ELECTRICAL SPECIFICATIONS

1.1 THE ELECTRICAL CONTRACT WORK SHALL INCLUDE ALL ELECTRICAL MATERIALS AND INSTALLATION TO RESULT IN A BUILDING READY AND SUITABLE FOR USE AS INTENDED BY OWNER. THE CONTRACTOR SHALL REFER TO THE SITE, ARCHITECTURAL, AND MECHANICAL PLANS.

1.2 ALL ELECTRICAL INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND ITS SUPPLEMENTS IN FORCE AT THE TIME OF BID OPENING, AND ALL MATERIALS EMPLOYED SHALL BE UL LISTED AND APPROVED AND BEAR THE UL OFFICIAL LABELS WHERE SUCH LABELING IS CUSTOMARY. IN THE EVENT THAT LOCAL CODES ARE MORE RIGID THAN THE NATIONAL CODE, BOTH CODES SHALL THEN BE CONSIDERED AS JOINTLY GOVERNING AND THE REQUIREMENTS OF THE MOST RIGID SHALL THEN PREVAIL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SELECTION AND APPLICATION OF MATERIALS AND METHODS OF THEIR INSTALLATION. PRINCIPAL FEATURES ARE AS FOLLOWS:

A. CONNECTIONS TO HVAC UNITS.

B. WIRING DEVICES, OUTLETS, AND ETC.

C. A SYSTEM OF PANELBOARDS, DRY TYPE TRANSFORMER, FEEDER LINES, AND BRANCH WIRING FOR A COMPLETE POWER DISTRIBUTION SYSTEM FOR THE OFFICE AREA.

D. CONNECTION OF MECHANICAL EQUIPMENT.

E. COMMUNICATIONS SYSTEM RACEWAY PROVISIONS.

1.3 POWER SERVICE

A. POWER SERVICE IS EXISTING 480/277-VOLTS, 3-PHASE, 4-WIRE.

1.4 DISTRIBUTION EQUIPMENT

A. DISTRIBUTION EQUIPMENT AND BRANCH CIRCUIT PANELBOARDS SHALL BE MOLDED CASE CIRCUIT BREAKER EQUIPMENT HAVING THE NECESSARY INTERRUPTING RATINGS BUT NOT LESS THAN 10,000 AIC. GROUND FAULT SENSING AND AUTOMATIC INTERRUPTING SHALL BE FURNISHED ON ANY OUTDOOR POWER CIRCUITS AND AS OTHERWISE REQUIRED. EQUIPMENT SHALL BE SQUARE-D OR EQUAL. ALL BUS SHALL BE COPPER

1.5 GROUNDING

A. PROVIDE CODE GROUNDING FOR ANY SYSTEM ADDITIONS.

1.6 CONNECTION OF EQUIPMENT

A. THE ELECTRICAL CONTRACTOR SHALL CONNECT ALL MECHANICAL EQUIPMENT FURNISHED BY OTHER TRADES INCLUDING HVAC EQUIPMENT AND PLUMBING EQUIPMENT. CONNECTION SHALL BE EXTENDED TO ALL ELECTRICALLY OPERATED EQUIPMENT INCLUDING THE EQUIPMENT FURNISHED BY THE OWNER. THE ELECTRICAL CONTRACTOR SHALL VERIFY VOLTAGE, CAPACITY AND PHASE OF EQUIPMENT REQUIRING CONNECTION BEFORE CONNECTION AND NOTIFY THE ARCHITECT AND/OR ENGINEER IN THE EVENT OF DIFFERENCES. WHERE REQUIRED, THE ELECTRICAL CONTRACTOR SHALL FURNISH DISCONNECT SWITCHES AND MANUAL MOTOR STARTERS. ALL MOTOR STARTER HEATER ELEMENTS AND OVERCURRENT PROTECTION SHALL BE CHECKED FOR PROPER APPLICATION TO THE DEVICE BEING SERVED. DISCONNECTS AND SWITCHES SHALL BE SQUARE-D COMPANY OR EQUAL.

1.7 CONVENIENCE

A. FURNISH AND INSTALL CONVENIENCE OUTLETS WHERE ILLUSTRATED ON THE PLANS. ALL OUTLET DEVICES AND SWITCH DEVICES SHALL BE COMMERCIAL GRADE RATED 20-AMPERES FOR COMMERCIAL SERVICE OR DESIGNATED EQUIPMENT. DEVICES SHALL BE HUBBELL COMPANY OR EQUAL.

1.8 TYPES OF WIRING AND RACEWAYS

A. THE TYPES AND GRADES OF MATERIALS TO BE EMPLOYED IN THE WIRING SYSTEMS ARE SUBJECT TO BUILDING STRUCTURAL CONDITIONS AND THE GOVERNING CODES. THE WIRING SHALL BE GALVANIZED CONDUIT AND GALVANIZED STEEL AND DEVICE BOXES WHERE NECESSARY AND REQUIRED.

WHERE PERMITTED BY CODE WIRING SYSTEMS MAY BE EMT OR INTERMEDIATE METALLIC CONDUIT. ALL CONDUCTORS SHALL BE COPPER.

B. UNLESS PARTICULARLY STATED OTHERWISE, ALL WIRING SHALL BE RUN CONCEALED AND OUTLETS SHALL BE FLUSH MOUNTED IN WALLS AND CEILINGS.

C. ALL CONDUITS INSTALLED UNDERGROUND, IN CONCRETE SLABS, OR EXTERIOR OF BUILDINGS, MAY BE PLASTIC "PVC" EXCEPT WHEN EXPOSED, THEY SHALL BE SUITABLE GALVANIZED STEEL.

D. WIRING SYSTEMS WITH OUTLET DEVICES AND BOXES, SHALL BE GROUNDED AS REQUIRED BY THE GOVERNING CODES.

1.9 MATERIALS

A. BASIC MATERIALS AND DEVICES REQUIRED IN THE WIRING SYSTEMS SHALL BE UL APPROVED STANDARDS. IN THE EVENT THAT UL STANDARD IS REVISED, SUPPLEMENTED, OR MODIFIED, ETC., THE LATEST REQUIREMENTS SHALL THEN GOVERN.

B. AT THE REQUEST OF THE OWNER OR HIS DESIGNATED REPRESENTATIVE, THE CONTRACTOR SHALL SUBMIT A LIST OF MATERIALS PROPOSED TO BE USED IN THE CONSTRUCTION OR PROVIDE SAMPLES, ETC., FULLY ESTABLISHING THE TYPE, GRADE, AND QUALITY OF EACH DEVICE OR ITEM OF MATERIAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ONLY SUCH DEVICES AND MATERIALS AS OBVIOUSLY MEET GOVERNING REQUIREMENTS.

C. FIRE ALARM SYSTEM SHALL BE ADDRESSABLE. PROVIDE CONDUIT IN ALL AREAS (3/4"MIN.) PROVIDE ONE DEDICATED AND ONE BACKUP PHONE LINE. PROVIDE ONE YEAR MONITORING AT NO COST TO THE OWNER. ALL WORK SHALL BE IN COMPLIANCE WITH LOCAL, STATE, AND NATIONAL CODES.

1.10 CABINETS

A. CABINETS SHALL BE CONSTRUCTED OF SHEET STEEL, OF CODE GAUGE, AND FOR EITHER SURFACE OR FLUSH MOUNTING AS SHOWN ON DRAWINGS. SURFACES SHALL BE BONDERIZED TO RESIST CORROSION OR RUSTING.

B. CABINETS FOR INTERIOR INSTALLATION SHALL HAVE DOOR AND TRIMS PAINTED TO MATCH SURROUNDINGS.

C. CABINETS MOUNTED OUTDOORS SHALL BE OF WEATHERPROOF CONSTRUCTION WITH A FINISH TO ADEQUATELY PROTECT THE METAL AGAINST ACTION OF THE ELEMENTS PROVIDING MEANS OF LOCKING COVERS OR DOORS OVER THE CIRCUIT PROTECTIVE SECTIONS AND FURNISH A PIN-TYPE TUMBLER OR PADLOCK ARRANGED FOR MASTER-KEYING OR EACH ASSEMBLY.

1.11 WORK QUALITY

A. ALL ELECTRICAL WORK SHALL BE SPECIFIED TO BE PERFORMED IN A WORKMANLIKE AND PROFESSIONAL MANNER BY WORKMEN SKILLED IN THE TRADE REQUIRED. THE WORK SHALL RESULT IN A FINISHED AND OPERATING SYSTEM.

1.12 GUARANTEE

A. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL WORK TO BE FREE OF GROUNDS AND SHORT CIRCUITS AND SHALL REPAIR OR REPLACE ALL DEFECTIVE WORK WITHIN A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER.

1.13 CODES, PERMITS, FEES

A. THE ELECTRICAL CONTRACTOR SHALL PAY FOR AND SECURE ALL NECESSARY PERMITS. THE ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND CONFORMING TO ALL LOCAL, STATE AND NATIONAL GOVERNING CODES.

ELECTRICAL LEGEND

STANDARD ABBREVIATIONS AND NOTATIONS

A	AMPERE (AMPS)
AC	INDICATES DEVICE SHALL BE MOUNTED ABOVE COUNTERTOP
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT INTERRUPTER (AT EXT. BKR)
AIC	AMPS INTERRUPTING CURRENT
BKR	BREAKER
C	CONDUIT
CKT	CIRCUIT
CU	COPPER CONDUCTOR
DISC.	DISCONNECT
DN	DOWN
EM	CONNECTED TO EMERGENCY POWER
EMT	ELECTRICAL METALLIC TUBING
FLA	FULL LOAD AMPS
G	GROUND (ALSO "GND")
GFI	GROUND-FAULT CIRCUIT-INTERRUPTER (ALSO "GFCI")
GRS	GALVANIZED RIGID STEEL CONDUIT
HP	HORSEPOWER
IMC	INTERMEDIATE METALLIC CONDUIT
KCMIL	1000 CIRCULAR MILS. SAME AS "MCM".
KVA	KILOVOLT-AMPS
KW	KILOWATT
LC	LEXAN COVER
MCA	MINIMUM CIRCUIT AMPS
MCC	MOTOR CONTROL CENTER
MCM	1000 CIRCULAR MILS. SAME AS "KCMIL".
N	NEUTRAL
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT. LUMINAIRE SHALL BE UNSWITCHED EXCEPT FOR CIRCUIT BREAKER.
PC	INDICATES DEVICE IS CONTROLLED BY PHOTOCELL OR TIMECLOCK
PVC	POLYVINYLCHLORIDE CONDUIT. CLASSIFIED AS RIGID NONMETALLIC CONDUIT PER NEC. SCHEDULE 40 UON.
QR	INDICATES LUMINAIRE SHALL BE PROVIDED WITH QUARTZ RESTRIKE
SCCR	SHORT-CIRCUIT CURRENT RATING
TR	TAMPER RESISTANT
UC	UNDER COUNTER. INDICATES DEVICE SHALL BE LOCATED BELOW THE COUNTERTOP.
UON	UNLESS OTHERWISE NOTED
V	VOLTS
W	WATTS
WG	INDICATES DEVICE SHALL BE PROVIDED WITH WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER

EXISTING DEVICE NOTATIONS

EX	EXISTING DEVICE TO REMAIN
EXM	EXISTING DEVICE TO BE MOVED TO NEW LOCATION SHOWN
EXR	EXISTING DEVICE TO BE RECONNECTED TO NEW CONTROL SYSTEM AT A DIFFERENT LOCATION. SUPPLY ALL WIRING, MODULES, ETC, AS REQUIRED.

SYMBOL	DESCRIPTION
[fused disconnect symbol]	FUSED DISCONNECT SWITCH - RATING TO MATCH THE REQUIREMENTS OF THE EQUIPMENT BEING SERVED. NORMAL DUTY INDOORS AND HEAVY DUTY NEMA 3R OUTDOORS UNLESS NOTED OTHERWISE.
AC 3	GROUND FAULT CIRCUIT INTERRUPTING DUPLEX RECEPTACLE - 120-VOLT, 20-AMP WITH GFCI PROTECTION IN THE RECEPTACLE. MOUNT 18" ABOVE FINISHED FLOOR OR 8" ABOVE COUNTERTOPS OR BACK SPLASHES UNLESS OTHERWISE NOTED. "3" REFERS TO THE CIRCUIT NUMBER.
(EX)"A"	EXISTING PANELBOARD - FLUSH OR SURFACE MOUNTED AS INDICATED. "A" INDICATES THE PANEL DESIGNATION. SEE PANELBOARD SCHEDULE FOR PANELBOARD REQUIREMENTS.
———	CONDUIT INSTALLED IN CEILING OR WALL CONSTRUCTION.
— — —	CONDUIT INSTALLED UNDERGROUND OR BELOW THE FLOOR CONSTRUCTION.
----------	LOW-VOLTAGE WIRING INSTALLED ABOVE LAY-IN CEILING WITHOUT CONDUIT.
A-1,3	HOMERUN - EXTEND CONDUIT TO THE PANELBOARD OR DEVICE INDICATED. NUMBER OF CROSSHATCHED LINES INDICATES THE QUANTITY OF CURRENT CARRYING CONDUCTORS (NOT INCLUDING THE GROUND CONDUCTOR) WHERE MORE THAN TWO. CIRCUITS SHALL ALL HAVE SEPARATE NEUTRALS AND SHALL BE CONNECTED TO DIFFERENT PHASES WITHIN THE PANELBOARD REGARDLESS OF THE NUMBERING ON THE DRAWINGS. ALL CONDUIT RUNS SHALL BE PROVIDED WITH A GREEN CODE SIZE EQUIPMENT GROUNDING CONDUCTOR THAT SHALL BOND TO THE GROUNDING BUS BAR IN THE PANELBOARD.
S^4	WALL SWITCH - RATED FOR 20-AMP OPERATION AT LINE VOLTAGE. SINGLE POLE UNLESS NOTED 3-WAY OR 4-WAY. MOUNT 48" ABOVE FINISHED FLOOR EXCEPT IN MASONRY WHERE THE HEIGHT SHALL BE ADJUSTED TO HAVE EDGE OCCUR AT NEAREST JOINT.
T	THERMOSTAT - MOUNT 54" ABOVE FINISHED FLOOR. EXTEND CONDUIT AND CONDUCTORS TO EQUIPMENT BEING CONTROLLED AND CONNECT.
DD	FIRE ALARM DUCT MOUNTED SMOKE DETECTOR - "S" INDICATES MOUNTED IN SUPPLY DUCT, "R" INDICATES MOUNTED IN RETURN DUCT. PROVIDE WITH CONTROLS, WIRING, AND CONDUIT TO SHUTDOWN UNIT UPON ALARM INDICATION. PROVIDE ENCLOSURE AND SAMPLING TUBE AS RECOMMENDED BY MANUFACTURER FOR THE DUCT INSTALLATION. MATCH EXISTING IN SCHOOL.

DEMOLITION AND GENERAL NOTES:

1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO PREPARING HIS BID IN ORDER TO FAMILIARIZE HIMSELF WITH CONDITIONS AS THEY EXIST AND SHALL STUDY ALL AVAILABLE BUILDING PLANS AND ARCHITECTURAL AND MECHANICAL DRAWINGS TO SATISFY HIMSELF AS TO THE EXTENT OF ALL CONTINGENCIES AND SHALL INCLUDE THE COST OF THE SAME IN HIS BID.
2. THE CONTRACTOR SHALL NOT CREATE INTERRUPTION OF THE EXISTING BUILDING SERVICES WITHOUT PRIOR SCHEDULING OF SUCH OUTAGES WITH THE OWNER'S REPRESENTATIVE.
3. CIRCUIT NUMBERS ARE FOR DESIGN INTENT. FIELD VERIFY EXACT ROUTING AND CIRCUIT NUMBERS. PROVIDE NEW DIRECTORIES FOR ALL PANELBOARDS.

DRAWING NOTES:

1. CONNECT TO NEAREST UNSWITCHED 120V CIRCUIT THIS AREA.
2. PROVIDE AND INSTALL NEW 60/3 BREAKER IN EXISTING PANEL "EE1" TO FEED NEW RTU-1", 4#6, 1#10G, 1-1/4" C. PROVIDE ALL NECESSARY HARDWARE FOR MOUNTING BREAKERS.
3. PROVIDE ALL PROGRAMMING AND WIRING NECESSARY FOR A COMPLETE INSTALLATION.

HVAC WIRING NOTES:

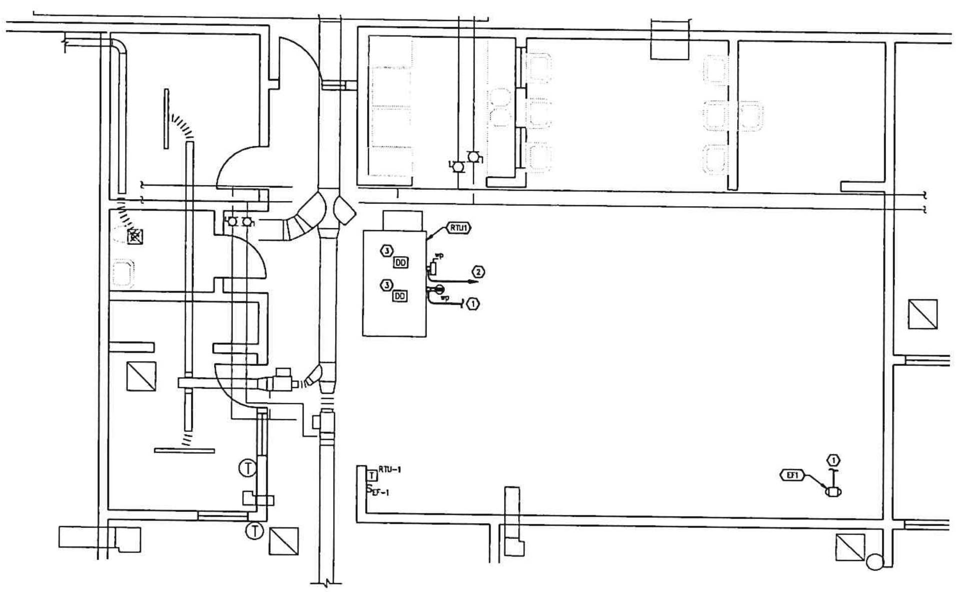
(RTU1) RTU1, 33.0MCA, 480V., 3PH. PROVIDE A 60/3 DISCONNECT WITH 60AMP. FUSES. 1-1/4", 3#4, #8GND. VERIFY LOCATION.

(EF1) EF-1, 16 WATTS, 120V. MEANS OF DISCONNECT PROVIDED AT FAN. 3/4", 2#12, #12GND.

VERIFY NAMEPLATE RATINGS PRIOR TO ROUGH-IN.

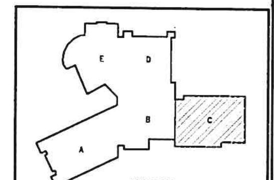
PANELBOARD GENERAL NOTE:

ELECTRICAL CONTRACTOR SHALL TRACE ALL EXISTING CIRCUITS PRIOR TO STARTING WORK AND VERIFY SPACE FOR NEW CONNECTIONS AND RE-CONNECTING TO EXISTING CIRCUITS. AFTER WORK IS COMPLETE, FURNISH AND INSTALL A NEW DIRECTORY LISTING ALL BREAKERS NEW AND EXISTING.



PARITAL FLOOR PLAN "C" - ELECTRICAL NEW WORK

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



KEYPLAN

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UNION COUNTY HIGH SCHOOL
ROOFTOP UNITS

PARTIAL FLOOR PLAN "C" -
ELECTRICAL NEW WORK

RONALD ALAN CARTER
REGISTERED ENGINEER
No. 109452
STATE OF TENNESSEE

JOB NO:	120064
FILE:	120064
DRAWN:	CLM
DESIGNED:	CLM
CHECKED:	RAC
DATE:	11-08-21

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WWR PROJECT# 121078

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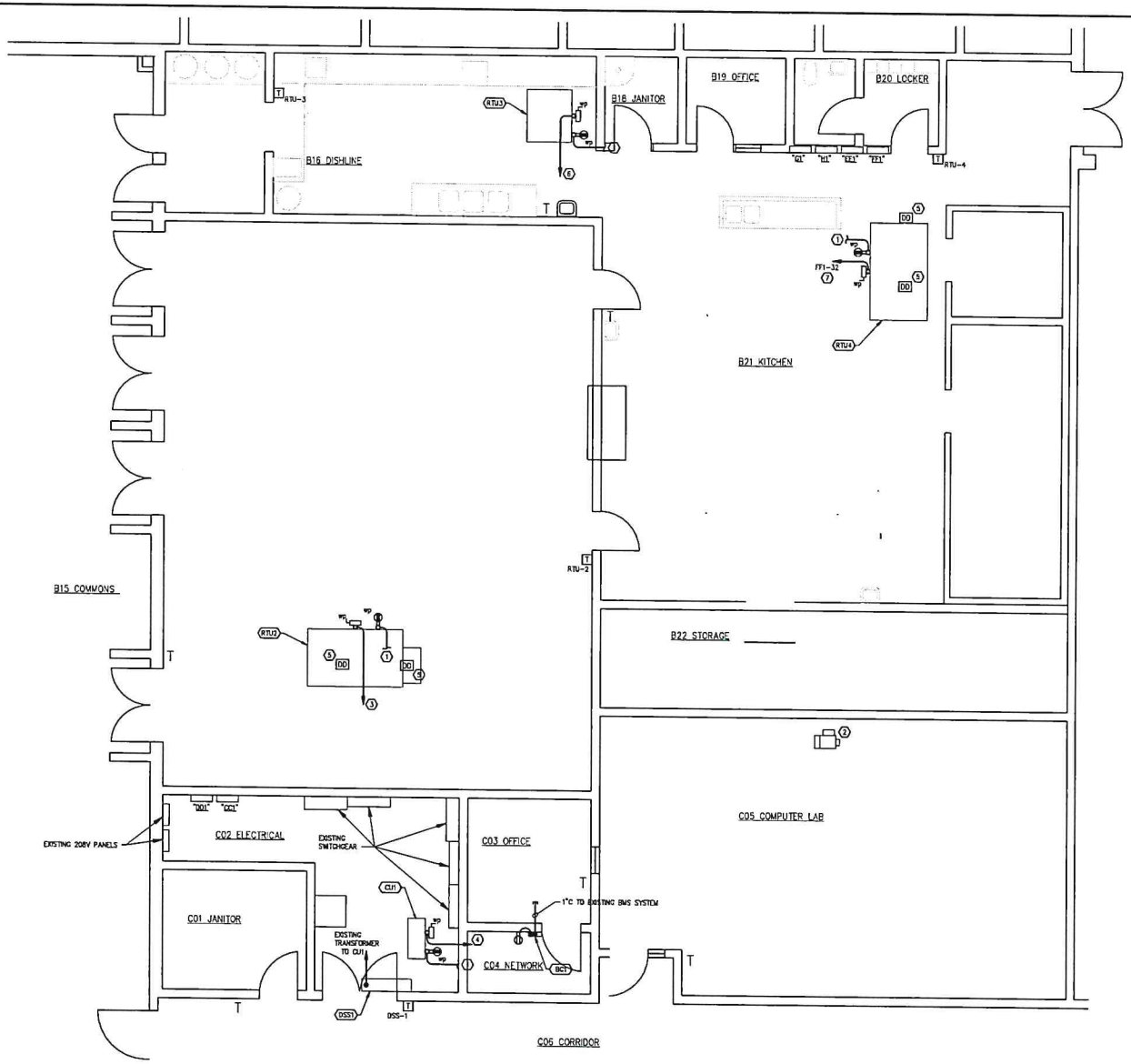
E1



PARTIAL FLOOR PLAN "B" - HVAC NEW WORK

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

DEMOLITION AND GENERAL NOTES:

1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO PREPARING HIS BID IN ORDER TO FAMILIARIZE HIMSELF WITH CONDITIONS AS THEY EXIST AND SHALL STUDY ALL AVAILABLE BUILDING PLANS AND ARCHITECTURAL AND MECHANICAL DRAWINGS TO SATISFY HIMSELF AS TO THE EXTENT OF ALL CONTINGENCIES AND SHALL INCLUDE THE COST OF THE SAME IN HIS BID.
2. THE CONTRACTOR SHALL NOT CREATE INTERRUPTION OF THE EXISTING BUILDING SERVICES WITHOUT PRIOR SCHEDULING OF SUCH OUTAGES WITH THE OWNER'S REPRESENTATIVE.
3. CIRCUIT NUMBERS ARE FOR DESIGN INTENT. FIELD VERIFY EXACT ROUTING AND CIRCUIT NUMBERS. PROVIDE NEW DIRECTORIES FOR ALL PANELBOARDS.

DRAWING NOTES:

1. CONNECT TO NEAREST UNSWITCHED 120V CIRCUIT THIS AREA.
2. RELOCATED VAV-79. COORDINATE MOUNTING WITH EXISTING UTILITIES INCLUDING STRUCTURAL. RECONNECT TO EXISTING CIRCUIT IN THIS AREA.
3. PROVIDE AND INSTALL NEW 60/3 BREAKER IN EXISTING PANEL "CC1" TO FEED NEW RTU-2, 4#6, 1#10G, 1-1/4 C. PROVIDE ALL NECESSARY HARDWARE FOR MOUNTING BREAKERS.
4. PROVIDE AND INSTALL NEW 30/2 BREAKER IN EXISTING PANEL "D1" TO FEED NEW CU-1, 3#10, 1#10G, 3/4 C. PROVIDE ALL NECESSARY HARDWARE FOR MOUNTING BREAKERS.
5. PROVIDE ALL PROGRAMMING AND WIRING NECESSARY FOR A COMPLETE INSTALLATION.
6. PROVIDE AND INSTALL NEW 30/2 BREAKER IN EXISTING PANEL "D1" TO FEED NEW CU-1, 3#10, 1#10G, 3/4 C. PROVIDE ALL NECESSARY HARDWARE FOR MOUNTING BREAKERS.
7. PROVIDE AND INSTALL NEW 50/3 BREAKER IN EXISTING PANEL "FF1" TO FEED NEW RTU-4, 4#6, 1#10G, 1-1/4 C. PROVIDE ALL NECESSARY HARDWARE FOR MOUNTING BREAKERS.

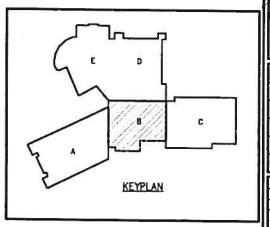
HVAC WIRING NOTES:

- RTU2 — RTU2, 41.0MCA, 480V., 3PH. PROVIDE A 60/3 DISCONNECT WITH 45AMP. FUSES. 1-1/4", 3#4, #8GND. VERIFY LOCATION.
- RTU3 — RTU3, 19.4MCA, 208V., 1PH. PROVIDE A 30/2 DISCONNECT WITH 30AMP. FUSES. 1", 2#8, #10GND. VERIFY LOCATION.
- RTU4 — RTU4, 45.0MCA, 480V., 3PH. PROVIDE A 60/3 DISCONNECT WITH 50AMP. FUSES. 1-1/4", 3#4, #8GND. VERIFY LOCATION.
- DSS1 — DSS-1, 1.0MCA, 208V., 1PH. INDOOR UNIT POWERED BY RESPECTIVE OUTDOOR UNIT. PROVIDE 1"C WITH CABLING AS REQUIRED. PROVIDE 120V FOR CONDENSATE PUMP AS REQUIRED.
- CU1 — CU-1, 19.0MCA, 208V., 1PH. PROVIDE A 30/2 DISCONNECT WITH 30AMP. FUSES. 3/4", 2#12, #12GND.
- BC1 — AIR CONDITIONING CONTROL SYSTEM. CONNECT TO DEDICATED 120V CIRCUIT IN PANEL "MUT". 3/4", 2#12, #12GND.

VERIFY NAMEPLATE RATINGS PRIOR TO ROUGH-IN.

PANELBOARD GENERAL NOTE:

ELECTRICAL CONTRACTOR SHALL TRACE ALL EXISTING CIRCUITS PRIOR TO STARTING WORK AND VERIFY SPACE FOR NEW CONNECTIONS AND RE-CONNECTING TO EXISTING CIRCUITS. AFTER WORK IS COMPLETE, FURNISH AND INSTALL A NEW DIRECTORY LISTING ALL BREAKERS NEW AND EXISTING.



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UNION COUNTY HIGH SCHOOL ROOFTOP UNITS

PARTIAL FLOOR PLAN "B" - HVAC NEW WORK

RONALD ALAN CARTER — REGISTERED ENGINEER — NO. 104655 — STATE OF TENNESSEE

JOB NO:	120064
FILE:	120064
DRAWN:	CLM
DESIGNED:	CLM
CHECKED:	RAC
DATE:	11-08-21

REVISIONS:

E2

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UNION COUNTY HIGH SCHOOL
ROOFTOP UNITS
LEGENDS, SCHEDULES & DETAILS

JOB NO:	120064
FILE:	120064
DRAWN:	MAW
DESIGNED:	MAW
CHECKED:	KLS
DATE:	11-08-21
REVISIONS:	

M1

PACKAGE HEAT PUMP SCHEDULE

DRAWING SYMBOL	TOTAL CFM	CFM OA	MIN. E.S.P.	EVAP. FAN HP	COOLING (MBH) TOTAL	COOLING (MBH) SENSIBLE	HEAT (MBH) @ 47°	AUX. HEAT (kW)	MCA	MOCP	EER	VOLTAGE	WEIGHT (LBS.)	MAKE/MODEL#	SMOKE DETECTORS	CO_2 SENSORS	NOTES
RTU 1	2,000	500	0.5	1.0	61.0	48.8	57.4	12.0	33.0	35.0	12.3	480/3	1,071	TRANE WSC060	✓		SEE BELOW
RTU 2	2,000	500	0.5	1.0	61.0	48.8	57.4	18.0	41.0	45.0	12.3	480/3	1,071	TRANE WSC060	✓		SEE BELOW
RTU 3	800	200	0.5	1/3	61.0	48.8	22.1	12.0	19.4	30.0	12.0	208/1	1,071	TRANE WSC060			SEE BELOW
RTU 4	3,000	750	0.5	1.0	95.3	74.6	84.5	18.0	45.0	50.0	11.0	480/3	1,185	TRANE WSC092	✓		SEE BELOW

ACCESSORIES AND FEATURES: (BY EQUIPMENT INSTALLER)
* TRANE IS THE BASE OF DESIGN. HIGH EFFICIENCY CARRIER, LENNOX, YORK OR APPROVED SUBSTITUTE.
* 5-YEAR COMPRESSOR WARRANTY.
* FILTER RACK AND THROW-AWAY 2" THICK FILTER FURNISHED WITH UNIT.
* UNITS SHALL HAVE PHENOMENAL-AIRE-SERIES MODEL R-6 AIR PURIFIER.
* ACCESSORIES SHALL INCLUDE CONTROLS TO PREVENT SUPPLEMENTAL HEAT FROM COMING ON UNTIL UNIT BALANCE POINT IS REACHED.
* SUBMIT BALANCE POINT CALCULATIONS AND GRAPHS WITH EQUIPMENT SUBMITTAL.
* FEATURES SHALL INCLUDE HIGH AND LOW PRESSURE CUTOUTS, ANTI-CYCLE TIMER, SUCTION LINE ACCUMULATOR, DEMAND INITIATION AND POSITIVE TERMINATION DEFROST CONTROL.
* COOLING CAPACITIES ARE AT 80/67° F INDOOR AND 95° F OUTDOOR TEMPERATURE.
* HEATING CAPACITIES ARE AT 70° F INDOOR AND 47° F OUTDOOR TEMPERATURE.
* EQUIPMENT TO ARI CERTIFIED AND U.L. APPROVED.
* AUTOMATIC CHANGEOVER THERMOSTAT WITH EMERGENCY HEAT SUBBASE AND LOCKING PLASTIC THERMOSTAT COVER.
* UNITS WITH 2,000 CFM AND OVER SHALL HAVE DUCT MOUNTED SMOKE DETECTORS IN SUPPLY AND RETURN. SMOKE DETECTORS SHALL MEET IMC AND NFPA REQUIREMENTS.
* COOLING CAPACITIES DO NOT HAVE FAN MOTOR HEAT DEDUCTED.
* UNIT SHALL BE PROVIDED WITH LOUVERED HAIL GUARDS.
* UNIT SHALL HAVE HOT GAS REHEAT CAPABILITY.
* UNITS SHALL HAVE DIFFERENTIAL ENTHALPY CONTROL VENTILATION CONTROLLED ECONOMIZERS.
* UNITS SHALL HAVE DOWNFLOW DISCHARGE.
* SUBMIT SHOP DRAWINGS SHOWING COOLING CAPACITIES WITH MOTOR HEAT AS NOTED.
* SEE SPECIFICATIONS FOR OTHER PERTINENT INFORMATION.

** UNITS SHALL HAVE PHASE MONITOR.

MECHANICAL LEGEND

STANDARD ABBREVIATIONS AND NOTATIONS

CD	CEILING DIFFUSER	EX	EXHAUST DUCTWORK	RE	RETURN DUCTWORK
CE	CEILING EXHAUST	FA	FROM ABOVE	RR	RETURN REGISTER
CR	CEILING RETURN	FFE	FINISHED FLOOR ELEVATION	SR	SUPPLY REGISTER
CRD	COUNTER BALANCED RELIEF DAMPER	NIC	NOT IN CONTRACT	SU	SUPPLY DUCTWORK
DN	DOWN	OA	OUTDOOR AIR DUCTWORK		
ER	EXHAUST REGISTER	RD	RETURN DIFFUSER		

SYMBOL	DESCRIPTION
18x18 / 18x18 / 18x18	RECTANGULAR DUCT: MANUAL OPPOSED BLADE DAMPER WITH LOCKING QUADRANT, LEVER OPERATOR, OF STEEL CONSTRUCTION. LOUVERS & DAMPERS MODEL CD-400; KRUEGER MODEL 080-DM TYPE 2 OPERATION FOR LESS THAN 10" WIDE.
18ø / 18ø / 18ø	ROUND DUCT: ROUND BLADE CONTROL DAMPER OF STEEL CONSTRUCTION WITH MANUAL OPERATOR LOUVERS AND DAMPERS MODEL CD-600.
18x18 / D	SHEET METAL CONNECTORS, INC. HIGH EFFICIENCY TAKEOFF WITH DAMPER AND LOCKING QUADRANT FOR ROUND DUCT TAKEOFFS FROM RECTANGULAR DUCTWORK. INCREASE MAIN DUCT SIZE AT FITTING TO ACCOMODATE ITS INSTALLATION IF REQUIRED TO MEET SMACNA AND MANUFACTURER'S INSTRUCTIONS. ALL BRANCH TAKEOFFS SHALL HAVE BALANCING DAMPERS FOR BALANCING PURPOSES. DIMENSION: D = RUNOUT DIAMETER (6"-14")
	RECTANGULAR ELBOW WITH SINGLE THICKNESS TURNING VANES OF STEEL CONSTRUCTION.
	POINT OF CONNECTION OF NEW TO EXISTING
	POINT OF DISCONNECTION FROM EXISTING
DN / UP	SUPPLY DUCT RISER
DN / UP	RETURN DUCT RISER
DN / UP	EXHAUST DUCT RISER
	FLEX DUCT
XXX / X	EQUIPMENT TAG
	ELECTRICAL PANEL - AVOID INSTALLING EQUIPMENT IN PANEL BOARD SPACE PER ARTICLE 110 OF THE NATIONAL ELECTRIC CODE.
UC	UNDERCUT DOOR 3/4"
T XX-1 / S XX-1	THERMOSTAT - XXX-1 WALL SWITCH - XXX-1
1	REFER TO NOTE #1
DSD	DUCT SMOKE DETECTOR, SUPPLIED BY MANUFACTURER.

GRILLES AND DIFFUSERS

SYMBOL	MANUFACTURER	MODEL	DESCRIPTION	ACCESSORIES AND FEATURES
	METALAIRE	5800	SQUARE, LOUVER FACE CEILING SUPPLY DIFFUSER WITH REMOVABLE CORE, LAY-IN BORDER OR FLANGED MOUNT. FACTORY PROVIDE ROUND ADAPTER.	• 24x24 LAY IN OR FLANGED MOUNT FRAME • ALUMINUM OPPOSED BLADE DAMPER • 2 OR 3 WAY PATTERN WHERE NOTED • STEEL CONSTRUCTION • NC < 30
PCD	METALAIRE	7000	PERFORATED CEILING SUPPLY DIFFUSER WITH LAY-IN BORDER, FLUSH FACE. FACTORY PROVIDE ROUND ADAPTER.	• 24x24 LAY IN OR SURFACE MOUNT • ALUMINUM OPPOSED BLADE DAMPER • 2 OR 3 WAY PATTERN WHERE NOTED • ALUMINUM CONSTRUCTION • NC < 30
CR/RFA	METALAIRE	CCS	EGG CRATE TYPE WITH 1/2" SPACING, FLANGED OR LAY-IN BORDER AS REQUIRED TO MATCH CEILING CONSTRUCTION.	• 12x12 OR 24x24 LAY IN OR FLANGED FRAME • ALUMINUM OPPOSED BLADE DAMPER • ALUMINUM CONSTRUCTION • COLOR SHALL BE WHITE PER ARCHITECT • NC < 30

CEILING SUPPLY DIFFUSER CFM	SQUARE NECK SIZE	ROUND NECK SIZE	DUCTED CEILING RETURN/EXHAUST GRILLE CFM	SQUARE NECK SIZE	NON-DUCTED CEILING RETURN/EXHAUST GRILLE CFM	SQUARE NECK SIZE	FLEXIBLE DUCT SIZES TO SUPPLY DIFFUSERS CFM	ROUND NECK SIZE
0-100	6x6	6"ø	0-150	8x8	0-350	12x12	0-100	6"ø
101-250	9x9	8"ø	151-350	12x12	351-600	16x16	101-250	8"ø
251-400	12x12	10"ø	351-650	16x16	601-1200	22x22	251-400	10"ø
401-600	15x15	12"ø	651-1000	22x22	1201-3000	24x48	401-600	12"ø
601-800	18x18	14"ø	1001-3000	24x48			601-800	14"ø

ROOF RELIEF HOOD SCHEDULE

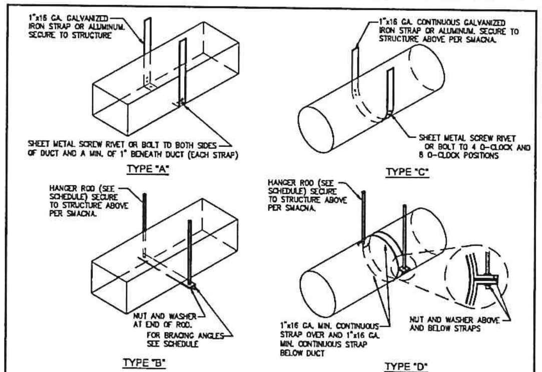
DRAWING SYMBOL	SERVES	FUNCTION	CFM	THROAT VELOCITY (FPM)	STATIC P.D. IN. Wg	THROAT AREA (SQ.FT)	MANUFACTURER	MODEL#
RH 1	RTU-1	RELIEF AIR	1,500	463	0.03	3.24	GREENHECK	GRSR-24
RH 2	RTU-2 & 4	RELIEF AIR	3,750	495	0.04	7.58	GREENHECK	WRH

ACCESSORIES AND FEATURES (BY EQUIPMENT SUPPLIER)
* GREENHECK IS BASIS OF DESIGN, LOREN COOK, TWIN CITY FAN & BLOWER, DAYTON OR APPROVED SUBSTITUTE.
* RELIEF HOODS: ALUMINUM HOUSING; GALVANIZED BIRD/INSECT SCREEN; 12" HIGH INSULATED ROOF CURB TO MATCH SLOPE & CONSTRUCTION OF ROOF.
* RELIEF HOODS SHALL HAVE GRAVITY DAMPER SET TO OPEN 0.05" W.C.

EXHAUST FAN SCHEDULE

DRAWING SYMBOL	LOCATION	AMCA CFM	S.P. IN WATER	RPM	TIP SPEED	WATTS	TYPE	VOLTAGE	SONES	WEIGHT LBS.	MANUFACTURER & MODEL NO.
EF 1	COSMOTOLOGY	300	0.5	1,350	2,386	151	CEILING	120/1	11.1	31	GREENHECK SP-A390

ACCESSORIES AND FEATURES:
* GREENHECK IS BASIS OF DESIGN. LOREN COOK, TWIN CITY FAN & BLOWER, DAYTON OR APPROVED SUBSTITUTE.
* CEILING FANS: PLASTIC INLET GRILLE; INSULATED HOUSING; CENTRIFUGAL FAN; BACKDRAFT DAMPER; RECTANGULAR-TO-ROUND DUCT ADAPTER; WALL CAP WC; HANGING ISOLATION KIT WITH SPRING ISOLATORS; UNIT MOUNTED SOLID STATE SPEED CONTROLLER WITH WALL SWITCH.



RECTANGULAR DUCT SCHEDULE

DUCT DIMENSIONS (INCHES)	TYPE HANGER	HANGER ROD DIA	BRACING ANGLE	MAXIMUM HANGER SPACING
UP THRU 18	A	-	-	8'-0" O.C.
19 THRU 30	A OR B	5/16"	1.5 x 1.5 x 1/8	8'-0" O.C.
31 THRU 60	B	5/16"	1.5 x 1.5 x 1/8	8'-0" O.C.
61 THRU 96	B	3/8"	1.5 x 1.5 x 3/16	8'-0" O.C.
OVER 96	B	1/2"	2 x 2 x 1/4	4'-0" O.C.

* ALSO PROVIDE 3 HANGERS AT EACH TAKE-OFF OR BRANCH

- FOR MORE THAN ONE DUCT ON ONE HANGER TYPE "B", "C", OR "D" MAY BE USED. SIZE OF HANGER WILL BE SELECTED ON SUM OF DUCT WIDTHS EQUAL TO MAXIMUM WIDTH OF SCHEDULE

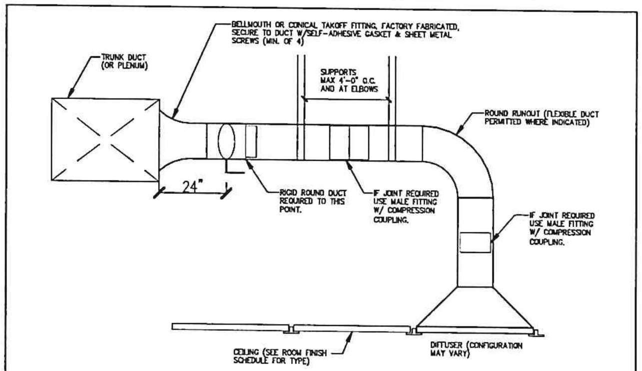
ROUND DUCT SCHEDULE

DUCT DIAMETER (INCHES)	TYPE HANGER	HANGER ROD DIA	BRACING ANGLE	MAXIMUM HANGER SPACING
UP THRU 18	C	-	-	8'-0" O.C.
19 THRU 30	D	5/16"	-	8'-0" O.C.
31 THRU 60	D	3/8"	-	8'-0" O.C.
61 THRU 96	D	3/8"	-	8'-0" O.C.
OVER 96	D	1/2"	-	4'-0" O.C.

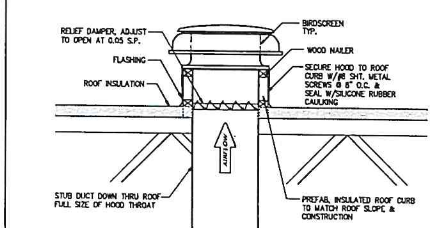
* ALSO PROVIDE 3 HANGERS AT EACH TAKE-OFF OR BRANCH

- ALL ROUND DUCTS TO BE SUPPORTED INDIVIDUALLY.
- SELECT HANGERS FOR OVAL DUCT BASED ON EQUIVALENT DUCT DIAMETER

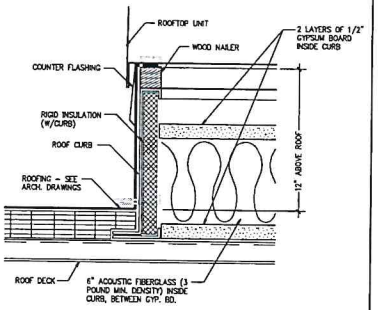
DUCT HANGER DETAIL
SCALE: N.T.S.



ROUND DUCT TAKE-OFF DETAIL
SCALE: N.T.S.



RELIEF HOOD DETAIL
SCALE: N.T.S.

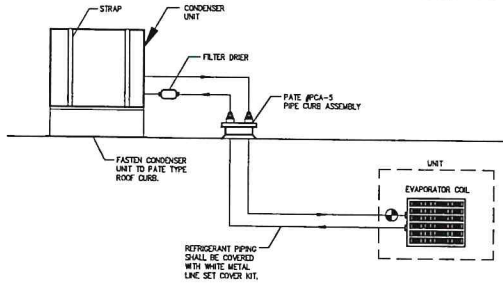


ROOFTOP AIR UNIT CURB DETAIL

SCALE: N.T.S.

NOTES:

1. PROVIDE STRUCTURAL SUPPORTS AS REQUIRED TO MAKE INSTALLED UNIT LEVEL.
2. VERIFY ROOF SLOPE & CONSTRUCTION & PROVIDE CURB TO MATCH.



TYPICAL DUCTLESS SYSTEM

SCALE: N.T.S.

NOTES:

1. PITCH ALL HORIZONTAL LINES A MINIMUM OF 1/2" IN 10 FEET IN THE DIRECTION OF REFRIGERANT FLOW.
2. SIZE AND INSTALL REFRIGERATION PIPING IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
3. MANUFACTURER SHALL SUBMIT A COMPUTER PRINTOUT SHOWING CALCULATED PIPE SIZES, LENGTHS OF RUN, TRAP LOCATIONS AND SIZES, AND ALL OTHER NECESSARY REQUIREMENTS.

Min Floor or Wall Thkns In.	Max Pipe Diam In.	Nom Pipe Covering Thkns In.	Annular Space In.	F Rating Hr	T Rating Hr
2-1/2	4	1 or 1-1/2	1/2 to 2-3/8	2	1
4-1/2	4	2	1/4 to 3-3/8	2	1-1/2
2-1/2	12	1	1/2 to 1-1/2	2	1/2
4-1/2	12	1	1/2 to 2-3/8	3	1
2-1/2	12	1/2	1/2 to 2-3/8	2	0

1. FLOOR OR WALL ASSEMBLY - MIN 2-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150) PCF CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS. MAX DIAM OF OPENING IS 18 IN.

   SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

1A. STEEL SLEEVE(OPTIONAL, NOT SHOWN) - NOM 10 IN. (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY. SLEEVE MAY EXTEND A MAX OF 2 IN. ABOVE TOP OF FLOOR OR BEYOND EITHER SURFACE OF WALL. T RATING IS 0 HR WHEN SLEEVE IS USED.

2. THROUGH PENETRANT - NOM 4 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER PIPE, NOM 12 IN. DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. DIAM (OR SMALLER) CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE OR NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE CENTERED IN THE OPENING AND RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY.

3. PIPE COVERING(NON 1/2 TO 2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET, LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT. SEE (BRGU) CATEGORY IN BUILDING

   PIPE AND EQUIPMENT COVERING - MATERIALS*
   MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

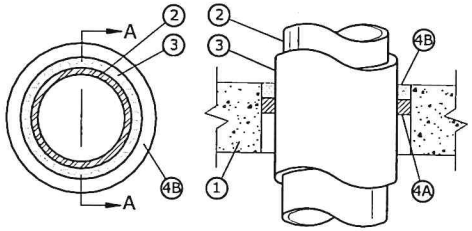
4. FIRESTOP SYSTEM- THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

   A. PACKING MATERIAL - MIN 1 IN. THICKNESS OF FIRMLY PACKED MINERAL WOOL BATT INSULATION USED AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR SLEEVE OR FROM BOTH SURFACES OF WALL AS REQUIRED TO

   B. ACCOMMODATE THE REQUIRED THICKNESS OF CAULK FILL MATERIAL (ITEM B).- APPLIED TO FILL THE ANNULAR FILL VOID OR CAVITY MATERIAL* - CAULK OR SEALANT SPACE FLUSH WITH THE TOP SURFACE OF THE FLOOR OR SLEEVE OR FLUSH WITH BOTH SURFACES OF WALL. WHEN NOM PIPE COVERING THICKNESS IS 2 IN., MIN THICKNESS OF CAULK OR SEALANT FILL MATERIAL IS 2 IN. WHEN NOM PIPE COVERING THICKNESS IS 1-1/2 IN. OR LESS, MIN THICKNESS OF CAULK OR SEALANT FILL MATERIAL IS 1 IN.

   THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE DEPENDENT UPON THE THICKNESS OF THE FLOOR OR WALL, THE SIZE OF PIPE, THE THICKNESS OF PIPE COVERING MATERIAL AND THE SIZE OF THE ANNULAR SPACE (BETWEEN THE PIPE COVERING MATERIAL AND THE EDGE OF THE CIRCULAR THROUGH OPENING), AS SHOWN IN THE FOLLOWING TABLE:

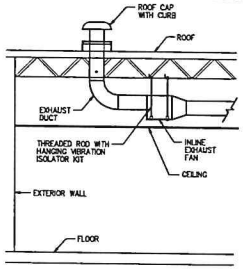
SYSTEM NO. C-AJ-5001
(FORMERLY SYSTEM NO. 91) F RATINGS - 1-1/2, 2 AND 3 HR (SEE ITEM 4) T RATINGS - 0, 1/2, 3/4 AND 1 HR (SEE ITEMS 1A AND 4) L RATING AT AMBIENT - 2 CFM PER SQ FT L RATING AT 400 F - LESS THAN 1 CFM PER SQ FT



SECTION A-A

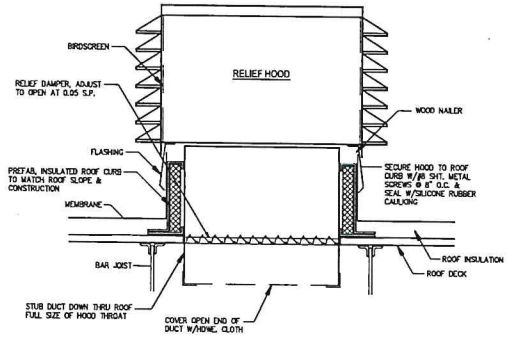
FIRESTOP PENETRATION FOR RATED WALLS

SCALE: N.T.S.



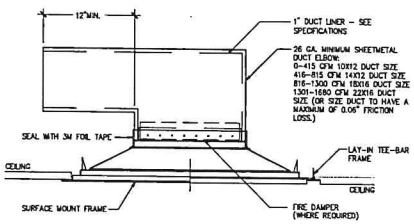
CEILING EXHAUST FAN DETAIL

SCALE: N.T.S.



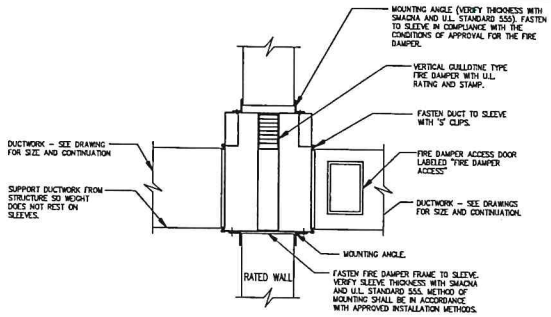
ROOFTOP RELIEF HOOD DETAIL

SCALE: N.T.S.



TYPICAL CEILING PLENUM RETURN DETAIL

SCALE: N.T.S.



DRAWING SYMBOL
FD

VERTICAL FIRE DAMPER DETAIL

SCALE: N.T.S.

NOTE:

COMPLETED INSTALLATION SHALL COMPLY WITH THE THIRD EDITION OF THE SMACNA FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE FOR HVAC SYSTEMS. DAMPER INSTALLATION SHALL BE IN ACCORDANCE W/MFRS. INSTRUCTIONS.

WWR ENGINEERS INC.
WEST, WELCH, REED ENGINEERS, INC.
ELECTRICAL & MECHANICAL ENGINEERING
5410 BALL CAMP PIKE
KNOXVILLE, TENNESSEE
PHONE: (865) 689-2451
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UNION COUNTY HIGH SCHOOL ROOFTOP UNITS

DETAILS

NEAL L. STUCKEY
REGISTERED PROFESSIONAL ENGINEER
AGRICULTURE
No. 81811
STATE OF TENNESSEE

JOB NO:	120064
FILE:	120064
DRAWN:	MAW
DESIGNED:	MAW
CHECKED:	KLS
DATE:	11-08-21

REVISIONS:

M2

PACKAGE UNIT - SEQUENCE OF OPERATION FOR RTU-1 THRU 4

OCCUPANCY CONTROL

THE OCCUPIED MODE SHALL BE ACTIVATED BY THE WALL-MOUNTED 7-DAY PROGRAMMABLE THERMOSTAT. THE OCCUPIED MODE IS DETERMINED BY OCCUPANCY SCHEDULES THAT CAN BE SET-UP AND CHANGED BY THE OPERATOR. OCCUPIED MODE CAN ALSO BE ACTIVATED BY INITIATING AN AFTER HOURS OVERRIDE, LOCATED ON THE THERMOSTAT.

FAN ACTIVATION AND ALARM

ANYTIME THERE IS A CALL FOR UNIT OPERATION, THE SUPPLY FAN SHALL BE ACTIVATED. THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY WHEN THE UNIT IS IN THE OCCUPIED MODE AND SHALL CYCLE ON A CALL FOR COOLING OR HEATING DURING NIGHT SET BACK OPERATION. FAN OPERATION SHALL BE LOCKED OUT IF FLOW IS NOT PROVEN OR DURING FIRE ALARM SHUTDOWN COMMAND FROM THE FIRE ALARM SYSTEM.

ECONOMIZER/MIXING BOX DAMPER CONTROL

DURING THE OCCUPIED MODE OF OPERATION THE OUTSIDE AIR DAMPER SHALL OPEN TO ITS MINIMUM SETTING UNLESS OUTSIDE AIR CONDITIONS ALLOW FOR ECONOMIZER OPERATION.

IF OUTSIDE AIR CONDITIONS ARE SUITABLE FOR FREE COOLING, AS DETERMINED BY THE ENTHALPY SENSORS, AND THE UNIT IS IN THE OCCUPIED MODE OF OPERATION, THE ECONOMIZER SHALL MODULATE THE RETURN AIR AND THE OUTSIDE AIR DAMPERS TO MAINTAIN ROOM TEMPERATURE. AS THE SIGNAL VARIES BETWEEN 0 AND 100, THE ECONOMIZER DAMPERS SHALL MODULATE BETWEEN THE MINIMUM POSITION AND FULL OUTSIDE AIR. WHEN THE SYSTEM IS OPERATING IN OCCUPIED MODE, THE MINIMUM POSITION IS SET TO THE USER SPECIFIED ECONOMIZER MINIMUM POSITION. WHEN THE UNIT IS OFF, THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND THE RETURN AIR DAMPER SHALL FULLY OPEN.

THE BAROMETRIC RELIEF DAMPER IN THE UNIT AND BUILDING RELIEF HOOD SHALL RELIEVE EXCESS BUILDING PRESSURE DURING ECONOMIZER OPERATION.

COOLING OPERATION

WHEN THE COOLING COMPRESSOR OPERATION IS ALLOWED, A COMPRESSOR IS ACTIVATED IF THE SPACE TEMPERATURE IS ABOVE THE SPACE TEMPERATURE SET POINT. WHEN EQUIPPED WITH MULTIPLE COMPRESSORS, ONLY ONE COMPRESSOR SHALL BE ACTIVATED EVERY 3 MINUTES. IF THE SUPPLY TEMP DROPS BELOW THE SUPPLY TEMP SET POINT PLUS DEADBAND A COMPRESSOR SHALL BE DEACTIVATED.

WHEN THE UNIT IS ACTIVATED AFTER BEING IN THE UNOCCUPIED MODE OR THE SPACE TEMPERATURE IS GREATER THAN 82 DEGREES F (ADJUSTABLE), THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. COOLING SHALL BE ACTIVATED AS INDICATED ABOVE. WHEN THE SPACE TEMPERATURE REACHES 78 DEGREES F (ADJUSTABLE) OR LESS, THE COOL-DOWN MODE SHALL BE DEACTIVATED AND THE UNIT SHALL RETURN TO ITS NORMAL MODE OF OPERATION.

DEHUMIDIFICATION OPERATION

ON A RISE IN SPACE HUMIDITY ABOVE THE MAXIMUM SET POINT OF 55% RH (ADJUSTABLE), AS SENSED BY THE DUCT MOUNTED HUMIDITY SENSOR, THE HUMIDITY SENSOR SHALL CAUSE THE COOLING CYCLE AND THE 3-WAY VALVE TO BE ENERGIZED. THE 3-WAY VALVE SHALL DIRECT HOT DISCHARGE GAS INTO A SEPARATE DESUPERHEATING CONDENSER CIRCUIT THAT REHEATS THE CONDITIONED AIR. WHEN THE SENSOR IS SATISFIED, THE SYSTEM SHALL SWITCH BACK TO NORMAL AIR CONDITIONING OPERATION.

HEATING OPERATION

ON A DROP IN SPACE TEMPERATURE BELOW THE HEATING TEMPERATURE SETPOINT OF 70° F (ADJ.), AS SENSED BY THE WALL MOUNTED THERMOSTAT, THE HEATING CYCLE SHALL BE ACTIVATED. IF THE UNIT IS IN THE HEATING MODE AND THE HEAT PUMP CAN NOT MAINTAIN SPACE TEMPERATURE, THE AUXILIARY ELECTRIC HEATING COIL SHALL BE ENERGIZED. WHEN THE TEMPERATURE RISES, THE REVERSE SHALL OCCUR.

SAFETIES

ON A GENERAL FIRE ALARM OR IF EITHER SMOKE DETECTOR SENSES SMOKE, THE UNIT'S FAN SHALL BE DEACTIVATED AND THE OUTSIDE AIR DAMPER SHALL FULLY CLOSE.

SEQUENCE OF OPERATION - EXHAUST FANS

ALL EXHAUST FANS SHALL BE CONTROLLED BY WALL SWITCHES LOCATED IN THEIR INDIVIDUAL SPACES.

DUCTLESS SPLIT SYSTEM - SEQUENCE OF OPERATION

DUCTLESS UNITS:
(DSS-1)

MONITOR SPACE TEMPERATURE VIA WALL MOUNTED SENSOR AND PROVIDE THE FOLLOWING ALARMS:

-HIGH TEMPERATURE
-LOW TEMPERATURE

HEAT, VENTILATING & AIR CONDITIONING SPECIFICATIONS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. PROVIDE ALL LABOR, TOOLS, AND MATERIAL TO CONSTRUCT A COMPLETE HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM AS HEREIN SPECIFIED AND SHOWN ON THE DRAWINGS. PROVIDE EVERYTHING NECESSARY FOR A COMPLETE AND SATISFACTORY INSTALLATION, WHETHER OR NOT SPECIFICALLY SHOWN OR SPECIFIED. THIS INCLUDES ALL MISCELLANEOUS PARTS, DEVICES, CONTROLS, AND APPURTENANCES WHICH ARE REQUIRED TO COMPLETE THE JOB IN A SAFE AND PROPER OPERATING CONDITION. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE LOCAL MECHANICAL CODE, NFPA 90A AND ALL STATE AND LOCAL CODES AND REGULATIONS. PAY ALL FEES AND PERMITS. ALL EQUIPMENT SHALL BE U.L. OR ASME APPROVED AND BEAR SUCH LABEL WHERE APPROVAL IS APPLICABLE.

B. THE CONTRACTOR SHALL EXAMINE THE GENERAL AND SUPPLEMENTARY CONDITIONS, ALL OTHER CONTRACT DOCUMENTS, AND EXAMINE THE EXISTING CONDITIONS AT THE BUILDING SITE TO FAMILIARIZE THEMSELVES WITH THE PROVISIONS THEREIN AFFECTING THE MECHANICAL WORK.

C. THE CONTRACTOR IS REQUIRED TO SUBMIT TO THE ARCHITECT FOR APPROVAL A DIGITAL PDF SET OF MANUFACTURER'S SUBMITTAL DATA FOR ALL EQUIPMENT.

D. IN ADDITION TO MANUFACTURER'S WARRANTY, THE CONTRACTOR SHALL WARRANT EQUIPMENT AND WORKMANSHIP FOR ONE YEAR AFTER ACCEPTANCE AND SHALL MAKE GOOD ANY DEFECT IN MATERIAL AND WORKMANSHIP DURING THIS PERIOD WITHOUT COST TO THE OWNER.

1.2 CERTIFICATION

A. ALL ELECTRICAL COMPONENTS SHALL BE UL LABELED.

B. ALL UNITS SHALL BE RATED UNDER ARI CERTIFICATION PROGRAM.

1.3 CLEANING

A. GENERAL:

1. UPON COMPLETION OF THE CONTRACT AND PROGRESSIVELY AS THE WORK PROCEEDS, CLEAN UP ALL DIRT, DEBRIS, OIL, MATERIALS, ETC., AND REMOVE IT FROM THE SITE, KEEPING PREMISES IN A NEAT AND CLEAN CONDITION TO THE SATISFACTION OF THE ARCHITECT. SEE GENERAL CONDITIONS.

2. THOROUGHLY CLEAN ALL DUCTS, AIR DISTRIBUTION DEVICES AND APPARATUS CASINGS BEFORE FANS AND FILTERS ARE OPERATED. CLEAN OR RENEW ALL FILTERS AFTER THE EQUIPMENT HAS BEEN TESTED AND BEFORE TURNING OVER TO OWNER.

3. ALL FACTORY APPLIED FINISHES, IF NOT TO BE REPAINTED, SHALL BE TOUCHED-UP, COVERING ALL BARE PLACES, SCRATCHES, ETC.

4. ANY STOPPAGE, DISCOLORATION, OR OTHER DAMAGE TO PARTS OF THE BUILDING, ITS FINISH, OR FURNISHINGS DUE TO THE CONTRACTOR'S FAILURE TO PROPERLY CLEAN THE PIPING SYSTEM AND DUCT SYSTEMS SHALL BE REPAIRED BY THE CONTRACTOR WITHOUT COST TO THE OWNER.

PART 2 - PRODUCTS

2.1 PACKAGE ROOFTOP HEAT PUMP UNITS

A. THE UNITS SHALL BE COMPLETE FACTORY ASSEMBLED HEATING AND COOLING UNITS. THE ASSEMBLIES SHALL BE COMPLETE UL LISTED ELECTRIC HEATERS, COMPRESSOR, CRANKCASE HEATER, MOTORS, AIR COOLED CONDENSER, HEATING/COOLING COIL, STANDARD SIZE THROWAWAY FILTERS, RECEIVER, REFRIGERANT SPECIALTIES, INTERNAL WIRING, ALL PIPING, INSULATION, REFRIGERANT, MULTI-SPEED MOTOR, FAN MOTOR CONTROLS, INSULATED CABINETS, TIME GUARD CIRCUIT, AUTOMATIC DEFROST, EMERGENCY HEAT CONTROL, OUTDOOR THERMOSTATS, LOW VOLTAGE THERMOSTAT, DIFFERENTIAL ENTHALPY ECONOMIZER AND ALL REQUIRED SPECIALTIES, ACCESSORIES, AND CONTROLS FOR COMPLETE JOB.

B. THE UNITS SHALL HAVE THE CAPACITY CALLED FOR ON THE DRAWINGS. UNITS SHALL CARRY A 5-YEAR GUARANTEE ON THE REFRIGERANT CIRCUITS.

C. THE UNITS SHALL BE TRANE, LENNOX, CARRIER OR YORK.

2.2 DUCTWORK

A. ALL DUCTWORK, UNLESS OTHERWISE NOTED, SHALL BE GALVANIZED STEEL, CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SMACNA "HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE". SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS.

B. ALL SUPPLY AND RETURN DUCTWORK WITHIN 20 FT. OF THE AIR UNIT OR AS SHOWN ON THE DRAWING SHALL BE INTERNALLY LINED WITH 1-1/2" DUCT LINER. ALL OTHER SUPPLY, RETURN, AND FRESH AIR DUCT SHALL BE EXTERNALLY INSULATED WITH 2-3/16" DUCT WRAP.

C. DUCT LINER SHALL BE 1.5 POUND PER CUBIC FOOT DENSITY MEETING NFPA 90A STANDARDS, LINER SHALL BE 1" THICK OWENS-CORNING "QUIETR - ACOUSTICR" DUCT LINER, MINIMUM R VALUE EQUAL TO 6.0 HR-SQ.FT./BTU. DUCT LINER SHALL BE INSTALLED PER THE EFFECTIVE EDITION OF SMACNA "DUCT LINER APPLICATION STANDARD". LINER ADHESIVE SHALL COMPLY WITH NFPA 90A OR NFPA 90B AND WITH ASTM C 916.

D. DUCT WRAP SHALL BE EQUAL TO OWENS-CORNING "SOFTR", ALL SERVICE FIBER GLASS DUCT WRAP, TYPE 75 WITH FOIL REINFORCED VAPOR BARRIER, MINIMUM R VALUE EQUAL TO 6 HR-SQ.FT.-F/BTU. DUCT WRAP SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

E. DUCTWORK SIZES SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. WHERE SHEET METAL IS INTERNALLY LINED, INCREASE DUCT SIZE BOTH DIRECTIONS TO COMPENSATE FOR LINER.

F. FLEXIBLE DUCTWORK SHALL BE EQUAL TO FLEXMASTER TYPE 3M, INSULATED WITH MINIMUM R VALUE EQUAL TO 6.0 HR-SQ.FT.-F/BTU. MAXIMUM INSTALLED LENGTH SHALL BE FIVE FEET.

2.3 DUCTLESS SPLIT SYSTEM

A. THE UNIT SHALL BE FACTORY ASSEMBLED INCLUDING COIL, CONDENSATE DRAIN PAN, FAN MOTOR, WASHABLE FILTER, AND AIR PURIFYING FILTER. UNIT SHALL HAVE THE CAPABILITY TO BE CONTROLLED REMOTELY. UNIT SHALL BE UL LISTED.

B. CONDENSING UNIT MATERIALS OF CONSTRUCTION

1. CABINET:

A. FABRICATED OF G-60 GALVANNEALED STEEL
B. FINISHED WITH CORROSION INHIBITING, HIGH-GLOSS, POWDER COATED

2. FAN GUARD:

A. HEAVY-GAUGE, VINYL DIPPED WIRE

C. COMPRESSOR - HERMETICALLY SEALED, HIGH EFFICIENCY ROTARY OR RECIPROCATING TYPE, DEPENDING ON UNIT CAPACITY. MOTOR SHALL BE PSC TYPE WITH INTERNAL OVERLOAD PROTECTION. COMPRESSOR SHALL BE INSTALLED ON RESILIENT MOUNTINGS.

D. REFRIGERATION CIRCUIT - THE UNIT SHALL BE DELIVERED WITH PRECHARGED REFRIGERANT FOR THE CONDENSER COIL AND EVAPORATOR. CHARGING OF THE FIELD INSTALLED PIPING IS REQUIRED. UNIT REFRIGERATION VALVES SHALL BE PRIMORE, SOLID BRASS, FOR SWEAT CONNECTION.

E. CONDENSER COIL - CONDENSER COIL SHALL BE SEAMLESS, COPPER TUBING, ARRANGED IN STAGGERED CONFIGURATION, WITH ENHANCED ALUMINUM FINS. THE TUBES SHALL BE MECHANICALLY EXPANDED FOR SECURE BONDING TO FIN SHOULDER.

F. CONDENSER FAN/MOTOR - THE CONDENSER FAN SHALL BE A LARGE DIAMETER, HIGH EFFICIENCY, THREE BLADE PROPELLER TYPE, DIRECTLY CONNECTED TO THE TOTALLY ENCLOSED, 8 POLE, PSC MOTOR. INTERNAL, THERMAL PROTECTION OF THE MOTOR SHALL BE SUPPLIED.

E. HIGH PRESSURE CONTROL

H. INDOOR UNIT MATERIALS OF CONSTRUCTION

1. CABINET:

A. FABRICATED OF GALVANNEAL STEEL, WITH STRUCTURAL STIFFENERS
B. POWDER COATED FINISH

2. DISCHARGE GRILLE ASSEMBLY:

A. DUAL HORIZONTAL BLADES WITH AUTO SWING

3. CONDENSATE DRAIN PAN:

A. GALVANIZED STEEL WITH ANTI-CORROSION COATING

4. CABINET COLOR:

A. DESIGNER WHITE

I. AIR SYSTEMS - FAN SHALL BE TANGENTIAL TYPE, DIRECTLY MOUNTED TO THE MOTOR SHAFT. MOTOR SHALL BE PSC TYPE WITH OVERLOAD PROTECTION. AIR STREAM SURFACES SHALL BE INSULATED WITH 1/4" FIBERGLASS OR 1/8" VOLARA. FILTER SHALL BE PERMANENT, WASHABLE, AND USER ACCESSIBLE.

J. COIL - COIL SHALL BE SEAMLESS, COPPER TUBING, ARRANGED IN STAGGERED CONFIGURATION, WITH ENHANCED ALUMINUM FINS, TESTED TO 460 PSIG. THE TUBES SHALL BE MECHANICALLY EXPANDED FOR SECURE BONDING TO FIN SHOULDER.

K. CONTROLS/COMPONENTS - CONTROLS AND COMPONENTS INSTALLED AT THE FACTORY OR SUPPLIED SHALL INCLUDE:

1. RELAYS AND CONNECTIONS FOR CONDENSING UNIT

2. UNIT MOUNTED OPERATING CONTROLS SHALL INCLUDE:

A. WALL MOUNTED CONTROLLER (HARDWIRED)
B. FAN SPEED CONTROL
C. HEAT/COOL SWITCH WHEN APPLICABLE

2.4 REFRIGERANT PIPING SYSTEM

A. THE REFRIGERANT PIPING SHALL BE ASTM-B-280 TYPE ACR COPPER WITH WROUGHT COPPER FITTINGS AND HIGH TEMPERATURE SOLDER JOINTS, SIL-FOS, OR APPROVED SUBSTITUTE. THE PIPING SYSTEM SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING: CHARGING VALVES, SIGHT GLASS WITH MOISTURE INDICATOR, LIQUID LINE STRAINER DRIER, AND FLEXIBLE CONNECTORS WHERE REQUIRED. THE PIPING SHALL BE INSTALLED ACCORDING TO THE DIAGRAMS FURNISHED BY THE MANUFACTURER'S AUTHORIZED AGENT. THESE DIAGRAMS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION. THE PIPING SYSTEM SHALL BE TESTED AT 400 POUNDS WITH DRY NITROGEN UNTIL ALL LEAKS HAVE BEEN MADE TIGHT. AFTER THE PRESSURE TEST USE SUITABLE VACUUM PUMP TO EVACUATE THE SYSTEM TO AT LEAST 500 MICRONS, THEN CHARGE THE SYSTEM WITH REFRIGERANT AND OIL AS REQUIRED. PRIOR TO RUNNING THE REFRIGERANT EQUIPMENT, ALL SAFETY AND OPERATING DEVICES AND CONTROLS SHALL BE PROPERLY ADJUSTED AND TESTED FOR PROPER OPERATION AND PROTECTION OF THE EQUIPMENT.

B. REFRIGERANT PIPING EXTENDING THROUGH THE WALL SHALL BE SLEEVED, WATERPROOFED AND BE FLASHED WATERTIGHT.

C. INSULATE ALL REFRIGERANT SUCTION LINES ARMSTRONG ARMAFLEX II, 1" THICK FOR PIPE SIZES UP TO AND INCLUDING 1", 1-1/2" THICK FOR PIPE SIZES OVER 1". ALL EXTERIOR INSULATION SHALL BE ENCASED WITH 0.016 INCH SMOOTH ALUMINUM JACKET WITH WEATHER-TIGHT CONSTRUCTION.

2.5 HYDRONIC PIPING

A. COPPER PIPE: HARD OR SOFT DRAWN, ASTM 88 TYPE "K", "L" OR "M". JOINTS WITH 95-5 SOLDER ABOVE GROUND. JOINTS WITH SILVER SOLDER OR PHOS-COPPER BELOW FLOOR.

B. PVC PIPE: SCHEDULE 40, ASTMD 2665.

C. VALVES 2-1/2" AND SMALLER - BALL VALVE AS MANUFACTURED BY HAMMOND, APOLLO, AND WATTS.

D. PROVIDE ACCESS PANELS FOR ALL VALVES, DAMPERS, ETC.

E. INSTALL ALL PIPING AS NEATLY AS PRACTICABLE AS INDICATED AND DETAILED ON THE DRAWINGS. ARRANGE AND INSTALL PIPING STRAIGHT, LEVEL, PLUMB, AND AS DIRECT AS POSSIBLE. FORM RIGHT ANGLES AND PARALLEL LINES WITH THE STRUCTURES. KEEP PIPES CLOSE TO WALLS, PARTITIONS, CEILINGS, AND SLABS WHERE POSSIBLE. WHERE TWO OR MORE PIPES ARE LOCATED TOGETHER, RUN PARALLEL TO EACH OTHER AND SPACE AT DISTANCES WHICH WILL PERMIT APPLICATION OF FULL INSULATION AND ACCESS FOR SERVICING.

F. FLEXIBLE UNICELLULAR PIPING INSULATION, TEES AND ELBOWS FOR INSULATED PIPING SHALL BE FACTORY PREMOLDED INSULATION FITTINGS, SIMILAR TO THAT MANUFACTURED BY HAMFAB. ADHESIVES, SEALERS, AND PROTECTIVE FINISHES: AS RECOMMENDED BY INSULATION MANUFACTURER FOR APPLICATIONS INDICATED.

2.6 FIRE DAMPERS

A. ALL FIRE DAMPERS SHALL BE UL LABELED AND INSTALLED WHERE SHOWN ON THE DRAWING ACCORDANCE WITH NFPA 90A AND MANUFACTURERS INSTRUCTIONS.

2.7 CONTROL WIRING

A. ALL CONTROL WIRING TO BE FURNISHED AND INSTALLED BY THE MECHANICAL INSTALLER. ALL POWER WIRING SHALL BE BY THE ELECTRICAL INSTALLER.

2.8 SEALANT MATERIALS

A. WATER-BASED JOINT AND SEAM SEALANT: FLEXIBLE, ADHESIVE SEALANT, RESISTANT TO UV LIGHT WHEN CURED, U.L. 723 LISTED, AND COMPLYING WITH NFPA REQUIREMENTS FOR CLASS 1 DUCTS.

B. FLANGE GASKETS: BUTYL RUBBER OR EPDM POLYMER WITH POLYISOBUTYLENE PLASTICIZER.

2.9 CONDENSATE PIPING

A. EVAPORATOR CONDENSATE PIPING SHALL BE TYPE L COPPER. CHECK FOR LEAKS AT 10 FT. HEAD BEFORE CONCEALING PIPING.

PART 3 - EXECUTION

3.1 TESTS

A. TEST AND MAKE NECESSARY ADJUSTMENTS ON ALL AIR CONDITIONING EQUIPMENT TO CONFORM TO MANUFACTURER'S INSTRUCTIONS. FURNISH ALL LABOR, FUEL, AND ENERGY FOR TESTING.

B. PLACE EACH BLOWER OR FAN IN OPERATION AND MAKE REQUIRED ADJUSTMENT FOR CORRECT SPEED AND QUIET OPERATION. ADJUST ALL BALANCING DAMPERS SO THAT AIR DELIVERED TO OR EXHAUSTED FROM EACH ROOM COMPLIES WITH AMOUNTS INDICATED WITHIN 10%. TEST TO BE PERFORMED BY AN INDEPENDENT AABC OR NEBB CERTIFIED BALANCING COMPANY. PROVIDE BALANCE REPORT LISTING AIR VOLUME FOR EACH ITEM OF AIR CONDITIONING AND AIR HANDLING EQUIPMENT.

3.2 INSTALLATION

A. MOUNT UNITS AS SHOWN ON THE DRAWINGS.

B. PROVIDE COMPETENT FACTORY-TRAINED ENGINEER FOR START-UP TESTING AND INSTRUCTIONS TO OPERATING PERSONNEL.

C. THE MANUFACTURER'S AUTHORIZED AGENT SHALL BE RESPONSIBLE FOR ALL INSTALLATION AND CONTROL WIRING SUPERVISION, MOUNTING INSTRUCTIONS, SIZING REFRIGERANT PIPING, SPECIALTIES, AND ALL SUCH DETAILS. HIS AGENT SHALL BE RESPONSIBLE FOR START-UP AND FINAL CHECKOUT. HE SHALL, UPON JOB COMPLETION, NOTIFY THE OWNER, ARCHITECT AND ENGINEER THAT ALL UNITS HAVE BEEN CHECKED OUT, ARE OPERATING PROPERLY AND ARE SATISFACTORY IN EVER RESPECT.

3.3 PROJECT CLOSEOUT

A. BEFORE REQUESTING FINAL INSPECTION, THE FOLLOWING ITEMS MUST BE COMPLETED:

1. COMPLETE ALL WORK REQUIRED UNDER THIS DIVISION OF THE SPECIFICATIONS EXCEPT AS MAY BE PERMITTED HEREINAFTER.

2. SUBMIT TEST AND BALANCE REPORT FOR ALL AIR SYSTEMS.

3. SUBMIT SPECIFIC WARRANTIES AND ANY MAINTENANCE AGREEMENTS.

4. DELIVER TOOLS, SPARE PARTS, EXTRA STOCK, AND SIMILAR ITEMS.

5. INSTALL ALL ITEMS OF IDENTIFICATION ON ALL DUCTWORK, PIPING, AND EQUIPMENT.

B. BEFORE REQUESTING FINAL PAYMENT, THE FOLLOWING ITEMS MUST BE COMPLETED:

1. SUBMIT OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS.

2. DEMONSTRATE TO OWNER'S REPRESENTATIVE THE PROPER OPERATION OF ALL EQUIPMENT AND SYSTEMS.

HIGH WALL DUCTLESS SYSTEM SCHEDULE

DRAWING SYMBOL	CFM SETTINGS	CFM OA	EVAP. FAN (W)	COOLING (BTUH) TOTAL	COOLING (BTUH) SENSIBLE	TOTAL HEAT (BTUH) @ 47° F	AUX. HEAT (KW)	SEER	EER	COND. UNIT MCA	COND. UNIT MOCP	COND. UNIT VOLTAGE	COND. UNIT WEIGHT LBS	MANUFACTURER	MODEL NUMBER AIR UNIT	MODEL NUMBER COND. UNIT
DSS 1 / CU 1	635-705-775	—	—	24,000	—	—	—	21.4	12.2	19.0	26.0	208/1	151	MITSUBISHI	TPKA0A0241KA70A	TRUYA0241HA70NA

ACCESSORIES AND FEATURES: (BY EQUIPMENT INSTALLER)

* MITSUBISHI IS THE BASE OF DESIGN. HIGH EFFICIENCY LG, DAIKIN, PANASONIC, HITACHI OR APPROVED SUBSTITUTE.
* COOLING CAPACITIES ARE AT 80/67° F INDOOR AND 95° F OUTDOOR TEMPERATURE.
* HEATING CAPACITIES ARE AT 70° F INDOOR AND 47° F OUTDOOR TEMPERATURE.
* INDOOR UNIT SHALL BE POWERED BY OUTDOOR UNIT.
* UNITS SHALL HAVE PHENOMENAL-AIRE-SERIES MODEL D-1.2.1 AIR PURIFIER.
* WALL MOUNTED TEMPERATURE SENSOR (MODEL PAC-SE41TSE WIRED BACK TO EACH INDOOR UNIT).
* COOLING CAPACITIES DO NOT HAVE FAN MOTOR HEAT DEDUCTED.
* UNITS SHALL HAVE DRAIN PAN WITH CONDENSATE PUMP (REFCO GOBI II# 3004145 PUMP KIT).
* UNITS SHALL HAVE OVERFLOW SWITCH.
* SUBMIT SHOP DRAWINGS SHOWING COOLING CAPACITIES WITH MOTOR HEAT AS NOTED.

NOTE
** PROVIDE EW-50A MASTER CONTROLLER FOR MITSUBISHI DUCTLESS SPLIT SYSTEM.

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UNION COUNTY HIGH SCHOOL
ROOFTOP UNITS
SPECIFICATIONS, SCHEDULES & SEQUENCES

JOB NO:	120064
FILE:	120064
DRAWN:	MAW
DESIGNED:	MAW
CHECKED:	KLS
DATE:	11-08-21
REVISIONS:	

M3

DEMOLITION NOTES:

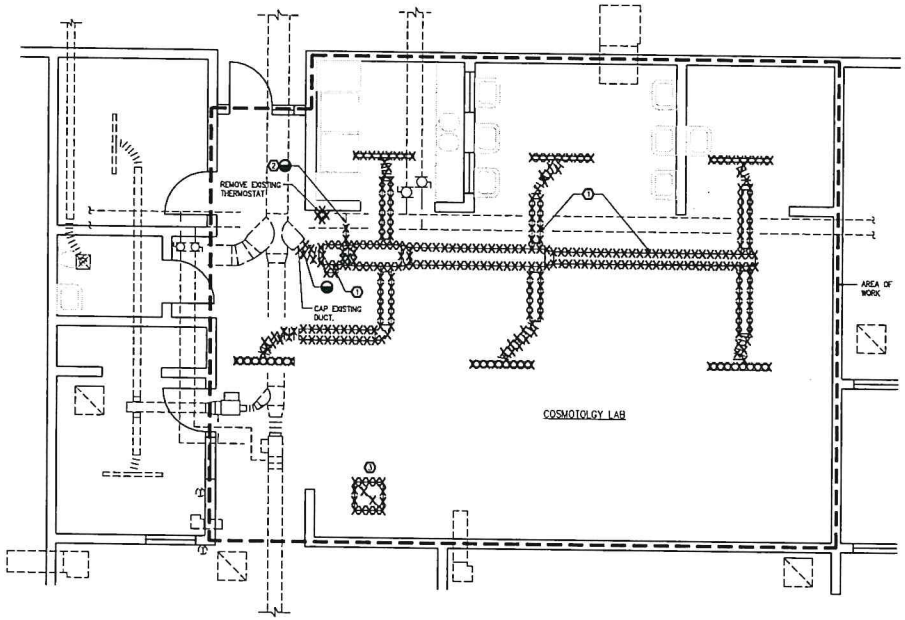
1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO PREPARING HIS BID IN ORDER TO FAMILIARIZE HIMSELF WITH CONDITIONS AS THEY EXIST AND SHALL STUDY ALL AVAILABLE BUILDING PLANS AND ARCHITECTURAL AND MECHANICAL DRAWINGS TO SATISFY HIMSELF AS TO THE EXTENT OF ALL CONTINGENCIES AND SHALL INCLUDE THE COST OF THE SAME IN HIS BID.
2. THE CONTRACTOR SHALL NOT CREATE INTERRUPTION OF THE EXISTING BUILDING SERVICES WITHOUT PRIOR SCHEDULING OF SUCH OUTAGES WITH THE OWNER.
3. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL EXISTING SERVICES IN FIELD.

KEY NOTES:

(1) EXISTING VAV UNIT, ACCESSORIES, DIFFUSERS AND DUCTWORK SHALL BE REMOVED AS SHOWN.

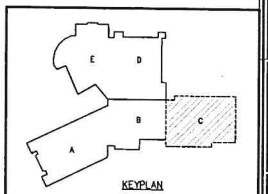
(7) REMOVE EXISTING BRANCH HOT WATER SUPPLY AND RETURN PIPING BACK TO MAIN PIPING, VALVE AND CAP OFF.

(13) REMOVE EXISTING RETURN REGISTER.



PARTIAL FLOOR PLAN "C" - HVAC DEMOLITION

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



KEYPLAN

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WWR PROJECT# 121078

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UNION COUNTY HIGH SCHOOL ROOFTOP UNITS

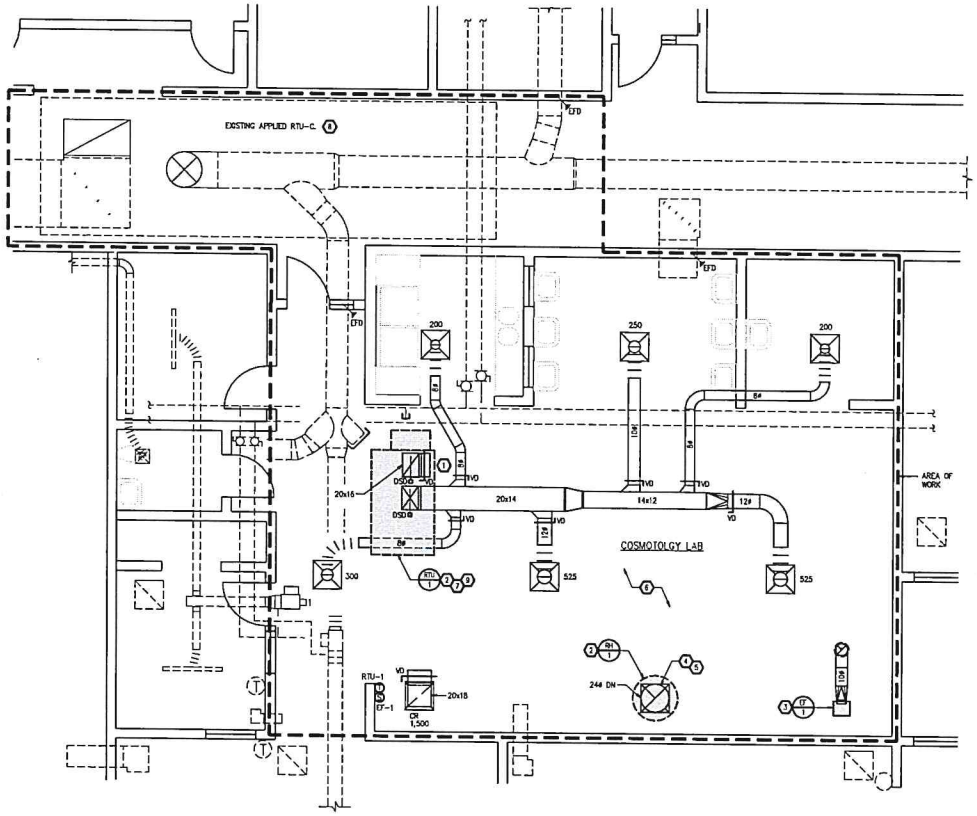
PARTIAL FLOOR PLAN 'C' - HVAC NEW WORK

NEAL STUCKEY
REGISTERED PROFESSIONAL ENGINEER
AGRICULTURE
NO. 016414
STATE OF TENNESSEE

JOB NO:	120064
FILE:	120064
DRAWN:	MAW
DESIGNED:	MAW
CHECKED:	KLS
DATE:	11-08-21

REVISIONS:

M4



PARITAL FLOOR PLAN "C" - HVAC NEW WORK

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

GENERAL NOTES:

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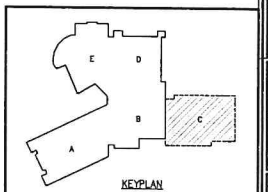
2. THE CONTRACTOR SHALL NOT CREATE INTERRUPTION OF THE EXISTING BUILDING SERVICES WITHOUT GIVING A MINIMUM 48 HOUR NOTICE OF SUCH OUTAGES WITH THE OWNER.
3. COORDINATE ROUTING OF DUCTWORK WITH ALL OTHER TRADES IN FIELD INCLUDING STRUCTURAL.
4. COORDINATE EXACT LOCATION OF GRILLES AND DIFFUSERS WITH EXISTING REFLECTED CEILING PLAN AND LIGHTING LAYOUT.
5. ROUTE DUCTWORK AS HIGH AS POSSIBLE ABOVE CEILING AND GENERALLY ABOVE WATER PIPING.
6. ALL ROOF WORK SHALL BE PERFORMED BY THE MANUFACTURER'S CERTIFIED INSTALLER SO NOT TO VOID ROOF WARRANTY.

KEY NOTES:

1. PROVIDE 1/2"X1/2" WELDED WIRE MESH SCREEN ON END OF RETURN DUCT. BALANCE TO 1,500 CFM.
2. UNIT LOCATED ON BUILDING ROOF.
3. ROUTE EXHAUST DUCT UP THROUGH ROOF AND TERMINATE WITH GREENHECK/ RCC-7 ROOF CAP. SEAL ALL ROOF PENETRATIONS WATER TIGHT. REFER TO DETAIL SHEET M2.
4. INSTALL COUNTER-BALANCED RELIEF DAMPER IN VERTICAL TRANSITION. ADJUST TO OPEN AT 0.05" S.P. TO RELIEVE ECONOMIZER AIR.
5. METALAIRE MODEL# CCS 24x24 CEILING RELIEF AIR GRILLE (RFA) LOCATED IN CEILING.
6. COORDINATE NEW SUPPLY, RETURN, RELIEF AND EXHAUST DUCTWORK ROUTING WITH EXISTING ELECTRICAL CONDUITS, LIGHTING, DUCTWORK, PIPING, STRUCTURAL BEAMS, ETC. CEILINGS SHALL BE REPAIRED TO MATCH SURROUNDING AREA.
7. INTERFACE CONTROLS WITH EXISTING JOHNSON CONTROLS INC. BAS. REFER TO PLAN FOR THERMOSTAT LOCATION. RE-ESTABLISH CAMPUS STANDARD SEQUENCE OF OPERATION.
8. CONTRACTOR SHALL ADJUST EXISTING APPLIED RTU-C TOTAL CFM DOWN TO 18,310.
9. CONNECT AIR PURIFIER TO UNSWITCHED POWER SOURCE.



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UNION COUNTY HIGH SCHOOL ROOFTOP UNITS

PARTIAL FLOOR PLAN "C" - HVAC NEW WORK

NEAL L. STUCKEY
REGISTERED PROFESSIONAL ENGINEER
AGRICULTURE
NO. 01848
STATE OF TENNESSEE

JOB NO:	120064
FILE:	120064
DRAWN:	MAW
DESIGNED:	MAW
CHECKED:	KLS
DATE:	11-08-21

REVISIONS:

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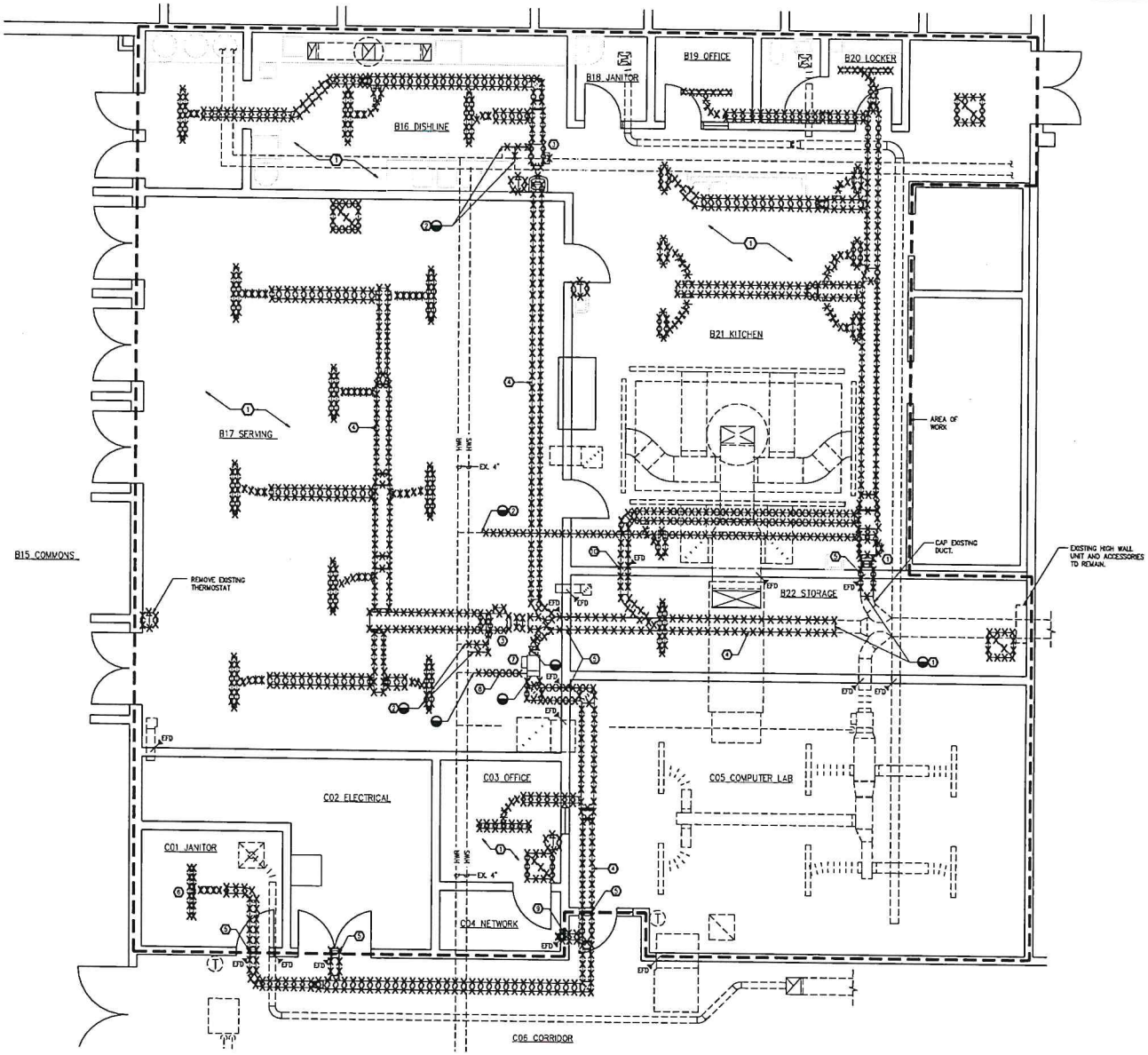


PARTIAL FLOOR PLAN "B" - HVAC DEMOLITION

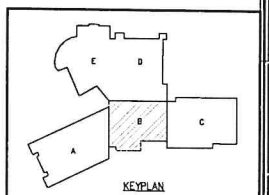
SCALE: 1/4"=1'-0"

DEMOLITION NOTES:

1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO PREPARING HIS BID IN ORDER TO FAMILIARIZE HIMSELF WITH CONDITIONS AS THEY EXIST AND SHALL STUDY ALL AVAILABLE BUILDING PLANS AND ARCHITECTURAL AND MECHANICAL DRAWINGS TO SATISFY HIMSELF AS TO THE EXTENT OF ALL CONTINGENCIES AND SHALL INCLUDE THE COST OF THE SAME IN HIS BID.
2. THE CONTRACTOR SHALL NOT CREATE INTERRUPTION OF THE EXISTING BUILDING SERVICES WITHOUT PRIOR SCHEDULING OF SUCH OUTAGES WITH THE OWNER.
3. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL EXISTING SERVICES IN FIELD.

KEY NOTES:

1. EXISTING VAV UNIT, ACCESSORIES, DIFFUSERS AND DUCTWORK SHALL BE REMOVED AS SHOWN.
2. REMOVE EXISTING HOT WATER SUPPLY AND RETURN BRANCH PIPING BACK TO MAIN PIPING, VALVE AND CAP OFF.
3. EXISTING VAV UNIT, ACCESSORIES AND DUCTWORK SHALL BE REMOVED AS SHOWN.
4. EXISTING DUCTWORK AND ACCESSORIES SHALL BE REMOVED AS SHOWN.
5. EXISTING FIRE DAMPER SHALL BE REMOVED, REPAIR AND SEAL TO MATCH EXISTING FIRE RATED WALL.
6. EXISTING CEILING SLOT DIFFUSER OR RETURN GRILLE SHALL BE REMOVED, REPAIR CEILING TO MATCH EXISTING.
7. EXISTING VAV-79 SHALL BE RELOCATED AND REUSED, REFER TO M7 FOR NEW WORK.
8. REMOVE EXISTING HOT WATER SUPPLY AND RETURN BRANCH PIPING BACK TO MAIN PIPING AND VALVE OFF, REFER TO NEW WORK SHEET M7.
9. EXISTING WALL PENETRATION SHALL BE REUSED FOR NEW SUPPLY DUCT, REFER TO SHEET M7 FOR NEW WORK.
10. EXISTING WALL PENETRATION SHALL BE REUSED FOR WALL TRANSFER, SEE SHEET M7 FOR NEW WORK.



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UNION COUNTY HIGH SCHOOL ROOFTOP UNITS

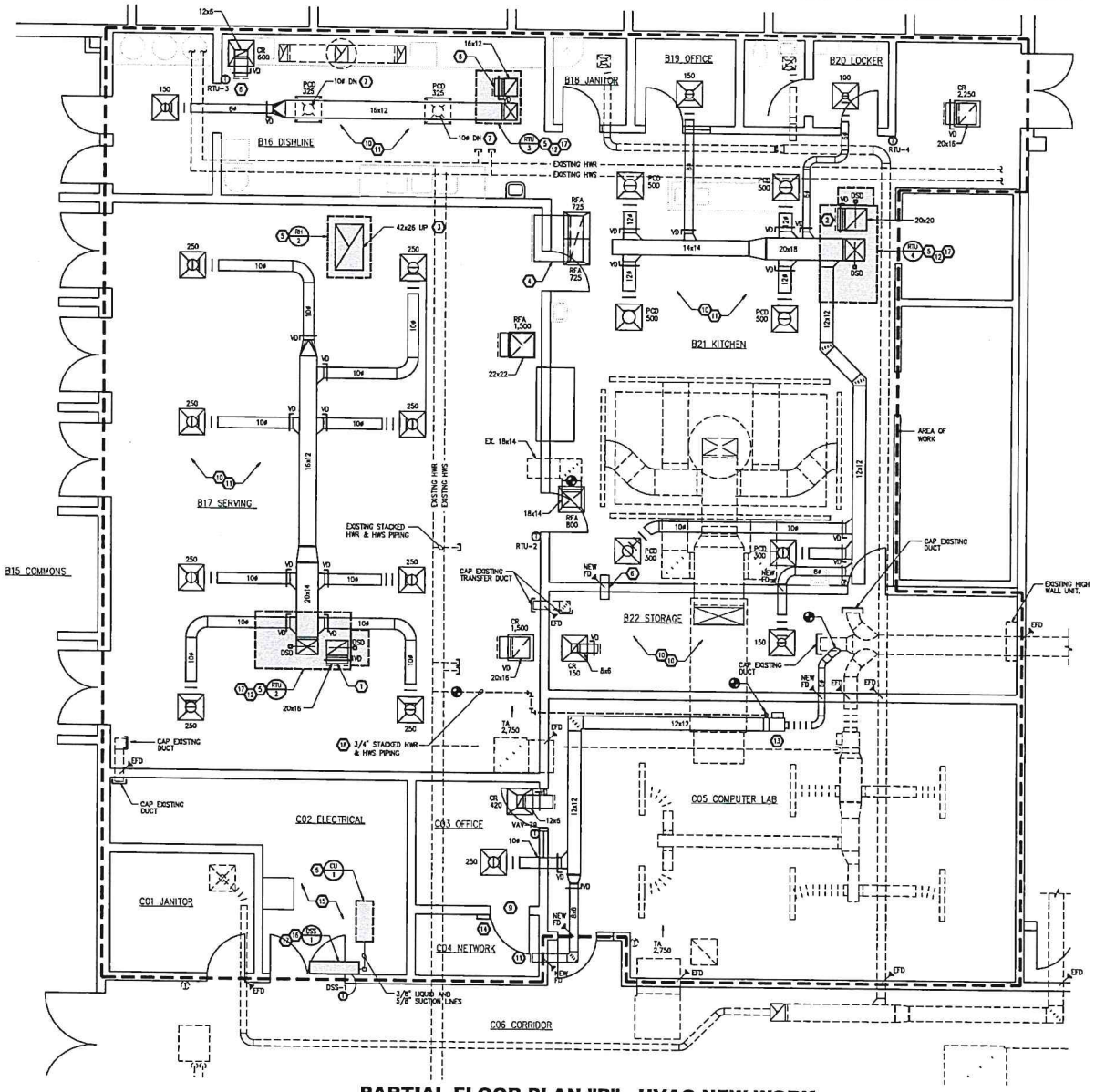
PARTIAL FLOOR PLAN "B" - HVAC DEMOLITION

NEAL STUCKEY
REGISTERED ARCHITECT
NO. 21321
STATE OF TENNESSEE

JOB NO:	120064
FILE:	120064
DRAWN:	MAW
DESIGNED:	MAW
CHECKED:	KLS
DATE:	11-08-21

REVISIONS:

M6



PARTIAL FLOOR PLAN "B" - HVAC NEW WORK

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

GENERAL NOTES:

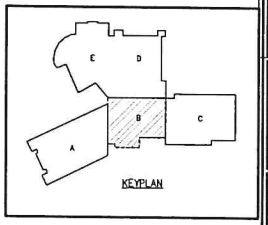
1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO PREPARING HIS BID IN ORDER TO FAMILIARIZE HIMSELF WITH CONDITIONS AS THEY EXIST AND SHALL STUDY ALL AVAILABLE BUILDING PLANS AND ARCHITECTURAL AND MECHANICAL DRAWINGS TO SATISFY HIMSELF AS TO THE EXTENT OF ALL CONTINGENCIES AND SHALL INCLUDE THE COST OF THE SAME IN HIS BID.
2. THE CONTRACTOR SHALL NOT CREATE INTERRUPTION OF THE EXISTING BUILDING SERVICES WITHOUT GIVING A MINIMUM 48 HOUR NOTICE OF SUCH OUTAGES WITH THE OWNER.
3. COORDINATE ROUTING OF DUCTWORK WITH ALL OTHER TRADES IN FIELD INCLUDING STRUCTURAL.
4. COORDINATE EXACT LOCATION OF GRILLES AND DIFFUSERS WITH EXISTING REFLECTED CEILING PLAN AND LIGHTING LAYOUT.
5. ROUTE DUCTWORK AS HIGH AS POSSIBLE ABOVE CEILING AND GENERALLY ABOVE WATER PIPING.
6. ALL ROOF WORK SHALL BE PERFORMED BY THE MANUFACTURER'S CERTIFIED INSTALLER SO NOT TO VOID ROOF WARRANTY.

KEY NOTES:

1. PROVIDE 1/2"X1/2" WELDED WIRE MESH SCREEN ON END OF RETURN DUCT. BALANCE TO 1,500-CFM.
2. PROVIDE 1/2"X1/2" WELDED WIRE MESH SCREEN ON END OF RETURN DUCT. BALANCE TO 2,250-CFM.
3. PROVIDE 1/2"X1/2" WELDED WIRE MESH SCREEN ON END OF RELIEF DUCT. ADJUST COUNTER-BALANCED RELIEF DAMPER TO OPEN AT 0.05" S.P. TO RELIEVE ECONOMIZER AIR.
4. INSTALL NEW 42x12 TRANSFER DUCT THROUGH WALL ABOVE CEILING. PROVIDE 1/2"X1/2" WELDED WIRE MESH SCREEN ON END OF RELIEF DUCT.
5. UNIT LOCATED ON BUILDING ROOF.
6. INSTALL NEW 8x6 TRANSFER DUCT THROUGH WALL ABOVE CEILING. PROVIDE 1/2"x1/2" WELDED WIRE MESH SCREEN ON END OF RELIEF OR RETURN DUCT.
7. PROVIDE VOLUME DAMPER IN VERTICAL TRANSITION.
8. PROVIDE 1/2"X1/2" WELDED WIRE MESH SCREEN ON END OF RETURN DUCT. BALANCE TO 600-CFM.
9. METALAIRE MODEL# DC 12x12 DOOR GRILLE, MOUNT BOTTOM AT 0'-6" AFF.
10. COORDINATE NEW SUPPLY, RETURN, RELIEF AND EXHAUST DUCTWORK ROUTING WITH EXISTING ELECTRICAL CONDUITS, LIGHTING, DUCTWORK, PIPING, STRUCTURAL BEAMS, ETC. CEILINGS SHALL BE REPAIRED TO MATCH SURROUNDING AREA.
11. PROVIDE 1/2"X1/2" WELDED WIRE MESH SCREEN ON END OF SUPPLY DUCT. BALANCE TO 170-CFM.
12. INTERFACE CONTROLS WITH EXISTING JOHNSON CONTROLS INC. BAS. REFER TO PLAN FOR THERMOSTAT LOCATION. RE-ESTABLISH CAMPUS STANDARD SEQUENCE OF OPERATION.
13. RELOCATED VAV-79, COORDINATE MOUNTING WITH EXISTING UTILITIES INCLUDING STRUCTURAL.
14. PROVIDE AND INSTALL MITSUBISHI TE-200A CENTRALIZED CONTROLLER FOR NEW DSS-1 IN RECEPTION OFFICE. INTERFACE NEW CONTROLS WITH EXISTING JOHNSON CONTROLS INC. BAS.
15. COORDINATE ALL REFRIGERANT PIPING AND UNIT WITH EXISTING ELECTRICAL, LIGHTING, CABLE TROUGH AND STRUCTURAL.
16. 4-SPEED AIRFLOW HIGH WALL MOUNT TYPE. ADJUST CFM SETTING AS NEEDED FOR OPTIMUM LEVEL OF COMFORT. MOUNT BOTTOM AT 8'-0" AFF.
17. CONNECT AIR PURIFIER TO UNSWITCHED POWER SOURCE.
18. CONNECT NEW HWS & HWR PIPING TO EXISTING AND ROUTE TO RELOCATED VAV-79. INSULATE NEW PIPING PER SPECIFICATIONS.

KITCHEN AIR BALANCE

UNIT	O.A SUPPLY (CFM)	EXHAUST (CFM)
EX. KEF-1	---	10,000
EX. MAU-1	7,000	---
RTU-5	750	---
EX. DEF-1	---	1,200
RTU-3	200	---
TRANSFER RTU-2	500	---
TRANSFER C06 CORRIDOR	2,750	---
TOTAL:	11,200	11,200



KEYPLAN

WWR ENGINEERS INC
5417 Ball Camp Pike
Knoxville, Tn 37921
Phone: (865) 588-2431
Fax: (865) 588-2434
West, Welch, Reed Engineers, Inc.
WWR PROJECT# 121078

THIS DRAWING IS GENERALLY DIAGRAMMATIC AND, EXCEPT WHERE SPECIFICALLY DIMENSIONED OR DETAILED, INDICATES THE GENERAL ARRANGEMENT OF THE WORK. THE CONTRACTOR SHALL INSTALL HIS WORK TO CONFORM AS NEARLY AS POSSIBLE TO THE LOCATIONS AND ARRANGEMENTS SHOWN, WITH ONLY SUCH MINOR ADJUSTMENTS AS NECESSARY TO COORDINATE THE WORK WITH ALL OTHER TRADES TO AVOID INTERFERENCES.

WWR ENGINEERS INC
WEST, WELCH, REED ENGINEERS, INC.
ELECTRICAL & MECHANICAL ENGINEERING
5417 BALL CAMP PIKE
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UNION COUNTY HIGH SCHOOL ROOFTOP UNITS

PARTIAL FLOOR PLAN "B" - HVAC NEW WORK

KEITH L. STUCKEY
REGISTERED ENGINEER
NO. 91331
STATE OF TENNESSEE

JOB NO:	120064
FILE:	120064
DRAWN:	MAW
DESIGNED:	MAW
CHECKED:	KLS
DATE:	11-08-21

REVISIONS:

M7