GENERAL NOTES

1. GENERAL NOTES SHALL APPLY TO ALL HVAC DRAWINGS.
2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS, METHODS, AND WORK SCHEDULING ASSOCIATED WITH THE INSTALLATION OF THE HVAC SYSTEMS.
4. PROVIDE ALL MATERIALS, EQUIPMENT, AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITIONS OF ALL APPLICABLE STATE AND LOCAL CODES.
6. CONTRACTOR SHALL VISIT THE SITE TO VERIFY/EXAMINE EXISTING CONDITIONS PRIOR TO SUBMISSION OF BID. NO ADDITIONAL COMPENSATION/ALLOWANCES SHALL BE CONSIDERED FOR FAILURE TO OBSERVE THIS REQUIREMENT.
7. VERIFY THE SIZE AND LOCATION OF ALL EXISTING SERVICES. NOTIFY THE ENGINEER OF ALL DISCREPANCIES THAT EXIST BETWEEN THE CONTRACT DOCUMENTS AND THE EXISTING SERVICES BEFORE MAKING ANY CONNECTIONS TO THE EXISTING SERVICES.
8. ALL MATERIALS AND EQUIPMENT REMOVALS SHALL BE DISPOSED OF AS DIRECTED BY THE OWNER OR THE ARCHITECT.
9. ALL FLOOR, CEILING, ROOF, SHAFT AND WALL OPENINGS LEFT BEHIND AFTER REMOVAL OF PIPING, WIRING, TUBING, EQUIPMENT, DUCTWORK, ETC. SHALL BE PATCHED TO MATCH EXISTING CONSTRUCTION UNLESS OTHERWISE NOTED.
10. THE CONTRACTOR SHALL REVIEW EXISTING EQUIPMENT AND HARDWARE FOR RE-USE AND/OR REMOVAL WITH THE BUILDING OWNER, AND SHALL REMOVE AND/OR DISPOSE OF ALL UNUSED MATERIAL FROM THE BUILDING SITE AS DIRECTED BY THE BUILDING OWNER. RETURN ALL REMOVED AND/OR UNUSED HARDWARE TO THE BUILDING OWNER.
11. THE CONTRACTOR SHALL LEAVE SITE BROOM CLEAN AT END OF EACH WORKING DAY. ALL RUBBISH AND DEBRIS SHALL BE PROMPTLY REMOVED FROM THE SITE. THE CONTRACTOR SHALL PROVIDE HIS OWN CONTAINERS AND CLEANING EQUIPMENT.
12. THE DRAWINGS DO NOT INDICATE ALL EQUIPMENT, PIPING, DUCTWORK AND CONDUIT LOCATED WITHIN THE SPACE OR ABOVE THE CEILING. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES PRIOR TO FABRICATION OF PIPING AND DUCTWORK AND INSTALLATION OF EQUIPMENT.
13. CONTRACTOR SHALL PROVIDE ALL NECESSARY MISCELLANEOUS STEEL FOR THE SUPPORT OF ALL EQUIPMENT SUSPENDED FROM SLAB OR STEEL. CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING CEILING JOISTS, ETC. PRIOR TO SUSPENDING EQUIPMENT.
14. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
15. ALL DUCTWORK, PIPING AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.
16. ANY 'EXISTING TO REMAIN' PIPING AND/OR DUCTWORK THAT IS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED TO MATCH EXISTING.
17. UNLESS OTHERWISE SPECIFIED, ALL MOTORS 1 H.P. AND ABOVE SHALL BE 3 PHASE AND MOTORS UNDER 1 H.P. SHALL BE SINGLE PHASE.
18. HVAC CONTRACTOR IS RESPONSIBLE FOR SUPPLYING ALL MOTOR STARTERS ASSOCIATED WITH HIS WORK. PROVIDE COMBINATION STARTER/DISCONNECTS WHEN EQUIPMENT IS NOT IN SIGHT OF ELECTRIC PANEL SERVING SAME. ALL STARTERS SHALL HAVE "HAND-OFF-AUTO" SELECTION SWITCHES.
19. CONTRACTOR SHALL MAINTAIN PROPER CLEARANCES AS PER CODE AND MFR'S RECOMMENDATIONS FOR MAINTENANCE FOR ALL HVAC EQUIPMENT.
20. EQUIPMENT MANUFACTURERS NAMES AND MODEL NUMBERS ARE SHOWN FOR THE BASIS OF DESIGN. THE EQUIPMENT HAS BEEN SELECTED BY THE ENGINEER FOR CONFORMANCE TO VARIOUS CRITERIA SUCH AS, CAPACITIES, ELECTRICAL CRITERIA, STANDARD FEATURES, ETC.. SUBSTITUTION OF ANY EQUIPMENT SHALL NOT BE ALLOWED UNLESS APPROVED BY THE ENGINEER. ALL COSTS RESULTING FROM SELECTION OF OTHER THAN SPECIFIED EQUIPMENT SHALL BE BORNE BY THE CONTRACTOR, INCLUDING BUT NOT LIMITED TO, WORK AFFECTING OTHER CONTRACTORS, OWNER, OR DESIGN, INCLUDING REVISING SUPPORTS AND STRUCTURES, ELECTRICAL PROVISIONS AND CONTROLS.
21. COORDINATE THE SIZE AND LOCATION OF ROOF PENETRATIONS AND FLASHING REQUIREMENTS WITH THE WORK OF OTHER TRADES.
22. ROUTE PIPING AND DUCT SYSTEMS PARALLEL AND PERPENDICULAR TO THE BUILDING LINES. MOUNT AS CLOSE AS POSSIBLE TO THE UNDERSIDE OF THE BUILDING STRUCTURES.
23. COORDINATE THE INSTALLATION OF THE HVAC SYSTEMS WITH THE WORK OF OTHER TRADES. PROVIDE OFFSETS IN PIPING AND DUCTWORK AS REQUIRED AT NO ADDITIONAL COST TO AVOID OBSTRUCTIONS.
24. ALL AC CONDENSATE PIPING SHALL PITCH DOWN A MINIMUM OF 1/8 INCH PER LINEAR FOOT. PROVIDE FULL SIZE TRAP AT EQUIPMENT CONNECTION.
25. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT AND ROOFTOP UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH 'P' TRAP, AND PIPED TO NEAREST DRAIN. SEE DETAILS SHOWN ON THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR DEPTH OF AIR CONDITIONING CONDENSATE TRAP.
26. PROVIDE SLEEVES AND CAULK ALL PIPING PENETRATIONS THROUGH WALLS AND FLOORS AND PATCH TO MATCH THE ADJACENT CONSTRUCTION. PROVIDE CHROME-PLATED ESCUTCHEONS ON ALL PIPING PENETRATIONS IN EXPOSED LOCATIONS.
27. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
28. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO AND WITHIN 50 FEET OF ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS) THROUGHOUT MECHANICAL EQUIPMENT ROOMS.
29. MECHANICAL CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR AND PROVIDE LOW VOLTAGE SUPPLY TO ALL ATC CONTROL PANELS, THERMOSTATS, VAV TERMINALS, SENSORS, MOTOR DAMPERS AND FIRE/SMOKE DAMPERS. PROVIDE LOW VOLTAGE TRANSFORMER AS REQUIRED.
30. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE.
31. PROVIDE MAGNETIC MOTOR STARTER WITH BUILT IN DISCONNECT SWITCH FOR ALL CONSTANT VOLUME FANs/AHUs/PUMPS CONNECTED TO ATC/BMS SYSTEM.
32. REFRIGERANT LINES SHOWN ARE DIAGRAMMATIC AND FOR SUGGESTED ROUTING ONLY. THE MECHANICAL CONTRACTOR SHALL PROVIDE REFRIGERANT LINE SIZES, FINAL LAYOUT AND REQUIRED ACCESSORIES (SUCH AS SIGHT GLASS, EXPANSION VALVES, FILTER-DRIER, LIQUID LINE TRAPS, SUCTION ACCUMULATOR, ETC.) IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
33. ANY NEW ROOFTOP EQUIPMENT LOCATED WITHIN CLOSE TO ROOF EDGE SHALL BE PROVIDED WITH ROOF RAILING BY CODE. PROVIDE MINIMUM 42" HIGH GUARDRAIL AS REQUIRED FOR EQUIPMENT LOCATED WITHIN 10 FT. FROM BUILDING EDGE, EXTEND GUARDRAIL HORIZONTALLY MIN. OF 3 FT BEYOND EDGE OF EQUIPMENT.
34. CONTRACTOR SHALL INSPECT, REFURBISH & REPAIR EXISTING EQUIPMENT TO BE REUSED. REPLACE FILTERS & BELTS. REPAIR DAMPERS, CLEAN & LUBRICATE AS NECESSARY TO RESTORE EXISTING EQUIPMENT TO GOOD WORKING ORDER.
35. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
36. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
37. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.
38. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
39. WHEN MECHANICAL WORK IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH OTHER SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A ARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
40. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
41. MECHANICAL EQUIPMENT AND PIPING SHALL NOT BE SUPPORTED FROM METAL DECK.
42. ALL ROOF MOUNTED EQUIPMENT CURBS FOR EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.
43. COORDINATE THE SIZE AND LOCATION OF ROOF PENETRATIONS AND FLASHING REQUIREMENTS WITH THE WORK OF OTHER TRADES.
44. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
45. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.
46. ALL KEY NOTES INDICATED ON THE DRAWINGS AS "TYPICAL" ARE TO BE CONSIDERED AS SHOWN AT ALL OTHER SIMILAR CONDITIONS WHETHER NOTED OR NOT.
47. ALL NEW EQUIPMENT AND MATERIAL SHALL BE FREE OF DEFECTS AND SHALL PERFORM AS INTENDED. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL MAJOR MANUFACTURED ITEMS REQUIRED ON THIS PROJECT.
48. THE CONTRACTOR SHALL PROVIDE THE OWNER WITH REPRODUCIBLE "AS-BUILT" DRAWINGS FOR DUCTWORK AND PIPING AND FOUR (4) COPIES OF AN OPERATING AND MAINTENANCE MANUAL AT THE CONCLUSION OF THE JOB.
49. THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A ONE (1) YEAR WRITTEN GUARANTEE OF ALL WORK (LABOR AND MATERIALS) STARTING FROM THE DATE OF THE OWNER ACCEPTANCE.

MECHANICAL SYMBOL LIST

ABBREVIATIONS

AC	A/C UNIT
ACCU	AIR COOLED CONDENSING UNIT
AHU	AIR HANDLING UNIT
AV	AUTOMATIC AIR VENT
BMS	BUILDING MANAGEMENT SYSTEM
CD	CEILING DIFFUSER
CFM	CUBIC FEET OF AIR PER MINUTE
CR	CEILING REGISTER
DDC	DIRECT DIGITAL CONTROL
(E)	ESISTING TO REMAIN
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EWT	ENTERING WATER TEMPERATURE
FLA	FULL LOAD AMPS
FTR	FINNED TUBE RADIATION
GPM	GALLONS PER MINUTE
GC	GENERAL CONTRACTOR
HW	HOT WATER — S-DENOTES SUPPLY, R-DENOTES RETURN, FTR-FINTUBE RADIATION
HC	HEATING COIL
HP	HORSEPOWER
HVAC	HEATING VENTILATION AND AIR CONDITIONING
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
LF	LINEAR FOOT
MBH	THOUSAND BTU'S PER HOUR
OA	OUTSIDE AIR
PC	PUMPED CONDENSATE
PHC	PRE-HEAT COIL
RHC	REHEAT COIL
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RF	RETURN FAN
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SR	SUPPLY REGISTER
SS	STAINLESS STEEL
SG	SUPPLY GRILLE
SP	STATIC PRESSURE
TEF	TOILET EXHAUST FAN
TYP	TYPICAL
Ø	DIAMETER

PIPING AND VALVES

	PIPE UP
	PIPE DOWN
	COMBINATION BALANCING & SHUT-OFF VALVE
	CHECK VALVE
	AUTOMATIC TWO-WAY CONTROL VALVE
	UNION
	RELIEF VALVE
	BUTTERFLY VALVE
	THERMOMETER
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
	PRESSURE GAUGE
	CAPPED PIPE WITH SHUTOFF VALVE
	FLOW ARROW
	SLOPE DIRECTION

MISCELLANEOUS

T	SPACE TEMPERATURE SENSOR/THERMOSTAT
	PIPE SECTION
	EXISTING TO NEW CONNECTION

NOTE: NOT ALL SYMBOLS INDICATED ARE NECESSARILY WITHIN THE SCOPE OF WORK

DEMOLITION GENERAL NOTES

1. THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT AND MATERIALS AS INDICATED ON THE CONTRACT DRAWINGS AND THESE SPECIFICATIONS.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITIONS OF ALL APPLICABLE STATE AND LOCAL CODES.
3. THE CONTRACTOR SHALL VISIT THE SITE AND INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A PROPOSAL FOR WORK. HE SHALL INVESTIGATE ALL CONDITIONS AND DIMENSIONS AND INCLUDE IN HIS PRICE THE COST FOR OVERCOMING ALL DIFFICULTIES DUE TO FIELD CONDITIONS. NO PART OF THE WORK SHALL BEGIN BEFORE EXISTING CONDITIONS ARE CAREFULLY CHECKED AND ALL DISCREPANCIES ARE REPORTED TO THE ARCHITECT OR ENGINEER.
4. THE CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED FOR CONSTRUCTION. THE OWNER SHALL PAY ALL ASSOCIATED FEES.
5. THE CONTRACTOR SHALL REMOVE AND/OR DISPOSE OF ALL UNUSED MATERIAL FROM THE BUILDING SITE AS DIRECTED BY THE BUILDING OWNER.
6. THE CONTRACTOR SHALL LEAVE SITE BROOM CLEAN AT END OF EACH WORKING DAY. ALL RUBBISH AND DEBRIS SHALL BE PROMPTLY REMOVED FROM THE SITE. THE CONTRACTOR SHALL PROVIDE HIS OWN CONTAINERS AND CLEANING EQUIPMENT.
7. ALL WORK SHALL BE DONE DURING NORMAL WORKING HOURS UNLESS OTHERWISE REQUESTED BY OWNER.
8. THE DRAWINGS DO NOT INDICATE ALL EQUIPMENT, PIPING, DUCTWORK AND CONDUIT LOCATED WITHIN THE SPACE OR ABOVE THE CEILING.
9. CONTRACTOR SHALL PROVIDE ALL NECESSARY ADDITIONAL DUCT, PIPE, AND/OR EQUIPMENT SUPPORTS REQUIRED FOR EXISTING ITEMS TO REMAIN DUE TO DUCT, PIPE, OR EQUIPMENT REMOVALS. CONTRACTOR SHALL PROVIDE TEMPORARY PIPE AND DUCT CAPS ON EXISTING EQUIPMENT TO REMAIN. PROTECT EXISTING EQUIPMENT TO REMAIN DURING DEMOLITION WORK.
10. OPENINGS LEFT BY THE REMOVAL OF EQUIPMENT, DUCTWORK, AND PIPING SHALL BE PATCHED TO MATCH EXISTING CONSTRUCTION UNLESS OTHERWISE NOTED.

MECHANICAL DRAWING LIST

PROJECT NAME

MONTCLAIR STATE UNIVERSITY –
VILLAGE APT – IDF ROOM AC UNIT REPLACEMENT

CLIENT PROJECT No.

KEY PLAN:

REV.#	DATE	ISSUE DESCRIPTION
1	4/15/21	ISSUE FOR BID

LORING CONSULTING ENGINEERS
Loring Consulting Engineers, Inc.
300 Alexander Park, Suite 310
Princeton, NJ 08540
P. 609.716.6160
www.loringengineers.com
New York City • Washington, DC • Princeton • Durham • Toronto
CERTIFICATE OF AUTHORIZATION NO. 24GA27952700
Loring No. 12284

DRAWING TITLE:

MECHANICAL
NOTES, SYMBOLS
& ABBREVIATIONS

GRAPHIC SCALE:

SEAL:

Vincent Farese, PE
N.J. Professional Engineer No. 43960

DRAWN: M.A.	CHECKED: A.B.
APPROVED:	
LORING JOB No.:	12284
DATE:	03/--/2021
SHEET NUMBER:	M-001

D:\12284 MSU – VILLAGE COMPLEX-IT-FCU REPLACEMENTS\...M-001 GENERAL NOTES.DWG 4/15/2021 5:30 PM PRINTED BY: ABHAVSAR

HVAC SPECIFICATIONS

PART- 1 GENERAL

1. GENERAL REQUIREMENTS

A. ALL MECHANICAL AND ELECTRICAL WORK SHALL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL MEET ALL LOCAL CODES AS STATED BELOW. ALL DEFECTS, WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING MANAGER AT NO ADDITIONAL COST. UPON COMPLETION OF THE WORK UNDER THIS CONTRACT, THE CONTRACTOR SHALL REMOVE ALL TOOLS, APPLIANCES, SURPLUS MATERIAL AND SCRAP LEAVING THIS WORK IN PERFECT CONDITION

B. THE BUILDING MANAGEMENT AND BUILDING STANDARDS FOR ALTERATIONS AND CONSTRUCTION ARE PART OF THIS SECTION AND CONTRACT. ALL WORK PERFORMED HEREUNDER SHALL BE SUBJECT THERETO.

2. SCOPE OF WORK

A. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, TOOLS, APPLIANCES, SERVICES, HOISTING, SCAFFOLDING, RIGGING, SUPERVISION AND OVERHEAD FOR THE FURNISHING AND INSTALLING OF ALL THE HEATING, VENTILATING AND AIR CONDITIONING, EXHAUST AND RELATED WORK COMPLETE, IN ACCORDANCE WITH THE DRAWINGS, SCHEDULES AND SPECIFICATIONS. ANY LISTING OR INDICATION OF THE ITEMS FURNISHED OR WORK PERFORMED SHALL NOT LIMIT THE GENERAL REQUIREMENTS TO FURNISH, INSTALL, TEST AND PLACE IN OPERATION ALL WORK, INCLUDING ACCESSORIES REQUIRED TO COMPLETE THE CONTRACT IN A COMPLETE MANNER. THE SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

1) PROVIDE AC UNITS.
2) PROVIDE PIPING, HANGERS, VALVES, ETC.
3) INSULATION FOR NEW AND EXISTING PIPING.
4) PROVIDE COMPLETE CONTROLS INCLUDING CONTROL DEVICES, PANELS, THERMOSTATS, CONTROL WIRING, TRANSFORMERS, ETC.
5) CUTTING, PATCHING AND FIRE-STOPPING
6) PAY ALL FEES AND OBTAIN ALL APPROVALS AND PERMITS AS REQUIRED BY FEDERAL, STATE AND LOCAL AGENCIES HAVING JURISDICTION.
7) TESTING, ADJUSTING AND BALANCING OF ALL AIR SYSTEMS.
8) COORDINATION WITH OTHER TRADES.
9) START-UP.

B. FINAL PATCHING AND PAINTING SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. CUTTING, CORE DRILLING, ROUGH PATCHING AND SHALL BE BY THE CONTRACTOR.

3. CODE, PERMITS AND INSPECTIONS

A. ALL WORK SHALL MEET OR EXCEED THE LATEST REQUIREMENT OF THE .

1) 2018 INTERNATIONAL BUILDING CODE
2) 2018 INTERNATIONAL EXISTING BUILDING CODE
3) 2018 INTERNATIONAL ENERGY CODE
4) 2018 INTERNATIONAL MECHANICAL CODE
5) 2017 NATIONAL ELECTRIC CODE
6) 2018 INTERNATIONAL FUEL GAS CODE
7) 2018 INTERNATIONAL FIRE CODE

B. COMPLY WITH APPLICABLE UTILITY COMPANY RULES AND REGULATIONS.

C. COMPLY WITH OCCUPATIONS SAFETY AND HEALTH ACT (OSHA) REQUIREMENTS.

D. CONTRACTOR SHALL PREPARE FILING DOCUMENTS, FILE, SECURE ALL REQUIRED PERMITS AND INSPECTION CERTIFICATES AND TRANSMIT SAME TO THE OWNER AT THE COMPLETION OF THE WORK.

E. ALL WORK IS TO BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE BUILDING STANDARDS DOCUMENT.

4. NOTICE TO BIDDERS

A. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS UPON WHICH THE CONTRACTOR SHALL SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR PROVISIONS.

B. WHEN CONFLICTS OCCUR IN THE SPECIFICATIONS OR ON THE DRAWINGS, OR BETWEEN EITHER, THE ITEMS GREATER QUANTITY OR HIGHER COST SHALL BE PROVIDED.

C. THE CONTRACTOR SHALL PROVIDE ALL ITEMS OF LABOR OR MATERIALS SPECIFICALLY INDICATED, OR REQUIRED TO COMPLETE THE INTENDED INSTALLATIONS.

D. THE CONTRACTOR SHALL COORDINATE THE WORK IN ORDER THAT CONFLICTS IN SPACE LOCATIONS DO NOT OCCUR.

E. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE, AND SHALL REPLACE ANY OF SAME WHICH MAY BE DAMAGED, LOST OR STOLEN, WITHOUT ADDITIONAL COSTS TO THE OWNER.

F. ALL WORK IN OCCUPIED AREAS SHALL BE PERFORMED ON OTHER THAN NORMAL WORKING HOURS OR SCHEDULED AS DIRECTED BY THE BUILDING MANAGER.

G. THE CONTRACTOR SHALL PRICE THE WORK BASED ON ANY NECESSARY MODIFICATIONS OF THE EXISTING SYSTEMS. CONTRACTOR SHALL INCLUDE ALL NECESSARY OVERTIME WORK.

H. THE CONTRACTOR WILL BE HELD TO HAVE VISITED THE SITE AND EXAMINED THE DRAWINGS AND SPECIFICATIONS OF OTHER TRADES AND OF GENERAL CONSTRUCTION TRADES TO BECOME SATISFIED OF ALL CONDITIONS INVOLVED. THE CONTRACTOR SHALL VERIFY ALL MEASUREMENTS GIVEN ON THE DRAWINGS AND BECOME THOROUGHLY ACQUAINTED WITH ALL EXISTING CONDITIONS AFFECTING THE PROPER INSTALLATION OF HIS WORK.

5. SHOP DRAWINGS & EQUIPMENT SUBMISSIONS

A. THREE (3) COMPLETE SETS OF ALL SHOP DRAWINGS FOR PROJECT SHALL BE SUBMITTED TO BUILDING MANAGEMENT PRIOR TO FABRICATION.

B. DUCTWORK, PIPING LAYOUTS AND ELEVATIONS SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO ERECTION OR PURCHASE. SUBMIT THREE SETS OF CATALOG CUTS FOR AIR CONDITIONING UNITS, PIPE HANGERS, INSULATION, DIFFUSERS, PUMPS, VALVES, MISC. ACCESSORIES, ETC. INCLUDING CERTIFIED EQUIPMENT MANUFACTURER'S DATA.

C. CONTRACTOR SHALL PREPARE PRELIMINARY SHOP DRAWINGS SUITABLE FOR USE IN COORDINATING THE WORK WITH THE WORK OF OTHER TRADES. CONTRACTOR SHALL PREPARE AND FURNISH DUCTWORK LAYOUTS AT 3/8" = 1'-0" SCALE FOR USE BY AND COORDINATION WITH OTHER TRADES. COORDINATION MEETINGS SHALL BE HELD UNDER THE SUPERVISION OF THE CONSTRUCTION MANAGER (CM) OR GENERAL CONTRACTOR (GC). EACH TRADE SHALL HAVE PROPER REPRESENTATION AT ALL COORDINATION MEETINGS FOR THE PURPOSE OF DETAILING, ON THE DRAWINGS MENTIONED ABOVE, THE EXACT LOCATION AND ROUTING OF THEIR WORK. AFTER THE CONCLUSION OF THE COORDINATION MEETINGS, EACH TRADE SHALL SIGN THE COORDINATED DRAWINGS AND COPIES SHALL BE DISTRIBUTED BY THE CM/GC TO ALL PARTIES CONCERNED, INCLUDING THE OWNER. FINAL SHOP DRAWINGS OF ALL TRADES SHALL BE IN ACCORDANCE WITH THE COORDINATED DRAWING, WHICH FINAL SHOP DRAWINGS SHALL BE SUBMITTED FOR FINAL APPROVAL.

D. SHOP DRAWINGS SHALL BE 3/8"=1'-0" SCALE.

E. SUBMIT HANGING DETAILS WITH LOADING FOR ALL NEW CEILING SUSPENDED EQUIPMENT.

6. TESTING ADJUSTING AND BALANCING

A. MAKE ALL REQUIRED ADJUSTMENTS OF THE AIR SYSTEM UNTIL ALL SPECIFIED PERFORMANCES ARE MET. ALL BALANCING REPORTS SHALL BE SUBMITTED FOR REVIEW.

7. AS BUILT DRAWINGS AND MAINTENANCE MANUALS

A. CONTRACTOR SHALL PREPARE AS-BUILT DRAWINGS AND PROVIDE A REPRODUCIBLE SET OF THE CONTRACT DRAWINGS WHICH SHALL BECOME THE BASIS OF THE AS-BUILT DRAWINGS. ANY DEVIATION OF DUCTWORK, DIFFUSERS, REGISTERS AND PIPING SHALL BE CORRECTED ON THE REPRODUCIBLE SET. THE REPRODUCIBLE SET SHALL BE STAMPED "AS-BUILT" WITH THE DATE AND CONTRACTOR'S SIGNATURE. TWO PRINTS AND A REPRODUCIBLE SET SHALL BE DELIVERED TO THE ENGINEER BEFORE FINAL PAYMENT IS MADE. AFTER REVIEW AND APPROVAL OF AS-BUILT CONTRACTOR SHALL DELIVER THE REPRODUCIBLE SET TO THE ENGINEER. ALSO, AS-BUILT SHOP DRAWINGS SHALL BE TURNED OVER TO THE BUILDING MANAGER UPON COMPLETION OF WORK. ALSO PROVIDE DISK OF AS-BUILTS IN LATEST AUTOCAD VERSION FOR OWNER'S RECORD AND USE.

B. A REPRODUCIBLE RECORD DRAWING SHALL BE SUPPLIED UPON WHICH CORRECTIONS SHALL BE MADE TO PROVIDE AN ACCURATE AND COMPLETE RECORD OF THE WORK AS INSTALLED. A REPRODUCIBLE COPY OF THIS DRAWING SHALL BE PROVIDED TO THE BUILDING MANAGER ONCE THE INSTALLATION IS COMPLETE.

C. FURNISH TO THE ARCHITECT SIX (6) BOUND AND INDEXED COPIES OF OPERATIONS, MAINTENANCE AND AIR BALANCING DATA MANUALS FOR THE INSTALLATION.

D. THE MANUAL SHALL PROVIDE COMPREHENSIVE DETAILED INFORMATION ON THE APPROVED INSTALLATION, OPERATION AND USE, MAINTENANCE AND PARTS LIST.

PART 2 - PRODUCTS

1. HVAC INSULATION

A. GENERAL

1) DESIGN AND PERFORMANCE OF COMPONENTS AND METHODS SPECIFIED HEREIN SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE CODES, STANDARDS
   a) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
   b) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
   c) UNDERWRITERS LABORATORIES INC. (UL)
2) INSULATION SHALL BE APPLIED TO PIPING, DUCT AND EQUIPMENT OF MATERIALS AS SPECIFIED HEREIN AND FOR APPLICABLE SYSTEMS OF THIS PROJECT.
3) ALL INSULATION, INCLUDING JACKETS OR FACINGS, ADHESIVES, MASTICS, CEMENTS, TAPES AND GLASS CLOTH FOR FITTINGS SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY ASTM E 84, NFPA 225, AND UL 723 PROCEDURES, NOT EXCEEDING A "FLAME SPREAD" OF 25 AND "SMOKE DEVELOPED" OF 50.
4) NOTE THAT EQUIPMENT CASINGS WHICH HAVE INTERNAL AND ACOUSTICAL INSULATION NEED NOT BE INSULATED AT THE EXTERIOR SURFACE.
5) WHERE INTERNAL DUCT INSULATION IS REQUIRED, THE EXTERIOR DUCT INSULATION MAY BE OMITTED, PROVIDED THAT THE EQUIVALENT "R" FACTOR FOR THE INTERNAL DUCT INSULATION IS THE SAME AS THE EXTERNAL DUCT INSULATION REQUIREMENTS.
6) ALL NEW DUCTWORK WITHIN 15'-0" DOWNSTREAM FROM MECHANICAL EQUIPMENT INCLUDING BUT NOT LIMITED TO A/C UNITS, EXHAUST FANS, AND VAV TERMINALS SHALL BE PROVIDED WITH ACOUSTICAL LINING. SEE SPECIFICATIONS FOR DETAILS.
7) VALVES, FITTINGS, STRAINERS, AND OTHER PIPING APPURTENANCES SHALL BE INSULATED TO MATCH THOSE OF THE SYSTEMS TO WHICH THEY ARE CONNECTED.
8) ALL NEW AND EXISTING INSULATION AND EXTERIOR JACKETS THAT ARE DAMAGED SHALL BE REPLACED WITH NEW MATERIAL AS SPECIFIED, TO THE SATISFACTION OF THE ENGINEER.
9) INSULATION MATERIALS SHALL BE PRODUCTS OF ONE OF THE FOLLOWING MANUFACTURERS:
   a) JOHN MANVILLE CORP.
   b) CERTAIN TEED CORP./INSULATION GROUP
   c) OWENS - CORNING FIBERGLASS CORP.

B. INSULATION OF PIPES

1) INSULATION FOR ALL PIPING, INCLUDING CONDENSATE DRAIN PIPING AND REFRIGERANT PIPING SHALL BE PROVIDED AS FOLLOWS:

TYPE OF PIPING	INSULATION THICKNESS
CONDENSATE DRAIN	1" IN.
REFRIGERANT	1” IN.

   a) FIBERGLASS INSULATION SIMILAR TO JMC MICRO-LOK HP, 4# DENSITY WITH VAPOR BARRIER LAPPED AND SEALED USING B-F 81-99.
   b) INSULATION TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATION.
   c) AT PIPE SUPPORT POINTS BELOW HANGERS INSTALL SECTION OF RIGID TYPE.
   d) ALL FITTINGS, FLANGES AND VALVES TO BE COVERED WITH ONE PIECE J-M ZESTON COVERS.
   e) FLAME SPREAD RATING AND SMOKE DEVELOPED RATING SHALL NOT TO EXCEED 25/50 RESPECTIVELY PER U.L. REQUIREMENTS.
2) ALL ADHESIVES' VOLATILE ORGANIC COMPOUND (VOC) CONTENT SHALL CONFORM TO THE LIMITS SET BY THE CURRENT SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE #1168 AND SHALL BE NO MORE THAN 250 GRAMS PER LITER.
3) ALL EXPOSED AND OUTDOOR PIPING SHALL HAVE PVC COVER OR 16 GAUGE ALUMINUM WEATHERPROOF JACKETING.

2. AIR CONDITIONING UNITS (AIR COOLED)

A. FURNISH AND INSTALL SPLIT AIR CONDITIONING UNITS AS DESCRIBED IN THE SCHEDULE ON DRAWINGS, MANUFACTURED BY CARRIER, TASK, COOLAIR, TRANE, MCQUAY OR APPROVED EQUAL. THE UNIT SHALL BE DESIGNED FOR USE WITH REFRIGERANT R-410A ONLY. THE CAPACITY AND SCHEDULE OF THE UNITS ARE TO BE AS INDICATED ON THE CONTRACT DRAWINGS. THE UNITS SHALL BE FACTORY OPERATED, TESTED AND RATED IN ACCORDANCE WITH ARI STANDARDS. EQUIPMENT SHALL BE COMPLETELY FACTORY ASSEMBLED TESTED, PIPED, INTERNALLY WIRED AND FULLY CHARGED WITH REFRIGERANT. THE THERMOSTAT FIELD INTERFACE TERMINAL STRIP, DISCHARGE AND RETURN DUCT COLLARS, ALL SAFETY CONTROLS AND FILTERS SHALL BE FURNISHED AND FACTORY INSTALLED. ALL EQUIPMENT SHALL HAVE FACTORY INSTALLED DECALS AND LABELS TO AID IN SERVICING AND INDICATE CAUTION AREAS.

B. THE EVAPORATOR COILS SHALL BE CONSTRUCTED OF HEAVY WALL SEAMLESS COPPER TUBES MECHANICALLY EXPANDED TO ALUMINUM FINS WITH DRAWN SELF SPACING COLLARS. THE EVAPORATOR COIL SHALL BE OF THE BLOW THROUGH DESIGN AND SHALL BE FED BY AN ADJUSTABLE THERMOSTATIC EXPANSION VALVE. THE COIL SHALL BE PROVIDED WITH A STAINLESS STEEL DRAIN PAN (PRIMARY).

C. THE CONDENSER COIL SHALL BE OF DRAW-THRU AIR FLOW DESIGN CONSTRUCTED OF HEAVY WALL SEAMLESS COPPER TUBES MECHANICALLY EXPANDED TO ALUMINUM FINS WITH DRAWN SELF SPACING COLLARS.

D. THE COMPRESSORS SHALL BE SCROLL TYPE. THE COMPRESSORS SHALL BE INTERNALLY PROTECTED FROM OVERHEATING. THEY SHALL HAVE AN INTERNAL CRANK CASE HEATER FOR PROTECTION DURING OPERATION AT LOW AMBIENT TEMPERATURES. THE COMPRESSOR SHALL BE VIBRATION ISOLATED WITH EXTERNAL SPRING MOUNTINGS.

E. REFRIGERATION CIRCUIT SHALL INCLUDE HIGH AND LOW SCHRADER ACCESS VALVES, SIGHT GLASS WITH INTEGRAL MOISTURE INDICATOR, MUFFLER, FILTER-DRIER, HIGH/LO PRESSURE SWITCHES, ALL LOCATED IN AN ACCESSIBLE PORTION OF THE CONDENSER SECTION OF THE UNIT. THE REFRIGERATION CIRCUIT SHALL BE FIELD SPLITABLE WITH REUSABLE QUICK CONNECTS TO PREVENT LOSS OF FACTORY CHARGE WHEN SPLIT IN THE FIELD.

F. THE EVAPORATOR AND CONDENSER SECTION FANS SHALL BE BELT DRIVEN, CENTRIFUGAL TYPE WITH PERMANENTLY LUBRICATED BALL BEARINGS, SELECTED TO OPERATE IN THE STABLE PORTION OF ITS PERFORMANCE CURVE WITH THE FILTERS CLEAN OR DIRTY.

G. THE FAN MOTORS SHALL BE RESILIENTLY MOUNTED WITH INTERNAL THERMAL OVERLOAD PROTECTION AND PERMANENTLY LUBRICATED BALL BEARINGS. IT SHALL BE MOUNTED ON ADJUSTABLE MOTOR FRAME POSITIONED BEHIND THE BLOWER ASSEMBLY AND BOLTED TO THE BOTTOM OF THE PAN. THE MOTOR PULLEY SHALL BE CAST IRON, KEYED, AND VARIABLE PITCH DESIGN TO ALLOW FOR FIELD ADJUSTMENT OF THE AIR-FLOW AND STATIC PRESSURE REQUIREMENTS. MOTORS SHALL BE MOUNTED ON AN ADJUSTABLE SLIDE BASE.

H. AIR FILTERS SHALL BE UL LISTED, CLASS 1 OR CLASS 2, TWO IN. THICK PLEATED MEDIA, RATED IN ACCORDANCE WITH ASHRAE TEST STANDARD 52-76 WITH AN EFFICIENCY RATING OF 25 TO 35 PERCENT AND AN ARRESTANCE RATING OF 92 PERCENT. THE FILERS SHALL BE RATED FOR MAXIMUM FLAME SPREAD OF 25, AND MAXIMUM SMOKE DEVELOPED OF 50. FILTERS AND FILTER RACKS SHALL BE FACTORY MOUNTED AND FIELD SERVICEABLE FROM THE LEFT OR RIGHT SIDE OF THE UNIT.

I. THE EVAPORATOR AND CONDENSING SECTIONS CABINETS SHALL BE MADE OF SCRATCH RESISTANT G90 GALVANIZED STEEL. THE EVAPORATOR SHALL BE EQUIPPED WITH A STAINLESS STEEL DRAIN PAN. EACH SECTION CABINET SHALL BE MOUNTED ON STURDY CHANNELS TO ACCOMMODATE HANGING RODS THE CASING SHALL HAVE INTERNAL ACOUSTICAL INSULATION OF MINIMUM 0.5 LBS. ALL AROUND. THE INSULATION MUST MEET THE REQUIREMENTS OF NFPA 90A AND 90B/ASTM-C1071/FEDERAL SPECIFICATION HH-1545B/R2:1.

J. ACCESS TO ALL PARTS OF THE EVAPORATOR SHALL BE PROVIDED FROM THE REAR SIDE OF THE UNIT ONLY. ACCESS PANEL SHALL SO DESIGNED AS TO PERMIT THE REMOVAL OF ANY FAN OR COIL INSIDE THROUGH THE REAR ONLY.

K. AC UNIT SHALL BE INTERLOCKED WITH ITS ASSOCIATED CONDENSATE PUMP SUCH THAT IF THE PUMP IS NOT OPERATING, THE AC UNIT SHALL BE LOCKED OUT, OR THE AC UNIT SHALL SHUTDOWN ON A HIGH-WATER CONDITION IN THE AUXILIARY CONDENSATE DRAIN PAN.

L. THE UNITS SHALL HAVE DUAL ELECTRICAL PANELS, ONE FOR THE EVAPORATOR AND ONE FOR THE CONDENSING SECTION. THE EVAPORATOR AND THE CONDENSING SECTIONS SHALL BE WIRED INDEPENDENTLY. EACH COMPONENT SHALL BE FACTORY TESTED, INSTALLED AND WIRED AND ALL SHALL INCLUDE INHERENT PROTECTION. UNIT SHALL HAVE STANDARD PRESSURE DIFFERENTIAL SWITCH TO SHUT DOWN THE ENTIRE SYSTEM IN THE EVENT OF AN EVAPORATOR BELT, MOTOR OR BLOWER FAILURE.

M. THE UNIT SHALL BE SUITABLE FOR OPERATION AT LOW AMBIENT TEMPERATURES BY THE USE OF FLOW AMBIENT DAMPER OR FAN CYCLING CONTROLS FOR TEMPERATURES UP TO 0°F.

N. FURNISH AND INSTALL AS SHOWN ON THE PLAN CONDENSATE PUMPS, MANUFACTURED BY LITTLE GIANT OR AN APPROVED EQUAL. CAPACITY SHALL BE AS SHOWN IN THE SCHEDULE ON THE CONTRACT DRAWINGS.

O. PROVIDE UNIT OVERFLOW PAN UNDER EVAPORATOR AND ALARM AS FOLLOWS:

1) MAKE PAN 6" LARGER THAN A/C UNIT, AND CONDENSATE PUMP ON ALL FOUR (4) SIDES.
2) MAKE UPSTANDING SIDES 3" WITH 1/2" HEM TURNED DOWN OUTSIDE OF PAN.
3) USE 16 GA. STAINLESS STEEL SHEETMETAL WITH SOLDERED CORNERS FOR WATER TIGHTNESS.
4) USE "WATER ALERT" WATER SENSING ALARM MADE BY DORLEN (7424 W. LAYTON AVENUE, MILWAUKEE, WISCONSIN 53220) PER CATALOG 81 OR APPROVED EQUAL.
5) THE AUDIBLE ALARM SHALL BE INSTALLED AT A LOCATION WHERE IT CAN BE EASILY HEARD BY PERSONNEL IN CLOSED NEARBY ROOMS.

P. PROVIDE MICROPROCESSOR BASED CONTROLS AND MODULATING HOT GAS BYPASS.

Q. AIR CONDITIONING AND CONDENSING UNITS SHALL BE INTERLOCKED WITH ASSOCIATED MOTORIZED DAMPERS AT THE INTAKE AND DISCHARGE LOUVERS TO BE LOCKED OUT UNTIL DAMPER POSITION IS CONFIRMED OPEN. PROVIDE END SWITCH TO CONFIRM DAMPER POSITION.

2. PIPING AND ACCESSORIES

A. PIPE:

1) PIPE SHALL BE NEW, FREE FROM SCALE OR RUST, AND OF MATERIAL AND WEIGHT SPECIFIED. EACH LENGTH OF PIPE SHALL BE PROPERLY MARKED AT THE MILL FOR PROPER IDENTIFICATION WITH NAME OR SYMBOL OF MANUFACTURER.
2) PIPING SHALL BE SEAMLESS STEEL AS SPECIFIED OR COPPER PIPING SHALL BE HARD TEMPERED K TYPE WITH WROUGHT COPPER BRAZING FITTINGS, FOR PARTICULAR SERVICE SPECIFIED BELOW, CONFORMING TO ASTM B-88 ANSI/ASME B16.22 AS MANUFACTURED BY CHASE-ANACONDA. PIPING MATERIALS AND FITTINGS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

SYSTEM	PIPING SCHEDULE	FITTINGS
CONDENSATE DRAIN	TYPE 'L' COPPER	WROUGHT COPPER SOLDER JOINT 95%/5% ANTIMONY ANSI B16.18
REFRIGERANT	COPPER ACR	BRAZED

VALVES

TYPE	SIZE	PRESSURE
BALL	2-1/2” & DOWN	350 PSI
GATE	2-1/2” & DOWN	350 PSI

B. ARRANGE PIPING TO EQUIPMENT TO PERMIT SERVICING OR REMOVAL WITHOUT DISMANTLING PIPE BRANCHES.

C. PROVIDE A CLEANOUT IN CONDENSATE DRAIN LINE PIPING AT EVERY CHANGE IN DIRECTION.

D. NEW PIPING IS TO BE INTERNALLY CLEANED PRIOR TO CONNECTION TO WATER SYSTEM.

E. WHERE CHANGES OF SIZE OCCUR IN HORIZONTAL PIPING, PROVIDE ECCENTRIC TYPE REDUCING FITTINGS TO ATTAIN PROPER DRAINAGE AND VENTING OF PIPELINE.

F. PROVIDE FOR THE EXPANSION AND CONTRACTION OF PIPING SYSTEMS.

G. FIELD QUALITY CONTROL

1) SECTION 01 40 00 - QUAILITY REQUIREMENTS AND 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS: FIELD INSPECTING, TESTING, ADJUSTING, AND BALANCING.
2) TEST REFRIGERANT SYSTEM IN ACCORDANCE WITH ASME B31.5.
3) PRESSURE TEST REFRIGERATION SYSTEM WITH DRY NITROGEN TO 1.3 TIMES WORKING PRESSURE. PERFORM FINAL TESTS AND 27" (92 kPA) VACUUM AND WORKING PRESSURE USING ELECTRONIC LEAK DETECTOR.
4) REPAIR LEAKS.
5) RETEST UNTIL NO LEAKS ARE DETECTED.

H. PIPE SUPPORTS AND HANGERS

1) ALL SUPPORTS AND PARTS SHALL CONFORM TO THE LATEST REQUIREMENTS OF ANSI B 31.9 AS APPLICABLE FOR PRESSURE PIPING AND MSS STANDARD PRACTICE SP-58 SP-69.
2) DO NOT HANG PIPING FROM OTHER PIPING. IN NO CASE SHALL HANGERS BE SUPPORTED BY MEANS OF VERTICAL EXPANSION BOLTS.
3) IF REMOVAL OF EXISTING FIREPROOFING IS REQUIRED FOR INSTALLATION PURPOSES, SUCH REMOVAL SHALL BE PERFORMED BY THE CONTRACTOR AND SHALL BE KEPT TO A MINIMUM. THE CONTRACTOR SHALL REPLACE ALL REMOVED FIREPROOFING WITH NEW FIREPROOFING TO THE SATISFACTION OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE AUTHORITY.
4) SUPPORT HANGERS FROM BUILDING STEEL FRAMING WITH AN APPROVED TYPE CLAMP INSERT. PROVIDE ANY ADDITIONAL STEEL SUPPORTS BETWEEN EXISTING FRAMING MEMBERS AS MAY BE REQUIRED. NO HANGERS SHALL BE SUPPORTED FROM METAL DECK FLOOR. WELDING TO THE BUILDING STRUCTURE MEMBERS WILL NOT BE PERMITTED UNLESS APPROVED BY THE BUILDING MANAGEMENT.
5) PIPE HANGERS RODS, INSERTS AND CLAMPS SHALL BE UL APPROVED FOR THEIR RESPECTIVE USES.

   a) UNLESS OTHERWISE SPECIFICALLY APPROVED, HANGER SIZE AND SPACING SHALL BE AS FOLLOWS:

COPPER TUBING PIPE SIZE	MAX. HANGER SPACING	MIN. ROD SIZE
1/2" TO 1-1/4"	6 FT. O.C.	

THE ABOVE HANGER SPACINGS APPLY TO STRAIGHT RUNS OF PIPE ONLY. AT POINTS WHERE VALVES, SPECIALTIES OR BRANCH CONNECTIONS ARE LOCATED, ADDITIONAL HANGERS, OR SUPPORTS SHALL BE USED TO PROPERLY SUPPORT THE LOAD.

   b) HANGERS AND SUPPORTS SHALL BE MANUFACTURED BY GRINNELL CORP, CARPENTER & PATTERSON INC., MICHIGAN HANGER CO. INC., OR AN APPROVED EQUAL.

G. PROVIDE BALL TYPE SHUT-OFF VALVES IN CONDENSER WATER PIPING WITH CHROME PLATED BRONZE BALL, STAINLESS STEEL TRIM, VINYL CLAD HANDLES. VALVES SHALL BE RATED FOR MINIMUM 300 PSI WSP.

1. INSTALLATION OF PIPING - GENERAL

A. INSTALL ALL PIPING AS SHOWN ON PLANS.

B. ARRANGE PIPING TO EQUIPMENT TO PERMIT SERVICING OR REMOVAL WITHOUT DISMANTLING PIPE BRANCHES.

C. FURNISH AND INSTALL PIPING HANGERS, SUPPORTS, ANCHORS AND GUIDES HAVING A BUILT-IN SAFETY FACTOR OF FIVE (5) IN CONFORMANCE TO THE LATEST ANSISME CODE FOR PRESSURE PIPING. ALL HANGER SPECIALTIES SHALL BE FURNISHED WITH ZINC CHROMATE PRIME PAINT FINISH.

D. PIPE AND VALVE IDENTIFICATION

1) PROVIDE AND AFFIX A SET OF APPROVED ADHESIVE BANDS IDENTIFYING THE SYSTEM AND DIRECTION OF FLOW, PROVIDE BANDS EVERY 15'-0", AT EVERY CHANGE IN DIRECTION AND AT EVERY BRANCH TEE.
2) EACH SET SHALL CONSIST OF ONE BAND ON WHICH THE NAME OF THE SERVICE AND THE PIPE SIZE ARE PRINTED IN LETTERS NOT LESS THAN ONE (1) INCH HIGH.
3) BANDS SHALL BE IN COLORS TO CONFORM TO ANSI STANDARD A-13.1.
4) 4. ADHESIVE BANDS SHALL BE W.H. BRADY CO. "QUICK-LABEL", OR AN APPROVED EQUAL.

E. E. PROVIDE DIELECTRIC FITTINGS AND BRONZE BODY VALVES WHERE DISSIMILAR METAL PIPING JOIN.

9. EQUIPMENT SUPPORTING REQUIREMENTS

A. ALL SUPPORTING STEEL SHALL CONFORM TO ASTM DESIGNATION A-36.

B. PATCH EXISTING BEAM FIREPROOFING WHERE REMOVED.

C. ALL NUTS SHALL HAVE LOCK WASHERS.

D. CONTRACTOR SHALL VERIFY AND FIELD MEASURE EXISTING CONDITIONS.

E. PAINT ALL STEEL.

10. VIBRATION ISOLATION SYSTEMS

A. ALL ROTATING, REVOLVING OR RECIPROCATION EQUIPMENT, SHALL BE FURNISHED WITH VIBRATION ISOLATORS, TO PREVENT THE TRANSMISSION OF OBJECTIONABLE NOISES, SOUND OR VIBRATIONS TO THE OCCUPIED SPACES AND TO THE BUILDING STRUCTURES. THE TYPE OF ISOLATORS REQUIRED SHALL BE AS FOLLOWS:

EQUIPMENT	ISOLATOR TYPE	STATIC DEF. (IN)
AC & ACCU UNITS	SPRING & NEOPRENE	2
CONDENSATE PUMPS	NEOPRENE WAFFLE PAD	0.1

ALL SPRINGS ARE TO BE UNHOUSED AND INCORPORATE A NEOPRENE PAD OR CUP. SPRING HANGERS SHALL HAVE A SPRING IN SERIES WITH NEOPRENE AND MUST ALLOW FOR UP TO 30 DEGRESS OS MISALIGNMENT.

B. VIBRATION ISOLATORS FOR CEILING SUPPORTED EQUIPMENT SHALL HAVE A MAXIMUM LATERAL MOTION UNDER EQUIPMENT START-UP OR SHUTDOWN CONDITIONS OF 1/4". MOTIONS IN EXCESS SHALL BE RESTRAINED BY SPRING TYPE MOUNTINGS.

C. VIBRATION ISOLATOR SHALL BE PROVIDED BY EITHER OF THE FOLLOWING MANUFACTURERS: MASON INDUSTRIES, VIBRATION ISOLATION CO. OR CONSOLIDATED KINETICS CO.

D. VIBRATION ISOLATORS SHALL BE SELECTED TO ACHIEVE 95% ISOLATION AT THE DESIGN ROTATIONAL SPEED OF THE AC UNITS SPECIFIED.

11. OVERFLOW DRAIN PANS

A. DRAIN PANS SHALL BE INSTALLED UNDER ALL CEILING MOUNTED AIR HANDLER UNITS. ALL PIPING AS SHOWN ON PLANS.

B. MAKE PANS 6" LARGER THAN UNIT AND CONDENSATE PUMP ON ALL FOUR (4) SIDES.

C. MAKE UPSTANDING SIDES 3" WITH 1/2" HEM TURNED DOWN OUTSIDE OF PAN.

D. USE 16 GA. STAINLESS STEEL SHEETMETAL WITH SOLDERED CORNERS FOR WATER TIGHTNESS.

12. WATER ALARM SYSTEMS

A. WATER LEAK DETECTION SYSTEMS IN THE OVERFLOW DRAIN PANS.

B. LOCAL ALARM SHALL SOUND UPON MOISTURE DETECTION, SHUT DOWN AC UNITS AND ACTIVATE AUTO DIALER.

C. ALL FIELD WIRING WORK INCLUDING INTERLOCKING WIRING IN CONNECTION WITH THE ELECTRICAL CONTROL SYSTEM SHALL BE PROVIDED BY THIS CONTRACTOR.

D. SEE SEQUENCE OF OPERATIONS FOR MORE INFORMATION.

14. SLEEVES AND ESCUTCHEONS FOR PIPING

A. PROVIDE SLEEVES FOR PIPES PASSING THROUGH WALL PARTITIONS. PIPE SLEEVES THROUGH INTERIOR WALLS AND PARTITIONS #18 GAGE GALVANIZED STEEL.

B. SPACE BETWEEN PIPE SHALL AND SLEEVE SHALL BE CAULKED WITH INCOMBUSTIBLE ROPE OR MINERAL WOOL TO WITHIN 1/2" OF WALL FACES AND FILLED WITH CAULKING COMPOUND TO WALL FACES.

C. FURNISH AND INSTALL ESCUTCHEON PLATES ON ALL EXPOSED PIPING THROUGH WALLS OR FLOORS AND HELD IN PLACE WITH SCREWS OR BE INTERNAL SPRING TENSION.

D. SLEEVES SHALL HAVE AN INTERNAL DIAMETER OF AT LEAST 1" LARGER THAN THE OUTSIDE PIPE SIZE DIAMETER.

E. WHERE PIPES PASS THROUGH CONSTRUCTION REQUIRED TO HAVE A FIRE RESISTANCE RATING, THE SPACE BETWEEN THE PIPE AND ITS SLEEVE SHALL NOT EXCEED Ô INCH AND SHALL BE COMPLETELY PACKED WITH MINERAL WOOL OR EQUIVALENT NON-COMBUSTIBLE MATERIAL AND SHALL BE CLOSED OFF BY CLOSE FITTING 16 GAUGE BLACK METAL ESCUTCHEONS ON BOTH SIDES OF THIS CONSTRUCTION.

15. SEQUENCE OF OPERATIONS

FURNISH, MOUNT AND CONNECT ALL DEVICES AND EQUIPMENT AS REQUIRED TO PERFORM THE SEQUENCE OF OPERATIONS HEREIN DESCRIBED.

B. IT ROOM UNITS

1) EACH UNIT SHALL BE PROVIDED WITH A PROGRAMMABLE THERMOSTAT THAT SHALL CONTROL THE AIR CONDITIONING UNIT COMPRESSOR TO MAINTAIN A SET-POINT TEMPERATURE OF 72°F (ADJUSTABLE).
2) AIR CONDITIONING UNIT FAN SHALL BE CONFIGURED TO RUN CONTINUOUSLY ON A 7-DAY/24-HOUR BASIS.
3) CONTROLS SHALL BE CONFIGURED TO SHUT DOWN THE UNIT UPON RECEIVING AN ALARM SIGNAL. ALARM SIGNALS SHALL BE PROVIDED FOR:
   a) LEAK DETECTION.
   b) REFRIGERANT SYSTEM SAFETIES.
   c) HIGH TEMPERATURE ALARM.
4) ASSOCIATED CONDENSATE PUMPS SHALL BE CONTROLLED AS REQUIRED BY THE MANUFACTURER'S REQUIREMENTS.

PART 3 - EXECUTION

1. SHUTDOWN

A. THE CONTRACTOR SHALL NOTIFY THE BUILDING ENGINEER AND OWNER WHEN SHUT-DOWN OF EXISTING SYSTEMS BECOMES NECESSARY. SHUT-DOWN TIME SHALL BE KEPT TO A MINIMUM.

B. WHERE WORK MUST BE DONE AFTER HOURS OR REQUIRES AN EQUIPMENT SHUTDOWN SUCH AS FOR THE INSTALLATION OF NEW DUCTWORK AND PIPING, OR REMOVAL OF EXISTING DUCTWORK AND PIPING, THE CONTRACTOR SHALL PROVIDE THE BUILDING ENGINEER AND OWNER WITH 72 HOURS NOTICE.

PROJECT NAME

MONTCLAIR STATE UNIVERSITY – VILLAGE APT – IDF ROOM AC UNIT REPLACEMENT

CLIENT PROJECT No.

KEY PLAN:

REV.#	DATE	ISSUE DESCRIPTION
1	4/15/21	ISSUE FOR BID

LORING CONSULTING ENGINEERS
Loring Consulting Engineers, Inc.
300 Alexander Park, Suite 310
Princeton, NJ 08540
P. 609.716.6160
www.loringengineers.com
New York City • Washington, DC • Princeton • Durham • Toronto
CERTIFICATE OF AUTHORIZATION NO. 24GA27952700
Loring No. 12284

DRAWING TITLE:

MECHANICAL SPECIFICATIONS

GRAPHIC SCALE:

SEAL:

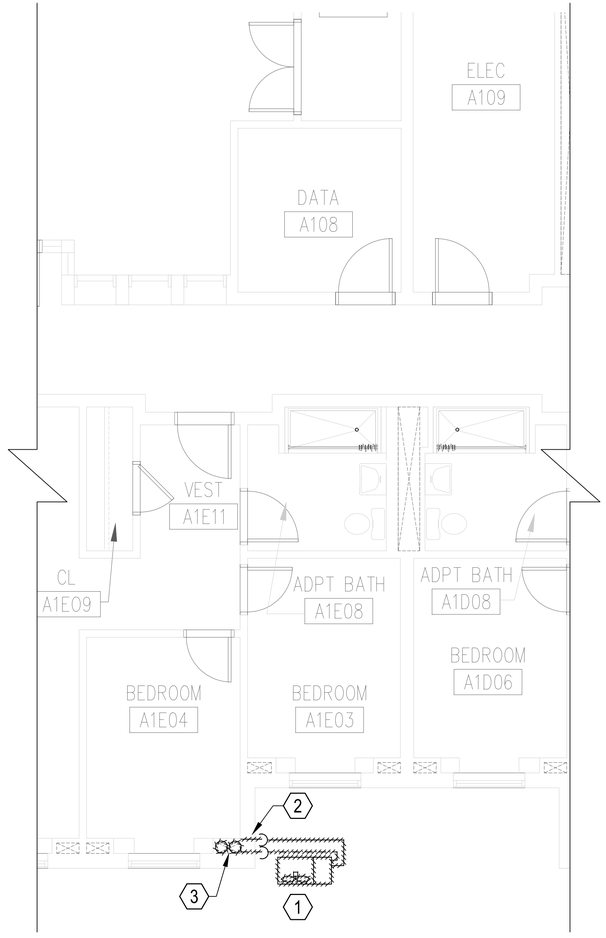
Vincent Farese, PE
N.J. Professional Engineer No. 43960

DRAWN: M.A.
CHECKED: A.B.
APPROVED:
LORING JOB No.: 12284
DATE: 03/--/2021
SHEET NUMBER: M-002

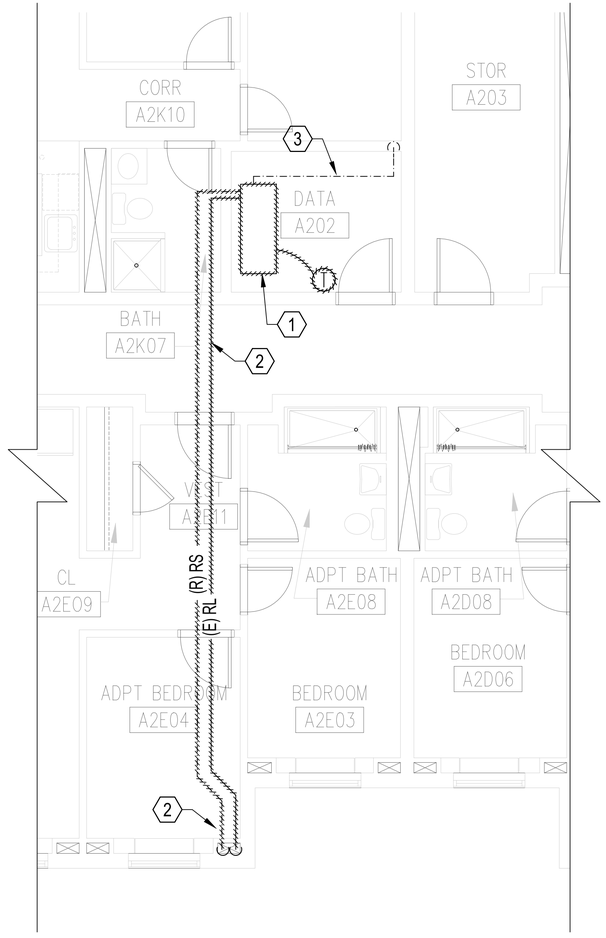
I:\12284 MSU – VILLAGE COMPLEX–IT–FCU REPLACEMENTS\... M–002_004 SPECS.DWG 4/15/2021 5:30 PM PRINTED BY: ABHAVSAR

GENERAL NOTES:

1. ANY REFRIGERANT FROM EXISTING EQUIPMENT BEING REMOVED/RELOCATED SHALL BE EVACUATED, RECOVERED, TAKEN FROM THE SITE AND DISPOSED OF IN ACCORDANCE WITH APPLICABLE LAWS, ENVIRONMENTAL REGULATION AND PUBLIC SAFETY ISSUES.
2. ALL DEMOLITION WORK SHOWN ON PLANS IS TYPICAL FOR ALL BUILDINGS IN THE VILLAGE APARTMENTS COMPLEX. REFER TO KEY PLAN FOR LOCATIONS OF WORK AREAS IN EACH BUILDING.
3. THESE FLOOR PLANS INDICATE REPLACEMENT OF AC UNIT (INDOOR AND OUTDOOR UNITS) AT 2ND FLOOR AND 4TH FLOOR IDF ROOMS OF ONE BUILDING, SCOPE OF WORK TO INCLUDE REPLACEMENT OF SAME UNITS AT OTHER THREE BUILDINGS. THERE ARE FOUR (4) BUILDINGS.
   - i. ALICE PAUL HALL
   - ii. COUNT BASIE HALL
   - iii. MILLICENT FENWICK HALL
   - iv. WILLIAM CARLOS WILLIAMS HALL



1 BUILDING A & C - FIRST FLOOR PARTIAL PLAN - DEMOLITION
1/4"=1'-0"



1 BUILDING A & C - SECOND FLOOR PARTIAL PLAN - DEMOLITION
1/4"=1'-0"

0 4 8 FEET

KEYED NOTES - 1ST FLOOR

1. EXISTING CONDENSING UNIT ON GRADE AND ASSOCIATED REFRIGERANT PIPING, SUPPORTS, RAILS, POWER, DISCONNECT TO BE REMOVED.
2. EXISTING PIPE PENETRATIONS IN EXTERIOR WALL TO REMAIN FOR ROUTING OF NEW REFRIGERANT PIPING. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.
3. EXISTING REFRIGERANT PIPING UP TO FLOOR ABOVE TO BE REMOVED IN PREPARATION FOR ROUTING OF NEW REFRIGERANT PIPING. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.

KEYED NOTES - 2ND FLOOR

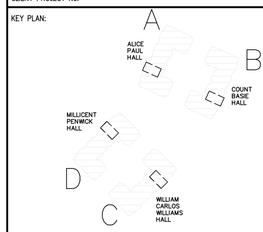
1. EXISTING SPLIT AC UNIT IN IDF ROOM AND ASSOCIATED THERMOSTAT AND REFRIGERANT PIPING TO BE REMOVED IN PREPARATION FOR NEW EQUIPMENT.
2. REMOVE EXISTING REFRIGERANT PIPING ABOVE CEILING. EXISTING WALL ENCLOSURE TO REMAIN FOR ROUTING OF NEW REFRIGERANT PIPING.
3. EXISTING ¾" CONDENSATE DRAIN PIPING TO REMAIN. DISCONNECT FROM EXISTING AIR HANDLING UNIT AND PREPARE FOR RECONNECTION TO NEW EQUIPMENT. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.

PROJECT NAME

MONTCLAIR STATE UNIVERSITY – VILLAGE APT – IDF ROOM AC UNIT REPLACEMENT

CLIENT PROJECT No.

KEY PLAN:



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Loring No. 12284

DRAWING TITLE:

MECHANICAL BUILDINGS A & C – PARTIAL PLANS – 1ST & 2ND FLOOR – DEMOLITION

GRAPHIC SCALE:

SEAL:

Vincent Farese, PE
N.J. Professional Engineer No. 43960

DRAWN:	CHECKED:
M.A.	A.B.

APPROVED:

LORING JOB No.: 12284

DATE: 03/--/2021

SHEET NUMBER: **MD-100**

I:\12284 MSU - VILLAGE COMPLEX-IT-FCU REPLACEMENT\... MD-100 1ST & 2ND FLRS.DWG 4/15/2021 5:30 PM PRINTED BY: MANTOZZESKI

GENERAL NOTES:

1. ANY REFRIGERANT FROM EXISTING EQUIPMENT BEING REMOVED/RELOCATED SHALL BE EVACUATED, RECOVERED, TAKEN FROM THE SITE AND DISPOSED OF IN ACCORDANCE WITH APPLICABLE LAWS, ENVIRONMENTAL REGULATION AND PUBLIC SAFETY ISSUES.
2. ALL DEMOLITION WORK SHOWN ON PLANS IS TYPICAL FOR ALL BUILDINGS IN THE VILLAGE APARTMENTS COMPLEX. REFER TO KEY PLAN FOR LOCATIONS OF WORK AREAS IN EACH BUILDING.
3. THESE FLOOR PLANS INDICATE REPLACEMENT OF AC UNIT (INDOOR AND OUTDOOR UNITS) AT 2ND FLOOR AND 4TH FLOOR IDF ROOMS OF ONE BUILDING, SCOPE OF WORK TO INCLUDE REPLACEMENT OF SAME UNITS AT OTHER THREE BUILDINGS. THERE ARE FOUR (4) BUILDINGS.
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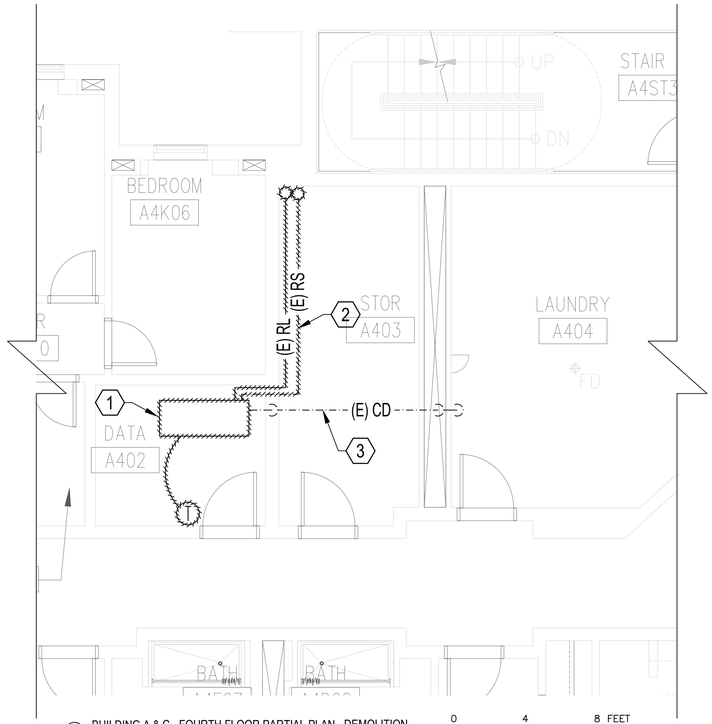
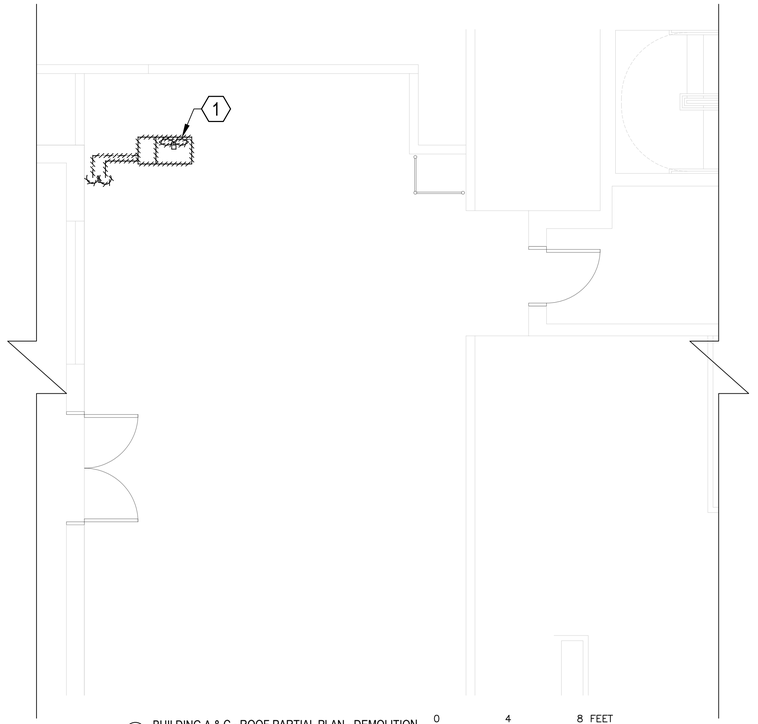


1 BUILDING A & C - FOURTH FLOOR PARTIAL PLAN - DEMOLITION
1/4"=1'-0"
0 4 8 FEET



1 BUILDING A & C - ROOF PARTIAL PLAN - DEMOLITION
1/4"=1'-0"
0 4 8 FEET

KEYED NOTES - 4TH FLOOR

1. EXISTING SPLIT AC UNIT IN IDF ROOM AND ASSOCIATED THERMOSTAT AND REFRIGERANT PIPING TO BE REMOVED IN PREPARATION FOR NEW EQUIPMENT.
2. REMOVE EXISTING REFRIGERANT PIPING ABOVE CEILING.
3. EXISTING ¾" CONDENSATE DRAIN PIPING TO REMAIN. DISCONNECT FROM EXISTING AIR HANDLING UNIT AND PREPARE FOR RECONNECTION TO NEW EQUIPMENT. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.

KEYED NOTES - ROOF

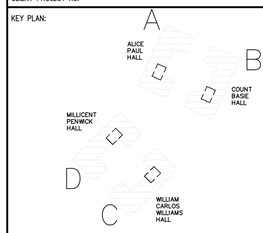
1. EXISTING CONDENSING UNIT ON ROOF AND ASSOCIATED REFRIGERANT PIPING TO BE REMOVED. EXISTING ROOF PIPE PENETRATIONS TO REMAIN AND/OR MODIFIED FOR ROUTING OF NEW REFRIGERANT PIPING. REFER TO NEW WORK PLANS FOR FURTHER INFORMATION.

PROJECT NAME

MONTCLAIR STATE UNIVERSITY – VILLAGE APT – IDF ROOM AC UNIT REPLACEMENT

CLIENT PROJECT No.

KEY PLAN:



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1	4/15/21	ISSUE FOR BID

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New York City • Washington, DC • Princeton • Durham • Toronto
CERTIFICATE OF AUTHORIZATION NO. 24GA27952700
Loring No. 12284

DRAWING TITLE:

MECHANICAL BUILDINGS A & C – PARTIAL PLANS – 4TH FLOOR & ROOF – DEMOLITION

GRAPHIC SCALE:

SEAL:

Vincent Farese, PE
N.J. Professional Engineer No. 43960

DRAWN:	CHECKED:
M.A.	A.B.

APPROVED:

LORING JOB No.: 12284

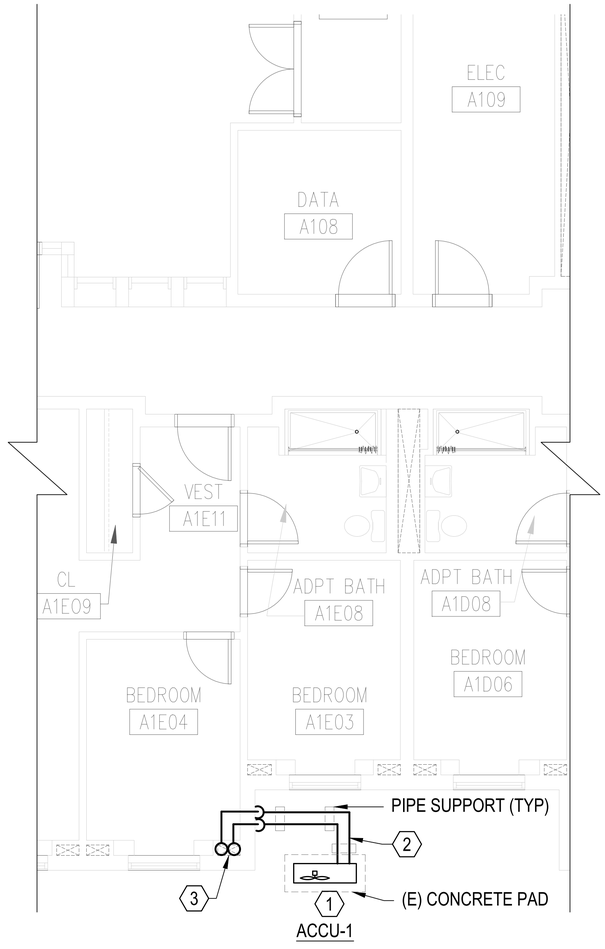
DATE: 03/--/2021

SHEET NUMBER: **MD-101**

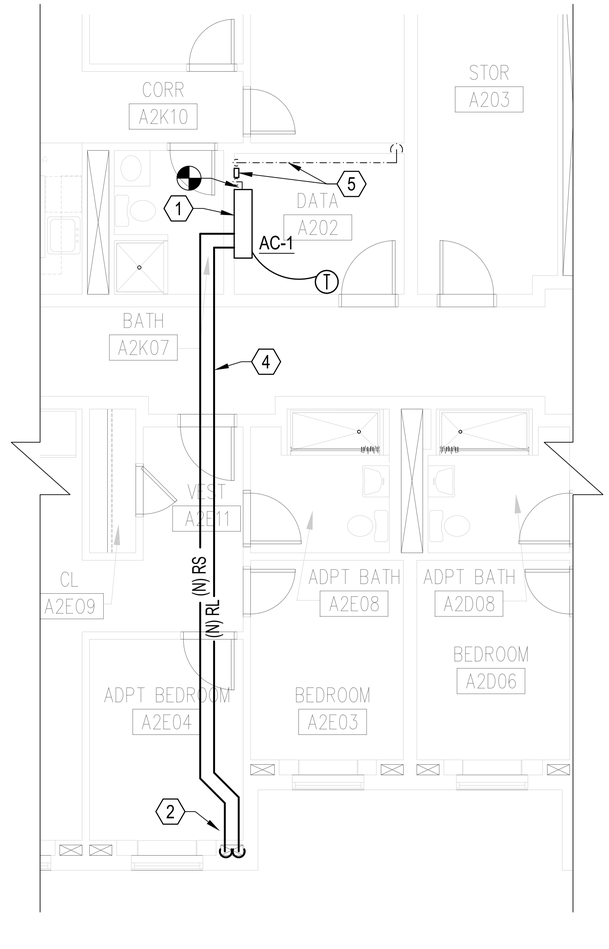
I:\12284 MSU - VILLAGE COMPLEX-IT-FCU REPLACEMENT_MD-101 4TH FLR & ROOF.DWG 4/15/2021 5:30 PM PRINTED BY: ABHAVSAR

GENERAL NOTES:

1. CONTRACTOR TO VERIFY OPERATION OF EXISTING CONDENSATE PUMP AND REPLACE NON-WORKING PUMP WITH MATCHING NEW PUMP.
2. ALL NEW REFRIGERANT PIPING SHALL BE INSTALLED AND ROUTED AS PER PLAN AT SAME LOCATION WHERE EXISTING REMOVED. CONTRACTOR IS RESPONSIBLE TO REMOVE CEILINGS AND WALLS WITH MINIMAL DESTRUCTION OF OTHER AREAS. PATCH, SPACKLE AND FIX ALL WALL OPENINGS. PAINT TO MATCH EXISTING. PROVIDE TEMPORARY PROTECTION IN OCCUPIED AREAS.
3. ALL NEW WORK SHOWN ON PLANS IS TYPICAL FOR ALL BUILDINGS IN THE VILLAGE APARTMENTS COMPLEX. REFER TO KEY PLAN FOR LOCATIONS OF WORK AREAS IN EACH BUILDING.
4. THESE FLOOR PLANS INDICATE REPLACEMENT OF AC UNIT (INDOOR AND OUTDOOR UNITS) AT 2ND FLOOR AND 4TH FLOOR IDF ROOMS OF ONE BUILDING, SCOPE OF WORK TO INCLUDE REPLACEMENT OF SAME UNITS AT OTHER THREE BUILDINGS. THERE ARE FOUR (4) BUILDINGS.
   - i. ALICE PAUL HALL
   - ii. COUNT BASIE HALL
   - iii. MILLICENT FENWICK HALL
   - iv. WILLIAM CARLOS WILLIAMS HALL



1 BUILDING A & C - FIRST FLOOR PARTIAL PLAN - NEW WORK
1/4"=1'-0"
0 4 8 FEET



2 BUILDING A & C - SECOND FLOOR PARTIAL PLAN - NEW WORK
1/4"=1'-0"
0 4 8 FEET

KEYED NOTES - 1ST FLOOR

1. NEW AIR COOLED CONDENSING UNIT ON GRADE. PROVIDE UNIT WITH NEW 12" HIGH RAILS AND VIBRATION ISOLATORS/NEOPRENE PAD.
2. NEW REFRIGERANT PIPING. ROUTE PIPING TO EXTERIOR WALL AND UP TO EXISTING WALL PENETRATIONS. MODIFY PENETRATIONS AS REQUIRED AND MAKE EXTERIOR WALL PENETRATION WATER TIGHT AND SEAL. EXTEND PIPING INTO BUILDING. ALL WALL/CEILING/FLOOR OPENINGS SHALL BE PATCHED TO MATCH EXISTING.
3. NEW REFRIGERANT PIPING UP TO FLOOR ABOVE. EXTEND TO DATA ROOM. REFER TO DRAWING 2-M-100 SECOND FLOOR PARTIAL PLAN FOR FURTHER INFORMATION.

KEYED NOTES - 2ND FLOOR

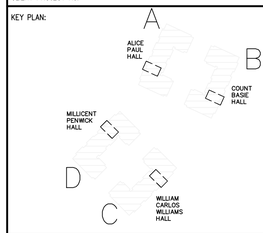
1. NEW WALL MOUNTED AC UNIT. MOUNT HIGH ON WALL 12" FROM CEILING. EXACT LOCATION TO BE VERIFIED IN FIELD AND CONFIRMED WITH OWNER. INSTALL SECONDARY DRAIN PAN AND ALARM/LEAK DETECTION, ETC. SEE DETAIL ON DRAWING M-200. PROVIDE NEW REFRIGERANT PIPING BETWEEN INDOOR AND OUTDOOR UNIT. PROVIDE NEW THERMOSTAT/CONTROLLER AND RELATED WIRING FOR AC UNIT CONTROLS. PROVIDE WIRING BETWEEN INDOOR AND OUTDOOR UNIT COMPLETE WITH ACCESSORIES, TERMINATIONS.
2. NEW REFRIGERANT PIPING. ROUTE DOWN TO FLOOR BELOW WITH IN EXISTING WALL ENCLOSURE.
3. PROVIDE NEW SECTIONS OF PIPING AND EXTEND AND CONNECT EXISTING CONDENSATE DRAIN PIPING TO NEW AC UNIT.
4. NEW REFRIGERANT PIPING ROUTED ABOVE CEILING. ALL WALL/CEILING/FLOOR OPENINGS SHALL BE PATCHED TO MATCH EXISTING.
5. NEW CONDENSATE DRAIN PUMP. PUMP SHALL BE WIPCOOL MODEL PC-12B, 120V / 1PH OR EQUAL. MOUNT PUMP ON WALL NEXT TO AC UNIT. EXTEND NEW PIPING AND CONNECT TO EXISTING. COORDINATE WITH ELECTRICAL CONTRACTOR.

PROJECT NAME

MONTCLAIR STATE UNIVERSITY – VILLAGE APT – IDF ROOM AC UNIT REPLACEMENT

CLIENT PROJECT No.

KEY PLAN:



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Loring No. 12284

DRAWING TITLE:

MECHANICAL BUILDINGS A & C – PARTIAL PLANS – 1ST & 2ND FLOOR – NEW WORK

GRAPHIC SCALE:

SEAL:

Vincent Farese, PE
N.J. Professional Engineer No. 43960

DRAWN:	CHECKED:
XX	XX

APPROVED:

LORING JOB No.: 12284

DATE: 03/--/2021

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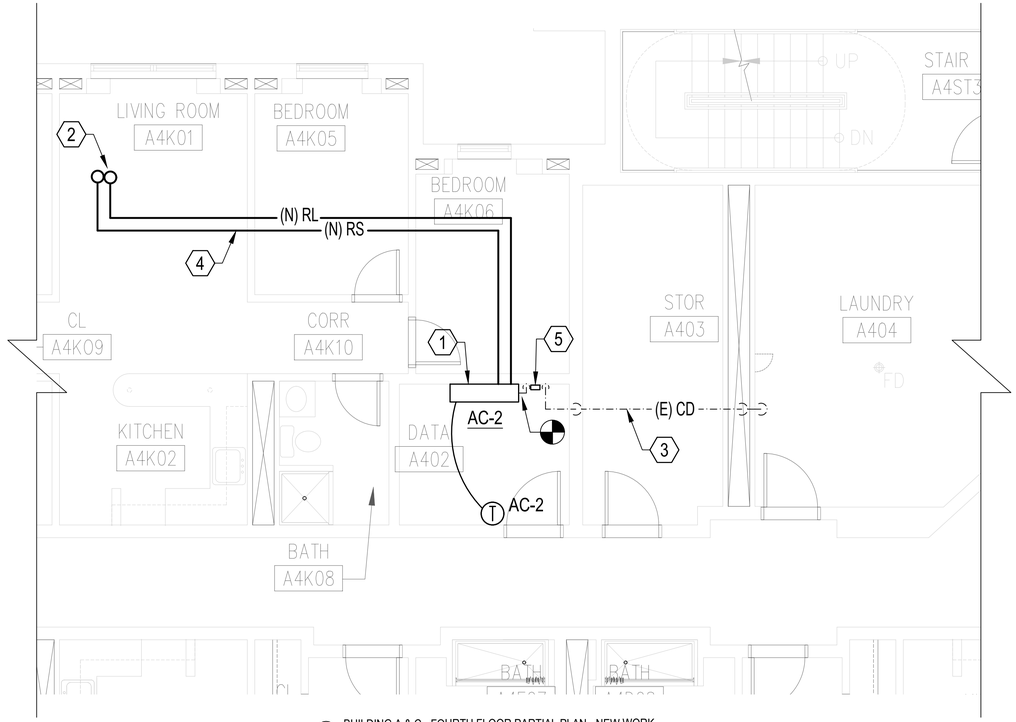
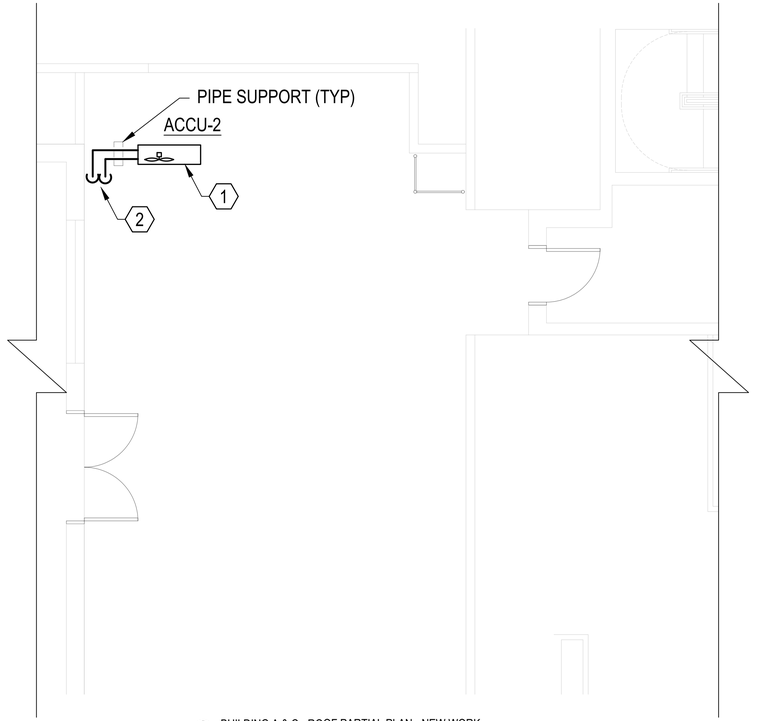


1 BUILDING A & C - FOURTH FLOOR PARTIAL PLAN - NEW WORK
1/4"=1'-0"



1 BUILDING A & C - ROOF PARTIAL PLAN - NEW WORK
1/4"=1'-0"

KEYED NOTES - 4TH FLOOR

1. NEW WALL MOUNTED AC UNIT. MOUNT HIGH ON WALL 12" FROM CEILING. EXACT LOCATION TO BE VERIFIED IN FIELD AND CONFIRMED WITH OWNER. INSTALL SECONDARY DRAIN PAN AND ALARM/LEAK DETECTION, ETC. SEE DETAIL ON DRAWING M-200. PROVIDE NEW REFRIGERANT PIPING BETWEEN INDOOR AND OUTDOOR UNIT. PROVIDE NEW THERMOSTAT/CONTROLLER AND RELATED WIRING FOR AC UNIT CONTROLS. PROVIDE WIRING BETWEEN INDOOR AND OUTDOOR UNIT COMPLETE WITH ACCESSORIES, TERMINATIONS.
2. NEW REFRIGERANT PIPING UP TO ROOF THROUGH PIPE CURB TO ASSOCIATED ACC UNIT ON ROOF.
3. PROVIDE NEW SECTIONS OF PIPING AND EXTEND AND CONNECT EXISTING CONDENSATE DRAIN PIPING TO NEW AC CASSETTE UNIT.
4. NEW REFRIGERANT PIPING ROUTED ABOVE CEILING.
5. NEW CONDENSATE DRAIN PUMP. PUMP SHALL BE WIPCOOL MODEL PC-12B, 120V / 1PH OR EQUAL. MOUNT PUMP ON WALL NEXT TO AC UNIT. EXTEND NEW PIPING AND CONNECT TO EXISTING. COORDINATE WITH ELECTRICAL CONTRACTOR.

GENERAL NOTES:

1. CONTRACTOR TO VERIFY OPERATION OF EXISTING CONDENSATE PUMP AND REPLACE NON-WORKING PUMP WITH MATCHING NEW PUMP.
2. ALL NEW REFRIGERANT PIPING SHALL BE INSTALLED AND ROUTED AS PER PLAN AT SAME LOCATION WHERE EXISTING REMOVED. CONTRACTOR IS RESPONSIBLE TO REMOVE CEILINGS AND WALLS WITH MINIMAL DESTRUCTION OF OTHER AREAS. PATCH, SPACKLE AND FIX ALL WALL OPENINGS. PAINT TO MATCH EXISTING. PROVIDE TEMPORARY PROTECTION IN OCCUPIED AREAS.
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   i. ALICE PAUL HALL
   ii. COUNT BASIE HALL
   iii. MILLICENT FENWICK HALL
   iv. WILLIAM CARLOS WILLIAMS HALL

KEYED NOTES - ROOF

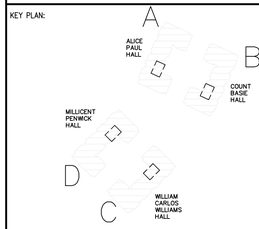
1. NEW AIR COOLED CONDENSING UNIT ON ROOF. PROVIDE UNIT WITH EQUIPMENT RAILS AND VIBRATION ISOLATORS.
2. NEW REFRIGERANT PIPING. ROUTE PIPING DOWN THROUGH EXISTING ROOF PIPE PENETRATION AND EXTEND DOWN TO FLOOR BELOW.

PROJECT NAME

MONTCLAIR STATE UNIVERSITY –
VILLAGE APT – IDF ROOM AC UNIT REPLACEMENT

CLIENT PROJECT No.

KEY PLAN:



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DRAWING TITLE:

MECHANICAL
BUILDINGS A & C –
PARTIAL PLANS – 4TH FLOOR
& ROOF – NEW WORK

GRAPHIC SCALE:

SEAL:

Vincent Farese, PE
N.J. Professional Engineer No. 43960

DRAWN:	CHECKED:
M.A.	A.B.

APPROVED:

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ACCU — AIR COOLED CONDENSING UNIT SCHEDULE

BASIS OF DESIGN: MITSUBISHI

UNIT NO.	COOLING CAPACITY (MBH)	FAN		ELECTRICAL 208/1/60		REF.	NOISE LEVEL (DBA)	EER	DIMENSIONS W X D X H (IN)	WEIGHT (LBS)	MODEL NO.	REMARKS
		AIR FLOW (CFM)	FAN MOTOR FLA	MCA	MOCP							
ACCU-1	36	3880	0.5	25	31	R-410A	52	10.8	41 x 13 x 53	211	TRUYA0361KA70NA	SEE NOTES
ACCU-2	36	3880	0.5	25	31	R-410A	52	10.8	41 x 13 x 53	211	TRUYA0361KA70NA	SEE NOTES

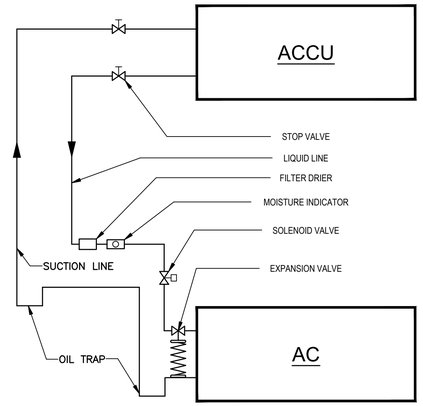
NOTES:
1. ALL UNITS SHALL HAVE FIVE YEAR EXTENDED WARRANTY FOR COMPRESSORS.
2. PROVIDE LOW AMBIENT CONTROL KIT FOR OPERATION DOWN TO 0 DEG F. AND WIND BAFFLE.
3. PROVIDE WEATHERPROOF DISCONNECT SWITCH FOR OUTDOOR CONDENSING UNITS.
4. ROOF MOUNTED UNIT SHALL BE PROVIDED WITH EQUIPMENT SUPPORT.

AC — COOLING ONLY AC UNIT SCHEDULE FOR IT CLOSET

BASIS OF DESIGN: MITSUBISHI

UNIT NO.	AREA SERVED	AIRFLOW - HIGH SPEED (CFM)	COOLING DATA-HIGH SPEED			MOTOR DATA			MODEL #	REMARKS
			TOTAL BTU/ HR	ENT. AIR °F		MCA	MOCP	VOLT/ PH		
				DB	WB					
AC-1	2ND FLR IDF	920	36,000	95	71	1	15	208 / 1	TPKA0361KA70A	SEE NOTES
AC-2	4TH FLR IDF	920	36,000	95	71	1	15	208 / 1	TPKA0361KA70A	SEE NOTES

NOTES:
1. PROVIDE FACTORY MOUNTED CONDENSATE PUMP, AUXILIARY DRAIN PAN, NON-FUSED SERVICE DISCONNECT SWITCH, AND LEAK DETECTOR FOR ALL UNITS.
2. PROVIDE UNITS WITH WALL MOUNTING BRACKETS.
3. PROVIDE UNIT WITH PROGRAMMABLE THERMOSTAT AND CENTRAL CONTROLLER WITH BACNET INTERFACE.
4. UNITS SHALL RUN 24/7 , 365 DAYS.
5. INDOOR UNIT FEED FROM OUTDOOR UNIT.
6. PROVIDE UNITS WITH NEW SEPARATE CONDENSATE DRAIN PUMP. UNIT SHALL BE WIPCOOL MODEL PC-12B, 120V / 1PH. MOUNT ON WALL NEXT TO AC UNIT AND CONNECT TO EXISTING CONDENSATE PIPING.



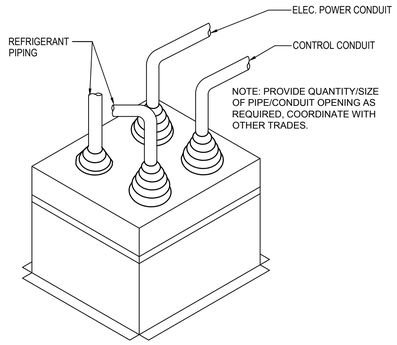
NOTES:
1. THE HORIZONTAL DIMENSION OF THE OIL TRAPS SHALL BE AS SHORT AS POSSIBLE.

REFRIGERANT DIAGRAM NOTES:

1. PITCH ALL LINES DOWN IN DIRECTION OF REFRIGERANT FLOW.
2. REFRIGERATION: PROVIDE ISOLATION VALVES DESIGNED, MANUFACTURED, TESTED, SPECIFICALLY FOR REFRIGERANT SERVICE AND SUITABLE FOR INSTALLATION WITH COPPER TUBING.
   a. INTERNAL PARTS SHALL BE REMOVED FOR INSPECTION OR REPLACEMENT WITHOUT APPLYING HEAT OR BREAKING PIPE CONNECTIONS. THREADED ENDS OF VALVES SHALL CONFORM TO ANSI B2.1.
   b. VALVES SHALL OPEN WHEN TURNED COUNTER-CLOCKWISE.
3. THERMOSTATIC EXPANSION VALVES (DIRECT-OPERATED): PROVIDE DIAPHRAGM AND SPRING LOADED TYPE WITH EXTERNAL EQUALIZERS, BULB AND TUBING AND EXTERNAL SUPERHEAT ADJUSTMENT WITH SEAL CAP.
   a. PROVIDE WITH EXTERNAL, REMOVABLE STRAINER.
   b. POWER ASSEMBLIES AND VALVE CAGE ASSEMBLIES SHALL BE REMOVABLE AND REPLACEABLE WITHOUT BREAKING VALVE CONNECTIONS.
   c. PROVIDE VALVE SIZE AND SUPERHEAT ADJUSTMENT AS RECOMMENDED BY THE VALVE MANUFACTURER.
   d. TEST AND RATE IN ACCORDANCE WITH ASHRAE STANDARD 17 AND ARI 750 FOR CAPACITIES UP TO 40 KW.
   e. VALVES SHALL HAVE BRASS, BRONZE OR STEEL ALLOY BODIES WITH STAINLESS STEEL OR NONCORROSIVE NONFERROUS INTERNAL PARTS.
   f. VALVES SHALL HAVE BRAZING TYPE CONNECTIONS.
4. LIQUID LINE DRYERS: DRYERS SHALL BE THE CARTRIDGE REFILLABLE TYPE, AND PROVIDED WITH A VALVED BYPASS OF THE SAME SIZE OF THE LIQUID LINE.
   a. DRYER BODY SHALL BE OF BRASS OR STEEL AND PROVIDED WITH MEANS FOR HOLDING THE DESICCANT IN PLACE AND DISTRIBUTING THE LIQUID REFRIGERANT EQUALLY THROUGHOUT THE DESICCANT.
   b. DRYER SHALL BE CAPABLE OF WITHSTANDING A SERVICE PRESSURE OF 250 PSIG. (DRYERS MAY BE OF COMBINATION DRYER-INDICATOR TYPE)
5. LIQUID REFRIGERANT SIGHT GLASSES: PROVIDE THE DOUBLE-PORT, SEE-THROUGH TYPE WITH TWO BULLS-EYE AND COVER CAPS OF NONFERROUS MATERIALS, UNLESS COMBINED AS PART OF THE MOISTURE INDICATOR.
   a. SIGHT GLASS INDICATOR SHALL CAPABLE OF WITHSTANDING A TEST PRESSURE OF 350 PSIG WITHOUT DAMAGE. SIGHT GLASS BODY SHALL BE FORGED BRASS OR BRONZE WITH FITTINGS AS SPECIFIED FOR REFRIGERANT PIPING.
6. CHARGING VALVES: EXCEPT AS INDICATED OTHERWISE , PROVIDE CHARGING VALVES FOR THE REFRIGERANT SYSTEM LOCATED IN THE LIQUID LINE BETWEEN THE SHUT-OFF VALVE TO THE CONDENSER AND THE LIQUID LINE SIGHT GLASS. VALVES SHALL BE CONNECTED BY A FULL-SIZE LIQUID LINE TEE.
7. PRESSURE TAPS: EXCEPT AS INDICATED OTHERWISE, PROVIDE RELIEF VALVE, FUSABLE PLUGS, AND RELIEF DISCHARGE PIPING AS RECOMMENDED BY ASHRAE 15. VENT DISCHARGE PIPING, WHERE REQUIRED, IN LOCATIONS THAT ARE SAFE FOR ALL PERSONNEL IN AND AROUND THE BUILDING.

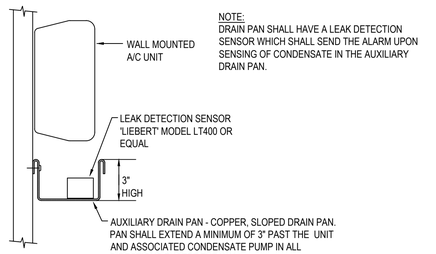
TYPICAL REFRIGERANT FLOW DIAGRAM

(NOT TO SCALE)



REFRIGERANT PIPING PORTAL DETAIL

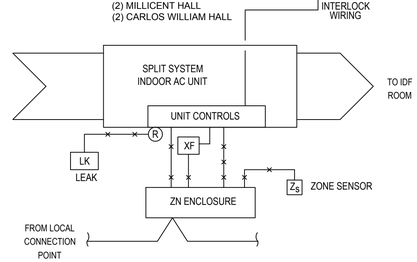
NOT TO SCALE



NOTE:
DRAIN PAN SHALL HAVE A LEAK DETECTION SENSOR WHICH SHALL SEND THE ALARM UPON SENSING OF CONDENSATE IN THE AUXILIARY DRAIN PAN.

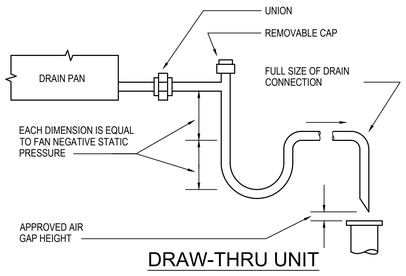
WALL MOUNTED AC UNIT WITH AUXILIARY DRAIN PAN

N.T.S.

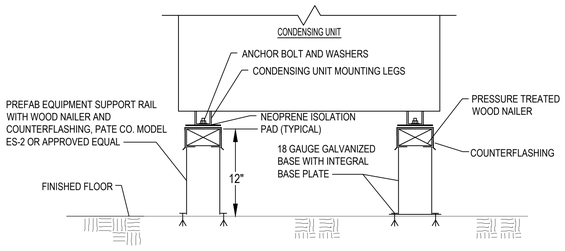


SPLIT SYSTEM AC UNIT CONTROLS

NTS

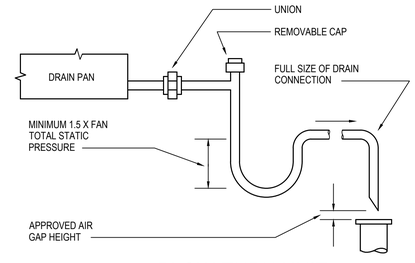


DRAW-THRU UNIT



CONDENSING UNIT ON FINISHED FLOOR

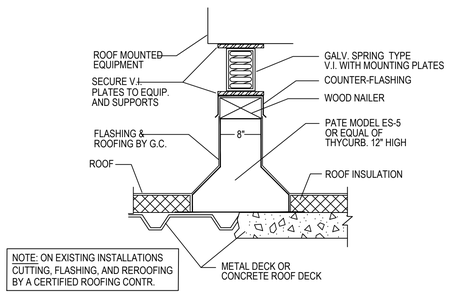
NOT TO SCALE



BLOW-THRU UNIT

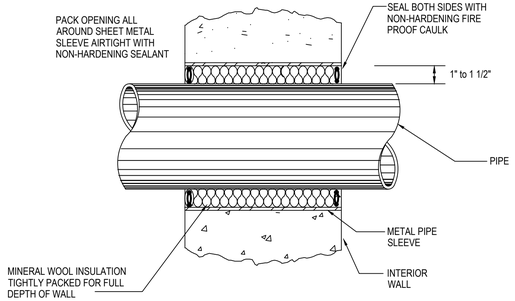
CONDENSATE DRAIN TRAP

NOT TO SCALE



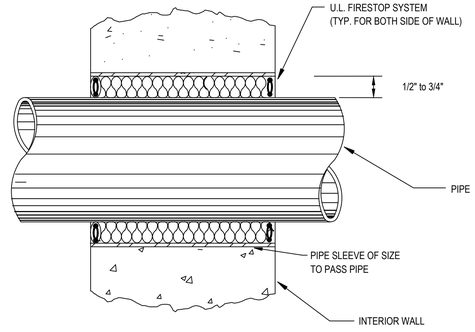
EQUIPMENT SUPPORT DETAIL

NOT TO SCALE



PIPE PENETRATION OF INTERIOR NON-RATED WALL

NOT TO SCALE



NOTE
FIRESTOP ALL PIPE PENETRATIONS IN ACCORDANCE WITH PUBLISHED U.L. STANDARD 1479 REQUIREMENTS, FOR THE RESPECTIVE WALL CONSTRUCTION, PIPE SIZE, PIPE MATERIAL AND INSULATION.

PIPE PENETRATION OF RATED WALL OR FLOOR

NOT TO SCALE

PROJECT NAME

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MECHANICAL SCHEDULES & DETAILS

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