSET
WG	WATER GAUGE
WH	WALL HYDRANT

MECHANICAL PIPING SYMBOLS

ABBREV.	DESCRIPTION
	PIPE ELBOW UP
	PIPE ELBOW DOWN
	PIPE TEE DOWN
	DIRECTION OF FLOW
	UNION
	STRAINER
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	EXPANSION JOINT
	FLEXIBLE CONNECTION
	PIPE ANCHOR
	PIPE GUIDE
	PIPE CAP OR PLUG
	ISOLATION VALVE
	CIRCULATING PUMP
	GLOBE VALVE
	BALL VALVE
	BUTTERFLY VALVE
	ANGLE VALVE
	CHECK VALVE (SWING)
	CHECK VALVE (SPRING)
	PLUG VALVE
	NEEDLE VALVE
	OUTSIDE SCREW AND YOKE VALVE (OS&Y)
	PRESSURE REGULATING VALVE
	SOLENOID VALVE
	CONTROL VALVE (2-WAY / 3-WAY)
	CENTRIFUGAL FAN
	AUTOMATIC GAS SHUT-OFF VALVE
	TRAP (PLAN VIEW)
	FLOOR DRAIN / FUNNEL FLOOR DRAIN (PLAN VIEW)
	FLOOR DRAIN / FUNNEL FLOOR DRAIN (ELEVATION)
	ROOF SUMP
	CLEAN OUT (IN FLOOR)
	CLEAN OUT (IN LINE)
	CLEAN OUT (WALL)
	BACKFLOW PREVENTER
	WATER METER ASSEMBLY
	HOSE BIBB, WALL HYDRANT
	DIRECTION OF PIPE PITCH
	SPRINKLER HEAD (UPRIGHT)
	SPRINKLER HEAD (SIDEWALL)
	FLOW SWITCH
	SIAMESE CONNECTION (YARD)
	SIAMESE CONNECTION (WALL MOUNTED)
	FIRE HYDRANT
	FLOW MEASURING DEVICE
	BALANCING VALVE
	COMBINATION FLOW MEASURING AND BALANCING DEVICE
	AUTOMATIC AIR VALVE
	MANUAL AIR VALVE

MECHANICAL SYMBOLS

ABBREV.	DESCRIPTION
	RECTANGULAR TAKE-OFF (SINGLE LINE)
	RECTANGULAR TAKE-OFF (DOUBLE LINE)
	ROUND TAKE-OFF (SINGLE LINE)
	ROUND TAKE-OFF (DOUBLE LINE)
	SPIN-IN FITTING (WITH VOLUME DAMPER)
	ELBOW (WITH TURNING VANES)
	RADIUS RECTANGULAR ELBOW
	RADIUS ROUND ELBOW
	RECTANGULAR ELBOW UP
	ROUND ELBOW UP
	RECTANGULAR ELBOW DOWN
	ROUND ELBOW DOWN
	CONCENTRIC TRANSITION (DOUBLE LINE)
	CONCENTRIC TRANSITION (SINGLE LINE)
	ECCENTRIC TRANSITION (DOUBLE LINE)
	ECCENTRIC TRANSITION (SINGLE LINE)
	INCLINED RISE IN DIRECTION OF AIR FLOW (DOUBLE LINE)
	INCLINED RISE IN DIRECTION OF AIR FLOW (SINGLE LINE)
	INCLINED DROP IN DIRECTION OF AIR FLOW (DOUBLE LINE)
	INCLINED DROP IN DIRECTION OF AIR FLOW (SINGLE LINE)
	FLEXIBLE CONNECTION
	FLEXIBLE DUCT CONNECTION TO SUPPLY DIFFUSER
	SUPPLY DIFFUSER
	LINEAR SLOT DIFFUSER
	RETURN OR EXHAUST GRILLE
	TRANSFER GRILLE
	CROSS SECTION OF SUPPLY AIR DUCT
	CROSS SECTION OF EXHAUST OR RETURN AIR DUCT
	EXISTING FIRE DAMPER (HORIZONTAL)
	NEW FIRE DAMPER (HORIZONTAL)
	EXISTING FIRE DAMPER (VERTICAL)
	NEW FIRE DAMPER (VERTICAL)
	EXISTING SMOKE DAMPER
	NEW SMOKE DAMPER
	EXISTING COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	EXISTING COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
	VOLUME DAMPER (MANUALLY ADJUSTABLE)
	MOTORIZED DAMPER
	SMOKE DETECTOR
	CO2 SENSOR
	THERMOSTAT OR TEMPERATURE SENSOR
	HUMIDISTAT OR HUMIDITY SENSOR
	RETURN OR EXHAUST / SUPPLY AIR FLOW

PIPING LEGEND

ABBREV.	DESCRIPTION
—CA—	COMPRESSED AIR PIPING
—CD—	CONDENSATE DRAIN PIPING
—DT—	DRAIN TILE
—F—	FIRE PROTECTION PIPING
—FOR—	FUEL OIL RETURN PIPING
—FOS—	FUEL OIL SUPPLY PIPING
—G—	NATURAL GAS PIPING
—BCW—	BOOSTED-DOMESTIC COLD WATER PIPING
—BHW—	BOOSTED-DOMESTIC HOT WATER PIPING
—CW—	DOMESTIC COLD WATER PIPING
—NPCW—	NON POTABLE COLD WATER PIPING
—TW—	TEMPERED WATER PIPING
—HW—	DOMESTIC HOT WATER PIPING
—HW(140°F)—	DOMESTIC 140°F HOT WATER PIPING
—HWR—	DOMESTIC HOT WATER RETURN PIPING
—SAN—	SANITARY WASTE PIPING
—PSAN—	PUMPED SANITARY PIPING
—V—	VENT PIPING
—ST—	STORM SEWER PIPING
—PST—	PUMPED STORM PIPING
—RC—	RAIN CONDUCTOR PIPING
—ORC—	OVERFLOW RAIN CONDUCTOR PIPING
—CHWR—	CHILLED WATER RETURN PIPING
—CHWS—	CHILLED WATER SUPPLY PIPING
—CWR—	CONDENSER WATER RETURN PIPING
—CWS—	CONDENSER WATER SUPPLY PIPING
—HHWR—	HEATING HOT WATER RETURN PIPING
—HHWS—	HEATING HOT WATER SUPPLY PIPING
—HPLR—	HEAT PUMP LOOP RETURN PIPING
—HPLS—	HEAT PUMP LOOP SUPPLY PIPING
—RL—	REFRIGERANT LIQUID PIPING
—RS—	REFRIGERANT SUCTION PIPING
—HGB—	HOT GAS BY-PASS PIPING
—GXHR—	GEO HEAT EXCHANGE RETURN
—GXHS—	GEO HEAT EXCHANGE SUPPLY
—STM—	STEAM PIPING
—HPS—	HIGH PRESSURE STEAM PIPING
—LPS—	LOW PRESSURE STEAM PIPING
—CR—	STEAM CONDENSATE RETURN PIPING
—PCR—	PUMPED STEAM CONDENSATE RETURN PIPING
—LPC—	LOW PRESSURE CONDENSATE PIPING
—HPC—	HIGH PRESSURE CONDENSATE PIPING
—MA—	MEDICAL AIR PIPING
—N—	NITROGEN GAS PIPING
—O2—	OXYGEN GAS PIPING
—VAC—	VACUUM PIPING

DRAWING INDEX

SHT NO	DESCRIPTION
M0.00	MECHANICAL GENERAL INFORMATION
M1.00	MECHANICAL DEMOLITION AND NEW WORK PLANS
M8.00	MECHANICAL DETAILS, SCHEDULES, AND TEMPERATURE CONTROLS

DRAWING NOTATION

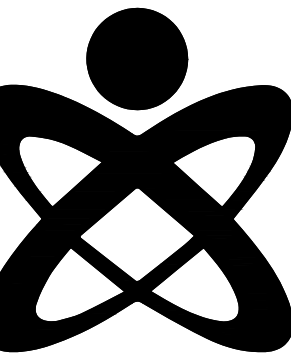
SYMBOL	DESCRIPTION
	NEW WORK KEY NOTE NO. 1
	DEMOLITION KEY NOTE NO. 1
AHU-1	EQUIPMENT TAG
S-1 12x12 150-2	AIR TERMINAL TAG: IE: DIFFUSER TYPE = S-1 NECK SIZE = 12x12 CFM = 150 (TYPICAL FOR 2)
—	EXISTING DEVICES OR EQUIPMENT
—	NEW OR MODIFIED DEVICES OR EQUIPMENT
	EXISTING SYSTEM COMPONENT TO BE REMOVED
	POINT OF NEW CONNECTION

APPLICABLE CODES AND REGULATIONS

YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
2021	MICHIGAN PLUMBING CODE
2021	MICHIGAN MECHANICAL CODE
2015	MICHIGAN UNIFORM ENERGY CODE
2015	INTERNATIONAL FUEL GAS CODE
2012	NFPA 101 WITH BPS AMENDMENTS

UNIFIED BUILDING SYSTEMS ENGINEERING

68 S. GRATIOT AVE
MT. CLEMENS, MI 48043
UBS PROJ. ID: 00124.01



CLIENT:
LIVONIA PUBLIC SCHOOLS
15125 FARMINGTON RD.
LIVONIA, MI 48154

PROJECT:
STEVENSON HIGH SCHOOL AUTO SHOP, WOOD / SCENE SHOP - AC REPLACEMENT



11/15/2024

ISSUANCE:
BIDS

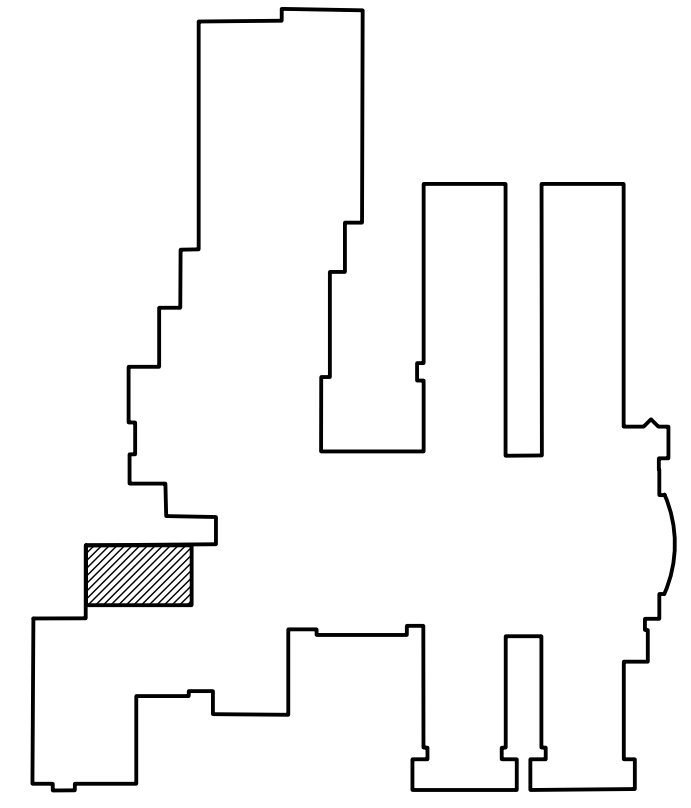
DRAWN: CEM
APPROVED: TDD

MECHANICAL GENERAL INFORMATION

M0.00



KEY PLAN



11/15/2024

ISSUANCE:
BIDS

DRAWN: CEM
APPROVED: TDD

**MECHANICAL
DEMOLITION AND
NEW WORK PLANS**

M1.00

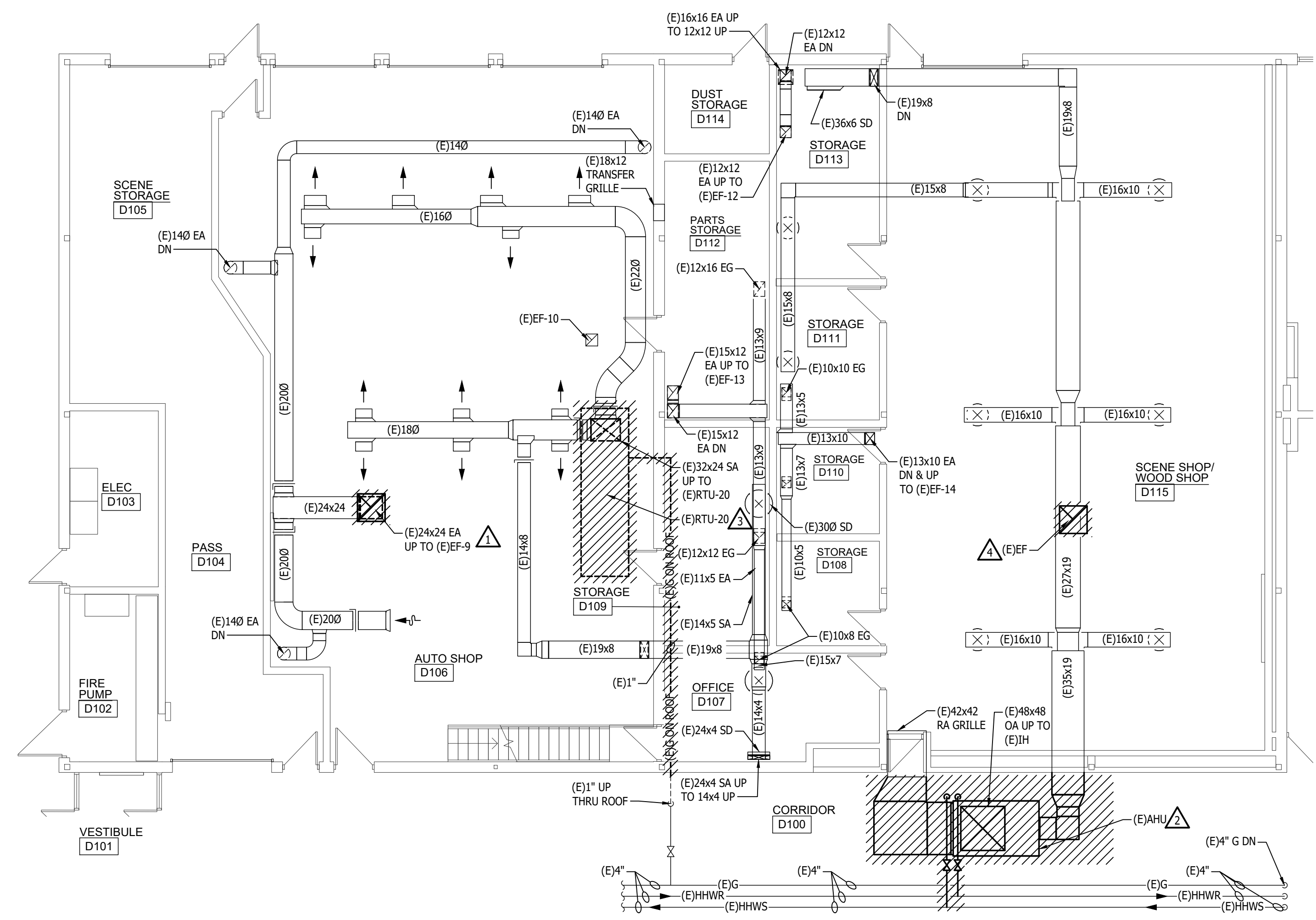
GENERAL DEMOLITION NOTES	
A	THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE DETERMINED BY THE NEW WORK.
B	ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
C	PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY DESIGN PROFESSIONAL OF ANY INTERFERENCES OR DISCREPANCIES.
D	ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETELY WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN-ENDED PIPES AND DUCTS.
E	THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER-PROVIDED EQUIPMENT.
F	VERIFY DEPTH, SIZE, LOCATIONS, AND CONDITIONS OF EXISTING UTILITIES IN THE FIELD, INCLUDING POINTS OF CONNECTION, PRIOR TO STARTING ANY WORK.
G	ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
H	ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT WORK PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.

DEMOLITION KEYED NOTES	
1	REMOVE EXHAUST FAN INCLUDING ALL DUCTWORK, CONTROLS AND ACCESSORIES COMPLETE. TEMPORARILY CAP OPENING AND PREPARE FOR NEW CONNECTION.
2	REMOVE AIR HANDLING UNIT ON MEZZANINE ABOVE CORRIDOR COMPLETE. INCLUDING ALL CONTROLS, DUCTWORK, HEATING HOT WATER COIL, INTAKE HOOD AND ACCESSORIES. SEAL ROOF OPENING WEATHER TIGHT.
3	REMOVE ROOF TOP UNIT COMPLETE. INCLUDING ALL CONTROLS, PIPING AND ACCESSORIES COMPLETE.
4	REMOVE EXHAUST FAN COMPLETE. INCLUDING ALL DUCTWORK, CONTROLS AND ACCESSORIES COMPLETE. CAP OPENING AND SEAL WEATHER TIGHT.

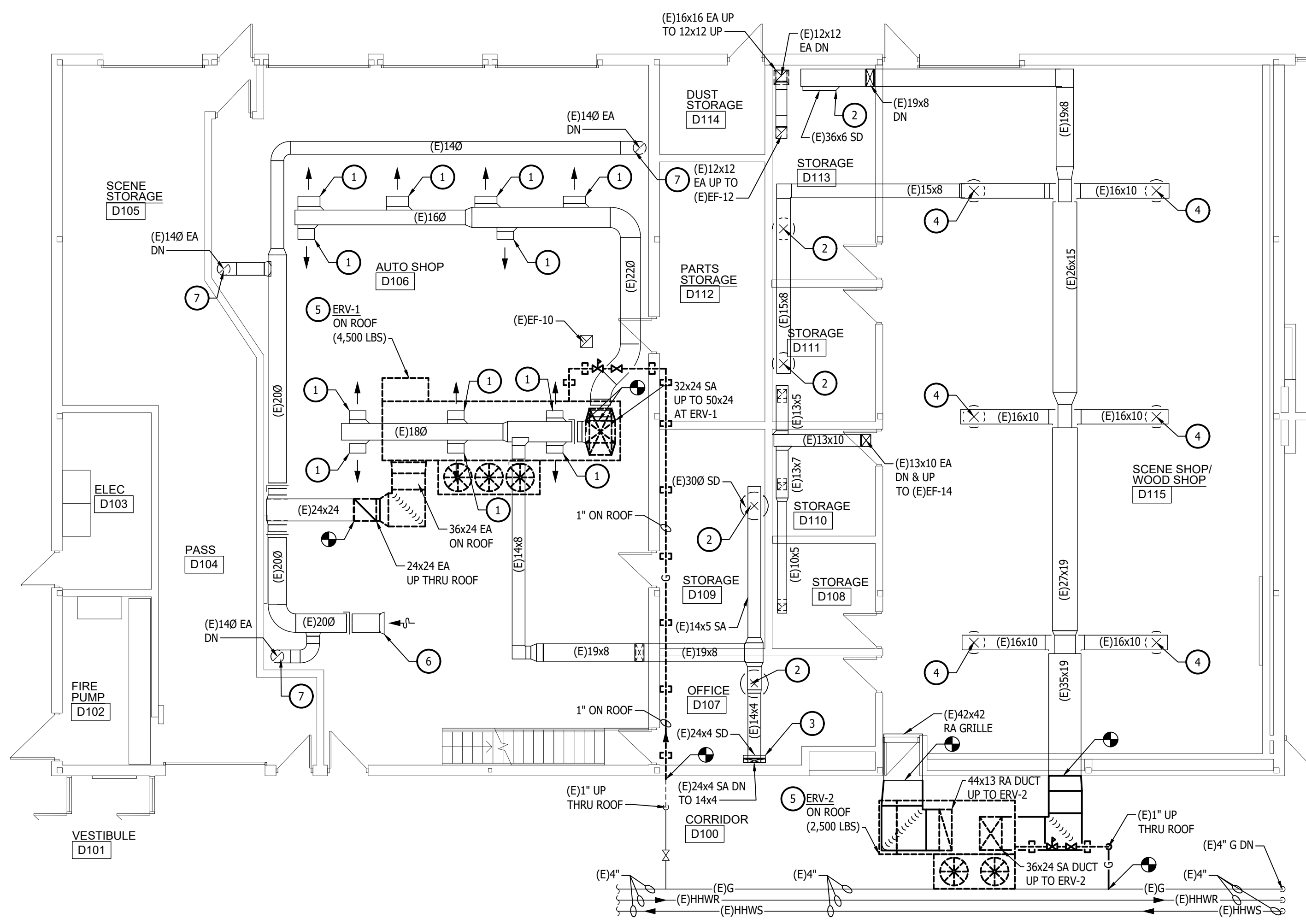
PLUMBING GENERAL NOTES	
A	THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE DETERMINED BY THE NEW WORK.
B	ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
C	PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY DESIGN PROFESSIONAL OF ANY INTERFERENCES OR DISCREPANCIES.
D	ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETELY WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN-ENDED PIPES AND DUCTS.
E	THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER-PROVIDED EQUIPMENT.
F	VERIFY DEPTH, SIZE, LOCATIONS, AND CONDITIONS OF EXISTING UTILITIES IN THE FIELD, INCLUDING POINTS OF CONNECTION, PRIOR TO STARTING ANY WORK.
G	ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
H	ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT WORK PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
J	INSTALL ALL SANITARY AND STORM PIPING 2 1/2" OR LESS AT 1/4" PER FOOT AND 3" AND LARGER PIPING AT 1/8" PER FOOT MINIMUM UNLESS NOTED OTHERWISE. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
K	PROVIDE "IN-LINE" WATERLESS PRIMER TRAP SEAL PROTECTION ON ALL FLOOR DRAINS AND TRAPS SUBJECT TO EVAPORATION.
L	AT EACH CONNECTION OF GAS SUPPLY TO EQUIPMENT, PROVIDE A PIPE UNION, GAS SHUT OFF VALVE, TEE, AND 6" LONG DIRT LEG WITH CAP.
M	THE CEILING SPACE IS USED AS A RETURN AIR PLENUM. NO PLASTIC MATERIALS INCLUDING PVC PIPING, CONDUIT WIRING, ETC. SHALL BE USED. ALL MATERIALS TO BE USED ARE TO BE PLENUM RATED.

NEW WORK KEYED NOTES	
1	RE-BALANCE TO 350 CFM
2	RE-BALANCE TO 150 CFM
3	RE-BALANCE TO 100 CFM
4	RE-BALANCE TO 675 CFM
5	INSTALL PACKAGED ENERGY RECOVERY UNIT. PROVIDE NEW CURB IN A LOCATION TO MEET MANUFACTURERS CLEARANCE REQUIREMENTS AND LOCAL CODES AS REQUIRED. SEAL ALL OPENING WEATHER TIGHT.
6	RE-BALANCE TO 1,675 CFM
7	RE-BALANCE TO 975 CFM

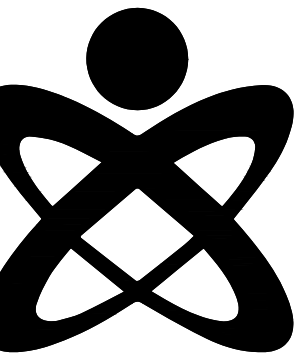
HVAC GENERAL NOTES	
A	THESE DRAWINGS ARE DIAGRAMMATIC AND REPRESENT THE GENERAL EXTENT OF THE WORK TO BE PERFORMED. PROVIDE AND EXECUTE ALL HVAC SYSTEMS PER ENGINEER'S SPECIFICATION, AND LOCAL APPLICABLE CODES INCLUDING AMENDMENTS, BULLETINS, ETC. AS WELL AS THE STANDARDS OF INSTALLATION AND EQUIPMENT ESTABLISHED FOR THE BUILDINGS, AND REQUIREMENTS OF THE OWNER.
B	EXCEPT FOR CHANGES AS MAY BE SPECIFICALLY APPROVED BY THE ENGINEER OF RECORD, IN ACCORDANCE WITH ALTERNATES OF OPTIONS AS STATED HEREINAFTER, ALL WORK MUST BE IN FULL ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS. SYSTEMS ARE TO BE COMPLETE, EFFICIENT, AND SATISFACTORY OPERATION WHEN PROJECT IS DELIVERED TO THE OWNER.
C	THE CONTRACTOR AND EACH SUBCONTRACTOR COVENANTS AND AGREES TO INDEMNIFY, DEFEND, AND HOLD HARMLESS THE CONSULTING ENGINEER, ARCHITECT, AND OWNER FROM AND AGAINST ANY LIABILITY, LOSS, DAMAGE, OR EXPENSE INCLUDING ATTORNEYS ARISING FROM A FAILURE OR ALLEGED FAILURE ON THE PART OF THE CONTRACTOR, SUBCONTRACTORS, AND THEIR AGENTS/EMPLOYEES PROPERLY TO DISCHARGE THE OBLIGATIONS ASSUMED BY HIM/HER IN THE PERFORMANCE OF THE WORK, INCLUDING ANY ACT OR OMISSION ALLEGEDLY RESULTING IN DEATH, PERSONAL INJURY, PROPERTY DAMAGE, OR IMPROPER CONSTRUCTION PROTOCOL.
D	CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVAL FROM GOVERNING AUTHORITIES AND FILE NECESSARY FORMS, PAY ALL INSPECTION FEES.
E	CONTRACTOR TO EXAMINE ALL ADJOINING WORK BEFORE COMMENCEMENT OF HIS/HER SCOPE OF WORK. REPORT ANY DISCREPANCIES TO THE CONSTRUCTION MANAGER FOR REVIEW AND APPROVAL. COORDINATE ALL WORK WITH OTHER TRADES TO ENSURE THAT INSTALLATION IS MADE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
F	PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT; DUCTWORK/PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
G	CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. ALL PIPING CONNECTIONS SHALL BE MINIMUM 3/4" UNLESS NOTED OTHERWISE.
H	FURNISH ADEQUATE LIABILITY INSURANCE AND BONDING DOCUMENTS AS REQUIRED BY THE OWNER.
J	SUPPORT ALL ANCHORS SECURED TO THE BOTTOM OF FLOOR SLABS SHALL BE DROP-IN OR SLEEVE ANCHOR TYPE. ALL SUPPORTING STEEL SHALL BE PROVIDED BY THE CONTRACTOR.
K	DUCTWORK/PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
L	THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL FOR THE PROPER INSTALLATION OF MECHANICAL SYSTEMS.
M	BRANCH DUCTWORK TO GRILLES, REGISTERS, AND DIFFUSERS SHALL BE THE SAME SIZE AS THE TERMINAL DEVICE NECK SIZE WHERE NO DUCT SIZE IS INDICATED.



MECHANICAL DEMOLITION PLAN - AUTO SHOP & WOOD / SCENE SHOP
SCALE: 1/8" = 1'-0"

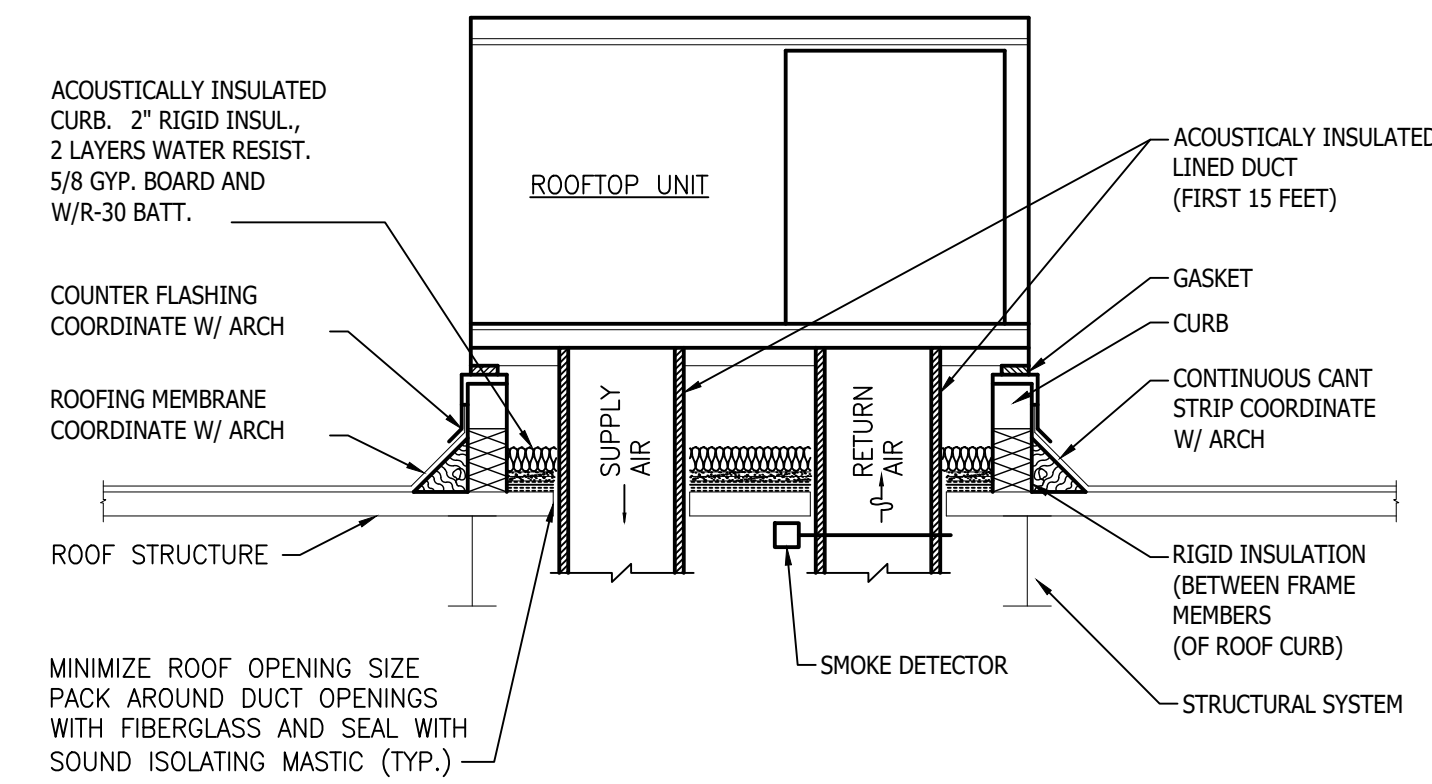


MECHANICAL NEW WORK PLAN - AUTO SHOP & WOOD / SCENE SHOP
SCALE: 1/8" = 1'-0"



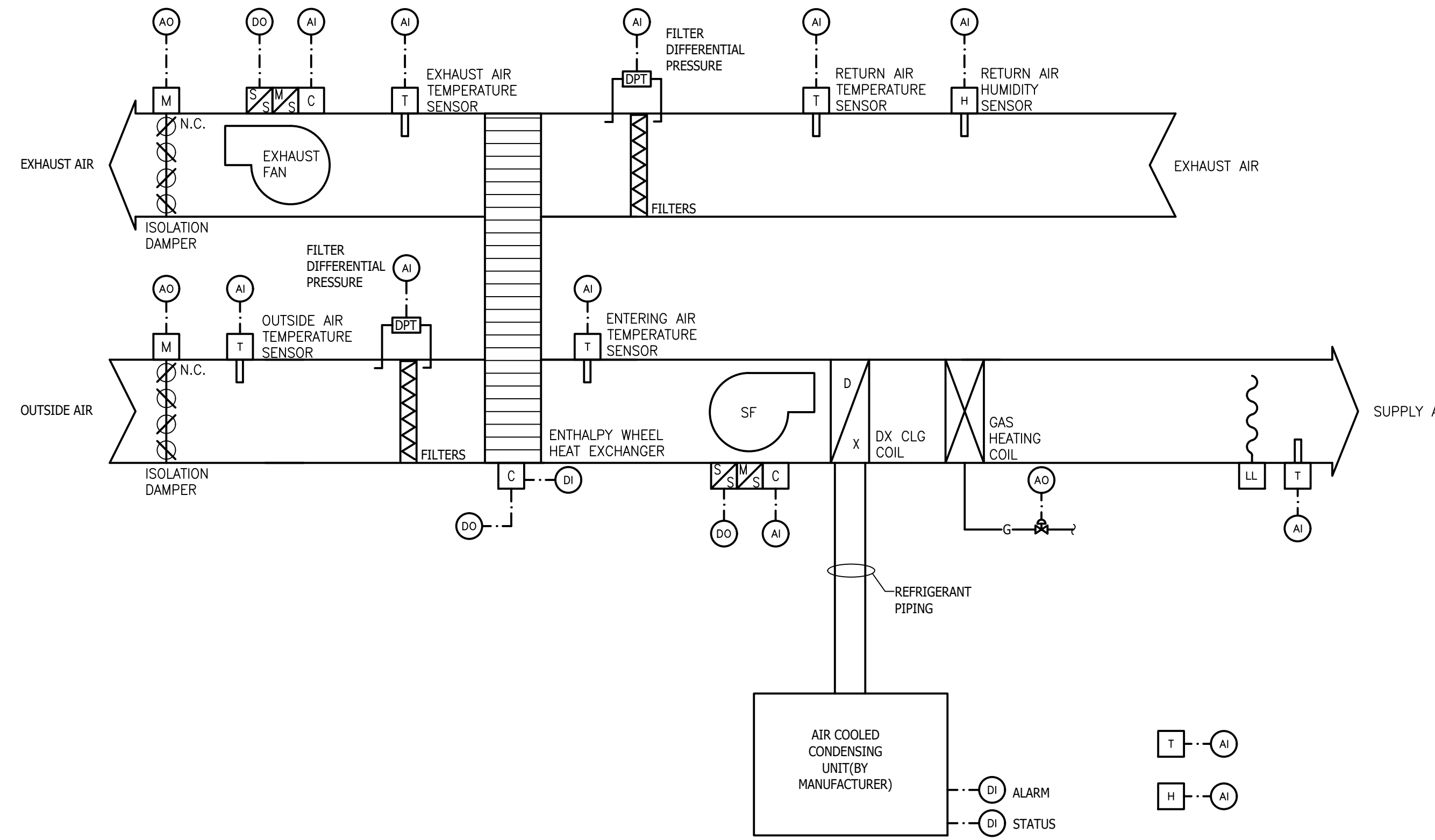
ENERGY RECOVERY UNIT WITH COOLING, GAS HEAT AND HOT GAS REHEAT SEQUENCE OF OPERATION
NOTE: ALL SETPOINTS AND TIME INTERVALS SHALL BE ADJUSTABLE BY THE SYSTEM OPERATOR.

- WITH THE SUPPLY AND EXHAUST FAN'S HAND/OFF/AUTO SWITCHES IN THE "AUTO" POSITION, THE SUPPLY FAN SHALL BE AUTOMATICALLY STARTED AND STOPPED WITH THE DDC/BAS SYSTEM OCCUPANCY SCHEDULE.
- FAN CONTROL: THE SUPPLY AND EXHAUST FANS WILL BE STARTED ACCORDING TO OCCUPIED AND UNOCCUPIED PROGRAMMED SCHEDULES. DURING OCCUPIED PERIODS THE UNIT SUPPLY AND EXHAUST FANS OPERATE CONTINUOUSLY. DURING UNOCCUPIED PERIODS THE FANS SHALL NOT OPERATE.
- ROOM TEMPERATURE AND HUMIDITY: THE DDC/BAS SYSTEM SHALL AVERAGE ALL OF THE FLOOR TEMPERATURE AND HUMIDITY SENSORS TO DETERMINE CONTROL SETPOINT.
- ENERGY RECOVERY WHEEL ECONOMIZER: THE ECONOMIZER WILL BE LOCKED OUT WHEN THE OUTSIDE AIR TEMPERATURE IS LESS THAN 40°F (ADJUSTABLE). THE ECONOMIZER IS ONLY ACTIVE WHEN THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE ROOM TEMPERATURE SETPOINT. THE HEAT WHEEL VFD MODULATES THE WHEEL SPEED IN ORDER TO MAINTAIN THE ROOM TEMPERATURE SETPOINT.
- ENERGY RECOVERY WHEEL DEFROST: THE ENERGY RECOVERY WHEEL VFD MODULATES THE WHEEL SPEED IN ORDER TO MAINTAIN THE EXHAUST AIR TEMPERATURE ABOVE THE DEFROST SET POINT OF 20°F.
- ENERGY RECOVERY WHEEL ENERGY RECOVERY: WHEN THE DEFROST AND ECONOMIZER FUNCTIONS ARE INACTIVE, THE ENERGY RECOVERY WHEEL VFD MODULATES THE WHEEL TO 100% SPEED.
- HEATING TEMPERATURE CONTROL: WHEN THE ROOM TEMPERATURE FALLS BELOW ITS SETPOINT THE DDC CONTROLLER SHALL MODULATE THE GAS BURNER TO MAINTAIN THE ROOM TEMPERATURE SETPOINT (72 DEGREES).
- COOLING TEMPERATURE CONTROL: WHEN THE ROOM TEMPERATURE RISES ABOVE ITS SETPOINT, DDC SHALL ACTIVATE STAGES OF DX COOLING TO MAINTAIN THE ROOM TEMPERATURE SETPOINT (74 DEGREES),(ADJ.)
- WHEN THE SUPPLY FAN IS DE-ENERGIZED, THE OUTSIDE AIR AND EXHAUST DAMPERS SHALL BE CLOSED.
- THE DDC SYSTEM SHALL MONITOR THE FOLLOWING POINTS: OUTDOOR AIR TEMPERATURE, ENTERING AIR TEMPERATURE, EXHAUST AIR TEMPERATURE, RETURN AIR TEMPERATURE, RETURN AIR HUMIDITY, DISCHARGE AIR TEMPERATURE, FILTER PRESSURE DIFFERENTIAL, SUPPLY FAN STATUS, EXHAUST FAN STATUS, REFRIGERATION CIRCUIT STATUS, DX REHEAT STATUS, GAS VALVE POSITION, HEAT RECOVERY WHEEL SPEED, AND ALL ALARMS.



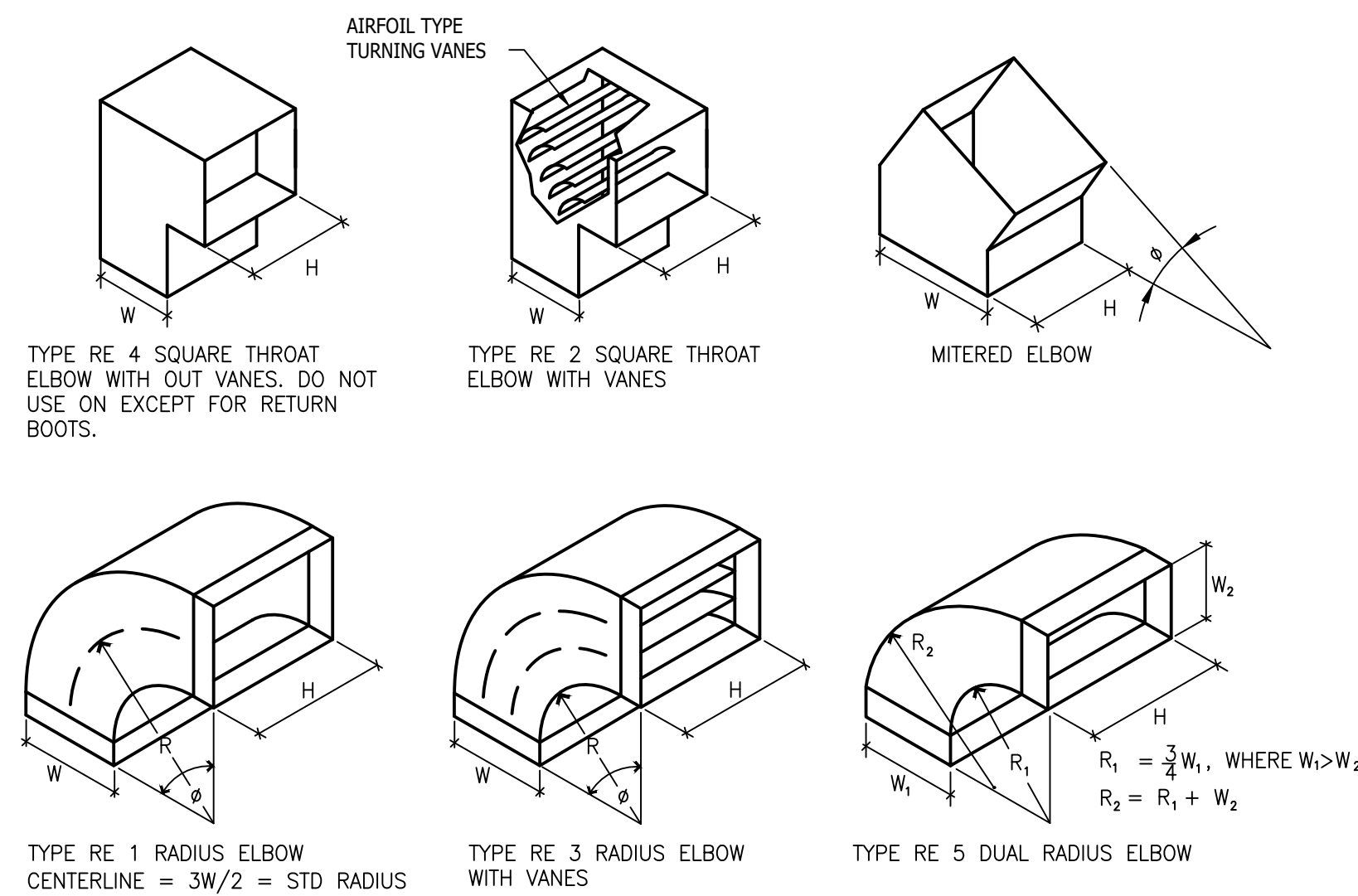
ROOFTOP UNIT - CURB MOUNTING DETAIL

NO SCALE



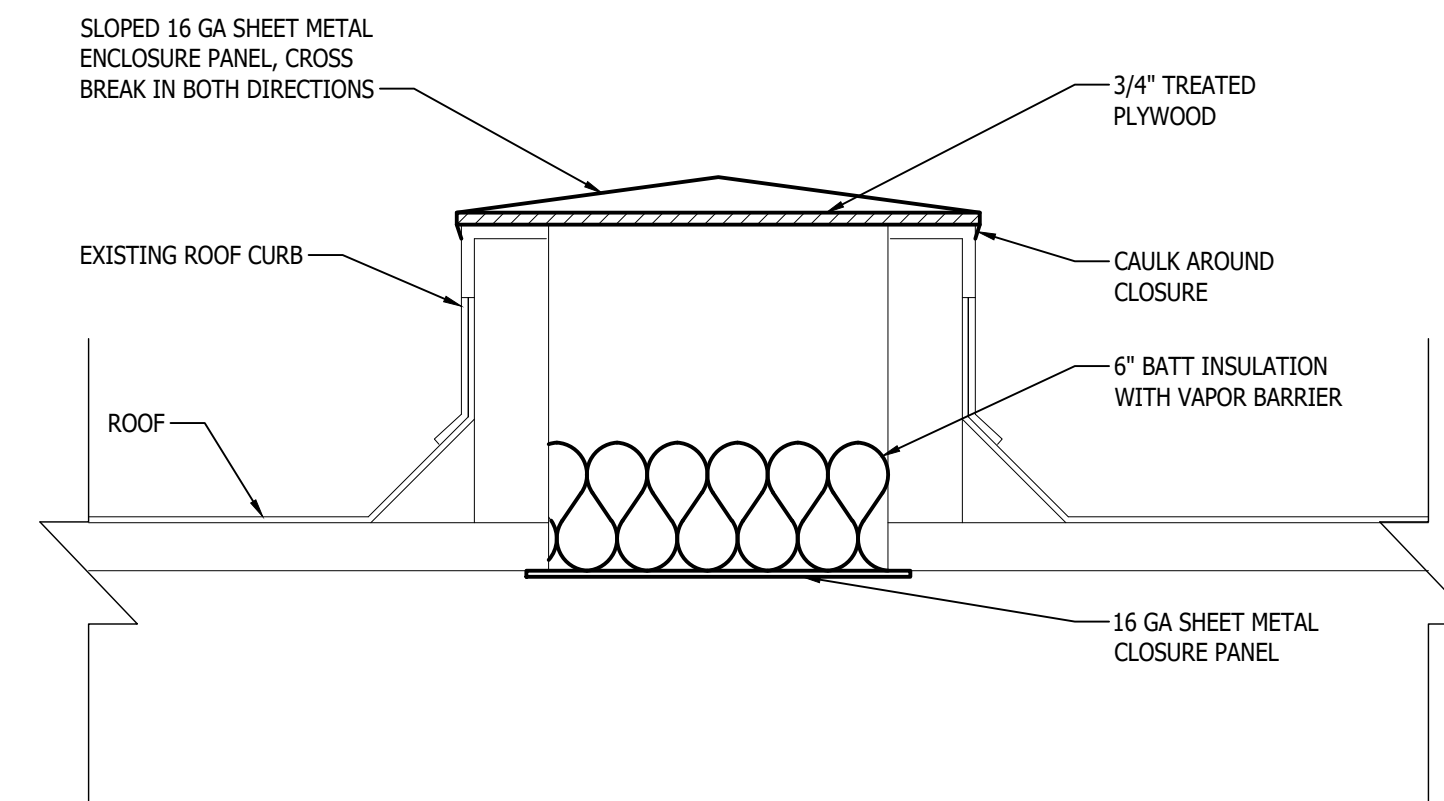
ENERGY RECOVERY WITH GAS HEAT CONTROL DIAGRAM

NO SCALE



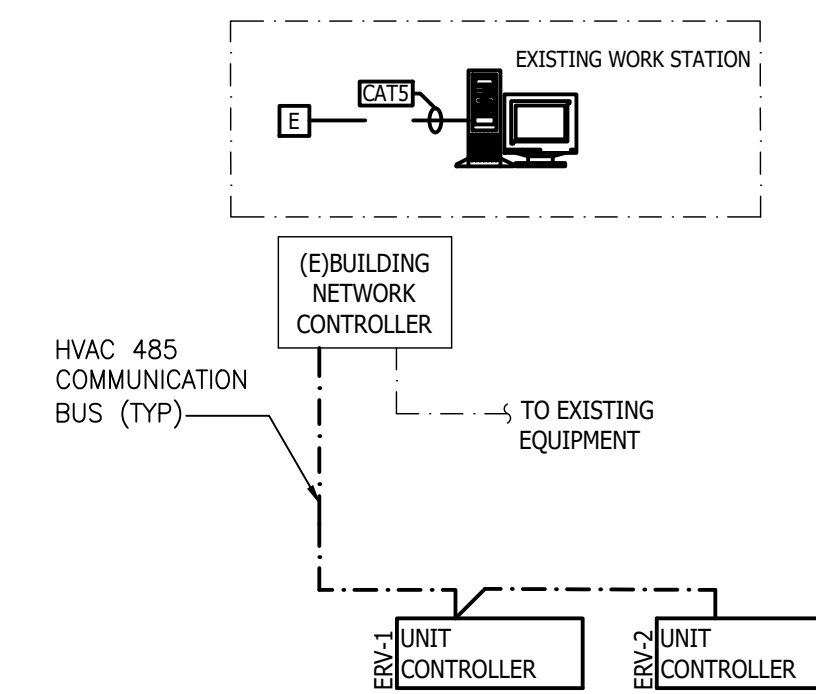
RECTANGULAR SHEET-METAL ELBOWS

NO SCALE



ROOF CURB CAPPING DETAIL

NO SCALE



PACKAGED ROOFTOP ENERGY RECOVERY UNIT SCHEDULE - (DX - GAS - HGR)

UNIT ID	SUPPLY FAN						EXHAUST FAN						ENTHALPY WHEEL - SUMMER				ENTHALPY WHEEL - WINTER				POST ENTHALPY WHEEL CONDITIONING										HOT GAS RE-HEAT COIL		FILTERS		ELECTRICAL					DISCONNECT		CURB HEIGHT (IN)	MANUFACTURER/ MODEL NO.	REMARKS								
	ESP (IN WG)	FLOW (CFM)	FAN TYPE	DRIVE TYPE	BHP	HP	ESP (IN WG)	FLOW (CFM)	FAN TYPE	DRIVE TYPE	BHP	HP	OUTSIDE AIR				EXHAUST AIR				DX COOLING COIL						GAS HEAT		RE-HEAT (MBH)	AIR		PRE FILTER	FINAL FILTER	MOCP	MCA	FLA	VOLTS	PHASE	FURN. BY	INST. BY												
													EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	EDB (°F)	RH	LDB (°F)	LWB (°F)	EDB (°F)	LDB (°F)	EDB (°F)	RH	LDB (°F)	LWB (°F)	APD (IN WG)	MIN. EFFICIENCY (EER)		REFRIGERANT TYPE	INPUT (MBH)										OUTPUT (MBH)				NO. STAGES	EDB (°F)	LOB (°F)					
ERV-1	1.0	4,600	SWSI	DIRECT	2.52	3.0	0.25	2,200	SWSI	DIRECT	1.72	2.0	95.0	75.0	79.1	65.3	74.0	90.09	89.5	72.1	-10.0	49.0	70.0	6.24	9.7	121.1	102.4	76.4	63.6	57.2	55.1	0.14	12.84	R-454B	270.0	218.7	MODULATING 9:1	72.9	55.8	70.5	2" MERV 8	4" MERV 13	35	29	27	460	3	MC	MC	18	AAON / RNA-011-C-A-3-GA0C-DB110:02-0FG0G-K CK-00000-ABLBG-EC-CB08-00-EO-0-ANO-E 0-N000-00-000-B00A00-C00A0B-000000B	
ERV-2	1.0	4,500	SWSI	DIRECT	2.74	5.0	0.25	1,300	SWSI	DIRECT	1.41	2.0	95.0	75.0	79.3	65.8	74.0	88.6	89.4	71.8	-10.0	48.0	70.0	7.1	10.1	120.8	100.2	75.5	63.1	56.4	54.4	0.29	12.84	R-454B	195.0	158.0	MODULATING 10:1	72.5	54.9	69.8	2" MERV 8	4" MERV 13	35	31	29	460	3	MC	MC	18	AAON / RNA-011-B-A-3-GA0C-CB110:00-0FEAH-K CK-00000-ABLBG-EC-CB08-00-EO-0-ANO-EO -N000-00-000-B00A00-C00A0B-000000B	

- NOTES:
- MODEL NUMBER IS AAON.
 - DUAL INPUT ENTHALPY CONTROL ECONOMIZER.
 - 2" PLEATED MEDIA ENERGY RECOVERY WHEEL FILTERS.
 - DISCONNECT SWITCH.
 - 115V SERVICE RECEPTACLE
 - REFRIGERATION COMPRESSORS SHALL BE VARIABLE SPEED OR DIGITAL.
 - ALL FANS SHALL BE ECM.
 - PROVIDE WITH REFRIGERATION CONTROLS ONLY. UNIT DDC CONTROLLER TO BE AUTOMATED LOGIC DDC FIELD INSTALLED BY TCC.
 - MODULATING GAS HEAT.

11/15/2024

ISSUANCE:
BIDS

DRAWN: CEM
APPROVED: TDD

**MECHANICAL DETAILS,
SCHEDULES, AND
TEMPERATURE
CONTROLS**

M8.00



CLIENT:
LIVONIA PUBLIC SCHOOLS
15125 FARMINGTON RD.
LIVONIA, MI 48154

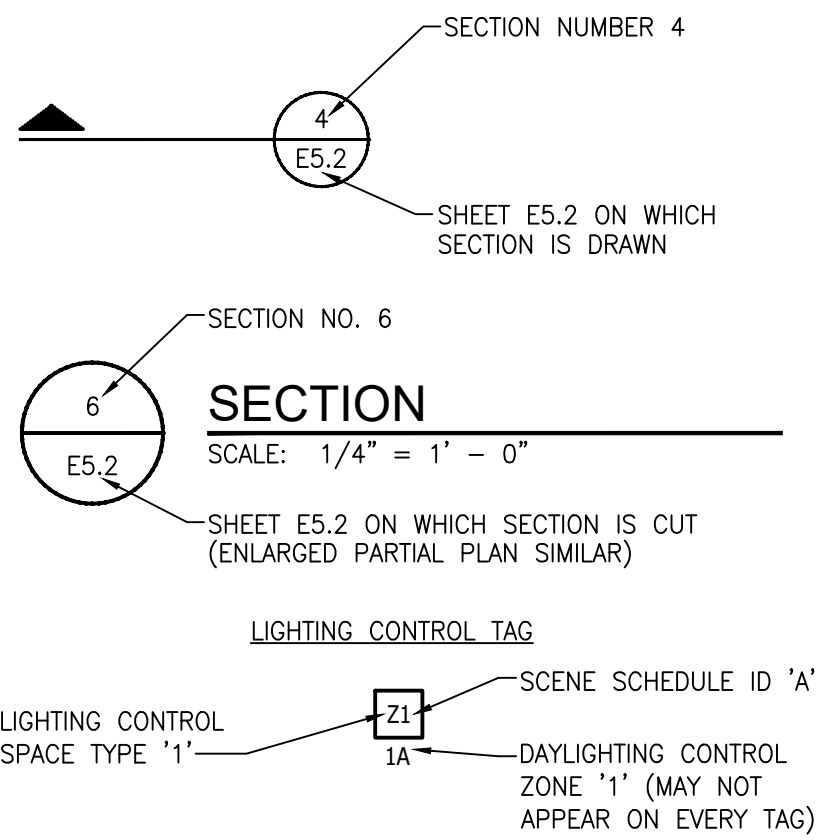
PROJECT:
**STEVENSON HIGH
SCHOOL AUTO SHOP,
WOOD / SCENE SHOP - AC
REPLACEMENT**



DRAWING INDEX	
SHT NO	DESCRIPTION
E0.00	ELECTRICAL GENERAL INFORMATION
EPI.00	ELECTRICAL POWER DEMOLITION AND NEW WORK PLANS
E5.00	ELECTRICAL DETAILS, SCHEDULES, AND DIAGRAMS

DRAWING NOTATION

SYMBOL	DESCRIPTION
LA	LIGHTING FIXTURE TAG
①	CONSTRUCTION KEY NOTE NUMBER 1
△1	DEMOLITION KEY NOTE NUMBER 1
①	FEEDER SIZE TAG (REFER TO FEEDER SCHEDULE ON THIS SHEET)
EF-1	EQUIPMENT DESIGNATION, (I.E. EXHAUST FAN NUMBER 1)
—	EXISTING DEVICES OR EQUIPMENT
—	NEW OR MODIFIED DEVICES OR EQUIPMENT
-----	NEW OR MODIFIED UNDERGROUND WIRING
///////	EXISTING SYSTEM COMPONENT TO BE REMOVED



APPLICABLE CODES AND REGULATIONS	
YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN ENERGY CODE
2023	MICHIGAN ELECTRICAL CODE RULES, PART 8
2023	NATIONAL ELECTRICAL CODE (NFPA 70)
2013	NFPA 20
2013	NFPA 72
2012	NFPA 101
2013	NFPA 110
2009	ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS & FACILITIES

POWER SYMBOL LIST

SYMBOL	DESCRIPTION
•	CONDUIT DOWN
◦	CONDUIT UP
C	CONTACTOR
⊏	DISCONNECT SWITCH – NON FUSED
⊏	DISCONNECT SWITCH – FUSED
⊏	DISCONNECT SWITCH – COMB. MOTOR STARTER
⊏	ELECTRICAL PANEL – 208/240 VOLTS
⊏	ELECTRICAL PANEL – 480 VOLTS
⊕	GROUNDING ROD
≡	GROUND
⊏	GROUNDING BAR
⊕	JUNCTION BOX
⊕	JUNCTION BOX WITH HARDWIRED CONNECTION
M	METER
⊕	MOTOR – SINGLE PHASE
⊕	MOTOR – THREE PHASE
\$w	MOTOR RATED SWITCH
⊕	POWER RECEPTACLE – SIMPLEX TYPE
⊕	POWER RECEPTACLE – DUPLEX TYPE
⊕	POWER RECEPTACLE – DUPLEX 6" ABOVE COUNTER
⊕ _{USB}	POWER RECEPTACLE – USB/DUPLEX COMBO. DEVICE
⊕	POWER RECEPTACLE – QUADRUPLEX TYPE
⊕	POWER RECEPTACLE – RECESSED FLOOR TYPE
⊕	POWER RECEPTACLE – SPECIALTY TYPE
SPD	SURGE PROTECTION DEVICE
TC	TIME CLOCK
T	TRANSFORMER (REFER TO SCHEDULES FOR INFO)
VSD	VARIABLE SPEED DRIVE

NOTES:
1. ALL DEVICE RATINGS/SIZES SHALL BE COORDINATED WITH PLANS AND SCHEDULES.

AUXILIARY SYST. SYMBOL LIST

SYMBOL	DESCRIPTION
⊏	CAMERA
CR	CARD READER
▼	COMMUNICATIONS DEVICE – 6" ABOVE COUNTER
▼	COMMUNICATIONS DEVICE – FLOOR
▼	COMMUNICATIONS DEVICE – WALL
DH	MAGNETIC DOOR HOLDER
□	PUSH BUTTON
S	SPEAKER
⊏	WALL CLOCK – SINGLE FACE
⊏	WALL CLOCK – DOUBLE FACE
⊏S	WALL CLOCK AND SPEAKER UNIT

NOTES:
1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR BOX AND CONDUIT FOR ALL DEVICES INDICATED.
2. LOW VOLTAGE CONTRACTOR SHALL PROVIDE EXACT SPECIFICATIONS AND LOCATIONS OF ALL DEVICES.

FIRE ALARM SYMBOL LIST

SYMBOL	DESCRIPTION
S	DETECTION DEVICE
S	DETECTION DEVICE – DUCT MOUNTED
FS	DETECTION DEVICE – FLOW SWITCH
TS	DETECTION DEVICE – TAMPER SWITCH
FAA	FIRE ALARM ANNUCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FD	FIRE DEPARTMENT COMMUNICATION OUTLET
F	MANUAL DEVICE – PULL STATION
F	NOTIFICATION DEVICE – WALL MOUNTED
F	NOTIFICATION DEVICE – CEILING MOUNTED

NOTES:
1. DRAWINGS INDICATE DESIGN INTENT ONLY, FINAL LOCATIONS AND DEVICE SPECIFICATIONS SHALL BE PROVIDED BY FIRE ALARM MANUFACTURER. REFER TO PROJECT SPECIFICATIONS FOR APPROVED MANUFACTURERS.

ELECTRICAL ABBREVIATIONS

ABBREV.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
A	AMPERE
AF	AMPERE FUSE/AMPERE FRAME
AWG	AMERICAN WIRE GAUGE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AIC	AVAILABLE INTERRUPTING CURRENT (AMPS)
C	CONDUIT OR CEILING MOUNTED
CB	CIRCUIT BREAKER
CU	COPPER
CT	CURRENT TRANSFORMER
DIA	DIAMETER
DISC	DISCONNECT
EMT	ELECTRICAL METALLIC TUBING
EWG	ELECTRIC WATER COOLER
EPO	EMERGENCY POWER OFF
(E)	EXISTING ELECTRICAL EQUIPMENT OR WORK
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
F	FUSE
G/GRD	GROUND
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
IG	ISOLATED GROUND
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LP	LIGHTING PANEL
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUG ONLY
MAX	MAXIMUM
MIN	MINIMUM
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
N/NEU	NEUTRAL
NF	NON-FUSIBLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NIC	NOT IN CONTRACT
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
PH. OR ♂	PHASE
P	POLE
PF	POWER FACTOR
PVC	POLYVINYL CHLORIDE (PLASTIC)
(R)	RELOCATED EXISTING ELECTRICAL EQUIPMENT
(RR)	REMOVE AND REINSTALL
RMC	RIGID METALLIC CONDUIT
RP	RECEPTACLE PANEL
SPEC/SPECS	SPECIFICATIONS
TBB	TELEPHONE BACKBOARD
TYP.	TYPICAL
UC	UNDER COUNTER
UL	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
USB	UNIVERSAL SERIAL BUS
V	VOLT
VA	VOLT AMPERE
W	WATT
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER

LIGHTING SYMBOL LIST

SYMBOL	DESCRIPTION
⊏	LIGHT FIXTURE – CEILING/GRID MOUNT
⊏	LIGHT FIXTURE – INTERIOR WALL MOUNT LINEAR
⊏	LIGHT FIXTURE – DOWNLIGHT WITH WALLWASH DIST.
⊏	LIGHT FIXTURE – INTERIOR WALL SCONCE
⊏	LIGHT FIXTURE – INTERIOR SURFACE MOUNT
⊏	LIGHT FIXTURE – INTERIOR WALL MOUNTED
⊏	LIGHT FIXTURE – INTERIOR PENDANT MOUNT
⊏	LIGHT FIXTURE – INTERIOR PENDANT MOUNT CYLINDER
⊏	TRACK AND TRACK MOUNTED LIGHT FIXTURES
⊏	EXIT LIGHT – CEILING MOUNTED – ARROWS AS INDICATED ON PLAN (SHADED AREA INDICATES FACE(S) OF FIXTURE)
⊏	EXIT LIGHT – WALL MOUNTED – ARROWS AS INDICATED ON PLAN (SHADED AREA INDICATES FACE(S) OF FIXTURE)
⊏	EMERGENCY LIGHT FIXTURE – EMERGENCY BATTERY UNIT
⊏	EMERGENCY LIGHT FIXTURE – BATTERY UNIT/EXIT SIGN
⊏	LIGHT FIXTURE – EXTERIOR POLE MOUNT TYPE
⊏	LIGHT FIXTURE – EXTERIOR WALL MOUNT TYPE
⊏	LIGHT FIXTURE – EXTERIOR POST TOP TYPE
⊏	LIGHT FIXTURE – EXTERIOR BOLLARD TYPE

NOTES:
1. LIGHTING SYMBOLS AS INDICATED ON PLANS ARE NOT DRAWN TO SCALE UNLESS NOTED OTHERWISE.

LIGHTING CONTROLS LEGEND

SYMBOL	DESCRIPTION
\$	SWITCH SINGLE POLE
\$ _o	OCCUPANCY SENSOR SWITCH
\$ _v	VACANCY SENSOR SWITCH
\$ _D	LOW VOLTAGE DIMMER SWITCH
\$ _{vo}	VACANCY DIMMER SENSOR SWITCH
⊕	CEILING MOUNTED OCCUPANCY SENSOR
⊕	CEILING MOUNTED VACANCY SENSOR
\$ ₃	SWITCH THREE-WAY
\$ _k	SINGLE POLE KEY SWITCH

11/15/2024

ISSUANCE:
BIDS

DRAWN: RDL
APPROVED: MPH

**ELECTRICAL
GENERAL
INFORMATION**

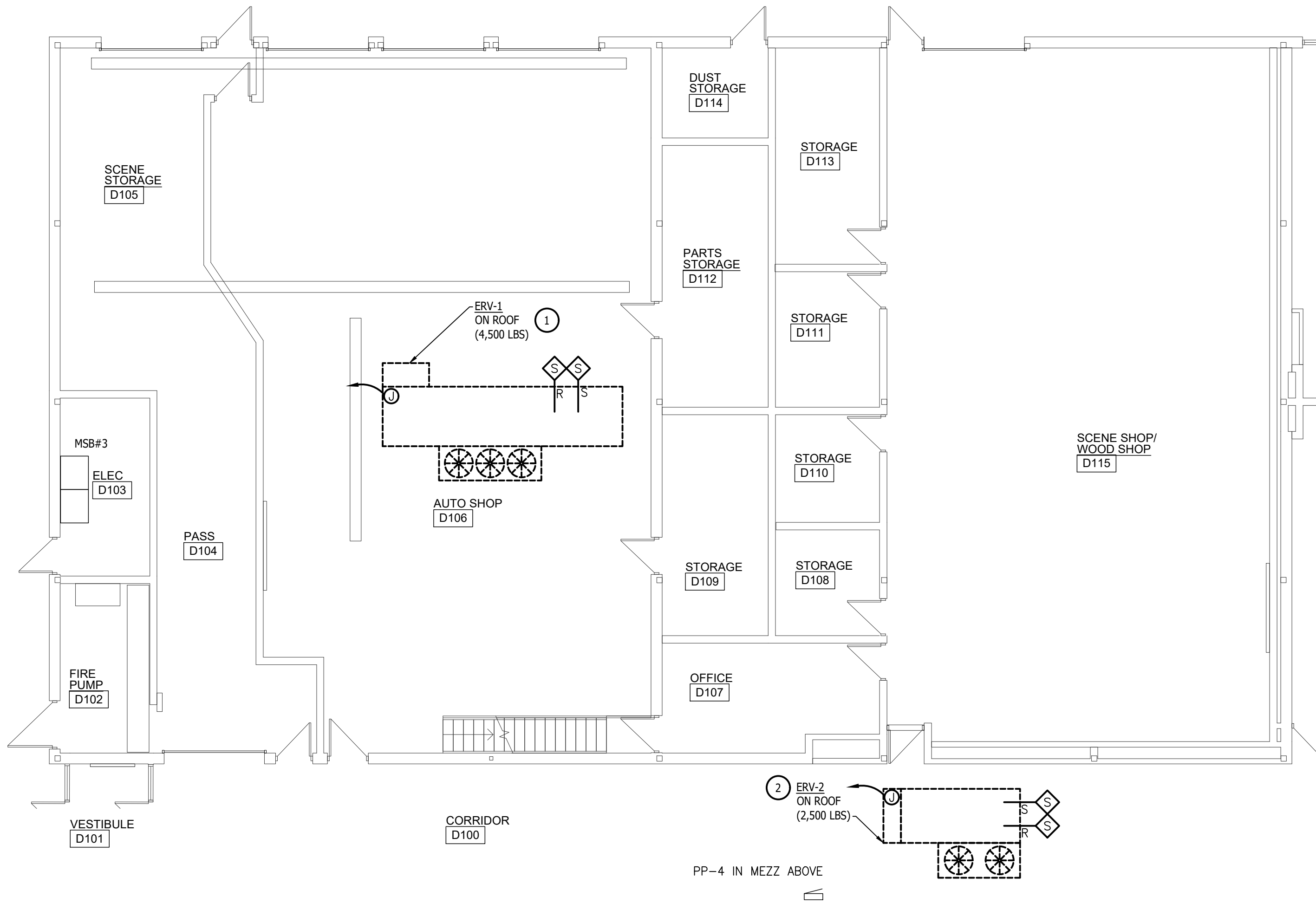
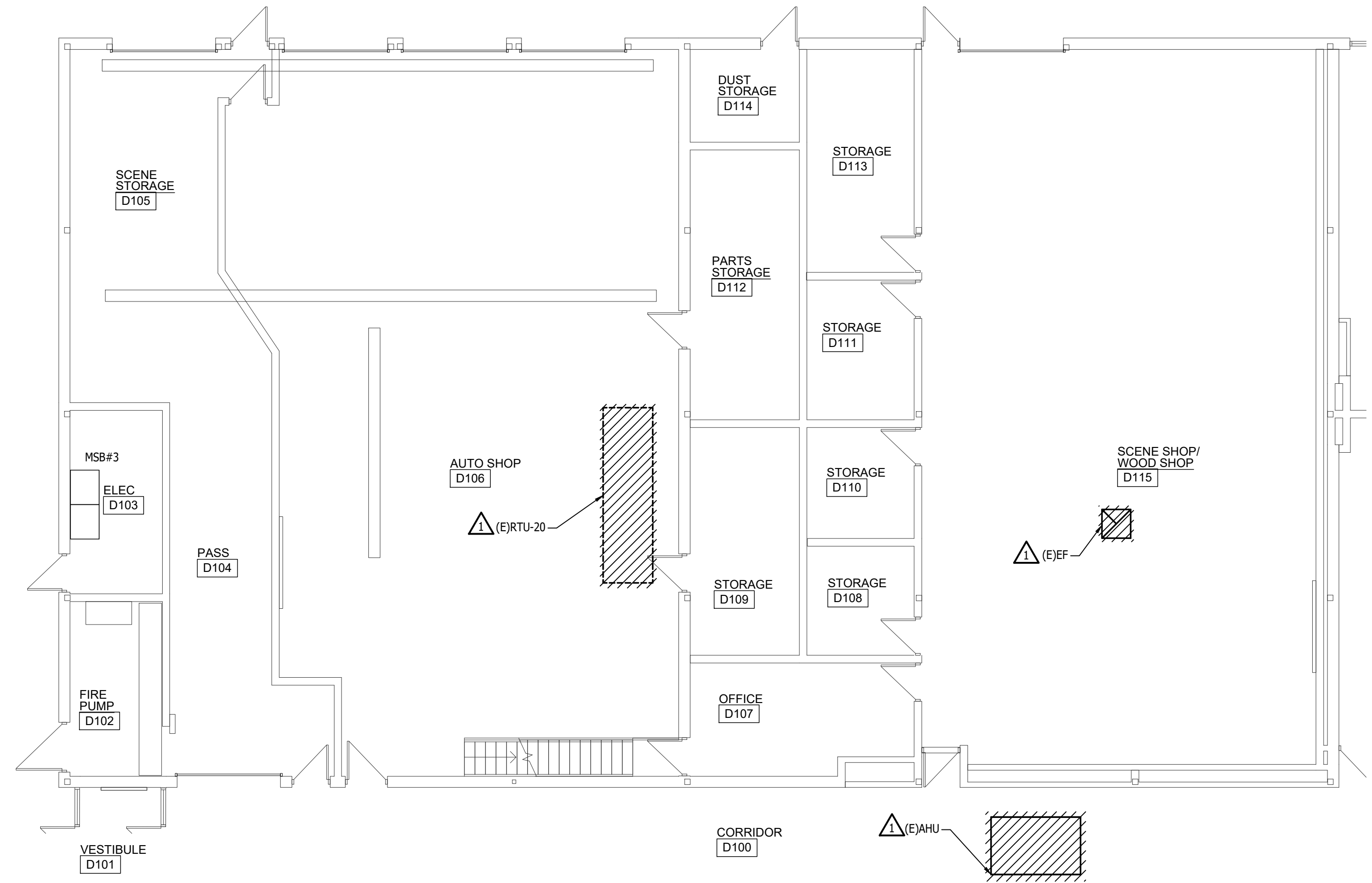


GENERAL DEMOLITION NOTES	
A	THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE DETERMINED BY THE NEW WORK.
B	ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
C	PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY DESIGN PROFESSIONAL OF ANY INTERFERENCES OR DISCREPANCIES.
D	ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETELY WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN-ENDED PIPES AND DUCTS.
E	THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER-PROVIDED EQUIPMENT.
F	VERIFY DEPTH, SIZE, LOCATIONS, AND CONDITIONS OF EXISTING UTILITIES IN THE FIELD. INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
G	ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
H	ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT WORK PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.

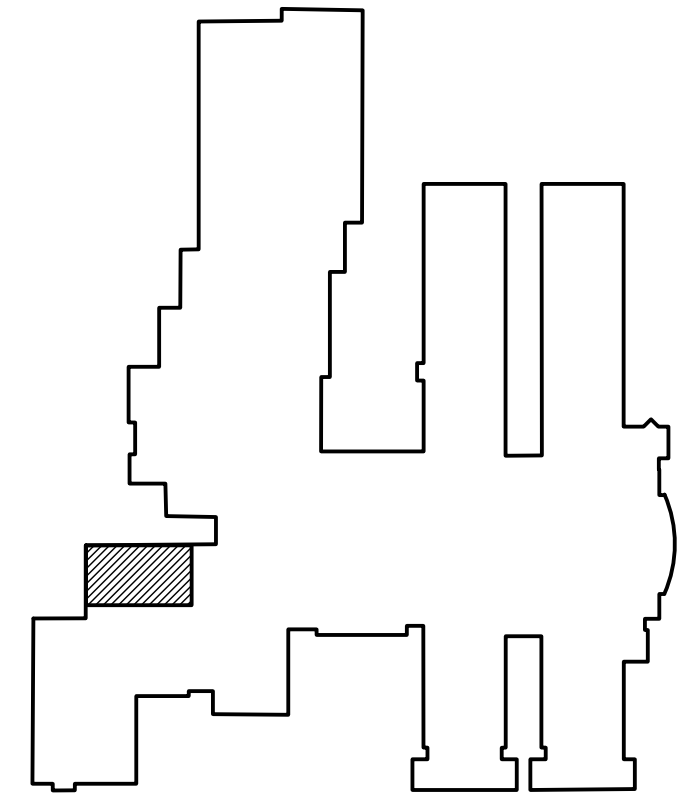
DEMOLITION KEYED NOTES	
1	MECHANICAL EQUIPMENT TO BE REMOVED COMPLETE BY MECHANICAL TRADES. EC TO DISCONNECT AND MAKE SAFE. REMOVE SWITCH, TAKE CONDUIT AND WIRING BACK TO SOURCE. MARK BREAKER AS SPARE AND UPDATE PANEL SCHEDULE.

POWER GENERAL NOTES	
A	THESE DRAWINGS ARE DIAGRAMMATIC AND REPRESENT THE GENERAL EXTENT OF THE WORK TO BE PERFORMED. PROVIDE AND EXECUTE ALL HVAC SYSTEMS PER ENGINEER'S SPECIFICATION, AND LOCAL APPLICABLE CODES INCLUDING AMENDMENTS, BULLETINS, ETC. AS WELL AS THE STANDARDS OF INSTALLATION AND EQUIPMENT ESTABLISHED FOR THE BUILDINGS, AND REQUIREMENTS OF THE OWNER.
B	EXCEPT FOR CHANGES AS MAY BE SPECIFICALLY APPROVED BY THE ENGINEER OF RECORD IN ACCORDANCE WITH ALTERNATES OF OPTIONS AS STATED HEREINAFTER, ALL WORK MUST BE IN FULL ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS. SYSTEMS ARE TO BE COMPLETE, EFFICIENT, AND SATISFACTORY OPERATION WHEN PROJECT IS DELIVERED TO THE OWNER.
D	CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVAL FROM GOVERNING AUTHORITIES AND FILE NECESSARY FORMS, PAY ALL INSPECTION FEES.
E	ELECTRICAL CONTRACTOR SHALL COMPLY WITH THE LATEST NATIONAL ELECTRICAL CODE, LIFE SAFETY CODE AND APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
F	ELECTRICAL EQUIPMENT AND WIRING SHALL BE NEW AND SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED.
G	WIRING SHALL BE IN CONDUIT. CONDUIT SHALL BE 3/4" CONDUIT MINIMUM. CONDUITS IN FINISHED AREAS SHALL BE CONCEALED.
H	NEW WIRES SHALL BE TYPE THHN. MINIMUM SIZE SHALL BE #12 AWG, UNLESS OTHERWISE NOTED. FINAL CONNECTIONS TO EQUIPMENT, FURNISHED AND INSTALLED BY OTHERS, SHALL BE PROVIDED BY THIS CONTRACTOR.
J	ALL PA AND SPEAKER SCOPE BY OTHERS. REFER TO TECH DRAWINGS FOR FURTHER INFORMATION.

NEW WORK KEYED NOTES	
1	ERV-1 BEING INSTALLED BY MECHANICAL TRADES, ELECTRICAL CONTRACTOR SHALL PROVIDE ALL FINAL CONNECTIONS USING NEW WIRING AND FEEDER. RUN 3#8&1#10G IN 3/4" TO MSB#3. REFER TO PANEL SCHEDULES ON E5.00
2	ERV-2 BEING INSTALLED BY MECHANICAL TRADES, ELECTRICAL CONTRACTOR SHALL PROVIDE ALL FINAL CONNECTIONS USING NEW WIRING AND FEEDER. RUN 3#8&1#10G IN 3/4" TO PP-4. REFER TO PANEL SCHEDULES ON E5.00



KEY PLAN

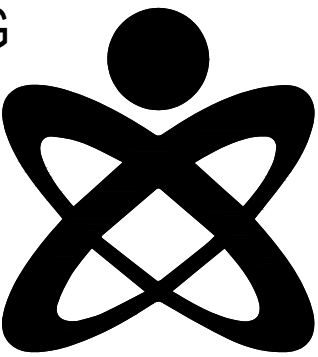


11/15/2024

ISSUANCE:
BIDS

DRAWN: RDL
APPROVED: MPH

ELECTRICAL POWER
DEMOLITION AND
NEW WORK PLANS



CLIENT:
LIVONIA PUBLIC SCHOOLS
15125 FARMINGTON RD.
LIVONIA, MI 48154

PROJECT:
**STEVENSON HIGH
SCHOOL AUTO SHOP,
WOOD / SCENE SHOP - AC
REPLACEMENT**



11/15/2024

ISSUANCE:
BIDS

DRAWN: RDL
APPROVED: MPH

**ELECTRICAL
DETAILS,
SCHEDULES, AND
DIAGRAMS**

E5.00

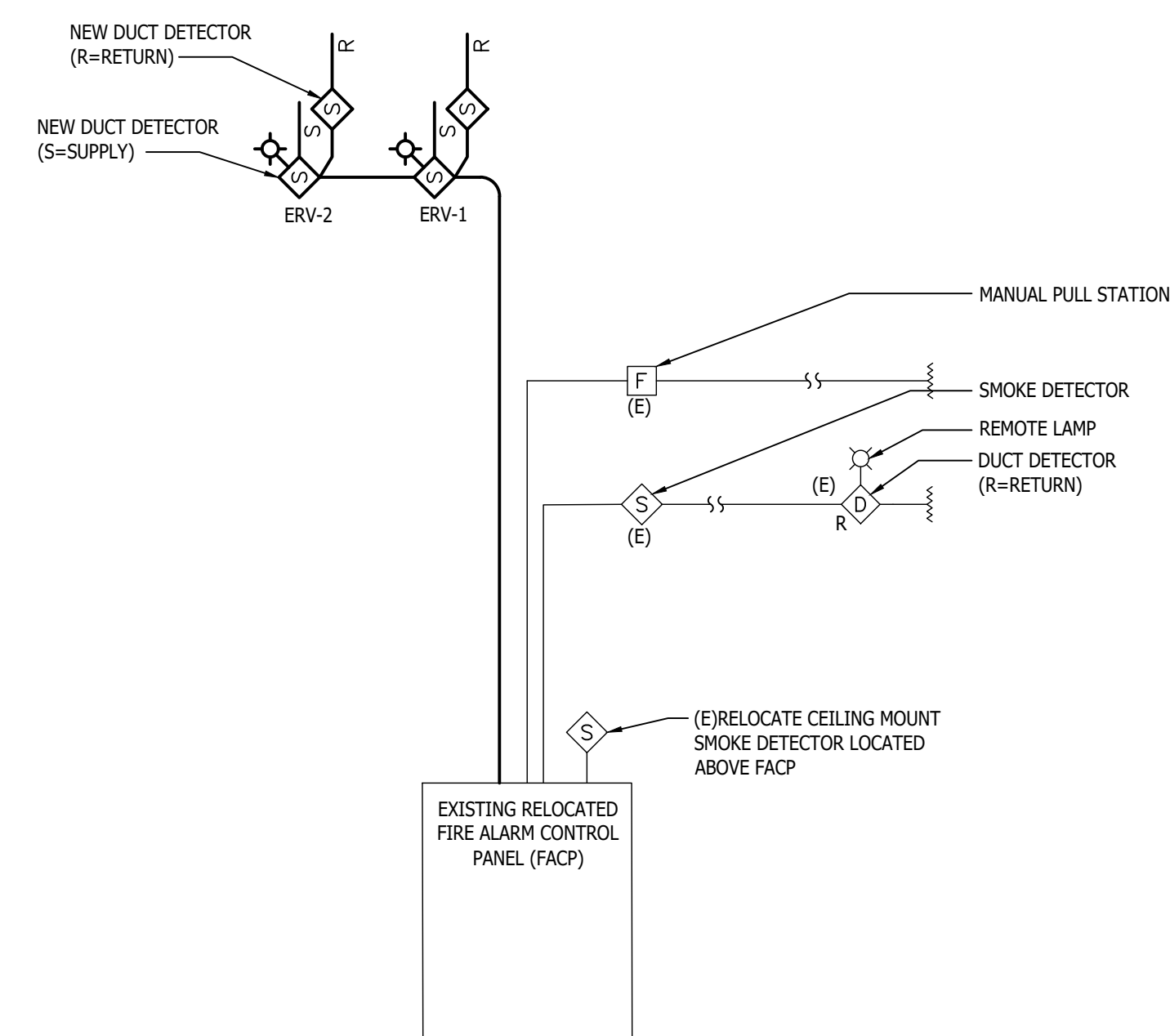
NEW WORK KEYED NOTES	
1	PROVIDE NEW 35A 3P BREAKER FOR NEW ERV-1 AS SHOWN
2	PROVIDE NEW 60A 3P SWITCHED FUSED DOWN TO 35A. SWITCH SHALL MATCH EXISTING GENERAL ELECTRIC BRAND.

Panel Designation: (E)MSB#3		Main: 1200A		P-P Voltage: 480										
Panel Location: ELEC D1030		Bussing: 2000		P-N Voltage: 277										
Fed From: EXISTING		Ground Bus: STANDARD		Phase: 3										
Feeder Size: EXISTING		Mounting: SURFACE		Wire: 4										
		Neutral: 100%		Min SC Interrupting Rating: EXISTING										
Remarks	Light Load	Recept Load	Cont Load	nonC Load	OC Prot	CTK A	CTK B	CTK C	OC Prot	nonC Load	Cont Load	Recept Load	Light Load	Remarks
(E) - T-DP1				48500		1	X	2		25667				(E) - RTU-19
				48500	500	3	X	4	125	25667				
				48500		5	X	6		25667				
(E) - BP-AV				2433		7	X	8		24333				(E) - T-RDPT
				2433	70	9	X	10	175	24333				
				2433		11	X	12		24333				
(E) - JP-1				800		13	X	14		69933				(E) - DP-1M
				800	15	15	X	16	400	69933				
				800		17	X	18		69933				
(E) - LP-T				4933		19	X	20		8223				ERV-1
				4933	100	21	X	22	35	8223				
				4933		23	X	24		8223				
						25	X	26						
						27	X	28						
						29	X	30						
Load Description	Connected Load				Demand				Demand Load					
Lighting or Continuous Load (Volt-Amps)	0	0	0	0	Factor				0	0	0	0		
180VA Receptacle Load (Volt-Amps)	0	0	0	0	1.00 (FHS 10kVA)				0	0	0	0	Receptacle Demand Factor per Article 220.44 of the National Electrical Code.	
	Amount over 10kVA				0.50 (F 10kVA)				0	0	0	0		
Continuous Load (Volt-Amps)	0	0	0	0	1.00				0	0	0	0		
Non-Continuous Load (Volt-Amps)	184823	184823	184823	554470	1.00				184823	184823	184823	554470		
Total Load (kVA)	184.82	184.82	184.82	554.47	125% of Light/Cont and Recept (<10kVA) load plus other load				184.82	184.82	184.82	554.47		
Total Ampacity (Amps)	666.9	666.9	666.9	666.9	<---- per NEC Article 215.2 ---->				666.9	666.9	666.9	666.9		
Minimum Feeder Sizing (Amps)	666.9	666.9	666.9	666.9	<---- per NEC Article 215.2 ---->				666.9	666.9	666.9	666.9		

1

Panel Designation: (E)PP-4		Main: MLO		P-P Voltage: 480										
Panel Location: MEZZ		Bussing: 600		P-N Voltage: 277										
Fed From: EXISTING		Ground Bus: STANDARD		Phase: 3										
Feeder Size: EXISTING		Mounting: SURFACE		Wire: 4										
		Neutral: 100%		Min SC Interrupting Rating: EXISTING										
Remarks	Light Load	Recept Load	Cont Load	nonC Load	OC Prot	CTK A	CTK B	CTK C	OC Prot	nonC Load	Cont Load	Recept Load	Light Load	Remarks
(E) - AIR COMPRESSOR				6366		1	X	2		6366				(E) - EX FAN 4AA#EE
				6366	30	3	X	4	30	6366				
				6366		5	X	6		6366				
(E) - DUST COLLECT #10				6366		7	X	8		6366				(E) - TEC LAB CONDENSORS<OFF>
				6366	30	9	X	10	30	6366				
				6366		11	X	12		6366				
(E) - SPARE						13	X	14		6366				(E) - EX 9
					30	15	X	16	30	6366				
						17	X	18		6366				
(E) - SPARE						19	X	20		6790				ERV-2
					30	21	X	22	60	6790				
						23	X	24		6790				
(E) - PANEL RH				21221		25	X	26		21221				(E) - PP4A - FUSED AT 100A
				21221	100	27	X	28	200	21221				
				21221		29	X	30		21221				
(E) - TRANSFORMER DP5<OFF>						31	X	32						
					400	33	X	34						
						35	X	36						
Load Description	Connected Load				Demand				Demand Load					
Lighting or Continuous Load (Volt-Amps)	0	0	0	0	Factor				0	0	0	0		
180VA Receptacle Load (Volt-Amps)	0	0	0	0	1.00 (FHS 10kVA)				0	0	0	0	Receptacle Demand Factor per Article 220.44 of the National Electrical Code.	
	Amount over 10kVA				0.50 (F 10kVA)				0	0	0	0		
Continuous Load (Volt-Amps)	0	0	0	0	1.00				0	0	0	0		
Non-Continuous Load (Volt-Amps)	74698	74698	74698	224094	1.00				74698	74698	74698	224094		
Total Load (kVA)	74.70	74.70	74.70	224.09	125% of Light/Cont and Recept (<10kVA) load plus other load				74.70	74.70	74.70	224.09		
Total Ampacity (Amps)	269.5	269.5	269.5	269.5	<---- per NEC Article 215.2 ---->				269.5	269.5	269.5	269.5		
Minimum Feeder Sizing (Amps)	269.5	269.5	269.5	269.5	<---- per NEC Article 215.2 ---->				269.5	269.5	269.5	269.5		

2



FIRE ALARM RISER
NO SCALE

NOTES:

- FOR FIRE ALARM EQUIPMENT SPECIFICATION AND ADDITIONAL REQUIREMENTS, SEE SPECIFICATIONS.
- ALL DUCT DETECTORS SHALL BE WIRED TO ACTIVATE ALARM SYSTEM AND SHUT DOWN FAN. PROVIDE INDICATOR LIGHT WHERE SMOKE DETECTORS ARE INSTALLED IN CONCEALED LOCATIONS OR ARE MORE THAN 10FT. ABOVE THE FINISHED FLOOR.
- CANDELA RATING ARE INTENDED TO BE 15cd UNLESS NOTED OTHERWISE. ALL AUDIO AND VISUAL RATINGS SHALL MEET OR EXCEED NFPA REQUIREMENTS. MINOR DEVIATIONS SUCH AS STROBE RATING, MISSING OF AUDIO/VISUAL UNITS, SMOKE DETECTORS UNITS, PULL STATION, ETC. (MAX OF 10) SHALL BE INCLUDED AS PART OF THIS BID.
- PROVIDE REMOTE POWER SUPPLIES AS REQUIRED FOR NOTIFICATION APPLIANCE CIRCUITS, NOT TO EXCEED 80% OF CAPACITY.
- PROVIDE SMOKE DETECTOR ABOVE EACH REMOTE POWER SUPPLY PANEL.
- PROVIDE BATTERY, CURRENT LOAD AND VOLTAGE DROP CALCULATIONS PER SPECIFICATIONS.
- SEAL AROUND ALL PIPES & CONDUITS IN MASONRY AND DRYWALL WALLS.
- ALL FIRE ALARM WIRING SHALL BE MINIMUM #14 AWG AND IN CONDUIT MIN 3/4" IN EXPOSED CEILING AREAS, CABLE IS ACCEPTABLE ABOVE LAY-IN CEILINGS IN J-HOOKS.
- FIRE ALARM CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CHARGES INVOLVED IN OBTAINING APPROVAL AND CERTIFICATION FROM STATE ELECTRICAL INSPECTOR FOR A COMPLETE SYSTEM. CERTIFIED CONTRACTOR TO PAY ALL FEES REQUIRED.
- THE ELEVATION DIAGRAM IS FOR REFERENCE PURPOSES. EXACT QUANTITIES OF DEVICES AND LOCATIONS SHALL COMPLY WITH NFPA GUIDELINES AND MEET APPROVAL OF THE STATE ELECTRICAL INSPECTOR. FIRE ALARM CONTRACTOR SHALL HAVE SHOP DRAWINGS APPROVED BY THE STATE ELECTRICAL INSPECTOR PRIOR TO COMMENCEMENT OF WORK.
- FOR FIRE ALARM SYMBOL LEGEND SEE DRAWING E000.
- PROVIDE COVER WITH SIREN FEATURE TO ALL FIRE ALARM MANUAL PULL STATION.
- FIRE ALARM VENDOR TO PROVIDE INSTALLATION DRAWINGS AS PART OF SUBMITTALS.
- THE FIRE ALARM SYSTEM SHOWN ON THE DRAWINGS AND SPECIFICATIONS ARE A PERFORMANCE SPECIFICATION SYSTEM WITH DEVICE LOCATIONS. FIRE ALARM VENDOR AND CONTRACTOR MUST PROVIDE A COMPLETE SYSTEM PER CODE.
- ALL STROBES EXISTING AND NEW SHALL BE SYNCHRONIZED.

**ELECTRICAL
DETAILS,
SCHEDULES, AND
DIAGRAMS**

E5.00