

MECHANICAL ABBREVIATIONS AND SYMBOL LIST

AC	AIR CONDITIONING	L	LENGTH		GATE VALVE
ACCU	AIR-COOLED CONDENSING UNIT	LAT	LEAVING AIR TEMPERATURE		CHECK VALVE
AD	ACCESS DOOR	LBS	POUNDS		AIR VENT
AFF	ABOVE FINISHED FLOOR	LDB	LEAVING DRY BULB TEMPERATURE		PRESSURE GAUGE
AL	ACOUSTICALLY LINED	LIN FT	LINEAR FEET		THERMOMETER
ALU	ALUMINUM	LWB	LEAVING WET BULB		BALL VALVE
AP	ACCESS PANEL	LWT	LEAVING WATER TEMPERATURE		PIPE UP
BDD	BACK DRAFT DAMPER	MAX	MAXIMUM		PIPE DOWN
BHP	BRAKE HORSEPOWER	MBH	THOUSAND BTU PER HOUR		PIPE STUB UP
BI	BLACK IRON	MCC	MOTOR CONTROL CENTER		FLOW DIRECTION
BTU	BRITISH THERMAL UNIT	MER	MECHANICAL EQUIPMENT ROOM		PITCH PIPE OR DUCT
BTUH	BTU PER HOUR	MHP	MOTOR HORSEPOWER		UNDERCUT DOOR
CHW	CHILLED WATER	MIN	MINIMUM		FLANGED END
CD	CEILING DIFFUSER	MOT	MOTOR		DEAD END, SCREWED CAP
CFM	CUBIC FEET PER MINUTE	NC	NORMALLY CLOSED		DIRECTION OF FLOW
CG	CEILING GRILLE	NIC	NOT IN CONTRACT		DOWN
CLG	CEILING	NO	NORMALLY OPEN		LINE BREAK
CO	CARBON MONOXIDE	NO.	NUMBER		
CR	CEILING REGISTER	NTS	NOT TO SCALE		
CU	COPPER	OAI	OUTSIDE AIR INTAKE		EXISTING TO BE REMOVED
CU FT	CUBIC FEET	OD	OUTSIDE DIAMETER		SUPPLY DUCT
CU IN	CUBIC INCHES	OV	OUTLET VELOCITY		RETURN OR EXHAUST DUCT
CV	CONSTANT VOLUME	PD	PRESSURE DROP		SQUARE ELBOW WITH VANES
D	DROP	PHC	PREHEAT COIL		ROUND ELBOW WITH VANES
DB	DRY BULB	PSIA	PSI ABSOLUTE		
DIAM	DIAMETER	PSIG	PSI GAUGE		
DN	DOWN	R	RISE		
DWG	DRAWING	RA	RETURN AIR		FIRE DAMPER AND ACCESS DOOR
DX	DIRECT EXPANSION	RF	RETURN FAN		FIRE SMOKE DAMPER AND ACCESS DOOR
EAT	ENTERING AIR TEMPERATURE	RM	ROOM		DUCT SMOKE DETECTOR
EDB	ENTERING DRY BULB TEMPERATURE	RPM	REVOLUTION PER MINUTE		
EF	EXHAUST FAN	RH	RELATIVE HUMIDITY		SMOKE DAMPER AND ACCESS DOOR
ELEC.	ELECTRIC	RHC	REHEAT COIL		
ERHC	ELECTRIC REHEAT COIL	SD	SMOKE DAMPER		MOTORIZED DAMPER
EQ	EQUAL	SDR	SMOKE DETECTOR		
EWB	ENTERING WET BULB	SLD	STRIPLINE LINEAR DIFFUSER		ACOUSTICALLY LINED DUCT BRANCH DUCT TAKE-OFF W/V.D.
EWT	ENTERING WATER TEMPERATURE	SP	STATIC PRESSURE		
EXH	EXHAUST	SPEC	SPECIFICATION		
EX	EXISTING	SS	STAINLESS STEEL		
F	FILTER	T	THROAT		
°F	DEGREE FAHRENHEIT	TEMP	TEMPERATURE		FLEX CONNECTION
FC	FLEXIBLE CONNECTION	TG	TOP GRILLE		FLEX CONNECTION
FD	FIRE DAMPER	TR	TOP REGISTER		CEILING SUPPLY DIFFUSER
FA	FREE AREA (SQ. FT.)	TRF	TRANSFER FAN		CEILING RETURN REGISTER
F.A.	FACE AREA	TT	TOP THROAT		
FLA	FULL LOAD AMPERES	TYP	TYPICAL		LINEAR DIFFUSER WITH ACOUSTICALLY LINED PLENUM
FPM	FEET PER MINUTE	TX	TOILET EXHAUST		
FL.DR.	FLOOR DRAIN	UH	UNIT HEATER		MUSHROOM TYPE ROOF FAN
FIN FL	FINISHED FLOOR	V	VOLTS		
FSD	FIRE SMOKE DAMPER	W	WIDTH		IN-LINE FAN
FT	FEET	W/	WITH		DUCT MOUNTED ELECTRIC REHEAT COIL
FTR	FINNED TUBE RADIATION	W/O	WITHOUT		VARIABLE AIR VOLUME BOX
GPH	GALLONS PER HOUR	WB	WET BULB		RISER TAG / EQUIPMENT TAG
GPM	GALLONS PER MINUTE	WC	WATER COLUMN		
H	HEIGHT	WG	WATER GAUGE		
HW	HOT WATER	WMS	WIRE MESH SCREEN		REQUIRED ACCESS AREA/ACCESS DOOR
HWC	HOT WATER COILS	VD	VOLUME DAMPER		THERMOSTAT
HR	HOUR	VAV	VARIABLE AIR VOLUME BOX		REMOTE TEMPERATURE SENSOR
HUM	HUMIDIFIER	⊙	POINT OF DISCONNECTION		WALL SWITCH
HZ	FREQUENCY	⊙	POINT OF CONNECTION OF NEW PIPE OR DUCT TO EXISTING PIPE OR DUCT		BACK DRAFT DAMPER
IN	IN OR INCHES				MOTORIZED DAMPER
KW	KILOWATT				

NOTE ALL ABBREVIATIONS AND SYMBOLS LISTED ABOVE ARE FOR REFERENCE AND NOT NECESSARILY USED IN THIS PROJECT.

GENERAL NOTES

- THE CONTRACTOR SHALL VISIT THE PREMISES TO DETERMINE EXISTING CONDITIONS AND COMPARE SAME WITH CONTRACT DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR IS TO SATISFY THEMSELVES OF ALL CONDITIONS PRIOR TO THE SUBMISSION OF A BID PROPOSAL. NO ALLOWANCE WILL BE MADE FOR FAILURE TO COMPLY WITH THESE REQUIREMENTS AND A BID PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THEY HAVE DONE SO.
- ALL HVAC WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
- COORDINATE DUCTWORK WITH APPROVED SUBMISSION OF SUPPLY, RETURN & EXHAUST AIR TERMINAL UNIT SIZES AND ASSOCIATED INLET AND OUTLET CONNECTIONS.
- PROVIDE ACCESS AS REQUIRED FOR DUCT SMOKE DETECTORS INSTALLED IN DUCTWORK.
- DUCT SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR MOUNTING THE SMOKE DETECTORS IN DUCTWORK AS REQUIRED AND SHOWN ON PLANS. MECHANICAL CONTRACTOR IS RESPONSIBLE TO CONDUCT AND PROVIDE THE RESULTS THE DUCT SMOKE DETECTOR PRESSURE DIFFERENTIAL TO THE ENGINEER AND ANY OTHER AUTHORITY HAVING JURISDICTION.
- PROVIDE ACCESS PANELS UPSTREAM OF ALL ELBOWS WITH TURNING VANES. ALL ACCESS DOORS AND ACCESS PANELS ARE TO BE LABELED. ALL VALVES ARE TO BE LOCATED IN THE HORIZONTAL POSITION AND BE EASILY REACHABLE WITHOUT CLIMBING UP INSIDE THE CEILING OR A REMOTE METHOD OF OPERATION AT CEILING HEIGHT IS TO BE PROVIDED.
- PROVIDE ACCESS PANELS IN DUCTWORK FOR OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL FANS, VALVES AND MECHANICAL EQUIPMENT.
- ACCESS DOORS INTO DUCTWORK SHALL NOT BE SMALLER THAN 18"X18" UNLESS DUCT SIZE DOES NOT PERMIT. INDICATE SIZE AND LOCATIONS OF ALL ACCESS DOORS.
- PROVIDE VOLUME DAMPERS IN ALL SUPPLY, RETURN AND EXHAUST BRANCH DUCTWORK. PROVIDE ONE VOLUME DAMPER FOR EACH SUPPLY DIFFUSER AND RETURN GRILLE. PROVIDE MANUAL DAMPERS IN EACH SPLIT OR TAP CONNECTION TO TRUNK DUCTS FOR BALANCING PURPOSES, EACH PROVIDED WITH OPERATOR AND LOCKING DEVICE. INSTALL DIVERTING VANES AT BRANCHES CONNECTED INTO THE MAIN WITHOUT A NECK
- ALL AIR OUTLETS (DIFFUSERS, GRILLES, REGISTERS, LINEAR SLOTS, ETC.) SHALL BE COORDINATED WITH THE ARCHITECTURAL CEILING PLAN (LIGHTS, SPRINKLER HEADS, CEILING GRID), ELECTRICAL PLANS, SPRINKLER PLANS, AND WITH REVIEWED AND APPROVED AIR OUTLET SUBMITTAL.
- ARCHITECT TO REVIEW AND APPROVE FACE SIZE AND EXACT LOCATION OF ALL AIR OUTLETS (DIFFUSERS, GRILLES, REGISTERS, ETC.) AND COORDINATE WITH EQUIPMENT MFR. REQUIREMENT.
- ARCHITECT & OWNER TO REVIEW AND APPROVE LOCATION OF ALL THERMOSTATS IN CONJUNCTION WITH FINAL EQUIPMENT LAYOUT.
- PROVIDE FLEXIBLE DUCT CONNECTIONS AT ALL EQUIPMENT WITH ROTATING OR RECIPROCATING EQUIPMENT.
- SHEET-METAL SHOP DRAWING CAN BE RELEASED FOR FABRICATION ONLY AFTER SHEET-METAL SHOP STANDARDS HAVE BEEN REVIEWED AND APPROVED.
- SHEET-METAL SHOP DRAWINGS MUST BE COORDINATED WITH ALL TRADES (MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION, STRUCTURAL ETC.) BEFORE FABRICATION.
- PROVIDE CEILING AND DUCT ACCESS DOORS FOR HOT WATER REHEAT COILS AND ANY OTHER EQUIPMENT REQUIRING ACCESS.
- CONTRACTOR TO COORDINATE DUCT LOCATIONS WITH STRUCTURAL STEEL AND ARCHITECTURAL DRAWINGS OF THE AREA.
- PROVIDE BRANCH CONNECTION TAPS AS INDICATED IN DETAIL ON DETAIL DRAWINGS. ANY OTHER TAP BRANCH CONNECTIONS ARE NOT ACCEPTABLE.
- ALL DUCT SIZES, SHOWN ARE INSIDE CLEAR DIMENSIONS.
- ALL CONDENSATE DRAIN LINES FROM EACH UNIT WILL BE PIPED FULL SIZE OF THE DRAIN OUTLET WITH P-TRAP AND TERMINATED AT THE NEAREST DRAIN OR SLOP SINK. PROVIDE A CONDENSATE PUMP SIMILAR TO LITTLE GIANT VCC-200LS IF GRAVITY DRAINAGE CANNOT BE UTILIZED. COORDINATE WITH ELECTRICAL CONTRACTOR AS REQUIRED.
- ALL EQUIPMENT, PIPING, DUCTWORK, ETC. SHALL BE INDEPENDENTLY SUPPORTED AS DETAILED AND SPECIFIED. ADDITIONAL SUPPORT SHALL BE PROVIDED AS REQUIRED TO PROVIDE VIBRATION-FREE INSTALLATION.
- ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH NEC AND ELECTRICAL PROJECT SPECIFICATIONS.
- ALL FIRE AND FIRE/SMOKE DAMPERS MUST BE INSTALLED IN STRICT ACCORDANCE WITH THE LATEST UL 555/555S REQUIREMENTS, PER THE CONDITIONS OF THEIR LISTING, THE MANUFACTURER'S INSTALLATION REQUIREMENTS, AND THE REQUIREMENTS OF ALL APPLICABLE BUILDING AND MECHANICAL CODES.
- PROVIDE AS REQUIRED BY CODE (LOCAL OR NATIONAL) ANY ADDITIONAL FIRE DAMPERS, SMOKE DAMPERS, ACCESS PANELS, OR SPECIAL SUPPORTS NOT SHOWN ON PLANS AT NO ADDITIONAL COST TO OWNER.
- ANY ABANDONED EXISTING EQUIPMENT, DUCTWORK, ETC. WHICH IS NOT SHOWN TO BE REMOVED, BUT INTERFERES WITH THE NEW CONSTRUCTION IS TO BE REMOVED BY THE CONTRACTOR.
- THE CONTRACTOR SHALL REMOVE, RELOCATE, REPLACE, ADJUST, ADAPT AND MODIFY EXISTING EQUIPMENT AND/OR SYSTEM AS REQUIRED BY THE DRAWINGS OR SPECIFICATIONS AND AS MAY BE REQUIRED WHEN SUCH WORK IS UNCOVERED AND FOUND TO INTERFERE WITH THE COMPLETION OF WORK IN THE CONTRACT WITHOUT ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR IS TO BALANCE ALL DUCT SYSTEMS AND PROVIDE ALL NECESSARY BELTS, PULLEYS, SHEAVES, ETC TO ACHIEVE THE DESIGN AIR QUANTITIES. NEWLY DESIGNED AREAS SHALL BE BALANCED TO THE INDICATED AIR QUANTITIES ON THE DRAWINGS. ALL EXISTING AREAS SHALL BE RE-BALANCED TO THE ORIGINAL DESIGN REQUIREMENTS. ALL BALANCED AIR QUANTITIES ARE TO BE WITHIN 5% OF DESIGN AIR QUANTITIES.
- ALL SQUARE ELBOWS ON DUCTWORK ARE TO HAVE DOUBLE THICK TURNING VANES.
- UL LISTED FIRESTOP ASSEMBLIES SHALL BE INSTALLED AT ALL PENETRATIONS OF FIRE RATED CONSTRUCTION.
- AFTER FINAL TESTS AND ADJUSTMENTS, FULLY INSTRUCT OWNER'S OPERATING PERSONNEL IN ALL DETAILS OF OPERATION FOR EQUIPMENT INSTALLED. A SIGNED RECEIPT WHICH SHALL BE OBTAINED FROM THE OPERATOR SHALL BE CONSTRUED AS EVIDENCE THAT INSTRUCTIONS WERE SATISFACTORY.
- FURNISH TWO (2) COPIES OF WRITTEN DESCRIPTIONS OF ALL SYSTEMS COVERING ALL MANUAL OPERATING PROCEDURE, AUTOMATIC CONTROL DESCRIPTIONS AND AUTOMATIC CONTROL TEMPERATURE AND PRESSURE SETTINGS. WRITTEN DESCRIPTIONS SHALL INCLUDE LUBRICATION SCHEDULES, PARTS LISTS, PERFORMANCE SERVICES FOR EQUIPMENT, FILTER SIZE / QUANTITY SCHEDULE, ETC. WHEN MANUFACTURER'S STANDARD INSTRUCTIONS, ARE UTILIZED, THEY SHALL BE CLEARLY MARKED TO INDICATE APPLICABILITY.
- CONTRACTOR IS RESPONSIBLE FOR THE TESTING & COMMISSIONING OF ALL HVAC SYSTEMS IN THE PRESENCE OF UNIT MANUFACTURER.
- ALL DUCTWORK & PIPING TO BE LABELED AS REQUIRED BY BUILDING STANDARDS.
- PROVIDE FD/FSD ON ALL NEW DUCTWORK PENETRATING NEW OR EXISTING RATED WALLS IN/THROUGH PROJECT SPACE. PROVIDE FD/FSD ON ALL EXISTING DUCTWORK PENETRATING NEW RATED WALLS IN/THROUGH PROJECT SPACE.
- ALL MECHANICAL EQUIPMENT TO BE PROVIDED WITH A PERMANENT LABEL (WEATHERPROOF IF EXTERIOR) INDICATING: THE DESIGNATION, THE SPACE IT SERVES, THE SOURCE OF POWER (PANEL NAME & LOCATION) AND THE DATE OF INSTALLATION (MONTH/YEAR).

DRAWING LIST

M-001	MECHANICAL SYMBOLS, NOTES & DRAWING LIST
M-002	LANDMARKS
M-003	FLOOD HAZARD MAP
M-004	COMCHECK
M-101	MECHANICAL PLANS
M-301	MECHANICAL RISER DIAGRAMS
M-401	MECHANICAL DETAILS
M-402	MECHANICAL DETAILS
M-501	MECHANICAL SCHEDULES
M-601	MECHANICAL SPECIFICATIONS
M-602	MECHANICAL SPECIFICATIONS
M-603	MECHANICAL SPECIFICATIONS

COORDINATION NOTES

- COORDINATE ALL WORK WITH THE ARCHITECTURAL DRAWINGS. VERIFY LOCATION OF ALL VISIBLE DEVICES WITH ARCHITECT OR OWNER PRIOR TO INSTALLATION, INCLUDING THERMOSTATS, DIFFUSERS, GRILLES, REGISTERS, ETC. RECEIVE APPROVAL FROM THE ARCHITECT OR OWNER FOR FINISH COLOR AND MOUNTING FRAME PRIOR TO PURCHASE. RECEIVE APPROVAL FROM THE ARCHITECT FOR ALL DEVICES PRIOR TO PURCHASE.
- VERIFY THE SIZES OF EXISTING DUCTWORK (IF ANY) TO BE REUSED PRIOR TO SUBMISSION OF SHOP DRAWINGS. NOTIFY THE ENGINEER IMMEDIATELY IF ACTUAL SIZES DIFFER FROM SIZES INDICATED ON THESE PLANS.
- SHOP DRAWING NOTES:
 - ALL MECHANICAL SHOP DRAWINGS SHALL BE SUBMITTED TO DESIGN ENGINEER
 - SUBMIT CAD AS-BUILT SHEETMETAL DRAWINGS (UPDATED WITH COMMENTS) FOR THE RECORD AT COMPLETION OF INSTALLATION TO DESIGN ENGINEER
 - SUBMIT AIR BALANCING REPORT TO DESIGN ENGINEER

MECHANICAL CONTRACTOR NOTES

- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL DUNNAGE, SUPPORTS, INSTALLATION, LEVELING, METHODS OF HANGING, SUPPLEMENTAL STEEL AND REINFORCEMENTS, ETC. THAT WILL BE REQUIRED FOR ALL MECHANICAL EQUIPMENT UTILIZED FOR THIS PROJECT.
- SIGNED AND SEALED DOCUMENTS PROVIDED BY A LICENSED STRUCTURAL ENGINEER ARE TO BE SUBMITTED TO THE ARCHITECT OF RECORD FOR FINAL REVIEW AND APPROVAL PRIOR TO ACTUAL EQUIPMENT INSTALLATION.
- COORDINATE WITH GENERAL CONTRACTOR, ARCHITECT & BUILDING MANAGER/ENGINEER.
- ANY EXTRAS AND DEVIATIONS APPEARED FROM THE SUBSTITUTION OF THE ORIGINALLY DESIGNED CONCEPTS OR UTILIZED EQUIPMENT, WILL HAVE TO BE THE RESPONSIBILITY OF THIS CONTRACTOR AND DONE AT NO ADDITIONAL COST TO THE CLIENT.

SPECIAL INSPECTIONS

1. MECHANICAL SYSTEMS	BC 1704.16
2. HEATING SYSTEMS	BC 1704.25
3. FIRE RESISTANT PENETRATIONS AND JOINTS	BC 1704.27
4. ENERGY CODE COMPLIANCE INSPECTIONS	BC 110.3.5
5. FINAL	28-116.2.4.2, BC 110.5 DIRECTIVE 14 OF 1975 AND 1 RCNY 101-10

ENERGY CODE PROGRESS INSPECTIONS

	COMMERCIAL	RESIDENTIAL
1. HVAC AND SERVICE WATER HEATING EQUIPMENT	(IIB3)	(IB3)
2. HVAC AND SERVICE WATER HEATING SYSTEM CONTROLS	(IIB4)	(IB4)
3. INSULATION AND SEALING	(IIB5)	(IB5)
4. MAINTENANCE INFORMATION	(IID1)	(ID1)

COMMISSIONING NOTE

PER THE REQUIREMENTS OF THE NYC ENERGY CONSERVATION CONSTRUCTION CODE C40B, THIS PROJECT WILL NOT REQUIRE COMMISSIONING.

SITE INFORMATION

53 WOOSTER STREET
BLOCK: 475 LOT: 17
ZONING DISTRICT: M1-5B
ZONING MAP: 12g
HEIGHT: 36'; 3 STORIES
CONSTRUCTION: CLASS 3 NON-FIREPROOF
OCCUPANCY: RESIDENTIAL
PROPERTY IS NOT IN A SFHA

NYC DOB STAMPS & SIGNATURES

LANDMARKS PRESERVATION COMMISSION
ELECTRONIC APPROVAL - 08/11/2020 - SEK

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK CITY ENERGY CONSERVATION CODE.

THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

DISCLAIMER NOTE

1. THE ENTIRE CONTENTS OF THIS DOCUMENT, INCLUDING ALL SKETCHES, PLANS, STUDIES, DRAWINGS, SCHEDULES, AND SPECIFICATIONS, AND COPYRIGHTS THEREIN ARE AND SHALL REMAIN THE PROPERTY OF LANDMARKS PRESERVATION COMMISSION. NO PART OF THIS DOCUMENT SHALL BE USED, PHOTOCOPIED, OR REPRODUCED DIGITALLY, ELECTRONICALLY, OR IN ANY OTHER MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF R.I.P. CONSTRUCTION CONSULTANTS, INC.

2. THE CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO START OF WORK.

3. IT IS A VIOLATION OF NYS EDUCATION DEPT. LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT OR ENGINEER, TO ALTER THIS PLAN IN ANY WAY.

4. THIS LAYOUT COMPLIES WITH THE 2010 E.C.C. NYS LOCAL LAW 48/2010 & LOCAL LAW 1/2011

REVISIONS:

NO.	DATE	DESCRIPTION

LANDLORD'S / OWNER'S INFORMATION:

NEW YORK CITY EXPEDITOR:
R.I.P. C.C. INC.
325 BROADWAY SUITE 304
NEW YORK, NY 10007
TEL: 212-334-7400

ARCHITECT / ENGINEER OF RECORD:
EDWARD GUTERMAN P.E. #061893-1
325 BROADWAY SUITE 304
NEW YORK, NY 10007
212-334-4114

CONSULTING ENGINEERS
GUTH-DECONZO CONSULTING ENGINEERS
242 30TH STREET, SUITE 301
NEW YORK, NY 10001
212-967-4306

MATTHEW N. DeCONZO, PE
LICENSE NO. 066664

PROJECT ADDRESS:
HEAT ME
53 WOOSTER STREET
NEW YORK, NEW YORK

SHEET TITLE:
MECHANICAL SYMBOLS & NOTES

SEAL:	DATE:
	03-23-20
PROJECT #:	DRAWN BY:
4264-G04	WH
SCALE:	NONE

NYC DOB BSCAN:

DRAWING NUMBER:
M-001.00

SHEET: 1 OF 12

MECHANICAL SPECIFICATIONS

1. GENERAL CONDITIONS

- A. THE APPLICABLE PROVISIONS OF THE GENERAL CONSTRUCTION SPECIFICATIONS SHALL APPLY.
B. THE BASE BUILDING GENERAL PROVISIONS AND BIDDING REQUIREMENTS ARE PART OF THIS SECTION AND CONTRACT.
C. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE PART OF THESE SPECIFICATIONS.

- W. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND AN APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ENGINEER.
X. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
Y. ALL EXISTING SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK AS WELL AS STEAM, HOT WATER AND CHILLED WATER PIPING WHERE INSULATION IS MISSING OR DAMAGED SHALL BE FULLY INSULATED WITH 1-1/2" THICK THERMAL INSULATION BY THIS CONTRACTOR AS PART OF THE SCOPE OF WORK AT NO ADDITIONAL COST TO THE CLIENT.

- NYCBC NEW YORK CITY BUILDING CODE
ASHRAE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
NYCECCC NEW YORK CITY ENERGY CONSERVATION CONSTRUCTION CODE
ASTM AMERICAN SOCIETY FOR TESTING MATERIALS
ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
UL UNDERWRITER'S LABORATORIES, INC
NFPA NATIONAL FIRE PROTECTION ASSOCIATION
SMACNA SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION
ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AMCA AIR MOVING AND CONTROL ASSOCIATION
ARI AMERICAN REFRIGERATION INSTITUTE.
MSS MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY

2. OPERATING & MAINTENANCE INSTRUCTIONS

- A. AFTER FINAL TESTS AND ADJUSTMENTS, FULLY INSTRUCT OWNER'S OPERATING PERSONNEL IN ALL DETAILS OF OPERATION FOR EQUIPMENT INSTALLED.
B. PROVIDE TO THE OWNER OPERATION AND MAINTENANCE MANUALS.
C. GUARANTEE AND SERVICE.
1. THE CONTRACTOR SHALL GUARANTEE THE ENTIRE INSTALLATION FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE FINAL ACCEPTANCE OF THE INSTALLATION BY THE OWNER.
2. THE CONTRACTOR SHALL DURING THE PERIOD OF GUARANTEE REPLACE OR REPAIR AT HIS OWN EXPENSE ANY PIECE OF EQUIPMENT AND/OR MATERIAL WHICH IS FOUND TO BE DEFECTIVE.

3. SHOP DRAWINGS & EQUIPMENT SUBMISSIONS

- A. SIX (6) COPIES OF DUCTWORK AND PIPING AND CERTIFIED EQUIPMENT MANUFACTURER'S DATA SHALL BE SUBMITTED FOR APPROVAL PRIOR TO FABRICATION, ERECTION OR PURCHASE.
B. PRODUCT DATA - SUBMIT MANUFACTURER'S PRINTED LITERATURE, CATALOG CUTS, CERTIFIED EQUIPMENT PERFORMANCE DATA, WIRING DIAGRAMS AND INSTALLATION INSTRUCTIONS.
C. SHOP DRAWINGS - SUBMIT PLANS, SECTIONS, DETAILS, SCHEDULES AND CALCULATIONS. LAYOUTS SHALL BE DOUBLE LINE, SCALE: 3/8"=1'-0" COORDINATED WITH OTHER TRADES AND WITH BUILDING CONSTRUCTION ELEMENTS. SUBMIT ONE REPRODUCIBLE AND FIVE (5) PRINTS OF EACH DRAWING.
D. MAINTENANCE MANUALS - PREPARE OPERATING AND MAINTENANCE MANUAL INCLUDING THE FOLLOWING:
1. MANUFACTURER'S LITERATURE DESCRIBING EACH PIECE OF EQUIPMENT.
2. COPIES OF PRODUCT WARRANTIES AND GUARANTEES.
3. OPERATING AND MAINTENANCE PROCEDURES, SERVICING INSTRUCTIONS.
E. ALL SHOP DRAWINGS MUST BE APPROVED BY THE BUILDING MANAGEMENT OFFICE BEFORE CONSTRUCTION PROCEEDS, INCLUDING THE FOLLOWING:
1. CATALOG CUTS AND PERFORMANCE OF PROPOSED MECHANICAL EQUIPMENT (6 SETS).
2. CONTRACTOR 3/8"-11" SCALE SHEET METAL SHOP DRAWINGS (6 SETS) SHOP DRAWINGS MUST BE APPROVED BY BUILDING MANAGEMENT OFFICE BEFORE CONSTRUCTION PROCEEDS.
3. PRESSURE TEST REPORTS AND WATER PURITY TEST REPORTS (6 SETS).
4. AIR AND WATER BALANCE REPORTS (2 SETS). WHEN BALANCING REPORT IS SUBMITTED TO THE BUILDING, INCLUDE 1/16" SCALE HVAC DRAWING NOTING DIFFUSERS NOS. AND COLUMN NOS. REPORT MUST BE SUBMITTED WITHIN 2 WEEKS AFTER BALANCING IS COMPLETED.

4. RECORD DRAWINGS

- A. REPRODUCIBLE RECORD DRAWINGS SHALL BE SUPPLIED UPON WHICH CORRECTIONS SHALL BE MADE TO PROVIDE AN ACCURATE AND COMPLETE RECORD OF THE WORK AS INSTALLED.
B. AS-BUILT INFORMATION SHALL BE SUBMITTED AS FOLLOWS:
1. CAD DRAWING FILES ON DISKS IN AUTOCAD VERSION 12 FORMAT.
2. ONE (1) SET OF REPRODUCIBLE DRAWINGS.
3. TWO (2) SETS OF BLUEPRINTS.

5. APPROVALS AND SUBSTITUTIONS

- A. IT IS THE INTENT OF THESE SPECIFICATIONS THAT WHEREVER A MANUFACTURER IS SPECIFIED AND SUBSTITUTIONS ARE MADE, THEY SHALL CONFIRM IN ALL RESPECTS TO THE SPECIFIED ITEM. CRITERIA AS DELINEATED FOR EQUIPMENT SHALL BE INTERPRETED AS MINIMUM PERFORMANCE REQUIREMENTS.
B. SUBSTITUTED EQUIPMENT WHERE PERMITTED MUST CONFORM TO SPACE REQUIREMENTS, ANY SUBSTITUTED EQUIPMENT THAT CANNOT MEET SPACE REQUIREMENTS, WHETHER APPROVED OR NOT, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ANY MODIFICATION OF RELATED SYSTEMS OR ADDITIONAL COSTS THAT RESULT FROM SUBSTITUTED EQUIPMENT SHALL BE BORNE BY THIS CONTRACTOR.

6. ELECTRICAL WIRING & WIRING DIAGRAMS

- A. ELECTRICAL WIRING FOR POWER AND MOTOR STARTERS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR UNDER ANOTHER DIVISION OF CONTRACT WORK.
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 INSTALLATIONS 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. ALL CONTROL SHALL BE ELECTRIC, ALL ELECTRICAL WORK TO BE IN ACCORDANCE WITH NEW YORK STATE ELECTRICAL CODE. PROVIDE REQUIRED TRANSFORMER SWITCHES, SENSORS, RELAYS AND ALL WIRING REQUIRED TO ACCOMPLISH FULL CONTROL.
E. ALL WIRING, STARTERS, SWITCHES, ETC. SHALL BE IN FULL ACCORDANCE WITH ALL LOCAL AND INSURANCE UNDERWRITERS' CODE REQUIREMENT.
F. FURNISH DETAILED COMPOSITE WIRING DIAGRAMS FOR THOSE INSTALLING THE 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.

7. CODES, PERMITS AND INSPECTIONS

- A. ALL WORK SHALL MEET OR EXCEED LATEST REQUIREMENTS OF THE N.Y. CITY CODE, MRI MNFR., BLDG. STANDARDS AND OTHER AUTHORITIES, EXERCISING JURISDICTION OF THE WORK OF THIS PROJECT.
B. ANY PORTION OF WORK WHICH IS NOT SUBJECT TO THE APPROVAL OF AN AUTHORITY HAVING JURISDICTION SHALL BE PROVIDED IN ACCORDANCE WITH NATIONAL FIRE PROTECTION ASSOCIATION REQUIREMENTS.
C. SECURE PERMITS AND INSPECTION CERTIFICATES AND TRANSMIT SAME TO THE OWNER AT THE COMPLETION OF THE WORK.
D. CONTRACTOR SHALL BE RESPONSIBLE FOR FILING ALL DOCUMENTS WITH ALL CITY AND STATE AGENCIES. CONTROLLED INSPECTION SHALL BE DONE BY CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE.

8. COORDINATION

- A. ALL NEW DUCTWORK SHALL BE KEPT AS HIGH AS POSSIBLE TO MAINTAIN CEILING HEIGHTS SHOWN ON ARCHITECTURAL DRAWINGS.
B. MECHANICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADE.
C. WHERE PIPING, LIGHTS AND DUCTWORK CONFLICT, DUCTWORK SHALL BE COORDINATED TO SITE CONDITIONS.
D. CONNECT NEW WORK TO EXISTING AS SHOWN ON THE DRAWING.
E. CONTRACTOR SHALL COORDINATE EXACT LOCATION OF ALL AIR OUTLETS THERMOSTATS AND SWITCHES WITH ARCHITECT'S REFLECTED CEILING PLANS.
F. COORDINATE LOCATION OF MECHANICAL EQUIPMENT, PIPING AND DUCTWORK WITH THE WORK OF OTHER TRADES, PROVIDING CLEARANCES FOR INSULATION SERVICING, REMOVAL OF COMPONENTS AND EQUIPMENT DISASSEMBLY.
G. COORDINATE PROVISION OF OPENINGS IN WALLS AND SLABS, POURING OF CONCRETE PADS, SETTING OF SLEEVES AND CURBS.
H. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENT.
I. SEQUENCE PHASES OF MECHANICAL WORK WITH THE WORK OF OTHER TRADES.

9. NOISE CONTROL

- A. PROVIDE ACOUSTIC DUCT LINER FOR THE FOLLOWING DUCTS:
1. ALL DUCTS UPSTREAM AND DOWNSTREAM FROM ALL FANS AND AIR CONDITIONING UNITS FOR A LENGTH OF NOT LESS THAN 15 FT.
2. ALL AIR TRANSFER DUCTS.
3. DOWNSTREAM AND UPSTREAM OF ALL VARIABLE AIR VOLUME AND CONSTANT VOLUME BOXES FOR A MINIMUM OF 10 FT.
4. ALL MIXED AIR PLENUMS, EXCEPT WHERE MOISTURE CARRYOVER FROM OUTDOOR AIR LOUVER WILL OCCUR.
5. WHERE NOTED ON THE CONTRACT DRAWINGS.
B. MATERIAL SHALL BE FIBERGLASS, MINIMUM 3 LB. DENSITY, 1 IN. THICKNESS, MAXIMUM 0.26 K FACTOR AT 75° F MEAN TEMPERATURE WITH NEOPRENE COATED FINISH AND STENCILED IN ACCORDANCE WITH NFPA 90 MAXIMUM FLAME SPREAD SHALL BE 25, AND MAXIMUM SMOKE DEVELOPED SHALL BE 50. IT SHALL BE SIMILAR TO JOHNS-MANVILLE LINACOUSTIC, OR AN APPROVED EQUAL.
C. ALL SOUND-LINING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, EXCEPT AS OTHERWISE NOTED.
D. PROVIDE RESILIENT SUPPORTS (ISOLATORS) FOR METAL PIPING UP STREAM AND DOWNSTREAM FROM ALL POWER DRIVEN EQUIPMENT FOR A LENGTH OF 10 FT, OR 50 PIPE DIAMETERS, WHICHEVER IS GREATER.
E. RESILIENT ISOLATORS SHALL HAVE THE FOLLOWING MINIMUM STATIC DEFLECTIONS:
1. 1 INCH FOR PIPING WITH OUTSIDE DIAMETERS 4 INCHES AND LARGER.
2. 1/2 INCH FOR PIPING WITH OUTSIDE DIAMETERS LESS THAN 4 INCHES.
F. EQUIPMENT SUCH AS HEAT EXCHANGERS, ABSORPTION REFRIGERATION MACHINES, OR SIMILAR EQUIPMENT THAT IS NOT POWER DRIVEN, WITHIN 50 PIPE DIAMETERS OF POWER DRIVER EQUIPMENT SHALL ALSO BE RESILIENTLY SUPPORTED. UNLESS THE EQUIPMENT IS MOUNTED ON A GRADE LEVEL FLOOR.
1. ISOLATORS WILL HAVE 1 INCH STATIC DEFLECTION AND SHALL INCORPORATE APPROVED PADS WITH 1/2 INCH STATIC DEFLECTION.

10. VIBRATION ISOLATION SYSTEMS

- A. ALL ROTATING, REVOLVING OR RECIPROCATING EQUIPMENT, SHALL BE FURNISHED WITH SEISMICALLY DESIGNED VIBRATION ISOLATORS, TO PREVENT THE TRANSMISSION OF OBJECTIONABLE NOISES, SOUND OR VIBRATIONS TO THE OCCUPIED SPACES AND TO THE BUILDING STRUCTURES.
B. VIBRATION ISOLATORS FOR CEILING SUPPORTED EQUIPMENT SHALL HAVE A MAXIMUM LATERAL MOTION UNDER EQUIPMENT START-UP OR SHUTDOWN CONDITIONS OF 1/4". MOTIONS IN EXCESS SHALL BE RESTRAINED BY SPRING TYPE MOUNTINGS.
C. VIBRATION ISOLATOR SHALL BE PROVIDED BY EITHER OF THE FOLLOWING MANUFACTURERS:
1. MASON INDUSTRIES.
2. VIBRATION ELIMINATOR CO.
3. CONSOLIDATED KINETICS CO.
D. MOUNTING OF CEILING SUPPORTED FANS AND AC UNITS:
1. ALL SUCH UNITS SHALL BE HUNG BY MEANS OF VIBRATION ISOLATOR HANGERS MADE OF A STEEL HOUSING OR RETAINER INCORPORATING A STEEL SPRING AND NEOPRENE MOUNTING.
2. IF THE EQUIPMENT TO BE MOUNTED IS NOT FURNISHED WITH INTEGRAL STRUCTURAL FRAMES AND EXTERNAL MOUNTING LUGS (BOTH OF SUITABLE STRENGTH AND RIGIDITY) APPROVED STRUCTURAL SUB-BASE SHALL BE INSTALLED IN THE FIELD. INSTALLED STRUCTURAL SUB-BASE SHALL SUPPORT THE EQUIPMENT TO BE HUNG, INCLUDING ADDITIONAL LOAD DUE TO FLUIDS AND OTHER COMPONENTS WITHIN THE UNIT DURING OPERATION, WHICH SHALL BE SUPPORTED BY SPECIFIED HANGERS AND HANGER SECUREMENTS.
3. ISOLATORS SHALL BE ONE OF THE FOLLOWING OR AS APPROVED:
a. FANS - TYPE HD - M.I.I. AND SUPPLY/OUTSIDE AIR FANS.
b. AIR HANDLING UNITS - TYPE 30N M.I.I. - MAXIMUM 1.75".
c. STATIC DEFLECTION AT INSTALLED OPERATING WEIGHTS.
4. DIAGONAL HANGER ROD ISOLATORS SHALL BE PROVIDED AS REQUIRE TO LIMIT HORIZONTAL MOTION TO 1/4 INCH MAXIMUM UNDER FAN OPERATING CONDITIONS.
E. MOUNTING OF FLOOR MOUNTED AC UNITS:
1. FLOOR MOUNTED AC UNITS SHALL BE MOUNTED ON 3/4"WAFFLE NEOPRENE PADS WITH SUITABLE TOP BEARING PLATE SIZE FOR 0.08" STACK DEFLECTION.

11. LEAK TESTING OF REFRIGERANT SYSTEMS

- A. TESTING OF ALL FORCED AIR AND REFRIGERANT CONTAINING HVAC SYSTEMS WILL BE PERFORMED AS REQUIRED BY THE NEW YORK CITY BUILDING CODE (OR OTHER AUTHORITIES HAVING JURISDICTION). TESTS WILL BE PERFORMED IN THE PRESENCE OF A BUILDING REPRESENTATIVE AND WITNESSED BY NYC SPECIAL INSPECTOR WHEN REQUIRED BY CHAPTER 17.
B. WORK IN THIS SECTION INCLUDES THE PROVIDING OF LABOR, MATERIALS, EQUIPMENT AND SERVICES NECESSARY FOR THE COMPLETE TESTING OF ALL HVAC SYSTEMS IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE, CONTRACT DOCUMENTS, PROCEDURES AND STANDARDS DESCRIBED IN THE LATEST MANUALS AS PUBLISHED BY AMERICAN SOCIETY FOR TESTING & MATERIALS (ASTM), AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE) THE SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION, INC. (SMACNA) FOR THE FOLLOWING:
1. FORCED AIR SYSTEMS INSTALLED IN PART OR COMPLETELY OUTSIDE OF THE BUILDING'S THERMAL ENVELOPE AND/OR WITHIN UNCONDITIONED SPACES.
2. REFRIGERATION HVAC SYSTEMS INCLUDING BUT NOT LIMITED TO SPLIT AC UNITS, VARIABLE REFRIGERANT, HEAT PUMPS, ETC.
C. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY SERVICES, ALL TEST APPARATUS, ALL TEMPORARY SEALS, AND ALL QUALIFIED PERSONNEL SERVICES NECESSARY TO CONDUCT THE SPECIFIED TESTING.
D. ALL MEASURING INSTRUMENTATION USED SHALL BE CALIBRATED, UNEXPIRED, AND MAINTAINED IN GOOD WORKING ORDER. ALL INSTRUMENTATION SHALL BE CALIBRATED BY AN ISO 17025 ACCREDITED AGENCY.
E. ALL SYSTEMS REQUIRING TESTING SHALL BE TESTED AND DEMONSTRATED AS ACCEPTABLE BEFORE A NYC SPECIAL INSPECTOR. TESTING SHALL BE PERFORMED AND WITNESSED BEFORE ANY PORTION IS TO BE CONCEALED.
1. ANY PORTION THAT IS NOT ABLE TO BE VISUALLY INSPECTED ON ALL SIDES DUE TO SHAFT WALLS, SHEETROCK CEILINGS, COATINGS, WRAPS OR OTHER FORMS OF CONSTRUCTION IS CONSIDERED TO BE CONCEALED.
I. THE CONTRACTOR SHALL MAKE AND KEEP A RECORD OF, AND REPORT FOR, EACH TEST PERFORMED ON THESE SYSTEMS. THE REPORT WILL RECORD SUCH DETAILS AS SYSTEM TYPE TESTED, MATERIALS INSTALLED, TIMES THE TEST STARTED AND ENDED, PERSONS IN ATTENDANCE AND RESPECTIVE COMPANIES, IN ADDITION TO THE INITIAL AND FINAL RESULTS AS WELL AS PARAMETERS OF THE TEST(S).
REFRIGERATION SYSTEMS
E. WORK AND TESTING IN THIS SECTION SHALL APPLY TO EVERY REFRIGERANT-CONTAINING PART OF EVERY SYSTEM THAT IS ERECTED ON-SITE FOR HEATING, VENTILATION, AND AIR-CONDITIONING SYSTEMS. EXCEPT COMPRESSORS, CONDENSERS, VESSELS, EVAPORATORS, SAFETY DEVICES, PRESSURE GAUGES AND CONTROL MECHANISMS LISTED AND FACTORY TESTED.
F. THE TEST APPARATUS SHALL BE A TEMPORARY CONNECTION MADE TO THE TESTED PIPING CONSISTING OF A PRESSURIZED TANK OF AN INERT DRY GAS, REGULATOR VALVE SET 15 PSI ABOVE TEST PRESSURE, CALIBRATED PRESSURE GAUGE (OR OTHER PRESSURE INDICATOR), ONE OR MORE ISOLATING VALVES BETWEEN THE GAUGE, APPARATUS AND THE SYSTEM, AND OTHER ACCESSORIES NECESSARY TO CONNECT THE APPARATUS TO THE TESTED SYSTEM.
G. LEAK TESTING OF REFRIGERANT SYSTEMS SHALL BE PERFORMED WITH AN INERT DRY GAS SUCH AS NITROGEN, OR CARBON DIOXIDE. GASES SUCH AS OXYGEN, AIR, FLAMMABLES GASES OR MIXTURES CONTAINING SUCH GASES SHALL NOT BE USED.
H. BOTH THE HIGH AND LOW SIDE OF EACH SYSTEM SHALL BE TESTED AT NOT LESS THAN THE LOWER OF THE DESIGN PRESSURES OR THE PRESSURE RELIEF DEVICE(S) INSTALLED. THE DESIGN PRESSURES SHALL BE THOSE LISTED ON THE CONDENSING UNIT, COMPRESSOR, OR COMPRESSOR UNIT NAME-PLATE.
I. LEAK TESTING SHALL BE PERFORMED FOR NO LESS THAN:
1. 4 HOURS - SYSTEMS WITH TOTAL CAPACITIES 10 TONS OR LESS.
2. 24 HOURS - SYSTEMS WITH TOTAL CAPACITIES GREATER THAN 10 TONS.

LANDMARKS PRESERVATION COMMISSION ELECTRONIC APPROVAL 09/28/2020

Table with columns for REVISIONS and LANDLORD'S / OWNER'S INFORMATION.

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Table with columns for SHEET TITLE (MECHANICAL SPECIFICATIONS), SEAL, DATE (03-23-20), PROJECT # (4264-G04), DRAWN BY (WH), SCALE (NONE).

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LANDMARKS PRESERVATION COMMISSION ELECTRONIC APPROVAL 09/28/2020

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK CITY ENERGY CONSERVATION CODE.

THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

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MECHANICAL SPECIFICATIONS

12. TESTING, ADJUSTMENTS AND BALANCING OF AIR SYSTEMS

- A. WORK IN THIS SECTION INCLUDES THE PROVIDING OF LABOR, MATERIALS, EQUIPMENT AND SERVICES NECESSARY FOR COMPLETE TESTING, ADJUSTING, AND BALANCING OF ALL HVAC SYSTEMS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, PROCEDURES AND STANDARDS DESCRIBED IN THE LATEST MANUALS AS PUBLISHED BY AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS (ASHRAE) AND THE SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION, INC. (SMACNA) FOR THE FOLLOWING:
1. ALL OF THE AIR SYSTEMS.
2. ALL SUPPLEMENTARY TENANT AIR CONDITIONING UNITS.
3. ALL RETURN, TRANSFER AND EXHAUST AIR SYSTEMS.
B. BALANCE AND ADJUST AIR DISTRIBUTION SYSTEM TO QUANTITIES INDICATED ON DRAWINGS IN ACCORDANCE WITH ASSOCIATED AIR BALANCE COUNCIL (AABC) MANUAL, LATEST EDITION.
C. BALANCING AND TESTING SHALL BE PERFORMED AND SUPERVISED BY A CERTIFIED INDEPENDENT FIRM SPECIALIZING IN TESTING AND BALANCING. FIRM SHALL BE A MEMBER OF AABC. TEST REPORTS SHALL BE SUBMITTED IN BOUND FOLDERS AND ON AABC TYPE REPORT FORMS. ALL DIFFUSERS SHALL BE IDENTIFIED BY DESIGNATIONS ON DRAWINGS.
D. ALL INSTRUMENTS USED SHALL HAVE AN UNEXPIRED CALIBRATION, AND WILL BE MAINTAINED IN GOOD WORKING ORDER.
E. THE TESTING SHALL BE PERFORMED IN THE PRESENCE OF A BUILDING REPRESENTATIVE.
F. THE CONTRACTOR SHALL PROVIDE ALL ADDITIONAL BALANCING DAMPERS, PRESSURE TAPS, GAUGES AND OTHER SIMILAR APPURTENANCES AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AND AT NO ADDITIONAL COST TO THE OWNER.
G. ALL BALANCING WORK SHALL BE PERFORMED IN STRICT ACCORDANCE TO THE PROCEDURES AND STANDARDS DESCRIBED IN THE "MANUAL FOR THE BALANCING AND ADJUSTMENT OF THE AIR DISTRIBUTION SYSTEMS" AS PUBLISHED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION, INC. (SMACNA)
H. THE TEST AND AIR BALANCE PROCEDURE SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
1. TEST AND ADJUST SYSTEM FOR THE DESIGN SUPPLY, RETURN AND EXHAUST AIR QUANTITIES.
2. TEST AND RECORD SUPPLY AIR TEMPERATURES.
3. TEST AND RECORD ROOM AIR TEMPERATURES.
4. ADJUST ALL MAIN SUPPLY, EXHAUST AND RETURN AIR DUCTS TO PROPER DESIGN CFM.
5. ADJUST ALL ZONES TO PROPER DESIGN CFM - SUPPLY, RETURN AND EXHAUST.
6. TEST AND ADJUST EACH DIFFUSER, GRILLE AND REGISTER TO DESIGN REQUIREMENTS.
I. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE RESPECTIVE MANUFACTURERS OF THE EQUIPMENT INVOLVED. BALANCING WORK SHALL NOT INTERFERE WITH NORMAL JOB PROGRESS SO AS TO PREVENT COMPLETION WITHIN THE SPECIFIED TIME.
J. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST REVIEW HIS WORK WITH THE RESPECTIVE MANUFACTURERS, AND SHALL COORDINATE AND SCHEDULE ALL CORRECTIVE WORK
K. IN THE EVENT THAT THE EQUIPMENT CANNOT BE PROPERLY BALANCED DUE TO LACK OF FINAL CONNECTION, THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST ADVISE THE ENGINEER, IN WRITING, OF THE OMISSION PRIOR TO THE SUBMISSION OF THE FINAL BALANCING REPORT.
L. ADJUSTMENT OR REPLACEMENT OF PARTS REQUIRED BY THE RESULTS OF THE TESTING AND BALANCING WORK SHALL BE MADE BY THE CONTRACTOR IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
M. UPON COMPLETION OF WORK SPECIFIED ABOVE, ALL INFORMATION SHALL BE INSERTED ON A SHEET LISTING ALL ITEMS REQUIRED TO BE INCLUDED IN THE COMPLETE TESTING AND BALANCING REPORT. ALL SHEETS SHALL BE NEATLY TYPED. THREE (3) COPIES OF THE BALANCING REPORT MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW.
N. ALL OPENING IN DUCTS PLENUMS AND OTHER SIMILAR ITEMS, NECESSARY TO THE BALANCING WORK, SHALL BE REPAIRED BY THE CONTRACTOR IN A SUITABLE MANNER. ALL PATCHING MUST BE SUITABLE TO THE SERVICE OF THE SYSTEM SUCH AS MAINTAINING VAPOR SEALS IN COLD DUCTWORK AND OTHER SIMILAR SERVICES.
O. RECOMMENDATIONS AND RESULTS OF THE TESTING AND BALANCING WORK WHICH ARE NECESSARY FOR THE PROPER OPERATION OF THE SYSTEMS, SHALL BE SUBMITTED IN WRITING TO THE ENGINEER. THE SUBMITTAL SHALL INCLUDE A SCHEMATIC DIAGRAM LOCATING ALL AIR INLETS AND OUTLETS.
P. ALL AIR TERMINAL DEVICES SHALL BE BALANCED TO WITHIN FIVE PERCENT OF THEIR DESIGN REQUIREMENTS.
Q. ALL FANS AND AIR HANDLING UNITS SHALL BE BALANCED TO WITHIN TEN PERCENT OF THEIR DESIGN CAPACITIES.
R. THE TEMPERATURE CONDITIONS, BOTH D.B. AND W.B. AND SOUND LEVELS SHALL BE READ AND RECORDED.
S. AFTER TESTING AND BALANCING WORK IS COMPLETE, THE CONTRACTOR SHALL INSTALL A NEW SET OF AIR FILTERS AND CLEAN UNIT COILS.

13. SHEET METAL DUCTWORK

- A. ALL DUCTWORK, DAMPERS AND ALL AUXILIARY DEVICES AND WORK NECESSARY TO MAKE THE VARIOUS AIR CONDITIONING AND VENTILATING SYSTEMS COMPLETE AND READY FOR SATISFACTORY OPERATION SHALL BE FURNISHED AND INSTALLED.
B. IN ACCORDANCE WITH SMACNA STANDARDS PROVIDE DUCTWORK CASING ACCESS AIR CONNECTION AND BRANCH DUCT TO AIR OUTLETS FOR BALANCING PURPOSES, DOORS TO ALL CONCEALED CONTROLS, FUSIBLE LINKS OF DAMPERS, ETC.
C. DUCTWORK LAYOUTS AND ROUTES AS SHOWN ON THE DRAWINGS ARE SCHEMATIC THEREFORE CHANGES IN DUCT SIZES AND/OR LOCATIONS SHALL BE MADE WHERE NECESSARY TO CONFORM TO SPACE CONDITIONS OR OBTAIN MAXIMUM HEADROOM CONDITIONS, WITHOUT ADDITIONAL COSTS TO THE OWNER.
D. EXCEPT AS OTHERWISE SHOWN OR NOTED, ALL DUCTS AND OTHER SHEET METAL WORK SHALL BE PRIME SHEETS OF GALVANIZED STEEL AND SHALL COMPLY WITH NFPA 90A AND ASTM STANDARDS A525 AND A527.
E. DUCTS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITIONS OF SMACNA AND ASHRAE. FOR DUCTWORK DOWNSTREAM OF AIR CONDITIONING UNITS A PRESSURE CLASSIFICATION OF 4" W.G. STATIC PRESSURE MAY BE USED. FOR DUCTWORK UPSTREAM OF THE AC UNIT A PRESSURE CLASSIFICATION OF 3" W.G. STATIC PRESSURE MAY BE USED. U.S. STANDARD GAUGES FOR DUCTWORK ARE TO CONFORM TO THE FOLLOWING REQUIREMENTS:
1. UP TO 30" WIDE - 24 GAUGE.
H. MATERIALS FOR HANGERS & SUPPORTS, INCLUDING FASTENERS, ANCHORS, RODS, STRAPS TRIM AND ANGLES SHALL MATCH THE DUCT FURNISHED. HORIZONTAL DUCTS CAN BE SUPPORTED WITH HANGERS SECURED TO THE EXISTING CONCRETE SLAB ABOVE. THE EXISTING TABS THAT ARE EMBEDDED IN THE CONCRETE ARE TO BE INSPECTED AND USED IN LIEU OF NEW EXPANSION BOLTS WHEREVER POSSIBLE. REFER TO DETAILS SHOWN ON CONTRACT DRAWINGS.
I. SHEETMETAL DUCTWORK SHALL BE SUPPORTED WITH APPROVED HANGERS AT NOT LESS THAN 8FT INTERVALS FROM BUILDING STRUCTURE, OR BY OTHER APPROVED SUPPORT SYSTEMS DESIGNED IN ACCORDANCE WITH NEW YORK CITY BUILDING CODE.
J. FLEXIBLE DUCTWORK, WHERE APPROVED, SHALL BE SUPPORTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
K. ALL DUCTWORK INSTALLED EXPOSED TO VIEW SHALL BE FABRICATED WITH SLIP-ON TRANSVERSE JOINTS AND COMPONENTS CONSTRUCTED USING MANUFACTURER'S GUIDELINES FOR MATERIAL THICKNESS, REINFORCEMENT SIZE AND SPACING, AND JOINT REINFORCEMENT. PROVIDE INTERNAL INSULATION CONFORMING TO SECTION "NOISE CONTROL" OF THIS SPECIFICATION.

- H. MATERIALS FOR HANGERS & SUPPORTS, INCLUDING FASTENERS, ANCHORS, RODS, STRAPS TRIM AND ANGLES SHALL MATCH THE DUCT FURNISHED. HORIZONTAL DUCTS CAN BE SUPPORTED WITH HANGERS SECURED TO THE EXISTING CONCRETE SLAB ABOVE. THE EXISTING TABS THAT ARE EMBEDDED IN THE CONCRETE ARE TO BE INSPECTED AND USED IN LIEU OF NEW EXPANSION BOLTS WHEREVER POSSIBLE. REFER TO DETAILS SHOWN ON CONTRACT DRAWINGS.
I. SHEETMETAL DUCTWORK SHALL BE SUPPORTED WITH APPROVED HANGERS AT NOT LESS THAN 8FT INTERVALS FROM BUILDING STRUCTURE, OR BY OTHER APPROVED SUPPORT SYSTEMS DESIGNED IN ACCORDANCE WITH NEW YORK CITY BUILDING CODE.
J. FLEXIBLE DUCTWORK, WHERE APPROVED, SHALL BE SUPPORTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
K. ALL DUCTWORK INSTALLED EXPOSED TO VIEW SHALL BE FABRICATED WITH SLIP-ON TRANSVERSE JOINTS AND COMPONENTS CONSTRUCTED USING MANUFACTURER'S GUIDELINES FOR MATERIAL THICKNESS, REINFORCEMENT SIZE AND SPACING, AND JOINT REINFORCEMENT. PROVIDE INTERNAL INSULATION CONFORMING TO SECTION "NOISE CONTROL" OF THIS SPECIFICATION.
L. ALL DUCT SIZES SHOWN ON THE CONTRACT DRAWINGS ARE CLEAR INSIDE DIMENSIONS. WHERE INTERNAL ACoustICAL LINING IS REQUIRED, DUCT SIZES SHALL BE CORRESPONDINGLY INCREASED TO ACCOMMODATE THE LINER THICKNESS SO THAT NET CROSS-SECTIONAL AREAS WILL NOT BE REDUCED.
M. RADIUS ELBOWS SHALL HAVE A CENTERLINE RADIUS EQUAL TO 1-1/2 TIMES DUCT WIDTH. PROVIDE SPLITTER VANES IN RADIUS ELBOWS WHERE INDICATED ON DRAWINGS SQUARE ELBOWS SHALL HAVE DOUBLE THICKNESS TURNING VANES MAXIMUM 4 IN. ON CENTER UNLESS SINGLE THICKNESS VANES ARE CLEARLY INDICATED ON THE DRAWINGS.
N. TRANSITIONS IN DUCTWORK SHALL BE MADE WITH A SLOPE NOT TO EXCEED A RATIO OF 1 TO 5. A 1 TO 7 SLOPE RATIO IS PREFERRED.
O. FOR DUCTS WITH A CROSS-SECTIONAL AREA 4 SQUARE FEET OR LESS, HANGERS SHALL BE NO MORE THAN 8 FEET APART; THE DISTANCES BETWEEN HANGERS SHALL BE MEASURED LINEAL ALONG THE DUCT.
P. VOLUME DAMPERS CONSTRUCTION SHALL BE QUADRANT TYPE, MINIMUM 16 GAUGE, GALVANIZED STEEL, IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE SMACNA MANUAL, EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT; INCLUDE APPROVED LEVER OPERATING AND LOCK-SCREW LOCKING DEVICES MOUNTED AT OTHER END, AND INSTALLED IN ACCESSIBLE LOCATIONS. FOR INSULATED DUCTS, QUADRANTS SHALL BE MOUNTED ON A COLLAR TO CLEAR INSULATION.
Q. UNLESS OTHERWISE NOTED, ALL NEW AND EXISTING LOW VELOCITY DUCTS SHALL BE SEALED TO MEET THE DUCT SEALING REQUIREMENT OF SEAL CLASS A4 W.G. OF SMACNA. THE FIRE HAZARD CLASSIFICATION OF THE SEALANT SHALL BE CLASS 1 (MAXIMUM FLAME SPREAD RATE OF 25, MAXIMUM SMOKE DEVELOPED RATE OF 50).
R. HARD DUCT CONNECTIONS TO SUPPLY AIR DIFFUSER COLLARS AND DUCTS SHALL BE SEALED WITH 3M CO. 800 SEALANT AND CLAMPED WITH STAINLESS STEEL "IDEAL" TYPE 52 CLAMP.

14. GRILLES, REGISTERS AND DIFFUSERS

- A. FURNISH AND INSTALL ALL METAL DIFFUSERS, GRILLES AND REGISTERS AS INDICATED ON THE CONTRACT DRAWINGS. ALL SIZES, AIR DISTRIBUTION PATTERNS AND AIR VOLUME CAPACITIES SHALL BE AS SPECIFIED ON THE CONTRACT DRAWINGS.
B. ALL DIFFUSERS AND REGISTERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED, UNLESS OTHERWISE NOTED.
C. ALL CEILING TYPE AIR DIFFUSERS SHALL BE PROVIDED WITH AIR EQUALIZING DEFLECTORS, FULLY ADJUSTABLE FOR HORIZONTAL TO VERTICAL AIR FLOW. ALL RETURN REGISTERS SHALL ALSO HAVE VOLUME DAMPERS. DAMPER OPERATING LEVERS SHALL BE ACCESSIBLE AT THE FACE OF AIR OUTLET.
D. MARGIN TYPES AND METHODS OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH ARCHITECTURAL CEILING DETAILS, SPECIFICATIONS AND CEILING GRID.
E. SUITABLE FOR OPERATION AT 20% EXCESS AND 20% LESS THAN NOTED CAPACITY FOR CONSTANT VOLUME SYSTEMS AND AT 20% EXCESS AND 60% LESS THAN NOTED CAPACITY FOR VARIABLE VOLUME SYSTEMS.
F. UNLESS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS, NOISE CRITERIA FOR ALL AIR TERMINAL DEVICES SHALL NOT EXCEED NOISE CRITERIA (NC)35, OR SOUND METER READING 40 DBA, MEASURED AT A LOCATION 42 IN. BELOW THE CENTER OF THE DEVICES. MANUFACTURER IS RESPONSIBLE FOR EXAMINING APPLICATION OF EACH OUTLET AND GUARANTEE THAT EACH WILL PROVIDE REQUIRED NC LEVELS AND COMFORT SPACE CONDITIONS WITHOUT DRAFTS THROUGHOUT OPERATING RANGE.
G. ALL AIR TERMINAL DEVICES SHALL BE TITUS, KRUEGER, TUTTLE & BAILEY, OR AN APPROVED EQUAL.
H. EXACT LOCATION FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH THE ARCHITECT. ARCHITECT'S DECISION SHALL PREVAIL.

15. INSULATION REQUIREMENTS

- A. INSULATION SHALL BE APPLIED TO DUCTWORK AND PIPING OF MATERIALS AS SPECIFIED BELOW.
B. NOTE THAT DUCTWORK THAT IS INTERNALLY AND ACOUSTICALLY INSULATED/LINED NEED NOT BE INSULATED ON THE EXTERIOR.
C. INSULATION/LINING SHALL HAVE COMPOSITE (INSULATION OR FACING AND ADHESIVE USED TO ADHERE THE FACING TO THE INSULATION) FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURE ASTM E.84, NFPA 255 OR UL 723 NOT EXCEEDING:
FLAME SPREAD 25
SMOKE DEVELOPED 50
D. DUCTWORK INSULATION MATERIAL
1. INSULATE INDOOR SHEET METAL AS FOLLOWS:
a. ALL INDOOR AIR CONDITIONED AND/OR HEATED LOW PRESSURE SUPPLY DUCTWORK FROM FAN DISCHARGE AS WELL AS GENERAL EXHAUST, TO DIFFUSERS, GRILLES AND REGISTERS INCLUDING DIFFUSER PLENUMS - 1-1/2" INSULATION, WITH A MINIMUM R-6 WITHIN UNCONDITIONED SPACES.
b. INDOOR DUCT INSULATION SHALL BE 1-1/2 LB. PER CU. FT. DENSITY GLASS FIBER WITH A MAXIMUM K FACTOR OF 0.25 AT 75F MEAN TEMPERATURE, WITH REINFORCED FOIL-FACED, FLAME RESISTANT KRAFT VAPOR BARRIER.
c. INSULATION SHALL BE SECURED WITH DUCT ADHESIVE. ALL JOINTS SHALL BE SEALED BY ADHERING A 2" SEALING LAP AT ALL JOINTS WITH VAPOR BARRIER ADHESIVE OR 3" STRIPS OF VAPOR BARRIER JACKET APPLIED WITH VAPOR BARRIER ADHESIVE. INSULATION SHALL THEN BE FASTENED WITH 16 GAUGE COPPER-CLAD WIRE OR FIBERGLASS CORD ON 12" CENTERS. ON DUCTS OVER 24" WIDE, WELDED PINS AND CLIPS SHALL BE USED ON THE UNDERSIDE.
d. EXPOSED ROUND SHALL HAVE A WHITE VINYL REINFORCED FOIL VAPOR BARRIER. APPLICATION SAME EXCEPT WIRES SHALL BE OMITTED AND BLANKET SHALL BE SECURED BY STAPLING 2" LONGITUDINAL LAP. STAPLES SHALL BE COATED WITH VAPOR BARRIER COATING.
4. EXTENT OF DUCTWORK INSULATION FOR NEW DUCTWORK
b. ALL SUPPLY DUCTWORK.
c. ALL RETURN DUCTWORK.
d. INSULATION SHALL BE IMPALED OVER WELDED PINS APPLIED TO DUCT SURFACE ON 12" TO 18" CENTERS. USE A MINIMUM OF TWO ROWS OF FASTENERS ON EACH SIDE OF DUCT. SECURE INSULATION WITH SUITABLE SPEED WASHERS OR CLIPS FIRMLY IMBEDDED INTO INSULATION.

- F. EXPOSED DUCT WORK SHALL HAVE A WHITE REINFORCED FOIL VAPOR BARRIER FACING. CASES SHALL BE TAKEN AT SEALING JOINTS SPEED WASHERS, ETC. WITH MATCHING STRIPS OF VAPOR BARRIER TO INSURE GOOD APPEARANCE.
G. INSULATION SHALL BE SECURED WITH DUCT ADHESIVE. ALL JOINTS SHALL BE SEALED BY ADHERING A 2" SEALING LAP AT JOINTS WITH VAPOR BARRIER ADHESIVE OR 3" STRIPS OF VAPOR BARRIER JACKET APPLIED WITH VAPOR BARRIER ADHESIVE. INSULATION SHALL THEN BE FASTENED WITH 16 GAUGE COPPER-CLAD WIRE OR FIBER GLASS CORD ON 12" CENTERS ON DUCTS OVER 24" WIDE, WELDED PINS AND CLIPS SHALL BE USED ON THE UNDERSIDE.
E. PIPE INSULATION
1. INSULATE ALL PIPING, FITTINGS, AND VALVES IN ACCORDANCE WITH INSULATION SCHEDULE FROM NYCECC, EXCEPT AS OTHERWISE NOTED.

MINIMUM PIPE INSULATION THICKNESS table with columns for FLUID OPERATION TEMP. RANGE & USE (F), INSULATION CONDUCTIVITY, MEAN RATING TEMPERATURE (F), and NOMINAL PIPE OR TUBE SIZE (IN) with sub-columns for < 1, 1 TO < 1 1/2, 1 1/2 TO < 4, 4 < 8, > 8.

- 2. INSULATION SHALL BE MINIMUM 6 LB DENSITY MOLDED FIBERGLASS INSULATION, MAXIMUM 0.23 K-FACTOR AT 75 DEG. F. MEAN TEMPERATURE WITH FACTORY-APPLIED ALL PURPOSED (AP) FACING OR ALUMINUM JACKET.
3. FITTINGS, VALVES AND FLANGES SHALL ALSO BE INSULATED WITH COMPRESSED FIBERGLASS AND WIRED IN PLACE WITH 18 GAUGE GALVANIZED STEEL WIRE. PREMOLDED PVC INSULATION COVERS FOR FITTINGS ARE NOT ALLOWED.
4. BEFORE APPLYING INSULATION, ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.
5. ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPOR-SEAL ADHESIVE WHERE REQUIRED. STAPLES ARE NOT PERMITTED.
6. ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION.

16. PIPING SYSTEMS - PIPING AND ACCESSORIES

- A. PROVIDE PIPING SYSTEMS SHOWN ON DRAWINGS COMPLETE INCLUDING PIPE, FITTINGS, VALVES, STRAINERS, MOTORIZED VALVES OPERATORS, HANGERS, SUPPORTS, SLEEVES, AND ACCESSORIES.
B. CONDENSATE DRAIN PIPING SHALL BE COPPER HARD TEMPER TYPE "L", CONFORMING TO ASTM B-88 WITH WROUGHT COPPER SOLDER JOINT, CONFORMING TO ANSI B 16.18.
C. INSTALL DRAIN VALVES AT ALL LOW POINTS OF PIPING AND AIR VENTS AT ALL HIGH POINTS.
D. ALL PIPING CONNECTIONS TO EQUIPMENT SHALL BE INSTALLED WITH UNION FOR EASY REMOVAL. UNIONS FOR 3 IN. OR LESS SHALL BE SIMILAR AND EQUAL TO MALLEABLE IRON WITH BRASS SEATS, CLASS 300, AS MANUFACTURED BY STOCKHAM, GRINNEL, OR AN APPROVED EQUAL.
E. USE TEFLON TAPE ON MALE THREADS OF SCHEDULED PIPE.
F. WHERE CHANGES OF SIZE OCCUR IN HORIZONTAL PIPING, PROVIDE ECCENTRIC TYPE REDUCING FITTINGS TO ATTAIN PROPER DRAINAGE AND VENTING OF PIPELINE.
G. PROVIDE DIELECTRIC COUPLINGS AT JUNCTIONS OF DIFFERING METALS SUCH AS COPPER AND STEEL OR GALVANIZED PIPING.
H. PROVIDE FOR EXPANSION AND CONTRACTION OF PIPING SYSTEMS IN THE INSTALLED SYSTEM.
I. PITCH WATER PIPING UNLESS OTHERWISE NOTED BACK TO PUMP, RISER, OR DRAIN:
1. UP TO 1 IN. DIA. - 1 IN. PER 40 FT.
2. 1-1/2 IN. DIA. AND LARGER - 1 IN. PER 100 FT..

17. REFRIGERANT PIPING

- A. UNLESS OTHERWISE SPECIFIED, ALL REFRIGERATION PIPING SHALL BE REFRIGERATION GRADE TYPE L OR TYPE K HARD DRAWN, DEGREASED SEALED COPPER TUBING. TYPE L SOFT COPPER TUBING MAY BE USED FOR UNDERFLOOR PIPING PROVIDED THE STRAIGHT LENGTH IS KEPT FREE FROM KINKS AND BENDS. NO UNDERFLOOR JOINTS ARE PERMITTED EXCEPT WHERE THE LENGTH OF THE RUN EXCEEDS THE LENGTH OF A FULL TUBING COIL.
B. FITTINGS SHALL BE WROUGHT COPPER OR FORGED BRASS AND ONLY LONG RADIUS ELBOWS SHALL BE USED. ALL CHANGES IN LINE SIZE AND DIRECTION SHALL BE ACCOMPLISHED WITH FITTINGS ONLY. ABSOLUTELY NO "STAB-INS" OR FORMED LONG SWEEP ELBOWS ARE PERMITTED.
C. TUBING SHALL BE INSTALLED IN A NEAT, WORKMAN LIKE MANNER WITH HORIZONTAL RUNS SLOPED TOWARD THE COMPRESSOR AT A RATE OF ONE (1) INCH PER TWENTY (20) FOOT. HANGERS OR STRAPS SHALL BE INSTALLED SO AS TO PROPERLY PREVENT VIBRATION OR UNDUE STRAIN ON ANY PIPE OR FITTING. CLAMP LINES WITH "UNISTRUT" OR EQUIVALENT AT LEAST EVERY TEN (10) FEET. CUSHION ALL PIPES WITH CURVED SHEET METAL SECTIONS AROUND THE ARMAFLEX, ON THE INTERMEDIATE SUPPORTS WHERE PIPE IS NOT CLAMPED. WHERE THE CLAMPS ARE APPLIED DIRECTLY ONTO THE COPPER LINES, HYDROZORB CUSHION CLAMP ASSEMBLIES SHALL BE USED WITH 1-5/8" WIDTH STEEL CHANNEL. STEEL CLAMPING COMPONENTS PARTS MUST NOT TOUCH OR RUB THE COPPER PIPE.
1. CADMIUM PLATED OR GALVANIZED NUTS AND BOLTS WITH SELF LOCKING TYPE NUT SHALL BE USED ON ALL PIPE CLAMPS.
2. ALL PIPING TO BE INSTALLED IN SUCH A MANNER AS TO COMPLETELY PREVENT ANY TYPE OF RUBBING AGAINST OTHER OBJECT.
3. ALL PIPING SHALL BE INSTALLED SO THAT NORMAL SERVICING OF THE COMPRESSOR AND RELATED EQUIPMENT IS NOT HINDERED. DO NOT OBSTRUCT THE VIEW OF THE CRANKCASE OIL SIGHT GLASS OR RUN PIPING SO IT INTERFERES WITH REMOVAL OF THE COMPRESSOR, CYLINDER HEADS, END BELLS, ACCESS PLATES, FANS, FAN MOTORS, COIL, FILTERS CONDENSERS, ETC.
4. SUCTION LINE FILTERS ARE TO BE INSTALLED FOR DIRECTION OF FLOW WITHOUT BYPASS RELIEF FILTER. PRESSURE DROP CAN THEN BE MEASURED BETWEEN THE FILTER GAUGE FITTING AND THE FITTING ON THE SUCTION SERVICE VALVE.
D. WHERE VERTICAL RISERS OF MORE THAN FIVE (5) FEET OCCUR IN A SUCTION LINE, THE RISER SHALL BE TRAPPED AT THE BOTTOM (INVERTED P TRAP). INSTALL AN ADDITIONAL TRAP FOR EACH TWENTY FEET (20') OF RISER.
E. WHERE A BRANCH SUCTION LINE ENTERS A MAIN SUCTION LINE IT SHALL ENTER AT THE TOP. PIPING SHALL BE ARRANGED SO REFRIGERANT OR OIL CANNOT DRAIN FROM THE SUCTION LINE INTO THE COIL.
1. VERTICAL DISCHARGE RISERS SHALL BE TRAPPED AT THE BOTTOM TO PREVENT OIL FROM DRAINING BACK INTO THE COMPRESSOR. INSTALL AN ADDITIONAL TRAP FOR EACH TWENTY (20) FEET OF RISER.
F. SUCTION LINES SHALL BE SIZED TO MAINTAIN ADEQUATE VELOCITIES TO PROPERLY RETURN OIL TO THE COMPRESSOR UNDER MINIMUM LOAD CONDITIONS AT THE LOWEST SATURATED SUCTION PRESSURE TO BE EXPECTED. FURTHER TOTAL PRESSURE LOSS THROUGH THE SUCTION LINES SHALL NOT EXCEED 2 DEG. F. EQUIVALENT PRESSURE REDUCTION.

- G. ALL JOINTS IN THE COMPRESSOR DISCHARGE SUCTION AND LIQUID LINE SHALL BE BRAZED WITH A SUITABLE HIGH TEMPERATURE SILVER SOLDER ALLOY CONTAINING NOT LESS THAN FIFTEEN PERCENT (15 SILVER). AT ANY COPPER TO BRASS JOINT WHERE DAMAGE COULD OCCUR FROM EXCESS HEAT USE 95/5 SOLDER. USE A SOLDER WITH AT LEAST THIRTY FIVE (35) PERCENT SILVER CONTENT ON ALL COPPER TO STEEL, BRASS TO STEEL, OR STEEL TO STEEL JOINTS. DURING THE BRAZING OPERATION DRY NITROGEN MUST BE BLED THROUGH THE PIPING AT VERY LOW PRESSURE TO PREVENT OXIDATION AND SCALING.
H. IN ORDER TO AVOID DAMAGE TO THE INTERNAL SILFOS JOINTS IN VIBRATION ELIMINATORS, LINE CONNECTIONS TO VIBRATION ELIMINATORS ARE TO BE MADE WITH A SILVER SOLDER ALLOY SUCH AS EASY-FLO HAVING A MELT TEMPERATURE OF 900 DEG. F. TO 1,200 DEG. F. (WELL BELOW THE 1,300 DEG. F. MELTING POINT OF SILFOS).

- I. TO PREVENT CONTAMINATION OF THE LINE INTERNALLY, LIMIT THE SOLDERING PASTE OR FLUX TO THE MINIMUM REQUIRED. FLUX ONLY THE MALE PORTION OF THE CONNECTION, NEVER THE FEMALE.
J. PROTECTION OF THE PIPING SYSTEMS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. TEMPORARY PROTECTION SHALL BE PROVIDED UNTIL THE JOB IS IN SATISFACTORY CONDITION, AND PERMANENT PROTECTION SHALL BE PROVIDED BY THE BUILDING CONTRACTOR AS REQUIRED TO PROTECT THE PIPING, FITTINGS, ETC., FROM DAMAGE.
K. INSTALL SCHRADER TYPE VALVES AT THE EVAPORATOR OUTLET AT EACH FIXTURE OR IN THE LAST COIL OF EACH SYSTEM TO FACILITATE ADJUSTMENT OF SUPERHEAT SETTINGS AND TO ESTABLISH PRESSURE DROP.
L. LIQUID LINES CAN BE AFFIXED TO THE SUCTION INSULATION VIA APPROVED DUCT TAPE.

- M. CONTRACTOR SHALL VERIFY THAT ALL EQUIPMENT INSTALLED BY HIM HAS PROPER PRESSURE RELIEF PROTECTION, AND THAT RELIEF PORT ARE DIRECTED DOWNWARD OR PIPED TO RELIEVE DOWNWARD.
N. INSULATION SHALL BE ARMSTRONG ARMAFLEX II, RUBATEX R-180-FS, OR HALSTEAD INDUSTRIES INSUL-TUBE. ALL LINES SHALL BE INSULATED WITH 1/2 IN WALL THICKNESS INSULATION.
O. ALL INSULATION JOINTS SHALL BE SEALED WITH RUBBER CEMENT TO INSURE A "DRIP-TIGHT" SEAL. INSULATION SHALL BE SLIPPED ON TUBING PRIOR TO JOINT BRAZING WHERE POSSIBLE AS AN ALTERNATE TO SPLITTING AND THEN SEALING THE JOINT.
P. ALL OPENINGS FOR REFRIGERANT LINES FROM PIPE CHASES SHALL BE CLOSED OFF ON OUTSIDE WITH PLYWOOD HAVING HOLES DRILLED FOR LINES AND SEALED FROM INSIDE USING UL LISTED FIRESTOP SEALANTS IN COMPLIANCE WITH ASTM E84(UL 723) AND ASTM E814(UL1479).

- Q. ANY ARMAFLEX INSULATION WHICH IS LOCATED OUTDOORS, MUST INCORPORATE A WEATHER RESISTANT PROTECTIVE FINISH, SUCH AS ARMSTRONG ARMAFLEX FINISH.
R. ALL REFRIGERATION LINES WITH RUN THROUGH PLENUMS SPACE MUST BE INSULATED WITH AP ARMAFLEX ELASTOMERIC FOAM INSULATION WITH A 25/50 FLAME-SPREAD AND SMOKE DEVELOPED RATINGS.

20. PENETRATIONS, SLEEVES, AND ESCUTCHEONS

- A. INSTALLATION OF PIPING, DUCTWORK, AND OTHER MECHANICAL EQUIPMENT OR ACCESSORIES SUBJECT TO VIBRATION, TEMPERATURE CHANGES, OR EXPANSION AND CONTRACTION SHALL BE PROVIDED WITH A CLEARANCE OR SLEEVE THROUGH RIGID CONSTRUCTION PER THE REQUIREMENTS OUTLINED IN THIS SECTION.
B. PIPE PENETRATIONS THROUGH MASONRY/CONCRETE WALLS OR FLOORS AND FRAMED PARTITIONS SHALL HAVE A TRIM OPENING CUT NOT GREATER THAN NECESSARY FOR THE INSTALLATION OF A SLEEVE SECURED THEREIN. THE SPACE BETWEEN THE PIPE, ITS INSULATION, AND ITS SLEEVE SHALL NOT EXCEED ONE-HALF INCH.
C. DUCT PENETRATIONS THROUGH MASONRY/CONCRETE WALLS OR FLOORS AND FRAMED PARTITIONS SHALL HAVE AN OPENING CUT TO PROVIDE ROOM FOR INSTALLATION OF MATERIALS, EXPANSION AND CONTRACTION. THE SPACE BETWEEN THE DUCT AND THE CONSTRUCTION SHALL NOT EXCEED ONE-HALF INCH.
D. PIPING SLEEVES SHALL BE FLUSH WITH THE FINISHED WALL OR PARTITION SURFACE.
E. SLEEVES FOR PIPING THROUGH MASONRY WALL SHALL BE SCHEDULE 40 STANDARD GALVANIZED STEEL PIPE; IN FRAMED PARTITIONS SHALL BE 20 GAUGE SHEET METAL. THE SPACE BETWEEN THE PIPE AND ITS SLEEVE SHALL NOT EXCEED ONE-HALF INCH. THE SLEEVE SHALL BE FLUSH WITH THE FINISHED WALL SURFACES.
G. PIPING IN EXPOSED AREAS, PASSING THROUGH WALLS, FLOORS, OR CEILINGS SHALL BE FITTED WITH CHROMIUM-PLATED CAST BRASS ESCUTCHEONS WITH FASTENING SET SCREWS.
H. ALL PENETRATIONS THROUGH EXTERIOR WALLS SHALL BE FLASHED AND SEALED IN A WEATHERPROOF MANNER AGAINST THE INTRUSION AND HARBORING OF WATER AS WELL AS INFILTRATION OF AIR.
4. THE EXTERIOR SIDE SHALL BE FLASHED WITH ALUMINUM OR APPROVED WATER BARRIER MATERIALS. THE OPENING SHALL BE SEALED WITH WATERPROOF CAULK OR FOAM.
5. INSULATION MATERIALS INSTALLED IN THE WALL CAVITY SHALL MATCH OR EXCEED THE R-VALUE OR U-FACTOR OF THE EXISTING WALL, SHALL BE RESISTANT TO THE GROWTH OF MOLD, AND RETARD THE PASSAGE OF AIR AND WATER.
6. THE INTERIOR SIDE OF THE OPENING SHALL BE SEALED WITH CAULK OR FOAM IN AN AIRTIGHT MANNER. IF IN AN EXPOSED AREA, THE PRODUCT SHALL BE LABELED TO BE PAINTABLE.

21. PIPE HANGERS, SUPPORTS, ANCHORS AND GUIDES

- A. ALL REQUIRED SUPPORTS, HANGERS, ANCHORS AND GUIDES SHALL BE PROVIDED AND INSTALLED BY THIS CONTRACTOR AND SHALL BE SEISMICALLY DESIGNED.
B. ALL SUPPORTS AND PARTS SHALL CONFORM TO THE REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE, ANSI B 31.9 AS APPLICABLE FOR PRESSURE PIPING, AND MSS STANDARD PRACTICE SP-58 SP-69.
C. INSTALL HANGERS AND SUPPORTS TO ALLOW CONTROLLED THERMAL AND SEISMIC MOVEMENT OF PIPING SYSTEMS, TO PERMIT FREEDOM OF MOVEMENT BETWEEN PIPE ANCHORS, AND TO FACILITATE ACTION OF EXPANSION JOINTS, EXPANSION LOOPS, EXPANSION BENDS, AND SIMILAR UNITS.
D. DO NOT HANG PIPING FROM OTHER PIPING.
E. WHEN REMOVAL OF EXISTING FIRE PROOFING IS REQUIRED FOR NEW INSTALLATION PURPOSES, SUCH REMOVAL SHALL BE PERFORMED BY THE CONTRACTOR AND SHALL BE KEPT TO A MINIMUM. THE CONTRACTOR SHALL REPLACE ALL REMOVED FIREPROOFING WITH NEW FIREPROOFING TO THE SATISFACTION OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE AUTHORITY.

- F. SUPPORT HANGERS FROM BUILDING STEEL FRAMING WITH AN APPROVED TYPE CLAMP INSERT. PROVIDE ANY ADDITIONAL STEEL SUPPORTS BETWEEN EXISTING FRAMING MEMBERS AS MAY BE REQUIRED. WELDING TO THE BUILDING STRUCTURE MEMBERS WILL NOT BE PERMITTED UNLESS APPROVED BY THE BUILDING MANAGEMENT.
G. PIPE HANGERS RODS, INSERTS AND CLAMPS SHALL BE UL APPROVED FOR THEIR RESPECTIVE USES
H. UNLESS OTHERWISE SPECIFICALLY APPROVED, HANGER SIZE AND SPACING SHALL BE AS FOLLOWS:

COPPER TUBING table with columns for PIPE SIZE, MAX. HANGER SPACING, and MIN. ROD SIZE. Includes note: NOTE: THE ABOVE HANGER SPACING APPLY TO STRAIGHT RUNS OF PIPE ONLY.

DOB NOW APPLICATION #M00350247-11 NYC DOB STAMPS & SIGNATURES NYC Buildings ACCEPTED Date: 09/28/2020

NYC DOB SCAN:

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Table with columns for SEAL, DATE, PROJECT #, DRAWN BY, SCALE, NONE.

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SHEET: 11 OF 12

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