SOUTHERN UNIVERSITY SHREVEPORT - NEW BACKUP IT ROOM

100% CONSTRUCTION DOCUMENTS

610 TEXAS STREET,
3RD FLOOR
SHREVEPORT, LA 71107
AUGUST 7, 2023

DRAWING INDEX	
Sheet Number	Sheet Name
T101	TITLE SHEET
T102	GENERAL NOTES
T103	GENERAL NOTES
LS01	LIFE SAFETY PLAN (3RD FLOOR)
A101	RENOVATION PLAN (3RD FLOOR)
A102	REFLECTED CEILING PLAN (3RD FLOOR)
A103	ROOF PLAN/DETAILS
MP100	MECHANICAL NOTES
MP101	MECHANICAL DEMOLITION AND RENOVATION PLANS
MP102	MECHANICAL DEMOLITION AND RENOVATION ROOF PLANS
MP201	MECHANICAL SCHEDULES AND LEGEND
MP301	MECHANICAL DETAILS
MP302	MECHANICAL DETAILS
MP401	MECHANICAL SPECIFICATIONS
MP402	MECHANICAL SPECIFICATIONS
MP403	MECHANICAL SPECIFICATIONS
E100	ELECTRICAL POWER PLAN AND NOTES
E200	ELECTRICAL SPECIFICATIONS

VICINITY MAP

SCALE:NTS

1 ARCHITECTURAL SITE PLAN
SCALE: 1" = 40'-0"

ARCHITECT	MECHANICAL	ELECTRICAL	IT CONSULTANT
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8.7.23

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SHREVEPORT, LOUISIANA 71107

NO.	REVISIONS	DATE

PROJECT NO.: WA-19-123
PHASE: 100% CONSTRUCTION DOCUMENTS
ISSUED FOR: CONSTRUCTION
DATE: 8-7-23

TITLE SHEET
T101

GENERAL NOTES

1. CONTRACTOR SHALL INSURE ALL WORK IS IN CONFORMANCE WITH ALL APPLICABLE BUILDING CODES. WORK SHALL BE COMPLETED IN STRICT ACCORDANCE WITH THE LATEST EDITIONS OF THE N.Y.S. UNIFORM FIRE PREVENTION AND BUILDING CODE, N.Y.S. ENERGY CONSERVATION CODE, N.Y.S. PLUMBING CODE, NATIONAL ELECTRIC CODE, AND ALL OTHER FEDERAL, STATE AND LOCAL AGENCY REGULATIONS HAVING JURISDICTION OVER THIS PROJECT. IN THE EVENT OF ANY DISCREPANCIES BETWEEN AGENCY REQUIREMENTS. THE CONTRACTOR SHALL OBSERVE THE MORE STRINGENT OF REQUIREMENTS.

2. ALL WORK SHALL COMPLY WITH THE STANDARDS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS (NBFU), INDUSTRIAL RISK INSURANCE UNDERWRITERS (IRI), FACTORY MUTUAL (FM), OR THE APPLICABLE RATING BUREAU. THE NATIONAL ELECTRIC CODE (NEC), THE AMERICAN GAS ASSOCIATION (AGA), AND THE AMERICAN SOCIETY OF HEATING AND AIR CONDITIONING ENGINEERS (ASHAE), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) APPLICABLE STATE AND CITY BUILDING CODES AND THE REQUIREMENTS OF ALL PUBLIC UTILITY COMPANIES SERVING THE PROJECT SITE.

3. CONTRACTOR (AND HIS SUBCONTRACTORS) SHALL BE LICENSED BY THE STATE IN WHICH THE PROJECT IS LOCATED AND APPROVED IN ADVANCE BY THE OWNER.

4. CONTRACTOR SHALL FILE ALL APPLICATIONS, PAY FOR ALL NECESSARY PERMITS AND SECURE CERTIFICATES OF OCCUPANCY FOR THE PROJECT.

5. ALL WORK IS TO BE COORDINATED WITH THE OWNER. THE CONTRACTOR IS TO MEET WITH THE OWNER PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR WILL PRESENT THE BUILDING PERMIT AND INSURANCE CERTIFICATES TO THE OWNER PRIOR TO STARTING CONSTRUCTION.

6. CONTRACTOR SHALL PROVIDE ANY NECESSARY MEASURES TO PROTECT THE WORKERS AND OTHER PERSONS DURING CONSTRUCTION.

7.CHECK WITH THE OWNER FOR COORDINATION OF THE WORK UNDER THIS CONTRACT WITH WORK OF OTHER TRADES. OWNER'S REGULATIONS GOVERN ALL ASPECTS OF OUTSIDE CONTRACTORS WORKING ON THE PROPERTY.

8. CONTRACTOR SHALL KEEP THE JOB FREE OF DEBRIS AND MAKE FINAL CLEANUP TO THE SATISFACTION OF THE OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ALL CONSTRUCTION DEBRIS FROM PROJECT SITE AND SHALL PROVIDE DUMPSTERS ETC. AS REQUIRED. REMOVE ALL DEBRIS ON A DAILY BASIS.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING BUILDINGS AND OTHER INSTALLATIONS THAT ARE TO REMAIN INTACT WHILE PERFORMING THE SPECIFIED WORK. PROVIDE AND MAINTAIN FIRE EXTINGUISHERS ON PROJECT SITE DURING CONSTRUCTION.

10.UNLESS INDICATED OTHERWISE, ALL MATERIAL FURNISHED AND INCORPORATED INTO THE WORK SHALL BE NEW, UNUSED AND OF QUALITY STANDARD TO THE INDUSTRY FOR FIRST CLASS WORK OF SIMILAR NATURE AND CHARACTER. INSTALL ALL MATERIALS TO THE MANUFACTURER'S RECOMMENDATIONS AND BEST STANDARD OF THE TRADES INVOLVED.

11. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS IN FIELD PRIOR CONSTRUCTION. NOTIFY ARCHITECT OF ANY DISCREPANCIES ON DRAWINGS.

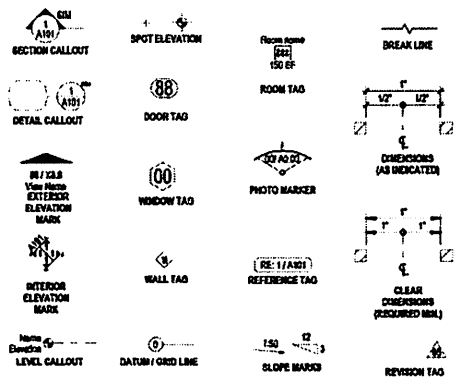
12. VISIT THE SITE TO VERIFY EXISTING CONDITIONS. EXISTING CONCEALED CONDITIONS AND CONNECTIONS ARE BASED UPON INFORMATION TAKEN FROM LIMITED FIELD INVESTIGATIONS. CONTRACTOR SHALL MAKE REQUIRED ADJUSTMENTS TO SYSTEM COMPONENTS AS NECESSITATED BY ACTUAL FIELD CONDITIONS AT NO ADDITIONAL COST TO OWNER OR ARCHITECT. REPORT ANY DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL FIELD CONDITIONS TO THE ARCHITECT BEFORE CONSTRUCTION BEGINS.

13. CONTRACTOR TO OBTAIN AND PROVIDE OWNER WITH COLOR SAMPLES FOR PROPER COLOR SELECTION AND FINAL APPROVAL OF ALL FINISHES PRIOR TO INSTALLATION.

AVG.	AVERAGE
ALT.	ALTERNATE
A.F.F.	ABOVE FINISHED FLOOR
ABV.	ABOVE
ADJ.	ADJUSTABLE
ALUM.	ALUMINUM
BALC.	BALCONY
BD.	BOARD
BLDG.	BUILDING
BEDRM.	BEDROOM
C.L.	CENTER LINE
CLG.	CLOSET
CLG.	CEILING
COL.	COLUMN
COMP.	COMPOSITION
CONC.	CONCRETE
CONSTR.	CONSTRUCTION
CONT.	CONTINUOUS
C.T.	CERAMIC TILE
DTL.	DETAIL
DIA.	DIAMETER
DIM.	DIMENSION
DWGS.	DRAWINGS
DN.	DOWN
D.S.	DOWNSPOUT
EA.	EACH
ELEC.	ELECTRIC
E.W.C.	ELECTRIC WATER COOLER
E.W.H.	ELECTRIC WATER HEATER
EL.	ELEVATION
EQ.	EQUAL
EXIST.	EXISTING
EXP.	EXPANSION
E.J.	EXPANSION JOINT
EXT.	EXTERIOR
FAB.	FABRICATE, FABRICATED
F.A.V.B.	FLUID APPLIED VAPOR BARRIER
FIN.	FINISH
F.C.	FIRE CODE
F.F.	FACINGED FLOOR
F.P.	FIRE PLACE
FLASH.	FLASHING
FLR.	FLOOR
F.D.	FLOOR DRAIN
FLUOR.	FLUORESCENT
FTG.	FOOTING
FDN.	FOUNDATION
F.B.O.	FURNISHED BY OTHERS
GALV.	GALVANIZED
GA.	GAUGE
GEN.	GENERAL
G.C.	GENERAL CONTRACTOR
GYP. BD.	GYPSUM BOARD
HT.	HEIGHT
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HDR.	HEADER
HD. HT.	HEAD HEIGHT
IN.	INCH
I.D.	INSIDE DIAMETER
INSUL.	INSULATION
INT.	INTERIOR
JAN.	JANITOR
JT.	JOINT
KIT.	KITCHEN
L.	LENGTH, LONG
LT.	LIGHT
MFR.	MANUFACTURER
MAS.	MASONRY
M.D.	MASONRY DIMENSION
M.O.	MASONRY OPENING
MAX.	MAXIMUM
MECH.	MECHANICAL
M.E.P.	MECHANICAL, ELECTRICAL, PLUMBING
MED.	MEDIUM
M.D.O.	MEDIUM DENSITY OVERLAY
M.D.F.	MEDIUM DENSITY FIBERBOAD
MTL.	METAL
MIN.	MINIMUM
MISC.	MISCELLANEOUS
N.	NORTH
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.C.E.W.	ON CENTER EACH WAY
OPG.	OPENING
OPP.H.	OPPOSITE HAND
O.S.B.	ORIENTED STRAND BOARD
O.D.	OUTSIDE DIAMETER
O.H.D.	OVERHEAD DOOR
PVMT.	PAVEMENT
PL.	PLATE
PLAS.LAM.	PLASTIC LAMINATE
PLYWD.	PLYWOOD
PT.	POINT
R.C.	RESILIENT CHANNEL
R.	RADIUS, RISER
REF.	REF., REFER TO
RECPT.	RECEPTACLE
RFGR.	REFRIGERATOR
REINF.	REINFORCE, REINFORCED, REINFORCING
REQ'D.	REQUIRED
RM.	ROOM
R.A.	ROOF DRAIN
R.O.	ROUGH OPENING
S.F.	SQUARE FOOT
SCHED.	SCHEDULE
SECT.	SECTION
SHT.	SHEET
SIM.	SIMILAR
STC.	SOUND TRANSMISSION CLASS
S.A.B.	SOUND ATTENUATION BLANKETS
S.	SOUTH OR SIDE
SPEC'S.	SPECIFIED, SPECIFICATION(S)
S.R.O.	SHEET ROCK OPENING
STD.	STANDARD
STL.	STEEL
STRUCT.	STRUCTURAL
STOR.	STORAGE
SQ.	SQUARE
THK.	THICK
T.C.	TOP OF CURB
T.W.	TOP OF WALL
T.	TREAD, T.L.E. TOP
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT.	VERTICAL
V.C.T.	VINYL COMPOSITION TILE
V.F.	VINYL FABRIC
W.	WEST OR WIDTH
W.W.M.	WELDED WIRE MESH
W.W.F.	WELDED WIRE FABRIC
w/	WITH
WD.	WOOD
W.I.C.	WALK-IN CLOSET
WT.	WEIGHT

&	AND
∠	ANGLE
@	AT
℄	CENTERLINE
=	EQUAL
°	DEGREE
'	FEET or MINUTES
"	INCHES or SECONDS
℘	PLATE or PROPERTY LINE
+/-	PLUS OR MINUS
#	POUND or NUMBER
:	RATIO
ø	ROUND or DIAMETER
□	SQUARE
□'	SQUARE FEET
c/	WITH
s/o	WITHOUT

1 ABBREVIATIONS
N.T.S.



2 ANNOTATIONS
N.T.S.

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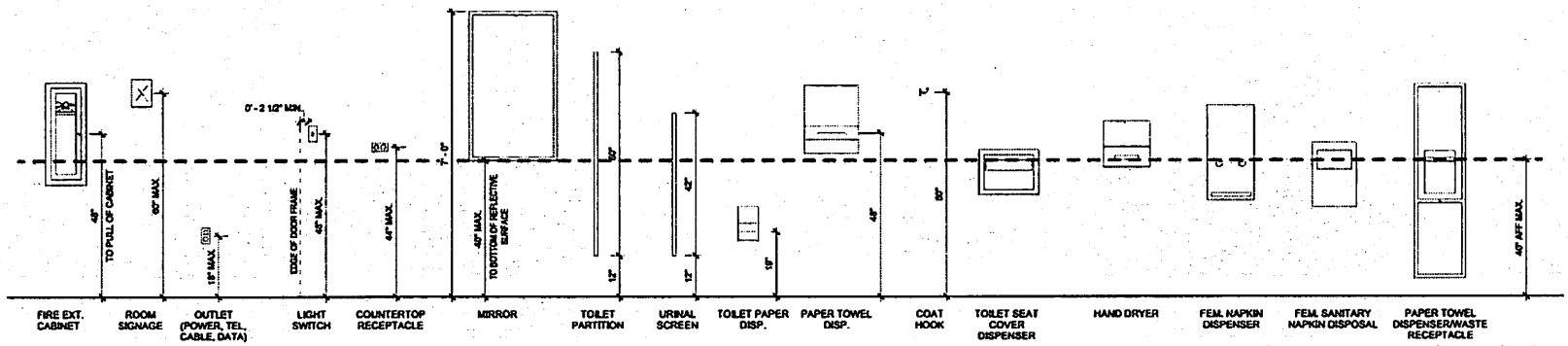
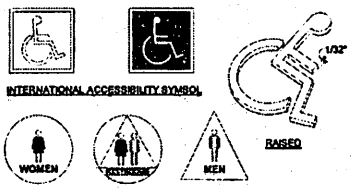
GENERAL NOTES

T102



1 MOUNTING HEIGHTS
N.T.S.



INTERNATIONAL ACCESSIBILITY SYMBOL

PROPORTIONS INTERNATIONAL ACCESSIBILITY SYMBOL

INTERNATIONAL TTY SYMBOL

INTERNATIONAL SYMBOL OF ACCESS FOR HEARING LOSS

LETTERS AND NUMBERS

1. LETTERS AND NUMBERS ON SIGNS SHALL BE RAISED 1/32" MINIMUM AND 2" SHALL BE SANS-SERIF UPPERCASE CHARACTERS ACCOMPANIED BY GRADE 2 BRAILLE.
2. RAISED CHARACTERS OR SYMBOLS SHALL BE A MINIMUM OF 5/8" HIGH
3. PICTORIAL SYMBOL SIGNS (PICTOGRAMS) SHALL BE ACCOMPANIED BY THE EQUIVALENT VERBAL DESCRIPTION PLACED DIRECTLY BELOW THE PICTOGRAM. THE BORDER DIMENSION OF THE PICTOGRAM SHALL BE A MINIMUM OF 6" IN HEIGHT
4. LETTERS AND NUMBERS ON SIGNS SHALL HAVE A WIDTH-TO-HEIGHT RATIO OF BETWEEN 3:5 AND 1:1 AND A STROKE WIDTH-TO-HEIGHT RATIO BETWEEN 1:5 AND 1:10
5. CHARACTERS AND SYMBOLS SHALL CONTRAST WITH THEIR BACKGROUND, EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND
6. CHARACTERS AND NUMBERS ON SIGNS SHALL BE SIZED ACCORDING TO THE VIEWING DISTANCE FROM WHICH THEY ARE TO BE READ. THE MINIMUM HEIGHT IS MEASURED USING AN UPPER CASE I. LOWER CASE CHARACTERS ARE PERMITTED FOR SIGNS SURFACED OR PROJECTED GREATER THAN 60" ABOVE THE FINISH FLOOR, THE MINIMUM CHARACTER HEIGHT SHALL BE 3"
7. CONTRACTED GRADE 2 BRAILLE SHALL BE USED WHERE VER BRAILLE SYMBOLS ARE SPECIFICALLY REQUIRED IN OTHER PORTIONS OF THESE REGULATIONS. DOTS SHALL BE .100 INCH MAXIMUM ON CENTERS IN EACH CELL WITH .300 INCH MAXIMUM DISTANCE BETWEEN CORRESPONDING DOTS IN ADJACENT CELLS. DOTS SHALL BE RAISED A MINIMUM OF .025 INCH ABOVE THE BACKGROUND.

SIGN LOCATIONS

1. ALL BUILDING ENTRANCES THAT ARE ACCESSIBLE TO AND USABLE BY PERSONS WITH DISABILITIES AND AT EVERY MAJOR JUNCTION ALONG OR LEADING TO AN ACCESSIBLE ROUTE OF TRAVEL SHALL BE IDENTIFIED WITH A SIGN DISPLAYING THE INTERNATIONAL SYMBOL OF ACCESSIBILITY AND WITH ADDITIONAL DIRECTIONAL SIGNS, AS REQUIRED, TO BE VISIBLE TO PERSONS ALONG APPROACHING PEDESTRIAN WAYS
2. WHEN PERMANENT IDENTIFICATION IS PROVIDED FOR ROOMS AND SPACES, RAISED LETTERS SHALL BE PROVIDED AND SHALL BE ACCOMPANIED BY BRAILLE. SIGNS SHALL BE INSTALLED ON THE WALL ADJACENT TO THE LATCH OUTSIDE OF THE DOOR WHERE THERE IS NO WALL SPACE ON THE LATCH SIDE, INCLUDING AT LEAF DOORS. SIGNS SHALL BE PLACED ON THE NEAREST ADJACENT WALL, PREFERABLY ON THE RIGHT. MOUNTING HEIGHT SHALL BE 60" ABOVE THE FINISH FLOOR TO THE CENTERLINE OF THE SIGN. MOUNTING LOCATION SHALL BE DETERMINED SO THAT THE PERSON MAY APPROACH WITHIN 3" OF THE SIGNAGE WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING OF A DOOR
3. ADDITIONAL DIRECTIONAL SIGNS ALONG ACCESSIBLE PATH OF TRAVEL ARE REQUIRED
4. BUILDINGS REMODELED TO PROVIDE ACCESSIBLE SANITARY FACILITIES FOR PUBLIC USE SHALL HAVE INFORMATION POSTED IN THE LOBBY AS PART OF THE BUILDING DIRECTORY.

INTERNATIONAL SYMBOL OF ACCESSIBILITY

1. STANDARD USED TO IDENTIFY ACCESSIBLE FACILITIES
2. WHITE FIGURE ON BLUE BACKGROUND
3. WHEN ENFORCING AGENCY DETERMINES, IF APPROPRIATE, SPECIAL DESIGNS AND COLORS MAY BE APPROVED

BRAILLE

1. USE CONTRACTED GRADE 2 BRAILLE. DOTS TO BE 0.100 INCH ON CENTER IN EACH CELL
2. 0.241 INCH SPACE BETWEEN CORRESPONDING DOTS IN ADJACENT CELLS
3. DOTS RAISED MINIMUM 0.025 INCH ABOVE BACKGROUND

2 ADA ACCESSIBILITY
N.T.S.

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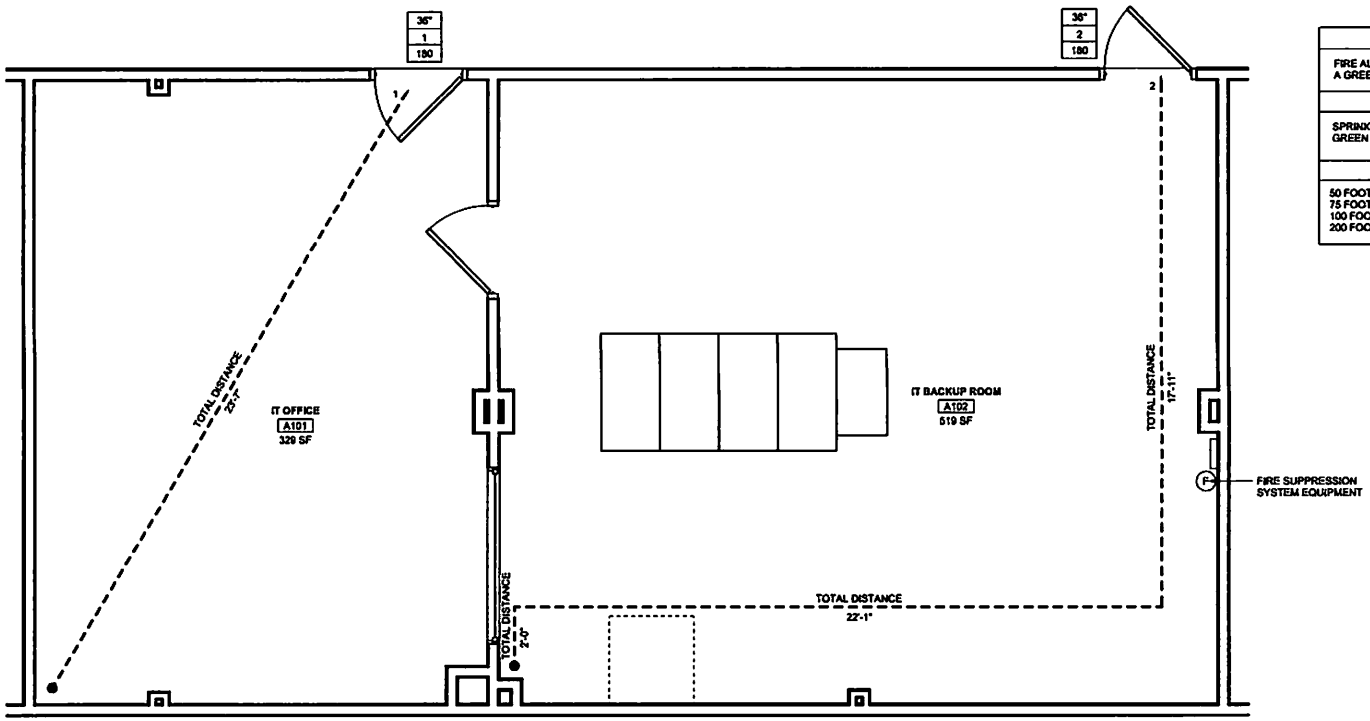
GENERAL NOTES

T103



1 LIFE SAFETY PLAN (3RD FLOOR NEW IT CLOSET AND OFFICE)
SCALE: 1/2" = 1'-0"

LEGEND	
----------	TRAVEL DISTANCE
(F)	FIRE SUPPRESSION SYSTEM EQUIPMENT
#	WIDTH OF CLEAR OPENING
#	# OF PEOPLE EXITING THROUGH DOOR
#	MAX # OF PEOPLE ALLOWED THROUGH DOOR

FIRE ALARM
FIRE ALARM SYSTEM WILL EXTEND TO EXISTING SYSTEM SO A GREEN TAG IS IN PLACE FOR OCCUPANCY.
SPRINKLER SYSTEM
SPRINKLER SYSTEM WILL EXTEND TO EXISTING SYSTEM SO A GREEN TAG IS IN PLACE FOR OCCUPANCY.
EGRESS COMPONENTS
50 FOOT DEAD END CORRIDOR (IBC 1020.4 / NFPA 101.12.2.5.1.3) 75 FOOT COMMON PATH OF TRAVEL (IBC 1006.2.1) 100 FOOT COMMON PATH OF TRAVEL (NFPA 101,15.2.5.2.2) 200 FOOT TRAVEL DISTANCE (IBC 1017.2 / NFPA 101 TABLE A7.5)

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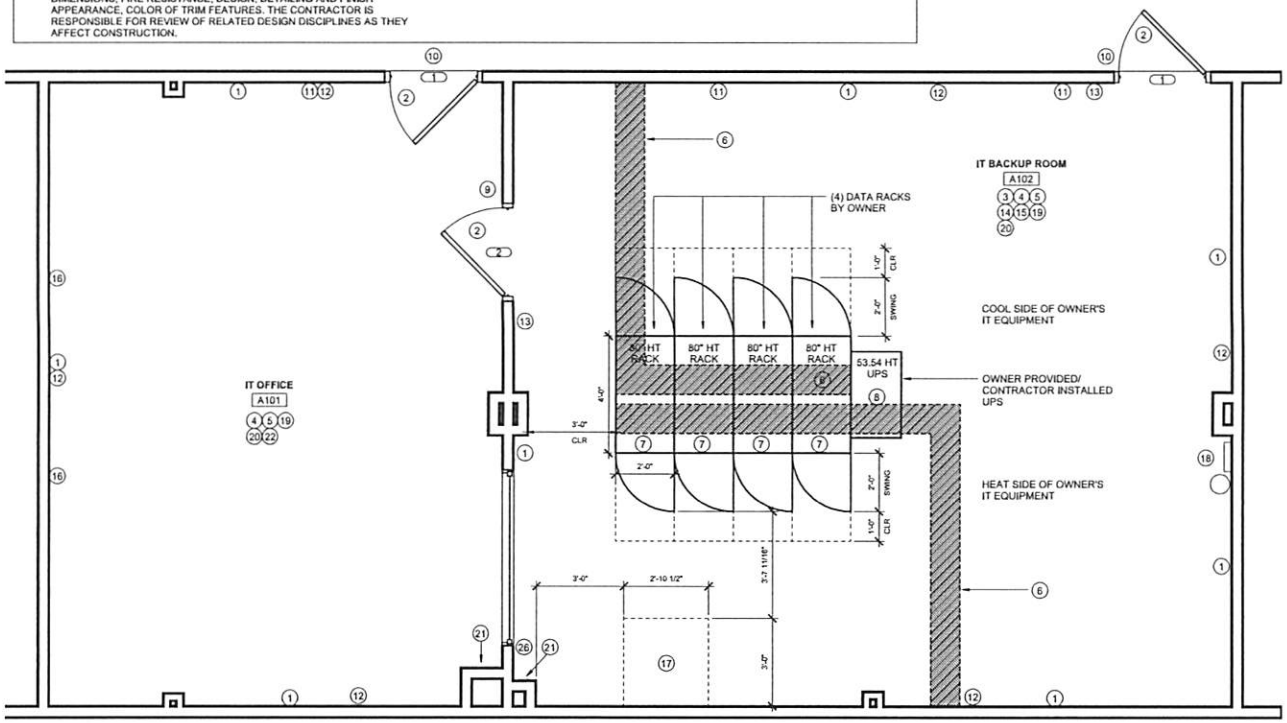
LIFE SAFETY PLAN (3RD FLOOR)

LS01

RENOVATION GENERAL NOTES

1. EXISTING GYPSUM BOARD TO BE PROTECTED THROUGHOUT THE DURATION OF CONSTRUCTION. ANY DAMAGE TO EXISTING GYPSUM BOARD SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE IN KIND.
2. ALL WORK SHALL BE PREFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCE HAVING JURISDICTION.
3. INSTALL MANUFACTURED ITEMS, MATERIALS AND EQUIPMENT IN STRICT ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDABLE SPECIFICATIONS, EXCEPT WHERE SPECIFIED HEREIN, WHERE MORE STRINGENT, SHALL BE COMPILED WITH.
4. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS FOR ACCURACY AND CONFIRMING THAT WORK IS BUILDABLE AS SHOWN BEFORE PROCEEDING WITH CONSTRUCTION. IF THERE ARE ANY QUESTIONS, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE PROCEEDING WITH THE WORK IN QUESTION OR RELATED WORK.
5. EACH DESIGN PROFESSIONAL WILL BE THE PRIMARY SOURCE FOR INFORMATION REGARDING THAT DISCIPLINE (ARCH., MECH., ELEC.,) HOWEVER, IT WILL NOT BE THE ONLY SOURCE FOR COORDINATION OF DIMENSIONS, FIRE RESISTANCE, DESIGN, DETAILING AND FINISH APPEARANCE, COLOR OF TRIM FEATURES. THE CONTRACTOR IS RESPONSIBLE FOR REVIEW OF RELATED DESIGN DISCIPLINES AS THEY AFFECT CONSTRUCTION.
6. ANY MATERIALS OR DEVICES SCHEDULED TO BE REUSED THAT ARE DAMAGED BY THE CONTRACTOR SHALL BE REPLACED IN KIND AT CONTRACTOR'S EXPENSE.
7. LOCATE SUSPENDED CEILING HANGERS AND CHANNELS TO AVOID DUCTWORK AND PROVIDE SPACES FOR RECESSED LIGHT FIXTURES, DIFFUSERS, AND CONVECTORS, ETC. SEE REFLECTED CEILING PLANS, ELECTRICAL AND MECHANICAL PLANS FOR LOCATIONS.
8. PROVIDE NECESSARY SUPPORTS AND BLOCKING IN WALLS TO SUPPORT WORK ATTACHED TO THEM.
9. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS, ARRANGE FOR ALL REQUIRED INSPECTIONS.
10. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT FOR FIRE ALARM, SPRINKLERS AND SUPPRESSION SYSTEMS PRIOR TO SUBMITTAL TO THE FIRE MARSHAL OFFICE FOR REVIEW. WORK IN THOSE AREAS SHALL NOT COMMENCE UNTIL SHOP DRAWINGS HAVE BEEN FOUND IN COMPLIANCE BY THE FIRE MARSHAL'S OFFICE
11. EXISTING SPRINKLER PIPING TO REMAIN. RE: MP100



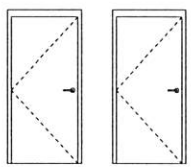
1 RENOVATION PLAN (3RD FLOOR NEW IT CLOSET AND OFFICE)

SCALE: 1/2" = 1'-0"

THE DESIGN TEAM HAS MADE EVERY EFFORT TO COORDINATE UTILITIES REQUIRED TO SUPPORT IT HARDWARE PLANNED FOR AND PROCURED BY THE OWNER. PLEASE NOTE THE FINAL UTILITY AND INFRASTRUCTURE DETAILS INCLUDED IN THIS SET OF DRAWINGS WERE BASED OFF LIMITED IT ENGINEERING GUIDANCE AND INFORMATION PROVIDED BY THE OWNER. WITHOUT BEING PROVIDED A FULL, DETAILED PART LIST OF THE EQUIPMENT THAT WILL BE INSTALLED WITHIN THE ROOM, THE DESIGN TEAM CANNOT FULLY GUARANTEE THAT THE UTILITIES (POWER/HVAC/ETC.) PROVIDED WILL BE SUFFICIENT TO SUPPORT EQUIPMENT PLANNED TO BE INSTALLED WITHIN THE ROOM. IN A VIRTUAL MEETING ON 8.7.23, REPRESENTATIVES FROM THE OWNER'S IT TEAM DIRECTED THE DESIGN TEAM TO COMPLETE THE DRAWINGS WITH SAID GUIDANCE AND INFORMATION; THE OWNER ALSO INDICATED THEIR TEAM TOOK NO EXCEPTIONS TO THE POTENTIAL NEED FOR ADDITIONAL ENGINEERING OR CONSTRUCTION THAT MAY BE REQUIRED TO COORDINATE FUTURE EQUIPMENT INSTALLATION. THE OWNER VOICES UNDERSTANDING THAT THIS ADDITIONAL ENGINEERING AND/OR CONSTRUCTION MAY ADD ADDITIONAL COSTS TO THE PROJECT. PRIOR TO THE FINALIZATION OF THE DOCUMENTS, THE DESIGN TEAM PROVIDED THE IT AND OWNERSHIP TEAMS WITH A REVIEW SET TO MAKE FINAL COMMENTS ON WHAT HAS BEEN INCLUDED. WHAT HAS BEEN PRODUCED FOR CONSTRUCTION IS A SET REFLECTIVE OF ANY COMMENTS RECEIVED FROM THE FINAL OWNER REVIEW.

DOOR SCHEDULE

SCALE: 3/8" = 1'-0"



1 — 3068 FLUSH H.M. DOOR H.M. FRAME EXISTING

2 — 3068 FLUSH H.M. DOOR H.M. FRAME ACCESS CONTROL EXISTING

RENOVATION KEYNOTES

1. EXISTING SMOKE PARTITION INSTALLED UP TO BOTTOM OF DECK ABOVE AND SEALED. CONTRACTOR TO EXAMINE ALL WALLS AROUND PERIMETER OF ROOMS ON ROOM SIDE AND CORRIDOR SIDE AND EXTEND EXISTING GYPSUM BOARD AND/OR SEAL AS REQUIRED TO ENSURE SMOKE PARTITION HAS BEEN PROVIDED.
2. EXISTING DOORS AND FRAMES IN PLACE CONTRACTOR TO INSTALL SMOKE LABELED GASKETING, STOPS AND SILENCERS. EXISTING LOCKS, HARDWARE, ACCESS CONTROL BY OWNER, RE: ELECTRICAL FOR ACCESS CONTROL UTILITY FOR DOOR "2", ALL DOORS SHALL RECEIVE CLOSERS PER SPECS.
3. CONTRACTOR TO REMOVE AND STORE ALL EXISTING CEILING TILES, DEVICES, GRILLES/DIFFUSERS AND LIGHTS, ETC FROM EXISTING CEILING GRID. CONTRACTOR TO REMOVE EXISTING CEILING GRID SYSTEM, BUT MAKE NOTE OF EXISTING GRID HEIGHT FOR NEW GRID INSTALLATION. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR WORK ASSOCIATED WITH LIFE SAFETY, LIGHTING, OR HVAC. ONCE MEP WORK ABOVE CEILING HAS BEEN INSTALLED, CONTRACTOR TO INSTALL NEW CEILING SYSTEM PER DRAWINGS AND SPECIFICATIONS. TURN OVER ALL UNUSED COMPONENTS TO OWNER. REINSTALL EXISTING LIGHTS PER RCP IN NEW CEILING GRID.
4. CONTRACTOR TO PAINT/TOUCHUP ALL WALLS AND FRAMES WITHIN THE ROOM AS REQUIRED. RE: SPECS.
5. CONTRACTOR TO EXAMINE EXISTING FLOOR TILE AND RESILIENT BASE IN PLACE, AND REPLACE, REPAIR, INSTALL ANY MISSING, DAMAGED, OR INCORRECTLY INSTALLED FLOORING OR BASE COMPONENTS IN KIND.
6. CONTRACTOR TO INSTALL NEW PRE-FINISHED CABLE LADDER RUNWAY SUSPENDED FROM THE CEILING AND/OR STRUCTURE ABOVE PER SPECIFICATIONS. RE: ELECTRICAL FOR DETAILS AND MOUNTING HEIGHT.
7. LOCATION OF OWNER'S DATA RACKS, PROCURED BY OWNER PREVIOUSLY AND INSTALLED BY OWNER AS SHOWN TO ALLOW FOR REQUIRED CLEARANCES AND MOUNTING. CONTRACTOR TO COORDINATE WITH OWNER WHEN TIME IS APPROPRIATE FOR OWNER TO DELIVER AND SET CABINETS.
8. LOCATION OF OWNER'S UPS, PROCURED UNDER SEPARATE CONTRACT AND INSTALLED BY CONTRACTOR. CONTRACTOR TO DELIVER UPS TO LOCATION WHEN GC COMMUNICATES THAT THE INFRASTRUCTURE IS READY FOR THE CONTRACTOR TO MAKE UTILITY CONNECTIONS REQUIRED.
9. CONTRACTOR TO COORDINATE AND INSTALL UTILITIES NECESSARY FOR OWNER'S SECURITY/ACCESS CONTROL. CONTRACTOR TO INSTALL ACCESS CONTROL PANEL. REFER TO ELECTRICAL ENGINEER DRAWINGS FOR PANEL INSTRUCTIONS. PREP AND ALTER FRAME AS REQUIRED TO ACCOMMODATE. PANEL LOCATION SHOULD BE VERIFIED BY ARCHITECT PRIOR TO INSTALLATION. CONTRACTOR TO REPAIR/PATCH WALL AS REQUIRED FOR PAINT.
10. CONTRACTOR TO INSTALL CARPET TO VCT FLOOR TRANSITION STRIP AT DOOR. RE:SPECS
11. AFTER PROVIDING THE OWNER WITH 48 HOUR NOTICE TO REMOVE ANY DATA CABLING THAT EXTENDS FROM THE CORRIDOR INTO THE DATA CENTER VIA HVAC DAMPER, THE CONTRACTOR SHALL CUT AND REMOVE ANY REMAINING WIRING THAT IS NOT IN PROPER SEALED PENETRATION.
12. CONTRACTOR TO INSPECT ALL THROUGH WALL PENETRATIONS IN PERIMETER WALLS AND SEAL ALL PENETRATIONS NOT SEALED PROPERLY.
13. EXISTING LIFE SAFETY SYSTEM PULL HANDLE AND BUTTON. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR INSTRUCTIONS ON MODIFICATIONS REQUIRED TO PROVIDE A PROPER CODE COMPLIANT LIFE SAFETY SYSTEM.
14. CONTRACTOR TO SELECTIVELY DEMOLISH ALL EXISTING DUCTWORK ABOVE THE CEILING AND CAP ANY DUCTS ENTERING THE ROOM AT THE FACE OF THE WALL IT IS PENETRATING FROM. REFER TO MECHANICAL DRAWINGS FOR NEW HVAC SYSTEM DESIGN.
15. CONTRACTOR TO MODIFY EXISTING FIRE/SMOKE/SPRINKLER/SUPPRESSION SYSTEM COMPONENTS EXISTING ABOVE THE CEILING AS DETAILED IN THE MECHANICAL AND ELECTRICAL DRAWINGS.
16. CONTRACTOR TO INSTALL DUPLEX RECEPTACLES WITH JUNCTION BOX FOR FUTURE DATA INSTALLATION BY OWNER. RE: ELECTRICAL.
17. LOCATION OF NEW HVAC EQUIPMENT. REFER TO MECHANICAL DRAWINGS FOR DESIGN AND DETAILS. COORDINATE POWER INSTALLATION PER ELECTRICAL DRAWINGS.
18. PREVIOUSLY INSTALLED FIRE ALARM AND SUPPRESSOR COMPONENTS. CONTRACTOR TO REFER TO MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR DEMOLITION, REUSE, NEW COMPONENT INSTALLATION INSTRUCTIONS.
19. CONTRACTOR TO TEST AND REPAIR EXISTING RECEPTACLES IN THE ROOM.
20. CONTRACTOR TO REMOVE ALL EXISTING WIRING ABOVE CEILING NOT CONNECTED ON BOTH ENDS AFTER GIVING OWNER 48 HOUR NOTICE TO HAVE EXISTING HARDWARE WIRES AND CABLES REMOVED, OR INDICATE TO THE CONTRACTOR WHICH WIRES AND CABLES SHALL REMAIN.
21. CONTRACTOR TO MODIFY EXISTING CHASE WALL AS REQUIRED IN THIS AREA ON THE 3RD AND 4TH FLOORS UP TO THE ROOF TO ALLOW FOR INSTALLATION OF HVAC SYSTEM COMPONENTS BEING ROUTED FROM ROOF TOP CONDENSER UNIT TO DATA ROOM HVAC UNIT. RE:NOTE #17. CONTRACTOR TO INSTALL FRAMING AND GYPSUM BOARD REQUIRED FOR CUTTING/PATCHING/RECONSTRUCTING CHASE, PREP AND PAINT PER SPECS.
22. CONTRACTOR TO INSTALL MISSING CEILING TILE THROUGHOUT ROOM, AND REPAIR/REPLACE ANY MISSING OR DAMAGED CEILING TILES.
23. CONTRACTOR TO CAREFULLY EXAMINE AND DOCUMENT EXISTING CONDITION OF ROOF. CONTRACTOR TO PROTECT EXISTING ROOF SURFACE TO ALLOW FOR INSTALLATION OF NEW HVAC CONDENSER. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO EXISTING ROOFING OR BUILDING COMPONENTS.

RENOVATION KEYNOTES (CONT'D)

24. CONTRACTOR TO VERIFY THAT PROPOSED FRAME MOUNTING DETAILED WILL WORK WITH BLOCKING/STRUCTURE IN PLACE AT DESIGNATED EXISTING ROOF CURBS. CONTRACTOR SHALL REMOVE ALUMINUM CAP AS REQUIRED AND REINSTALL PER ROOFING STANDARDS AFTER BLOCKING SUPPORT VERIFIED OR SHORED/REINFORCED AS NEEDED.
25. CONTRACTOR TO REMOVE EXISTING PITCH POCKET/ROOF PENETRATION TO ALLOW FOR REFRIGERANT LINE INSTALLATION. RE:MECH,SPECS.
26. CONTRACTOR TO PROVIDE AND INSTALL 2" HUB DRAIN. RE:MECH

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8.7.23

SOUTHERN UNIVERSITY SHREVEPORT - NEW BACKUP IT ROOM

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SHREVEPORT, LOUISIANA 71107

NO.	REVISIONS	DATE

PROJECT NO.: WA-19-123
PHASE: 100% CONSTRUCTION DOCUMENTS
ISSUED FOR: CONSTRUCTION
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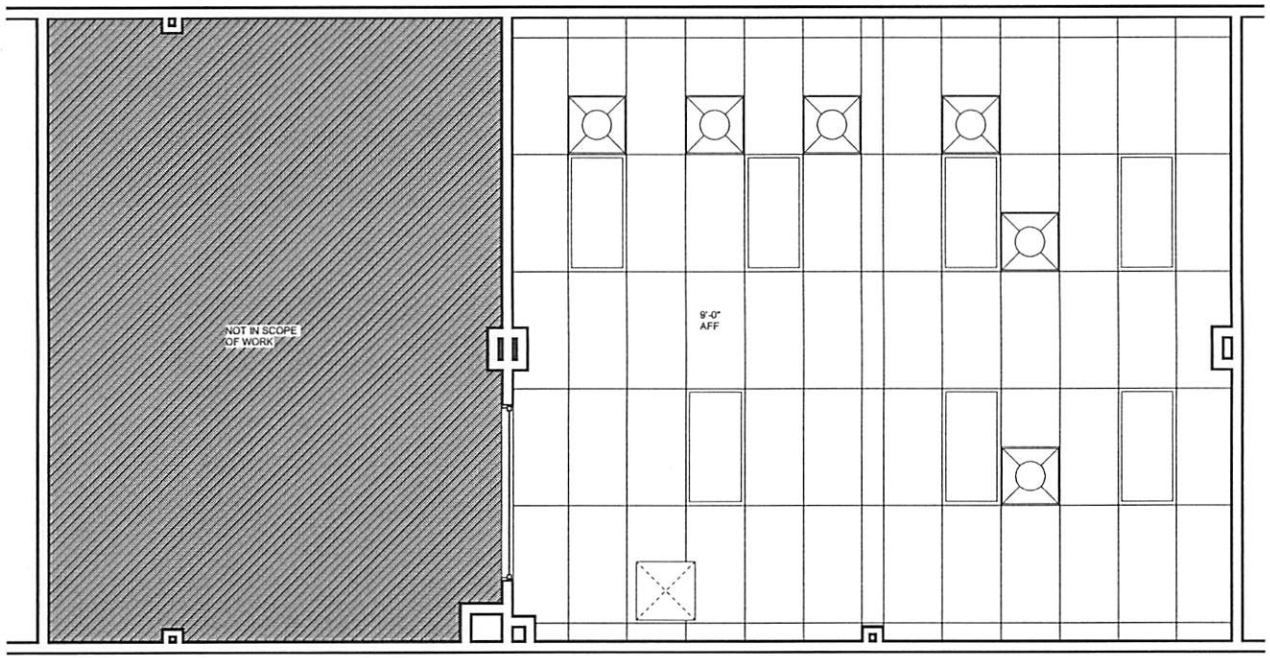
RENOVATION PLAN (3RD FLOOR)

A101

REFLECTED CEILING PLAN NOTES

1. ACOUSTICAL CEILING TILE GRID LAYOUT SHOWN IS ARCHITECT'S INSTALLATION INTENT. NOTIFY ARCHITECT IMMEDIATELY OF ANY CONFLICTS IN THE FIELD.
2. REFER TO FINISH SCHEDULE FOR ALL CEILING HEIGHTS NOT INDICATED AND ADDITIONAL CEILING MATERIAL INFORMATION.
3. SEE ARCHITECT'S SPECIFICATIONS FOR MATERIAL INFORMATION.



REFLECTED CEILING PLAN LEGEND

- ACT01 2X4 SUSPENDED ACOUSTICAL TILE
- SUPPLY AIR DUCT RE: MECHANICAL
- EXISTING LED FIXTURE
- VERTICAL DUCT RE:MECHANICAL

1 REFLECTED CEILING PLAN (3RD FLOOR NEW IT CLOSET AND OFFICE)
SCALE: 1/2" = 1'-0"

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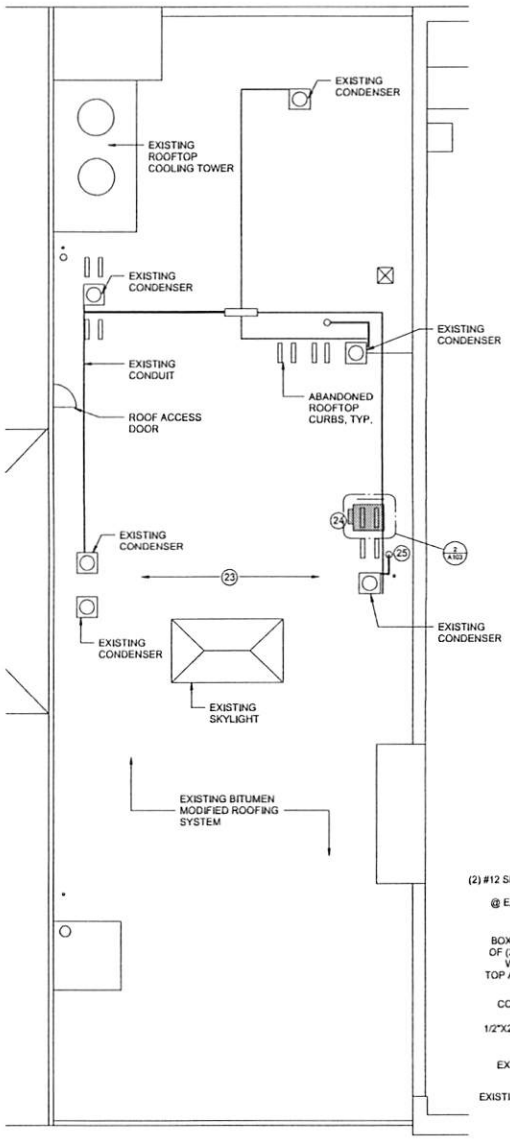
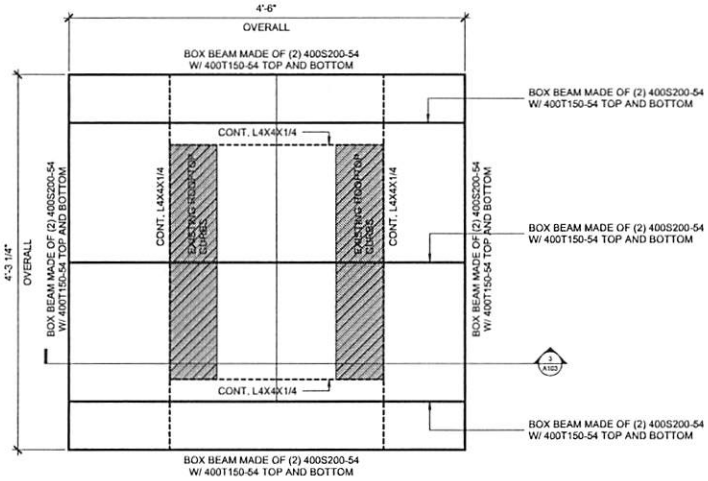
REFLECTED CEILING PLAN (3RD FLOOR)

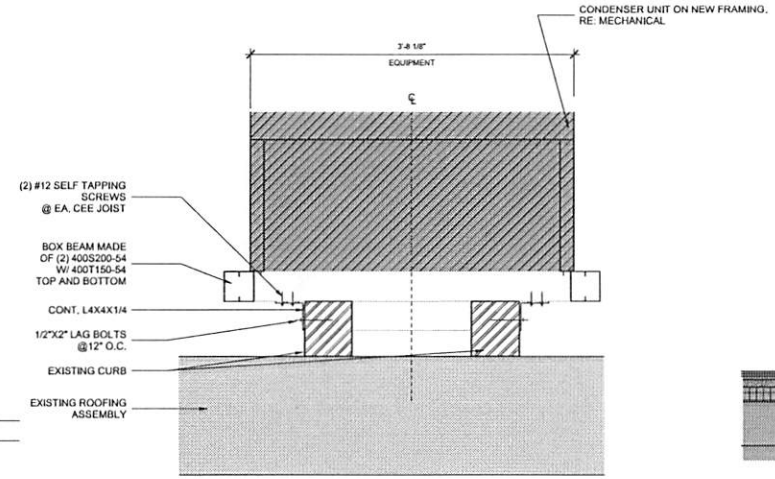
A102



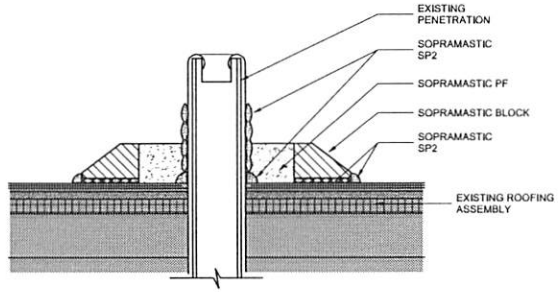
1 ROOF PLAN
SCALE: 1/8" = 1'-0"



2 ROOFTOP EQUIPMENT MOUNT FRAMING PLAN
SCALE: 1 1/2" = 1'-0"



3 ROOFTOP EQUIPMENT MOUNT SECTION
SCALE: 1 1/2" = 1'-0"



4 PITCH POCKET DETAIL
SCALE: 1/2" = 1'-0"

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ROOF PLAN/DETAILS

A103

GENERAL MECHANICAL NOTES:

1. ALL INSTALLATION OF DUCTWORK IS TO TAKE PRECEDENCE OVER THE INSTALLATION OF ALL PLUMBING LINES (EXCEPT GRADE SENSITIVE LINES), SPRINKLER, ELECTRICAL CONDUIT, MECHANICAL CONTRACTOR TO COORDINATE IN FIELD WITH ALL DISCIPLINES PRIOR AND DURING CONSTRUCTION.
2. NOT USED.
3. SHEET METAL DUCTWORK SHALL NOT BE SHOP FABRICATED UNTIL FIELD MEASURMENTS HAVE BEEN VERIFIED BY MECHANICAL CONTRACTOR.
4. ALL CONDENSATE LINES SHALL BE INSULATED, THIS PROJECT. INSULATION TO BE CELLULAR FOAM UNLESS OTHERWISE NOTED IN SPECIFICATIONS. ALL CONDENSATE LINES TO BE RIGID COPPER, REFER TO SCHEDULES FOR SIZES. SUPPORT CONDENSATE DRAIN WITH UNISTRUT PIPE SUPPORT EVERY 4'-0" AND AT EVERY TURN. PROVIDE NEOPRENE SLEEVE BETWEEN UNISTRUT AND COPPER CONDENSATE LINE. SUPPORTS NOT SHOWN FOR CLARITY.
5. ALL EQUIPMENT SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS SO AS TO MAINTAIN GUARANTEES, PROVIDE ADDITIONAL SUPPORTS, DRAINS, EQUIPMENT, ETC. TO CONFORM TO MANUFACTURERS RECOMMENDED INSTALLATION. CONTRACTOR IS TO PROVIDE AND INSTALL ALL SUPPORTS AND HANGERS THAT ARE REQUIRED FOR A PROPER INSTALLATION.
6. DUCTWORK & PIPING RUNS ARE SHOWN DIAGRAMMATICALLY. MECHANICAL CONTRACTOR SHALL ROUTE IN MOST DIRECT MANNER AVOIDING ANY OBSTRUCTIONS NOT INDICATED.
7. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION BETWEEN THE ELECTRICAL AND OTHER TRADES, ESPECIALLY COORDINATION CONCERNING PENETRATIONS OF THE WALLS AND FLOORS WITH PIPE AND DUCTWORK.
8. ALL MODEL NUMBERS SHOWN FOR SPECIFIC MANUFACTURER'S REPRESENT THE TYPE AND QUALITY OF EQUIPMENT TO BE USED. SUBMIT FOR PRIOR APPROVAL ANY EQUIPMENT BEFORE BIDDING.
9. MECHANICAL CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF ALL EQUIPMENT WITH ALL OTHER DIVISIONS. SHOULD CONFLICTS ARISE WHICH CANNOT BE CORRECTED WITH MINOR DEVIATIONS, THE CONTRACTOR SHALL CALL THESE CONFLICTS TO THE DESIGNER'S ATTENTION BEFORE PROCEEDING. ALL EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS AND/OR MOUNTING DETAILS SHOWN WITH MODIFICATIONS OF SAME AS REQUIRED TO SUIT FINISHED CONDITIONS.
10. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL THE MECHANICAL EQUIPMENT AS SHOWN OR DETAILED BY THE CONTRACT DOCUMENTS FOR THIS PROJECT. WHERE SPACE OR SPARE DEVICES ARE SHOWN, CONTRACTOR SHALL PROVIDE.
11. MECHANICAL CONTRACTOR SHALL PROVIDE PERMANENT LAMINATED LABELS FOR ALL EQUIPMENT THIS PROJECT (I.E. EACH AIR HANDLING UNITS, CONDENSING UNITS, ETC.). LABELING SHALL BE A MINIMUM OF 3/8" ENGRAVED BLACK LETTERS ON WHITE BACKGROUND. LABELS SHALL BE CONSTRUCTED OF MINIMUM 1" WIDE BY LENGTH AS REQUIRED LAMINATED PLASTIC SECURELY FASTENED TO DEVICE WITH STAINLESS STEEL HARDWARE. PRESSURE SENSITIVE "STICK ON" LABELS SHALL NOT BE ALLOWED.
12. MECHANICAL CONTRACTOR SHALL COORDINATE ALL DUCT AND PIPE PENETRATIONS (WALL, FLOOR) WITH ALL OTHER DISCIPLINES IN FIELD PRIOR TO INSTALLATION.
13. DRAWINGS BASED ON EQUIPMENT SPECIFIED. SHOULD OTHER EQUIPMENT BE USED, IT IS THE MECHANICAL CONTRACTORS RESPONSIBILITY TO COORDINATE ALL STRUCTURAL (ROOF PENETRATIONS, ETC.) AND ELECTRICAL (WIRE SIZES, ETC.) DIFFERENCES WITH ALL OTHER DISCIPLINES AS TO AVOID ANY CONFLICTS PRIOR TO CONSTRUCTION. COLOR SELECTION TO BE BY ARCHITECT.
14. THE USE OF THE TERM "PROVIDE" SHALL MEAN TO "FURNISH AND INSTALL THE ASSOCIATED DEVICE OR EQUIPMENT, COMPLETE AND READY FOR THE INTENDED USE".
15. CONTRACTOR SHALL BE AWARE THAT SPACE IS LIMITED THIS PROJECT. CONTRACTOR SHALL CAREFULLY REVIEW THE SPACE PROVIDED FOR THE DUCTWORK AND PIPE THIS PROJECT AND MAKE REQUIRED ALLOWANCES FOR THE SIZE OF MECHANICAL EQUIPMENT TO BE PROVIDED BEFORE BIDDING.
16. NO FLEX DUCT ALLOWED IN EXHAUST, RETURN, & FRESH AIR DUCT SYSTEMS.
17. ALL EXPOSED DUCTWORK SHALL BE OF PAINT GRIP GALVANIZED SHEETMETAL UNLESS OTHERWISE NOTED ON DRAWINGS.
18. ALL ROUND DUCT SHALL BE MINIMUM 26 GA. AS PER SMACNA STANDARDS. TYPICAL ALL ROUND DUCT.
19. CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL DIMENSIONS IN THE FIELD, AND SHALL ADVISE THE ARCHITECT/ENGINEER AND THE OWNER OF ANY DISCREPANCIES BEFORE PERFORMING THE WORK.
20. MECHANICAL CONTRACTOR TO COORDINATE EXACT LOCATION OF ALL GRILLES WITH NEW LIGHTS TO BE INSTALLED PRIOR TO CONSTRUCTION.
21. ALL DUCTWORK SEPARATED BY THE SYMBOL "/" DESIGNATES OVAL DUCTWORK AND ALL DUCTWORK SEPARATED BY "x" DESIGNATES RECTANGULAR DUCTWORK.
22. PROVIDE DISCONNECTS AT ALL AIR UNITS, CONDENSING UNITS, ETC. TYPICAL ALL MECHANICAL EQUIPMENT. COORDINATE WITH ELECTRICAL CONTRACTOR PRIOR TO BID.
23. SUBMISSION OF BID DIRECTLY OR INDIRECTLY IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE. SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
24. COORDINATE WITH ENGINEER ON FAN CURVE ORIENTATION AT AIR HANDLING UNITS PRIOR TO SUBMITTING PRIOR APPROVAL.
25. SUCCESSFULLY PRESSURE TEST ALL PIPING/DUCT SYSTEMS. TEST SHALL BE PERFORMED AS NOTED IN SPECIFICATIONS. REPAIR AND RETEST AS REQUIRED UNITL SYSTEMS PROVE TIGHT.
26. PROVIDE CUSTOM FITTING AS REQUIRED AT ALL LOCATIONS WHERE ROUND DUCT CONNECTS TO RECTANGULAR DUCT OF THE SAME DEPTH, REFER TO PLANS FOR EXACT LOCATIONS.
27. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
28. PRIOR TO SUBMITTING EQUIPMENT, MECHANICAL CONTRACTOR SHALL VERIFY ALL SIZES. JOB DESIGNED AROUND EQUIPMENT WITH SPECIFIED MODEL NUMBERS IN SCHEDULE, OTHER EQUIPMENT SUBJECT TO REJECTION DUE TO TIGHT SPACE CONSTRAINTS, THIS PROJECT.
29. THIS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE ARCHITECT/OWNER AND/OR ENGINEER FOR EXPEDITING AND RESOLVE.
30. CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT AND ENVIRONMENTAL CONDITIONS.
32. NOT USED.
33. ALL EXPOSED EQUIPMENT/MATERIAL TO BE PAINTED, REFER TO ENGINEER/ARCHITECT FOR COLOR SELECTION. PAINTING TO BE DONE IN FIELD DURING CONSTRUCTION.
34. MECHANICAL CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR AND ARCHITECT PRIOR TO INSTALLING ANY TEMPERATURE SENSORS ON WALLS. ALL TEMPERATURE SENSORS TO BE COORDINATED WITH ALL ARTWORK, SCREENS, FURNITURE, ETC. TO BE INSTALLED ON WALLS. OWNER TO APPROVE FINAL LAYOUT PRIOR TO CONSTRUCTION.

COORDINATION DRAWINGS:
THE CONTRACTOR SHALL SUBMIT TO ARCHITECT, **"NO LATER THAN 30 DAYS AFTER WORK HAS COMMENCED ON SITE"**, ENTIRE FACILITY SYSTEM LAYOUTS AT A SCALE NOT LESS THAN 1/4"=1'-0" SHOWING THE LAYOUT OF THE ACTUAL EQUIPMENT, PIPING, MATERIAL, ETC. TO BE USED AND ALL NECESSARY CLEARANCES. THIS DRAWINGS SHALL BE COMPREHENSIVE OF ALL TRADES AS TO ELIMINATE CONFLICTS. THE CONTRACTOR WILL BE RESPONSIBLE TO VERIFY ALL ACCESS FOR MAINTENANCE AS REQUIRED BY THE MANUFACTURER. COORDINATION DRAWING TO BE REVIEWED BY ARCHITECT PRIOR TO THE INSTALLATION OF ANY & ALL MECHANICAL EQUIPMENT. CONTRACTOR TO COORDINATE THE PRELIMINARY SPRINKLER PLAN, DUCTWORK SHOP DRAWINGS, PIPING SYSTEMS, PLUMBING SYSTEMS & STEEL SHOP DRAWINGS (STRUCTURAL) PRIOR TO SUBMITTING TO DESIGN TEAM. CONTRACTOR TO INCLUDE ALL REQUIRED OFFSETS IN PLUMBING, PIPING & DUCTWORK IN BID. NO ADDITIONAL COST WILL BE PROVIDED TO CONTRACTOR FOR FAILURE TO COORDINATE ALL PIPING & DUCTWORK WITH STEEL. ALL SHOP DRAWINGS ARE TO INCLUDE SECTION CUTS OF ALL BUILDING AREAS FOR COORDINATION PURPOSES.

MECHANICAL/PLUMBING DEMOLITION PLAN KEYNOTES: ⊗

1. EXISTING SPRINKLER PIPE TO REMAIN, ALL SPRINKLER HEADS WITHIN SPACE TO BE REMOVED AND EXISTING PIPE TO BE CAPPED/REUSED.
2. CONTRACTOR TO REMOVE EXISTING DUCTWORK, DUCT SUPPORTS, DUCT FITTINGS, AIR DEVICES, ETC. WITHIN HATCHED REGION AND HAUL OFF SITE AS DEBRIS. CONTRACTOR TO DEMOLISH EXISTING DUCTWORK PAST WALL OF NEW SERVER ROOM AND CAP. CONTRACTOR TO PATCH RESULTANT OPENING(S) IN WALL(S) TO MATCH EXISTING AND SEAL AIR TIGHT.
3. EXISTING ROOF-MOUNTED RAILS TO REMAIN AND BE REUSED. NEW CONDENSING UNIT TO UTILIZE NEW ADDITIONAL SUPPORTS ON EXISTING RAILS (REFER TO ARCHITECTURAL DETAIL #2 SHEET A104. CONTRACTOR TO PROVIDE VIBRATION ISOLATORS FOR NEW CONDENSING UNIT.
4. EXISTING CONDENSING UNIT TO REMAIN, NO WORK.
5. EXISTING SEWER VENT WITHIN CHASE TO REMAIN, CONTRACTOR TO SELECTIVELY DEMOLISH CHASE WALLS AS REQUIRED TO ACCOMMODATE NEW HUB DRAIN FOR CONDENSATE REMOVAL OF CRAHU-1 AND BACKFLOW PREVENTER DRAIN.
6. EXISTING CLEAN AGENT FIRE SUPPRESSION SYSTEM. CONTRACTOR TO MODIFY EXISTING SYSTEM AS REQUIRED TO ACCOMMODATE VOLUME OF CEILING SPACE FOR CLEAN AGENT CHEMICAL VOLUME. CONTRACTOR TO RESUBMIT REVISED CLEAN AGENT FIRE SUPPRESSION SYSTEM (IN ACCORDANCE WITH NFPA 2001) AS REQUIRED TO RESUBMIT TO FIRE MARSHALL.

MECHANICAL/PLUMBING RENOVATION PLAN KEYNOTES: ⊡

1. EXISTING SPRINKLER PIPE TO REMAIN, ALL SPRINKLER HEADS WITHIN SPACE TO BE REMOVED AND EXISTING PIPE TO BE CAPPED/REUSED.
2. CONTRACTOR TO DEMOLISH EXISTING DUCTWORK PAST WALL OF NEW SERVER ROOM AND CAP. CONTRACTOR TO PATCH RESULTANT OPENING(S) IN WALL(S) TO MATCH EXISTING.
3. EXISTING ROOF-MOUNTED RAILS TO REMAIN AND BE REUSED. NEW CONDENSING UNIT TO UTILIZE NEW ADDITIONAL SUPPORTS ON EXISTING RAILS (REFER TO ARCHITECTURAL DETAIL #2 SHEET A104. CONTRACTOR TO PROVIDE VIBRATION ISOLATORS FOR NEW CONDENSING UNIT.
4. EXISTING CONDENSING UNIT TO REMAIN, NO WORK.
5. EXISTING SEWER VENT WITHIN CHASE TO REMAIN, CONTRACTOR TO SELECTIVELY DEMOLISH CHASE WALLS AS REQUIRED TO ACCOMMODATE NEW HUB DRAIN FOR CONDENSATE REMOVAL OF CRAHU-1 AND BACKFLOW PREVENTER DRAIN.
6. EXISTING CLEAN AGENT FIRE SUPPRESSION SYSTEM. CONTRACTOR TO MODIFY EXISTING SYSTEM AS REQUIRED TO ACCOMMODATE VOLUME OF CEILING SPACE FOR CLEAN AGENT CHEMICAL VOLUME. CONTRACTOR TO RESUBMIT REVISED CLEAN AGENT FIRE SUPPRESSION SYSTEM (IN ACCORDANCE WITH NFPA 2001) AS REQUIRED TO RESUBMIT TO FIRE MARSHALL.
7. LEAK DETECTION CABLE (LIEBERT PART# LT480-30) TO BY PROVIDED BY HVAC UNIT MANUFACTURER, WIRED TO HVAC UNIT. UPON DETECTION, UNIT SHOULD SOUND ALARM AND SHUT DOWN.
8. VERTICAL AIR HANDLING UNIT WITH UPFLOW SUPPLY AIR FAN WITH FRONT AIR RETURN (RETURN AIR DEVICE MOUNTED ON FACE OF UNIT. UNIT TO BE INSTALLED ON 2"x2"x¼"(WELDED TO 4"x4"x¼" BOTTOM PLATE BOLTED TO FINISHED FLOOR) ANGLE IRON SUPPORTS 24" FROM FINISHED FLOOR. BOTTOM OF AIR UNIT TO BE APPROX. 24" FROM FINISHED FLOOR (VERIFY ON SITE ACTUAL DIMS PRIOR TO INSTALLATION). ROUTE CONDENSATE AS SHOWN TO 2" HUB DRAIN AND TURN DOWN. UNIT SHALL COME EQUIPPED WITH HUMIDIFIER CONNECTION. PROVIDE SUPPLY AIR DUCT CONNECTIONS AS SHOWN. CONTRACTOR TO ROUTE 1/4" WATER LINE WITH SHUT-OFF VALVE AND BACKFLOW PREVENTOR TO HVAC UNIT FOR HUMIDIFICATION PURPOSES. REFER TO SCHEDULES AND SPECIFICATIONS (SHEETS MP402 AND MP403). REFER TO DETAIL #4 SHEET MP302.
9. CONTRACTOR SHALL FIELD ROUTE ¾" COLD WATER PIPING FROM NEAREST EXISTING DOMESTIC WATER LINE OF SUFFICIENT SIZE AND CONNECT. PROVIDE ¾" REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER TO SERVE COMPUTER ROOM UNIT FOR HUMIDIFICATION PURPOSES. REDUCE FROM ¾" TO ¾" AT INLET OF BACKFLOW PREVENTER. COORDINATE WITH MECHANICAL CONTRACTOR ON EXACT LOCATION OF COMPUTER ROOM UNIT PRIOR TO INSTALLATION. DRAIN FROM BACK FLOW PREVENTER TO BE FIELD ROUTED TO ASSOCIATED HUB DRAIN AS REQUIRED. COORDINATE WITH EQUIPMENT SPECIFICATIONS ON EXACT REQUIREMENTS PRIOR TO INSTALLATION AND INSTALL IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. REFER TO DETAIL #1 SHEET MP302.
10. 45° LOW LOSS BRANCH DUCT TAP CONNECTION WITH DAMPER (FLEXMASTER MODEL STDOBO3), DAMPER CONSTRUCTED OF MINIMUM 28 GAUGE GALVANIZED STEEL. THE DAMPER SHALL HAVE A 2" RAISED HANDLE WITH A HIGH QUALITY LOCKING QUADRANT. A 3/8" CONTINUOUS ROD WITH "U" BOLTS CONNECTS THE DAMPER TO THE ROD. NYLON END BEARINGS ARE REQUIRED WHERE THE ROD PENETRATES THE BARREL. TYPICAL ALL BRANCH DUCTS. TYPICAL.
11. CONTRACTOR TO PROVIDE AND INSTALL 2" HUB DRAIN WITH BARRIER TYPE TRAP PRIMER OFF OF EXISTING SEWER LINE DOWN LOW FOR CONDENSATE FROM HVAC UNIT AND BACKFLOW PREVENTER DRAIN. PLUMBING CONTRACTOR TO COORDINATE WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION, REFER TO DETAIL #10, SHEET MP301.
12. REFRIGERANT LINES DOWN FROM ROOF, THRU 4TH FLOOR CHASE INTO 3RD FLOOR CEILING SPACE. CONTRACTOR TO FIELD ROUTE FROM CONDENSING UNIT AS REQUIRED AND SIZE THE LINES BASED ON MANUFACTURER RECOMMENDATIONS.
13. CONTRACTOR TO MODIFY EXISTING REFRIGERANT PIPE PENETRATION THRU ROOF AS REQUIRED TO ACCOMMODATE NEW REFRIGERANT PIPING, ELECTRICAL CONDUIT, AND CONTROL CONDUIT FROM CRACU-1. SEAL WATER/AIR TIGHT.

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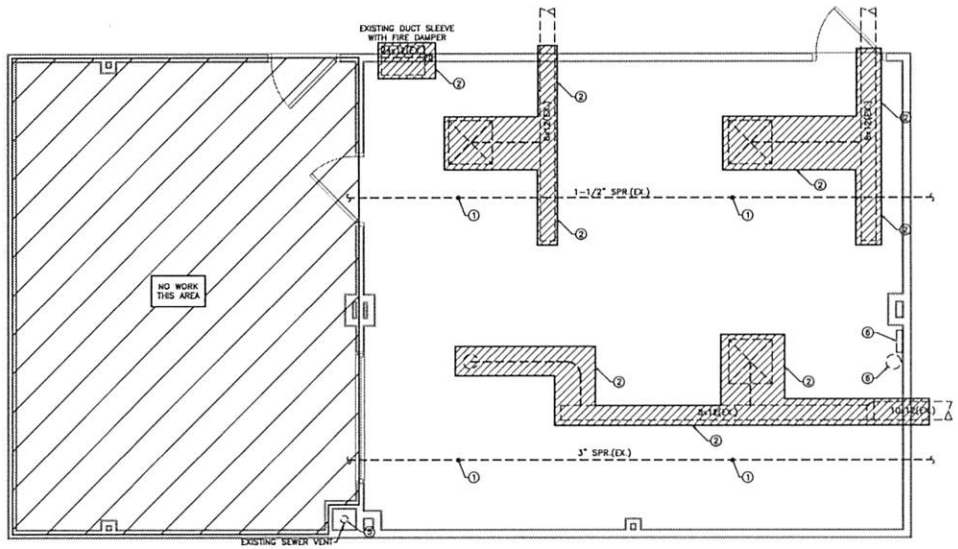
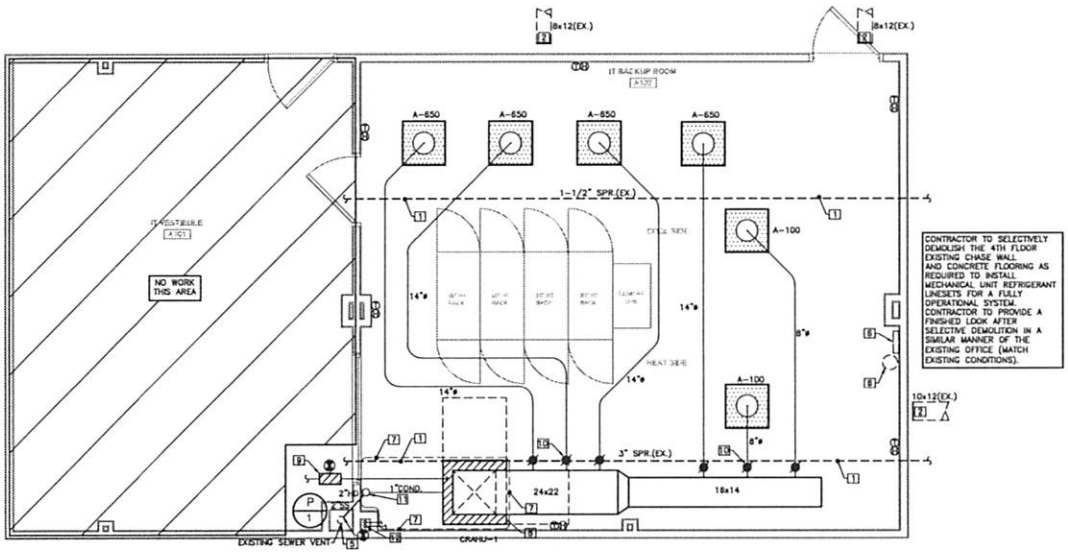
MP100



1 THIRD FLOOR PLAN - MECHANICAL AND PLUMBING DEMOLITION

SCALE: 3/8" = 1'-0"



2 THIRD FLOOR PLAN - MECHANICAL AND PLUMBING RENOVATION

SCALE: 3/8" = 1'-0"

*REFER TO SHEET M100 FOR GENERAL MECHANICAL NOTES & KEYNOTES.
**REFER TO SHEET MP201 FOR MECHANICAL LEGEND.

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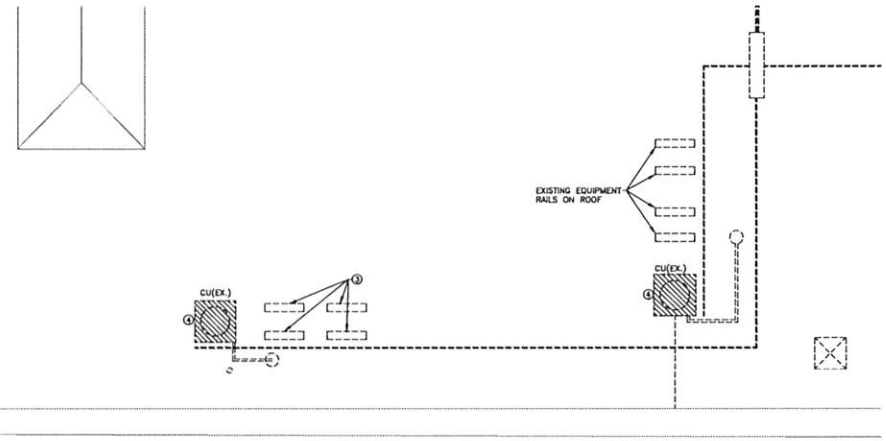
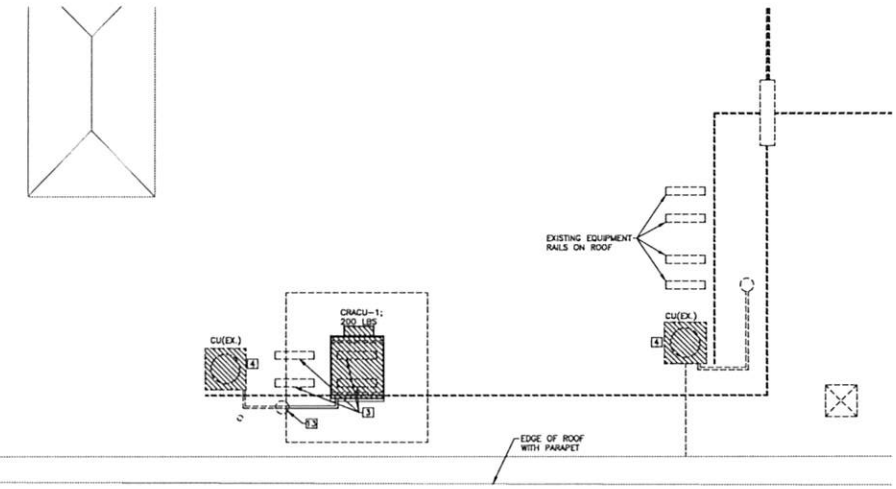
MP101



1 MECHANICAL ROOF PLAN - MECHANICAL DEMOLITION

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



2 MECHANICAL ROOF PLAN - MECHANICAL RENOVATION

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

*REFER TO SHEET MP100 FOR GENERAL MECHANICAL NOTES & KEYNOTES.
**REFER TO SHEET MP201 FOR MECHANICAL LEGEND.

EYRE ENGINEERING

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MP102

SERVER ROOM AIR HANDLING UNIT & CONDENSING UNIT SCHEDULE

UNIT NO.	LOCATION	SERVICE	FAN DATA				MOTOR DATA		DX COIL DATA		ELECTRIC COIL DATA				ELEC. DATA (SINGLE PT. CONN.)			HUMIDIFIER DATA:		REMARKS
			TOTAL C.F.M.	O.A. C.F.M.	EXT. S.P.	MAX. R.P.M.	H.P.	# SPEEDS	SENS. CAP. M.B.H.	TOTAL CAP. M.B.H.	AIR P.D. /SQ	CAP. M.B.H.	KW (MIN.)	STAGES	ELECTRIC SERVICE	F.L.A.	W.S.A.	AMP O.P.D.	CAPACITY LBS /HOUR	MIN. KW	
CRAHU-1	EXPOSED WITHIN ROOM	SEE DRAWINGS	2800	0	0.5"	--	4.2	ECM (VARIABLE)	80.4	80.4	--	46.4	13.6	2	208/3/60	65.2	79.2	90	7.7	--	LIEBERT MODEL PX018 OR PRIOR APPROVED EQUAL

GENERAL NOTES:
1. CONDENSING UNIT (CRACU-1): 208/3/60, 3.0 FLA, 3.8 WSA, 15 OPD, LIEBERT MCS028 SERIES (95°F) AMBIENT).
2. PROVIDE SWEAT ADAPTER KIT, FILTER BOX WITH MERV 8 FILTERS, FIRESTAT, FILTER CLOG SWITCH, AND DISCONNECT SWITCH.
3. PROVIDE FACTORY START-UP AND TRAINING.
4. PROVIDE LOW AMBIENT CONTROLS TO -20°.
5. REFRIGERANT TO BE R410A.
6. PROVIDE INFRARED HUMIDIFIER.
7. PROVIDE FACTORY INSTALLED HIGH TEMPERATURE SENSOR.
8. UNITS SHALL COME WITH FILTER BOX WITH MERV 8 FILTERS.
9. UNITS SHALL COME WITH TEMPERATURE & HUMIDITY SENSORS FOR PREDICTIVE HUMIDITY CONTROL (LOCATE WITHIN RETURN AIR DUCT & WIRE BACK TO LIEBERT ICOM CONTROL BOARD).
10. UNITS SHALL COME WITH SMOKE DETECTORS (SUPPLY AIR & RETURN AIR).
11. UNITS SHALL COME WITH FIRESTATS.
12. PROVIDE MODBUS/BACNET WEB CARD TO INTERCONNECT CRAHU-1 TO EMS SYSTEM (MONITOR ONLY).
13. ALL AIR HANDLING UNITS SHALL BE EQUIPPED WITH VIBRATION ISOLATORS.
14. SCHEDULED CAPACITY SHALL BE AT 72°(F)DB/62°(F)WB/50% RELATIVE HUMIDITY.
15. PROVIDE AND INSTALL HARD START TIME DELAY KIT.
16. CRAHU-1 TO COME WITH UPFLOW SUPPLY WITH FRONT AIR RETURN GRILLE.
17. CRACU-1 TO COME WITH 18" ALUMINUM MOUNTING LEGS.

AIR DISTRIBUTION DEVICE SCHEDULE

MARK	MANUFACTURER	MODEL NO.	C.F.M.	SUPPLY	RETURN	EXHAUST	O.A.	REGISTER	GRILLE	DIFFUSER	DOOR GR.	LOUVER	CEILING	WALL/DR.	EXPOSED	SURF.MT.	NECK SIZE	FACE SIZE	MATERIAL	FINISH	O.B.D.	SECTORIZING BAFFLE	FILTER	REMARKS
A	PRICE	SERIES PDDR	SEE DWG.	●						●			●				14"ø	24x24	ALUMINUM	RE: ARCH	NO	NO	NO	PERFORATED RETURN AIR DEVICE USED AS SUPPLY

GENERAL NOTES:
1. REFER TO ARCH FOR CEILING TYPE, CONTRACTOR TO PROVIDE AND INSTALL PLASTER FRAME FOR GYPSUM BOARD CEILING INSTALLATION.
2. ALL GRILLES, REGISTERS, DIFFUSERS, ETC. TO COME WITH WHITE FINISH UNLESS OTHERWISE SPECIFIED BY ARCHITECT IN FIELD DURING CONSTRUCTION. FINISH SHOULD BE SUITABLE FOR PAINTING WITHOUT ANY ADDITIONAL PREPARATION.
3. NOT ALL MARKS NECESSARILY FOUND ON THE PLANS.
4. ALL GRILLES SHALL BE ALUMINUM CONSTRUCTION UNLESS OTHERWISE NOTED ON DRAWINGS.
5. MANUFACTURERS MODEL NUMBER REPRESENTS QUALITY OF EQUIPMENT TO BE INSTALLED, THIS PROJECT.
6. PERFORMANCE DATA FOR ALL GRILLES, LINEARS, DIFFUSERS, ETC. MUST BE SUBMITTED TO ENGINEER BEFORE PRIOR APPROVAL IS AWARDED.
7. NAILOR, METALAIRE, KRUEGER, & TITUS = APPROVED MANUFACTURERS.
8. ALL GRILLES/REGISTERS/DIFFUSERS SIZES AS NOTED ON SCHEDULE UNLESS OTHERWISE NOTED ON DRAWINGS.
9. FIGURE IN BID PROVIDING SQUARE TO ROUND TRANSITIONS AND/OR REDUCER ON REAR OF ALL AIR DISTRIBUTION DEVICES.
10. FIGURE IN BID CUSTOM COLOR FOR ALL AIR DEVICES NOTED TO "RE: ARCH". ARCHITECT TO SELECT COLOR DURING SUBMITTAL PROCESS.

MECHANICAL AIRSIDE LEGEND

NOTE: ALL SYMBOLS IN THIS LEGEND ARE NOT NECESSARILY FOUND ON THE PLANS

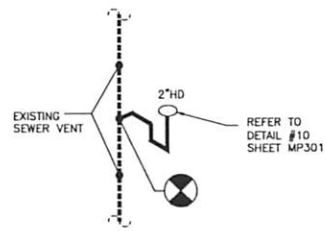
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CEILING SUPPLY AIR DEVICE		EXH OR RETURN AIR DUCT 90° ELBOW DOWN
	CEILING RETURN AIR OR EXHAUST AIR DEVICE		CONNECTION BETWEEN NEW AND EXISTING DUCT
	CEILING SUPPLY AIR SLOT OR SINGLE LIGHT TROFFER		STANDARD BRANCH FOR SA. OR RA. DUCT
	SUPPLY AIR DUCT	VAV-1-A	DESIGNATES VAV BOX; TYPE VAV BOX (REFER TO SCHEDULES); RESPECTIVE AIR HANDLING UNIT NUMBER
	RETURN AIR OR EXH. AIR DUCT		
	DUCT WORK		
	90 ELBOW W/TURNING VANE DUCT	A-150	AIR DEVICE TYPE (TYPE-A); AIR QUANTITY (150 CFM)
	VOLUME DAMPER OR MANUAL DAMPER, RECT. & ROUND DUCT; "M.V.D."		
	MOTORIZED DAMPER	RE-2/M-2	REFER TO SHEET M-2 DETAIL NUMBER (2)
	FIRE DAMPER, RATED FOR 2 HR., TYPICAL		
	SMOKE DAMPER		EQUIPMENT
	COMBINATION FIRE AND SMOKE DAMPER		SENSOR FOR THERMOSTAT
	BACK DRAFT DAMPER		THERMOSTAT
	SUPPLY AIR DUCT 90° ELBOW UP		FIRESTAT
	EXH OR RETURN AIR DUCT 90° ELBOW UP		HUMIDISTAT
	SUPPLY AIR DUCT 90° ELBOW DOWN		SENSOR FOR HUMIDISTAT IN R/A DUCT
	M.V.D. IN DUCT DROP		HVAC TIMER
	EXISTING DUCTWORK TO REMAIN		AIR EXTRACTOR
	EXISTING EQUIPMENT		45° DUCT LOW LOSS TAP WITH DAMPER
	EXISTING THERMOSTAT		RETURN AIR PLENUM TRANSFER DUCT
	EXISTING DUCT TO BE REMOVED	12x12	DUCT OPEN TO RETURN AIR PLENUM; DUCT SIZE
	CONNECT NEW WORK TO EXISTING		EXISTING SUPPLY AIR DEVICE
"TAG"(EX.)	EXISTING DUCT SIZES, EQUIPMENT TAGS, ETC.		EXISTING RETURN AIR DEVICE

THERMAL DESIGN CONDITIONS

ROOM DESCRIPTION	INDOOR			OUTDOOR		
	SUMMER		WINTER	SUMMER		WINTER
	DB(°F)	RH(%)	DB(°F)	DB(°F)	WB(°F)	DB(°F)
ALL CONDITIONED SPACES	74°*	50%	70°*	95°	80°	20°

DB(°F) = DRY BULB
WB(°F) = WET BULB
RH(%) = RELATIVE HUMIDITY

*CONTRACTOR TO UTILIZE THESE INITIAL SET POINTS FOR HVAC SYSTEM(S) AT PROJECT COMPLETION. COORDINATE WITH OWNER ON EXACT TEMPERATURE SET POINTS DESIRED AND ADJUST.



(P/1) RISER DIAGRAM
NO SCALE

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MP201

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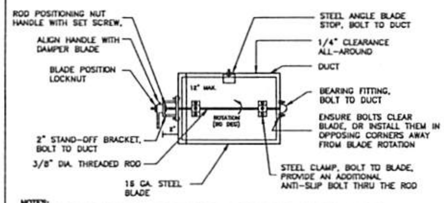
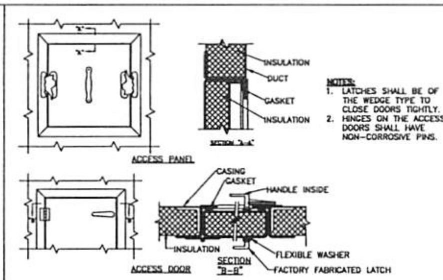
1 NTS DETAIL – NOT USED



ROD POSITIONING NUT HANDLE WITH SET SCREW
ALIGN HANDLE WITH DAMPER BLADE
BLADE POSITION LOCKNUT
2" STAND-OFF BRACKET, BOLT TO DUCT
3/8" DIA. THREADED ROD
16 GA. STEEL BLADE
STEEL ANGLE BLADE STOP, BOLT TO DUCT
1/4" CLEARANCE ALL-AROUND
DUCT
BEARING FITTING, BOLT TO DUCT
ENSURE BOLTS CLEAR BLADE, OR INSTALL THEM IN OPPOSING CORNERS AWAY FROM BLADE ROTATION
STEEL CLAMP, BOLT TO BLADE, PROVIDE AN ADDITIONAL ANTI-SLIP BOLT THRU THE ROD

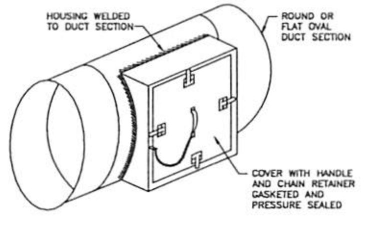
NOTES:
1. DAMPERS FOR ROUND DUCTS SHALL BE SIMILAR TO THE DAMPER SHOWN ABOVE.
2. ENSURE THAT FULL 90° DAMPER BLADE MOVEMENT IS UNOBSTRUCTED.
3. FOR DUCT HEIGHTS MORE THAN 12", PROVIDE FACTORY-FABRICATED OPPOSED BLADE DAMPERS

2 NTS DETAIL – MANUAL VOLUME DAMPER, TYPICAL



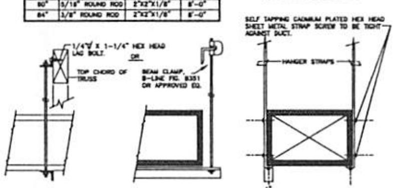
NOTES:
1. LATCHES SHALL BE OF THE WEDGE TYPE TO CLOSE DOORS TIGHTLY.
2. HINGES ON THE ACCESS DOORS SHALL HAVE NON-CORROSIVE PINS.

3 NTS DETAIL – DUCT ACCESS DOOR, TYPICAL



4 NTS DETAIL – ACCESS SECTION FOR ROUND DUCT

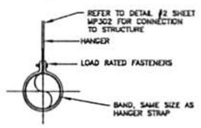
HANGER SUPPORT SCHEDULE			
MAX. SIDE	HANGER	HORIZONTAL SUPPORT ANGLE	MAXIMUM SPACING
30"	1"X18" GAGE STRIP	1½"X1½"X1/8"	10'-0"
36"	1/4" ROUND ROD	2"X2"X1/8"	8'-0"
48"	1/4" ROUND ROD	2"X2"X1/8"	8'-0"
60"	5/16" ROUND ROD	2"X2"X1/8"	8'-0"
84"	3/8" ROUND ROD	2"X2"X1/8"	8'-0"



NOTES:
1. REFER TO ARCH DRAWINGS FOR EXACT STRUCTURE OF BUILDING.
2. REFER TO SPECS FOR INSULATION TYPE

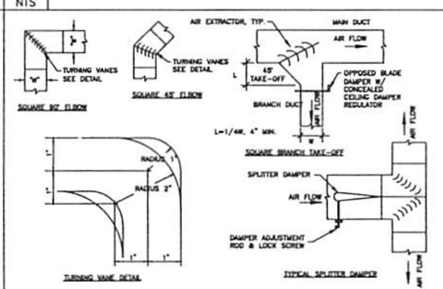
5 NTS DETAIL – RECTANGULAR DUCT SUPPORTS

MINIMUM HANGERS SIZES FOR ROUND DUCT			
DIA.	MIN. SPACING	ROD	STRAP
10" DN	12'0"	1/4"	1"x22 GA.
11"-18"	12'0"	1/4"	1"x22 GA.
19"-24"	12'0"	1/4"	1"x22 GA.
25"-36"	25"-36"	1/4"	1"x20 GA.
37"-50"	12'0"	TWO (2) 3/8"	TWO (2) 1"X18 GA.
51"-60"	12'0"	TWO (2) 3/8"	TWO (2) 1"X18 GA.



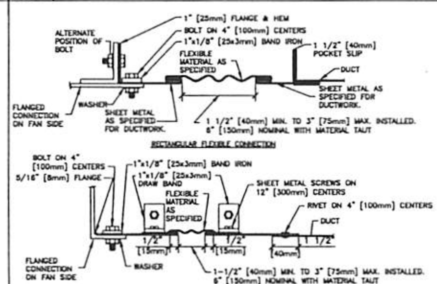
NOTES:
1. REFER TO ARCH DRAWINGS FOR STRUCTURE OF BUILDING.

6 NTS DETAIL – ROUND DUCT SUPPORTS



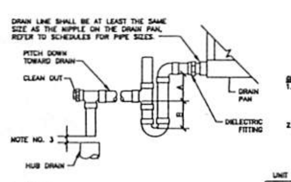
TURNING VANES SEE DETAIL
SQUARE 90° ELBOW
TURNING VANES SEE DETAIL
SQUARE 45° ELBOW
AIR EXTRACTOR, TYP.
MAIN DUCT
AIR FLOW
TAKE-OFF
OPPOSED BLADE DAMPER W/ CONCEALED CEILING DAMPER REGULATOR
BRANCH DUCT
L=1/4W, 4" MIN.
SQUARE BRANCH TAKE-OFF
RADIUS 2"
TURNING VANE DETAIL
SPLITTER DAMPER
AIR FLOW
DAMPER ADJUSTMENT ROD & LOCK SCREW
TYPICAL SPLITTER DAMPER

7 NTS DETAIL – TYPICAL DUCT LAYOUTS



1" [25mm] FLANGE & HEM
BOLT ON 4" [100mm] CENTERS
1"x1/8" [25x3mm] BAND IRON
1 1/2" [40mm] POCKET SLIP
ALTERNATE POSITION OF BOLT
FLEXIBLE MATERIAL AS SPECIFIED
DUCT
WASHER
SHEET METAL AS SPECIFIED FOR DUCTWORK.
FLANGED CONNECTION ON FAN SIDE
RECTANGULAR FLEXIBLE CONNECTION
BOLT ON 4" [100mm] CENTERS
5/16" [8mm] FLANGE
SHEET METAL SCREWS ON 12" [300mm] CENTERS
RIVET ON 4" [100mm] CENTERS
FLANGED CONNECTION ON FAN SIDE
WASHER

8 NTS DETAIL – FLEXIBLE EQUIPMENT/DUCT CONNECTIONS



GENERAL NOTE:
1. CONTRACTOR TO CONNECT AUXILIARY DRAIN LINE FROM DRAIN PAN TO MAIN CONDENSATE DRAIN AFTER TRAP ASSEMBLY.
2. DIELECTRIC FITTING TO BE USED WHEN TWO DISSIMILAR METALS ARE CONNECTED.

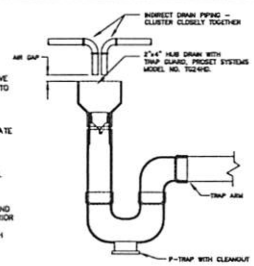
NOTES:
1. REFER TO SCHEDULES FOR SIZE OF CONDENSATE PIPE.
2. DIELECTRIC FITTING TO BE USED WHEN TWO DISSIMILAR METALS ARE TO BE CONNECTED.
3. TWICE THE PIPE DIAMETER, 2" MIN. CAP

UNIT TYPE	A	B
DRAW THRU	2" [50mm] PLUS X	X
BLOW THRU	1" [25mm] MINIMUM	2X

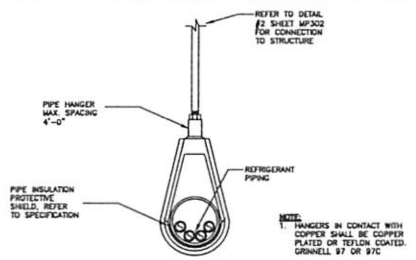
WHERE X = STATIC PRESSURE IN PAN

9 NTS DETAIL – CONDENSATE DRAIN TRAP

GENERAL NOTES:
1. HUB DRAIN TO COME WITH PROTECTIVE CAP AND 2" TRAP GUARD BUILT IN TO HANDLE UP TO 12 GPM.
2. INSTALLATION TYPICAL TO ANY HUB DRAIN ASSEMBLY, PLASTIC OR CAST IRON PIPE.
3. PLUMBING CONTRACTOR TO COORDINATE WITH MECHANICAL CONTRACTOR ON EXACT INSTALLATION HEIGHT AS TO GRAVITY FLOW CONDENSATE DRAIN PIPING FROM EVAPORATOR COIL.
4. DO NOT CONTACT FLEXIBLE MATERIAL WITH PRIMER OR SOLVER CEMENT.
5. USE PROSET E-Z FLEX COUPLING CONNECTION FOR CAST IRON PIPING.
6. INSPECT TRAP GUARD FOR DEBRIS AND FLUSH WITH CLEAR, WARM WATER PRIOR TO JOB COMPLETION.
7. INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDED INSTALLATION.

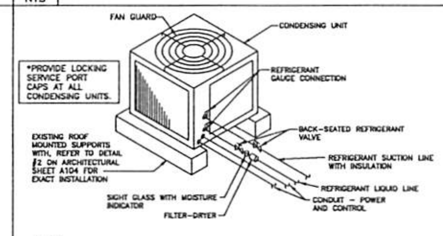


10 NTS DETAIL – HUB DRAIN INSTALLATION FOR CONDENSATE REMOVAL



NOTE:
1. HANGERS IN CONTACT WITH COPPER SHALL BE COPPER PLATED OR TEFLON COATED. GRINNELL 97 OR 97C

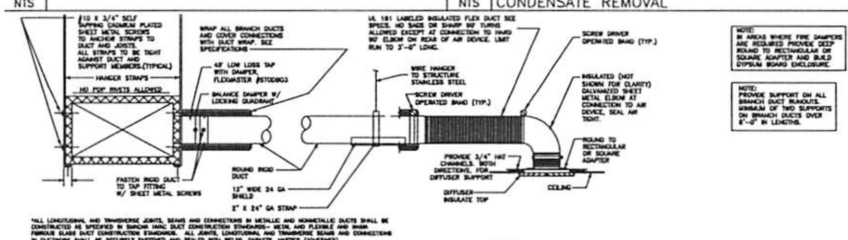
11 NTS DETAIL – REFRIGERANT PIPE SUPPORTS, TYPICAL



FAN GUARD
CONDENSING UNIT
*PROVIDE LOCKING SERVICE PORT CAPS AT ALL CONDENSING UNITS.
REFRIGERANT GAUGE CONNECTION
EXISTING ROOF MOUNTED SUPPORTS WITH, REFER TO DETAIL #2 ON ARCHITECTURAL SHEET A104 FOR EXACT INSTALLATION
BACK-SEATED REFRIGERANT VALVE
REFRIGERANT SUCTION LINE WITH INSULATION
REFRIGERANT LIQUID LINE
SIGHT GLASS WITH MOISTURE INDICATOR
FILTER-DRYER
CONDUIT – POWER AND CONTROL

NOTES:
1. ALL CONDENSING UNITS TO COME WITH SUCTION ACCUMULATORS.
2. REFRIGERANT CIRCUIT ACCESS PORTS SHALL BE FITTED WITH LOCKING-TYPE TAMPER-RESISTANT CAPS OR SHALL BE OTHERWISE SECURED TO PREVENT UNAUTHORIZED ACCESS.
3. INSTALL ACCESSORIES IN STRICT ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

12 NTS DETAIL – TYPICAL CONDENSING UNIT ON ROOF



#10 X 3/4" SELF TAPPING CADMIUM PLATED SHEET METAL SCREWS TO ANCHOR STRAPS TO DUCT AND JOISTS. ALL STRAPS TO BE TIGHT AGAINST DUCT AND SUPPORT MEMBERS.(TYPICAL)
HANGER STRAPS
NO POP RIVETS ALLOWED
WRAP ALL BRANCH DUCTS AND COVER CONNECTIONS WITH DUCT WRAP. SEE SPECIFICATIONS
45° LOW LOSS TAP WITH DAMPER, FLEXMASTER #STOD803
BALANCE DAMPER W/ LOCKING QUADRANT
UL 181 LABELED INSULATED FLEX DUCT SEE SPECS. NO SAGS OR SHARP 90° TURNS ALLOWED EXCEPT AT CONNECTION TO HARD 90° ELBOW ON REAR OF AIR DEVICE. LIMIT RUN TO 3'-0" LONG.
WIRE HANGER TO STRUCTURE STAINLESS STEEL
SCREW DRIVER OPERATED BAND (TYP.)
SCREW DRIVER OPERATED BAND (TYP.)
INSULATED (NOT SHOWN FOR CLARITY) GALVANIZED SHEET METAL ELBOW AT CONNECTION TO AIR DEVICE, SEAL AIR TIGHT.
ROUND TO RECTANGULAR OR SQUARE ADAPTER
PROVIDE 3/4" HAT CHANNELS, BOTH DIRECTIONS, FOR DIFFUSER SUPPORT
CEILING
DIFFUSER-INSULATE TOP
FASTEN RIGID DUCT TO TAP FITTING W/ SHEET METAL SCREWS
ROUND RIGID DUCT
12" WIDE 24 GA SHIELD
2" X 24" GA STRAP

NOTE:
IN AREAS WHERE FIRE DAMPERS ARE REQUIRED PROVIDE DEEP ROUND TO RECTANGULAR OR SQUARE ADAPTER AND BUILD GYPSUM BOARD ENCLOSURE.

NOTE:
PROVIDE SUPPORT ON ALL BRANCH DUCT RUNOUTS. MINIMUM OF TWO SUPPORTS ON BRANCH DUCTS OVER 6'-0" IN LENGTHS.

*ALL LONGITUDINAL AND TRANSVERSE JOINTS, SEAMS AND CONNECTIONS IN METALLIC AND NONMETALLIC DUCTS SHALL BE CONSTRUCTED AS SPECIFIED IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS- METAL AND FLEXIBLE AND NAIMA FIBROUS GLASS DUCT CONSTRUCTION STANDARDS. ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKETS, MASTICS (ADHESIVES), MASTIC-PLUS-EMBEDDED-FABRIC SYSTEMS, LIQUID SEALANTS OR TAPES. CLOSURE SYSTEMS USED TO SEAL DUCTWORK LISTED AND LABELED IN ACCORDANCE WITH UL 181A SHALL BE MARKED "181A-P" FOR PRESSURE-SENSITIVE TAPE, "181A-M" FOR MASTIC OR "181 A-H" FOR HEAT-SENSITIVE TAPE. CLOSURE SYSTEMS USED TO SEAL FLEXIBLE AIR DUCTS AND FLEXIBLE AIR CONNECTORS SHALL COMPLY WITH UL 181B AND SHALL BE MARKED "181B-FX" FOR PRESSURE-SENSITIVE TAPE OR "181B-M" FOR MASTIC. DUCT CONNECTIONS TO FLANGES OF AIR DISTRIBUTION SYSTEM EQUIPMENT SHALL BE SEALED AND MECHANICALLY FASTENED. MECHANICAL FASTENERS FOR USE WITH FLEXIBLE NONMETALLIC AIR DUCTS SHALL COMPLY WITH UL 181B AND SHALL BE MARKED "181B-C". CLOSURE SYSTEMS USED TO SEAL METAL DUCTWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. UNLISTED DUCT TAPE IS NOT PERMITTED AS A SEALANT ON ANY DUCT.

NOTES:
1. NO SPIN COLLARS ALLOWED.
2. 3'-0" FLEX MAX., NO EXCEPTION.
3. ALL EXPOSED DUCT SHALL BE DOUBLE WALL.
4. ALL EXPOSED DUCTWORK AND GRILLES SHALL BE PAINTED, REFER TO ARCHITECT FOR COLOR SELECTION.

13 NTS DETAIL – TYPICAL BRANCH TO DIFFUSER

15 NTS DETAIL – NOT USED

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[redacted]

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NO.	REVISIONS	DATE

PROJECT NO.: WA-18-123
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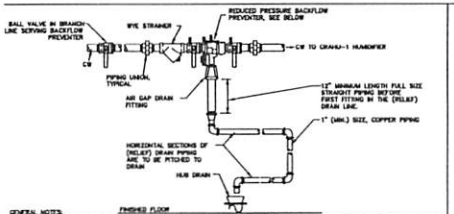
MP301

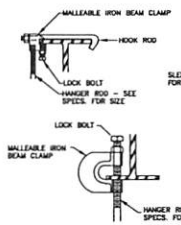


GENERAL NOTES:

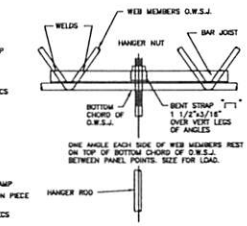
1. CONTRACTOR TO TEST ALL BACKFLOW PREVENTERS IN ACCORDANCE WITH INTERNATIONAL PLUMBING CODE (CURRENT EDITION) & IN ACCORDANCE WITH ONE OF THE FOLLOWING STANDARDS: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ASSE 5052, ASSE 5056, CSA B64.10.1, USC'S FCCC & HR'S 'MANUAL OF CROSS- CONNECTION CONTROL;' OR UFL'S TREUS'S 'BACKFLOW PREVENTION - THEORY AND PRACTICE'. PROVIDE INITIAL CERTIFICATION (AT PROJECT COMPLETION). INCLUDE CERTIFICATION WITHIN CLOSEOUT DOCUMENTS (O&M MANUALS).
2. BACKFLOW PREVENTER SPECIFICATION: A REDUCED PRESSURE ZONE ASSEMBLY SHALL BE INSTALLED AT EACH POTENTIAL HEALTH HAZARD LOCATION TO PREVENT BACKFLOW DUE TO BACKSYPHONAGE AND/OR BACKPRESSURE. THE ASSEMBLY SHALL CONSIST OF AN INTERNAL PRESSURE DIFFERENTIAL RELIEF VALVE LOCATED IN A ZONE BETWEEN TWO POSITIVE SEATING CHECK MODULES WITH CAPTURED SPRINGS AND SILICONE SEAT DISCS. SEATS AND SEAT DISCS SHALL BE REPLACEABLE IN BOTH CHECK MODULES AND THE RELIEF VALVE. THERE SHALL BE NO THREADS OF SCREWS IN THE WATERWAY EXPOSED TO LINE FLUIDS. SERVICE OF ALL INTERNAL COMPONENTS SHALL BE THROUGH A SINGLE ACCESS COVER SECURED WITH STAINLESS STEEL BOLTS. BODY AND SHUTOFFS SHALL BE CONSTRUCTED USING LEAD FREE* CAST COPPER SILICON ALLOY MATERIALS. LEAD FREE* REDUCED PRESSURE ZONE ASSEMBLY SHALL COMPLY WITH STATE CODES AND STANDARDS, WHERE APPLICABLE, REQUIRING REDUCED LEAD CONTENT. THE ASSEMBLY SHALL ALSO INCLUDE TWO RESILIENT SEATED ISOLATION VALVES, FOUR RESILIENT SEATED TEST COCKS, AND AN AIR GAP DRAIN FITTING. THE VALVE BODY SHALL UTILIZE A COATING SYSTEM WITH BUILT-IN ELECTROCHEMICAL CORROSION INHIBITOR AND MICROBIAL INHIBITOR. THE ASSEMBLY SHALL MEET THE REQUIREMENTS OF USC: ASSE STD. 1013; AWWA STD. C511; CSA B64.4, NSF 61. SHALL BE A WATTS SERIES LFRVH (LEAD FREE, SUITABLE FOR POTABLE WATER USE).

1 NTS DETAIL – HUMIDIFIER BACKFLOW PREVENTER

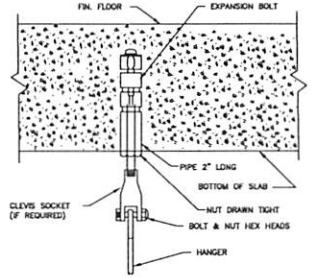
*CONTRACTOR TO HANG ALL DUCTWORK, PIPING, ETC. AT EVERY STRUCTURAL ROOF JOIST MEMBER, TYPICAL EVERY 2'-0" ON CENTER. AS TO NOT OVERLOAD THE ROOF STRUCTURE. NO EXCEPTION. TYPICAL ALL HVAC, PLUMBING, & SPRINKLER SYSTEMS.



BEAM CLAMPS FOR PIPE OR EQUIPMENT SUPPORT



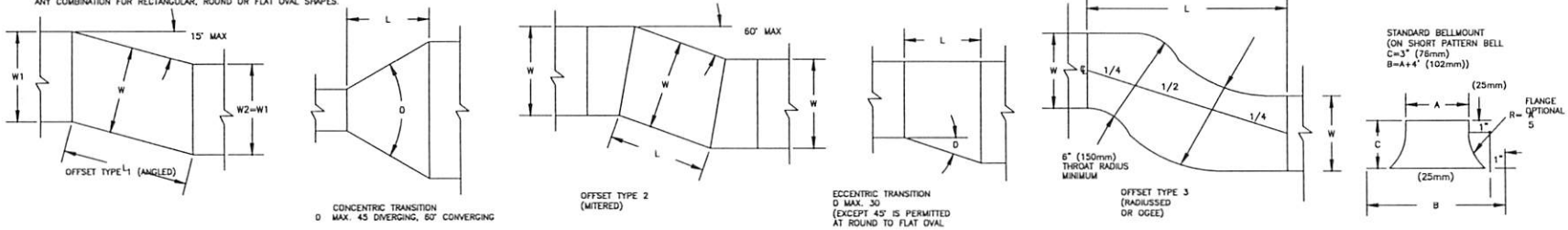
STEEL BAR JOIST PIPE SUPPORT



CONCRETE ANCHOR

2 NTS DETAIL – SUPPORTS/ANCHOR CONNECTIONS

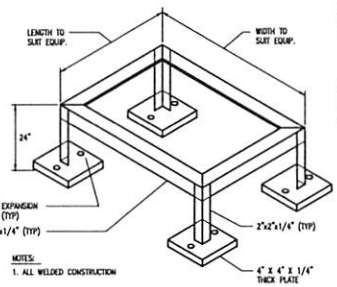
OFFSETS 2 AND 3 AND TRANSITIONS MAY HAVE EQUAL OR UNEQUAL INLET AND OUTLET AREAS. TRANSITIONS MAY CONVERT DUCT PROFILES TO ANY COMBINATION FOR RECTANGULAR, ROUND OR FLAT OVAL SHAPES.



3 NTS DETAIL – DUCTWORK OFFSETS & TRANSITIONS

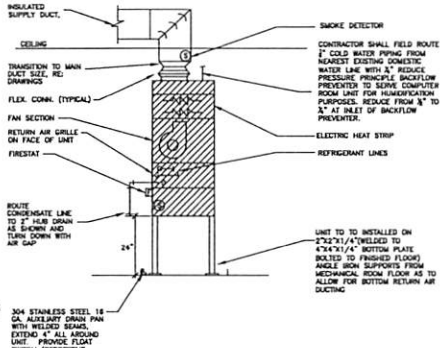
NOTES:

1. ALL DRAINS TO BE INDIRECT, DO NOT HARD CONNECT DRAIN LINES.
2. SMOKE DAMPER REQUIRED ON S/A & R/A ONLY IF CFM OF AIR HANDLING UNIT EXCEEDS 15,000 CFM.
   2.1. SMOKE DETECTOR IN R/A SIDE OF UNIT REQUIRED ONLY IF CFM OF AIR HANDLING UNIT EXCEEDS 2,000.
   2.2. SMOKE DETECTOR IN S/A SIDE OF UNIT REQUIRED ONLY IF CFM OF AIR HANDLING UNIT EXCEEDS 2,000.
   2.3. PROVIDE FIRESTAT IN R/A SIDE OF UNIT.
   2.4. REFER TO SCHEDULES FOR CFM OF AIR HANDLING UNIT.
3. MECHANICAL CONTRACTOR TO COORDINATE WITH ALL DISCIPLINES IN FIELD PRIOR TO INSTALLATION OF ALL DEVICES/EQUIP, ETC.
4. MECHANICAL CONTRACTOR TO COORDINATE WITH PLUMBING CONTRACTOR ON EXACT LOCATION OF ALL HUB DRAINS PRIOR TO PROJECT GROUND BREAKING AS NOT TO CONFLICT WITH MECHANICAL EQUIPMENT. HUB DRAIN LOCATION BASED ON EQUIPMENT ON DRAWINGS. IF DIFFERENT EQUIPMENT IS USED ON JOB PLUMBING CONTRACTOR SHALL COORDINATE NEW HUB DRAIN LOCATION AS NOT TO CONFLICT WITH NEW EQUIPMENT.



NOTES:
1. ALL WELDED CONSTRUCTION

TYPICAL SUPPORT FRAME DETAIL
N.T.S.



4 NTS DETAIL – VERTICAL AIR HANDLING UNIT INSTALLATION

NOTES:

1. DIMENSIONS OTHER THAN GAGE ARE IN INCHES.
2. TABLES ALLOW FOR DUCT WEIGHT, 1 LB./SF INSULATION WEIGHT AND NORMAL REINFORCEMENT AND TRAPEZE WEIGHT, BUT NO EXTERNAL LOADS.
3. FOR CUSTOM DESIGN OF HANGERS, DESIGNERS MAY CONSULT SMACNA'S RECTANGULAR INDUSTRIAL DUCT STANDARDS, THE ASD COLD FORMED STEEL DESIGN MANUAL AND THE AISC STEEL CONSTRUCTION MANUAL.
4. STRAPS ARE GALVANIZED STEEL; OTHER MATERIALS ARE UNCOATED STEEL.
5. ALLOWABLE LOADS FOR P/2 ASSUME THAT DUCTS ARE 18 ga. MAXIMUM, EXCEPT THAT WHEN MAXIMUM DUCT DIMENSION (W) IS OVER 60" THEN P/2 MAXIMUM IS 1.25 W.
6. 12,10, OR 8 ga. WIRE IS STEEL OF BLACK ANNEALED, BRIGHT BASIC, OR GALVANIZED TYPE

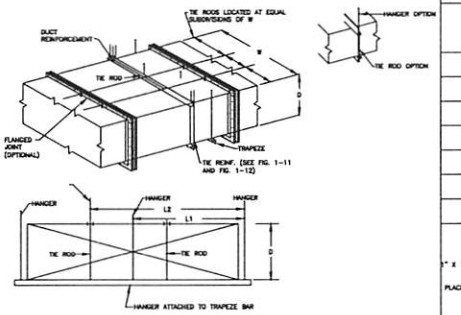


TABLE 4-1
RECTANGULAR DUCT HANGERS
MINIMUM SIZE

MAXIMUM HALF OF DUCT PERIMETER	PAIR AT 10 FT SPACING		PAIR AT 8 FT SPACING		PAIR AT 5 FT SPACING		PAIR AT 4 FT SPACING	
	STRAP	WIRE/ ROD	STRAP	WIRE/ ROD	STRAP	WIRE/ ROD	STRAP	WIRE/ ROD
P/2=30"	1" x 22 ga.	10 ga. (.135)	1" x 22 ga.	10 ga. (.135)	1" x 22 ga.	12 ga. (.105)	1" x 22 ga.	12 ga. (.105)
P/2=72"	1" x 18 ga.	3/8	1" x 20 ga.	1/4	1" x 22 ga.	1/4	1" x 22 ga.	1/4
P/2=96"	1" x 18 ga.	3/8	1" x 18 ga.	3/8	1" x 20 ga.	3/8	1" x 22 ga.	1/4
P/2=120"	1 1/2" x 18 ga.	1/2	1" x 18 ga.	3/8	1" x 18 ga.	3/8	1" x 20 ga.	1/4
P/2=168"	1 1/2" x 18 ga.	1/2	1 1/2" x 18 ga.	1/2	1" x 18 ga.	3/8	1" x 18 ga.	3/8
P/2=192"	NOT GIVEN	1/2	1 1/2" x 18 ga.	1/2	1" x 18 ga.	3/8	1" x 18 ga.	3/8
P/2=193" UP	SPECIAL ANALYSIS REQUIRED							

WHEN STRAPS ARE LAP JOINED USE THESE MINIMUM FASTENERS:	SINGLE HANGER MAXIMUM ALLOWABLE LOAD	
	STRAP	WIRE OR ROD (DIA.)
1" X 18,20,22 ga. –1NG #10 OR ONE 1/4" BOLT 1" X 16 ga. –1NG 1/4" DIA. 1 1/2" X 18 ga. –1NG 3/8" DIA. PLACE FASTENERS IN SERIES, NOT SIDE BY SIDE	1" X 22 ga.–260 LBS. 1" X 20 ga.–1320 LBS. 1" X 18 ga.–430 LBS. 1" X 16 ga.–700 LBS. 1 1/2" X 18 ga.–1100 LBS.	0.106"–80 LBS. 0.135"–120 LBS. 0.162"–180 LBS. 1/4"–270 LBS. 3/8"–590 LBS. 1/2"–1250 LBS. 5/8"–200 LBS. 3/4"–3000 LBS.

5 NTS DETAIL – LARGE DUCT SUPPORTS, TYPICAL

EYRE ENGINEERING
PRINTED: 8-25-2023

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NO.	REVISIONS	DATE

PROJECT NO.: WA-19-101
PHASE: 100% CONSTRUCTION DOCUMENT
ISSUED FOR: CONSTRUCTION
DATE: 8-7-23

MP302

MECHANICAL SPECIFICATIONS

15010 BASIC MECHANICAL REQUIREMENTS

GENERAL REQUIREMENTS

"PROVIDE" MEANS FURNISH AND INSTALL. THIS CONTRACTOR SHALL ALSO INSTALL MATERIALS FURNISHED "BY OTHERS" AND/OR OWNER.

GENERAL REQUIREMENTS AS LISTED IN THE SUBCONTRACT PURCHASE ORDER AGREEMENT SHALL BE INCLUDED AS PART OF THESE SPECIFICATIONS. WHERE THERE IS A CONFLICT THE SUBCONTRACT PURCHASE ORDER AGREEMENT SHALL GOVERN.

CONTRACTOR IS RESPONSIBLE FOR A COMPLETE SYSTEM. ALL EQUIPMENT AND RELATED ITEMS BY CONTRACTOR UNLESS OTHERWISE NOTED IN THESE SPECIFICATIONS.

IT IS THE INTENT OF THESE CONSTRUCTION DOCUMENTS TO DEPICT ENGINEERED DUCT, PIPE AND EQUIPMENT ARRANGEMENTS THAT MINIMIZE CONFLICTS AND/OR INTERFERENCES WITH STRUCTURES AND OTHER TRADES. FINAL CONSTRUCTION COORDINATION WITH OTHER TRADES TO AVOID SUCH CONFLICTS IS THE RESPONSIBILITY OF THIS CONTRACTOR.

DIFFERENCES AND/OR CONFLICTS BETWEEN CONTRACT DRAWING AND SPECIFICATION AND SHOP DRAWINGS, SHALL BE CALLED TO THE ENGINEERS ATTENTION. IF DIFFERENCES AND/ OR CONFLICTS ARE NOT NOTED TO CONTRACTOR PRIOR TO CONTRACT, CONTRACTOR SHALL DETERMINE GOVERNING CONDITION AND SUBCONTRACTOR SHALL PERFORM WORK AT NO ADDITIONAL COST TO THE OWNER.

TRADE NAMES ARE USED TO ESTABLISH QUALITY. SUBSTITUTIONS OF EQUAL QUALITY MAY BE USED IF PRIOR APPROVED BY THE ENGINEER.

RULES & REGULATIONS: ALL WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH ALL APPLICABLE ORDINANCES AND CODES. FURNISH, WITHOUT EXTRA CHARGE, ANY ADDITIONAL MATERIALS AND LABOR WHEN REQUIRED TO COMPLY WITH THESE LAWS/ORDINANCES/CODES, EVEN IF THE WORK IS NOT SPECIFICALLY MENTIONED HEREIN OR ON THESE DRAWINGS.

LICENSES, PERMITS, AND FEES: THE CONTRACTOR SHALL PROVIDE, PROCURE, AND PAY FOR ALL PERMITS, LICENSES, FEES, ETC., REQUIRED TO CARRY ON AND COMPLETE THE WORK UNDER THIS SECTION.

RECORD DRAWINGS

PROVIDE RECORD DRAWINGS SHOWING LOCATIONS OF ALL CHANGES IN EQUIPMENT, PIPING AND DUCT ARRANGEMENTS. DRAWINGS SHALL BE RED PENCIL ON BLUE LINE PRINTS, DETAILS AND SCHEDULES AND SHALL BE KEPT UP TO DATE ON A DAILY BASIS. THESE DRAWINGS SHALL BE AVAILABLE TO THE BUILDER OR HIS REPRESENTATIVE AT THE JOB SITE.

AT COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT UPDATED PRINTS TO THE BUILDER, BEFORE RECEIPT OF FINAL PAYMENT.

MATERIALS FURNISHED BY OWNER

WILL BE RECEIVED, CHECKED IN UNDAMAGED AND WITH PROPER ACCESSORIES AND STORED AT THE SITE IN A CONVENIENT LOCATION FOR THE CONTRACTOR. UNLESS OTHERWISE SPECIFIED, ALL EQUIPMENT INDICATED IN THE SPECIFICATIONS, DETAILS SCHEDULES AND/OR ON THE DRAWINGS AS "FURNISHED BY OWNER" WILL BE FURNISHED BY OWNER AND INSTALLED BY THE CONTRACTOR. ALL OTHER EQUIPMENT AND MATERIALS SHALL BE PROVIDED BY THE CONTRACTOR.

CONTRACTOR'S EQUIPMENT STORAGE

EQUIPMENT STORED AT THE SITE SHALL BE ADEQUATELY PROTECTED FROM THE WEATHER.

START UP

CONTRACTOR TO LUBRICATE BEARINGS AS REQUIRED, INSTALL BELTS AND CHECK FOR PROPER BELT TENSION AND MOTOR ROTATION, INSTALL ALL SAFETY DEVICES, RELIEF VALVES, AND FILTERS. CONNECT ALL DAMPER LINKAGES AND REMOVE ALL SHIPPING HOLD DOWN CLAMPS AND BLOCKING.

SYSTEM BALANCING

OBTAIN THE SERVICES OF AN INDEPENDENT AIR BALANCE AND TESTING AGENCY WHICH SPECIALIZES IN THE TESTING, AND BALANCING OF HEATING, VENTILATING, AIR CONDITIONING SYSTEMS: TO TEST ADJUST, AND BALANCE ALL SUPPLY, RETURN AND EXHAUST SYSTEMS. WORK SHALL BE BY SAME TEST AND BALANCE AGENCY.

ALL WORK TO BE PERFORMED IN COMPLETE ACCORDANCE WITH THE ASSOCIATED AIR BALANCE COUNCIL (AABC) NATIONAL STANDARDS FOR FIELD MEASUREMENTS AND INSTRUMENTATION, LATEST EDITION, THOSE SECTIONS APPLICABLE TO AIR DISTRIBUTION.

EQUIPMENT SUPPORT

ALL HEATING DEVICES AND EQUIPMENT SHALL BE SECURELY MOUNTED TO THE BUILDING STRUCTURE AND SHALL NOT DEPEND UPON CEILING OR WALL SURFACES FOR THEIR SUPPORT. THEY SHALL BE INCAPABLE OF BEING ROTATED OR DISPLACED. THE SUPPORT ATTACHMENT SHALL ADEQUATELY SUPPORT THE WEIGHT OF THE FIXTURE, DEVICE, OR EQUIPMENT PLUS THE WEIGHT OF THE SUPPORT ATTACHMENT.

TOUCH-UP AND COMPLETION

BUILDER WILL PAINT ALL EXTERIOR EXPOSED HVAC EQUIPMENT, INCLUDING DUCTS, PIPES, LOUVERS, ETC.

CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING AND KEEPING CLEAN HVAC EQUIPMENT DURING INSTALLATION, HVAC CONTRACTOR TO TEST EACH SYSTEM OR PIECE OF EQUIPMENT INSTALLED AND REPORT TO BUILDER ANY EQUIPMENT DAMAGE OR MAL- FUNCTION.

ELECTRICAL WIRING

ELECTRICAL CONTRACTOR (E.C.) SHALL PROVIDE ALL POWER WIRING, INCLUDING CONDUIT, WIRE AND CONNECTIONS. ALL STARTERS, FUSES AND DISCONNECTS BY OTHERS EXCEPT WHERE SPECIFIED AS PART OF PACKAGE EQUIPMENT. STARTERS THAT COME WITH EQUIPMENT SHALL BE AUTOMATIC AND HAVE T.O.L. APPROPRIATE COVERS AND INTERLOCKS. ALL MOTORS LESS THAN 1/2 HP ARE 115/60/1 WITH INTEGRAL THERMAL OVERLOAD UNLESS OTHERWISE SPECIFIED.

ELECTRICAL CONTRACTOR SHALL LABEL ALL REMOVABLE PANELS FOR DISCONNECTS IN EQUIPMENT CABINETS WITH NAMEPLATE FURNISHED BY BUILDER (LABELED "ELECTRICAL SERVICE DISCONNECT LOCATED BEHIND THIS PANEL").

SHOP DRAWINGS

SUBMIT TO THE ENGINEER FOR REVIEW IMMEDIATELY AFTER AWARD OF CONTRACT, SIX (6) COPIES OF COMPLETE DESCRIPTIVE INFORMATION AND DIMENSIONAL DATA ON ALL ITEMS OF EQUIPMENT, MATERIALS AND ACCESSORIES. SUBMIT ALL SHOP DRAWINGS AT ONE TIME. PIECE MEAL SUBMISSION SHALL NOT BE ACCEPTABLE.

"AS BUILT DRAWINGS": CONTRACTOR SHALL BE FURNISHED WITH ONE (1) SET OF BLUE LINE PRINTS, ON WHICH CONTR. SHALL SHOW ANY CHANGES IN THE WORK CAUSED BY UNFORSEEN CIRCUMSTANCES AND THESE DRAWINGS SHALL BE TURNED OVER TO THE ENGINEER IN GOOD ORDER PRIOR TO FINAL ACCEPTANCE OF THE BLDG. ENGINEER IN TURN PREPARE RECORD DRAWINGS FROM INFORMATION FURNISHED BY CONTR.

"PARTS CATALOG": FURNISH TO THE ENGINEER FOR THE OWNER, THREE (3) COMPLETE SETS OF PARTS CATALOGS AND OPERATING INSTRUCTIONS BOUND IN LARGE BINDERS FOR HIS USE. CONTR. SHALL INSTRUCT OWNER'S OPERATOR IN THE PROPER CARE, OPERATION, LUBRICATION, AND MAINTENANCE OF MECHANICAL EQUIPMENT INSTALLED.

GUARANTEE AND SERVICE

GUARANTEE ALL EQUIPMENT, MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FOLLOWING DATE OF ACCEPTANCE. GUARANTEE ALL EQUIPMENT CONTAINING HVAC REFRIGERATION COMPRESSORS FULL FIVE (5) YEARS COVERING COMPRESSORS, LABOR, AND REFRIGERANT. GUARANTEE DOES NOT INCLUDE NORMAL MAINTENANCE ITEMS.

15050 BASIC MATERIALS AND METHODS

MECHANICAL IDENTIFICATION

EQUIPMENT STENCILS SHALL IDENTIFY THE TYPE AND SERVICE WITH THE SAME NAMES, NUMBERS, AND/OR LETTERS USED TO IDENTIFY THE EQUIPMENT ON THE DRAWINGS. ALL STARTERS SHALL BE SIMILARLY STENCILED. OMIT IDENTIFICATION OF MINOR HEATING EQUIPMENT LOCATED IN THE ROOM IT SERVES, SUCH AS CONVECTORS, FINNED PIPE, UNIT HEATERS, ETC.

VIBRATION ISOLATORS

INSTALL VIBRATION ISOLATORS AS SHOWN ON DETAILS OR AS NOTED ON SCHEDULES.

PIPE INSULATION

REFRIGERANT SUCTION & CONDENSATE DRAIN LINES (NEW & EXISTING PIPING)

INSTALL 1" ARMAFLEX PER MANUFACTURER'S INSTRUCTIONS. ALL OUTSIDE LINES TO BE PAINTED WITH ARMSTRONG OUTDOOR FINISH. MUST HAVE A CONTINUOUS SEALED VAPOR BARRIER ON ALL SUCTION LINES.

COLD WATER DOMESTIC PIPING (NEW & EXISTING)

INSULATE ALL DOMESTIC COLD/HOT WATER PIPING WITH 1" THK. FIBERGLASS INSULATION WITH FRJ JACKET, ALL JOINTS AND ELBOWS SHALL BE NEATLY MITERED AND SEALED COVERED PVC COVER/JACKET.

REFRIGERANT PIPING (NEW & EXISTING PIPING)

CONTRACTOR TO INSTALL PRECLEANED, (DRIED AND SEALED) FACTORY REFRIGERANT LINE SETS. LIQUID & SUCTION LINES SHALL BE SIZED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. PROVIDE & INSTALL ALL MANUFACTURER REQUIRED & MANUFACTURER RECOMMENDED ACCESSORIES.

REFRIGERANT SYSTEMS PIPE WORK

PITCH HORIZONTAL PIPING DOWN IN THE DIRECTION OF REFRIGERANT FLOW NOT LESS THAN 1 INCH IN 40 FEET.

PROVIDE OIL TRAPS AND DOUBLE RISERS IN REFRIGERANT SUCTION AND HOT GAS LINES WHERE REQUIRED TO PREVENT OIL SLUGGING AT THE COMPRESSOR AND TO INSURE PROPER LUBRICATION.

SLEEVES

PIPE SLEEVES: WROUGHT IRON OR STEEL OF SUFFICIENT SIZE FOR PIPING INSTALLATION IN FLOORS, WALLS, BELOW GRADE, AND GRADE BEAMS WHERE PIPING PASSES THROUGH. PVC MAY ONLY BE USED WHERE SPECIFICALLY NOTED.

HANGERS AND SUPPORTS

HORIZONTAL PIPING ABOVE GRADE: RIGIDLY SUPPORTED ON MALLEABLE IRON SPLIT RING HANGERS; SUPPORTS FOR TWO OR MORE SYSTEMS OF PIPING RUN PARALLEL AND WITH SAME GRADE. TRAPEZE HANGERS MAY BE USED. USE ALL THREADED RODS FOR HANGERS AND SUPPORTS.

MAXIMUM SPACING OF SUPPORTS AND HANGERS FOR HORIZONTAL RUNS OF PIPE: FIVE (5) FEET FOR SOIL, TEN (10) FEET FOR OTHER SOIL PIPE EXCEPT SUPPORT PIPING 1-1/2" AND SMALLER EVERY SIX (6) FEET. PROVIDE GALVANIZED IRON SHIELDS BETWEEN HANGERS AND PIPE COVERING ON INSULATED PIPING. NO STRAP HANGERS OR WIRE WILL BE ACCEPTED.

SET INSERTS IN CONCRETE FOR HANGER RODS AND DUCT HANGERS WHERE APPLICABLE.

CONTR. SHALL SUPPORT DUCTWORK IN STRICT ACCORDANCE TO SMACNA STANDARDS, REFER TO DUCTWORK SPECIFICATION, THIS SHEET.

ACCESS PANELS

FACTORY MADE ACCESS DOORS AND FRAMES. PRIME COAT FINISH, SCREWDRIVER LATCH(S) OF SUITABLE SIZE AS REQUIRED. ACCESS PANELS IN RATED CEILING TO HAVE SAME RATING AS CEILING. ACCESS PANELS IN LINED DUCTWORK TO BE DOUBLE WALL TYPE WITH INSULATION SANDWICHED IN BETWEEN, SAME INSULATION VALUE AS ADJACENT DUCTWORK. WHERE VALVES, DAMPERS, CONTROLS, FIRE DAMPERS, SMOKE DAMPERS AND DETECTORS, REHEAT COILS, ETC. ARE CONCEALED IN WALLS OR NON- ACCESSIBLE CEILINGS, INSTALL FACTORY MADE ACCESS DOORS AND FRAMES. ACCESS PANELS TO BE 2 HR. RATED.

FLOOR, WALL AND CEILING PLATES (ESCUTCHEONS)

WHERE ANY PIPE OR RISERS PASS EXPOSED THROUGH WALLS, PARTITIONS, FLOORS OR CEILING, USED CHROME PLATED FLOOR OR CEILING PLATES. PLATES SHALL BE LARGE ENOUGH TO COMPLETELY CLOSE HOLE AROUND THE PIPES AND BE ROUND WITH THE LEAST DIMENSION NOT LESS THAN 1-1/2" LARGER THAN THE DIAMETER OF THE PIPE. PLATES SHALL BE SECURED IN AN APPROVED MANNER.

CUTTING AND PATCHING

CUT ALL OPENINGS AS REQUIRED FOR THE WORK UNDER THIS SECTION. PATCHING SHALL BE DONE BY THE CRAFT WHOSE WORK IS INVOLVED. FURNISH AND INSTALL ALL NECESSARY SLEEVES, THIMBLES, HANGERS, INSERTS, ETC., AT SUCH TIME AND IN SUCH A MANNER SO AS NOT TO DELAY OR INTERFERE WITH WORK OF OTHER TRADES. NO BEAMS OR JOISTS SHALL BE CUT. AFTER RESURFACING HAS BEEN DONE, ANY FURTHER CUTTING, PATCHING AND PAINTING SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR SHALL DO ALL CUTTING AND PATCHING TO DAMAGE CAUSED BY WORK UNDER THIS SECTION. THESE REPAIRS SHALL BE DONE IN A MANNER SATISFACTORY TO THE ARCHITECT/OWNER.

PIPE PENETRATIONS

ALL PIPE (MECHANICAL, PLUMBING, ETC.) PENETRATIONS OF ROOF, WALLS, FLOORS, CEILINGS, ETC. SHALL BE SEALED TO PRESERVE THE INTEGRITY OF WATERPROOFING, FIRE RATING, & SOUND PROOFING FOR WHICH THE ROOF, WALL, FLOOR, CEILING, ETC. IS DESIGNATED. REFER TO ARCHITECTURAL PLANS AS MATERIALS AND METHODS USED SHALL CONFORM TO THOSE SPECIFIED UNDER ARCHITECTURAL SECTIONS. COORDINATE AND OBTAIN OWNER/ARCHITECT'S APPROVAL PRIOR TO MAKING ANY PENETRATION THROUGH ROOFING SYSTEM OR FOUNDATION WALLS.

15400 PLUMBING

GENERAL

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE (2021 EDITION WITH LOUISIANA AMENDMENTS) ALONG WITH ALL LOCAL CODES, ORDINANCES AND REGULATIONS.
2. SLOPE DRAINAGE LINES, 3" AND SMALLER, 1/4" PER FOOT AND LINES 4" AND LARGER 1/8" PER FOOT.
3. ALL PIPES THRU WALLS TO BE EQUIPPED WITH ESCUTCHEONS, CHROME PLATED.
4. SANITARY SEWER PIPING: ASTM D2665, PVC-DWV, SOLID WALL (CELLULAR CORE NOT ALLOWED) SCHEDULE 40 SEWER PIPE WITH PVC FITTINGS, SOLVENT WELD JOINTS, ASTM D2665.
5. WATER PIPING.
   5.1. COPPER TUBING, ASTM B88 TYPE "L" SOFT DRAWN (UNDERGROUND) AND TYPE "L" HARD DRAWN (ABOVE SLAB) WITH SOLDERED JOINTS AND WROUGHT COPPER, ANSI/ASME B16.22, ANSI/ASME B16.18, SOCKET COPPER FITTINGS. SILVER SOLDERED (BRAZED) JOINTS (ANSI B31.1, SECTION 6) FOR ALL COPPER JOINTS UNDERGROUND.
6. CONTRACTOR SHALL PROVE EITHER AIR CHAMBERS (MIN. 18" HIGH) OR SHOCK ABSORBERS AT ALL FIXTURES TO PREVENT WATER HAMMER, APPLIES ALL RISER DIAG.
7. SUPPORT ALL PIPING WITH CLEVIS TYPE HANGERS, EIGHT (8) FOOT CENTERS.
8. PLUMBING CONTRACTOR SHALL INSTALL AND CONNECT ALL OWNER FURNISHED EQUIP. REQUIRING SERVICES (WATER OR SANITARY WASTE), COORDINATE WITH OWNER/ARCHITECT.

15880 AIR DISTRIBUTION

DUCTWORK

VERIFY ALL DIMENSIONS. DIMENSIONS SHOWN ARE METAL TO METAL. ALL DUCTWORK SHALL HAVE MAXIMUM 5% AIR LEAKAGE.

GALVANIZED SHEET METAL DUCTWORK FIRST QUALITY, COLD ROLLED, GALVANIZED, OPEN HEARTH SOFT STEEL SHEETS, CAPABLE OF DOUBLE SEAMING WITHOUT FRACTURE. TRANSVERSE JOINTS ON RECTANGULAR DUCTWORK WITH SLIPS AND DRIVES SHALL HAVE DRIVES BENT OVER AT CORNERS, GAUGES AND JOINT CONNECTORS PER LOCAL CODES, SMACNA OR ASHRAE RECOMMENDATIONS AND THE FOLLOWING UNLESS OTHERWISE NOTED. FLEX DUCT NOT PERMITTED.

ALL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA LOW PRESSURE DUCT STANDARD, 2 INCH S.P. WITH THE FOLLOWING METAL THICKNESS.

ROUND DUCTS - SNAP LOCK
UP TO 12 INCH DIAMETER #26 GAUGE MINIMUM.
13 INCH TO 18 INCH DIAMETER #24 GAUGE MINIMUM.
19 INCH TO 24 INCH DIAMETER #22 GAUGE MINIMUM.

SPIRAL LOCK SEAM ROUND DUCTS MAY BE ONE GAUGE LIGHTER THAN GAUGES

RECTANGULAR DUCTS AND PLENUMS
MAXIMUM SIDE UP TO 12 INCH #26 GAUGE MINIMUM.
MAXIMUM SIDE 13 INCH TO 30 INCH #24 GAUGE MINIMUM.
MAXIMUM SIDE 31 INCH TO 50 INCH #22 GAUGE MINIMUM.
MAXIMUM SIDE 51 INCH TO 84 INCH #20 GAUGE MINIMUM.
MAXIMUM SIDE 85 INCH AND UP #18 GAUGE MINIMUM.

AS NOTED ON DRAWINGS #16 GAUGE.

FOR GREATER THAN 24 INCHES USE REINFORCEMENT AS LISTED IN LATEST SMACNA LOW PRESSURE SHEET METAL CONSTRUCTION GUIDE, SECURELY HUNG, BRACED AND STIFFENED TO PREVENT BREATHING, RATTLING, VIBRATION OR SAGGING.

DUCT SIZES 19 INCHES WIDE AND LARGER WHICH HAVE MORE THAN 10 SQUARE FEET OF UNBRACED PANEL SHALL BE CROSS BROKEN OR BEADED.

SUPPORT ALL DUCTS IN ACCORDANCE WITH SMACNA, EXCEPT WIRE HANGERS SHALL NOT BE PERMITTED. DUCTS 36 INCHES OR LARGER SHALL HAVE TRAPEZE TYPE HANGERS SUSPENDED WITH THREADED ROD.

SEAL ALL DUCTWORK SERVING SYSTEMS HAVING FANS RATED FOR LESS THAN 2 INCHES STATIC PRESSURE IN ACCORDANCE WITH SMACNA, SEAL CLASS C. ALL TRANSVERSE JOINTS, FITTING CONNECTIONS, AND SQUARE OR RECTANGULAR TO ROUND CONNECTIONS IN DUCTWORK SHALL BE SEALED USING ADHESIVE TYPE SLIPS. DUCT SEALER OR HARD CAST, ROUND TO ROUND CONNECTIONS WITH FIRM FIT AND SEALED, SEAL ALL DUCTWORK SERVING SYSTEMS HAVING FANS RATED FOR 2 INCHES STATIC PRESSURE OR GREATER IN ACCORDANCE WITH SMACNA SEAL CLASS A. ALL TRANSVERSE JOINTS, LONGITUDINAL SEAMS, DUCT WALL PENETRATIONS TO BE SEALED.

BRANCH TAKEOFFS NOT TO EXCEED 45 DEGREES. PROVIDE A VOLUME DAMPER IN EACH AND EVERY BRANCH OF SUPPLY, RETURN AND EXHAUST DUCT. (SEE FLOOR PLANS AND DETAILS).

CANVAS CONNECTORS

18 OUNCE FIREPROOF CANVAS OR NEOPRENE AT ALL FANS AND HVAC UNITS (EXCEPT ROOF VENTILATORS AND VANE AXIAL FANS WITH COMPANION FLANGES).

DUCT INSULATION

INSULATION PRODUCTS PER NFPA-90A WITH 25 OF LESS FLAME SPREAD AND 50 OR LESS SMOKE DEVELOPMENT RATINGS. NO PLASTIC LINERS OR COVERS

DUCT LINER INSULATION

OWENS-CORNING AEROFLEX OR EQUIVALENT MANVILLE LINACOUSTIC OR KNAUF DUCT LINER M FIRE RESISTANT MATT FACED GLASS FIBER DUCT LINER. 1-1/2 LB. DENSITY. CERTIFIED EROSION RESISTANT DUCT LINER FOR DUCT AIR VELOCITIES UNDER 2000 F/P/M. K APPROX. 0.24 AT 50 DEGREES F. DUCT LINER SHALL BE ADHERED TO THE SHEET METAL WITH A 100% COVERAGE OF ADHESIVE, AND ALL EXPOSED LEADING EDGES AND ALL TRANSVERSE JOINTS COATED WITH ADHESIVE. DUCT LINER SHALL BE CUT TO ASSURE OVERLAPPED AND COMPRESSED LONG-LONGITUDINAL CORNER JOINTS. THE DUCT LINER SHALL BE ADDITIONALLY SECURED WITH MECHANICAL FASTENERS WHICH SHALL COMPRESS THE DUCT LINER SUFFICIENTLY TO HOLD IT FIRMLY IN PLACE.

FASTENERS SHALL START WITHIN 3 INCHES OF THE UPSTREAM TRANSVERSE EDGES OF THE DUCT LINER AND 3 INCHES FROM THE LONGITUDINAL JOINTS AND SHALL BE SPACED AR A MAXIMUM OF 12 INCHES O.C. AROUND THE PERIMETER OF THE DUCT, EXCEPT THAT THEY MAY BE A MAXIMUM OF 12 INCHES FROM A CORNER BREAK. ELSEWHERE THEY SHALL BE A MAXIMUM OF 18 INCHES O.C. EXCEPT THAT THEY SHALL BY PLACED NOT MORE THAN 6 INCHES FROM A CORNER BREAK.

DUCT WRAP INSULATION

OWENS-CORNING FIBERGLASS ALL-SERVICE FACED DUCT WRAP INSULATION, OR EQUAL. INSTALL DUCT WRAP INSULATION WITH FACING OUTSIDE SO THAT TAPE FLAP OVERLAPS INSULATION AND FACING OF ADJACENT PIECE OF DUCT WRAP. INSULATION SHALL BE TIGHTLY BUTTED. IF DUCTS ARE RECTANGULAR INSTALL SO INSULATION IS NOT EXCESSIVELY COMPRESSED AT DUCT CORNERS. SEAMS SHALL BE STAPLED APPROXIMATELY 6 INCHES ON CENTER WITH OUTWARD CLINCHING STAPLES. SEAL SEAMS WITH PRESSURE-SENSITIVE TAPE MATCHING THE FACING. WHERE RECTANGULAR DUCTS ARE 24 INCHES IN WIDTH OR GREATER, DUCT WRAP INSULATION SHALL BE ADDITIONALLY SECURED TO THE BOTTOM OF THE DUCT WITH MECHANICAL FASTENERS SUCH AS PINS AND SPEED CLIP WASHERS, SPACED ON 18 INCH CENTERS (MAXIMUM) TO PREVENT SAGGING OF INSULATION. ADJACENT SECTIONS OF WRAP INSULATION SHALL BE TIGHTLY BUTTED WITH THE 2 INCH TAPE FLAP OVERLAPPING. SEAL ALL TEARS, PUNCTURES AND OTHER PENETRATIONS OF THE DUCT WRAP INSULATION FACING WITH TAPE OR MASTIC TO PROVIDE A VAPOR TIGHT SYSTEM.

DUCT INSULATION LOCATION

SUPPLY AIR DUCTS
WRAP ALL ROUND AND RECTANGULAR SUPPLY AIR DUCTS WITH 3" DUCT WRAP INSULATION.

DUCT ACCESSORIES

TURNING VANES
TURNING VANES TO BE DOUBLE WALL FABRICATED PER SMACNA STANDARDS

VOLUME DAMPERS
MANUAL VOLUME DAMPERS, FABRICATED PER SMACNA STANDARDS, WITH LOCKING QUADRANT. PROVIDE MULTIBLADE DAMPERS FOR ALL DUCTS 12 INCHES DEEP AND LARGER.

BALANCING DAMPERS WIDTH OF THE BRANCH TAKEOFF. PROVIDE CEILING ACCESS FOR OPERATING DAMPERS. LEAVE ALL DAMPERS OPEN. VOLUME DAMPERS WHERE SHOWN ON DRAWING.

FOR ROUND DUCTS, HART & COOLEY #607 AND #608, OR EQUIVALENT, WITH 2 BEARING POINTS AND HANDLE AND WING NUT ASSEMBLY.

BACKDRAFT DAMPERS
INSTALL PER MANUFACTURER'S INSTRUCTIONS. SEE SCHEDULE. INTERLOCKED, FELT EDGED BLADE, ADJUSTABLE SPRING LOADED. PREFCO PHL, OR EQUIVALENT.

DUCT ACCESS PANELS
FOR MAINTENANCE, CLEANING, RESETTING OR EXAMINATION. AIR TIGHT HINGED ACCESS DOORS WITH FELT OR TUBULAR NEOPRENE GASKET. WITH CAM LATCHES (NOT SCREWS). KARP OR EQUIVALENT. INSULATED AT INSULATED DUCTS.

GRILLES AND DIFFUSERS
ALL GRILLES AND DIFFUSERS SHALL BE AS INDICATED ON THE PLANS AND SHALL BE EQUIPPED WITH OPPOSED BLADE DAMPERS AND HAVE A WHITE BAKED ON ENAMEL FINISH UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS.

FILTERS

FILTERS FURNISHED WITH ALL RETURN AIR GRILLES. SEE SCHEDULES. SPARE FILTERS PROVIDED WHERE INDICATED IN SCHEDULE. HVAC CONTRACTOR IS REQUIRED DURING AND AT THE COMPLETION OF THE BUILDING CONSTRUCTION TO PROVIDE NEW REPLACEMENT AIR FILTERS OF EQUAL EFFICIENCY AT ALL HVAC UNITS USED DURING CONSTRUCTION.

15850 REFRIGERATION

AIR HANDLING UNIT / CONDENSING UNIT

*REFER TO SHEETS MS102 AND MS103 FOR ASSOCIATED SPECIFICATIONS

15850 AIR HANDLING

ALL RIGHTS AND LEFTS FOR FAN UNITS SHALL BE DETERMINED BY LOOKING INTO THE AIR OUTLET. CLOCKWISE AND COUNTERCLOCKWISE ROTATION SHALL BE DETERMINED BY VIEWING FROM THE DRIVE SIDE.

15952 BUILDING TEMPERATURE CONTROLS

CONTRACTOR TO INTERCONNECT CRAHU-1 WITH EXISTING BUILDING MANAGEMENT SYSTEM. CRAHU-1 TO HAVE BACNET INTERFACE CARDS. BACNET INTERFACE CARD FOR MONITORING ONLY. CRAHU-1 TO HAVE STANDALONE CONTROLS.

CONTRACTOR TO INTERCONNECT LEAK DETECTION SYSTEM WITH EXISTING BUILDING MANAGEMENT SYSTEM.

EYRE ENGINEERING

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MP401

SECTION 15650 – LIEBERT PDX SYSTEM

PART 1 – GENERAL

1.1 SUMMARY

THESE SPECIFICATIONS DESCRIBE REQUIREMENTS FOR A MISSION CRITICAL ENVIRONMENTAL CONTROL SYSTEM. THE SYSTEM SHALL BE DESIGNED TO CONTROL TEMPERATURE AND HUMIDITY CONDITIONS IN ROOMS CONTAINING ELECTRONIC EQUIPMENT, WITH GOOD INSULATION AND VAPOR BARRIER. THE MANUFACTURER SHALL DESIGN AND FURNISH ALL EQUIPMENT TO BE FULLY COMPATIBLE WITH THE HEAT DISSIPATION REQUIREMENTS OF THE ROOM.

1.2 DESIGN REQUIREMENTS

THE PRECISION ENVIRONMENTAL CONTROL SYSTEM SHALL BE A FACTORY–ASSEMBLED LIEBERT PDX. STANDARD 60HZ UNITS SHALL BE CSA–CERTIFIED TO THE HARMONIZED U.S. AND CANADIAN PRODUCT SAFETY STANDARD, CSA C22.2 NO. 236/UL 1995 FOR HEATING AND COOLING EQUIPMENT AND ARE MARKED WITH THE CSA C–US LOGO. IT SHALL BE SPECIFICALLY DESIGNED FOR SERVICE FROM THE FRONT AND RIGHT SIDE OF THE UNIT. THE SYSTEM SHALL BE DESIGNED FOR DRAW–THROUGH AIR ARRANGEMENT TO ENSURE EVEN AIR DISTRIBUTION TO THE ENTIRE FACE AREA OF THE COIL. ONLY INFRARED HUMIDIFIERS ARE ACCEPTABLE. DIGITAL SCROLL COMPRESSORS ARE REQUIRED. MANUFACTURER SHALL HAVE 20 YEARS OF EXPERIENCE IN THE MANUFACTURE OF COMPUTER ROOM AIR CONDITIONING. CONDENSER SHALL BE MICROCHANNEL COIL WITH EC PLUG FANS AND BE RATED FOR AT LEAST 100F F AMBIENT.

1.3 SUBMITTALS

SUBMITTALS SHALL BE PROVIDED WITH THE PROPOSAL AND SHALL INCLUDE: SINGLE–LINE DIAGRAMS; DIMENSIONAL, ELECTRICAL, AND CAPACITY DATA; PIPING AND ELECTRICAL CONNECTION DRAWINGS.

1.4 SERVICEABILITY/ ACCESS

THE CABINET SHALL BE DESIGNED SO THAT ALL COMPONENTS ARE EASILY ACCESSIBLE FOR SERVICE AND MAINTENANCE THROUGH THE UNIT'S FRONT AND RIGHT SIDE.

PART 2 – PRODUCT

2.1 COOLING SYSTEM

2.1.1 AIR–COOLED REFRIGERATION SYSTEM––MODEL 018

2.1.1.1 SYSTEM DESCRIPTION

SINGLE REFRIGERATION CIRCUIT SHALL INCLUDE A LIQUID LINE FILTER DRIER, A REFRIGERANT SIGHT GLASS WITH MOISTURE INDICATOR, AN EXPANSION VALVE, PRESSURE SAFETY SWITCHES AND A LIQUID LINE SOLENOID VALVE. THE INDOOR EVAPORATOR REFRIGERANT PIPING SHALL BE FILLED WITH A NITROGEN HOLDING CHARGE AND SPUN SHUT. FIELD RELIEF OF THE SCHRADER VALVE SHALL INDICATE A LEAK–FREE SYSTEM.

2.1.1.2 HYDROPHILIC–COATED EVAPORATOR COIL

LIEBERT PDX

MODEL 018

THE COOLING COIL SHALL HAVE A FACE VELOCITY OF 283 FPM AT 2800 CFM .THE COOLING COIL SHALL BE CONSTRUCTED OF COPPER TUBES AND HYDROPHILIC COATED ALUMINUM FINS. THE HYDROPHILIC COATING SHALL SIGNIFICANTLY IMPROVE THE SPEED OF CONDENSATE DRAINAGE FROM THE FINS AND SHALL PROVIDE SUPERIOR WATER CARRYOVER RESISTANCE. A STAINLESS STEEL CONDENSATE DRAIN PAIN SHALL BE PROVIDED TO ALLOW THE REMOVAL OF MOISTURE FROM THE COOLING COIL.

2.1.1.3 R–410A REFRIGERANT

THE SYSTEM SHALL BE DESIGNED FOR USE WITH R–410A REFRIGERANT, WHICH MEETS THE U.S. CLEAN AIR ACT FOR PHASEOUT OF HCFC REFRIGERANTS.

2.1.1.4 COMPRESSOR

DIGITAL SCROLL COMPRESSOR

THE COMPRESSOR SHALL BE AN R–410A SCROLL–TYPE WITH VARIABLE CAPACITY OPERATION FROM 20–100%, COMMONLY KNOWN AS A DIGITAL SCROLL. THE COMPRESSOR SOLENOID VALVE SHALL UNLOAD THE COMPRESSOR TO PROVIDE VARIABLE CAPACITY OPERATION. THE COMPRESSOR SHALL HAVE A SUCTION GAS–COOLED MOTOR, EPDM VIBRATION ISOLATORS, INTERNAL THERMAL OVERLOADS, AUTOMATIC RESET HIGH PRESSURE SWITCH WITH LOCKOUT AFTER THREE FAILURE OCCURRENCES, ROTALOCK SERVICE VALVES, LOW PRESSURE TRANSDUCER, AND CRANKCASE HEATER. THE COMPRESSOR SHALL BE REMOVABLE AND SERVICEABLE FROM THE FRONT OF THE UNIT. THE CRANKCASE HEATER AND A DISCHARGE CHECK VALVE SHALL BE PROVIDED FOR ADDITIONAL SYSTEM PROTECTION FROM REFRIGERANT MIGRATION DURING OFF CYCLES.

COMPRESSOR SOUND JACKET

THE COMPRESSOR SOUND JACKET SHALL REDUCE THE LEVEL OF SOUND EMITTED FROM THE COMPRESSOR. IT SHALL CONSIST OF A 3/8 INCH CLOSED CELL POLYMERIC 4.5 – 8.5 LB/FT^3 DENSITY JACKET THAT ENCLOSES THE COMPRESSOR.

2.1.1.5 EXPANSION VALVE

THERMOSTATIC EXPANSION VALVE

A MANUALLY ADJUSTABLE, EXTERNALLY EQUALIZED THERMOSTATIC EXPANSION VALVE (TXV) SHALL CONTROL THE FLOW OF LIQUID REFRIGERANT ENTERING THE DIRECT EXPANSION COIL. THE TXV SHALL MAINTAIN CONSISTENT SUPERHEAT OF THE REFRIGERANT VAPOR AT THE OUTLET OF THE EVAPORATOR COIL OVER THE UNIT'S OPERATING RANGE. THE TXV SHALL PREVENT LIQUID REFRIGERANT FROM RETURNING TO THE COMPRESSOR.

2.1.1.6 HYDROPHILIC–COATED EVAPORATOR COIL

LIEBERT PDX (MODEL 018)

2.2 FAN SECTION

2.2.1 FAN AND MOTOR

THE UNIT SHALL BE EQUIPPED WITH ONE PLUG FAN: INTEGRAL DIRECT DRIVEN FAN WITH BACKWARD–CURVED BLADES AND ELECTRONICALLY COMMUTATED DC MOTORS, COMMONLY REFERRED TO AS EC FAN. THE FAN SPEED SHALL BE VARIABLE AND AUTOMATICALLY REGULATED BY THE LIEBERT ICOM THROUGH ALL MODES OF OPERATION. THE FAN SHALL HAVE A DEDICATED MOTOR, FAULT MONITORING CIRCUITRY AND SPEED CONTROLLER, WHICH SHALL PROVIDE A LEVEL OF REDUNDANCY. THE IMPELLER SHALL BE MADE OF ALUMINUM AND DYNAMICALLY BALANCED. THE EC FAN SHALL BE LOCATED WITHIN THE UNIT. THE EC FAN SHALL ALSO PROVIDE GREATER ENERGY SAVINGS THAN FORWARD–CURVED CENTRIFUGAL FANS AND VARIABLE SPEED DRIVES.

2.2.2 AIR FLOW CONFIGURATION

2.2.2.1 UPFLOW SUPPLY

UPFLOW SUPPLY WITH FRONT AIR RETURN

THE SUPPLY AIR SHALL EXIT FROM THE TOP OF THE CABINET. THE RETURN AIR SHALL BE THROUGH THE FRONT FACTORY–INSTALLED GRILLES. THE FAN SHALL BE ABOVE THE COIL AND PULL AIR THROUGH THE FILTERS AND COOLING COIL TO ENSURE EVEN AIR DISTRIBUTION AND MAXIMUM COIL PERFORMANCE.

2.3 CABINET CONSTRUCTION AND ACCESSIBILITY

2.3.1 CABINET CONSTRUCTION

THE EXTERIOR PANELS SHALL BE 20 GAUGE STEEL AND POWDER–COATED WITH BLACK COLOR PAINT TO PROTECT AGAINST CORROSION. THE EXTERIOR PANELS SHALL BE INSULATED WITH 1/2" TO 1" (12.7 TO 25.4MM), 1–1/2 LB. (0.68 KG) INSULATION. FRONT AND SIDE PANELS SHALL HAVE CAPTIVE, QUARTER–TURN FASTENERS. THE CABINET SHALL BE DESIGNED SO THAT ALL COMPONENTS ARE SERVICEABLE AND REMOVABLE USING THE FRONT AND RIGHT SIDES OF THE UNIT.

2.4 LOCKING DISCONNECT SWITCH

A LOCKING–TYPE, FUSED DISCONNECT SWITCH SHALL BE MOUNTED IN THE ELECTRICAL PANEL AND SHALL BE CAPABLE OF DISRUPTING THE FLOW OF POWER TO THE UNIT. THE LOCKING TYPE SHALL CONSIST OF A MAIN UNIT SWITCH OPERATIONAL FROM OUTSIDE THE UNIT. THE ELECTRIC PANEL COMPARTMENT SHALL BE ACCESSIBLE ONLY WITH THE SWITCH IN THE OFF POSITION. THE LOCKING DISCONNECT SHALL BE LOCKABLE IN SUPPORT OF LOCKOUT/TAGOUT SAFETY PROGRAMS.

2.5 SHORT–CIRCUIT CURRENT RATING (SCCR)

THE ELECTRICAL PANEL SHALL PROVIDE AT LEAST 65,000A SCCR.

2.6 FILTRATION

2.6.1 MERV 8 FILTERS

THE FILTER SHALL BE AN INTEGRAL PART OF THE SYSTEM AND LOCATED WITHIN THE CABINET. THE FILTER SHALL BE DEEP–PLEATED, 2" (51MM) THICK WITH A MERV 8 RATING EFFICIENCY BASED ON ASHRAE 52.2–2007. A FILTER CLOG SWITCH SHALL BE INCLUDED. MESH TYPE, CLEANABLE FILTERS SHALL BE UNACCEPTABLE.

2.7 ELECTRIC REHEAT

MODEL 029 – AIR–COOLED

THE REHEAT SHALL BE A LOW–WATT DENSITY 304/304 STAINLESS STEEL FINNED–TUBULAR ELECTRIC REHEAT. THE REHEAT SECTION SHALL INCLUDE UL/CSA RECOGNIZED SAFETY SWITCHES TO PROTECT THE SYSTEM FROM OVERHEATING.

AIR–COOLED

THE CAPACITY OF THE REHEAT SHALL BE 23.6 KW (48.4 KBTUH) INCLUDING MOTOR HEAT. THE ELECTRIC REHEAT SHALL BE CONTROLLED IN TWO STAGES. THE REHEAT ELEMENTS SHALL BE ACCESSIBLE FROM THE RIGHT OF THE CABINET.

2.8 INFRARED HUMIDIFIER

THE HUMIDIFIER SHALL BE OF THE INFRARED TYPE, CONSISTING OF HIGH INTENSITY QUARTZ LAMPS MOUNTED ABOVE AND OUT OF THE WATER SUPPLY. THE EVAPORATOR PAN SHALL BE STAINLESS STEEL AND ARRANGED TO BE SERVICEABLE WITHOUT DISCONNECTING WATER SUPPLY LINES, DRAIN LINES OR ELECTRICAL CONNECTIONS. THE COMPLETE HUMIDIFIER SECTION SHALL BE PRE–PIPED READY FOR FINAL CONNECTION. THE INFRARED HUMIDIFICATION SYSTEM SHALL USE BYPASS AIR TO PREVENT OVERHUMIDIFICATION OF THE CONTROLLED SPACE. THE AUTO–FLUSH SYSTEM SHALL AUTOMATICALLY FLUSH DEPOSITS FROM THE HUMIDIFIER PAN. THE SYSTEM SHALL BE FIELD ADJUSTABLE TO CHANGE THE CYCLE TIME TO SUIT LOCAL WATER CONDITIONS. THE HUMIDIFIER SHALL HAVE A CAPACITY OF 7.7 LB/H (3.5 KG/H).

2.9 CONDENSATE PUMP

THE DUAL–FLOAT CONDENSATE PUMP SHALL HAVE A MINIMUM CAPACITY OF 5 GPM (18.9 L/MIN) AT 40 FT. (12.2M) HEAD. PUMP SHALL BE COMPLETE WITH INTEGRAL PRIMARY AND SECONDARY FLOAT SWITCHES, PUMP, MOTOR ASSEMBLY AND RESERVOIR. THE SECONDARY FLOAT SHALL SEND A SIGNAL TO THE LOCAL ALARM AND SHUT DOWN THE UNIT UPON HIGH WATER CONDITION. THE CONDENSATE PUMP SHALL BE FACTORY–INSTALLED ON UPFLOW UNITS AND FIELD–INSTALLED ON DOWNFLOW UNITS.

2.10 LIEBERT ICOM MICROPROCESSOR CONTROL

THE LIEBERT ICOM SHALL BE FACTORY–SET TO ALLOW PRECISE MONITORING AND CONTROL OF THE IT EQUIPMENT IT IS PLACED NEAR. THIS CONTROL SHALL INCLUDE PREDICTIVE METHODS TO CONTROL AIR FLOW AND COOLING CAPACITY BASED ON SUPPLY AND REMOTE SENSORS. PROPORTIONAL AND TUNABLE PID SHALL ALSO BE USER–SELECTABLE OPTIONS. INTERNAL UNIT COMPONENT CONTROL SHALL INCLUDE THE FOLLOWING:

COMPRESSOR SHORT CYCLE CONTROL–SHALL PREVENT COMPRESSOR SHORT–CYCLING AND NEEDLESS COMPRESSOR WEAR.

SYSTEM AUTO RESTART–THE AUTO RESTART FEATURE SHALL AUTOMATICALLY RESTART THE SYSTEM AFTER A POWER FAILURE. TIME DELAY SHALL BE PROGRAMMABLE.

SEQUENTIAL LOAD ACTIVATION–ON INITIAL STARTUP OR RESTART AFTER POWER FAILURE, EACH OPERATIONAL LOAD SHALL BE SEQUENCED WITH A MINIMUM OF ONE SECOND DELAY TO MINIMIZE TOTAL INRUSH CURRENT.

PREDICTIVE HUMIDITY CONTROL–SHALL CALCULATE THE MOISTURE CONTENT IN THE ROOM AND PREVENT UNNECESSARY HUMIDIFICATION AND DEHUMIDIFICATION CYCLES BY RESPONDING TO CHANGES IN DEW POINT TEMPERATURE.

THE LIEBERT ICOM SHALL BE COMPATIBLE WITH ALL LIEBERT REMOTE MONITORING AND CONTROL DEVICES. OPTIONS SHALL BE AVAILABLE FOR BMS INTERFACE VIA MODBUS, HTTP, BACNET AND SNMP.

THE LIEBERT ICOM SHALL BE MICROPROCESSOR–BASED WITH A 320X240 DOT MATRIX GRAPHIC FRONT MONITOR DISPLAY AND CONTROL KEYS FOR USER INPUTS MOUNTED IN AN ERGONOMIC, AESTHETIC HOUSING. THE DISPLAY AND HOUSING SHALL BE VIEWABLE WHILE THE FRONT PANEL IS OPEN OR CLOSED.

THE CONTROLS SHALL BE MENU DRIVEN. THE DISPLAY SHALL BE ORGANIZED INTO THREE MAIN SECTIONS: USER MENUS, SERVICE MENUS AND ADVANCED MENUS WITH A SECURE LOGIN FOR EACH SECTION. THE SYSTEM SHALL DISPLAY USER MENUS FOR ACTIVE ALARMS, EVENT LOG, GRAPHIC DATA, UNIT VIEW/STATUS OVERVIEW (INCLUDING THE MONITORING OF ROOM CONDITIONS, OPERATIONAL STATUS IN PERCENTAGE OF EACH FUNCTION, DATE AND TIME), TOTAL RUN HOURS, VARIOUS SENSORS, DISPLAY SETUP AND SERVICE CONTACTS. A PASSWORD SHALL BE REQUIRED TO MAKE SYSTEM CHANGES WITHIN THE SERVICE MENUS. SERVICE MENUS SHALL INCLUDE SETPOINTS, STANDBY SETTINGS (LEAD/LAG), TIMERS/SLEEP MODE, ALARM SETUP, SENSOR CALIBRATION, MAINTENANCE/WELLNESS SETTINGS, OPTIONS SETUP, SYSTEM/NETWORK SETUP, AUXILIARY BOARDS AND DIAGNOSTICS/SERVICE MODE. A PASSWORD SHALL BE REQUIRED TO ACCESS THE ADVANCED MENUS, WHICH INCLUDE THE FACTORY SETTINGS AND PASSWORD MENUS.

THE USER MENUS SHALL BE:

- ACTIVE ALARMS: UNIT MEMORY SHALL HOLD THE 200 MOST RECENT ALARMS WITH TIME AND DATE STAMP FOR EACH ALARM.
- EVENT LOG: UNIT MEMORY SHALL HOLD THE 400 MOST RECENT EVENTS WITH ID NUMBER, TIME AND DATE STAMP FOR EACH EVENT.
- GRAPHIC DATA VIEW: TWO SELECTABLE GRAPHIC RECORDS SHALL BE AVAILABLE FROM THE FOLLOWING: RETURN AIR TEMPERATURE, RETURN AIR HUMIDITY, DEW POINT, SUPPLY AIR TEMPERATURE.
- UNIT VIEW – STATUS OVERVIEW: SIMPLE OR GRAPHICAL UNIT VIEW SUMMARY DISPLAYS SHALL INCLUDE TEMPERATURE AND HUMIDITY VALUES, ACTIVE FUNCTIONS (AND PERCENT OF OPERATION) AND ANY ALARMS OF THE HOST UNIT.
- TOTAL RUN HOURS: MENU SHALL DISPLAY CUMULATIVE COMPONENT OPERATING HOURS FOR MAJOR COMPONENTS INCLUDING COMPRESSORS, ECON–O–COIL (FC), FAN MOTOR, HUMIDIFIER AND REHEAT.
- VARIOUS SENSORS: MENU SHALL ALLOW SETUP AND DISPLAY OF OPTIONAL CUSTOM SENSORS.
- DISPLAY LANGUAGE: CUSTOMER SHALL BE ABLE TO SELECT THE DESIRED LANGUAGE AT THE TIME OF THE ORDER FROM THE FOLLOWING CHOICES: ENGLISH, FRENCH, ITALIAN AND SPANISH.
- SERVICE CONTACTS: MENU SHALL ALLOW DISPLAY OF LOCAL SERVICE CONTACT NAME AND PHONE NUMBER.
- SYSTEM VIEW – STATUS OVERVIEW: SYSTEM VIEW SHALL DISPLAY A SUMMARY OF OPERATION FOR THE TOTAL NUMBER OF OPERATING UNITS WITHIN A UNIT–TO–UNIT (U2U) CONFIGURATION.
- SPARE PARTS LIST: MENU SHALL INCLUDE A LIST OF CRITICAL SPARE PARTS, THEIR QUANTITY AND PART NUMBERS.
- UNIT DIARY: MENU SHALL INCLUDE A FREE FIELD AREA WITHIN THE UNIT MEMORY WHERE UNIT HISTORY MAY BE STORED FOR REFERENCE.

THE SERVICE MENUS SHALL BE:

SETPOINTS: MENU SHALL ALLOW SETPOINTS WITHIN THE FOLLOWING RANGES:

- TEMPERATURE SETPOINT: 41–104°F (5–40°C)*
- TEMPERATURE PROPORTIONAL BAND: +1–50°F (–17 TO 10°C)
- FAN TEMPERATURE SETPOINT: 41–104°F (5–40°C)*
- HUMIDITY SETPOINT: 20–80% RH*
- HUMIDITY SENSITIVITY: 1–30% RH
- HIGH TEMPERATURE ALARM: 35–90°F (2–32°C)
- LOW TEMPERATURE ALARM: 35–90°F (2–32°C)
- HIGH HUMIDITY ALARM: 15–85% RH
- LOW HUMIDITY ALARM: 15–85% RH

* THE MICROPROCESSOR MAY BE SET WITHIN THESE RANGES; HOWEVER, THE UNIT MAY NOT BE ABLE TO CONTROL TO EXTREME COMBINATIONS OF TEMPERATURE AND HUMIDITY.

STANDBY SETTINGS/LEAD–LAG: MENU SHALL ALLOW PLANNED ROTATION OR EMERGENCY ROTATION OF OPERATING AND STANDBY UNITS.

ALARM SETUP: MENU SHALL ALLOW CUSTOMER SETTINGS FOR ALARM NOTIFICATION (AUDIBLE/LOCAL/REMOTE). THE FOLLOWING ALARMS SHALL BE AVAILABLE:

- HIGH TEMPERATURE
- LOW TEMPERATURE
- HIGH HUMIDITY
- LOW HUMIDITY
- COMPRESSOR OVERLOAD––OPTIONAL
- MAIN FAN OVERLOAD––OPTIONAL
- HUMIDIFIER PROBLEM
- HIGH HEAD PRESSURE
- CHANGE FILTER
- FAN FAILURE
- LOW SUCTION PRESSURE
- UNIT OFF

AUDIBLE ALARM: THE AUDIBLE ALARM SHALL ANNUNCIATE ANY ALARM THAT IS ENABLED BY THE OPERATOR.

COMMON ALARM: A PROGRAMMABLE COMMON ALARM SHALL BE PROVIDED TO INTERFACE USER–SELECTED ALARMS WITH A REMOTE ALARM DEVICE.

REMOTE MONITORING: ALL ALARMS SHALL BE COMMUNICATED TO THE LIEBERT MONITORING SYSTEM WITH THE FOLLOWING INFORMATION: DATE AND TIME OF OCCURRENCE, UNIT NUMBER AND PRESENT TEMPERATURE AND HUMIDITY.

SENSOR CALIBRATION: MENU SHALL ALLOW UNIT SENSORS TO BE CALIBRATED WITH EXTERNAL SENSORS.

MAINTENANCE/WELLNESS SETTINGS: MENU SHALL ALLOW REPORTING OF POTENTIAL COMPONENT PROBLEMS BEFORE THEY OCCUR.

OPTIONS SETUP: MENU SHALL PROVIDE OPERATION SETTINGS FOR THE INSTALLED COMPONENTS.

SYSTEM/NETWORK SETUP: MENU SHALL ALLOW UNIT–TO–UNIT (U2U) COMMUNICATION AND SETUP FOR TEAMWORK MODES OF OPERATION (UP TO 32 UNITS).

TEAMWORK MODES OF OPERATION: SAVES ENERGY BY PREVENTING OPERATION OF UNITS IN OPPOSITE MODES MULTIPLE UNITS.

DIAGNOSTICS/SERVICE MODE: THE LIEBERT ICOM^T SHALL BE PROVIDED WITH SELF–DIAGNOSTICS TO AID IN TROUBLESHOOTING. THE MICROCONTROLLER BOARD SHALL BE DIAGNOSED AND REPORTED AS PASS/NOT PASS. CONTROL INPUTS SHALL BE INDICATED AS ON OR OFF AT THE FRONT DISPLAY. CONTROL OUTPUTS SHALL BE ABLE TO BE TURNED ON OR OFF FROM THE FRONT DISPLAY WITHOUT USING JUMPERS OR A SERVICE TERMINAL. AN LED ON A CIRCUIT BOARD WILL INDICATE EACH CONTROL OUTPUT.

THE ADVANCED MENUS SHALL BE:

- FACTORY SETTINGS: CONFIGURATION SETTINGS SHALL BE FACTORY–SET BASED ON THE PRE–DEFINED COMPONENT OPERATION.
- CHANGE PASSWORDS: MENU SHALL ALLOW PASSWORDS TO BE SET OR CHANGED.

2.11 LIEBERT ICOM CONTROL METHODS AND ACCESSORIES

CONTROLLING SENSOR ACCESSORIES: LIEBERT ICOM SHALL BE FLEXIBLE IN THE SENSE THAT IT ALLOWS FOR CONTROLLING THE CAPACITY AND FAN FROM MULTIPLE DIFFERENT SENSOR SELECTIONS. THE SENSOR SELECTIONS SHALL BE:

- COOLING CAPACITY:
- SUPPLY
- REMOTE
- RETURN
- FAN SPEED
- SUPPLY
- REMOTE
- RETURN
- MANUAL (FOR DIAGNOSTICS OR TO RECEIVE A SIGNAL FROM THE BMS THROUGH THE LIEBERT IS–UNITY–DP CARD)

TEAMWORK MODES OF OPERATION: LIEBERT ICOM TEAMWORK SHALL SAVE ENERGY BY PREVENTING OPERATION OF MULTIPLE UNITS IN OPPOSING MODES. THE THREE MODES OF TEAMWORK OPERATION ARE:

- TEAMWORK MODE 1: THIS MODE ALLOWS THE CONTROL TO OPTIMIZE A GROUP OF COOLING UNITS EQUIPPED WITH LIEBERT ICOM'S USING THE U2U. THE CAPACITY AND FAN OPERATIONS ARE COUPLED TOGETHER IN THIS MODE.
- TEAMWORK MODE 2: THIS MODE ALLOWS THE CONTROL TO OPTIMIZE A GROUP OF COOLING UNITS EQUIPPED WITH LIEBERT ICOM'S USING THE U2U. THE CAPACITY AND FAN OPERATIONS ARE DECOUPLED IN THIS MODE MEANING THE FAN AND COOLING RAMP TOGETHER AND RESPOND TO THE THERMAL LOAD BASED ON IT CONTROLLING SENSORS.
- OPTIMIZED AISLE – TEAMWORK MODE 3: THIS MODE ALLOWS THE CONTROL TO OPTIMIZE A GROUP OF CONNECTED COOLING UNITS EQUIPPED WITH LIEBERT ICOM'S USING THE U2U. THE CAPACITY AND FAN OPERATIONS ARE DECOUPLED IN THIS MODE, MEANING THE FAN AND COOLING RAMP SEPARATELY AND RESPOND TO THE THERMAL LOAD BASED ON ITS CONTROLLING SENSORS. WHEN USING OPTIMIZED AISLE, THE FANS CAN BE CONTROLLED BY USING STATIC PRESSURE (DP OR STATIC) WITH A SECONDARY REMOTE TEMPERATURE SENSOR AS AN OVERRIDE TO ENSURE THE INLET RACK TEMPERATURE IS BEING MET.

TEMPERATURE COMPENSATION: LIEBERT ICOM ALLOWS THE ABILITY TO COMPENSATE THE SUPPLY AND RETURN SETPOINTS TO MAINTAIN COOLING OR RETURN TEMPERATURES TO MEET COOLING NEEDS OR SERVICE LEVEL AGREEMENT (SLA) GUIDELINES.

DEW POINT CONTROL: LIEBERT ICOM SHALL BE ABLE TO CONTROL THE HUMIDITY BASED ON DEW POINT TO ENSURE ACCURATE HUMIDITY CONTROL. THIS METHOD WILL ELIMINATE THE NEED TO DEHUMIDIFY OR HUMIDIFY BASED ON THE AIR TEMPERATURE WHEN LOOKING AT MOISTURE CONTENT.

VIRTUAL BACK–DRAFT DAMPER: LIEBERT ICOM ALLOWS FOR THE USE OF A VIRTUAL BACK–DRAFT DAMPER – ELIMINATING THE NEED FOR A MECHANICAL DAMPER. THIS ALLOWS THE EC FAN TO SPIN AT A LOW SPEED (15%) TO ACT AS A DAMPER.

CASCADE: LIEBERT ICOM CASCADE OPTION SHALL ALLOW THE UNITS TO TURN ON AND OFF BASED ON HEAT LOAD WHEN IN TEAMWORK MODE 1. WHEN UTILIZING OPTIMIZED AISLE, TEAMWORK MODE 3, THE CASCADING SHALL BECOME MORE DYNAMIC AS THE UNITS COORDINATE THE FAN SPEED TO SAVE ENERGY AND TO MEET THE COOLING DEMANDS. FOR INSTANCE, WITH A GROUP OF SIX COOLING UNITS EQUIPPED WITH LIEBERT ICOM'S AND ONLY 50% OF THE HEAT LOAD, THE LIEBERT ICOM SHALL SHUT DOWN FOUR UNITS AT 80% FAN SPEED AND LEAVE THE OTHER TWO UNITS IN STANDBY/CASCADE. AS THE HEAT LOAD INCREASES, THE LIEBERT ICOM SHALL AUTOMATICALLY RESPOND TO THE NEW LOAD AND BRING ON THE FIFTH UNIT. AS THE HEAT LOAD SHIFTS UP OR DOWN, THE CONTROL SHALL MEET THE NEEDS BY CASCADING UNITS ON OR PUTTING THEM INTO STANDBY.

VIRTUAL MASTER: THE LIEBERT ICOM CONTROL SHALL ALLOW FOR A VIRTUAL MASTER THAT COORDINATES OPERATION. IF FOR ANY REASON THE VIRTUAL MASTER BECOMES DISCONNECTED, THE CONTROL SHALL SHIFT RESPONSIBILITY TO THE NEXT UNIT IN THE GROUP.

REMOTE 2T SENSOR SHARING: EACH LIEBERT PDX/PCW UNIT CAN CONNECT UP TO TEN 2T SENSORS. THE 2T SENSORS CAN BE USED AS A CONTROLLING SENSOR OR REFERENCE SENSOR. AS PART OF THE U2U NETWORK AND TEAMWORK, THOSE SENSORS CAN BE SHARED AND USED TO CONTROL THE UNITS AND PROVIDE GREATER FLEXIBILITY, VISIBILITY AND CONTROL USING THAT TO RESPOND TO CHANGES IN THE DATA CENTER. THE 2T SENSORS CAN BE SET TO A MINIMUM OR MAXIMUM OR AVERAGE TEMPERATURE CONTROL.

QUICK START: EACH LIEBERT PDX/PCW UNIT SHALL BE EQUIPPED WITH A QUICK–START FEATURE THAT ALLOWS THE UNIT TO QUICKLY RECOVER FROM A LOSS OF POWER.

LIEBERT MC CONDENSER: LIEBERT PDX (AIR–COOLED) CAN BE MATCHED TO A PREMIUM LIEBERT MC CONDENSER TO PROVIDE AN INTELLIGENT COMMUNICATION LINK. THIS SHALL ENABLE ENHANCED MONITORING AND ALARMING, DIAGNOSTICS, LOW_NOISE MODE AND FAN REVERSAL FOR CLEANING MODE.

2.12 SUPPLY AIR SENSOR

2.12.1 UPFLOW

THE SUPPLY AIR TEMPERATURE SENSOR SHALL PROVIDE REAL–TIME MONITORING OF THE SUPPLY AIR TEMPERATURE.

2.13 HIGH TEMPERATURE SENSOR

THE HIGH TEMPERATURE SENSOR SHALL IMMEDIATELY SHUT DOWN THE SYSTEM WHEN HIGH TEMPERATURES ARE DETECTED. THE HIGH TEMPERATURE STAT SHALL BE MOUNTED IN THE ELECTRICAL PANEL WITH THE SENSING ELEMENT IN THE RETURN AIR.

2.14 SMOKE SENSOR

THE SMOKE SENSOR SHALL SAMPLE THE RETURN AIR, SHUT DOWN THE UNIT UPON ACTIVATION AND SEND VISUAL AND AUDIBLE ALARMS. DRY CONTACTS SHALL BE AVAILABLE FOR A REMOTE CUSTOMER ALARM. THIS SMOKE SENSOR IS NOT INTENDED TO FUNCTION AS OR REPLACE ANY ROOM SMOKE DETECTION SYSTEM THAT MAY BE REQUIRED BY LOCAL OR NATIONAL CODES.

2.15 LIEBERT INTELLISLOT UNITY–DP CARD

THE LIEBERT INTELLISLOT UNITY CARD (IS–UNITY–DP) SHALL PROVIDE GROUND FAULT ISOLATED RS–485 MODBUS, BACNET IP AND MODBUS IP NETWORK CONNECTIVITY TO BUILDING MANAGEMENT SYSTEMS FOR UNIT MONITORING AND MANAGEMENT. ALSO, IT SHALL PROVIDE GROUND FAULT ISOLATED 10/100 BASET ETHERNET CONNECTIVITY FOR UNIT MONITORING AND MANAGEMENT. THE SUPPORTED MANAGEMENT INTERFACES INCLUDE: SNMP FOR NETWORK MANAGEMENT SYSTEMS, HTTP FOR WEB PAGE VIEWING, SMTP FOR E–MAIL AND SMS FOR MOBILE MESSAGING. THE CARD SHALL SUPPORT IP AND 485 PROTOCOLS SIMULTANEOUSLY.

2.16 LIEBERT LIQUI–TECT 410 POINT LEAK DETECTION SENSOR FOR REMOTE MOUNTING

A TOTAL OF 1 (QUANTITY) SOLID–STATE WATER SENSOR(S) WITH NO MOVING PARTS AND HERMETICALLY SEALED TO KEEP OUT DUST AND DIRT SHALL BE PROVIDED. THE LIEBERT LIQUI–TECT 410 (LT410) SHALL PROVIDE A SINGLE–POINT DETECTION OF LEAKS. THE POINT DETECTION SENSOR SHALL HAVE TWO GOLD–PLATED SENSING PROBES TO PREVENT CORROSION AND TO PROVIDE ACCURATE READINGS. THE LT410 SHALL CONSTANTLY MONITOR POINTS FOR LEAKS, INTERNAL FAULTS AND POWER FAILURES AND WARN OF ANY ABNORMAL CONDITIONS. MOUNTING BRACKETS SHALL ALLOW FOR SENSOR HEIGHT ADJUSTMENT AND LEVELING. THE LT410 SHALL PROVIDE TWO INDEPENDENT OUTPUTS TO SIGNAL BOTH A LOCAL ALARM PANEL AND A REMOTE BUILDING MANAGEMENT SYSTEM OR EXTERNAL EQUIPMENT. THE LT410 SHALL BE RATED FOR 24VAC, 50/60HZ AND 0.10 AMP.

2.17

2.17.1 AIR FLOW CONFIGURATION

2.17.1.1 DUCTED

THE UNIT SHALL BE SUPPLIED WITH A DUCTED AIR DISCHARGE PLENUM. THE PLENUM SHALL BE 18 IN. (457MM), 24 IN. (609MM), 30 IN. (762MM), 38 IN. (914MM), 42 IN. (1066MM) OR 48 IN. (1219) WITH TOP DUCT CONNECTION.

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SECTION 15650 – LEIBERT PDX SYSTEM (CONTINUED)

2.18 HEAT REJECTION

2.18.1 LIEBERT MC CONDENSER SUMMARY

THESE SPECIFICATIONS DESCRIBE REQUIREMENTS FOR A LIEBERT AIR-COOLED CONDENSER FOR A LIEBERT THERMAL MANAGEMENT SYSTEM. THE CONDENSER SHALL BE DESIGNED TO REJECT WASTE HEAT TO OUTDOOR AIR AND TO CONTROL REFRIGERANT HEAD PRESSURE AS INDOOR EQUIPMENT LOADING AND OUTDOOR AMBIENT CONDITIONS CHANGE.

THE MANUFACTURER SHALL DESIGN AND FURNISH ALL EQUIPMENT IN THE QUANTITIES AND CONFIGURATIONS SHOWN ON THE PROJECT DRAWINGS.

STANDARD 60HZ UNITS SHALL BE CSA-CERTIFIED TO THE HARMONIZED U.S. AND CANADIAN PRODUCT SAFETY STANDARD CSA C22.2 NO. 238/UL 1995 FOR HEATING AND COOLING EQUIPMENT AND SHALL BE MARKED WITH THE CSA C-US LOGO.

2.18.1.1 LIEBERT MC DESIGN REQUIREMENTS

THE AIR-COOLED CONDENSER SHALL BE A FACTORY-ASSEMBLED UNIT, COMPLETE WITH INTEGRAL ELECTRICAL PANEL, DESIGNED FOR OUTDOOR INSTALLATION. THE CONDENSER SHALL BE A DRAW-THROUGH DESIGN.

2.18.1.2 LIEBERT MC STANDARD FEATURES

CONDENSER SHALL CONSIST OF MICROCHANNEL CONDENSER COIL(S), PROPELLER FAN(S) DIRECT-DRIVEN BY INDIVIDUAL FAN MOTOR(S), ELECTRICAL CONTROLS, HOUSING AND MOUNTING LEGS. THE LIEBERT AIR-COOLED CONDENSER SHALL PROVIDE POSITIVE REFRIGERANT HEAD PRESSURE CONTROL TO THE INDOOR COOLING UNIT BY ADJUSTING HEAT REJECTION CAPACITY. MICROCHANNEL COILS SHALL PROVIDE SUPERIOR HEAT TRANSFER, REDUCE AIR-SIDE PRESSURE DROP, INCREASE ENERGY EFFICIENCY AND SIGNIFICANTLY REDUCE THE SYSTEM REFRIGERANT VOLUME REQUIRED. EC FANS AND FAN OPERATING TECHNIQUES SHALL REDUCE SOUND LEVELS. VARIOUS METHODS SHALL BE AVAILABLE TO MATCH INDOOR UNIT TYPE, MAXIMUM OUTDOOR DESIGN AMBIENT AND MAXIMUM SOUND REQUIREMENTS.

2.18.1.3 LIEBERT MC CONDENSER COIL

LIEBERT MICROCHANNEL COILS SHALL BE CONSTRUCTED OF ALUMINUM MICROCHANNEL TUBES, FINS AND MANIFOLDS. TUBES SHALL BE FLAT AND CONTAIN MULTIPLE, PARALLEL FLOW MICROCHANNELS AND SPAN BETWEEN ALUMINUM HEADERS. FULL-DEPTH LOUVERED ALUMINUM FINS SHALL FILL SPACES BETWEEN THE TUBES. TUBES, FINS AND ALUMINUM HEADERS SHALL BE OVEN_BRAZED TO FORM A COMPLETE REFRIGERANT-TO-AIR HEAT EXCHANGER COIL. COPPER STUB PIPES SHALL BE ELECTRIC RESISTANCE_WELDED TO ALUMINUM COILS AND JOINTS PROTECTED WITH POLYOLEFIN TO SEAL JOINTS FROM CORROSIVE ENVIRONMENTAL ELEMENTS. COIL ASSEMBLIES SHALL BE FACTORY LEAK-TESTED AT A MINIMUM OF 300 PSIG (2068KPAG). HOT GAS AND LIQUID LINES SHALL BE COPPER AND SHALL BE BRAZED USING NITROGEN GAS FLOW TO THE STUB PIPES WITH SPUN-CLOSED ENDS FOR CUSTOMER PIPING CONNECTIONS. COMPLETE COIL/PIPING ASSEMBLY SHALL BE THEN FILLED AND SEALED WITH AN INERT GAS HOLDING CHARGE FOR SHIPMENT.

2.18.1.4 LIEBERT MC FAN MOTOR/BLADE ASSEMBLY

THE FAN MOTOR/BLADE ASSEMBLY SHALL HAVE AN EXTERNAL ROTOR MOTOR, FAN BLADES AND FAN/FINGER GUARD. FAN BLADES SHALL BE CONSTRUCTED OF CAST ALUMINUM OR GLASS-REINFORCED POLYMERIC MATERIAL. FAN GUARDS SHALL BE HEAVY GAUGE, CLOSE-MESHED STEEL WIRE, COATED WITH A BLACK CORROSION RESISTANT FINISH. FAN TERMINAL BLOCKS SHALL BE IN AN IP54 ENCLOSURE ON THE TOP OF THE FAN MOTOR. FAN ASSEMBLIES SHALL BE FACTORY-BALANCED, TESTED BEFORE SHIPMENT AND MOUNTED SECURELY TO THE CONDENSER STRUCTURE.

LIEBERT MC CONDENSER EC FAN MOTOR

THE EC FAN MOTORS SHALL BE ELECTRONICALLY COMMUTATED FOR VARIABLE SPEED OPERATION AND SHALL HAVE BALL BEARINGS. THE EC FANS SHALL PROVIDE INTERNAL OVERLOAD PROTECTION THROUGH BUILT-IN ELECTRONICS. EACH EC FAN MOTOR SHALL HAVE A BUILT-IN CONTROLLER AND COMMUNICATION MODULE, LINKED VIA RS485 COMMUNICATION WIRE TO EACH FAN AND THE PREMIUM CONTROL BOARD, ALLOWING EACH FAN TO RECEIVE AND RESPOND TO PRECISE FAN SPEED INPUTS FROM THE PREMIUM CONTROL BOARD.

2.18.1.5 ELECTRICAL CONTROLS

ELECTRICAL CONTROLS AND SERVICE CONNECTION TERMINALS SHALL BE PROVIDED AND FACTORY-WIRED INSIDE THE ATTACHED CONTROL PANEL SECTION. ONLY HIGH-VOLTAGE SUPPLY WIRING AND LOW VOLTAGE INDOOR UNIT COMMUNICATION/INTERLOCK WIRING ARE REQUIRED AT CONDENSER INSTALLATION.

EC FAN SPEED AND PREMIUM CONTROL

THE EC FAN/PREMIUM CONTROL SYSTEM SHALL INCLUDE AN ELECTRONIC CONTROL BOARD, EC FAN MOTOR(S) WITH INTERNAL OVERLOAD PROTECTION, REFRIGERANT AND AMBIENT TEMPERATURE THERMISTORS AND REFRIGERANT PRESSURE TRANSDUCERS. THE PREMIUM CONTROL BOARD SHALL COMMUNICATE DIRECTLY WITH THE INDOOR UNIT'S LIEBERT ICOM CONTROL VIA FIELD_SUPPLIED CANBUS COMMUNICATION WIRES AND VIA FIELD-SUPPLIED LOW-VOLTAGE INTERLOCK WIRES. THE CONTROL BOARD SHALL USE SENSOR AND COMMUNICATION INPUTS TO MAINTAIN REFRIGERANT PRESSURE BY CONTROLLING EACH EC FAN ON THE SAME REFRIGERANT CIRCUIT TO THE SAME SPEED. THE PREMIUM CONTROL BOARD SHALL BE RATED TO A TEMPERATURE OF _30°F TO 125°F. THE PREMIUM CONTROL SHALL BE FACTORY-SET FOR (FAN SPEED) (FAN SPEED WITH LIEBERT LEE-TEMP) CONTROL.

LOCKING DISCONNECT SWITCH

A LOCKING-TYPE DISCONNECT SWITCH SHALL BE FACTORY-MOUNTED AND WIRED TO THE ELECTRICAL PANEL. THE SWITCH SHALL BE ACCESSIBLE FROM THE OUTSIDE OF THE UNIT WITH THE DOOR CLOSED, AND SHALL PREVENT ACCESS TO THE HIGH-VOLTAGE ELECTRICAL COMPONENTS UNTIL SWITCHED TO THE OFF POSITION. THE LOCKING DISCONNECT SHALL BE LOCKABLE IN SUPPORT OF LOCKOUT/TAGOUT SAFETY PROGRAMS.

SHORT CIRCUIT CURRENT RATING

THE ELECTRICAL PANEL SHALL PROVIDE AT LEAST 65,000A SCCR.

CABINET

THE CONDENSER CABINET SHALL BE CONSTRUCTED OF BRIGHT ALUMINUM SHEET AND DIVIDED INTO INDIVIDUAL FAN SECTIONS BY FULL WIDTH BAFFLES. INTERNAL STRUCTURAL SUPPORT MEMBERS, INCLUDING COIL SUPPORT FRAME, SHALL BE GALVANIZED STEEL FOR STRENGTH AND CORROSION RESISTANCE. PANEL DOORS SHALL BE PROVIDED ON TWO SIDES OF EACH COIL/FAN SECTION TO PERMIT COIL CLEANING. AN ELECTRICAL PANEL SHALL BE CONTAINED INSIDE A FACTORY-MOUNTED NEMA 3R WEATHERPROOF ELECTRICAL ENCLOSURE.

2.18.1.6 MOUNTING LEGS STANDARD ALUMINUM LEGS

ALUMINUM LEGS SHALL BE PROVIDED TO MOUNT THE UNIT FOR VERTICAL AIR DISCHARGE WITH RIGGING HOLES FOR HOISTING THE UNIT INTO POSITION. STANDARD HEIGHT IS 18 IN. (457MM).

PART 3 – EXECUTION

3.1 INSTALLATION OF PRECISION COOLING UNITS

3.1.1 GENERAL

INSTALL PRECISION COOLING UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. INSTALL UNITS PLUMB AND LEVEL, FIRMLY ANCHORED IN LOCATIONS INDICATED AND MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES.

3.1.2 ELECTRICAL WIRING

INSTALL AND CONNECT ELECTRICAL DEVICES FURNISHED BY MANUFACTURER BUT NOT SPECIFIED TO BE FACTORY-MOUNTED. FURNISH COPY OF MANUFACTURER'S ELECTRICAL CONNECTION DIAGRAM SUBMITTAL TO ELECTRICAL CONTRACTOR.

3.1.3 PIPING CONNECTIONS

INSTALL AND CONNECT DEVICES FURNISHED BY MANUFACTURER BUT NOT SPECIFIED TO BE FACTORY-MOUNTED. FURNISH COPY OF MANUFACTURER'S PIPING CONNECTION DIAGRAM SUBMITTAL TO PIPING CONTRACTOR.

3.2 FIELD QUALITY CONTROL

START UP THE SYSTEM IN ACCORDANCE WITH MANUFACTURER'S STARTUP INSTRUCTIONS. TEST CONTROLS AND DEMONSTRATE COMPLIANCE WITH REQUIREMENTS. THESE SPECIFICATIONS DESCRIBE REQUIREMENTS FOR A COMPUTER ROOM ENVIRONMENTAL CONTROL SYSTEM. THE SYSTEM SHALL BE DESIGNED TO MAINTAIN TEMPERATURE AND HUMIDITY CONDITIONS IN THE ROOMS CONTAINING ELECTRONIC EQUIPMENT.

THE MANUFACTURER SHALL DESIGN AND FURNISH ALL EQUIPMENT TO BE FULLY COMPATIBLE WITH HEAT DISSIPATION REQUIREMENTS.

3.2.1 SUPPLY AND DRAIN WATER PIPING

CONNECT WATER SUPPLY AND DRAINS TO AIR CONDITIONING UNIT. PROVIDE PITCH AND TRAP AS MANUFACTURER'S INSTRUCTIONS AND LOCAL CODES REQUIRE.

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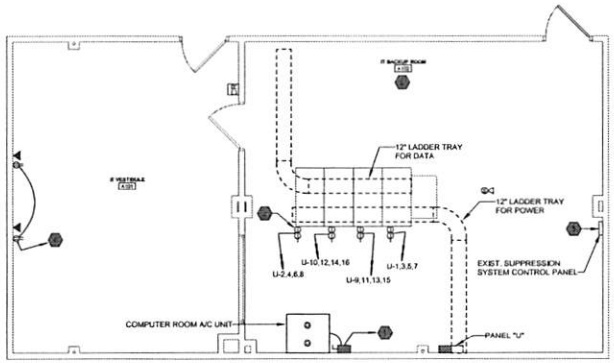
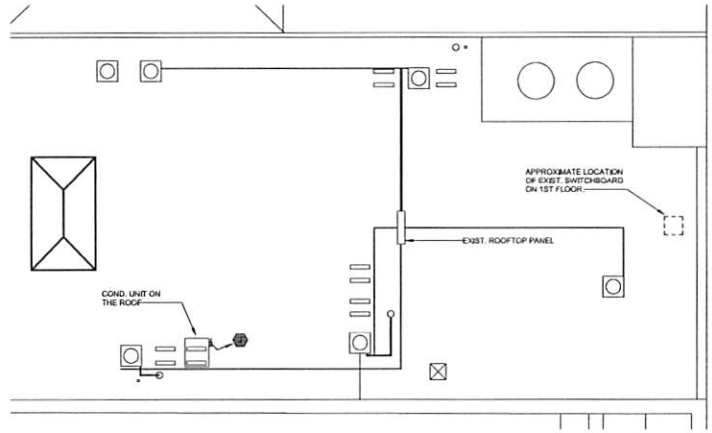


1 Partial 3rd Floor Power Plan
1/4" = 1'-0"



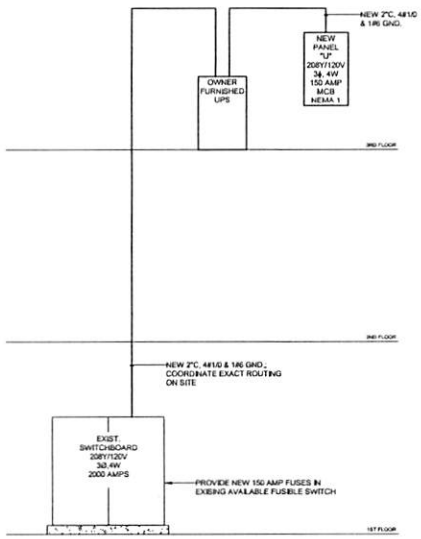
2 Partial Roof Power Plan
1/8" = 1'-0"

Electrical Plan Keynotes

1. NEW HOMERUN TO EXIST. 800 AMP "RESTAURANT" PANEL ON 1ST FLOOR. PROVIDE 1-1/4"C, 3#3 & 1#8 GND. AND NEW 60 AMP, 3 POLE BREAKER IN AVAILABLE SPACE. PROVIDE MOUNTING HARDWARE AS REQUIRED.
2. NEW HOMERUN TO EXIST. ROOFTOP PANEL. PROVIDE 3/4"C, 3#12 & 1#12 GND. TO NEW 15 AMP, 3 POLE BREAKER IN AVAILABLE SPACE.
3. SPECIAL RACK OUTLET. PROVIDE SJ CORD WITH 2#10 & 1#10 GND. FROM NEW PANEL "U" AND A NEMA L6-30R RECEPTACLE (TYP. OF 8). COORDINATE EXACT LOCATION WITH OWNER PRIOR TO INSALLATION.VERIFY EXACT CORD & PLUG CONFIGURATION WITH THE OWNER PRIOR TO INSALLATION.
4. NEW HOMERUN TO EXIST. AVAILABLE PANEL. PROVIDE 1/2"C, 2#12 & 1#12 GND. TO NEW 15 AMP, 3 POLE BREAKER IN AVAILABLE SPACE.
5. DISCONNECT AND RECONNECT HOOD SUPPRESSION SYSTEM PANEL AS REQUIRED FOR WORK IN THIS CONTRACT.
6. REMOVE AND RE-INSTALL LIGHTING IN THIS ROOM. CONNECT TO EXISTING LIGHTING CIRCUIT.

Power Plan Notes

1. THE ARCHITECTURAL FEATURES SHOWN ON THESE DRAWINGS UPON WHICH THE CONTRACT DOCUMENTS ARE BASED MAY BE INACCURATE OR INCOMPLETE. THE CONTRACTOR SHALL COORDINATE ALL INSTALLATION REQUIREMENTS WITH THE MOST CURRENT TO DATE SEALED ARCHITECTURAL CONTRACT DOCUMENTS AND MODIFY AS REQUIRED.
2. THE CONTRACTOR IS RESPONSIBLE FOR INCLUDING IN BID A COMPLETE AND WORKING SYSTEM IN ACCORDANCE WITH THE MOST CURRENT TO DATE SEALED ARCHITECTURAL CONTRACT DOCUMENTS.
3. DEVICE LOCATIONS REPRESENT INTENT AND ARE NOT MEANT TO SHOW THE EXACT LOCATION OF DEVICES. DO NOT SCALE DEVICES FROM THESE DRAWINGS. VERIFY EXACT LOCATION OF ALL DEVICES WITH THE ARCHITECT PRIOR TO ROUGH-IN.
4. WIRING DEVICES SHALL BE LOCATED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
   A. ALL DEVICES SHOWN AT ARCHITECTURAL CASEWORK SHALL BE MOUNTED ABOVE THE COUNTER TOP UNLESS SPECIFICALLY NOTED OTHERWISE. COORDINATE LOCATIONS OF ALL CASEWORK WITH ARCHITECTURAL DRAWINGS.
   B. DEVICES CALLED TO BE LOCATED BELOW CASEWORK SHALL BE LOCATED IN KNEE SPACE OR ACCESSIBLE CABINETS. DEVICES SHALL NOT BE LOCATED BEHIND DRAWERS OR OTHER INACCESSIBLE LOCATIONS. CASEWORK SHALL BE CUT TO ALLOW RECESSED OUTLETS TO BE FLUSH WITH WALL FINISH OR AN EXTENSION RING PROVIDED THAT IS FLUSH WITH THE SURFACE OF THE CASEWORK.
   C. COORDINATE THE RECEPTACLE CONFIGURATION AND FINAL LOCATION OF ALL OWNER FURNISHED EQUIPMENT WITH ARCHITECT PRIOR TO ROUGH-IN. MAKE MODIFICATIONS AS REQUIRED.
5. EACH CIRCUIT SHALL HAVE IT'S OWN NEUTRAL CONDUCTOR. SHARING OF NEUTRAL CONDUCTORS IS NOT ALLOWED.
6. FOR EACH CONDUIT WITH MORE THAN THREE CURRENT CARRYING CONDUCTORS, APPLY DERATING FACTORS AS PER NEC 310.15 (B)(3)(a) AND ADJUST CONDUIT AND CONDUCTOR SIZE ACCORDINGLY.
7. FOR OWNER FURNISHED AND SPECIALTY EQUIPMENT SHOWN PLUG AND CORD CONNECTED, PROVIDE A PLUG AND SEPARATE CORD SIZED ON ACTUAL EQUIPMENT SUPPLIED FOR EACH RECEPTACLE BACK TO NEW PANEL "U". CORD SHALL BE SJ TYPE FOR 250 VOLT EQUIPMENT OR SO TYPE FOR 600 VOLT EQUIPMENT. ALL CORDS SHALL BE SUPPLIED WITH GROUND CONDUCTORS.
8. DUCT MOUNTED SMOKE DETECTORS SHALL BE ADDRESSIBLE TYPE UL LISTED FOR USE WITH EXISTING CONTROL PANEL.
9. ALL WORK SHOWN IS NEW UNLESS NOTED OTHERWISE.
10. PROVIDE RECESSED JUNGTION BOX AND 3/4"C TO ACCESSIBLE CEILING FOR ALL CARD READER LOCATIONS.
11. PROVIDE 4" SQUARE BOX AND SINGLE GANG MUD RING WITH 3/4"C TO ABOVE ACCESSIBLE CEILING AT ALL DATA OUTLET LOCATIONS.
12. MOUNT LADDER TRAY 12" BELOW CEILING. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL HARDWARE AND ACCESSORIES FOR A COMPLETE INSTALLATION.



3 Partial Electrical Riser Diagram
Not to Scale

Panel U

Location: IT BACKUP ROOM A102
Fed From:

Type: Surface, Type 1
Voltage: 120/208 Wye, 3PH, 4W
Mains: 150 A MAIN BREAKER
A.I.C. RATING: 22,000

Remarks: Ground Bus

CKT	Circuit Description	wire	Notes	Trip	Poles	A	B	C	Poles	Trip	Notes	wire	Circuit Description	CKT
1	Receptacle			30 A	2	2400	2400		2	3 A			Receptacle	2
3	--	--	--	--	--			2400	--	--	--	--	--	4
5	Receptacle			30 A	2			2400	2	30 A			Receptacle	6
7	--	--	--	--	--	2400	2400		--	--	--	--	--	8
9	Receptacle			30 A	2		2400	2400	2	30 A			Receptacle	10
11	--	--	--	--	--			2400	--	--	--	--	--	12
13	Receptacle			30 A	2	2400	2400		2	30 A			Receptacle	14
15	--	--	--	--	--		2400	2400	--	--	--	--	--	16
17	Space			--	1				1	--			Space	18
19	Space			--	1	-	-		1	--			Space	20
21	Space			--	1		-	-	1	--			Space	22
23	Space			--	1			-	1	--			Space	24
25	Space			--	1	-	-		1	--			Space	26
27	Space			--	1		-	-	1	--			Space	28
29	Space			--	1			-	1	--			Space	30
31	Space			--	1	-	-		1	--			Space	32
33	Space			--	1		-	-	1	--			Space	34
35	Space			--	1			-	1	--			Space	36
37	Space			--	1	-	-		1	--			Space	38
39	Space			--	1		-	-	1	--			Space	40
41	Space			--	1			-	1	--			Space	42
				Total Load:		14976 VA	14976 VA	9984 VA						
				Total Amps:		131 A	131 A	83 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Receptacle	39936 VA	62.52%	24968 VA	Total Conn. Load: 39936 VA
				Total Est. Demand: 24968 VA
				Total Conn.: 111 A
				Total Est. Demand: 69 A

Notes:

SYMBOL SCHEDULE

	SPECIAL PURPOSE RECEPTACLE
	DUPLEX RECEPTACLE
	DATA OUTLET ROUGH-IN
	CONDUIT IN WALL OR CEILING
	HOMERUN
PANEL	POWER PANEL
	FUSED SAFETY DISCONNECT SWITCH
GND	GROUND
	KEYNOTES
	FIRE ALARM SYSTEM DUCT MOUNTED SMOKE DETECTOR
	FIRE ALARM SYSTEM CEILING MOUNTED SPEAKER/ STROBE
CR	CARD READER ROUGH-IN

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E100

BASIC ELECTRICAL REQUIREMENTS

1. It is the intent of the drawings and specifications to obtain a complete, fully functional and satisfactory installation. They are not intended to show over connection detail or each item essential to the functioning of the systems. The contractor shall be responsible for finishes and structural conditions and soundness with other trades to avoid interference between the various systems. Additionally, the contractor shall provide all essential options and accessories for a fully functional system as described.

2. Organize and lay out Work so that it will be concealed in furred chases and suspended ceilings, etc., in finished portions of the building, unless specifically noted to be exposed. Install all Work parallel or perpendicular to building lines unless otherwise noted.

3. Products shall conform to requirements of the National Electrical Code. Where Underwriters' Laboratories have set standards, listed products and listed labels, products used shall be listed and labeled by UL and meet NEMA standards.

4. Equipment selected shall conform to the building features and shall be coordinated with all components. Do not provide equipment that will not meet arrangement and space limitations. Contractor shall submit room layouts with submitted items shown drawn to scale. Submittals will be rejected without floor plan Drawings showing submitted items.

5. Equipment specified in Sections Panelboards, and Disconnect Safety Switches shall be provided by the same manufacturer.

6. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the Contract Documents. Applicable codes include the following:

NFPA 70, National Electrical Code (2020)
NFPA 101, Life Safety Code (2018)
International Building Code (2018)
American National Standards Institute (ANSI)
National Electrical Manufacturers Association (NEMA)
Underwriters' Laboratories (UL)

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS

1. Provide factory-fabricated wire of the size, rating, material and type as indicated for each service. Where not indicated, provide proper selection as required to comply with installation requirements and with NEC standards. The minimum size wire to be used for power or lighting circuits shall be #12 copper with insulation as noted below.

2. All wire #10 and smaller shall be solid, all wire #8 and larger shall be stranded.

3. Feeders and Branch Circuits at sizes: 98 percent conductivity copper, stranded conductor, 600-volt insulation, THHW/THWN.

4. Conductors No. 10 and smaller shall have a solid colored insulation throughout the entire length of the wire.

5. Conductors No. 8 AWG and larger shall be identified by colored plastic tape that matches the circuit phase color at all visible points where colored insulation is unavailable. Colored tape shall be applied at all accessible locations of the conductor.

6. Each multi-wire branch circuit shall have a separate neutral conductor. Sharing neutral conductors is not allowed.

7. Install conductor sizes as indicated. Provide No. 10 conductor for single phase, 20 ampere circuits for which the distance from panelboard to the first outlet is more than 100 feet.

8. Insulation color shall be as follows:

	120/208 Volts
Phase A	Black
Phase B	Red
Phase C	Blue
Neutral	White
Ground	Green

GROUNDING AND BONDING

Grounding Conductors.

1. Provide 600-volt insulated conductors having a green-colored insulation for grounding electrode and equipment grounding conductors. Use stranded conductors.

2. Grounding conductors shall be insulated copper conductor, green in color to size #8 AWG. Insulated conductors larger than #8 AWG shall be same as phase conductors but identified with green tape at each accessible opening or location in raceway.

3. Provide bare conductors for bonding jumpers.

Connections.

4. Unless otherwise noted, for below-grade connections provide exothermic welded type.

5. For above-grade connections provide mechanical bolted-type connections utilizing high conductive copper alloy or bronze lugs or clamps.

6. Grounding clips shall be O-Z Gedney, Steel City (Thomas & Betts) Type G.

7. Grounding electrodes shall not be smaller than 3/4-inch diameter, with minimum length ten (10) feet.

8. Grounding electrodes shall be copper-clad steel for corrosion protection.

9. Ground cabinets, junction boxes, outlet boxes, motors, conveyors, raceways, fittings, switchgear, transformer enclosures, and other equipment and metallic enclosures. Ground equipment and enclosures to the continuous grounded, metallic raceway system is required in addition to any other specific grounding shown.

10. Provide bonding jumpers and ground wire throughout to ensure electrical continuity of the grounding system.

11. Provide grounding type insulated bushings for metal conduits terminating in equipment enclosures containing a ground bus and connect the bushing to the ground bus.

12. Provide a green insulated equipment grounding conductor for each feeder, receptacle lighting and power branch circuit.

13. When grounding and bonding conductors are not sized on drawings, size the grounding conductors in accordance with NEC Table 250-122. Size bonding jumper so that minimum cross-section area is greater than or equal to that of the equivalent grounding conductor as determined from NEC Table 250-122.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

Conduit.

1. Rigid metallic conduit shall be steel conduit manufactured in accordance with ANSI C80.1 and listed to UL 6 with label showing evidence of third party testing. Rigid metallic conduit shall be hot-dipped galvanized and shall be supplied with factory tapered threads. Conduit shall be galvanized after cutting of threads. Manufactured elbows and nipples shall meet the same ANSI/6 and UL standards. Field installed fittings shall be threaded galvanized steel fittings and listed to UL6/6A.

2. Electrical Metallic Tubing shall be steel conduit manufactured in accordance with ANSI C80.3 and listed to UL 797 with label showing evidence of third party listing. Electrical Metallic Tubing shall be hot-dipped galvanized. Manufactured elbows and nipples shall meet the same ANSI/03 and UL standards. Field installed fittings shall be compression type steel fittings and listed to UL6/6A. Set screw fittings are not acceptable.

3. Flexible Metallic Conduit shall be reduced wall steel conduit listed to UL-1 and UL 1-479 with label showing evidence of third party listing. Flexible Metallic Conduit shall be hot-dipped galvanized. Field installed fittings shall be malleable iron screw fittings manufacturer to NEMA FB-1 and listed to UL6/6A. Press on or crimp type fittings are not acceptable.

4. Liquid Tight Flexible Metallic Conduit shall be steel interlocked conduit core with extruded PVC jacket listed to UL-360 with label showing evidence of third party listing. Flexible Metallic Conduit shall be hot-dipped galvanized with a UV sunlight resistant jacket. Field installed fittings shall be malleable iron threaded fittings manufacturer to NEMA FB-1 and listed to UL6/6A.

5. Conduit shall be a minimum trade size of ½".

6. Metallic conduits must be continuous between enclosures such as outlet, junction and pull boxes, panels, cabinets, motor control centers, etc. The conduit must enter and be secured to enclosures so that each system is electrically continuous throughout. Where knockouts are used, provide double locknuts, one on each side. At conduit terminations, provide insulated bushings or insulated throat connectors for conductor protection. Where conduits terminate in equipment having a ground bus, such as in switchgear, motor control centers and panelboards, provide conduit with an insulated grounding bushing and extend a suitable grounding wire to the ground bus.

7. Run concealed conduit as directly and with the largest radius bends as possible. Run exposed conduit parallel or at right angles to building or other construction lines in a neat and orderly manner. All conduit shall be concealed unless specifically noted otherwise.

8. Install each entire conduit system complete before pulling in any conductors. Clean the interior of every run of conduit before pulling in conductors to guard against obstruction and abrasions.

9. Make bends with standard elbows or conduit bent to not less than same radius. Bends must be free from dents or flattening. For power conduits use no more than the equivalent of four 90 bends (for telecommunications conduits use no more than two 90 bends or a total of 180 of bends) in any run between terminals and cabinets, or between outlets and junction boxes or pull boxes.

Conduit type according to use and location:

10. Exposed to rain, condensation, moisture or constant high humidity: RMC

11. Exposed in areas not specified in the preceding paragraphs: RMC or EMT

12. Concealed in exterior or interior walls and ceiling spaces: EMT

13. Electrical equipment in dry locations and subject to vibration and movement, excluding motors: flexible metal conduit, 36 inches maximum length.

14. Electrical equipment in wet locations and subject to vibration and movement, and all motors. Liquidtight flexible metal conduit, 36 inches maximum length.

15. Below grade: RMC or rigid nonmetallic conduit a minimum 24 inches below finished grade.

16. Continue the heavier, more protective type conduit application into the area where lighter, less protective type conduit is permitted.

17. For below grade to above grade outdoor locations, provide rigid metal steel conduit elbows and risers.

Outlet Boxes.

18. General: All outlet boxes shall be listed to UL-514. Sheet metal and device boxes shall be manufactured to NEMA OS-1. Cast boxes shall be manufactured to NEMA FB 1. All outlet boxes shall be flush device boxes unless specifically noted otherwise.

19. Flush Device Boxes: Provide galvanized steel boxes of sufficient size to accommodate wiring devices to be installed at outlet. Provide an extension ring for the device to be installed. Square or rectangular boxes may be supplied. Unless otherwise noted, provide 1-1/2 inch deep by 4 inch square box. Boxes for use with outlet wired and telecommunications outlets shall be 4 inch square x 2-1/8" deep minimum.

20. Exposed Device Boxes: Provide galvanized steel boxes of sufficient size to accommodate wiring devices to be installed at outlet. Provide a surface cover for the device to be installed. Square or rectangular boxes may be supplied. Unless otherwise noted, provide 1-1/2 inch deep by 4 inch square box. Boxes for use with outlet wired and telecommunications outlets shall be 4 inch square x 2-1/8" deep minimum.

21. Exterior Locations: For both flush and exposed applications, provide cast, one piece type, listed for use in wet locations. Provide weather proof "while-in-use" cover for the device to be installed. Unless otherwise noted, provide 1-1/2 inch deep by 4 inch square box.

22. Small Sheet Metal Pull and Junction Boxes: Boxes shall be galvanized sheet metal with screw-on cover and welded seams, stainless steel nuts, bolts, screws and washers. Boxes shall be sized in accordance with NEC and shall be manufactured in accordance with NEMA OS 1.

23. Do not mount boxes back-to-back in walls. Provide minimum 6-inch separation in non-fire-rated walls. Provide minimum 24-inch horizontal separation in acoustic-rated walls.

24. Membrane penetration of maximum 1-hour, up to maximum 2-hour fire rating walls and partitions shall be protected by listed putty pads or other listed materials and methods. Refer to the architectural requirements for fire stopping of rated walls.

25. Secure boxes rigidly to the substrate upon which they are being mounted, or solidly linked boxes in concrete or masonry. Boxes shall not be permitted to move laterally. Boxes shall be secured between two studs. Boxes connected to one stud are not permitted.

Junction and Pull Boxes:

26. Install boxes as required to facilitate cable installation in raceway systems. Generally provide boxes in conduit runs of more than 100 feet or with more than three 90 degree bends. Locate boxes strategically and make them of such shape to permit easy pulling of wire or cables.

27. Install boxes so that covers are readily accessible and easily removable after completion of the installation. Include suitable access doors for boxes above inaccessible ceilings. Select a practical size for each box and cover

28. In inaccessible ceiling areas, position outlets and junction boxes within reach of ceiling access panels.

29. Locate pull boxes and junction boxes above accessible ceilings or in unfinished areas.

30. Support pull and junction boxes independent of conduit. Combination box/conduit hangers from drop rod (like Caddy B13 Series) are acceptable.

PANELBOARDS

1. Provide dead-front, bolt-on circuit breaker type panelboards as scheduled.

2. Enclosure shall be NEMA Type 1 for indoor dry locations and NEMA type 3R for exterior and wet locations unless otherwise indicated on the Contract Documents.

3. Provide cabinet front with one door over the interior and an additional full-height hinged door front cover over interior and wireway (door-in-door). Cabinet front shall be cleaned and finished with manufacturer's standard finish. Provide flush door locks.

4. Panelboard NEMA type 1 enclosures shall be galvanized steel with all cut edges galvanized. Boxes shall have standard conduit knockouts on ends of enclosure.

5. Bus shall be tin-plated copper and braced for the maximum available fault current. Minimum bus ampacity shall be 100 amperes.

6. Provide a 6 inch x ¼ inch tin-plated copper ground bus in all panelboards. The ground bus shall be drilled to accept lugs for all grounding conductors. Mount ground bus on brackets to allow easy installation of bolts, nuts and lockwashers used to attach ground lugs.

7. Provide a tin-plated copper neutral bus with the same ampacity rating as the phase bus. Neutral bus shall be isolated from the ground bus.

8. Panelboard electrical ratings and configurations are indicated in the Contract Documents.

9. Branch circuit panelboards shall be as follows:

Type 120/208 V	Square D NQ	Siemens P1 or P2	Cutler-Hammer PRL1A

10. Provide molded case circuit breakers of manufacturer's standard industrial construction, with integral inverse time delay thermal and instantaneous trip. Provide bolt-on circuit breakers for 120/208V panels.

11. Circuit breakers shall be 240 VAC rated for nominal 120/208V panels. Minimum interrupting ratings shall be 10,000 amperes for 120/208V circuits, unless higher rating noted on the Contract Documents.

12. Multi-pole breakers shall be two or three pole as specified. Handle ties are not permitted.

13. Panels shall be fully rated; combination series rated is not allowed. All overcurrent devices shall be capable of interrupting the available fault current.

14. Anchor enclosures firmly to walls and structural surfaces, ensuring that they are permanently and mechanically secured.

15. Install panelboards such that the center of the circuit breaker in the highest position will not be more than 6-1/2 feet above the floor.

SAFETY SWITCHES

Fusible Switches:

1. Provide heavy duty, type HD, single throw, 240 VAC or 600 VAC switch in accordance with the load voltage with fuse interiors to accommodate fuses as required for the load. Switch shall be provided with a lockable handle that interlocks with the cover in the closed position.

2. Heavy Duty Switches shall be Square D H series, Siemens HF series, or Cutler Hammer DH.

Accessories.

3. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.

4. Neutral Kit: Internally mounted, insulated, capable of being grounded and bonded, labeled for copper and aluminum neutral conductors.

5. Indoor, Dry and Clean Locations: NEMA 1 enclosure.

Wet Locations: NEMA 3R enclosure.

FUSES

Class RK1

1. Provide low peak dual element time delay fuses rated for 600 amps or less at 250 or 600 volts.

2. Fuses shall be Bussmann LPSH or SpRK; Gould Shawmut A2D or A6D; Littelfuse LLSp or SJ RK.

Class RK5

3. Provide dual element time delay fuses rated for 600 amps or less at 250 or 600 volts.

4. Fuses shall be Bussmann FRSH or SpR; Gould Shawmut TR or TR3; Littelfuse FLSH or SJR_D

Application:

5. Provide class RK1 fuses for feeders to panels and other electrical equipment.

6. Provide class RK5 fuses for all motors, compressor loads and all other loads not listed above.

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8/13/2023

SOUTHERN UNIVERSITY SHREVEPORT
LOUISIANA - NEW BACKUP IT ROOM
610 TEXAS STREET

NO.	REVISIONS	DATE

PROJECT NO.:
PHASE: 50% CONSTRUCTION DOCUMENTS
ISSUED FOR: CONSTRUCTION
DATE: 8-7-2023

E200

MERGE engineering

WILLIAMS
ARCHITECTURE

SOUTHERN UNIVERSITY SHREVEPORT LOUISIANA – NEW BACKUP IT ROOM

WA PROJECT #WA-19-123

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