ENERGY CODE PROGRESS INSPECTIONS

A LICENSED PROFESSIONAL ENGINEER OR ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF MECHANICAL/PLUMBING SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORT OF TEST THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.

PROGRESS INSPECTIONS:

1. HVAC-R AND SERVICE WATER HEATING EQUIPMENT
2. HVAC-R AND SERVICE WATER HEATING SYSTEM CONTROLS
3. HVAC-R AND SERVICE WATER PIPING DESIGN AND INSULATION
4. DUCT LEAKAGE TESTING INSULATION AND DESIGN
5. LIGHTING IN DWELLING UNITS
6. INTERIOR LIGHTING POWER
7. LIGHTING CONTROLS
8. MAINTENANCE INFORMATION

MECHANICAL DRAWING LIST

M-001.00	MECHANICAL LEGEND & GENERAL NOTES
M-101.00	MECHANICAL SPECIFICATIONS SHEET NO.1
M-102.00	MECHANICAL SPECIFICATIONS SHEET NO.2
M-103.00	MECHANICAL SPECIFICATIONS SHEET NO.3
M-401.00	MECHANICAL SCHEDULES
M-501.00	MECHANICAL DUCTWORK PLAN
M-601.00	MECHANICAL PIPING PLAN
M-901.00	MECHANICAL DETAILS SHEET NO.1
M-902.00	MECHANICAL DETAILS SHEET NO.2
M-903.00	MECHANICAL DETAILS SHEET NO.3

NEW YORK CITY BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE BUILDING CODE, CITY OF NEW YORK, EFFECTIVE NOVEMBER 7, 2022 AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. A TEST WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF THE MECHANICAL SYSTEM. THE TEST WILL SHOW COMPLIANCE WITH 2022 BUILDING CODE REQUIREMENTS AS OUTLINED IN SECTION [BC 1705].
2. THE LICENSED PROFESSIONAL ENGINEER OR ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORT OF TEST THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.
3. SPECIAL INSPECTIONS:
   a. ALL MECHANICAL SYSTEMS, EQUIPMENT AND MATERIALS INSPECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION [BC 1705.21] OF THE 2022 NYC BUILDING CODE.
   b. POST-INSTALLED ANCHOR INSPECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION [BC 1705.37] OF THE 2022 NYC BUILDING CODE.
   c. FIRE-RESISTANT PENETRATIONS AND JOINT INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH SECTION [BC 1705.17] OF THE 2022 NYC BUILDING CODE.
4. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION [MC 606] OF THE 2022 NYC MECHANICAL CODE.
5. FIRE DAMPERS LOCATED WITHIN AIR DISTRIBUTION AND SMOKE CONTROL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION [MC 607] OF THE 2022 NYC MECHANICAL CODE.
6. ALL FIRE DAMPERS SHALL BE ACCEPTED FOR USE BY THE NEW YORK CITY DEPARTMENT OF BUILDINGS AND SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF UL 555.
7. THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
8. TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK CITY ENERGY CONSERVATION CODE.

MECHANICAL LEGEND

CEILING SUPPLY DIFFUSER
CEILING RETURN REGISTER
CEILING EXHAUST REGISTER
LINEAR SUPPLY/RETURN DIFFUSER
SIDEWALL DIFFUSER
A(250) DIFFUSER TYPE AND CFM (CUBIC FEET PER MINUTE). REFER TO SCHEDULE.
DOUBLE LINE DUCT
DOUBLE LINE PIPE
ACOUSTIC LINING IN DUCT
FLEXIBLE DUCT
WIRE MESH SCREEN
VD VOLUME DAMPER
FD FIRE DAMPER WITH DUCT ACCESS DOOR
BD BACKDRAFT DAMPER
MD MOTORIZED DAMPER WITH DUCT ACCESS DOOR
FSD COMBINATION FIRE/SMOKE DAMPER WITH DUCT ACCESS DOOR
UNDERCUT DOOR
DOOR LOUVER
FAN
CEILING MOUNTED INLINE EXHAUST FAN
TERMINAL BOX (VAV, CV). DESIGNATION INDICATES TYPE, BOX SIZE, AND CFM. REFER TO SCHEDULES FOR QUANTITY
FAN POWERED TERMINAL BOX SERIES TYPE. DESIGNATION INDICATES TYPE, BOX SIZE AND CFM. REFER TO SCHEDULES FOR QUANTITY
T THERMOSTAT/TEMPERATURE SENSOR. REFER TO PLANS FOR LOCATION.
S ELECTRIC ON/OFF THERMALLY PROTECTED SWITCH WITH PILOT LIGHT
SD DUCT MOUNTED SMOKE DETECTOR
L SPOT TYPE LIQUID DETECTOR
TC TIME CLOCK
STARTER/DISCONNECT SWITCH
STARTER
CAPPED PIPE
CAPPED AND VALVE CONNECTION (BALL VALVE UNLESS OTHERWISE NOTED)
STRAINER WITH BLOW DOWN VALVE
ELBOW TURNED UP
ELBOW TURNED DOWN
BOTTOM PIPE CONNECTION
TOP PIPE CONNECTION
GATE VALVE
BALL VALVE
CHECK VALVE
AUTOMATIC THREE WAY VALVE
AUTOMATIC TWO WAY CONTROL VALVE
PRESSURE REDUCING VALVE
PLUG VALVE
SOLENOID VALVE
BUTTERFLY VALVE (MANUAL)
BUTTERFLY VALVE (MOTORIZED)
COMBINATION BALANCING VALVE AND METER STATION
PRESSURE GAUGE WITH GATE VALVE
M MANUAL AIR VENT WITH GATE VALVE
A AUTOMATIC AIR VENT WITH GATE VALVE
THERMOMETER
F FLOW SWITCH
P PRESSURETROL
CP CONDENSATE PUMP (SEE SCHEDULES FOR TYPE)
INLINE PUMP

LINE REPRESENTATION

NEW PIPING, DUCTWORK OR EQUIPMENT
EXISTING DUCTWORK
EXISTING PIPING
EXISTING PIPING, DUCTWORK OR EQUIPMENT TO BE REMOVED
THERMOSTAT/SENSOR WIRING FROM SENSING DEVICE TO CONTROLLED DEVICE
NEW EQUIPMENT
EXISTING EQUIPMENT TO REMAIN
ER EXISTING EQUIPMENT TO BE RELOCATED
RE RELOCATED POSITION OF EXISTING EQUIPMENT
EXISTING EQUIPMENT TO BE REMOVED

DRAWING NOTATIONS

DRAWING NOTE TAG
A B SECTION DESIGNATION ON DRAWING WHERE SECTION IS CUT
A–SECTION DESIGNATION
B–DRAWING NO.
POINT OF NEW CONNECTION TO EXISTING WORK
POINT OF DEMOLITION
REMOVE AND PATCH EXISTING WORK
1 REVISION SYMBOL

ABBREVIATION

AC	AIR CONDITIONING UNIT
AD	ACCESS DOOR
AF	AIR FILTER
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AL	ACOUSTIC LINING
ATC	AUTOMATIC TEMPERATURE CONTROL
BD	BACK DRAFT DAMPER
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CWS&R	CONDENSER WATER SUPPLY AND RETURN
CHWS&R	CHILLED WATER SUPPLY AND RETURN
CR	CEILING REGISTER
CW	COLD WATER
D	DRAIN
DN	DOWN
ECM	ELECTRICALLY COMMUTATED MOTOR
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
FAI	FRESH AIR INTAKE
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FP-VAV	FAN POWERED VARIABLE AIR VOLUME
FSD	FIRE SMOKE DAMPER
GC	GENERAL CONTRACTOR
LD	LINEAR DIFFUSER
MD	MOTORIZED DAMPER
MB	MIXING BOX
MOD	MOTORIZED OUTSIDE AIR DAMPER
MS	MOTOR STARTER
NK	NECK SIZE
OA	OUTSIDE AIR
OED	OPEN ENDED DUCT
RG	RETURN GRILLE
RA	RETURN AIR
REF	REFRIGERANT
TD/TRD	TRANSFER DUCT
TF	TRANSFER FAN
TR	TOP REGISTER
TG	TRANSFER GRILLE
TX	TOILET EXHAUST FAN
UH	UNIT HEATER
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (OPPOSED BLADE DAMPER)
VFD	VARIABLE FREQUENCY DRIVE
WMS	WIRE MESH SCREEN

CLIENT
ROCKWOOD
CAPITAL

ARCHITECT
Fogarty Finger
69 Walker Street
New York, NY 10013
212.966.7450
www.fogartyfinger.com

MEP/FP
ama group
825 Eighth Avenue, FL18 | New York, NY 10019
212.944.7722 | amagroupusa.com

IT/AV/SECURITY
tmt technology
825 Eighth Avenue, FL18 | New York, NY 10019
212.398.2424 | tmtechpartners.com

ACOUSTICS
Longman Lindsey
200 West 41st Street, Suite 1100 | New York, NY 10036
212.315.6400 | longmanlindsey.com

ARCHITECTURAL LIGHTING
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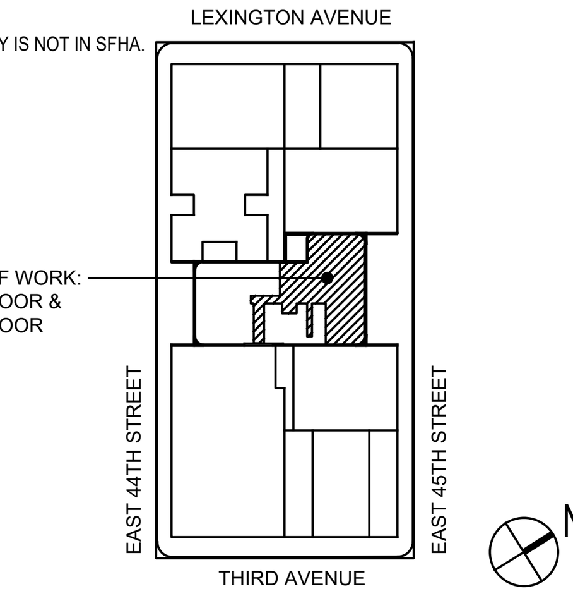
ARCHITECTURAL LIGHTING DESIGN • 50 BROAD ST SUITE 1602 • NEW YORK NY 10004 • 212 343 8400

KEY PLAN
NOTE: PROPERTY IS NOT IN SFHA.



BLOCK: 1299
LOT: 27

No.	Date	Issue
04	05/02/2024	ISSUED FOR BULLETIN 1
03	11/27/2023	ISSUED FOR BID + FILING
02	11/21/2023	ISSUED FOR 90% BD
01	11/14/2023	ISSUED FOR PROGRESS

PROJECT
2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

DRAWING TITLE
MECHANICAL
GENERAL NOTES
AND SYMBOLS

SEAL AND SIGNATURE

DATE (MM-DD-YY):	05-02-24
PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK
DWG. No.:	M-001.00
SCALE: NOT TO SCALE	01 OF 10

DOB DRAWING NUMBER: M00979855-I1

Filename: U:_AMA\Projects\G\G050-01-119 - 2 GCT - 18th Floor Amenity Space\DWGs\HVAC\G0500119-M001_LEGENDS & NOTES.dwg By: ERCAN KOCABASOGLU On: May 2, 2024 At: 12:00 PM Page: ARCH D (36.00 X 24.00 INCHES)

MECHANICAL SPECIFICATIONS

PART 1- GENERAL

1.01 GENERAL

A. THE LATEST EDITION OF AIA DOCUMENTS A201 GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, OR AS REQUIRED BY THE ARCHITECTURAL DOCUMENTS AND/OR THE STRUCTURAL ENGINEERS DOCUMENTS ARE PART OF THE CONTRACT.

B. BIDDERS SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THIS WORK BEFORE SUBMITTING PROPOSALS. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BID. IF DISCREPANCIES ARE NOT RESOLVED TO CONTRACTORS SATISFACTION THEY SHALL BE QUALIFIED IN THEIR BID SUBMISSION.

C. THIS CONTRACTOR SHALL REVIEW ALL CONSTRUCTION DOCUMENTS ASSOCIATED WITH THIS PROJECT INCLUDING GENERAL CONSTRUCTION, DEMOLITION, ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND SPRINKLER PLANS AND SPECIFICATIONS. ALL WORK REQUIRED IN THE BID WHICH IS INDICATED OR IMPLIED TO BE PERFORMED BY THIS TRADE IN OTHER SECTIONS OF THE WORK SHALL BE INCLUDED IN THEIR BID. IF A CONFLICT OCCURS IN THE BID SPECIFICATIONS AND/OR ON THE DRAWINGS, THE MORE STRINGENT SITUATION SHALL APPLY.

D. COORDINATE ALL WORK OF THE SECTION WITH EXISTING CONDITIONS AND THE WORK OF OTHER TRADES. THE CONTRACTOR SHALL THOROUGHLY ACQUAINT HIMSELF WITH THE WORK INVOLVED AND SHALL VERIFY AT THE BUILDING ALL MEASUREMENTS NECESSARY FOR THE PROPER INSTALLATION OF THE WORK, OBTAINING THE SAME WHEN NECESSARY FROM THE OTHER CONTRACTORS AND SECTIONS. CONTRACTOR SHALL ALSO BE PREPARED TO PROMPTLY FURNISH TO OTHER CONTRACTORS ANY INFORMATION RELATING TO THE WORK OF THIS SECTION NECESSARY FOR THE PROPER INSTALLATION OF OTHER CONTRACTS AND SHALL COOPERATE TO SECURE THE BEST PROGRESS OF, AND HARMONY BETWEEN, THE WORK OF THE DIFFERENT CONTRACTS AND SECTIONS IN THE INTERESTS OF THE INSTALLATION AS A WHOLE. CONFER WITH OTHER CONTRACTORS AND ENGINEER FOR ADJACENT WORK TO THIS SECTION AND ARRANGE TO HAVE VISIBLE PORTIONS OF WORK FIT AND HARMONIZE IN A MANNER SATISFACTORY TO THE OWNER'S REPRESENTATIVE.

E. THE SPECIFICATIONS ARE ACCOMPANIED BY DRAWINGS INDICATING THE GENERAL LOCATION OF EQUIPMENT AND CONNECTIONS THERETO. UNLESS SPECIFICALLY DIMENSIONED, LOCATIONS OF EQUIPMENT AND ROUTINGS ARE APPROXIMATE. SCALES ON DRAWINGS ARE INDICATED FOR BIDDING PURPOSES ONLY. DRAWINGS SHALL NOT BE SCALED FOR CONSTRUCTION AND MANUFACTURING DETAILS. CERTAIN SYSTEMS ARE DIAGRAMMATIC AND GIVE THE GENERAL ARRANGEMENT ONLY. NO ADDED COMPENSATION WILL BE PERMITTED FOR VARIATIONS DUE TO FIELD CONDITIONS. EXACT LOCATIONS AND ARRANGEMENTS SHALL BE DETERMINED IN THE FIELD ON THE BASIS OF DETAILS INDICATED ON APPROVED SHOP DRAWINGS, AND SUPPLEMENTARY INFORMATION ISSUED BY THE ENGINEER, AND SHALL PROVIDE FOR OPERATING EFFICIENCY, NEATNESS OF APPEARANCE, AND EASE OF MAINTENANCE.

F. GUARANTEE: THE CONTRACTOR SHALL GUARANTEE AND SERVICE THE ENTIRE INSTALLATION FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE FINAL ACCEPTANCE OF THE INSTALLATION. THE CONTRACTOR SHALL, DURING THE PERIOD OF THE GUARANTEE, REPLACE OR REPAIR AT HIS OWN EXPENSE ANY PIECE OF EQUIPMENT AND/OR MATERIAL WHICH IS FOUND TO BE DEFECTIVE. THE REPLACEMENT OR REPAIR SHALL BE PERFORMED THE SAME DAY OF NOTIFICATION IN AN EMERGENCY FASHION WHEN NOTIFIED BY THE OWNER OR AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL ALSO REPAIR ALL DAMAGE TO SURROUNDING WORK CAUSED BY THE FAILURE, REPAIR OR REPLACEMENT OF DEFECTIVE EQUIPMENT. ALL REFRIGERATION COMPRESSORS SHALL HAVE A FACTORY GUARANTEE INCLUDING PARTS AND LABOR FOR FIVE YEARS TOTAL. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATION, AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVALS.

G. EQUIPMENT AND MATERIALS: MOST ITEMS OF MECHANICAL AND ELECTRICAL EQUIPMENT AND MATERIAL ARE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS WITH A MANUFACTURER'S NAME AND CATALOG NUMBER. THIS DESIGNATION IS USED TO SET THE STANDARD FOR CONSTRUCTION, PERFORMANCE, OPERATION AND APPEARANCE. PRODUCTS OF OTHER MANUFACTURERS WILL BE CONSIDERED AND RULED UPON BY THE ENGINEER. THE SUBMISSION OF A SUBSTITUTION IMPLIES THAT THE ITEM HAS ALL NECESSARY UNDERWRITERS' LABORATORIES, BOARD OF STANDARDS AND APPEALS, NEW YORK CITY MEA, NATIONAL ELECTRICAL CODE, NEW YORK CITY ELECTRICAL CODE AND NEW YORK CITY ELECTRICAL ADVISORY BOARD, ETC. APPROVALS. SHOULD THE ITEM BE FOUND NOT TO HAVE SUCH APPROVAL, IT SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER

H. SUBSTITUTIONS: DEVIATIONS FROM CONTRACT DOCUMENTS AND SUBSTITUTION OF MATERIALS OR EQUIPMENT FOR THOSE SPECIFIED SHALL BE REQUESTED INDIVIDUALLY IN WRITING. FURNISH INFORMATION AS REQUIRED TO DEMONSTRATE THAT THE ARTICLE, MATERIAL, APPARATUS, PRODUCT OR PROCESS TO BE USED IS ADEQUATELY COMPARABLE TO THAT SPECIFIED IN QUALITY, FINISH, DESIGN, EFFICIENCY, DURABILITY AND GENERAL APPEARANCE, AND HAS BEEN ELSEWHERE DEMONSTRATED TO BE SERVICEABLE FOR THE PURPOSES FOR WHICH IT IS INTENDED. IF TESTS OR DEMONSTRATIONS ARE REQUIRED BY THE OWNER'S REPRESENTATIVES, THE COST OF SUCH TESTS OR DEMONSTRATIONS SHALL BE BORNE BY THE CONTRACTOR. DESCRIBE REASON FOR CHANGE, CONNECTIONS TO ADJACENT MATERIALS, ELECTRICAL SERVICES, SERVICE ACCESS REQUIREMENTS, DIFFERENCES IN OPERATING CHARACTERISTICS OR CYCLES AND ALL OTHER POINTS OF DEVIATION. CONTRACTOR TO ASSUME FULL RESPONSIBILITY FOR SAFETY, COORDINATION WITH OTHER TRADES, OPERATION AND PERFORMANCE OF ALTERED SYSTEM.

I. THIS CONTRACTOR IS TO OBTAIN A COPY OF THE BUILDING RULES AND REGULATIONS PRIOR TO BID SUBMISSION. ALL WORK MUST BE INSTALLED IN ACCORDANCE WITH THE BUILDING RULES AND REGULATIONS. DETERMINE REQUIREMENTS AND THE EXTENT OF PREMIUM TIME WORK REQUIRED BY BUILDING, FOR THE PURPOSE OF THE BID ASSUME ANY NOISY WORK (E.G., CHOPPING, CORE DRILLING, WELDING, BRAZING, SOLDERING, ETC.) AND BASE BUILDING SYSTEMS INTERRUPTIONS ARE TO BE PERFORMED OUTSIDE NORMAL BUSINESS HOURS.

J. REMOVAL, TEMPORARY CONNECTIONS AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE INSTALLATION OF THE NEW SYSTEMS. ALL EXISTING CONDITIONS ARE NOT COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND MAKE ALL NECESSARY CHANGES REQUIRED BASED ON EXISTING CONDITIONS FOR PROPER INSTALLATION OF NEW WORK.

K. ALL NECESSARY CUTTING AND PATCHING IN FLOOR SLABS, ROOF SLABS, WALLS, AND CEILINGS FOR THE HVAC WORK SHALL BE PERFORMED BY THIS CONTRACTOR. RESTORE TO MATCH EXISTING CONDITIONS.

L. WHERE PIPE AND/OR DUCTWORK PENETRATE RATED WALLS, THE SPACE BETWEEN THE INSULATION AND THE WALL SHALL BE CAULKED WITH NON-COMBUSTIBLE MATERIAL IN AN APPROVED MANNER. ALL PIPING AND/OR DUCTWORK TO BE INSTALLED ABOVE HUNG CEILING UNLESS OTHERWISE NOTED ON DRAWINGS. THE CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL DRAWINGS FOR ALL CEILING ELEVATIONS.

M. ACCESS DOORS IN FINISHED CONSTRUCTION: THE CONTRACTOR SHALL PREPARE A LIST OF ALL ACCESS DOORS (MINIMUM 18"X18") REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT AND OTHER DEVICES, WHICH SHALL BE SUPPLIED TO THE GENERAL CONTRACTOR FOR INSTALLATION. THE COST TO FURNISH AND INSTALL ACCESS DOORS SHALL BE INCLUDED IN THIS CONTRACTORS BID. THIS CONTRACTOR IN ADVANCE OF CEILING INSTALLATIONS SHALL SUITABLY FIELD TAG AND IDENTIFY ALL CONCEALED EQUIPMENT, VALVES, DAMPERS, ETC., WHICH REQUIRE ACCESS DOOR PROVISIONS.

N. NEW DUCTWORK SHALL ARRIVE ON THE CONSTRUCTION SITE SEALED AND REMAIN PROTECTED FROM DEBRIS THROUGHOUT CONSTRUCTION PRIOR TO FINAL INSTALLATION. AIR DISTRIBUTION ACCESSORIES AND INTERNAL COMPONENTS OF ALL HVAC EQUIPMENT SHALL BE SEALED AND PROTECTED FROM DEBRIS WHILE ON THE CONSTRUCTION SITE PRIOR TO FINAL CONNECTION AND START-UP.

O. ALL VOLATILE ORGANIC COMPOUND (VOC) LIMITS OF ADHESIVES, SEALANTS AND SEALANT PRIMERS MUST COMPLY WITH SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE #1168, AMENDMENT DATE OF JANUARY 7, 2005.

1.02 SCOPE OF WORK

A. THE CONTRACTOR SHALL FURNISH AND INSTALL AN HVAC SYSTEM COMPLETE WITH ALL EQUIPMENT, DUCTWORK, PIPING, INSULATION, CONTROLS, ACCESSORIES AND ASSOCIATED WORK IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE,. ALL NATIONAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION, BUILDING MANAGEMENT, DESIGN DRAWINGS AND THIS SPECIFICATION.

B. THE WORK SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, HOISTING AND RIGGING, BREAKDOWN AND SETUP OF EQUIPMENT FOR INSTALLATION, SCAFFOLDING, AND SERVICES TO COMPLETE THE SYSTEM AND PROVIDE THE OWNER WITH A FULLY OPERATIONAL SYSTEM. ANY EQUIPMENT, PARTS, MATERIALS, ACCESSORIES, OR LABOR THAT IS NECESSARY FOR PROPER PERFORMANCE OF THE MECHANICAL WORK ALTHOUGH NOT SPECIFICALLY MENTIONED HEREIN OR SHOWN ON THE DRAWINGS, SHALL BE FURNISHED AND INSTALLED WITHOUT ADDITIONAL COSTS. WHEN INSTALLATION OF A PART OF ANY SYSTEM (PLUMBING, HEATING, AIR CONDITIONING, ELECTRICAL OR OTHERWISE) REQUIRES A SHUTDOWN OF ANY OPERATING SYSTEM, CONNECT THE PARTIAL SYSTEM ONLY AFTER NOTIFICATION TO AND WITH APPROVAL OF THE OWNER. COORDINATE ACTIVITIES CLOSELY WITH THOSE OF SUBCONTRACTOR'S SO THE OPERATION IS RESTRICTED TO AS SHORT AN INTERVAL AS POSSIBLE AND "OUT OF SERVICE" TIME OF THESE FACILITIES IS KEPT TO A MINIMUM. ANY SHUTDOWN OF THE ELECTRICAL SYSTEM WILL BE DONE OUT OF HOURS AS APPROVED BY OWNER.

C. IT IS IMPERATIVE THAT EXISTING SYSTEMS BE MAINTAINED IN CONTINUOUS OPERATION DURING THE COURSE OF CONSTRUCTION; IF SHUTDOWNS ARE REQUIRED TO PERMIT THE DISCONNECTION AND REMOVAL OR RECONNECTION OF EXISTING WORK, OR FINAL CONNECTION TO BE MADE TO AN EXISTING SYSTEM, THEY SHALL OCCUR ONLY DURING OFF-HOURS AND ONLY AFTER PROPER PERMISSION HAS BEEN OBTAINED FROM BUILDING MANAGEMENT.

D. THE BUILDING MANAGEMENT REQUIRES NOT LESS THAN SEVEN DAYS NOTICE FOR SHUTDOWN OF ANY BUILDING SYSTEM.

E. MAKE AN ACCURATE TAKE-OFF ALL EXISTING EQUIPMENT, DUCTWORK, PIPING, CONDUIT, PANELBOARDS, WIRING DEVICES, AND OTHER ACCESSORIES BEING REMOVED DURING DEMOLITION AND INCLUDE THE COST FOR DISCONNECTING AND REMOVAL OF STATED EQUIPMENT, ETC. INTO THE BASE BID. REMOVALS SHALL BE AS SPECIFIED AND/OR AS INDICATED ON THE DRAWINGS. IN CERTAIN CASES, EQUIPMENT OR MATERIALS DESIGNATED FOR REMOVAL SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER AT LOCATIONS IN THE BUILDING AS DIRECTED BY THE OWNER.

F. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING MANAGEMENT.

G. THIS TENANT/OWNER SHALL PROCURE THE SERVICES OF A THIRD PARTY INSPECTION COMPANY TO PERFORM ALL SPECIAL INSPECTIONS IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO THE OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.

1.03 SHOP DRAWINGS, EQUIPMENT SUBMISSION, MAINTENANCE MANUALS

A. SUBMIT ONE (1) REPRODUCIBLE AND ONE (1) PRINT OF THE SHEET METAL AND PIPING SHOP DRAWINGS, 3/8" SCALE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED.

B. SUBMIT THREE (3) COPIES OF ALL SHEET METAL AND PIPING SHOP STANDARDS LEAKAGE TEST CERTIFICATION, AIR AND WATER BALANCING REPORTS, AND CERTIFIED EQUIPMENT CUTS WITH CONSTRUCTION WIRING DIAGRAMS, AND AUTOMATIC TEMPERATURE CONTROL SHOP DRAWINGS INCLUDING CONTROL AND POWER WIRING DIAGRAMS, SEQUENCE OF OPERATIONS AND ALL CUTS OF EQUIPMENT AND DEVICES.

C. SUBMIT FOUR (4) BOOK BOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL AS-BUILT SHOP DRAWINGS FOLDED AND PLACED INTO BINDER POCKETS, AS-BUILT DRAWINGS IN ELECTRONIC FORMAT, COPIES OF REVIEWED EQUIPMENT CUTS FOR INSTALLED EQUIPMENT, COPIES OF EQUIPMENT START UP CHECKLISTS, AIR AND WATER BALANCING REPORTS, LEAK TESTS, HYDROSTATIC TESTS, WATER TREATMENT AND CHEMICAL CLEANING CERTIFICATION. CONTRACTOR SHALL INSTRUCT OWNERS PERSONNEL ON THE OPERATION OF ALL HVAC SYSTEMS.

D. CONFLICTS NOT SPECIFICALLY FLAGGED ON SHOP DRAWINGS FOR COORDINATION BETWEEN TRADES OR FROM PRE-EXISTING CONDITIONS UNCOVERED DURING DEMOLITION ARE ASSUMED TO BE COORDINATED TO ALLOW FOR THE INSTALLATION OF THE DESIGN INTENT ON THE MEP/ARCHITECTURAL DRAWINGS. ALL ITEMS UNFLAGGED AND FOUND IN THE FIELD SHALL BE THE CONTRACTORS RESPONSIBILITY TO COORDINATE TO MAINTAIN THE DESIGN INTENT. ALL CHANGES SHALL BE DOCUMENTED IN THE AS-BUILT CONDITIONS.

E. AS WORK PROGRESSES AND FOR DURATION OF CONTRACTOR, MAINTAIN COMPLETE AND SEPARATE SET OF PRINTS OF CONTRACT DRAWINGS AT THE JOB SITE. RECORD WORK COMPLETED AND ALL CHANGES FROM ORIGINAL CONTRACT DRAWINGS CLEARLY AND ACCURATELY INCLUDING WORK INSTALLED AS A MODIFICATION OR ADDITION TO THE ORIGINAL DESIGN. RECORD VALVE TAGS AS THEY ARE INSTALLED. FINAL SUBMISSION OF REPRODUCIBLE AS-BUILT DRAWINGS ARE TO BE SIGNED AND CERTIFIED BY INSTALLING CONTRACTOR THAT THIS IS THE AS-BUILT CONDITION OF THE WORK. AS-BUILT SHOP DRAWINGS SHALL BE SUBMITTED IN DRAWING AND ELECTRONIC FORMAT (AUTOCAD 2007 MINIMUM).

PART 2- PRODUCT/APPLICATION

2.01 DUCTWORK

A. PROVIDE ALL SUPPLY, RETURN, EXHAUST, AND OUTSIDE AIR SHEET METAL DUCTWORK, FITTINGS, DAMPERS, TURNING VANES, ACCESS DOORS, PLENUMS, FLEXIBLE CONNECTIONS, AND SUPPORTS AND PERFORM LEAK TEST PER LATEST SMACNA STANDARDS AND NFPA90A AS MODIFIED BY N.Y.C. BUILDING CODE OR AS MODIFIED BY CALIFORNIA BUILDING CODE. ALL DUCTWORK JOINTS SHALL BE SEALED AIR TIGHT WITH APPROVED DUCT SEALANT, SIMILAR TO 3M-540.

B. ALL LOW PRESSURE DUCTS EXPOSED IN OCCUPIED AREAS, OTHER THAN MECHANICAL AND FAN ROOMS FABRICATED WITH HEMMED "S" SLIPS. REINFORCE JOINTS OF DUCTS OVER 30" WIDE WITH FLAT BARS OR FLAT BARS AND 3/8" RODS FOR DUCTS OVER 54" WIDE. TOP JOINT WITH BAR SKIP UNDER 31" WIDTH AND REINFORCED BAR SKIP FOR 31" AND LARGER IN WIDTH.

C. ROUND DUCTS SPIRAL LOCK. G.I. COMPANY, SHEET METAL PRODUCTS, UNITED SHEET METAL, PACIFIC AIR PRODUCTS, OR AS APPROVED. ROUND DUCTS OVER 60" WITH BUTT WELDED, LONGITUDINAL SEAMS, AND FLANGE JOINTS.

D. FITTINGS IN ROUND DUCTS SHALL BE NO LIGHTER THAN 20 GAUGE, AND WELDED. G. 1. COMPANY, SHEET METAL PRODUCTS, UNITS SHEET METAL, PACIFIC AIR PRODUCTS, OR AS APPROVED. BRANCH TEE TAKE-OFFS MADE WITH "CON-T" TYPE CONICAL TEE FITTINGS. WHERE MAIN DUCT REDUCES IN SIZE AFTER TAKE-OFF, USE "CON-T" OR TURNS, AND 3-PIECE FOR 45 DEGREE TURNS.

E. CONTRACTOR SHALL ADHERE TO THE FULL INSIDE CROSS SECTIONAL DUCTWORK AREAS SHOWN ON THE DRAWINGS AND PROVIDE ALL TRANSITIONS AND OFFSETS AS REQUIRED TO MEET FIELD CONDITIONS, ACCOMMODATE EQUIPMENT MAINTENANCE REQUIREMENTS AND COORDINATE WITH ALL TRADES. ALL FIELD CONDITIONS WHICH REQUIRE MODIFIED TRANSITIONS WILL NOT BE APPROVED WITHOUT PRIOR ENGINEER APPROVAL THROUGH SHOP DRAWING OR RFI.

F. FOR DUCTS WITH ACOUSTICAL LINING THE SIZES SHOWN ON THE PLAN SHALL BE THE CLEAR INSIDE DIMENSIONS.

G. ALL OPEN-ENDED RETURN, TRANSFER OR EXHAUST DUCTS SHALL BE PROVIDED WITH WIRE MESH SCREENS.

H. ANY OPEN-ENDED DUCT ON EQUIPMENT OR THROUGH A RATED PARTITION THAT REQUIRES SMOKE DETECTION AS PER THE MECHANICAL CODE SHALL INCLUDE AN EXTENSION OF A MINIMUM THREE (3) FEET STRAIGHT SECTION TO ALLOW FOR INSTALLATION OF DUCT-MOUNTED SMOKE DETECTOR.

I. DUCTWORK TO BE INSTALLED AT THE HIGHEST LOCATION POSSIBLE UNLESS A CONFLICT PREVENTS THIS OR THE INSTLLATION HIGH WOULD IMPEDE ACCESS TO EQUIPMENT CONNECTED TO THE DUCTWORK.

J. EXISTING DUCTWORK TO BE REUSED: CONTRACTOR SHALL INSPECT, SEAL AS PER PRESSURE CLASSIFICATION, LEAK TEST, AND INSULATE ALL EXISTING DUCTWORK TO BE REUSED. ALL REQUIRED WORK SHALL BE PART OF BID.

K. NEW AND EXISTING DUCTWORK TO BE REUSED SHALL HAVE PRESSURE CLASSIFICATION, SEALING REQUIREMENTS AND LEAKAGE TESTING AS LISTED BELOW UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS:

1. 4" CLASS: ALL SUPPLY DUCTWORK FROM DISCHARGE OF AIR UNITS TO INLETS OR TERMINAL BOXES. SEAL CLASS A, LEAKAGE CLASS 4 (RECTANGULAR) OR CLASS 3 (ROUND). PROVIDE TDF FLANGE CONNECTIONS FOR ALL SYSTEM 4" PRESSURE CLASS AND ABOVE.
2. 2" CLASS: ALL OTHER LOW PRESSURE DUCTWORK. SEAL CLASS B, LEAKAGE CLASS 16 (RECTANGULAR) OR CLASS 8 (ROUND).
3. LEAKAGE TESTING:
   A) FOR DUCT SYSTEMS DESIGNED TO OPERATE AT STATIC PRESSURES IN EXCESS OF 3 INCHES W.G. (746 PA) (3" CLASS AND ABOVE), REPRESENTATIVE SECTIONS (AS DETERMINED BY THE INSPECTOR WHEN APPLICABLE), TOTALING AT LEAST 50% OF THE DUCT AREA SHALL BE TESTED TO VERIFY THAT ACTUAL AIR LEAKAGE IS BELOW ALLOWABLE AMOUNTS AS DEFINED BY ASHRAE 90.1 OR THE ENERGY CODE AS INDICATED ON THE PROJECT'S COMCHECK COMPLIANCE CERTIFICATE, WHICHEVER IS MORE STRINGENT.
   B) ALL EXISTING LOW PRESSURE DUCTWORK SHALL BE LEAK TESTED PRIOR TO REUSE TO VERIFY ITS INTEGRITY.
   C) ALL NEW LOW PRESSURE DUCTWORK (2" CLASS) SHALL BE TESTED ON AN AS-NEEDED BASIS AT THE ENGINEERS DISCRETION OR IF BALANCING AIR QUANTITIES CAN NOT BE MET. IF SPECIMEN FAILS TO MEET ALLOTTED LEAKAGE LEVEL, THE CONTRACTOR SHALL MODIFY TO BRING IT INTO COMPLIANCE AND SHALL RETEST IT UNTIL ACCEPTABLE LEAKAGE IS DEMONSTRATED. TESTS AND NECESSARY REPAIRS SHALL BE COMPLETED PRIOR TO CONCEALMENT OF DUCTS.

F. MATERIALS:

1. SHEETMETAL: HOT-DIPPED GALVANIZED SHEETMETAL WITH G90 COMMERCIAL COATING ACCORDING TO ASTM A653 & A924 FOR ALL DUCTWORK UNLESS OTHERWISE SPECIFIED.
2. ALUMINUM: ALLOY 3003-H14, OF THICKNESS REQUIRED BY THE SMACNA DUCT CONSTRUCTION STANDARDS. PROVIDE FOR ALL DUCTWORK EXPOSED TO WEATHER AND MOISTURE INCLUDING OUTSIDE AIR DUCTS WITHIN 10 FEET OF LOUVERS AND TOILET ROOMS EQUIPPED WITH BATHS OR SHOWERS.
3. FLEXIBLE CONNECTIONS AT FANS SHALL BE NEOPRENE COATED, FLAME RETARDANT GLASS FABRIC (COMPLYING WITH NFPA 90), 30 OZ./SQ, YD. WITH SEWED AND CEMENTED SEAMS.
4. FLEXIBLE DUCTWORK: CONSTRUCTED OF A SUPPORTING HELIX OF COATED SPRING STEEL OR FORMED ALUMINUM; BONDED OR MECHANICALLY LOCKED TO A CORE LINER OF IMPREGNATED/COATED FIBERGLASS FABRIC OR LAMINATED FIBERGLASS-REINFORCED AND ALUMINIZED POLYESTER FILM. INSULATED FLEXIBLE DUCTWORK TO HAVE A MINIMUM INSULATIVE PROPERTY MATCHING THAT INDICATED IN THE INSULATION SPECIFICATION SECTION HEREIN. OUTER JACKET/VAPOR BARRIER TO BE AS A MINIMUM, FIBERGLASS-REINFORCED, ALUMINIZED POLYESTER FILM, WITH A MAXIMUM ASTM E96 PERMEANCE RATING OF 0.1 INCH PERM (GRAIN/H/FT2/IN. HG). DUCT TO HAVE A POSITIVE PRESSURE RATING OF 10 IN. W.G.

G. PROVIDE MANUAL BALANCING DAMPERS AS REQUIRED TO PROPERLY BALANCE THE AIR DISTRIBUTION SYSTEM AS SHOWN ON DRAWINGS AND AS LISTED BELOW:

1. ALL SUPPLY AIR MAIN BRANCHES FROM TRUNK, EACH SPLIT, AND ALL SUB-BRANCHES FROM MAINS SHALL HAVE BALANCING DAMPERS.
2. EXHAUST AND RETURN MAIN BRANCHES FROM TRUNK, EACH SPLIT AND ALL SUB-BRANCHES FROM MAINS SHALL HAVE BALANCING DAMPERS.
3. IF DAMPER IS NOT ACCESSIBLE, OR IS LOCATED ABOVE A PLASTER OR DRYWALL CEILING, PROVIDE A REMOTE DAMPER ACTUATOR AND DAMPER AS MANUFACTURED BY YOUNG REGULATOR MODEL 896-C WITH NO. 1200A RIGHT ANGLE WORM GEAR AND DAMPER MODEL 820 OR APPROVED EQUAL.

H. MOTORIZED DAMPERS LOCATED IN OUTDOOR AIR INTAKES OR EXPOSED TO MOISTURE SHALL BE TAMCO SERIES 1000 CONTROL DAMPER OR SIMILAR. THE DAMPER SHALL BE:

1. EXTRUDED ALUMINUM DAMPER FRAME SHALL NOT BE LESS THAN 0.080" (2.03 MM) IN THICKNESS. DAMPER FRAME SHALL BE 4", WITH DUCT MOUNTING FLANGES ON BOTH SIDES OF FRAME. DAMPER FRAME SHALL HAVE A 2" (50.8 MM) MOUNTING FLANGE ON THE REAR OF THE DAMPER, WHEN INSTALLED AS EXTENDED REAR FLANGE INSTALL TYPE. FRAME TO BE ASSEMBLED USING ZINC-PLATED STEEL MOUNTING FASTENERS. WELDED FRAMES SHALL NOT BE ACCEPTABLE.
2. BLADES SHALL BE MAXIMUM 6.4" DEEP EXTRUDED ALUMINUM AIR-FOIL PROFILES WITH A MINIMUM WALL THICKNESS OF 0.06". ALL BLADES SHALL BE SYMMETRICALLY PIVOTED.
3. BLADE SEALS SHALL BE EXTRUDED EPDM, SECURED IN AN INTEGRAL SLOT WITHIN THE ALUMINUM BLADE EXTRUSIONS AND SHALL BE MECHANICALLY FASTENED TO PREVENT SHRINKAGE AND MOVEMENT OVER THE LIFE OF THE DAMPER. ADHESIVE OR CLIP-ON TYPE BLADE SEALS WILL NOT BE APPROVED.
4. FRAME SEALS SHALL BE EXTRUDED SILICONE, SECURED IN AN INTEGRAL SLOT WITHIN THE ALUMINUM FRAME EXTRUSIONS AND SHALL BE MECHANICALLY FASTENED TO PREVENT SHRINKAGE AND MOVEMENT OVER THE LIFE OF THE DAMPER. METALLIC COMPRESSION TYPE JAMB SEALS WILL NOT BE APPROVED.
5. LINKAGE HARDWARE SHALL BE ALUMINUM AND CORROSION-RESISTANT ZINC-PLATED STEEL, INSTALLED IN THE FRAME SIDE, OUT OF THE AIRSTREAM, AND ACCESSIBLE AFTER INSTALLATION.
6. DAMPERS SHALL BE AMCA RATED FOR LEAKAGE CLASS 1A AT 1 IN. W.G. (0.25 KPA) STATIC PRESSURE DIFFERENTIAL.
7. DAMPERS SHALL BE INSTALLED IN AS FLANGED TO DUCT.
8. CONTRACTOR TO PROVIDE A 12"X12" ACCESS DOOR IN THE DUCTWORK FOR ACCESS TO INTERNAL COMPONENTS OF THE DAMPER.

I. FIRE DAMPERS:

1. PROVIDE ALL FIRE DAMPERS, SMOKE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS, SMOKE DETECTORS, AND ASSOCIATED CONTROLS AND ALARMS AS REQUIRED BY CODE.
2. DAMPERS SHALL BE DYNAMIC TYPE, U.L. LISTED AND LABELED, AND IN CONFORMANCE WITH NFPA.
3. FIRE DAMPER SHALL BE FUSIBLE LINK TYPE (165 DEGREE F.), TYPE B SHUTTER OUT OF THE AIR STREAM AS MANUFACTURED BY POTTORFF MODEL VFD-10 (1-1/2 HR RATED) OR MODEL VFD-30 (3HR RATED) AS REQUIRED OR APPROVED EQUAL.
4. THE HVAC CONTRACTOR SHALL PROVIDE ALL DEVICES, RELAYS, END SWITCHES, E/P SWITCHES, CONTROL COMPONENTS, AIR PIPING, POWER WIRING, CONTROL WIRING AND INTERLOCK WIRING AS REQUIRED TO ACCOMPLISH THE SEQUENCE OF OPERATION FOR THESE DAMPERS.
5. DUCTWORK SHALL BE TRANSITIONED LARGER AT ALL FIRE AND FIRE/SMOKE DAMPERS SUCH THAT THE NET FREE AREA OF THE DUCTWORK IS NOT COMPROMISED.
6. CONTRACTOR TO PROVIDE A 12"X12" ACCESS DOOR IN THE DUCTWORK FOR ACCESS TO INTERNAL COMPONENTS OF THE DAMPER.

J. PROTECTION PANS AND DRIP PANS:

1. PROVIDE PROTECTION PANS UNDER NEW CEILING MOUNTED AIR CONDITIONING UNITS, PIPES PASSING THROUGH SWITCHGEAR ROOMS OR OVER ELECTRIC EQUIPMENT. THE PANS SHALL BE CONSTRUCTED OF GALVANIZED STEEL, SUITABLE REINFORCEMENT TO PREVENT SAGGING.
2. EDGES OF THE PANS SHALL TURN UP 2" ON ALL SIDES WITH CORNERS SEALED TO MAKE PAN WATERTIGHT.
3. PAN SHALL BE SUPPORTED BY PIPE HANGERS AND SHALL DRAIN CLEAR OF ELECTRICAL EQUIPMENT
4. PROVIDE A 3/4" DRAIN PIPE FOR EACH PAN TERMINATING ABOVE NEAREST CONVENIENT SINK OF FLOOR DRAIN.

K. SLOPE AND DRAIN ALL DUCTS EXPOSED TO MOISTURE, CONSTRUCT OF ALUMINUM AND DO NOT INTERNALLY LINE

L. AUTOMATIC CONTROL DAMPERS: PROVIDE DAMPERS WITH PARALLEL BLADES FOR 2-POSITION OR MIXING CONTROL, OR OPPOSED BLADES FOR MODULATING CONTROL OF CONSTANT OR VARIABLE VOLUME SYSTEM. AUTOMATIC DAMPERS ARE TO BE VERY LOW LEAKING TYPE WITH A MAXIMUM LEAKAGE RATE OF 6 CFM PER SQUARE FOOT AT 4" W.G. DAMPER MATERIAL SHALL BE THE SAME AS DUCT. PROVIDE WEATHERPROOF COMPONENTS FOR DAMPERS IN A MOISTURE ENVIRONMENT.

M. LOUVERS SHALL BE AS SPECIFIED BY THE ARCHITECT AND COORDINATED TO MATCH THE BASE BUILDING EXTERIOR SUBMIT THE SELECTED LOUVERS PRESSURE DROP AND WATER PENETRATION CHARACTERISTICS FOR REVIEW. LOUVERS NOT SPECIFIED BY THE ARCHITECT AT A MINIMUM SHALL BE OUTDOOR LOUVERS AS MANUFACTURED BY ARROW LOUVER AND DAMPER CO. OR CONSTRUCTION SPECIALTIES. LOUVERS SHALL HAVE AN EXTRUDED ALUMINUM STRUCTURE WITH AN ANODIZED ALUMINUM MILL FINISH OR FINISH AS SPECIFIED BY THE BUILDING MANAGEMENT. LOUVERS ARE ALSO TO BE PROVIDED WITH 1/2" WIRE MESH ALUMINUM BIRD SCREENS. ALL LOUVER SECTIONS NOT IN USE SHALL BE BLANKED OFF WITH AN INSULATED SHEET METAL PANEL.

2.02 GRILLES, REGISTERS AND DIFFUSERS

A. PROVIDE ALL AIR OUTLETS AND RETURNS OF THE TYPE AND SIZES, AS SELECTED AND INDICATED ON DRAWING. ALL DUCTED RETURN AND EXHAUST OUTLETS SHALL HAVE OPPOSED BLADE DAMPERS (ADJUSTABLE THROUGH THE FACE). PROVIDE FRAMES AND MOUNTING TYPES AS REQUIRED TO MATCH SURROUNDING CEILING CONSTRUCTION. FINISHES TO BE SELECTED BY THE ARCHITECT.

B. ALL CEILING TYPE AIR DIFFUSERS SHALL BE PROVIDED WITH EQUALIZING DEFLECTOR.

C. A SCHEDULE OF DIFFUSERS, GRILLES AND REGISTERS WITH MANUFACTURERS MODELS, SIZES, ACCESSORIES, FINISHES, ETC., SHALL BE SUBMITTED FOR APPROVAL PRIOR TO RELEASE FOR FABRICATION AND DELIVERY

D. DIFFUSERS SHOWN ON DIFFUSER SCHEDULE SHALL BE CHANGED TO MATCH EXISTING DIFFUSER TYPE WHERE EXISTING DIFFUSERS ARE REMAINING.

E. ALL LINEAR DIFFUSERS SHALL BE PROVIDED WITH PATTERN CONTROL VANES. ALL ADJUSTABLE PATTERN DEFLECTORS SHALL BE FIELD ADJUSTED TO OPTIMIZE AIR DISTRIBUTION PREVENTING DRAFT CONDITIONS. CONTRACTOR SHALL PLAN FOR A SECOND COMFORT FIELD ADJUSTMENT PER OWNER/ENGINEER DISCRETION.

F. ALL UNUSED PORTIONS OF SUPPLY LINEAR DIFFUSERS SHALL BE USED AS RETURN GRILLE AND SHOULD BE PROVIDED WITH LIGHT SHIELDS.

G. ALL LINEAR DIFFUSERS AND DIFFUSERS IN INACCESSIBLE CEILINGS SHALL BE PROVIDED WITH A REMOTE OPERATED OPPOSED BLADE DAMPER AND A 3-FOOT (MINIMUM) FLEXIBLE ADJUSTMENT CABLE WITH 1/8-INCH KEY OPERATOR.

2.03 PIPING

A. PROVIDE PIPING WHICH IS SCHEMATICALLY INDICATED AND SIZED ON DRAWINGS. PIPING TO BE INSTALLED TO MEET SPECIFIED HEADROOM OR FIELD CONDITIONS AND SHALL CONFORM TO LATEST ASME CODES FOR PRESSURE PIPING. PIPE MATERIALS AND FITTING MATERIALS SHALL BE AS PER THE PIPE AND FITTING SCHEDULES SHOWN ON DRAWINGS.

B. PIPING, FITTINGS, AND ALL PIPE APPURTENANCES SHALL BE SUITABLE FOR THE PRESSURE AND TEMPERATURE OF SERVICE.

C. PROVIDE DIELECTRIC FITTINGS TO CONNECT DIFFERENT PIPING MATERIALS.

D. PROVIDE AIR VENTS AT EACH HIGH POINT AND DRAIN VALVES WITH HOSE BIB AT EACH LOW POINT.

E. PIPING SHALL BE INSTALLED WITH PROPER ANCHORS AND EXPANSION/CONTRACTION DEVICES SUCH AS LOOPS OR APPROVED EXPANSION JOINTS TO PREVENT UNDUE STRAINS ON PIPING OR APPARATUS CONNECTED TO THE PIPING, AS REQUIRED.

F. SUPPORT PIPING WITH HANGERS EQUIPPED WITH INSULATION SADDLES FROM APPROVED CONCRETE INSERTS, EXPANSION SHIELDS, BEAM CLAMPS, AND/OR SUPPLEMENTARY STEEL ANGLES, PLATES, AND CHANNELS. CONTRACTOR SHALL SUBMIT METHOD OF PIPING SUPPORT SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR REVIEW.

G. UNIONS WITH REMOVABLE SECTIONS OF PIPING SHALL BE INSTALLED AT ALL EQUIPMENT TO PERMIT EASE OF DISCONNECTION FOR EQUIPMENT SERVICE/REMOVALS WITHOUT DISMANTLING OF MAJOR PORTIONS OF CONNECTED PIPING.

H. PROVIDE TEES IN PIPING SYSTEM FOR TESTING AND BALANCING, AND INSTALLATIONS OF FLOW OR FLOAT SWITCHES, GAUGED, THERMOMETERS AND OTHER BALANCING AND CONTROL DEVICES, COORDINATE WITH THE CONTROL CONTRACTOR AND BALANCER.

I. PROVIDE AUTOMATIC PRESSURE RELIEF VALVES AND VACUUM BREAKERS TO PREVENT AGAINST PIPE RUPTURE OR SYPHONING ACTIONS. EXTEND DRAINS FROM RELIEF VALVES TO SPILL OVER FLOOR DRAINS.

J. ALL PIPE SLEEVES SHALL BE SCHEDULE 40 GALVANIZED STEEL. ANNULUS BETWEEN PIPE OR PIPE INSULATION AND SLEEVE SHALL BE CAULKED WITH A NON-COMBUSTIBLE MATERIAL TO WITHIN 1/4" OF WALL FACES AND FILLED WITH CAULKING COMPOUND FOR INTERIOR SLEEVES. EXTERIOR SLEEVES OR WATERPROOF SLEEVES SHALL UTILIZE LINK SEAL (LS) TYPE TO FILL THE ANNULUS. PROVIDE ESCUTCHEONS ON ALL EXPOSED PIPING THROUGH WALLS OR FLOORS HELD IN PLACE WITH SCREWS.

K. PIPING TO BE INSTALLED AT THE HIGHEST LOCATION POSSIBLE UNLESS A CONFLICT PREVENTS THIS OR THE INSTLLATION HIGH WOULD IMPEDE ACCESS TO EQUIPMENT OR VALVES CONNECTED TO THE PIPING.

L. PROVIDE SECURELY FASTENED LABELING OF ALL PIPING (BOTH EXPOSED AND CONCEALED) IN ACCORDANCE WITH ANSI STANDARDS AND COLOR CODED AS PER BUILDING MANAGEMENT STANDARDS. LABELING SHOULD BE PROVIDED 20 FEET ON CENTERS AND/OR AT LEAST ONCE IN EACH ENCLOSED SPACE OR ROOM WHERE THE WALLS EXTEND ABOVE THE CEILING.

M. PROVIDE VALVE TAGS AND CHARTS:

1. EACH VALVE SHALL HAVE A 2 INCH DIAMETER BRASS TAG WITH 1 INCH HIGH NUMERAL STAMPED THEREON, SECURED TO THE VALVE BY MEANS OF BRASS S HOOK OR BRASS CHAIN. EACH SYSTEM TO HAVE A LETTER DESIGNATION INDICATING SERVICE.
2. THE CONTRACTOR SHALL FURNISH AN APPROVED NEATLY DRAWN VALVE CHART, PROPERLY FRAMED, SHOWING THE USE AND LOCATION OF EACH VALVE THAT IS TAGGED.

N. PROVIDE NEW HOT (WET) TAP CONNECTION INTO PIPING SYSTEMS AS INDICATED ON THE PLANS. HOT TAP TO BE PERFORMED BY A QUALIFIED CONTRACTOR WHO IS SPECIALIZED IN PERFORMING THIS TYPE OF WORK. CONTRACTORS NAME SHALL BE SUBMITTED TO THE OWNER, OWNERS REPRESENTATIVE, BUILDING MANAGEMENT AND ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK.

O. VALVES AND STRAINERS:

1. VALVES, STRAINERS, STEAM TRAPS, ETC., SHALL NOT CONTAIN ASBESTOS AND HAVE THE NAME OF THE MANUFACTURER AND GUARANTEED WORKING PRESSURE CAST OR STAMPED ON BODIES. VALVES OF SIMILAR TYPE SHALL BE BY A SINGLE MANUFACTURER.
2. VALVES USED FOR THROTTLING OR CONTROLLING FLOW SHALL BE BALL (3" OR SMALLER) OR PLUG TYPE VALVES (ALL SIZES). VALVES FOR ISOLATION SHALL BE BALL FOR LIQUID SYSTEMS AND GATE FOR STEAM SYSTEMS UNLESS OTHERWISE SPECIFIED. BUTTERFLY VALVE SHALL BE LUG TYPE AND MAY BE SUBSTITUTED FOR BALL VALVES FOR SIZES 4" AND LARGER. BUTTERFLY VALVES SHALL NOT BE USED FOR MODULATING SERVICE OR STEAM SERVICE, USE ONLY FOR 2 POSITION ISOLATION ON WATER SYSTEMS. REFER TO AUTOMATIC TEMPERATURE CONTROL SECTION FOR CONTROL VALVES.
3. VALVES SHALL HAVE WORKING PRESSURE AND TEMPERATURE RATINGS SAME AS PIPE FITTINGS SPECIFIED FOR THE SERVICE. REGARDLESS OF SERVICE, VALVES SHALL NOT BE DESIGNED FOR LESS THAN 125 PSI STEAM WORKING PRESSURE.
4. LUBRICATED, TAPERED PLUG VALVES WITH LOCKING FLOW PLATE SHALL BE PROVIDED IN THE DISCHARGE PIPING FROM WATER CIRCULATING PUMPS, IN THE LEAVING WATER PIPING BRANCHES FROM ALL COILS, HEAT EXCHANGER TYPES OF EQUIPMENT, AND ALL RETURN WATER RISERS OF SUB-MAINS THAT CONNECT TO HYDRONIC MAINS FOR BOTH BALANCING AND ISOLATION PURPOSES.
5. CHECK VALVES SIZED 2" AND SMALLER SHALL BE BRONZE BODY, SCREWED ENDS, SWING PATTERN. PROVIDE SPRING LOADED, SILENT ACTION, NON-SLAM TYPE CHECK VALVE WITH REMOVABLE CAP, RE-GRINDING DISC AND SEAT RING IN ALL VERTICAL INSTALLATIONS AND DISCHARGE PIPING FROM PUMPS AS MANUFACTURED BY SMOLENKSY, MEULLER, WILLIAMS-HAGER OR MILLER.
6. BALL VALVES SHALL BE PROVIDED WITH STAINLESS STEEL BALL, STEM AND SEAT RING, TFE BUSHING AND SEAT RING GASKET. BALL VALVES INSTALLED IN COPPER SYSTEMS SHALL HAVE BRONZE BODIES. BALL VALVES SHALL BE RATED FOR A MINIMUM OF 275 PSI @ 100 DEGREE F. BALL VALVES USED FOR THROTTLING (3" AND SMALLER) SHALL BE PROVIDED WITH A LOCKING BALANCING STOP.
7. STRAINERS OF SARCO OR MEULLER MANUFACTURER SHALL BE PROVIDED IN THE INLET PIPING TO EACH STEAM TRAP, MAKE UP CONNECTION, PUMP, AND AUTOMATIC CONTROL VALVE OF STEAM AND HYDRONIC SYSTEM. STRAINER SHALL BE Y-PATTERN UNLESS OTHERWISE SPECIFIED ON DRAWINGS. STRAINERS SHALL BE OF DESIGN TO ALLOW BLOW-DOWN OF ACCUMULATED DEBRIS AND TO FACILITATE REMOVAL AND REPLACEMENT OF THE STRAINER SCREEN WITHOUT DISCONNECTION FROM THE MAIN PIPING. STRAINERS INSTALLED IN COPPER SYSTEMS SHALL HAVE BRONZE BODIES. STRAINER BASKET SHALL BE NICKEL, COPPER, BRASS OR STAINLESS STEEL OF AMPLE STRENGTH TO PREVENT COLLAPSING UNDER SHOCK LOADING. PERFORATIONS SHALL BE AS FOLLOWS: STEAM=1/32", WATER UP TO 3" SIZE-1/16", WATER 4" AND OVER -1/8". FOR STRAINERS 2-1/2" AND LARGER, PROVIDE A VALVE DIRT BLOW-OUT PIPING CONNECTION TERMINATED WITH A PIPE NIPPLE AND CAP. STRAINERS 2" AND SMALLER SHALL HAVE 6" LONG BLOW-OFF NIPPLE WITH CAPPED END.

P. THERMOMETERS AND PRESSURE GAUGES:

1. PROVIDE PIPE THERMOMETERS WITH SEPARABLE SOCKETS IN THE ENTERING AND LEAVING WATER PIPING CONNECTIONS TO COOLING TOWERS, CHILLERS, HEAT EXCHANGES, HEATING, COOLING AND CONDENSER COILS. THERMOMETERS SHALL BE WEISS, WEKSLER, THERICE OR OTHER APPROVED MANUFACTURER AND SHALL BE MINIMUM OF 4-1/2" DIAL TYPE, ALUMINUM FLANGELESS CASE FURNISHED WITH MICROMETER ADJUSTABLE POINTER. THERMOMETER SHALL HAVE A 1% ACCURACY AND MIDPOINT AS SYSTEM OPERATING TEMPERATURE.
2. PROVIDE LIQUID FILLED PRESSURE GAUGES ON INLET AND OUTLET WATER PIPING CONNECTIONS TO ALL PUMPS AND OTHER WATER HEAT EXCHANGE APPARATUS INCLUDING WATER COILS, HEAT EXCHANGERS, CHILLERS. EACH PRESSURE GAUGE INSTALLATION SHALL INCLUDE A 1/4" BALL VALVE FOR ITS CONNECTION TO PIPING. PRESSURE GAUGES SHALL BE WEISS, WEKSLER, THERICE OR OTHER APPROVED MANUFACTURER AND SHALL BE MINIMUM OF 4-1/2" DIAL TYPE, CAST ALUMINUM CASE, STEEL MOVEMENT, MICROMETER ADJUSTABLE POINTER, 1% ACCURACY AND MIDPOINT AT SYSTEM OPERATING PRESSURE.

Q. PIPE TESTING:

1. NO TESTING SHALL BE CONDUCTED UNTIL PIPE CLEANING AND PRETREATMENT HAS BEEN COMPLETED AND RECORDED.
2. ALL TESTING SHALL BE COORDINATED BY THE CONTRACTOR AND SHALL BE WITNESSED BY A BUILDING OWNERS REPRESENTATIVE. ALL SYSTEMS WHICH FAIL THE PRESSURE TESTS SHALL BE FIXED AND RETESTED AT NO EXPENSE TO THE OWNER.
3. ISOLATE ALL EQUIPMENT WHICH IS TO BE EXCLUDED FROM THE PRESSURE TEST AND PROVIDE ALL TEMPORARY PIPING CONNECTIONS, FITTINGS, VALVES, EQUIPMENT, LABOR, ETC., TO PRESSURE TEST ALL SYSTEMS.
4. ALL TENANT WATER SYSTEM SHALL BE ISOLATED FROM THE BASE BUILDING SYSTEM.
5. CONDENSER WATER SYSTEMS WILL BE HYDROSTATICALLY TESTED WITH WATER AT 1-1/2 TIMES THE WORKING PRESSURE, FOR A MINIMUM PERIOD OF TWO HOURS, WITH NO LEAKS.

2.04 INSULATION REQUIREMENTS

A. INSULATION SHALL BE APPLIED TO PIPING AND DUCTWORK OF MATERIALS AS SPECIFIED HEREIN AND FOR APPLICABLE SYSTEMS OF THIS PROJECT. INSULATION SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED INDEX OF 50 OR LESS AND SHALL MEET THE REQUIREMENTS OF ASTM, NFPA.

B. INSULATION SHALL BE CONTINUOUS THROUGH WALL AND SLAB SLEEVE OPENINGS EXCEPT FOR RATED WALLS OR SLABS WHERE AN APPROVED FIRESTOP IS REQUIRED AS PER NFPA.

C. INSULATION OF COLD SURFACES WHERE VAPOR BARRIER JACKETS ARE SPECIFIED SHALL BE APPLIED WITH AN UNBROKEN VAPOR SEAL. HANGERS AND SUPPORTS THAT ARE SECURED TO COLD SURFACES SHALL BE ADEQUATELY INSULATED TO PREVENT CONDENSATION.

D. WHERE INSULATION IS SPECIFIED FOR PIPING, INSULATE SIMILARLY ALL CONNECTIONS, VENTS, DRAINS, FLANGES, FITTINGS, VALVES, TANKS, PUMP CASINGS AND OTHER PARTS OF THE SYSTEM SUBJECT TO HEAT GAIN OR LOSS AND TO PREVENT CONDENSATION.

E. ALL EQUIPMENT, FITTINGS, DEVICES, ETC REQUIRING SERVICING OR INSPECTION SHALL HAVE REMOVABLE INSULATION WHICH CAN BE REPLACED WITHOUT DAMAGE.

F. ALL LEAK AND PRESSURE TESTS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF ANY INSULATION.

G. DUCTWORK INSULATION:

1. ALL NEW AND EXISTING SHEET METAL DUCTWORK SHALL BE INSULATED WITH FLEXIBLE DUCT WRAP INSULATION, OF REQUIRED THICKNESS AND DENSITY TO ACHIEVE A MINIMUM INSTALLED R-6 INSULATIVE VALUE AT 75 DEGREES F MEAN TEMPERATURE WHEN

CLIENT

ROCKWOOD CAPITAL

ARCHITECT

Fogarty Finger
69 Walker Street
New York, NY 10013
212.966.7450
www.fogartyfinger.com

MEP/FP

ama group
825 Eighth Avenue, FL18 | New York, NY 10019
212.944.7722 | amagroupusa.com

IT/AV/SECURITY

tmt technology
825 Eighth Avenue, FL18 | New York, NY 10019
212.398.2424 | tmtechpartners.com

ACOUSTICS

Longman Lindsey
200 West 41st Street, Suite 1100 | New York, NY 10036
212.315.6400 | longmanlindsey.com

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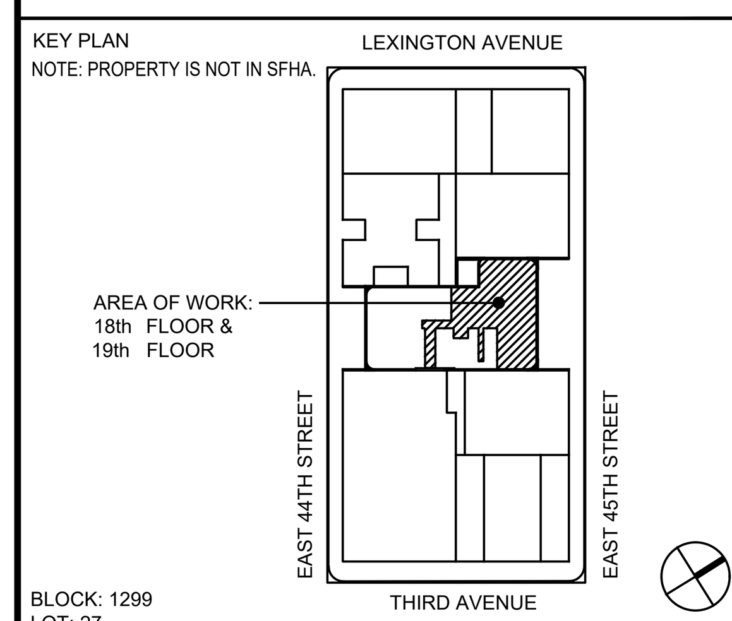
KEY PLAN
NOTE: PROPERTY IS NOT IN SFHA.



BLOCK: 1299
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No.	Date	Issue
04	05/02/2024	ISSUED FOR BULLETIN 1
03	11/27/2023	ISSUED FOR BID + FILING
02	11/21/2023	ISSUED FOR 90% BD
01	11/14/2023	ISSUED FOR PROGRESS

PROJECT

2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

DRAWING TITLE

MECHANICAL SPECIFICATION SHEET NO.1

SEAL AND SIGNATURE

DATE (MM-DD-YY):	05-02-24
PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK
DWG. No.:	M-101.00
SCALE: NOT TO SCALE	02 OF 10

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LOCATED WITHIN A CONDITIONED OR UNCONDITIONED SPACE. INSULATION TO BE PROVIDED WITH REINFORCED FOIL FACED, FLAME RESISTANT, ALUMINUM FOIL VAPOR BARRIER. ALL INSULATION SHALL BE SECURED WITH DUCT ADHESIVE AND SEAMS SEALED BY TWO-INCH SEALING LIP WITH ADHESIVE AND FASTENED WITH 16 GAUGE RUST RESISTANT WIRE OR FIBERGLASS CORD ON 12" CENTERS. ON DUCTS OVER 24" WIDE, WELDED PINS AND CLIPS SHALL BE USED ON THE UNDERSIDE FOR FASTENING INSULATION.

H. PIPING INSULATION:

1. CONDENSATE DRAIN AND DOMESTIC WATER MAKE-UP PIPING SHALL BE INSULATED WITH 1" THICK MOLDED GLASS FIBER WITH A MAXIMUM K FACTOR OF 0.27 AT 75 DECREE F MEAN TEMPERATURE AND FACTORY APPLIED VAPOR BARRIER JACKET.
2. ALL CONDENSER WATER PIPING SHALL BE INSULATED WITH 1-1/2" THICK MOLDED GLASS FIBER FOR PIPE SIZES UP TO 1-1/2" INCHES IN DIAMETER AND 1-1/2" THICK FOR PIPE SIZES LARGER THAN 1-1/2" INCHES IN DIAMETER. INSULATION SHALL HAVE A MAXIMUM K FACTOR OF 0.27 AT 75 DEGREE F MEAN TEMPERATURE AND FACTORY APPLIED VAPOR BARRIER JACKET.
3. INDOOR PIPING EXPOSED IN KITCHENS: PROVIDE JACKETS OVER INDOOR PIPE MADE OF 0.016" ALUMINUM HELD WITH A FRICTION TYPE, Z-LOCK AND ALUMINUM BANDS. PROVIDE A MOISTURE BARRIER LINING.
4. ALL PIPING INSULATION TO BE INSTALLED WITH LONGITUDINAL LAP AND VAPOR BARRIER JOINT SEAL STRIPS WITH ADHESIVE OR SELF-SEALING LAPS. FITTINGS, FLANGES, AND VALVES SHALL BE INSULATED WITH PRE-MOLDED AND PRE-CUT FITTINGS WITH METERED SEGMENTS.
5. PROVIDE METAL SHIELDS ON ALL HANGERS SUPPORTING INSULATED PIPING WITH HALF SECTIONS OF HYDROUS CALCIUM SILICATE OR RIGID INSULATION TO PREVENT COMPRESSION OF PIPE INSULATION.
6. ALL EXISTING PIPING EXPOSED DURING DEMOLITION SHALL BE INSULATED AS PER THE CURRENT INSULATION REQUIREMENTS AS NOTED BY THE ENERGY CODE. IF INSULATION THICKNESSES CANNOT BE INSTALLED THE MAXIMUM THICKNESS AVAILABLE SHALL BE INSTALLED.

2.05 ACOUSTICAL TREATMENT

A. ACOUSTICAL LINING SHALL MEET THE MINIMUM THERMAL INSULATION VALUE OF R-6 OR A MAXIMUM K FACTOR OF 0.24 AT 1.5” THICKNESS WITH A MEAN TEMPERATURE OF 75 DEGREE F.
B. INSTALL LINER IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. COMPLETELY COVER ALL PORTIONS OF DUCTWORK PLENUMS AND CASINGS WITH APPROVED ADHESIVE. INSTALL LINER WITH ALL TRAVERSE JOINTS NEATLY BUTTED WITH NO INTERRUPTIONS OR GAPS. COVER ALL EXPOSED EDGES, JOINTS, MECHANICAL FASTENERS AND ANY DAMAGED AREAS WITH ADHESIVE. PROVIDE METAL NOSING AT EQUIPMENT DISCHARGES AND AT END EDGES OF LINING. SECURE LINER WITH APPROVED MECHANICAL FASTENERS INSTALLED IN ACCORDANCE WITH SMACNA DUCT LINER APPLICATION STANDARD.
C. DO NOT EXTERNALLY INSULATE ACOUSTICALLY LINED DUCTS.
D. DO NOT INTERNALLY LINE DUCTWORK WHICH IS A PART OF AN OUTSIDE AIR SYSTEM WHICH DISTRIBUTES UNCONDITIONED AIR.
E. FURNISH AND INSTALL ACOUSTICAL LINING IN DUCTWORK, PLENUMS AND CASINGS AS SHOWN ON THE DRAWINGS AND AS SPECIFIED BELOW:
   1. ALL DUCTS WITH DUCT VELOCITIES GREATER THAN 2,000 FPM SHALL HAVE ACOUSTICAL LINING FACED WITH 24 GAUGE PERFORATED ALUMINUM OR GALVANIZED STEEL SUPPORTED 12" ON CENTER.
   2. A MINIMUM DISTANCE OF 20 FEET FROM ALL AIR CONDITIONING UNIT INLETS AND DISCHARGES.
   3. ALL TERMINAL BOXES SUPPLY DUCTWORK SHALL BE LINED FOR A MINIMUM DISTANCE OF 15 FEET DOWNSTREAM OF BOX DISCHARGE.
   4. ALL RETURN/EXHAUST FANS SHALL BE ACOUSTICALLY LINED FOR A MINIMUM DISTANCE OF 20 FEET OF THE FAN INTAKE AND DISCHARGE OPENING.
   5. ALL TRANSFER DUCTS SHALL BE PROVIDED WITH 1” THICK ACOUSTICAL LINING FOR ACOUSTICAL PURPOSES ONLY.
   6. ALL DUCTWORK PASSING THROUGH OR SERVING CONFERENCE AND MEETING ROOMS SHALL BE PROVIDED WITH ACOUSTICAL LINING.
   7. ALL EXPOSED DUCTWORK.

2.06 VIBRATION ISOLATION SYSTEMS

A. ALL ROTATING, REVOLVING OR RECIPROCATING EQUIPMENT, INCLUDING PIPING CONNECTIONS TO THIS EQUIPMENT SHALL BE ACOUSTICALLY ISOLATED TO PREVENT THE TRANSMISSION OF OBJECTIONABLE NOISES, SOUND OR VIBRATIONS TO THE OCCUPIED SPACES AND TO THE BUILDING STRUCTURES. ALL VIBRATION ISOLATION PRODUCTS SHALL BE SPECIFICALLY DESIGNED FOR THEIR INTENDED USE.
B. STATIC DEFLECTION OF ISOLATORS SHALL BE A MINIMUM OF 90% EFFICIENT.
C. MANUFACTURER OF VIBRATION ISOLATION EQUIPMENT SHALL DETERMINE VIBRATION ISOLATOR SIZES AND LOCATIONS, PROVIDE SUITABLE PIPING AND EQUIPMENT VIBRATION ISOLATION SYSTEMS, GUARANTEE SPECIFIED ISOLATION SYSTEM ATTENUATION AND DEFLECTION, AND PROVIDE INSTALLATION INSTRUCTIONS, DRAWINGS AND FIELD SUPERVISION TO ASSURE PROPER INSTALLATION AND PERFORMANCE.
D. MOUNTING TYPES:
   1. PROVIDE SPRING ISOLATORS TYPE 30N FOR CEILING-SUPPORTED FANS, IN-LINE PUMPS, HEAT EXCHANGERS, AND AIR HANDLING UNITS. PROVIDE 1” MINIMUM STATIC DEFLECTION.
   2. PROVIDE NEOPRENE-IN-SHEAR ISOLATORS TYPE RND FOR FLOOR MOUNTING OF PUMPS (3HP OR LESS). PROVIDE 3'8” MINIMUM STATIC DEFLECTION.
   3. PACKAGED AIR CONDITIONING UNITS WITH INTERNAL SPRING ISOLATION OF COMPRESSORS OR FANS, PROVIDE NEOPRENE-IN-SHEAR ISOLATORS TYPE RND EXTERNAL.
   4. SUPPORT OF PIPING EXPOSED ON ROOF AND IN EQUIPMENT ROOMS:
      A) FLOOR SUPPORTED PIPING ISOLATORS (TYPE SLR).
      B) VERTICAL RISER PIPING ANCHOR AND GUIDES (TYPE ADA).
      C) CEILING SUPPORTED PIPING ISOLATORS (TYPE 30N).
   5. PROVIDE FLEXIBLE CONNECTIONS BETWEEN ALL FANS, AHU, AC UNITS AND DUCTWORK AS PER DUCTWORK SPECIFICATION SECTION.
E. FLEXIBLE HOSE CONNECTORS SHALL BE INSTALLED AT INLET AND DISCHARGE CONNECTIONS TO ALL PUMPS.
F. SPRING TYPE 30N HANGERS SHALL BE PROVIDED FOR PIPING FOR A DISTANCE OF 50 FEET OR 50 PIPE DIAMETERS, WHICHEVER IS GREATER, UP AND DOWNSTREAM OF ALL POWER DRIVEN EQUIPMENT. THE HANGER SHALL PROVIDE 1” OF STATIC DEFLECTION FOR PIPES 4” OF OUTSIDE DIAMETER AND LARGER AND 1/2” STATIC DEFLECTION FOR PIPES SMALLER THEN 4” OUTSIDE DIAMETER.
G. VIBRATION ISOLATORS FOR CEILING SUPPORTED EQUIPMENT SHALL HAVE A MAXIMUM LATERAL MOTION UNDER EQUIPMENT START-UP OR SHUT-DOWN CONDITIONS OF 1/4" AND MOTIONS IN EXCESS SHALL BE RESTRAINED BY SPRING TYPE MOUNTINGS.
H. ALL ISOLATORS INSTALLED OUTDOORS SHALL BE PROVIDED WITH CORROSION PROTECTION.
I. VIBRATION ISOLATOR SHALL BE PROVIDED BY MASON INDUSTRIES, VIBREX, VIBRATION ELIMINATOR CO., CONSOLIDATED KINETICS CO., OR APPROVED EQUAL.

2.06 EQUIPMENT

A. PROVIDE AND INSTALL ALL EQUIPMENT AND ACCESSORIES OF THE SIZES AND CAPACITIES AS SCHEDULED AND AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH APPROVED SHOP DRAWINGS AND MANUFACTURERS RECOMMENDATIONS. PROVIDE ALL MOTOR STARTERS AS REQUIRED; MOTOR STARTERS WILL BE INSTALLED BY THIS CONTRACTOR AND WIRED BY ELECTRICAL TRADE.
B. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL REQUIRED CLEARANCES FOR SERVICING AND MAINTENANCE. COORDINATE REQUIREMENTS WITH ALL TRADES.
C. IDENTIFICATION OF EQUIPMENT AND CONTROLS:
   1. ALL EQUIPMENT SHALL BE STENCILED OR LABELED WITH LAMACOID PLATES SCREWED THEREON WHICH SHALL INDICATE SYSTEMS SERVICE.
   2. MOTOR STARTERS SHALL BE PROVIDED WITH LAMACOID PLATES WHICH INDICATE SYSTEM SERVED.
   3. MOTOR STARTERS SHALL BE PROVIDED WITH LAMACOID PLATES WHICH INDICATE SYSTEM SERVED.
D. FAN POWERED TERMINALS:
   1. FURNISH AND INSTALL SERIES FAN POWERED TERMINALS, OR APPROVED EQUAL, OF THE SIZE AND CAPACITIES SHOWN ON THE PLANS. SPACE LIMITATIONS SHALL BE REVIEWED CAREFULLY TO ENSURE THAT ALL TERMINALS WILL FIT THE AVAILABLE SPACE. THE ENTIRE TERMINAL WITH ACCESSORIES SHALL NOT EXCEED 10 1/2 INCHES IN OVERALL HEIGHT.
   2. TERMINALS SHOULD BE CERTIFIED UNDER THE ARI STANDARD 880 CERTIFICATION PROGRAM AND CARRY THE ARI SEAL. NON-CERTIFIED TERMINALS MAY BE SUBMITTED AFTER TESTING AT AN INDEPENDENT TESTING LABORATORY UNDER CONDITIONS SELECTED BY THE ENGINEER IN FULL COMPLIANCE WITH ARI STANDARD 880. THESE TESTS MUST BE WITNESSED BY THE ENGINEERING CONSULTANT WITH ALL COSTS TO BE BORNE BY THE TERMINAL MANUFACTURER. TESTING DOES NOT ENSURE ACCEPTANCE.
   3. THE TERMINAL SHALL BE DESIGNED, BUILT, AND TESTED AS A SINGLE UNIT INCLUDING MOTOR AND FAN ASSEMBLY, PRIMARY AIR DAMPER ASSEMBLY, WATER OR ELECTRIC HEATING COILS, AND ACCESSORIES AS SHIPPED. UNIT SHALL SHIP AS A COMPLETE ASSEMBLY REQUIRING NO FIELD ASSEMBLY (INCLUDING ACCESSORIES). ALL ELECTRICAL COMPONENTS SHALL BE UL LISTED AND INSTALLED IN ACCORDANCE WITH THE UL STANDARD 1995. ELECTRICAL CONNECTION SHALL BE SINGLE POINT. ALL ELECTRICAL COMPONENTS, INCLUDING LOW VOLTAGE CONTROLS, SHALL BE MOUNTED IN SHEET METAL CONTROL ENCLOSURES. THE ENTIRE TERMINAL SHALL BE ETL LISTED AS A COMPLETE ASSEMBLY.
   4. THE TERMINAL CASING SHALL BE MINIMUM 20 GAUGE GALVANIZED STEEL. THE UNITS SHALL BE LINED WITH 1/2 INCH THICK INSULATION, MEETING UL 181 AND NFPA 90A, ENCLOSED BETWEEN THE UNIT CASING AND A NON-PERFORATED INTERNAL 22-GAUGE SHEET METAL COVER EXTENDING OVER THE FIBERGLASS INSULATION, AS WELL AS COVERING THE LINER CUT EDGES. THE DISCHARGE CONNECTION SHALL BE SLIP AND DRIVE CONSTRUCTION FOR ATTACHMENT TO METAL DUCTWORK. THE CASING SHALL BE DESIGNED FOR HANGING BY METAL STRAPS.
   5. THE TERMINAL CASING SHALL HAVE A BOTTOM ACCESS PANEL, WHICH ALLOWS REMOVAL OF FAN AND SERVICING OF TERMINAL WITHOUT DISTURBING DUCT CONNECTIONS.
   6. THE FAN SHALL BE CONSTRUCTED OF STEEL AND HAVE A FORWARD CURVED, DYNAMICALLY BALANCED WHEEL WITH DIRECT DRIVE MOTOR. THE MOTOR SHALL BE SUITABLE FOR 277 VOLT, 60 CYCLE, SINGLE PHASE POWER. THE MOTOR SHALL BE OF ENERGY EFFICIENT DESIGN,
   7. SPECIFICALLY DESIGNED FOR USE WITH AN SCR FOR FAN SPEED ADJUSTMENT. FAN ASSEMBLY SHALL INCLUDE A TUNED SPRING STEEL SUSPENSION AND ISOLATION BETWEEN MOTOR AND FAN HOUSING.
   8. THE TERMINALS SHALL UTILIZE A MANUAL SCR, WHICH ALLOWS CONTINUOUSLY ADJUSTABLE FAN SPEED FROM MAXIMUM TO MINIMUM, AS A MEANS OF SETTING FAN AIRFLOW. SETTING FAN AIRFLOW WITH ANY DEVICE THAT RAISES THE PRESSURE ACROSS THE FAN TO REDUCE AIRFLOW IS NOT ACCEPTABLE. THE SPEED CONTROL SHALL INCORPORATE A MINIMUM VOLTAGE STOP TO ENSURE THAT THE MOTOR CANNOT OPERATE IN A STALL MODE.
   9. THE PRIMARY AIR DAMPER ASSEMBLY SHALL BE HEAVY GAUGE STEEL WITH SHAFT ROTATING IN DELRIN BEARINGS. NYLON BEARINGS ARE NOT ACCEPTABLE. DAMPER LEAKAGE SHALL NOT EXCEED 5 PERCENT OF THE MANUFACTURERS' SCHEDULED MAXIMUM FAN CAPACITY AT 1 INCH WG. INLET STATIC PRESSURE.
   10. SOUND RATINGS FOR THE TERMINALS SHALL NOT EXCEED 35 NC AT 0.5" INLET STATIC PRESSURE, AND DISCHARGE STATIC PRESSURE OF 35 NC. SOUND PERFORMANCE SHALL BE ARI CERTIFIED. THE RADIATED AND DISCHARGE PATH ATTENUATION FUNCTION FOR THE SPECIFIED NC SHALL BE BASED UPON FACTORS FOUND IN ARI STANDARD 885-98 AND IN THE FOLLOWING TABLES. NO ADDITIONAL ATTENUATION FACTORS SHALL BE DEDUCTED FROM THE SOUND POWER.
   11. ECM MOTOR
      A) FAN MOTOR ASSEMBLY SHALL BE FORWARD CURVED CENTRIFUGAL FAN WITH A DIRECT DRIVE MOTOR. MOTORS SHALL BE GENERAL ELECTRIC ECM VARIABLE-SPEED DC BRUSHLESS MOTORS SPECIFICALLY DESIGNED FOR USE WITH SINGLE PHASE, 277 VOLT, 60 HERTZ ELECTRICAL INPUT. MOTOR SHALL BE COMPLETE AND OPERATED BY A SINGLE PHASE INTEGRATED CONTROLLER/INVERTER THAT OPERATES THE WOUND STATOR AND SENSES ROTOR POSITION TO ELECTRONICALLY COMMUTATE THE STATOR. ALL MOTORS SHALL BE DESIGNED FOR SYNCHRONOUS ROTATION. ROTOR SHALL BE PERMANENT MAGNET TYPE WITH NEAR ZERO ROTOR LOSSES. MOTOR SHALL HAVE BUILT-IN SOFT START AND SOFT SPEED CHANGE RAMPS. MOTOR SHALL BE ABLE TO BE MOUNTED WITH SHAFT IN HORIZONTAL OR VERTICAL ORIENTATION. MOTOR SHALL BE PERMANENTLY LUBRICATED WITH BALL BEARINGS. MOTOR SHALL BE DIRECTLY COUPLED TO THE BLOWER. MOTOR SHALL MAINTAIN A MINIMUM OF 70 PERCENT EFFICIENCY OVER ITS ENTIRE OPERATING RANGE. PROVIDE A MOTOR THAT IS DESIGNED TO OVERCOME REVERSE ROTATION AND NOT AFFECT LIFE EXPECTANCY.
E. IN-LINE CABINET TRANSFER FANS.
   1. CEILING MOUNTED EXHAUST FANS SHALL BE OF THE CENTRIFUGAL DIRECT DRIVE TYPE.
   2. THE FAN HOUSING SHALL BE CONSTRUCTED OF HEAVY GAUGE GALVANIZED STEEL. THE HOUSING INTERIOR SHALL BE LINED WITH 1/2" ACOUSTICAL INSULATION.
   3. THE OUTLET DUCT COLLAR SHALL INCLUDE AN ALUMINUM BACKDRAFT DAMPER AND SHALL BE ADAPTABLE FOR HORIZONTAL OR VERTICAL DISCHARGE.
   4. THE ACCESS FOR WIRING SHALL BE EXTERNAL. THE MOTOR DISCONNECT SHALL BE INTERNAL AND OF THE PLUG-IN TYPE. THE MOTOR SHALL BE MOUNTED ON VIBRATION ISOLATORS.
   5. THE FAN WHEEL(S) SHALL BE OF THE FORWARD CURVED CENTRIFUGAL TYPE AND DYNAMICALLY BALANCED.
   6. ALL FANS SHALL BEAR THE AMCA CERTIFIED RATINGS SEAL FOR SOUND AND AIR PERFORMANCES AND SHALL BE U.L. LISTED AND C.S.A. APPROVED.
   7. A MANUFACTURER SUPPLIED SPEED SWITCH SHALL BE PROVIDED WITH EACH EXHAUST FAN TO BE MOUNTED ON THE HOUSING FOR BALANCING PURPOSES.
   8. FANS SHALL BE MANUFACTURED BY GREENHECK OR EQUAL.

2.07 MOTOR STARTERS, CONTROL DEVICES AND MOTORS

A. MECHANICAL CONTRACTOR TO FURNISH AND INSTALL STARTERS FOR POWER WIRING BY THE ELECTRICAL CONTRACTOR.
B. MOTOR STARTERS SHALL BE CUTLER HAMMER, WESTINGHOUSE OR ALLEN-BRADLEY MANUFACTURER, SUITABLE FOR WALL OR ANGLE IRON FRAME MOUNTING.
C. ALL STARTERS FOR MOTORS LESS THAN 1/2 HP SHALL BE 120 VOLT, SINGLE PHASE, 60 CYCLE, A.C. SERVICE. MANUAL STARTERS WITH OVERLOAD PROTECTION AND LOCKOUT TYPE DISCONNECT SWITCH OR BREAKER MAY BE USED TO CONTROL SUCH MOTORS, EXCEPT WHERE INTERLOCKS OR AUTOMATIC CONTROLS ARE REQUIRED. IN SUCH CASES, MAGNETIC ACROSS-THE-LINE STARTERS SHALL BE FURNISHED.
D. ALL STARTERS FOR MOTORS 1/2 HP TO 75 HP SHALL BE COMBINATION FUSED DISCONNECT, MAGNETIC ACROSS-THE-LINE TYPE WITH FUSIBLE SWITCH. STARTERS 75 HP AND GREATER SHALL BE SOLID STATE ELECTRONIC SOFT START TYPE STARTERS.
E. CONTROLLERS FOR CONDENSATE PUMPS, DUPLEX AIR COMPRESSOR, SUMP AND EJECTOR PUMPS, ETC., SHALL BE FACTORY MOUNTED AND WIRED AS PART OF THE WORK OF THE HEATING, VENTILATING AND AIR CONDITIONING SECTION.
F. 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 IN TO COVER. ALL MAGNETIC STARTERS SUBJECT TO ELECTRICAL INTERLOCK OR AUTOMATIC CONTROL SHALL HAVE HAND-OFF-AUTOMATIC SWITCHES AND PILOT LIGHT BUILT INTO COVER.
G. WHERE STARTERS ARE NOT IN SIGHT OF MOTORS THEY CONTROL, A LOCAL DISCONNECT SWITCH WILL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
H. PROVIDE ALL STARTERS WITH TRANSFORMERS BUILT INTO EACH STARTER CASING FOR CONTROL CIRCUIT. TRANSFORMERS SHALL SERVE ALL CONTROL CIRCUITS. EACH STARTER SUBJECT TO ELECTRICAL INTERLOCK AND/OR AUTOMATIC CONTROL SHALL HAVE THE NECESSARY AUXILIARY CONTACTS. ONE SET OF TERMINALS SHALL BE PROVIDED FOR EACH CONTROL CIRCUIT. CONTROL CENTERS SHALL BE PROVIDED WITH CONTROL TERMINAL BLOCKS. PROVIDE THREE SETS OF NORMALLY CLOSED OR NORMALLY OPEN CONTACTS.
I. ALL MAGNETIC STARTERS SHALL HAVE THERMAL OVERLOAD IN EACH PHASE LEG AND LOW VOLTAGE PROTECTION.
J. ALL PARTS SUBJECT TO WEAR, ARCING, ETC., SHALL BE REPLACEABLE.
K. ALL WIRING, STARTERS, SWITCHES, ETC., SHALL BE IN FULL ACCORDANCE WITH ALL LOCAL INSURANCE UNDERWRITERS CODE REQUIREMENTS.
L. FURNISH DETAILED COMPOSITE WIRING DIAGRAMS FOR THOSE INSTALLING ELECTRICAL WORK, AND FURNISH SUCH OTHER INFORMATION NECESSARY TO ASSURE THE PROPER CONNECTION, OPERATION AND CONTROL OF MOTORIZED EQUIPMENT, INCLUDING INTERLOCKS, AUTOMATIC OR SAFETY CONTROLS AND AUXILIARY CIRCUITS.
M. FURNISH THE PERTINENT INFORMATION SUCH AS STARTING TORQUE REQUIREMENTS OF HIGH INERTIA EQUIPMENT, SO THAT THE PROPER TYPE STARTER MAY BE PROVIDED BY THE STARTER MANUFACTURER. ALL INFORMATION IS SUBJECTED TO THE REVIEW OF THE ENGINEER.
N. PROVIDE LAMINATED NAME PLATE ATTACHED TO EACH STARTER AND VFD IDENTIFYING THE SYSTEM IT SERVES.
O. STARTERS AND VFD'S SHALL BE PROVIDED WITH ENCLOSURES RATED NEMA 1 FOR INDOOR APPLICATIONS, NEMA 3R WITH ADDITIONAL GASKETING FOR WEATHERPROOF RAINTIGHT OUTDOOR ENCLOSURE OR INDOOR ENVIRONMENTS SUBJECT TO MOISTURE.
P. MOTORS SHALL BE HIGH EFFICIENCY, COMPLY WITH NEMA MG-1 STANDARD AND MEET THE 1992 EPA ENERGY EFFICIENCY ACT AND UTILITY COMPANY REBATE REQUIREMENTS.
Q. PROVIDE VARIABLE FREQUENCY DRIVES (VFD) AS MANUFACTURED BY GENERAL ELECTRIC, MAGNATEK, ABB, OR APPROVED EQUAL BY THE ENGINEER FOR CONTROL OF FANS AND/OR PUMPS AS SHOWN ON THE PLANS AND AS SPECIFIED HEREIN. VFD DISTORTION FACTOR SHALL NOT EXCEED 3% THD (VOLTAGE) AT POINT OF COMMON COUPLING, AS DEFINED BY IEEE 519.1992 AND IN NO CASE SHALL THE CURRENT THD EXCEED 10%. VFDS SHALL INCLUDE THE FOLLOWING:
   1. PWM TECHNOLOGY INCORPORATING IGBT.
   2. 40 CHARACTER FULL ENGLISH DIGITAL DISPLAY. CODES ARE NOT ACCEPTABLE.
   3. DC LINE CHOKE.
   4. MANUAL BYPASS AND MANUAL BYPASS CONTACTORS.
   5. THREE SETS OF NORMALLY CLOSED OR NORMALLY OPEN CONTACTS.
   6. CIRCUIT BREAKER DISCONNECT.
   7. VFD DRIVE SERVICE SWITCH.
   8. SPEED CONTROL DIAL.
   9. THERMAL MOTOR OVERLOADS.
   10. 3% AC LINE REACTOR PRE-WIRED AND INSTALLED WITHIN VFD ENCLOSURE.
   11. FACTORY START-UP SERVICE INCLUDING COMPONENT TESTING, FIELD CHECK OF CONTROL CONNECTION, AND DOCUMENTS STATING THAT ALL WORK AND DRIVE FUNCTIONS ARE DEEMED ACCEPTABLE.
   12. PROGRAMMING OF ALL DRIVE PARAMETERS PARTICULAR TO THIS INSTALLATION.
   13. 2 YEAR SITE PARTS AND LABOR WARRANTY AFTER START-UP.
R. VARIABLE FREQUENCY DRIVE MOTORS SHALL COMPLY WITH NEMA MG-1 PART 31.40.4.2 STANDARD SUITABLE FOR VFD OPERATION. CONTRACTOR TO COORDINATE VFD AND MOTOR MANUFACTURERS.
S. ALL VFD DRIVES FOR ALL EQUIPMENT SHALL BE OF THE SAME MANUFACTURER. MECHANICAL CONTRACTOR SHALL COORDINATE VFD DRIVE MANUFACTURER WITH EACH EQUIPMENT VENDOR.

2.08 AUTOMATIC TEMPERATURE CONTROL

A. GENERAL
   1. PROVIDE ALL CONTROL, POWER, AND INTERLOCK WIRING INCLUDING CONDUITS AND INSTALL PER THE NEW YORK CITY, AND NATIONAL ELECTRIC CODE. SUBMIT TERMINAL TO TERMINAL WIRING DIAGRAM, SEQUENCE OF OPERATION AND CUTS OF ALL COMPONENTS FOR APPROVAL. PROVIDE ALL RELAYS, SWITCHES, DAMPERS AND ACTUATORS, PNEUMATIC EQUIPMENT, PILOT POSITIONERS THERMOSTATS, PANELS, LIMIT SAFETIES, TRANSFORMERS, TIME CLOCKS, CONTROL VALVES AND OTHER DEVICES TO ACCOMPLISH THE DESIRED SEQUENCE OF OPERATION.
   2. FURNISH AND INSTALL AS HEREIN SPECIFIED, A COMPLETE AUTOMATIC TEMPERATURE CONTROL SYSTEM. THE ATC CONTRACTOR SHALL BE AN INDEPENDENT CONTRACTOR NOT AFFILIATED WITH THE MECHANICAL CONTRACTOR.
   3. ALL TEMPERATURE CONTROL SYSTEMS AND COMPONENTS ARE TO BE FULLY MODULATING TYPE, EXCEPT WHERE NOTED OTHERWISE.
   4. IF NEW WORK IS TO CONNECT TO AN EXISTING SYSTEM, THE PROPOSED NEW SYSTEM TO BE INSTALLED SHALL BE FULLY COMPATIBLE WITH THE EXISTING SYSTEM. THE MANUFACTURER OF THE PROPOSED NEW SYSTEM SHALL PROVIDE ALL REQUIRED INTERFACES OR GATEWAYS TO ENSURE THAT THEIR SYSTEM IS FULLY COMPATIBLE.
   5. WHEN CONNECTING TO AN EXISTING BMS WORKSTATION THE CONTRACTOR SHALL UPDATE THE EXISTING BMS WORKSTATION AND GRAPHICS WITH THE NEW SYSTEMS INSTALLED/MONITORED AS PART OF THIS PROJECT
   7. ALL CONTROLS MUST BE THE PRODUCT OF ONE MANUFACTURER. ALL AUTOMATIC CONTROL VALVES AND DAMPER OPERATORS SHALL BE MANUFACTURED BY THE TEMPERATURE CONTROL MANUFACTURER.
   8. THE MANUFACTURER OF THE AUTOMATIC CONTROL EQUIPMENT SHALL SUBMIT THE FOLLOWING FOR APPROVAL: A SCHEMATIC DIAGRAM OF EACH CONTROL SYSTEM WHICH SHALL INDICATE THE PROPER SEQUENCE OF OPERATION AND RANGE OF THE CONTROLS FOR ALL CYCLES, PROVIDE TERMINAL POINT TO TERMINAL POINT ELECTRICAL WIRING DIAGRAMS FOR APPROVAL, A COMPLETE DESCRIPTION OF THE AUTOMATIC OPERATION OF EACH SYSTEM WHERE THE DESCRIPTION INCLUDES THE DUTY OF EACH THERMOSTAT, VALVE, SWITCH, ETC., INCORPORATED IN THE CONTROL SYSTEM WITH A SCHEDULE AND ILLUSTRATION OF ALL CONTROL INSTRUMENTS AND EQUIPMENT INCLUDING CONTROL PANELS AND DEVICES FOR EACH SYSTEM.
   9. INDIVIDUAL SMOKE DETECTORS SHALL BE INSTALLED (PROVIDED BY ELECTRICAL CONTRACTOR) IN THE RETURN DUCT OF ALL AIR HANDLING SYSTEMS SHARING A COMMON CEILING OR DUCT PLENUM AS REQUIRED BY CODE.
   10. FOR AIR DISTRIBUTION SYSTEMS 2,000 CFM OR LARGER, INSTALL SMOKE DETECTORS (PROVIDED BY ELECTRICAL CONTRACTOR) IN MAIN SUPPLY DUCT (DOWNSTREAM OF AIR FILTERS AND AHEAD OF ANY BRANCH CONNECTIONS) AND MAIN RETURN DUCT (UPSTREAM OF ANY FILTERS AND BEFORE RETURN AIR IS DILUTED WITH OUTDOOR AIR).
   11. PROVIDE SMOKE DAMPERS (N.C.) IN THE SUPPLY (AHEAD OF ANY BRANCH CONNECTIONS) AND RETURN DUCTS FOR SUPPLY AIR SYSTEMS 15,000 CFM OR LARGER AND SERVING MORE THAN THE FLOOR ON WHICH THE SYSTEM IS LOCATED. PROVIDE END SWITCHES IN SMOKE DAMPERS FOR CONNECTION TO FIRE ALARM SYSTEM AND HVAC CONTROLS.
   12. ALL SMOKE DETECTORS SHALL BE TIED TO THE BUILDING FIRE ALARM SYSTEM. A SIGNAL FROM THE BUILDING FIRE ALARM SYSTEM SHALL AUTOMATICALLY SHUT DOWN SYSTEM FANS AND CLOSE ALL ASSOCIATED SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS. SIGNAL, INTERLOCK WIRING, POWER WIRING AND FINAL CONNECTIONS WILL BE PROVIDED BY ELECTRICAL CONTRACTOR.
   13. ALL AUTOMATIC TEMPERATURE CONTROL SYSTEM SHALL COMPLY WITH THE NEW YORK CITY ENERGY CONSERVATION CODE REQUIREMENTS. ALL HVAC SYSTEM CONTROLS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:
      A) HEATING AND COOLING TO EACH ZONE SHALL BE CONTROLLED BY A THERMOSTAT. A MINIMUM OF ONE HUMIDITY CONTROL DEVICE SHALL BE INSTALLED PER HUMIDIFICATION OR DEHUMIDIFICATION SYSTEM.
      B) ALL ZONE THERMOSTAT SHALL OPERATE WITH A MINIMUM OF 5°F DEADBAND BETWEEN HEATING AND COOLING WITH SETPOINT OVERLAP CAPABILITY.
      C) ALL ZONE THERMOSTATS SHALL BE OPERATED VIA THERMOSTATIC SETBACKS CONTROLS OPERATED VIA AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.
      D) ALL CONTROLS SHALL HAVE THE ABILITY TO SETBACK TEMPERATURE DOWN TO 55°F OR UP TO 85°F.
      E) CONTROLS SHALL BE CAPABLE OF AUTOMATICALLY STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK, CAPABLE OF HAVING SETTING SAVED IN MEMORY FOR 10 HOURS DURING A LOSS OF POWER AND A MANUAL SYSTEM “ON” OVERRIDE FOR UP TO TWO (2) HOURS OR AN OCCUPANCY SENSOR.
      F) CONTROL SYSTEM SHALL AUTOMATICALLY RESET SUPPLY AIR TEMPERATURE IN RESPONSE TO BUILDING LOAD OR OUTSIDE AIR TEMPERATURE.
      G) THE CONTRACTOR SHALL PROVIDE TESTING TO ENSURE PER OPERATION, CALIBRATION AND ADJUSTMENT OF CONTROLS.
      H) OFF-HOURS CONTROLS WITH SETBACK AND/OR SHUTDOWN CAPABILITIES. FOR SPECIFIC OCCUPANCIES AND CONDITIONS, EACH SPACE-CONDITIONING SYSTEM MUST BE PROVIDED WITH CONTROLS THAT CAN AUTOMATICALLY SHUT-OFF THE EQUIPMENT DURING UNOCCUPIED HOURS. THE CONTROL DEVICE SHALL BE AN AUTOMATIC WITH SWITCH DEVICE. THIS CAN BE ACCOMPLISHED WITH A 7-DAY PROGRAMMABLE THERMOSTAT WITH BACKUP CAPABILITIES THAT STORES THE DEVICE'S SCHEDULE FOR AT LEAST 7 DAYS AND THE TIME AND DATE FOR AT LEAST 72 HOURS IF POWER IS LOST.
      I) ALL CONTROLLERS SERVING AIR COOLED AC UNITS WITH AIRSIDE ECONOMIZER CONTROLS SHALL BE EQUIPMENT WITH A FAULT DETECTION AND DIAGNOSTIC SYSTEM COMPLY WITH THE REQUIREMENTS OF NYECC 2016 SECTION C403.2.4.7. THE UNIT CONTROLLER SHALL BE CAPABLE OF MANUALLY INITIATING EACH OPERATING MODE SO THAT THE OPERATION OF COMPRESSORS, ECONOMIZERS, FANS AND THE HEATING SYSTEM CAN BE INDEPENDENTLY TESTED AND VERIFIED. THE UNIT SHALL BE CAPABLE OF REPORTING FAULTS TO A FAULT MANAGEMENT APPLICATION ACCESSIBLE BY DAY-TO-DAY OPERATING OR SERVICE PERSONNEL, OR ANNUNCIATED LOCALLY ON ZONE THERMOSTATS.
B. ELECTRIC WIRING:
   1. ALL ELECTRIC WORK (EXCEPT FOR MOTOR FEEDERS, WIRING BETWEEN MOTORS, MOTOR CONTROLLERS, FEEDER PANELS, FUSES, CIRCUIT BREAKERS AND BUS BARS) REQUIRED FOR THE AUTOMATIC TEMPERATURE CONTROL SYSTEM SHALL BE PROVIDED BY THIS CONTRACTOR. WORK SHALL INCLUDE BUT NOT BE LIMITED TO TIME SWITCHES, DAMPER MOTORS, DAMPER SWITCHES, ELECTRIC THERMOSTAT, ELECTRIC RELAYS, E/P SWITCHES, INTERLOCKING WIRING, WIRE, CONDUIT, ETC.
   1. ALL CONTROL POWER, WIRING AND TRANSFORMERS FOR DAMPERS, ACUATORS, VAV BOXES, CONTROL PANLES, ETC. TO BE PROVIDED BY THE CONTROLS CONTRACTOR FROM A SOURCE DESIGNATED BY THE ELECTRICAL CONTRACTOR. CIRCUITS FOR CONTROL DEVICES HAVE BEEN DESIGNATED IN THE ELECTRICAL PANEL SCHEDULES.
   2. THE CONTROL MANUFACTURER SHALL INCLUDE WIRING DIAGRAMS IN HIS SHOP DRAWINGS SUBMITTALS FULLY COORDINATED WITH THE ELECTRICAL CONTRACTORS WORK. IT SHALL BE THE AUTOMATIC TEMPERATURE CONTROL CONTRACTORS RESPONSIBILITY TO PROVIDE ALL WIRING AND CONDUIT AS REQUIRED TO ACHIEVE THE FUNCTION CALLED FOR IN THESE SPECIFICATIONS, CONFORMING WITH LOCAL CODES FOR MATERIAL AND INSTALLATION. THE ELECTRICAL SPECIFICATION FOR THE PROJECT ELECTRICAL WORK IS TO BE FOLLOWED.
A. CONTROL PANELS SHALL BE NEMA 1 FOR INDOOR APPLICATIONS, NEMA 3R WITH ADDITIONAL GASKETING FOR WEATHERPROOF RAINTIGHT OUTDOOR ENCLOSURE OR INDOOR ENVIRONMENTS SUBJECT TO MOISTURE. THEY SHALL BE PROVIDED WITH WELDED ANGLE BRACKETS AND A BAKED PRIME COAT ENAMEL FINISH. THE PANEL DOORS SHALL BE HINGED LOCKING TYPE. CONTROL PANELS SHALL CONTAIN ALL CENTRAL CONTROL DEVICES, SUCH AS CONTROLLERS, RELAYS, SWITCHES, PILOT LIGHTS, TERMINAL BLOCKS, AND ALL OTHER ACCESSORIES AS REQUIRED FOR A WORKABLE ENVIRONMENTAL CONTROL SYSTEM. ALL COMPONENTS WITHIN THE CONTROL PANELS SHALL BE PRE-WIRED TO NUMBERED TERMINAL TRIPS, READY FOR FIELD CONNECTION FOR FIELD MOUNTED CONTROL COMPONENTS. PROVIDE ENGRAVED NAMEPLATES TO LABEL THE CONTROLLED EQUIPMENT. PROVIDE A PLASTIC LAMINATED CONTROL SCHEMATIC DRAWING HUNG NEXT TO EACH CONTROL PANEL.
B. ALL CONTROL PANELS SHALL BE PROVIDED WITH INTERNAL BATTERY FOR CONTINUOUS OPERATION DURING TEMPORARY POWER LOSS. ALTERNATIVELY, IF UPS POWER IS AVAILABLE, PROVIDE CONTROL PANEL POWER FROM THE UPS SOURCE.
C. THE SYSTEM INSTALLATIONS SHALL BE SUPERVISED BY THE AUTOMATIC CONTROL MANUFACTURER, WHO SHALL COORDINATE WITH AND INSTRUCT PIPING OR SHEET METAL TRADES AS TO TEES OR TAPPINGS TO BE INSTALLED IN PIPING OR EQUIPMENT AND OPENINGS THAT ARE REQUIRED IN SHEET METAL FOR THE SETTING AND INSTALLATIONS OF CONTROL DEVICES THEREIN BY THESE TRADES.
D. THE CONTROL CONTRACTOR SHALL FURNISH AND INSTALL THE NECESSARY AIR PIPING FOR ALL INDICATING, CONTROLLING AND CONTROLLED DEVICES. AIR PIPING THROUGHOUT THE SYSTEM SHALL BE FR (FIRE RETARDANT) MULTIPLE VIRGIN POLYETHYLENE TUBING WITH INTEGRAL ANTI-OXIDANT, VERMIN-PROOF INHIBITOR UNLESS OTHERWISE SPECIFIED HEREIN.
   1. THE AIR PIPING SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND SHALL BE PROPERLY SUPPORTED USING STRAPS, CLIPS OR HANGERS, AS APPROVED. AIR PIPING SHALL BE SUPPORTED ON NOT OVER 6 FT. CENTERS ON VERTICAL RUNS, AND 4FT. CENTERS ON HORIZONTAL RUNS. PIPES SHALL NOT BE HIDDEN WITHIN DUCT INSTALLATION, RUN OVER ACCESS PANELS, OR SUPPORTED FROM PIPES OR CONDUITS.
   2. ALL-LOW PRESSURE CONNECTIONS (25 PSI OR LESS) SHALL BE BARBED, PUSH-ON TYPE, WHEREAS, HIGH-PRESSURE TUBING SHALL BE MADE WITH COMPRESSION FITTINGS AND SHALL BE SEAMLESS, HARD COPPER TUBING.
   3. SUPPLY AIR RISERS SHALL BE SEAMLESS, HARD COPPER TUBING.
E. ALL ROOM THERMOSTATS/SENSORS AND SWITCH LOCATIONS SHALL BE SUBMITTED FOR REVIEW BY THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION WHETHER THE DEVICES ARE SHOWN ON PLANS OR NOT
F. AUTOMATIC VALVES:
   1. ALL AUTOMATIC CONTROL AND ISOLATION VALVES SHALL BE OF THE ELECTRONIC TYPE, UNLESS OTHERWISE SPECIFIED, QUIET IN OPERATION, AND SHALL BE ARRANGED TO SPRING RETURN FAIL SAFE, IN A NORMALLY OPEN OR NORMALLY CLOSED POSITION. CONTROL VALVES SHALL BE FULLY PROPORTIONING AND ISOLATION VALVES SHALL BE 2-POSITION. VALVES TO HAVE ADJUSTABLE OPERATING RANGES AND STARTING POINTS TO PROVIDE FLEXIBILITY OF ADJUSTMENT IN SEQUENCING AND THROTTLING. MODULATING VALVES SHALL BE PROVIDED WITH PILOT POSITIONERS.
   2. VALVES SHALL BE SIZED BY THE TEMPERATURE CONTROL MANUFACTURER AND GUARANTEED TO MEET THE HEATING OR COOLING REQUIREMENTS AS SPECIFIED. CONTROL VALVES SHALL BE SUITABLE FOR PRESSURE CONDITIONS AND CLOSE AGAINST 110% OF PUMP DIFFERENTIAL PRESSURE.
   3. ALL VALVE BODIES SHALL HAVE THE SAME PRESSURE CHARACTERISTICS AS THE PIPE IN WHICH IT IS INSTALLED.
   4. VALVES 2 INCHES AND SMALLER UNLESS OTHERWISE SPECIFIED SHALL HAVE BRONZE BODIES WITH SCREWED CONNECTIONS. VALVES SHALL BE FISHER TYPE ED, WARREN TYPE 20/70, K&M SERIES GCG, OR AS APPROVED.
   5. VALVES BETWEEN 2-1/2" AND 4 INCH UNLESS OTHERWISE SPECIFIED, SHALL HAVE CAST IRON OR CARBON STEEL BODIES WITH FLANGED CONNECTIONS IN ACCORDANCE WITH THE PIPING SPECIFICATIONS. VALVES SHALL BE FISHER STYLE ED, WARREN TYPE 20/70 OR 1800 SERIES GCG, K&M SERIES GCG OR AS APPROVED.
   6. ALL CONTROL VALVES 4” AND ABOVE SHALL BE BUTTERFLY CONTROL VALVES. VALVES SHALL BE BUTTERFLY TYPE WITH LUG ENDS AND SHALL BE FURNISHED WITH ELECTRIC OR PNEUMATIC SPRING RETURN DIAPHRAGM OPERATORS. ALL SUCH VALVES SHALL BE PROVIDED UNDER THIS SECTION. VALVE BODY SHALL BE CAST IRON WITH 316 STAINLESS DISC, 17-4 PH STAINLESS SHAFT. SEAT AND SEAL MATERIALS SHALL BE TEFLON. THE VALVE BE PROVIDED WITH A SPEED CONTROL DEVICE (ADJUSTABLE) TO PREVENT THE VALVE FROM TOO RAPID A CLOSURE RATE. VALVES SHALL BE RATED IN ALL SIZES OF BUBBLE TIGHT CLOSURE AT 150 PSI, OR THE REQUIRED DIFFERENTIAL PRESSURE ACROSS THE DISC AND MAXIMUM SYSTEM OPERATING TEMPERATURE.
   7. AUTOMATIC CONTROL VALVES EXPOSED TO THE ELEMENTS SHALL HAVE ELECTRONIC ACTUATORS WITH ALL REQUIRED ACCESSORIES.
I. AUTOMATIC DAMPERS:
   1. PROVIDE CONTROLS FOR ALL THE AUTOMATIC DAMPERS, AS SPECIFIED IN THE DUCTWORK SECTION, AND SHOWN ON THE DRAWINGS.
   2. CONTROL MOTORS OR ACTUATORS SHALL BE OF THE ELECTRONIC TYPE, UNLESS OTHERWISE NOTED, OF APPROPRIATE SIZE AND QUANTITIES TO PROVIDE TWO-POSITION OR PROPORTIONING CONTROL ACTION AS SPECIFIED. PROPORTIONING TYPE SHALL BE EQUIPPED WITH PILOT TYPE POSITIONERS. PILOT POSITIONERS SHALL BE SELECTED FOR VARIED SPRING RANGES AND ADJUSTABLE WITHOUT DISMANTLING POSITIONER AND CONTROL MOTOR.
   3. AUTOMATIC DAMPERS EXPOSED TO THE ELEMENTS SHALL HAVE ELECTRIC ACTUATORS WITH ALL REQUIRED ACCESSORIES.
J. SEQUENCES OF OPERATION - FURNISH AND MOUNT ALL DEVICES AS REQUIRED TO PERFORM THE FOLLOWING SEQUENCES OF OPERATION:

WATER COOLED AIR CONDITIONING UNITS:

1. UNITS SHALL BE AUTOMATICALLY STARTED AND STOPPED VIA AN INDIVIDUAL DIGITALLY PROGRAMMABLE COOLING THERMOSTAT WITH SEVEN-DAY TIME CLOCK CONTROL AND [LOCKING COVER OR TOTAL KEYPAD LOCKOUT AND PARTIAL KEYPAD LOCKOUT WITH PASSWORD OVERRIDE] LOCATED WITHIN THE SERVED SPACE. THE TIME SCHEDULE TO BE DETERMINED BY OWNER (E.G. 8:00 AM TO 6:00 PM). THERMOSTATS TO INCLUDE TIMED OVERRIDE CAPABILITY TO OVERRIDE THE CLOCK SETTING IN THREE (3) HOUR INCREMENTS (ADJUSTABLE). THERMOSTAT SHALL BE SIMILAR TO HONEYWELL TB8220 PREMIUM THERMOSTAT.
2. THERMOSTATS TO INCLUDE MULTIPLE STAGES AS REQUIRED BY EQUIPMENT CONTROLLED.
3. THE THERMOSTAT SHALL ALLOW FOR TEMPERATURE CONTROL BY ADJUSTING AND CONTROLLING THE REFRIGERATION CYCLE AND 2-WAY NORMALLY CLOSED CONTROL VALVE AND SHALL HAVE A SETPOINT OF 75dF (ADJUSTABLE).
4. THE THERMOSTAT SHALL ALLOW THE UNITS FAN(S) TO RUN CONTINUOUSLY WHILE IN OPERATION.
5. THE RESPECTIVE CONDENSATE PUMP FOR EACH AIR CONDITIONING UNIT SHALL BE ENERGIZED AT ALL TIMES REGARDLESS OF THE AIR CONDITIONING UNIT'S OPERATION. THE CONDENSATE PUMPS SAFETY FLOAT SWITCH SHALL BE WIRED TO SHUT DOWN THE AC UNIT, CLOSE THE MOTORIZED ISOLATION VALVES AND SEND AN ALARM TO A COMMON AUDIO/VISUAL ALARM PANEL
6. AN AUDIO/VISUAL ALARM PANEL WITH SILENCING BUTTON SHALL BE WALL MOUNTED JUST OUTSIDE OF THE MECHANICAL ROOM TO ALERT THE OCCUPIED SPACE OF AC UNIT ALARMS.
7. PROVIDE NORMALLY CLOSED MOTORIZED ISOLATION VALVES ON THE CONDENSER WATER SUPPLY AND RETURN PIPING LINES.
8. LEAK DETECTION SHALL BE PROVIDED IN THE AUXILIARY DRAIN PAN FOR EACH UNIT. WHEN THE LOCAL LEAK DETECTOR SENSES MOISTURE IN THE AUXILIARY DRAIN PAN, THE UNIT SHALL SHUT DOWN, THE MOTORIZED ISOLATION VALVES ON SUPPLY AND RETURN LINES SHALL CLOSE AND AN ALARM SIGNAL SHALL SOUND AT THE AUDIO/VISUAL ALARM PANEL.
9. PROVIDE A DIFFERENTIAL PRESSURE SENSOR FOR AIR CONDITIONING UNIT. THE DP SENSOR SHALL SENSE THE MINIMUM CONDENSER WATER PRESSURE NECESSARY FOR OPERATING THE UNIT. UPON REACHING THE MINIMUM PRESSURE SETPOINT, THE DP SENSOR SHALL ENGAGE A CONTACT AND ALLOW THE UNIT TO OPERATE. IF THE PRESSURE IS BELOW THE MINIMUM SETPOINT, THE CONTACT SHALL OPEN AND PREVENT THE UNIT FROM RUNNING.
10. STATIC PRESSURE TRANSMITTER LOCATED 2/3 DOWNSTREAM OF THE AC UNIT SHALL MEASURE STATIC PRESSURE IN THE SUPPLY TRUNK DUCT. THE OUTPUT SIGNAL FROM THE TRANSMITTER SHALL BE INPUT TO A SOFTWARE BASED STATIC PRESSURE CONTROLLER WITH PROPORTIONAL INTEGRAL CONTROL MODE TO MAINTAIN DUCT PRESSURE AT 0.75" W.G. ADJUSTABLE. THE

CLIENT

ROCKWOOD CAPITAL

ARCHITECT

Fogarty Finger
69 Walker Street
New York, NY 10013
212.966.7450
www.fogartyfinger.com

MEP/FP

ama group
825 Eighth Avenue, FL18 | New York, NY 10019
212.944.7722 | amagroupusa.com

IT/AV/SECURITY

tmt technology
825 Eighth Avenue, FL18 | New York, NY 10019
212.398.2424 | tmtechpartners.com

ACOUSTICS

Longman Lindsey
200 West 41st Street, Suite 1100 | New York, NY 10036
212.315.6400 | longmanlindsey.com

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ARCHITECTURAL LIGHTING DESIGN • 50 BROAD ST SUITE 1602 • NEW YORK NY 10004 • 212 343 8400

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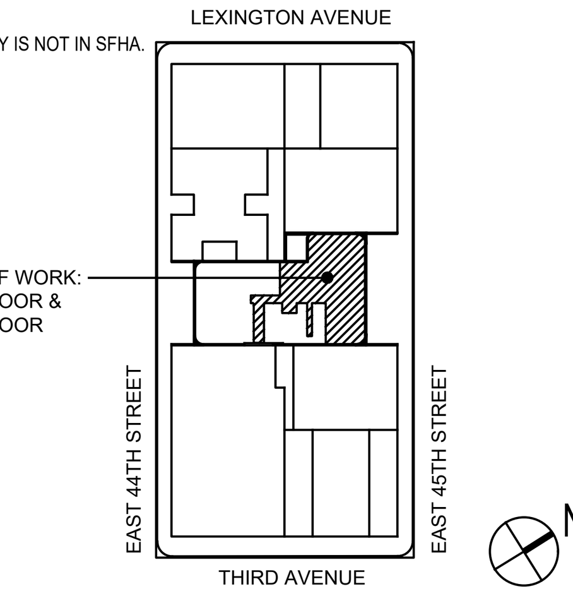

BLOCK: 1299
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No.	Date	Issue
04	05/02/2024	ISSUED FOR BULLETIN 1
03	11/27/2023	ISSUED FOR BID + FILING
02	11/21/2023	ISSUED FOR 90% BD
01	11/14/2023	ISSUED FOR PROGRESS

PROJECT

2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

DRAWING TITLE

MECHANICAL SPECIFICATION SHEET NO.2

SEAL AND SIGNATURE

DATE (MM-DD-YY):	05-02-24
PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK
DWG. No.:	M-102.00
SCALE: NOT TO SCALE	03 OF 10

DOB DRAWING NUMBER: M00979855-I1

OUTPUT OF THE CONTROLLER SHALL BE INPUT TO THE VFD CONTROLLER ON THE SUPPLY FAN WHICH SERVE THE TRUCK DUCT IN WHICH THE STATIC PRESSURE TRANSMITTER IS LOCATED. AS THE DUCT STATIC PRESSURE DECREASES, THE OUTPUT SHALL INCREASE THE VARIABLE FREQUENCY DRIVE AND INCREASE FAN CAPACITY. ON AN INCREASE IN STATIC PRESSURE, THE OUTPUT SHALL DECREASE THE VARIABLE FREQUENCY DRIVE AND DECREASE FAN CAPACITY. A SOFTWARE HIGH LIMIT ALGORITHM SHALL LIMIT CONTROLLER OUTPUT SO THAT THE FAN CAN NOT EXCEED ITS DESIGN CAPACITY BY MORE THAN 10% AS DETERMINED THROUGH THE FANS SPEED. A SOFTWARE AUTO/MANUAL SWITCH FUNCTION SHALL ENABLE THE OPERATOR TO OVERRIDE THE OUTPUT OF THE STATIC PRESSURE CONTROLLER AND ADJUST THE FAN SPEED MANUALLY.

11. CONDENSER/CHILLED WATER CIRCULATING PUMPS:

1. CIRCULATING PUMP OPERATION SHALL BE INTERLOCKED WITH AC UNITS. UPON ACTIVATION OF ANY UNIT, THE LEAD CIRCULATING PUMP SHALL START.
2. PROVIDE FOR LEAD/LAG SEQUENCING IN ORDER TO HAVE ONE PUMP RUNNING AND THE OTHER AS STAND-BY. PUMPS SHALL BE CYCLED ON A 150 HOUR OPERATING SCHEDULE (ADJUSTABLE) FOR EVEN WEAR.
3. A FLOW SENSOR (ON DISCHARGE OF EACH PUMP) SHALL PROVE FLOW BEFORE STARTING ANY AIR CONDITIONING UNITS. A LOSS OF FLOW AS INDICATED BY THE FLOW SENSOR ON THE RUNNING PUMP SHALL ANNUNCIATE AN AUDIO/VISUAL ALARM AND SWITCH OPERATION TO THE STAND-BY PUMP.
4. PROVIDE A LEAK DETECTOR AT THE AUXILIARY DRAIN PAN OF EACH PUMP. LEAK DETECTION SHALL ANNUNCIATE AN AUDIO/VISUAL ALARM. IF IN THE PAN OF THE OPERATING PUMP, IT SHALL STOP AND THE STAND-BY PUMP SHALL START.
5. SYSTEM DIFFERENTIAL PRESSURE WILL BE MAINTAINED BY A 2-WAY DIFFERENTIAL PRESSURE CONTROL VALVE INSTALLED IN A BYPASS LOOP AT THE PUMPS. THE VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN A SYSTEM DIFFERENTIAL PRESSURE SETPOINT (ADJUSTABLE) AS SENSED BY A PIPE MOUNTED DIFFERENTIAL PRESSURE SENSOR. DIFFERENTIAL PRESSURE SENSOR TO BE MOUNTED 3/4 DOWNSTREAM IN THE LONGEST PIPING DISTRIBUTION RUN.

EXHAUST FAN:

TOILET EXHAUST FAN SHALL BE CONTROLLED BY TIME CLOCK. IDF ROOM EXHAUST FAN SHALL BE CONTROLLED BY THERMOSTAT.

FPVAV (FPB) BOXES:

a. ELECTRICALLY CONTROLLED FPB BOXES WITH FAIL IN PLACE DAMPERS SHALL BE CONTROLLED FROM A UNIT MOUNTED PRESSURE INDEPENDENT CONTROL UNIT.
b. AN AIR FLOW SENSOR IN THE PRIMARY AIR DUCT CONNECTION SHALL START THE FPVAV BOXES BOXES INDIVIDUALLY WHEN THE RESPECTIVE BASE BUILDING AC SYSTEM IS IN OPERATION.
c. AN ELECTRONIC ROOM TEMPERATURE TRANSMITTER SHALL RESET THE FPB BOX VOLUME CONTROLLER TO MAINTAIN SET POINT (ADJUSTABLE).
d. WHEN THE SPACE TEMPERATURE RISES, THE CONTROLLER SHALL MODULATE THE TERMINAL UNIT DAMPER OPEN. AS THE SPACE TEMPERATURE DECREASES, THE TERMINAL UNIT DAMPER SHALL MODULATE TO ITS MINIMUM POSITION OF 25%, UNLESS OTHERWISE NOTED.
e. WHENEVER THE FPB BOX IS OFF, THE TERMINAL UNIT DAMPER SHALL FULLY OPEN.

CONTROLLER SHALL BE CAPABLE OF OPERATING FPB IN AN EARLY MORNING WARM-UP MODE.

PART 3- EXECUTION

3.01 A. PROVIDE AND INSTALL ALL EQUIPMENT AND ACCESSORIES OF THE SIZES AND CAPACITIES AS SCHEDULED AND AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH APPROVED SHOP DRAWINGS AND MANUFACTURERS RECOMMENDATIONS. PROVIDE ALL MOTOR STARTERS AS REQUIRED; MOTOR STARTERS WILL BE INSTALLED BY THIS CONTRACTOR AND WIRED BY ELECTRICAL TRADE.

A. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL REQUIRED CLEARANCES FOR SERVICING AND MAINTENANCE. COORDINATE REQUIREMENTS WITH ALL TRADES.

B. IDENTIFICATION OF EQUIPMENT AND CONTROLS:

1. ALL EQUIPMENT SHALL BE STENCILED OR LABELED WITH LAMACOID PLATES SCREWED THEREON WHICH SHALL INDICATE SYSTEMS SERVICE.
2. MOTOR STARTERS SHALL BE PROVIDED WITH LAMACOID PLATES WHICH INDICATE SYSTEM SERVED.
3. CONTRACTOR TO SUBMIT LIST OF EQUIPMENT TO RECEIVE LABELS AND THE COORDINATED DESIGNATIONS, SIZE OF LABEL LETTERING, PLATE SIZE AND COLOR FOR REVIEW PRIOR TO INSTALLATION.

C. FOR ALL FLOOR MOUNTED EQUIPMENT PROVIDE A 4" HIGH CONCRETE HOUSE-KEEPING PAD; WHERE FLOOR STANDS ARE INDICATED PROVIDE FLOOR STAND OF STRUCTURAL STEEL OR STEEL PIPES AND FITTINGS AND BOLT TO PAD; FOR ROOF MOUNTED EQUIPMENT PROVIDE SUPPORTS WITH APPROVED ANCHORS DIRECTLY FROM BUILDING STEEL STRUCTURE. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED TO ADEQUATELY SUPPORT THE LOAD.

3.02 CHEMICAL CLEANING AND PRETREATMENT

A. CLEANING OF PIPING SHALL BE PERFORMED IN THE PRESENCE OF A BUILDING REPRESENTATIVE.
B. PROVIDE ALL DISPERSANTS, SCALE INHIBITORS AND CORROSION INHIBITORS AS REQUIRED FOR CLEANING AND TREATING ALL PIPING SYSTEMS. CHROMATES SHALL NOT BE USED.
C. ALL CHEMICALS TO BE USED FOR PIPE CLEANING SHALL BE APPROVED BY THE BASE BUILDING CHEMICAL TREATMENT COMPANY.
D. FLUSH PIPING SYSTEMS WITH THE APPROVED CLEANING CHEMICAL TO REMOVE PIPE DOPE, SLUSHING COMPOUNDS, CUTTING OILS AND OTHER LOOSE EXTRANEOUS MATERIALS. SEAL ENDS AFTER CLEANING.
E. THE CONTRACTOR SHALL:
   1. SATISFY EACH CHEMICAL HAS THE PROPER FEED RATES FOR CLEANING AND PRETREATMENT OF EACH SYSTEM AND RECORD.
   2. CHECK THAT THE CLEANING SOLUTION IS ACTUALLY IN EACH SYSTEM.
   3. SATISFY WHEN TO FLUSH THE SYSTEM.
   4. CHECK EACH SYSTEM FOLLOWING FLUSHING TO ENSURE CLEANING CHEMICALS HAVE BEEN REMOVED FROM EACH SYSTEM AND TEST TO ENSURE PH OF NEW SYSTEM IS WITHIN 0.5 OF FRESH INCOMING WATER.
F. BLOCK MODULATING VALVES, ZONE VALVES AND OTHER SYSTEM RESTRICTIONS. PROVIDE BY PASS PIPING AND VALVING TO ISOLATE NEW AND EXISTING TO BE RE-USED EQUIPMENT SUCH AS CHILLERS, COILS, HEAT EXCHANGERS, ETC. FROM THE CLEANING PROCESS.
G. PROVIDE PORTABLE PUMPS TO CIRCULATE WATER FOR CLEANING PURPOSES AT RESPECTIVE FLOWS FOR FOUR (4) HOURS. REMOVE AND CLEAN STRAINERS. BLOW OFF LOW POINTS WITH STEAM AFTER CLEANING AND BEFORE TRAPS ARE INSTALLED. DRAIN ENTIRE SYSTEM.
H. CHEMICAL USED FOR CLEANING OF SYSTEMS SHALL COMPLY WITH THE RECOMMENDATIONS OF THE MANUFACTURERS OF THE MAJOR COMPONENTS IN THE SYSTEM AND SHALL BE APPROVED FOR USE.
I. UPON INITIAL FILL (FOLLOWING SYSTEM FLUSHING) THE APPROVED CHEMICALS WHICH PROVIDE A PROTECTIVE COATING TO PREVENT OXIDATION OF THE CLEANED SYSTEM SHALL BE ADDED.

3.03 WATER TREATMENT

C. ALL WATER TREATMENT REQUIREMENTS TO BE PROVIDED BY EXISTING BASE BUILDING WATER SYSTEM.
D. ALL CHEMICALS TO BE USED FOR WATER TREATMENT SHALL BE APPROVED BY THE BASE BUILDING.
E. PROVIDE ALL BIOCIDES AND BIODISPERSANTS AS REQUIRED TO TREAT WATER SYSTEMS FOR THE PREVENTION OF MICROBIOLOGICAL GROWTH. CHROMATES SHALL NOT BE USED.
F. PROVIDE A VENTURI CHEMICAL FEED FITTING AND SYSTEM OR EACH SYSTEM TO BE TREATED. FITTINGS SHALL BE NALCO BIODUCTOR OR APPROVED EQUAL.
G. PROVIDE ALL CONTROLS AND EQUIPMENT REQUIRED FOR AN AUTOMATIC BLEED AND CHEMICAL FEET SYSTEM.
H. AFTER CHEMICAL CLEANING AND PRETREATMENT OF PIPING SYSTEMS ANALYZE WATER SYSTEMS TO DETERMINE SPECIFIC BIOCIDES AND INHIBITORS TO BE USED.
G. ADD THE NECESSARY BLEND OF INHIBITORS, BIOCIDES AND DISPERSANTS FOR PROPER CONTROL OF CORROSION, SCALING AND MICROBIOLOGICAL GROWTH. SUBMIT IN WRITING THE RECOMMENDED FEED RATE OF ALL CHEMICALS AND BLEED RATE OF ALL SYSTEMS. USE PROPER CHEMISTRY TO PROVIDE THE FOLLOWING MINIMUM LEVELS:
   1. CLOSED SYSTEM BACTERIA COUNTS BELOW 10^3 COLONIES PER MILLILITER (AEROBIC & NON AEROBIC). PH LEVELS TO BE BETWEEN 7.0 AND 9.0 CORROSION RATE TO BE LESS THAN 1/2 MILS/YEAR STEEL, 1/10 MIL/YEAR COPPER.
   2. OPEN SYSTEM TREATMENT (CONDENSER WATER) PROVIDE AGENTS TO REDUCE SCALE DEPOSITS, TO ADJUST PH AND TO INHIBIT CORROSION. TREATMENT SHALL NOT CONTAIN ANY CHROMATES OR OTHER TOXIC SUBSTANCES. USE PROPER CHEMISTRY TO PROVIDE BACTERIA COUNTS BELOW 10^5 COLONIES PER MILLIMETER (AEROBIC AND NON-AEROBIC). PH TO BE BETWEEN 7.5 AND 8.5. CORROSION RATES TO BE LESS THAN 1 MILS/YEAR - STEEL AND 1/10 MILS/YEAR COPPER.

3.04 EQUIPMENT START-UP AND TESTING

A. UPON COMPLETION OF THE INSTALLATION, THIS CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT AND SYSTEMS ARE TESTED AND BALANCED UNDER FIELD OPERATING CONDITIONS TO DEMONSTRATE ITS COMPLIANCE WITH SPECIFICATION REQUIREMENTS.
B. SHOULD ANY PART OF THE EQUIPMENT OR SYSTEM FAIL TO MEET THE CONTRACT REQUIREMENTS, THIS CONTRACTOR SHALL ADJUST, REPAIR OR REPLACE ALL DEFECTIVE OR INOPERATIVE PARTS AND AGAIN CONDUCT THE COMPLETE START-UP TEST.
C. SUBMIT SYSTEM START UP SHEETS AND TEST RESULTS TO THE OWNER AND ENGINEER.

3.05 PERFORMANCE TESTS

C. FUNCTIONAL PERFORMANCE TESTING:

1. START UP OF SYSTEMS AND COMPONENTS SHALL BE PERFORMED BY CONTRACTORS AND MANUFACTURER TECHNICIANS AS APPLICABLE PRIOR TO FUNCTIONAL PERFORMANCE TESTING (FPT) IN THE PRESENCE OF THE CXA. ALL POWER, SAFETIES AND CONTROL INTERLOCKS SHALL BE MADE OPERATIONAL. PRE-TEST VERIFICATION BY THE CONTRACTOR OF COMPONENTS AND SYSTEMS IS MANDATORY TO VERIFY OPERATION BEFOREHAND AND AVOID LAST MINUTE CORRECTIVE WORK OR REPEAT TESTING. SUBMISSION OF PRE-FUNCTION CHECKLISTS SHALL COMMUNICATE THAT SUCH PROCESS HAS OCCURRED.
2. ONCE PRE-FUNCTION CHECKLISTS HAVE BEEN SUBMITTED TO AND REVIEWED BY THE CXA, FUNCTIONAL TESTING CAN BE SCHEDULED BY THE CXA.
3. THE CXA MUST BE KEPT INFORMED OF THE CONSTRUCTION SCHEDULE AND GIVEN TWO (2) WEEKS NOTICE OF THE ANTICIPATED FUNCTIONAL TESTING TIMEFRAME WINDOW.
4. FUNCTIONAL TESTING SHOULD FOLLOW THE SYSTEMS TESTING AND BALANCING PROCESS.
5. PERFORMANCE TEST PROCEDURES ARE INTENDED TO DEMONSTRATE AND RECORD THE PERFORMANCE OF EQUIPMENT AND SYSTEMS UNDER SAFETY AND OPERATIONAL SCENARIOS AS APPLICABLE INCLUDING:
   A) RESPONSE TO SAFETIES IN MANUAL AND AUTOMATIC MODE
   B) SIGNALS TO FIRE ALARM, SECURITY AND TENANT ALARM PANELS
   C) SEQUENCE OF OPERATION, STEP BY STEP
   D) INTERLOCK WITH OTHER PIECES OF EQUIPMENT (E.G., VALVES, LEAK DETECTORS, ETC.)
   E) CONTROL SYSTEM RESPONSE AND ANNUNCIATION OF SENSOR/MONITOR POINTS
6. THE FUNCTIONAL TESTING PROCEDURES ARE EXECUTED BY THE CONTRACTORS, UNDER THE DIRECTION OF, AND RECORDED BY THE CXA. THE CONTRACTOR SHALL PROVIDE A FIELD TECHNICIAN AND A REPRESENTATIVE FROM THE AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR TO OPERATE EQUIPMENT AND CONFIRM RESPONSES IN THE PRESENCE OF THE CXA AND OWNER'S APPOINTED REPRESENTATIVE.
7. ANY NON-COMPLIANCE ITEMS FOUND SHALL BE LISTED IN A COMMISSIONING ISSUES LOG PREPARED BY THE CXA. CONTRACTORS SHALL ENSURE THAT CORRECTIVE ACTION OF LISTED DEFICIENCIES IS IMPLEMENTED AND SHALL RESPOND UPON COMPLETION OF SUCH TO THE CXA VIA THE PROVIDED AREAS IN THE COMMISSIONING ISSUES LOG.
8. ITEMS OF NON-COMPLIANCE IN MATERIAL, INSTALLATION OR SETUP ARE CORRECTED AT THE CONTRACTOR'S EXPENSE.
9. ONCE THE CONTRACTOR INDICATES THAT ALL DEFICIENCIES HAVE BEEN ADDRESSED, THE SYSTEMS SHALL BE RETESTED.

3.06 AIR AND WATER BALANCING

A. AIR AND WATER SYSTEM BALANCING SHALL BE PERFORMED BY ADVANCED TESTING & BALANCING (CONTACT KEVIN WILTON 718-486-6764) OR AN APPROVED INDEPENDENT CERTIFIED TESTING AND BALANCING FIRM. THE TESTING AND BALANCING FIRM SHALL BE AABC, NEBB, TABB CERTIFIED OR DIRECTLY SUPERVISED BY A STAFFED LICENCED PROFESSIONAL ENGINEER WITH A MINIMUM OF FIVE YEARS EXPERIENCE. AIR AND WATER SYSTEM BALANCING SHALL BE PERFORMED IN THE PRESENCE OF A BUILDING REPRESENTATIVE.
B. MAKE ALL REQUIRED ADJUSTMENTS OF ALL NEW AND EXISTING AIR AND WATER SYSTEM DEVICES UNTIL ALL SPECIFIED PERFORMANCES ARE MET. PROVIDE NECESSARY PIPING AND CONNECTIONS FOR BALANCING ALL WATER SYSTEMS. PROVIDE VOLUME DAMPERS AS REQUIRED FOR FINAL BALANCING OF AIR SYSTEMS. PROVIDE A CLEAN SET OF AIR FILTERS AT ALL AIR CONDITIONING UNITS AND CLEAN ALL STRAINERS PRIOR TO ANY BALANCING.
C. SUBMIT AIR AND WATER BALANCING REPORTS FOR REVIEW CONSISTING OF DESIGN AND ACTUAL READINGS OF ALL EQUIPMENT/DEVICES, LOCATION PLANS OF ALL EQUIPMENT/DEVICES BALANCED, BALANCING EQUIPMENT USED AND METHODS OF BALANCING.
D. ALL REPORTS SHALL INDICATE PRELIMINARY READINGS PRIOR TO BALANCING AND FINAL READINGS AFTER BALANCING HAS BEEN COMPLETED. IF IT IS DETERMINED THAT DRIVE CHANGES ARE REQUIRED, CONTRACTOR SHALL PROVIDE ALL NECESSARY NEW COMPONENTS.
E. CONTRACTOR SHALL INCLUDE IN THEIR BID TWO (2) JOB SITE COMFORT BALANCES UPON ACCEPTANCE OF THE FINAL BALANCING REPORT.
F. CONTRACTOR SHALL SUBMIT WATER BALANCE DATA SHEETS AND REPORTS WHICH TABULATE TEST DATA FOR FINAL ADJUSTED SYSTEM CONDITIONS WITHIN 2% OF DESIGN QUANTITIES FOR SYSTEM COMPONENTS INDICATING GPM AND PRESSURE DROP AT PIPE RISERS AND MAINS; PERFORMANCE CHARACTERISTICS FOR ALL PUMPS INDICATING RPM, GPM, TDH, AMPS, SUCTION AND DISCHARGE HEAD PRESSURE, BHP AND HP AT DESIGN AND NO FLOW CONDITIONS; PRESSURE DROP ACROSS COILS, EQUIPMENT, EACH RISER AND MAIN. MARK BALANCING VALVE TAG OF BALANCED POSITION.
G. CONTRACTOR SHALL SUBMIT AIR BALANCE DATA SHEETS AND REPORTS WHICH TABULATE TEST DATA FROM FINAL ADJUSTED SYSTEM CONDITIONS WITHIN 10% OF DESIGN QUANTITIES FOR SYSTEM COMPONENTS AIR OUTLETS, RETURNS AND TERMINAL UNITS INDICATING CFM AND PRESSURE DROP AT DUCT RISERS AND MAINS; PERFORMANCE CHARACTERISTICS FOR ALL FANS AND AIR CONDITIONING EQUIPMENT INDICATING RPM, CFM, PRESSURE DROP ACROSS EACH COMPONENT (FILTERS, COILS, DAMPERS, ETC), AMPS, SUCTION AND DISCHARGE STATIC PRESSURE, OUTSIDE AIR CFM, BHP AND HP AT DESIGN CONDITIONS; AIR OUTLET DISCHARGE TEMPERATURE AND CFM; TERMINAL BOX INLET SP, MINIMUM AND MAXIMUM AIR SETTINGS.
H. BALANCING CONTRACTOR SHALL BALANCE THE SYSTEM AND ALL ITS COMPONENTS IN SUCH A WAY AS TO ENSURE THE COMPONENTS ARE TESTED AS PER ALL THE ANTICIPATED OPERATING CONDITIONS.
I. BALANCING OF INDIVIDUAL COMPONENTS WITHOUT THE ENTIRE SYSTEM OPERATING AS INTENDED PER THE SEQUENCE OF OPERATIONS SHALL BE DEEMED UNACCEPTABLE AND ANY ISSUES WITH ACHIEVING AIR OR WATER FLOWS RESULTING FROM BALANCING IN THIS MANNER SHALL BE CORRECTED BY THE INSTALLING CONTRACTOR AS NECESSARY AT NO COST TO THE CLIENT.
J. CONTRACTOR TO PROVIDE TRAVERSE READING AT BASE BUILDING MAIN SUPPLY AND RETURN SHAFTS AND PROVIDE STATIC PRESSURE READINGS DOWNSTREAM AND UPSTREAM OF ALL REHEAT/HEAT COILS AND PRV.
K. THE FINAL REPORT AFTER COMFORT BALANCE IS PERFORMED SHALL BE PROVIDED TO THE BUILDING MANAGER.
L. PRE-CONSTRUCTION AIR TESTING.

4. MEASURE PRESSURE, TEMPERATURE, AND VOLUME OF AIR FROM EXISTING BASE BUILDING RETURN AND SUPPLY AIR SYSTEMS SERVING THE SCOPE OF WORK AREA BEFORE STARTING WORK. SUBMIT REPORT TO ENGINEER IMMEDIATELY AFTER COMPLETION OF TEST.

3.07 ELECTRICAL WORK

A. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR POWER WIRING UNDER A SEPARATE DIVISION OF CONTRACT WORK. AUTOMATIC TEMPERATURE, SAFETY AND INTERLOCKING CONTROLS FOR MOTORS, MOTOR STARTERS AND OTHER ELECTRICAL APPARATUS AND DEVICES SHALL BE PROVIDED BY THE HVAC CONTRACTOR. CONTROL WIRING SHALL INCLUDE BUT NOT LIMITED TO ALL 12, 24, AND 120 VOLT WIRING.
B. THE MECHANICAL CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL TERMINAL POINT TO TERMINAL POINT, COMPLETELY COORDINATED AND INTEGRATED WIRING DIAGRAMS FOR ALL WIRING REQUIRING FIELD INSTALLATION BY THE ELECTRICAL CONTRACTOR.
C. SPECIFIC WIRING DIAGRAMS OF FACTORY INSTALLED EQUIPMENT WIRING SHALL ALSO BE SUBMITTED FOR APPROVAL AND FURNISHED TO THE ELECTRICAL CONTRACTOR FOR HIS INSTALLATION REQUIREMENTS AND OTHER USES.
D. HVAC CONTRACTOR SHALL MAINTAIN ALL EXISTING CONTROL CONNECTIONS FOR STARTERS TO BE REUSED. CONTRACTOR SHALL COORDINATE EXISTING CONDITIONS AND PROVIDE ALL CONTACTS AND RELAYS REQUIRED FOR EXISTING STARTERS TO BE REPLACED WITH NEW.
E. HVAC CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR THE INSTALLATION OF DUCT DETECTORS. DUCT DETECTOR SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR AND MOUNTED BY THE HVAC CONTRACTOR.

CLIENT
ROCKWOOD CAPITAL

ARCHITECT
Fogarty Finger
69 Walker Street
New York, NY 10013
212.966.7450
www.fogartyfinger.com

MEP/FP
ama group
825 Eighth Avenue, FL18 | New York, NY 10019
212.944.7722 | amagroupusa.com

IT/AV/SECURITY
tmt technology
825 Eighth Avenue, FL18 | New York, NY 10019
212.398.2424 | tmtechpartners.com

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Longman Lindsey
200 West 41st Street, Suite 1100 | New York, NY 10036
212.315.6400 | longmanlindsey.com

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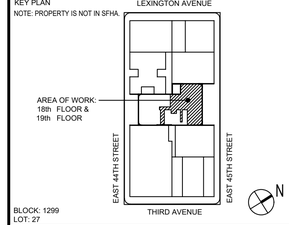

BLOCK: 1299
LOT: 27

No.	Date	Issue
04	05/02/2024	ISSUED FOR BULLETIN 1
03	11/27/2023	ISSUED FOR BID + FILING
02	11/21/2023	ISSUED FOR 90% BD
01	11/14/2023	ISSUED FOR PROGRESS

PROJECT

2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

DRAWING TITLE

MECHANICAL SPECIFICATION SHEET NO.3

SEAL AND SIGNATURE

DATE (MM.DD.YY): 05-02-24
PROJECT No.: G050-01-119
ENGINEER: EK
PROJECT MANAGER: RK
DWG. No.:
M-103.00
SCALE: NOT TO SCALE
04 OF 10

DOB DRAWING NUMBER: M00979855-I1

Filename: U:_AMA Projects\G0500-01-119 - 2 GCT - 18th Floor Amenity Space\DWG\HVAC\G050011919-M101.102.103_MECHANICAL SPEC.dwg By: ERCAN KOCABASOGLU On: May 2, 2024 At: 12:00 PM Page: ARCH D (36.00 X 24.00 INCHES)

WATER SIDE ECONOMIZER HEAT PUMP UNIT SCHEDULE

DESIGNATION	CAPACITY: NOMINAL TONS	CAPACITY: TOTAL (MBH)	CAPACITY: SENSIBLE (MBH)	CAPACITY: HEATING (MBH)	CONDENSER WATER FLOW: GPM	CONDENSER WATER FLOW: MAX PD (FT)	CONDENSER WATER FLOW: EWT (°F)	CONDENSER WATER FLOW: LWT (°F)	ECONOMIZER DATA: TC (BTU)	ECONOMIZER DATA: SC (BTU)	ECONOMIZER DATA: EWT (°F)	AIR FLOW: ESP	AIR FLOW: ENTERING AIR DB (°F)	AIR FLOW: ENTERING AIR WB (°F)	AIR FLOW: VFD	AIR FLOW: CFM	FAN RPM	FAN MOTOR HP	ELECTRICAL V/Ø/Hz	MCA	MFS	FLA	OPERATING WEIGHT (LBS)	EER	COR	MANUFACTURER/ MODEL	COMMENTS
AC-18-1	5	58.5	39.1	80.4	15	-	85	95	35	32	50	0.9	80	67	N/A	1780	-	-	460/3/60	11.9	15	9.9	1041	13.9	4.4	CLIMATE MASTER TC-060	ULTRA QUITE UNIT WATER COOLED ECONOMIZER

HEAT PUMP UNIT SCHEDULE NOTES (TYPICAL FOR EACH UNIT):

1. PROVIDE FACTORY INSTALLED CONTROLS.
2. PROVIDE SPRING TYPE VIBRATION UNDER UNIT.
3. PROVIDE FACTORY SUPPLIED INTEGRAL DISCONNECT AND START/STOP CONTACTS
4. UNIT SHALL BE PROVIDED WITH ECONOMIZER COILS
5. ALL UNITS WITH ECONOMIZER COILS TO HAVE FACTORY INSTALLED AUTOMATIC FLUSH CYCLE.
6. ALL UNITS TO BE CAPABLE FOR BOTH HEATING AND COOLING OPERATION.
7. PROVIDE WITH PROGRAMMABLE HEATING/COOLING THERMOSTAT.
8. UNIT TO BE RATED FOR SYSTEM PRESSURE.
8. PROVIDE BACNET NETWORK CARD

CONTRACTOR TO PROVIDE DISCONNECT SWITCH, THERMOSTAT, DRAIN PAN, CONDENSATE PUMP, LEAK DETECTOR & SMOKE DETECTORS

AIR OUTLET SCHEDULE

DESIGNATION	DESCRIPTION	NECK SIZE	FRAME SIZE	CFM RANGE	MAX NC	MANUFACTURER/ MODEL	COMMENTS
A	PLAQUE TYPE SUPPLY DIFFUSER	8"Ø	24"x24"	0-200	<20	TITUS/ OMNI	LAY-IN COORD. W/ CEILING TYPE
	PLAQUE TYPE SUPPLY DIFFUSER	10"Ø	24"x24"	201-350	<20	TITUS/ OMNI	LAY-IN COORD. W/ CEILING TYPE
	PLAQUE TYPE SUPPLY DIFFUSER	12"Ø	24"x24"	351-450	<20	TITUS/ OMNI	LAY-IN COORD. W/ CEILING TYPE
	PLAQUE TYPE SUPPLY DIFFUSER	14"Ø	24"x24"	451-600	<20	TITUS/ OMNI	LAY-IN COORD. W/ CEILING TYPE
	PLAQUE TYPE SUPPLY DIFFUSER	15"Ø	24"x24"	601-750	<20	TITUS/ OMNI	LAY-IN COORD. W/ CEILING TYPE
B	PLAQUE TYPE SUPPLY DIFFUSER	8"Ø	12"x12"	0-200	<20	TITUS/ OMNI	SURFACE MOUNT, G.C. TO CUT CEILING TILE AS REQUIRED
C	LINEAR SUPPLY DIFFUSER	(2) 1" SLOT		0-80	22	TITUS FL-HT-10	VERTICAL MOUNT CONTINUOUS LINEAR
D	LINEAR SUPPLY DIFFUSER	(2) 1" SLOT		0-80	22	TITUS FL-HT-10	VERTICAL MOUNT CONTINUOUS LINEAR
C1	LINEAR SUPPLY DIFFUSER	(2) 1" SLOT		0-80	22	TITUS FL-HT-10	HORIZONTAL MOUNT CONTINUOUS LINEAR
D1	LINEAR SUPPLY DIFFUSER	(2) 1" SLOT		0-80	22	TITUS FL-HT-10	HORIZONTAL MOUNT CONTINUOUS LINEAR
E	LINEAR SUPPLY DIFFUSER	(1) 1 $\frac{1}{2}$" SLOT		0-80	22	TITUS FL-HT-15	VERTICAL/HORIZONTAL MOUNT CONTINUOUS LINEAR
F	LINEAR RETURN DIFFUSER	(1) 1 $\frac{1}{2}$" SLOT		0-80	22	TITUS FL-HT-15	VERTICAL/HORIZONTAL MOUNT CONTINUOUS LINEAR
G	CEILING RETURN/ EXHAUST GRILLE	22"x22"	24"x24"	0-1570	<20	TITUS/ 355RL	$\frac{1}{2}$" SPACING, 35° DEFLECTION PROVIDE LIGHT SHEILD
I	CEILING RETURN/ EXHAUST GRILLE	10"x22"	12"x24"	0-730	<20	TITUS/ 355RL	$\frac{1}{2}$" SPACING, 35° DEFLECTION, PROVIDE LIGHT SHEILD
J	CEILING EXHAUST GRILLE	10"x10"	12"x12"	0-325	<20	TITUS/ 355RL	$\frac{1}{2}$" BLADE SPACING, 35° DEFLECTION
-	- -	-	-	-	-	- -	- -

AIR OUTLET SCHEDULE NOTES (TYPICAL FOR EACH OUTLET):

1. INSTALL FOUR (4) WAY DIFFUSER UNLESS OTHERWISE NOTED. PROVIDE BLANK OFF BAFFLES FOR DIFFUSERS SHOWN TO HAVE 2-WAY AND 3-WAY PATTERNS. INCREASE NECK SIZES AS REQUIRED TO COMPENSATE FOR BLANKED-OFF AREA.
2. DIFFUSERS SHALL BE SUITABLE FOR THE TYPE OF CEILING CONSTRUCTION BEING INSTALLED IN.
3. DIFFUSERS THAT SERVE AREAS WITHOUT HUNG CEILINGS SHALL BE SUITABLE FOR DUCTWORK MOUNTING.
4. ALL ADJUSTABLE AIR OUTLET PATTERN DEFLECTORS SHALL BE FIELD ADJUSTED TO OPTIMIZE AIR DISTRIBUTION PREVENTING DRAFT CONDITIONS. CONTRACTOR SHALL PLAN FOR A SECOND COMFORT FIELD ADJUSTMENT PER OWNER/ENGINEER DIRECTION.
5. PROVIDE CABLE OPERATED DAMPERS FOR LINEAR DIFFUSERS AND DIFFUSERS IN INACCESSIBLE CEILINGS.
6. NON-ACTIVE LENGTHS OF LINEAR DIFFUSERS TO BE USED AS RETURN. PROVIDE LIGHT SHIELDS.
7. FINISHES SHALL BE AS SPECIFIED BY THE ARCHITECT.
8. SEE EQUIPMENT SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SERIES FAN POWERED BOXES SCHEDULE

DESIGNATION	MANUFACTURER BOX SIZE	MAX. SET POINT CFM RANGE OF VALVE: LOW	MAX. SET POINT CFM RANGE OF VALVE: HIGH	SET POINT OF FAN: LOW	SET POINT OF FAN: HIGH	MIN. MOTOR HP HIGH POWER	MIN. SP @ BOX @ MAX. CFM (BOX ONLY)	INLET AND OUTLET SIZES: IN	INLET AND OUTLET SIZES: OUT	ELECTRICAL: V/Ø/Hz	ELECTRICAL: FLA	MANUFACTURER/ MODEL	REMARKS
FPB-A	3	190	750	190	525	1/3	0.1	8	8	277/1/60	-	TITUS AFLS	WITH ECM
FPB-B	4	250	1200	250	750	(2) 1/3	0.1	10	8	277/1/60	-	TITUS AFLS	WITH ECM
FPB-C	A	70	300	70	225	1/3	0.1	8	8	277/1/60	-	TITUS ATFS	WITH ECM

FAN POWERED BOX SCHEDULE NOTES:

1. REFER TO FLOOR PLANS FOR ACTUAL QUANTITY OF FAN POWERED BOXES.
2. ALL FAN POWERED BOXES SHALL BE PROVIDED WITH STARTER & DISCONNECT SWITCHES.
3. BOXES SHALL BE PROVIDED WITH PRESSURE INDEPENDENT ELECTRONIC CONTROLLERS MULTIPOINT CENTER AVERAGING INLET SENSORS.
4. FAN CONTROL PACKAGE SHALL BE PROVIDED WITH AN ELECTRONIC FAN SPEED CONTROLLER.
5. INSTALL CLEAN AIR FILTERS PRIOR TO BALANCING.
6. PROVIDE ECM FAN MOTOR.
7. PERFORMANCE BASED ON 0.4" SP UPSTREAM OF THE FAN POWERED BOX INLET.
8. BOXES SHALL BE PROVIDED WITH ELECTRONIC THERMOSTAT. PROVIDE EARLY MORNING WARM-UP CAPABILITY.
9. ALL BRANCH DUCTWORK UPSTREAM OF THE TERMINAL UNIT SHALL BE EQUAL TO THE INLET SIZE OF THE TERMINAL UNIT, UNLESS OTHERWISE NOTED.
10. MAXIMUM PRIMARY AIR QUANTITIES TO BE 75% OF FAN CFM, UNLESS OTHERWISE NOTED.
11. U.O.N. EACH BOX SHALL HAVE A PRIMARY AIR MINIMUM SETPOINT OF 25%.
12. REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION

CONDENSATE PUMP SCHEDULE

DESIGNATION	SERVICE	TANK CAPACITY	GPH	TDH (FT)	RPM	BHP	MOTOR HP	ELECTRICAL V/Ø/Hz	WEIGHT (LBS.)	MANUFACTURER/ MODEL	UL LISTING	COMMENTS
CP	AC EQUIPMENT	1 QUART	38	12	3000	-	1/10	120/1/60	5	HARTELL KL-1DG-115	UL2043 PLENUM RATED	-

PUMP SCHEDULE NOTES (TYPICAL FOR EACH PUMP):

1. PROVIDE COMBINATION DISCONNECT SWITCH AND STARTER AS REQUIRED.
2. PROVIDE AUXILIARY SAFETY SWITCH.
3. PROVIDE 1" INLET SIZE AND BUILT IN CHECK VALVE.
4. SEE EQUIPMENT SPECIFICATIONS FOR ADDITIONAL INFORMATION.

PUMP SCHEDULE

DESIGNATION	SERVICE	TYPE	GPM	TDH (FT)	RPM	BHP	MOTOR HP	ELECTRICAL V/Ø/Hz	WEIGHT (LBS.)	MANUFACTURER/ MODEL	COMMENTS
CWP-18-1 CWP-18-2 (STAND BY)	WATER COOLED AC UNITS	INLINE	15	40	1800	N/A	1/2	460/3/60	114	GRUNDFOS CR5-7-DOL7-4P	W / VARIABLE FREQUENCY DRIVE

PUMP SCHEDULE NOTES (TYPICAL FOR EACH PUMP):

1. PROVIDE SPRING TYPE VIBRATION AT PUMP.
2. PROVIDE COMBINATION DISCONNECT SWITCH AND STARTER AS REQUIRED.
3. PROVIDE DRIP PAN UNDER EACH IN-LINE PUMP WITH LEAK DETECTOR.
4. PUMPS TO BE RATED FOR SYSTEM PRESSURE.
5. SEE EQUIPMENT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
6. MECHANICAL CONTRACTOR TO VERIFY SUPPLY AND RETURN DIFFERENTIAL PRESSURE OF EXISTING RISERS IN FIELD AT POINT OF CONNECTION AND SUBMIT PRESSURE READINGS WITH PUMP SHOP SUBMITTALS FOR REVIEW AND RECORD.
7. ALL MOTORS SHALL BE WITH PREMIUM MOTOR EFFICIENCY.
8. PROVIDE VFD LEAD LAG PANEL TO PUMPS. IT SHALL BE DOLPHIN-DPV WITH BUILT IN VFD SINGLE POINT OF CONNECTION AND 2 PRESSURE SENSORS
9.
10. UNITS BE RATED FOR SYSTEM PRESSURE, 300 PSI
11. CONTRACTOR TO PROVIDE A COMMON DRAIN PAN AND LEAK DETECTOR TO EACH PUMP.

PIPING MATERIAL SCHEDULE

SERVICE	SIZE	MATERIAL	WEIGHT	STANDARD	JOINT TYPE
COLD CONDENSATE DRAINS, MISCELLANEOUS DRAINS AND OVERFLOWS	2" & BELOW	HARD COPPER	TYPE 'L'	ASTM A88	BRAZE OR SILVER SOLDER
	2i" & ABOVE	GALVANIZED STEEL	SCHEDULE 40	ASTM A53 SEAMLESS GRADE B	WELDED
CONDENSER WATER	4" & BELOW	HARD COPPER	TYPE 'K'	ASTM B88	BRAZE OR SILVER SOLDER

PIPING MATERIAL NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

PIPING FITTING SCHEDULE

PIPE MATERIAL	PIPE SIZE	JOINT TYPE	FITTING MATERIAL	FITTING CLASS
COPPER TUBING HARD DRAWN	4" & SMALLER	SOLDER 95-5 TINANTIMONY ASTM B32 GR 95 TA SILVER SOLDER ASTM B32 GR 95 TS	WROUGHT COPPER OR CAST COPPER	300 PSIG AT 100°F, 150 PSIG AT 250°F
		BRAZING	WROUGHT COPPER	450 PSIG AT 100°F TO 200°F, 150 PSIG AT 250°F

PIPING FITTING NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

EXHAUST/TRANSFER FAN SCHEDULE

DESIGNATION	SERVICE	CFM (1)	STATIC PRESSURE (IN W.G.)	ELECTRICAL V/Ø/Hz	MOTOR (WATTS OR HP)	DRIVE (BELT OR DIRECT)	VFD	CONTROL (SWITCH OR THERMOSTAT)	WEIGHT	MANUFACTURER/ MODEL	COMMENTS
TEF-18-1	TOILETS	200	0.8	120/60/1	94	DIRECT	N/A	TIMECLOCK	24	GREENHECK CSP-A390-VG	-
EF-18-1	IT ROOM	300	0.3	120/60/1	55	DIRECT	N/A	THERMOSTAT	24	GREENHECK SP-A390-VG	-

EXHAUST FAN SCHEDULE NOTES (TYPICAL FOR EACH FAN):

1. PROVIDE FACTORY SUPPLIED VARIABLE SPEED SWITCH MOUNTED TO FAN CASING.
2. PROVIDE INTEGRAL DISCONNECT SWITCH.
3. SEE EQUIPMENT SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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ARCHITECT

Fogarty Finger
69 Walker Street
New York, NY 10013
212.966.7450
www.fogartyfinger.com

MEP/FP

ama group
825 Eighth Avenue, FL18 | New York, NY 10019
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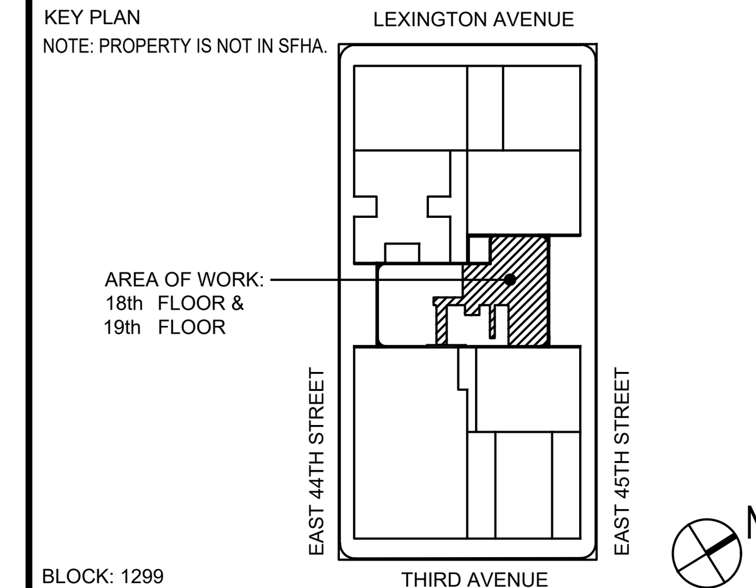

BLOCK: 1299
LOT: 27

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03	11/27/2023	ISSUED FOR BID + FILING
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PROJECT

2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

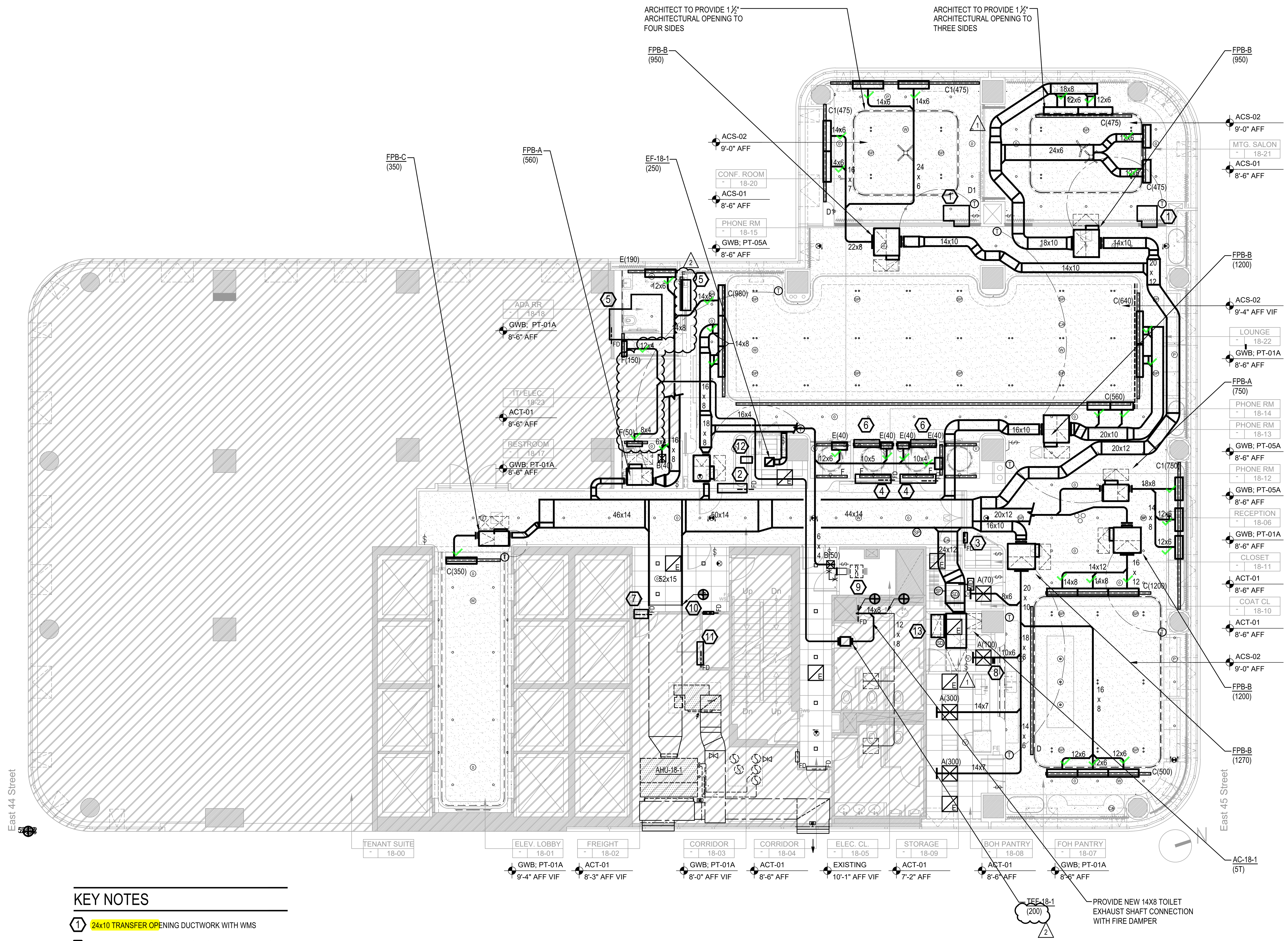
DRAWING TITLE

MECHANICAL SCHEDULE

SEAL AND SIGNATURE

DATE (MM-DD-YY):	05-02-24
PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK
DWG. No.:	M-401.00
SCALE: NOT TO SCALE	- OF -

DOB DRAWING NUMBER: M00979855-I1



NOTES

1. ALL WORK SHALL CONFORM TO THE LATEST BUILDING STANDARDS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN A COPY OF THE BUILDING STANDARDS AND MEET WITH BUILDING MANAGEMENT IN ORDER TO BECOME TOTALLY FAMILIAR WITH THE BUILDING CONSTRUCTION RULES. THERE SHALL BE NO DEVIATION FROM THE BUILDING STANDARDS WITHOUT PRIOR WRITTEN APPROVAL FROM THE BUILDING MANAGEMENT.
2. WHEN MECHANICAL WORK IS SUBCONTRACTED IT SHALL BE THE MECHANICAL CONTRACTORS RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT. IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
3. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR AND COORDINATED WITH THE GENERAL CONTRACTOR FOR COORDINATION AMONG ALL TRADES.
4. PROVIDE ALL MATERIALS, EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
5. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
6. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
7. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR THE FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATIONS.
8. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATELY ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
9. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO GENERAL CONTRACTOR INSTALLATION.
10. ALL DUCTWORK AND EQUIPMENT SUPPORTED FORM STRUCTURAL STEEL SHALL BE COORDINATED WITH GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING SMACNA STANDARDS.
11. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM METAL DECK.
12. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC, SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL AS SPECIFIED IN THE ARCHITECTURAL DOCUMENTS
13. CERTAIN ITEMS SUCH AS RISERS AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS. LOCATIONS OF ALL SUCH ITEMS SHALL BE INDICATED ON SHOP DRAWINGS BY THE INSTALLING CONTRACTOR FOR REVIEW AND APPROVAL DRING THE SHOP DRAWING PROCESS.
14. EXACT LOCATIONS OF ALL THERMOSTATS SHALL BE AS PER ARCHITECT/ENGINEER. REFER TO ARCHITECTURAL DWGS FOR THERMOSTAT MOUNTING HEIGHT. MECHANICAL CONTRACTOR SHALL SUBMIT THERMOSTAT LOCATIONS FOR REVIEW PRIOR TO INSTALLATION.
15. FLEXIBLE DUCTWORK, MAXIMUM OF THREE FEET, IS PERMITTED ONLY FOR CONNECTION TO DIFFUSERS. REFER TO MECHANICAL SPECIFICATIONS FOR EXACT REQUIREMENTS OF ALL FLEXIBLE DUCTWORK AND FLEXIBLE CONNECTIONS.
16. FLEXIBLE CONNECTIONS TO THE SUPPLY DUCTS & CEILING DIFFUSERS SHALL BE SEALED WITH 3M COMPANY SCOTCH SEALANT 800 & CLAMPED WITH STAINLESS STEEL IDEAL TYPE 52 CLAMP.
17. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS. REFER TO MECHANICAL SPECIFICATIONS FOR EXACT REQUIREMENTS OF ALL INSULATION AND/OR DUCT LINING.
18. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS.
19. LOCATE ALL MECHANICAL EQUIPMENT (SINGLE DUCT, DUAL DUCT VARIABLE VOLUME, CONSTANT VOLUME AND FAN POWERED BOXES, FAN COIL UNITS, CABINET HEATERS, UNIT HEATERS, UNIT VENTILATORS, COILS, STEAM HUMIDIFIERS, ETC.) FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS AND VALVING.
20. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN, AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.
21. ALL DUCTWORK SHALL BE INSTALLED AT MAXIMUM HEIGHTS ALLOWABLE OR AS REQUIRED TO CLEAR NEW CEILING. DUCTWORK SHALL BE OFFSET AS REQUIRED TO AVOID CONFLICTS EVEN IF NOT SPECIFICALLY INDICATED ON PLAN.
22. PROVIDE ALL REQUIRED BRANCH SUPPLY DUCTWORK TO SERVE NEW AIR OUTLETS IN LOCATIONS INDICATED. ALL AIR OUTLETS SHALL BE PROVIDED WITH VOLUME DAMPERS OR CABLE OPERATED DAMPERS.
23. PROVIDE NEW TRANSITION SECTIONS AS REQUIRED TO CONNECT EXISTING DUCTWORK TO NEW DIFFERING IN SIZE.
24. ALL SUPPLY DUCTWORK SHOWN TO HAVE ROUND DIMENSIONS SHALL BE SPIRAL ROUND DUCTWORK.
25. MOUNT ALL SUPPLY REGISTERS AT SAME ELEVATION. ELEVATIONS SHALL BE INDICATED ON THE SHEETMETAL SHOP DWGS FOR REVIEW BY ARCHITECT/ENGINEER.
26. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, HUMIDIFIERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/OR INSPECTION.
27. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MOUNTING THE SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH MANUFACTURERS PRINTED INSTRUCTIONS.
28. MECHANICAL CONTRACTOR TO TAKE PRE-CONSTRUCTION AIR READINGS AT ALL BASE BUILDING MAIN DUCTWORK SERVING SCOPE OF WORK AREA. INCLUDE KEYED PLAN SHOWING READING LOCATIONS AND SUBMIT TO ENGINEER PRIOR TO PRODUCTION OF SHEET METAL SHOP DWGS. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
29. AIR BALANCING WORK SHALL BE WITNESSED BY THE BUILDING'S CHIEF ENGINEER OR HIS REPRESENTATIVE AND A COPY OF THE CERTIFIED BALANCING REPORT SHALL BE SUBMITTED TO THE BUILDING MANAGEMENT. PROVIDE 48 HOUR NOTICE TO BUILDING MANAGEMENT FOR THIS WORK.
30. MECHANICAL CONTRACTOR TO BALANCE SCOPE OF WORK TO NEW AIR AND WATER QUANTITIES INDICATED UPON PROJECT COMPLETION. BALANCING TO BE PERFORMED BY BASE BUILDING APPROVED CONTRACTOR.
31. CONTRACTOR TO PROVIDE TRAVERSE VOLUMETRIC, STATIC PRESSURE AND TEMPERATURE READINGS AT ALL BASE BUILDING MAIN SUPPLY, RETURN AND EXHAUST SHAFTS. READINGS TO BE INCLUDED IN FINAL BALANCING REPORT.

KEY NOTES

1. 24x10 TRANSFER OPENING DUCTWORK WITH WMS
2. 44x12 TRANSFER OPENING DUCTWORK WITH FD & WMS
3. 16x12 TRANSFER OPENING DUCTWORK WITH FD & WMS
4. 54x12 TRANSFER OPENING DUCTWORK WITH FD & WMS
5. 48x13 TRANSFER OPENING DUCTWORK WITH FD & WMS
6. 40x11 TRANSFER OPENING DUCTWORK WITH WMS
7. 22x12 TRANSFER OPENING DUCTWORK WITH WMS & FD
8. LOCAL ALARM PANEL RCM-4
9. SHIFT THE EXISTING EXHAUST FAN NOT TO BE IN CONFLICT WITH NEW WALL. EXTEND EXISTING CONTROL WIRING AND DISCHARGE DUCTWORK. CUT DISCHARGE DUCTWORK IN CORRIDOR AND PROVIDE WMS
10. 16X10 TRANSFER OPENING DUCTWORK WITH FIRE DAMPER & WMS
11. 36X10 TRANSFER OPENING DUCTWORK WITH FIRE DAMPER & WMS
12. 16X8 TRANSFER OPENING DUCTWORK WITH WMS
13. 36x20 RETURN AIR PLENUM WITH SMOKE DETECTOR AND WMS. PROVIDE 32x16 OPENING AT BELOW

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New York, NY 10013
212.966.7450
www.fogartyfinger.com

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212.944.7722 | amagroupusa.com

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tmt technology
825 Eighth Avenue, FL18 | New York, NY 10019
212.398.2424 | tmtechpartners.com

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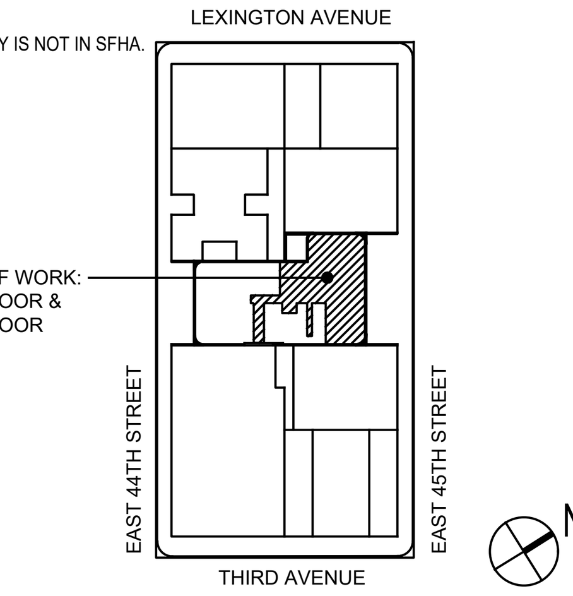
KEY PLAN
NOTE: PROPERTY IS NOT IN SFHA.



BLOCK: 1299
LOT: 27

No.	Date	Issue
05	05/02/2024	ISSUED FOR BULLETIN 1 (2)
04	12/14/2023	ISSUED FOR ADDENDUM 1 (1)
03	11/27/2023	ISSUED FOR BID + FILING
02	11/21/2023	ISSUED FOR 90% BD
01	11/14/2023	ISSUED FOR PROGRESS

PROJECT
2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

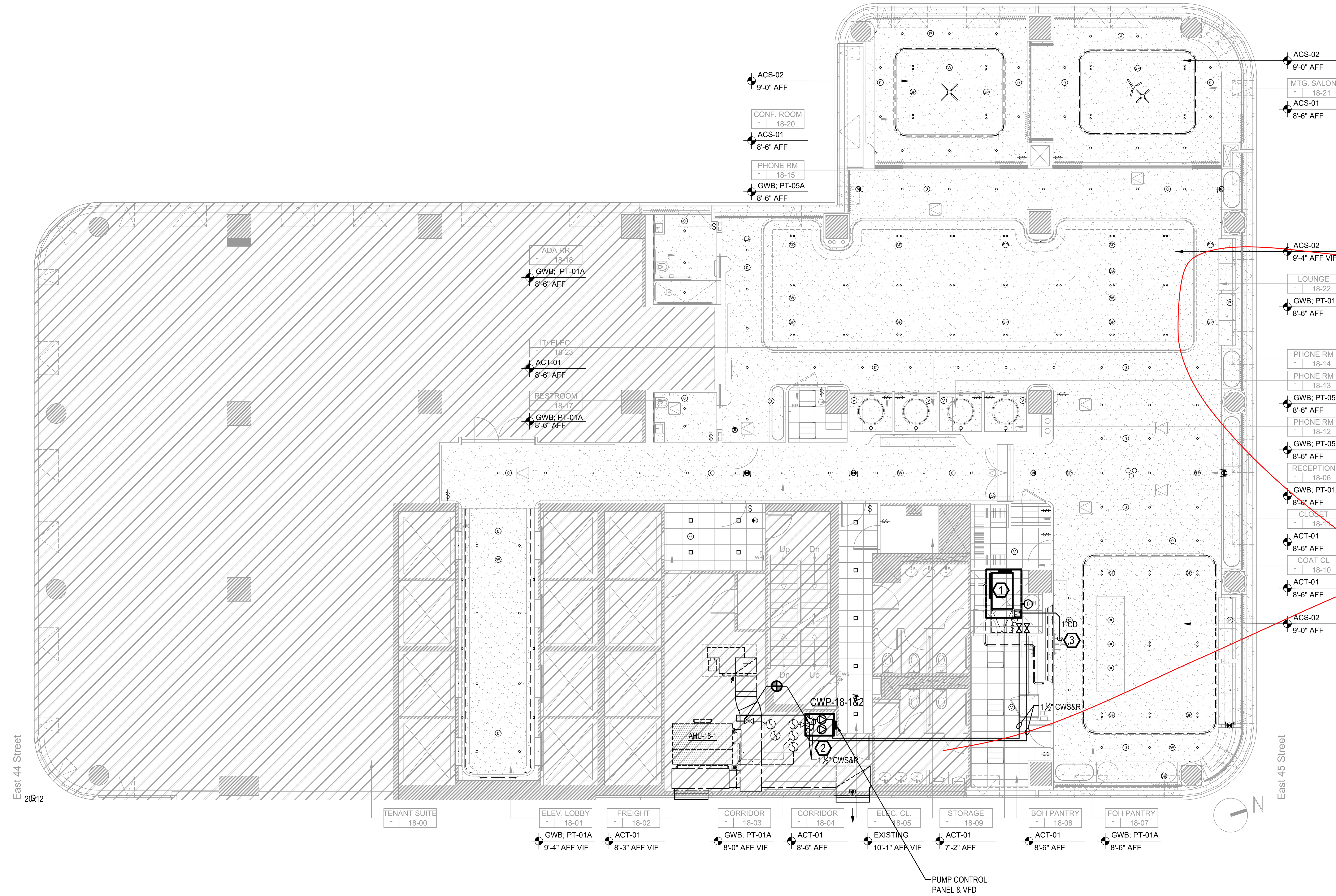
DRAWING TITLE
MECHANICAL 18TH FLOOR PLAN

SEAL AND SIGNATURE

DATE (MM-DD-YY):	05-02-24
PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK
DWG. No.:	M-501.00
SCALE: 1/8" = 1'-0"	06 OF 10

DOB DRAWING NUMBER: M00979855-I1

Filename: U:_AMA\Projects\G\G050-01-119 - 2 GCT - 18th Floor Amenity Space\DWGs\HVAC\G05001119-M501_18TH FL PLAN.dwg By: ERCAN KOCABASOGLU On: May 2, 2024 At: 12:00 PM



NOTES

1. ALL WORK SHALL CONFORM TO THE LATEST BUILDING STANDARDS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN A COPY OF THE BUILDING STANDARDS AND MEET WITH BUILDING MANAGEMENT IN ORDER TO BECOME TOTALLY FAMILIAR WITH THE BUILDING CONSTRUCTION RULES. THERE SHALL BE NO DEVIATION FROM THE BUILDING STANDARDS WITHOUT PRIOR WRITTEN APPROVAL FROM THE BUILDING MANAGEMENT.
2. WHEN MECHANICAL WORK IS SUBCONTRACTED IT SHALL BE THE MECHANICAL CONTRACTORS RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT. IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
3. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR AND COORDINATED WITH THE GENERAL CONTRACTOR FOR COORDINATION AMONG ALL TRADES.
4. PROVIDE ALL MATERIALS, EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
5. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
6. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
7. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO AND WITHIN 50 FEET OR 50 PIPE DIAMETERS IF ISOLATED EQUIPMENT REFER TO SPECIFICATIONS FOR EXACT REQUIREMENTS OF ALL PIPING, DUCTWORK AND EQUIPMENT VIBRATION ISOLATION.
8. LOCATE ALL TEMPERATURE, PRESSURE AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER.
9. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL PIPING TRANSITIONS REQUIRED FOR THE FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATIONS.
10. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATELY ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
11. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO GENERAL CONTRACTOR INSTALLATION.
12. ALL DUCTWORK AND EQUIPMENT SUPPORTED FORM STRUCTURAL STEEL SHALL BE COORDINATED WITH GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING SMACNA STANDARDS.
13. MECHANICAL EQUIPMENT, PIPING SHALL NOT BE SUPPORTED FROM METAL DECK.
14. ALL OPENINGS IN FIRE WALLS DUE TO PIPING, CONDUIT, ETC, SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL AS SPECIFIED IN THE ARCHITECTURAL DOCUMENTS
15. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FORM EACH AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH " P" TRAP, AND PIPED TO NEAREST DRAIN. SEE DETAILS SHOWN ON THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR DEPTH OF AIR CONDITIONING CONDENSATE TRAP.
16. ALL WATER SYSTEMS (COILS, VALVES, PUMPS, PIPING AND FITTINGS, ETC.) SHALL BE RATED FOR 300 PSIG WORKING PRESSURE.
17. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF STRUCTURE OF SLAB, WITH SPACE FOR INSULATION OF REQUIRED.
18. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
19. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS).
20. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS.
21. PROVIDE FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS, CHILLERS, COOLING TOWERS, AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION EXCEPT WATER COILS.
22. NEW HYDRONIC SYSTEMS SHALL BE CHEMICALLY CLEANED AND FLUSHED IN THE PRESENCE OF THE BUILDING MANAGEMENT'S REPRESENTATIVE USING CHEMICAL IN ACCORDANCE WITH BUILDING'S CHEMICAL TREATMENT COMPANY'S RECOMMENDATION.

KEY NOTES

1. PROVIDE DRAIN PAN, CONDENSATE PUMP AND LEAK DETECTOR
2. PROVIDE DRAIN PAN AND LEAK DETECTOR
3. SPILL 1" CONDENSATE LINE OVER FUNNEL DRAIN

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KEY PLAN
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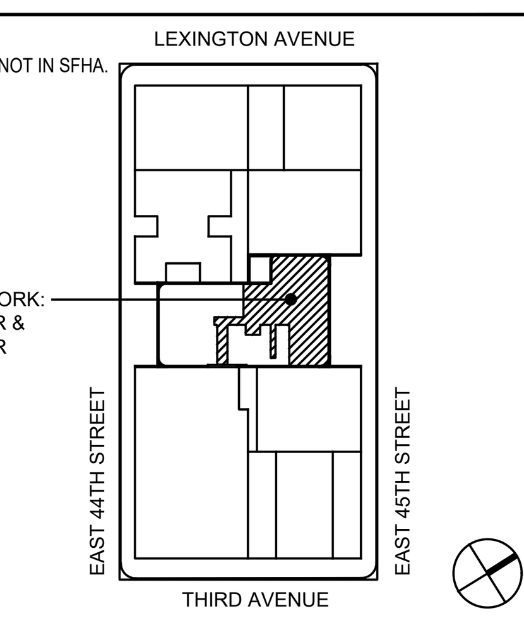


BLOCK: 1299
LOT: 27

No.	Date	Issue
04	05/02/2024	ISSUED FOR BULLETIN 1
03	11/27/2023	ISSUED FOR BID + FILING
02	11/21/2023	ISSUED FOR 90% BD
01	11/14/2023	ISSUED FOR PROGRESS

PROJECT

2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

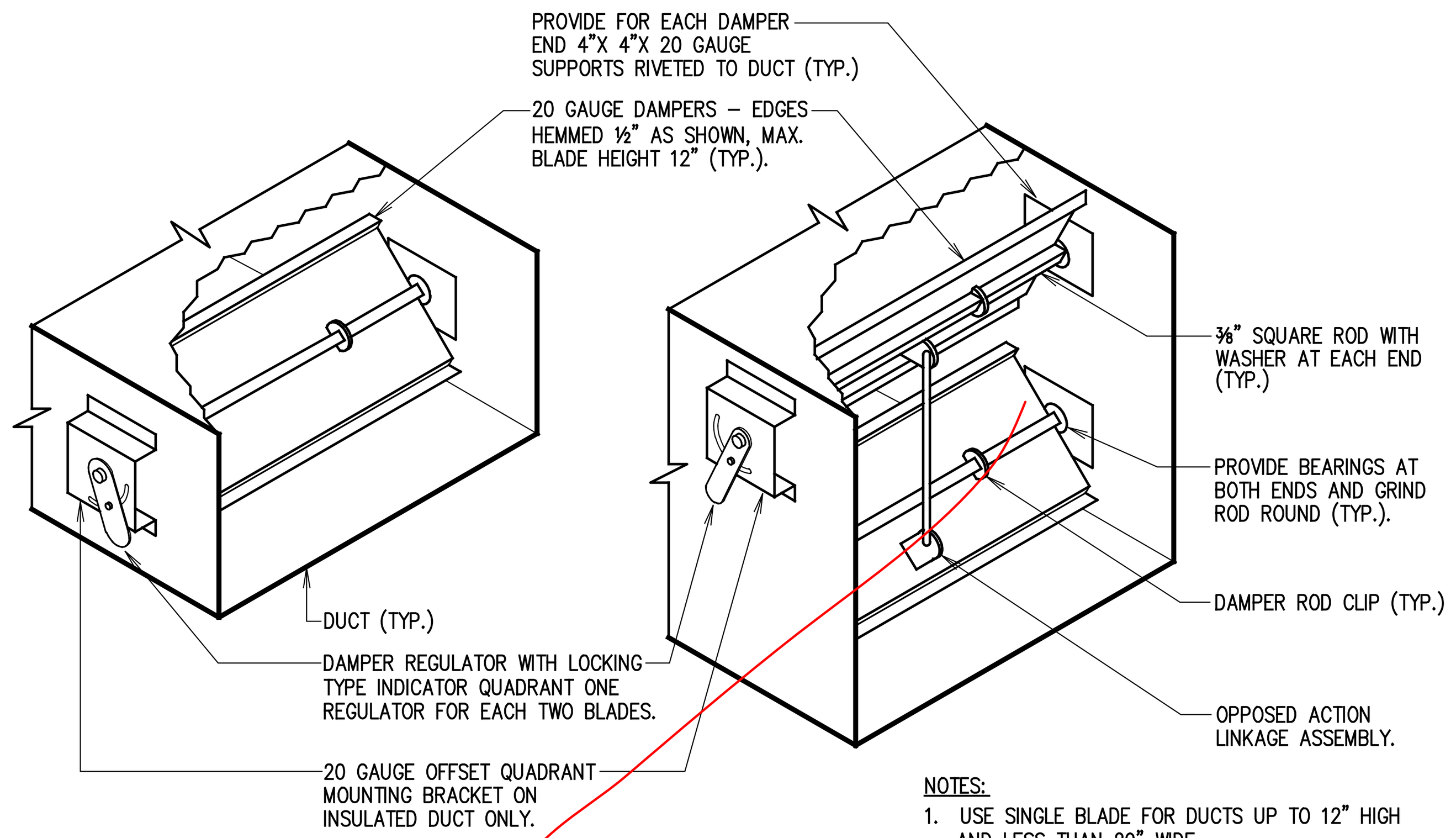
DRAWING TITLE

MECHANICAL 18TH FLOOR PIPING PLAN

SEAL AND SIGNATURE

DATE (MM-DD-YY):	05-02-24
PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK
DWG. No.:	M-601.00
SCALE: 1/8" = 1'-0"	07 OF 10

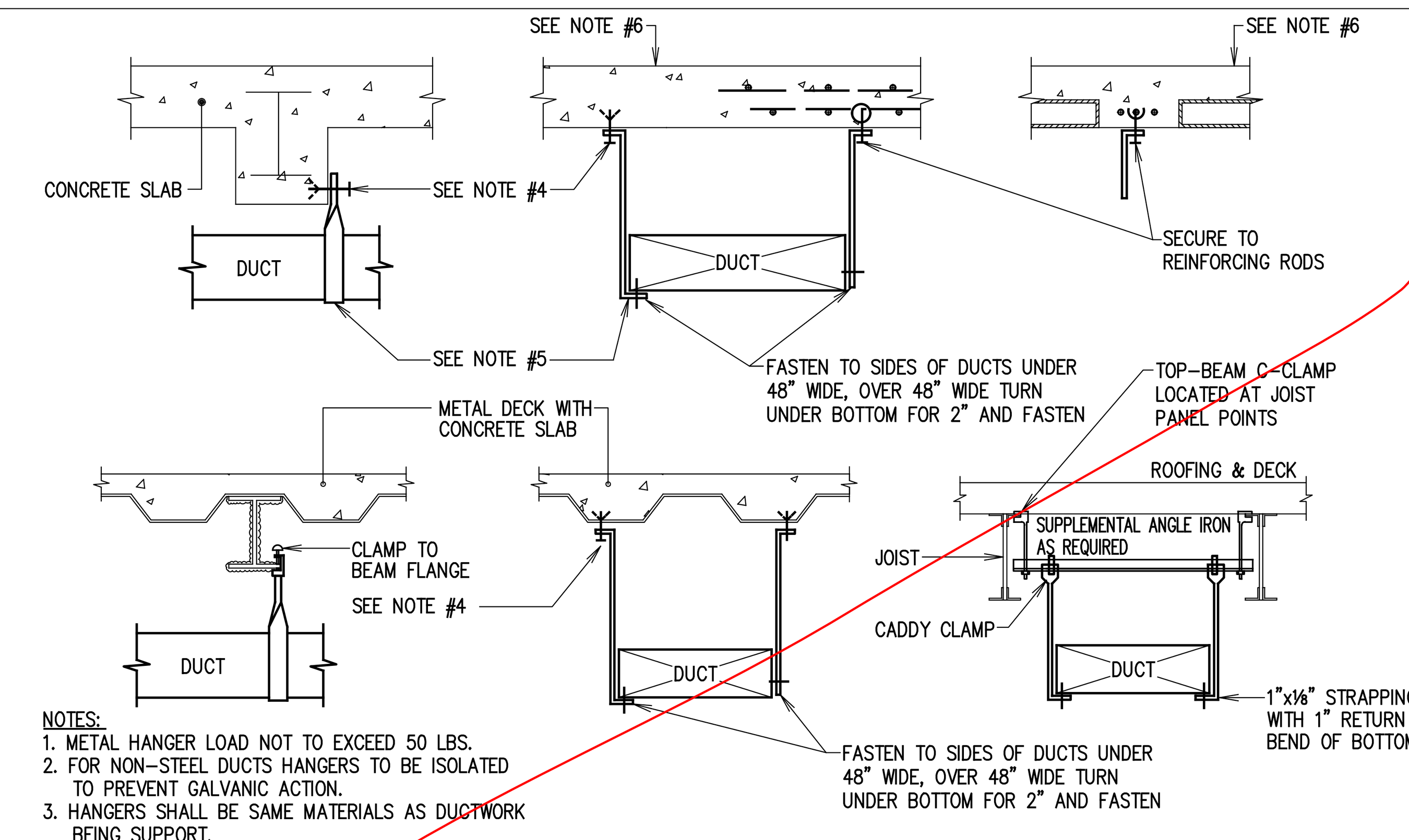
DOB DRAWING NUMBER: M00979855-I1



NOTES:
1. USE SINGLE BLADE FOR DUCTS UP TO 12" HIGH AND LESS THAN 29" WIDE.
2. USE MULTIPLE BLADES FOR DUCTS GREATER THAN OR EQUAL TO 29" AND/OR OVER 12" HIGH.
3. PROVIDE DAMPERS FOR ALL BRANCH DUCT SERVING AIR DEVICES.

LOW PRESSURE BALANCING DAMPER
NOT TO SCALE

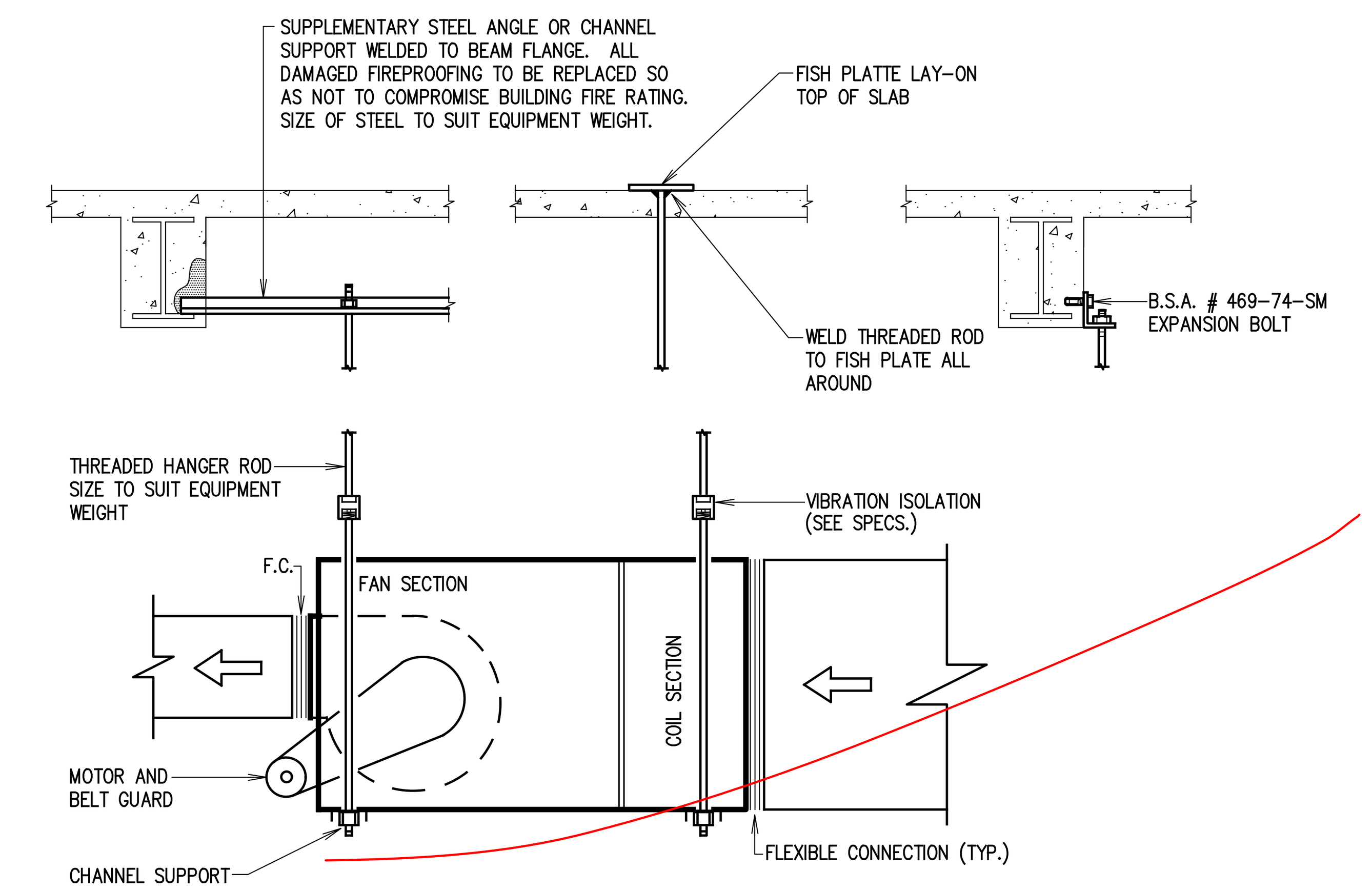
HD-001



NOTES:
1. METAL HANGER LOAD NOT TO EXCEED 50 LBS.
2. FOR NON-STEEL DUCTS HANGERS TO BE ISOLATED TO PREVENT GALVANIC ACTION.
3. HANGERS SHALL BE SAME MATERIALS AS DUCTWORK BEING SUPPORT.
4. EXPANSION BOLT MINIMUM SIZE ¼" (B.S.&A. FILE #390-58-SM OR #480-64-SM OR #481-64-SM) FOR STONE CONCRETE ONLY.
5. ⅛" x 1" GALVANIZED IRON HANGERS 8'-0" ON CENTER FOR DUCTS 4 SQ. FT. AND UNDER, 4'-0" ON CENTER FOR DUCTS OVER 4 SQ. FT. IN AREA.
6. IN CINDER CONCRETE SLABS OR IN REPUBLIC ARCH. USE APPROVE SCISSOR TYPE HANGER HOOK (B.S.&A. FILE #A-61-63 SM).

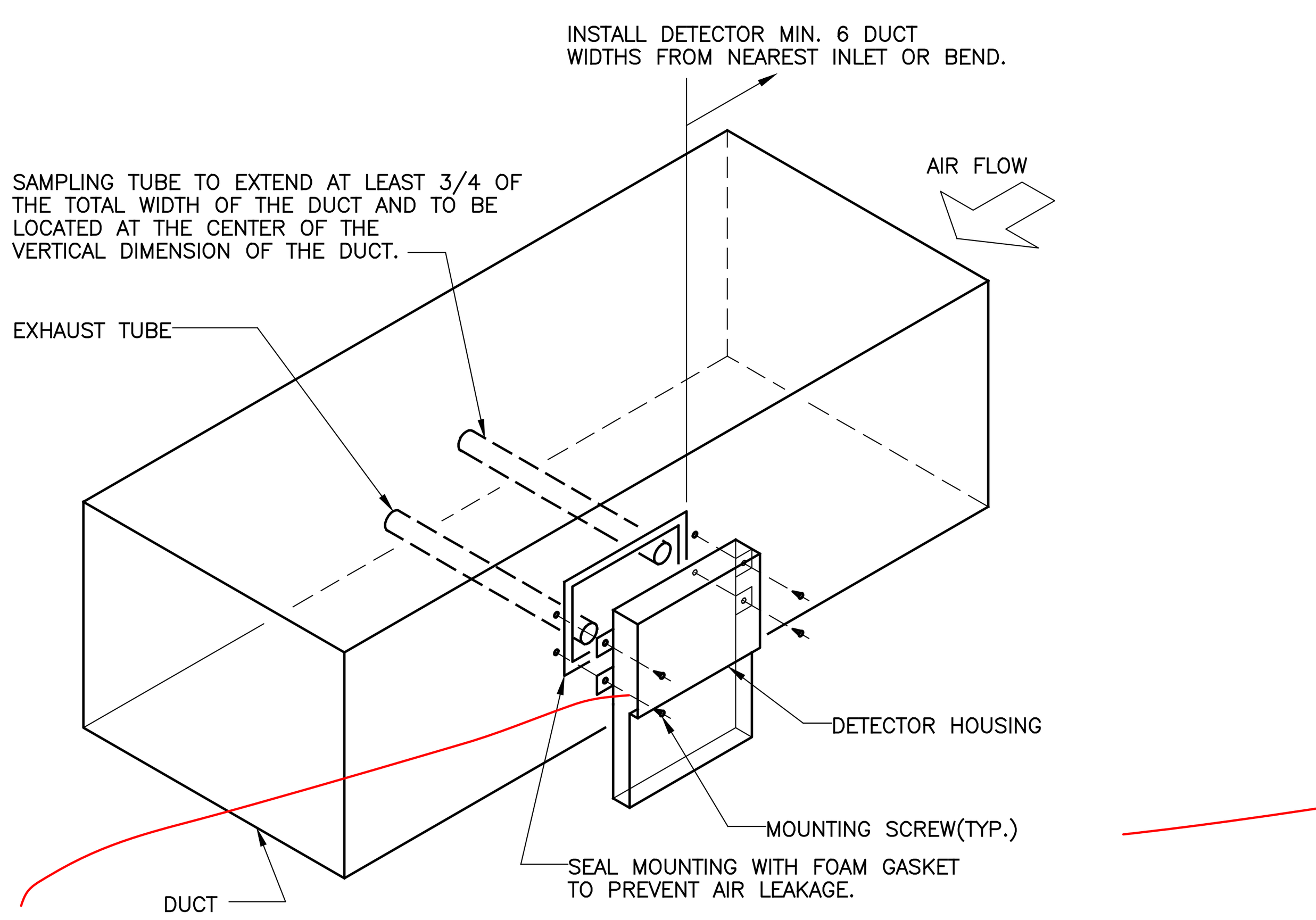
TYPICAL DUCT HANGING DETAILS
NOT TO SCALE

HD-002



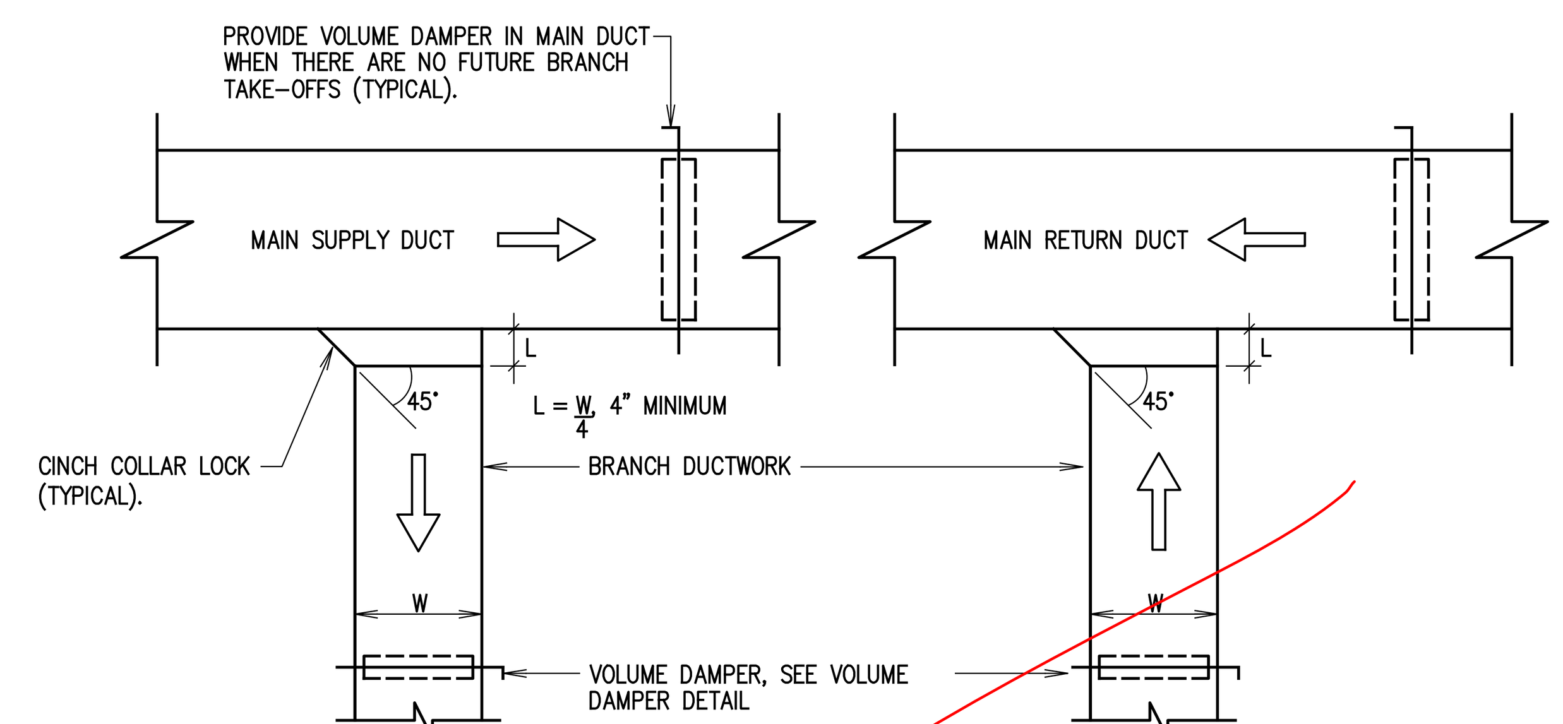
HVAC EQUIPMENT HANGING DETAIL
NOT TO SCALE

HD-037



DUCT SMOKE DETECTOR MOUNTING DETAIL
NOT TO SCALE

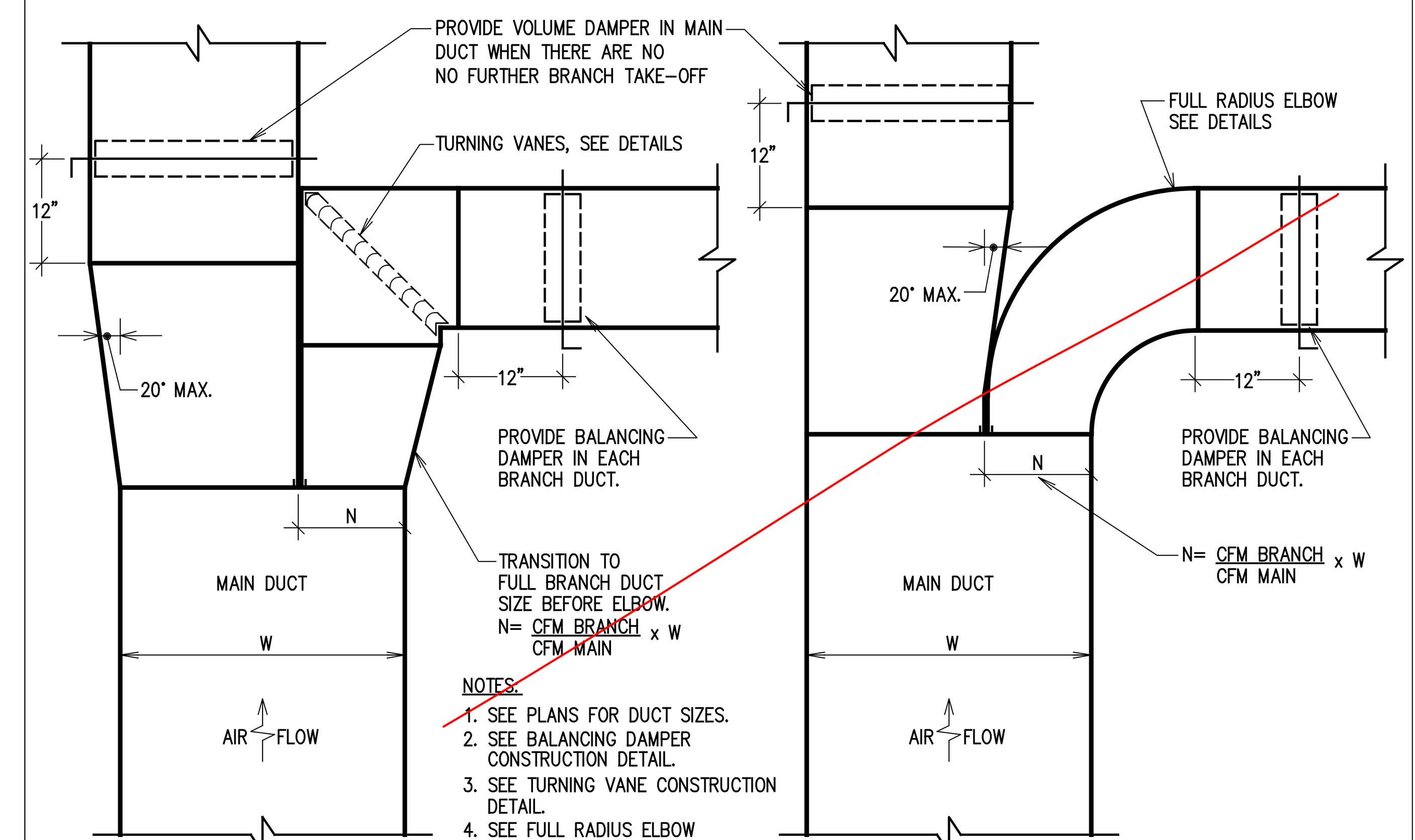
HD-114



NOTES:
1. SEE PLANS FOR DUCT SIZES.
2. ALL DIMENSIONS SHOWN ON PLANS ARE ALL INTERIOR DUCT SIZES.

TYPICAL RECTANGULAR SUPPLY AND RETURN DUCTWORK BRANCH DUCT CONNECTIONS
NOT TO SCALE

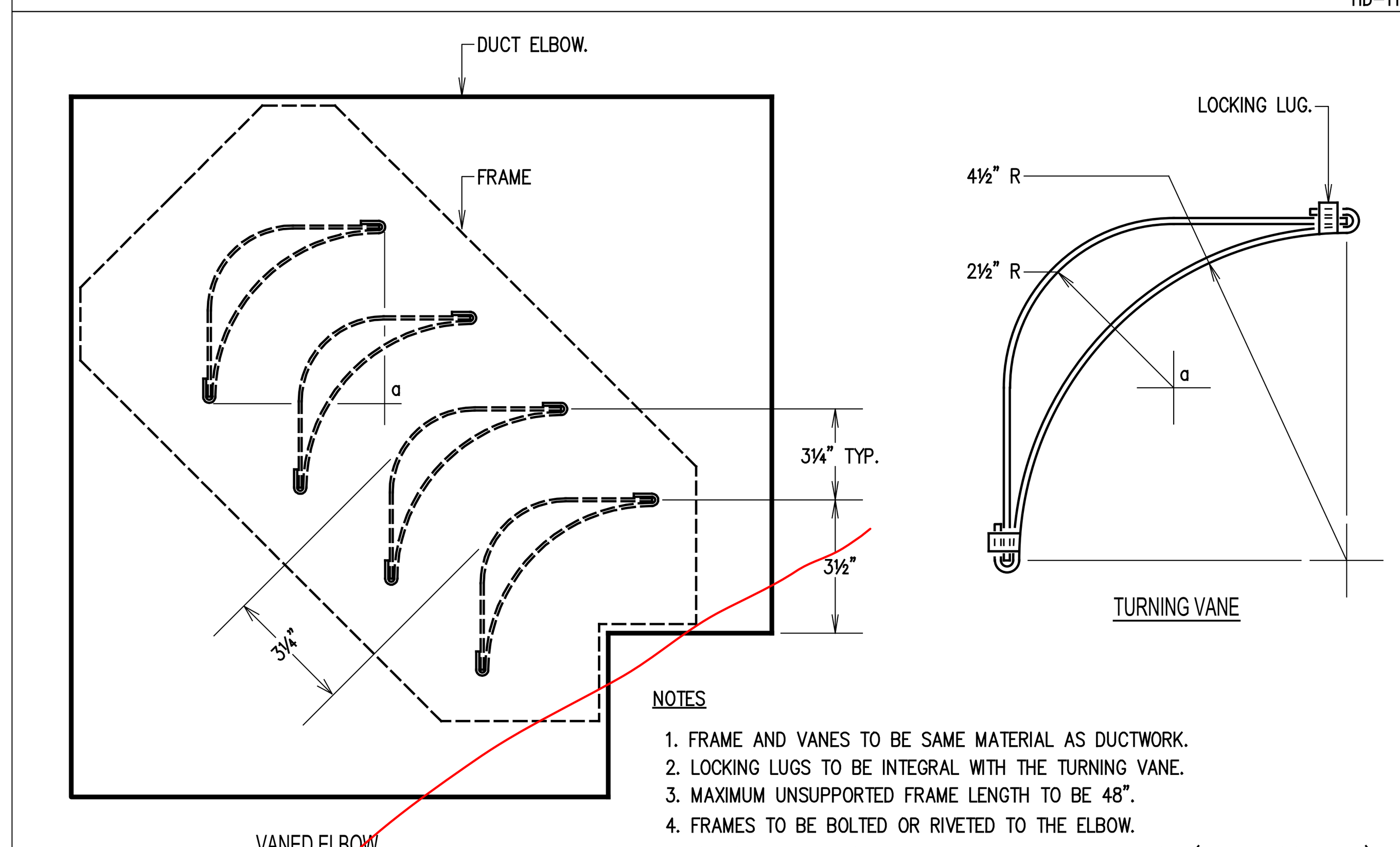
HD-005



NOTES:
1. SEE PLANS FOR DUCT SIZES.
2. SEE BALANCING DAMPER CONSTRUCTION DETAIL.
3. SEE TURNING VANE CONSTRUCTION DETAIL.
4. SEE FULL RADIUS ELBOW CONSTRUCTION DETAIL.
5. PROVIDE OPPOSED BLADE DAMPERS FOR BALANCING.

SUPPLY AIR DUCT NECK CONNECTIONS
NOT TO SCALE

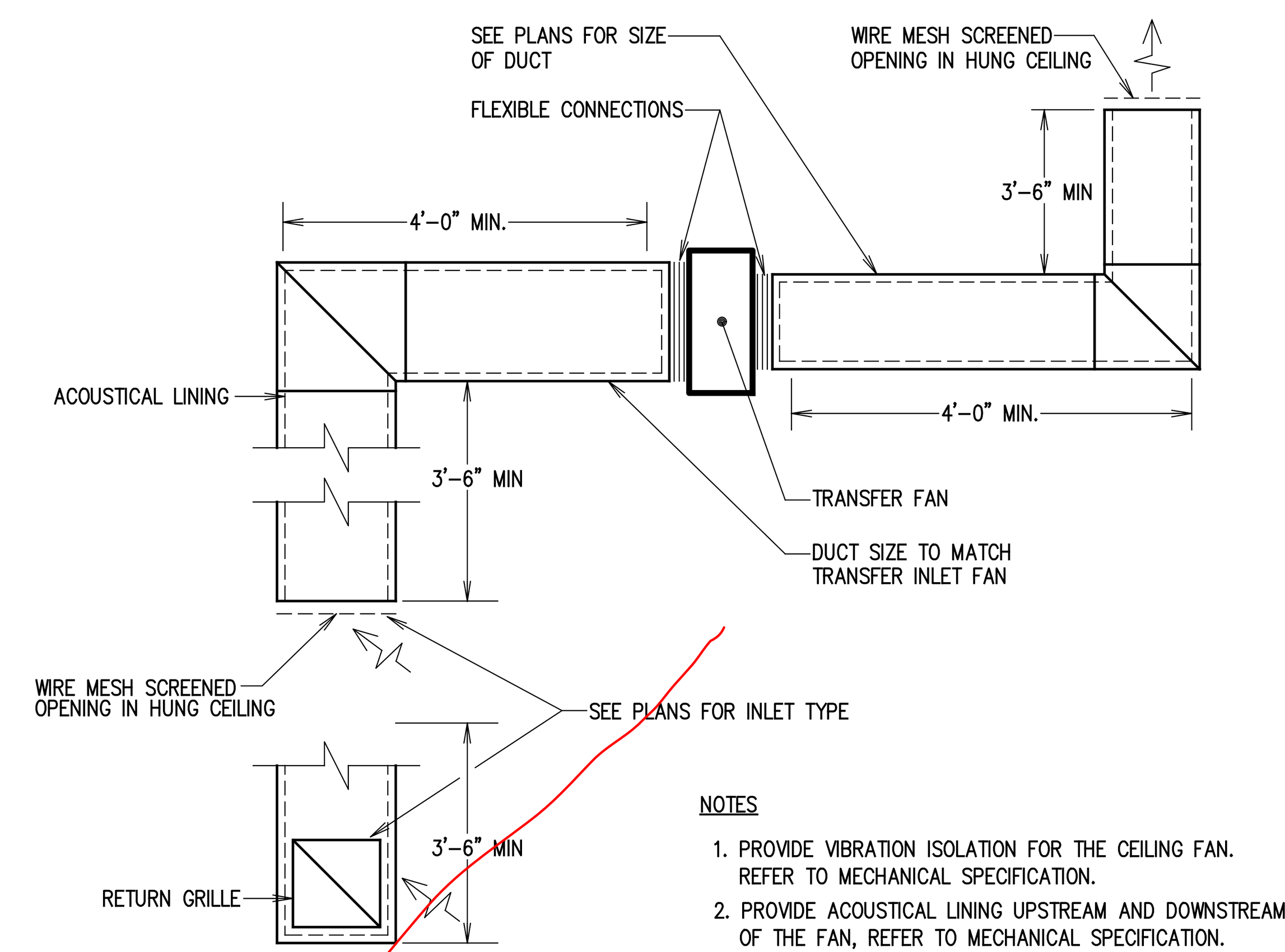
HD-006



NOTES
1. FRAME AND VANES TO BE SAME MATERIAL AS DUCTWORK.
2. LOCKING LUGS TO BE INTEGRAL WITH THE TURNING VANE.
3. MAXIMUM UNSUPPORTED FRAME LENGTH TO BE 48".
4. FRAMES TO BE BOLTED OR RIVETED TO THE ELBOW.
5. VANES AND FRAMES TO BE SAME GAUGE AS THE ELBOW. (MINIMUM 20 GAUGE)
6. SQUARE ELBOWS ARE TO BE USED ONLY WHEN SPECIFICALLY INDICATED ON THE DESIGN DRAWINGS.

MITERED ELBOWS WITH DOUBLE THICKNESS TURNING VANES
NOT TO SCALE

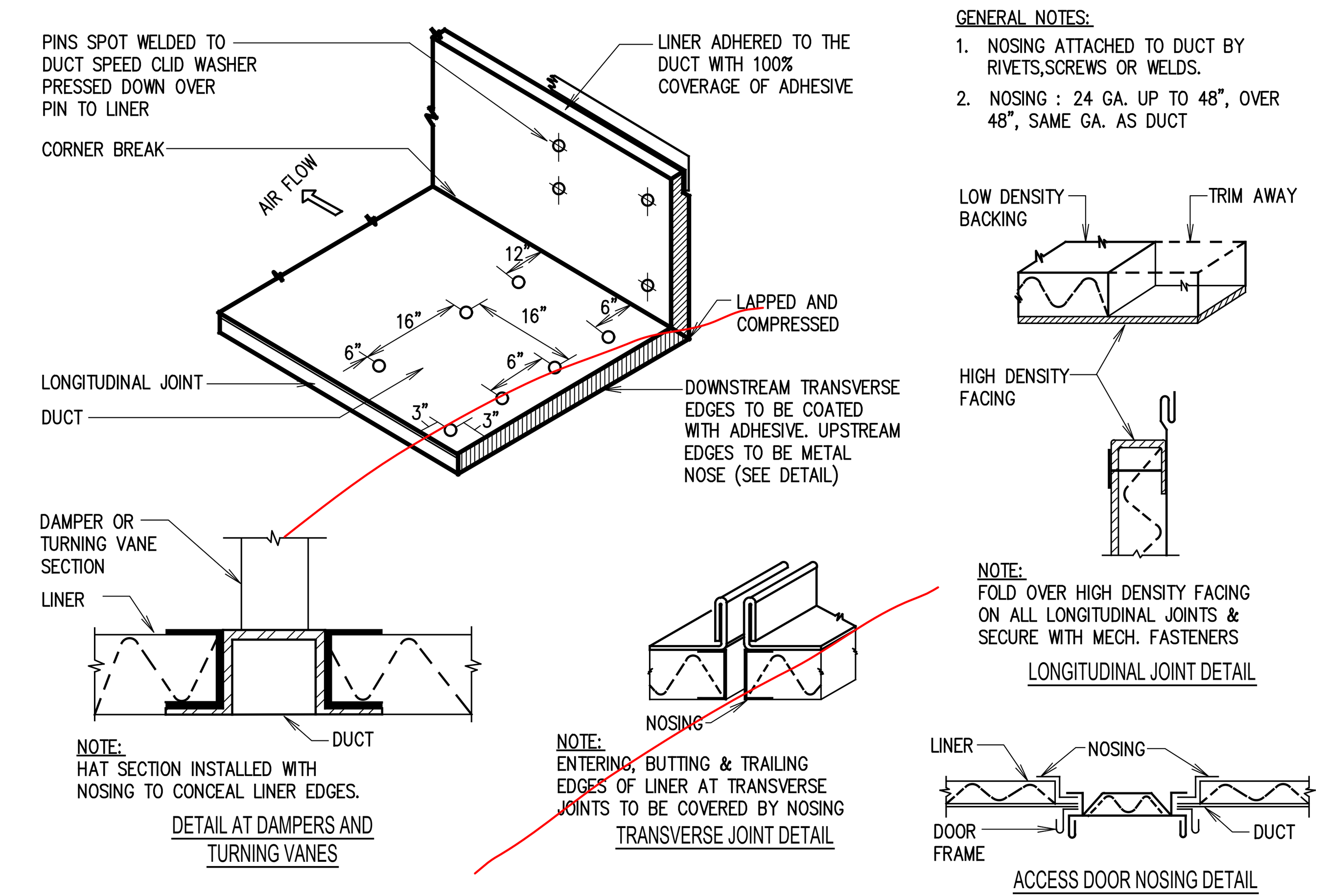
HD-007



NOTES
1. PROVIDE VIBRATION ISOLATION FOR THE CEILING FAN. REFER TO MECHANICAL SPECIFICATION.
2. PROVIDE ACOUSTICAL LINING UPSTREAM AND DOWNSTREAM OF THE FAN, REFER TO MECHANICAL SPECIFICATION.

INLINE FAN AIR TRANSFER DETAIL
NOT TO SCALE

HD-009



GENERAL NOTES:
1. NOSING ATTACHED TO DUCT BY RIVETS,SCREWS OR WELDS.
2. NOSING : 24 GA. UP TO 48", OVER 48", SAME GA. AS DUCT

ACOUSTICAL DUCT LINER DETAIL
NOT TO SCALE

HD-019

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KEY PLAN
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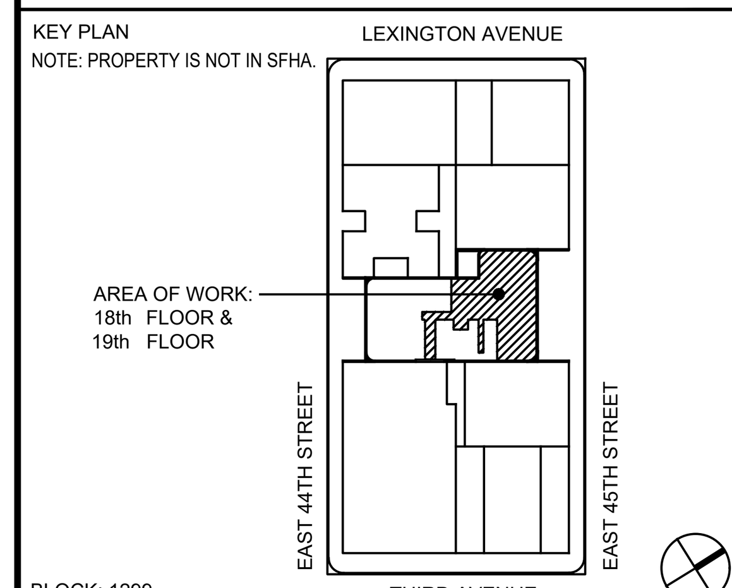

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03	11/27/2023	ISSUED FOR BID + FILING
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01	11/14/2023	ISSUED FOR PROGRESS

PROJECT

2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

DRAWING TITLE

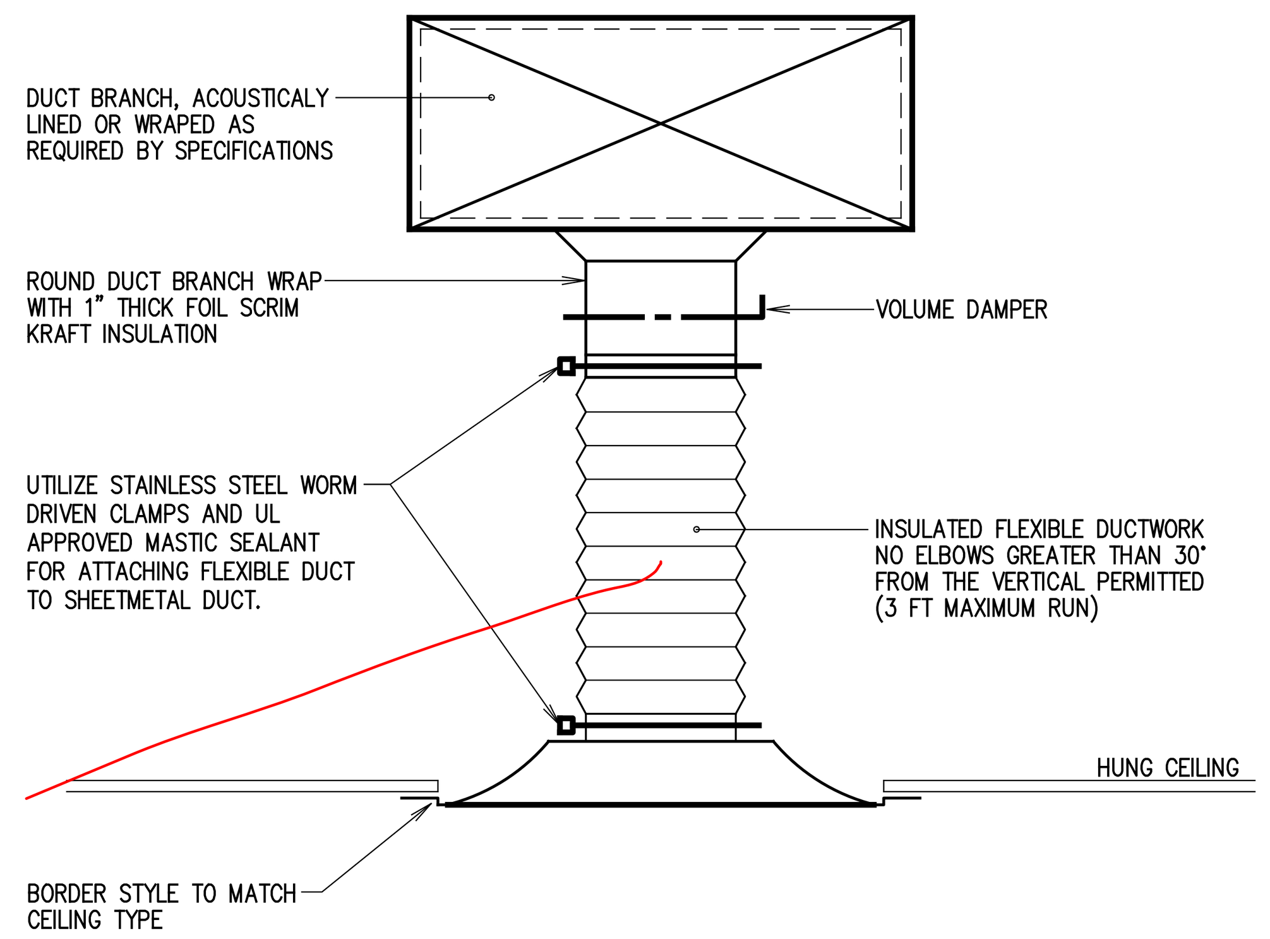
MECHANICAL DETAILS SHEET NO.1

SEAL AND SIGNATURE

DATE (MM-DD-YY):	05-02-24
PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK
DWG. No.:	M-901.00
SCALE: NOT TO SCALE	08 OF 10

DOB DRAWING NUMBER: M00979855-I1

Filename: U:_AMA\Projects\G\G050-01-119 - 2 GCT - 18th Floor Amenity Space\DWGs\HVAC\G05001119-M901,M902_DETAILS.dwg By: ERCAN KOCABASOGLU On: May 2, 2024 At: 12:00 PM Page: ARCH D (36.00 x 24.00 INCHES)

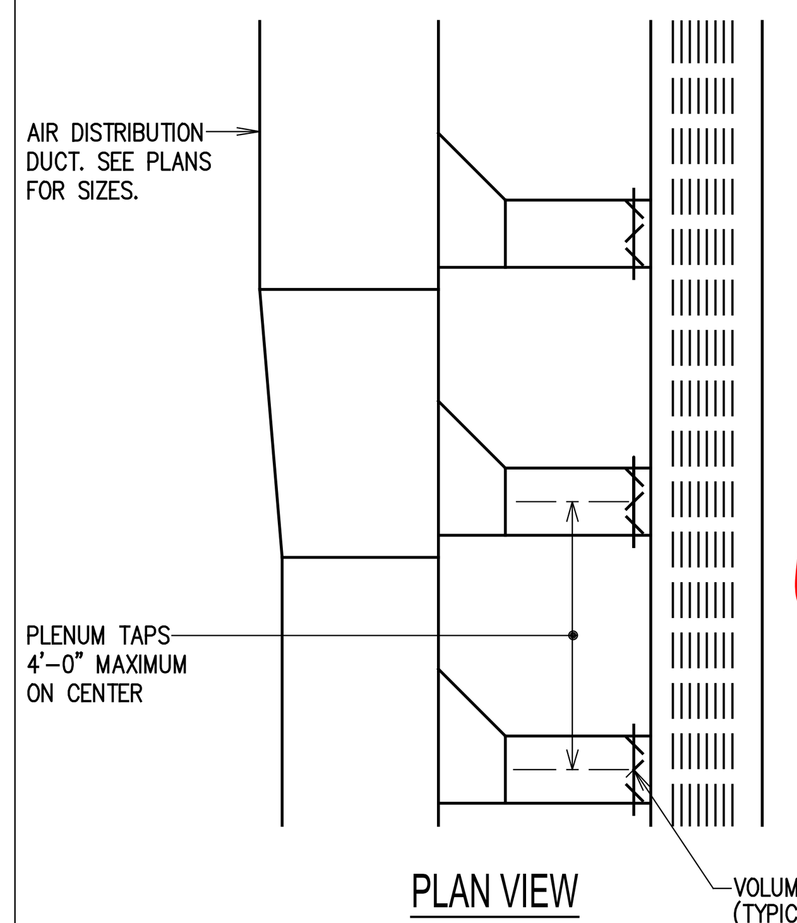


TYPICAL DIFFUSER CONNECTION WITH FLEXIBLE DUCTWORK

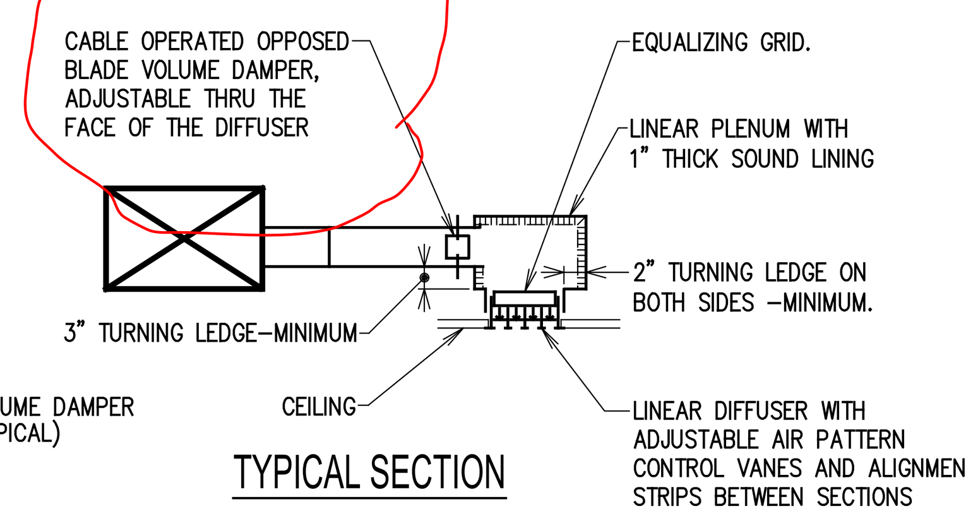
NOT TO SCALE

HD–031

DIFFUSER (CFM/LF)	MAXIMUM PLENUM TAP (CFM)	PLENUM TAP SIZE (W x H)	MINIMUM PLENUM SIZE W x H (INTERIOR CLEAR DIMENSIONS)
30	120	8" x 4"	8" x 8"
45	180	12" x 4"	10" x 8"
60	240	12" x 5"	14" x 9"
75	300	14" x 5"	14" x 9"
110	440	16" x 6"	16" x 10"
140	560	16" x 7"	16" x 11"
190	760	20" x 7"	16" x 12"



PLAN VIEW

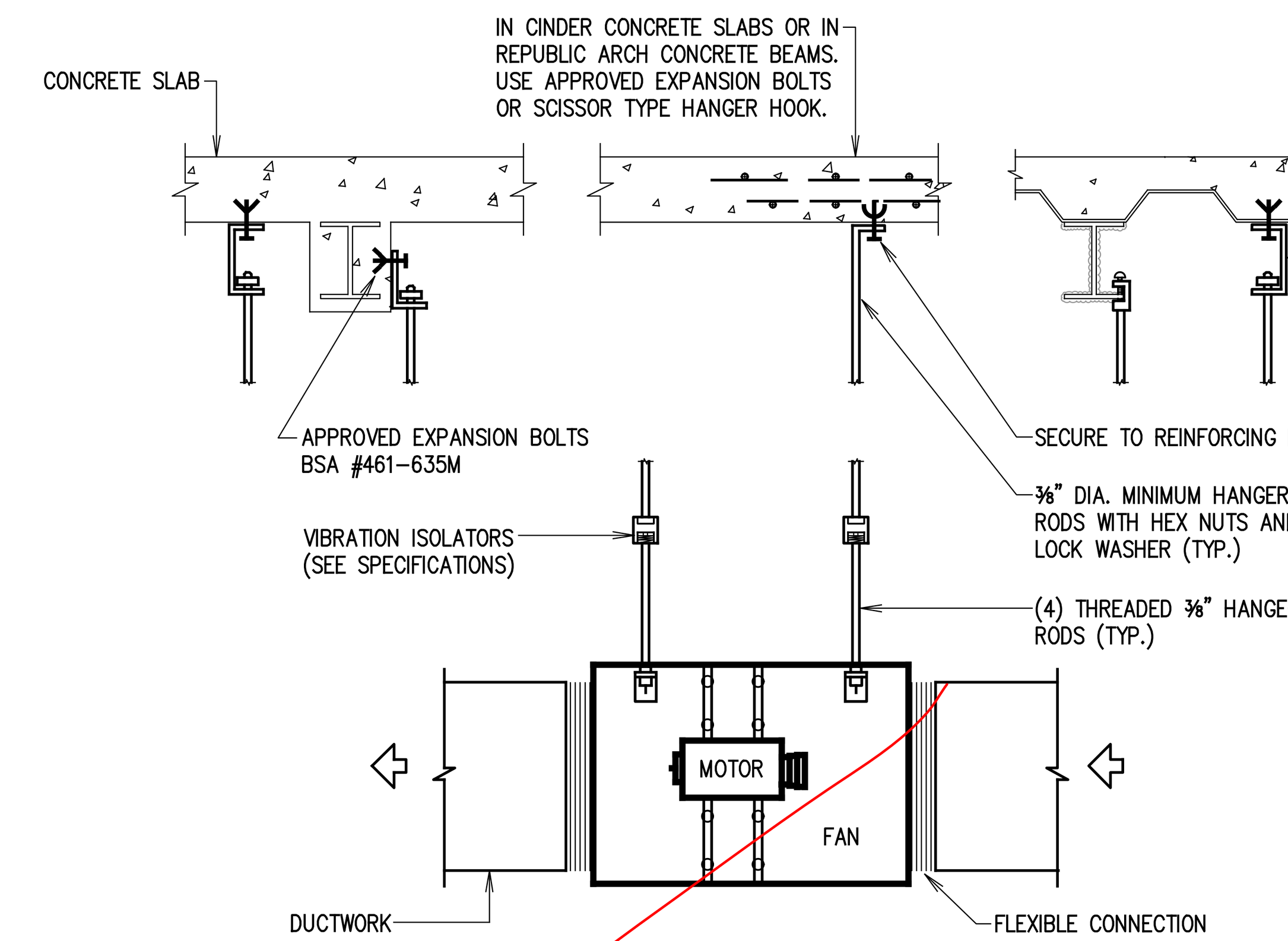


TYPICAL SECTION

DETAILS OF LINEAR DIFFUSER INSTALLATION

NOT TO SCALE

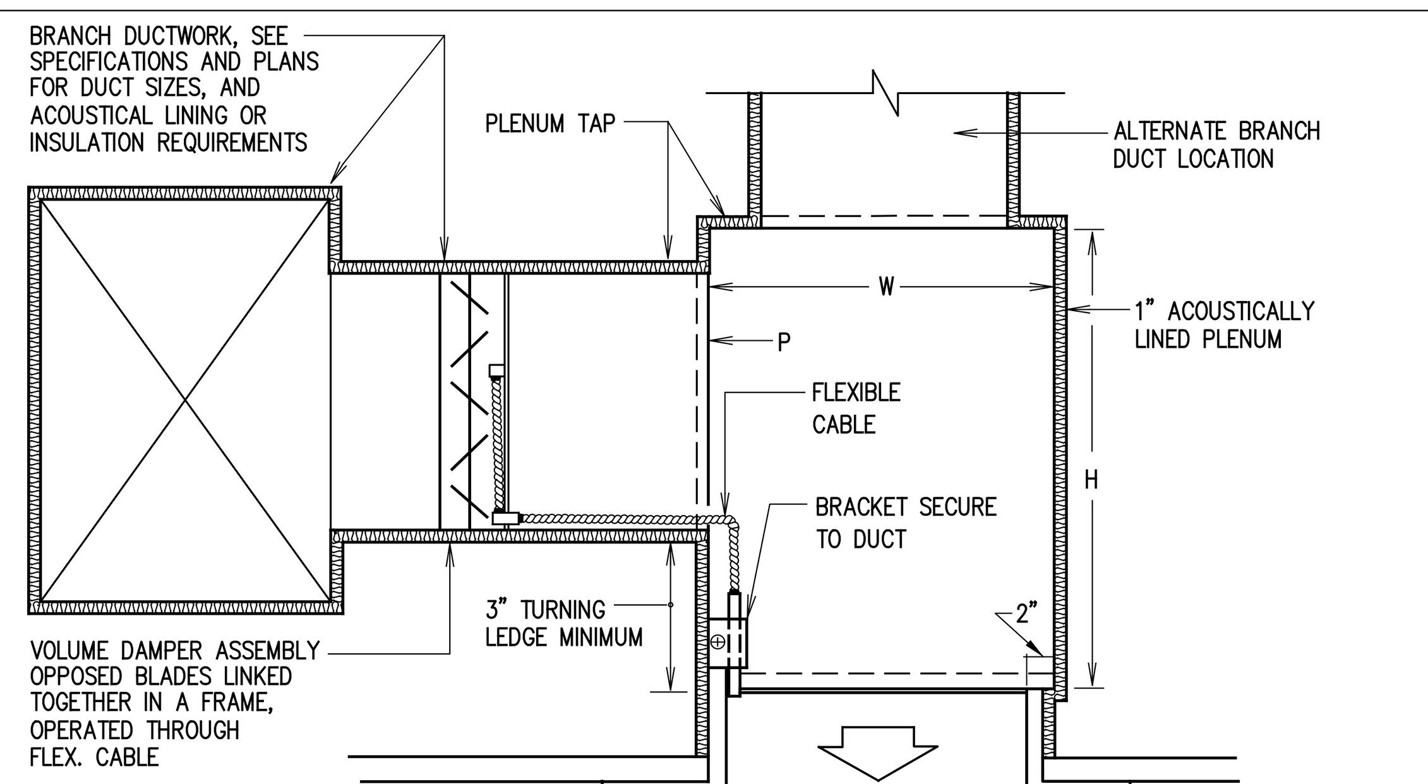
HD–047



INLINE FAN HANGING SUPPORT DETAIL

NOT TO SCALE

HD–026



DIFFUSER (CFM/LF)	MINIMUM PLENUM SIZE W x H (INTERIOR CLEAR DIMENSIONS)
30	8" x 8"
45	10" x 8"
60	14" x 9"
75	14" x 9"
110	16" x 10"
140	16" x 11"
190	16" x 12"

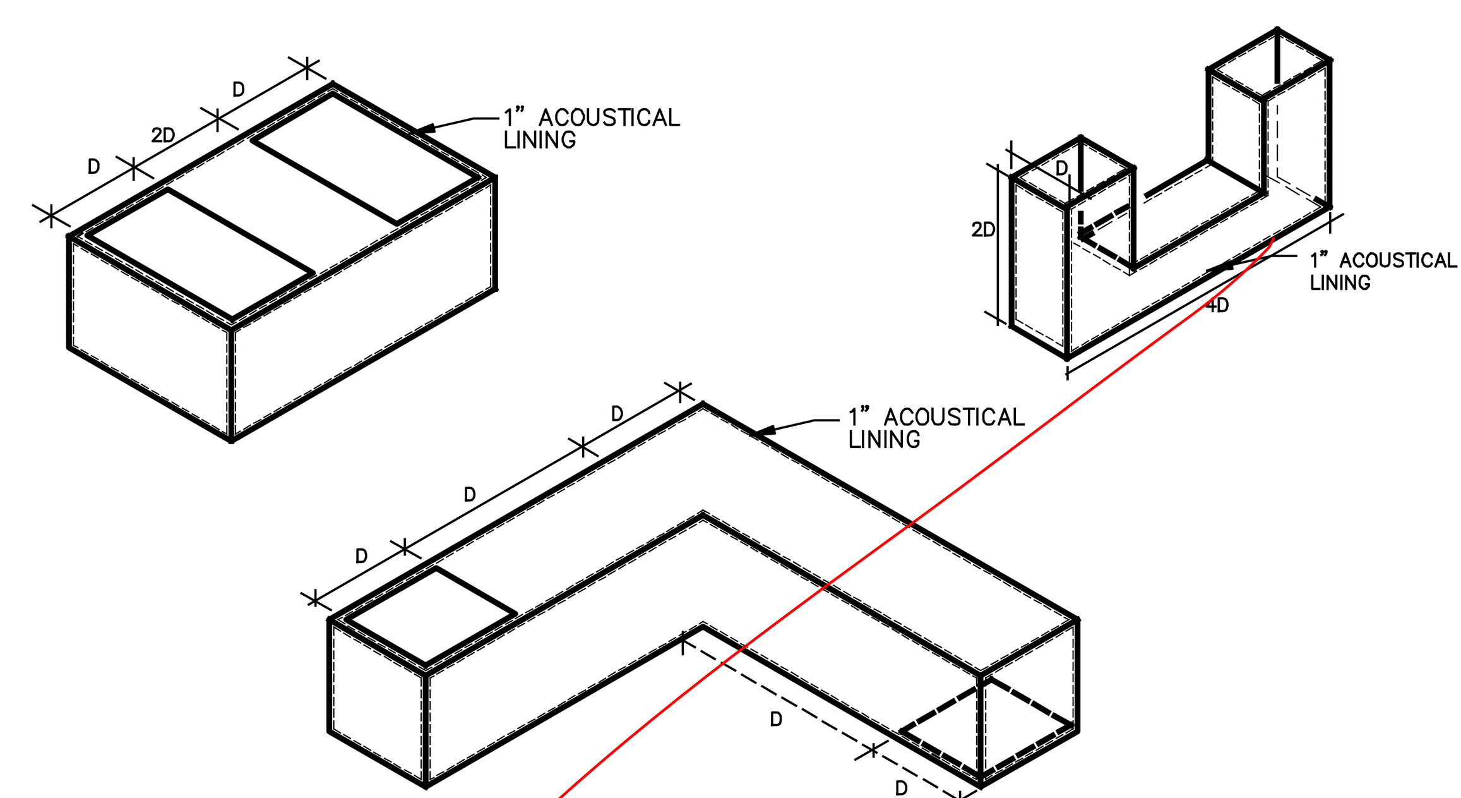
NOTES:

1. PROVIDE CABLE OPERATED DAMPERS FOR ALL LINEARS LOCATED IN INACCESSIBLE CEILING.

LINEAR DIFFUSER DETAIL

NOT TO SCALE

HD–018



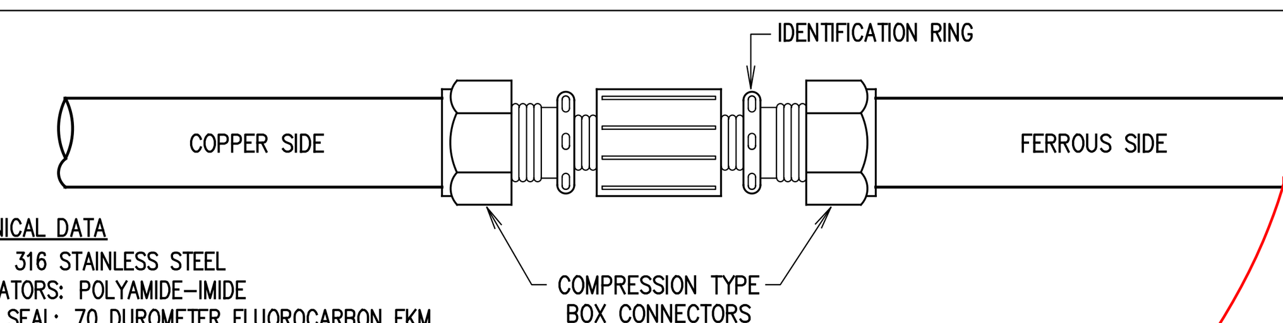
NOTES:

1. TRANSFER OPENINGS TO FACE SIDEWAYS IF MINIMUM CLEARANCE CANNOT BE MAINTAINED AS INDICATED
2. ALL TRANSFER DUCTS SHALL SIZED FOR 500 FPM
3. PRVODE 1" LINING FOR ALL TRANSFER DUCTS.

TYPICAL DETAILS OF SOUND-LINED TRANSFER DUCT (TD)

NOT TO SCALE

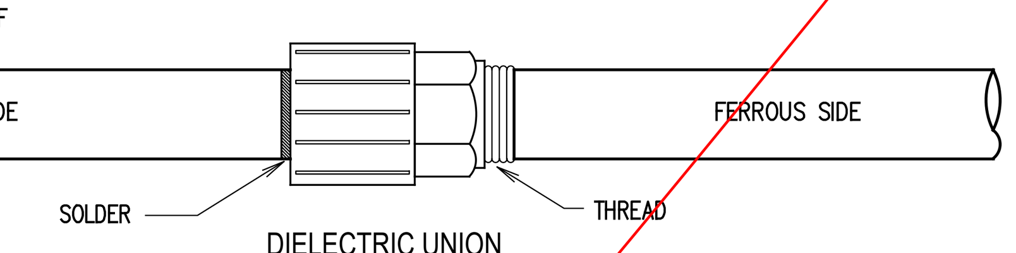
HD–133



DIELECTRIC COUPLING

TECHNICAL DATA
BODY: 316 STAINLESS STEEL
INSULATORS: POLYAMIDE–IMIDE
QUAD SEAL: 70 DUROMETER FLUOROCARBON FKM
BACKUP RING: VIRGIN PTFE
ELECTRICAL RESISTANCE OF INSULATORS AT 70°F: 10×10^6 OHMI AT 10V (DC)
PRESSURE RATING: 5000 PSIG
TEMPERATURE RATING: –40 TO 200°F

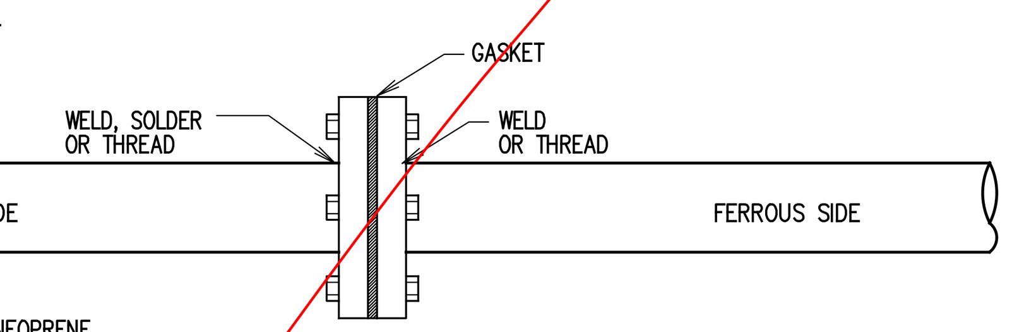
PIPE SIZES
3/4"
1"
1–1/4"
1–1/2"
2"



DIELECTRIC UNION

TECHNICAL DATA
GALVANIZED STEEL COUPLING WITH INERT AND NONCORROSIVE, THERMOPLASTIC LINING
SYSTEM PRESSURE RATING: 300 PSIG
TEMPERATURE RATING: –40 TO 200°F

PIPE SIZES
3/4"
1"
1–1/4"
1–1/2"
2"



DIELECTRIC FLANGE

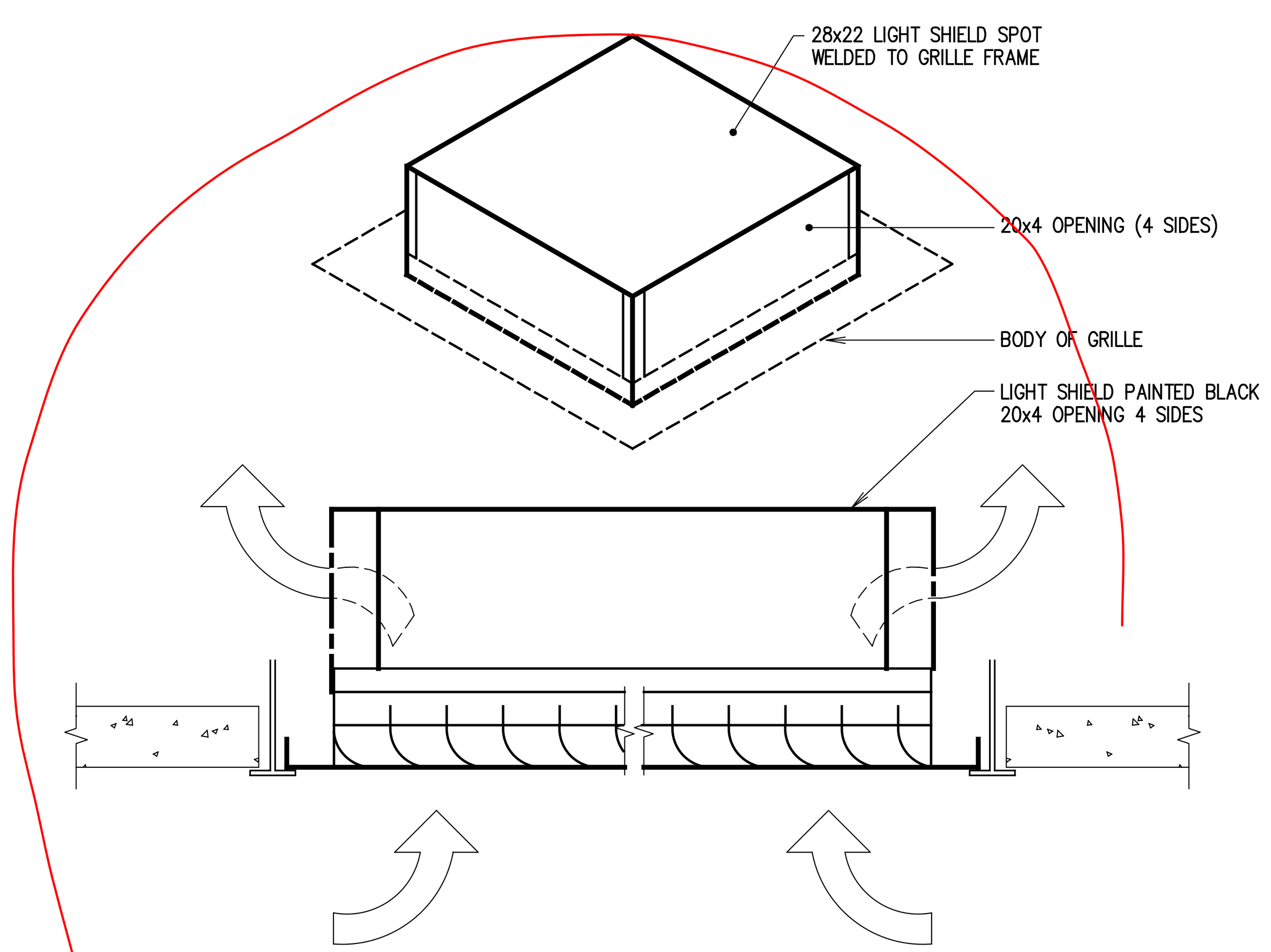
TECHNICAL DATA
PROVIDE FULL–FACE OR RING TYPE NEOPRENE OR PHENOLIC GASKET
PROVIDE PHENOLIC OR POLYETHYLENE BOLT SLEEVES, PHENOLIC WASHERS, AND STEEL BACKING.
SYSTEM PRESSURE RATING: 300 PSIG
TEMPERATURE RATING: –40 TO 200°F

PIPE SIZES
2–1/2" AND UP

DIELECTRIC FITTING DETAIL

NOT TO SCALE

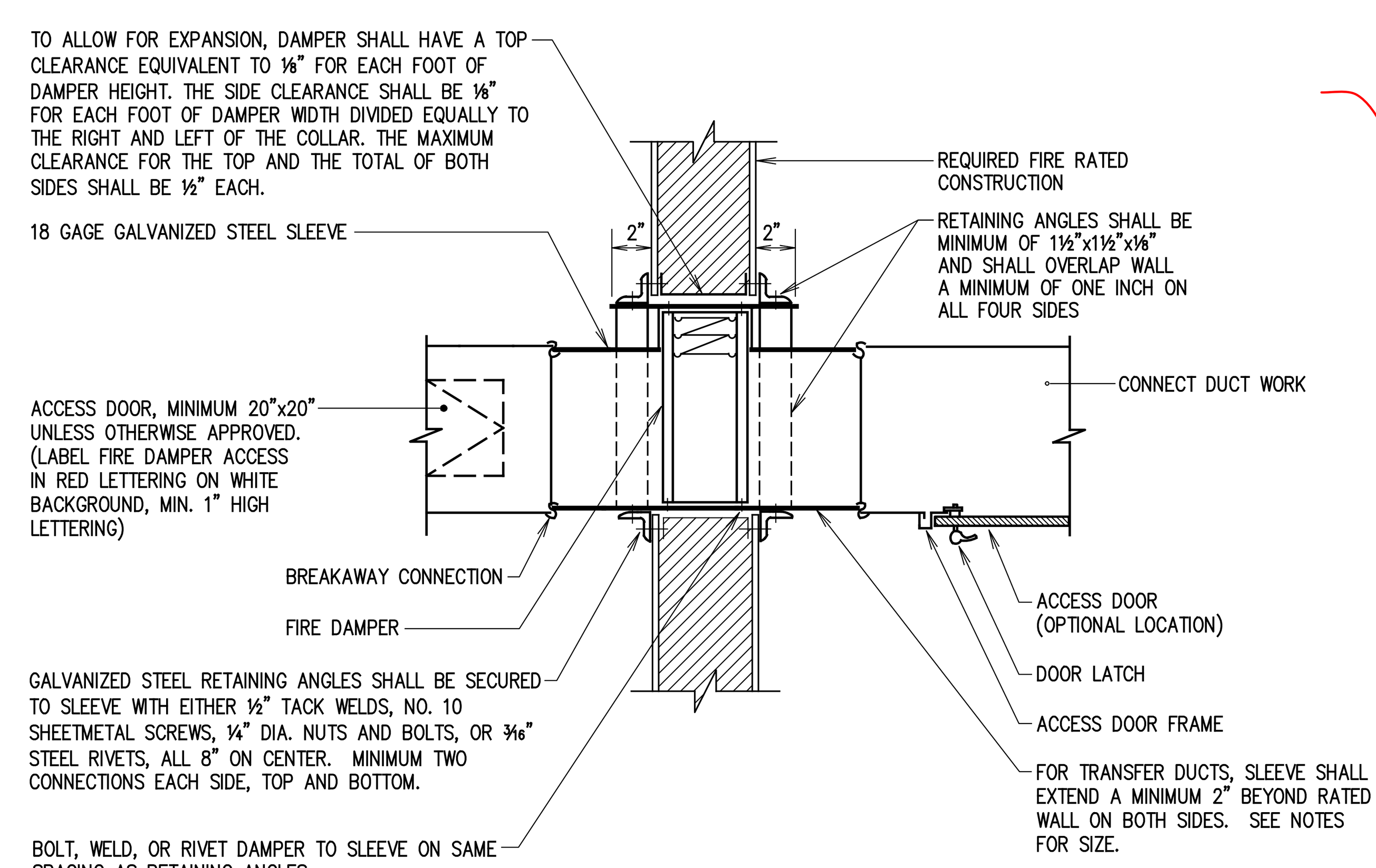
HD–103



RETURN GRILLE WITH LIGHT SHIELD DETAIL

NOT TO SCALE

HD–082



NOTES:

1. DAMPERS SHALL BE CONSTRUCTED, TESTED, LABELED, AND INSTALLED IN ACCORDANCE WITH UL 555, UL 555–S, NFPA 90A, NFPA 92A.
2. LEAKAGE RATINGS – CLASS II:
3. ALL FIRE DAMPERS SHALL BE RATED TO MAINTAIN THE RATING OF THE FIRE SEPARATION. THE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S APPROVED INSTRUCTIONS. DAMPERS SHALL BE AS MANUFACTURED BY POTTORFF MODEL #VFD–150 (1½" HOUR) OR MODEL #VFD–350 (3 HOUR) TYPE B OR APPROVED EQUAL BY THE ENGINEER.
4. FACTORY SLEEVE TO BE 24" LENGTH UNLESS OTHERWISE SPECIFIED.
5. ALL DUCT–SLEEVE CONNECTIONS SHALL COMPLY WITH UL 555, ASHRAE & SMACNA.
6. CONNECTIONS BETWEEN SLEEVE AND DUCTWORK SHALL BE BREAKAWAY TYPE SUCH AS "S" SLIP, CRIMP. OR OTHER SLIP TYPE IN ACCORDANCE WITH UL 555.
7. WHERE THE HUNG CEILING DOES NOT HAVE REMOVABLE TILES AN ACCESS DOOR (FIRE RATED WHERE REQUIRED) SHALL BE FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED IN CEILING NEAR LOCATION OF FIRE DAMPER,
8. ALL DUCT ACCESS DOORS SHALL BE LOCATED SO THAT THERE WILL NOT BE ANY INTERFERANCES FOR MAINTENANCE AND INSPECTION OF DAMPER.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR UPSIZING THE FIRE DAMPERS NOT TO COMPROMISE THE DUCTWORK FREE AREA IN AREAS WHERE TYPE 'B' DAMPERS CANNOT BE USED.

TYPE "B" FIRE DAMPER DETAIL AND NOTES

NOT TO SCALE

HD–011

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ARCHITECT
Fogarty Finger
69 Walker Street
New York, NY 10013
212.966.7450
www.fogartyfinger.com

MEP/FP
ama group
825 Eighth Avenue, FL18 | New York, NY 10019
212.944.7722 | amagroupusa.com

IT/AV/SECURITY
tmt technology
825 Eighth Avenue, FL18 | New York, NY 10019
212.398.2424 | tmtechpartners.com

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212.315.6400 | longmanlindsey.com

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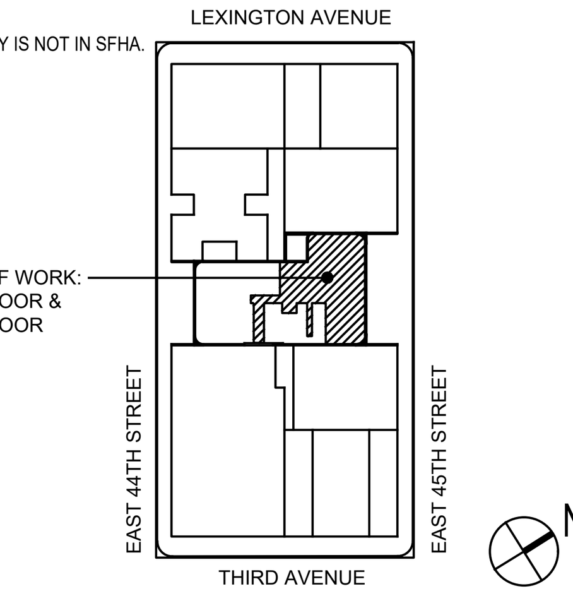
KEY PLAN
NOTE: PROPERTY IS NOT IN SFHA.



BLOCK: 1299
LOT: 27

No.	Date	Issue
04	05/02/2024	ISSUED FOR BULLETIN 1
03	11/27/2023	ISSUED FOR BID + FILING
02	11/21/2023	ISSUED FOR 90% BD
01	11/14/2023	ISSUED FOR PROGRESS

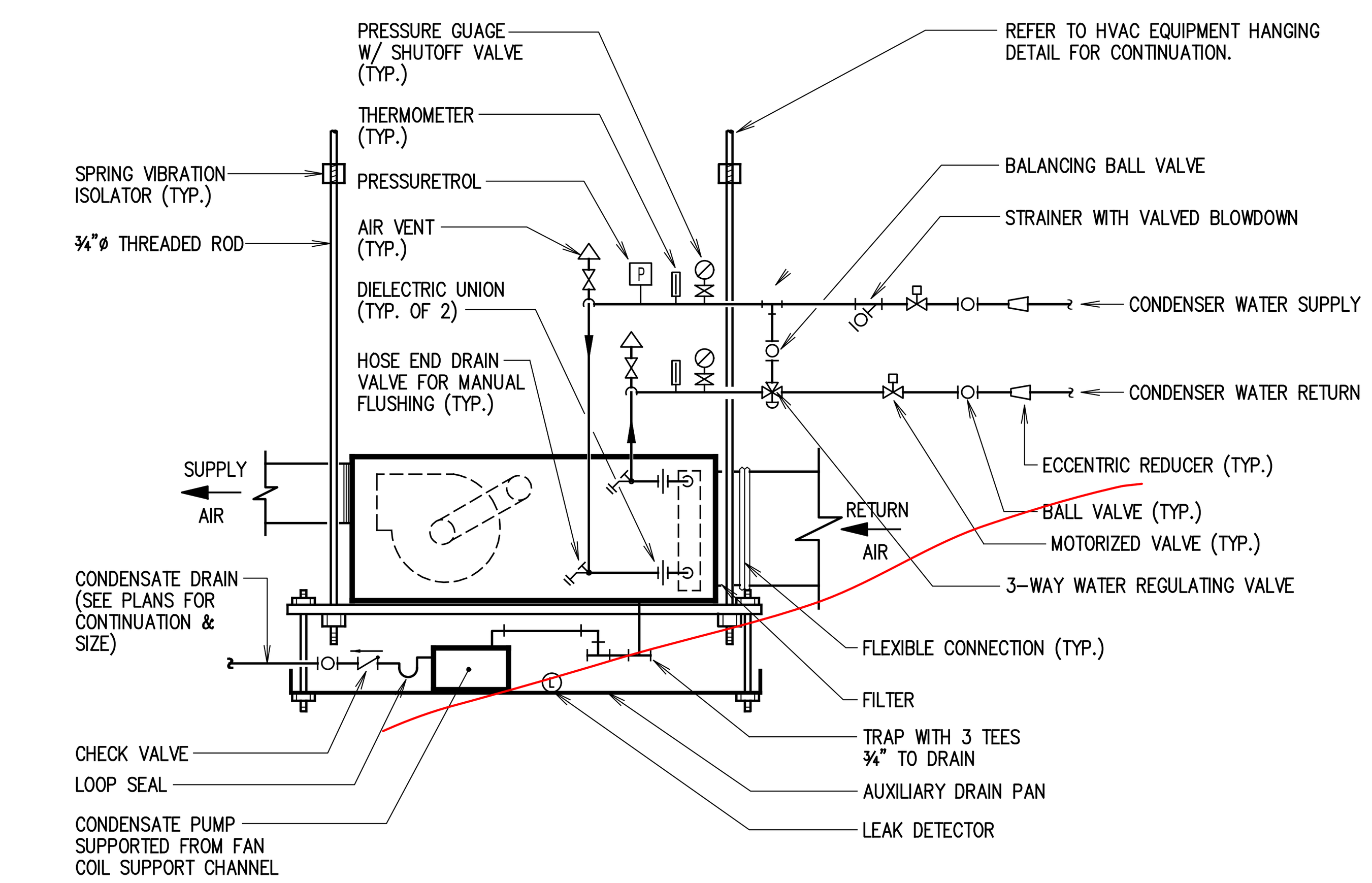
PROJECT
2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
18TH FLOOR
NEW YORK, NY, 10017

DRAWING TITLE
MECHANICAL DETAILS SHEET NO.2

SEAL AND SIGNATURE

DATE (MM-DD-YY):	05-02-24
PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK
DWG. No.:	M-902.00
SCALE: NOT TO SCALE	09 OF 10

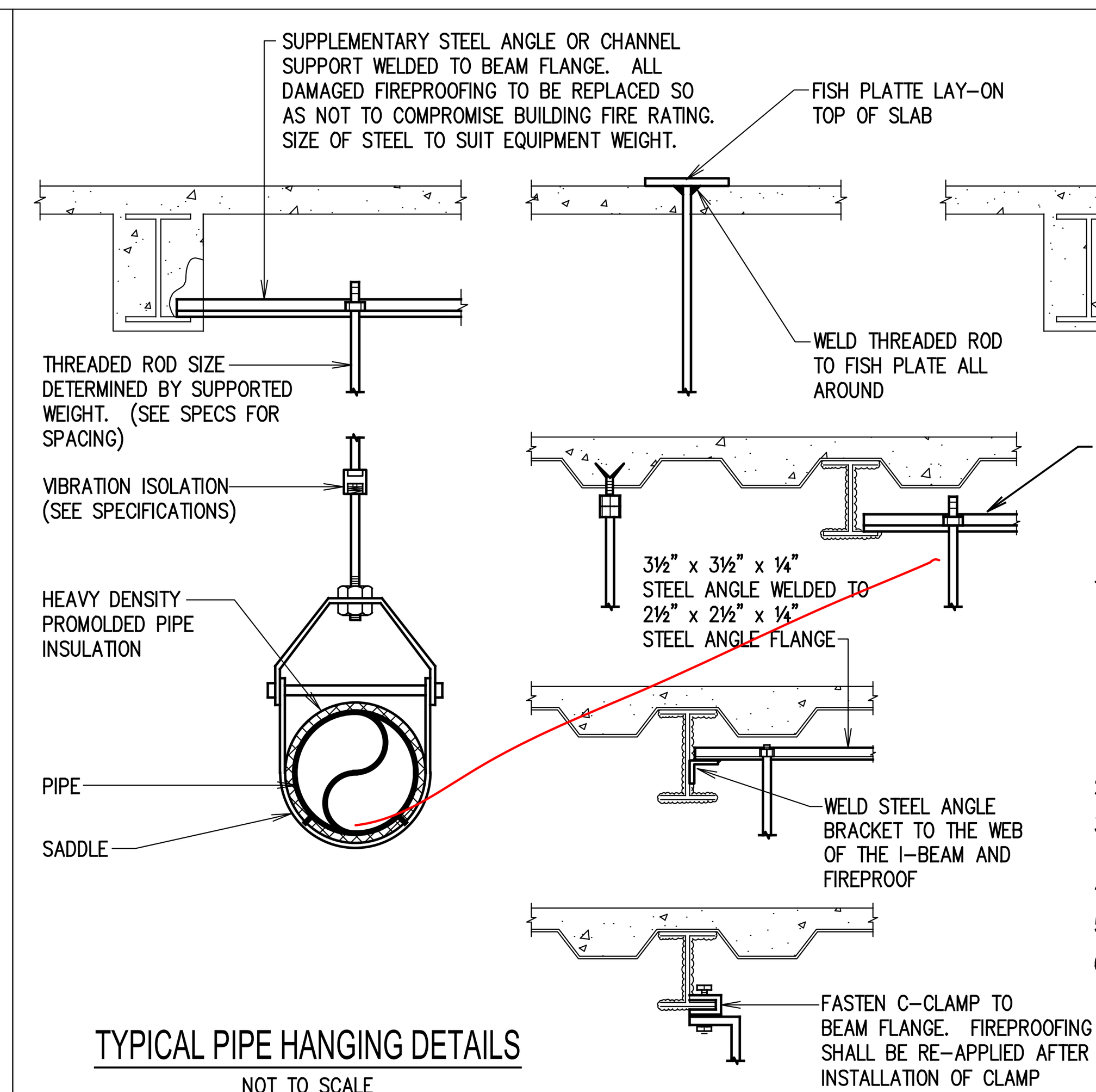
DOB DRAWING NUMBER: M00979855-I1



HORIZONTAL WATER COOLED AC UNIT PIPING DETAIL (3-WAY CONTROL VALVE)

NOT TO SCALE

HD-023



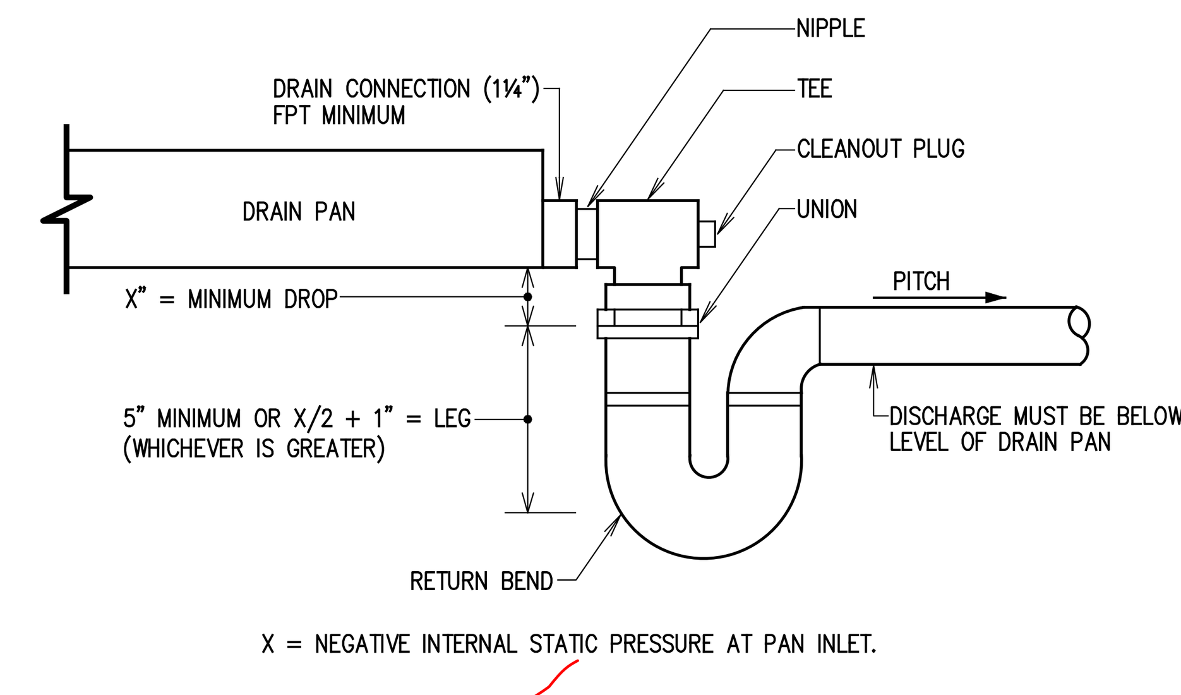
NOTES:

1. SHOP DRAWINGS SHALL BE SUBMITTED SHOWING HANGER LAYOUTS AND LOADS OF EACH HANGER. CALCULATIONS FOR HEAVY LOADS (100 LBS OR GREATER) OR ANY VARIATION IN HANGERS SHALL HAVE THE SUBMITTED DRAWINGS AND CALCULATIONS SIGNED BY A LISCENSED PROFESSIONAL ENGINEER.
2. FISHPLATE DETAIL MAX. LOAD 300 LBS.
3. STEEL TO STEEL ANGEL DETAIL MAX. LOAD 400 LBS.
4. ANCHOR BOLT MAX. LOAD 60 LBS.
5. BEAM CLAMP DETAIL MAX. LOAD 300 LBS.
6. PROVIDE UNIT PRICE FOR EACH DIFFERENT PIPE SUPPORT DETAIL.

TYPICAL PIPE HANGING DETAILS

NOT TO SCALE

HD-036



X = NEGATIVE INTERNAL STATIC PRESSURE AT PAN INLET.

DRAW - THRU UNIT

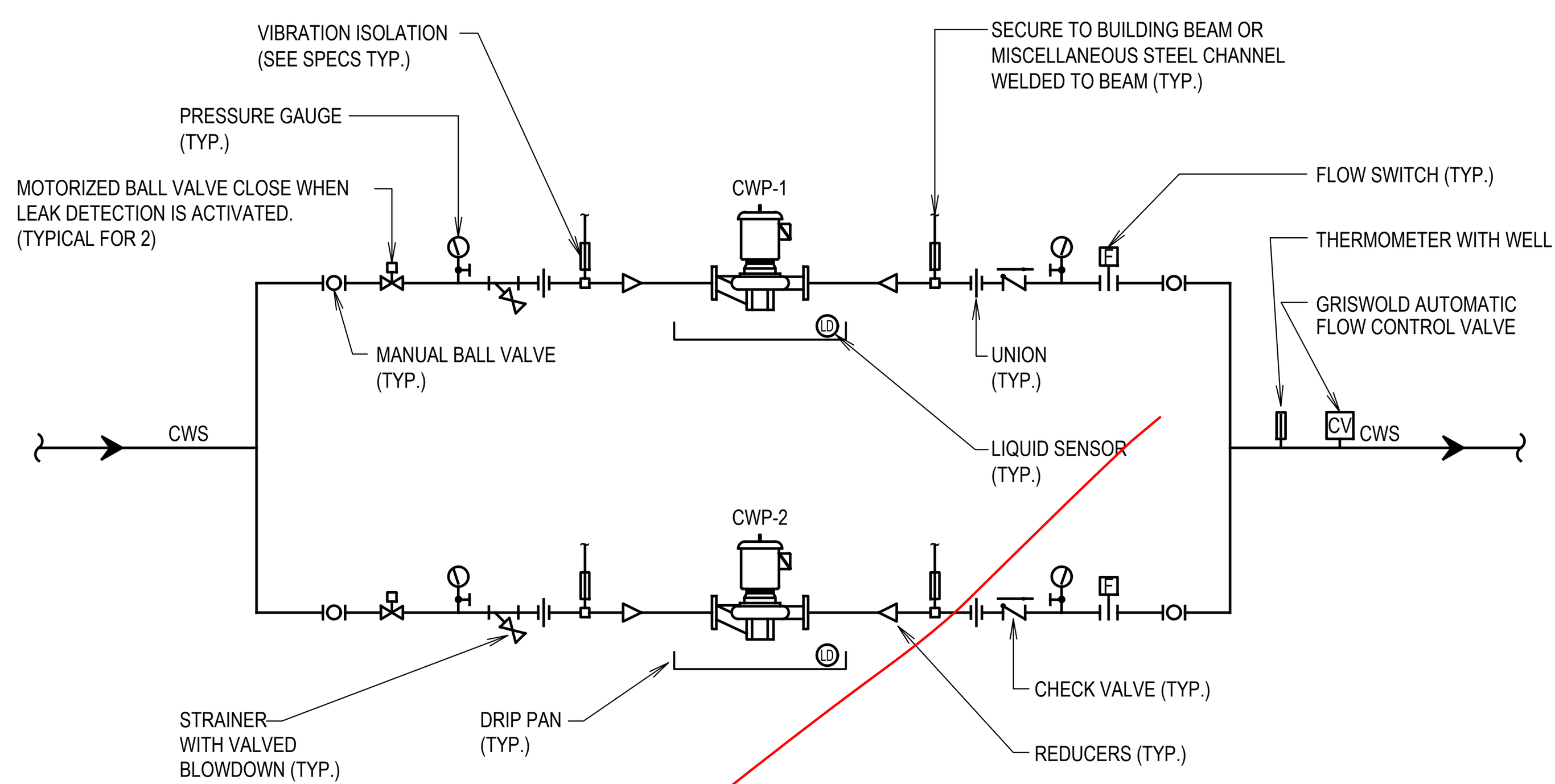
NOTES:

1. ALLOW SUFFICIENT SPACE BELOW DRAIN PAN FOR TRAPS.
2. PITCH DRAIN FOR PROPER RUN-OFF.
3. MANUALLY PRIME FILL TRAP BEFORE START UP TO FORM INITIAL DRAIN SEAL.
4. SUPPORT LENGTHY DRAIN LINES TO PREVENT SAG AND CONDENSATE OVERFLOW.

DRAIN PAN WATER SEAL PIPING DETAIL

NOT TO SCALE

HD-044



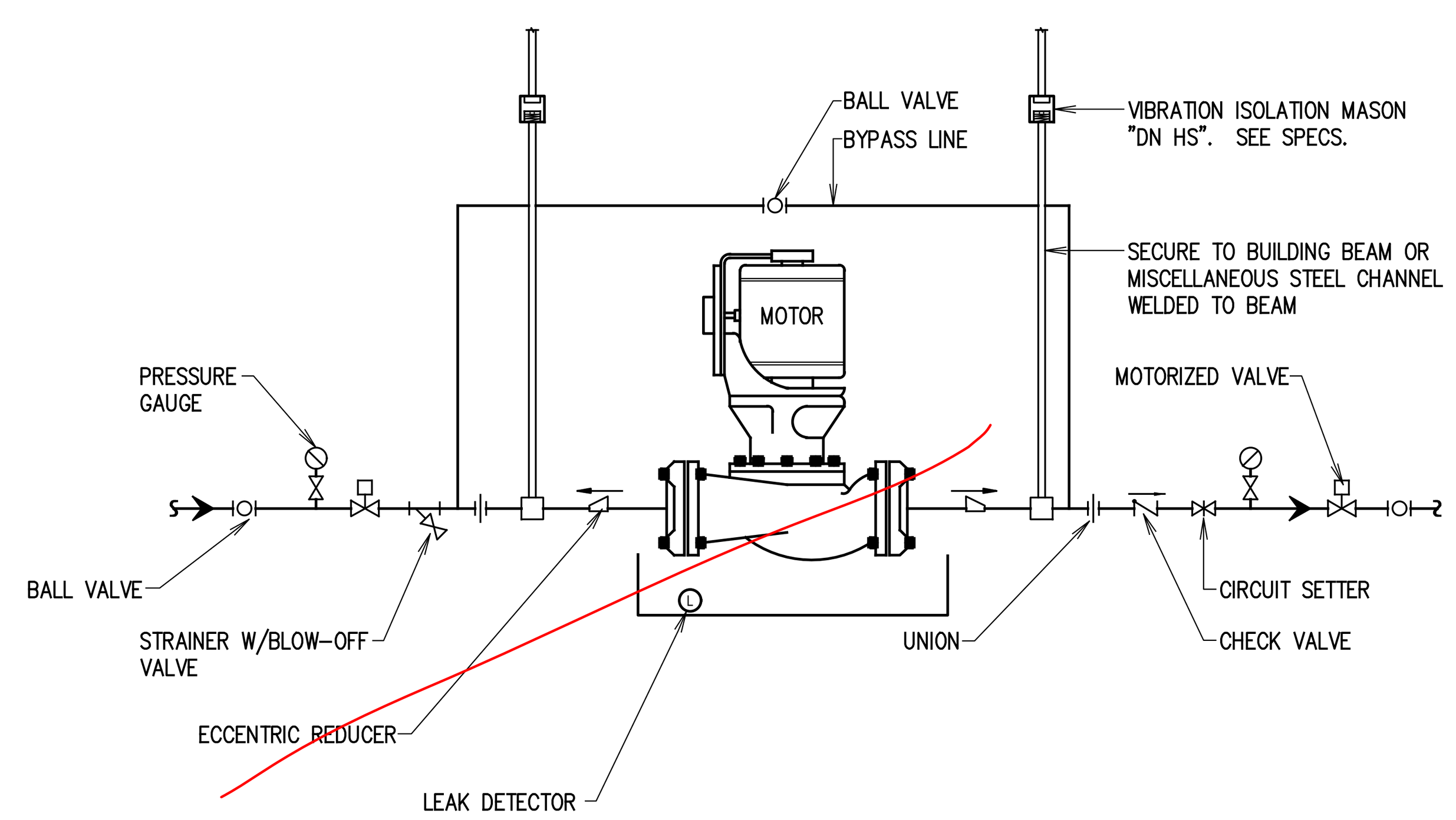
NOTES:

1. CONTRACTOR SHALL PROVIDE SPRING VIBRATION ISOLATORS.
2. CONTRACTOR SHALL COORDINATE WITH ENGINEER IF FLOW SWITCHES ARE REQUIRED.

IN-LINE PUMP SET SCHEMATIC TRIM DETAIL

NOT TO SCALE

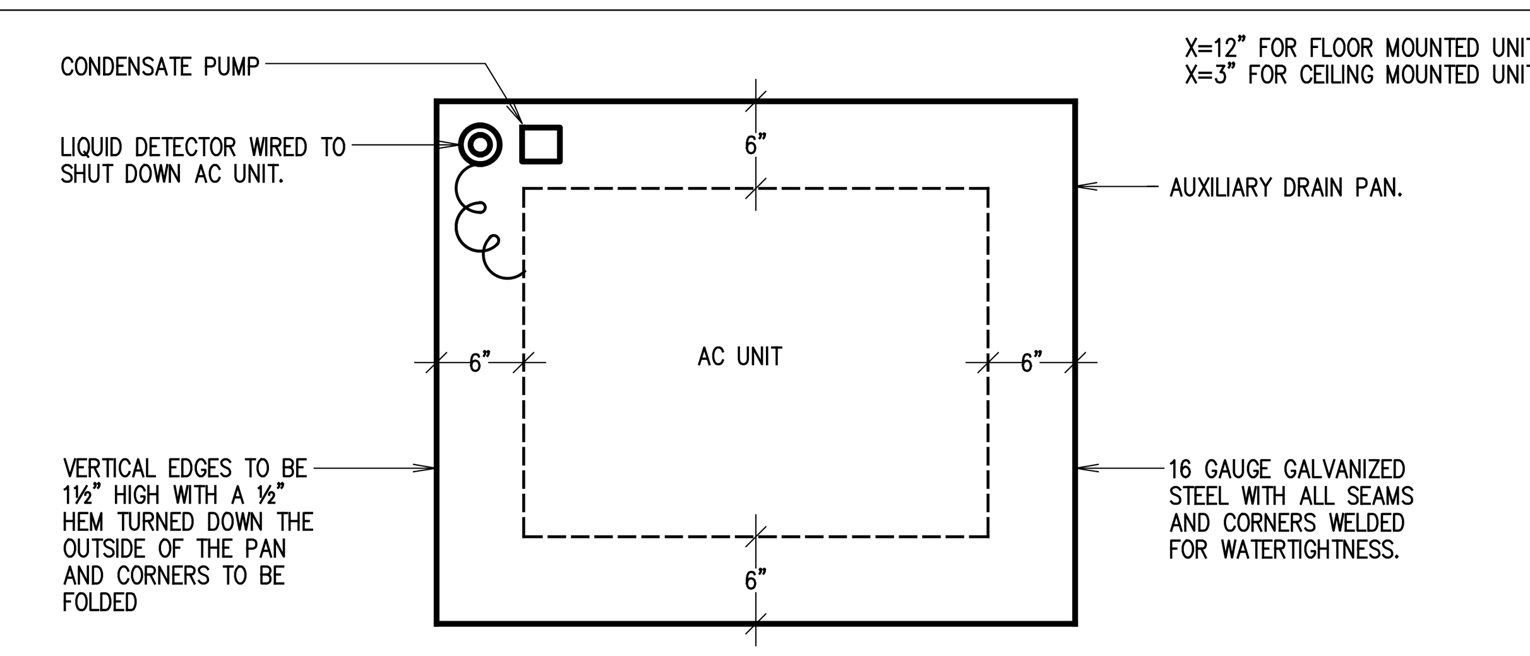
HD-053



IN-LINE PUMP DETAIL

NOT TO SCALE

HD-049



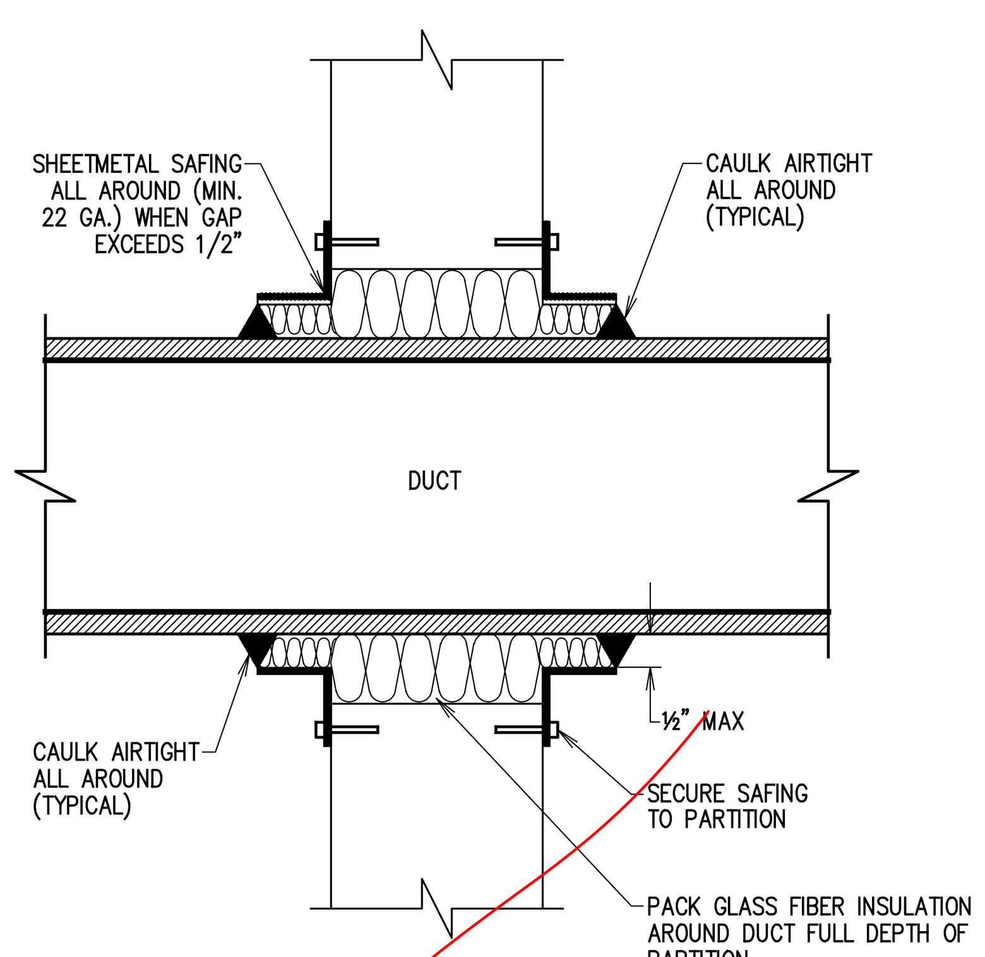
NOTES:

1. THIS DETAIL APPLIES TO-
   - FLOOR MOUNTED OR CEILING HUNG AC UNITS WITH INTEGRAL CONDENSATE DISCHARGE PUMPS.
   - FLOOR MOUNTED OR CEILING HUNG AC UNITS WITH GRAVITY FLOW CONDENSATE DRAIN PIPING.
2. FOR CEILING INSTALLATIONS, SUPPORT AC UNIT AND DRAIN PAN INDEPENDENTLY FROM STRUCTURE OVERHEAD.
3. PITCH DRAIN PAN TO LIQUID DETECTOR. PROVIDE ¾" PLUGGED DRAIN AT LOW POINT.
4. PROVIDE AUXILIARY CONTACT OR LIQUID DETECTOR FOR INTERFACE WITH THE BUILDING MANAGEMENT SYSTEM WHEN SPECIFIED.

TYPICAL DETAIL OF AUXILIARY DRAIN PAN FOR AC UNITS

NOT TO SCALE

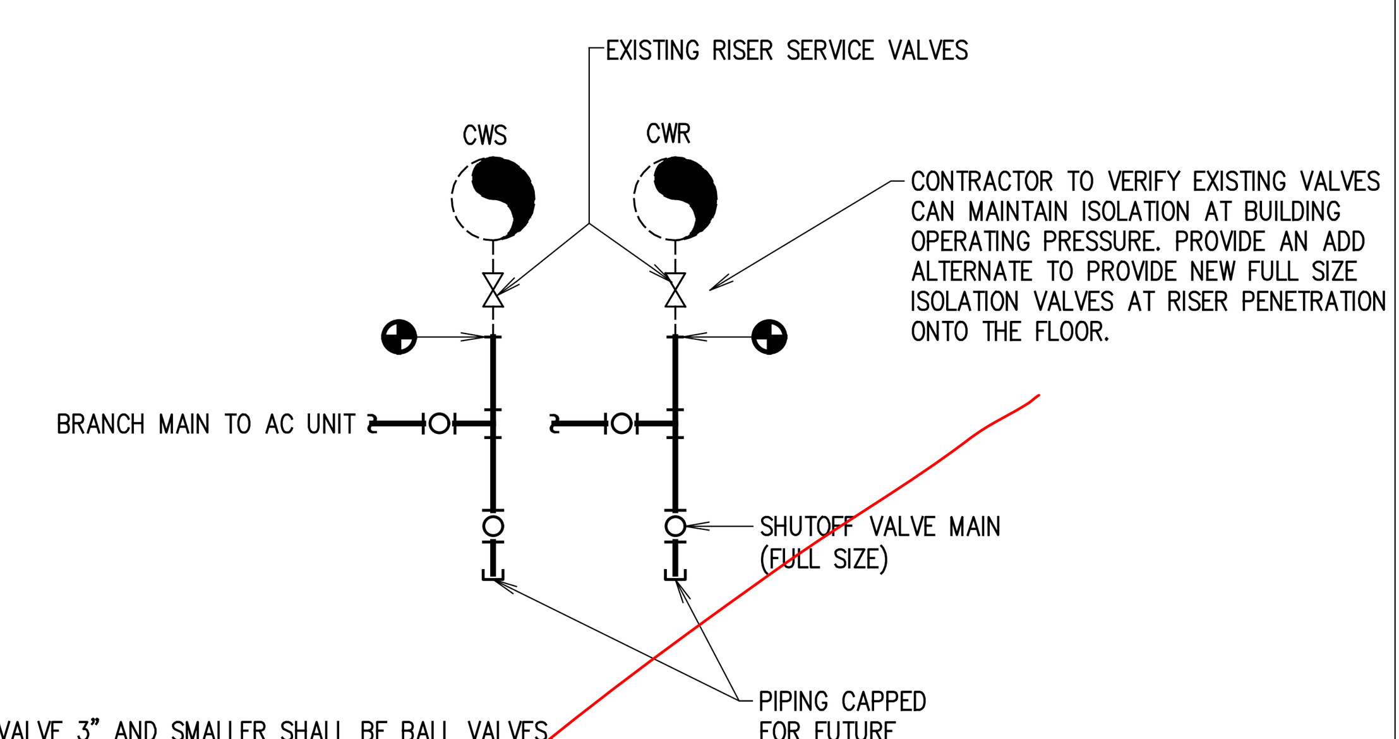
HD-086



ACOUSTICAL SEAL FOR DUCT PENETRATIONS

NOT TO SCALE

HD-096



NOTES:

1. ALL ISOLATION VALVE 3" AND SMALLER SHALL BE BALL VALVES. ALL VALVES 4" AND LARGER SHALL BE BUTTERFLY VALVES.
2. CONTRACTOR SHALL PROVIDE ONE PIPE SIZE SMALL VALVES CAPPED FOR FUTURE CONNECTION.
3. ALL PIPE FITTING SHALL BE RATED FOR SYSTEM PRESSURE.
4. PROVIDE DIELECTRIC FITTING FOR ALL DISSIMILAR METALS.

TYPICAL CONDENSER WATER CONNECTION TO CAPPED OUTLETS

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Fogarty Finger
69 Walker Street
New York, NY 10013
212.966.7450
www.fogartyfinger.com

MEP/FP

ama group
825 Eighth Avenue, FL18 | New York, NY 10019
212.944.7722 | amagroupusa.com

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KEY PLAN

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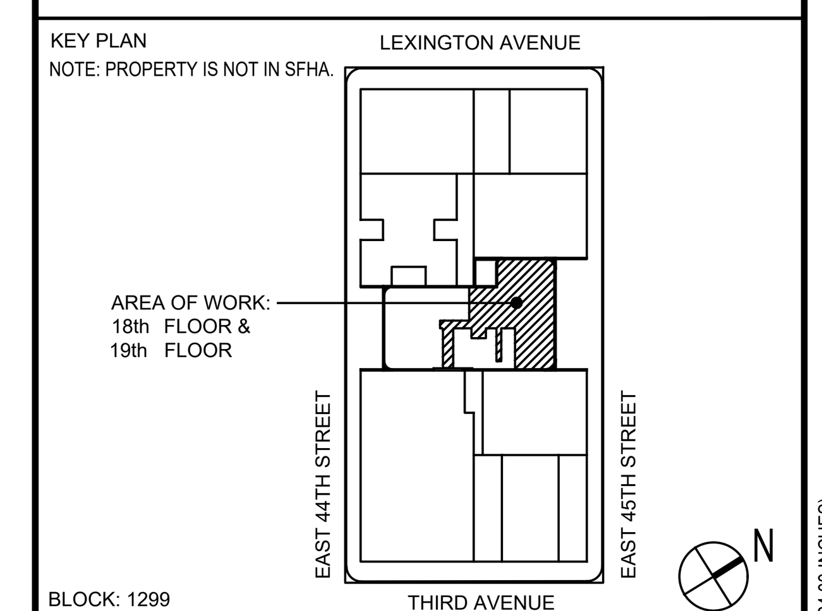

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DRAWING TITLE

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SEAL AND SIGNATURE

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PROJECT No.:	G050-01-119
ENGINEER:	EK
PROJECT MANAGER:	RK

DWG No.

M-903.00

SCALE: NOT TO SCALE

10 OF 10

DOB DRAWING NUMBER: M00979855-I1