ENERGY CODE ANALYSIS			
NYS ECC 2020 CHAPTER C4: COMMERCIAL ENERGY EFFICIENCY			
CLIMATE ZONE 4A			
ITEM DESCRIPTION	WORK DESCRIPTION	PROPOSED DESIGN VALUE	"CODE PRESCRIPTIVE VALUE AND CITATION"
THERMOSTATIC CONTROLS	THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONESHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, AT LEAST ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM	THERMOSTATIC CONTROLS PROVIDED FOR EACH INDIVIDUAL ZONE	C403.4.1
SET POINT OVERLAP RESTRICTION	WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE PROVIDED WITH THE CAPABILITY TO PREVENT THE HEATING SET POINT FROM EXCEEDING THE COOLING SET POINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.	THERMOSTATIC CONTROL WITH MINIMUM 5F DEADBAND	C403.4.1.3
OFF-HOUR CONTROLS	EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM. EXCEPTIONS: 1.ZONES THAT WILL BE OPERATED CONTINUOUSLY. 2.ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A READILY ACCESSIBLE MANUAL SHUTOFF SWITCH.	THERMOSTATS ARE 7 DAY PROGRAMMABLE WITH SET BACK CONTROL	C403.4.2
DUCT AND PLENUM INSULATION AND SEALING	SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND WHERE LOCATED OUTSIDE THE BUILDING WITH A MINIMUM OF R-8 INSULATION IN CLIMATE ZONES 1 THROUGH 4 AND A MINIMUM OFR-12 INSULATION IN CLIMATE ZONESS THROUGH 8. WHERE LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY A MINIMUM OF R-8 INSULATION IN CLIMATE ZONES1 THROUGH 4AND A MINIMUM OF R-12 INSULATION IN CLIMATE ZONESS THROUGH 8	R-8 FOR OUTDOOR R-6 FOR INDOOR	C403.2.9
PIPING INSULATION	CONSULT CITED TABLE FOR PROJECT-SPECIFIC INSULATION THICKNESSES BASED ON FLUID TEMPERATURE AND NOMINAL PIPE SIZE	-	TABLE C403.11.1

RELATED APPLICATIONS:
1. *** - GENERAL CONSTRUCTION
2. *** - MECHANICAL SYSTEMS

ENERGY ANALYSIS
Climate Zone 4

TABLE 403.3.2(2)
NYCECC 2020

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY	MIN. EFFICIENCY	TEST PROCEDURE	PROPOSED DESIGN VALUE
WSHP-1: HEAT PUMP, WATER COOLED	>65,000 BTU/H, <135,000 BTU/H	85°F EWT	13.0 EER	ISO 13256-1	16.25 EER

ENERGY ANALYSIS
Climate Zone 4

TABLE 403.3.2(2)
NYCECC 2020

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY	MIN. EFFICIENCY	TEST PROCEDURE	PROPOSED DESIGN VALUE
WSHP-1: HEAT PUMP, WATER COOLED	<135,000 BTU/H	68°F EWT	4.3 COP	ISO 13256-1	5.35 COP

SYMBOL LIST & ABBREVIATIONS

	NEW WORK	M	MOTORIZED DAMPER
	EXISTING WORK	SD	DUCT MOUNTED SMOKE DETECTOR
	EXISTING WORK TO BE REMOVED	FC	FLEXIBLE CONNECTION
	CONDENSATE DRAIN PIPING		GATE VALVE
	CONDENSER WATER RETURN PIPE		CHECK VALVE
	CONDENSER WATER SUPPLY PIPE		UNION
RL	REFRIGERANT		STRAINER
	CONNECT TO EXISTING		ELEC. ZONE VALVE
	CEILING DIFFUSER		THREE-WAY MOTORIZED VALVE
	CEILING REGISTER/GRILLE		PIPE TURNING DOWN
(000)	CUBIC FEET/MINUTE (AIR FLOW)		PIPE TURNING UP
T H	THERMOSTAT, HUMIDISTAT OR REMOTE SENSOR LOCATION		AC CONDESNSATE PUMP
	ACCESS DOOR		CIRCULATING PUMP WITH CHECKVALVE
	VOLUME DAMPER	FD/AD	FIRE DAMPER WITH ACCESS DOOR
	RETURN/EXHAUST AIR	DH	DUCT HIGH LIMIT MOISTURE SENSOR
	SUPPLY ARROW	APS	AIR PROVING SWITCH

MIN. PIPE INSULATION THICKNESS AS PER TABLE C403.11.1 2020NYCECC

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NORMAL PIPE OR TUBE SIZE(inches)		
	CONDUCTIVITY BTU.in/(h.ft^2.°F)	MEAN RATING TEMPT, °F	<1"	1 TO <1-1/2"	1-1/2" TO <4"
141-200	0.25-0.29	125	1.5	1.5	2.0
105-140	0.21-0.28	100	1.0	1.0	1.5
40-60	0.21-0.27	75	0.5	0.5	1.0

ABBREVIATIONS

(000)	CUBIC FEET PER MINUTE
AD	ACCESS DOOR
AHU-#	AIR HANDLING UNIT
AL	ACOUSTIC LINING
BDD	BACK DRAFT DAMPER
CP	CONDENSATE PUMP
CU-#	CONDENSING UNIT
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SPECIAL INPECTIONS REQUIRED	
DESCRIPTION	CODE/SECTION
MECHANICAL SYSTEMS	BC 1704.16
POST INSTALLED ANCHORS	BC 1704.32
FIRE RESISTANT PENETRATIONS & JOINTS	BC 1704.27

PROGRESS INSPECTIONS REQUIRED	
DESCRIPTION	CODE/SECTION
ENERGY CODE COMPLIANCE (TR8)	BC 110.3.5
SHUTOFF DAMPERS	(IIB2)
HVAC AND SERVICE WATER HEATING EQUIPMENT	(IIB3)
HVAC AND SERVICE WATER HEATING SYSTEM CONTROLS	(IIB4)
HVAC-R & SERVICE WATER PIPING DESIGN AND INSULATION	(IIB5)
MAINTENANCE INFORMATION	(IID1)

APPLICABLE CODES AND STANDARDS

ALL WORK AS INDICATED ON PLANS MEET THE LATEST REQUIREMENTS OF THE NEW YORK STATE CODES AS ADOPTED LISTED BELOW.

2022 NYC MECHANICAL CODE
2022 NYC BUILDING CODE
2022 NYC PLUMBING CODE

66
LEONARD ST

KEY PLAN

03	FOR PERMIT	11.05.24
02	CLIENT PRESENTATION	10.18.24
01	CLIENT PRESENTATION	09.20.24
NO	REVISION	DATE
AS NOTED		SCALE
CZ, DZ		DRAWN

TITLE

CODE COMPLIANCE NOTES

SEAL AND SIGNATURE:

STATE OF NEW YORK · KEVIN KENDALL · 084032 · LICENSED PROFESSIONAL ENGINEER

JOB NO:
24-019

PROJECT:
66 LEONARD STREET, NEW YORK, NY, 10013

DOB NOW#: - MECH

EN-001.00

DRAWING 1 OF 1

AKA
Allen + Killcoyne Architects
ALLEN + KILLCOYNE ARCHITECTS 212 645 2222
12 WEST 27th ST, 17th FLOOR, NY, NY 10001

ENERGY CODE ANALYSIS			
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ENERGY ANALYSIS
Climate Zone 4

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2022 NYC BUILDING CODE
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66
LEONARD ST

KEY PLAN

03	FOR PERMIT	11.05.24
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01	CLIENT PRESENTATION	09.20.24
NO	REVISION	DATE
AS NOTED		SCALE
CZ, DZ		DRAWN

TITLE

CODE COMPLIANCE NOTES

SEAL AND SIGNATURE:

STATE OF NEW YORK
KEVIN KENDALL
No. 084032
LICENSED PROFESSIONAL ENGINEER

JOB NO:
24-019

PROJECT:
66 LEONARD STREET,
NEW YORK, NY, 10013

DOB NOW#: - MECH

M-001.00

DRAWING 1 OF 7

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Allen + Killcoyne Architects

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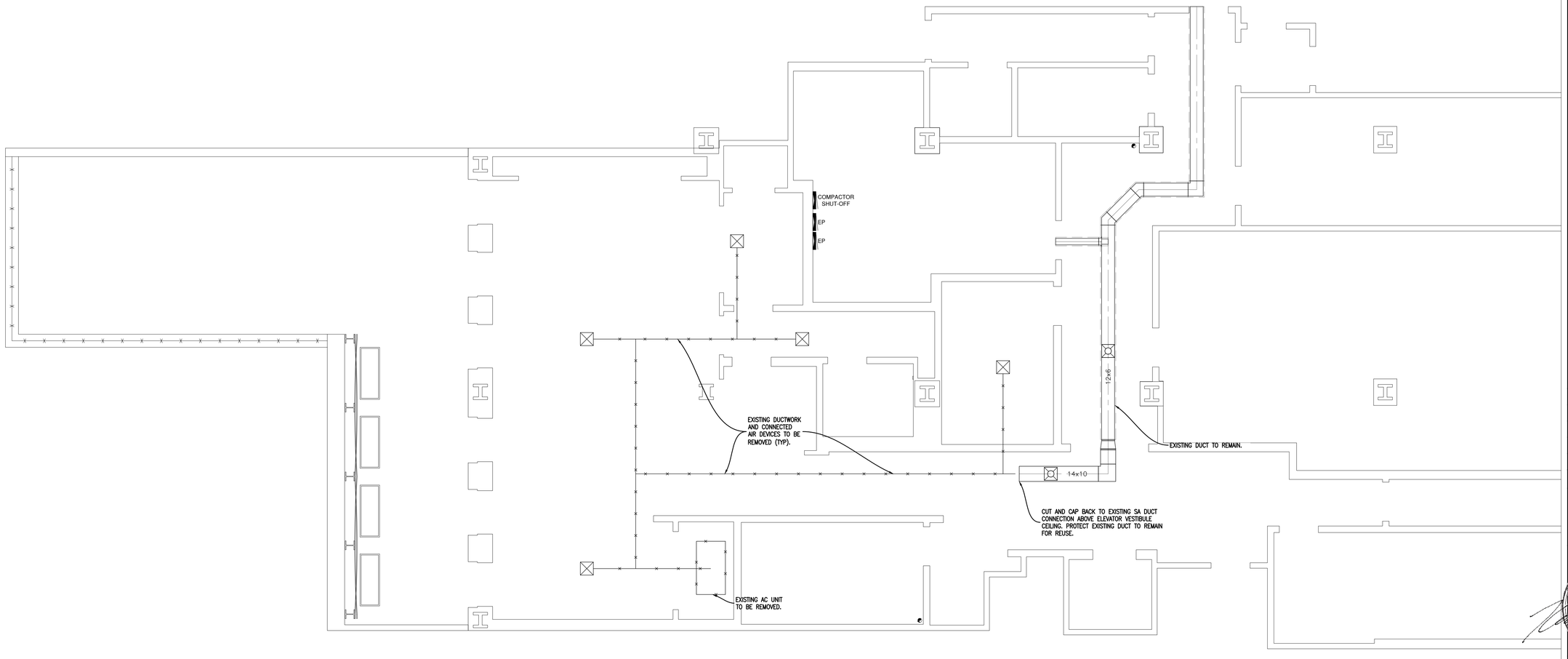
12 WEST 27th ST, 17th FLOOR, NY, NY 10001



1 REMOVALS PLAN - CELLAR
SCALE: 1/4" = 1'-0"

66
LEONARD ST

KEY PLAN

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CZ, DZ		DRAWN

TITLE

MECHANICAL DEMO PLANS

SEAL AND SIGNATURE:

STATE OF NEW YORK
KEVIN KENDALL
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LICENSED PROFESSIONAL ENGINEER

JOB NO:
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NEW YORK, NY, 10013

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DM-100.00

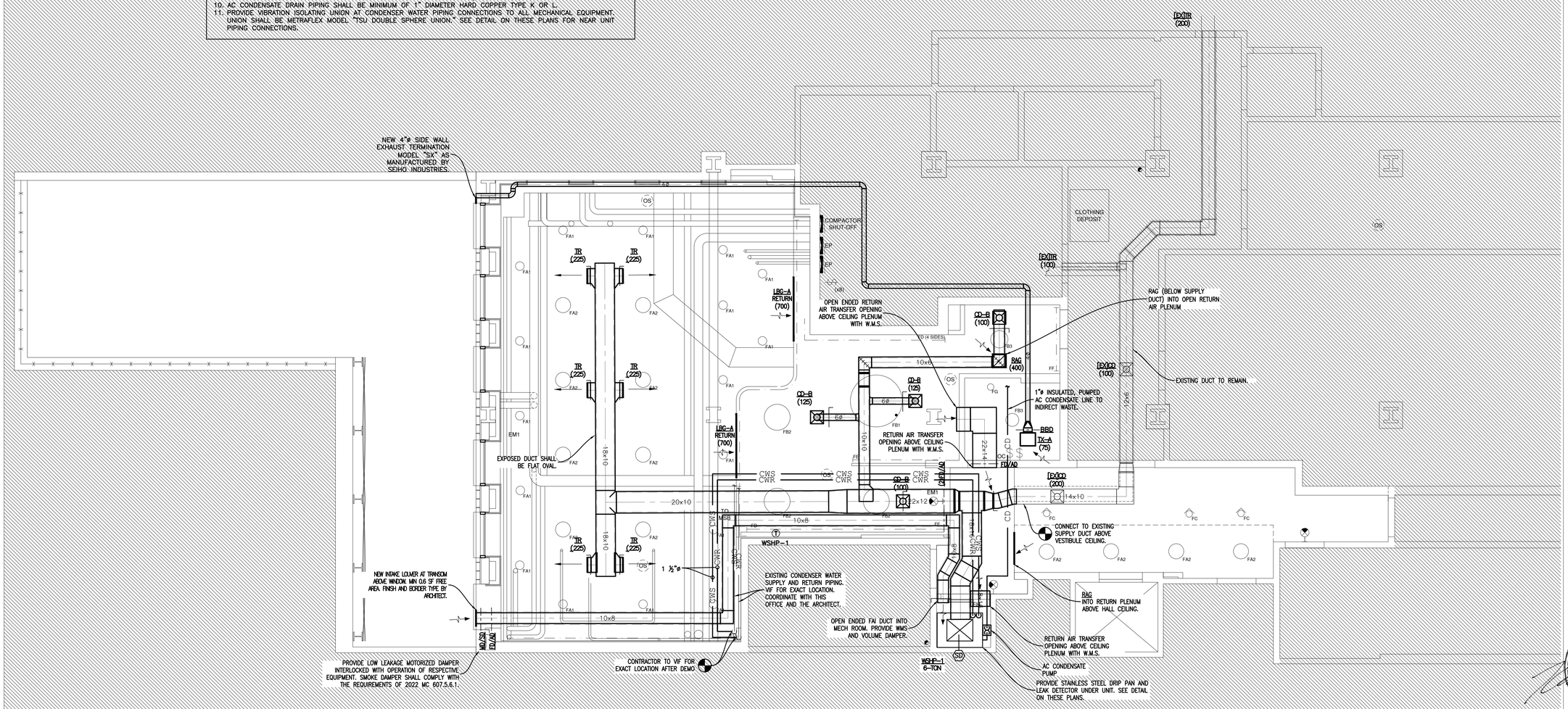
DRAWING 2 OF 7

AKA
Allen + Killcoyne Architects

ALLEN + KILLCOYNE ARCHITECTS 212 645 2222
12 WEST 27th ST, 17th FLOOR, NY, NY 10001

NOTES:

1. SEE AIR OUTLET SCHEDULE FOR AIR DEVICE INFORMATION.
2. SUPPLY AIR OUTLETS, BOTH NEW AND EXISTING, SHALL BE BALANCED TO THE AIRFLOWS INDICATED ON THE PLAN ABOVE.
3. COORDINATE EXACT SUPPLY AND RETURN OUTLET LOCATIONS WITH ARCHITECTURAL DRAWINGS.
4. PROVIDE VOLUME DAMPERS ON ALL BRANCH DUCT TAPS TO AIR OUTLETS. ALL NON-ACCESSIBLE VOLUME DAMPERS SHALL BE CABLE OPERATED.
5. ALL DUCT DIMENSIONS INDICATED ON PLANS ARE INTERNAL CLEAR DIMENSIONS.
6. PROVIDE 1" OF FOIL FACED DUCT WRAP INSULATION TO ALL NEW DUCTWORK.
7. INSULATED FLEXIBLE DUCT CONNECTIONS MAY BE PROVIDED ON THE FINAL 4' OF BRANCH DUCT CONNECTIONS TO THE AIR OUTLETS.
8. PROVIDE MIN 15 LINEAR FEET OF ACOUSTIC LINING AT ALL CONNECTIONS (SUPPLY AND RETURN) TO MECHANICAL EQUIPMENT. ACOUSTIC LINING MATERIAL SHALL BE LINACOUSTIC RC BY JOHNS MANVILLE OR SIMILAR APPROVED.
9. INSULATE ALL MECHANICAL PIPING: CONDENSER WATER SUPPLY&RETURN, AC CONDENSATE DRAIN PIPING.
10. AC CONDENSATE DRAIN PIPING SHALL BE MINIMUM OF 1" DIAMETER HARD COPPER TYPE K OR L.
11. PROVIDE VIBRATION ISOLATING UNION AT CONDENSER WATER PIPING CONNECTIONS TO ALL MECHANICAL EQUIPMENT. UNION SHALL BE METRAFLEX MODEL "TSU DOUBLE SPHERE UNION." SEE DETAIL ON THESE PLANS FOR NEAR UNIT PIPING CONNECTIONS.



1 PROPOSED REFLECTED CEILING PLAN - CELLAR
SCALE: 1/4" = 1'-0"

66
LEONARD ST

KEY PLAN

NO	REVISION	DATE
03	FOR PERMIT	11.05.24
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MECHANICAL PLAN

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DRAWING 3 OF 7

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MECHANICAL VENTILATION CALCULATION (2022 NYC MECH CODE,TABLE 403.3.1.1)						
FLOOR	ROOM	AREA (SF)	OCCUPANT DENSITY	CFM/PERSON	CFM/SF	MINIMUM REQ. VENTILATION (CFM)
CELLAR	TENANT FITNESS	1055 SF	10PPL/1000SF	20	.06	284

EC072 - R454B
Commercial Large

Project Name:
66 LEONARD STREET

Unit Tag	Qty	Configuration	Remarks

Electrical Data

Voltage-Ph-Hz	Unit Amps - FLA	Min. Cir. Amps - MCA	Max. Fuse Size - MFS
208-230/3/60	33.6	36.6	45

System Information

Air Flow:	2,200	CFM	External Static Pressure:	0.70	Inches of H20
Fluid Flow:	16	GPM	Altitude:	0	Feet
Fluid Type:	Water		WPD Cooling / Heating:	13.3 / 14.0	Feet of Water
Unit Load:	Full Load		Antifreeze Percentage:	0	%

Entering Conditions

	Cooling		Heating	
Entering Air Dry Bulb:	80.00	F	70.00	F
Entering Air Wet Bulb:	67.00	F	-	
Entering Water/Fluid:	85.00	F	70.00	F

Unit Performance

	Cooling		Heating	
Total Capacity:	77.2	MBH	88.6	MBH
Sensible Capacity:	56.8	MBH		
Heat of Rejection:	88.0	MBH		
Heat of Absorption:			73.0	MBH
Leaving Air Dry Bulb:	56.8	F	106.2	F
Leaving Air Wet Bulb:	55.9	F		
Leaving Water Temp:	96.1	F	60.9	F
Input Power:	4.42	kW	4.84	kW

General Information

Unit Length:	32.00	inches
Unit Width:	42.00	inches
Unit Height:	62.00	inches
Refrigerant Charge:	9.13	lbs.-all circuits

Fan Performance

Fan Motor BHP:	0.95	BHP
Fan RPM:	1,008	RPM
CFM:	2,200	CFM
External Duct Static:	0.70	inches H20
Internal PD:	0.81	inches H20
Total Static:	1.51	inches H20

Motors

Compressor	Fan Service	Qty	HP (ea.)	FLA (ea.)	RLA (ea.)	LRA (ea.)
		2			12.2	97.5
	Supply	1	3	9.2		

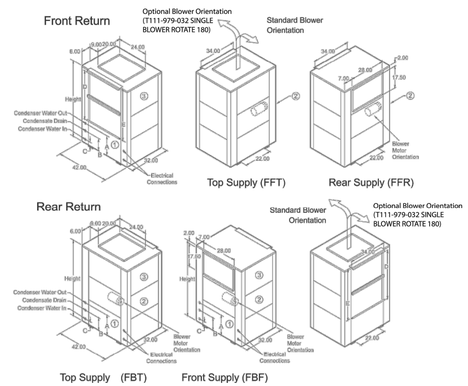
The results reported herein are based on testing by FHP. Variations in the installation and operational environment may alter performance. FHP disclaims all warranties, express and implied, t

Bosch Thermotechnology

EC Model Series -
Commercial Water Source Heat Pumps

BOSCH

EC072-120 Vertical Unit Configurations & Dimensions



EC072-120 Vertical Unit Dimensions

Model	Width	Depth	Height	Distance Between Base Rails	Top Supply: Supply Depth	Top Supply: Supply Width	Top Supply: Front to Supply	Top Supply: Left Side to Supply Duct	Top Supply: Distance WA Supply Ducts	Rear Supply: Supply Height	Rear Supply: Supply Width	Rear Supply: Top to Supply	Rear Supply: Right Side to Supply Duct	Rear Supply: Distance WA Supply Ducts	A	B	C	WA Duct Width	Distance Between WA Ducts	D	E	Condenser Water Connection (FPT)	Condensate Drain Connection (FPT)	Recommended Replacement Nominal Filter Size - 1"thick
072	42.00	32.00	62.00	22.00	20.00	24.00	6.00	9.00	-	17.50	28.00	2.00	7.00	-	14.75	8.50	2.75	34.00	-	38.00	40.00	1"	3/4"	20 x 34.5 (2)
096	42.00	32.00	62.00	22.00	20.00	24.00	6.00	9.00	-	17.50	28.00	2.00	7.00	-	14.75	8.50	2.75	34.00	-	38.00	40.00	1"	3/4"	20 x 34.5 (2)
120	42.00	32.00	62.00	22.00	20.00	24.00	6.00	9.00	-	17.50	28.00	2.00	7.00	-	15.00	9.00	3.00	34.00	-	38.00	40.00	1 1/2"	3/4"	20 x 34.5 (2)

All dimensions in inches unless otherwise noted.
All dimensions within +- 0.125".
Specifications subject to change without notice.

Bosch Thermotechnology Corp.
Londonderry, NH • Watertown, MA • Ft. Lauderdale, FL

4 of 39

Tel: 1-800-283-3787 | www.bosch-homecomfort.us

NOTES:
1. UNIT FACTORY OPTIONS:
   1.1. R-454B REFRIGERANT
   1.2. ECM MOTOR WITH "CONSTANT AIRFLOW" ECM FAN MOTOR OPTION
   1.3. HOT GAS BYPASS
   1.4. WATER SIDE ECONOMIZER
   1.5. EXTRA QUIET SOUND PKG
   1.6. LOW WATER TEMP PKG
   1.7. STAINLESS STEEL DRAIN PAN
2. PROVIDE 2-WAY MOTORIZED ZONE VALVES ON CONDENSER WATER SUPPLY AND RETURN TAPS TO THE UNIT. VALVES SHALL BE INTERLOCKED WITH UNIT OPERATION.
4. PROVIDE WATER DIFFERENTIAL PRESSURE SWITCH. IT WILL PREVENT OPERATION IF THERE IS NO FLUID FLOW BY DISABLING THE COMPRESSOR IF A LACK OF WATER-FLOW OCCURS.
9. PROVIDE CIRCUIT SETTER, STRAINER, AND P&T TEST PORTS.
10. ETL LISTING: 10554157GCRT-002
11. ETL LISTING: 10107139GCRT-009

AC CONDENSATE PIPE SIZING SCHEDULE (GRAVITY FLOW)

PIPE SIZE	MAXIMUM CONNECTED TONNAGE
3/4"	UP TO 20 TONS
1"	OVER 20 TONS TO 40 TONS
1-1/4"	OVER 40 TONS TO 90 TONS
1-1/2"	OVER 90 TONS TO 125 TONS
2"	125 TONS TO 250 TONS

NOTES:

1. CONDENSATE DRAIN LINE SIZE SHALL NOT BE LESS THAN 3/4" INTERNAL DIAMETER.

CONDENSATE PUMP SCHEDULE

NO.	SERVICE	LOCATION	GPH	TOTAL HEAD FT.	MODEL No.	DISCHARGE SIZE IN.	MOTOR DATA H.P. MAX.	MOTOR DATA WATTS	TANK CAPACITY GALLONS	ELECTRICAL CHARACTERISTICS V/PH	REMARKS
CP-1	A/C CONDENSATE UNITS 1-4 TONS	SEE DRAWING	3.7	39.5	BLUE DIAMOND MAXIBLUE	1/4"	1/25	4.7	-	110/1/60	(1)(2)(3)(4)

NOTES:

1. PROVIDE WITH SAFETY SWITCH, CHECK VALVE AND TUBING.
2. PROVIDE CONDENSATE PUMP ON ALL AIR COOLING AND DEHUMIDIFICATION UNITS WHERE CONDENSATE DRAINING BY GRAVITY IS NOT POSSIBLE.
3. PROVIDE SAFETY OVERFLOW SWITCH IN AUXILIARY DRAIN PAN OF ALL AIR COOLING AND DEHUMIDIFICATION UNITS. SAFETY SWITCH SHALL SHUT DOWN EQUIPMENT UPON DETECTION OF CONDENSATE IN AUXILIARY DRAIN PAN.
4. PROVIDE WITH RESERVOIR TANK, DEDICATED RECEPTACLE AND MOUNTING FEET

DIFFUSER/GRILLE SCHEDULE

TITUS AS STD.

TAG	MODEL	DESCRIPTION	DUCT WIDTH (IN.)	AIRFLOW	CFM/FT	TOTAL PRESSURE	REMARKS
LBG-A	CT-540	LINEAR BAR DIFFUSER 1/4" BARS, 1/2" SPACING	4	SUPPLY	160	0.1	
LBG-A	CT-540	LINEAR BAR DIFFUSER 1/4" BARS, 1/2" SPACING	4	RETURN	146	0.082	
LSD-A	FLOWBAR FL-10-JT	LINEAR SLOT DIFFUSER 1" SLOT WIDTH, JETTHROW PATTERN CONTROLLER	PLENUM BOX	SUPPLY	75	0.1	
LSD-B	FLOWBAR FL-10-HT	LINEAR SLOT DIFFUSER 1" SLOT WIDTH, HIGHTHROW PATTERN CONTROLLER	PLENUM BOX	SUPPLY	50	0.136	
TR	300FL	LOUVERED SUPPLY GRILLE, ALUMINUM, ¾" BLADE SPACING.	-	SUPPLY	(700/FPM)	0.10	PROVIDE MODEL "AG-15" OPPOSED BLADE DAMPER
RAG	350RL	LOUVERED RETURN GRILLE, STEEL, ¾" BLADE SPACING.	PLENUM BOX	RETURN	(700/FPM)	0.13	
CD-A	OMNI	24X24 SQUARE PLAQUE CEILING DIFFUSER	10"ø NECK	SUPPLY	545(MAX)	0.168	
CD-B	OMNI	12X12 SQUARE PLAQUE CEILING DIFFUSER	8"ø NECK	SUPPLY	350(MAX)	0.434	WHITE; BORDER TYPE 1
RG-A	OMNI	24X24 SQUARE PLAQUE CEILING DIFFUSER	15"ø NECK	RETURN	982(MAX)	0.231	
RG-B	OMNI	12X12 SQUARE PLAQUE CEILING DIFFUSER	8"ø NECK	RETURN	350(MAX)	0.434	

NOTES:
1. FINISH AND BORDER TYPE BY ARCHITECT.

FAN SCHEDULE

TAG	LOCATION	AREA SERVED	MAKE	MODEL	DRIVE TYPE	CFM	TOTAL EXTERNAL SP	FAN RPM	BHP	HP	V/C/P	SONES (INLET)	NOTES
TX-A	-	SEE PLAN	GREENHECK	CSP-A390-VG	DIRECT	75	0.30	1004	0.04	-	120/60/1	0.4	1,2,3

NOTES:
1. PROVIDE SPEED CONTROLLER FOR AIRFLOW BALANCING.
2. PROVIDE BACKDRAFT DAMPER.
3. FAN SHALL OPERATE DURING OCCUPIED HOURS VIA TIME-CLOCK LOCATED AT THE SUPER'S OFFICE.

66 LEONARD ST

KEY PLAN

NO	REVISION	DATE
03	FOR PERMIT	11.05.24
02	CLIENT PRESENTATION	10.18.24
01	CLIENT PRESENTATION	09.20.24
AS NOTED		SCALE
CZ, DZ		DRAWN

TITLE

MECHANICAL SCHEDULES

SEAL AND SIGNATURE:

STATE OF NEW YORK · KEVIN KENDALL · No. 084032 · LICENSED PROFESSIONAL ENGINEER

JOB NO:
24-019

PROJECT:
66 LEONARD STREET,
NEW YORK, NY, 10013

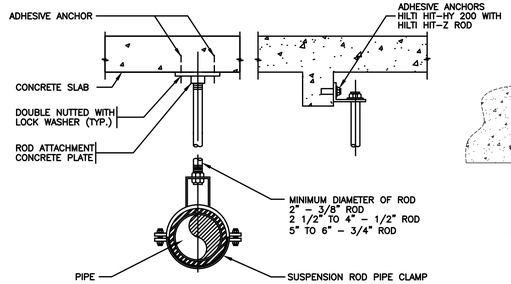
DOB NOW#: - MECH

M-200.00

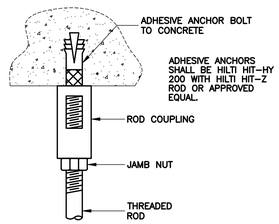
DRAWING 4 OF 7

AKA
Allen + Killcoyne Architects

ALLEN + KILLCOYNE ARCHITECTS 212 645 2222
12 WEST 27th ST, 17th FLOOR, NY, NY 10001



PIPE HANGING DETAIL
D–2–12A



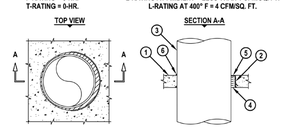
HANGER DETAIL FOR PIPE HANGER
NTS

UL/cUL SYSTEM NO. C-AJ-1226

METAL PIPE THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL

F-RATING = 3-HR. T-RATING = 0-HR.

L-RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT. L-RATING AT 400° F = 4 CFM/SQ. FT.

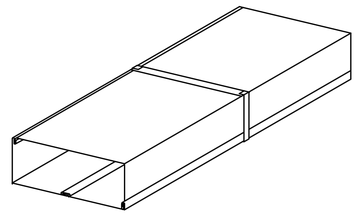


CAJ1226fc.080107

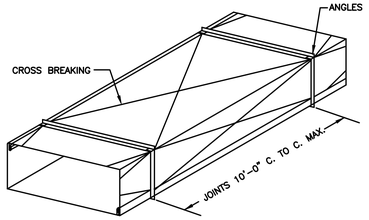
1. CONCRETE FLOOR OR WALL ASSEMBLY (3-HR. FIRE-RATING) :
   A. LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR OR WALL (MINIMUM 4-1/2" THICK).
   B. ANY UL/cUL CLASSIFIED CONCRETE BLOCK WALL.
2. [OPTIONAL] ANY OF THE FOLLOWING STEEL SLEEVES MAY BE USED :
   A. MAXIMUM 32" NOMINAL DIAMETER STEEL PIPE SLEEVE (SCHEDULE 40 OR HEAVIER) MAY EXTEND MAXIMUM 3" ABOVE FLOOR OR BEYOND BOTH SURFACES OF WALL.
   B. MAXIMUM 6" (MIN. 26 GA.) OR 12" (MIN. 24 GA.) DIAMETER GALVANIZED STEEL SLEEVE WITH SQUARE FLANGE SPOT WELDED TO BOTTOM OR MID-HEIGHT OF SLEEVE AND SIZED MINIMUM 2" LARGER THAN SLEEVE DIAMETER. SLEEVE MAY EXTEND MAXIMUM 1" ABOVE TOP SURFACE OF FLOOR, AND MAXIMUM 4" BELOW BOTTOM SURFACE OF FLOOR.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 30" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 30" NOMINAL DIAMETER CAST IRON PIPE.
   C. MAXIMUM 6" NOMINAL DIAMETER COPPER PIPE.
   D. MAXIMUM 6" NOMINAL DIAMETER STEEL CONDUIT.
   E. MAXIMUM 4" NOMINAL DIAMETER EMT.
4. MINIMUM 4" THICKNESS MINERAL WOOL (MINIMUM 4 PCF DENSITY) TIGHTLY PACKED AND RECESSED TO ACCOMMODATE FIRESTOP SEALANT.
5. MINIMUM 1/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT FLUSH WITH TOP SURFACE OF PIPE SLEEVE OR FLOOR ASSEMBLY.
6. MINIMUM 1/4" BEAD HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 32".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-7/8".
3. MINIMUM 1/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT IS REQUIRED ON BOTH SIDES OF A WALL ASSEMBLY.
4. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT OF CONTACT.

EXTERIOR WALL PIPE PENETRATION DETAIL

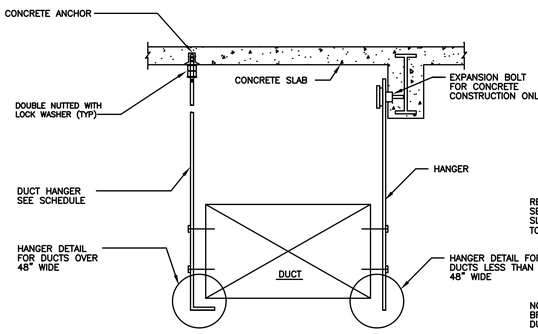


(DUCTS THRU 18" MAXIMUM DIMENSION)



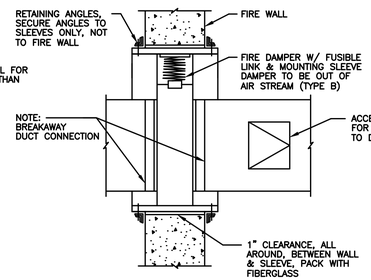
(DUCTS THRU 19" THRU 30")

DUCT CONSTRUCTION DETAIL
D–1–17

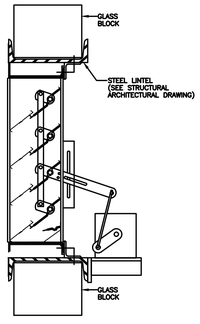


DUCT SIZE	HANGER SIZE	MAX. SPACING
Up to 2 sq. ft.	1" x 1/16"	8'–0"
2 to 8 sq. ft.	1" x 1/8"	8'–0"
over 8 sq. ft.	1" x 1/8"	4'–0"

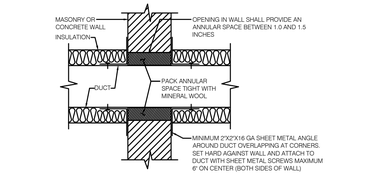
DUCT HANGING DETAIL
SCHEDULE OF SUPPORTS
D–2–1



FIRE DAMPER DETAIL
D–1–4

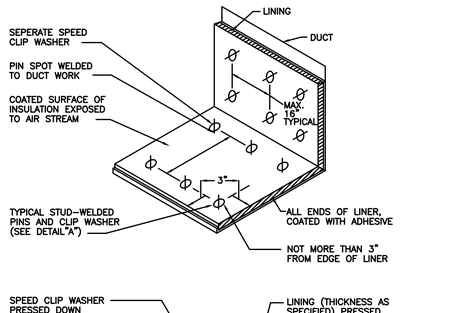


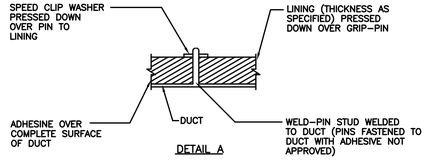
MOTORIZED LOUVER
D–1–25



NOTE: THIS DETAIL IS A MINIMUM REQUIREMENT. CONTRACTOR SHALL VERIFY THAT LOCAL AUTHORITIES HAVING JURISDICTION ACCEPT THIS CONSTRUCTION, OR MAKE THE REQUIRED REVISIONS WHERE REQUIREMENTS ARE MORE STRINGENT.

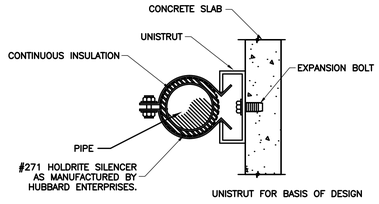
DUCT PENETRATION THROUGH MASONRY OR CONCRETE WALL WITH FIRE RATING 1.0 HOUR OR LESS AND WITHOUT FIRE DAMPER
NO SCALE





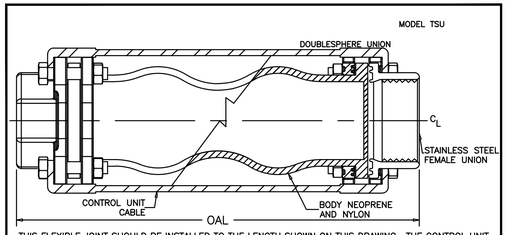
DETAIL A

SOUND LINING INSTALLATION DETAIL
D–1–21



WALL HUNG PIPE DETAIL
NTS D–2–12B

MODEL TSU



THIS FLEXIBLE JOINT SHOULD BE INSTALLED TO THE LENGTH SHOWN ON THIS DRAWING. THE CONTROL UNIT CABLES SHOULD BE REMOVED FOR THE INSTALLATION OF THE UNION ENDS. AFTER INSTALLATION THE CONTROL UNIT CABLES SHOULD BE REINSTALLED TO PREVENT MOVEMENT PAST DESIGN LIMITS. THIS PRODUCT IS NOT INTENDED FOR TORSION.

QTY.	SIZE	OAL	ALLOWABLE MOVEMENTS				NOTES
			LATERAL (IN)	ELONGATION (IN)	COMP. (IN)	ANGULAR (DEG.)	
	3/4	8	7/8	1/4	7/8	30	
	1	8	7/8	1/4	7/8	25	
	1–1/4	8	7/8	1/4	7/8	25	
	1–1/2	8	7/8	1/4	7/8	20	
	2	8	7/8	1/4	7/8	15	
	2–1/2	8 7/8	7/8	1/4	7/8	12	

MAXIMUM OPERATING TEMPERATURE*	
TEMPERATURE (°F)	PRESSURE (PSI)**
170	225
180	200
190	175
200	150
210	125
220	100

* CONTACT FACTORY FOR OTHER ELASTOMERS. NOT FOR STEAM APPLICATIONS
** VACUUM TO 15" Hg

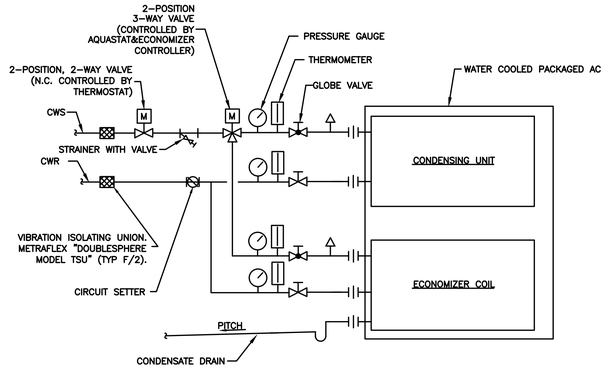
REV.	DATE	DESCRIPTION

2323 W. HUBBARD ST.
CHICAGO, IL 60612
TEL: 312–738–3800
FAX: 312–738–0415
WWW.METROFLEX.COM

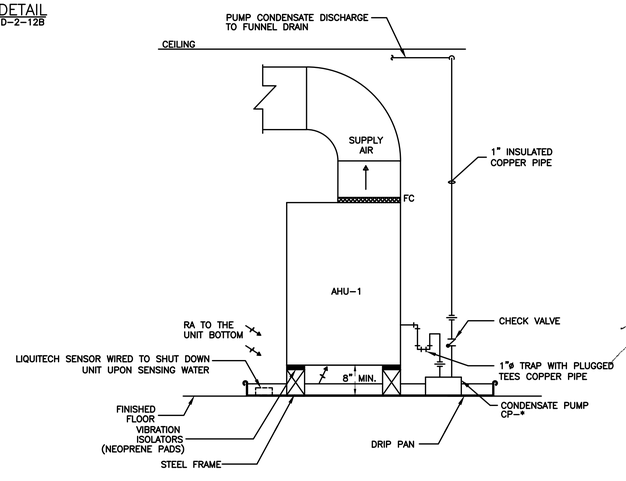
DESCRIPTION: DOUBLESPHERE FEMALE UNION WITH CONTROL UNITS

DRAWN BY: DTH DATE: 2/6/2013

SCALE: NONE DRAWING NUMBER: TSU



CONDENSER WATER PIPING DETAIL FOR HEAT PUMPS
NTS



FLOOR MOUNTED HVAC UNIT.
N.T.S.

66
LEONARD ST

KEY PLAN

NO	REVISION	DATE
03	FOR PERMIT	11.05.24
02	CLIENT PRESENTATION	10.18.24
01	CLIENT PRESENTATION	09.20.24
AS NOTED		SCALE
CZ, DZ		DRAWN

TITLE
MECHANICAL DETAILS

SEAL AND SIGNATURE:
STATE OF NEW YORK · KEVIN KENDALL · NO. 084032 · LICENSED PROFESSIONAL ENGINEER

JOB NO: 24-019

PROJECT: 66 LEONARD STREET, NEW YORK, NY, 10013

DOB NOW#: - MECH
M-300.00

DRAWING 5 OF 7

AKA
Allen + Killcoyne Architects

ALLEN + KILLCOYNE ARCHITECTS 212 645 2222
12 WEST 27th ST, 17th FLOOR, NY, NY 10001

HVAC SPECIFICATIONS

A. GENERAL:

1. WORK SHALL CONFORM TO THE REQUIREMENTS OF APPLICABLE GOVERNMENTAL REGULATIONS AND SHALL BEAR APPROVAL CERTIFICATES AS APPLICABLE.

2. ALL MECHANICAL WORK IS TO BE PERFORMED BY A NYS LICENSED MECHANICAL CONTRACTOR

3. WORK SHALL CONFORM TO THE STANDARD OF THE BUILDING AND BE APPROVED BY THE BUILDING'S REPRESENTATIVES BEFORE COMMENCING WORK.

4. INVESTIGATE EACH SPACE THROUGH WHICH EQUIPMENT MUST BE MOVED. WHEN NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN CRATED SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTED SPACES AVAILABLE. ASCERTAIN FROM BUILDING OWNER AT WHAT TIMES OF DAY EQUIPMENT COULD BE MOVED THROUGH THE BUILDING.

5. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATING, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES OF MAGNITUDE THAT INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

6. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK SHALL BE NECESSARY FOR THE PERFORMANCE OF GENERAL WORK. ALL EXISTING CONDITIONS ARE NOT COMPLETELY DETAILED ON THE DRAWINGS. THIS CONTRACTOR SHALL SURVEY THE SITE AND MAKE ALL NECESSARY CHANGES REQUIRED BASED ON EXISTING CONDITIONS FOR PROPER INSTALLATION OF NEW WORK, AND INCLUDE ALL MATERIALS AND LABOR IN HIS BID PRICE. NO ALLOWANCE WILL BE MADE FOR FAILURE TO DO SO.

7. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OF THE VENTILATION AND AIR CONDITIONING SYSTEMS. DETAILS OF CONSTRUCTION AND OF WORKMANSHIP WHERE NOT SPECIFICALLY DESCRIBED HEREIN OR INDICATED ON THE DRAWINGS SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL. IT IS THE INTENT OF THESE SPECIFICATIONS TO PROVIDE COMPLETE SYSTEMS, LEFT IN GOOD WORKING ORDER, READY FOR OPERATION, INCLUDING NECESSARY LABOR AND MATERIALS, WHETHER OR NOT SPECIFICALLY SHOWN ON THE DRAWINGS OR MENTIONED HEREIN. IT IS NOT THE INTENTION OF THESE DRAWINGS TO SHOW ALL NECESSARY OFFSETS, OBSTRUCTIONS OR STRUCTURAL CONDITIONS. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO INSTALL HIS WORK IN SUCH A MANNER TO AVOID OBSTRUCTIONS, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR WITHOUT FURTHER COST OR INSTRUCTIONS.

8. BEFORE SUBMITTING PROPOSAL BIDDERS SHALL CAREFULLY EXAMINE FIELD CONDITIONS AND CONTRACT DRAWINGS OF ALL TRADES. SUBMISSION OF PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT REQUIRED EXAMINATION HAS BEEN MADE. LATER CLAIMS FOR EXTRA LABOR, EQUIPMENT AND MATERIALS REQUIRED DUE TO DIFFICULTIES WHICH COULD HAVE BEEN FORESEEN, WILL NOT BE RECOGNIZED. VERIFICATION SHALL BE MADE AS TO THE ACTUAL LOCATIONS WHERE NEW DUCT AND PIPE LINE RUNS WILL BE INSTALLED, AS WELL AS CLEARANCES BETWEEN NEW AND EXISTING DUCTWORK, PIPING AND STRUCTURAL MEMBERS. SHOULD THE CONTRACTOR FIND ANY EQUIPMENT OR CONDITION THAT IS NOT IN AGREEMENT WITH THE PLANS, HE SHALL REFER THE MATTER TO THE ENGINEER'S ATTENTION BEFORE PROCEEDING WITH THE DEMOLITION OR CONSTRUCTION.

9. CONTRACTOR SHALL BRING TO THE IMMEDIATE ATTENTION OF THE OWNER ANY CHANGES IN THE SIZE OR LOCATION OF THE MATERIAL OR EQUIPMENT WHICH MAY BE NECESSARY IN ORDER TO MEET FIELD CONDITIONS, OR IN ORDER TO AVOID CONFLICT WITH THE EQUIPMENT OF OTHER SECTIONS. OBTAIN THE OWNER'S APPROVAL BEFORE SUCH DEVIATIONS ARE MADE.

10. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OF SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING.

11. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUT DOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO EXISTING PIPING. PROVIDE TEMPORARY PIPING OR DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUT DOWN TIME. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.

12. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO A CONDITION ACCEPTABLE TO THE ENGINEER.

13. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS AND WALLS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL.

14. ALL PRESENT MATERIAL AND EQUIPMENT TO BE REMOVED UNDER THIS CONTRACT WILL REMAIN THE PROPERTY OF THE OWNER OR SHALL BE DISPOSED OF BY THIS CONTRACTOR AS DIRECTED BY THE OWNER.

15. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

16. ALL EQUIPMENT TO HAVE MEA, BSA, AND/OR UL NUMBER.

17. PROVIDE BUTTONS, TABS AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT. SUBMIT TO ARCHITECT FOR APPROVAL.

18. THE MECHANICAL CONTRACTOR SHALL FURNISH ELECTRIC, AUTOMATIC CONTROLS, MOTORS AND MOTOR CONTROLLERS. THE MECHANICAL CONTRACTOR SHALL GIVE THE MOTOR CONTROLLERS AND CONTROLS TO THE ELECTRICAL CONTRACTOR FOR INSTALLATION, TOGETHER WITH ALL NECESSARY WIRING DIAGRAMS AND INSTRUCTIONS FOR INSTALLATION.

a. EACH SINGLE PHASE MOTOR SHALL BE PROVIDED WITH A MANUAL STARTER. MANUAL STARTERS SHALL BE TOGGLE SWITCH TYPE, TRIP FREE AND TRIP INDICATING. FLUSH MOUNTED UNITS SHALL BE PROVIDED WITH STAINLESS STEEL PLATES. ALL MANUAL STARTERS SHALL BE EQUIPPED WITH NEON PILOTS AND SHALL BE EQUAL TO SQUARE D, WESTINGHOUSE OR APPROVED EQUAL.

b. MAGNETIC STARTERS SHALL BE NEMA STANDARD CONTROLLERS SUITABLE FOR THE USE INTENDED, EQUIPPED WITH NECESSARY AUXILIARY CONTACTS REQUIRED FOR CONTROL TO OPERATE THE SYSTEMS INDICATED. CONTROLLERS SHALL BE PROVIDED WITH A THERMAL OVERLOAD IN EACH MOTOR FEEDER UNDERGROUND LEG, AN EXTERNAL RESET BUTTON AND A HAND-OFF-AUTOMATIC SWITCH, WITH PILOT STATION. CONTROLLERS FOR THREE-PHASE MOTORS SHALL BE MAGNETIC, NON-REVERSING, FULL VOLTAGE, ACROSS-THE-LINE TYPE AND FURNISHED WITH CONTROL TRANSFORMERS.

19. ALL EQUIPMENT HAVING MOVING PARTS SHALL BE ISOLATED FROM THE BUILDING STRUCTURE BY MEANS OF SPRING VIBRATION ISOLATORS. ISOLATION SHALL BE OF THE SAME BRAND AND EQUIPMENT MANUFACTURER'S RECOMMENDATIONS SHALL BE FOLLOWED IN THE ISOLATION OF THE EQUIPMENT.

20. DAILY DURING CONSTRUCTION, THE MECHANICAL CONTRACTOR SHALL REMOVE ALL RUBBISH AND EXCESS MATERIAL ACCUMULATED AS A RESULT OF HIS OPERATIONS. ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT SHALL BE WIPED CLEAN OF DUST AND DEBRIS BEFORE FINAL ACCEPTANCE BY THE OWNER.

21. BEFORE COMPLETION OF THIS PROJECT, THE MECHANICAL CONTRACTOR SHALL TEST ALL EQUIPMENT. ALL EQUIPMENT SHALL BE OPERATED SUFFICIENTLY LONG TO PROVE TO THE OWNER THAT EACH UNIT PERFORMS SATISFACTORILY AND MEETS THE REQUIREMENTS SPECIFIED.

22. THE MECHANICAL CONTRACTOR SHALL INCLUDE WITH HIS BASE BID AN ADDED ALTERNATE TO PROVIDE COMPLETE SERVICING OF THE MECHANICAL EQUIPMENT WHICH HE HAS INSTALLED FROM THE PERIOD STARTING WITH THE WRITTEN ACCEPTANCE OF THE COMPLETE INSTALLATION FOR THE ONE (1) YEAR WARRANTY UP TO ITS CONCLUSION DATE. SERVICING SHALL CONSIST OF, BUT NOT BE LIMITED TO, LUBRICATION OF UNITS, ADJUSTMENTS, CLEANING, FILTER CHANGES AND REPLACEMENT OF CEILING TILES.

23. FOR EXACT LOCATION OF CEILING DIFFUSERS, GRILLES AND REGISTERS REFER TO ARCHITECTURAL PLANS AND DETAILS.

24. OBTAIN FROM THE ENGINEER THE LOCATION OF ANY APPARATUS NOT DEFINITELY LOCATED ON THE DRAWINGS. LOCATE EQUIPMENT AND ACCESSORIES IN SUCH A MANNER AS TO PROVIDE EASY ACCESS FOR PROPER SERVICE AND MAINTENANCE OF ALL EQUIPMENT AND ITEMS REQUIRING MAINTENANCE.

25. REVIEW WITH THE ENGINEER AND THE BUILDING MANAGER ANY CONDITION THAT PREVENTS ADEQUATE ACCESSIBILITY FOR MAINTENANCE PRIOR TO INSTALLATION OF THE WORK. ALL EQUIPMENT AND/OR ACCESSORIES THAT ARE INSTALLED WITHOUT PROPER ACCESS, IN THE OPINION OF THE BUILDING MANAGER, AND INSTALLED WITHOUT THE BUILDING MANAGER'S AND/OR ENGINEER'S APPROVAL, SHALL BE REMOVED AND REVISED AS DIRECTED BY THE BUILDING MANAGER AND/OR ENGINEER AT NO ADDITIONAL COST TO THE OWNER.

26. THE CONTRACTOR'S WORK SHALL INCLUDE THE COST OF BREAKING DOWN AND REASSEMBLY OF THE NEW EQUIPMENT AS NECESSARY TO FIT THE EQUIPMENT INTO THE BUILDING.

27. THE CONTRACTOR'S WORK SHALL INCLUDE THE HOISTING OF ALL MATERIALS AND EQUIPMENT, AND HE SHALL ASSUME ALL RESPONSIBILITY FOR SUCH HOISTING AND WORK.

28. THIS CONTRACTOR SHALL REPAIR AND RESTORE TO ORIGINAL CONDITION ANY EXISTING EQUIPMENT OR MATERIALS DAMAGED IN THE PROCESS OF INSTALLATION, TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVES.

B. DEMOLITION AND REMOVAL:

1. CONTRACTOR SHALL ERECT AND MAINTAIN BARRIERS TO PROTECT ADJACENT AREAS FROM DUST AND DEBRIS DURING PERIOD OF DEMOLITION AND CONSTRUCTION.

2. ALL EXISTING WORK NOT INDICATED FOR DEMOLITION SHALL BE PROTECTED FROM DAMAGE. IF EXISTING IS DAMAGED, CONTRACTOR SHALL MAKE REPAIRS USING SAME MATERIALS AT THE CONTRACTOR'S COST.

3. CONTRACTOR SHALL COORDINATE WITH BUILDING MANAGER PRIOR TO WORKING ON OR CONNECTING TO BUILDING SYSTEM AND SHALL TAKE PRECAUTIONS AGAINST DAMAGING OR DISRUPTING BUILDING SYSTEMS, WIRING OR CONTROL TUBING FOR THE TENANTS ABOVE OR BELOW. ANY DAMAGE TO THESE ITEMS SHALL BE REPAIRED AT THE CONTRACTOR'S COST.

4. REMOVE ALL EXISTING DUCTWORK AND AIR TERMINALS. PROVIDE FOR LEGAL REMOVAL AND DISPOSAL OF ALL RUBBISH AND DEBRIS FROM THE BUILDING AND SITE. COORDINATE ALL DEMOLITIONS AND REMOVALS WITH BUILDING MANAGEMENT. PROTECT ALL WORK NOT SLATED FOR DEMOLITION.

5. TAG ALL EQUIPMENT REMOVED. STORE ALL EQUIPMENT SLATED FOR RELOCATION ON THE FLOOR. TURN OVER TO THE BUILDING MANAGEMENT ALL OTHER REMOVED EQUIPMENT. DISPOSE OF EQUIPMENT AND MATERIAL AS REQUIRED BY THE BUILDING MANAGEMENT.

C. CLEANING AND PROTECTION:

1. STORE MATERIALS IN A MANNER THAT WILL MAINTAIN AN ORDERLY, CLEAN APPEARANCE. IF STORED ON SITE IN OPEN OR UNPROTECTED AREAS, ALL EQUIPMENT AND MATERIALS SHALL BE KEPT OFF THE GROUND BY MEANS OF PALLETS OR RACKS, AND COVERED WITH TARPAULINS.

2. INLET AND DISCHARGE OPENINGS OF ALL EQUIPMENT SHALL BE KEPT COVERED UNTIL THE EQUIPMENT IS READY TO RUN.

3. EQUIPMENT AND MATERIAL DAMAGED IS SUBJECT TO REJECTION AND REPLACEMENT.

4. DURING CONSTRUCTION, PROTECT ALL DUCTWORK, PIPING AND EQUIPMENT FROM DAMAGE AND DIRT. CAP THE OPENINGS OF ALL DUCTWORK, PIPING AND EQUIPMENT NOZZLES.

5. AFTER COMPLETION OF PROJECT, CLEAN THE THE EXTERIOR SURFACES OF THE EQUIPMENT.

D. SCOPE OF WORK:

PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND CONTRACTOR'S SERVICES NECESSARY FOR A COMPLETE SAFE INSTALLATION OF ALL WORK INDICATED IN CONTRACT DOCUMENTS, IN FULL CONFORMITY WITH REQUIREMENTS OF BUILDING CODES AND OF ALL AUTHORITIES HAVING JURISDICTION, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. SECURE CERTIFICATES, PAY ALL FEES AND CHARGES FOR ALL WORK INSTALLED CERTIFYING COMPLIANCE WITH THE 2022 BUILDING CODE OF NEW YORK CITY AND GOVERNING AUTHORITIES. DELIVER CERTIFICATES TO OWNER BEFORE FINAL BILLING.

2. DEMOLITION AND REMOVAL FROM SITE OF EXISTING A/C UNITS AND DUCTWORK, CEILING EXHAUST FANS, UNLESS OTHERWISE NOTED.

3. NEW LOW PRESSURE DUCTWORK AND ACCESSORIES

4. HORIZONTAL AND VERTICAL, PACKAGED, WATER SOURCE HEAT PUMP UNITS WITH FULLY DUCTED DISTRIBUTION AUTOMATIC TEMPERATURE CONTROLS, MECHANICAL PIPING, CONDENSATE DISPOSAL SYSTEMS.

5. CONDENSER WATER SUPPLY AND RETURN PIPING SYSTEMS, FITTINGS, VALVES, AND PIE ACCESORIES.

6. INLINE EXHAUST FANS AND CONTROLLERS

7. DIFFUSERS, REGISTERS AND GRILLES.

8. INSULATION AND ACOUSTICAL LINING.

9. VIBRATION ISOLATION FOR ALL EQUIPMENT

10. MOTORS, STARTERS AND MISCELLANEOUS ELECTRICAL EQUIPMENT

11. SHOP DRAWINGS AND RECORD DRAWINGS.

12. COMPLETE AUTOMATIC CONTROL SYSTEMS FOR ALL THE UNITS.

13. BALANCING OF ALL AIR SYSTEMS, TESTING OF RESULTS AND FURNISHING BALANCING REPORT. SHOWING COMPLIANCE WITH DESIGN AIR FLOW VALUES.

14. STORING AND PROTECTION OF EQUIPMENT AND/OR APPURTENANCES SPECIFIED HEREIN.

15. TESTING OF NEW PIPING.

16. INSTALLATION AND TESTING OF SMOKE DETECTORS.

17. COMMISSIONING AND STARTUP OF ALL SYSTEMS AND EQUIPMENT SPECIFIED ON THESE PLANS BY THE CONTRACTOR.

18. PROVIDE A BOUND O&M MANUAL OF ALL SYSTEMS SPECIFIED ON THESE PLANS TO THE OWNER.

E. CODES AND REGULATIONS:

1. WORK SHALL MEET OR EXCEED THE LATEST REQUIREMENTS OF NATIONAL, STATE, COUNTY, MUNICIPAL, AND OTHER AUTHORITIES EXERCISING JURISDICTION OVER THE CONSTRUCTION WORK AT THE PROJECT.

2. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.

3. CONTRACTOR SHALL GIVE NECESSARY NOTICES, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, AND OBTAIN ALL NECESSARY PERMITS AND CERTIFICATES, AND PAY ALL FEES AND CHARGES CONNECTED THEREWITH. ALL CERTIFICATES SHALL BE DELIVERED TO THE OWNER BEFORE THE WORK IS FINALLY ACCEPTED. ALL EQUIPMENT SHALL HAVE THE REQUIRED N.Y.C. B.S.A. NUMBERS AS REQUIRED BY THE GOVERNING CODES. THE CONTRACTOR SHALL PROVIDE THE SPECIAL INSPECTION. ALL NEW EQUIPMENT SHALL HAVE MEA NUMBERS, WHICH SHALL BE PROVIDED IN WRITING TO THE OWNER.

F. GUARANTEE AND CERTIFICATION:

THE CONTRACTOR SHALL GUARANTEE WORK PERFORMED AND MATERIALS INSTALLED TO BE FREE FROM DEFECTS AND SHALL REPLACE ANY DEFECTIVE MATERIAL OR WORKMANSHIP, FREE OF COST TO THE OWNER, FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE, EVIDENCED BY THE DATE OF FINAL PAYMENT.

G. SUBMITTALS AND RECORD DRAWINGS:

1. PRIOR TO ASSEMBLING OR INSTALLING THE WORK, THE FOLLOWING SHALL BE SUBMITTED FOR APPROVAL.

a. SUBMIT 3/8"=1' SCALE FIELD MEASURED FABRICATION SHOP DRAWINGS IN PDF FORMAT. SHOP DRAWINGS SHALL BE FULLY COORDINATED WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS. SPRINKLER AND PLUMBING PIPING, ARCHITECTURAL LIGHTING, ETC. SHALL BE OVERLAYED ONTO SHETT METAL SHOP DRAWINGS FOR COORDINATION. DRAWINGS SHALL SHOW THE EXACT LOCATION OF DUCTS IN RELATION TO WALLS, CEILING CONSTRUCTION, LIGHTS, DIFFUSERS, AND STRUCTURAL ELEMENTS

c. DUCT CONSTRUCTION STANDARDS AND DETAILS.

d. 1/4" SCALE DRAWING INDICATING PIPING.

e. AUTOMATIC CONTROLS DEVICES AND DIAGRAMS WITH SEQUENCE OF OPERATION DESCRIPTION.

f. CUTS AND TECHNICAL DATA ON EACH EQUIPMENT, LOUVER, DIFFUSER, GRILLE, DAMPER, ACCESS DOOR, THERMOSTAT, VIBRATION ISOLATION EQUIPMENT INSTALLATION DETAIL.

2. DOCUMENTS WILL NOT BE ACCEPTED FOR APPROVAL UNLESS:

a. DUCTWORK SHOP DRAWINGS SHALL BE FULLY COORDINATED WITH EXISTING FIELD CONDITIONS AND WORK OF OTHER TRADES AND SHALL BE SO STATED ON THE SHOP DRAWINGS.
b. VRF (VARIABLE REFRIGERANT FLOW) EQUIPMENT SUBMITTALS SHALL BE PRODUCED BY THE FACTORY, COMPLETE WITH REFRIGERANT PIPING LENGTHS, DIAMETERS, CAPACITY DERATINGS (IF ANY), AND WIRING DIAGRAMS.

1. RECORD DRAWINGS: RECORD ALL DEVIATIONS FROM CONTRACT DRAWINGS AND DELIVER TO OWNER MYLAR TRACINGS SHOWING WORK AS ACTUALLY INSTALLED.

H. CONNECTIONS TO EXISTING WORK:

1. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. SUBMIT TO OWNER FOR APPROVAL, DATE SCHEDULE OF NECESSARY TEMPORARY SHUTDOWNS OF EXISTING SERVICES. ALL SHUTDOWNS SHALL BE MADE AT SUCH TIMES AS WILL NOT INTERFERE WITH REGULAR OPERATION OF EXISTING FACILITIES AND ONLY AFTER WRITTEN APPROVAL OF THE BUILDING.

2. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED TO ORIGINAL CONDITION.

I. WIRING:

THE RESPONSIBILITY OF THIS TRADE IN CONNECTION WITH ELECTRICAL WORK IS AS FOLLOWS:

1. FURNISH AND DELIVER TO THE SITE ACTUATING DEVICES WHICH REQUIRE ELECTRICAL CONNECTION ONLY (SUCH AS PUSH-BUTTON STATIONS, WALL-MOUNTED ELECTRICAL CONTACTING THERMOSTATS, ETC.,) FOR MOUNTING AND CONNECTION BY THE ELECTRICAL TRADE.

2. PROVIDE NECESSARY INFORMATION, SUPERVISION, AND COORDINATION AS REQUIRED TO IMPLEMENT THE WIRING DIAGRAMS AND OTHER INFORMATION FOR WORK OF THE ELECTRICAL TRADE.

3. FURNISH AND INSTALL AUTOMATIC CONTROL WIRING BELOW 100 VOLT. WIRING SHALL CONFORM TO THE NATIONAL ELECTRIC CODE AND TO AND LOCAL AND/OR STATE CODES THAT APPLY.

J. MOTORS:

1. ALL MOTOR AND MOTOR CONTROL EQUIPMENT SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE AND THE LOCAL PUBLIC UTILITY FURNISHING CURRENT TO THE BUILDING.

2. MOTOR CONTROL:

a. FURNISH SUITABLE STARTING AND CONTROLLING EQUIPMENT FOR MOTORS FURNISHED AS PART OF THE AIR CONDITIONING SYSTEMS.

b. FURNISH PUSH BUTTONS AND OTHER DEVICES, INCLUDING PILOT LIGHTS REQUIRED FOR THE MANUAL OR AUTOMATIC ACTUATING OF MOTOR STARTING EQUIPMENT AS NOTED ON THE PLANS. DEVICES INDICATED AS BEING REQUIRED IN STARTER COVERS SHALL BE DELIVERED SO MOUNTED TO THE PROJECT. WHERE PLANS INDICATE THAT DEVICES ARE TO MOUNT SEPARATELY FROM THE MOTOR STARTERS, SUCH DEVICES SHALL BE FURNISHED COMPLETE WITH NEMA CLASS I GENERAL PURPOSE ENCLOSURES.

c. STARTERS FOR MOTORS 1/2 HP AND LARGER SHALL BE OF THE MAGNETIC CIRCUIT BREAKER TYPE. EACH MAGNETIC STARTER SHALL BE FURNISHED WITH COMBINATION MAGNETIC CIRCUIT BREAKER TYPE OVERLOAD UNITS IN ALL PHASE LEGS FOR THE MOTOR CONTROLLED, AND SHALL PROVIDE EITHER LOW VOLTAGE PROTECTION OR LOW VOLTAGE RELEASE AS DETERMINED BY THE CONTROL WIRING METHOD INTERLOCKED WITH THE HANDLE OF THE DISCONNECT MEANS TO PREVENT OPENING WHEN THE HANDLE IS IN THE CLOSED POSITION.

d. STARTING EQUIPMENT FOR ALL MOTORS SHALL BE THE PRODUCT OF CUTLER-HAMMER, WESTINGHOUSE, GENERAL ELECTRIC, OR ALLEN BRADLEY.

e. PILOT LIGHTS SHALL BE NEON TUBE TYPE WITH CANDELABRA BASE AND CLEAR GLASS.

f. PUSH BUTTONS SHALL BE THE SPRING RELEASE TYPE.

g. PROVIDE PERMANENT NAMEPLATES MOUNTED ON THE COVER OF EVERY STARTER, SWITCH, OR CIRCUIT BREAKER, REGARDLESS OF ITS LOCATION.

h. PROVIDE "HANDS-OFF AUTOMATIC," (HOA) STARTERS FOR ALL CYCLING EQUIPMENT.

K. CUTTING AND PATCHING:

ALL CUTTING AND ROUGH PATCHING FOR THE INSTALLATION OF THE NEW WORK SHALL BE INCLUDED. FINISH PATCHING SHALL BE BY THE GENERAL CONTRACTOR.

L. SLEEVES AND OPENINGS:

1. PROVIDE SLEEVES FOR ALL PIPING AND DUCTWORK PASSING THROUGH WALLS.

2. SLEEVES SHALL BE 20 USSG GALVANIZED IRON.

3. SEAL OPENINGS BETWEEN SLEEVES AND PIPE OR PIPE INSULATION, FOR FULL DEPTH OF SLEEVE, WITH MINERAL WOOL OR EQUIVALENT NON-ASBESTOS, NON-COMBUSTIBLE MATERIAL.

M. WATER MAKEUP PRESSURE REDUCING STATION:

1. PROVIDE ADJUSTABLE TYPE WATER MAKE-UP PRESSURE REGULATING VALVES FOR EACH WATER SYSTEM INDICATED ON THE DRAWINGS. VALVES SHALL BE AS MANUFACTURED BY BELL AND GOSSETT NO. 7, TACO NO.320, OR THRUSH NO. 22.

2. VALVES SHALL BE SUITABLE FOR UP TO 100 PSI INLET PRESSURE, SHALL BE ADJUSTABLE TO THE SYSTEM PRESSURE.

3. VALVES SHALL BE PROVIDED WITH ASSEMBLIES CONSISTING OF INLET PRESSURE GAUGE, SHUT-OFF VALVES INLET STRAINER, OUTLET PRESSURE GAUGE AND QUICK FILL BYPASS WITH GLOBE VALVE.

N. PIPING FOR HVAC SYSTEMS:

1. GENERAL

a. NO PIPING SHALL BE LESS THAN 3/4", UNLESS OTHERWISE NOTED

b. FOR PIPE SIZES NOT INDICATED ON PLANS, SEE MANUFACTURER'S EQUIPMENT CONNECTION DETAILS

c. PROVIDE FITTINGS FOR CHANGE IN PIPE SIZE FOR FINAL CONNECTION AT EQUIPMENT AS REQUIRED

d. PROVIDE UNION CONNECTIONS AT EACH PIECE OF EQUIPMENT AND ON EACH SIDE OF ALL VALVES AND IN-LINE EQUIPMENT

e. PROVIDE VALVED AND CAPPED CONNECTIONS AT ALL LOW POINTS IN PIPING SYSTEMS REQUIRED FOR DRAINING SYSTEMS

f. ALL PIPING BETWEEN STEEL OR BRONZE DIELECTRIC FITTINGS SHALL BE BRAZED USING SILVER SOLDER AND ALL COPPER FITTINGS TO COPPER PIPE SHALL BE BRAZED USING PHSCO, OR APPROVED 99.4 % COPPER SOLDER ALLOY.

g. ALL EQUIPMENT SHALL BE PROVIDED WITH UNIONS FOR EASILY REMOVAL AND FOR SERVICING.

h. PRESSURE RATING OF STRAINER TO MATCH THAT OF THE VALVES IN THE SAME LINE. PROVIDE DIELECTRIC UNIONS BETWEEN ALL FERROUS AND NON-FERROUS PIPING.

i. HIGH POINTS OF ALL WATER PIPING SHALL BE PROVIDED WITH MANUAL VENTS, AND ALL LOW POINTS SHALL HAVE DRAIN VALVES WITH HOSE CONNECTIONS FOR COMPLETE DRAINING OF THE LINES, RATED FOR 200 #S.W.P.

j. PROVIDE DIELECTRIC GASKETS BETWEEN JOINTS OF DISSIMILAR METALS AND SLEEVES AND WASHERS BETWEEN FLANGES, BOLTS AND NUTS.

k. ALL PIPING SHALL BE LABELED TO INDICATE SIZE, PURPOSE AND DIRECTION OF FLOW IN SUCH A MANNER THAT IT CAN EASILY BE READ FROM THE FLOOR. LETTERS SHALL NOT BE LESS THAN 2".

l. BALANCE AND ADJUST ALL MANUAL BALANCING VALVES.

m. PROVIDE MINIMUM PITCH TO INSURE ADEQUATE VENTING AND DRAINAGE.

n. PROVIDE, AS REQUIRED, AUTOMATIC AIR VENTS, MANUAL AIR VENTS AND RELIEF AIR VENTS.

o. AVOID ENTRY OF FOREIGN MATTER INTO PIPING DURING CONSTRUCTION. AFTER COMPLETION OF PIPING, FLUSH SYSTEM WITH WATER FOR AN 8 HOUR PERIOD. REMOVE AND CLEAN STRAINERS, AND BLOW OFF ALL PIPING LOW POINTS AT THE END OF THE 8-HOUR PERIOD. REFILL SYSTEM WITH WATER OR, FOR GLYCOL SYSTEMS, REFILL WITH 40% OF ETHYLENE GLYCOL SOLUTION WITH INHIBITORS. COORDINATE AND PROVIDE WATER TREATMENT IN ACCORDANCE WITH THE BUILDING STANDARDS.

p. MOTORIZED TWO WAY CHILLED WATER VALVES TO BE HONEYWELL OR APPROVED EQUAL, SELECTED BY THE MANUFACTURER AT 150 #S.W.P. AND SUITABLE FOR 110 VOLT PRIMARY SUPPLY AND 24 VOLT CONTROL ACTUATION.

q. HOT GAS AND LIQUID REFRIGERANT LINES, AND SUCTION LINES FOR HEAT PUMP APPLICATIONS TO BE COPPER, TYPE L (B) OR K (A), ANNEALED- OR DRAWN-TEMPERED TUBING AND WROUGHT-COPPER FITTINGS WITH BRAZED JOINTS.

2. COMPLETE WITH:

a. PIPE
b. FITTINGS
c. VALVES
d. HANGERS, SUPPORTS
e. ACCESSORIES

3. MATERIALS:

a. CHILLED WATER, CONDENSER WATER, STEAM, AND HOT WATER PIPING SHALL BE STEEL SCHEDULE 40, SEAMLESS OR ELECTRIC WELD ASTM-53.

b. GLYCOL WATER SUPPLY AND RETURN, CONDENSATE DRAIN, AND WATER MAKE-UP PIPING SHALL BE TYPE "L" COPPER TUBING.

c. REFRIGERATION PIPING SHALL BE TYPE "L" COPPER TUBING OF THE SIZE SHOWN ON THE DRAWINGS OR AS RECOMMENDED BY THE MANUFACTURER OF THE EQUIPMENT INSTALLED. ALL NEW REFRIGERATION PIPING SHALL BE TESTED AS PER THE MANUFACTURER'S REQUIREMENTS.

4. FITTINGS AND VALVES:

a. STEEL PIPING FITTINGS 2" AND SMALLER SHALL BE 125(250) LB. CAST IRON FITTINGS 2-1/2" AND LARGER SHALL BE 150(250) LB. WSP FLANGED OR BUTT WELDED.

b. COMPRESSION AND FLARED FITTINGS: CAST BRASS ANSI B16.26. FLANGE GASKETS FOR JOINTS OF DISSIMILAR METALS: ISOLATING GASKETS, SLEEVES AND WASHERS BETWEEN FLANGES, BOLTS AND NUTS.

c. PROVIDE 1/2" DRAIN VALVE AND CAPPED CONNECTIONS AT LOW POINTS. PROVIDE 3/4" CAPPED CONNECTION FOR DRAINING CONNECTION AT THE LOWEST POINT IN THE SYSTEM AND IN EQUIPMENT ROOM.

d. TRAP SEAL IN CONDENSATE DRAIN PIPING SHALL BE MINIMUM 1" GREATER THAN THE STATIC PRESSURE IN THE SYSTEM.

e. STEEL PIPING 2-1/2" AND ABOVE SHALL BE WELDED AND CONFORM TO THE LATEST REVISION OF:
B31.1 CODE FOR PRESSURE PIPING CHAPTER V.
ANSI 49.1 SAFETY IN WELDING AND CUTTING.
API CODE FOR FUEL AND OTHER API GOVERNING PIPING.

f. WELDERS SHALL BE QUALIFIED PER SECTION IX OF ASME BOILER AND PRESSURE VESSEL CODE.

g. STEEL PIPING 2" AND BELOW MAY BE SCREWED ENDS AND THREADED TO CORRECT LENGTHS.

h. COPPER PIPING EXCEPT CITY WATER AND CONDENSATE DISCHARGE: (SILVER SOLDER) HIGH TEMPERATURE BRAZING ALLOY CONNECTION.

i. CITY WATER PIPING FOR WATER MAKE-UP AND CONDENSATE DISCHARGE PIPING: 95-5 SOLDER JOINT CONNECTIONS.

j. VALVES SHALL BE SUITABLE FOR THE SERVICE PRESSURE AND TEMPERATURE AND SHALL BE:

1) GATE VALVE "JENKINS" FIGURE 270 OR APPROVED EQUAL. BRONZE 300 LBS S.W.P., SOLID WEDGE, INSIDE SCREW, RISING SPINDLE

2) GLOBE VALVE "JENKINS" FIGURE 556. BRONZE, 300 LBS S.W.P., INSIDE SCREW, UNION BONNET, RENEWABLE DISC

3) CHECK VALVE "JENKINS" FIGURE 30A. BRONZE, 300 LBS S.W.P., INSIDE SCREW, UNION BONNET

4) BALANCING VALVE BELL AND GOSSETT "CIRCUIT SETTER"

5) STRAINER "MEULLER STEAM SPECIALTY" MUESSCO NO. 11 OR APPROVED EQUAL. SCREWED ENDS UP TO 2 1/2", 300 LBS S.W.P., FORGED STEEL 8OR CAST STEEL BODY, 316 STAINLESS STEEL OR MONEL SCREEN WITH 1/8" PERFORATIONS

5. PRESSURE RELIEF VALVES:

a. PRESSURE RELIEF VALVE BODIES SHALL HAVE SCREWED ENDS AND BE CONSTRUCTED OF BRONZE. THE MAIN VALVE IS TO BE MADE OF STAINLESS STEEL IN SIZES ½" TO 1½" AND OF BRONZE IS SIZES 2" TO 3". MANUFACTURER IS TO RECOMMEND LOADING SPRING SIZE BASED UPON APPROVED EQUIPMENT SPECIFICATIONS AND INTENDED APPLICATIONS. SPRINGS ARE TO BE CADMIUM PLATED STEEL. SPRING RATINGS SHALL COVER 5 TO 35 PSIG AND 25 TO 100 PSIG. THE SET PRESSURE SHALL BE ADJUSTABLE BY A STEEL SET SCREW.

b. PRESSURE RELIEF VALVES SHALL BE OF THE SIZES AND CAPACITIES REQUIRED TO RELIEVE THE FLOW QUANTITIES INDICATED ON THE DRAWINGS IN ACCORDANCE WITH APPLICABLE ASME CODES.

c. PRESSURE RELIEF VALVES SHALL GENERALLY BE SET FOR 10 PSI HIGHER THAN PRESSURE REDUCING VALVES DISCHARGE PRESSURE OR 10 PSI GREATER THAN THE WATER SYSTEM. PIPE TO DRAIN.

d. PRESSURE RELIEF VALVES SHALL HAVE BRONZE BODIES WITH PRESSURE RATING IN EXCESS OF THAT ENCOUNTERED IN SERVICE. VALVES SHALL BE AS MANUFACTURED BY J.B. LONERGAN, WATSON McDANIEL, CONSOLIDATED OR APPROVED EQUAL.

6. PRESSURE GAUGES:

PRESSURE GAUGES SHALL BE PHOSPHOR BRONZE BOURDON TUBE ACTUATED WITH A 4 1/2" CAST ALUMINUM CASE. THE RANGE OF THE GAUGE SHALL BE SUITABLE FOR THE SERVICE INTENDED. ALL PRESSURE GAUGES SHALL BE INSTALLED WITH BRASS GAUGE COCKS. PRESSURE GAUGES SHALL BE TAYLOR, WEKSLER, ASHCROFT AND MARSH INSTRUMENT CO.

7. THERMOMETERS:

ALL TEMPERATURE GAUGES ARE TO BE 3 1/2" DIAL, VAPOR TENSION TYPE WITH 180-DEGREE ROTATION ADJUSTMENT. MARSH TYPE 59V OR APPROVED EQUAL, WITH SUITABLE SCALE. DRAWN BLACK STEEL CASE AND BLACK SLIP RING. SCALE SELECTED FOR OPERATING TEMPERATURE IN MID-RANGE AND SUITABLE FOR 150 LBS W.O.G.

8. SOLDERED JOINTS:

95-5 TIN ANTIMONY SOLDER HAVING A MELTING POINT GREATER THAN 450 DEGREES F. EXCESS SOLDER SHALL BE REMOVED WHILE STILL IN THE MOLTEN STATE WITH A FILL LEFT AT THE FACE OF THE FITTING.

9. AUTOMATIC AIR VENTS:

PROVIDE AUTOMATIC AIR VENTS, FLOAT OPERATED AT HIGH POINTS OF WATER PIPING SYSTEMS AS INDICATED AND REQUIRED FOR SYSTEM FILLING, DRAINAGE AND AIR FREE SYSTEM OPERATION. GATE VALVE AND PIPING FROM OUTLET TO NEAREST OPEN-SIGHT DRAIN OR SINK.

10. PIPING TAPS AND FITTINGS:

PROVIDE PIPE FITTINGS, WELLS, PETE'S PLUGS, AND CONNECTION TO ACCOMMODATE THERMOMETERS, GAUGES, FLOW AND TEMPERATURE SENSING ELEMENTS, THAT ARE REQUIRED IN THE PIPING SYSTEMS.

11. PIPE HANGERS AND SUPPORTS:

a. PROVIDE HANGERS, ANCHORS AND SUPPORTS FOR PIPING TO SUPPORT PIPE AND ITS CONTENTS, PREVENT VIBRATION AND SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION.

b. ALL SUPPORTS SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE ANSI CODE FOR PRESSURE PIPING B31.10 AND MSS STANDARD PRACTICE SP-58.

c. HANGER SHALL BE MANUFACTURED BY GRINNEL CO., CENTRAL IRON, FEE AND MASON, BLACKNOX CO. OR AN APPROVED EQUAL.

d. PIPE HANGERS, RODS, INSERTS AND CLAMPS SHALL BE THOSE APPROVED FOR THEIR RESPECTIVE USE BY THE UNDERWRITER'S LABORATORIES, INC.

e. PROVIDE ADDITIONAL SUPPORTS AT CHANGE OF DIRECTION, RUNOUTS AND CONCENTRATED LOADS DUE TO VALVES, ETC.

f. VERTICAL PIPING SHALL BE SUPPORTED WITH BEARING PLATE ON STRUCTURAL SUPPORT. PROVIDE GUIDES AT EVERY SECOND FLOOR (SPACING NOT TO EXCEED 25 FT.) SUPPORT AT TOP SHALL BE PROVIDED WITH SPRING HANGER HAVING A PROVISION FOR EXPANSION.

g. HANGER RODS SHALL BE OF THE FOLLOWING SIZE AND SPACING:

PIPE SIZE	ROD DIAMETER	MAXIMUM HANGER SPACING
1" SMALLER	3/8"	6 FEET
1-1/4" TO 2"	1/2"	9 FEET
2-1/2" LARGER	1/2"	11 FEET

12. PIPING SPECIALTIES:

PROVIDE ESCUTCHEONS FOR ALL EXPOSED PIPING, BOTH BARE AND INSULATED, WHERE PASSING THROUGH WALLS, CEILINGS, OR PARTITIONS. ESCUTCHEONS SHALL BE CHROMIUM PLATED BRASS OR CHROMIUM PLATED CAST IRON.

O. VALVE TAGS:

1. PROVIDE VALVE TAGS FOR EACH VALVE AND CONTROL DEVICE EXCEPT EQUIPMENT SHUTOFF VALVES LOCATED AT EQUIPMENT.

2. TAGS SHALL BE MINIMUM 2" DIAMETER, NO. 18 BS GAUGE BRASS, STAMPED IDENTIFYING LETTER AND NUMBER FILLED IN WITH BLACK PAINT, FASTENED BY HEAVY BRASS HOOK OR CHAIN.

3. USE DIFFERENT PATTERN TAGS THAN THOSE USED FOR PLUMBING OR SPRINKLER WORK.

P. EXPANSION JOINTS, GUIDES AND ANCHORS:

1. MAKE ADEQUATE PROVISIONS FOR EXPANSION IN ALL PIPING BY MEANS OF LOOPS, BENDS, OR OFFSETS. WHERE PIPE LINES JOIN OR WHERE BRANCHES OCCUR, MAKE PROVISIONS FOR THE EXPANSION OF BOTH LINES.

2. GUIDES:

a. LOCATE AND CONSTRUCT WHEREVER REQUIRED TO PERMIT FREE AXIAL MOVEMENT ONLY.

b. A MINIMUM OF TWO GUIDES SHALL BE INSTALLED ON EACH END OF AN EXPANSION JOINT PLUS AT LEAST ONE GUIDE BETWEEN TWO JOINTS.

3. ANCHOR PIPING WHERE NECESSARY TO CONTROL EXPANSION AND PREVENT UNDUE STRAIN ON THE FITTINGS AND APPARATUS.

4. ANCHORS: HEAVY CONSTRUCTION ATTACHED TO PIPE AND FASTENED TO STRUCTURE.

5. PROVIDE NECESSARY STEEL FOR CONNECTION TO STRUCTURE.

Q. DUCTWORK AND ACCESSORIES:

1. SHEETMETAL DUCTWORK:

a. ALL DUCTWORK SHALL BE FURNISHED, INSTALLED AND FABRICATED IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA LOW PRESSURE AND MEDIUM PRESSURE DUCT CONSTRUCTION STANDARDS MANUALS, USING PRIME SHEETS OF GALVANIZED STEEL.

b. ALL SQUARE ELBOWS SHALL BE PROVIDED WITH TURNING VANES ON MAXIMUM 4" CENTERS. ROUND ELBOWS SHALL HAVE FULL WIDTH RADIUS.

c. ALL DUCT SYSTEMS SHALL BE TIGHT AND FREE FROM LEAKS AND VIBRATION. ALL JOINTS IN DUCTWORK SHALL BE SEALED AIRTIGHT. THIS INCLUDES ALL SUPPLY, RETURN AND EXHAUST DUCTWORK. DUCT SEALER DURODYNE 5-2C SHALL BE USED AND SHALL BE TESTED FOR AIRTIGHTNESS AFTER INSTALLATION.

66
L E O N A R D S T

KEY PLAN

NO	REVISION	DATE
03	FOR PERMIT	11.05.24
02	CLIENT PRESENTATION	10.18.24
01	CLIENT PRESENTATION	09.20.24

AS NOTED — SCALE

CZ, DZ — DRAWN

TITLE

MECHANICAL SPECIFICATIONS

SEAL AND SIGNATURE:

JOB NO: 24-019

PROJECT: 66 LEONARD STREET, NEW YORK, NY, 10013

DOB NOW#: - MECH

M-400.00

DRAWING 6 OF 7

AKA
Allen + Killcoyne Architects

ALLEN + KILLCOYNE ARCHITECTS 212 645 2222
12 WEST 27th ST, 17th FLOOR, NY, NY 10001

d. SUPPORT HORIZONTAL DUCTS WITH HANGERS SECURED TO STRUCTURAL STEEL ABOVE. INSTALL ADDITIONAL STEEL AS REQUIRED.

e. PROVIDE ACCESS DOORS AT ALL FIRE AND AUTOMATIC DAMPERS FOR ACCESS. ALL ACCESS DOORS SHALL BE AS PER LATEST SMACNA STANDARDS.

2. DAMPERS:

a. ALL BRANCHES AND TAKE-OFFS SHALL BE EQUIPPED WITH VOLUME DAMPERS. VOLUME DAMPERS SHALL BE MANUAL, OPPOSED BLADE TYPE, WITH LOCKING QUADRANT, CONSTRUCTED AS PER SMACNA MANUALS.

b. SPLITTER DAMPERS: PROVIDE AT DUCT BRANCHES AND WHERE SHOWN ON THE DRAWINGS. CONSTRUCTION AS PER SMACNA MANUALS.

c. MOTORIZED DAMPERS SHALL HAVE INTERLOCKING BLADES AND FRAMES.THE DAMPERS SHALL BE DESIGNED AND CONSTRUCTED SO THAT THE BLADES, FRAMES AND LINKAGE MECHANISMS SHALL PRESENT A RIGID ASSEMBLY WITH FREE AND EASY ACTION. DAMPERS SHALL HAVE GALVANIZED STEEL BLADES AND WELDED STEEL FRAMES. DAMPER BEARINGS SHALL BE BRASS. ALL DAMPERS IN DUCTS SHALL HAVE THE TOP AND BOTTOM EDGES AND BOTH ENDS TRIMMED WITH NEOPRENE AND FASTENED IN AN APPROVED MANNER SO AS TO BE PRACTICALLY AIR TIGHT WHEN CLOSED. DAMPERS SHALL BE CLASS I WITH A MAXIMUM LEAKAGE RATE OF 4CFM/FT² AT 1.0"W.C. WHEN TESTED IN ACCORDANCE WITH AMCA 500D AS REQUIRED TO COMPLY WITH SECTION C403.2.4.4.2 OF THE 2022 NYC ECC.

3. FIRE DAMPERS:

a. FURNISH AND INSTALL ALL FIRE DAMPERS REQUIRED BY THE LOCAL AND STATE RULES AND REGULATIONS, THE NFPA, AND THE LOCAL AUTHORITY. IN GENERAL, DAMPERS ARE REQUIRED WHEREVER DUCTS ENTER OR LEAVE SHAFTS OR PIERCE FIRE RATED CONSTRUCTIONS. DAMPERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ABOVE CODE REQUIREMENTS AND SHALL HAVE UL LABELS, AND AS APPROVED BY THE NEW YORK CITY BOARD OF STANDARDS AND APPEALS.

b. THERE SHALL BE A TIGHT FITTING ACCESS DOOR IN THE DUCT SO LOCATED AND OF SUCH DIMENSIONS THAT EASY ACCESS MAY BE HAD TO EACH FIRE DAMPER. THE FUSIBLE LINK SHALL BE SO LOCATED AS TO BE READILY REMOVED AND SET FROM THE DOOR. THERE SHALL BE TWO OR MORE DOORS IN WIDE DUCTS, WHICH HAVE MORE THAN ONE DAMPER, ONE OPPOSITE EACH DAMPER. UNLESS OTHERWISE INDICATED, ALL FUSIBLE LINKS SHALL BE SELECTED FOR 160 F.

c. FIRE DAMPERS SHALL BE AS MANUFACTURED BY RUSKIN MANUFACTURING CO., OR EQUAL AS APPROVED, MODEL NO. IBD2, STYLE B, BSA APPROVAL NO. 292-71-5A.

4. FIRE SMOKE DAMPERS:

A. FURNISH AND INSTALL ALL COMBINATION FIRE SMOKE DAMPERS REQUIRED BY THE LOCAL AND STATE RULES AND REGULATIONS, THE NFPA, AND THE LOCAL AUTHORITY. IN GENERAL, DAMPERS ARE REQUIRED WHEREVER DUCTS ENTER OR LEAVE SHAFTS OR PIERCE FIRE RATED CONSTRUCTIONS. DAMPERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ABOVE CODE REQUIREMENTS AND SHALL HAVE UL LABELS, AND AS APPROVED BY THE NEW YORK CITY BOARD OF STANDARDS AND APPEALS.

B. THERE SHALL BE A TIGHT FITTING ACCESS DOOR IN THE DUCT SO LOCATED AND OF SUCH DIMENSIONS THAT EASY ACCESS MAY BE HAD TO EACH FIRE DAMPER. THE FUSIBLE LINK SHALL BE SO LOCATED AS TO BE READILY REMOVED AND SET FROM THE DOOR. THERE SHALL BE TWO OR MORE DOORS IN WIDE DUCTS, WHICH HAVE MORE THAN ONE DAMPER, ONE OPPOSITE EACH DAMPER. UNLESS OTHERWISE INDICATED, ALL FUSIBLE LINKS SHALL BE SELECTED FOR 160 F.

C. FIRE SMOKE DAMPERS SHALL BE AS MANUFACTURED BY RUSKIN MANUFACTURING CO., OR EQUAL AS APPROVED, MODEL NO. FSD-60, BSA APPROVAL NO. 176-82-SM.

D. ALL FIRE SMOKE DAMPER MOTORS SHALL OPERATE AT 120 VOLT AND BE CONTROLLED WITH 24 VOLT WIRING.

5. FLEXIBLE CONNECTIONS:

PROVIDE BETWEEN AIR HANDLING UNITS AND CONNECTING DUCTWORK AND PLENUMS. MATERIAL SHALL BE NEOPRENE FABRIC. INSTALL TO ALLOW MINIMUM MOVEMENT OF 3".

PROVIDE BETWEEN INLINE EXHAUST FANS AND CONNECTING DUCTWORK.

a. FAN CONNECTIONS, BOTH AT INLET AND DISCHARGE, SHALL BE MADE WITH FLEXIBLE MATERIAL SO AS TO PROHIBIT THE TRANSFER OF VIBRATION FROM FANS TO DUCTWORK CONNECTING THERETO. CONNECTIONS SHALL BE MADE OF VINYL AND NEOPRENE CLOTH. ALL VIBRATION ISOLATION CONNECTORS IN DUCT SYSTEM SHALL BE MADE OF AN APPROVED FLAME RETARDANT FABRIC OR SHALL CONSIST OF SLEEVE JOINTS WITH PACKING OF APPROVED MATERIAL HAVING FLAME SPREAD RATING OF NOT OVER 25 AND SMOKE DEVELOPMENT RATING OF NOT OVER 50.

b. THE FLEXIBLE CONNECTIONS SHALL BE APPROXIMATELY 6 INCHES LONG AND HELD IN PLACE WITH HEAVY METAL BANDS OR DOUBLE HEMLOCK SECURELY ATTACHED TO PREVENT ANY LEAKAGE AT THE CONNECTION POINTS.

c. FLEXIBLE DUCT CONNECTIONS BETWEEN SUPPLY DUCTS AND SUPPLY DIFFUSER PLENUM ON COMBINATION LIGHTING FIXTURES SHALL BE WIREMOLD TYPE 54, OR THERMAFLEX TYPE A SPIRAL REINFORCED, FLEXIBLE HOSE. CONNECTIONS TO COLLARS ON THE SUPPLY DUCT AND THE DIFFUSER PLENUM SHALL BE SEALED WITH EC-800 SEALER AND CLAMPED WITH IDEAL TYPE 52 CLAMPS.

d. FLEXIBLE DUCT CONNECTIONS BETWEEN SUPPLY DUCTS AND SUPPLY DIFFUSER PLENUMS SHALL BE THERMAFLEX TYPE G-KM INSULATED DOUBLE AIR SEAL FLEXIBLE AIR DUCT SUITABLE FOR LOW AND MEDIUM PRESSURE SYSTEMS. CONNECTIONS TO THE SUPPLY DUCT AND THE DIFFUSER PLENUM SHALL BE SEALED AND CLAMPED AS REQUIRED.

6. TURNING VANES:

PROVIDE IN ALL MITER ELBOWS FACTORY FABRICATED AIR FOIL TURNING VANES. CONSTRUCTION SHALL BE AS PER SMACNA MANUALS. SECURE TO DUCT IN A RATTLE OR VIBRATION-FREE MANNER.

7. ACCESS DOORS:

PROVIDE IN ACCORDANCE WITH SMACNA DUCT MANUALS, AND WHERE SHOWN ON THE DRAWINGS. ACCESS DOORS SHALL BE INSULATED GASKETED, AND SHALL BE MADE LARGE ENOUGH TO EASILY SERVICE ALL DAMPERS AND CONTROL DEVICES.

R. INSULATION:

ALL INSULATION (INCLUDING JACKET OR FACING AND ADHESIVE) SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURE ASTM E-84, NFPA 255 AND UL 723 NOT EXCEEDING A "FLAME SPREAD" OF 25 AND "SMOKE DEVELOPED" OF 50.

1. PIPING INSULATION:

a. INSULATE ALL CHILLED WATER, CONDENSER WATER, GLYCOL, HOT WATER AND CONDENSATE DRAIN PIPING.

b. INSULATION FOR PIPING SHALL BE MOLDED FIBERGLASS, MAXIMUM 0.23 K-FACTOR AT 75 DEG. F MEAN TEMPERATURE, 4 LB. DENSITY WITH ALL PURPOSE JACKET. THE VAPOR BARRIER JACKET SHALL BE OF LAMINATED CONSTRUCTION USING ALUMINUM FOIL, REINFORCING, FLAME EXTINGUISHING ADHESIVE AND EMBOSSED KRAFT PAPER. ALL LONGITUDINAL JOINTS SHALL HAVE A 1 1/2" OVERLAP AND AT END JOINTS 3" WIDE STRIPS TO PROVIDE A POSITIVE AND CONTINUOUS VAPOR SEAL BARRIER.

c. PIPE FITTINGS SHALL BE COVERED WITH THE SAME TYPE AND THICKNESS OF INSULATION AS THE ADJACENT PIPE LINES AND JACKETING. MITERED SEGMENTS OF PIPE INSULATION MAY BE USED WHERE PREMOLDED IS NOT MANUFACTURED.

d. ENDS OF INSULATION AT SECTIONS OF PIPING WHICH ARE NOT TO BE INSULATED SHALL BE TAPERED TO A NEAT FINISH WITH OWENS CORNING CC-110 INSULATION.

e. INSULATION THICKNESS SHALL BE AS FOLLOWS:

CHILLED, CONDENSER, GLYCOL PIPING.	
PIPING UP TO 4":	1½"
PIPING 5" AND ABOVE:	2"
VAPOR SEAL REQUIRED.	
HOT WATER PIPING (100 TO 250 DEG. F)	
PIPING UP TO 1.5":	1½"
PIPING 2" AND ABOVE:	3"
WATER MAKE-UP AND CONDENSATE PIPING	½"

f. FOR INSULATED PIPING EXPOSED TO OUTDOOR WEATHER, OUTER FINISH SHALL BE 0.016 IN THICK WEATHERPROOF ALUMINUM JACKET WITH LOCK SEAMS.

g. INSULATE ALL REFRIGERANT PIPING WITH 1" THICK CELLULAR PLASTIC INSULATION.

h. INSULATE STEAM PIPING WITH RIGID GLASS FIBER BONDED WITH A THERMO SETTING RESIN. INSULATION TO HAVE ONE PIECE "HINGED" CONSTRUCTION WITH PRESSURE SENSITIVE LAP SEALING SYSTEM JACKET. SIMILAR TO MANVILLE CORPORATION "MICRO-LOK" -AP-T OR APPROVED EQUAL. REPLACE EXISTING STEAM PIPE INSULATION DISTURBED DURING THE RELOCATION OF THE A/C UNITS.

2. DUCT INSULATION

a. INSULATE ALL NEW SUPPLY AIR DUCTWORK (EXCEPT WHERE ACOUSTICALLY LINED) WITH A 1-1/2" THICKNESS, 1-1/2 POUND DENSITY, FIBROUS GLASS BLANKET DUCT INSULATION WITH FACTORY APPLIED FOIL-SCRIM-KRAFT FACING:

a.a. FOR RESIDENTIAL APPLICATIONS: SUPPLY AND RETURN DUCTS IN UNCONDITIONED SPACES SHALL BE INSULATED TO R-8, ALL OTHER SUPPLY AND RETURN DUCTS SHALL BE INSULATED TO R-6.

a.b. FOR COMMERCIAL APPLICATIONS: SUPPLY AND RETURN DUCTS AND PLENUMS IN UNCONDITIONED SPACES SHALL BE INSULATED TO R-5, AND SHALL BE INSULATED TO R-8 WHEN LOCATED OUTSIDE.

b. APPLY ADHESIVE TO DUCT WITH A 2" OVERLAP OF FACING AT ALL INSULATION JOINT AND SEAMS. ALL JOINTS SHALL BE SEALED WITH "GLASFAB" TO FORM A CONTINUOUS VAPOR BARRIER. SECURE WITH TYING CORD.

c. DUCT INSULATION SHALL BE OWENS CORNING ALL SERVICE FACED DUCT WRAP, OR APPROVED EQUAL.

d. INSULATE/REINSULATE ALL EXISTING TO REMAIN SUPPLY AIR DUCTWORK WHERE INSULATION HAS BEEN REMOVED OR IS MISSING.

e. INSULATE PLENUMS AND DUCTS ASSOCIATED WITH OUTSIDE AIR INTAKES AND THE CONDENSER AIR INTAKES AND DISCHARGES WITH 1.5" THICK FIBERGLASS BOARD WITH VAPOR BARRIER.

3. EQUIPMENT INSULATION:

INSULATE WATER AND GLYCOL CIRCULATING PUMPS WITH 2" THICK 6 LB. DENSITY FIBERGLASS BOARD, MAXIMUM 0.22 K-FACTOR AT 75 F MEAN TEMPERATURE. INSULATION SCORED TO FIT CURVATURE OF EQUIPMENT. PORTIONS TO BE REMOVED FOR SERVICING SHALL BE SECURED WITH ADHESIVE TO 18 GAUGE ALUMINUM COVERS FLANGED AND BOLTED. APPLY COAT OF INSULATION CEMENT AND A COAT OF VAPOR SEAL.

4. INSULATION INSTALLATION:

a. PRIOR TO APPLYING ANY INSULATION, ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETE AND APPROVED. ALL INSULATION SHALL BE BUTTED FIRMLY. USE 2" LAP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. NO STAPLES ARE PERMITTED. APPLY COAT OF VAPOR SEAL ADHESIVE WHERE REQUIRED.

S. ACOUSTICAL TREATMENT:

1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1" THICK, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED.

2. WHERE ACOUSTICAL LINING IS INSTALLED, THE DUCT SHALL BE INCREASED IN SIZE SO THAT THE CLEAR INSIDE LINING DIMENSIONS MATCH THE DUCT SIZES ON THE DRAWINGS.

3. LINING SHALL BE SUITABLE FOR OPERATION UP TO A VELOCITY OF 4000 FPM. ADHERE LINING TO DUCTWORK WITH ADHESIVE OVER 100% OF CONTACT AREA.

T. AIR OUTLETS AND TERMINAL UNITS:

1. CEILING DIFFUSERS, GRILLES AND REGISTERS SHALL BE AS SHOWN ON THE DRAWINGS.

2. COLOR OF FINISH ON DIFFUSERS, GRILLES AND REGISTERS SHALL BE AS PER ARCHITECT. SUBMIT COLOR SAMPLE OF FINISH TO ARCHITECT FOR APPROVAL.

3. ALL DIFFUSERS ARE TO HAVE NOISE CRITERIA LESS THAN 30.

U. CEILING EXHAUST FANS:

1. EXHAUST FANS SHALL BE PENN "ZEPHYR" MODEL TDA (UNLESS OTHERWISE SPECIFIED) OF CAPACITIES AS SCHEDULED ON THE DRAWINGS. FANS SHALL HAVE ACOUSTICALLY INSULATED HOUSING, TRUE CENTRIFUGAL WHEEL, VIBRATION ISOLATORS AND DUCT CONNECTORS FOR INLINE SERVICE. FANS SHALL BE AMCA RATED AND UL LABELED.

2. THE EXHAUST FAN MANUFACTURER SHALL FURNISH WITH EACH FAN A MANUAL STARTER SWITCH WITH PILOT LIGHT AND A SEPARATE VARI-SPEED CONTROLLER TO BE LOCATED IN THE HUNG CEILING SPACE ADJACENT TO THE FAN.

3. FANS SHALL BE MOUNTED FROM SLAB WITH VIBRATION ELIMINATORS IN LINE WITH THE HANGER RODS.

V. ELECTRIC DUCT HEATERS:

8. ELECTRIC DUCT HEATERS SHALL BE OPEN COIL SLIP IN DUCT HEATERS; SUPPLY VOLTAGE SHALL BE 208 VOLT, 3 PHASE, 60 HZ. INDEECO OR APPROVED EQUAL.

9. HEATING COILS SHALL BE 80% NICKEL, 20% CHROMIUM, TYPE A RESISTANCE WIRE. HEATER FRAMES SHALL BE ALUMINIZED STEEL. TERMINAL BOX SHALL BE NEMA 1 CONSTRUCTION.

10. PROVIDE HEATER WITH AUTOMATIC RESET THERMAL CUTOUT FOR PRIMARY OVERTEMPERATURE PROTECTION. ALL HEATERS ALSO TO BE PROVIDED WITH LOAD CARRYING MANUAL RESET THERMAL CUTOUTS, FACTORY WIRED IN SERIES WITH THE HEATER STAGES FOR SECONDARY PROTECTION.

11. TERMINAL BLOCKS SHALL BE PROVIDED FOR ALL FIELD WIRING.

12. PROVIDE SCR CONTROLLER, AIR FLOW SWITCH, DIFFERENTIAL PRESSURE AIRFLOW SWITCH, FACTORY INSTALLED TRANSFORMER FOR CONTROL CIRCUIT. PROVIDE BUILT-IN DISCONNECT SWITCH.

W. HOUSEKEEPING PAD:

1. A HOUSEKEEPING CONCRETE PAD IS REQUIRED FOR FLOOR MOUNTED EQUIPMENT.

2. EXAMINE THE AREAS AND CONDITIONS WHERE THE BOILER IS TO BE INSTALLED AND NOTIFY THE ARCHITECT OF CONDITIONS DETRIMENTAL TO THE PROPER AND TIMELY COMPLETION OF THE WORK. DO NOT PROCEED WITH THE WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED BY THE CONTRACTOR IN A MANNER ACCEPTABLE TO THE ARCHITECT.

EE. CONDENSATE PUMPS:

NEW CONDENSATE PUMPS SHALL BE SERIES 1965 AS MANUFACTURED BY WATSCO OR APPROVED EQUAL. PUMP TO DELIVER 45 GPH AT 20 FEET HEAD. NOMINAL UNITS ELECTRICAL CHARACTERISTICS SHALL BE 115D VOLTS, SINGLE PHASE, 60 HERTZ. UNITS SHALL HAVE FLOAT OPERATED HIGH WATER ALARM SWITCH AND AUTOMATIC CUT OUT SWITCH TO PREVENT RECEIVER OVERFLOW.

LOCAL ALARM ANNUNCIATOR IS TO BE SIMILAR TO "REMOTE ALARM MODULE" (RAM) AS MANUFACTURED BY GOLDLINE. ANNUNCIATOR IS TO BE 24 VOLT ALARM MODULE CONTAINING TIME DELAY, PIESSOELECTRIC HORN, LED INDICATOR LIGHTS FOR ALERT AND ALARM STATUS, PUSH BUTTON SILENCE BUTTON AND HAVE SPDT DRY CONTACT OUTPUT.

INSTALL ALARM MODULE AS DIRECTED BY ARCHITECT.

JJ. CEILING HUNG WATER COOLED AIR CONDITIONING UNITS:

108. A/C UNITS TO BE WATER SOURCE HEAT PUMPS DESIGN AND TESTED IN ACCORDANCE WITH UL 559 AND E.T.L LISTED. ALL UNITS TO BE FACTORY TESTED.

109. EXTERIOR CASING AND INTERNAL SHEET METAL COMPONENTS SHALL BE FABRICATED WITH HEAVY GAUGE FORMED GALVANIZED STEEL. CABINET SHALL INCLUDE REMOVABLE ACCESS PANELS AND DISCHARGE DUCT COLLARS. CASING SHALL BE THERMALLY AND ACOUSTICALLY INSULATED. MOUNTING BRACKETS WITH REMOVABLE FUBBER ISOLATORS SHALL BE FURNISHED FOR FIELD INSTALLATION.

110. REFRIGERANT CIRCUIT SHALL BE CAPABLE OF OPERATING AT PRESSURES OF 300 PSI AND SHALL BE COMPLETELY PIPED, TESTED, DEHYDRATED AND CHARGED. REFRIGERANT CIRCUIT COMPONENTS SHALL INCLUDE COMPRESSOR, WATER COIL, AIR COIL, 4-WAY REVERSING VALVE, HIGH AND LOW SIDE ACCESS FITTINGS AND CAPILLARY TUBES.

111. COMPRESSOR TO BE HIGH EFFICIENCY SUCTION COOLED, HERMETIC TYPE MOUNTED OUTSIDE OF AIR STREAM. COMPRESSOR SHALL INCLUDE CENTRIFUGAL FEED LUBRICATION, INTERNAL AND EXTERNAL VIBRATION ISOLATORS AND THERMAL OVERLOAD PROTECTION.

112. WATER COIL SHALL BE A COAXIAL TUBE-IN TUBE TYPE WITH THE INNER TUBE CONSTRUCTED OF COPER (WATER SIDE) AND THE OUTER TUBE CONSTRUCTED OF STEEL (REFRIGERANT SIDE). THE WATER SIDE SHALL BE CAPABLE OF WITHSTANDING PRESSURES UP TO 450 PSI.

113. AIR COIL SHALL BE CONSTRUCTED OF SEAMLESS COPPER TUBING EXPANDED INTO ALUMINUM CORRUGATED FINS AND SHALL BE FURNISHED WITH A GALVANIZED STEEL DRAIN PAN.

114. THE BLOWER WHEEL SHALL BE A FORWARD CURVED TYPE AND SHALL BE DIRECT DRIVE. THE MOTOR SHALL BE PERMANENT SPLIT CAPACITOR TYPE WITH MAXIMUM 1075 RPM AND SHALL INCLUDE PERMANENTLY LUBRICATED SLEEVE BEARINGS.

MM. IN LINE PUMP:

1. PUMP SHALL BE INLINE TYPE, CLOSE COUPLED, SINGLE STAGE DESIGN FOR INSTALLATION IN VERTICAL POSITION.

2. PUMP CASING SHALL BE CLASS 30 CAST IRON, IMPELLER SHALL BE OF CAST BRONZE, ENCLOSED TYPE, DYNAMICALLY BALANCED, KEYED TO THE SHAFT AND SECURED BY A LOCKING CAPSCREW.

3. LIQUID CAVITY SHALL BE SEALED OFF AT THE MOTOR SHAFT BY AN INTERNALLY FLUSHED MECHANICAL SEAL WITH CERAMIC SEAL SEAT AND CARBON SEAL RING. A BRONZE SHAFT SLEEVE SHALL COMPLETELY COVER THE WETTED AREA UNDER THE SEAL.

4. PUMPS SHALL BE RATED FOR MINIMUM 175 (250) POUNDS WORKING PRESSURE. PUMP CASE SHALL HAVE GAUGE TAPPINGS AT THE SUCTION AND DISCHARGE NOZZLES AND WILL INCLUDE VENT AND DRAIN PORTS.

5. PUMPS TO BE FACTORY TESTED.

6. PUMPS SHALL BE SERIES 80 AS MANUFACTURED BY ITT BELL AND GOSSETT OR APPROVED EQUAL.

NN. VIBRATION ISOLATION:

1. ALL MOTOR DRIVEN MECHANICAL EQUIPMENT SHALL BE MOUNTED ON SPRING ISOLATION SUPPORTS. THE ISOLATION MANUFACTURER SHALL SUPPLY ALL ISOLATION EQUIPMENT. WHERE AIR HANDLING PACKAGE TYPE UNITS ARE FLOOR MOUNTED, ISOLATION UNITS ARE TO BE MOUNTED BETWEEN UNIT AND HEAVY- ANGLE IRON FRAMEWORK. PLATFORM FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

2. PROVIDE VIBRATION ISOLATION FOR PIPING AND DUCTWORK.

3. VIBRATION CONTROL EQUIPMENT SHALL BE BY MASON INDUSTRIES, VIBRATION ELIMINATOR CO., OR VIBRATION MOUNTING AND CONTROLS.

4. SPRING ISOLATORS SHALL BE EQUIPPED WITH SOUND DEADENING PADS AND LEVELING BOLTS AND SHALL BE UNHOUSED, FREE STANDING AND STABLE. ISOLATORS SHALL BE DESIGNED AND CONSTRUCTED SO THAT ENDS OF SPRINGS REMAIN PARALLEL DURING DEFLECTION AND ANY HORIZONTAL MOVEMENT OF THE ISOLATION BASE BE LIMITED TO A MAXIMUM OF 1/4". SPRINGS SHALL HAVE A RUNOUT OF AT LEAST 50% OF THE DESIGNED DEFLECTION. WHERE TO FLOOR SUPPORT IS NOT CONSIDERED NECESSARY BY THE ISOLATION MANUFACTURERS, ISOLATORS SHALL BE EQUIPPED WITH NON-SKID RUBBER PADS.

5. FANS SHALL BE MOUNTED ON RUBBER-IN SHEAR VIBRATION HANGERS.

6. A/C UNITS SUSPENDED ABOVE CEILING SHALL BE INSTALLED ON SPRING HANGERS.

SS. MISCELLANEOUS PROVISIONS:

1. PAINT ALL SUPPORTING STEEL. PATCH EXISTING BEAM FIREPROOFING WHERE STEEL IS EXPOSED.

2. TOUCH UP WITH MATCHING PAINT ALL EQUIPMENT WHERE NECESSARY.

3. PROVIDE CONDENSATE DRAIN PIPING WITH CLEANABLE P-TRAPS. DRAIN SHALL BE FULL SIZE OF THE COIL DRAIN CONNECTIONS, BUT NOT LESS THAN 3/4".

4. SEAL OPENINGS AROUND DUCTS AND PIPE THROUGH FULL HEIGHT WALLS WITH MINERAL WOOL OR OTHER NON-COMBUSTIBLE MATERIAL. MAINTAIN INTEGRITY OF SOUND ISOLATION AROUND DUCTS PENETRATING SOUND INSULATED WALLS.

5. PROVIDE A SPARE SET OF FILTERS FOR EACH AIR CONDITIONING UNIT.

TT. MECHANICAL VENTILATION NOTES:

1. UPON COMPLETION OF THE VENTILATING SYSTEMS, A TEST SHALL BE CONDUCTED IN THE PRESENCE AND UNDER THE DIRECTION OF A PROFESSIONAL LICENSED ENGINEER OR REGISTERED ARCHITECT QUALIFIED TO CONDUCT SUCH TESTS OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF VENTILATION SYSTEMS, AND QUALIFIED TO CONDUCT SUCH TESTS. THE TESTS SHALL SHOW COMPLIANCE WITH THE CODE REQUIREMENTS FOR VENTILATION AND THE PROPER FUNCTIONING OF ALL OPERATING DEVICES BEFORE THE SYSTEM IS APPROVED.

2. THE LICENSED PROFESSIONAL ENGINEER OR REGISTERED ARCHITECT OR OTHER QUALIFIED PERSON WHO CONDUCTS THE TEST SHALL FILE A CERTIFICATE AND REPORT OF TEST AS TO WHETHER THE TEST SHOWS THAT THE RATE OF AIR SUPPLY AND EXHAUST COMPLIES WITH THE REQUIREMENTS OF THE CODE PERTAINING TO VENTILATION.

3. A STATEMENT SHALL BE FILED BY THE OWNER THAT THE SYSTEM OF VENTILATING SHALL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING NORMAL OCCUPANCY OF THE STRUCTURE AS PROVIDED IN THE APPLICABLE SECTIONS OF THE CODE.

4. ALL FIRE DAMPERS TO COMPLY WITH REQUIREMENTS OF BOARD OF FIRE UNDERWRITERS, SEE NFPA NO.90A, RUSKIN, B.S. A. NO.292-71-5A.

5. SYSTEM WILL COMPLY WITH NEW BUILDING CODE MOST RECENT EDITION, RELATING TO THE INSTALLATION OF VENTILATING SYSTEMS.

6. HVAC EQUIPMENT SHALL BE APPROVED BY BOARD OF STANDARDS AND APPEALS AND CONTRACTOR SHALL PROVIDE B.S. A. NUMBER OF EQUIPMENT PURCHASED AND APPROVED FOR INSTALLATION.

7. THE ENTIRE VENTILATION SYSTEM WILL BE INSTALLED IN STRICT ACCORDANCE WITH THE N.Y.C. MECHANICAL CODE AND THE RULES AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.

8. CONTRACTOR SHALL RETAIN A LICENSED PROFESSIONAL ENGINEER TO PERFORM ALL REQUIRED SPECIAL INSPECTIONS. SAME SHALL BE FILED WITH THE DEPARTMENT OF BUILDINGS.

9. FIRE DAMPERS SHALL BE PROVIDED IN ALL DUCTWORK AS PER N.Y.C. BUILDING CODE AND N.Y.C. MECHANICAL CODE. FIRE DAMPERS SHALL BE PROVIDED IN ALL OUTDOOR AIR INTAKE (F.A.I.) OPENINGS AND AS REQUIRED.

10. AN EQUIPMENT USE PERMIT SHALL BE FILED BY THE CONTRACTOR FOR ALL AIR CONDITIONING AND VENTILATING SYSTEMS.

11. PROVIDE FLAME AND SMOKE RATED FLEXIBLE CONNECTIONS FOR ALL EXHAUST FANS AND AT MEDIUM PRESSURE SIDE OF VAV BOXES AS PER THE NEW YORK CITY BUILDING CODE AND THE N.Y.C. MECHANICAL CODE.

12. FIRE DAMPERS SHALL BE INSTALLED IN EXHAUST AND RETURN DUCTWORK IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE AND THE N.Y.C. MECHANICAL CODE.

UU. EQUIPMENT START-UP AND VERIFICATION

UPON COMPLETION OF WORK, THE CONTRACTOR IS RESPONSIBLE FOR START-UP AND VERIFICATION OF ALL EQUIPMENT SPECIFIED ON THESE CONTRACT DOCUMENTS UNLESS OTHERWISE NOTED. ALL INSTALLED EQUIPMENT SHALL OPERATE AS SPECIFIED ON THESE PLANS AND WITHIN MANUFACTURE'S NORMAL OPERATIONAL PARAMETERS.

1. PRIOR TO START-UP, THE INSTALLING SUBCONTRACTOR SHALL CONDUCT A FINAL INSTALLATION VERIFICATION AUDIT WHICH SHALL INCLUDE BUT NOT BE LIMITED TO CHECKING THE FOLLOWING:
a. PIPING SPECIALTIES INCLUDING BALANCE, CONTROL, AND ISOLATION VALVES.
b. DUCTWORK SPECIALTY ITEMS INCLUDING TURNING DEVICES, BALANCE, FIRE, SMOKE, CONTROL DAMPERS, AND ACCESS DOORS.
c. CONTROL WIRING, SENSOR TYPES, AND LOCATION.
d. IDENTIFICATION OF PIPING, VALVES, EQUIPMENT, CONTROLS, ETC.
e. MAJOR EQUIPMENT, PUMPS, VALVES, STARTERS, GAUGES, THERMOMETERS, ETC.
f. DOCUMENTATION OF PRESTART-UP TESTS PERFORMED, INCLUDING MANUFACTURER'S FACTORY TESTS.
2. IF ANY WORK IS FOUND TO BE INCOMPLETE, INCORRECT, OR NON-FUNCTIONAL DURING THE AUDIT, THE SUBCONTRACTOR SHALL CORRECT THE DEFICIENCY BEFORE SYSTEM START-UP WORK PROCEEDS.
3. INITIAL START-UP OF EQUIPMENT SHALL BE CONDUCTED PER ORIGINAL MANUFACTURER'S INSTALLATION INSTRUCTIONS INCLUDING EQUIPMENT START-UP CHECKLISTS IF AVAILABLE. EQUIPMENT MANUFACTURER'S REPRESENTATIVES WILL BE PRESENT FOR START-UP AS SPECIFIED IN THE EQUIPMENT SPECIFICATION SECTIONS AND FOR EQUIPMENT TRAINING.
4. DESIGNATED SYSTEMS REQUIRING TEST AND BALANCE WORK SHALL HAVE THIS ACTIVITY COMMENCE AFTER SYSTEMS HAVE SUCCESSFULLY COMPLETED START-UP. SYSTEM AND EQUIPMENT DEFICIENCIES OBSERVED DURING THIS ACTIVITY IS TO BE NOTED AND CORRECTED.
5. AFTER SUCCESSFUL START-UP, THE AUTOMATIC TEMPERATURE CONTROLS (ATC) SUBCONTRACTOR SHALL PROGRAM THE CONTROLS OF ALL SPECIFIED EQUIPMENT TO CONFORM TO THE SEQUENCE OF OPERATION AND SPECIFICATIONS OF THE CONTRACT DOCUMENTS.

UV. EQUIPMENT OPERATING INSTRUCTIONS:

1. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS TO THE OWNER ON THE PROPER START-UP, OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

2. THESE INSTRUCTION SHALL BE TYPED ON 8 1/2" X 11" PAPER AND BOUND IN THREE-RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTION TO THE OWNER.

VV. TESTING AND BALANCING:

1. GENERAL:

a. WORK OF THIS SECTION INCLUDES ALL LABOR AND SERVICES NECESSARY FOR COMPLETING THE INSPECTION, TESTING, INITIAL START-UP AND BALANCING OF ALL EQUIPMENT, AIR AND WATER SYSTEMS OF THE HVAC WORK AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

b. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF AN INDEPENDENT AIR AND WATER BALANCE TESTING COMPANY, SPECIALIZING IN, AND WHOSE BUSINESS IS LIMITED TO, TESTING AND BALANCING OF HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS. THE BALANCING CONTRACTOR SELECTED SHALL MEET ALL REQUIREMENTS NECESSARY FOR MEMBERSHIP IN THE ASSOCIATED AIR BALANCE COUNCIL.

c. BALANCING CONTRACTOR SHALL TEST AND BALANCE ALL AIR AND WATER SYSTEMS AS FURTHER SPECIFIED HEREIN. ALL WORK BY THIS CONTRACTOR SHALL BE UNDER THE DIRECT SUPERVISION OF A QUALIFIED TEST AND BALANCE ENGINEER EMPLOYED BY THEM. ALL INSTRUMENTS USED BY THIS CONTRACTOR SHALL BE ACCURATELY CALIBRATED AND MAINTAINED IN GOOD WORKING ORDER.

2. AIR SYSTEMS:

a. REQUEST FROM BUILDING ENGINEER TIME FOR TESTING TO BE PERFORMED. REQUEST THAT BUILDING SYSTEMS BE SET 100 % CAPACITY. BALANCE AIR FLOW TO ALL OUTLETS TO PROVIDE AIR QUANTITIES NOTED. SUBMIT A DETAILED CERTIFIED BALANCING REPORT, SHOWING INSTRUMENTS USED, SUCTION AND DISCHARGE STATIC PRESSURE OF AIR HANDLERS AND EXHAUST FANS, SUPPLY, RETURN AND OUTSIDE AIR TEMPERATURES AND ACTUAL VERSUS DESIGN AIR QUANTITIES FROM DIFFUSERS, GRILLES, REGISTERS, ETC. AFTER ADJUSTMENTS.

b. THE QUANTITY OF AIR DISCHARGED BY EACH OUTLET SHALL BE WITHIN 10 % OF THE AMOUNT SHOWN ON THE DRAWINGS.

c. THE QUANTITY OF AIR DISCHARGED BY EACH AIR HANDLING SYSTEM SHALL BE WITHIN 5% OF THE TOTAL OF THE ASSOCIATED OUTLETS.

3. WATER SYSTEMS:

a. PROVIDE NECESSARY PIPING AND CONNECTIONS FOR BALANCING ALL WATER SYSTEMS. OPERATE WATER SYSTEMS AT FULL FLOW AND PERFORM NECESSARY ADJUSTMENTS AND BALANCING TO DELIVER WATER QUANTITIES TO ALL SYSTEM COMPONENTS AS SCHEDULED ON THE DRAWINGS.

b. SUBMIT FLOW TEST DATA FOR WATER SYSTEMS, INCLUDING GPM, TEMPERATURES AND PRESSURE DROPS.

c. STRAINERS SHALL BE CLEANED AT COMPLETION OF FLOW TEST. AFTER THE ENTIRE SYSTEM HAS BEEN ADJUSTED, OPERATE THE SYSTEM UNDER CONDITIONS, MAKING ALL ADDITIONAL ADJUSTMENTS UNTIL ALL PERFORMANCE REQUIREMENTS ARE MET.

d. AFTER THE CHILLED WATER PIPING IS INSTALLED AND BEFORE ANY INSULATION IS APPLIED OR THE PIPING IS CONNECTED TO THE MAIN CHILLED WATER SYSTEM, THE CONTRACTOR SHALL PERFORM A DRY PIPE TEST WITH NITROGEN TO 400 PSIG AND TEST FOR LEAKS. THE PRESSURE SHALL BE MAINTAINED WHILE VISUAL INSPECTION IS WITNESSED BY THE BUILDING ENGINEER, AND THE PIPING UNDER TEST, SHALL HOLD ITS PRESSURE FOR A PERIOD FOR A MINIMUM PERIOD OF TWO (2) HOURS. CAULKING OF LEAKING JOINTS SHALL NOT BE PERMITTED. GAUGES AND ANY OTHER SUCH EQUIPMENT OR APPARATUS THAT TESTS MAY DAMAGE SHALL NOT BE SUBJECT TO THE ABOVE TEST.

e. AFTER THE WATER PIPING IS INSTALLED AND BEFORE THE PIPING IS CONNECTED TO THE COOLING TOWER AND THE A/C UNITS, THE CONTRACTOR SHALL PERFORM A HYDROSTATIC PIPE TEST TO 1.5 X OPERATING PRESSURE AND TEST THE PIPING SYSTEM FOR LEAKS. THE PRESSURE SHALL BE MAINTAINED WHILE VISUAL INSPECTION IS WITNESSED BY THE BUILDING ENGINEER AND OWNER'S REPRESENTATIVE AND THE PIPING SHALL HOLD ITS PRESSURE FOR A MINIMUM PERIOD OF TWO HOURS. CAULKING OF LEAKY JOINTS SHALL NOT BE PERMITTED. PROTECT GAUGES, AND ANY OTHER EQUIPMENT THAT MAY BE DAMAGED.

WW. AUTOMATIC CONTROLS:

MECHANICAL CONTRACTOR TO RETAIN THE SERVICES OF A QUALIFIED AUTOMATIC CONTROLS CONTRACTOR. ALL POWER AND LOW VOLTAGE WIRING FOR THE SPECIFIED MECHANICAL EQUIPMENT, AUTOMATIC TEMPERATURE CONTROLS (ATC), AND BUILDING MANAGEMENT SYSTEMS (IF PRESENT) SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

THE INTENT OF THIS SECTION IS TO DESCRIBE THE COMPLETE FUNCTIONAL CONTROL OF ALL MECHANICAL EQUIPMENT, SYSTEMS AND DEVICES OF THE PROJECT. THIS CONTRACTOR IS TO FURNISH AND INSTALL AS REQUIRED ELECTRIC/ELECTRONIC CONTROLS, ALL NECESSARY COMPONENTS, CONTROL WIRING, INTERLOCK WIRING, WIRING CONTACTORS, THERMOSTATS, RELAYS, P.E.S, CONTROL TRANSFORMERS, STARTERS, ALARMS, CONTROL VALVES, ETC. TO ACHIEVE THE DESIRED CONTROL OPERATION FOR THE AIR CONDITIONING SYSTEMS.

1. EXHAUST FANS:

EXHAUST FANS SHALL BE STARTED BY THE PROGRAMMABLE TIMECLOCK.

2. AIR CONDITIONING UNITS:

PROVIDE AC SYSTEM WITH NEW DIGITAL THERMOSTAT WITH WIFI CONNECTIVITY AND ASTRONOMICAL PROGRAMMING CAPABILITY SIMILAR TO HONEYWELL Model # RTH9590WF.

CONTROL SYSTEM TO BE COMPLETELY SOLID STATE. UNITS SHALL BE STARTED AND STOPPED BY THE PROGRAMMABLE THERMOSTAT. THE THERMOSTAT SHALL HAVE A SUBBASE WITH FAN 'ON-AUTO', COMPRESSOR 'OFF-AUTO' SWITCHES WITH AUTO CHANGEOVER FOR HEAT. SUPPLY AIR FAN SHALL RUN CONTINUOUSLY WHEN AIR CONDITIONING UNIT IS ACTIVATED. COMPRESSOR SHALL CYCLE TO MAINTAIN THERMOSTAT SET POINT. THERMOSTAT SUBBASE SHALL BE INSULATED WHEN MOUNTED ON AN EXTERIOR WALL OR A SURFACE ADJACENT TO UNCONDITIONED SPACES. PROVIDE AND INSTALL ALL INTERCONNECTING CONTROL WIRING.

SEQUENCE OF OPERATION:

A. WATER SOURCE HEAT PUMP UNITS

1. UNIT SHALL BE CONTROLLED VIA PROGRAMMABLE SPACE THERMOSTAT LOCATED IN CONDITIONED AREA OF THE RESPECTIVE UNITS. THE THERMOSTAT SHALL PROVIDE MINIMUM 5°F DEADBAND BETWEEN HEATING AND COOLING SETPOINTS AS REQUIRED TO COMPLY WITH SECTION C403.2.4.2 OF THE 2020 NYCECC.
2. OCCUPIED MODE: UPON A RISE OR DROP IN SPACE TEMPERATURE BEYOND THE SETPOINT TEMPERATURE DEADBAND OF THE SPACE THERMOSTAT, THE CONDENSER WATER MOTORIZED VALVE SHALL OPEN, COMPRESSOR CIRCUITS SHALL ENERGIZE ACCORDING TO THE PREPROGRAMMED COMPRESSOR STAGES BY THE UNIT'S MANUFACTURER. WHEN THE SPACE TEMPERATURE IS SATISFIED, COMPRESSOR CIRCUITS SHALL DE-ENERGIZE, CONDENSER WATER MOTORIZED VALVE SHALL CLOSE.
3. ECONOMIZER MODE (FREE-COOLING): ON A CALL FOR COOLING FROM THE SPACE THERMOSTAT, WHEN THE INCOMING CONDENSER WATER TEMPERATURE IS BELOW 50°F, THE MOTORIZED VALVE SHALL DIVERT FLOW TO THE WATER SIDE ECONOMIZER COIL.
4. MORNING START-UP: UNITS SHALL BE ENERGIZED AUTOMATICALLY ONE HOUR PRIOR TO SPACE OCCUPANCY VIA PREPROGRAMMED TENANT TIMECLOCK. OUTSIDE AIR DAMPERS SHALL BE CLOSED DURING MORNING START-UP OPERATION.
5. UNOCCUPIED MODE: OUTSIDE AIR DAMPER SHALL REMAIN CLOSED DURING UNOCCUPIED HOURS PREPROGRAMMED INTO THE SPACE THERMOSTAT. UNITS SHALL OPERATE AS NEEDED TO MAINTAIN UNOCCUPIED SETBACK TEMPERATURE.
6. SMOKE SHUTDOWN: ON DETECTION OF SMOKE, THE DUCT MOUNTED SMOKE DETECTOR SHALL SIGNAL THE BUILDINGS FIRE ALARM SYSTEM AND DEACTIVATE THE SUPPLY FAN.

B. LEAK DETECTORS:

1. LEAK DETECTOR SHALL GENERATE A CONTROL SIGNAL WHENEVER WATER IS DETECTED. CONTROL SIGNAL SHALL SHUT DOWN AC UNIT. CONTROL SIGNAL SHALL NOTIFY TENANT OF THE ALARM CONDITION. ALARM PANEL SHALL DIAL OUT TO TENANT VIA AUTO DIAL OUT. PROVIDE A PHONE LINE FOR AUTO DIAL SYSTEM. A UNIT MOUNTED RED LED ALARM LIGHT SHALL PROVIDE A VISUAL NOTIFICATION OF THE ALARM CONDITION. AN ALARM BUZZER SHALL PROVIDE AN AUDIBLE NOTIFICATION FOR TENANT AT A LOW VOLUME. COORDINATE ALARM CONTROLS, DEVICE LOCATIONS AND WITH TENANT BEFORE INSTALLATION.

K. COMBINATION FIRE AND SMOKE DAMPER (FSD/AD):

1. UPON A DETECTION OF SMOKE FROM A NEARBY DUCT MOUNTED SMOKE DETECTOR, THE COMBINATION FIRE AND SMOKE DAMPER SHALLMODULATE TO THE CLOSED POSITION AND A SIGNAL SHALL BE SENT TO THE FIRE ALARM MASTER PANEL TO ALERT THE BUILDING OF A SMOKE CONDITION.

66
L E O N A R D S T

KEY PLAN

NO	REVISION	DATE
03	FOR PERMIT	11.05.24
02	CLIENT PRESENTATION	10.18.24
01	CLIENT PRESENTATION	09.20.24

AS NOTED — SCALE

CZ, DZ — DRAWN

TITLE

MECHANICAL SPECIFICATIONS

SEAL AND SIGNATURE: STATE OF NEW YORK · KEVIN KENDALL · LIC. NO. 084032 · LICENSED PROFESSIONAL ENGINEER

JOB NO: 24-019

PROJECT: 66 LEONARD STREET, NEW YORK, NY, 10013

DOB NOW#: - MECH

M-401.00

DRAWING 7 OF 7

AKA
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