SYMBOLS

SYMBOLS	DESCRIPTION	SYMBOLS	DESCRIPTION
	NEW DUCT OR PIPE	RT	REMOTE TEMPERATURE SENSOR
	EXISTING DUCT OR PIPE		CONNECT TO EXISTING
	TO BE REMOVED		POINT OF DISCONNECTION
	FLEX TO DIFFUSER (5'-0" MAXIMUM)	X	KEY NOTE DESIGNATION
R	RISE IN DUCT	X / X	TOP: EQUIPMENT DESIGNATION BOTTOM: UNIT NUMBER (E-SIGNIFIES EXISTING)
D	DROP IN DUCT	RS	REFRIGERANT SUCTION PIPING
FC	FLEXIBLE DUCT CONNECTION	RL	REFRIGERANT LIQUID PIPING
	CEILING DIFFUSER 4 WAY BLOW	PC	PUMPED CONDENSATE PIPING
	CEILING DIFFUSER 3 WAY BLOW	CD	CONDENSATE DRAIN PIPING
	CEILING DIFFUSER 2 WAY BLOW		SHUT-OFF VALVE
	CEILING DIFFUSER 1 WAY BLOW		BALANCE VALVE
	RETURN OR EXHAUST REGISTER		THROTTLING VALVE
VD	VOLUME DAMPER	M	MOTOR OPERATED VALVE, THREE WAY
FD	FIRE DAMPER AND ACCESS DOOR	M	MOTOR OPERATED VALVE, TWO WAY
M	MOTOR OPERATED DAMPER		CHECK VALVE
U	UNDERCUT DOOR		GAS COCK
L	LOUVERED DOOR		UNION
T	THERMOSTAT		STRAINER WITH BLOWDOWN
S	SENSOR		RELIEF VALVE
H	HUMIDISTAT		PRESSURE GAUGE
W	DUCT SMOKE DETECTOR		THERMOMETER
CO2	CO2 DETECTOR		

GENERAL NOTES

1. DO NOT SCALE FROM THESE DRAWINGS.
2. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES, LAWS, ORDINANCES, RULES AND REGULATIONS.
3. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING HIS BID FOR THE PROPOSED WORK. HE SHALL BE RESPONSIBLE TO VERIFY FIELD CONDITIONS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO SUBMISSION OF BIDS IN WRITING.
4. CONTRACTOR RESPONSIBLE TO PAY FOR AND SECURE ALL PERMITS AND INSPECTIONS.
5. CONTRACTOR RESPONSIBLE FOR THE PROPER CARE OF ALL OWNER'S EQUIPMENT AND/OR FURNISHINGS WHICH ARE REQUIRED TO BE TEMPORARILY REMOVED, STORED OR RELOCATED. CONTRACTOR SHALL REPLACE, REPAIR OR REIMBURSE OWNER FOR ALL DAMAGES TO SUCH PROPERTIES AT FULL REPLACEMENT VALUE AND EQUIVALENCY. CONTRACTOR SHALL ADVISE OWNER FOR DISPOSITION OF REMOVED EQUIPMENT AND/OR MATERIALS.
6. ALL CONTRACTORS SHALL PROVIDE CUTTING AND PATCHING FOR THEIR RESPECTIVE TRADES.
7. CONTRACTOR'S WORK MAY BE REQUIRED OUTSIDE OF DESIGNATED SPACE. ALL SYSTEMS BEING DEMOLISHED AND REMOVED, MODIFIED, AND/OR TERMINATED SHALL BE FIELD VERIFIED TO INSURE NO WORK PERFORMED, INSIDE OR OUTSIDE OF THE DESIGNATED SPACE, SHALL DISRUPT ANY SERVICES OR SYSTEMS OF ANY OTHER AREAS. IF ANY CONDITIONS ARISE THAT ARE NOT IDENTIFIED ON DRAWINGS, IMMEDIATE NOTIFICATION SHALL BE PROVIDED TO THE ENGINEER OR OWNER. NO WORK SHALL PROCEED WITHOUT APPROVAL FROM ENGINEER OR OWNER.
8. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND MAY HAVE TO BE ADAPTED TO COMPLY WITH EXISTING BUILDING CONDITIONS. CONTRACTOR SHALL SUBMIT HVAC SHOP DRAWINGS, INDICATING LOCATIONS, AND ROUTING AND LOCATIONS OF DUCTS, PIPING, AND WIRING.
9. DUCTING & PIPING SHOWN ON DRAWINGS SHOW THE GENERAL RUN AND CONNECTIONS. ALL PARTS MAY OR MAY NOT BE SHOWN IN THEIR EXACT POSITION. CONTRACTOR SHALL BE RESPONSIBLE FOR ERECTING THE DUCTING/PIPING SUITABLE IN EVERY RESPECT FOR THE WORK. DUCTING/PIPING SHALL BE INSTALLED SO THAT ACCESS, CLEARANCE, HEADROOM AND PITCH ARE MAINTAINED. CONTRACTORS OF THE VARIOUS TRADES SHALL COORDINATE THE INSTALLATION.
10. CONTRACTOR SHALL COORDINATE HIS SCHEDULING WITH THE OWNER AND GENERAL CONTRACTOR TO COMPLY WITH THE OWNERS USAGE OF THE BUILDING.
11. UPON CONTRACT AWARD, CONTRACTOR SHALL CONTACT LOCAL UTILITY COMPANY TO SCHEDULE ANY UTILITY UPGRADES. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL UTILITY UPGRADES, SECURE ALL PERMITS AND INSPECTIONS.
12. ALL CONNECTIONS TO EXISTING BUILDING SERVICES SHALL BE CAREFULLY COORDINATED WITH THE UTILITY CO. AND THE OWNER'S SCHEDULE. SERVICE WORK OF THIS NATURE TO OCCUR DURING UNOCCUPIED BUILDING HOURS. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL EXISTING EQUIPMENT IS OPERATIONAL AFTER ANY SHUTDOWN OCCURS.
13. ALL PENETRATIONS THRU WALLS, FLOORS, AND CEILINGS SHALL BE SEALED WITH A UL APPROVED FIRESTOP MATERIAL SUITABLE FOR CONSTRUCTION MATERIAL TO MAINTAIN FIRE, SMOKE, AND DRAFT INTEGRITY OF STRUCTURE.
14. ALL CONTRACTORS REMOVING OR INSTALLING ANY EQUIPMENT, PIPES, DUCTS, CONDUITS, ETC. SHALL PATCH ALL SURFACES DISTURBED BY THIS WORK WITH SUITABLE FIRE PROOF MATERIALS AND FINISH TO MATCH ADJACENT SURFACES.
15. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER HANDLING, DISPOSAL, & ASSOCIATED COSTS OF ALL REFRIGERANT MATERIAL, DURING THIS CONTRACT, IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES AND/OR REGULATIONS.
16. THE ELECTRICAL CONTRACTOR TO PROVIDE, INSTALL AND WIRE DUCT MOUNTED SMOKE DETECTORS. ELECTRIC CONTRACTOR SHALL ALSO PROVIDE AND WIRE A REMOTE MONITORING KEY OPERATED TEST AND ALARM STATION FOR EACH DUCT SMOKE DETECTOR. THE REMOTE TEST ALARM STATION SHALL BE MOUNTED AS DIRECTED IN THE AREA OF THE SMOKE DETECTOR.
17. THE MECHANICAL CONTRACTOR SHALL REVIEW ALL CONTRACT DOCUMENTS, EXISTING CONDITIONS, AND AS-BUILT CONDITIONS PERTAINING TO THE HVAC SYSTEMS. MECHANICAL CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIAL, PARTS, SUPPLIES AND LABOR TO BALANCE ALL HVAC EQUIPMENT TO OWNER'S SATISFACTION.
18. ALL RECTANGULAR RIGID DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET STEEL. FABRICATION OF DUCTWORK AND INSTALLATION SHALL BE IN ACCORDANCE WITH SMACNA STANDARDS AND RECOMMENDATIONS.
19. ALL DUCTWORK SIZES SHOWN ON DRAWINGS ARE CLEAR INTERNAL DIMENSIONS.
20. ALL NEW SUPPLY AND RETURN AIR DUCTWORK WITHIN 15' OF HVAC UNIT SHALL BE ACOUSTICALLY LINED.
21. ALL INTERIOR ROUND DUCTWORK CONCEALED OR EXPOSED IN NON-FINISHED AREA, EG ATTIC, ABOVE CEILING, ETC. SHALL BE SINGLE WALLED EXTERNALLY INSULATED WITH FLEXIBLE DUCTWRAP AND VAPOR BARRIER. SEE SPECIFICATIONS FOR DETAILS.
22. ALL FLEXIBLE DUCTWORK SHALL BE CLASS I, LABELED UL 181. SEE SPECIFICATIONS FOR DETAILS.
23. THE MECHANICAL CONTRACTOR TO PROVIDE ALL ROOF CURBS, EQUIPMENT RAILS, SUPPORTS, ROOF PORTALS, AND ASSOCIATED EQUIPMENT TO ENSURE A COMPLETE INSTALLATION FOR NEW HVAC EQUIPMENT. MECHANICAL CONTRACTOR RESPONSIBLE TO PROVIDE EXACT LOCATIONS AND REVIEW AND RELEASED EQUIPMENT SUBMITTALS, OF ROOF CURBS, EQUIPMENT SUPPORTS, ROOF PORTALS, AND ASSOCIATED EQUIPMENT TO THE ARCHITECT. ALL ROOF PENETRATIONS, EQUIPMENT SUPPORTS, ROOF PORTALS AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED BY ROOFING SUB-CONTRACTOR. ROOFING CONTRACTOR SHALL BE BONDED AND ALL WORK SHALL BE DONE SO AS NOT TO VOID ROOF WARRANTY. ROOFING CONTRACTOR SHALL PROVIDE BASE FLASHING, AND PROVIDE TEMPORARY WEATHER-PROOF COVERS UNTIL MECHANICAL CONTRACTOR INSTALLS NEW HVAC UNITS. MECHANICAL CONTRACTOR TO PROVIDE COUNTER FLASHING.

CODE INFORMATION

1	OCCUPANCY TYPE	RETAIL
2	GOVERNING CODES AND REFERENCES	2020 BUILDING CODE OF NEW YORK STATE
		2020 MECHANICAL CODE OF NEW YORK STATE
		2020 PLUMBING CODE OF NEW YORK STATE
		2017 NATIONAL ELECTRICAL CODE
		2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE
		2020 FUEL GAS CODE OF NEW YORK STATE
		2020 FIRE CODE OF NEW YORK STATE

DRAWING INDEX

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MC	MECHANICAL CONTRACTOR
AD	ACCESS DOOR	NAE	NETWORK AUTOMATION ENGINE
BDD	BACKDRAFT DAMPER	OAI	OUTDOOR AIR INTAKE
BOD	BOTTOM OF DUCT	PC	PLUMBING CONTRACTOR
CD	CEILING DIFFUSER	RR	RETURN REGISTER
CFM	CUBIC FEET PER MINUTE	SR	SUPPLY REGISTER
EC	ELECTRICAL CONTRACTOR	VD	VOLUME DAMPER
EG	EXHAUST GRILLE	WMS	WIRE MESH SCREEN
ER	EXHAUST REGISTER	WR	WALL REGISTER

Bank of America

YONKERS

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	Issue	Date & Issue Description	By	Check
	01	10/09/20	CTH	JDS
		ISSUED FOR BID		
	02	02/03/2021		
		ISSUE FOR PERMIT & PRICING II		
	03	07/15/2021		
		ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
– – – – –

CAD File Name

Description
MECHANICAL SYMBOLS, NOTES & ABBREVIATIONS

Scale
AS SHOWN

M-001

Ref. North

O:\BK61000\165 - Bank Of America Branch Locations\6165.264 - BOA 928 McLean Ave Yonkers NY\CAD\DWG\6165.264 - M-001.dwg

SPECIFICATIONS

1. GENERAL
   - A. DRAWINGS AND GENERAL & SUPPLEMENTARY CONDITIONS SHALL APPLY TO WORK OF THIS SECTION.
   - B. ALL MATERIALS SHALL BE NEW AND THE BEST OF THEIR RESPECTIVE KINDS, SUITABLE FOR THE CONDITIONS AND DUTIES IMPOSED UPON SAME AT THE BUILDING. MATERIALS SHALL MATCH EXISTING FOR SIMILAR SERVICE EXCEPT AS OTHERWISE NOTED HEREIN. THEY SHALL GENERALLY BE OF REPRESENTATIVE MANUFACTURER. BRAND NAMES ARE SPECIFIED TO INDICATE A STANDARD OF QUALITY ONLY. INSTALLATION OF THE WORK SHALL BE PERFORMED BY SKILLED TRADESMEN.
   - C. CODE COMPLIANCE: ALL WORK SHALL BE INSTALLED IN CONFORMANCE TO BUILDING CODES HAVING JURISDICTION INCLUDING BUT NOT LIMITED TO THE LATEST ADOPTED EDITION OF IBC, NATIONAL ELECTRICAL CODE, NATIONAL FIRE CODE, INTERNATIONAL MECHANICAL CODE AND INTERNATIONAL FUEL GAS CODE.
   - D. IF ANY UNEXPECTED DISCOVERY OF SUSPECTED HAZARDOUS MATERIALS IS MADE DURING THE COURSE OF WORK, THE CONTRACTOR SHALL REPORT THE DISCOVERY IMMEDIATELY TO THE OWNER. THE CONTRACTOR SHALL STOP ANY WORK THAT MAY DISTURB THE SUSPECTED HAZARDOUS MATERIAL. CONTRACTOR SHALL RESUME WORK AFTER ALL HAZARDOUS MATERIAL HAS BEEN REMEDIATED.
2. SUBSTITUTIONS
   - A. IF CONTRACTOR IS CONSIDERING SUBSTITUTION OF BASE SPECIFICATION, SUCH EQUIPMENT SHALL MEET OR EXCEED ALL LISTED CAPACITIES, OPERATIONAL EFFICIENCIES AND POWER/CONTROL REQUIREMENTS OF BASE SPECIFIED EQUIPMENT. COSTS FOR ANY REVISIONS TO STRUCTURAL DESIGN OR MECHANICAL/ELECTRICAL REQUIREMENTS DUE TO EQUIPMENT SUBSTITUTIONS SHALL BE PAID BY CONTRACTOR.
3. VERIFYING EXISTING CONDITIONS, REMOVALS AND ALTERATIONS
   - A. THE CONTRACTOR SHALL VISIT THE PREMISES TO DETERMINE EXISTING CONDITIONS AND COMPARE SAME WITH DRAWINGS AND SPECIFICATIONS AND SATISFY HIMSELF OF ALL CONDITIONS PRIOR TO THE SUBMISSION OF A BID PROPOSAL. NO ALLOWANCE WILL BE MADE FOR FAILURE TO COMPLY WITH THESE REQUIREMENTS AND A BID PROPOSAL SHALL BE CONSTRUED AS EVIDENCE HE HAS DONE SO.
   - B. THE CONTRACTOR SHALL REMOVE, RELOCATE, REPLACE, ADJUST, ADAPT AND MODIFY EXISTING EQUIPMENT AND/OR SYSTEMS AS REQUIRED BY THE DRAWINGS OR SPECIFICATIONS AND AS MAY BE REQUIRED WHEN SUCH WORK IS UNCOVERED AND FOUND TO INTERFERE WITH THE COMPLETION OF WORK IN THIS CONTRACT OR OTHER CONTRACT WORK.
   - C. ALL REMOVED EQUIPMENT AND MATERIAL SHALL BE REMOVED FROM THE PROJECT SITE. PRIOR TO REMOVAL, COORDINATE DISPOSITION WITH OWNER.
   - D. PROVIDE SHUTDOWNS, DRAINING AND REFILLING, RECONNECTIONS AND STARTUPS OF EXISTING SYSTEMS NECESSARY IN CONNECTION WITH THE NEW WORK. COORDINATE SHUTDOWNS WITH THE OWNERS REPRESENTATIVE.
   - E. TEMPORARY SERVICES: PROVIDE TEMPORARY SERVICES DURING THE INTERRUPTION IN SERVICE CREATED BY THE DEMOLITION OF THE EXISTING FACILITY AND UNTIL THE NEW FACILITY BECOMES OPERATIONAL. PROCURE RENTAL EQUIPMENT OF ADEQUATE CAPACITIES AND ASSUME ALL COSTS RELATED TO THIS INSTALLATION AND OPERATION OF SAME.
4. COORDINATION
   - A. MECHANICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADE.
   - B. COORDINATE REFRIGERANT PIPING SIZES, ROUTING & SUPPORTS.
   - C. COORDINATE LOCATION OF ROOF CURBS, EQUIPMENT SUPPORTS, AND ROOF PENETRATIONS.
   - D. COORDINATE LOCATION OF MECHANICAL EQUIPMENT, PIPING AND DUCTWORK WITH THE WORK OF OTHER TRADES, PROVIDING CLEARANCES FOR INSULATION, SERVICING, REMOVAL OF COMPONENTS AND EQUIPMENT DISASSEMBLY.
   - E. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENT.
   - F. SEQUENCE PHASES OF MECHANICAL WORK WITH THE WORK OF OTHER TRADES.
5. SHOP DRAWINGS
   - A. SUBMIT A MINIMUM FIVE (5) COPIES OF MANUFACTURER'S EQUIPMENT DRAWINGS CONSISTING OF: DIMENSIONAL PLANS, PRODUCT, AND PERFORMANCE DATA; WIRING DIAGRAMS; AND OPERATING AND MAINTENANCE INSTRUCTIONS INCLUDING TROUBLE SHOOTING PROCEDURES.
   - B. WORK SHALL NOT PROCEED PRIOR TO SHOP DRAWING RELEASE BY THE ENGINEER WITH STAMPED NOTATION "NO EXCEPTIONS TAKEN" APPLIED.
6. RECORD DRAWINGS
   - A. REPRODUCIBLE RECORD DRAWINGS SHALL BE SUPPLIED UPON WHICH CORRECTIONS SHALL BE MADE TO PROVIDE AN ACCURATE AND COMPLETE RECORD OF THE WORK AS INSTALLED.
   - B. AS-BUILT INFORMATION SHALL BE SUBMITTED AS FOLLOWS: WORK SHALL NOT PROCEED PRIOR TO SHOP DRAWING RELEASE BY THE ENGINEER WITH STAMPED NOTATION "NO EXCEPTIONS TAKEN" APPLIED.
     - a. ONE (1) SET OF REPRODUCIBLE DRAWINGS.
     - b. TWO (2) SETS OF PRINTS.
7. DELIVERY AND STORAGE: DELIVER FACTORY FURNISHED MATERIALS AND EQUIPMENT IN PROPER CONTAINERS AND STORE IN AREA PROTECTED FROM WEATHER, FUMES AND VANDALISM.
8. REMOVALS: REMOVE EXISTING MATERIALS AND EQUIPMENT INDICATED AND REPLACE WITH NEW MATERIALS AS INDICATED.
9. CUTTING AND PATCHING
   - A. PERFORM CUTTING AND PATCHING IN A COMPETENT AND WORKMANLIKE MANNER WITHOUT DAMAGE TO WORK OR STRUCTURES TO REMAIN.
   - B. CUT REMOVE AND LEGALLY DISPOSE OF DESIGNATED MATERIALS, EQUIPMENT AND COMPONENTS, INCLUDING BUT NOT LIMITED TO GYPSUM BOARD, CONCRETE, CEILING TILE, DUCTS, PIPING AND OTHER MATERIALS REQUIRING REMOVAL TO INSTALL THE NEW WORK.
   - C. PROTECT THE STRUCTURE, FURNISHINGS, FINISHES AND ADJACENT MATERIALS NOT INDICATED OR SCHEDULED TO BE REMOVED.
   - D. PROVIDE AND MAINTAIN TEMPORARY PARTITIONS OR DUST BARRIERS ADEQUATE TO PREVENT THE SPREAD OF DUST AND DIRT TO ADJACENT AREAS.
   - E. PATCH EXISTING FINISHED SURFACES AND BUILDING COMPONENTS USING NEW MATERIALS MATCHING EXISTING MATERIALS. USE EXPERIENCED INSTALLERS TO RESTORE SURFACE OF MATERIALS BEING PATCHED.
10. GUARANTEE: THE CONTRACTOR SHALL GUARANTEE, IN WRITING, FOR A PERIOD OF ONE YEAR, COMMENCING FROM THE DATE OF ACCEPTANCE BY THE OWNER, ALL MATERIALS AND WORKMANSHIP PROVIDED AS PART OF THIS PROJECT.
11. INSPECTION
    - A. UNLESS OTHERWISE INDICATED, THE ARRANGEMENT, POSITION, CONNECTIONS, ETC., SHOWN ON THE DRAWINGS SHALL BE TAKEN AS DIAGRAMMATIC.
    - B. THE RIGHT IS RESERVED BY THE ENGINEER TO MAKE MINOR CHANGES IN LOCATIONS AND ARRANGEMENTS WHEN REQUIRED BY JOB DEVELOPMENT WITHOUT ADDITIONAL COMPENSATION TO THIS CONTRACTOR.
12. SHEET METAL WORK AND ACCESSORIES
    - A. ALL INTERIOR DUCTWORK SHALL BE CONSTRUCTED OF PRIME QUALITY GALVANIZED SHEET STEEL, ASTM A527, G-90 GALVANIZED.
    - B. ALL EXTERIOR DUCTWORK SHALL BE CONSTRUCTED OF PRIME QUALITY GALVANIZED SHEET STEEL, ASTM A527, G-90 GALVANIZED.
    - C. MATERIAL GAUGES AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARDS FOR 2" W.G. POSITIVE PRESSURE SUPPLY AND 1" W.G. NEGATIVE PRESSURE DUCT.
    - D. PROVIDE 3/8"- 1'-0" SCALE SHEET METAL SHOP DRAWINGS OF DUCT LAYOUT INDICATING GAUGES, PRESSURES, FITTINGS, REINFORCING DETAILS, SPACING, SEAM AND JOINT CONSTRUCTION DETAILS.
    - E. ALL SHEET METAL DUCTWORK SEAMS, JOINTS AND FLANGES SHALL BE COATED WITH A WATER BASED LOW VOC MASTIC SEALANT APPROVED FOR SUCH USE.
13. DUCT LINER
    - A. COMPLY WITH NFPA STANDARD 90A ASTM STANDARD AHC-101. ASTM C 1071, TYPE 2, WITH COATED SURFACE EXPOSED TO AIR STREAM TO PREVENT EROSION OF GLASS FIBERS.
    - B. LINER SHALL BE BY JOHNS MANVILLE CO LINACOUSTIC RC OR APPROVED EQUAL.
    - C. INTERIOR DUCTWORK
      - a. THICKNESS 1 INCH, DENSITY 1 1/2 POUNDS. THERMAL PERFORMANCE: "K-FACTOR" EQUAL TO 0.28 OR BETTER, AT A MEAN TEMPERATURE OF 75 DEG. F. FLAME SPREAD RATING NOT MORE THAN 25, SMOKE DEVELOPED RATING NO HIGHER THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM TEST E-84. MINIMUM R-4.2 VALUE.
    - D. EXTERIOR DUCTWORK
      - a. THICKNESS 1 1/2 INCH, DENSITY 1 1/2 POUNDS. THERMAL PERFORMANCE: "K-FACTOR" EQUAL TO 0.28 OR BETTER, AT A MEAN TEMPERATURE OF 75 DEG. F. FLAME SPREAD RATING NOT MORE THAN 50, SMOKE DEVELOPED RATING NO HIGHER THAN 100 WHEN TESTED IN ACCORDANCE WITH ASTM TEST E-84. MINIMUM R-6 VALUE.
      - b. THE INSULATED DUCT ASSEMBLY SHALL BE WRAPPED WITH A SHEET TYPE PROTECTIVE MEMBRANE THAT IS UV AND OZONE RESISTANT ALUMINUM CLAD SURFACE WITH HIGH DENSITY CROSS-LINKED POLYETHYLENE WITH MULTIPLE LAYERS WITH A MINIMUM 10 YEAR WARRANTY. PRODUCT SHALL BE VENTURE CLAD #1577CW WITH WHITE FINISH AS MANUFACTURED BY VENTURE TAPE OR ENGINEER APPROVED EQUAL.
    - E. LINER ADHESIVE SHALL COMPLY WITH NFPA STANDARD 90A AND ASTM C 916. LINER TO BE AFFIXED TO DUCT WITH LOW VOC ADHESIVE AND WELD PINS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. INCREASE DUCT SIZE TO COMPENSATE FOR LINER THICKNESS.
14. DUCT INSULATION
    - A. PROVIDE 1 1/2" THICK 12 PCF DENSITY FIBERGLASS BLANKET INSULATION, ASTM C 533 WITH FOIL FACED VAPOR BARRIER JACKET WITH SELF SEALING LAP ON ALL UNLINED SUPPLY AND RETURN AIR DUCT WORK. MINIMUM R-6 VALUE.
    - B. UL LISTED WITH FLAME SPREAD RATING OF 25 OR LESS AND SMOKE DEVELOPED RATING 50 OR LESS. PROVIDE TIGHT CLOSURE AT POINT OF CONNECTION TO EXISTING INSULATION.
15. FLEXIBLE DUCT
    - A. PROVIDE FLEXIBLE AIR DUCT WHERE INDICATED ON PLANS ONLY.
    - B. DUCT SHALL BE LISTED BY UNDERWRITERS LABORATORIES UNDER UL STANDARD 181 AS A CLASS 1 FLEXIBLE AIR DUCT AND COMPLYING WITH NFPA STANDARDS 90A AND 90B.
    - C. DUCT SHALL BE FACTORY FABRICATED, INSULATED, ROUND DUCT, WITH OUTER JACKET ENCLOSING 1" THICK, GLASS FIBER INSULATED AROUND A CONTINUOUS INNER LINER. REINFORCEMENT SHALL BE STEEL WIRE HELIX ENCAPSULATED IN THE INNER LINER. OUTER JACKET SHALL BE GLASS-REINFORCED SILVER MYLAR WITH CONTINUOUS HANGING TAB, INTEGRAL FIBERGLASS TAPE, AND NYLON HANGING CORD. INNER LINER SHALL BE POLYETHYLENE FILM. FLEXIBLE DUCT CLAMPS SHALL BE STAINLESS STEEL WITH CADMIUM PLATED HEX SCREWS. MINIMUM INSULATION R-4.2 VALUE.
17. FLEXIBLE CONNECTORS
    - A. FLAME-RETARDED OR NON COMBUSTIBLE FABRICS, COATINGS AND ADHESIVES COMPLYING WITH UL STANDARD 181, CLASS 1. GLASS FABRIC DOUBLE COATED WITH POLYCHLOROPRENE. MINIMUM WEIGHT 26 OZ. PER SQ. YD.
    - B. JOINTS AT FLEXIBLE CONNECTIONS SHALL BE SEALED WITH GASKET MATERIAL IN ACCORDANCE WITH SMACNA DETAIL FIGURE 2-19. FLEXIBLE CONNECTIONS SHALL BE CONSTRUCTED FROM NEOPRENE FLAME RETARDANT FABRIC.
18. AIR OUTLETS
    - A. FURNISH & INSTALL SUPPLY AIR CEILING DIFFUSERS & REGISTERS, RETURN/EXHAUST AIR CEILING REGISTERS & GRILLES WITH ALL ALUMINUM OR STEEL CONSTRUCTION. THE FINISH SHALL BE BAKED ENAMEL WITH COLORS TO BE SELECTED BY THE ARCHITECT. MANUFACTURED BY TITUS OR APPROVED EQUAL.
    - B. CONFIGURATION: VOLUME-DAMPER ASSEMBLY AND CONTROL COMPONENTS INSIDE UNIT CASING.
    - C. CASINGS: STEEL OR ALUMINUM SHEET METAL OF THE FOLLOWING MINIMUM THICKNESSES: UPSTREAM PRESSURE SIDE:0.0239-INCH STEEL. DOWNSTREAM PRESSURE SIDE: 0.0179-INCH STEEL.
    - D. ACCESS: REMOVABLE PANELS TO PERMIT ACCESS TO DAMPERS AND OTHER PARTS REQUIRING SERVICE, ADJUSTMENT, OR MAINTENANCE; WITH AIRTIGHT GASKET AND QUARTER TURN LATCHES.
    - E. VOLUME DAMPER: CONSTRUCT OF GALVANIZED STEEL WITH PERIPHERAL GASKET AND SELF-LUBRICATING BEARINGS. MAXIMUM DAMPER LEAKAGE: 2 PERCENT OF NOMINAL AIRFLOW AT 1-INCH WG INLET STATIC PRESSURE. DAMPER POSITION: NORMALLY CLOSED.
    - F. REGULATOR ASSEMBLY: EXTRUDED-ALUMINUM OR 20-GAGE GALVANIZED-STEEL COMPONENTS; KEY DAMPER BLADES INTO SHAFT WITH NYLON-FITTED PIVOT POINTS LOCATED INSIDE UNIT CASING.
19. CONTROLS: DAMPER OPERATOR, THERMOSTAT, AND OTHER DEVICES SHALL BE COMPATIBLE WITH THE EXISTING TEMPERATURE CONTROLS & BUILDING MANAGEMENT SYSTEM (BMS).
20. TESTING AND BALANCING
    - A. INDEPENDENT TESTING AND BALANCING AGENCY SHALL BE RETAINED BY THE CONTRACTOR TO BALANCE THE AIR AND WATER SYSTEMS. THE TEST AND BALANCE AGENCY SHALL HAVE A STATE OF NEW JERSEY PROFESSIONAL ENGINEER ON STAFF OR RETAINED AS A CONSULTANT.
    - B. THE BALANCER SHALL PERFORM WORK IN ACCORDANCE WITH THE AABC NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE AND THE LATEST EDITION OF THE ASHRAE HANDBOOK.
    - C. MECHANICAL CONTRACTOR SHALL REVIEW ALL CONTRACT DOCUMENTS AND AS-BUILT CONDITIONS PERTAINING TO THE HVAC SYSTEMS. MECHANICAL CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIAL, PARTS, SUPPLIES AND LABOR TO BALANCE ALL HVAC EQUIPMENT TO OWNER'S SATISFACTION.
    - D. SUBMIT CERTIFIED REPORTS CONTAINING SEAL AND SIGNATURE OF THE TEST AND AIR BALANCE ENGINEER CERTIFYING THAT THE SYSTEM WAS TESTED AND BALANCED IN ACCORDANCE WITH REFERENCED STANDARDS, AND IS OPERATING ACCORDING TO THE CONTRACT DOCUMENTS.
    - E. REPORTS SHALL INCLUDE A SINGLE LINE DIAGRAM OF AIR SYSTEMS WITH AIR OUTLETS IDENTIFIED NUMERICALLY. AIR OUTLETS WILL BE TABULATED IN COLUMNAR FORM WITH THE FOLLOWING DATA PROVIDED FOR EACH NUMERICALLY IDENTIFIED OUTLET:
      - a. REGISTER SIZE
      - b. DIFFUSER SIZE
      - c. FREE AREA IN SQUARE FEET, AIR VELOCITY, REGISTER CONSTANT, CFM.
      - d. FOR EACH FAN SUBMIT DESIGN AND RECORDED CFM, STATIC PRESSURE, FAN RPM AND MOTOR AMPERAGE IN SEPARATE VERTICAL COLUMNS.
    - F. PROCEDURES FOR TESTING, ADJUSTING AND BALANCING EXISTING EQUIPMENT THAT IS TO REMAIN AND BE REUSED.
      - a. PERFORM A PRE-CONSTRUCTION INSPECTION OF EXISTING EQUIPMENT THAT IS TO REMAIN AND BE REUSED.
        - MEASURE AND RECORD THE OPERATING SPEED, AIRFLOW AND STATIC PRESSURE OF EACH FAN.
        - MEASURE MOTOR VOLTAGE AND AMPERAGE. COMPARE THE VALUES TO MOTOR NAMEPLATE INFORMATION.
        - CHECK THE CONDITION OF FILTERS.
        - CHECK THE CONDITION OF COILS.
        - CHECK BEARINGS AND OTHER LUBRICATED PARTS FOR PROPER LUBRICATION.
        - CHECK THE OPERATION OF THE DRAIN PAN AND CONDENSATE DRAIN TRAP.
        - REPORT ON THE OPERATING CONDITION OF THE EQUIPMENT AND THE RESULTS OF THE MEASUREMENTS TAKEN. REPORT DEFICIENCIES.
      - b. BEFORE PERFORMING TESTING AND BALANCING OF EXISTING SYSTEMS, INSPECT EXISTING EQUIPMENT THAT IS TO REMAIN AND BE REUSED TO VERIFY THAT EXISTING EQUIPMENT HAS BEEN CLEANED AND REFURBISHED.
        - NEW FILTERS ARE INSTALLED.
        - COILS ARE CLEAN AND FINS COMBED.
        - DRAIN PANS ARE CLEAN.
        - FANS ARE CLEAN.
        - BEARINGS AND OTHER PARTS ARE PROPERLY LUBRICATED.
        - DEFICIENCIES NOTED IN THE PRECONSTRUCTION REPORT ARE CORRECTED.
      - c. PERFORM TESTING AND BALANCING OF EXISTING SYSTEMS TO THE EXTENT THAT EXISTING SYSTEMS ARE AFFECTED BY THE RENOVATION WORK.
        - COMPARE THE INDICATED AIRFLOWS OF THE RENOVATED WORK TO THE MEASURED FAN AIRFLOWS AND DETERMINE THE NEW FAN, SPEED, FILTER AND COIL FACE VELOCITY.
        - VERIFY THAT THE INDICATED AIRFLOWS OF THE RENOVATED WORK RESULT IN FILTER AND COIL FACE VELOCITIES AND FAN SPEEDS THAT ARE WITHIN THE ACCEPTABLE LIMITS DEFINED BY EQUIPMENT MANUFACTURER.
        - IF CALCULATIONS INCREASE OR DECREASE THE AIRFLOW RATES BY MORE THAN 5 PERCENT, MAKE EQUIPMENT ADJUSTMENTS TO ACHIEVE THE CALCULATED AIRFLOW AND WATER FLOW RATES. IF 5 PERCENT OR LESS, EQUIPMENT ADJUSTMENTS ARE NOT REQUIRED.
        - AIR BALANCE EACH AIR OUTLET.
        - PROVIDE BALANCING REPORT TO THE ENGINEER FOR APPROVAL. BALANCING REPORT TAKEN SHALL BE USED TO BALANCE THE SYSTEM AFTER CONSTRUCTION.
20. REFRIGERANT PIPING
    - A. ALL REFRIGERANT PIPING SHALL BE COPPER TYPE ACR WITH MATCHING WROUGHT COPPER FITTINGS.
    - B. ALL JOINTS SHALL BR BRAZED, SOLDER JOINTS NOT PERMITTED.
    - C. PIPING SHALL BE INSTALLED IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S RECOMMENDATIONS, RECOMMENDED GOOD PRACTICE AND CODE PROVISIONS.
    - D. REFRIGERANT PIPING SHALL BE INSULATED WITH MINIMUM 1/2" THICK EXPANDED FOAM BY ARMAFLEX OR APPROVED EQUAL.
    - E. EXTERIOR INSULATED PIPING SHALL HAVE PVC OR ALUMINUM JACKETING TO PROTECT INSULATION FROM ELEMENTS OR VERMIN.
    - F. PRECHARGED LINE SETS ARE PERMITTED AS A SUBSTITUTION FOR FIELD ASSEMBLED PIPING SYSTEMS IF USED ACCORDING TO THEIR LISTINGS AND REFRIGERANT TYPE.
21. CONDENSATE DRAIN PIPING
    - A. TYPE M, DRAWN TEMPER COPPER TUBING, WROUGHT COPPER FITTINGS AND SOLDERED JOINTS.
    - B. CONDENSATE DRAIN PIPING INSULATION SHALL BE MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: 1 INCH THICK.
22. ELECTRIC CONTROLS: 24-V DAMPER ACTUATOR WITH WALL MOUNTED ELECTRIC THERMOSTAT AND APPROPRIATE MOUNTING HARDWARE.
23. HANGERS AND SUPPORTS
    - A. PIPING:
      - a. PROVIDE PIPE HANGERS AND SUPPORTS IN ACCORDANCE WITH PIPE SIZE AND SPAN SCHEDULES IN THE LATEST ADOPTED EDITION OF IMC.
      - b. ALL PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING STRUCTURE. ALL HANGERS, RODS AND SUPPORTS SHALL BE SPECIFICALLY APPROVED FOR USE INTENDED. HANGERS AND SUPPORTS SHALL BE INSTALLED IN STRICT CONFORMITY WITH ALL APPLICABLE CODE REQUIREMENTS.
      - c. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OF HANGER RODS, INSERTS, ETC. IN REQUIRED LOCATIONS, THE CONTRACTOR SHALL PROVIDE ADDITIONAL STEEL FRAMING AS REQUIRED AND APPROVED.
      - d. EXPANSION SHIELDS SHALL BE PROVIDED TO SUPPORT HANGER RODS AT REQUIRED INTERVALS. EXPANSION SHIELDS SHALL BE "PHILLIPS" ANCHORS, HILTI CO., OR APPROVED EQUAL.
    - B. DUCTWORK
      - a. PROVIDE HANGERS AND SUPPORTS FOR ALL RIGID DUCTWORK OF COMPATIBLE MATERIAL AS REQUIRED IN ACCORDANCE WITH SMACNA AND ASHRAE RECOMMENDATIONS.
      - b. DUCTWORK SHALL BE SUPPORTED WHERE REQUIRED WITH RESTRAINING CABLES OR STRAPS.
      - c. ROUND FLEXIBLE DUCTWORK TO BE SUPPORTED AS RECOMMENDED BY DUCT MANUFACTURER.
23. VIBRATION ISOLATION SYSTEMS
    - A. ALL ROTATING, REVOLVING OR RECIPROCATING EQUIPMENT, SHALL BE FURNISHED WITH SEISMICALLY DESIGNED VIBRATION ISOLATORS, TO PREVENT THE TRANSMISSION OF OBJECTIONABLE NOISES, SOUND OR VIBRATIONS TO THE OCCUPIED SPACES AND TO THE BUILDING STRUCTURES.
    - B. VIBRATION ISOLATORS FOR CEILING SUPPORTED EQUIPMENT SHALL BE SUPPORTED FROM STRUCTURE ABOVE AND HAVE A MAXIMUM LATERAL MOTION UNDER EQUIPMENT STARTUP OR SHUTDOWN CONDITIONS OF 1/4". MOTIONS IN EXCESS SHALL BE RESTRAINED BY SPRING TYPE MOUNTINGS.
    - C. VIBRATION ISOLATOR SHALL BE PROVIDED BY ONE OF THE FOLLOWING MANUFACTURERS:
      - a. MASON INDUSTRIES
      - b. VIBRATION ELIMINATOR CO.
      - c. CONSOLIDATED KINETICS CO.
      - d. OR APPROVED EQUAL.
24. MOTOR STARTERS & CONTROL DEVICES
    - A. FURNISH TO THE ELECTRICAL CONTRACTOR WHO SHALL INSTALL AND WIRE STARTER AND CONTROL EQUIPMENT FOR ALL MOTORS.
    - B. MOTOR STARTERS SHALL BE CUTLER HAMMER, WESTINGHOUSE OR ALLEN-BRADLEY MANUFACTURE, SUITABLE FOR WALL OR ANGLE IRON FRAME MOUNTING
    - C. GENERAL NOTES:
      - a. ALL STARTERS FOR MOTOR 1/2 HP AND ABOVE SHALL BE MAGNETIC ACROSS-THE-LINE TYPE WITH HOA SWITCH. SUCH STARTERS SHALL BE 208 OR 460 VOLTS, 3 PHASE, 60 CYCLE.
      - b. ALL MAGNETIC STARTERS SUBJECT TO MANUAL START AND IN DIRECT VIEW OF THE MOTORS THEY CONTROL SHALL HAVE MOMENTARY CONTACT START AND STOP BUTTONS AND PILOT LIGHT BUILT INTO COVER. ALL SELECTOR SWITCHES IN STARTERS SHALL BE OF THE MAINTAIN CONTACT TYPE.
      - c. WHERE STARTERS ARE NOT IN SIGHT OF MOTORS THEY CONTROL, A LOCAL DISCONNECT SWITCH WILL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
      - d. ALL MAGNETIC STARTERS SHALL HAVE THERMAL OVERLOAD IN EACH PHASE LEG AND LOW VOLTAGE PROTECTION.
      - e. ALL COILS, CORES, RESISTANCE, INSULATION CONTACTS, TRIPPERS, ETC. OF STARTERS AND RELAYS SHALL BE OF THE APPROVED TYPE IN ACCORDANCE WITH MOTOR NAMEPLATE DATA. ALL PARTS SUBJECT TO WEAR, ARCING, ETC., SHALL BE RENEWABLE.
      - f. ALL WIRING, STARTERS, SWITCHES, ETC., SHALL BE IN FULL ACCORDANCE WITH ALL LOCAL AND INSURANCE UNDERWRITERS' CODE REQUIREMENTS.
      - g. FURNISH DETAILED COMPOSITE WIRING DIAGRAMS FOR THOSE INSTALLING THE ELECTRICAL WORK, AND FURNISH SUCH OTHER INFORMATION NECESSARY TO ASSURE THE PROPER CONNECTION AND GROUNDING REQUIREMENTS. OPERATION AND CONTROL OF MOTORIZED EQUIPMENT, INCLUDING INTERLOCKS, AUTOMATIC OR SAFETY CONTROLS AND AUXILIARY CIRCUITS.
      - h. PROVIDE LAMACOID NAMEPLATE ATTACHED TO EACH STARTER IDENTIFYING THE SYSTEM IT SERVES.
25. PIPE COVER SYSTEMS
    - A. PIPE ENCLOSURES SHALL EXTEND FROM FLOOR OR TOP OF FIN-TUBE RADIATION COVER AND TERMINATE JUST ABOVE CEILING.
    - B. SHEET METAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL AND ELECTRICAL CONTRACTOR FOR REQUIRED SIZES AND LOCATION OF PIPE/ELECTRICAL SERVICE COVERS. FINAL SIZES AND LOCATIONS WILL BE PREDICATED ON SLAB CORE LOCATIONS AND INSULATED PIPE SIZES OVERALL.
    - C. LOCATE AND PLACE FORMED METAL ITEMS LEVEL AND PLUMB AND IN ALIGNMENT WITH ADJACENT CONSTRUCTION. PERFORM CUTTING, DRILLING, AND FITTING REQUIRED TO INSTALL FORMED METAL.
      - a. DO NOT CUT OR ABRADE FINISHES THAT CANNOT BE COMPLETELY RESTORED IN THE FIELD. RETURN ITEMS WITH SUCH FINISHES TO THE SHOP FOR REQUIRED ALTERATIONS, FOLLOWED BY COMPLETE REFINISHING, OR PROVIDE NEW UNITS AS REQUIRED.
    - D. FORM TIGHT JOINTS WITH EXPOSED CONNECTIONS ACCURATELY FITTED TOGETHER. PROVIDE REVEALS AND OPENINGS FOR SEALANTS AND JOINT FILLERS AS REQUIRED.
    - E. TOUCHUP PAINTING: IMMEDIATELY AFTER ERECTION, CLEAN FIELD WELDS, BOLTED CONNECTIONS, AND ABRADED AREAS OF SHOP PAINT, AND PAINT EXPOSED AREAS WITH THE SAME MATERIAL AS USED FOR SHOP PAINTING TO COMPLY WITH SSPC-PA 1 FOR TOUCHING UP SHOP-PAINTED SURFACES.
      - a. APPLY BY BRUSH OR SPRAY TO PROVIDE A MINIMUM 2.0-MIL (0.05-MM) DRY FILM THICKNESS.
      - b. RESTORE FINISHES DAMAGED DURING INSTALLATION AND CONSTRUCTION PERIOD SO NO EVIDENCE REMAINS OF CORRECTION WORK. RETURN ITEMS THAT CANNOT BE REFINISHED IN THE FIELD TO THE SHOP; MAKE REQUIRED ALTERATIONS AND REFINISH ENTIRE UNIT OR PROVIDE NEW UNITS.
    - F. MATERIALS
      - a. SHEET METAL: PROVIDE SHEET METAL WITHOUT PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS OR OTHER IMPERFECTIONS WHERE EXPOSED TO VIEW ON FINISHED UNITS.
      - b. INTERIOR SEALANT: NONSAG, PAINTABLE, NONSTAINING, LATEX SEALANT COMPLYING WITH ASTM C 834; OF TYPE AND GRADE REQUIRED TO SEAL JOINTS IN DECORATIVE FORMED METAL; AND AS RECOMMENDED IN WRITING BY DECORATIVE FORMED METAL MANUFACTURER. USE SEALANT THAT HAS A VOC CONTENT OF NOT MORE THAN 250 G/L WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
      - c. FASTENERS: FABRICATED FROM SAME BASIC METAL AND ALLOY AS FASTENED METAL UNLESS OTHERWISE INDICATED. DO NOT USE METALS THAT ARE INCOMPATIBLE WITH MATERIALS JOINED.
        - PROVIDE CONCEALED FASTENERS FOR INTERCONNECTING FORMED METAL ITEMS AND FOR ATTACHING THEM TO OTHER WORK OR SURFACES.
        - PROVIDE PHILLIPS OVAL-HEAD MACHINE SCREWS FOR EXPOSED FASTENERS UNLESS OTHERWISE INDICATED.
      - d. PRE-ASSEMBLE FORMED METAL ITEMS IN SHOP TO GREATEST EXTENT POSSIBLE TO MINIMUM FIELD SPLICING AND ASSEMBLY.
26. EQUIPMENT SUPPORTS (CURBS)

    PERFORMANCE REQUIREMENTS:
    - A. DELEGATED DESIGN: DESIGN RTU SUPPORTS TO COMPLY WITH WIND AND SEISMIC PERFORMANCE REQUIREMENTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
    - B. WIND-RESTRAINT PERFORMANCE:
      - a. BASIC WIND SPEED: 115 MPH.F MEMBRANE SYSTEM.
    - C. MANUFACTURER WIND LOADING QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION THAT SPECIFIED EQUIPMENT WILL WITHSTAND WIND FORCES IDENTIFIED IN "PERFORMANCE REQUIREMENTS" ARTICLE AND IN DIVISION 23 SECTION "VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT."
      - b. BASIS FOR CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATION IS BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATIONS.
      - c. DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF WIND FORCE AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE PROVISIONS.
      - d. DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS.
    - D. COORDINATION DRAWINGS: PLANS AND OTHER DETAILS, DRAWN TO SCALE, ON WHICH THE FOLLOWING ITEMS ARE SHOWN AND COORDINATED WITH EACH OTHER, USING INPUT FROM INSTALLERS OF THE ITEMS INVOLVED:
      - e. STRUCTURAL MEMBERS TO WHICH RTUS WILL BE ATTACHED.
      - f. ROOF OPENINGS
      - g. ROOF CURBS AND FLASHING.
    - E. FIELD QUALITY-CONTROL TEST REPORTS.
    - F. OPERATION AND MAINTENANCE DATA: FOR RTUS TO INCLUDE IN EMERGENCY, OPERATION, AND MAINTENANCE MANUALS.

SEQUENCE OF OPERATION

ROOFTOP UNIT :

1. OCCUPIED MODE:

   THE SUPPLY FAN SHALL RUN CONTINUOUSLY. THE DX COOLING SHALL STAGE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT. THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE DYNAMICALLY RESET BASED ON THE DEVIATION OF ACTUAL SPACE TEMPERATURE FROM THE ACTIVE SPACE TEMPERATURE SETPOINT.
2. UNOCCUPIED

   WHEN THE SPACE TEMPERATURE IS ABOVE THE COOLING SETPOINT, THE SUPPLY FAN SHALL START AND THE DX COOLING SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE COOLING SETPOINT, THE SUPPLY FAN SHALL STOP AND THE DX COOLING SHALL BE DISABLED.

AIR HANDLING UNIT :

1. EVAPORATOR FAN
   - A. OCCUPIED: FAN SHALL BE ON DURING ALL OCCUPIED PERIODS PER BUILDING SCHEDULE TO PROVIDE CODE REQUIRED MECHANICAL VENTILATION. OUTDOOR AIR DAMPER SHALL BE OPEN TO MINIMUM POSITION DURING ALL OCCUPIED PERIODS.
   - B. UNOCCUPIED: FAN SHALL CYCLE AS NECESSARY TO MAINTAIN ADJUSTABLE SETBACK TEMPERATURE (60°F HEATING / 85°F COOLING) DURING UNOCCUPIED PERIODS PER BUILDING SCHEDULE. OUTDOOR AIR DAMPER SHALL BE CLOSED DURING ALL UNOCCUPIED PERIODS EXCEPT DURING ECONOMIZER OPERATION.
2. COOLING
   - A. ENGAGE COMPRESSOR 1ST/ STAGE TO MAINTAIN ADJUSTABLE COOLING SPACE SETPOINT TEMPERATURE (75°F). ENGAGE COMPRESSOR 2ND/ STAGE AS AVAILABLE WHERE NECESSARY IF 1ST/ STAGE RUNS CONTINUOUSLY AND DOES NOT ACHIEVE DISCHARGE AIR TEMPERATURE AFTER ADJUSTABLE TIME DURATION (4 MINUTES). CONDENSER FAN(S) SHALL CYCLE AS NECESSARY FOR PROPER COMPRESSOR OPERATION.

Bank of America

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△ Issue	Date & Issue Description	By	Check
01	10/09/20	CTH	JDS
	ISSUED FOR BID		
02	02/03/2021		
	ISSUE FOR PERMIT & PRICING II		
03	07/15/2021		
	ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
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CAD File Name

Description
MECHANICAL SPECIFICATIONS

Scale
AS SHOWN

M-002

Ref. North

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RTU SPECIFICATIONS

A. GENERAL:

1. OUTDOOR, ROOFTOP MOUNTED, ELECTRICALLY CONTROLLED, HEATING AND COOLING UNIT UTILIZING A FULLY HERMETIC SCROLL COMPRESSOR(S) FOR COOLING DUTY AND OPTIONAL ELECTRIC HEAT FOR HEATING DUTY.

2. FACTORY ASSEMBLED, SINGLE-PIECE HEATING AND COOLING ROOFTOP UNIT. CONTAINED WITHIN THE UNIT ENCLOSURE SHALL BE ALL FACTORY WIRING, PIPING, CONTROLS, AND SPECIAL FEATURES REQUIRED PRIOR TO FIELD START-UP.

3. UNIT SHALL USE PURON® (R-410A) REFRIGERANT.

4. UNIT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

5. UNIT MUST BE SELECTED AND INSTALLED IN COMPLIANCE WITH LOCAL, STATE, AND FEDERAL CODES.

B. QUALITY ASSURANCE:

1. UNIT MEETS AND EXCEEDS ASHRAE 90.1 MINIMUM EFFICIENCY REQUIREMENTS.

2. UNIT SHALL BE RATED IN ACCORDANCE WITH AHRI STANDARDS 210/240.

3. UNIT SHALL BE DESIGNED TO CONFORM TO ASHRAE 15.

4. UNIT SHALL BE UL-TESTED AND CERTIFIED IN ACCORDANCE WITH ANSI Z21.47 STANDARDS AND UL-LISTED AND CERTIFIED UNDER CANADIAN STANDARDS AS A TOTAL PACKAGE FOR SAFETY REQUIREMENTS.

5. INSULATION AND ADHESIVE SHALL MEET NFPA 90A REQUIREMENTS FOR FLAME SPREAD AND SMOKE GENERATION.

6. UNIT CASING SHALL BE CAPABLE OF WITHSTANDING 500-HOUR SALT SPRAY EXPOSURE PER ASTM B117 (SCRIBED SPECIMEN).

7. UNIT SHALL BE DESIGNED IN ACCORDANCE WITH ISO 9001, AND SHALL BE MANUFACTURED IN A FACILITY REGISTERED BY ISO 9001:2015.

8. ROOF CURB SHALL BE DESIGNED TO CONFORM TO NRCA STANDARDS.

9. UNIT SHALL BE SUBJECTED TO A COMPLETELY AUTOMATED RUN TEST ON THE ASSEMBLY LINE. THE DATA FOR EACH UNIT WILL BE STORED AT THE FACTORY AND MUST BE AVAILABLE UPON REQUEST.

10. UNIT SHALL BE DESIGNED IN ACCORDANCE WITH UL STANDARD 1995, INCLUDING TESTED TO WITHSTAND RAIN.

11. UNIT SHALL BE CONSTRUCTED TO PREVENT INTRUSION OF SNOW AND TESTED TO PREVENT SNOW INTRUSION INTO THE CONTROL BOX UP TO 40 MPH.

12. UNIT SHAKE TESTED TO ASSURANCE LEVEL 1, ASTM D4169 TO ENSURE SHIPPING RELIABILITY.

C. DELIVERY, STORAGE, AND HANDLING:

1. UNIT SHALL BE STORED AND HANDLED PER MANUFACTURER'S RECOMMENDATIONS.

2. LIFTED BY CRANE REQUIRES EITHER SHIPPING TOP PANEL OR SPREADER BARS.

3. UNIT SHALL ONLY BE STORED OR POSITIONED IN THE UPRIGHT POSITION.

D. PROJECT CONDITIONS:

1. AS SPECIFIED IN THE CONTRACT.

E. OPERATING CHARACTERISTICS:

2. UNIT SHALL BE CAPABLE OF STARTING AND RUNNING AT 125°F (52°C) AMBIENT OUTDOOR TEMPERATURE, MEETING MAXIMUM LOAD CRITERIA OF AHRI STANDARD 210/240 AT ±10% VOLTAGE.

3. COMPRESSOR WITH STANDARD CONTROLS SHALL BE CAPABLE OF OPERATION DOWN TO 35°F (2°C), AMBIENT OUTDOOR TEMPERATURES. ACCESSORY WINTER START KIT IS NECESSARY IF MECHANICALLY COOLING AT AMBIENT TEMPERATURES DOWN TO 25°F (-4°C).

4. UNIT SHALL DISCHARGE SUPPLY AIR VERTICALLY OR HORIZONTALLY AS SHOWN ON CONTRACT DRAWINGS.

5. UNIT SHALL BE FACTORY CONFIGURED FOR VERTICAL SUPPLY AND RETURN CONFIGURATIONS.

6. UNIT SHALL BE FIELD CONVERTIBLE FROM VERTICAL TO HORIZONTAL AIRFLOW ON ALL MODELS. NO SPECIAL KIT REQUIRED.

7. UNIT SHALL BE CAPABLE OF MIXED OPERATION: VERTICAL SUPPLY WITH HORIZONTAL RETURN OR HORIZONTAL SUPPLY WITH VERTICAL RETURN.

F. ELECTRICAL REQUIREMENTS:

1. MAIN POWER SUPPLY VOLTAGE, PHASE, AND FREQUENCY MUST MATCH THOSE REQUIRED BY THE MANUFACTURER.

G. UNIT CABINET:

1. UNIT CABINET SHALL BE CONSTRUCTED OF GALVANIZED STEEL AND SHALL BE BONDERIZED AND COATED WITH A PRE-PAINTED BAKED ENAMEL FINISH ON ALL EXTERNALLY EXPOSED SURFACES.

2. UNIT CABINET EXTERIOR PAINT SHALL BE: FILM THICKNESS, (DRY) 0.003-IN. MINIMUM, GLOSS (PER ASTM D523, 60°F/16°C): 60, HARDNESS: H_2H PENCIL HARDNESS.

3. EVAPORATOR FAN COMPARTMENT INTERIOR CABINET INSULATION SHALL CONFORM TO AHRI STANDARDS 210/240 MINIMUM EXTERIOR SWEAT CRITERIA. INTERIOR SURFACES SHALL BE INSULATED WITH A MINIMUM 1/2-IN. THICK, 1 LB. DENSITY, FLEXIBLE FIBERGLASS INSULATION, NEOPRENE COATED ON THE AIR SIDE. ALUMINUM FOIL-FACED FIBERGLASS INSULATION SHALL BE USED IN THE HEAT COMPARTMENT.

4. BASE OF UNIT SHALL HAVE A MINIMUM OF FOUR LOCATIONS FOR THRU-THE-BASE GAS AND ELECTRICAL CONNECTIONS (FACTORY-INSTALLED OR FIELD-INSTALLED), STANDARD.

5. BASE RAIL:

a) UNIT SHALL HAVE BASE RAILS ON A MINIMUM OF 2 SIDES.

b) HOLES SHALL BE PROVIDED IN THE BASE RAILS FOR RIGGING SHACKLES TO FACILITATE MANEUVERING AND OVERHEAD RIGGING.

c) HOLES SHALL BE PROVIDED IN THE BASE RAIL FOR MOVING THE ROOFTOP BY FORK TRUCK.

d) BASE RAIL SHALL BE A MINIMUM OF 16 GAGE THICKNESS.

6. CONDENSATE PAN AND CONNECTIONS:

a) SHALL BE A SLOPED CONDENSATE DRAIN PAN MADE OF A CORROSION RESISTANT MATERIAL.

b) SHALL COMPLY WITH ASHRAE STANDARD 62.

c) SHALL USE A 3/4-IN. 14 NPT DRAIN CONNECTION, POSSIBLE EITHER THROUGH THE BOTTOM OR SIDE OF THE DRAIN PAN. CONNECTION SHALL BE MADE PER MANUFACTURER'S RECOMMENDATIONS.

7. TOP PANEL: SHALL BE A SINGLE PIECE TOP PANEL ON ALL SIZES.

8. ELECTRICAL CONNECTIONS:

a) ALL UNIT POWER WIRING SHALL ENTER UNIT CABINET AT A SINGLE, FACTORY PREPARED, KNOCKOUT LOCATION.

b) THRU-THE-BASE CAPABILITY.

1. STANDARD UNIT SHALL HAVE A THRU-THE-BASE ELECTRICAL LOCATION(S) USING A RAISED, EMBOSSED PORTION OF THE UNIT BASEPAN.

2. OPTIONAL, FACTORY APPROVED, WATER-TIGHT CONNECTION METHOD MUST BE USED FOR THRU-THE-BASE ELECTRICAL CONNECTIONS.

3. NO BASEPAN PENETRATION, OTHER THAN THOSE AUTHORIZED BY THE MANUFACTURER, IS PERMITTED.

9. COMPONENT ACCESS PANELS (STANDARD):

a) CABINET PANELS SHALL BE EASILY REMOVABLE FOR SERVICING.

b) UNIT SHALL HAVE ONE FACTORY INSTALLED, TOOL-LESS, REMOVABLE, FILTER ACCESS PANEL.

c) PANELS COVERING CONTROL BOX, INDOOR FAN, INDOOR FAN MOTOR, GAS COMPONENTS (WHERE APPLICABLE), AND COMPRESSORS SHALL HAVE MOLDED COMPOSITE HANDLES.

d) HANDLES SHALL BE UV MODIFIED, COMPOSITE. THEY SHALL BE PERMANENTLY ATTACHED AND RECESSED INTO THE PANEL.

e) SCREWS ON THE VERTICAL PORTION OF ALL REMOVABLE ACCESS PANEL SHALL ENGAGE INTO HEAT RESISTANT, MOLDED COMPOSITE COLLARS.

f) COLLARS SHALL BE REMOVABLE AND EASILY REPLACEABLE USING MANUFACTURER RECOMMENDED PARTS.

H. COILS:

1. STANDARD ALUMINUM FIN-COPPER TUBE COILS:

a) STANDARD EVAPORATOR AND CONDENSER COILS SHALL HAVE ALUMINUM LANCED PLATE FINS MECHANICALLY BONDED TO SEAMLESS INTERNALLY GROOVED COPPER TUBES WITH ALL JOINTS BRAZED.

b) EVAPORATOR COILS SHALL BE LEAK TESTED TO 150 PSIG, PRESSURE TESTED TO 450 PSIG, AND QUALIFIED TO UL 1995 BURST TEST AT 1775 PSIG.

c) CONDENSER COILS SHALL BE LEAK TESTED TO 150 PSIG, PRESSURE TESTED TO 650 PSIG, AND QUALIFIED TO UL 1995 BURST TEST AT 1980 PSIG.

2. OPTIONAL PRE-COATED ALUMINUM-FIN CONDENSER COILS (3 PHASE MODELS ONLY):

a) SHALL HAVE A DURABLE EPOXY-PHENOLIC COATING TO PROVIDE PROTECTION IN MILDLY CORROSIVE COASTAL ENVIRONMENTS.

b) COATING SHALL BE APPLIED TO THE ALUMINUM FIN STOCK PRIOR TO THE FIN STAMPING PROCESS TO CREATE AN INERT BARRIER BETWEEN THE ALUMINUM FIN AND COPPER TUBE.

c) EPOXY-PHENOLIC BARRIER SHALL MINIMIZE GALVANIC ACTION BETWEEN DISSIMILAR METALS.

d) CORROSION DURABILITY OF FIN STOCK SHALL BE CONFIRMED THROUGH TESTING TO BE NO LESS THAN 1000 HOURS SALT SPRAY PER ASTM B117-90.

e) CORROSION DURABILITY OF FIN STOCK SHALL BE CONFIRMED THROUGH TESTING TO HAVE NO VISIBLE CORROSION AFTER 48-HOUR IMMERSION IN A ROOM TEMPERATURE SOLUTION OF 5% SALT, 1% ACETIC ACID.

f) FIN STOCK COATING SHALL PASS 2000 HOURS OF THE FOLLOWING: ONE-WEEK EXPOSURE IN THE PROHESION CHAMBER FOLLOWED BY ONE WEEK OF ACCELERATED ULTRAVIOLET LIGHT TESTING. PROHESION CHAMBER: THE SOLUTION SHALL CONTAIN 3.5% SODIUM CHLORIDE AND 0.35% AMMONIUM SULFATE. THE EXPOSURE CYCLE IS ONE HOUR OF SALT FOG APPLICATION AT AMBIENT FOLLOWED BY ONE HOUR DRYING AT 95°F (35°C).

3. OPTIONAL COPPER-FIN EVAPORATOR AND CONDENSER COILS (3 PHASE MODELS ONLY):

a) SHALL BE CONSTRUCTED OF COPPER FINS MECHANICALLY BONDED TO COPPER TUBES AND COPPER TUBE SHEETS.

b) GALVANIZED STEEL TUBE SHEETS SHALL NOT BE ACCEPTABLE.

c) A POLYMER STRIP SHALL PREVENT COIL ASSEMBLY FROM CONTACTING THE SHEET METAL COIL PAN TO MINIMIZE POTENTIAL FOR GALVANIC CORROSION BETWEEN COIL AND PAN.

4. OPTIONAL E-COATED ALUMINUM-FIN EVAPORATOR AND CONDENSER COILS (3 PHASE MODELS ONLY):

a) SHALL HAVE A FLEXIBLE EPOXY POLYMER COATING UNIFORMLY APPLIED TO ALL COIL SURFACE AREAS WITHOUT MATERIAL BRIDGING BETWEEN FINS.

b) COATING PROCESS SHALL ENSURE COMPLETE COIL ENCAPSULATION OF TUBES, FINS AND HEADERS.

c) COLOR SHALL BE HIGH GLOSS BLACK WITH GLOSS PER ASTM D523-89.

d) UNIFORM DRY FILM THICKNESS FROM 0.8 TO 1.2 MIL ON ALL SURFACE AREAS INCLUDING FIN EDGES.

e) SUPERIOR HARDNESS CHARACTERISTICS OF 2H PER ASTM D3363-92A AND CROSSHATCH ADHESION OF 4B-5B PER ASTM D3359-93.

f) IMPACT RESISTANCE SHALL BE UP TO 160 IN. LB. (ASTM D2794-93).

g) HUMIDITY AND WATER IMMERSION RESISTANCE SHALL BE UP TO MINIMUM 1000 AND 250 HOURS RESPECTIVELY (ASTM D2247-92 AND ASTM D870-92).

h) CORROSION DURABILITY SHALL BE CONFIRMED THROUGH TESTING TO BE NO LESS THAN 1000 HOURS SALT SPRAY PER ASTM B117-90.

I. REFRIGERANT COMPONENTS:

1. REFRIGERANT CIRCUIT SHALL INCLUDE THE FOLLOWING CONTROL, SAFETY, AND MAINTENANCE FEATURES:

a) TXV METERING SYSTEM ON ALL MODELS SHALL INCLUDE A MULTIPLE FEED DISTRIBUTION SYSTEM.

b) REFRIGERANT FILTER DRIER - SOLID CORE DESIGN.

c) SERVICE GAGE CONNECTIONS ON SUCTION AND DISCHARGE LINES.

d) PRESSURE GAGE ACCESS THROUGH A SPECIALLY DESIGNED ACCESS PORT IN THE TOP PANEL OF THE UNIT.

2. THERE SHALL BE GAGE LINE ACCESS PORT IN THE SKIN OF THE ROOFTOP, COVERED BY A BLACK, REMOVABLE PLUG.

a) THE PLUG SHALL BE EASY TO REMOVE AND REPLACE.

b) WHEN THE PLUG IS REMOVED, THE GAGE ACCESS PORT SHALL ENABLE MAINTENANCE PERSONNEL TO ROUTE THEIR PRESSURE GAGE LINES.

c) THIS GAGE ACCESS PORT SHALL FACILITATE CORRECT AND ACCURATE CONDENSER PRESSURE READINGS BY ENABLING THE READING WITH THE COMPRESSOR ACCESS PANEL ON.

d) THE PLUG SHALL BE MADE OF A LEAK PROOF, UV_RESISTANT, COMPOSITE MATERIAL.

3. COMPRESSORS:

a) UNIT SHALL USE FULLY HERMETIC, TWO STAGE SCROLL COMPRESSOR ON A SINGLE REFRIGERATION CIRCUIT.

b) COMPRESSOR MOTORS SHALL BE COOLED BY REFRIGERANT GAS PASSING THROUGH MOTOR WINDINGS.

c) COMPRESSORS SHALL BE INTERNALLY PROTECTED FROM HIGH DISCHARGE TEMPERATURE CONDITIONS.

d) COMPRESSORS SHALL BE PROTECTED FROM AN OVER-TEMPERATURE AND OVER-AMPERAGE CONDITIONS BY AN INTERNAL, MOTOR OVERLOAD DEVICE.

e) COMPRESSOR SHALL BE FACTORY MOUNTED ON RUBBER GROMMETS.

f) COMPRESSOR MOTORS SHALL HAVE INTERNAL LINE BREAK THERMAL, CURRENT OVERLOAD AND HIGH-PRESSURE DIFFERENTIAL PROTECTION.

g) CRANKCASE HEATERS SHALL NOT BE REQUIRED FOR NORMAL OPERATING RANGE, UNLESS REQUIRED BY COMPRESSOR MANUFACTURER DUE TO REFRIGERANT CHARGE LIMITS.

J. FILTER SECTION:

a) FILTERS ACCESS IS SPECIFIED IN THE UNIT CABINET SECTION OF THIS SPECIFICATION.

b) FILTERS SHALL BE HELD IN PLACE BY A PIVOTING FILTER TRAY, FACILITATING EASY REMOVAL AND INSTALLATION.

c) SHALL CONSIST OF FACTORY INSTALLED, LOW VELOCITY, THROW-AWAY 2-IN. THICK FIBERGLASS FILTERS.

d) FILTERS SHALL BE MERV 13

e) ONLY ONE SIZE FILTER PER UNIT IS ALLOWED.

K. EVAPORATOR FAN AND MOTOR:

1. DIRECT DRIVE EVAPORATOR FAN MOTOR:

a) SHALL BE AN ECM MOTOR DESIGN.

b) SHALL HAVE PERMANENTLY LUBRICATED BEARINGS.

c) SHALL HAVE INHERENT AUTOMATIC-RESET THERMAL OVERLOAD PROTECTION.

d) SHALL HAVE SLOW RAMP UP TO SPEED CAPABILITIES.

e) SHALL REQUIRE NO FAN/MOTOR BELTS FOR OPERATION, ADJUSTMENTS AND OR INITIAL FAN SPEED SET UP.

f) FAN DC VOLTAGE SET UP ON UNIT CONTROL BOARD CAN ELIMINATE THE NEED OF REMOVAL OF BLOWER ACCESS DOOR, REQUIRED ON CONVENTIONAL BELT DRIVE SYSTEMS.

g) SHALL BE INTERNALLY PROTECTED FROM ELECTRICAL PHASE REVERSAL AND LOSS.

2. EVAPORATOR FAN:

a) SHALL BE EASILY SET WITH SELECTION SWITCH AND ADJUSTMENT POT ON UNIT CONTROL BOARD OR THROUGH SYSTEMVU™ CONTROLLER.

b) ON ALL SIZES 04-06 WHICH HAVE TWO STAGE COOLING CAPACITY CONTROL, THE INDOOR FAN SPEED IS AUTOMATICALLY CONTROLLED TO MEET THE AHRI PERFORMANCE REQUIREMENT WITH 75% LOW FAN SPEED AND 100% AT FULL FAN SPEED OPERATION

c) BLOWER FAN SHALL BE A VANE AXIAL FAN DESIGN WITH 75% LESS MOVING PARTS THAN A CONVENTIONAL BELT DRIVE SYSTEM.

d) SHALL BE CONSTRUCTED OF A CAST ALUMINUM STATOR AND HIGH IMPACT COMPOSITE MATERIAL ON ROTOR AND AIR INLET CASING.

e) SHALL BE A PATENTED / PENDING DESIGN WITH A CORROSION RESISTANT MATERIAL AND DYNAMICALLY BALANCED.

f) SHALL HAVE SLOW RAMP UP TO SPEED CAPABILITIES TO HELP REDUCE SOUND AND COMFORT ISSUES TYPICALLY ASSOCIATED WITH SINGLE SPEED BELT DRIVE SYSTEMS.

g) SHALL BE A SLIDE OUT DESIGN WITH TWO SCREW REMOVAL.

3. SHALL INCLUDE AN EASILY ACCESSIBLE UNIT CONTROL BOARD TO CONVENIENTLY AND SAFELY PROVIDE CONNECTION POINTS FOR VITAL CONTROL FUNCTIONS SUCH AS: SMOKE DETECTORS, PHASE MONITOR, GAS CONTROLLER, ECONOMIZER, THERMOSTAT, DDC CONTROL OPTIONS, AND LOW AND HIGH PRESSURE SWITCHES. CONTROLLER SHALL ALSO PROVIDE AN INTUITIVE MEANS TO ADJUST THE INDOOR FAN SPEED THROUGH A SIMPLE SWITCH AND POT ADJUSTMENT DESIGN.

L. CONDENSER FANS AND MOTORS:

1. CONDENSER FAN MOTORS:

a) SHALL BE A TOTALLY ENCLOSED MOTOR.

b) SHALL USE PERMANENTLY LUBRICATED BEARINGS.

c) SHALL HAVE INHERENT THERMAL OVERLOAD PROTECTION WITH AN AUTOMATIC RESET FEATURE.

d) SHALL USE A SHAFT-DOWN DESIGN ON ALL SIZES.

2. CONDENSER FANS:

a) SHALL BE A DIRECT-DRIVEN PROPELLER TYPE FAN CONSTRUCTED OF HIGH IMPACT COMPOSITE MATERIAL.

b) SHALL HAVE HIGH IMPACT COMPOSITE BLADES COMPLETELY FORMED INTO ONE PIECE WITHOUT BLADE FASTENERS OR CONNECTORS AND SHALL BE DYNAMICALLY BALANCED.

M. SPECIAL FEATURES OPTIONS AND ACCESSORIES:

1. INTEGRATED ECONOMI$ER® IV, ECONOMI$ER2, AND ECONOMI$ER X LOW LEAK RATE MODELS. (ECONOMI$ER2, AND ECONOMI$ER X ARE FACTORY- INSTALLED ON 3 PHASE MODELS ONLY. ALL ARE FIELD INSTALLED ON ALL 3 AND 1 PHASE MODELS.)

a) INTEGRATED, GEAR DRIVEN OPPOSING MODULATING BLADE DESIGN TYPE CAPABLE OF SIMULTANEOUS ECONOMIZER AND COMPRESSOR OPERATION.

b) INDEPENDENT MODULES FOR VERTICAL OR HORIZONTAL RETURN CONFIGURATION SHALL BE AVAILABLE. VERTICAL RETURN MODULES SHALL BE AVAILABLE AS A FACTORY INSTALLED OPTION.

c) DAMPER BLADES SHALL BE GALVANIZED STEEL WITH COMPOSITE GEARS. PLASTIC OR COMPOSITE BLADES ON INTAKE OR RETURN SHALL NOT BE ACCEPTABLE.

d) SHALL INCLUDE ALL HARDWARE AND CONTROLS TO PROVIDE FREE COOLING WITH OUTDOOR AIR WHEN TEMPERATURE AND/OR HUMIDITY ARE BELOW SET POINTS.

e) SHALL BE EQUIPPED WITH GEAR DRIVEN DAMPERS FOR BOTH THE OUTDOOR VENTILATION AIR AND THE RETURN AIR FOR POSITIVE AIR STREAM CONTROL.

f) LOW LEAK RATE SHALL BE EQUIPPED WITH DAMPERS NOT TO EXCEED 2% LEAKAGE AT 1 IN. WG PRESSURE DIFFERENTIAL.

g) ECONOMIZER CONTROLLER ON ECONOMI$ER IV (FIELD-INSTALLED ONLY) MODELS SHALL BE HONEYWELL W7212 THAT PROVIDES:

1. COMBINED MINIMUM AND DCV MAXIMUM DAMPER POSITION POTENTIOMETERS WITH COMPRESSOR STAGING RELAY.

2. FUNCTIONS WITH SOLID-STATE ANALOG ENTHALPY OR DRY BULB CHANGEOVER CONTROL SENSING.

3. CONTAIN LED INDICATES FOR: WHEN FREE COOLING IS AVAILABLE, WHEN MODULE IS IN DCV MODE, WHEN EXHAUST FAN CONTACT IS CLOSED.

4. ECONOMIZER CONTROLLER ON ECONOMI$ER X MODELS SHALL BE THE HONEYWELL W7220 THAT PROVIDES:

5. 2-LINE LCD INTERFACE SCREEN FOR SETUP, CONFIGURATION AND TROUBLESHOOTING.

6. ON-BOARD FAULT DETECTION AND DIAGNOSTICS (FDD) THAT SENSES AND ALERTS WHEN THE ECONOMIZER IS NOT OPERATING PROPERLY, PER CALIFORNIA TITLE 24, ASHRAE 90.1 AND IECC.

7. SENSOR FAILURE LOSS OF COMMUNICATION IDENTIFICATION.

8. AUTOMATIC SENSOR DETECTION.

9. CAPABILITIES FOR USE WITH MULTIPLE-SPEED OR SINGLE SPEED INDOOR FAN SYSTEMS.

10. UTILIZE DIGITAL SENSORS: DRY BULB AND ENTHALPY.

h) ECONOMIZER CONTROLLER ON ECONOMI$ER® 2 MODELS WITH RTU OPEN OR SYSTEMVU CONTROLLERS SHALL BE A 4-20MA DESIGN CONTROLLED DIRECTLY BY THE CONTROLLER. RTU OPEN AND SYSTEMVU MEET CALIFORNIA TITLE 24, ASHRAE 90.1 AND IECCIECC is a registered trademark of the International Code Council, Inc.

FAULT DETECTION AND DIAGNOSTIC (FDD) REQUIREMENTS.

i) SHALL BE CAPABLE OF INTRODUCING UP TO 100% OUTDOOR AIR.

j) SHALL BE EQUIPPED WITH A BAROMETRIC RELIEF DAMPER CAPABLE OF RELIEVING UP TO 100% RETURN AIR AND CONTAIN SEALS THAT MEET ASHRAE 90.1 REQUIREMENTS.

k) SHALL BE DESIGNED TO CLOSE DAMPER(S) DURING LOSS-OF-POWER SITUATIONS WITH SPRING RETURN BUILT INTO MOTOR.

l) DRY BULB OUTDOOR AIR TEMPERATURE SENSOR SHALL BE PROVIDED AS STANDARD. ENTHALPY SENSOR IS ALSO AVAILABLE ON FACTORY INSTALLED ONLY. OUTDOOR AIR SENSOR SETPOINT SHALL BE ADJUSTABLE AND SHALL RANGE FROM 40°F TO 100°F (4°C TO 38°C). ADDITIONAL SENSOR OPTIONS SHALL BE AVAILABLE AS ACCESSORIES.

m) THE ECONOMIZER CONTROLLER SHALL ALSO PROVIDE CONTROL OF AN ACCESSORY POWER EXHAUST UNIT FUNCTION. FACTORY SET AT 100%, WITH A RANGE OF 0% TO 100%.

n) THE ECONOMIZER SHALL MAINTAIN MINIMUM AIRFLOW INTO THE BUILDING DURING OCCUPIED PERIOD AND PROVIDE DESIGN VENTILATION RATE FOR FULL OCCUPANCY.

o) DAMPERS SHALL BE COMPLETELY CLOSED WHEN THE UNIT IS IN THE UNOCCUPIED MODE.

p) ECONOMIZER CONTROLLER SHALL ACCEPT A 2 TO 10 VDC CO2 SENSOR INPUT FOR IAQ/DCV CONTROL. IN THIS MODE, DAMPERS SHALL MODULATE THE OUTDOOR AIR DAMPER TO PROVIDE VENTILATION BASED ON THE SENSOR INPUT.

q) COMPRESSOR LOCKOUT TEMPERATURE ON W7220 CONTROL IS ADJUSTABLE FROM -45°F TO 80°F, SET AT A FACTORY DEFAULT OF 32°F. W7212 CONTROL OPENS AT 35°F (2°C) AND CLOSES AT 50°F (10°C).

r) ACTUATOR SHALL BE DIRECT COUPLED TO ECONOMIZER GEAR. NO LINKAGE ARMS OR CONTROL RODS SHALL BE ACCEPTABLE.

s) ECONOMIZER CONTROLLER SHALL PROVIDE INDICATIONS WHEN IN FREE COOLING MODE, IN THE DCV MODE, OR THE EXHAUST FAN CONTACT IS CLOSED.

2. INTEGRATED ECONOMI$ER®2, AND ECONOMI$ER X ULTRA LOW LEAK RATE MODELS. (FACTORY INSTALLED ON 3 PHASE MODELS ONLY. FIELD INSTALLED ON ALL 3 AND 1 PHASE MODELS.)

a) INTEGRATED, GEAR DRIVEN OPPOSING MODULATING BLADE DESIGN TYPE CAPABLE OF SIMULTANEOUS ECONOMIZER AND COMPRESSOR OPERATION.

b) INDEPENDENT MODULES FOR VERTICAL OR HORIZONTAL RETURN CONFIGURATION SHALL BE AVAILABLE. VERTICAL RETURN MODULES SHALL BE AVAILABLE AS A FACTORY-INSTALLED OPTION.

c) DAMPER BLADES SHALL BE GALVANIZED STEEL WITH COMPOSITE GEARS. PLASTIC OR COMPOSITE BLADES ON INTAKE OR RETURN SHALL NOT BE ACCEPTABLE.

d) SHALL INCLUDE ALL HARDWARE AND CONTROLS TO PROVIDE FREE COOLING WITH OUTDOOR AIR WHEN TEMPERATURE AND/OR HUMIDITY ARE BELOW SETPOINTS.

e) SHALL BE EQUIPPED WITH GEAR DRIVEN DAMPERS FOR BOTH THE OUTDOOR VENTILATION AIR AND THE RETURN AIR FOR POSITIVE AIR STREAM CONTROL.

f) ULTRA-LOW LEAK DESIGN MEETS CALIFORNIA TITLE 24 SECTION 140.4 AND ASHRAE 90.1 REQUIREMENTS FOR 4 CFM PER SQ. FT ON THE OUTSIDE AIR DAMPERS AND 10 CFM PER SQ. FT ON THE RETURN DAMPERS.

g) ECONOMIZER CONTROLLER ON ECONOMI$ER X MODELS SHALL BE THE HONEYWELL W7220 THAT PROVIDES:

1. 2-LINE LCD INTERFACE SCREEN FOR SETUP, CONFIGURATION AND TROUBLESHOOTING.

2. ON-BOARD FAULT DETECTION AND DIAGNOSTICS (FDD) THAT SENSES AND ALERTS WHEN THE ECONOMIZER IS NOT OPERATING PROPERLY, PER CALIFORNIA TITLE 24, ASHRAE 90.1 AND IECC.

3. SENSOR FAILURE LOSS OF COMMUNICATION IDENTIFICATION.

4. AUTOMATIC SENSOR DETECTION.

5. CAPABILITIES FOR USE WITH MULTIPLE-SPEED INDOOR FAN SYSTEMS.

6. UTILIZE DIGITAL SENSORS: DRY BULB AND ENTHALPY.

h) ECONOMIZER CONTROLLER ON ECONOMI$ER 2 MODELS WITH RTU OPEN OR SYSTEMVU CONTROLS SHALL BE A 4 TO 20MA DESIGN CONTROLLED DIRECTLY BY THE CONTROLLER. RTU OPEN AND SYSTEMVU MEET CALIFORNIA TITLE 24, ASHRAE 90.1 AND IECC FAULT DETECTION AND DIAGNOSTIC (FDD) REQUIREMENTS.

i) SHALL BE CAPABLE OF INTRODUCING UP TO 100% OUTDOOR AIR.

j) SHALL BE EQUIPPED WITH A BAROMETRIC RELIEF DAMPER CAPABLE OF RELIEVING UP TO 100% RETURN AIR AND CONTAIN SEALS THAT MEET ASHRAE 90.1 REQUIREMENTS.

k) SHALL BE DESIGNED TO CLOSE DAMPER(S) DURING LOSS-OF-POWER SITUATIONS WITH SPRING RETURN BUILT INTO MOTOR.

l) DRY BULB OUTDOOR AIR TEMPERATURE SENSOR SHALL BE PROVIDED AS STANDARD. ENTHALPY SENSOR IS ALSO AVAILABLE ON FACTORY INSTALLED ONLY. OUTDOOR AIR SENSOR SETPOINT SHALL BE ADJUSTABLE AND SHALL RANGE FROM 40°F TO 100°F (4°C TO 38°C). ADDITIONAL SENSOR OPTIONS SHALL BE AVAILABLE AS ACCESSORIES.

m) THE ECONOMIZER CONTROLLER SHALL ALSO PROVIDE CONTROL OF AN ACCESSORY POWER EXHAUST UNIT FUNCTION. FACTORY SET AT 100%, WITH A RANGE OF 0% TO 100%.

n) THE ECONOMIZER SHALL MAINTAIN MINIMUM AIRFLOW INTO THE BUILDING DURING OCCUPIED PERIOD AND PROVIDE DESIGN VENTILATION RATE FOR FULL OCCUPANCY.

o) DAMPERS SHALL BE COMPLETELY CLOSED WHEN THE UNIT IS IN THE UNOCCUPIED MODE.

p) ECONOMIZER CONTROLLER SHALL ACCEPT A 2 TO 10 VDC CO2 SENSOR INPUT FOR IAQ/DCV CONTROL. IN THIS MODE, DAMPERS SHALL MODULATE THE OUTDOOR AIR DAMPER TO PROVIDE VENTILATION BASED ON THE SENSOR INPUT.

q) COMPRESSOR LOCKOUT TEMPERATURE ON W7220 CONTROL IS ADJUSTABLE FROM -45°F TO 80°F, SET AT A FACTORY DEFAULT OF 32°F. W7212 CONTROL OPENS AT 35°F (2°C) AND CLOSES AT 50°F (10°C).

r) ACTUATOR SHALL BE DIRECT COUPLED TO ECONOMIZER GEAR. NO LINKAGE ARMS OR CONTROL RODS SHALL BE ACCEPTABLE.

s) ECONOMIZER CONTROLLER SHALL PROVIDE INDICATIONS WHEN IN FREE COOLING MODE, IN THE DCV MODE, OR THE EXHAUST FAN CONTACT IS CLOSED.

3. TWO-POSITION DAMPER (FIELD-INSTALLED ONLY):

a) DAMPER SHALL BE A TWO-POSITION DAMPER. DAMPER TRAVEL SHALL BE FROM THE FULL CLOSED POSITION TO THE FIELD ADJUSTABLE %-OPEN SET-POINT.

b) DAMPER SHALL INCLUDE ADJUSTABLE DAMPER TRAVEL FROM 25% TO 100% (FULL OPEN).

c) DAMPER SHALL INCLUDE SINGLE OR DUAL BLADE, GEAR DRIVEN DAMPERS AND ACTUATOR MOTOR.

d) ACTUATOR SHALL BE DIRECT COUPLED TO DAMPER GEAR. NO LINKAGE ARMS OR CONTROL RODS SHALL BE ACCEPTABLE.

e) DAMPER WILL ADMIT UP TO 100% OUTDOOR AIR FOR APPLICABLE ROOFTOP UNITS.

f) DAMPER SHALL CLOSE UPON INDOOR (EVAPORATOR) FAN SHUTOFF AND/OR LOSS OF POWER.

g) THE DAMPER ACTUATOR SHALL PLUG INTO THE ROOFTOP UNIT'S WIRING HARNESS PLUG. NO HARD WIRING SHALL BE REQUIRED.

h) OUTSIDE AIR HOOD SHALL INCLUDE ALUMINUM WATER ENTRAINMENT FILTER.

4. MANUAL DAMPER (FIELD-INSTALLED ONLY):

a) MANUAL DAMPER PACKAGE SHALL CONSIST OF DAMPER, AIR INLET SCREEN, AND RAIN HOOD WHICH CAN BE PRE-SET TO ADMIT UP TO 25% OR 50% OUTDOOR AIR FOR YEAR-ROUND VENTILATION.

5. HUMIDI-MIZER® ADAPTIVE DEHUMIDIFICATION SYSTEM (3 PHASE MODELS ONLY):

a) THE HUMIDI-MIZER ADAPTIVE DEHUMIDIFICATION SYSTEM SHALL BE FACTORY INSTALLED AND SHALL PROVIDE GREATER DEHUMIDIFICATION OF THE OCCUPIED SPACE BY TWO MODES OF DEHUMIDIFICATION OPERATIONS IN ADDITION TO ITS NORMAL DESIGN COOLING MODE:

1. SUBCOOLING MODE FURTHER SUB COOLS THE HOT LIQUID REFRIGERANT LEAVING THE CONDENSER COIL WHEN BOTH TEMPERATURE AND HUMIDITY IN THE SPACE ARE NOT SATISFIED.

2. HOT GAS REHEAT MODE SHALL MIX A PORTION OF THE HOT GAS FROM THE DISCHARGE OF THE COMPRESSOR WITH THE HOT LIQUID REFRIGERANT LEAVING THE CONDENSER COIL TO CREATE A TWO-PHASE HEAT TRANSFER IN THE SYSTEM, RESULTING IN A NEUTRAL LEAVING AIR TEMPERATURE WHEN ONLY HUMIDITY IN THE SPACE IS NOT SATISFIED.

3. INCLUDES LOW AMBIENT CONTROLLER.

6. LOW AMBIENT CONTROL PACKAGE:

a) CONTROLLER SHALL CONTROL COIL HEAD PRESSURE BY CONDENSER FAN SPEED MODULATION OR CONDENSER FAN CYCLING AND WIND BAFFLES.

b) SHALL CONSIST OF SOLID-STATE CONTROL AND CONDENSER COIL TEMPERATURE SENSOR TO MAINTAIN CONDENSING TEMPERATURE BETWEEN 90°F (32°C) AND 110°F (43°C) AT OUTDOOR AMBIENT TEMPERATURES DOWN TO -20°F (-29°C).

7. CONDENSER COIL HAIL GUARD ASSEMBLY (FACTORY-INSTALLED ON 3 PHASE MODELS ONLY. FIELD-INSTALLED ON ALL 3 AND 1 PHASE MODELS.)

a) SHALL PROTECT AGAINST DAMAGE FROM HAIL.

b) SHALL BE EITHER HOOD STYLE OR LOUVERED.

8. UNIT-MOUNTED, NON-FUSED DISCONNECT SWITCH (AVAILABLE ON UNITS WITH MOCPS OF 80 AMPS OR LESS):

a) SWITCH SHALL BE FACTORY INSTALLED, INTERNALLY MOUNTED.

b) NATIONAL ELECTRIC CODE (NEC) AND UL APPROVED NON-FUSED SWITCH SHALL PROVIDE UNIT POWER SHUTOFF.

c) SHALL BE ACCESSIBLE FROM OUTSIDE THE UNIT.

d) SHALL PROVIDE LOCAL SHUTDOWN AND LOCKOUT CAPABILITY.

e) SIZED ONLY FOR THE UNIT AS ORDERED FROM THE FACTORY. DOES NOT ACCOMMODATE FIELD-INSTALLED DEVICES.

9. HACR BREAKER:

a) THESE MANUAL RESET DEVICES PROVIDE OVERLOAD AND SHORT CIRCUIT PROTECTION FOR THE UNIT. FACTORY WIRED AND MOUNTED WITH THE UNITS, WITH ACCESS COVER TO HELP PROVIDE ENVIRONMENTAL PROTECTION. ON 575V APPLICATIONS, HACR BREAKER CAN ONLY BE USED WITH WYE POWER DISTRIBUTION SYSTEMS. USE ON DELTA POWER DISTRIBUTION SYSTEMS IS PROHIBITED.

b) SIZED ONLY FOR THE UNIT AS ORDERED FROM THE FACTORY. DOES NOT ACCOMMODATE FIELD-INSTALLED DEVICES.

10. CONVENIENCE OUTLET:

a) POWERED CONVENIENCE OUTLET.

(3 PHASE MODELS ONLY)

1. OUTLET SHALL BE POWERED FROM MAIN LINE POWER TO THE ROOFTOP UNIT.

2. OUTLET SHALL BE POWERED FROM LINE SIDE OR LOAD SIDE OF DISCONNECT BY INSTALLING CONTRACTOR, AS REQUIRED BY CODE. IF OUTLET IS POWERED FROM LOAD SIDE OF DISCONNECT, UNIT ELECTRICAL RATINGS SHALL BE UL CERTIFIED AND RATED FOR ADDITIONAL OUTLET AMPERAGE.

3. OUTLET SHALL BE FACTORY-INSTALLED AND INTERNALLY MOUNTED WITH EASILY ACCESSIBLE 115-V FEMALE RECEPTACLE.

4. OUTLET SHALL INCLUDE 15-AMP GFI RECEPTACLES WITH INDEPENDENT FUSE PROTECTION.

5. VOLTAGE REQUIRED TO OPERATE CONVENIENCE OUTLET SHALL BE PROVIDED BY A FACTORY INSTALLED STEP-DOWN TRANSFORMER.

6. OUTLET SHALL BE ACCESSIBLE FROM OUTSIDE THE UNIT.

7. OUTLET SHALL INCLUDE A FIELD INSTALLED “WET IN USE” COVER.

b) FACTORY-INSTALLED NON-POWERED CONVENIENCE OUTLET.

1. OUTLET SHALL BE POWERED FROM A SEPARATE 115/120V POWER SOURCE.

2. A TRANSFORMER SHALL NOT BE INCLUDED.

3. OUTLET SHALL BE FACTORY-INSTALLED AND INTERNALLY MOUNTED WITH EASILY ACCESSIBLE 115-V FEMALE RECEPTACLE.

4. OUTLET SHALL INCLUDE 15-AMP GFI RECEPTACLES WITH INDEPENDENT FUSE PROTECTION.

5. OUTLET SHALL BE ACCESSIBLE FROM OUTSIDE THE UNIT.

6. OUTLET SHALL INCLUDE A FIELD INSTALLED “WET IN USE” COVER.

7. FIELD-INSTALLED NON-POWERED CONVENIENCE OUTLET.

1. OUTLET SHALL BE POWERED FROM A SEPARATE 115/120V POWER SOURCE.

2. A TRANSFORMER SHALL NOT BE INCLUDED.

3. OUTLET SHALL BE FIELD-INSTALLED AND INTERNALLY MOUNTED WITH EASILY ACCESSIBLE 115-V FEMALE RECEPTACLE.

4. OUTLET SHALL INCLUDE 20-AMP GFI RECEPTACLES. THIS KIT PROVIDES A FLEXIBLE INSTALLATION METHOD WHICH ALLOWS CODE COMPLIANCE FOR HEIGHT REQUIREMENTS OF THE GFCI OUTLET FROM THE FINISHED ROOF SURFACE AS WELL AS THE CAPABILITY TO RELOCATE THE OUTLET TO A MORE CONVENIENT LOCATION.

5. OUTLET SHALL BE ACCESSIBLE FROM OUTSIDE THE UNIT.

6. OUTLET SHALL INCLUDE A FIELD INSTALLED “WET IN USE” COVER.

11. THRU-THE-BASE CONNECTORS:

a) KITS SHALL PROVIDE CONNECTORS TO PERMIT GAS AND ELECTRICAL CONNECTIONS TO BE BROUGHT TO THE UNIT THROUGH THE UNIT BASEPAN.

b) MINIMUM OF FOUR CONNECTION LOCATIONS PER UNIT.

12. PROPELLER POWER EXHAUST:

a) POWER EXHAUST SHALL BE USED IN CONJUNCTION WITH AN INTEGRATED ECONOMIZER.

b) INDEPENDENT MODULES FOR VERTICAL OR HORIZONTAL RETURN CONFIGURATIONS SHALL BE AVAILABLE.

c) HORIZONTAL POWER EXHAUST IS SHALL BE MOUNTED IN RETURN DUCTWORK.

d) POWER EXHAUST SHALL BE CONTROLLED BY ECONOMIZER CONTROLLER OPERATION. EXHAUST FANS SHALL BE ENERGIZED WHEN DAMPERS OPEN PAST THE 0 TO 100% ADJUSTABLE SETPOINT ON THE ECONOMIZER CONTROL.

13. ROOF CURBS (VERTICAL):

a) FULL PERIMETER ROOF CURB WITH EXHAUST CAPABILITY PROVIDING SEPARATE AIR STREAMS FOR ENERGY RECOVERY FROM THE EXHAUST AIR WITHOUT SUPPLY AIR CONTAMINATION.

b) FORMED GALVANIZED STEEL WITH WOOD NAILER STRIP AND SHALL BE CAPABLE OF SUPPORTING ENTIRE UNIT WEIGHT.

c) PERMITS INSTALLATION AND SECURING OF DUCTWORK TO CURB PRIOR TO MOUNTING UNIT ON THE CURB.

14. OUTDOOR AIR ENTHALPY SENSOR:

a) THE OUTDOOR AIR ENTHALPY SENSOR SHALL BE USED TO PROVIDE SINGLE ENTHALPY CONTROL. WHEN USED IN CONJUNCTION WITH A RETURN AIR ENTHALPY SENSOR, THE UNIT WILL PROVIDE DIFFERENTIAL ENTHALPY CONTROL. THE SENSOR ALLOWS THE UNIT TO DETERMINE IF OUTSIDE AIR IS SUITABLE FOR FREE COOLING.

15. RETURN AIR ENTHALPY SENSOR:

a) THE RETURN AIR ENTHALPY SENSOR SHALL BE USED IN CONJUNCTION WITH AN OUTDOOR AIR ENTHALPY SENSOR TO PROVIDE DIFFERENTIAL ENTHALPY CONTROL.

16. INDOOR AIR QUALITY (CO2) SENSOR:

b) SHALL BE ABLE TO PROVIDE DEMAND VENTILATION INDOOR AIR QUALITY (IAQ) CONTROL.

c) THE IAQ SENSOR SHALL BE AVAILABLE IN DUCT MOUNT, WALL MOUNT, OR WALL MOUNT WITH LED DISPLAY. THE SETPOINT SHALL HAVE ADJUSTMENT CAPABILITY.

17. SMOKE DETECTORS (FACTORY-INSTALLED ONLY):

a) SHALL BE A FOUR-WIRE CONTROLLER AND DETECTOR.

b) SHALL BE ENVIRONMENTAL COMPENSATED WITH DIFFERENTIAL SENSING FOR RELIABLE, STABLE, AND DRIFT-FREE SENSITIVITY.

c) SHALL USE MAGNET-ACTIVATED TEST/RESET SENSOR SWITCHES.

d) SHALL HAVE TOOL-LESS CONNECTION TERMINAL ACCESS.

e) SHALL HAVE A RECESSED MOMENTARY SWITCH FOR TESTING AND RESETTING THE DETECTOR.

f) CONTROLLER SHALL INCLUDE:

1. ONE SET OF NORMALLY OPEN ALARM INITIATION CONTACTS FOR CONNECTION TO AN INITIATING DEVICE CIRCUIT ON A FIRE ALARM CONTROL PANEL.

2. TWO FORM-C AUXILIARY ALARM RELAYS FOR INTERFACE WITH ROOFTOP UNIT OR OTHER EQUIPMENT.

3. ONE FORM-C SUPERVISION (TROUBLE) RELAY TO CONTROL THE OPERATION OF THE TROUBLE LED ON A REMOTE TEST/RESET STATION.

4. CAPABLE OF DIRECT CONNECTION TO TWO INDIVIDUAL DETECTOR MODULES.

5. CAN BE WIRED TO UP TO 14 OTHER DUCT SMOKE DETECTORS FOR MULTIPLE FAN SHUTDOWN APPLICATIONS.

18. WINTER START KIT:

a) SHALL CONTAIN A BYPASS DEVICE AROUND THE LOW-PRESSURE SWITCH.

b) SHALL BE REQUIRED WHEN MECHANICAL COOLING IS REQUIRED DOWN TO 25°F (-4°C).

c) SHALL NOT BE REQUIRED TO OPERATE ON AN ECONOMIZER WHEN BELOW AN OUTDOOR AMBIENT OF 35°F (2°C).

19. TIME GUARD:

a) SHALL PREVENT COMPRESSOR SHORT CYCLING BY PROVIDING A 5-MINUTE DELAY (±2 MINUTES) BEFORE RESTARTING A COMPRESSOR AFTER SHUTDOWN FOR ANY REASON.

b) ONE DEVICE SHALL BE REQUIRED PER COMPRESSOR.

20. HINGED ACCESS PANELS:

a) SHALL PROVIDE EASY ACCESS THROUGH INTEGRATED QUARTER TURN LATCHES.

b) SHALL BE ON MAJOR PANELS OF FILTER, CONTROL BOX, FAN MOTOR, AND COMPRESSOR.

21. CONDENSATE OVERFLOW SWITCH:

a) THIS SENSOR AND RELATED CONTROLLER MONITOR THE CONDENSATE LEVEL IN THE DRAIN PAN AND SHUTS DOWN COMPRESSION OPERATION WHEN OVERFLOW CONDITIONS OCCUR. IT INCLUDES:

1. INDICATOR LIGHT -- SOLID RED (MORE THAN 10 SECONDS ON WATER CONTACT - COMPRESSORS DISABLED), BLINKING RED (SENSOR DISCONNECTED).

2. 10 SECOND DELAY TO BREAK -- ELIMINATES NUISANCE TRIPS FROM SPLASHING OR WAVES IN PAN (SENSOR NEEDS 10 SECONDS OF CONSTANT WATER CONTACT BEFORE TRIPPING).

1) DISABLES THE COMPRESSOR(S) OPERATION WHEN CONDENSATE PLUG IS DETECTED, BUT STILL ALLOWS FANS TO RUN FOR ECONOMIZER.

22. FOIL FACED INSULATION:

a) THROUGHOUT UNIT CABINET AIR STREAM, NON-FIBROUS AND CLEANABLE FOIL FACED INSULATION IS USED.

23. MERV-8 RETURN AIR FILTERS:

a) FACTORY OPTION TO UPGRADE STANDARD UNIT FILTERS TO MERV-8 FILTERS.

24. PHASE MONITOR CONTROL:

b) SHALL MONITOR THE SEQUENCE OF THREE PHASE ELECTRICAL SYSTEM TO PROVIDE A PHASE REVERSAL PROTECTION

c) SHALL MONITOR THE THREE PHASE VOLTAGE INPUTS TO PROVIDE A PHASE LOSS PROTECTION FOR THE THREE-PHASE DEVICE.

d) WILL WORK ON EITHER A DELTA OR WYE POWER CONNECTION.

25. WARRANTY

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a. THE CONTRACTOR SHALL OPERATE THE AIR CONDITIONING, HEATING AND VENTILATING SYSTEMS AND PLUMBING SYSTEMS FOR A PERIOD OF ONE WEEK TO THE SATISFACTION OF THE ARCHITECT. THEREAFTER, THE CONTRACTOR SHALL GUARANTEE AND BE RESPONSIBLE FOR ALL MATERIALS, LABOR AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FOLLOWING THE DATE OF SUBSTANTIAL COMPLETION.

b. THE CONTRACTOR SHALL PROVIDE FIVE YEAR COMPRESSOR WARRANTY, TEN YEAR HEAT EXCHANGER WARRANTY FOR ALL ROOFTOP AND AIR HANDLING UNIT.

c. THE CONTRACTOR SHALL ALSO PROVIDE MAINTENANCE FOR THE ONE (1) YEAR PERIOD BY PROVIDING FOUR (4) PERIODIC INSPECTIONS AT APPROXIMATELY THREE_MONTH INTERVALS, WHICH SHALL INCLUDE THE FOLLOWING:

1. CHECK ALL BEARINGS, ALIGN AND OIL OR GREASE.

2. CHECK BELT TENSIONS AND PULLEY ADJUSTMENTS AND ADJUST AS NECESSARY.

3. CHECK FILTERS AND ADVISE OWNER WHEN CHANGE IS NECESSARY.

4. CHECK REFRIGERANT CHARGES AND OIL LEVELS AND REPLENISH AS NECESSARY.

5. CHECK AND RE-CALIBRATE CONTROLS AS NECESSARY.

d. ANY REQUIRED MAINTENANCE FOR THE ABOVE SHALL BE PERFORMED AND MATERIALS NEEDED SHALL BE FURNISHED BY THE CONTRACTOR. NOT INCLUDED IN THE MATERIALS TO BE FURNISHED BY THE CONTRACTOR ARE FUEL, ELECTRICITY, WATER, AND FILTERS. PROVIDE THE OWNER WITH A COPY OF THE INSPECTION REPORTS INDICATING ALL ITEMS CHECKED AND ADJUSTMENT OR REPAIRS PERFORMED.

e. ALL EQUIPMENT COMPRESSORS SHALL BE GUARANTEED FOR FIVE YEARS.

f. ALSO INCLUDED IN THE BASE CONTRACT 1 YEAR WARRANTY WORK SHALL BE ANY OWNER REQUESTED WORK CONCERNING SETUP AND FINE TUNING OF THE AUTOMATIC CONTROLS. AS THE BUILDING'S OPERATING SCHEDULES AND LOADING PROFILES BECOME RECOGNIZED BY THE OWNER, THE CONTROLS CONTRACTOR SHALL ASSIST THE OWNER DURING THIS 1 YEAR WARRANTY PERIOD TO ADJUST THE SYSTEM FOR SATISFACTORY BUILDING OPERATIONS.

Bank of America

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△	Issue	Date & Issue Description	By	Check
	01	10/09/20	CTH	JDS
		ISSUED FOR BID		
	02	02/03/2021	CTH	JDS
		ISSUE FOR PERMIT & PRICING II		
1	03	03/25/2021	HKP	JDS
		ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
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CAD File Name

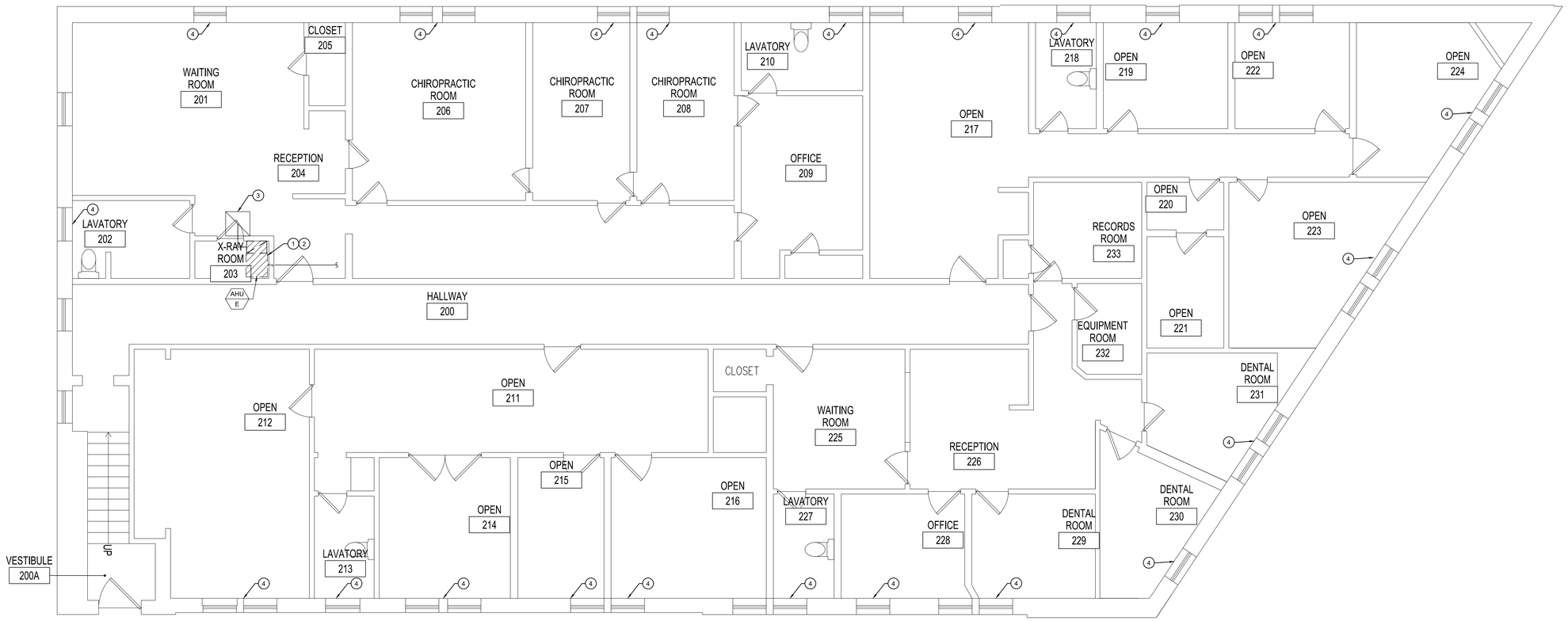
Description
MECHANICAL SPECIFICATIONS

Scale
AS SHOWN

M-003

Ref. North

O:\6K\6100\6165 - Bank Of America Branch Locations\6165.264 - BOA 928 McLean Ave Yonkers NY\CADD\DWG\6165.264 - M-003.dwg



SECOND FLOOR DEMOLITION PLAN

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

KEY NOTES

1. REMOVE EXISTING AIR HANDLING UNIT. CONTRACTOR TO DEMOLISH EXISTING REFRIGERANT PIPING FROM INDOOR AIR HANDLING UNIT TO CONDENSING UNIT ON THE ROOF. PATCH ALL SURFACES DISTURBED OR LEFT UNFINISHED BY THIS WORK TO MATCH ADJACENT SURFACES.
2. REMOVE AND DISCARD THAT PORTION OF EXISTING SUPPLY AND RETURN DUCTWORK AS SHOWN INCLUDING AIR DEVICE, DAMPERS, SUPPORTS, REGISTERS/DIFFUSERS AND ALL ASSOCIATED ACCESSORIES AS SHOWN TO MAINS. MAKE REMAINING DUCTWORK READY FOR CONNECTION TO NEW. SEE FLOOR PLAN FOR ADDITIONAL INFORMATION. PATCH ALL SURFACES DISTURBED OR LEFT UNFINISHED BY THIS WORK TO MATCH ADJACENT SURFACES.
3. EXISTING TO REMAIN.
4. EXISTING FIN TUBE RADIATORS TO REMAIN IN THIS ROOM; CONTRACTOR SHALL INSPECT ALL RADIATORS AND CONFIRM OPERATIONAL. REPLACE AND/OR REPAIR PARTS OF RADIATORS THAT ARE DEFECTIVE.

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03	07/15/2021		
	ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
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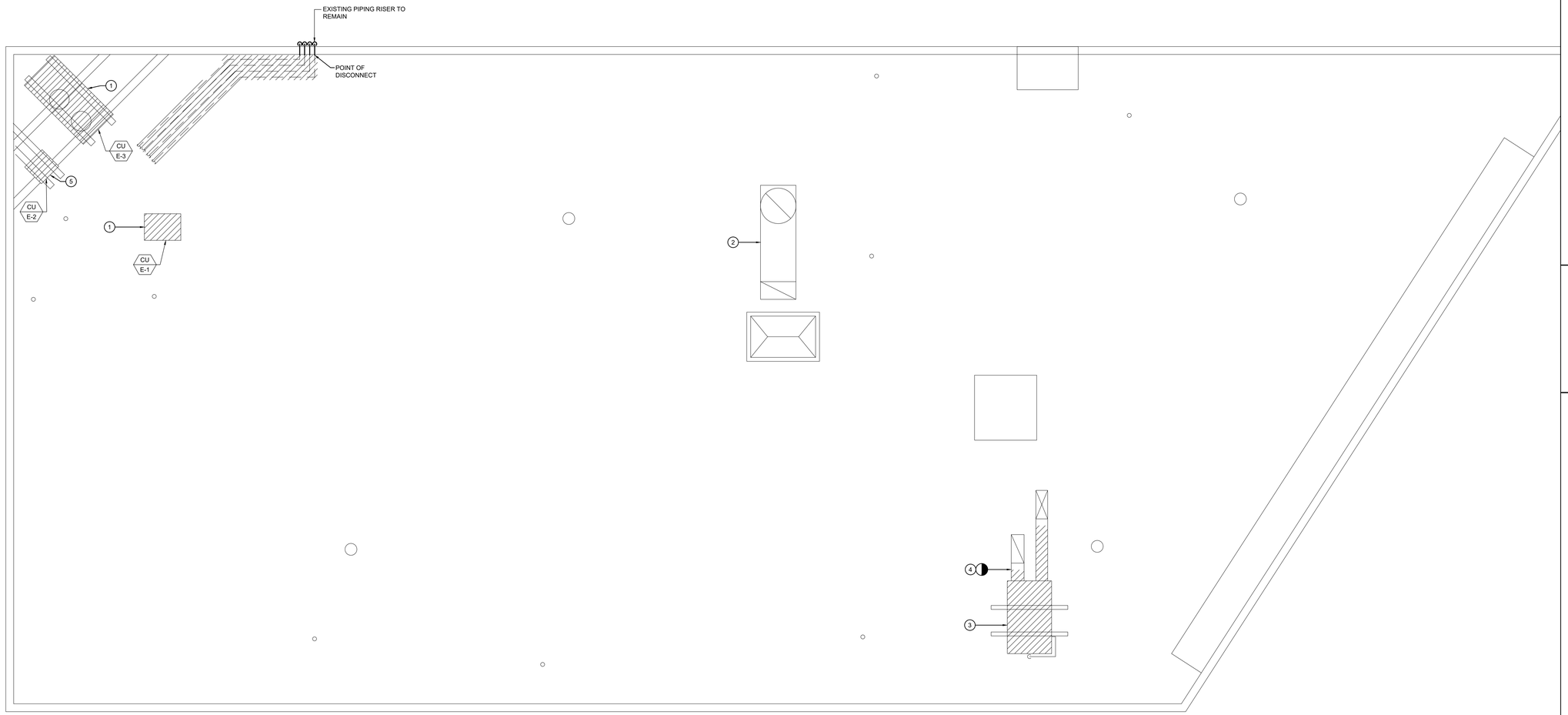
CAD File Name

Description
MECHANICAL SECOND FLOOR DEMOLITION PLAN

Scale
AS SHOWN

M-100

Ref. North



DEMOLITION PLAN - ROOF PLAN

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

KEY NOTES

1. REMOVE AND DISCARD EXISTING CONDENSING UNIT, PIPING, SUPPORTS, AND ALL ASSOCIATED ACCESSORIES. SEE GENERAL NOTES. PATCH ALL SURFACES DISTURBED OR LEFT UNFINISHED BY THIS WORK TO MATCH ADJACENT SURFACES.
2. EXISTING EXHAUST TO REMAIN.
3. REMOVE AND DISCARD EXISTING UNIT, DUCTWORK, DAMPERS, REGISTERS/DIFFUSERS, SUPPORTS AND ALL ASSOCIATED ACCESSORIES. INFILL ROOF DECK WITH ASSOCIATED FRAMING AND PROVIDE ROOFING TO MATCH EXISTING & SEAL WEATHERTIGHT; MAINTAIN ROOF WARRANTY AS APPLICABLE. PATCH ALL SURFACES DISTURBED OR LEFT UNFINISHED BY THIS WORK TO MATCH ADJACENT SURFACES.
4. REMOVE AND DISCARD THAT PORTION OF EXISTING DUCTWORK INCLUDING DAMPERS, SUPPORTS AND ALL ASSOCIATED ACCESSORIES AS SHOWN. MAKE REMAINING DUCTWORK READY FOR CONNECTION TO NEW.PATCH ALL SURFACES DISTURBED OR LEFT UNFINISHED BY THIS WORK TO MATCH ADJACENT SURFACES.
5. REMOVE AND DISCARD EXISTING UNIT, SUPPORTS AND ALL ASSOCIATED ACCESSORIES. EXISTING REFRIGERANT PIPES TO REMAIN. EXTEND THE EXISTING REFRIGERANT PIPING TO NEW LOCATION. SEE NEW WORK PLAN FOR ADDITIONAL INFORMATION. PATCH ALL SURFACES DISTURBED OR LEFT UNFINISHED BY THIS WORK TO MATCH ADJACENT SURFACES.

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03	07/15/2021		
	ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
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CAD File Name

Description
MECHANICAL ROOF DEMOLITION PLAN

Scale
AS SHOWN

M-101

Ref. North

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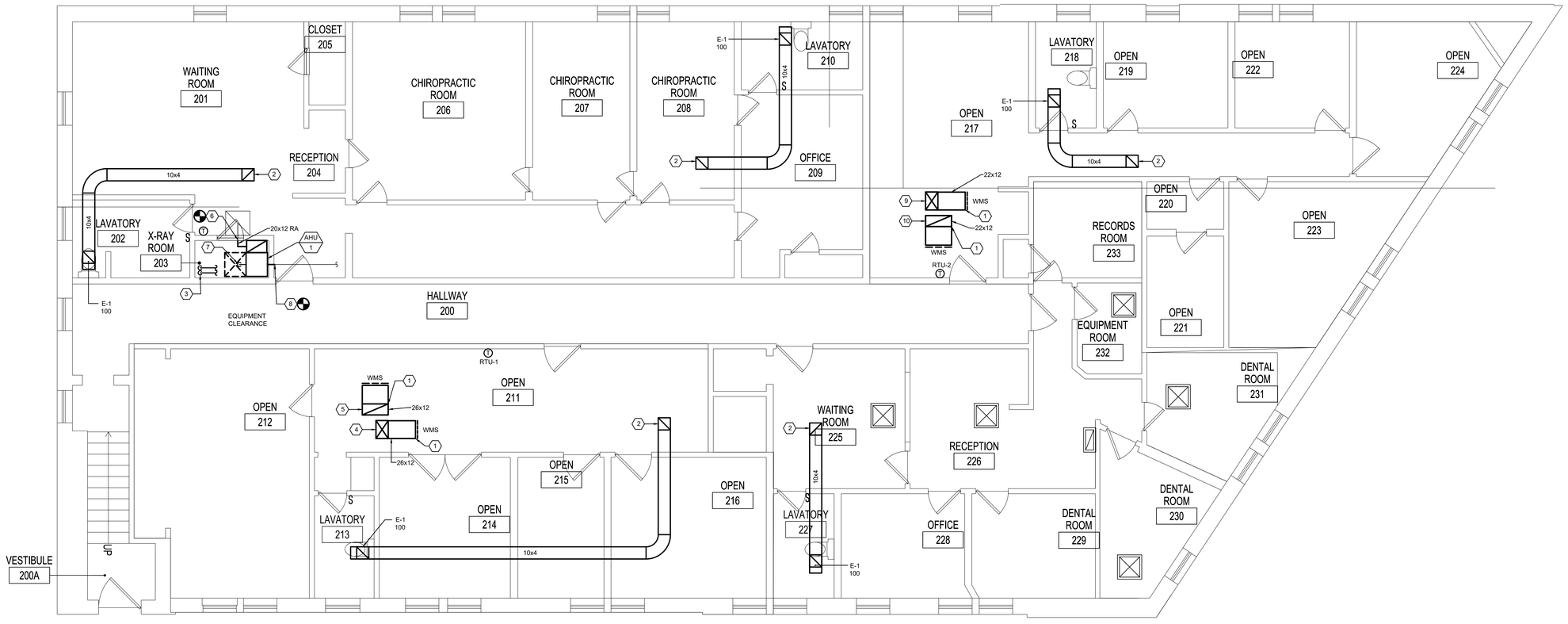

SECOND FLOOR PLAN

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

1. DUCTWORK TO BE TERMINATED WITH WIRE MESH SCREEN FOR FUTURE TENANT USE.
2. 10"x4" EXHAUST DUCTWORK UP TO FAN LOCATED ON ROOF. TRANSITION DUCTWORK TO THE FAN AS REQUIRED. REFER TO SHEET M-201 FOR CONTINUATION.
3. REFRIGERANT PIPING - SUCTION AND LIQUID UP TO ROOF. SIZE AND ROUTING AS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE SUPPORTS AS REQUIRED. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.LOCATION OF UNIT IS APPROXIMATE. FIELD VERIFY AND COORDINATE WITH ARCHITECT FOR EXACT LOCATION.
4. 26x12 SUPPLY DUCT UP TO ROOFTOP UNIT ON ROOF. TRANSITION TO UNIT AS REQUIRED.
5. 26x12 RETURN DUCT UP TO ROOFTOP UNIT ON ROOF. TRANSITION TO UNIT AS REQUIRED.
6. CONNECT NEW 20x12 RETURN DUCTWORK TO EXISTING RETURN DUCTWORK AT WALL PENTRATION.
7. CONTRACTOR TO EXTEND 3/4" CONDENSATE TO EXISTING DRAIN.
8. CONNECT NEW 20x12 SUPPLY DUCTWORK TO EXISTING SUPPLY DUCTWORK AT WALL PENTRATION.
9. 22x12 SUPPLY DUCT UP TO ROOFTOP UNIT ON ROOF. TRANSITION TO UNIT AS REQUIRED.
10. 22x12 RETURN DUCT UP TO ROOFTOP UNIT ON ROOF. TRANSITION TO UNIT AS REQUIRED.

KEY NOTES

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		ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
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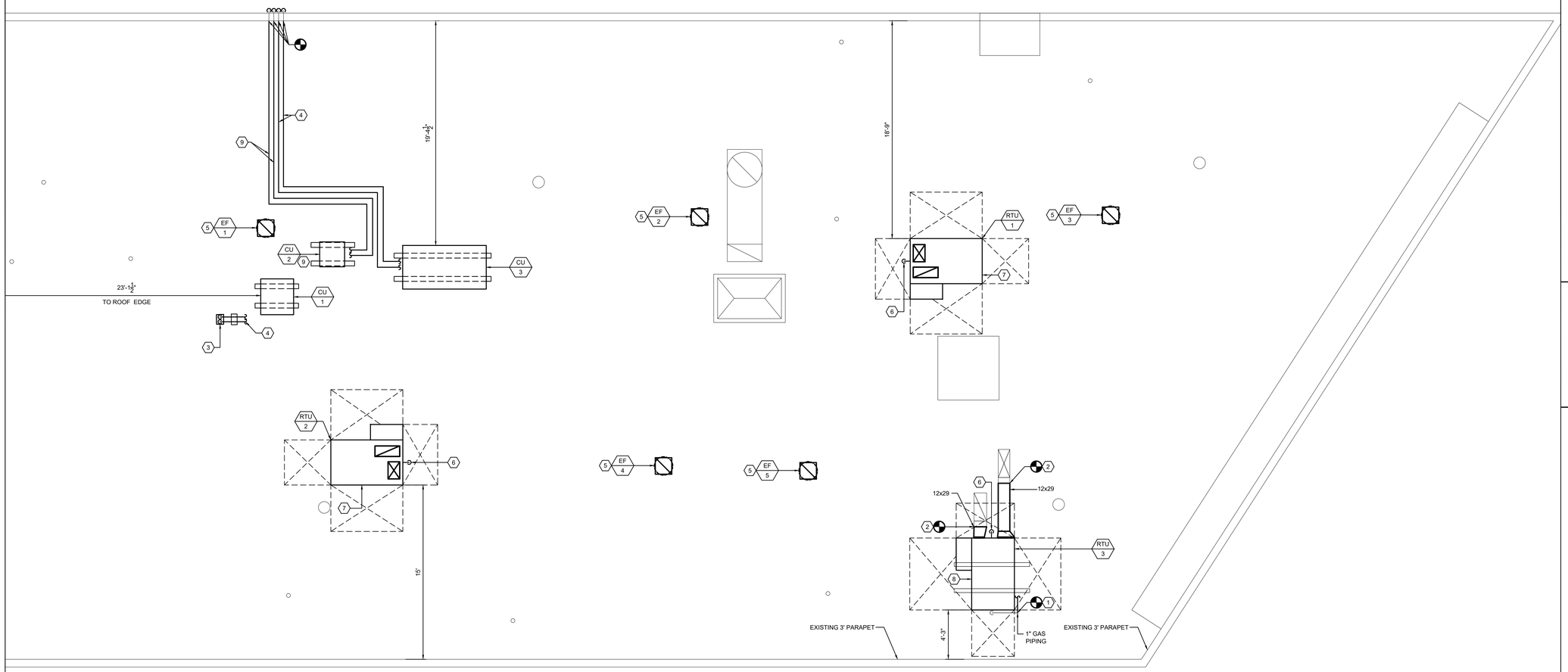
CAD File Name

Description
MECHANICAL SECOND FLOOR PLAN

Scale
AS SHOWN

M-200

Ref. North



ROOF PLAN

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

KEY NOTES

1. PROVIDE NEW 1" GAS AND CONNECT TO EXISTING GAS PIPING.
2. CONNECT TO EXISTING DUCTWORK 6" DOWN FROM ELBOW.
3. PROVIDE ROOF PORTAL. PATE CO OR EQUAL. PROVIDE SEPARATE BOOT FOR EACH PIPE. PROVIDE ADDITIONAL BOOTS FOR ELECTRICAL POWER AND CONTROL CONDUITS. DO NOT PASS MORE THAN (1) PIPE THRU EACH BOOT TO FACILITATE PROPER SEALING.
4. REFRIGERANT PIPING - SUCTION AND LIQUID UP TO ROOF. SIZE AND ROUTING AS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE SUPPORTS AS REQUIRED. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
5. TRANSITION EXHAUST DUCT TO EXHAUST FAN AS REQUIRED.
6. FULL SIZE CONDENSATE DRAIN WITH MINIMUM 2" DEEP TRAP. DISCHARGE TO SPLASH BLOCK.
7. PROVIDE NEW WIND-RATED ROOF CURB BY VMC OR ENGINEER APPROVED EQUAL. PATCH ALL SURFACES DISTURBED OR LEFT UNFINISHED BY THIS WORK TO MATCH ADJACENT SURFACES.
8. SUPPORT FROM EXISTING RAILS. ADD SUPPLEMENTAL SUPPORT AS REQUIRED FOR PROPER INSTALLATION.
9. CONNECT NEW REFRIGERANT PIPING - GAS & LIQUID TO EXISTING PIPING. FIELD VERIFY EXACT LOCATION AND SIZE OF EXISTING PIPING. COORDINATE WITH UNIT MANUFACTURER FOR PIPE SIZE. SEE PIPING DETAILS FOR ADDITIONAL INFORMATION.

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		ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
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CAD File Name

Description
MECHANICAL ROOF PLAN

Scale
AS SHOWN

M-201

Ref. North

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SCHEDULES

PACKAGED GAS-FIRED ROOF TOP UNIT SCHEDULE

RTU X

GENERAL DATA			SUPPLY FAN					EXH FAN CFM	COOLING (EVAPORATOR COIL)								NATURAL GAS BURNER				ELECTRICAL DATA			WEIGHT LBS W/CURB & ACCESS.	REMARKS
PLAN NO.	MANUFACTURER MODEL	AREA SERVED	TOTAL AIR CFM	EXT STATIC PRESS IN. WC	FAN SPEED RPM	FAN HP	MIN OA CFM		NOM TONS	EER	TOTAL MBH	SENS MBH	EAT DB °F	EAT WB °F	LAT DB °F	LAT WB °F	INPUT MBH	OUTPUT MBH	AFUE %	STAGES	EAT DB °F	LAT DB °F	VOLTS/Ø	MCA	MOP		
RTU-3	CARRIER 48LCEA05A-5-0E2C0	FIRST FLOOR TENANT	1600	1.5	1379	2.9 BHP	240	240	4	12.6	44.2	25.9	78	67	63.2	60.8	82/115	66/93	81	TWO	57	95.8	208/3	32	-	777	SEE NOTES

NOTES:

1. UNIT SHALL BE SUPPORTED BY EXISTING RAILS. PROVIDE SUPPLEMENTAL SUPPORT AS NECESSARY FOR PROPER MOUNTING.
2. PROVIDE DRAIN PAN WITH UL #508 APPROVED WATER DETECTION SENSOR FOR UNIT SHUTDOWN. WIRE CONTROL CIRCUIT THROUGH NC CONTACT.
3. PROVIDE UNIT WITH VAV OPERATION.
4. PROVIDE WITH COMPARATIVE ENTHALPY ECONOMIZER WITH FAULT DETECTION MONITORING.
5. PROVIDE WITH POWER EXHAUST.
6. PROVIDE THRU BASE ELECTRIC.
7. PROVIDE UNIT MOUNTED NON-FUSED DISCONNECT SWITCH.
8. PROVIDE FACTORY POWERED 120V CONVENIENCE RECEPTACLE (ALWAYS HOT) WITH CIRCUIT PROTECTION BY EC.
9. PROVIDE HINGED ACCESS DOORS.
10. PROVIDE HAIL GUARDS.
11. PROVIDE MERV 13 FILTERS.
12. PROVIDE BACNET INTERFACE.
13. PROVIDE RETURN AIR SMOKE DETECTOR WIRED TO SHUT DOWN UNIT WITH ACCESSORY REMOTE KEY OPERATED TEST STATION. LOCATE TEST STATION NEAR THERMOSTAT.
14. PROVIDE 2-STAGE COOLING WITH HUMIDI-MIZER (HOT GAS REHEAT COIL).
15. PROVIDE MINIMUM 2" THICK R-8 RIGID INSULATION AFFIXED TO ENTIRE BOTTOM OF UNIT WITH ADHESIVE AND MECHANICAL FASTENERS. COVER INSULATION WITH VENTURE TAPE MODEL 1577CW OR EQUAL EXTERIOR MEMBRANE WRAP INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
16. PROVIDE MODULATING OUTDOOR AND RETURN AIR DAMPERS FOR ECONOMIZER WITH FAULT DETECTION AS PER ASHRAE 90.1 LATEST EDITION.
17. PROVIDE UNIT WITH MODULATING CONTROL WITH VARIABLE SPEED COMPRESSORS.
18. AFTER COMPLETING SYSTEM INSTALLATION AND TESTING, ADJUSTING, AND BALANCING RTU AND AIR-DISTRIBUTION SYSTEMS, CLEAN FILTER HOUSINGS AND PROVIDE NEW FILTERS.
19. PROVIDE BI-POLAR IONIZATION GENERATOR SERVING RTU-3. BASIS OF DESIGN: GLOBAL PLASMA SOLUTIONS MODEL #GPS-FC24-AC - 120 VAC. PROVIDE 120V POWER.
20. PROVIDE PROGRAMMABLE THERMOSTAT.

PACKAGED ROOF TOP UNIT SCHEDULE

RTU X

GENERAL DATA			SUPPLY FAN					EXH FAN CFM	COOLING (EVAPORATOR COIL)									ELECTRICAL DATA			WEIGHT LBS W/ ACCESS.	REMARKS
PLAN NO.	MANUFACTURER MODEL	AREA SERVED	TOTAL AIR CFM	EXT STATIC PRESS IN. WC	FAN SPEED RPM	FAN BHP	MIN OA CFM		NOM TONS	SEER	EER	TOTAL MBH	SENS MBH	EAT DB °F	EAT WB °F	LAT DB °F	LAT WB °F	VOLTS/Ø	MCA	MOP		
RTU-1	CARRIER 50GC-N05B2A3-0F6C0	SECOND FLOOR TENANT	1600	1.5	2323	1.35	240	-	4.0	16	12.2	40	23.6	78	67	64.5	62.3	208/1	38	50	749	SEE NOTES
RTU-2	CARRIER 50GC-N06B2A3-0F6C0	SECOND FLOOR TENANT	1950	1.5	259	1.38	293	-	5.0	16	12.5	56.1	33.7	78	67	61.4	60.6	208/1	41	60	807	SEE NOTES

NOTES:

1. MOUNT AND SECURE UNIT ON EXISTING DUNNAGE. PROVIDE SUPPLEMENTAL STEEL SUPPORTS AS REQUIRED.
2. PROVIDE DRAIN PAN WITH UL #508 APPROVED WATER DETECTION SENSOR FOR UNIT SHUTDOWN. WIRE CONTROL CIRCUIT THROUGH NC CONTACT.
3. PROVIDE UNIT WITH SINGLE ZONE OPERATION.
4. PROVIDE WITH COMPARATIVE ENTHALPY ECONOMIZER AND ENTHALPY SENSOR. INCLUDE FAULT DETECTION AND DIAGNOSTIC AS PER 2016 NYCECC SECTION C403.2.4.7.
5. PROVIDE OUTSIDE AIR INTAKE HOOD.
6. PROVIDE WITH BAROMETRIC RELIEF.
7. PROVIDE THRU BASE ELECTRIC.
8. CFC BASED REFRIGERANTS ARE NOT PERMITTED.
9. FURNISH DISCONNECT FOR INSTALLATION BY ELECTRICAL CONTRACTOR.
10. PROVIDE FACTORY INSTALLED CONVIENCE OUTLET.
11. PROVIDE HINGED ACCESS DOORS.
12. PROVIDE MOTORIZED OUTSIDE AIR DAMPER AND LOW AMBIENT CONTROL.
13. PROVIDE HAIL GUARDS.
14. PROVIDE PROGRAMMABLE THERMOSTAT.
15. PROVIDE RETURN AIR SMOKE DETECTOR WIRED TO SHUT DOWN UNIT WITH ACCESSORY REMOTE KEY OPERATED TEST STATION. LOCATE TEST STATION NEAR THERMOSTAT.
16. PROVIDE BI-POLAR IONIZATION GENERATOR SERVING RTU-1 & 2. BASIS OF DESIGN: GLOBAL PLASMA SOLUTIONS MODEL #GPS-FC24-AC - 120 VAC. PROVIDE 120V POWER.
17. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE HIGH STATIC DRIVE.
18. PROVIDE MERV 13 FILTERS.
19. PROVIDE BACNET INTERFACE.

AIR HANDLING UNIT SCHEDULE

AHU X

PLAN NO.	MANUFACTURER MODEL	LOCATION	AREA SERVED	MIN OA CFM	SUPPLY FAN				COOLING COIL							FILTERS		ELECTRICAL			MATCH CU-X UNIT	WEIGHT LBS	REMARKS
					AIRFLOW CFM	ESP IN. H20	MOTOR HP	MOTOR RPM	TOTAL MBH	SENS MBH	REFRIG	EAT DB °F	EAT WB °F	LAT DB °F	LAT WB °F	TYPE	MIN MERV RATING	VOLTS/Ø	HP	FLA			
AHU-1	AMERICAN STANDARD TEM4A0C48S41SA	ROOM 203	CHIROPRACTOR SUITE	240	1600	0.7	1-1/2	1075	48	30	R-410A	75.3	65.4	55.5	54.3	PLEATED	8	208/1	1-3/4	6.3	CU-1	138	SEE NOTES

NOTES:

1. PROVIDE DRAIN PAN WITH UL #508 APPROVED WATER DETECTION SENSOR FOR UNIT SHUTDOWN. WIRE CONTROL CIRCUIT THROUGH NC CONTACT.
2. PROVIDE UNIT MOUNTED NON-FUSED DISCONNECT SWITCH.
3. PROVIDE POWERED CONVENIENCE RECEPTACLE (ALWAYS HOT) WITH CIRCUIT PROTECTION.
4. PROVIDE HINGED ACCESS DOORS.
5. PROVIDE PROGRAMMABLE THERMOSTAT.
6. PROVIDE 4" FILTER RACK FOR MERV 13 FILTERS.
7. PROVIDE BI-POLAR IONIZATION GENERATOR SERVING AHU-1. BASIS OF DESIGN: GLOBAL PLASMA SOLUTIONS MODEL #GPS-FC24-AC - 120 VAC. PROVIDE 120V POWER.

EXHAUST FAN SCHEDULE

EF X

PLAN NO	MANUFACTURER MODEL	LOCATION	AREA SERVED	FAN TYPE	SYSTEM TYPE	FAN PERFORMANCE		ELECTRICAL DATA					dBA	DUCT CONN (INCHES)	ROOF OPENING (INCHES)	WEIGHT LBS	REMARKS
						CFM	TOTAL SP	FAN RPM	HP	RPM	VOLTS/Ø	DRIVE					
EF-1	GREENHECK G-060-VG	ROOF	LAVATORY 202	DOME CENTRIF	GEN EXH	75	0.25	1382	1/15	1725	115/1	DIRECT	41	8x8	10.5x10.5	32	SEE NOTES
EF-2	GREENHECK G-060-VG	ROOF	LAVATORY 210	DOME CENTRIF	GEN EXH	75	0.25	1382	1/15	1725	115/1	DIRECT	41	8x8	10.5x10.5	32	SEE NOTES
EF-3	GREENHECK G-060-VG	ROOF	LAVATORY 218	DOME CENTRIF	GEN EXH	75	0.25	1382	1/15	1725	115/1	DIRECT	41	8x8	10.5x10.5	32	SEE NOTES
EF-4	GREENHECK G-060-VG	ROOF	LAVATORY 227	DOME CENTRIF	GEN EXH	75	0.25	1382	1/15	1725	115/1	DIRECT	41	8x8	10.5x10.5	32	SEE NOTES
EF-5	GREENHECK G-060-VG	ROOF	LAVATORY 213	DOME CENTRIF	GEN EXH	75	0.25	1382	1/15	1725	115/1	DIRECT	41	8x8	10.5x10.5	32	SEE NOTES

NOTES:

1. MOUNT FAN ON MINIMUM 12" HIGH SEISMIC/WIND-RATED ROOF CURB.
2. PROVIDE NEMA-1 TOGGLE DISCONNECT SWITCH, BIRDSCREEN, & BACKDRAFT DAMPER.
3. PROVIDE CONTROLS FROM WALL SWITCH.
4. UL 705 LISTED.
5. PROVIDE VARI-GREEN ELECTRONICALLY COMMUTATED (EC) MOTOR.
6. PROVIDE UNIT-MOUNTED SPEED CONTROLLER FOR BALANCING.

GRILLES, REGISTERS, AND DIFFUSERS SCHEDULE

MARK	MAKE	MODEL	CFM RANGE	NECK	SIZE	DESCRIPTION	REMARKS
E-1	TITUS	50F	0 - 210	10"x4"	6"x6"	EGGCRATE RETURN AIR GRILLE - CORE OF 1/2"x1/2"x1" ALUMINUM GRID. PROVIDE SQUARE TO ROUND TRANSITION AS NEEDED.	SEE NOTES

NOTES:

1. MAXIMUM NOISE CRITERION < 30.
2. FINISH WITH STANDARD WHITE BAKED ENAMEL FINISH (#26 WHITE), UNO.
3. FURNISH "RAPID-MOUNT" FRAMES FOR S-1 & R-1 DEVICES LOCATED IN DRYWALL CEILINGS.
4. COORDINATE MOUNTING FRAME WITH CEILING/WALL CONSTRUCTION TYPE.
5. PROVIDE DIRECTIONAL BLOW CLIPS WHERE REQUIRED.
6. PROVIDE REMOTE CABLE OPERATED VOLUME DAMPERS LOCATED IN INACCESSIBLE CONSTRUCTION.

AIR COOLED CONDENSING UNIT SCHEDULE

CU X

PLAN NO	MANUFACTURER MODEL	EER	COOLING CAPACITY		ELECTRICAL DATA			WEIGHT LBS	REMARKS
			NOM TONS	TOTAL MBH	VOLTS/Ø	MCA	MOP		
CU-1	TRANE 4TTA4048A3000A	13.0	4	48	208/3	18	30	203	SEE NOTES
CU-2	CARRIER 25CHE424AP03	14.5	2	-	208/3	14.2	25	175	SEE NOTES
CU-3	CARRIER 38AU2016	12.5	15	183.7	208/3	60.8	80	731	SEE NOTES

NOTES:

1. MOUNT OUTDOOR UNIT ON MINIMUM 18" HIGH NONISOLATED WIND RESTRAINT RAILS. BASIS OF DESIGN: THE VMC GROUP MODEL #R-7000.
2. PROVIDE UNIT MOUNTED DISCONNECT SWITCH, LOW AMBIENT CONTROL AND HAIL GUARDS.
3. PROVIDE EXPANSION VALVE KIT FROM THE UNIT MANUFACTURER AND ELECTRICAL DISCONNECT.
4. PROVIDE FREEZESTAT WITH REFRIGERANT LINE KIT FROM THE UNIT MANUFACTURER WITH INSULATION ON BOTH LINES.
5. SWITCH FROM THE UNIT MANUFACTURER.
6. PROVIDE CONTROL WIRING DISTRIBUTION INTERLOCKED WITH EQUIPMENT SERVED.

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Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
_____

CAD File Name

Description
MECHANICAL SCHEDULES

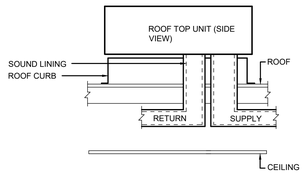
Scale
AS SHOWN

M-300

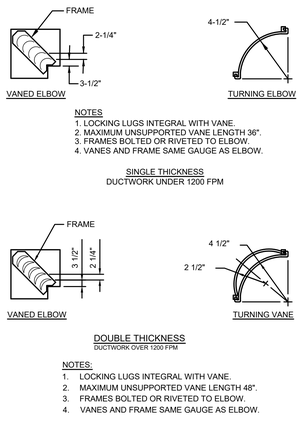
Ref. North

D:\BKofA\1009165 - Bank Of America Branch Locations\6165.264 - BOA 928 McLean Ave Yonkers NY\CAD\DWG\6165.264 - M-300.dwg

DETAILS



ROOFTOP UNIT DETAIL 1
NOT TO SCALE



TURNING VANES 2
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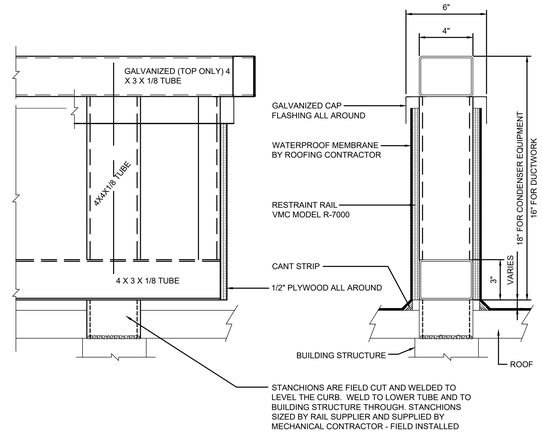

NON-ISOLATED WIND AND SEISMIC RESTRAINT RAIL 3
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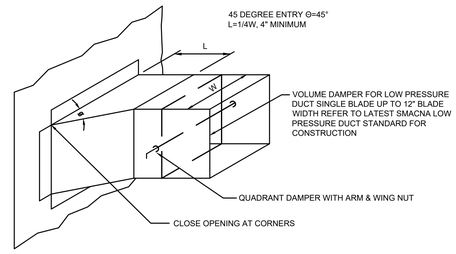

BRANCH CONNECTION DETAIL 4
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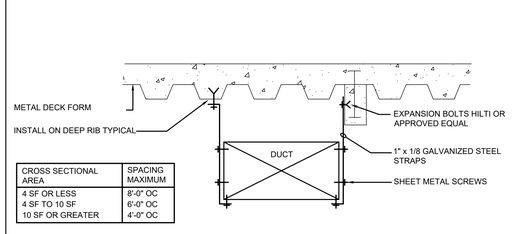

DUCT HANGER DETAIL 5
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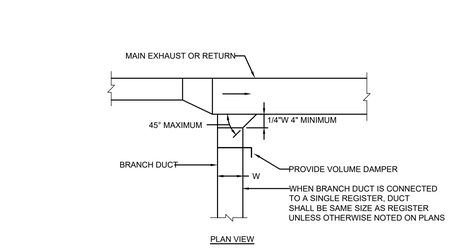

EXHAUST BRANCH DUCT CONNECTION DETAIL 6
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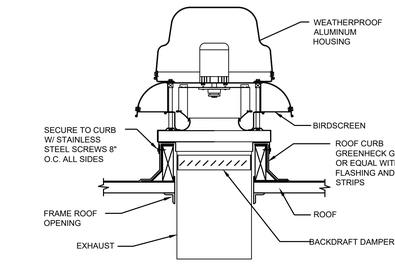

DOWNBLAST EXHAUST FAN DETAIL 7
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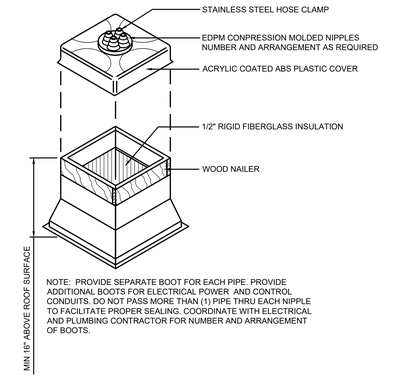

PIPE PORTAL DETAIL 8
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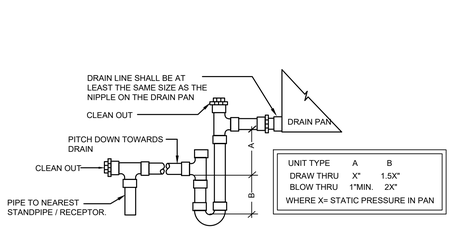

CONDENSATE DRAIN TRAP DETAIL 9
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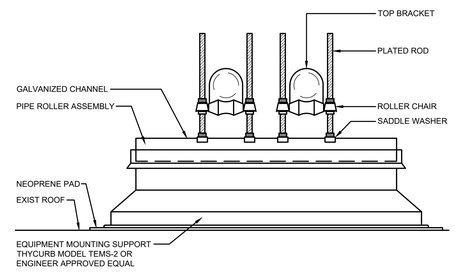

ROOF REFRIGERANT PIPE DETAIL 10
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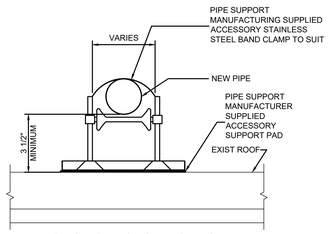

GAS PIPE SUPPORT DETAIL 11
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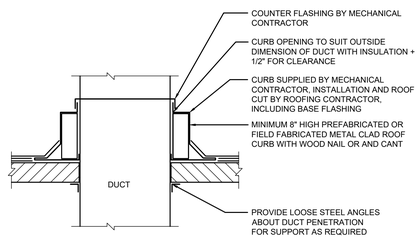

DUCT PENETRATION THRU ROOF DETAIL 12
NOT TO SCALE

Bank of America

YONKERS

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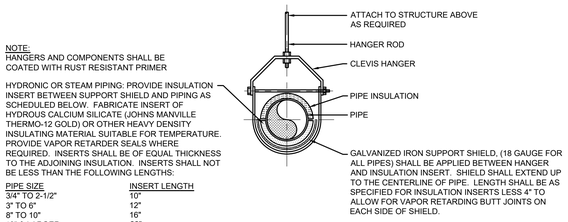
O:\BK\61005165 - Bank Of America Branch Locations\61005165-284 - BOA 928 McLean Ave Yonkers NY\CAD\DGN\61005165-284 - M-400.dwg

DETAILS



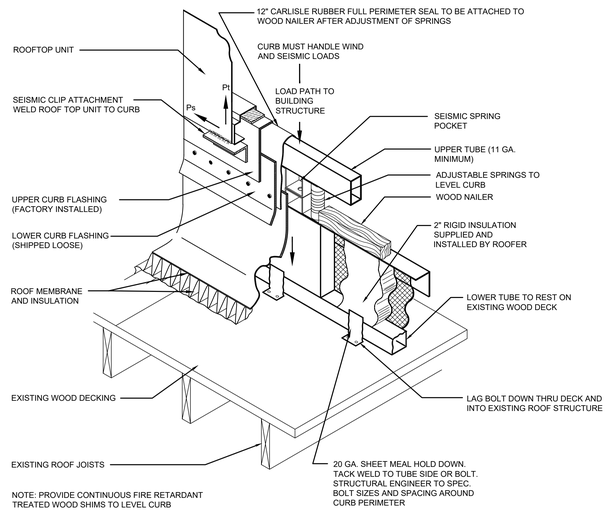
NOTE:
HANGERS AND COMPONENTS SHALL BE COATED WITH RUST RESISTANT PRIMER

HYDRONIC OR STEAM PIPING: PROVIDE INSULATION INSERT BETWEEN SUPPORT SHIELD AND PIPING AS SCHEDULED BELOW. FABRICATE INSERT OF HYDROUS CALCIUM SILICATE (JOHNS MANVILLE THERMO-12 GOLD) OR OTHER HEAVY DENSITY INSULATING MATERIAL SUITABLE FOR TEMPERATURE. PROVIDE VAPOR RETARDER SEALS WHERE REQUIRED. INSERTS SHALL BE OF EQUAL THICKNESS TO THE ADJOINING INSULATION. INSERTS SHALL NOT BE LESS THAN THE FOLLOWING LENGTHS:

PIPE SIZE	INSERT LENGTH
3/4" TO 2-1/2"	10"
3" TO 6"	12"
8" TO 10"	16"
12" & LARGER	22"

PIPE HANGER DETAIL
NOT TO SCALE

13



NOTE: PROVIDE CONTINUOUS FIRE RETARDANT TREATED WOOD SHIMS TO LEVEL CURB

ATTACHMENT OF ISOLATED WIND ROOF CURB ON LEVEL OR PITCHED WOOD BEAM-SUPPORTED ROOF
NOT TO SCALE

14

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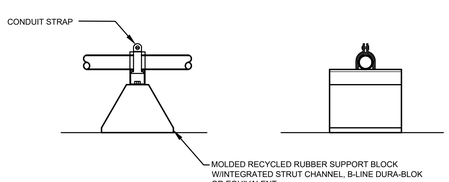
SYMBOLS

POWER DEVICE LEGEND	
SYMBOLS	DESCRIPTION
	SURFACE MOUNTED PANELBOARD, POWER AND LIGHTING
	RECESSED PANELBOARD, POWER AND LIGHTING
	HOMERUN TO PANELBOARD
J	JUNCTION BOX - WALL MOUNTED
J	JUNCTION BOX - CEILING MOUNTED
	DISCONNECT SWITCH.
S_M	MOTOR RATED DISCONNECT SWITCH.
S_{OC}	PASSIVE INFRARED WALL SWITCH OCCUPANCY SENSOR WATTSTOPPER - PW-100
S_V	nLIGHT AIR WIRELESS POWERED WALL SWTICH - RPODLA MVOLT WH G2

WIRING DEVICE LEGEND	
SYMBOLS	DESCRIPTION
X X	NEMA 5-20R DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER. "X" INDICATES CIRCUIT NUMBER. SYMBOL WITH LINE THRU IT DENOTES MOUNTED ABOVE 18". MOUNTINGHEIGHTS TO BE COORDINATED WITH ARCHITECT.

ABBREVIATIONS

A	AMPERE	GND, G	GROUND
AFF	ABOVE FINISHED FLOOR	IC	INTERRUPTING CAPACITY
AFG	ABOVE FINISHED GRADE	IG	ISOLATED GROUND
C	CONDUIT(S)	I/L	INTERLOCKED
CB	CIRCUIT BREAKER	MC	MECHANICAL CONTRACTOR
CH	COUNTER HEIGHT	MOD	MOTOR OPERATED DAMPER
CO	CONDUIT ONLY	NIC	NOT IN CONTRACT
CT	CURRENT TRANSFORMER	NL	NIGHT LIGHT
CU	COPPER	NTS	NOT TO SCALE
EC	ELECTRICAL CONTRACTOR	RGS	RIGID GALVANIZED STEEL
EG	EQUIPMENT GROUND	SPD	SURGE PROTECTIVE DEVICE
EM	EMERGENCY	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
EMT	ELECTRICAL METALLIC TUBING	T/C	TIME CLOCK
ETR	EXISTING TO REMAIN	UON	UNLESS OTHERWISE NOTED
EWC	ELECTRIC WATER COOLER	V	VOLTS
FA	FIRE ALARM	W	WALL MOUNTED
FBO	FURNISHED BY OTHERS	WP	WEATHERPROOF
GFI	GROUND FAULT INTERRUPTER		



NOTES:

1. RUBBER FOOTINGS TO REST ON ROOF. NO AFFIXING IS REQUIRED.

ROOF CONDUIT SUPPORT DETAIL
NOT TO SCALE

GENERAL ELECTRICAL NOTES

1. AS PART OF THIS CONTRACT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXAMINATION AND ACCEPTANCE OF THESE DETAILED NOTES. SUCH OMISSIONS WHICH THEY HAVE FAILED TO SATISFY, SHALL NOT RELIEVE HIM FROM CARRYING OUT SUCH PORTIONS AS INDICATED BY THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS.
2. PRIOR TO BIDDING THE CONTRACT, REVIEW ALL PERTINENT DRAWINGS AND SPECIFICATIONS. WHERE DISCREPANCIES OCCUR BETWEEN DRAWINGS AND SPECIFICATIONS, THE MOST RESTRICTIVE TAKES PRECEDENCE. WHERE ITEMS ARE SHOWN ONLY ON THE CONSTRUCTION DOCUMENTS OR SPECIFICATIONS, THE CONTRACTOR SHALL INTERPRET ITEMS TO BE ON BOTH. IN ALL CASES THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMMEDIATELY NOTIFYING THE ENGINEER FOR INTERPRETATIONS AND CLARIFICATIONS.
3. STUDY AND REVIEW ALL SUPPLEMENT DRAWINGS. THE CONTRACTOR SHALL FURNISH AND INSTALL LABOR, EQUIPMENT AND MATERIALS AS SPECIFIED ON ALL RELATED DOCUMENTS.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE SCOPE OF WORK WITH THE OWNER'S REPRESENTATIVE REGARDING THE PROVISIONS AND INSTALLATION OF ALL SPECIAL SYSTEMS INCLUDING, BUT NOT LIMITED TOO: FIRE ALARM, SECURITY AND DATA SYSTEMS ETC. IT SHALL BE PERTINENT TO COORDINATE WITH ALL DISCIPLINES.
5. WORK SHALL COMPLY WITH THE APPLICABLE RULES OF THE NATIONAL ELECTRICAL CODES, ELECTRICAL SAFETY CODE, THE NATIONAL FIRE CODES (PUBLISHED BY THE NATIONAL FIRE PROTECTION), THE LOCAL ELECTRICAL CODE AND ORDINANCES AND THE TERMS AND CONDITIONS OF SERVICES OF THE ELECTRICAL UTILITY, AS WELL AS ALL AUTHORITIES HAVING LAWFUL JURISDICTON. NONE OF THE TERMS OR PROVISIONS OF THESE SPECIFICATIONS OR CONSTRUCTION DOCUMENTS SHALL BE CONSTRUED AS WAVING ANY OF THE RULES, REGULATIONS, OR REQUIREMENTS OF THESE AUTHORITIES.
6. IT SHALL BE REQUIRED BY THE CONTRACTOR TO VISIT THE PROJECT SITE TO FAMILIARIZE HIMSELF WITH THE CONDITIONS AS THEY EXIST, AND TO CONFIRM LOCATIONS, SIZES AND QUANTITIES OF MATERIALS AND ITEMS TO BE REMOVED OR INSTALLED AS REQUIRED BY THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS. ENTERING HIS BID IS A CLEAR INDICATION THAT HE HAS VISITED THE SITE AND PROJECT AREA AND ACCEPTS THE EXISTING CONDITIONS AND HIS WILLINGNESS TO COMPLY WITH THE DESIGN INTENT. ANY ADJUSTMENTS TO THE PROJECT DURING CONSTRUCTION DUE TO SITE OR PROJECT AREA CONDITIONS WILL BE AT NO CHARGE TO THIS CONTRACT.
7. ALL EXISTING DISTRIBUTION CONDUCTORS SERVING DISTRIBUTION PANELS AND BRANCH CIRCUIT PANELS SHALL BE LABELED FOR FUTURE REFERENCE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE AREA WHERE HE IS WORKING AND THE EQUIPMENT STORAGE FREE OF TRASH, CUTTINGS, STRIPPING, AND DISCARDED ITEMS OF THIS NATURE.
9. IN ALL AREAS COORDINATE BETWEEN THE ELECTRICAL, MECHANICAL AND PLUMBING TRADES. PROVIDE CLEARANCES IN CEILING SPACES, BETWEEN RECESSED LIGHTING FIXTURES AND THERMAL INSULATION OR COMBUSTIBLE MATERIALS; PIPING, ETC. REFERENCE NEC 410-65 & 66.
10. MECHANICAL AND PLUMBING EQUIPMENT SHOWN ON THE ELECTRICAL PLANS ARE SIZED AS DESIGNED. BREAKERS, DISCONNECT SWITCHES, STARTERS, DEVICES, CONDUIT, CONDUCTORS, BRANCH CIRCUITRY SHALL BE MODIFIED AS SUBMITTED AND APPROVED FOR INSTALLATION FOR MECHANICAL ENGINEER. PROVIDE BRANCH CIRCUITRY AS REQUIRED BY THE EQUIPMENT'S NAMEPLATE DATA.
11. VERIFY THE LIGHTING FIXTURE SCHEDULE FOR CONFLICTS WITHIN MANUFACTURES CATALOGUE NUMBERS AND DESCRIPTIONS, VOLTAGE ETC. WHICH ARE NOTED. NOTIFY THE ENGINEER WHERE CONFLICTS OCCUR AND ASK FOR CLARIFICATION.
12. ALL BRANCH CIRCUITS SHALL CONTAIN A GROUND CONDUCTOR AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.
13. EACH REMOTE MOUNTED FRACTIONAL MOTOR SHALL BE PROVIDED WITH A RECEPTACLE AND PLUG, OR MANUAL MOTOR STARTER/DISCONNECT SWITCH SIZED AND INSTALLED ACCORDING TO FLA. EACH MOTOR SHALL BE COMPATIBLE WITH TYPE CONSTRUCTION AND N.E.C.
14. PROVIDE AND INSTALL STARTERS FOR EACH MOTOR AND SIZE AS REQUIRED BY THE N.E.C.. COORDINATE WITH THE MECHANICAL CONTRACTOR AND PROVIDE ALL CONTROL STARTERS AND CONTROL SWITCHES PRIOR TO ROUGH-IN. THE MECHANICAL SCHEDULE INDICATES THE CONTROLS WHICH DIVISION 15 WILL PROVIDE.
15. WIRING MEANS AND METHOD ABOVE INACCESSIBLE CEILINGS OR IN AREAS WHERE ACCESS IS LIMITED SHALL CONFORM TO ALL APPLICABLE CODES AND THE AHJ. LOCATION OF JUNCTION BOXES ABOVE INACCESSIBLE CEILINGS SHALL NOT BE APPROVED. THE CONTRACTOR SHALL CONFIRM CEILING TYPES IN ALL AREAS PRIOR TO INSTALLATION.
16. ALL DUPLEX RECEPTACLES LOCATED WITHIN 4'-0" OF ANY WET AREAS, OR SUBJECT TO MOISTURE SHALL BE GROUND FAULT CIRCUIT INTERRUPT (GFCI).
17. ALL SPECIAL PURPOSE OUTLETS, DUPLEX RECEPTACLES OR DEVICES LOCATED ON THE EXTERIOR OF THE BUILDING SHALL BE GFI TYPE, AND INSTALLED IN A WEATHERPROOF TYPE FS BOX WITH WEATHERPROOF COVER.
18. THE BID SUBMITTED BY THE CONTRACTOR SHALL INCLUDE COSTS FOR ANY AND ALL UTILITY COMPANY CHARGES AND/OR FEES.
19. ALL WIRES MUST BE PLENUM RATED.
20. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY POWER AND ASSOCIATED COSTS FOR ALL TRADES

GENERAL REQUIREMENTS FOR ELECTRICAL WORK

1. DIVISIONS 26 SPECIFICATION ARE WRITTEN IN IMPERATIVE AND STREAMLINES FORMAT. THIS IMPERATIVE LANGUAGE IS DIRECTED TO THE CONTRACTOR. THE WORDS "SHALL BE" SHALL BE INCLUDED BY INTERFACE WHERE A COLON (:) IS USED WITHIN SENTENCES AND PHRASES. WHERE USED IN THE SPECIFICATIONS, THE FOLLOWING DEFINITIONS OF THE WORDS INSTALL,FURNISH AND PROVIDE SHALL APPLY.
   A. INSTALL : TO SET IN PLACE IN POSITION FOR SERVICE.
   B. FURNISH : TO SUPPLY.
   C. PROVIDE : TO FURNISH,AND SET IN PLACE FOR SERVICE.
2. OBTAIN PERMIT AND PAY THE COSTS FOR THE CONSTRUCTION AND INSPECTION BY LOCAL AUTHORITIES OF JURISDICTION OF THE WORK OF THE PROJECT.
3. MATERIALS AND EQUIPMENTS: NEW ONLY, STANDARD CATALOG PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE MANUFACTURE OF PRODUCTS CONFORMING TO THE SPECIFICATIONS.
4. PROTECT METALLIC MATERIALS AGAINST CORROSION BY RUST INHIBITING PRIME TREATMENT AND FINISH PAINT OR BY ZINC OR CADMIUM PLATING.
5. DO NOT RECEIVE MATERIALS AND EQUIPMENT AT THE SITE UNTIL READY FOR INSTALLATION OR UNTIL SUITABLE SPACE IS PROVIDED FOR PROPERLY PROTECTED STORAGE.
6. PROVIDE EQUIPMENT COMPONENTS WITH PERMANENTLY ATTACHED NAMEPLATES IDENTIFYING THE MANUFACTURER, PART NUMBER, SERIAL NUMBER, ELECTRICAL CHARACTERISTICS AND UL LABEL.
7. INSTALL EQUIPMENT AND COMPONENTS IN A MANNER TO PERMIT ACCESS TO PART REQUIRING SERVICE AND IN A MANNER SO TO ALLOW REMOVAL FOR SERVICE WITHOUT DISASSEMBLY OF ADJACENT EQUIPMENT.
8. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING THE PROPER ELECTRICAL EQUIPMENT AND MATERIAL AND FOR THE INSTALLATION AND USE AS INTENDED BY THE MANUFACTURER. REQUEST ADVICE AND SUPERVISORY ASSISTANCE FROM EQUIPMENT MANUFACTURERS AS NECESSARY FOR THE PROPER INSTALLATION, OPERATION, OR START -UP. NOTIFY THE ARCHITECT IN WRITING OF ANY CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND THE MANUFACTURERS RECOMMENDATIONS AND OBTAIN FROM THE ARCHITECT INSTRUCTIONS/ DIRECTION BEFORE PROCEEDING WITH THE WORK.
9. SUBMIT THREE (3) COPIES OF MANUFACTURERS DATA FOR MATERIALS AND EQUIPMENT . SUBMIT DATA AT ONE TIME IN A THREE RING, LOOSE LEAF BINDER. SUBMITTAL FORMAT SHALL FOLLOW THE SPECIFICATION FORMAT, BEING DIVIDED BY IDENTIFICATION SECTIONS. DO NOT INSTALL EQUIPMENT OR MATERIALS UNTIL SUBMITTAL DATA HAD BEEN RECEIVED FROM THE ARCHITEC/ENGINEER. ALLOW SEVEN (7) BUSINESS DAY FOR ARCHITECT/ENGINEER PROCESSING AND REVIEW OF SUBMITTAL DATA.
10. LAY OUT PENETRATIONS OF EXISTING WALLS, FLOOR AND CEILING AND OBTAIN ARCHITECT APPROVAL PRIOR TO EXECUTION OF THE WORK.
11. PROVIDE HOISTING AND SCAFFOLDING FACILITIES AND EQUIPMENTS AS REQUIRED TO PERFORM THE WORK OF THE CONTRACT AND REMOVE FROM THE SITE UPON COMPLETION OF WORK.
12. AT ALL TIMES KEEP THE PREMISES FREE FROM THE ACCUMULATION OF WASTE MATERIALS AND RUBBISH.
13. ELECTRIC WIRING OF MOTORS AND EQUIPMENT:
   A. THE WORK OF DIVISION 26 INCLUDES:
      1) POWER WIRING AND CONTROL WIRING FOR INDIVIDUALLY GROUP MOUNTED MOTOR CONTROLLERS FURNISHED AND INSTALLED UNDER DIVISION 26.
      2) INSTALLATION AND POWER WIRING FOR INDIVIDUALLY MOUNTED MOTOR CONTROLLERS FURNISHED UNDER OTHER DIVISIONS.
15. KEEP AT THE SITE, A SET OF DRAWINGS, NOTING DAILY THE INSTALLED CONDITIONS AND CHANGES OF THE SPECIFIED WORK. AT COMPLETION OF THE WORK OF THE CONTRACT, DELIVER TO THE ARCHITECT/ENGINEER NEATLY MARKED SET OF SEPIA REPRODUCIBLE DRAWINGS SHOWING "AS INSTALLED" CONDITIONS.
16. FURNISH INDEXED OPERATING AND MAINTENANCE MANUALS WITH COMPLETE TECHNICAL DATA FOR EQUIPMENT AND MATERIALS PROVIDED UNDER THIS CONTRACT. PROVIDE TWO COPIES, BOUND IN HARDBACK BINDERS OR AN APPROVED EQUIVALENT. DELIVER TO THE ARCHITECT/OWNER AT FINAL ACCEPTANCE.
17. GUARANTEE MATERIALS AND WORKMANSHIP FOR A PERIOD OF TWELVE (12) MONTHS FROM DATE OF FINAL ACCEPTANCE.

DRAWING INDEX

CODE INFORMATION

1	OCCUPANCY TYPE	BUSINESS
2	GOVERNING CODES AND REFERENCES	2020 BUILDING CODE OF NEW YORK STATE
		2020 PLUMBING CODE OF NEW YORK STATE
		2020 FUEL GAS CODE OF NEW YORK STATE
		2020 ENERGY CONSERVATION CODE OF NEW YORK STATE
		2020 MECHANICAL CODE OF NEW YORK STATE
		2020 EXISTING BUILDING CODE OF NEW YORK STATE
		NATIONAL ELECTRIC CODE (NEC) 2017
		REQUIREMENTS OF LOCAL AUTHORITY HAVING JURISDICTION

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SPECIFICATIONS

1. DEMOLITION

   A. FURNISH ALL LABOR AND MATERIALS AS REQUIRED TO COMPLETE DEMOLITION AND REMOVAL OF ALL ITEMS AS INDICATED ON DRAWINGS OR AS OTHERWISE DIRECTED BY INCLUDING TEMPORARY PROTECTION AS INDICATED BELOW:

   B. PROVIDE TEMPORARY PROTECTIONS AS REQUIRED TO PRESERVE EXISTING ITEMS INDICATED TO REMAIN AND RESTORE DAMAGED WORK TO THE CONDITION EXISTING PRIOR TO THE START OF WORK, UNLESS OTHERWISE DIRECTED.

   C. CONTROL DUST AND DIRT CAUSED BY DEMOLITION OPERATIONS. AREA OUTSIDE THE AREA OF WORK SHALL BE KEPT CLEAN FROM DIRT AND DUST.

   D. ALL ACTIVE MECHANICAL, ELECTRICAL, FIRE PROTECTION, AND PLUMBING SYSTEMS TO REMAIN SHALL BE FULLY PROTECTED FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION.

   E. ALL WORK DEMOLISHED SHALL BE REMOVED FROM THE PREMISES EXCEPT ITEMS TO BE REUSED OR RETURNED TO OWNER OR AS OTHERWISE INDICATED.

   F. AT ALL TIMES PROTECT THE PROPERTY OF THE OWNER, INCLUDING BUT NOT LIMITED TO WINDOWS, FLOOR, AND CEILING TILE, PUBLIC TOILETS, ELEVATORS, DOORS, BUCKS, ELECTRICAL AND AIR CONDITIONING EQUIPMENT, LIGHT FIXTURES, CONVECTOR ENCLOSURES, ETC.

   G. ALL EXISTING OUTLETS ALONG EXISTING WALLS, PERIMETER, CORE OR COLUMNS TO REMAIN, ARE TO BE CHECKED AND MAINTAINED BY ELECTRICAL CONTRACTOR AS ACTIVE OUTLETS UNLESS LOCATION CONFLICTS WITH NEW CONSTRUCTION OR LAYOUT. PROVIDE NEW COVER PLATES AND RECEPTACLES.

   H. REMOVE ALL ABANDONED CONDUITS LEFT AFTER WALL DEMOLITION, INCLUDING SWITCH BOXES, PLATES, BRIDGES, OR ANY OTHER TELEPHONE OR ELECTRICAL, WIRING, AND EQUIPMENT.

   I. ALL EXPOSED LIGHT FIXTURES, WIRING, SWITCHES, AND WIRE MOLDING NOT BEING REUSED SHALL BE REMOVED AND EITHER STORED OR CARTED AWAY BY THE ELECTRICAL CONTRACTOR.

   J. ALL ELECTRICAL DEVICES INDICATED TO BE REMOVED IN AREAS BEING RENOVATED AND SERVED BY CIRCUIT(S) WHICH DO NOT SERVE DEVICES IN OTHER AREAS BEING RENOVATED SHALL BE COMPLETELY REMOVED WITH ASSOCIATED WIRING, BOXES, ETC. BACK TO THE ASSOCIATED POWER PANEL. DEVICES TO BE DISCARDED.

   K. ELECTRICAL DEVICES INDICATED TO BE REMOVED IN AREAS BEING RENOVATED AND SERVED BY CIRCUIT(S) WHICH SERVE DEVICES IN AREAS NOT AFFECTED BY RENOVATION WORK SHALL BE REMOVED WITH ASSOCIATED WIRING, BOXES, ETC. TO THE NEAREST BOX IN THE UNAFFECTED AREA. DEVICES IN AREAS UNAFFECTED BY RENOVATION/ DEMOLITION SHALL BE REROUTED AND REMAIN ACTIVE.

2. PATCHING AND CUTTING

   A. PERFORM ALL CUTTING, FITTING AND PATCHING WORK THAT MAY BE REQUIRED BY ITS WORK AND AS SHOWN OR REASONABLY IMPLIED BY THE DRAWINGS AND NOTES.

   B. PERFORM WORK IN ADVANCE OF THE WORK OF OTHERS WHENEVER POSSIBLE IN ORDER TO MINIMIZE CUTTING AND PATCHING.

   C. ALL DAMAGED AREAS AND EXISTING AREAS EFFECTED BY DEMOLITION OR NEW CONSTRUCTION WORK SHOWN ON DRAWINGS SHALL BE PATCHED AS REQUIRED TO MATCH IMMEDIATE EXISTING ADJACENT AREAS IN MATERIAL, FIRE RATING, FINISH COLOR, UNLESS OTHERWISE NOTED.

   D. THE ELECTRICAL CONTRACTOR IS TO REPLACE THE INTEGRITY OF RATED PARTITIONS, COLUMNS AND BEAM FIREPROOFING EFFECTED BY ITS WORK. REPLACEMENT TO COMPLY WITH LOCAL CODES.

   E. PROVIDE SUPPORTS TO ASSURE STRUCTURAL INTEGRITY OF SURROUNDINGS, DEVICES AND METHODS TO PROTECT OTHER PORTIONS OF PROJECT FROM DAMAGE.

   F. EXECUTE WORK BY METHODS TO AVOID DAMAGE TO OTHER WORK, AND WHICH WILL PROVIDE PROPER SURFACES TO RECEIVE PATCHING AND FINISHING.

3. GENERAL

   A. FURNISH AND INSTALL ALL ELECTRICAL WORK AS SHOWN ON THE DRAWINGS AND THESE SPECIFICATIONS HEREIN. WORK INCLUDES THE FOLLOWING UNDERSTANDINGS:

      a. CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO OUTLINE BASIC ENGINEERING AND SYSTEMS DESIGN, THEREFORE DO NOT SHOW MINOR DETAILS AND ACCESSORIES. BECAUSE A MINOR COMPONENT IS NOT SHOWN, SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR FURNISHING AND INSTALLING ALL SUCH ITEMS NECESSARY TO PROVIDE COMPLETE, OPERATIVE AND PROPERLY INSTALLED SYSTEMS TO THE OWNER, UNDER THE BASIC CONTRACT. IF THERE ARE ANY DOUBTS AS TO WORK REQUIRED, THE CONTRACTOR SHALL OBTAIN A CLARIFICATION FROM THE ENGINEER IN THE BID STAGE.

      b. THE CONTRACT DRAWINGS SHOW THE INTENDED LOCATION OF THE EQUIPMENT, HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MINOR ADJUSTMENTS OR RELOCATIONS NECESSARY DUE TO CHOICE OF EQUIPMENT AND COORDINATION CONFLICTS. ALL EQUIPMENT RELOCATIONS MUST BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR APPROVAL.

      c. THE PROJECT DRAWINGS, THIS SPECIFICATION, AND OTHER RELATED DOCUMENTS ARE COMPLEMENTARY. ITEMS REQUIRED BY ONE SHALL DESIGNATE REQUIREMENT BY THE OTHER, WHETHER EXPLICITLY STATED OR NOT. WHERE DOCUMENTS CONFLICT, THE WORK OF THE MORE STRINGENT NATURE SHALL BE REQUIRED.

      d. COOPERATION AND COORDINATION WITH UTILITIES, OWNER, AND OTHER SUBCONTRACTORS IS MANDATORY.

      e. EXISTING WORK AND UTILITIES WHICH ARE DAMAGED OR DISTURBED DUE TO ANY PHASE OF OPERATIONS, SHALL BE RESTORED TO THE SATISFACTION OF FPA, THE OWNER, AND THE GOVERNING AUTHORITIES.

      f. PROCUREMENT AND INSTALLATION OF MATERIALS, PRODUCTS AND EQUIPMENT SHALL BE COORDINATED WITH THE WORK OF THE OTHER TRADES, INCLUDING ALL WORK SHOWN ON THE PLUMBING, MECHANICAL, ELECTRICAL, FIRE PROTECTION, AND ARCHITECTURAL DRAWINGS.

   B. CLEARANCES FOR WORKING SPACE AND MAINTENANCE SHALL BE MAINTAINED AS REQUIRED BY CODE AND/OR MANUFACTURER'S REQUIREMENT, WHICHEVER IS MORE STRINGENT.

   C. "PROVIDE" AND/OR "FURNISH AND INSTALL" MEANS PURCHASE, ARRANGE DELIVERY, UNLOAD, INSTALL, CONNECT, TEST, AND LEAVE READY FOR OPERATION.

   D. THE WORK CALLED FOR ON THE DRAWINGS AND SPECIFICATIONS HEREIN SHALL BE COORDINATED WITH THE STRUCTURE AND WORK OF ALL OTHER TRADES AND SHALL BE SO ARRANGED THAT THERE WILL BE NO DELAY IN THE PROPER INSTALLATION AND COMPLETION OF ANY PART OR PARTS OF EACH PERSPECTIVE WORK WHEREIN IT MAY BE INTERRELATED WITH THAT OF THIS CONTRACT SO THAT GENERALLY ALL WORK CAN PROCEED IN ITS NATURAL SEQUENCE WITHOUT UNNECESSARY DELAY.

   E. WHERE EXISTING POWER CIRCUITS HAVE BEEN DISTURBED, ALL COSTS FOR RECIRCUITING OF SAME IS TO BE INCLUDED.

   F. SHOP DRAWINGS AND DATA SHEETS ARE REQUIRED FOR ASSEMBLIES AND EQUIPMENT. THEY SHALL PROVIDE ALL PERTINENT DATA AND INFORMATION NECESSARY TO EVALUATE EACH ITEM. IRRELEVANT INFORMATION ON DRAWINGS AND DATA SHEETS SHALL BE COMPLETELY MARKED OUT LEAVING ONLY DATA THAT PERTAINS TO THE ITEMS SUBMITTED FOR APPROVAL. DRAWINGS AND DATA SHEETS SHALL SHOW:

      b. PRINCIPAL DIMENSIONS AND DETAILS OF CONSTRUCTION.

      c. WEIGHTS OF PRINCIPAL PARTS AND TOTAL WEIGHTS WITH INFORMATION REQUIRED FOR THE DESIGN OF SUPPORTS AND FOUNDATIONS.

      d. PERFORMANCE DATA.

      e. UNDERWRITERS LABEL AND OTHER AUTHORITIES HAVING JURISDICTION OF EQUIPMENT REQUIRING LABELS.

      f. ALL MANUFACTURER'S TEST REPORTS THAT MAY HAVE BEEN CONDUCTED AT THE FACTORY ON TRANSFORMERS, AND INSULATION TESTS ON MEDIUM VOLTAGE CABLE INCLUDING HIGH POTENTIAL POWER AND POWER FACTOR TEST RESULTS.

      g. CERTIFIED PERFORMANCE GUARANTEES.

   I. FURNISH TEMPORARY CONNECTIONS TO SERVICES AND THE INSTRUMENTS FOR TESTING.

   J. OVERLOAD DEVICES SHALL BE ADJUSTED AND SET TO SUIT THE LOADS WHICH THEY CONTROL.

   K. ALL CHANGES SHALL BE MADE THAT ARE NECESSARY FOR ADJUSTING, SETTING, AND BALANCING.

   L. PHASE ROTATION AT ALL BUSSES, PANELS, SWITCHGEAR ETC. SHALL BE CHECKED TO SEE THAT IT CONFORMS WITH RECOGNIZED STANDARDS.

   M. BEFORE ENERGIZING ANY FACTORY FABRICATED EQUIPMENT, INSPECT EACH UNIT IN DETAIL. BOLTS AND CONNECTIONS SHALL BE TIGHT (TORQUE TIGHT WHERE REQUIRED) PER MANUFACTURERS SPECIFICATIONS. COMPONENTS SHALL BE ALIGNED AND THE EQUIPMENT SHALL BE PLACED IN A SAFE OPERATIONAL CONDITION.

   N. THE COMPLETE ELECTRICAL SYSTEM SHALL BE FREE OF GROUNDS AND SHORT CIRCUITS. IT SHALL OPERATE PROPERLY UNDER FULL LOAD CONDITIONS WITHOUT EXCESSIVE HEATING AT ANY POINT IN THE SYSTEM.

   O. FURNISH AND INSTALL 120VAC CONTROL WIRING FOR THE MECHANICAL EQUIPMENT. WIRING DIAGRAMS TO BE OBTAINED FROM THE MECHANICAL CONTRACTOR AND CONTROL SHOP DRAWINGS.

   P. OBTAIN ALL NECESSARY CONTROL WIRING DIAGRAMS FROM THE EQUIPMENT MANUFACTURER.

   Q. PROVIDE ALL NECESSARY CONTROL CIRCUITS AND INTERLOCK WIRING BETWEEN UNITS.

   R. ANY BUILDING SERVICE SHUTDOWNS REQUIRED FOR THIS WORK SHALL BE REQUESTED IN WRITING BY THE ELECTRICAL CONTRACTOR AT LEAST 72 HOURS IN ADVANCE OF THE SHUTDOWN. THE ELECTRICAL CONTRACTOR SHALL OBTAIN APPROVAL IN WRITING FROM THE OWNER PRIOR TO SHUTDOWN. ANY SHUTDOWN AFFECTING THE NORMAL ELECTRICAL SERVICE OF ANY BUILDING OCCUPANTS SHALL BE DONE ON OVERTIME.

   S. INSTALL AND WIRE ALL CONTROL DEVICES AS INDICATED ON THE DRAWING. THE MECHANICAL CONTRACTOR WILL FURNISH ALL CONTROL DEVICES TO THE ELECTRICAL CONTRACTOR AND WILL ASSIST IN THE INSTALLATION OF SAME, UNLESS OTHERWISE NOTED.

4. CONDUITS

   A. ALL CONDUIT SHALL BE CONCEALED IN CONCRETE SLAB, IN WALLS, OR ABOVE FINISHED CEILINGS, UNLESS OTHERWISE NOTED.

   B. WHERE INDICATED, IN SERVICE AREAS, EXPOSED CONDUIT SHALL BE INSTALLED TO PROVIDE THE MAXIMUM HEADROOM BUT IN NO CASE SHALL CONDUIT BE INSTALLED LESS THAN SEVEN (7) FEET ABOVE THE FINISHED FLOOR. CONDUIT INSTALLED IN AREAS WHERE HUNG CEILINGS OR OTHER FURRED SPACES ARE INDICATED SHALL BE INSTALLED CONCEALED.

   C. WHERE WORK IS TO BE CONCEALED, CARE SHALL BE TAKEN TO INSURE THAT IT DOES NOT PROJECT BEYOND THE FINISHED LINES OF FLOORS, CEILINGS, OR WALLS.

   D. EXPOSED CONDUIT AND CONDUIT ABOVE CEILINGS SHALL BE RUN PARALLEL & PERPENDICULAR TO LINES OF THE BUILDING. BENDS SHALL BE FREE FROM DENTS OR FLATTENING. CONDUIT SHALL BE SUPPORTED AND SECURELY FASTENED.

   E. CONDUIT SHALL BE INSTALLED TO MAINTAIN CLEARANCE FROM OTHER PIPING, VALVES, OR OTHER MECHANICAL EQUIPMENT, AND SHALL NOT BE INSTALLED WITHIN 6" OF HOT WATER, STEAM PIPING, HEATING FLUES, OR SIMILAR HOT SURFACES.

   F. POCKETS OR TRAPS IN ALL CONDUIT RUNS WHERE MOISTURE MAY COLLECT SHALL BE AVOIDED. WHERE DIPS ARE UNAVOIDABLE, AN APPROVED DRAIN FITTING SHALL BE LOCATED AT EACH LOW POINT IN ORDER TO PROVIDE A MEANS FOR DRAINAGE.

   G. CONDUIT SIZES SHALL BE IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS OF THE NEC, EXCEPT NO 1/2" CONDUIT WILL BE PERMITTED (ALL CONDUIT IN WALLS, FLOORS, ABOVE CEILINGS, EXPOSED, OR UNDERGROUND SHALL BE A MINIMUM OF 3/4".)

   H. SLEEVES PASSING THROUGH FIRE WALLS AND ALL SLEEVES PASSING THROUGH FLOORS SHALL BE SIZED TO ALLOW SUFFICIENT SPACE BETWEEN SLEEVE AND CONDUIT FOR FIREPROOFING WITH 3M FIRE BARRIER CAULKING MATERIAL CP25. ALL SPARE SLEEVES PASSING THROUGH FIRE WALLS OR FLOORS SHALL BE THOROUGHLY PACKED WITH 3M FIRE BARRIER PUTTY 303 AND CAPPED.

   I. FLEXIBLE (LIQUID TIGHT) CONDUIT SHALL BE PROVIDED TO CONNECT TO ALL MOTORS, DELICATE INSTRUMENTS AND CONTROLS, AND TO VIBRATING EQUIPMENT.

   J. INSTALLATION SHALL BE SUCH SO AS TO SUPPORT CONDUIT WITHOUT SAGGING AND SHALL BE CLEAR OF THE WORK OF OTHER TRADES. PROVISIONS FOR EXPANSION AND CONTRACTION SHALL BE MADE.

   K. CONDUITS SHALL BE FREE OF MOISTURE AND MANHOLES SHALL BE DRY.

   L. CONDUIT WORK, IN AREAS WHERE NO HUNG CEILINGS ARE PROVIDED, SHALL BE RUN EXPOSED UNLESS SPECIFICALLY NOTED OTHERWISE. IN EXPOSED AND HUNG CEILINGS ALL LIGHTING, RECEPTACLE, AND SWITCH BRANCH CIRCUITS SHALL BE RUN IN EMT. A SIX FOOT WHIP OF 'MC' FLEXIBLE CONDUIT SHALL BE CONNECTED TO LIGHTING FIXTURES. IN STUD WALLS VERTICAL DROPS SHALL BE 'MC' FLEXIBLE CONDUIT. IN FINISHED OR UNFINISHED BLOCK WALLS VERTICAL DROPS SHALL BE EMT CONDUIT RUN IN THE WALL.

5. BOXES

   A. PULL BOXES SHALL BE OF AMPLE SIZE FOR THE APPLICATION, AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE NEC REQUIREMENTS.

   B. PULL BOXES SHALL BE INSTALLED BETWEEN A MAXIMUM OF EVERY 3 RIGHT ANGLE BENDS OR THE EQUIVALENT. LONG CONDUITS RUNS SHALL HAVE A PULL BOX AT LEAST EVERY 100'-0".

   C. ALL PULL BOXES SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS.

6. CABLES/WIRES

   A. USE ONLY APPROVED TYPE LUBRICANT TO FACILITATE THE PULLING OF WIRE AND CABLE.

   B. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE COPPER 75°C. TYPE THWN AND THHN. ALL SIZES SHOWN ON THE DRAWINGS ARE BASED ON THHN COPPER.

   C. WHENEVER MULTIPLE SETS OF FEEDERS ARE RUN TO A DEVICE OR PIECE OF EQUIPMENT, EACH SET SHALL RUN IN ITS OWN CONDUIT. MULTIPLE SETS OF FEEDERS ARE NOT PERMITTED IN A COMMON CONDUIT. NO EXCEPTIONS.

   D. ALUMINUM CONDUCTORS SHALL NOT BE USED.

   E. ALL PHASE LEG, NEUTRAL AND GROUND CONDUCTORS SHALL BE PROPERLY COLOR CODED IN ALL PANELS, TROUGHS, CABINETS, AND BOXES IN ACCORDANCE WITH THE NEC.

   F. UNLESS OTHERWISE SPECIFIED, FURNISH ALL LABOR AND MATERIALS NECESSARY FOR THE COMPLETE INSTALLATION AND PROPER OPERATION OF ALL ELECTRICAL WORK AND EQUIPMENT ASSOCIATED WITH THE PLUMBING, FIRE PROTECTION, HEATING, VENTILATING, AND AIR CONDITIONING EQUIPMENT, AND PROCESS EQUIPMENT.

   G. ALL CONDUCTORS SHALL BE COPPER.

   G. CONDUCTORS UP TO AND INCLUDING SIZE #6 AWG. SHALL BE TYPE THWN-THHN. CONDUCTORS LARGER THAN SIZE #6 AWG. SHALL BE TYPE THWN, ALL RATED 600 VOLTS, COPPER CONDUCTORS.

   H. MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG FOR POWER AND #14 AWG. FOR CONTROL UNLESS OTHERWISE NOTED.

   I. MAKE DIRECT CONNECTIONS AS REQUIRED TO ALL EQUIPMENT NOT FURNISHED WITH CORD AND PLUG.

   J. ALL FEEDER WIRING RUN WITHIN THE BUILDING SHALL BE INSTALLED IN ELECTRICAL METALLIC TUBING (EMT). ALL WIRES SHALL BE RUN IN EMT TO FIRST DEVICE. MC CABLE MAY BE USED AFTER FIRST DEVICE AND ONLY IN STUDDED WALLS AND ABOVE ACOUSTICAL CEILING.

7. GROUNDING

   A. GROUNDING OF THE NON-CURRENT CARRYING METALLIC PARTS OF ALL ELECTRICAL EQUIPMENT AND ENCLOSURES INCLUDING CONDUITS, SUPPORTS, CABINETS, TRANSFORMERS, MOTOR FRAMES, SWITCHGEAR ENCLOSURES, CONTROL PANELS, ETC., WHICH ARE INSTALLED OR CONNECTED UNDER THIS CONTRACT, SHALL BE PROPERLY CONNECTED TO THE GROUNDING SYSTEM, REGARDLESS OF WHETHER OR NOT THESE CONNECTIONS ARE SHOWN ON THE DRAWINGS.

   B. THE GROUNDING INSTALLATION SHALL HAVE PROVISIONS FOR BOTH SYSTEM AND EQUIPMENT GROUNDS AS DEFINED BY THE NEC. THESE GROUNDING SYSTEMS ARE TO BE EFFECTIVELY INSULATED FROM EACH OTHER EXCEPT AT THE SERVICE CONNECTION.

   C. GROUNDING SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF NEC AND THE NESC. LOCAL REQUIREMENTS OF THE INSPECTION AUTHORITY HAVING JURISDICTION SHALL GOVERN IN ALL MATTERS OF INTERPRETATION.

8. WIRING DEVICES

   H. DUPLEX CONVENIENCE RECEPTACLES SHALL BE SPECIFICATION GRADE, 20 AMPERE, 125 VOLT PARALLEL SLOT, GROUNDING TYPE, EQUAL TO HUBBELL-5362.

9. SAFETY SWITCHES

   A. FURNISH AND INSTALL ALL DISCONNECT SWITCHES AND MOTOR STARTERS INDICATED ON THE DRAWINGS, UNLESS OTHERWISE NOTED

   B. ALL SAFETY SWITCHES SHALL BE QUICK MAKE, QUICK BREAK TYPE.

   C. ALL SAFETY SWITCHES, STARTERS, PUSH BUTTONS, AND ENCLOSURES SHALL BE UL LISTED AND SHALL BE NEMA 1 FOR INDOOR AND NEMA 3R FOR OUTDOOR, UNLESS OTHERWISE NOTED.

   D. ALL SAFETY SWITCHES SHALL BE HORSEPOWER RATED AND HAVE PROVISIONS FOR LOCKOUT.

   E. ALL SAFETY SWITCHES SHALL BE AS MANUFACTURED BY SQUARE 'D', CUTLER-HAMMER OR APPROVED EQUAL.

10. PANEL BOARDS

   A. BUS BAR CONNECTIONS TO THE BRANCH CIRCUIT SHALL BE "PHASE SEQUENCE" TYPE. THREE(3) PHASE, FOUR(4) WIRE BUSSING SHALL BE SUCH THAT ANY THREE(3) ADJACENT SINGLE POLE BREAKERS ARE INDIVIDUALLY CONNECTED TO EACH OF THE THREE(3) DIFFERENT PHASES IN SUCH A MANNER THAT TWO(2) OR THREE(3) POLE BREAKERS CAN BE INSTALLED AT ANY LOCATION. ALL CURRENT CARRYING PARTS OF THE BUS ASSEMBLY SHALL BE COPPER. MAINS RATINGS SHALL BE AS SHOWN IN THE PANEL BOARD SCHEDULE OR ON THE PLANS.

   B. NEW CIRCUIT BREAKERS BEING INSTALLED IN EXISTING PANELBOARDS OR SWITCHGEAR SHALL BE OF THE SAME MANUFACTURER TYPE AND AIC RATING AS THE EXISTING BREAKERS.

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01	10/09/20	CA	AHG
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03	07/15/2021		
	ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
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Prototype Layout
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CAD File Name

Description
ELECTRICAL
SPECIFICATIONS

Scale
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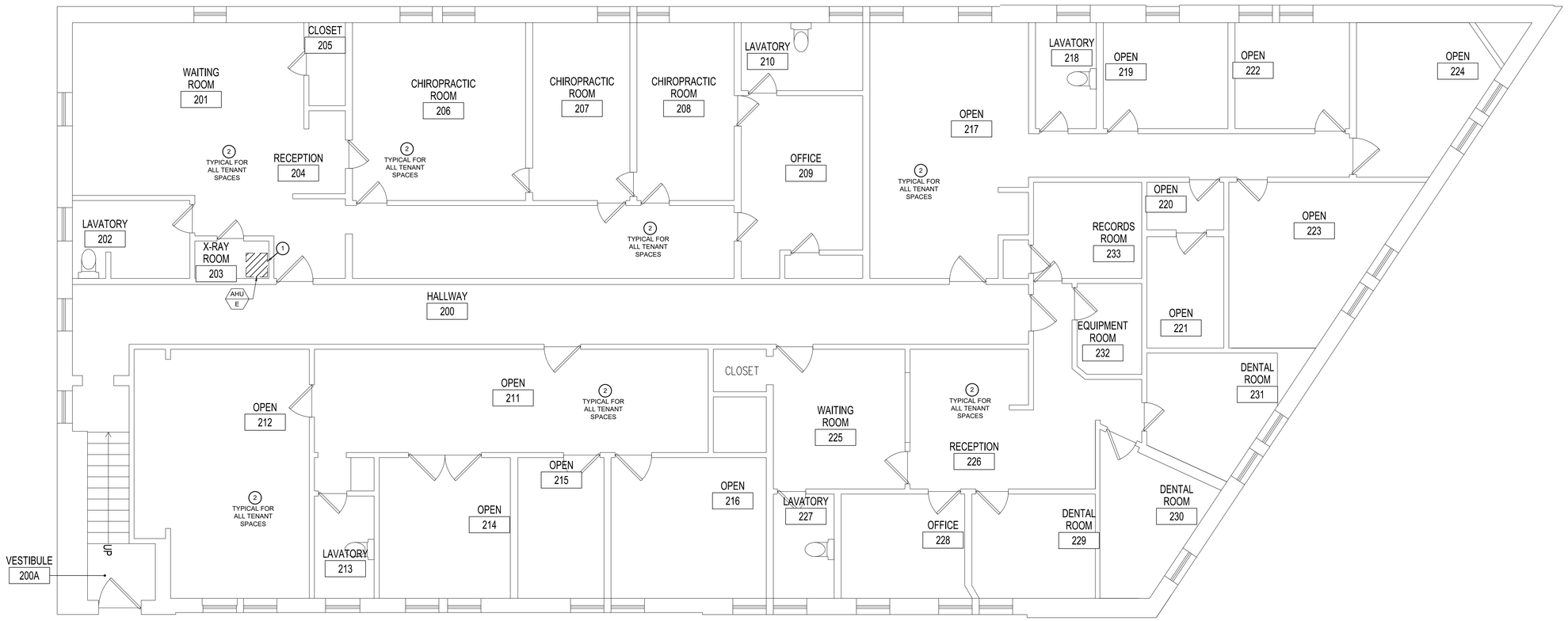

SECOND FLOOR DEMOLITION PLAN

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

KEY NOTES

1. CONTRACTOR SHALL DISCONNECT POWER TO THE EXISTING AIR HANDLER UNIT. REMOVE ASSOCIATED DISCONNECT SWITCH AND ALL WIRING/CONDUIT BACK TO THE SOURCE. REFER TO THE NEW WORK PLAN FOR ADDITIONAL INFORMATION.
2. REMOVE ALL ABANDONED EXISTING LINE AND LOW VOLTAGE WIRING. TYPICAL FOR ALL SPACES.

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YONKERS – MEDIUM RENOVATION

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Description
SECOND FLOOR DEMOLITION PLAN

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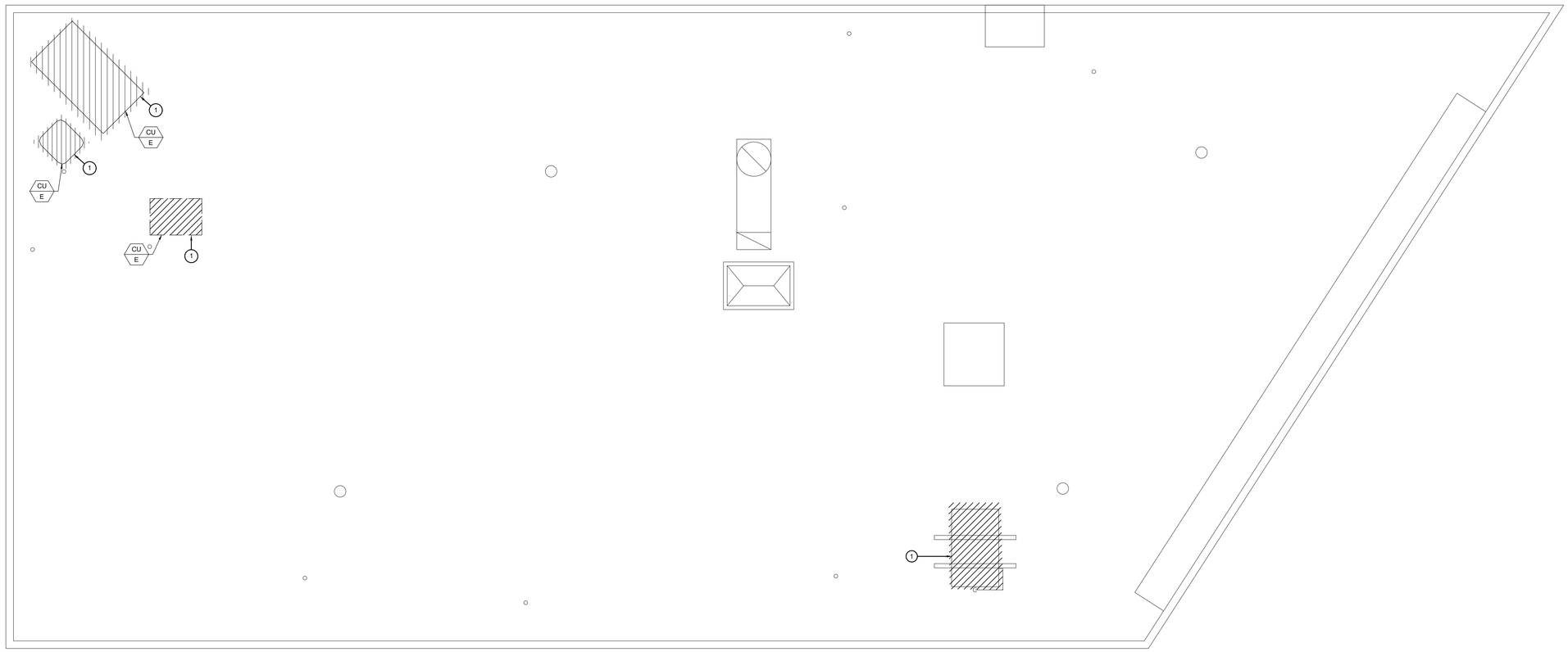

ROOF DEMOLITION PLAN

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

1 CONTRACTOR SHALL DISCONNECT POWER TO THE EXISTING CONDENSING UNIT. REMOVE ASSOCIATED DISCONNECT SWITCH AND ALL WIRING/CONDUIT BACK TO THE SOURCE. REFER TO THE NEW WORK PLAN FOR ADDITIONAL INFORMATION.

KEY NOTES

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CAD File Name

Description
ROOF DEMOLITION PLAN

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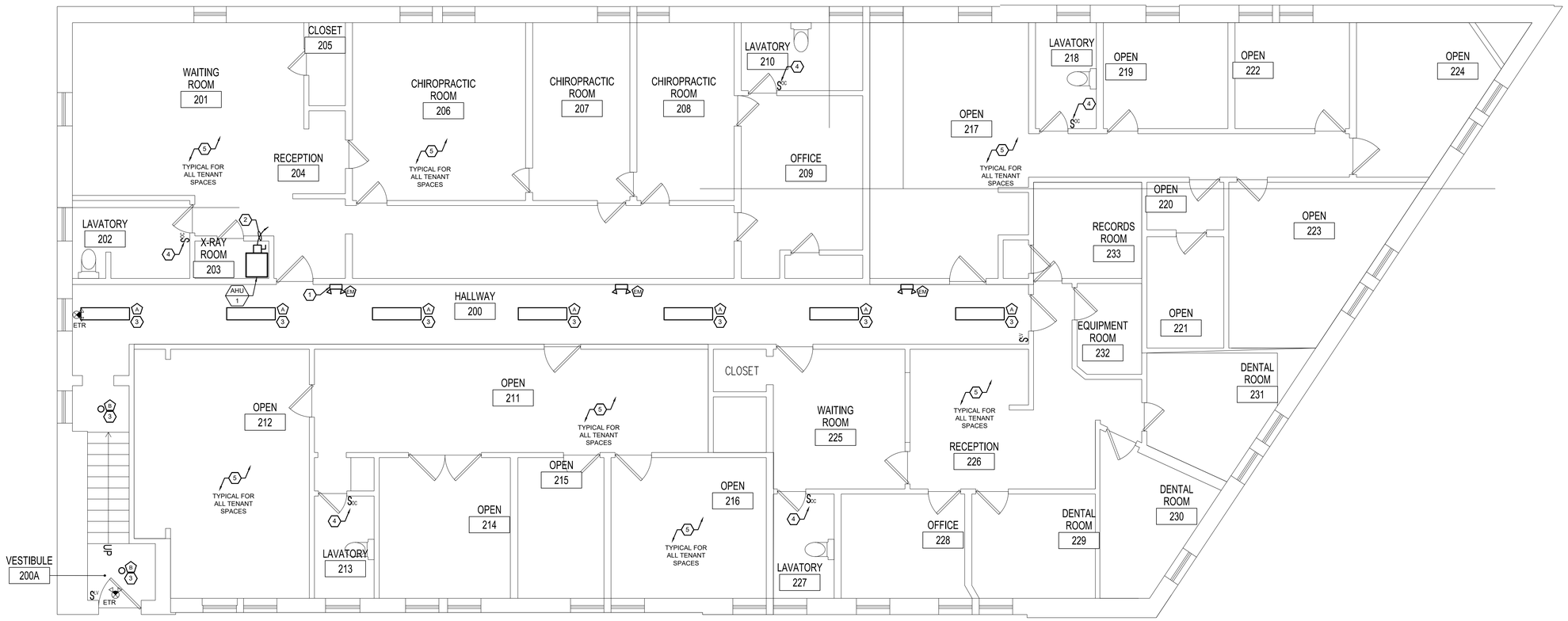

SECOND FLOOR PLAN

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

KEY NOTES

1. CONTRACTOR SHALL CONNECT EMERGENCY LIGHT FIXTURE TO LIGHTING CIRCUIT SERVING THE CORRIDOR LIGHTING AHEAD OF ANY LIGHTING CONTROLS.
2. PROVIDE NEW 3#12 & 1#12 EG FEEDER IN 3/4" CONDUIT FROM A NEW 15A 2P CIRCUIT BREAKER IN PANEL "DR KELLER" LOCATED THE THE BASEMENT TO THE AIR HANDLER UNIT. FOR BID PURPOSES ASSUME 100 FOOT RUN. PROVIDE A 120 VOLT FEED FOR THE AHU GPS BAR.
3. CONNECT NEW LIGHTING FIXTURES TO EXISTING BRANCH CIRCUIT AND CONTROLS SERVING THE LIGHTING IN THIS AREA.
4. PROVIDE NEW SWITCH WITH INTERNAL OCCUPANCY SENSOR FOR LIGHT FIXTURE AND NEW EXHAUST FAN. TIE IN NEW EXHAUST FAN WITH LIGHT FIXTURE. SEE ROOF PLAN FOR ADDITIONAL INFORMATION AND EXHAUST FAN LOCATIONS.
5. INSPECT EXISTING LIGHT FIXTURES. REPLACE DEFECTIVE FIXTURES, LAMPS, AND LENSES. LENSES TYPES TO BE CONSISTENT THROUGHOUT TENANT SPACES.

KEY NOTES

TYPE	SYMBOL	DESCRIPTION	MANUFACTURER	CATALOG NO.	LAMPS	BALLAST TYPE	BALLAST QTY	VOLTS	TOTAL WATTAGE	NOTES	MOUNTING
A		4' WRAPAROUND LINEAR LED, 4000 LUMENS, 3500°K WITH NLIGHT AIR WIRELESS OCCUPANCY SENSOR	ACUITY LITHONIA	BLWP4-40L-ADSM-MVOLT-EZ1-LP830 NLTAIR2	INCLUDED	L	1	120	34.9		SURFACE
B		4" ROUND LED DOWNLIGHT, 1500 LUMEN, 3500°K WITH NLIGHT AIR WIRELESS OCCUPANCY SENSOR	ACUITY GOTHAM	EVO4-35/15-AR-120 NLTAIR2	INCLUDED	L	1	120	14		RECESSED
EM		WALL MOUNTED LED DUAL REMOTE HEAD WITH THERMOPLASTIC HOUSING AND 6 VDC BATTERY.	DUAL LITE	LZ2-03L	INCLUDED	L	1	120	3	1,3	WALL MOUNTED

GENERAL NOTES:
A. BOA HAS ENTERED INTO NATIONAL AGREEMENT WITH SHEALY ELECTRICAL WHOLESALER'S, INC. AND WIEDENBACH BROWN, TO FURNISH LIGHTING FIXTURES. FOR INFORMATION REGARDING PRICING, PURCHASING, ORDERING, SHIPPING, AND DELIVERY COORDINATION CONTACT TRAVIS DOAK; (980) 636-5731 - TDOAK@SHEALYELECTRICAL.COM. NO SUBSTITUTIONS WILL BE ALLOWED, AND CONTRACTOR MUST SUBMIT 1 SET OF APPROVED FIXTURE CUT SHEETS FOR EACH PROJECT.

LIGHTING FIXTURE SCHEDULE

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Description
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SECOND FLOOR PLAN

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Ref. North

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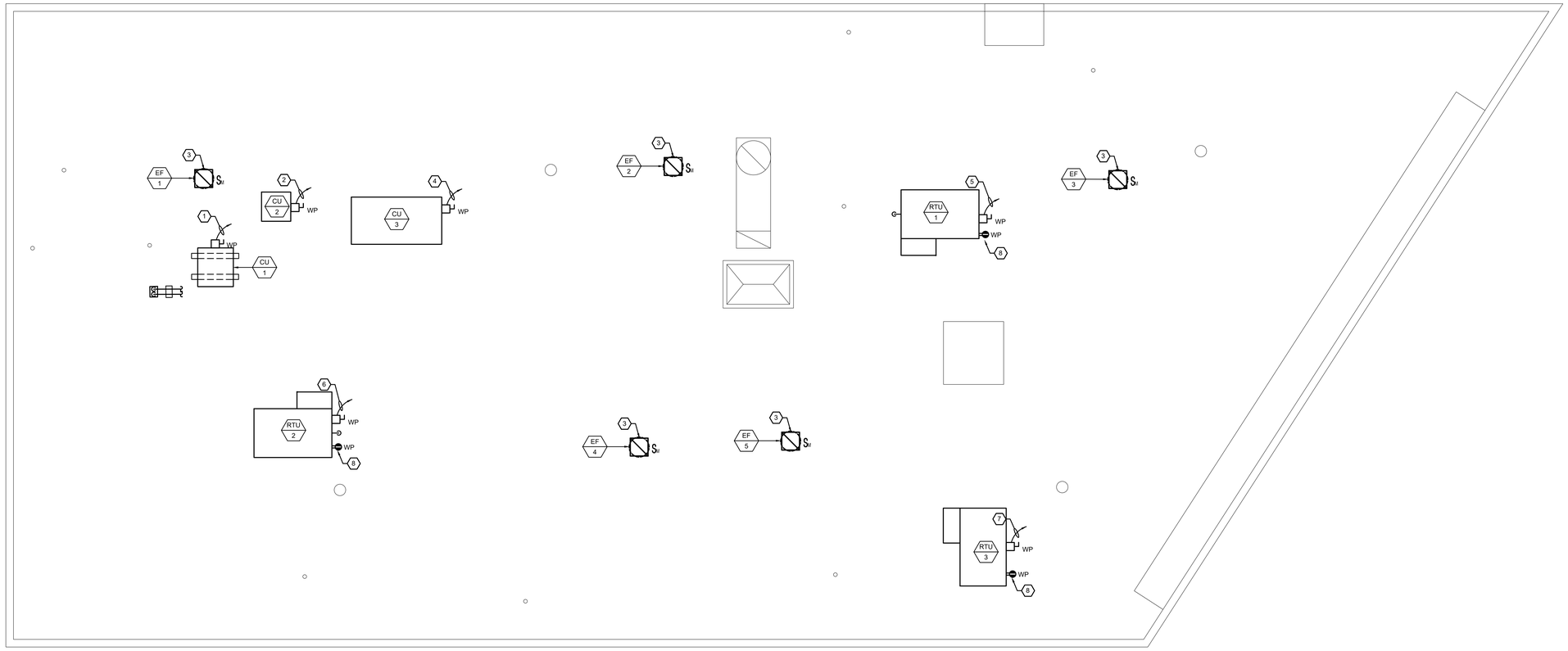
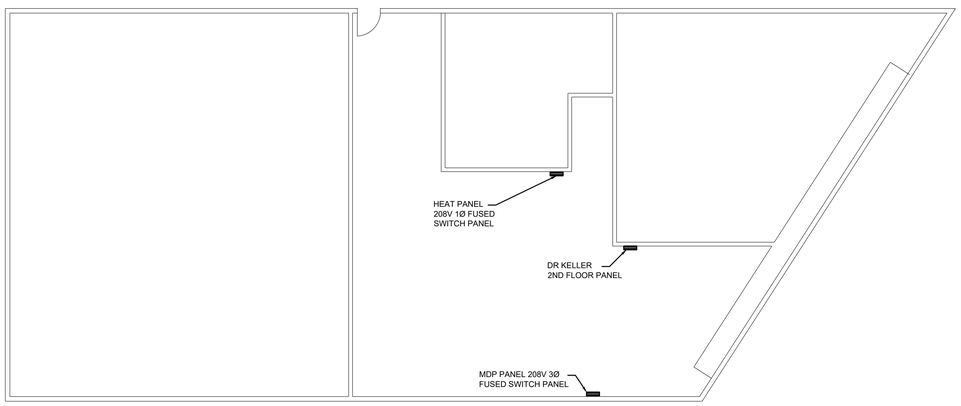


ROOF PLAN
SCALE: 1/4" = 1'-0"



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

KEY NOTES

1. PROVIDE NEW 4#10 & 1#10 EG FEEDER IN 3/4" CONDUIT FROM A NEW 30A 3P BREAKER IN PANEL "DR KELLER" LOCATED IN THE BASEMENT TO NEW CONDENSING UNIT. FOR BID PURPOSES ASSUME APPROXIMATELY 120 FOOT RUN.
2. REMOVE EXISTING FUSES & PROVIDE (2) NEW 25A FUSES IN SPARE SPACE IN "HEAT PANEL" LOCATED IN BASEMENT. PROVIDE NEW 3#10 & 1#10 EG FEEDER IN 3/4" CONDUIT FROM SPARE SPACE TO CONDENSING UNIT. FOR BID PURPOSES ASSUME APPROXIMATELY 120 FOOT RUN.
3. PROVIDE POWER TO EXHAUST FAN FROM CIRCUIT SERVING THE LIGHT FIXTURE IN THE RESTROOM ASSOCIATED WITH THE FAN - 2#12 & 1#12 EG IN 3/4" CONDUIT. EXHAUST FAN SHALL BE CONTROLLED VIA RESTROOM LIGHT SWITCH.
4. REMOVE EXISTING FUSES & PROVIDE (3) NEW 80A FUSES IN SPACE IN "MDP PANEL" LOCATED IN BASEMENT. PROVIDE NEW 4#3 & 1#6 EG FEEDER IN 1-1/4" CONDUIT FROM SPARE SPACE TO CONDENSING UNIT. FOR BID PURPOSES ASSUME APPROXIMATELY 120 FOOT RUN.
5. REMOVE EXISTING FUSES & PROVIDE (2) NEW 50A FUSES IN SPARE SPACE IN "HEAT PANEL" LOCATED IN BASEMENT. PROVIDE NEW 3#6 & 1#10 EG FEEDER IN 1" CONDUIT FROM SPARE SPACE TO NEW ROOF TOP UNIT. FOR BID PURPOSES ASSUME APPROXIMATELY 120 FOOT RUN.
6. REMOVE EXISTING FUSES & PROVIDE (2) NEW 60A FUSES IN SPARE SPACE IN "HEAT PANEL" LOCATED IN BASEMENT. PROVIDE NEW 3#6 & 1#10 EG FEEDER IN 1" CONDUIT FROM SPARE SPACE TO NEW ROOF TOP UNIT. FOR BID PURPOSES ASSUME APPROXIMATELY 120 FOOT RUN.
7. REMOVE EXISTING FUSES & PROVIDE (3) NEW 40A FUSES IN SPACE IN "MDP PANEL" LOCATED IN BASEMENT. PROVIDE NEW 4#8 & 1#10 EG FEEDER IN 1" CONDUIT FROM SPARE SPACE TO NEW ROOF TOP UNIT. FOR BID PURPOSES ASSUME APPROXIMATELY 120 FOOT RUN.
8. PROVIDE POWER TO GPS BARS IN RTU AND RECEPTACLE. PROVIDE A NEW 1P20 AMP CIRCUIT IN THE "DR KELLER" PANEL WITH - 2#12 & 1#12 EG IN 3/4" CONDUIT.

KEY NOTES

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Bank of America

YONKERS

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Issue	Date & Issue Description	By	Check
01	10/09/20	CA	AHG
	ISSUED FOR BID		
02	02/03/2021		
	ISSUE FOR PERMIT & PRICING II		
03	07/15/2021		
	ISSUE FOR PERMIT & PRICING VI		

Seal/Signature

Project Name
YONKERS – MEDIUM RENOVATION

Prototype Layout
_____

CAD File Name

Description
ELECTRICAL
ROOF PLAN

Scale
AS SHOWN

E-201

Ref. North