MECHANICAL SCOPE OF WORK SUMMARY

1. PROVIDE AND INSTALL HVAC AND RELATED SYSTEMS AS SHOWN ON THESE PLANS AND AS SPECIFIED IN THE PROJECT MANUAL.

2. PROVIDE AND INSTALL NEW HVAC EQUIPMENT AND APPURTENANCES AS SCHEDULED OR INDICATED, INCLUDING DUCTWORK, SUPPLY AND RETURN GRILLES, INSULATION, SUPPORTS, SEALING PENETRATIONS, ETC. TO MAKE THE JOB COMPLETE AND FULLY FUNCTIONAL IN ACCORDANCE WITH THE DESIGN INTENT.

3. MECHANICAL CONTRACTOR SHALL INCLUDE TEST & BALANCE IN HIS SCOPE.

4. MECHANICAL CONTRACTOR SHALL SUPPLY THE SIEMENS CONTROLS SHOWN IN THESE PLANS.

5. WORK INCLUDES OBTAINING PERMITS, PROCUREMENT OF EQUIPMENT, MATERIALS, ETC.; COORDINATING BETWEEN TRADES; INSTALLATION, STARTUP, REPORTING, SYSTEMS CHECKOUT; ASSISTING THE TEST, ADJUST AND BALANCE CONTRACTOR, AND RESOLVING DISCREPANCIES; PERFORMING SUBSTANTIAL AND FINAL COMPLETION ACTIVITIES, TRAINING, DEVELOPING AND SUBMITTING THE OPERATION AND MAINTENANCE MANUALS, AND PERFORMING PROJECT CLOSEOUT.

GENERAL NOTES

ALL CONSTRUCTION WILL CONFORM TO CURRENTLY (AS OF DRAWING DATE) ADOPTED EDITIONS OF THE APPLICABLE CODE STANDARDS INCLUDING BUT NOT LIMITED TO:

FLORIDA STATE UNIVERSITY DESIGN GUIDELINES
FBC-B 2023; THE FLORIDA BUILDING CODE (8th EDITION)
FPC 2023; THE FLORIDA FIRE PREVENTION CODE (8th EDITION)
INCLUDING NFPA 101 - 2021; THE LIFE SAFETY CODE
FBC-M 2023; THE FLORIDA MECHANICAL CODE (8th EDITION)
FBC-A 2023; THE FLORIDA BUILDING CODE, ACCESSIBILITY (8th EDITION)
FBC-EC 2023; THE FLORIDA BUILDING CODE, ENERGY CONSERVATION (7th EDITION)
FBC-FG 2023; THE FLORIDA BUILDING CODE, FUEL GAS (8th EDITION)
FBC-P 2023; THE FLORIDA BUILDING CODE, PLUMBING (8th EDITION)

THE WORK WILL BE COMPLETE, FULLY OPERATIONAL, AND SUITABLE FOR THE SERVICE REQUIRED. DRAWINGS INDICATE SCOPE AND DO NOT SHOW ALL DETAILS, DEVICES AND INCIDENTAL MATERIALS NECESSARY TO ACCOMPLISH THE WORK. IT IS UNDERSTOOD THAT SUCH DEVICES AND INCIDENTAL MATERIALS REQUIRED WILL BE FURNISHED.

INSTALLERS ARE EXPECTED TO PROVIDE PROFESSIONAL WORK PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND GOOD PRACTICE.

INSTALLERS ARE EXPECTED TO COORDINATE IN ORDER TO AVOID INTERFERENCE BETWEEN TRADES. THE INSTALLERS ARE EXPECTED TO VERIFY CRITICAL DIMENSIONS AND FIELD FABRICATE PIPING AS NECESSARY TO ACCOMMODATE CONDITIONS. INSTALLERS ARE EXPECTED TO INSTALL EQUIPMENT SUCH THAT PROPER MAINTENANCE CLEARANCES ARE MAINTAINED FOR EQUIPMENT OF ALL TRADES.

UPON COMPLETION OF THE WORK THE INSTALLERS WILL CLEAN SPACES THAT WERE OCCUPIED BY TEMPORARY WORK AND TEMPORARY FACILITIES. REMOVE DEBRIS, RUBBISH AND EXCESS MATERIALS FROM THE SITES. REPAIR DAMAGES CAUSED BY INSTALLATION OR USE OF TEMPORARY FACILITIES.

THE INSTALLERS WILL DELIVER TO THE OWNER, UPON SUBSTANTIAL COMPLETION OF THE WORK, TWO COPIES OF DESCRIPTIVE LITERATURE RELATED TO THE EQUIPMENT INSTALLED UNDER THIS CONTRACT, INCLUDING PARTS LISTS, WIRING DIAGRAMS, MAINTENANCE AND OPERATION MANUALS AND WARRANTIES CUSTOMARILY SUPPLIED BY MANUFACTURERS FOR EQUIPMENT INCORPORATED IN THIS WORK. THE LITERATURE WILL BE NEATLY BOUND IN A 3-RING BINDER AND DELIVERED PRIOR TO FINAL ACCEPTANCES

THE CONTRACTOR SHALL GIVE PHYSICAL DEMONSTRATION AND VERBAL INSTRUCTIONS FOR PROPER OPERATION AND MAINTENANCE OF EQUIPMENT TO THE OWNER OR HIS DESIGNATED REPRESENTATIVE. SCHEDULE THESE DEMONSTRATIONS AND INSTRUCTIONS AT THE OWNER'S CONVENIENCE.

MECHANICAL GENERAL NOTES

THE CONTRACTOR IS EXPECTED TO VERIFY CRITICAL DIMENSIONS AND FIELD FABRICATE MATERIAL AS NECESSARY TO ACCOMMODATE CONDITIONS.

PROVIDE PHENOLIC LABELS INDICATING EQUIPMENT DESIGNATION FOR EACH PIECE OF EQUIPMENT SCHEDULED WITH A UNIQUE IDENTIFICATION.

PROVIDE DIELECTRIC ISOLATION FITTINGS TO ISOLATE DISSIMILAR MATERIALS.

TEST, ADJUST AND BALANCE (TAB) SCOPE OF WORK AND COORDINATION

THE CONSTRUCTION MANAGER WILL CONTRACT WITH A PROFESSIONAL/AABB CERTIFIED TAB COMPANY TO TEST, ADJUST AND BALANCE THE NEW HVAC SYSTEMS.

THE MECHANICAL CONTRACTOR SHALL FULLY TEST THE OPERATION OF THE HVAC SYSTEM AND RESOLVE ALL KNOWN DISCREPANCIES PRIOR TO REQUESTING TAB SERVICES VIA THE CONSTRUCTION MANAGER.

THE MECHANICAL CONTRACTOR SHALL PARTICIPATE AND ASSIST THE TAB WORK , INCLUDING RESOLUTION OF TAB DISCREPANCIES.

TEST AND BALANCE CONTRACTOR SHALL PERFORM THE FOLLOWING TASKS:

A. MARK EQUIPMENT/DAMPER/VALVE POSITIONS TO SHOW FINAL SETTINGS. MARK WITH PAINT OR OTHER SUITABLE/PERMANENT IDENTIFICATION MATERIALS.

B. COMPLETE TESTING, ADJUSTING, AND BALANCING OF NEW HVAC SYSTEMS, INCLUDING HYDRONIC PIPING AND RELATED SYSTEMS INCLUDED IN THE SCOPE OF WORK.

C. MEASURE AND BALANCE CHILLED WATER & HOT WATER TO AIR HANDLER AND PUMP.

TEST AND BALANCE CONTRACTOR SHALL PROVIDE ONE (1) PAPER AND ELECTRONIC COPY OF THE PRELIMINARY REPORT TO THE ENGINEER FOR REVIEW/COMMENTS. DISCREPANCIES SHALL BE RESOLVED, THE TAB CONTRACTOR SHALL RETEST SYSTEMS AS NEEDED AND ISSUE THREE (3) FINAL SIGNED AND SEALED REPORTS PLUS ONE ELECTRONIC COPY AFTER ALL ISSUES ARE RESOLVED TO THE SATISFACTION OF THE ENGINEER.

DUCTWORK:

- ALL WORK SHALL COMPLY WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE. STATIC PRESSURE REQUIREMENTS FOR VAV SINGLE-ZONE SYSTEMS: SUPPLY (2") AND RETURNS (-1"). OUTSIDE AIR DUCT SHALL BE CAPABLE OF 3" STATIC PRESSURE DOWNSTREAM OF FAN.
- USE EITHER ROUND OR RECTANGULAR DUCT WITH EQUAL OR GREATER EQUIVALENT FREE AREA TO ACCOMMODATE EXISTING STRUCTURE.
- FLEXIBLE DUCT ON RUNOUTS SHALL NOT EXCEED 10'. USE SPIRAL ROUND DUCT FOR LONGER RUNS.
- DUCT SIZES MAY BE CHANGED TO ACCOMMODATE CONDITION AS LONG AS THE INTERNAL FREE AREA IS NOT DIMINISHED.
- RUN-OUT DUCTS TO DIFFUSERS SHALL BE EQUAL TO DIFFUSER NECK SIZE.
- TAG ALL DAMPER LOCATIONS WITH ORANGE FLAG TAPE.
- PERMANENTLY MARK ALL DAMPER SHAFTS TO INDICATE DAMPER POSITION.

DUCTWORK INSULATION:

- INSULATION IN CONCEALED/ACCESSIBLE INTERIOR SPACES SHALL BE BLANKET TYPE. SECURE INSULATION WITH IMPALE PINS WHEN DUCT IS OVER 24" WIDE.
- BLANKET INSULATION SHALL BE 2.2" THICK (OUT OF PACKAGE) FOIL BACKED R-6 (INSTALLED) INSULATION. SEAL ALL JOINTS, SEAMS, ETC. PER THE MANUFACTURER'S RECOMMENDATIONS. SEALING TAPE SHALL BE UL 181 LISTED PRESSURE-SENSITIVE TYPE.
- INSULATION IN MECHANICAL ROOMS AND ON DUCTS PENETRATING WALLS (WITHOUT FIRE DAMPERS) SHALL BE RIGID FIBERGLASS TO 7 FEET ABOVE FINISHED FLOOR. EXTEND INSULATION 6" BEYOND WALL THEN TRANSITION TO DUCT WRAP (WHEN CONCEALED). USE CLIP ANGLES AT WALL TO SEAL OPENING (BOTH SIDES) UOS. SEAL PENETRATION TO COMPLY WITH THE WALL RATING, SEE ARCHITECTURAL SHEETS.
- RIGID INSULATION ON SUPPLY DUCTWORK SHALL BE 1.5" THICK TO PROVIDE AN R-VALUE EQUAL TO 6 (MINIMUM).
- RIGID INSULATION ON RETURN AND OUTSIDE AIR DUCTWORK SHALL BE 1" THICK.
- INSULATE OUTSIDE AIR PLENUMS, LOUVER COVERS, OA DUCTS, ETC. WITH 1" RIGID INSULATION. SECURE INSULATION WITH MECHANICAL FASTENERS (IMPALE PINS) ON DUCTS OVER 24" WIDE. SEAL ALL RIGID EDGES WITH ALUMINUM TAPE AND MASTIC AT TAPE EDGES.
- MECHANICAL FASTENERS (IMPALE PINS) SHALL BE ADHERED WITH MASTIC SPACED ON 18" CENTERS. NOTE: SELF-ADHESIVE TYPE IMPALE PINS ARE PROHIBITED.
- ALL DUCTWORK CONVEYING CONDITIONED OR OUTSIDE AIR AIR SHALL BE EXTERNALLY INSULATED UNLESS SPECIFIED OTHERWISE.
- PROVIDE INCOMPRESSIBLE INSULATION/INSERTS AT ALL TRAPEZE-TYPE SUPPORTS TO PREVENT INSULATION COMPRESSION.
- INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY BEST PRACTICES FOR THE INTENDED PURPOSE.
- PROVIDE COMPOSITE MECHANICAL INSULATION (INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES) HAVING FLAME SPREAD INDEX OF 25 OR LESS, AND SMOKE DEVELOPED INDEX OF 50 OR LESS, AS TESTED BY ASTM E 84 (NFPA 255) METHODS.
- VAPOR BARRIERS SHALL BE MAINTAINED COMPLETE AND CONTINUOUS. SEAL ALL GAPS, JOINTS, SEAMS, ETC.
- INSTALL INSULATION AFTER THE DUCT SYSTEMS HAVE BEEN SEALED WITH MASTIC, PRESSURE TESTED AND FOUND FREE OF ALL LEAKS.
- SURFACES SHALL BE CLEAN AND DRY BEFORE APPLYING INSULATION MASTICS OR INSULATION.
- RATED PARTITIONS & WALLS SHALL BE PENETRATED ONLY WITH INSULATION MATERIALS AND TECHNIQUES THAT ARE UL LISTED TO MAINTAIN FIRE RATING. ANY QUESTIONS SHALL BE REFERRED TO THE ARCHITECT/ENGINEER.

SMOKE DETECTORS:

-DUCT SMOKE DETECTORS ARE PROVIDED AND WIRED TO THE FIRE ALARM BY DIVISION 26.
- THE MECHANICAL SUBCONTRACTOR WILL BE RESPONSIBLE FOR MOUNTING DUCT FIRE/SMOKE DAMPERS/ DETECTORS AND WIRING TO THE AHU FOR SYSTEM SHUTDOWN ON ANY GENERAL FIRE ALARM.

DUCT SMOKE/FIRE DAMPERS, COMMON DAMPERS, AND DETECTORS:

- SMOKE AND FIRE DAMPERS, WHERE INDICATED, SHALL BE INSTALLED IN STRICT CONFORMANCE WITH THE MANUFACTURER'S INSTRUCTIONS. PROVIDE SLEEVES AND ANGLES WHERE REQUIRED. PROVIDE DUCT ACCESS PANELS FOR INSPECTION AND RESETTING OF FIRE DAMPERS.

MISCELLANEOUS METALS:

- INTERIOR EQUIPMENT/PIPING SUPPORTS, HARDWARE, BRACKETS, FRAMING CHANNEL, ETC. SHALL BE GALVANIZED STEEL AND EQUAL TO B-LINE.
- METAL/ELECTRICAL FRAMING/CHANNEL, SUPPORTS, ETC. IN CONTACT WITH CONCRETE OR INSTALLED OUTDOORS SHALL BE HOT-DIPPED GALVANIZED.
- MISCELLANEOUS INTERIOR SUPPORTS SHALL BE 12 GA, 1-5/8" SQ. ELECTRO-GALVANIZED FRAMING CHANNEL. (MINIMUM).

CONCRETE HOUSEKEEPING PADS:

- WHERE INDICATED EXTEND EXISTING CONCRETE PADS FOR EQUIPMENT SUPPORT.
- USE MECHANICAL MEANS TO REMOVE FLOOR EPOXY FINISH, ROUGHEN CONCRETE, AND CLEAN
- POUR 4" CONCRETE SLAB W/ WELDED WIRE REINFORCING. CHAMFER EDGES

FANS:

- INSTALL FANS PER THE MANUFACTURER'S RECOMMENDATIONS.
- INSTALL FLEXIBLE CONNECTIONS AT FAN.
- SUPPORT FANS FROM OR ATTACH TO STRUCTURE. SEE DETAILS.
- INSTALL SPEED CONTROLLERS NEAR FAN OR IN NEAREST ACCESSIBLE LOCATION WHEN FAN IS ABOVE HARD CEILING.

EQUIPMENT INSTALLATION

GENERAL EQUIPMENT INSTALLATION REQUIREMENTS:

PROVIDE ENGRAVED PLASTIC LABELS INDICATING EQUIPMENT DESIGNATION FOR EACH PIECE OF EQUIPMENT SCHEDULED WITH A UNIQUE IDENTIFICATION.

PROVIDE PHENOLIC PIPE LABELS INDICATING CONTENTS AND DIRECTION OF FLOW.

INSTALL UNIT IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONTRACTOR IS REQUIRED TO HAVE EQUIPMENT INSTALLATION INSTRUCTIONS ON SITE FOR ALL EQUIPMENT THAT IS ON SITE.

ALL EQUIPMENT SHALL BE SECURED TO PADS OR BUILDING STRUCTURE. INSURE THAT PROPER ACCESS TO THE UNIT IS MAINTAINED. DO NOT RUN PIPING IN FRONT OF ACCESS PANELS.

INSTALL MISCELLANEOUS DEVICES SHIPPED LOOSE.

COORDINATE CONTROLS AND POWER WIRING INSTALLATION.

START-UP ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

CLEAN FACTORY-FINISHED SURFACES. REPAIR ANY MARRED OR SCRATCHED SURFACES WITH MANUFACTURER'S TOUCH-UP PAINT. TURNOVER ANY SPECIAL TOOLS PROVIDED BY THE EQUIPMENT MANUFACTURER.

PACKAGED AIR CONDITIONER UNIT INSTALLATION:

INSTALL UNIT ON FACTORY SUPPLIED ROOF CURB. SECURE UNIT TO CURB AND CURB TO ROOF. INSTALL CONTROLS, DUCTWORK, ETC. SEE DETAILS.

PROVIDE EACH PRIMARY CONDENSATE DRAIN WITH TRAP AND DOWN STREAM CLEAN-OUT CAP. DEPTH OF SEAL SHALL EXCEED MAX FAN STATIC, SEE TRAP DETAIL.

PRIOR TO START-UP, REMOVE DEBRIS FROM INSIDE THE UNIT, VACUUM INTERIOR SURFACES, WIPE DOWN INTERIOR WITH DAMP CLOTH, AND INSTALL CLEAN FILTERS.

PERFORM FACTORY CERTIFIED START UP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND COMPLETE START-UP REPORT.

DX SPLIT SYSTEM INSTALLATION:

SET CONDENSING UNITS ON 1/2" THICK NEOPRENE PADS, ONE AT EACH CORNER, AND SECURE UNIT TO EQUIPMENT RAILS DESIGNATED FOR THAT PURPOSE, (OR OTHERWISE AS PROVIDED FOR WITH THE EQUIPMENT) SEE DETAIL.

PIPE CONDENSATE TO NEAREST SAFE WASTE AND SECURE PIPING TO FLOOR ON 4' MAXIMUM CENTERS.

PRIOR TO START-UP, REMOVE DEBRIS FROM INSIDE THE UNIT, VACUUM INTERIOR SURFACES, WIPE DOWN INTERIOR WITH DAMP CLOTH, AND INSTALL CLEAN FILTERS.

PROGRAM AND TEST HUMIDISTATS/CONTROLS. CORRECT SYSTEM DEFICIENCIES.

AIR HANDLER UNIT INSTALLATION:

LOCATE UNIT TO PROVIDE PROPER CLEARANCE TO ACCESS PANELS, PIPING, CONTROLS, ETC. OPTIMIZE AVAILABLE SPACE.

SET UNIT ON 1/2" THICK NEOPRENE VIBRATION-ISOLATION PADS ON 2' CENTERS UNDER MAIN SUPPORTS.

PROVIDE EACH PRIMARY CONDENSATE DRAIN WITH P-TRAP AND DOWN STREAM CLEAN-OUT CAP. DEPTH OF SEAL SHALL EXCEED MAX FAN STATIC, SEE TRAP DETAIL.

INSTALL DUCTWORK PER PROJECT PLANS. MAJOR DEVIATIONS ARE TO BE REVIEWED WITH ENGINEER.

REMOVE ALL DEBRIS, DUST, METAL SHAVINGS, ETC. FROM INTERIOR OF UNIT PRIOR TO STARTUP.

PERFORM START-UP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND COMPLETE A STARTUP REPORT.

PROGRAM AND TEST CONTROLS, DAMPERS, AND SAFETIES.

PROVIDE NEW FILTERS AT SUBSTANTIAL COMPLETION.

DUCTLESS SPLIT FAN COIL INSTALLATION

COORDINATE EXACT LOCATION OF THE FAN COIL UNIT WITH THE OWNER.

INSTALL WIRED CONTROLLER AND CONTROL WIRING TO THE CONDENSING UNIT. CONTROL CABLE MUST BE IN CONDUIT EXCEPT: ACCESSIBLE CONCEALED LOCATIONS PLENUM RATED CABLE MAY BE USED.

NO AIR BALANCE TEST IS REQUIRED. SET FAN AIR FLOW ON AUTO.

PIPE PUMPED CONDENSATE (PUMP PROVIDED WITH EQUIPMENT) TO CONDENSATE DRAIN. INSTALL REFRIGERANT PIPING TO CONDENSING UNIT; SEE SCHEDULE FOR PIPE SIZES.

CONDENSING UNIT INSTALLATION:

INSTALL CONDENSING UNIT ON MANUFACTURER SUPPLIED BASE OR WALL BRACKET. SECURE UNIT TO BRACKET PER MANUFACTURER'S INSTRUCTIONS.

INSTALL SITE GLASS AND FILTER/DRYER.

START-UP & CHECK-OUT THE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. THE MECHANICAL CONTRACTOR SHALL TEST AND CERTIFY THE PROPER OPERATION OF THE SYSTEM AND CONTROLS.

CONDENSATE & PIPING

CONDENSATE DRAIN SHALL INCLUDE A P-TRAP, SEE DETAIL.

PIPING SHALL BE SAME SIZE AS DISCHARGE CONNECTION; PVC AND FITTINGS. MINIMUM SIZE IS 3/4". SUPPORT PIPING ON 4' CENTERS; SLOPE TO DISCHARGE.

INSULATE CONDENSATE PIPING WITH 3/4" CLOSED CELL FOAM INSULATION. SEAL ALL JOINTS SEAMS, ETC. AIR TIGHT. EXTERIOR INSULATION TO HAVE A UV-RESISTANT COATING.

PROVIDE ACCESS PLUGS/CAPS TO FITTINGS THAT REQUIRE MAINTENANCE.

SLOPE CONDENSATE PIPING 1/8" TO 1/4" PER FOOT TO DRAIN. PROVIDE CLEANOUTS AT 90° BENDS/FITTINGS.

SECONDARY CONDENSATE PANS, WHERE SHOWN, SHALL BE EQUIPPED WITH FLOAT SWITCH AND WIRED TO DISABLE THE AIR HANDLER OR FAN COIL UNIT.

PROVIDE CLEANOUTS WITH SCREW CAPS/PLUGS AT TRAPS, ON VERTICAL DROPS, AND IN HORIZONTAL DIRECTION CHANGES.

HVAC SYMBOLS/LEGEND

DESIGNATION	DESCRIPTION
8"Ø	ROUND DUCT WITH SIZE INDICATED
T	THERMOSTAT/TEMPERATURE SENSOR & WIREWAY
T/H	TEMP/RELATIVE HUMIDITY SENSOR AND WIREWAY
8"Ø	INSULATED FLEXIBLE DUCTWORK & SIZE/DIA.
12X12	RECTANGULAR DUCTWORK & INTERNAL SIZE (FREE AREA)
FD	FIRE DAMPER
FSD	COMBINATION FIRE/SMOKE DAMPER
SD	SMOKE DAMPER
	FLEXIBLE DUCT CONNECTION
D	DUCT SMOKE DETECTOR
	POINT OF CONNECTION TO EXISTING
	DEMOLITION WORK TERMINATION POINT
M	MANUAL VOLUME DAMPER WITH LOCKING QUADRANT
E	ELECTRIC OPERATED CONTROL DAMPER
	FLOW DIRECTION
OR	DUCT TURNING DOWN
OR	DUCT TURNING UP
	AIR FLOW DIRECTION
D 375	GRILLE AND FLOWRATE (CFM) DESIGNATION
EF-	CENTRIFUGAL INLINE CABINET EXHAUST FAN
UP OR DN	DUCT RISE UP OR DOWN
	SERVICE AREA - MAINTAIN CLEAR
R (R)	RELOCATE AND RELOCATED, RESPECTIVELY

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AHAP	AS HIGH AS POSSIBLE
AS	AIR SEPARATOR
BAS	BLDG AUTOMATION SYSTEM
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSE POWER
BTUH	BRITISH THERMAL UNIT/HOUR
CFM	CUBIC FEET PER MINUTE
C/D	CLEAN/DIRTY
CL	CHAIN LINK
CONC	CONCRETE
CU	CONDENSER UNIT
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CNTRL	CONTROL
CR	CLASSROOM
DB	DRY BULB
DIA OR Ø	DIAMETER
DG	DOOR GRILLE
DW	DOUBLE WALL
EA	EXHAUST AIR
EF	EXHAUST FAN
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EX OR (E)	EXISTING
EXT	EXTERNAL OR EXTERIOR
FCU	FAN COIL UNIT
FL	FLOOR
FJ	FLEXIBLE JOINT
FPM	FEET PER MINUTE
GPM	GALLONS PER MINUTE
GV	GOOSENECK VENT
H	HIGH
HDG	HOT-DIP GALVANIZED
HP	HORSE POWER
HPU	HEAT PUMP UNIT
KW	KILOWATT
L	LONG
LAT	LEAVING AIR TEMPERATURE
MU	MAKE UP WATER
MAX	MAXIMUM
MBH	1000 BTU/HOUR
MIN	MINIMUM
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPS	NOMINAL PIPE SIZE
OA	OUTSIDE AIR
PD	PRESSURE DROP
PH	PHASE
PNL	PANEL
PRS	PRESS REDUCING STATION
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RLA	RATED LOAD AMPS
RV	ROOF VENT
SA	SUPPLY AIR
SAG	SUPPLY AIR GRILLE
SP	STATIC PRESSURE
SQ	SQUARE
SST	STRUCTURAL STEEL TUBING
T	TEMPERATURE
TEFC	TOTALLY ENCL. FAN COOLED
THK	THICK
TOD	TOP OF DUCT
TYP	TYPICAL
UG	UNDERGROUND
UOS	UNLESS OTHERWISE SPECIFIED
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
V	VOLTS
WB	WET BULB
WG	WATER GAUGE
WTR HTR	WATER HEATER
XFA	TRANSFER AIR

PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN:	REVIEWED:	DATE:
CONCEPT SCHEM. DESIGN								
DESIGN DEVELOPMENT								
EARLY DEMOLITION PACKAGE								
90% CONSTRUCTION DOCS.								
PERMIT DOCS.								
100% CONSTRUCTION DOCS.	JB	JB	9/29/25					

Client:
Florida State University
Tallahassee, Florida

Job Title:
Theater 7 HVAC Replacement

Consultant:
McGINNISS + FLEMING ENGINEERING

Seal:

ALW Project #:
FSU Project #:
Phase: **100% Construction Documents**

Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:
Mechanical General Notes and Legend

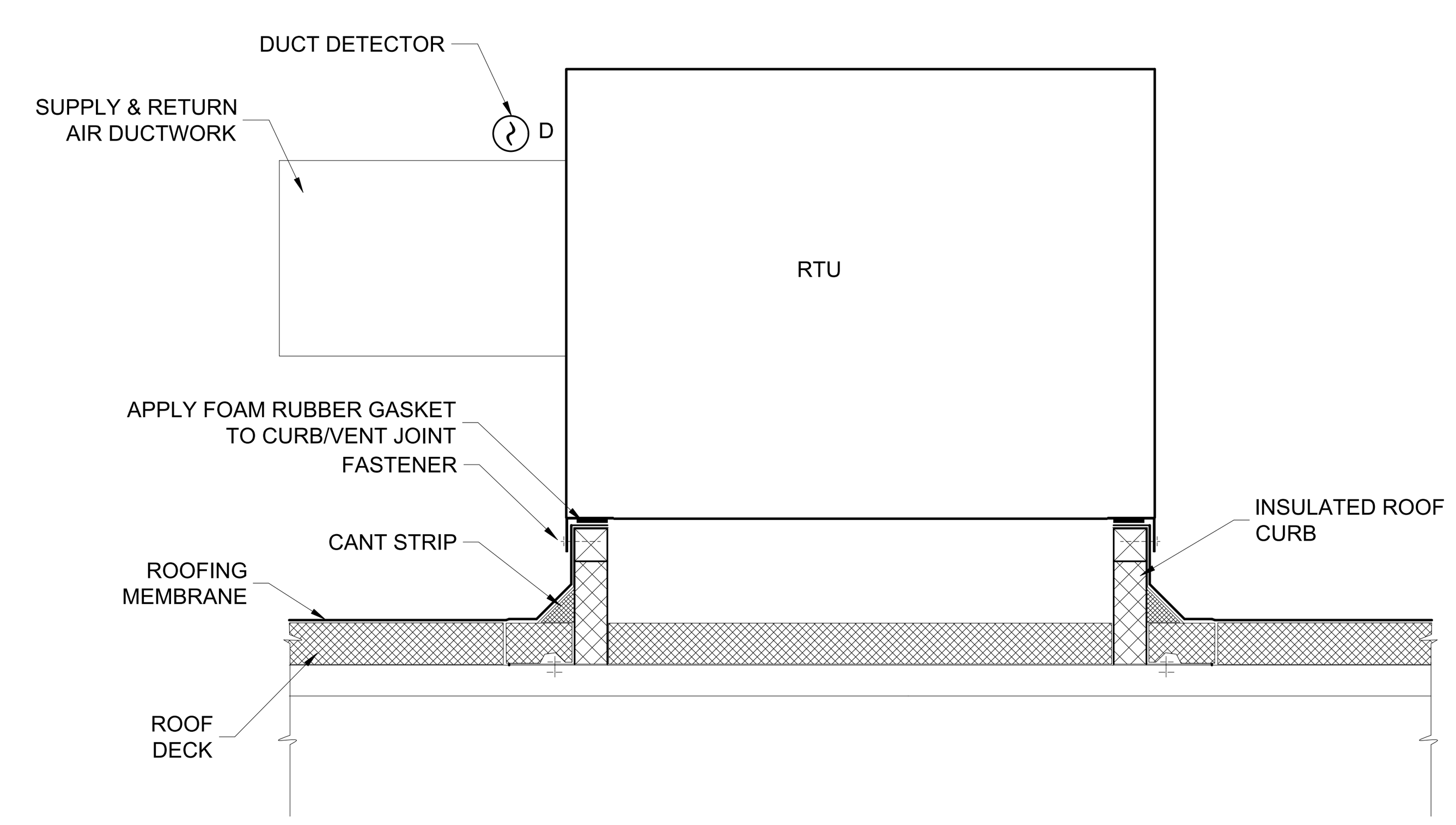
Sheet No.:
M1.0

ROOF TOP UNIT SCHEDULE

DESIGNATION		RTU-13 & RTU-14
TYPE		SINGLE ZONE VAV
QUANTITY		2
AREAS SERVED		THEATER 7
MANUFACTURER		TRANE
UNIT MODEL		PRECEDENT WHK102
CONFIGURATION		SIDE DISCHARGE SIDE RETURN
SUPPLY AIR	CFM	3000
VENTILATION AIR (MAX / MIN)	CFM	650 / 165
ZONE EXHAUST	CFM	-
MAX COOLING COIL FACE VELOCITY	FPM	**
CC ENTERING AIR CONDITIONS	°FDB/°FWB	77.1 / 66
CC LEAVING AIR CONDITIONS	°FDB/°FWB	55.6 / 55.2
UNIT TOTAL COOLING CAPACITY	MBH	104
UNIT LATENT COOLING CAPACITY	MBH	31
UNIT SENSIBLE COOLING CAPACITY	MBH	73
COOLING COIL NUMBER OF ROWS		**
HGRH CAPACITY	MBH	56
COOLING EFFICIENCY EER / IEER		12.1 / 17
HEATING CAPACITY	MBH	99
HEATING TYPE		HEAT PUMP
AUXILIARY HEATING		NONE
HEATING COIL ENT. AIR TEMPERATURE	°F DB	60
HEATING COIL LEAVING AIR TEMP.	°F DB	75
HEATING TURNDOWN RATIO		N/A
EXTERNAL STATIC	IN WG	1"
FAN BRAKE HORSEPOWER	BHP	1.1
FAN MOTOR HORSEPOWER	HP	3
ELECTRICAL CHARACTERISTICS	V/Ø/HZ	208 / 3 / 60
MCA/MOCP	AMPS	70
SCCR	kVa	65
CABINET DIMENSIONS (LXWXH)	IN	88 x 53 x 52
UNIT WEIGHT	LB	1020
APPLICABLE NOTES		ALL

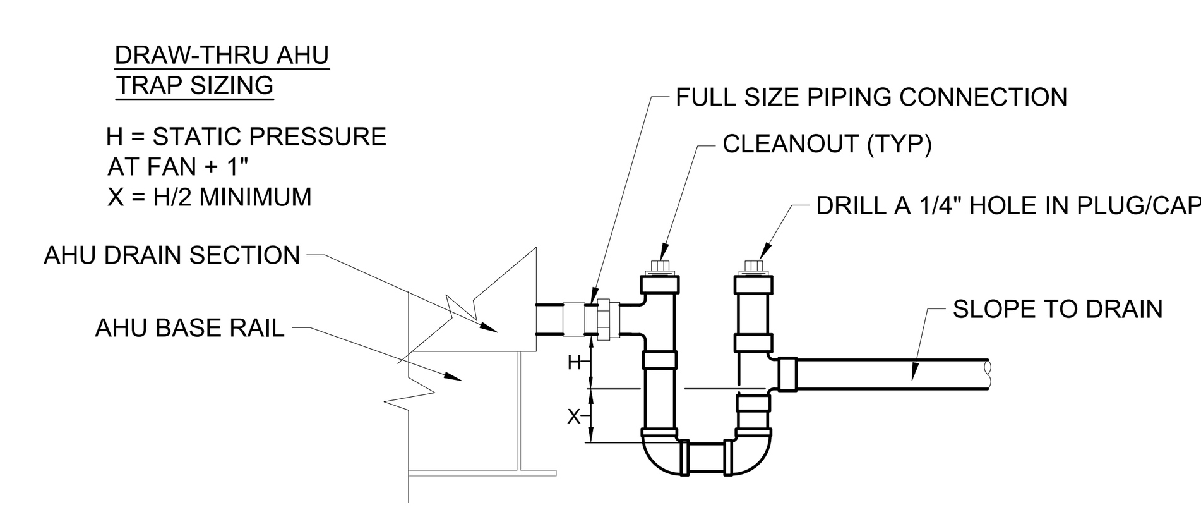
NOTES:

1. UNIT CANNOT EXCEED THE EXISTING 70-AMP SERVICE
2. SINGLE ZONE VAV, SUPPLY FAN WITH VFD.
3. OUTSIDE AIR FLOW RATE SHALL VARY BASED ON ON INDOOR CO2 CONCENTRATION (DCV).
4. O/A & RECIRC DAMPERS TO BE LOW LEAKAGE, FULLY MODULATING.
5. INTEGRAL NON-FUSED SERVICE DISCONNECT FOR SINGLE-POINT WIRING.
6. FILTER SECTION TO ACCOMMODATE 2" MERV13 FILTERS.
7. COMPRESSOR MOTOR SHALL BE PREMIUM EFFICIENCY, OPEN DRIP PROOF, AND RATED FOR INVERTER DUTY. ALL CONDENSER FANS TO BE ECM.
8. MICROPROCESSOR CONTROLLER WITH BUILT-IN LCD DISPLAY & BACNET MS/TP COMMUNICATIONS.
9. MODULATING HOT GAS REHEAT COIL.
10. HAIL GUARDS.
11. DOUBLE-WALL CASE WITH 1" INSULATION.
12. COOLING COIL SECTION SHALL HAVE STAINLESS STEEL IAQ DRAIN PAN.
13. LOW AMBIENT FOR OPERATION TO 0°F.
14. MFR STANDARD PAINT, MINIMUM 600-HR SALT SPRAY RATING.
15. PROVIDE COMPARATIVE ENTHALPY ECONOMIZER.
16. PROVIDE BAROMETRIC RELIEF DAMPER.
17. PROVIDE INTERNAL AIRFLOW MONITOR, DIRTY FILTER SENSOR, & CONDENSATE OVERFLOW SWITCH.
18. PROVIDE 5-YR PARTS & LABOR WARRANTY.



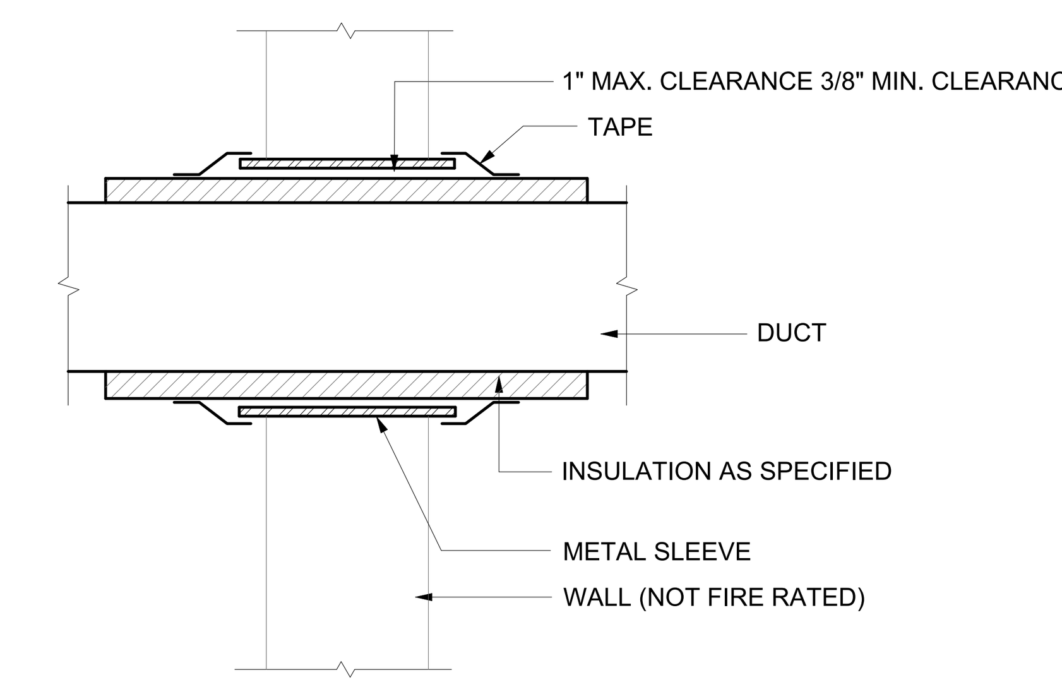
AHU ROOF CURB DETAIL
SCALE: NONE

NOTES:
1. SECURE CURB TO ROOF DECK WITH 1/4" DIAMETER ANCHOR BOLTS, 2' O.C. OR AS DIRECTED BY THE MANUFACTURER TO COMPLY WITH THE UNIT'S WIND LOAD CAPABILITY.



CONDENSATE P-TRAP DETAIL
SCALE: NTS

NOTES:
1. CONDENSATE PIPING SHALL BE FULL SIZE DWV OR TYPE L COPPER WITH CAST DWB OR PRESSURE SOLDER JOINTS.
2. ROUTE CONDENSATE PIPING TO NEW CONDENSATE DRAIN.
3. SLOPE CONDENSATE PIPING 1/4" PER FOOT TOWARD DRAIN.



NON-RATED WALL PENETRATION
SCALE: NONE

NOTES:
1. ENSURE DUCT INSULATION IS NOT COMPRESSED.
2. SEE PLAN FOR WALL RATINGS.

PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN:	REVIEWED:	DATE:
CONCEPT SCHEM. DESIGN								
DESIGN DEVELOPMENT								
EARLY DEMOLITION PACKAGE								
90% CONSTRUCTION DOCS.								
PERMIT DOCS.								
100% CONSTRUCTION DOCS.	JB	JB	9/29/25					

Client: Florida State University
Tallahassee, Florida

Job Title: Theater 7 HVAC Replacement

Seal:

Consultant: McGINNISS + FLEMING ENGINEERING
JON BARBER, PE 55427 | BRIAN WALLACE, PE 75562
820 EAST PARK AVE, I-200, TALLAHASSEE, FL 32301
MFE-INC.COM | 850.681.6424

ALW Project #:
FSU Project #:
Phase: **100% Construction Documents**

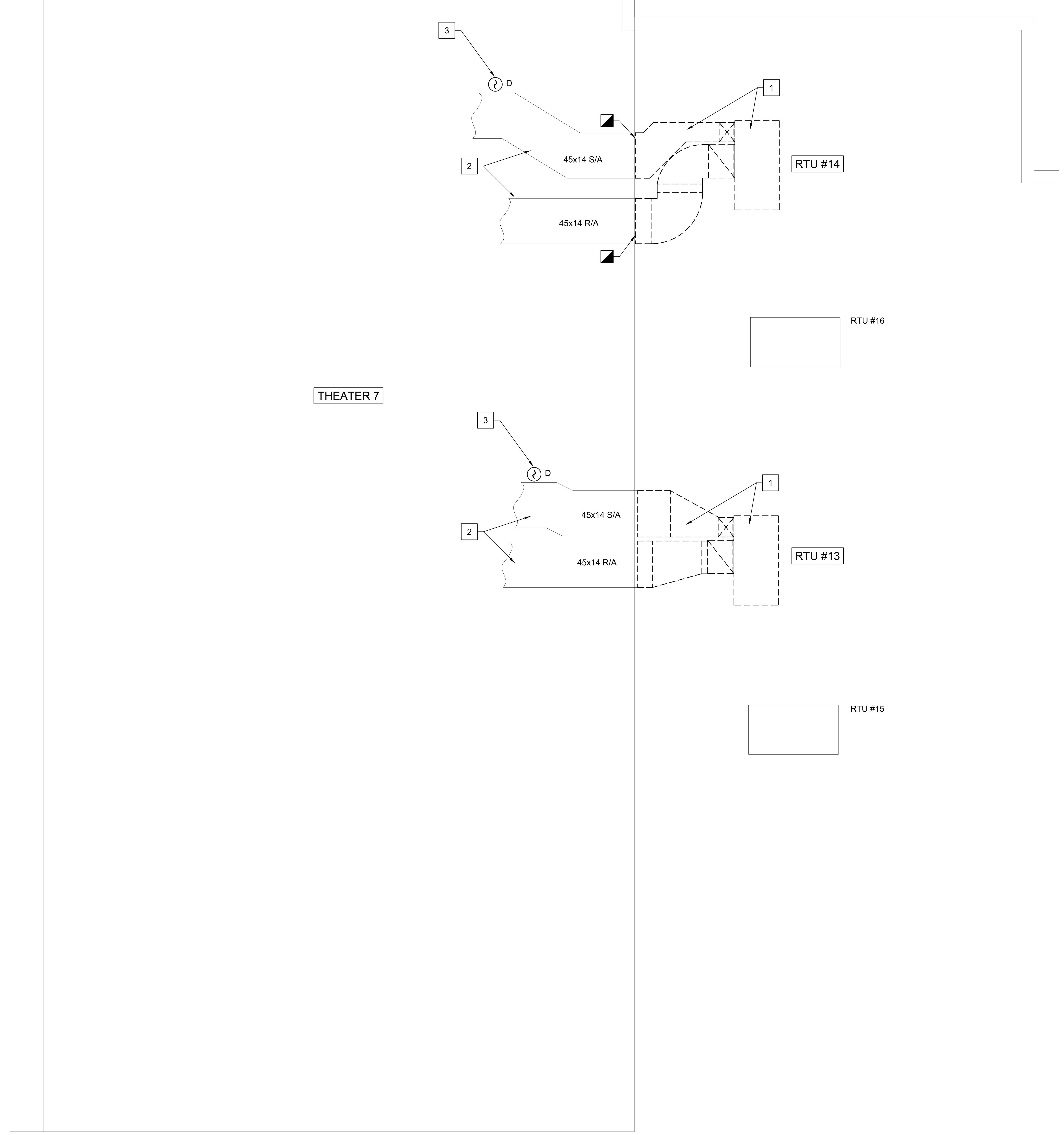
Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:
Mechanical HVAC Schedules

Sheet No.:
M1.1

DEMO NOTES:

1. DEMO EXISTING ROOFTOP UNITS AND EXTERIOR DUCT FOR THEATER 7. ELECTRICAL SERVICE TO THE UNITS IS TO REMAIN FOR CONNECTION TO NEW UNITS.
2. SUPPLY AND RETURN DUCT INSIDE THE BUILDING IS TO REMAIN IN SERVICE.
3. DEMO EXISTING DUCT DETECTORS FOR EACH RTU. COORDINATE WITH ELECTRICAL.



N

1 Demolition Plan - HVAC - Roof

Scale: 3/16" = 1'-0"

PHASE:	DRAWN:	REVIEWED:	DATE:
CONCEPT SCHEM. DESIGN			
DESIGN DEVELOPMENT			
EARLY DEMOLITION PACKAGE			
90% CONSTRUCTION DOCS.			
PERMIT DOCS.			
100% CONSTRUCTION DOCS.	JB	JB	9/29/25

ID:	REVISION:	DRAWN:	REVIEWED:	DATE:

Client:

Florida State University
Tallahassee, Florida

Job Title:

Theater 7 HVAC Replacement

Seal:

Consultant:

McGINNISS + FLEMING ENGINEERING

ALW Project #:
FSU Project #:
Phase: **100% Construction Documents**

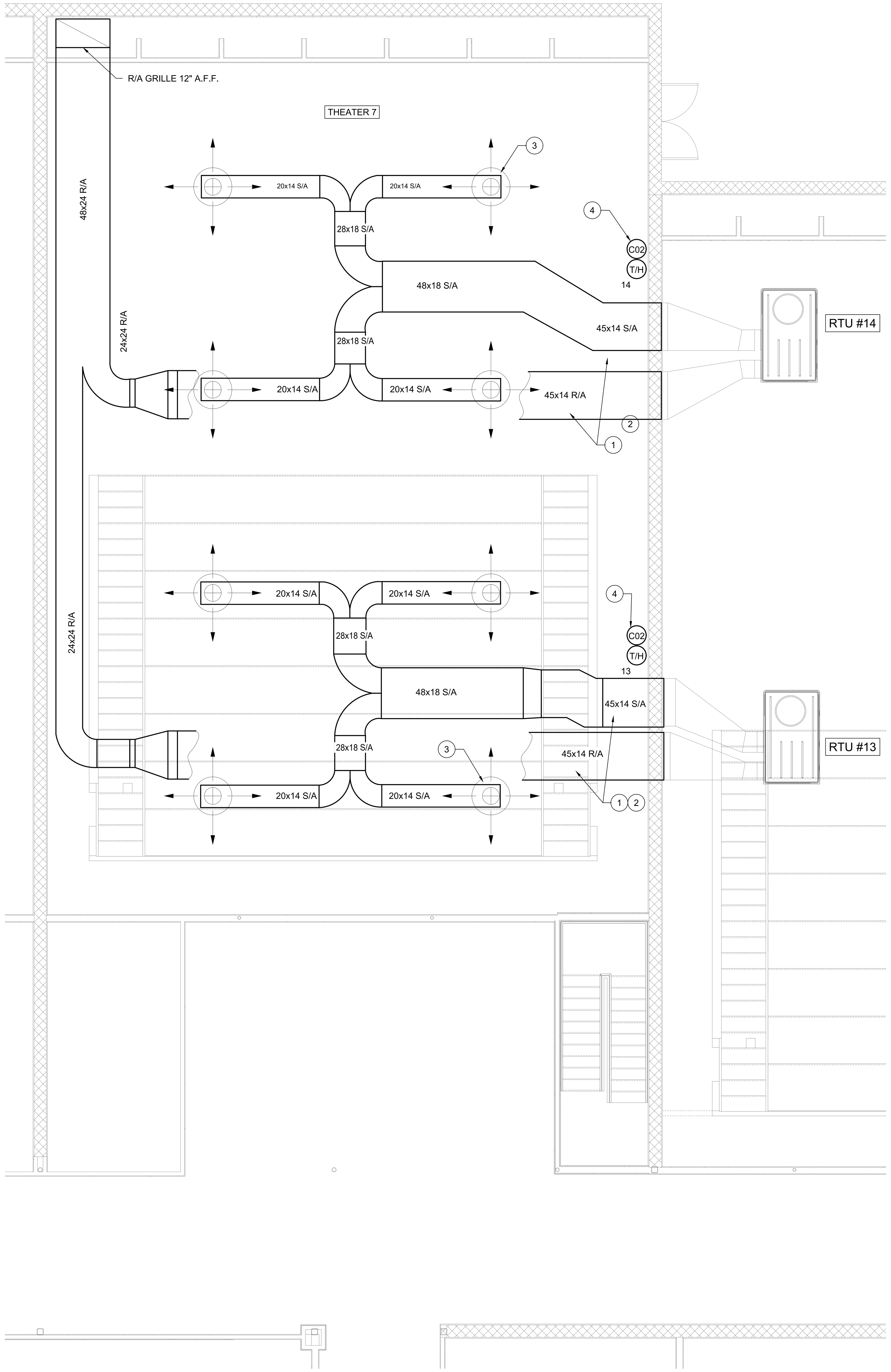
Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:

Demolition Plan

Sheet No.:

M2.0



1 New Work Plan - Theater 7

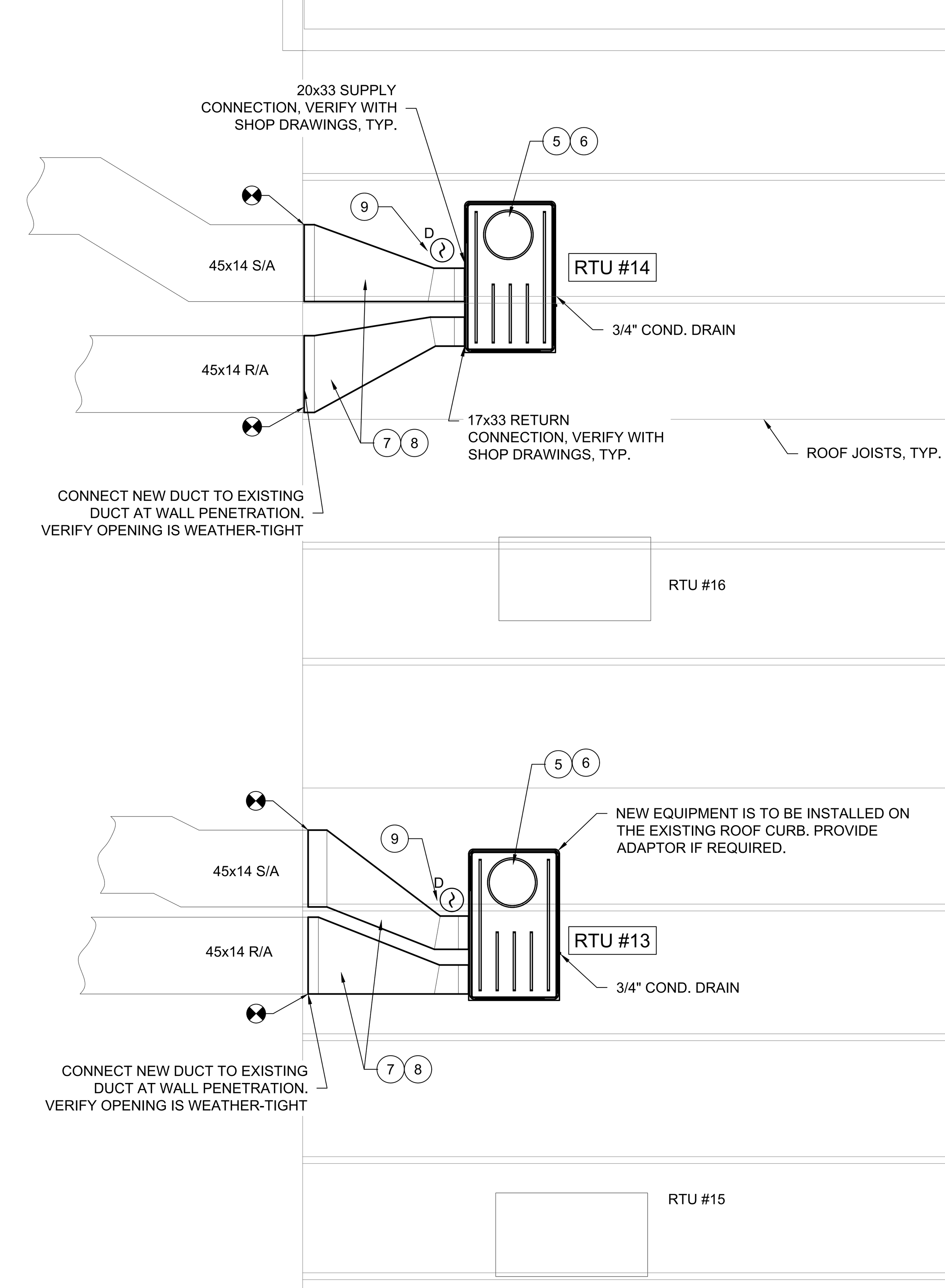
Scale: 3/16" = 1'-0"

N

NEW WORK KEY NOTES:

1. THE EXISTING SUPPLY AND RETURN DUCTS ARE TO REMAIN IN SERVICE.
2. THE DUCTS ARE INTERNALLY LINED AND SHALL BE CLEANED AND SEALED DURING THE HEAT PUMP REPLACEMENT. THE LINER WILL REMAIN AND BE SEALED AFTER CLEANING WITH DUCT ARMOR, OR EQUAL.
3. REMOVE AND CLEAN ALL SUPPLY AIR DIFFUSERS. REINSTALL DIFFUSERS WHEN COMPLETE.
4. THE CONTROLS CONTRACTOR SHALL INSTALL TEMPERATURE + HUMIDITY SENSORS, AND CO2 SENSORS IN THE SPACE. THE SENSORS WILL WIRE INTO THE RTU CONTROLLER; COMMUNICATION TO BAS WILL BE VIA BACNET FROM THE CONTROLLER.
5. INSTALL NEW ROOFTOP UNITS ON THE EXISTING ROOF CURBS. THE EXISTING 70-AMP ELECTRICAL SERVICE WILL BE REUSED; VERIFY PIGTAIL IS LONG ENOUGH FOR TERMINATION IN NEW UNIT.
6. REPAIR ROOF MEMBRANE AS REQUIREDTO MAKE THE INSTALLATION WEATHER-TIGHT.
7. INSTALL NEW SUPPLY AND RETURN DUCTS BETWEEN THE UNITS AND THE EXISTING PENETRATIONS IN THE BUILDING; CONNECT TO THE EXISTING DUCT. INSTALL DUCT DETECTOR IN SUPPLY AIR DUCT. SEAL WALL PENETRATIONS WEATHER-TIGHT.
8. SUPPLY AND RETURN DUCTS SHALL EACH HAVE 2" OF RIGID INSULATION, TAPERED AWAY FROM THE MIDDLE OF THE DUCT SO IT IS SELF-DRAINING. APPLY INSULATION CLADDING FOR RAIN AND UV RESISTANCE - ALUMAGUARD, OR EQUAL.
9. INSTALL DUCT DETECTORS IN THE SUPPLY AIR SIDE OF THE NEW UNITS. COORDINATE WITH ELECTRICAL.
10. NEW EQUIPMENT SHALL BE CONNECTED INTO THE BUILDING AUTOMATION SYSTEM FOR CONTROL OF TEMPERATURE, HUMIDITY, DEMAND CONTROL VENTILATION, AND SCHEDULING, THROUGH THE BAS.

THEATER 7



2 New Work Plan - Roof

Scale: 3/16" = 1'-0"

N

PHASE:	DRAWN:	REVIEWED:	DATE:
CONCEPT SCHEM. DESIGN			
DESIGN DEVELOPMENT			
EARLY DEMOLITION PACKAGE			
90% CONSTRUCTION DOCS.			
PERMIT DOCS.			
100% CONSTRUCTION DOCS.	JB	JB	9/29/25

ID:	REVISION:	DRAWN:	REVIEWED:	DATE:

Client:

FSU

Florida State University
Tallahassee, Florida

Job Title:

Theater 7 HVAC Replacement

Seal:

Consultant:
McGINNISS + FLEMING ENGINEERING
JON BARBER, PE 55427 | BRIAN WALLACE, PE 75562
820 EAST PARK AVE, I-200, TALLAHASSEE, FL 32301
MFE-INC.COM | 850.681.6424

ALW Project #:
FSU Project #:
Phase: **100% Construction Documents**

ALW
Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

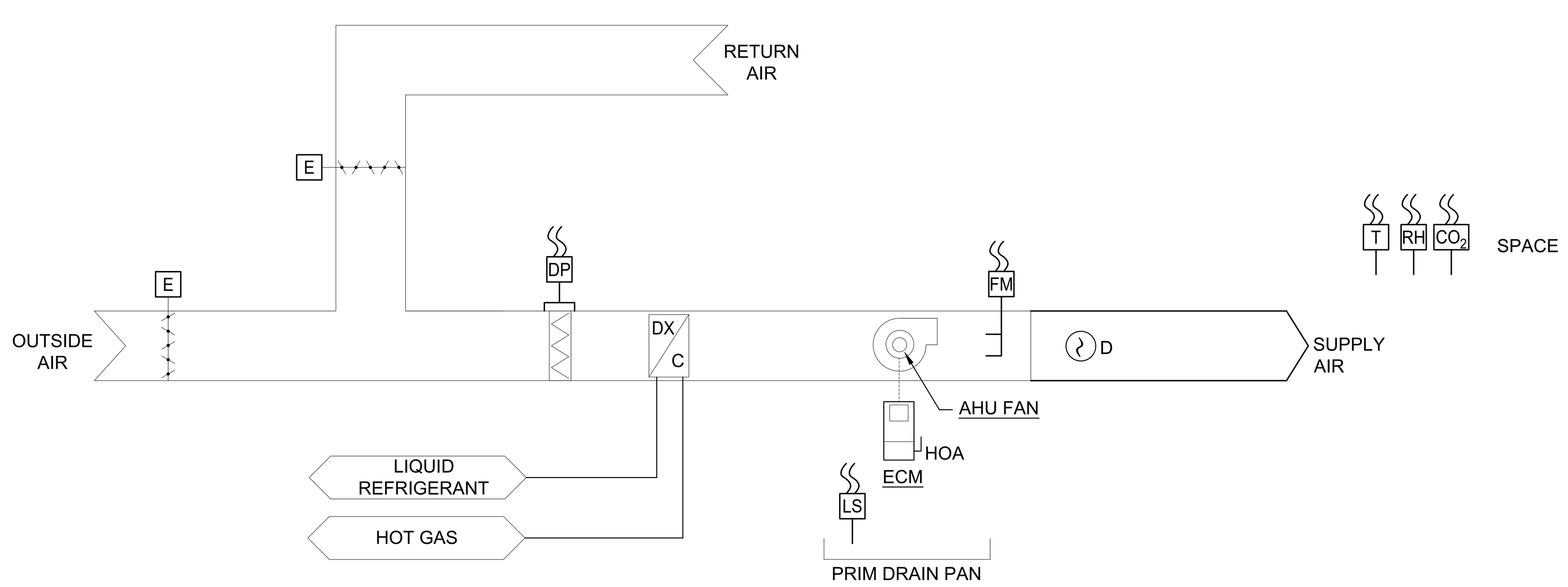
Description:
New Work Floor Plan & Roof Plan

Sheet No.:
M3.0

CONTROLS SCOPE OF WORK AND COORDINATION:

1. CONNECT TO EXISTING SIEMENS PANEL FOR COMMUNICATION TO THE FSU BUILDING AUTOMATION DESIGO SERVER.
2. THE CONTROLS CONTRACTOR SHALL COORDINATE WITH THE OWNER'S INFORMATION TECHNOLOGY (IT) AND CONTROLS STAFF, AND THE MECHANICAL AND ELECTRICAL CONTRACTORS.
3. INTEGRATED AUTOMATION INCLUDES BUT IS NOT LIMITED TO LABOR AND MATERIALS FOR TERMINATIONS, PATHWAYS, INSTALLATIONS, CERTIFICATIONS, TESTING, SYSTEM VERIFICATION, PROJECT COMMISSIONING, INTEGRATION EQUIPMENT, AND INSTRUMENTATION.
4. CONTROL WIRING REQUIRED FOR THIS SYSTEM SHALL BE PROVIDED & INSTALLED PER DIVISION 16. WIRING MUST BE IN CONDUIT OVER ITS ENTIRE LENGTH. COORDINATE SUPPORTS & WALL PENETRATIONS WITH OTHER TRADES.
5. UNLESS EXPLICITLY LISTED BELOW, THE CONTROLS DEVICES AND PROGRAMMING ARE NEW AND SHALL BE PROVIDED AND INSTALLED BY THE CONTROLS CONTRACTOR. THE SEQUENCE ON THIS SHEET SHALL GOVERN THE OPERATION OF THE CONTROLS.
6. ALL OF THE DEVICES SHALL BE INTEGRATED INTO THE BAS; VISIBLE AND CONTROLLABLE (WHERE APPLICABLE) IN THE USER INTERFACE.
7. PRIOR TO START-UP, PERFORM SYSTEM OPERATIONAL CHECKOUT.
8. PROVIDE OWNER TRAINING, INCLUDING PROCESS TO START-UP AND OPERATE EQUIPMENT
9. AT THE END OF THE PROJECT, PROVIDE RECORD DOCUMENTS, MANUFACTURER INFORMATION FOR BAS & INSTRUMENTS, AND OPERATION MANUALS.

POINT NAME	UNITS	CONTROL POINTS											
		POINTS						ALARM			GENERAL		
		INPUT			OUTPUT								
		ANALOG	DIGITAL	INTEGRATED	ANALOG	DIGITAL	INTEGRATED	GENERAL	UNIT SHUTDOWN		TREND LOG	GRAPHIC	INTERLOCK
SPACE AIR TEMPERATURE	°F	X									X	X	
SPACE RELATIVE HUMIDITY	%	X									X	X	
SPACE CO2 CONCENTRATION	PPM	X									X	X	
OUTSIDE AIR DAMPER	%			X							X	X	
RETURN AIR DAMPER	%			X							X	X	
R/A FILTER STATUS	DP, IN W.C.			X				X			X	X	
COOLING COIL PAN LEVEL				X				X	X		X	X	
OUTSIDE AIR FLOW	CFM			X							X	X	
AHU DUCT DETECTOR			X					X	X		X	X	X
ENABLE COMMAND	ON/OFF						X				X	X	
ZONE TEMP SETPOINT	°F						X				X	X	
ZONE HUMIDITY SETPOINT	% RH						X				X	X	
CO_2 CONCENTRATION SETPOINT	PPM						X				X	X	
SPACE OCCUPANCY				X							X	X	



PACKAGED DX HEAT PUMP SYSTEM CONTROL DIAGRAM

EQUIPMENT

RTU-13 & RTU-14

GENERAL
SINGLE ZONE VARIABLE AIR VOLUME (SZVAV) PACKAGED HEAT PUMP SYSTEM AND LOGIC FOR DEMAND CONTROL VENTILATION (DCV)

UNIT OPERATES BASED ON PACKAGED CONTROLS PROVIDED BY MANUFACTURER. ALL DEVICES, INCLUDING THERMOSTATS, ARE TO BE WIRED BACK INTO UNIT CONTROLLER.

BAS TO INTEGRATE WITH UNIT TO PROVIDE REMOTE MONITORING AND SETPOINT CONTROL.

OCCUPIED MODE
UPON OCCUPIED COMMAND, VIA SCHEDULE:
1. SUPPLY FAN STARTS
2. OCCUPIED SETPOINTS ACTIVATE

UNOCCUPIED MODE
UPON OCCUPIED COMMAND, VIA SCHEDULE:
1. UNIT SHUTS DOWN
2. OUTSIDE AIR DAMPER CLOSES
3. UNIT REMAINS AVAILABLE FOR UNOCCUPIED SETPOINTS

COOLING MODE
1. HEAT PUMP IS IN COOLING MODE
2. SUPPLY FAN MODULATES TO MAINTAIN ZONE COOLING TEMPERATURE SETPOINT
3. DX THERMAL EXPANSION VALVE MODULATES TO MAINTAIN COOLING COIL LEAVING AIR TEMPERATURE.

HEATING MODE - HEAT PUMP ONLY
1. HEAT PUMP IS IN HEATING MODE
2. SUPPLY FAN MODULATES TO MAINTAIN ZONE HEATING TEMPERATURE SETPOINT
3. COMPRESSORS ARE STAGED TO MAINTAIN HEATING COIL LEAVING AIR TEMPERATURE.

DEHUMIDIFICATION MODE
WHEN SPACE RELATIVE HUMIDITY EXCEEDS SETPOINT:
1. DX COOLING COIL VALVE MODULATES TO MAINTAIN MINIMUM COIL DISCHARGE AIR TEMPERATURE SETPOINT.
2. HOT GAS REHEAT COIL VALVE MODULATES TO MAINTAIN SUPPLY AIR REHEAT TEMPERATURE SETPOINT.

WHEN SPACE RELATIVE HUMIDITY FALLS BELOW SETPOINT:
1. UNIT RETURNS TO COOLING OR HEATING MODE OF OPERATION.

DEMAND CONTROL VENTILATION
EVERY 10 MINUTES (ADJ), THE OUTSIDE AIR FLOW SETPOINT RESETS WITHIN THE MINIMUM AND MAXIMUM LIMITS:
1. IF RETURN AIR CO_2 CONCENTRATION IS BELOW THE CO_2 CONCENTRATION LIMIT, THE OUTSIDE AIR DAMPER CLOSES IN INCREMENTS OF 10% (ADJ).
2. IF RETURN AIR CO_2 CONCENTRATION IS ABOVE THE CO_2 CONCENTRATION LIMIT, THE OUTSIDE AIR DAMPER OPENS IN INCREMENTS OF 10% (ADJ).

SAFETIES
THE FOLLOWING SAFETIES SHUT DOWN THE UNIT:
1. DUCT SMOKE ALARM
2. DRAIN PAN FLOAT SWITCH

A MANUAL RESET IS REQUIRED AFTER SAFETY ACTIVATION.

OCCUPIED COOLING SETPOINT: 72°F (ADJ.)
UNOCCUPIED COOLING SETPOINT: 78°F (ADJ.)
OCCUPIED HEATING SETPOINT: 70°F (ADJ.)
UNOCCUPIED HEATING SETPOINT: 63°F (ADJ.)

OCCUPIED CO_2 CONCENTRATION SETPOINT: 900 PPM
OCCUPIED CO_2 CONCENTRATION MINIMUM: 500 PPM
OCCUPIED CO_2 CONCENTRATION MAXIMUM: 1000 PPM

OUTSIDE AIR MAX. FLOW: 650 CFM
OUTSIDE AIR MIN. FLOW: 165 CFM

PHASE:	DRAWN:	REVIEWED:	DATE:
CONCEPT SCHEM. DESIGN			
DESIGN DEVELOPMENT			
EARLY DEMOLITION PACKAGE			
90% CONSTRUCTION DOCS.			
PERMIT DOCS.			
100% CONSTRUCTION DOCS.	JB	JB	9/29/25

ID:	REVISION:	DRAWN:	REVIEWED:	DATE:

FSU

Client:
Florida State University
Tallahassee, Florida

Job Title:
Theater 7 HVAC Replacement

Consultant:
McGINNISS + FLEMING ENGINEERING

Seal:

ALW Project #:
FSU Project #:
Phase: 100% Construction Documents

ALW
Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:
Controls

Sheet No.:
M4.0

23 01 00 MECHANICAL - GENERAL PROVISIONS

PART 1 - GENERAL

GENERAL CONDITIONS

The work described hereunder shall be installed subject to the Contractual Conditions for the entire Specifications.

CORRELATION

This Section of the Specifications and its accompanying Drawings are made separate for the convenience of the General Contractor in preparing his bid and in no way relieves the General Contractor of his responsibility to correlate the work under this Section with that of all other trades as regards the items to be furnished by various Subcontractors, the exact location of all equipment and materials and the necessity of planning the work of all trades to avoid interference.

PLANS AND SPECIFICATIONS

Drawings and Specifications are intended to clearly set forth all work, and the detailed description is added to assist in establishing the scope and the location of the several parts of the work. Collectively, they shall govern and control the scope, character, and design of the Work, and any item called for in any one of the documents shall be as though mentioned in all.

Failure to refer in the Specifications to any items of the work shown on the Drawings, but necessary to the completion of the Work shall not relieve the Contractor of the full responsibility to furnish the materials and perform the work of such items, in a manner comparable to other items of similar nature for which detailed Specifications are included.

PROJECT FAMILIARIZATION

The bidder is expected to visit the site and familiarize himself with conditions at the site before submitting his bid. He shall familiarize himself with the work required throughout the entire project and shall make allowances for contingencies which may occur in the interconnection of the various systems.

ALTERNATES AND ADDENDA

The Contractor shall investigate all Alternates, Addenda and Allowances as they relate to the Work of this Section.

TESTING

The Work shall include complete testing of all equipment and piping at the completion of the Work and making any connection changes or adjustments necessary for the proper functioning of the system and equipment.

WORK INCLUDED

Work covered under this Section consists of furnishing all labor, materials, tools, equipment, transportation, scaffolding, services, supervision, and performing of all operations required to properly complete all mechanical work in accordance with this Division of the Specifications and as indicated on the applicable Drawings, subject to terms and conditions of the Contract.

SUPERVISION OF WORK

The Mechanical Contractor shall have a qualified and experienced superintendent on the job when any related work is in progress.

RELATED WORK SPECIFIED ELSEWHERE

The Contractor is cautioned to note carefully other Sections of the project Specifications with their cross references to other specific standard specifications, standard detail, etc., describing work to be furnished under these Specifications as well as any mechanical work that may be shown on electrical, structural, architectural, or other drawings, in order that he may fully understand the requirements and work to be provided under this Section of the Specifications.

ORDINANCES AND REGULATIONS

All work shall conform with all local and State ordinances or regulations governing the installation of such equipment. If work as laid out, indicated or specified is recognized to be contrary to or conflicting with local ordinances or regulations, the Subcontractor shall report same to the Architect/Engineer before submitting a bid. The Architect/Engineer will then issue instructions as to procedure.

CODES AND STANDARDS

The currently adopted standards of the following organizations, and individual standards named, shall be followed the same as if they were fully written herein and constitute a part of the Specification requirements except where otherwise specified:

National Fire Protection Associations - Standards
- NFPA 70, National Electric Code
- NFPA 90-A, Installation of Air Conditioning and Ventilating Systems.

FL Building Code
FL Mechanical Code
FL Gas Code
FL Plumbing Code
Florida Fire Prevention Code
National Board of Fire Underwriters
SMACNA HVAC Duct Construction Standard
ANSI/ASME B31.1, Power Piping
ANSI/ASME B31.9, Building Services Piping

The foregoing rules, standards, regulations, specifications, recommendations, and requirements shall be followed by the Contractor as minimum requirements. They shall not relieve the Contract from furnishing and installing higher grades of materials and workmanship which are specified herein or indicated on the Drawings.

Any material, equipment or workmanship specified by reference to the number, symbol or title of Specification or detail, or other standard rules, codes, regulations, etc., shall comply with the latest edition amendments and revisions thereto in effect on the date of these Specifications.

The Contractor shall submit proof, if requested by the Engineer or his representative, that the materials, appliances, equipment, or devices that he furnishes and installs under this Contract meet the requirements of the Underwriters' Laboratories, Inc., or Factory Mutual, as regards fire and casualty hazards.

PERMITS, INSPECTIONS AND UTILITY FEES

Coordinate costs of taps with the Owners Representative & the CM.

The Contractor shall obtain necessary permits and inspections required for work and pay all charges incidental thereto. Contractor shall coordinate all utility taps and shall pay all associated fees, impact charges, etc. Upon completion of the work the Contractor shall deliver to the Engineer a certificate of inspection and approval from the local inspection department, if required.

MINOR DEVIATIONS

The Contractor shall note that the Mechanical Drawings are intended to indicate only the extent diagrammatically, general character and location of the work included. Work intended, but having minor details obviously omitted or not shown, shall be furnished and installed complete to perform the functions intended.

Arrangements of piping, ductwork, and equipment that differ materially from the obvious intent of the Drawings will not be permitted except where necessary to avoid interferences, and only where specifically approved by the Architect/Engineer. Drawings shall be furnished showing all changes. Any change resulting in a saving in labor and materials shall be made in accordance with a Contract change order.

BASIC MATERIALS AND METHODS

The materials and methods specified in this article are to be used for work specified throughout this Section of the Specifications.

All materials and workmanship shall be of the highest quality.

Any materials on the job rejected by the Architect/Engineer shall be removed from the premises.

The installation shall be made in a workmanlike manner in accordance with acceptable industry standards except where specific procedures are called for in these Specifications, in which case they shall be followed.

All materials shall be new, free of defects and of the manufacturers latest standard design.

Reference to a particular material or specific equipment by name, make or catalog number is to describe equipment which will meet the requirements of the project and is not intended to restrict bidding.

It is the intent that all of the equipment of a similar type shall be the products of the same (one) manufacturer when practicable, providing unit responsibility for each group.

REVIEW OF MATERIALS

Submittals shall be made in compliance with the General Conditions of the Contract for Construction and the following:

Submittals shall be identified by items numbers as listed in the pertinent section of the specifications and shall be accompanied by a letter of transmittal.

Certificates shall be in triplicate and where required in conjunction with other submittals shall accompany such submittals.

Materials and other items subject to approval shall not be purchased or incorporated in the work before receipt of written approval.

Submittals shall be rendered all at one time for the entire project. Partial submittals will not be accepted or acknowledged. Exception: If a few items have long shop drawing preparation time, then these items will be accepted later to avoid delaying the shop drawing procedure.

SHOP DRAWINGS

Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier or distributor and which illustrates some portion of the Work.

All shop drawings submitted shall bear the stamps of approval of the Contractor as evidence that the drawings have been checked by the Contractor. If the shop drawings show variances from the other requirements of the contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment. Otherwise, the Contractor will not be relieved of the responsibility for executing the work even though such shop drawings have been approved.

Submit electronic copies of the shop drawings to be retained and additional copies as required by the Contractor, all items required under appropriate sections of the Specifications.

All materials are to be submitted in a hard cover, three ring binder. All materials are to be labeled with the pertinent Specification Section and are to be separated with dividers for each section of the Mechanical Specifications.

All materials submitted late or re-submitted shall be 3-ring punched and marked with the appropriate Specification Section Numbers.

PROJECT CLOSEOUT

The Contractor shall remove all temporary work and temporary facilities prior to final pay request.

The Contractor shall clean spaces that were occupied by temporary work and temporary facilities. Remove debris, rubbish and excess materials from the sites. Burning or burying is not permitted on the sites.

Repair damages caused by installation or use of temporary facilities. Restore to original condition.

Restore grass, landscaping, hardscaping to original condition.

GUARANTEES, BONDS AND AFFIDAVITS

Warranties:

The Contractor shall submit to the Owner all manufacturer's warranties on equipment furnished and installed under this Contract.

In addition, to the guarantee of equipment by the manufacturer of each piece specified herein, the Contractor shall also guarantee such equipment and shall be held for a period of one year from final acceptance test to make good any defects of the materials or workmanship occurring during this period, without expense to the Owner.

Affidavits:

The Contractor shall provide affidavits as required in the non-technical portion of these Specifications.

Provide Warranty Labels:

All warrantied mechanical equipment see Mechanical Identification requirements.

OPERATION AND MAINTENANCE DATA

Manuals and Instructions:

The Contractor shall deliver to the Engineer, upon substantial completion of the Work, two copies of descriptive literature related to the equipment installed under this Contract, including parts lists, wiring diagrams, maintenance and operation manuals and warranties customarily supplied by manufacturers for equipment incorporated in this work. The literature shall be neatly bound in a 3-ring binder and delivered to the Engineer prior to final acceptances. Each manual shall include a copy of the Control Diagrams and a complete description of the operation of the control systems.

The Contractor shall give physical demonstration and verbal instructions for proper operation and maintenance of equipment to the Owner or his designated representative. Schedule these demonstrations and instructions at the Owner's convenience.

Provide four (4) hours of tour and demonstration of all equipment installed under this project.

AS-BUILT DRAWINGS

As-Built Drawings are required. Maintain a current and legible record set (full size set) on the job. Final record prints will be drafted by the Engineer and signed off by the contractor. The Contractor is solely responsible for providing accurate as-builts.

QUALITY ASSURANCE

Products Criteria:

Standard Products: Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products. Items of equipment shall essentially duplicate equipment that has been in satisfactory use at least two (2) years prior to bid opening. Provide list of users upon request.

Equipment having less than a two-year use record, which in the opinion of the Engineer, provided significant benefits to the Owner such as improved energy efficiency, will be acceptable if it is a product of a manufacturer who has been regularly engaged in the manufacture of that specific type of product which has been used in similar applications for a period of two years. The Engineer reserves the right to require the Contractor to submit evidence to this effect for his approval.

Equipment Service: Products shall be supported by a service organization which maintains an adequate inventory of repair parts and is located, in the opinion of the Engineer, reasonably close to the site.

Manufacturer's Nameplates: Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped or otherwise permanently marked on each item of equipment.

Welding: Before any welding is performed submit a copy of the Welding Procedure Specification (WPS) together with the Procedure Qualification Record as required by Section IX of the ASME Boiler and Pressure Vessel Code.

Before any welder performs any welding, submit a copy of the Manufacturer's Record of Welder or Welding Operator Qualification Tests as required by Section IX of the ASME Boiler and Pressure Code. The letter or symbol (as shown on the qualification test form) shall be used to identify the work of that welder and shall be affixed, in accordance with appropriate construction code, to each completed weld.

The types and extent of non-destructive examinations required for pipe welds are shown in Table 136.4 of the Code for Pressure Piping, ANSI/ASME B 31.1.

Manufacturer's Recommendations: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Engineer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

FIRESTOPPING

Provide for firestopping of all mechanical systems. UL listed methods conforming to the situations present shall be utilized. Submit shop drawings of intended methods, including installation instructions and proof of UL Listing.

WALL, FLOOR AND CEILING PLATES

Material and Type: Chrome plated brass or chrome plated steel. Use plates that fit tight around pipes, cover openings around pipes, and cover the entire pipe sleeve projection.

Thickness: Not less than 3/32 inch for floor plates. For wall and ceiling plates, not less than 0.025 for up to 3 inch pipe, 0.035 for larger pipe.

Locations: Use where pipe penetrates floors, walls and ceilings in exposed locations, except mechanical rooms or chases. Use also where insulation ends on exposed water supply pipe drop from overhead. Provide a watertight joint in spaces where brass or steel pipe sleeves are specified.

INSTALLATION

Coordinate location of piping, sleeves, inserts, hangers, ductwork and equipment. Locate piping, sleeves, inserts, hangers, ductwork and equipment clear of windows, doors, openings, light outlets, and other services and utilities. Follow manufacturer's published recommendations for installation methods not otherwise specified.

Protection and Cleaning:

Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Engineer. Damaged or defective items, in the opinion of the Engineer, shall be replaced.

Protect all finished parts of equipment, such as shafts and bearings, where accessible, from rust prior to operation by means of protective grease coating and wrapping. Close pipe openings with caps or plugs during installation. Tightly cover and protect fixtures and equipment against dirt, water, chemical or mechanical injury. At completion of all work thoroughly clean fixtures, exposed materials and equipment.

Concrete and Grout: Use concrete and shrink-compensating grout, 3000 psi minimum.

Install gauges, thermometers, valves and other devices with due regard for ease in reading or operating and maintaining said devices. Locate and position thermometers and gauges to be easily read by operator or staff standing on floor or walkway provided. Servicing shall not require dismantling adjacent equipment or pipe work.

PAINTING

Paint all bare steel pipe, supports, hangers, fabricated parts, etc. with two coats of enamel paint. Prepare surfaces in accordance with the manufacturer's recommendations. Coordinate colors with existing like components or per the Owner.

Paint all cut or heat affected galvanized steel components with two coats of cold galvanizing spray paint, ZRC Cold Galvanizing compound or equal. Prepare surfaces per the manufacturer's recommendations.

PIPE AND EQUIPMENT SUPPORTS

Generally, support in accordance with industry standards and as described in Section 23 15 00.

Use of chain, wire or strap hangers, wood for blocking, stays and bracing, nor hangers suspended from piping above will not be permitted.

Use hanger rods that are straight and vertical. Turnbuckles for vertical adjustments may be omitted where limited space prevents use. Provide a minimum of 1" clearance between pipe or pipe covering and adjacent work.

LUBRICATION

Field check and lubricate equipment requiring lubrication prior to initial operation.

23 74 16.12 PACKAGED VAV ROOFTOP HEAT PUMP

PART 1 - GENERAL

1.1. SUMMARY
- A. This section includes units with integral heating and cooling for outdoor installation. Integral heating and cooling source shall be a packaged DX Heat Pump. Airflow arrangement shall be Outdoor Air with Recirculation.
- B. Related Sections include the following:
  1. Section 23 01 00: General Provisions
  2. Section 23 07 10: Insulation
  3. Section 22 05 00: Plumbing
  4. Section 26 00 00: Electrical

1.2 SUBMITTALS
- A. Product Data: For each type or model include the following:
  1. Complete fan performance curves for both Supply Air and Exhaust Air, with system operating conditions indicated, as tested in an AMCA certified chamber.
  2. Sound performance data for both Supply Air and Exhaust Air, as tested in an AMCA certified chamber.
  3. Motor ratings, electrical characteristics and motor and fan accessories.
  4. Performance ratings for all chilled water or DX coils.
  5. Dimensioned drawings for each type of installation, showing isometric and plan views, to include location of attached ductwork and service clearance requirements.
  6. Estimated gross weight of each installed unit.
  7. Installation, Operating and Maintenance manual (IOM) for each model.
  8. Microprocessor Controller (DDC) specifications to include available options and operating protocols.

1.3. QUALITY ASSURANCE
- A. Product Options: Drawings must indicate size, profiles and dimensional requirements of unit and are to be based on the specific system indicated. Refer to Division 1 Section "Product Requirements".
- B. End of line test with full report available upon request.
- C. Certifications
  1. Entire unit shall be ETL Certified per U.L. 1995 and bear an ETL sticker.
  2. Coils shall be Recognized Components for ANSI/UL 1995, CAN / CSA C22.2 No 236.05.
  3. AHRI 210 / 240 - Performance Rating of Unitary Air Conditioning and Air-Source Heat Pump Equipment
  4. AHRI 340 / 360 - Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat pump Equipment
  5. ASHRAE 90.1 - Energy Standard for New Buildings Except Low-Rise Residential Buildings
  6. AHRI 270 or 370 Sound Rating of Outdoor Refrigeration and Air Conditioning Equipment, as applicable.

1.4. COORDINATION
- A. Coordinate size and location of all building penetrations required for installation of each unit and associated plumbing and electrical systems.
- B. Coordinate location of water system fittings to ensure correct positioning for connection to the condensate drain pipe.
- C. Coordinate sequencing of construction of associated plumbing, HVAC, electrical supply, roofing contractor.

1.5. HANDLING
- A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.
- B. Protect units from physical damage. Leave factory shipping covers in place until installation.

1.6. WARRANTY
- A. Provide a full parts and labor warranty for five years from start-up.

PART 2 - PRODUCTS

2.1. CASING
- A. Unit casing shall be zinc coated, heavy gauge, galvanized steel.
- B. Weather resistant painted metal with galvanized substrate.
- C. Meets ASTM B117, 672 hour salt spray test.
- D. Removable single side maintenance access panels.
- E. Exposed vertical panels and top covers in the indoor air section insulated with a cleanable foil-faced, fire-retardant permanent, odorless glass fiber material.
- F. Base pan with no penetrations within the perimeter of the curb other than the raised 1-inch downflow supply/return openings to provide an added water integrity precaution, if the condensate drain backs up.
- G. Base of the unit insulated with 1/8-inch, foil-faced, closed-cell insulation.
- H. Unit base provisions for forklift and/or crane lifting on three sides of unit.

2.2. FIN AND TUBE COILS
- A. Heat pump units shall have internally finned, 5/167-inch copper tubes, mechanically bonded to a configured aluminum plate fin.
- B. Assembled coil shall be factory leak tested to 600 psi.
- C. Assembled unit shall be leak tested to 465 psi.

2.3. COIL GUARDS
- A. Provide condenser coil protection.

2.4. COMPRESSORS
- A. All units have direct-drive, hermetic, scroll type compressors with centrifugal type oil pumps.
- B. Suction gas-cooled motor with voltage utilization range of plus or minus 10 percent of unit nameplate voltage.
- C. Internal overloads shall be standard with scroll compressors.
- D. Crankcase heaters shall be standard on all compressors.
- E. All 6-17.5 ton unit shall have 3 stages of cooling.

2.5. FILTERS
- A. 2-inch MERV 13 filters.

2.6. FAN
- A. The unit shall have direct drive plenum fans with ECM motors. Plenum fan shall be backward-curved fan wheel along with an external rotor direct drive variable speed indoor motor.
- B. Supply fan speed adjustments can be made using the unit controller or using a manufacturer supplied app. The connection between the unit control and the app shall be Bluetooth.
- C. Motors are electronically protected.

2.7. STAINLESS STEEL DRAIN PAN
- A. Provide a factory installed stainless steel drain pan.

2.8. THROUGH THE BASE ELECTRICAL WITH DISCONNECT SWITCH
- A. Provide a 3-pole, molded case, disconnect switch with provisions for through-the-base electrical connections.
- B. Disconnect switch installed within unit and shall be protected from outdoor elements.
- C. Wiring shall be provided from the switch to the unit high voltage terminal block.
- D. Switch shall be UL recognized.

2.9. ECONOMIZER
- A. A comparative enthalpy economizer shall be available with or without barometric relief. It shall be fully modulating from 0 to 100 percent and shall include provision for a minimum position setting. Assembly also includes, preset linkage, wiring harness with plug, and spring return actuator.
- B. A standard discharge air sensor shall be included on all units with economizers.

2.9. ROOF MOUNTING CURB
- A. Roof mounting curb shall be heavy gauge zinc coated steel with nominal two-inch by four-inch nailer setup. Supply/return air opening gasketing shall be provided. Curb shall ship knocked down for easy assembly. Channel shall be provided to allow for adjustment of return air opening location. Curb shall be manufactured to National Roofing Contractors Association guidelines.

PART 3 - EXECUTION

3.1. EXAMINATION
- A. Prior to start of installation, examine area and conditions to verify correct location for compliance with installation tolerances and other conditions affecting unit performance. See unit IOM.
- B. Examine roughing-in of plumbing, electrical and HVAC services to verify actual location and compliance with unit requirements. See unit IOM.
- C. Proceed with installation only after all unsatisfactory conditions have been corrected.

3.2. INSTALLATION
- A. Installation shall be accomplished in accordance with these written specifications, project drawings, manufacturer's installation instructions as documented in manufacturer's IOM, Best Practices and all applicable building codes.

3.3. CONNECTIONS
- A. In all cases, industry Best Practices shall be incorporated. Connections are to be made subject to the installation requirements shown above.
- B. Piping installation requirements are specified in Division 22 (Plumbing). Drawings indicate general arrangement of piping, fittings and specialties.
- C. Duct installation and connection requirements are specified in Division 23 of this document.
- D. Electrical installation requirements are specified in Division 26 of this document.

3.4. FIELD QUALITY CONTROL
- A. Inspect field assembled components and equipment installation, to include electrical and piping connections. Inspection must include a complete startup checklist to include the following: Completed Start-Up Checklists as found in manufacturer's IOM.

3.5. START-UP SERVICE
- A. Clean entire unit, comb coil fins as necessary, install clean filters. Measure and record electrical values for voltage and amperage. Refer to Division 23 "Testing, Adjusting and Balancing" and comply with provisions therein.

END OF SECTION

PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN:	REVIEWED:	DATE:
CONCEPT SCHEM. DESIGN								
DESIGN DEVELOPMENT								
EARLY DEMOLITION PACKAGE								
90% CONSTRUCTION DOCS.								
PERMIT DOCS.								
100% CONSTRUCTION DOCS.	JB	JB	9/29/25					

Client: Florida State University
Tallahassee, Florida

Job Title: Theater 7 HVAC Replacement

Consultant: McGINNISS + FLEMING ENGINEERING
JON BARBER, PE 55427 BRIAN WALLACE, PE 75562
820 EAST PARK AVE, I-200, TALLAHASSEE, FL 32301
MFE-INC.COM 850.681.6424

Seal:

ALW Project #:
FSU Project #:
Phase: **100% Construction Documents**

Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850,942.1718
www.think3d.net

Description: **Specifications**

Sheet No.: **M5.0**

23 31 13 MECHANICAL - METAL AND FLEXIBLE DUCTWORK AND ACCESSORIES

GENERAL CONDITIONS

The work described hereunder shall be installed in accordance with the "Mechanical General Conditions," Section 15010.

DESCRIPTION OF WORK:

Extent of metal ductwork is indicated on drawings and in schedules, and by requirements of this section. In general, the work consists of, but is not limited to, the following:

A system of heating and air-conditioning supply and return air ductwork.
Smoke/fire dampers, air diffusers, and miscellaneous accessories.
Miscellaneous volume/control dampers.

QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacture of metal ductwork products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's qualifications: Firm with at least three (3) years of successful installation experience on projects with metal ductwork systems similar to that required for project.

Codes and Standards:

SMACNA Standards: Comply with SMACNA's "HVAC Duct Construction Standards, Metal and Flexible" for fabrication and installation of metal ductwork.
NFPA Compliance: Comply with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilation Systems".
NFPA Compliance: Comply with NFPA 96 "Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment".

SUBMITTALS:

Submit to the Architect/Engineer for approval six (6) copies of brochures, technical data and/or shop drawings of the following, and as many additional copies as required for Contractor use:

Ductwork and materials
Ductwork Insulation
Mastics
Grilles & accessories
Smoke and fire dampers, miscellaneous dampers and installation instructions

DELIVERY, STORAGE AND HANDLING:

Handle ductwork and equipment carefully to prevent damage. Do not install damaged sections or components; replace with new.

Store ductwork and equipment in clean dry place. Protect from weather, dirt, fumes, water, construction debris, and physical damage.

DUCTWORK MATERIALS:

Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 527, lockforming quality; with G-90 zinc coating in accordance with ASTM A 525.

Single-Wall Spiral Round Duct: Round duct with mechanical fastening, spiral flat seams, complying with ASTM A527, with G-90 zinc coating in accordance with ASTM A 525.

DUCTWORK INSULATION MATERIALS:

Duct Insulation values: Provide R=6 insulation.

Rigid Fiberglass Board Insulation: Federal Specification HH-1-558B, 3 pcf density, k=0.23, rated to 450 degrees F operating temperature. FSK reinforced foil vapor retarder. Owens / Corning Quiet R, Manville Type 814 or an approved equivalent.

Fiberglass Duct Wrap: Federal Specification HH-1-558B, 1 pcf density, k=0.24, rated to 450 degrees F operating temperature. FSK reinforced foil vapor retarder. Owens / Corning Type 100 or an approved equivalent.

Plenum Liner: Fiberglass liner with erosion resistant surface of thermosetting resin bonded glass fibers. R value is 4.3 / inch thickness. Air stream surface is to be treated with an EPA registered antimicrobial agent.

Exterior duct and insulation shall be covered with cladding that provides weather and UV protection. See project information.

MISCELLANEOUS MATERIALS:

General: Provide miscellaneous materials and products of types and sizes indicated and, where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connections of ductwork and equipment.

Duct Sealant: Non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.

Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.

Flexible Ducts: Insulated spiral-wound spring steel with flame proof vinyl sheathing complying with UL 181, Class I air duct (duct connectors will not be accepted).

Smoke Dampers: Dampers shall meet the requirements listed in NFPA 90A, 92A and 92B and shall be classified as leakage rated dampers for use in smoke control systems in accordance with the UL555S. Provide factory installed electric actuators qualified under UL555S. For each damper provide an access door 4" smaller than sheet metal size in width (up to 18") and 18" in length.

Fire Dampers: Dampers shall meet UL 555 for dynamic systems and shall be provided with angles, hardware, etc. Dampers shall be airfoil blade type or Style “B” out of the airstream type. Damper procurement and installation shall accommodate existing conditions. Provide damper access either via the duct or grille.

Smoke Damper Actuators: Actuators to be normally closed (powered open), spring return (selectable), 120 VAC with end position indication (two built in auxiliary switches), overload protection with disconnect switch. It will meet UL555 and UL555S requirements and be factory mounted to the smoke damper.

Grilles & Registers: Provide as scheduled on the drawings or an approved equivalent.

FABRICATION:

Duct sizes are internal free area unless otherwise noted.

Shop fabricate ductwork of gages and reinforcement complying with SMACNA "HVAC Duct Construction Standards".

Construct high pressure VAV supply duct (upstream of VAV terminal boxes) for 2.5” static pressure.

Construct low pressure supply air duct for 1.5” static pressure.

Construct return and outside air duct for 1” static pressure.

Limit angular tapers to 30 degrees for contracting tapers and 20 degrees for expanding tapers.

INSTALLATION OF METAL DUCTWORK

Examine areas and conditions under which metal ductwork is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

Install metal ductwork in accordance with SMACNA HVAC "Duct Construction Standards". Assemble and install ductwork in accordance with recognized industry practices, which will achieve airtight and noiseless systems, capable of performing each indicated service. Install each run with minimum number of joints. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling.

Use single-wall spiral seam round duct where specified and/or as needed to accommodate existing conditions.

Duct sizes shown are internal dimensions. Maintain free area equivalence when making transitions or when transforming between round and/or rectangular duct.

Seal all transverse and longitudinal joints, seams, etc. regardless of pressure class with approved duct mastic.

Routing: Field verify duct route prior to any fabrication. Coordinate layout with existing structure, suspended ceiling and lighting layouts and similar finished work.

Hangers for steel ducts shall be fabricated from sheet metal. Ducts shall be supported from the structure.

Penetrations: Where ducts pass through interior partitions and exterior walls, conceal space between construction opening and duct or duct insulation with sheet metal flanges/collars two gauges heavier than duct. Minimum width of flanges/collars shall be 1-1/2” or as required to completely seal opening. Overlap opening on rectangular openings by at least 1-1/2". Fasten to duct and substrata. Where ducts pass through fire-rated floors, walls, or partitions, provide in accordance with approved UL listed details and accepted industry practice.

Hard Ceiling or Sidewall Connections: Provide insulated sheet metal boots sized to fit the grille size as indicated. Secure boot to ceiling structure. Boot insulation shall be semi-rigid foil faced where exposed to the air stream and sealed with tape.

INSTALLATION OF SMOKE/FIRE DAMPERS:

General: Install dampers in accordance with the manufacturers’ installation instructions in order to maintain the UL listing. Fire dampers shall be out of the air stream as specified on the plans.

INSTALLATION OF FLEXIBLE DUCTS:

Maximum Length: For any duct run using flexible ductwork, do not exceed ten (10) feet extended length – use round spiral seam steel duct for longer runs. Install shortest possible length.

Installation: Install in accordance with Section III of SMACNA “HVAC Duct Construction Standards, Metal and Flexible". No bends shall be made with center-line radius of less than one duct diameter.

Flexible duct hangers shall be constructed from hanger wire and 3” wide sheet metal saddles. Wire gauge shall be per SMACNA and saddles shall have hemmed edges and corners. Support as needed to avoid kinks and flow obstructions.

END OF SECTION

23 05 93 MECHANICAL - TEST AND BALANCE

PART 1 - GENERAL

GENERAL REQUIREMENT

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

QUALITY ASSURANCE

The Testing Contractor shall be independent of the Mechanical Subcontractor, certified by NEBB member of AABC, and shall have a registered engineer in responsible charge of the work. The engineer must be a full time, direct employee of the Testing Contractor. Outside consultants will not be accepted.

The personnel involved in performing the tests shall be experienced and specifically trained in balancing mechanical systems.

SUBMITTALS:

Prior to any test & balance work, submit the TAB agency and job supervisor qualifications for approval. Also submit TAB agenda including sample forms, system diagrams for each air and water system and a synopsis of testing and adjusting procedures.

After completion of test, submit draft test reports.

Prior to Contractors request for final completion inspections, submit final test reports.

Submit 3 copies in accordance with general submittal requirements.

DESCRIPTION OF WORK:

The TAB work shall include:

Adjust and balance the complete HVAC system included in this specific project.

All grille air flowrates shall be tested and balanced to the specified flowrates.

Test and record space temperatures and setpoints, space relative humidity and setpoints, etc.

Record all test data and submit reports upon completion.

At the completion of the balancing contract instruct the owner's personnel in the proper operation and maintenance of each piece of equipment.

Check all control devices for proper operation, calibration and location.

Test, adjust, and balance the following mechanical systems:

Supply air systems

Equipment to be tested includes but is not necessarily limited to the following:

Verify temperature control system operation.
VAV boxes
All associated control devices.

Testing and balancing shall not begin until the system has been completed and in full working order. The mechanical contractor shall be responsible for putting all heating, ventilating and air conditioning systems and equipment into full operation and shall continue the operation of same during each working day of testing and balancing.

The Contractor shall furnish the Test and Balance Subcontractor with a full set of Drawings and Specification, applicable submittal data, and manufacturer's performance data.

The contractor shall make any changes required for correct balance, as recommended by the balancing contractor, at no additional cost to the owner. Such changes may encompass but are not necessarily restricted to pulleys, belts, ductwork, dampers, or the addition of dampers and access doors.

Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.

PART 2 - PRODUCTS: (NOT APPLICABLE)

PART 3 - EXECUTION:

GENERAL

All systems shall be tested, adjusted and balanced in accordance with applicable NEBB or AABC standards and the TAB agenda.

All instruments will have been calibrated recently and verification of calibration shall be provided with submittal data.

Coordinate TAB procedures with any phased construction requirements for the project so that usable increments of finished work may be accepted for beneficial occupancy. Systems serving partially occupied phases of the project may require balancing for each phase prior to final balancing.

The Agenda shall also include the following detailed narrative procedures, system diagrams and forms for test results.

Specific standard procedures required and proposed for each system. Additional procedures for variable flow systems shall be developed by the TAB Agency and included for review and approval.

Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with the project identification and a title descriptive of the contents. Divide the contents of the binder into the below listed divisions, separated by divider tabs:

General Information and Summary
Air Systems

General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses, and contact names and telephone numbers. Also include a certification sheet containing the seal and name, address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentations used for the procedures along with the proof of calibration.

Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

AIR BALANCE:

Make flow measurements at each terminal device, and each supply, return, or exhaust diffuser. Adjust each air outlet unit within plus or minus 10 percent of design requirements, but total air for each system shall be not less than shown. Adjust grilles and diffusers to minimize drafts in all areas.

Adjust outside air and return air quantities N/A

Adjust exhaust systems N/A

Test function of automatic dampers and operation of air terminal units. Check all controls for proper operation. N/A

Ductless Split Systems N/A

EQUIPMENT ELECTRICAL OPERATION:

N/A

CONTROLS OPERATION:

Proper operation of all new control devices shall be verified and certified.

END OF SECTION

PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN/REVIEWED/DATE:
CONCEPT SCHEM. DESIGN						
DESIGN DEVELOPMENT						
EARLY DEMOLITION PACKAGE						
95% CONSTRUCTION DOCS.						
PERMIT DOCS.						
100% CONSTRUCTION DOCS.	JB	JB	9/29/25			

Client:
Florida State University
Tallahassee, Florida

Job Title:
Theater 7 HVAC Replacement

Seal:

Consultant:
McGINNISS + FLEMING ENGINEERING

ALW Project #:
FSU Project #:
Phase: **100% Construction Documents**

Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:
Specifications

Sheet No.:
M5.1

SYMBOL LEGEND

ABBREVIATIONS

A	AMPERE
ER	EXISTING DEVICE SHOWN IN RELOCATED POSITION
EX	EXISTING - RECONNECT AS REQUIRED AT EXISTING LOCATION. REMOVE AND REINSTALL IF REQUIRED
ETR	EXISTING TO REMAIN
FA	FIRE ALARM
J	JUNCTION
RELO	DEVICE TO BE RELOCATED
V	VOLT
VA	VOLT-AMPS
W	WATT
WP	WEATHERPROOF (NEMA 3R)

CIRCUITING AND BRANCH CIRCUITS

ARROW INDICATES CIRCUIT HOMERUNS IN CONDUIT

LPA-2,4 — INDICATES HOMERUN TO CIRCUIT NUMBERS 2 & 4 IN PANEL "LPA"

NOTE:
NUMBER OF HOMERUNS SHOWN ON THE PLANS ARE THE NUMBER OF HOMERUNS REQUIRED. DO NOT RUN MORE THAN THREE HOMERUNS IN ONE CONDUIT. DO NOT RUN 2 CIRCUITS ON THE SAME PHASE IN ONE CONDUIT.

INDICATES CONTINUATION OF RUN SHOWN ON ANOTHER PLAN VIEW

L2A-3 — INDICATES 1 #12 PHASE CONDUCTOR, 1 #12 NEUTRAL & 1 #12 GND - 3/4" C. TO 1-POLE BREAKER, SIZED AS SHOWN IN PANEL SCHEDULES, ON CIRCUIT No. 3, IN PANEL 'L2A'.

L2A-2,4 — INDICATES 2 #12 PHASE CONDUCTORS & 1 #12 GND - 3/4" C. TO 2-POLE BREAKER, SIZED AS SHOWN IN PANEL SCHEDULES, ON CIRCUIT No.'s 2 & 4 IN PANEL 'L2A'.

L2A-2,4,6 — INDICATES 3 #12 PHASE CONDUCTORS & 1 #12 GND - 3/4" C, TO 3-POLE BREAKER, SIZED AS SHOWN IN PANEL SCHEDULES, ON CIRCUIT No.'S 2,4,6 IN PANEL 'L2A'.

10's — INDICATES ALL CONDUCTORS ARE TO BE MINIMUM #10 GAUGE, CONDUIT PER NEC OR AS INDICATED.

SHORTER TICKMARKS INDICATE 2 OR MORE PHASE CONDUCTORS, OR SWITCH LEGS

LONGER TICKMARKS INDICATE GROUNDED CONDUCTOR(S), QUANTITY AS SHOWN.

NEUTRALS SHALL NOT BE SMALLER SIZE THAN PHASE CONDUCTORS UNLESS SPECIFICALLY INDICATED OTHERWISE. PROVIDE THE APPROPRIATE NUMBER OF NEUTRALS IN ACCORDANCE WITH NEC.

INSULATED GROUNDING CONDUCTORS SHALL BE USED IN ALL CIRCUITS, SIZED IN ACCORDANCE WITH NEC ARTICLE 250.

2-#12, 1-#12 GROUND SHALL BE RUN IN 3/4" CONDUIT. 4 OR MORE #12 CONDUCTORS SHALL BE RUN IN 3/4" C. OR AS REQUIRED BY NEC. LARGER THAN #12 CONDUCTORS SHALL BE RUN IN CONDUIT SIZED IN ACCORDANCE WITH NEC.

FIRE ALARM SYSTEM

S — FIRE ALARM DUCT SMOKE DETECTOR

AOM — FIRE ALARM SUPERVISED ADDRESSABLE RELAY MODULE - INSTALL IN CEILING TILE OR WALL-MOUNT ADJACENT TO EQUIPMENT / DEVICE BEING MONITORED OR CONTROLLED

JUNCTION BOXES AND OUTLETS

J — JUNCTION BOX IN OR ABOVE CEILING

CONTROLS & MECHANICAL EQUIPMENT

DISCONNECT SWITCH, NON-FUSIBLE, SIZE AND NEMA TYPE AS NOTED.

CODES AND REQUIREMENTS

THE INSTALLATION SHALL COMPLY WITH THE INDICATED EDITION OF THE FOLLOWING CODES AND ORDINANCES. WHERE SPECIFIC EDITION IS NOT INDICATED, COMPLY WITH THE LATEST PUBLISHED EDITION.

NATIONAL FIRE PROTECTION ASSOCIATION - NFPA
- NFPA 70 - 2020; NATIONAL ELECTRICAL CODE
- NFPA 72 - 2019; NATIONAL FIRE ALARM AND SIGNALING CODE

FLORIDA BUILDING CODE
- FBC-B 2023; THE FLORIDA BUILDING CODE (8th EDITION)
- FPC 2023; THE FLORIDA FIRE PREVENTION CODE (8th EDITION) INCLUDING NFPA 101 - 2021; THE LIFE SAFETY CODE
- FBC-M 2023; THE FLORIDA MECHANICAL CODE (8th EDITION)
- FBC-EB 2023; THE FLORIDA BUILDING CODE, EXISTING BUILDING (8th EDITION)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

NATIONAL ELECTRICAL SAFETY CODE

DESCRIPTION OF WORK

1. FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS REQUIRED TO COMPLETE ALL ELECTRICAL WORK AS SHOWN ON THE CONTRACT DRAWINGS.
2. THIS SHALL INCLUDE THE INSTALLATION OF A COMPLETE AND PROPERLY OPERATING ELECTRICAL SYSTEM. THIS SYSTEM REQUIRED CONSISTS BASICALLY OF, AND IS NOT LIMITED TO, THE FOLLOWING:
   - DISCONNECT AND RECONNECT POWER CIRCUIT TO MECHANICAL EQUIPMENT BEING REPLACED.
   - INSTALL FIRE ALARM SYSTEM COMPONENTS AND DEVICES. FURNISH AND CONNECT COMMUNICATION AND SIGNALLING CIRCUITS TO THE EXISTING FIRE ALARM SYSTEM.
   - PERFORM THE DEMOLITION WORK INDICATED.
3. THE BIDDER SHALL INSPECT THE PRESENT JOBSITE CONDITIONS BEFORE PREPARING HIS BID. THE SUBMISSION OF A BID WILL BE CONSIDERED EVIDENCE THAT SUCH A VISIT AND INSPECTION WAS PERFORMED BY THE BIDDER AND THAT HE TAKES FULL RESPONSIBILITY FOR ALL FACTORS GOVERNING HIS WORK.
4. THE ELECTRICAL WORK SHALL BE COMPLETE, FULLY OPERATIONAL, AND SUITABLE IN EVERY WAY FOR THE SERVICE REQUIRED. DRAWINGS ARE GENERALLY DIAGRAMMATIC IN NATURE AND DO NOT SHOW ALL DETAILS, DEVICES AND INCIDENTAL MATERIALS NECESSARY TO ACCOMPLISH THEIR INTENT. THEREFORE, IT SHALL BE UNDERSTOOD THAT SUCH DEVICES AND INCIDENTAL MATERIALS REQUIRED SHALL BE FURNISHED AT NO COST TO THE OWNER.

DEMOLITION NOTES - GENERAL

1. THE LOCATIONS OF ALL ELECTRICAL EQUIPMENT INDICATED (FIXTURES AND DEVICES) MAY VARY FROM DRAWINGS. CONDITIONS AND DEMOLITION WORK WAS DETERMINED BY SITE OBSERVATION AND REVIEW OF EXISTING DOCUMENTS WITHOUT THE BENEFIT OF DESTRUCTIVE INVESTIGATION. VERIFY ACTUAL LOCATIONS, TYPES, CIRCUITING, AND QUANTITIES OF EQUIPMENT AND APPLY DEMOLITION NOTES AS APPROPRIATE FOR THE EQUIPMENT AND ROOM OR AREA.
2. ALL ELECTRICAL ITEMS SHOWN ON DEMOLITION PLANS ARE TO BE REMOVED UNLESS NOTED OTHERWISE. REMOVE ALL ELECTRICAL TRADE MATERIALS ASSOCIATED WITH ITEMS SHOWN TO BE REMOVED. THIS SHALL INCLUDE BUT NOT BE LIMITED TO CONDUIT AND RACEWAYS (BOTH SURFACE MOUNTED AND CONCEALED ACCESSIBLE), WIRE, DEVICES AND CONDUIT SUPPORTS, BACK TO SERVING PANEL.
3. ALL REMOVED ELECTRICAL EQUIPMENT, INCLUDING DISCONNECTS, MOTORS, CONDUIT, WIRE, DEVICES, AND ALL OTHER MATERIALS SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. WHERE EXISTING CIRCUITS ARE REWORKED BY THE ADDITION OR REMOVAL OF CONDUCTORS, THE OLD WIRE SHALL BE REMOVED, THE CONDUIT SWABBED OUT, AND NEW THWN WIRES REPULLED UNLESS INDICATED OTHERWISE.
5. MOTORS AND HVAC DEVICES SHALL BE REMOVED BY CRAFTSMEN SKILLED IN THE HVAC TRADE. REMOVE ELECTRICAL CONNECTIONS TO SAME. COORDINATE REMOVAL OF CONTROL DEVICES AND ASSOCIATED RACEWAY WITH MECHANICAL TRADE. ALL LINE VOLTAGE WIRING SHALL BE DISCONNECTED AND REMOVED BY A QUALIFIED ELECTRICIAN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CUTTING OR PATCHING OF WALLS AND CEILINGS REQUIRED. CUTTING AND PATCHING WORK SHALL BE PERFORMED BY SKILLED CRAFTSMEN. RETURN ALL WALLS AND THEIR FINISHES TO ORIGINAL CONDITION.
7. ANY AND ALL HOLES OR DAMAGED SURFACES DUE TO DEMOLITION WORK SHALL BE PATCHED BY A SKILLED CRAFTSMAN.
8. WHERE ITEMS ARE DESIGNATED EXISTING TO REMAIN, THEY SHALL BE PROTECTED DURING DEMOLITION. RELOCATE AS REQUIRED WHERE ITEMS ARE INSTALLED IN CEILING.

GENERAL NOTES

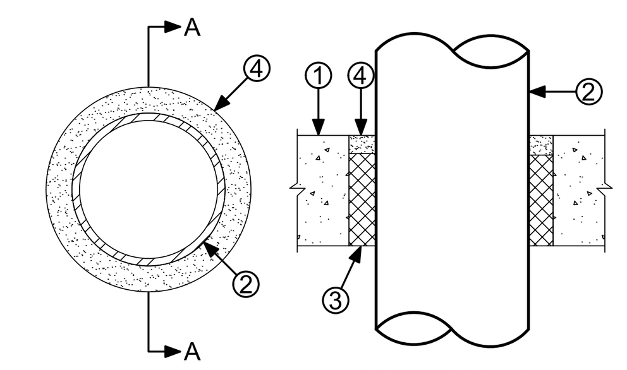
1. ALL CONDUCTORS SHALL BE INSTALLED IN METAL CONDUIT OR TUBING. FLEXIBLE CONDUIT INSTALLED OUT-OF-DOORS, IN ANY MECHANICAL EQUIPMENT ROOM, OR IN NORMALLY WET AREAS, SHALL BE LIQUID TIGHT FLEX WITH SUITABLE FITTINGS.
2. COORDINATE WITH ALL MECHANICAL TRADES FOR SPACE REQUIREMENTS IN MECHANICAL ROOMS, CORRIDORS, SHAFTS, ABOVE CEILING, ETC. THIS INCLUDES SPACE ABOVE PANELS WHERE DUCTS AND PIPING ARE PROHIBITED.
3. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT, SEE MECHANICAL PLANS.
4. CONDUIT SHALL BE INSTALLED TIGHT TO DECK WHERE INSTALLED ABOVE CEILING. RELOCATE INCIDENTAL HANGERS, BRACKETS, ETC. WHERE IN CONFLICT. MAXIMIZE USE OF SPACE.
5. PROVIDE CONDUIT EXPANSION FITTINGS WITH BONDING JUMPERS FOR ALL CONDUITS PASSING THROUGH EXPANSION JOINTS.
6. CONDUIT SHALL PASS THROUGH WALLS AT 90 DEGREES AND SHALL BE RUN PARALLEL AND PERPENDICULAR TO WALLS.
7. BRANCH CIRCUITS AND HOMERUNS SHALL BE #12 WIRE AND 3/4" CONDUIT MINIMUM. EVERY CONDUIT SHALL HAVE A GREEN GROUND WIRE (#12 MINIMUM).
8. ALL CONDUCTORS SHALL BE COPPER WITH THHN/THWN INSULATION. CONDUCTORS SIZE # 8 AWG AND LARGER SHALL BE STRANDED.
9. NO MORE THAN 3 PHASE CONDUCTORS SHALL BE INSTALLED IN ONE CONDUIT UNLESS NOTED OTHERWISE. SHARED NEUTRALS ARE NOT PERMITTED.
10. COLOR OF ALL NORMAL BRANCH RECEPTACLES, SWITCHES, ETC. TO BE WHITE. COVERPLATES SHALL BE STAINLESS STEEL, UNLESS NOTED OTHERWISE.
11. MAINTAIN NEC MINIMUM CLEARANCE IN FRONT OF ALL SAFETY SWITCHES AND PANELBOARDS.
12. PROVIDE CONDUIT AND OUTLET BOXES AS REQUIRED FOR THERMOSTATS AND SENSORS. THERMOSTATS AND SENSORS ARE SHOWN ON MECHANICAL DRAWINGS.
13. ALL FIRE ALARM WORK SHALL BE IN ACCORDANCE WITH NFPA 70 AND NFPA 72 REQUIREMENTS.
14. ALL ITEMS ON PLANS ARE NEW UNLESS NOTED OTHERWISE.
15. EXISTING PANELS TO REMAIN SHALL HAVE THEIR PANEL SCHEDULES UPDATED AND RETYPED AFTER COMPLETION OF NEW WORK. NEW PANEL LOAD DESCRIPTIONS SHALL CLEARLY DEFINE LOAD TYPE AND LOCATION. PANEL SCHEDULES SHALL INCLUDE CONTRACTOR COMPANY NAME, PHONE NUMBER, AND DATE SCHEDULE WAS MADE AND APPLIED.
16. ALL CONDUITS PENETRATING ROOF SHALL BE SEALED BY THE ELECTRICAL CONTRACTOR, USING SEALING METHOD APPROVED BY THE ROOFING INSTALLER.
17. ALL WALL PENETRATIONS SHALL BE SEALED USING AN APPROPRIATE UL ASSEMBLY TO MAINTAIN THE RATING OF THE WALL.
18. WHERE RECEPTACLES ARE INDICATED TO BE EQUIPPED WITH GROUND FAULT INTERRUPTING CIRCUITRY, IT SHALL BE INTEGRAL TO THE DEVICE AND HAVE A TEST/RESET MECHANISM INTEGRAL WITH THE DEVICE. REMOTE TEST/RESET OR THE INTERWIRING OF ADDITIONAL RECEPTACLES UTILIZING GF SENSING OF A SINGLE RECEPTACLE IS NOT ACCEPTABLE.
19. ALL SINGLE POLE CIRCUITS SHALL TERMINATE ON A SINGLE POLE CIRCUIT BREAKER ASSEMBLY. DO NOT USE MULTI-POLE CIRCUIT BREAKER OVERCURRENT PROVISIONS FOR 120 VOLT OR 277 VOLT CIRCUITS. PROVIDE INDIVIDUAL GROUNDED CONDUCTORS FOR ALL SINGLE POLE CIRCUITS.
20. WHERE CORE DRILLING OCCURS, CONTRACTOR SHALL USE CAUTION TO AVOID DAMAGING SURROUNDING SURFACES. CONTRACTOR RESPONSIBLE FOR CLEANING UP ALL SLURRY AND ENSURING A CLEAN AND PROFESSIONAL FINISH. CONTRACTOR SHALL REPLACE OR REPAIR BUILDING SURFACES OR EQUIPMENT DAMAGED BY SLURRY OR CORE DRILLING MATERIALS.
21. WHERE INSTALLING ELECTRICAL CONDUIT, MAINTAIN CONDUIT STRAPPING AND FASTENING PER NEC.
22. WHERE INSTALLING ELECTRICAL CONDUIT, MAINTAIN PULL POINTS PER NEC AND DO NOT EXCEED 360 DEGREES IN BENDS IN ANY CONDUIT RUN WITHOUT APPROPRIATE PULL POINTS.
23. ALL JUNCTION BOXES, PULLBOXES, AND DEVICES SHALL BE LABELED WITH CIRCUIT NUMBER AND CIRCUIT VOLTAGE.

DETAILS

PENETRATION DETAIL - B

NOT TO SCALE

SYSTEM NO. C-AJ-1014
(FORMERLY SYSTEM NO. 133)
F RATING - 2 HOUR
T RATING - 0 HOUR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT (SEE ITEM 4)
L RATING AT 400°F - LESS THAN 1 CFM/SQ FT (SEE ITEM 4)



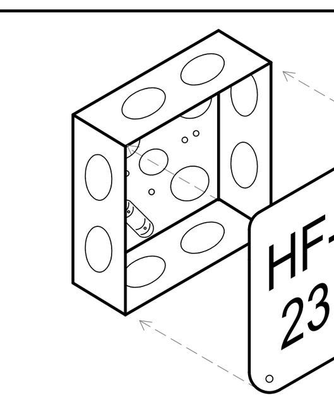
SECTION A - A

1. FLOOR OR WALL ASSEMBLY - MIN 3-1/4" THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAMETER OF CIRCULAR OPENING IS 6". SEE CONCRETE BLOCK (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
2. THROUGH PENETRANTS - ONE METALLIC PIPE OR CONDUIT TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. A NOMINAL ANNULAR SPACE OF 3/4" IS REQUIRED WITHIN THE FIRESTOP SYSTEM. PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR CONDUITS MAY BE USED:
   - 2.1. STEEL PIPE - NOMINAL 4" DIAMETER (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   - 2.2. CONDUIT - NOMINAL 4" DIAMETER (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR STEEL CONDUIT.
3. PACKING MATERIAL - MINIMUM 4 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL. MINIMUM THICKNESS OF PACKING MATERIAL IN FLOORS AND WALLS TO BE 2-3/4" AND 2-1/4", RESPECTIVELY.
4. FILL, VOID OR CAVITY MATERIAL* - SEALANT - MINIMUM 1/2" THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. AS AN ALTERNATE, THE PERMANENT FORMING MATERIAL (ITEM 3) MAY BE OMITTED IF THE FILL MATERIAL THICKNESS IS INCREASED TO A MINIMUM OF 1-1/2".
   MINNESOTA MINING AND MFG CO - (TYPES FB-2000 OR FB-2000+). (NOTE: L RATINGS APPLY ONLY WHEN FB-2000+ IS USED.)

*BEARING THE UL CLASSIFICATION MARKING.

JUNCTION BOX IDENTIFICATION

NOT TO SCALE



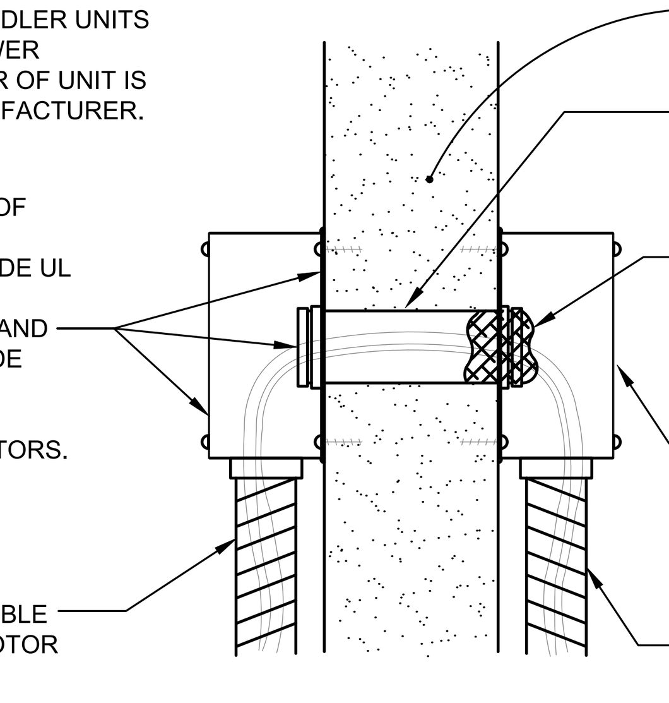
EACH JUNCTION BOX COVER SHALL BE LABELED WITH A PERMANENT "MAGIC" MARKER OR OTHER PERMANENT MEANS TO IDENTIFY THE CIRCUITS OR SYSTEMS CABLES WITHIN. INCLUDE THE PANEL AND CIRCUIT BREAKER NUMBER FOR ALL POWER CIRCUITS WITHIN. FOR EXAMPLE, A JUNCTION BOX CONTAINING LIGHTING CIRCUITS 21, 23, 25 FROM PANEL "HF" WOULD BE LABELED "HF-21,23,25" AS SHOWN.

FIRE ALARM JUNCTION BOXES SHALL BE PAINTED RED AND LABELED "FA" IN WHITE.

AHU ELECTRICAL PENETRATION DETAIL

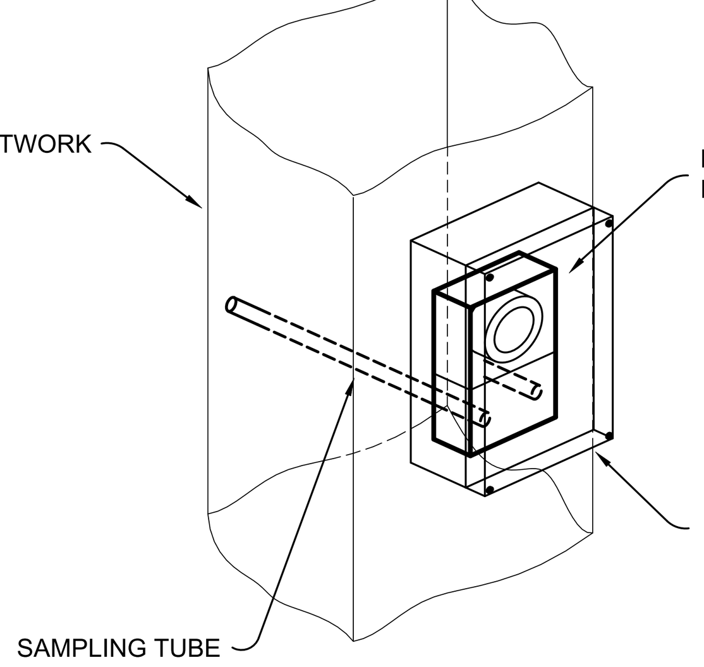
NOT TO SCALE

NOTE: USE THIS DETAIL FOR POWER CIRCUIT PENETRATIONS INTO NEW AIR HANDLER UNITS WITH INTERNAL MOTORS, IF A POWER TERMINATION MEANS AT EXTERIOR OF UNIT IS NOT ALREADY PROVIDED BY MANUFACTURER.



EXTERIOR DUCT DETECTOR INSULLATION

NOT TO SCALE



NOTES:
1. ATTACH ENCLOSURE TO DUCT WITH SCREWS AND SELF-SEALING GASKETED WASHERS.
2. CAREFULLY SEAL DUCT PENETRATIONS AND PENETRATIONS THROUGH EXTERIOR HOUSING. USE EXPANDED RUBBER FOAM AS A GASKETING MATERIAL.
3. USE RAINTIGHT FITTINGS FOR CONDUIT PENETRATIONS.
4. PROVIDE ENGRAVED NAMEPLATE ON EXTERIOR TO INDICATE SMOKE DETECTOR INSIDE.
5. HOUSING SHALL HAVE GASKETED COVER AND BE WEATHER TIGHT. HOUSING SHALL ALLOW CONDITIONED AIR INTO THE SPACE WITH DETECTOR FOR MAINTAINING CONDITIONED ENVIRONMENT AND PREVENTING CONDENSATION BUILD-UP.

FIRE ALARM SYSTEM NOTES

1. EXISTING FIRE ALARM SYSTEM IS A SIMPLEX SYSTEM. SECURE SERVICES OF JCI FOR ALL FIRE ALARM SCOPE.
2. PROVIDE PROTECTIVE SIGNALING SYSTEM SUITABLE FOR TYPE OCCUPANCY AS DEFINED BY FLORIDA BUILDING CODE AND AS APPROVED BY AUTHORITY HAVING JURISDICTION. THE SYSTEM SHALL CONSIST OF, BUT NOT BE LIMITED TO, DUCT SMOKE DETECTORS AND AIR HANDLER SHUTDOWN RELAYS.
3. PROVIDE THE REQUIRED WIRING IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. PROVIDE INSTALLATION DRAWINGS PREPARED BY THE EQUIPMENT MANUFACTURER FOR REVIEW. INSTALLATION SHALL BE SUPERVISED BY A DULY LICENSED CERTIFIED CONTRACTOR AND INSTALLED BY PERSONNEL SKILLED IN THE TRADE. OUTER JACKET OF ALL MULTI-CONDUCTOR CABLES SHALL BE BRIGHT RED. JACKET SHALL BE RATED FOR INSTALLATION IN AIR PLENUM. FIRE ALARM VENDOR SHALL PROVIDE LOW VOLTAGE FIRE ALARM CIRCUIT WIRING. ALL WIRING MUST BE NEW, UNLESS SPECIFICALLY NOTED OTHERWISE. EXISTING WIRING CANNOT BE REUSED.
4. WIRING SHALL CONFORM TO NFPA 72 AND NFPA 90A AS APPLICABLE AND ARTICLE 760 OF THE NEC. WIRING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AS NECESSARY TO PERFORM THE REQUIRED FUNCTION.
5. ALL WIRING SHALL BE IN STEEL CONDUIT.
6. EACH NEW JUNCTION BOX WILL BE PAINTED RED WITH "FA" STENCILED IN WHITE LETTERS ON THE COVER.
7. INITIATING DEVICE CIRCUITS, SIGNALING LINE CIRCUITS, AND NOTIFICATION DEVICE CIRCUITS, SHALL BE WIRED FOR 2-WIRE CLASS B SERVICE. NO T-TAPS PERMITTED. ONE-WAY EMERGENCY COMMUNICATION SYSTEM CIRCUITS SHALL MEET SURVIVABILITY LEVEL 1.
8. AUXILIARY RELAYS SHALL BE PROVIDED FOR INTERFACE WITH AIR HANDLER SHUT DOWN. AIR HANDLER SHUTDOWN SHALL BE ACTIVATED BY DEDICATED DUCT DETECTORS. COORDINATE WITH HVAC EQUIPMENT FOR AHU CONNECTION LOCATION.
9. COORDINATE WITH HVAC SYSTEMS TO INSTALL DUCT DETECTORS IN SUPPLY DUCTS, LOCATED IN ACCORDANCE WITH NFPA 90A REQUIREMENTS. DUCT DETECTORS SHALL BE NEW AND SHALL BE INTELLIGENT ADDRESSABLE TYPE. DUCT DETECTOR HOUSING AND SAMPLING TUBES SHALL ALL BE NEW. DUCT DETECTORS SHALL BE INSTALLED AND TESTED PER MANUFACTURES INSTRUCTIONS. THIS INCLUDES VERIFYING THAT AIR VELOCITY AND HUMIDITY WHERE THE DUCT DETECTOR IS LOCATED IS WITHIN THE LISTED RANGE OF THE DETECTOR. THIS ALSO INCLUDES VERIFYING AIR FLOW THROUGH THE DUCT DETECTOR. DUCT DETECTORS WHICH UTILIZE A SAMPLING TUBE SHALL BE TESTED WITH A MANOMETER, ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, TO VERIFY THE PRESSURE DIFFERENTIAL BETWEEN THE INLET AND OUTLET TUBES. RESULTS OF AIR VELOCITY, HUMIDITY, AND PRESSURE DIFFERENTIAL TESTING SHALL BE RECORDED FOR ALL DUCT DETECTORS AND PROVIDED TO THE OWNER AND AHJ. IF PRESSURE DIFFERENTIAL SPECIFIED BY THE MANUFACTURER CANNOT BE ATTAINED DUCT DETECTOR SHALL BE RELOCATED TO MEET REQUIREMENT.
10. THE COMPLETED SYSTEM SHALL BE FULLY TESTED AND CERTIFIED PRIOR TO THE COMPLETION OF THE PROJECT. PROVIDE TEST RESULTS AND CERTIFICATION AT THE COMPLETION OF THE PROJECT. THE COMPLETED AND CERTIFIED SYSTEM SHALL BE INSPECTED AND RE-TESTED IN THE PRESENCE OF THE AHJ, THE ENGINEER, AND THE FACILITY MANAGER.
11. THE FIRE ALARM SYSTEM CONTRACTOR SHALL SUBMIT A SEPARATE PERMIT APPLICATION AND PLANS FOR REVIEW IN ACCORDANCE WITH NFPA 1 AND FBC. A FLORIDA LICENSED FIRE ALARM CONTRACTOR SHALL PROVIDE TWO COPIES OF FIRE ALARM SYSTEM SHOP DRAWINGS CONTAINING: 1) CONTRACTOR'S NAME AND LICENSE NUMBER, 2) MANUFACTURER'S TECHNICAL CUT SHEETS WITH SYSTEM COMPONENTS AND DEVICES IDENTIFIED, 3) STANDARD POWER AND BATTERY CALCULATIONS FOR ALL PANELS SHOWING STANDBY POWER VALUES AND TIME TO MEET EITHER 24 OR 60 HOURS STANDBY TIME, 4) SCALED PLANS SHOWING LOCATION OF ALL PANELS, DEVICES (WITH DEVICE SPECIFIC INFORMATION), WIRE RUNS, NUMBER OF CONDUCTORS, END-OF-LINE RESISTORS, SURGE PROTECTION DEVICES, AND TYPICAL WIRING METHODS USED ON THE DEVICES, 5) FIRE ALARM RISER DIAGRAM SHOWING ALL COMPONENTS, 6) WIRING NOTES OR SCHEDULE, AND 7) SEQUENCE OF OPERATION TO INCLUDE METHOD OF SUPERVISORY COMMUNICATION. SHOP DRAWINGS SHALL BE APPROVED BEFORE INSTALLATION OF SYSTEM.
12. AS-BUILT DRAWINGS SHALL BEGIN WITH APPROVED SHOP DRAWINGS AND INDICATE ALL CONDUIT ROUTES, POINT-TO-POINT CIRCUIT WIRING, ALL JUNCTION BOX LOCATIONS, END-OF-LINE RESISTOR LOCATIONS, DEVICE ADDRESSES, DEVICE CIRCUIT NUMBERS, STROBE DEVICE CANDELA RATINGS, SPEAKER DEVICE DECIBAL RATING, AND PANEL LAYOUT WITH EVERY CIRCUIT TERMINATION POINT IDENTIFIED. SHOP DRAWINGS AND AS-BUILTS SHALL COMPLY WITH ALL REQUIREMENTS OF NFPA 72 CHAPTER 7. SHOP DRAWINGS AND AS-BUILT DRAWINGS SHALL BE SUBMITTED TO THE OWNER IN PDF FORMAT AND DWG (AUTOCAD) FORMAT. AUTOCAD FORMAT DOCUMENTS SHALL INCLUDE DEDICATED LAYERING FOR DEVICES, CONDUIT, WIRING, AND LABELS.
13. AHU SHUTDOWN SHALL BE DEMONSTRATED AND TESTED BEFORE SYSTEM ACCEPTANCE.
14. ALL SMOKE DETECTORS SHALL BE INTELLIGENT ADDRESSABLE DEVICES.
15. ANY DISRUPTION OF THE EXISTING FIRE ALARM SYSTEM SHALL BE CONDUCTED IN ACCORDANCE WITH NFPA 101.
16. ADDRESSABLE RELAY MODULES SHALL BE INSTALLED WITHIN 3' OF THE EQUIPMENT THEY CONTROL.
17. ALL JUNCTION BOXES ON THE FIRE ALARM SYSTEM SHALL BE PAINTED FIRE-TRUCK RED AND ALL CONDUIT SHALL BE SPOT PAINTED RED.
18. DUCT MOUNTED DETECTORS SHALL BE MOUNTED IN A READILY ACCESSIBLE LOCATION. PROVIDE A REMOTE, LABELED, LED INDICATOR FOR EACH DETECTOR INSTALLED ABOVE THE CEILING, MOUNTED IN A CONVENIENT, VISIBLE LOCATION. DUCT DETECTORS SHALL OPERATE TO SHUTDOWN THE UNIT OR CLOSE ASSOCIATED DAMPER, AND PROVIDE SUPERVISORY NOTIFICATION AT THE FACP.
19. THE CONSTRUCTOR AND THE EH&S FIRE SAFETY SECTION SHALL TEST THE FIRE ALARM SYSTEM BEFORE ANY RENOVATION OR MODIFICATION IS MADE. ANY PART OF THE SYSTEM NOT WORKING PROPERLY SHALL BE NOTED OR REPAIRED BEFORE ANY CONSTRUCTION BEGINS.
20. ON RENOVATIONS ALWAYS REMOVE EXISTING WIRING AND INSTALL NEW, PROPERLY COLOR CODED WIRING.
21. PROGRAMMING OF THE FIRE ALARM SHALL BE AS SPECIFIED BY THE UNIVERSITY. CONSULT WITH EH&S FIRE SAFETY SECTION CONCERNING THE REQUIREMENTS. PROGRAMMING INCLUDES, BUT IS NOT LIMITED TO, FUNCTION KEYS, FAAP, SOFTWARE ZONES, ETC.

PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN/REVIEWED/DATE:
CONCEPT SCHEM. DESIGN						
DESIGN DEVELOPMENT						
EARLY DEMOLITION PACKAGE						
95% CONSTRUCTION DOCS.						
PERMIT DOCS.						
100% CONSTRUCTION DOCS.	BW	BW	9/2025			

FSU

Client: Florida State University
Tallahassee, Florida

Job Title: Theater 7 HVAC Replacement

Consultant: McGINNISS + FLEMING ENGINEERING

Seal:

ALW Project #:
FSU Project #:
Phase: 100% Construction Documents

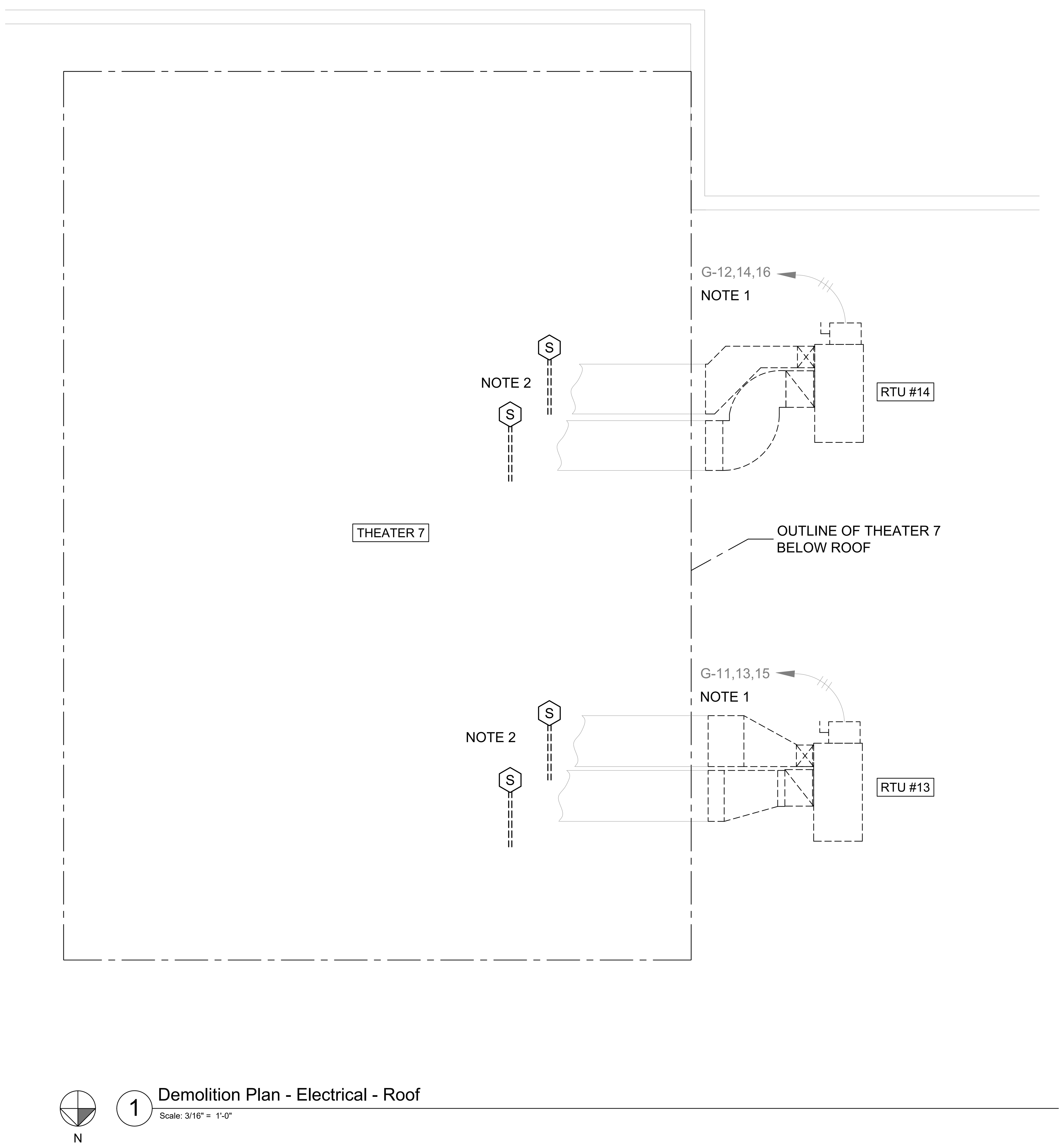
ALW
Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:
Electrical General Notes, Legend and Details

Sheet No.:
E1.0

SHEET NOTES:

1. DISCONNECT EXISTING 208V, 3Ø, 70A POWER CIRCUIT FROM UNIT BEING REMOVED AND MAKE PROVISIONS TO RECONNECT EXISTING CIRCUIT TO NEW UNIT. NOTE EXISTING CIRCUIT ROUTES TO UNIT INSIDE OF ROOF CURB.
2. REMOVE EXISTING CONVENTIONAL FIRE ALARM DUCT DETECTORS AND SHUTDOWN RELAY ASSOCIATED WITH UNIT BEING REMOVED. COORDINATE WITH MECHANICAL TO PATCH AND INSULATE DUCT WHERE DETECTOR IS REMOVED. DUCT DETECTOR IS LOCATED ABOVE LAY-IN CEILING WITHIN THEATER SPACE. REMOVE REMOTE INDICATOR LIGHT IN CEILING TILE AFTER DETECTOR IS REMOVED. REPLACE TILE WITH NEW.

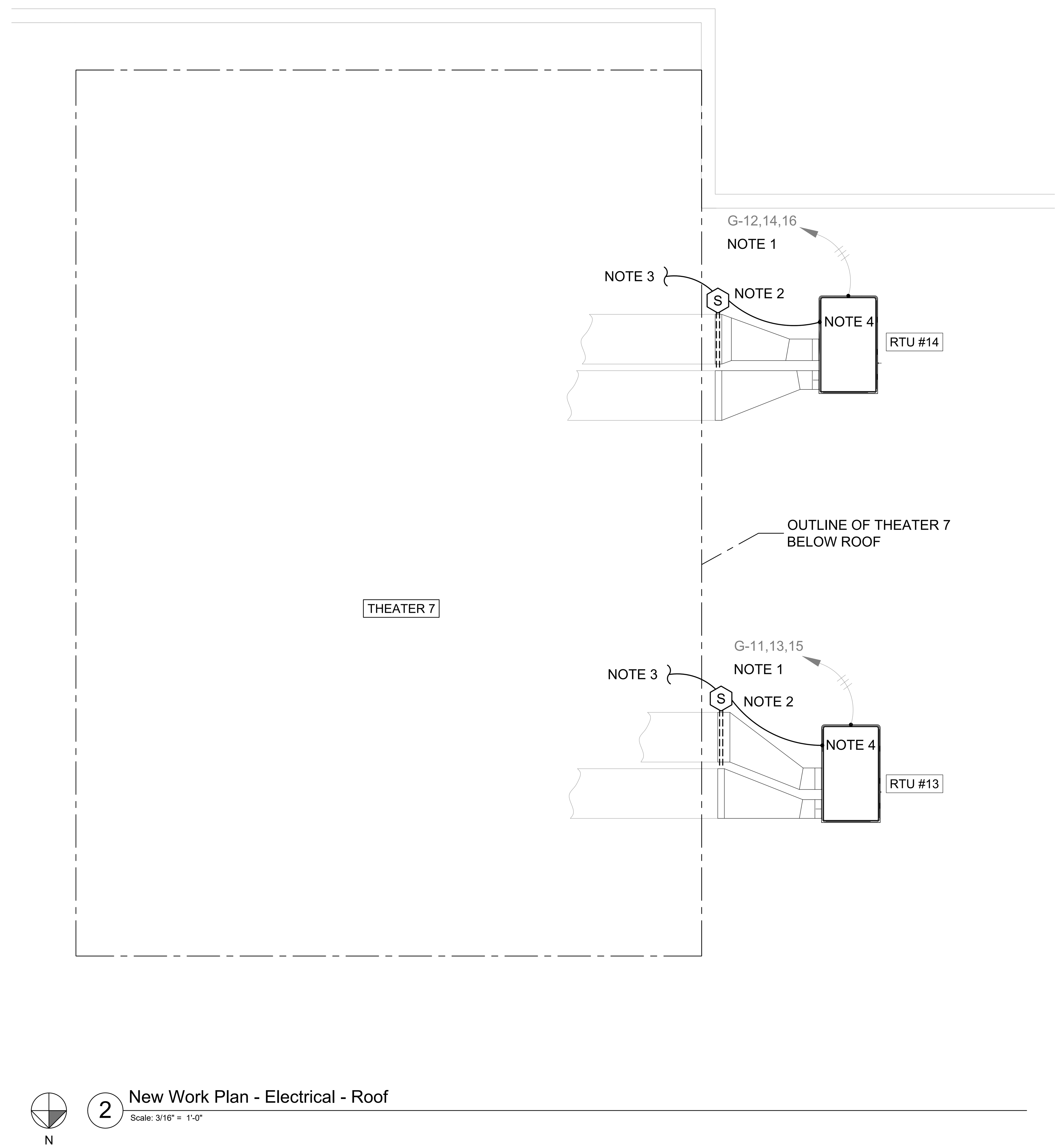


1 Demolition Plan - Electrical - Roof

Scale: 3/16" = 1'-0"

SHEET NOTES:

1. RECONNECT EXISTING 208V, 3Ø, 70A CIRCUIT REMAINING FROM DEMOLITION TO NEW UNIT. NEW UNIT IS EXPECTED TO REQUIRE SAME CIRCUIT SIZE AS EXISTING UNIT REMOVED. NEW HVAC UNITS SHALL HAVE INTEGRAL DISCONNECTS.
2. INSTALL NEW FIRE ALARM 4-WIRE ADDRESSIBLE DUCT DETECTOR IN SUPPLY AIR DUCT WITH BASE TO SHUTDOWN AIR HANDLER. COORDINATE WITH MECHANICAL FOR FINAL LOCATIONS OF DUCT DETECTOR AND CONFIGURE WITH FIRE ALARM SYSTEM FOR SHUTDOWN ON GENERAL ALARM. DUCT DETECTOR SHALL BE INSTALLED IN WEATHERPROOF ENCLOSURE - SEE DETAIL.
3. EXTEND FIRE ALARM RACEWAY THROUGH CMU WALL INTO BUILDING EXTEND ALL THE WAY TO FIRE ALARM CONTROL PANEL. FACP LOCATED ON FIRST FLOOR OPPOSITE SIDE OF THE BUILDING FROM MAIN ATRIUM.
4. CONTRATOR SHALL PROVIDE WIRING CONNECTION BETWEEN FIRE ALARM DETECTOR BASE AND CONNECTION POINT ON AHU FOR PROPER SHUTDOWN.
5. COORDINATE WITH UNIT PROVIDED FOR POWER AND FIRE ALARM CONNECTION POINT. REUSE EXISTING RACEWAY UP THROUGH ROOF CURB FOR POWER RECONNECTION TO NEW UNIT.



2 New Work Plan - Electrical - Roof

Scale: 3/16" = 1'-0"

PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN:	REVIEWED:	DATE:
CONCEPT SCHEM. DESIGN								
DESIGN DEVELOPMENT								
EARLY DEMOLITION PACKAGE								
90% CONSTRUCTION DOCS.								
PERMIT DOCS.								
100% CONSTRUCTION DOCS.	BW	BW	9/29/25					

Client:

Florida State University
Tallahassee, Florida

Job Title:

Theater 7 HVAC Replacement

Seal:

Consultant:

McGINNISS + FLEMING ENGINEERING
JON BARBER, PE 55427 | BRIAN WALLACE, PE 75562
820 EAST PARK AVE, I-200, TALLAHASSEE, FL 32301
MFE-INC.COM | 850.681.6424

ALW Project #:
FSU Project #:
Phase: **100% Construction Documents**

Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:

Demolition and New Work Roof Plan

Sheet No.:

E2.0

26 00 00 ELECTRICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

APPLICATION

The work described hereunder shall be installed subject to the Contractual Conditions for the entire Specifications.

These provisions apply to all sections of Division 26 of this project except as specified otherwise in each individual section. Codes, standards, policies and requirements contained in this Section are applicable to all contract documentation.

CORRELATION

This Section of the Specifications and its accompanying Drawings are made separate for the convenience of the General Contractor / Construction Manager in preparing his bid and in no way relieves the General Contractor / Construction Manager of his responsibility to correlate the work under this Section with that of all other trades as regards the items to be furnished by various Subcontractors, the exact location of all equipment and materials and the necessity of planning the work of all trades to avoid interference.

DESCRIPTION OF WORK

Furnish all labor, materials, equipment and incidentals required to complete all electrical work as specified in this Division and as shown on the Contract Drawings. Division 26 work shall include the installation of a complete and properly operating electrical system.

Refer to other Divisions of this specification for electrical requirements of factory installed motors, controllers, power supplies, etc. Electrical connections to equipment furnished as specified in other sections of these Specifications or shown on other than the Electrical Drawings shall be governed by this Division of the Specifications.

The bidder shall inspect the present jobsite conditions before preparing his bid. The submission of a bid will be considered evidence that such a visit and inspection was performed by the bidder and that he takes full responsibility for all factors governing his work.

The electrical work shall be complete, fully operational, and suitable in every way for the service required. Drawings are generally diagrammatic in nature and do not show all details, devices and incidental materials necessary to accomplish their intent. Therefore, it shall be understood that such devices and incidental materials required shall be furnished at no cost to the Owner.

RELATED WORK

Drawings and general provisions of Contract, including General Conditions, Supplementary General Conditions, and Special Conditions sections apply to work specified in Division 26.

The Contractor shall be aware that other divisions of these Specifications may apply to related work required to perform Division 26 requirements. All related work shall be performed in accordance with those divisions.

CONFORMANCE

If the Contractor takes no exceptions to these Specifications in the Submitted Bid, the Contractor will be held totally responsible for failure to comply.

Any exception to the Specification shall reference the affected paragraph(s), subject(s), and list benefit to the Owner.

The Owner reserves the right to have the Contractor replace installed material or equipment which does not comply with these Specifications at the Contractor's expense.

SUBMITTALS

Obtain approval before procurement, fabrication, or delivery of items to the job site. Submit manufacturers' data on the equipment listed below and as directed in other Sections of Division 26. Follow the procedures required in Division 1 of this specification. Data shall be in the form of manufacturer's descriptive data sheets and engineering drawings and will be reviewed by the Architect/Engineer before materials and equipment are delivered to the work site. Review of the submittal by the Architect/Engineer is to check for general conformance to the design intent and will not relieve the Contractor of the responsibility for the correctness of all dimensions, conformance and the proper fitting of all parts of the work.

Plugs and Receptacles
Lighting Fixtures
Lighting Controls

Submit manufacturers' names and catalog numbers for the following materials:

Conduit, Fittings, and Couplings
Boxes and Fittings
600 Volt Wire and Cables
Grounding Equipment

The Contractor shall thoroughly check the submittal for accuracy and compliance with the contract requirements. Shop drawings and data sheets shall bear the date checked and shall be accompanied by the Contractor's statement that they have been checked for conformity to the Specifications and Drawings. Submittals not so checked and noted will be returned without review.

Deliver the entire electrical submittal to the Architect/Engineer complete and in one package. An incomplete submittal will be returned to the Contractor without review.

CODES, INSPECTION AND FEES

Comply with the indicated edition of the following codes and ordinances. Where specific edition is not indicated, comply with the latest published edition.

American National Standards Institute - ANSI
C2 – The National Electrical Safety Code
American Society for Testing and Materials - ASTM
National Fire Protection Association - NFPA
NFPA 70; The National Electrical Code
NFPA 101; The Life Safety Code
Florida Building Code
FBC-B 2023; The Florida Building Code 8th Edition
FPC 2023; The Florida Fire Prevention Code 8th Edition
Electronic Industries Association/Telecommunications Industries Association - EIA/TIA
568C - Commercial Buildings Telecommunications Cabling Standards
569 - Commercial Buildings Standard for Telecommunications Pathways and Spaces
606 - Administrative Standard for Telecommunications Infrastructure of Commercial Buildings
607B - Commercial Building Grounding and Bonding Requirements for Telecommunications
Federal Communications Commission - FCC
Insulated Cable Engineers Association - ICEA
National Electrical Manufacturers Association
Serving Utility Company Policies
City of Tallahassee Municipal Codes and Requirements
Underwriters Laboratories - UL
467 Electrical Grounding and Bonding Equipment
506 Enclosures 514A Outlet Boxes and Fittings
514C Non-metallic Outlet Boxes and Fittings

Obtain all permits required. Contractor shall pay all fees for permits and inspections.

RECORD DOCUMENTS

Prepare record documents in accordance with Division 1 requirements. Record documents shall be complete and accurate and clearly show deviations to the Contract Drawings. Additionally, indicate major raceway sizes and routings, locations of all control devices, all equipment and locations to scale, and fuse and circuit breaker ratings and arrangements.

Record documents shall reflect the complete contract record, including all changes, supplements and addenda as issued. All drawings, sketches and notations describing the work and as issued by the Architect/Engineer shall be incorporated.

Prepare bound sets of equipment Operation and Maintenance Instructions. These instructions shall include the name and location of the system, the name and telephone number of the Contractor, and all subcontractors installing the system or equipment, and the name and telephone number of each local manufacturer's representative for the system or equipment. Routine maintenance actions shall be clearly identified and include a listing of approved disposable materials necessary.

Furnish bound copies of all test results required in other sections of this division.

GUARANTEES

Equipment: one (1) year from final acceptance by the Owner. Materials and labor: one (1) year from final acceptance by the Owner.

All equipment shall be warranted to be free from defects in workmanship, design and materials. If any part of the equipment should fail during the warranty period, it shall be replaced and the unit(s) restored to service at no expense to the Owner.

In addition to the guarantee of equipment by the manufacturer the Contractor shall also guarantee such equipment for a period of one (1) year from final acceptance by the Owner. The Contractor's one (1) year guarantee shall be for equipment, materials, and labor.

The manufacturer's warranty period shall run concurrently with the Contractor's warranty period. No exception to this provision will be allowed.

Additional guarantee requirements specific to certain parts or assemblies or installations may be in the General and Special Conditions, or other Sections of these Specifications.

PART 2 - PRODUCTS

EQUIPMENT AND MATERIALS

Furnish materials or equipment specified by manufacturers named.

Materials furnished shall be new, undamaged and packed in the original manufacturer's packing.

All equipment and apparatus shall bear the seal of approval of the Underwriter's Laboratory where testing and listing performance criteria has been established for like items.

Protect equipment and materials from mechanical and water damage during construction. Suitable storage facilities shall be provided. Equipment shall not be stored out-of-doors except as follows:

Concrete items, plastic conduit if protected from sunlight, rigid metal conduit if protected from water and debris, padmounted equipment for outdoor installation if maintained in a normal weathertight condition, ground rods, and large spools of cables with ends properly sealed. In no case will materials be stored directly on the ground. Provide suitable timbers or billets on which items will be stored out of direct contact with the earth.

All items to be installed shall be free of rust and dirt. Damaged materials and equipment shall be replaced by the Contractor at no cost to the Owner.

All electrical panels, enclosures, raceways, conduit, and boxes shall be fabricated of metal unless indicated otherwise.

EQUIPMENT AND MATERIALS STANDARDS

Design and fabrication of electrical equipment and materials:

The American National Standards Institute (ANSI)
The American Society of Mechanical Engineers (ASME)
The American Society for Testing and Materials (ASTM)
The Institute of Electrical and Electronic Engineers (IEEE)
The National Electrical Manufacturers Association (NEMA)
The Occupational Safety and Health Administration (OSHA)
The Underwriters Laboratories (UL)
The National Fire Protection Association (NFPA)

Comply with the latest edition and revisions of these codes and standards.

PART 3 - EXECUTION

QUALITY ASSURANCE

Installer's Qualifications: At least three years of successful installation experience on projects with electrical work similar to that required for this project.

Manufacturer's Qualifications: Manufacturers regularly engaged in the manufacture of electrical components and equipment of the types and sizes required, whose products have been in satisfactory use in similar service for not less than five years.

Electrical work shall be performed by experienced persons skilled in the trade.

Work shall be done neatly and in keeping with good practice and conventions of the trade. The electrical installation shall be of high quality, and of the performance level associated with top level commercial electrical installations as determined by the Architect/Engineer and the National Electrical Code.

IDENTIFICATION

Panelboards shall have typewritten directories with all loads thoroughly described for each circuit. Update existing panelboards and their directories to reflect new work.

CLEANING AND PAINTING

Clean all equipment and boxes thoroughly inside and outside at the completion of installation. Do not leave dirt and debris inside panelboard and equipment cabinets, device and junction boxes, etc.

All painting shall be done according to the Finishes Section of these specifications.

Paint all exposed conduit and wiremold installed on painted surfaces to match surrounding surface. Paint exposed threads on conduits and touch up all scratches in galvanized pipe and fittings with a high quality cold galvanizing compound.

TESTS

Contractor shall test all wiring for shorts and all equipment for proper grounding before energizing. Equipment shall be thoroughly checked and adjusted for proper operation. Check motors for proper rotation before energizing and adjust if necessary.

END OF SECTION

26 05 00 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

SCOPE OF WORK

Furnish all labor, materials and equipment and incidentals required to construct and install the complete electrical systems as indicated on the Drawings and as specified in this Section.

STANDARD OF MATERIALS

All materials, equipment and apparatus covered by this specification shall be new, of current manufacture and shall bear the seal of approval of the Underwriters' Laboratories.

All equipment and materials shall have ratings established by a recognized independent agency or laboratory. The Contractor shall apply the items used on this project within the ratings and subject to any stipulations or exceptions established by the independent agency or laboratory.

All conduits and raceways, wire, devices, panelboards, switches, etc. of a given type shall be the product of one manufacturer.

PART 2 - PRODUCTS

CONDUCTORS

Compliance: Provide wires, cables and connectors that comply with the following standards as applicable:

UL Standard 83 Thermoplastic Insulated Wires and Cables
UL Standard 486A Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL Standard 854 Service Entrance Cable
NEMA/ICEA WC-5 Thermoplastic Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
NEMA/ICEA WC-8 Ethylene Propylene Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
IEEE Standard 82 Test procedures for Impulse Voltage Tests on Insulated Conductors

Wire and cable manufactured more than twelve months before delivery to the jobsite shall not be used.

All conductors shall be soft-drawn copper of not less than ninety-eight percent (98%) conductivity, with NEC Type THW, THHN, or THWN for No. 4 and smaller, and Type RHW, THW, or THWN for No. 2 and larger, 600 volt insulation.

Jackets: Factory applied nylon or PVC external jacketed wires and cables for installation in raceways and where indicated.

Color coding of all ungrounded service, feeder, and branch circuits conductors shall be required according to the following convention:

120/208 Volt, 3 phase: black, red, and blue

Ground wires shall be green and neutrals shall be white or gray or other combination per NEC. Isolated grounding conductors shall be green with yellow stripe or green with applied yellow tape to indicate isolated ground. Ground and grounded wire colors shall be used for these purposes only. Where grounded conductors of different systems are installed in the same raceway, box, auxiliary gutter, or other type of enclosure, each grounded conductor shall be individually identified by system. Additional grounded conductors shall be white with a readily distinguishable colored stripe, other than green, running along the insulation.

Conductors No. 12 AWG through No. 10 AWG shall be solid and No. 8 AWG and larger shall be stranded. No conductors smaller than No. 12 AWG shall be used except as otherwise noted.

Acceptable manufacturers: Anaconda Wire and Cable Co., General Electric Co., Okonite Co., Southwire Co., or Rome Cable Co.

RECEPTACLES

Receptacles shall be furnished and installed where shown on the drawings and shall conform to the following requirements:

Grounding type duplex receptacle: rated 20 amperes, 125 volt, 2 wire, 3 pole with grounded shunt (yoke permanently grounded to third clip), NEMA Configuration No. 5-20R, and conforming to Federal Specification W-C-596F (submit proof of compliance).

All receptacles listed on the drawings shall be specification grade receptacles.

Acceptable manufacturer: Eagle, GE, Hubbell, Leviton or Pass and Seymour.

DEVICE PLATES

All plates for switch, receptacles and telephone outlets located on finished walls shall be UL listed with the number of gangs required for the application. Nylon or plastic plates shall match device color. All plates for outlets located on unfinished walls or on condulet type fittings shall be zinc coated sheet metal with rounded or beveled edges.

Weatherproof receptacle covers shall be of impact resistant plastic, gasketed, in-use type. Switch covers shall be gasketed metal.

Device plates shall be factory engraved where indicated on the drawings. Letters shall be black filled.

GROUNDING AND BONDING

Conductors: type THW, THHN/THWN, or RHW to match power supply wiring.

Bonding Jumper Braid: copper braided tape, constructed of 30 gage bare copper wires and properly sized for application.

Flexible Jumper Strap: flexible flat conductor, 48,250 circular mils, with copper bolt hole ends sized for 3/8" diameter bolts.

PART 3 - EXECUTION

WIRING

All conductors shall be carefully handled to avoid kinks or damage to insulation.

All wires, cables and each conductor of multi-conductor cables shall be uniquely identified at each end by color or with wire and cable markers. Lighting and receptacle wiring shall be distinctly differentiated and junction boxes marked.

Lubrications shall be used, if required, to facilitate wire pulling. Lubricants shall be UL approved for use with the insulation specified.

Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torqueing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.

All 600 Volt wire insulation shall be tested with a "megger" after installation. Tests shall be made at not less than 500 Volts.

DEVICES

Unless indicated otherwise on the drawings all light switches shall be mounted with the centerline of the device 48" above the finished floor.

Unless indicated otherwise on the drawings or in the specifications all receptacles shall be mounted with the centerline of the device 18" above the finished floor.

Receptacles shall be installed with the grounding contact at the top. Where receptacles are required to be mounted horizontally they shall be installed with the neutral contact at the top.

Mount all devices so that the cover plate edges are in contact with the wall and are parallel to building features.

GROUNDING

Ground all non-current carrying metal parts of the electrical system to provide a low impedance path for ground fault current. Route ground connections and conductors to ground and protective devices in shortest and straightest paths as possible.

Insulated grounding bushings shall be required for all raceways, service entrance panels, distribution panels, all raceways one inch and larger and any raceway entering a concentric knock-out.

In general a ground wire shall be installed in every conduit. The conduit installation itself shall serve as an additional grounding means.

Where conduits terminate without mechanical connection (i.e., locknuts and bushings) to panelboards, and for all terminations of conduit sizes one inch and larger; and for all sizes of metallic conduit (rigid or flexible) terminating in concentric knockouts, the following procedure shall be followed: Each conduit shall be provided with an insulated grounding bushing and each bushing connected with a bare copper conductor to the ground bus in the electrical equipment. The ground conductor shall be in accordance with Article 250 of the NEC.

Grounding conductors shall be attached to equipment with a bolt-on lug or approved tapered screw used for no other purpose. Use crimp-on spade lugs for stranded conductors.

IDENTIFICATION

Equipment

Equipment identification shall be made using engraved laminated plastic plates (indented tape labels will not be permitted). Characters shall be white on a black background and 1/4" high minimum. Plates shall be secured to the panels by means of screws or metal pressure pins. Cement, by itself, will not be acceptable. All nameplates shall be mounted on the outside surface of the piece of equipment.

Individually enclosed safety switches, circuit breakers, and motor starters, pull boxes, control cabinets and other such items shall be identified indicating load, electrical characteristics, and source. For example, a disconnect switch for a 7-1/2 horsepower, 208 volt, 3 phase air handling unit, Number 8 feed from Panel "MDP", Circuit Number 2 shall be labeled as follows:

AHU-8
7-1/2 HP, 208V, 3Ø
Cir: MDP-2

All enclosures containing energized components shall be marked with mylar labels identifying hazards. Such warning messages as "WARNING-HAZARDOUS VOLTAGE", "480 VOLTS", "240 VOLTS", etc. are acceptable. Labels shall be EZ-Code by Thomas & Betts or similar product.

Junction Box Identification: Each junction box cover shall be labeled with a permanent "magic" marker or other means to identify the circuits within. For example, a junction box containing lighting circuits 21, 23, 25 from Panel L2A would be labeled "L2A-21,23,25". Telephone junction boxes shall be labeled "T". Fire alarm system junction boxes shall be labeled "FA".

Conductor Identification: All cables and wires shall be color coded as to phase per convention. See color coding above.

Device Identification: When it is not clear what a wall switch or what a receptacle is dedicated for then the device plate shall be engraved appropriately. Blank plates for future devices shall be engraved "FUTURE". All plates shall be factory-engraved.

FIREPROOFING

All conduit and boxes passing through or installed within fire walls and smoke walls shall be installed so as to maintain the integrity and rating of the wall through which it passes. Boxes shall be installed within 1/8" of wall surface. Conduits penetrating rated floors shall be installed to maintain the fire rating of the floor using UL approved sealing materials.

END OF SECTION

PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN/REVIEWED/DATE:
CONCEPT SCHEM. DESIGN						
DESIGN DEVELOPMENT						
EARLY DEMOLITION PACKAGE						
95% CONSTRUCTION DOCS.						
PERMIT DOCS.						
100% CONSTRUCTION DOCS.	BW	BW	9/29/25			

FSU

Client: Florida State University
Tallahassee, Florida

Job Title: Theater 7 HVAC Replacement

Consultant: McGINNISS + FLEMING ENGINEERING

Seal:

ALW Project #:
FSU Project #:
Phase: 100% Construction Documents

ALW
Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description: **Specifications**

Sheet No.: **E3.0**

26 05 05 - ELECTRICAL SELECTIVE DEMOLITION

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section includes all labor, material, equipment and services necessary and incidental to complete all the demolition and removal of electrical work as shown on the Drawings or as required.

The demolition drawings do not necessarily indicate all the conditions, details, or work required. The Contractor shall examine the building to determine the actual conditions and extent of the work. Any details not clear to this Contractor shall be referred to the Engineer for clarification prior to bidding.

The Contractor shall be responsible for demolition and removal of all existing electrical systems where shown for demolition. No portion of electrical systems shown for demolition may be abandoned in place.

SUBMITTALS

Shop Drawings: Indicate demolition and removal sequence and location of salvageable items.

Schedules: Submit schedule showing time and detailed sequence of demolition, removal of materials and arranged coordination of anticipated electrical interruptions.

1. Schedule demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

Project Record Documents: Submit in accordance with Section 260000.

1. Accurately record actual locations of abandoned or dead ended utilities.

QUALITY ASSURANCE

Contractor shall verify the extent of the demolition work. Any questions as to which systems are to be removed versus which systems are to remain shall be referred to the Engineer for clarification prior to commencing demolition work.

The demolition work shall be a phased operation and shall comply with the construction sequence schedule.

Do not close or obstruct egress width of fire exits or access.

Do not disable or disrupt building fire or life safety systems without written permission from the Owner. In all cases, permission shall have been granted not less than ten (10) working days prior to the intended interruption.

PROJECT CONDITIONS

Owner will vacate demolition area prior to start of demolition work.

Owner will continuously occupy areas of building immediately adjacent to selective
demolition areas.

Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations.

Provide minimum of ten (10) working days advanced notice to Owner of demolition
activities which will severely impact Owner's normal operations.

Maintain free and safe passage to and from Owner occupied areas.

Condition of Structures: Owner assumes no responsibility for actual condition of areas to be demolished.

Traffic and Passageways: Maintain accessibility for fire fighting apparatus.

1. Conduct demolition operations and debris removal to avoid interference with adjacent occupied facilities.

2. Obtain written permission from authorities having jurisdiction prior to closing or obstructing adjacent occupied facilities.

3. Provide alternate routes when closing or obstructing traffic ways when required by governing authorities.

4. Ensure safe passage of persons around area of demolition. Provide and maintain temporary covered passageways; comply with requirements of governing authorities.

Protection: Perform work in manner to eliminate hazards to persons or property and avoid interference with adjacent areas.

1. Maintain existing utilities that are to remain in service and protect from damage during demolition operations.

2. Do not interrupt existing utilities serving occupied facilities, except when authorized by Owner in writing. Provide temporary services during interruptions.

3. Coordinate in advance with Owner electrical interruptions.

4. Protect existing floors with suitable coverings when necessary.

COORDINATION

The Contractor shall be responsible for coordinating demolition of all affected electrical systems to prevent disruption to the Owner and minimize downtime.

The Contractor shall be responsible for coordinating demolition by other Divisions of the Specifications to prevent disruption to the Owner and minimize downtime.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

EXAMINATION

Beginning alterations to existing building systems means the installer accepts existing conditions.

PREPARATION

Provide, erect, and maintain temporary barriers, warning notifications (signs) and other security devices as may be required for personnel safety.

Inventory each panelboard where circuits are indicated to be reused. Sequentially consolidate existing circuits within each panelboard with regard to area served. Maximize capacity for service to the project area by including existing spares with the group of circuits breakers to be disconnected as a result of this selective demolition. Prepare a current directory, post demolition, for each panelboard as the base upon which the final directories will be compiled.

Temporarily tag every circuit breaker serving systems outside the demolition area. The tag shall be an OSHA compliant, commercially preprinted, 3¼ inch by 5-5/8 inch, accident prevention card with write on matte finish plastic surface, ¼ inch reinforced grommet and attachment string loop. The message on the card front shall read: “DANGER, DO NOT OPEN” and the message on the reverse side shall read: “DANGER, DO NOT REMOVE THIS TAG. NECESSARY DISCIPLINARY ACTION WILL BE TAKEN IF THESE ORDERS ARE DISREGARDED. SEE OTHER SIDE.” The tags shall remain in place until the demolition and renovation are complete.

TEMPORARY CONDITIONS

The Contractor shall include all temporary connections necessary to permit the Owner to occupy areas of the building during the various construction phases.

SALVAGEABLE MATERIAL AND EQUIPMENT

Carefully remove, store and protect the salvage materials and equipment shown on the Drawings for Owner's use. Deliver to location directed by Owner.

Carefully salvage, remove and store, and protect for re-installation the materials and equipment shown on the Drawings.

Materials Retained by Contractor:

1. Items of salvageable value not indicated as Owner salvaged or scheduled for reinstallation may be removed as work progresses.

2. Salvaged items must be removed from site as they are removed. Storage or sale of salvaged items on site will not be permitted.

REMOVAL OF DEMOLITION MATERIAL

Contractor shall remove existing systems, shown or specified, necessary or reasonably inferred, for completion of his/her work. Owner will have the option of retaining any item of material removed under this contract. Item or materials not retained by Owner will become the property of the Contractor, removed from the premises and legally disposed off-site.

Contractor shall dispose of fluorescent lamps, ballasts, and other hazardous materials in accordance with all Local, State and Federal regulations.

Contractor shall remove all wiring determined to be disconnected and abandoned, and remove all conduit and junction boxes determined to be empty and not intended to be used during the reconstruction phase.

Remove abandoned wiring to source of supply.

Remove all exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Remove all junction boxes and conduit supports associated with conduit being removed.

Repair adjacent construction and finishes damaged during demolition and extension work.

Maintain continuity of circuits, which remain in service.

Remove all existing luminaires, switches, receptacles, and other electrical equipment and devices and associated wiring from walls, ceilings floors, and other surfaces scheduled for demolition unless specifically shown as retain or relocate on drawings.

Remove auxiliary and signal systems (IE: fire alarm, security, telephone, data, sound/paging and the like) not scheduled for reuse or relocation. Remove associated devices, appliances and cabling complete.

Remove electrical systems associated with equipment (IE: Elevators, motorized doors/shades/gates/ dampers, mechanical HVAC and plumbing equipment, landscape, civil, kitchen and other equipment served by the electrical systems) not scheduled for reuse or relocation on the drawings. Remove switchboards, motor control centers, panelboards, busway, electrical junctions boxes, pull boxes, conduit, raceway systems (IE: bus gutter, cable tray, plugmold), wiring, safety switches, enclosed circuit breakers, control panels, Energy management systems, relays and contactors associated with equipment scheduled for removal.

PERFORMANCE

Perform drilling, cutting, block-offs, and demolition work required for removal of necessary portions of electrical system. Do not cut joists, beams, girders, trusses, or columns without prior written permission from Architect/Engineer.

CLEANING

Broom clean demolition areas of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.

Remove temporary work and protection when no longer needed.

Unless noted otherwise, existing fixtures that are to remain shall be cleaned and lamps and ballasts replaced with new lamps and ballasts.

END OF SECTION

26 05 30 - ELECTRICAL RACEWAY SYSTEMS

PART 1 - GENERAL

SCOPE OF WORK

Furnish all labor, materials and equipment and incidentals required to construct and install the complete electrical systems as indicated on the Drawings and as specified in this Section.

STANDARD OF MATERIALS

All materials, equipment and apparatus covered by this specification shall be new, of current manufacture and shall bear the seal of approval of the Underwriters' Laboratories.

All equipment and materials shall have ratings established by a recognized independent agency or laboratory. The Contractor shall apply the items used on this project within the ratings and subject to any stipulations or exceptions established by the independent agency or laboratory.

All conduits and raceways, wire, devices, panelboards, switches, etc. of a given type shall be the product of one manufacturer.

PART 2 - PRODUCTS

RIGID CONDUIT, TUBING AND FITTINGS

Rigid steel conduit: zinc coated, threaded type conforming to the requirements of UL 6 and ANSI C80.1 standards. Zinc coating shall be applied to both inner and outer surfaces.

Intermediate metal conduit: hot-dipped galvanized, threaded type conforming to the requirements of UL 1242 and ANSI C80.6 standards.

A fitted thread protector shall protect threaded ends from damage during shipment and handling.

Fittings for rigid steel and IMC conduit: zinc coated, threaded type, conforming to Federal Specification W-F-408.

Electrical Metallic Tubing (EMT): UL 797 and ANSI C80.3 standards.

Fittings for electrical metallic tubing: Federal Specification W-F-408. Steel compression type, galvanized or cadmium plated, and suitable for location of installation. Conduit bushings shall be metallic with insulated throats. Insulating grounding type bushings shall be provided where required under "Grounding". EMT connectors shall be similar to T&B "Insuline" with completely insulated throats. Field applied insulated throats are not acceptable.

Acceptable Metal Conduit and Tubing Manufacturers:

EMT: Allied Tube & Conduit Co.
Wheatland Tube Co.
Triangle PWC, Inc.

Fittings: Steel City
Thomas & Betts (T&B)
Raco Inc.

FLEXIBLE METAL CONDUIT, COUPLINGS AND FITTINGS

Flexible metal conduit for dry interior applications: Federal Specification WW-C-566 and UL 1, continuous, spiral wound galvanized steel type.

Fittings (connectors) for flexible metal conduit: UL E 23018. Squeeze Type (Screw-in type, of galvanized steel or) malleable iron zinc plated.

Flexible metal conduit for damp or exterior applications: liquid tight, UL listed, spiral wound galvanized steel with PVC outer jacket.

Fittings for liquid tight conduit: Federal Specification W-F-406. Provide cadmium plated, malleable iron fittings with compression type steel ferrule and gasket sealing rings and insulated throats.

Acceptable Metal Conduit and Fittings Manufacturers:

FMC: Alflex Corp.
American Flexible Conduit Co.
Anaconda Metal Hose, ANAMET Inc.

FMC Fittings: Steel City
Thomas & Betts (T&B)
Raco Inc.

CONDUIT MOUNTING EQUIPMENT

Hangers, rods, backplates, beam clamps etc. shall be hot-dipped galvanized iron or steel. They shall be as manufactured by the Appleton Electric Co., Thomas and Betts Co., Unistrut Corp., or approved equal.

JUNCTION BOXES

Sheet Steel Outlet Boxes: conform to UL 514A, “Metallic Outlet Boxes, Electrical”, UL 514B, “Fittings for Conduit and Outlet Boxes, Covers, and Box Supports”, and NEMA OS1, “Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports”.

Sheet Steel: Flat-rolled, code gauge galvanized steel.

Acceptable Manufacturers: Sheet-steel boxes shall be manufactured by RACO, Steel City or equal.

All junction boxes and pull boxes shall be sized per NEC requirements and be of the proper NEMA classification for the locations where they are installed. Where boxes occur above other than lift-out ceilings, access panels must be provided.

OUTLET BOXES

Switch, receptacle and wall or ceiling mounted junction boxes shall be the 4" X 2 1/8" square type. Tile, dry wall, or flat cover plates for one or two devices shall be furnished for each box as required.

TELEPHONE AND DATA SYSTEM OUTLETS

Wall outlets shall in general consist of four inch (4") square boxes with single gang switch ring. Conduits shall be supplied turned out of wall above ceiling assembly. Conduits shall be 1” or larger, with insulated bushing installed on all bare ends.

Install finished blank plates on all unused openings.

PART 3 - EXECUTION

RACEWAY INSTALLATION

All interior and above grade exterior wiring shall be installed in a metal conduit and all embedded in concrete or below grade wiring shall be in PVC conduit unless indicated otherwise on the drawings.

Exterior low voltage (less than 50 volts) wiring may be installed in liquid tight, non-metallic flexible conduit (“Sealtite”) where installation is above grade and not subject to damage.

No conduit smaller than 3/4 inch electrical trade size shall be used, nor shall any have more than three 90 degree bends in any one run. Pull boxes shall be provided as required or directed.

No wire shall be pulled until the conduit system is complete in all details.

The ends of all conduits shall be tightly plugged to exclude dust and moisture during construction.

Conduit support shall be spaced at intervals of 8 ft. or less, as required to obtain rigid construction.

Single conduits shall be supported by means of two-hole pipe clamps. Multiple runs of conduits shall be supported on trapeze type hangers with steel horizontal members and threaded hanger rods. The rods shall be not less than 3/8 inch diameter. The channel shall be not less than 1 1/2" nominal size.

Conduit hangers shall be attached to structural steel by means of beam or channel clamps.

All conduits on exposed work shall be run at right angles to and parallel with the surrounding walls and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduit shall be run straight and true.

Conduit terminating in sheet steel boxes shall have double locknuts and insulated bushings.

Provide expansion coupling every 100 feet for long runs of conduit and at concrete expansion joints. Provide ground bonding jumpers around expansion couplings, used on metallic conduit, sized according to NEC.

Seal all wall penetrations to watertight condition. Finish as applicable to location.

Approval by the Architect shall be required to install conduit in structural members.

In general, the conduit installation shall follow the layout shown on the plans. This layout is, however, diagrammatic only, and where changes are necessary due to structural conditions, other apparatus or other causes, such changes shall be made without additional cost to the Owner. It is recognized that branch circuit routing shown on the drawings may not always be the most economical or the most feasible method. Routing may be changed by the Contractor subject to the following provisions:

Not more than three circuits may be installed in any one conduit. Care must be taken to provide the appropriate number of neutrals where two or three circuits are on the same phase.

All conduit shall be concealed unless otherwise noted on the drawings.

Exposed conduit will be permitted only as shown on the drawings. Exposed conduit shall be run parallel with or at right angles to the building walls.

All empty conduits shall be provided with a plastic pull wire rated for a minimum of 200 lbs.

Telephone and data raceways shall be 1” minimum. This includes conduits stubbed up into ceiling cavity.

Flexible conduit in all areas subject to moisture shall be liquid-tight flexible conduit.

All electrical connections to vibration isolated equipment shall be made with flexible conduit.

All conduit passing through a structural expansion joint shall be provided with a UL approved expansion joint fitting and bonded as required by the National Electrical Code.

Any wiring in a finished area which cannot be concealed in conduit shall be installed in a surface metal raceway system as manufactured by Wiremold or equal. Utilization of surface metal raceway, if not indicated as such on the plans, will be accomplished only with the written approval of the Architect.

Conduit run in areas with hung ceilings shall be installed in the space above the hung ceiling as close to the structure as possible. Conduits shall be supported from the structure.

RACEWAY INSTALLATION - CONDITIONS

Conduit raceways shall be installed as indicated herein. Where more than one type of raceway is listed under one condition, the Contractor may exercise his option of the raceway used. Conditions of raceway installation are as follows:

Exposed Raceway Below 8'-0" from Finish Floor and in Areas Subject to Moisture: Rigid galvanized steel conduit.

Raceway Concealed Overhead, or in Walls: Rigid galvanized steel conduit, intermediate metallic conduit or electrical metallic tubing (EMT).

Final Raceway Connection to Recessed Fixtures in Accessible Locations: Flexible steel conduit maximum of 6'-0" long.

OUTLET BOXES

Set boxes plumb and such that their device mounting plane is within 1/8" of the finished wall.

Surface mounted boxes and wiremold boxes, both new or existing, shall be painted to match surrounding surfaces.

The location of boxes on the electrical plans is approximate. Review architectural drawings for specific location or if not shown center and align within architectural detail. The Architect shall reserve the right to move boxes during rough in.

END OF SECTION

PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN:	REVIEWED:	DATE:
CONCEPT SCHEM. DESIGN								
DESIGN DEVELOPMENT								
EARLY DEMOLITION PACKAGE								
90% CONSTRUCTION DOCS.								
PERMIT DOCS.								
100% CONSTRUCTION DOCS.	BW	BW	9/29/25					

Client:
Florida State University
Tallahassee, Florida

Job Title:
Theater 7 HVAC Replacement

Seal:

Consultant:
McGINNISS + FLEMING ENGINEERING

ALW Project #:
FSU Project #:
Phase: 100% Construction Documents

Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:
Specifications

Sheet No.:
E3.1