April 23, 2019

Amendment
To
Level II Site Plan Application
167 Fore Street – Ocean Gateway Garage Addition
Portland, ME
By
Archetype, P.A.
48 Union Wharf
Portland, Maine 04101

The attached plans (revised site plan and mechanical plans) demonstrate the amendment to the HVAC design as part of the original Level II Site Plan application for the Ocean Gateway Garage Addition at 167 Fore Street.

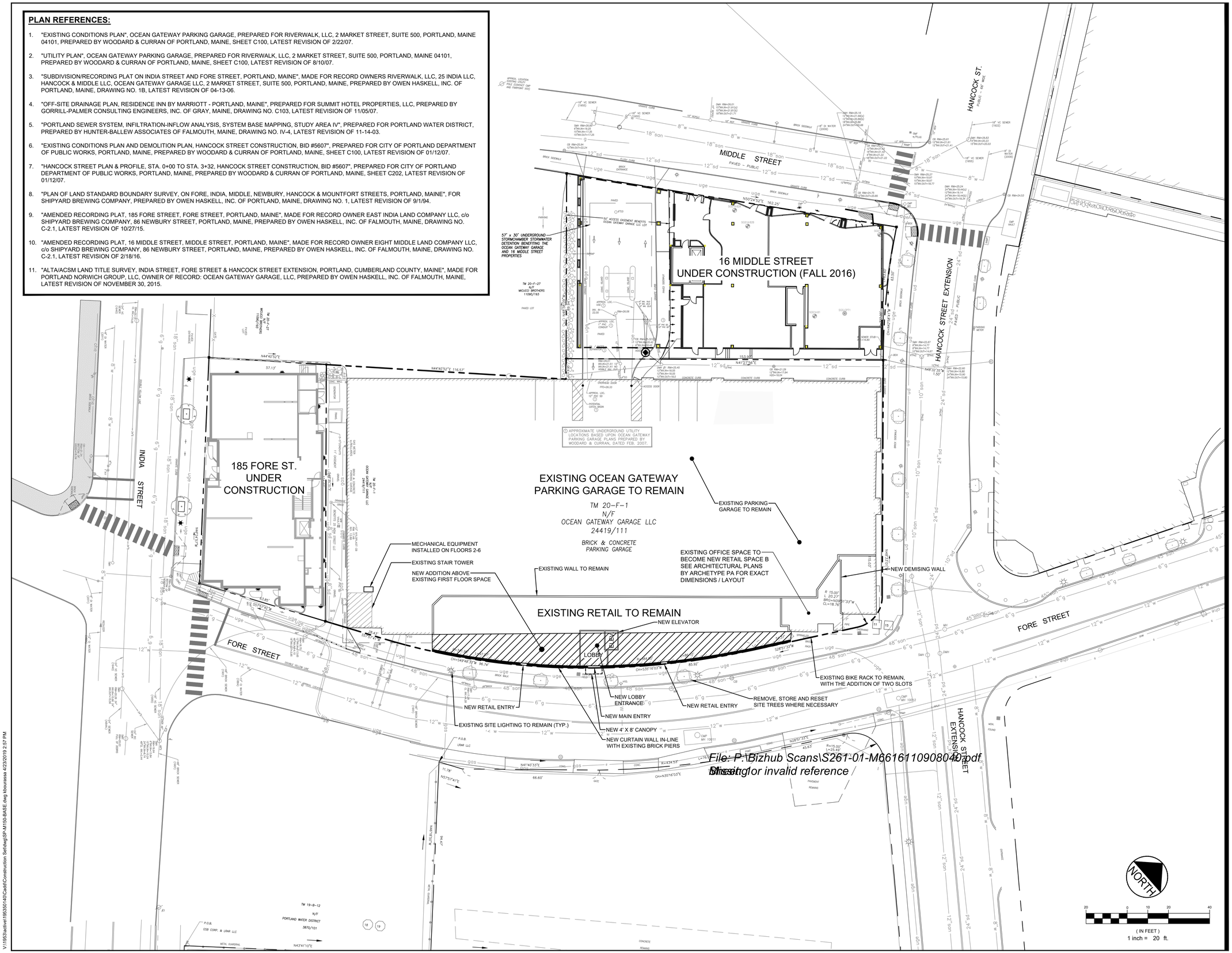
The original design intent was for the HVAC units to be located within a parking spot, typical of each level. Due to site constraints and parking requirements/lease agreements filed with the city, the location of these HVAC units was revised and resubmitted. The locations shown on the attached drawings represent the only feasible location within the existing garage layout, and all units are kept internal to the garage structure, not visible to the surrounding neighborhood.

All units are being treated and wrapped with sound attenuation material to help mitigate any sound or vibration and eliminate this concern.

- End of Section –
Attachment Below

PLAN REFERENCES:

1. "EXISTING CONDITIONS PLAN", OCEAN GATEWAY PARKING GARAGE, PREPARED FOR RIVERWALK, LLC, 2 MARKET STREET, SUITE 500, PORTLAND, MAINE 04101, PREPARED BY WOODARD & CURRAN OF PORTLAND, MAINE, SHEET C100, LATEST REVISION OF 2/22/07.
2. "UTILITY PLAN", OCEAN GATEWAY PARKING GARAGE, PREPARED FOR RIVERWALK, LLC, 2 MARKET STREET, SUITE 500, PORTLAND, MAINE 04101, PREPARED BY WOODARD & CURRAN OF PORTLAND, MAINE, SHEET C100, LATEST REVISION OF 8/10/07.
3. "SUBDIVISION/RECORDING PLAT ON INDIA STREET AND FORE STREET, PORTLAND, MAINE", MADE FOR RECORD OWNERS RIVERWALK, LLC, 25 INDIA LLC, HANCOCK & MIDDLE LLC, OCEAN GATEWAY GARAGE LLC, 2 MARKET STREET, SUITE 500, PORTLAND, MAINE, PREPARED BY OWEN HASKELL, INC. OF PORTLAND, MAINE, DRAWING NO. 1B, LATEST REVISION OF 04-13-06.
4. "OFF-SITE DRAINAGE PLAN, RESIDENCE INN BY MARRIOTT - PORTLAND, MAINE", PREPARED FOR SUMMIT HOTEL PROPERTIES, LLC, PREPARED BY GORRILL-PALMER CONSULTING ENGINEERS, INC. OF GRAY, MAINE, DRAWING NO. C103, LATEST REVISION OF 11/05/07.
5. "PORTLAND SEWER SYSTEM, INFILTRATION-INFLOW ANALYSIS, SYSTEM BASE MAPPING, STUDY AREA IV", PREPARED FOR PORTLAND WATER DISTRICT, PREPARED BY HUNTER-BALLEW ASSOCIATES OF FALMOUTH, MAINE, DRAWING NO. IV-4, LATEST REVISION OF 11-14-03.
6. "EXISTING CONDITIONS PLAN AND DEMOLITION PLAN, HANCOCK STREET CONSTRUCTION, BID #5607", PREPARED FOR CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS, PORTLAND, MAINE, PREPARED BY WOODARD & CURRAN OF PORTLAND, MAINE, SHEET C100, LATEST REVISION OF 01/12/07.
7. "HANCOCK STREET PLAN & PROFILE, STA. 0+00 TO STA. 3+32, HANCOCK STREET CONSTRUCTION, BID #5607", PREPARED FOR CITY OF PORTLAND DEPARTMENT OF PUBLIC WORKS, PORTLAND, MAINE, PREPARED BY WOODARD & CURRAN OF PORTLAND, MAINE, SHEET C202, LATEST REVISION OF 01/12/07.
8. "PLAN OF LAND STANDARD BOUNDARY SURVEY, ON FORE, INDIA, MIDDLE, NEWBURY, HANCOCK & MOUNTFORT STREETS, PORTLAND, MAINE", FOR SHIPYARD BREWING COMPANY, PREPARED BY OWEN HASKELL, INC. OF PORTLAND, MAINE, DRAWING NO. 1, LATEST REVISION OF 9/1/94.
9. "AMENDED RECORDING PLAT, 185 FORE STREET, FORE STREET, PORTLAND, MAINE", MADE FOR RECORD OWNER EAST INDIA LAND COMPANY LLC, c/o SHIPYARD BREWING COMPANY, 86 NEWBURY STREET, PORTLAND, MAINE, PREPARED BY OWEN HASKELL, INC. OF FALMOUTH, MAINE, DRAWING NO. C-2.1, LATEST REVISION OF 10/27/15.
10. "AMENDED RECORDING PLAT, 16 MIDDLE STREET, MIDDLE STREET, PORTLAND, MAINE", MADE FOR RECORD OWNER EIGHT MIDDLE LAND COMPANY LLC, c/o SHIPYARD BREWING COMPANY, 86 NEWBURY STREET, PORTLAND, MAINE, PREPARED BY OWEN HASKELL, INC. OF FALMOUTH, MAINE, DRAWING NO. C-2.1, LATEST REVISION OF 2/18/16.
11. "ALTA/ACSM LAND TITLE SURVEY, INDIA STREET, FORE STREET & HANCOCK STREET EXTENSION, PORTLAND, CUMBERLAND COUNTY, MAINE", MADE FOR PORTLAND NORWICH GROUP, LLC, OWNER OF RECORD: OCEAN GATEWAY GARAGE, LLC, PREPARED BY OWEN HASKELL, INC. OF FALMOUTH, MAINE, LATEST REVISION OF NOVEMBER 30, 2015.



Stantec
482 Payne Road Scarborough Court
Scarborough, Maine 04074-8929
Tel. 207.883.3355
www.stantec.com

Consultants

Notes

No.	Revision	By	Appd.	YY.MM.DD
3	REVISED AND RESUBMITTED TO CITY	KAB	SRB	2019.04.23
2	ADDED CANOPY AT MAIN ENTRANCE	DED	SRB	2016.11.09
1	ISSUED TO CLIENT	CDD	SRB	2016.07.13

File Name: SP-M150-BASE	CDD	SRB	SRB	2016.07.13
	DWN.	CHKD.	DSGN.	DATE

Permit-Seal

STATE OF MAINE
STEPHEN R. BUSHEY
2019.04.23
LICENSED
PROFESSIONAL ENGINEER

P.E. STEPHEN R. BUSHEY
LIC. #7429

Client/Project
PREPARED FOR
ARCHETYPE PA

ADDITION TO OCEAN GATEWAY GARAGE

167 FORE STREET, PORTLAND, MAINE

Title
SITE PLAN

Project No.	Scale
195350140	1" = 20'

Sheet
C-1.1

V:\1953\active\195350140\Cadd\Construction Set\dwg\SP-M150-BASE.dwg kbourassa 4/23/2019 2:57 PM

ABBREVIATIONS

@	AT
A	AMP
ABS	ACRYLONITRILE BUTADIENE STYRENE PLASTIC
ABV	ABOVE
AC	AIR CONDITIONING
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABILITIES ACT
AF	AIR FILTER
AFF	ABOVE FINISHED FLOOR
AFM	AIR FLOW MEASURING STATION
AHU	AIR HANDLING UNIT
AL	ACOUSTICAL LINER
AMB	AMBIENT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
APPROX	APPROXIMATELY
AS	AIR SEPARATOR
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASSY	ASSEMBLY
ATC	AUTOMATIC TEMPERATURE CONTROL
ATT	ACOUSTICAL ATTENUATOR
AV	AUTOMATIC VENT
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOT	BOTTOM
BTUH	BTU PER HOUR
C	CENTERLINE
CA	COMPRESSED AIR
CAP	CAPACITY
CD	CONDENSATE DRAIN
CF	CEILING FAN
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLG	CEILING
CO	CLEAN OUT, CARBON MONOXIDE
COL	COLUMN
CONC	CONCRETE
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONV	CONVECTOR
CP	CONTROL PANEL, CONDENSATE PUMP
CPT	CONDENSATE PUMP TRAP
CSA	CANADIAN STANDARDS ASSOCIATION
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
Cv	CONTROL VALVE RATING
CVT	CONSTANT VOLUME AIR TERMINAL
CW	COLD WATER
CWR	COLD WATER RETURN
CWS	COLD WATER SUPPLY
D	DRAIN
dB	DECIBELS
DB	DRY BULB
DC	DRY COOLER
DDC	DIRECT DIGITAL CONTROL
ø, DIA	DIAMETER
DIFF	DIFFERENTIAL, DIFFUSER
DISCH	DISCHARGE
DN	DOWN
DOM	DOMESTIC
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
DWGS	DRAWINGS
E	ELECTRICAL, EXHAUST
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EDR	EQUIVALENT DIRECT RADIATION
EER	ENERGY EFFICIENT RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATION
ENT	ENTERING
EPDM	ETHYLENE PROPYLENE DIENE MEMBRANE
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EVAP	EVAPORATOR
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXIST	EXISTING
EXT	EXPANSION TANK
EXP	EXPANSION
F	FAN, DEGREES FAHRENHEIT
FA	FRESH AIR
FAI	FRESH AIR INTAKE
FBG	FURNISHED BY GOVERNMENT
FC	FLEX CONNECTION
FCO	FLOOR CLEANOUT
FD	FIRE DAMPER, FLOOR DRAIN
FF	FINISH FLOOR
FIX	FIXTURE
FLA	FULL LOAD AMPS
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FS	FLOAT SWITCH
FTR	FIN TUBE RADIATION
FZ	FREEZESTAT
G	GAS
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GP	GENERAL PURPOSE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR	GLYCOL RETURN
GRH	GRAVITY RELIEF HOOD
GS	GLYCOL SUPPLY
GV	GATE VALVE
GSM	GALVANIZED SHEET METAL
GYP	GYPSUM WALLBOARD
HC	HEATING COIL
HOA	HANDS-OFF-AUTOMATIC
HOR	HORIZONTAL
HP	HORSEPOWER, HIGH PRESSURE
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM (16 PSI TO 150 PSI)
HR	HOUR
HT	HEIGHT
HUMID	HUMIDIFIER, HUMIDITY
HV	HEATING AND VENTILATING UNIT
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ
IBR	HYDRONICS INSTITUTE
ID	INSIDE DIAMETER
IN	INCHES
INDIR	INDIRECT WASTE
KW	KILOWATT
L	LENGTH, LOUVER
LAT	LEAVING AIR TEMPERATURE
LD	LIQUEFIED PETROLEUM
LDB	LEAVING DRY BULB
LF	LINEAR FEET
LG	LONG
LOC	LOCATION, LOCATED
LP	LIQUEFIED PROPANE
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM (15 PSI OR LESS)
LRA	LOCKED ROTOR AMPS
LVG	LEAVING
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
M	MECHANICAL
MANUF	MANUFACTURER
MAX	MAXIMUM
MAX PD	MAXIMUM PRESSURE DROP
MBH	1000 BTU PER HOUR
MBU	1000 BTU
MCA	MAXIMUM CIRCUIT AMPS
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFG	MANUFACTURER
MIN	MINIMUM, MINUTES
mm	MILLIMETERS
MNTD	MOUNTED
MOCP	MAXIMUM OVERCURRENT PROTECTION
MUA	MAKE-UP AIR
MUW	MAKE-UP WATER
N/A	NOT APPLICABLE
NATL	NATURAL
NC	NORMALLY CLOSED, NOISE CRITERIA
NEC	NATIONAL ELECTRIC CODE
NG	NATURAL GAS
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN, NUMBER
NO2	NITROGEN DIOXIDE
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OAT	OUTSIDE AIR TEMPERATURE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
OS&Y	OUTSIDE STEM AND YOKE
P	PUMP, PITCH
PC	PUMPED CONDENSATE
PD	PRESSURE DROP
PLMB	PLUMBING
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	PRESSURE TREATED
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
R	RADIUS, RETURN
RA	RETURN AIR
RAD	RADIATOR
RAF, RF	RETURN AIR FAN
RAT	RETURN AIR TEMPERATURE
REL	RELIEF
REQD	REQUIRED
RET	RETURN
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RLA	RATED LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
S	SUPPLY DIFFUSER
SA	SUPPLY AIR
SCR	SCREEN
SD	SMOKE DAMPER
SF	SQUARE FOOT
SIM	SIMILAR
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION
SOV	SHUT OFF VALVE
SP	STATIC PRESSURE
SPH	STATIC PRESSURE HIGH LIMIT
SPL	STATIC PRESSURE LOW LIMIT
SPS	STATIC PRESSURE SENSOR
SQ	SQUARE
SS	STAINLESS STEEL
STL	STEEL
SUP	SUPPLY
T	TEMPERATURE SENSOR, THERMOSTAT
TC	TOTAL COOLING
TEMP	TEMPERATURE
THK	THICK, THICKNESS
TG	TRANSFER GRILLE
TRANS	TRANSITION
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VENT
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
W	WIDTH, WATT
W/	WITH
WB	WET BULB
WC	WATER COLUMN
WCO	WALL CLEANOUT
WF	WALL FAN
WG	WATER GAUGE
WH	WATER HEATER
WMS	WIRE MESH SCREEN
WPD	WATER PRESSURE DROP

MECHANICAL SYMBOLS

- C5 / M101 — DETAIL NUMBER / DRAWING WHERE DETAIL IS DRAWN
- D1 — DETAIL NUMBER
- B / 1 — SYMBOL PER ABBREVIATION LIST / EQUIPMENT SEQUENCE NUMBER
- S-1 / 100 — DIFFUSER, REGISTER OR GRILLE SEQUENCE NUMBER / CFM
- FR-1 / 2.2 / 5 LF — FINTUBE DESIGNATION / MBH / LENGTH OF ACTIVE FIN TUBE
- # — EXIST HOT WATER FIN TUBE UNIT TAG
- 2.2 — GPM
- 22 — KEY NOTE (NUMBER)
- A — REVISION (LETTER)
- RETURN OR EXHAUST GRILLE, REGISTER
- SUPPLY DIFFUSER, REGISTER, GRILLE
- AD — ACCESS DOOR
- FINTUBE RADIATION AND ENCLOSURE
- UNIT HEATER
- TERMINAL UNIT, VARIABLE VOLUME WITH HOT WATER COIL
- TERMINAL UNIT, VARIABLE VOLUME
- PROPELLER FAN
- CENTRIFUGAL FAN
- CO/NO2 — COMBINATION CARBON MONOXIDE / NITROGEN DIOXIDE SENSOR
- INLINE FAN
- DIRECTION OF AIR FLOW / DIRECTION OF AIR FLOW EXHAUST
- DOOR UNDERCUT
- DOOR LOUVER
- VOLUME DAMPER
- SD — SMOKE DAMPER
- FD — FIRE DAMPER
- M — MOTORIZED DAMPER, PARALLEL BLADE
- M — MOTORIZED DAMPER, OPPOSED BLADE
- T — THERMOSTAT OR THERMISTOR
- H — HUMIDISTAT
- S — SWITCH
- SMOKE DETECTOR
- CONNECT TO EXISTING
- SQUARE ELBOW WITH TURNING VANES
- FLEXIBLE DUCT
- FLEXIBLE CONNECTOR
- ROOF VENTILATOR, EXHAUST
- STARTER/DISCONNECT
- PUMP
- CEILING SUPPLY DIFFUSER W/ THROW DIRECTION SHOWN BY ARROWS (FOR 4-WAY THROW ARROWS NOT SHOWN)
- CEILING PADDLE FAN
- WALL MOUNTED OSCILLATING FAN

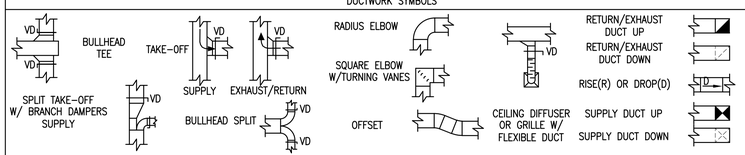
PIPING SYMBOLS

- AFS — AIR FLOW SWITCH
- S — AIR SEPARATOR
- AUTOMATIC AIR VENT WITH ISOLATION VALVE
- BALL VALVE / BALL VALVE IN VERTICAL
- BOILER DRAIN VALVE W/ HOSE BIB
- B — BUCKET TRAP
- BUTTERFLY VALVE
- CHECK VALVE
- TRIPLE DUTY VALVE
- COCK
- COMBINATION FLOW MEASURING/ BALANCING VALVE (CIRCUIT SETTER)
- DIRECTION OF FLOW OF PIPE
- DIRT LEG
- ES — END SWITCH
- FLEXIBLE PIPE CONNECTION
- FS — FLOW SWITCH, FREEZESTAT
- FLOAT AND THERMOSTATIC TRAP
- FUSOMATIC VALVE
- GATE VALVE
- THREE WAY VALVE
- GLOBE VALVE
- HOSE BIBB
- MANUAL AIR VENT
- M — METER
- NEZV — NONELECTRIC ZONE VALVE
- OS&Y VALVE
- OS&Y VALVE IN VERTICAL (PLAN)
- ("PETE'S PLUG")
- PIPE DROP
- PIPE END CAP
- PIPE GUIDE
- DN — PIPE PITCH DOWN IN DIRECTION OF FLOW
- UP — PIPE PITCH UP IN DIRECTION OF FLOW
- PIPE RISE
- PIPE TEE FROM BOTTOM
- PIPE TEE FROM TOP
- PIPE UP TO FINTUBE RADIATION ON FLOOR ABOVE
- PLUG VALVE
- PRESSURE GAUGE W/BALL VALVE (GATE VALVE AND SIPHON FOR STEAM)
- PRESSURE REDUCING VALVE
- PRESSURE REGULATING VALVE
- PS — PRESSURE SWITCH
- REDUCED PRESSURE BACKFLOW PREVENTER
- REDUCER (CONCENTRIC)
- REDUCER (ECCENTRIC-FOB OR FOT)
- SAFETY RELIEF VALVE
- SOLENOID VALVE
- SM — STEAM MONITOR
- STRAINER W/BALL DRAIN VALVE, HOSE BIB AND CAP (GATE VALVE FOR STEAM)
- STRAINER W/ BLOW OFF
- TS — TEMPERATURE SENSOR
- THERMOMETER TEMPERATURE/PRESSURE WELL
- THERMOSTATIC TRAP
- THREE-WAY AUTOMATIC CONTROL VALVE (ELECTRIC OR DDC)
- THREE-WAY AUTOMATIC CONTROL VALVE (PNEUMATIC)
- TWO-WAY AUTOMATIC CONTROL VALVE (ELECTRIC OR DDC)
- TWO-WAY AUTOMATIC CONTROL VALVE (PNEUMATIC)
- UNION AS DICTATED BY PIPE SIZE
- FLANGE AS DICTATED BY PIPE SIZE
- VIBRATION ISOLATOR

GENERAL NOTES

1. GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO DRAWINGS MARKED M#.
2. DRAWINGS ARE DIAGRAMMATIC. DETERMINE LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.
3. COORDINATE WORK OF THIS SECTION WITH THAT OF OTHER SECTIONS.
4. REMOVALS SHALL BE COORDINATED BY THE CONTRACTOR TO MAINTAIN THE INTEGRITY OF THE BUILDING.
5. DUCTWORK SHALL BE GALVANIZED STEEL, CONSTRUCTED AND INSTALLED ACCORDING TO LATEST SMACNA STANDARDS FOR SPECIFIED STATIC PRESSURE RATING.
6. INSTALL THERMOSTATS 4'-6" ABOVE FINISHED FLOOR OR AS DIRECTED OTHERWISE BY THE CONTRACTING OFFICER.
7. WORK SHALL BE COORDINATED WITH TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
8. VERIFY EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE DIMENSIONS BEFORE FABRICATION.
9. ACCESS PANELS SHALL BE PROVIDED, WHERE REQUIRED, TO SERVICE HEATERS, VALVES AND CONCEALED MECHANICAL EQUIPMENT. PROVIDE ACCESS PANELS UP STREAM OF ELBOWS WITH TURNING VANES.
10. INSTALL EQUIPMENT, PIPING AND DUCTWORK AS REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION AND TO FACILITATE EQUIPMENT ACCESS AS REQUIRED BY EQUIPMENT MANUFACTURER.
11. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED TO THE FIRE ALARM SYSTEM UNDER THE ELECTRICAL SECTION. UNDER THE MECHANICAL SECTION, THIS CONTRACTOR SHALL MOUNT THE DETECTORS IN DUCTWORK, WHERE REQUIRED BY CODE, AND SHALL WIRE THE DETECTORS TO THE FAN STARTERS FOR SHUTDOWN.
12. CONTROL WIRE AND CONDUIT SHALL COMPLY WITH NEC AND SPECIFICATIONS.
13. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF AIR DEVICES WHERE APPLICABLE.
14. INTERNAL AIR FLOW DIMENSIONS ARE SHOWN FOR DUCTS.
15. DIFFUSER SIZES SHOWN ARE NECK SIZES. REGISTER AND GRILLE SIZES ARE NOMINAL.
16. PRESSURE DROP THROUGH COIL CONTROL VALVES SHALL NOT EXCEED 3 PSIG UNLESS OTHERWISE NOTED ON DRAWINGS.
17. PROVIDE FLEXIBLE DUCT CONNECTIONS ON DUCTS CONNECTING TO FANS, AND TO AIR HANDLING UNITS WHICH ARE NOT INTERNALLY ISOLATED. DUCTS TO BE GROUNDED ACROSS FLEXIBLE CONNECTION WITH FLEXIBLE COPPER GROUNDING STRAPS.
18. THE INSIDE OF DUCTWORK VISIBLE THROUGH A GRILLE OR DIFFUSER SHALL BE PAINTED FLAT BLACK.
19. INSULATE PIPING AS SPECIFIED. PERFORM TESTS SPECIFIED BEFORE INSULATING.
20. PROVIDE CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS AND GUIDES AS NECESSARY TO PREVENT STRESS ON PIPING.
21. PROVIDE BALANCING COCKS AT SYSTEM LOOP RETURNS AND AT RETURN RISERS. PROVIDE SHUT-OFF VALVES AT SYSTEM LOOP SUPPLIES AND SUPPLY RISERS.
22. PROVIDE VENTS AT HIGH POINTS IN PIPING SYSTEMS AND DRAIN VALVES AT LOW POINTS.
23. PROVIDE AT LEAST THREE ELBOW SWINGS FOR PIPE TAKE-OFFS.
24. PROVIDE GAUGE FITTINGS AND THERMOMETER WELLS AT HOT WATER SUPPLY AND RETURN BRANCHES AND HEATING COIL INLETS AND OUTLETS.
25. RUN PIPING LEVEL.

DUCTWORK SYMBOLS



MECHANICAL LINETYPE LEGEND

- ITEMS TO BE REMOVED
- EXIST ITEMS TO REMAIN
- ITEMS TO BE PROVIDED
- HIDDEN ITEMS
- CONTROL WIRING

JOHNSON & JORDAN
MECHANICAL CONTRACTORS
18 MUSSEY ROAD
SCARBOROUGH, ME 04074
TEL. (207) 883-8345

STATE OF MAINE — JACOB R. MARTIN — No. 12013 — LICENSED PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:
ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:
OCEAN GATEWAY ADDITION
PORTLAND, ME

SHEET TITLE:
HVAC SYMBOLS, LEGEND & GENERAL NOTES

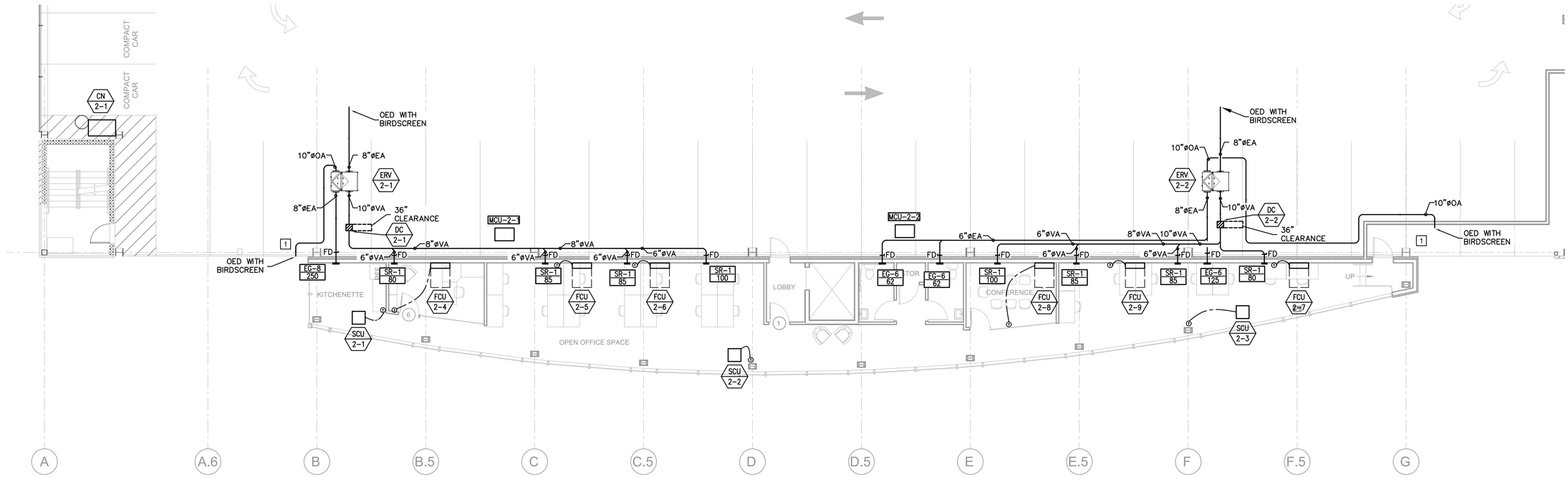
DATE:	PROJECT#
3-28-19	17150

DRAWN:	CHECKED:	SCALE:
MAC	JRM	NOT TO SCALE

SHEET #
M-001

KEYED NOTES:

1. PROVIDE OPEN-ENDED DUCT FOR INTAKE AT PERIMETER OF BUILDING W/ BIRD SCREEN COVER. PROVIDE DUAL 2" FILTER RACK FOR FUTURE MERV 8 AND CARBON FILTER IF NECESSARY. LOW POINT DRAIN AND INSPECTION DOORS RECOMMENDED.



N

GRAPHIC SCALE

8'-0" 0 4'-0" 8'-0" 8'-0"

(IN INCHES)

1/8 " = 1'-0"

JOHNSON & JORDAN

MECHANICAL CONTRACTORS

18 MUSSEY ROAD
SCARBOROUGH, ME 04074
TEL. (207) 883-8345

STATE OF MAINE
JACOB R. MARTIN
No. 12013
LICENSED
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:

ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:

OCEAN GATEWAY ADDITION

PORTLAND, ME

SHEET TITLE:

2ND FLOOR MECH PLANS

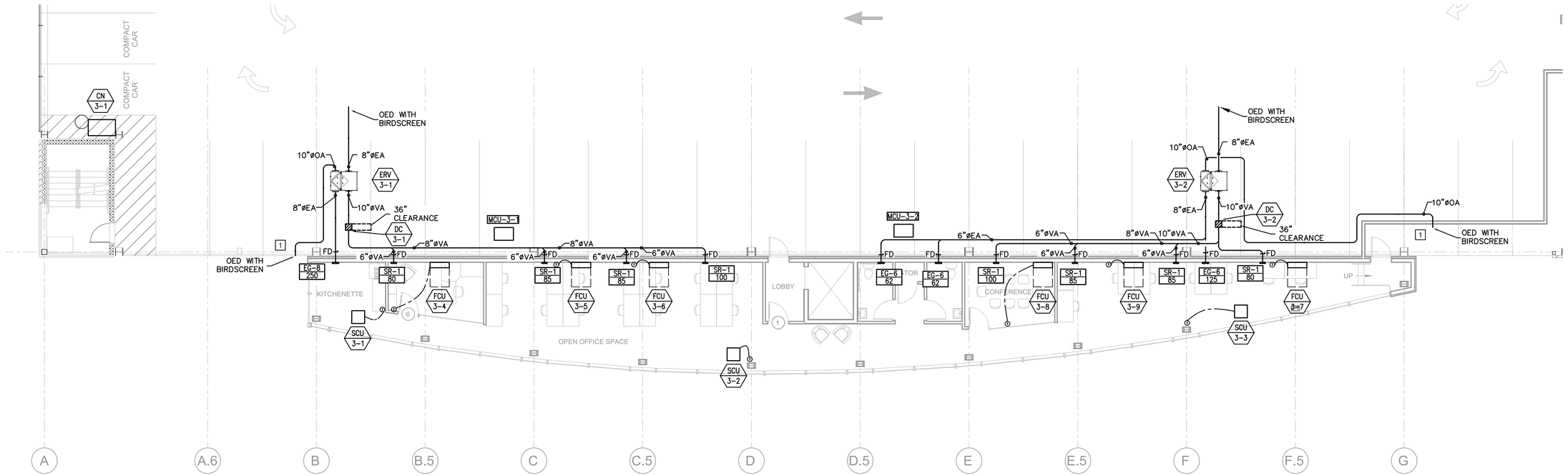
DATE:		PROJECT#
3-28-19		17150
DRAWN: MAC	CHECKED: JRM	SCALE: 1/8" = 1'-0"

SHEET #

M-102

KEYED NOTES:

1. PROVIDE OPEN-ENDED DUCT FOR INTAKE AT PERIMETER OF BUILDING W/ BIRD SCREEN COVER. PROVIDE DUAL 2" FILTER RACK FOR FUTURE MERV 8 AND CARBON FILTER IF NECESSARY. LOW POINT DRAIN AND INSPECTION DOORS RECOMMENDED.



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MECHANICAL CONTRACTORS
18 MUSSEY ROAD
SCARBOROUGH, ME 04074
TEL. (207) 883-8345

STATE OF MAINE
JACOB R. MARTIN
No. 12013
LICENSED
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:

ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:

OCEAN GATEWAY ADDITION

PORTLAND, ME

SHEET TITLE:

3RD FLOOR MECH PLANS

DATE:		PROJECT#
3-28-19		17150
DRAWN: MAC	CHECKED: JRM	SCALE: 1/8" = 1'-0"

SHEET #

M-103

N

GRAPHIC SCALE

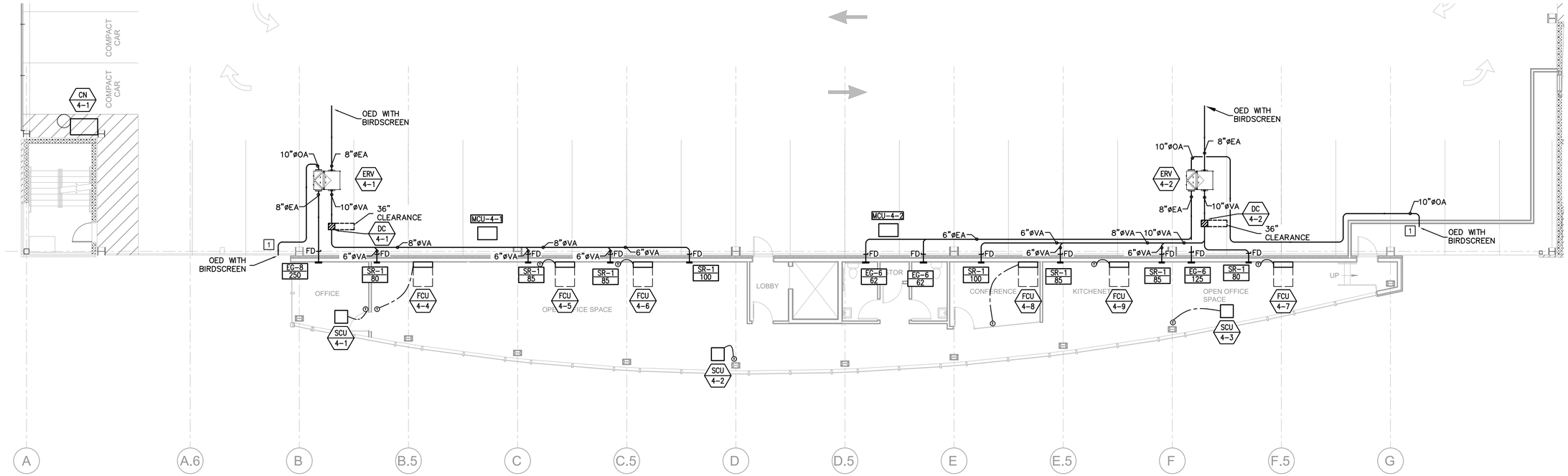
8'-0" 0 4'-0" 8'-0" 8'-0"

(IN INCHES)

1/8 " = 1'-0"

KEYED NOTES:

1. PROVIDE OPEN-ENDED DUCT FOR INTAKE AT PERIMETER OF BUILDING W/ BIRD SCREEN COVER. PROVIDE DUAL 2" FILTER RACK FOR FUTURE MERV 8 AND CARBON FILTER IF NECESSARY. LOW POINT DRAIN AND INSPECTION DOORS RECOMMENDED.



JOHNSON & JORDAN
MECHANICAL CONTRACTORS
18 MUSSEY ROAD
SCARBOROUGH, ME 04074
TEL. (207) 883-8345

JACOB R. MARTIN
No. 12013
LICENSED PROFESSIONAL ENGINEER
STATE OF MAINE

REV.	DESCRIPTION	DATE

ISSUE STATUS:

ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:

OCEAN GATEWAY ADDITION

PORTLAND, ME

SHEET TITLE:

4TH FLOOR MECH PLANS

DATE:	PROJECT#
3-28-19	17150

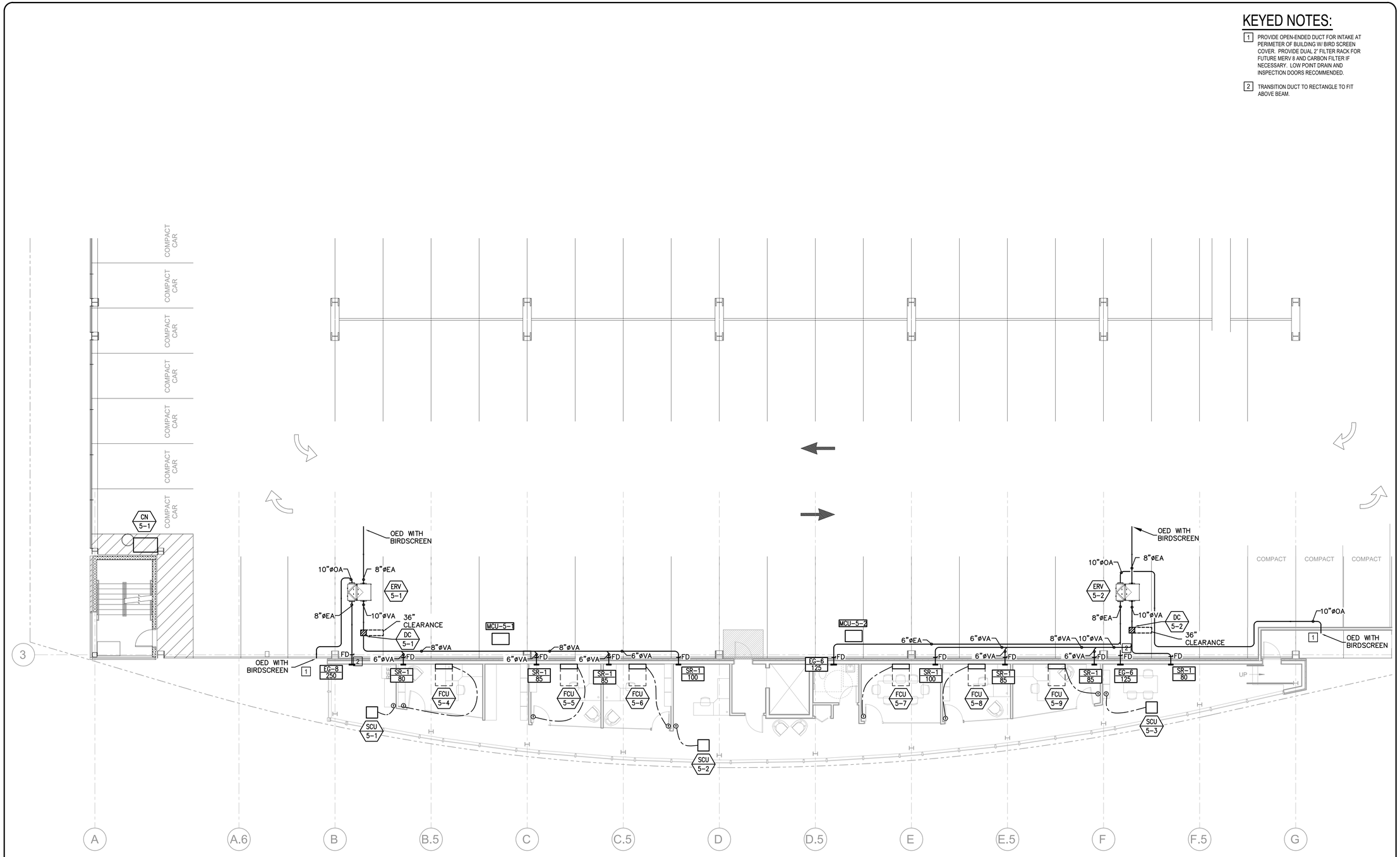
DRAWN:	CHECKED:	SCALE:
MAC	JRM	1/8" = 1'-0"

SHEET #

M-104

KEYED NOTES:

1. PROVIDE OPEN-ENDED DUCT FOR INTAKE AT PERIMETER OF BUILDING W/ BIRD SCREEN COVER. PROVIDE DUAL 2" FILTER RACK FOR FUTURE MERV 8 AND CARBON FILTER IF NECESSARY. LOW POINT DRAIN AND INSPECTION DOORS RECOMMENDED.
2. TRANSITION DUCT TO RECTANGLE TO FIT ABOVE BEAM.



GRAPHIC SCALE

6'-0" 0 4'-0" 8'-0" 8'-0"

(IN INCHES)

1/8 " = 1'-0"

JOHNSON & JORDAN
MECHANICAL CONTRACTORS
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SCARBOROUGH, ME 04074
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STATE OF MAINE
JACOB R. MARTIN
No. 12013
LICENSED
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:

ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:

OCEAN GATEWAY ADDITION

PORTLAND, ME

SHEET TITLE:

5TH FLOOR MECH PLANS

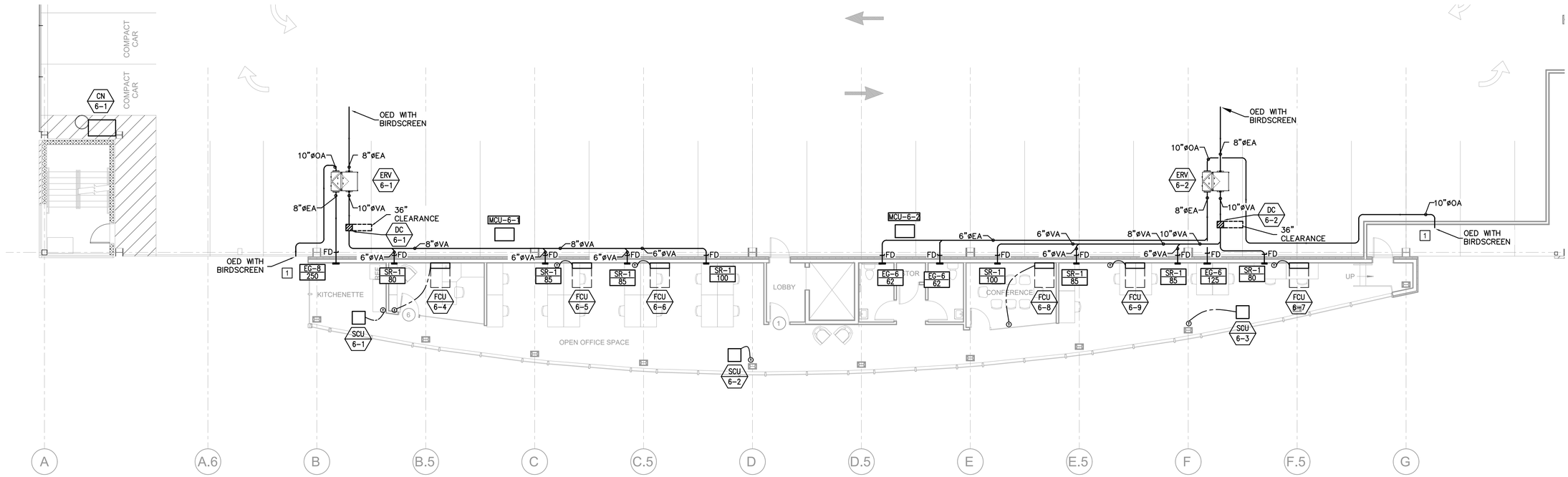
DATE:		PROJECT#
3-28-19		17150
DRAWN: MAC	CHECKED: JRM	SCALE: 1/8" = 1'-0"

SHEET #

M-105

KEYED NOTES:

1. PROVIDE OPEN-ENDED DUCT FOR INTAKE AT PERIMETER OF BUILDING W/ BIRD SCREEN COVER. PROVIDE DUAL 2" FILTER RACK FOR FUTURE MERV 8 AND CARBON FILTER IF NECESSARY. LOW POINT DRAIN AND INSPECTION DOORS RECOMMENDED.



GRAPHIC SCALE

(IN INCHES)
1/8 " = 1'-0"

JOHNSON & JORDAN
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18 MUSSEY ROAD
SCARBOROUGH, ME 04074
TEL. (207) 883-8345

STATE OF MAINE
JACOB R. MARTIN
No. 12013
LICENSED
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:

ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:

OCEAN GATEWAY ADDITION

PORTLAND, ME

SHEET TITLE:

6TH FLOOR MECH PLANS

DATE:		PROJECT#
3-28-19		17150
DRAWN: MAC	CHECKED: JRM	SCALE: 1/8" = 1'-0"

SHEET #

M-106

INDOOR ABOVEGROUND PIPE INSULATION MINIMUM THICKNESS SCHEDULE

PIPING SYSTEM	FLUID OPERATING TEMPERATURE RANGE (DEG F)	INSULATION CONDUCTIVITY RANGE (BTU-IN/HR-FT2 DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL PIPE OR TUBE SIZE (INCHES)						INSULATION MATERIAL	VAPOR BARRIER REQUIRED
				PIPE BRANCH RUN OUTS (SEE NOTE 2 BELOW)	< 1	1 TO < 1-1/2	1-1/2 TO < 4	4 TO < 8	8 TO > 8		
				INSULATION THICKNESS (INCHES)							
DOMESTIC COLD WATER	40-60	0.21 - 0.27	75	N/A	0.5	0.5	0.5	N/A	N/A	MF	YES
DOMESTIC DHW & DHWR	105-140	0.22 - 0.28	100	N/A	1	1	1.5	N/A	N/A	MF	NO
REFRIGERANT SUCTION & LIQUID (SEE NOTE 3 BELOW)	10 & UP	0.21 - 0.27	75	0.5	0.75	0.75	N/A	N/A	N/A	FC	NO

NOTES:

1.THE TABLE ABOVE APPLIES TO METALLIC PIPES AND SCHEDULE 80 OR LESS NON-METALLIC PIPES. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. ASHRAE 90.1-2013 DOES NOT PROVIDE REDUCED INSULATION THICHNESS FOR BRANCH RUNOUTS.

2. PIPING INSULATION THICKNESSES MAY BE REDUCED AS INDICATED ABOVE FOR BRANCH RUNOUTS BETWEEN COIL CONTROL VALVE AND THE COIL WHEN THE CONTROL VALVE IS LOCATED WITHIN 4 FEET OF THE COIL AND THE PIPE SIZE IS 1 INCH OR LESS.

3. FOR OUTDOOR ABOVEGROUND REFRIGERANT PIPING, INSULATION REQUIREMENTS SHALL BE THE SAME AS FOR INDOOR ABOVEGROUND REFRIGERANT PIPING, WITH THE FOLLOWING EXCEPTION: INSULATION SHALL BE JACKED WITH FLEXCAD-250, OR APPROVED EQUAL, ALUMINUM JACKETING SYSTEM, INSTALLED PER THE MANUFACTUREER'S RECOMMENDATIONS.

PIPE INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM RUBBER TUBULAR INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM C 534, TYPE 1 FOR TUBULAR MATERIALS WITH FLAME SPREAD INDEX LESS THAN 25 AND SMOKE DEVELOPED INDELX LESS THAN 50. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

MINERAL-FIBER PREFORMED PIPE INSULATION (MF): TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 547, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED ALL-SERVICE JACKET (ASJ). JACKET SHALL BE WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE 1. FOR INDOOR EXPOSED PIPING REQUIRING FIBERGLASS INSULATION, PROVIDE A WHITE HIGH-IMPACT RESISTANT PVC JACKET COMPLYING WITH ASTM D 1784 CLASS 16354-C. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

ABBREVIATIONS: (APPLIES TO PIPE INSULATION THICKNESS SCHEDULES & PIPE INSULATION SPECIFICATIONS ON THIS DRAWING)
FC - FLEXIBLE CLOSED-CELL
MF - MINERAL FIBER
N/A - NOT APPLICABLE

DUCTWORK INSULATION SCHEDULE

DUCT SYSTEM	OPERATING TEMPERATURE RANGE (DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL SIZES		INSULATION MATERIAL	VAPOR BARRIER REQUIRED	NOTES
			THICKNESS INCH	R VALUE			
INTERIOR DUCT LINER (ACOUSTICAL)(WHERE NOTED)	0-150	75	1/2"	NA	FC	YES	1
SUPPLY DUCT FROM FCU TO DIFFUSERS (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
RETURN DUCT FROM RETURN BOOT TO FCU (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
EXTERIOR OUTSIDE AIR DUCT FROM INTAKE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR VENTILATION AIR DUCT FROM ERV TO REHEAT COIL	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM SPACE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM ERV TO GARAGE	0-150	75	0"	NONE			
VENTILATION DUCTWORK FROM REHEAT COIL TO DIFFUSERS	0-150	75	0"	NONE			
EXHAUST DUCT IN SPACE TO EXTERIOR WALL	0-150	75	0"	NONE			

NOTES:

1.THE TABLE ABOVE APPLIES TO DUCTWORK. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. BRANCH RUNOUTS LESS THAN 10FT CAN BE R-3.5.

2. UNCONDITIONED SPACES INCLUDE LOADING DOCKS, WAREHOUSES, MECHANICAL ROOMS, NON-PLENUM CEILINGS, VESTIBULE CEILING AREA.

3. DUCTWORK IS EXPOSED IN SPACE. DUCTWORK MAY BE PAINTED BLACK.

4. PROVIDE PVC OR OTHER PROTECTIVE COVER WHERE DUCTWORK IS EXPOSED AND SUBJECT TO IMPACT

5. PROVIDE WITH PROTECTIVE/WEATHERPROOF EXTERIOR WRAP. WRAP SHALL BE MINIMUM OF 40 MIL, SELF-ADHERING,

6. PROVIDE UL LISTED GREASE DUCT ASSEMBLY TO MEET CLEARANCE TO COMBUSTABLES

DUCT INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

RIGID BOARD (RB): RIGID POLYISOCYANURATE FOAM CORE DUCT BOARD WITH FACTORY APPLIED VAPOR RETARDER FACING BOTH SIDES. DUCT BOARD SHALL BE "ENERGY 3 FOIL FACE" BY JOHN MANSVILLE OR EQUIVALENT. R-6 PER INCH, k-VALUE = 0.16 AT 50 DEG F. ASTM C 1289, TYPE I, CLASS I.

MINERAL-FIBER DUCT-WRAP INSULATION (MF): FORMELDEHYDE-FREE, TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 1290, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED FSK (FOIL-SCRIM-KRAFT). FOIL WILL BE 0.02 PERMS; COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

DUCT COIL SCHEDULE

Tag	DESCRIPTION	HEATING	COIL SIZE			HEATING CAPACITY		AIRSIDE			ELECTRICAL			MANU. & MODEL	NOTES
		AIRFLOW	WIDTH	HEIGHT	AREA			EAT	LAT	VEL	V	PH	HZ		
		CFM	IN	IN	SF	KW	MBH	DEG F	DEG F	FPM					
DC 2-1	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4	13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL
DC 2-2	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4	13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL

NOTES:
1. PROVIDE DISCHARGE AIR TEMPERATURE CONTROL W/ OA RESET SCHEDULE
2. PROVIDE SCR STAGING OF COIL
3. PROVIDE AIR-FLOW PROVING WITH FAN RELAY
4. UNIT IS HORIZONTAL AIRFLOW

FAN COIL UNIT (FCU)

TAG	DESCRIPTION	NOM. TONS	INDOOR UNIT							ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
			TYPE	AIRFLOW (CFM)	ESP (IN)	SENSIBLE COOLING	HEATING (MBH)	REFRIG.	SOUND (dBA)	WEIGHT (LBS)	VOLTS	PH	MCA	MOP		
SCU-2-1	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-2-2	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-2-3	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
FCU-2-4	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-2-5	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-2-6	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-2-7	CONFERENCE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-2-8	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-2-9	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL

NOTES:
1. PROVIDE GRAVITY CONDENSATE DRAIN TO APPROVED LOCATION.
2. PROVIDE UNIT WITH WIRED REMOTE THERMOSTAT MOUNTED ON WALL AS SHOWN (WIRED BY MC).
3. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.
*VENTILATION AIR IS PROVIDED THRU ERV 2-1 & ERV 2-2 AND DUCTED DIRECTLY INTO THE SPACE.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

TAG	DESCRIPTION	AIRFLOW	NECK	FACE SIZE	NC	SP	THROW (FT)	MATRL	VOL DAMP	MOUNTING	AIR PATTERN	MODEL	NOTES
		CFM	INCHES	INCHES		W.G.	@ 22-1/2						
SR-1	SUPPLY - SIDEWALL	100	6"	8"X8"	<20	0.01	6-9-19	ALUM	YES	SURFACE	ADJ	PRICE 22DAL	1
EG-6	EXHAUST - CEILING	125	6"	12"X12"	<20	0.011	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1
EG-8	EXHAUST - CEILING	250	8"	12"X12"	<20	0.025	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1

NOTES:
1. CORRDINATE FINISH WITH ARCHITECTURAL

CONDENSER SCHEDULE (CN)

TAG	DESCRIPTION	NOM. TONS	TYPE	REFRIG.	EER	SOUND (dBA)	WEIGHT (LBS)	ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
								VOLTS	PH	MCA	MOP		
CN 2-1	SERVES FCU 2-1 THRU 2-5	14	INVERTER COMPRESSOR	R-410A	20.8	63	740	460	3	31.3	40	TRANE 4TVR0169C400N	ALL

NOTES:
1. OUTDOOR HEATPUMP UNIT MOUNTED ON 12" STAND.
2. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.

ENERGY RECOVERY VENTILATOR SCHEDULE (ERV)

TAG	DESCRIPTION	SUPPLY/VENTILATION AIR			EXHAUST/RETURN AIR			SUMMER					WINTER					EFFECTIVENESS				ELECTRICAL DATA					INSTALLED WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
		AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	TOTAL CAPACITY	LATENT CAPACITY	OA AT	EXH. AT	ERV LAT	TOTAL CAPACITY	LATENT CAPACITY	EAT	EXH. AT	ERV LAT	SUMMER CONDITIONS		WINTER CONDITIONS		VOLTS	PH	HZ	MCA	MOP			
								MBH	MBH	DB/WB	DB/WB	DB/WB	MBH	MBH	DB/WB	DB/WB	DB/WB	SENSIBLE	TOTAL	SENSIBLE	TOTAL								
ERV 2-1	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL
ERV 2-2	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL

NOTES:
1. UNIT HAS DUAL MOTORS, DUAL ECM FANS.
2. PROVIDE STANDARD 2" MERV 8 FILTERS WITH UNIT.

JOHNSON & JORDAN
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SCARBOROUGH, ME 04074
TEL. (207) 883-8345

STATE OF MAINE — JACOB R. MARTIN — No. 12013 — LICENSED PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:
ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:
OCEAN GATEWAY ADDITION
PORTLAND, ME

SHEET TITLE:
2ND FLOOR MECHANICAL SCHEDULES

DATE: 3-28-19
PROJECT# 17150
DRAWN: MAC
CHECKED: JRM
SCALE: NOT TO SCALE

SHEET #
M-602

INDOOR ABOVEGROUND PIPE INSULATION MINIMUM THICKNESS SCHEDULE

PIPING SYSTEM	FLUID OPERATING TEMPERATURE RANGE (DEG F)	INSULATION CONDUCTIVITY RANGE (BTU-IN/HR-FT2 DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL PIPE OR TUBE SIZE (INCHES)						INSULATION MATERIAL	VAPOR BARRIER REQUIRED
				PIPE BRANCH RUN OUTS (SEE NOTE 2 BELOW)	< 1	1 TO < 1-1/2	1-1/2 TO < 4	4 TO < 8	8 TO > 8		
				INSULATION THICKNESS (INCHES)							
DOMESTIC COLD WATER	40-60	0.21 - 0.27	75	N/A	0.5	0.5	0.5	N/A	N/A	MF	YES
DOMESTIC DHW & DHWR	105-140	0.22 - 0.28	100	N/A	1	1	1.5	N/A	N/A	MF	NO
REFRIGERANT SUCTION & LIQUID (SEE NOTE 3 BELOW)	10 & UP	0.21 - 0.27	75	0.5	0.75	0.75	N/A	N/A	N/A	FC	NO

NOTES:

1.THE TABLE ABOVE APPLIES TO METALLIC PIPES AND SCHEDULE 80 OR LESS NON-METALLIC PIPES. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. ASHRAE 90.1-2013 DOES NOT PROVIDE REDUCED INSULATION THICHNESS FOR BRANCH RUNOUTS.

2. PIPING INSULATION THICKNESSES MAY BE REDUCED AS INDICATED ABOVE FOR BRANCH RUNOUTS BETWEEN COIL CONTROL VALVE AND THE COIL WHEN THE CONTROL VALVE IS LOCATED WITHIN 4 FEET OF THE COIL AND THE PIPE SIZE IS 1 INCH OR LESS.

3. FOR OUTDOOR ABOVEGROUND REFRIGERANT PIPING, INSULATION REQUIREMENTS SHALL BE THE SAME AS FOR INDOOR ABOVEGROUND REFRIGERANT PIPING, WITH THE FOLLOWING EXCEPTION: INSULATION SHALL BE JACKED WITH FLEXCAD-250, OR APPROVED EQUAL, ALUMINUM JACKETING SYSTEM, INSTALLED PER THE MANUFACTUREER'S RECOMMENDATIONS.

PIPE INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM RUBBER TUBULAR INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM C 534, TYPE 1 FOR TUBULAR MATERIALS WITH FLAME SPREAD INDEX LESS THAN 25 AND SMOKE DEVELOPED INDELX LESS THAN 50. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

MINERAL-FIBER PREFORMED PIPE INSULATION (MF): TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 547, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED ALL-SERVICE JACKET (ASJ). JACKET SHALL BE WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE 1. FOR INDOOR EXPOSED PIPING REQUIRING FIBERGLASS INSULATION, PROVIDE A WHITE HIGH-IMPACT RESISTANT PVC JACKET COMPLYING WITH ASTM D 1784 CLASS 16354-C. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

ABBREVIATIONS: (APPLIES TO PIPE INSULATION THICKNESS SCHEDULES & PIPE INSULATION SPECIFICATIONS ON THIS DRAWING)
FC - FLEXIBLE CLOSED-CELL
MF - MINERAL FIBER
N/A - NOT APPLICABLE

DUCTWORK INSULATION SCHEDULE

DUCT SYSTEM	OPERATING TEMPERATURE RANGE (DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL SIZES		INSULATION MATERIAL	VAPOR BARRIER REQUIRED	NOTES
			THICKNESS INCH	R VALUE			
INTERIOR DUCT LINER (ACOUSTICAL)(WHERE NOTED)	0-150	75	1/2"	NA	FC	YES	1
SUPPLY DUCT FROM FCU TO DIFFUSERS (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
RETURN DUCT FROM RETURN BOOT TO FCU (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
EXTERIOR OUTSIDE AIR DUCT FROM INTAKE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR VENTILATION AIR DUCT FROM ERV TO REHEAT COIL	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM SPACE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM ERV TO GARAGE	0-150	75	0"	NONE			
VENTILATION DUCTWORK FROM REHEAT COIL TO DIFFUSERS	0-150	75	0"	NONE			
EXHAUST DUCT IN SPACE TO EXTERIOR WALL	0-150	75	0"	NONE			

NOTES:

1.THE TABLE ABOVE APPLIES TO DUCTWORK. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. BRANCH RUNOUTS LESS THAN 10FT CAN BE R-3.5.

2. UNCONDITIONED SPACES INCLUDE LOADING DOCKS, WAREHOUSES, MECHANICAL ROOMS, NON-PLENUM CEILINGS, VESTIBULE CEILING AREA.

3. DUCTWORK IS EXPOSED IN SPACE. DUCTWORK MAY BE PAINTED BLACK.

4. PROVIDE PVC OR OTHER PROTECTIVE COVER WHERE DUCTWORK IS EXPOSED AND SUBJECT TO IMPACT

5. PROVIDE WITH PROTECTIVE/WEATHERPROOF EXTERIOR WRAP. WRAP SHALL BE MINIMUM OF 40 MIL, SELF-ADHERING,

6. PROVIDE UL LISTED GREASE DUCT ASSEMBLY TO MEET CLEARANCE TO COMBUSTABLES

DUCT INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

RIGID BOARD (RB): RIGID POLYISOCYANURATE FOAM CORE DUCT BOARD WITH FACTORY APPLIED VAPOR RETARDER FACING BOTH SIDES. DUCT BOARD SHALL BE "ENERGY 3 FOIL FACE" BY JOHN MANSVILLE OR EQUIVALENT. R-6 PER INCH, k-VALUE = 0.16 AT 50 DEG F. ASTM C 1289, TYPE I, CLASS I.

MINERAL-FIBER DUCT-WRAP INSULATION (MF): FORMELDEHYDE-FREE, TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 1290, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED FSK (FOIL-SCRIM-KRAFT). FOIL WILL BE 0.02 PERMS; COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

DUCT COIL SCHEDULE

Tag	DESCRIPTION	HEATING	COIL SIZE			HEATING	AIRSIDE			ELECTRICAL			MANU. & MODEL	NOTES
		AIRFLOW	WIDTH	HEIGHT	AREA	CAPACITY	EAT	LAT	VEL	V	PH	HZ		
		CFM	IN	IN	SF	KW / MBH	DEG F	DEG F	FPM					
DC 3-1	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4 / 13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL
DC 3-2	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4 / 13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL

NOTES:
1. PROVIDE DISCHARGE AIR TEMPERATURE CONTROL W/ OA RESET SCHEDULE
2. PROVIDE SCR STAGING OF COIL
3. PROVIDE AIR-FLOW PROVING WITH FAN RELAY
4. UNIT IS HORIZONTAL AIRFLOW

FAN COIL UNIT (FCU)

TAG	DESCRIPTION	NOM. TONS	INDOOR UNIT							ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
			TYPE	AIRFLOW (CFM)	ESP (IN)	SENSIBLE COOLING	HEATING (MBH)	REFRIG.	SOUND (dBA)	WEIGHT (LBS)	VOLTS	PH	MCA	MOP		
SCU-3-1	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-3-2	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-3-3	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
FCU-3-4	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-3-5	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-3-6	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-3-7	CONFERENCE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-3-8	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-3-9	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL

NOTES:
1. PROVIDE GRAVITY CONDENSATE DRAIN TO APPROVED LOCATION.
2. PROVIDE UNIT WITH WIRED REMOTE THERMOSTAT MOUNTED ON WALL AS SHOWN (WIRED BY MC).
3. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.
*VENTILATION AIR IS PROVIDED THRU ERV 3-1 & ERV 3-2 AND DUCTED DIRECTLY INTO THE SPACE.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

TAG	DESCRIPTION	AIRFLOW	NECK	FACE SIZE	NC	SP	THROW (FT)	MATRL	VOL DAMP	MOUNTING	AIR PATTERN	MODEL	NOTES
		CFM	INCHES	INCHES		W.G.	@ 22-1/2						
SR-1	SUPPLY - SIDEWALL	100	6"	8"X8"	<20	0.01	6-9-19	ALUM	YES	SURFACE	ADJ	PRICE 22DAL	1
EG-6	EXHAUST - CEILING	125	6"	12"X12"	<20	0.011	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1
EG-8	EXHAUST - CEILING	250	8"	12"X12"	<20	0.025	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1

NOTES:
1. CORRDINATE FINISH WITH ARCHITECTURAL

CONDENSER SCHEDULE (CN)

TAG	DESCRIPTION	NOM. TONS	TYPE	REFRIG.	EER	SOUND (dBA)	WEIGHT (LBS)	ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
								VOLTS	PH	MCA	MOP		
CN 3-1	SERVES FCU 3-1 THRU 3-5	14	INVERTER COMPRESSOR	R-410A	20.8	63	740	460	3	31.3	40	TRANE 4TVR0169C400N	ALL

NOTES:
1. OUTDOOR HEATPUMP UNIT MOUNTED ON 12" STAND.
2. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.

ENERGY RECOVERY VENTILATOR SCHEDULE (ERV)

TAG	DESCRIPTION	SUPPLY/VENTILATION AIR			EXHAUST/RETURN AIR			SUMMER					WINTER					EFFECTIVENESS				ELECTRICAL DATA					INSTALLED WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
		AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	TOTAL CAPACITY MBH	LATENT CAPACITY MBH	OA AT DB/WB	EXH. AT DB/WB	ERV LAT DB/WB	TOTAL CAPACITY MBH	LATENT CAPACITY MBH	EAT DB/WB	EXH. AT DB/WB	ERV LAT DB/WB	SUMMER CONDITIONS SENSIBLE	SUMMER CONDITIONS TOTAL	WINTER CONDITIONS SENSIBLE	WINTER CONDITIONS TOTAL	VOLTS	PH	HZ	MCA	MOP			
ERV 3-1	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL
ERV 3-2	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL

NOTES:
1. UNIT HAS DUAL MOTORS, DUAL ECM FANS.
2. PROVIDE STANDARD 2" MERV 8 FILTERS WITH UNIT.

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STATE OF MAINE
JACOB R. MARTIN
No. 12013
LICENSED
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:
ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:
OCEAN GATEWAY ADDITION
PORTLAND, ME

SHEET TITLE:
3RD FLOOR MECHANICAL SCHEDULES

DATE: 3-28-19
PROJECT# 17150
DRAWN: MAC
CHECKED: JRM
SCALE: NOT TO SCALE

SHEET #
M-603

INDOOR ABOVEGROUND PIPE INSULATION MINIMUM THICKNESS SCHEDULE

PIPING SYSTEM	FLUID OPERATING TEMPERATURE RANGE (DEG F)	INSULATION CONDUCTIVITY RANGE (BTU-IN/HR-FT2 DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL PIPE OR TUBE SIZE (INCHES)						INSULATION MATERIAL	VAPOR BARRIER REQUIRED
				PIPE BRANCH RUN OUTS (SEE NOTE 2 BELOW)	< 1	1 TO < 1-1/2	1-1/2 TO < 4	4 TO < 8	8 TO > 8		
				INSULATION THICKNESS (INCHES)							
DOMESTIC COLD WATER	40-60	0.21 - 0.27	75	N/A	0.5	0.5	0.5	N/A	N/A	MF	YES
DOMESTIC DHW & DHWR	105-140	0.22 - 0.28	100	N/A	1	1	1.5	N/A	N/A	MF	NO
REFRIGERANT SUCTION & LIQUID (SEE NOTE 3 BELOW)	10 & UP	0.21 - 0.27	75	0.5	0.75	0.75	N/A	N/A	N/A	FC	NO

NOTES:

1.THE TABLE ABOVE APPLIES TO METALLIC PIPES AND SCHEDULE 80 OR LESS NON-METALLIC PIPES. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. ASHRAE 90.1-2013 DOES NOT PROVIDE REDUCED INSULATION THICHNESS FOR BRANCH RUNOUTS.

2. PIPING INSULATION THICKNESSES MAY BE REDUCED AS INDICATED ABOVE FOR BRANCH RUNOUTS BETWEEN COIL CONTROL VALVE AND THE COIL WHEN THE CONTROL VALVE IS LOCATED WITHIN 4 FEET OF THE COIL AND THE PIPE SIZE IS 1 INCH OR LESS.

3. FOR OUTDOOR ABOVEGROUND REFRIGERANT PIPING, INSULATION REQUIREMENTS SHALL BE THE SAME AS FOR INDOOR ABOVEGROUND REFRIGERANT PIPING, WITH THE FOLLOWING EXCEPTION: INSULATION SHALL BE JACKED WITH FLEXCAD-250, OR APPROVED EQUAL, ALUMINUM JACKETING SYSTEM, INSTALLED PER THE MANUFACTUREER'S RECOMMENDATIONS.

PIPE INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM RUBBER TUBULAR INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM C 534, TYPE 1 FOR TUBULAR MATERIALS WITH FLAME SPREAD INDEX LESS THAN 25 AND SMOKE DEVELOPED INDELX LESS THAN 50. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

MINERAL-FIBER PREFORMED PIPE INSULATION (MF): TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 547, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED ALL-SERVICE JACKET (ASJ). JACKET SHALL BE WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE 1. FOR INDOOR EXPOSED PIPING REQUIRING FIBERGLASS INSULATION, PROVIDE A WHITE HIGH-IMPACT RESISTANT PVC JACKET COMPLYING WITH ASTM D 1784 CLASS 16354-C. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

ABBREVIATIONS: (APPLIES TO PIPE INSULATION THICKNESS SCHEDULES & PIPE INSULATION SPECIFICATIONS ON THIS DRAWING)
FC - FLEXIBLE CLOSED-CELL
MF - MINERAL FIBER
N/A - NOT APPLICABLE

DUCTWORK INSULATION SCHEDULE

DUCT SYSTEM	OPERATING TEMPERATURE RANGE (DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL SIZES		INSULATION MATERIAL	VAPOR BARRIER REQUIRED	NOTES
			THICKNESS INCH	R VALUE			
INTERIOR DUCT LINER (ACOUSTICAL)(WHERE NOTED)	0-150	75	1/2"	NA	FC	YES	1
SUPPLY DUCT FROM FCU TO DIFFUSERS (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
RETURN DUCT FROM RETURN BOOT TO FCU (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
EXTERIOR OUTSIDE AIR DUCT FROM INTAKE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR VENTILATION AIR DUCT FROM ERV TO REHEAT COIL	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM SPACE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM ERV TO GARAGE	0-150	75	0"	NONE			
VENTILATION DUCTWORK FROM REHEAT COIL TO DIFFUSERS	0-150	75	0"	NONE			
EXHAUST DUCT IN SPACE TO EXTERIOR WALL	0-150	75	0"	NONE			

NOTES:

1.THE TABLE ABOVE APPLIES TO DUCTWORK. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. BRANCH RUNOUTS LESS THAN 10FT CAN BE R-3.5.

2. UNCONDITIONED SPACES INCLUDE LOADING DOCKS, WAREHOUSES, MECHANICAL ROOMS, NON-PLENUM CEILINGS, VESTIBULE CEILING AREA.

3. DUCTWORK IS EXPOSED IN SPACE. DUCTWORK MAY BE PAINTED BLACK.

4. PROVIDE PVC OR OTHER PROTECTIVE COVER WHERE DUCTWORK IS EXPOSED AND SUBJECT TO IMPACT

5. PROVIDE WITH PROTECTIVE/WEATHERPROOF EXTERIOR WRAP. WRAP SHALL BE MINIMUM OF 40 MIL, SELF-ADHERING,

6. PROVIDE UL LISTED GREASE DUCT ASSEMBLY TO MEET CLEARANCE TO COMBUSTABLES

DUCT INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

RIGID BOARD (RB): RIGID POLYISOCYANURATE FOAM CORE DUCT BOARD WITH FACTORY APPLIED VAPOR RETARDER FACING BOTH SIDES. DUCT BOARD SHALL BE "ENERGY 3 FOIL FACE" BY JOHN MANSVILLE OR EQUIVALENT. R-6 PER INCH, k-VALUE = 0.16 AT 50 DEG F. ASTM C 1289, TYPE I, CLASS I.

MINERAL-FIBER DUCT-WRAP INSULATION (MF): FORMELDEHYDE-FREE, TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 1290, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED FSK (FOIL-SCRIM-KRAFT). FOIL WILL BE 0.02 PERMS; COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

DUCT COIL SCHEDULE

Tag	DESCRIPTION	HEATING	COIL SIZE			HEATING	AIRSIDE			ELECTRICAL			MANU. & MODEL	NOTES
		AIRFLOW	WIDTH	HEIGHT	AREA	CAPACITY	EAT	LAT	VEL	V	PH	HZ		
		CFM	IN	IN	SF	KW	MBH	DEG F	DEG F	FPM					
DC 4-1	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4	13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL
DC 4-2	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4	13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL

NOTES:
1. PROVIDE DISCHARGE AIR TEMPERATURE CONTROL W/ OA RESET SCHEDULE
2. PROVIDE SCR STAGING OF COIL
3. PROVIDE AIR-FLOW PROVING WITH FAN RELAY
4. UNIT IS HORIZONTAL AIRFLOW

FAN COIL UNIT (FCU)

TAG	DESCRIPTION	NOM. TONS	INDOOR UNIT								ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
			TYPE	AIRFLOW (CFM)	ESP (IN)	SENSIBLE COOLING	HEATING (MBH)	REFRIG.	SOUND (dBA)	WEIGHT (LBS)	VOLTS	PH	MCA	MOP		
SCU-4-1	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-4-2	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-4-3	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
FCU-4-4	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-4-5	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-4-6	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-4-7	CONFERENCE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-4-8	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-4-9	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL

NOTES:
1. PROVIDE GRAVITY CONDENSATE DRAIN TO APPROVED LOCATION.
2. PROVIDE UNIT WITH WIRED REMOTE THERMOSTAT MOUNTED ON WALL AS SHOWN (WIRED BY MC).
3. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.
*VENTILATION AIR IS PROVIDED THRU ERV 4-1 & ERV 4-2 AND DUCTED DIRECTLY INTO THE SPACE.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

TAG	DESCRIPTION	AIRFLOW	NECK	FACE SIZE	NC	SP	THROW (FT)	MATRL	VOL DAMP	MOUNTING	AIR PATTERN	MODEL	NOTES
		CFM	INCHES	INCHES		W.G.	@ 22-1/2						
SR-1	SUPPLY - SIDEWALL	100	6"	8"X8"	<20	0.01	6-9-19	ALUM	YES	SURFACE	ADJ	PRICE 22DAL	1
EG-6	EXHAUST - CEILING	125	6"	12"X12"	<20	0.011	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1
EG-8	EXHAUST - CEILING	250	8"	12"X12"	<20	0.025	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1

NOTES:
1. CORRDINATE FINISH WITH ARCHITECTURAL

CONDENSER SCHEDULE (CN)

TAG	DESCRIPTION	NOM. TONS	TYPE	REFRIG.	EER	SOUND (dBA)	WEIGHT (LBS)	ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
								VOLTS	PH	MCA	MOP		
CN 4-1	SERVES FCU 4-1 THRU 4-5	14	INVERTER COMPRESSOR	R-410A	20.8	63	740	460	3	31.3	40	TRANE 4TVR0169C400N	ALL

NOTES:
1. OUTDOOR HEATPUMP UNIT MOUNTED ON 12" STAND.
2. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.

ENERGY RECOVERY VENTILATOR SCHEDULE (ERV)

TAG	DESCRIPTION	SUPPLY/VENTILATION AIR			EXHAUST/RETURN AIR			SUMMER					WINTER					EFFECTIVENESS				ELECTRICAL DATA					INSTALLED WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
		AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	TOTAL CAPACITY	LATENT CAPACITY	OA AT	EXH. AT	ERV LAT	TOTAL CAPACITY	LATENT CAPACITY	EAT	EXH. AT	ERV LAT	SUMMER CONDITIONS		WINTER CONDITIONS		VOLTS	PH	HZ	MCA	MOP			
								MBH	MBH	DB/WB	DB/WB	DB/WB	MBH	MBH	DB/WB	DB/WB	DB/WB	SENSIBLE	TOTAL	SENSIBLE	TOTAL								
ERV 4-1	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL
ERV 4-2	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL

NOTES:
1. UNIT HAS DUAL MOTORS, DUAL ECM FANS.
2. PROVIDE STANDARD 2" MERV 8 FILTERS WITH UNIT.

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STATE OF MAINE — JACOB R. MARTIN — No. 12013 — LICENSED PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:
ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:
OCEAN GATEWAY ADDITION
PORTLAND, ME

SHEET TITLE:
4TH FLOOR MECHANICAL SCHEDULES

DATE:	PROJECT#
3-28-19	17150

DRAWN:	CHECKED:	SCALE:
MAC	JRM	NOT TO SCALE

SHEET #
M-604

INDOOR ABOVEGROUND PIPE INSULATION MINIMUM THICKNESS SCHEDULE

PIPING SYSTEM	FLUID OPERATING TEMPERATURE RANGE (DEG F)	INSULATION CONDUCTIVITY RANGE (BTU-IN/HR-FT2 DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL PIPE OR TUBE SIZE (INCHES)						INSULATION MATERIAL	VAPOR BARRIER REQUIRED
				PIPE BRANCH RUN OUTS (SEE NOTE 2 BELOW)	< 1	1 TO < 1-1/2	1-1/2 TO < 4	4 TO < 8	8 TO > 8		
				INSULATION THICKNESS (INCHES)							
DOMESTIC COLD WATER	40-60	0.21 - 0.27	75	N/A	0.5	0.5	0.5	N/A	N/A	MF	YES
DOMESTIC DHW & DHWR	105-140	0.22 - 0.28	100	N/A	1	1	1.5	N/A	N/A	MF	NO
REFRIGERANT SUCTION & LIQUID (SEE NOTE 3 BELOW)	10 & UP	0.21 - 0.27	75	0.5	0.75	0.75	N/A	N/A	N/A	FC	NO

NOTES:

1.THE TABLE ABOVE APPLIES TO METALLIC PIPES AND SCHEDULE 80 OR LESS NON-METALLIC PIPES. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. ASHRAE 90.1-2013 DOES NOT PROVIDE REDUCED INSULATION THICHNESS FOR BRANCH RUNOUTS.

2. PIPING INSULATION THICKNESSES MAY BE REDUCED AS INDICATED ABOVE FOR BRANCH RUNOUTS BETWEEN COIL CONTROL VALVE AND THE COIL WHEN THE CONTROL VALVE IS LOCATED WITHIN 4 FEET OF THE COIL AND THE PIPE SIZE IS 1 INCH OR LESS.

3. FOR OUTDOOR ABOVEGROUND REFRIGERANT PIPING, INSULATION REQUIREMENTS SHALL BE THE SAME AS FOR INDOOR ABOVEGROUND REFRIGERANT PIPING, WITH THE FOLLOWING EXCEPTION: INSULATION SHALL BE JACKED WITH FLEXCAD-250, OR APPROVED EQUAL, ALUMINUM JACKETING SYSTEM, INSTALLED PER THE MANUFACTUREER'S RECOMMENDATIONS.

PIPE INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM RUBBER TUBULAR INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM C 534, TYPE 1 FOR TUBULAR MATERIALS WITH FLAME SPREAD INDEX LESS THAN 25 AND SMOKE DEVELOPED INDELX LESS THAN 50. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

MINERAL-FIBER PREFORMED PIPE INSULATION (MF): TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 547, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED ALL-SERVICE JACKET (ASJ). JACKET SHALL BE WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE 1. FOR INDOOR EXPOSED PIPING REQUIRING FIBERGLASS INSULATION, PROVIDE A WHITE HIGH-IMPACT RESISTANT PVC JACKET COMPLYING WITH ASTM D 1784 CLASS 16354-C. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

ABBREVIATIONS: (APPLIES TO PIPE INSULATION THICKNESS SCHEDULES & PIPE INSULATION SPECIFICATIONS ON THIS DRAWING)
FC - FLEXIBLE CLOSED-CELL
MF - MINERAL FIBER
N/A - NOT APPLICABLE

DUCTWORK INSULATION SCHEDULE

DUCT SYSTEM	OPERATING TEMPERATURE RANGE (DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL SIZES		INSULATION MATERIAL	VAPOR BARRIER REQUIRED	NOTES
			THICKNESS	R VALUE			
			INCH				
INTERIOR DUCT LINER (ACOUSTICAL)(WHERE NOTED)	0-150	75	1/2"	NA	FC	YES	1
SUPPLY DUCT FROM FCU TO DIFFUSERS (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
RETURN DUCT FROM RETURN BOOT TO FCU (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
EXTERIOR OUTSIDE AIR DUCT FROM INTAKE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR VENTILATION AIR DUCT FROM ERV TO REHEAT COIL	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM SPACE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM ERV TO GARAGE	0-150	75	0"	NONE			
VENTILATION DUCTWORK FROM REHEAT COIL TO DIFFUSERS	0-150	75	0"	NONE			
EXHAUST DUCT IN SPACE TO EXTERIOR WALL	0-150	75	0"	NONE			

NOTES:

1.THE TABLE ABOVE APPLIES TO DUCTWORK. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. BRANCH RUNOUTS LESS THAN 10FT CAN BE R-3.5.

2. UNCONDITIONED SPACES INCLUDE LOADING DOCKS, WAREHOUSES, MECHANICAL ROOMS, NON-PLENUM CEILINGS, VESTIBULE CEILING AREA.

3. DUCTWORK IS EXPOSED IN SPACE. DUCTWORK MAY BE PAINTED BLACK.

4. PROVIDE PVC OR OTHER PROTECTIVE COVER WHERE DUCTWORK IS EXPOSED AND SUBJECT TO IMPACT

5. PROVIDE WITH PROTECTIVE/WEATHERPROOF EXTERIOR WRAP. WRAP SHALL BE MINIMUM OF 40 MIL, SELF-ADHERING,

6. PROVIDE UL LISTED GREASE DUCT ASSEMBLY TO MEET CLEARANCE TO COMBUSTABLES

DUCT INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

RIGID BOARD (RB): RIGID POLYISOCYANURATE FOAM CORE DUCT BOARD WITH FACTORY APPLIED VAPOR RETARDER FACING BOTH SIDES. DUCT BOARD SHALL BE "ENERGY 3 FOIL FACE" BY JOHN MANSVILLE OR EQUIVALENT. R-6 PER INCH, k-VALUE = 0.16 AT 50 DEG F. ASTM C 1289, TYPE I, CLASS I.

MINERAL-FIBER DUCT-WRAP INSULATION (MF): FORMELDEHYDE-FREE, TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 1290, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED FSK (FOIL-SCRIM-KRAFT). FOIL WILL BE 0.02 PERMS; COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

DUCT COIL SCHEDULE

Tag	DESCRIPTION	HEATING	COIL SIZE			HEATING	AIRSIDE			ELECTRICAL			MANU. & MODEL	NOTES
		AIRFLOW	WIDTH	HEIGHT	AREA	CAPACITY	EAT	LAT	VEL	V	PH	HZ		
		CFM	*IN*	*IN*	*SF*	*KW*	*MBH*	*DEG F*	*DEG F*	*FPM*					
DC 5-1	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4	13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL
DC 5-2	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4	13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL

NOTES:
1. PROVIDE DISCHARGE AIR TEMPERATURE CONTROL W/ OA RESET SCHEDULE
2. PROVIDE SCR STAGING OF COIL
3. PROVIDE AIR-FLOW PROVING WITH FAN RELAY
4. UNIT IS HORIZONTAL AIRFLOW

FAN COIL UNIT (FCU)

TAG	DESCRIPTION	NOM. TONS	INDOOR UNIT								ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
			TYPE	AIRFLOW (CFM)	ESP (IN)	SENSIBLE COOLING (MBH)	HEATING (MBH)	REFRIG.	SOUND (dBA)	WEIGHT (LBS)	VOLTS	PH	MCA	MOP		
SCU-5-1	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-5-2	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-5-3	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
FCU-5-4	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-5-5	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU5-6	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-5-7	CONFERENCE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-5-8	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU 5-9	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL

NOTES:

1. PROVIDE GRAVITY CONDENSATE DRAIN TO APPROVED LOCATION.
2. PROVIDE UNIT WITH WIRED REMOTE THERMOSTAT MOUNTED ON WALL AS SHOWN (WIRED BY MC).
3. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.

*VENTILATION AIR IS PROVIDED THRU ERV 5-1 & ERV 5-2 AND DUCTED DIRECTLY INTO THE SPACE.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

TAG	DESCRIPTION	AIRFLOW	NECK	FACE SIZE	NC	SP	THROW (FT)	MATRL	VOL DAMP	MOUNTING	AIR PATTERN	MODEL	NOTES
		CFM	*INCHES*	*INCHES*		*W.G.*	*@ 22-1/2*						
SR-1	SUPPLY - SIDEWALL	100	6"	8"X8"	<20	0.01	6-9-19	ALUM	YES	SURFACE	ADJ	PRICE 22DAL	1
EG-6	EXHAUST - CEILING	125	6"	12"X12"	<20	0.011	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1
EG-8	EXHAUST - CEILING	250	8"	12"X12"	<20	0.025	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1

NOTES:

1. CORRDINATE FINISH WITH ARCHITECTURAL

CONDENSER SCHEDULE (CN)

TAG	DESCRIPTION	NOM. TONS	TYPE	REFRIG.	EER	SOUND (dBA)	WEIGHT (LBS)	ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
								VOLTS	PH	MCA	MOP		
CN 5-1	SERVES FCU 5-1 THRU 5-5	14	INVERTER COMPRESSOR	R-410A	20.8	63	740	460	3	31.3	40	TRANE 4TVR0169C400N	ALL

NOTES:

1. OUTDOOR HEATPUMP UNIT MOUNTED ON 12" STAND.
2. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.

ENERGY RECOVERY VENTILATOR SCHEDULE (ERV)

TAG	DESCRIPTION	SUPPLY/VENTILATION AIR			EXHAUST/RETURN AIR			SUMMER					WINTER					EFFECTIVENESS				ELECTRICAL DATA					INSTALLED WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
		AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	TOTAL CAPACITY	LATENT CAPACITY	OA AT	EXH. AT	ERV LAT	TOTAL CAPACITY	LATENT CAPACITY	EAT	EXH. AT	ERV LAT	SUMMER CONDITIONS		WINTER CONDITIONS		VOLTS	PH	HZ	MCA	MOP			
								MBH	MBH	DB/WB	DB/WB	DB/WB	MBH	MBH	DB/WB	DB/WB	DB/WB	SENSIBLE	TOTAL	SENSIBLE	TOTAL								
ERV 5-1	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL
ERV 5-2	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL

NOTES:
1. UNIT HAS DUAL MOTORS, DUAL ECM FANS.
2. PROVIDE STANDARD 2" MERV 8 FILTERS WITH UNIT.

JOHNSON & JORDAN
MECHANICAL CONTRACTORS
18 MUSSEY ROAD
SCARBOROUGH, ME 04074
TEL. (207) 883-8345

STATE OF MAINE
JACOB R. MARTIN
No. 12013
LICENSED
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:
ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:
OCEAN GATEWAY ADDITION
PORTLAND, ME

SHEET TITLE:
5TH FLOOR MECHANICAL SCHEDULES

DATE: 3-28-19
PROJECT# 17150
DRAWN: MAC
CHECKED: JRM
SCALE: NOT TO SCALE

SHEET #
M-605

INDOOR ABOVEGROUND PIPE INSULATION MINIMUM THICKNESS SCHEDULE

PIPING SYSTEM	FLUID OPERATING TEMPERATURE RANGE (DEG F)	INSULATION CONDUCTIVITY RANGE (BTU-IN/HR-FT2 DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL PIPE OR TUBE SIZE (INCHES)						INSULATION MATERIAL	VAPOR BARRIER REQUIRED
				PIPE BRANCH RUN OUTS (SEE NOTE 2 BELOW)	< 1	1 TO < 1-1/2	1-1/2 TO < 4	4 TO < 8	8 TO > 8		
				INSULATION THICKNESS (INCHES)							
DOMESTIC COLD WATER	40-60	0.21 - 0.27	75	N/A	0.5	0.5	0.5	N/A	N/A	MF	YES
DOMESTIC DHW & DHWR	105-140	0.22 - 0.28	100	N/A	1	1	1.5	N/A	N/A	MF	NO
REFRIGERANT SUCTION & LIQUID (SEE NOTE 3 BELOW)	10 & UP	0.21 - 0.27	75	0.5	0.75	0.75	N/A	N/A	N/A	FC	NO

NOTES:

1.THE TABLE ABOVE APPLIES TO METALLIC PIPES AND SCHEDULE 80 OR LESS NON-METALLIC PIPES. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. ASHRAE 90.1-2013 DOES NOT PROVIDE REDUCED INSULATION THICHNESS FOR BRANCH RUNOUTS.

2. PIPING INSULATION THICKNESSES MAY BE REDUCED AS INDICATED ABOVE FOR BRANCH RUNOUTS BETWEEN COIL CONTROL VALVE AND THE COIL WHEN THE CONTROL VALVE IS LOCATED WITHIN 4 FEET OF THE COIL AND THE PIPE SIZE IS 1 INCH OR LESS.

3. FOR OUTDOOR ABOVEGROUND REFRIGERANT PIPING, INSULATION REQUIREMENTS SHALL BE THE SAME AS FOR INDOOR ABOVEGROUND REFRIGERANT PIPING, WITH THE FOLLOWING EXCEPTION: INSULATION SHALL BE JACKED WITH FLEXCAD-250, OR APPROVED EQUAL, ALUMINUM JACKETING SYSTEM, INSTALLED PER THE MANUFACTUREER'S RECOMMENDATIONS.

PIPE INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM RUBBER TUBULAR INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM C 534, TYPE 1 FOR TUBULAR MATERIALS WITH FLAME SPREAD INDEX LESS THAN 25 AND SMOKE DEVELOPED INDELX LESS THAN 50. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

MINERAL-FIBER PREFORMED PIPE INSULATION (MF): TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 547, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED ALL-SERVICE JACKET (ASJ). JACKET SHALL BE WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE 1. FOR INDOOR EXPOSED PIPING REQUIRING FIBERGLASS INSULATION, PROVIDE A WHITE HIGH-IMPACT RESISTANT PVC JACKET COMPLYING WITH ASTM D 1784 CLASS 16354-C. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

ABBREVIATIONS: (APPLIES TO PIPE INSULATION THICKNESS SCHEDULES & PIPE INSULATION SPECIFICATIONS ON THIS DRAWING)
FC - FLEXIBLE CLOSED-CELL
MF - MINERAL FIBER
N/A - NOT APPLICABLE

DUCTWORK INSULATION SCHEDULE

DUCT SYSTEM	OPERATING TEMPERATURE RANGE (DEG F)	MEAN TEMPERATURE RATING (DEG F)	NOMINAL SIZES		INSULATION MATERIAL	VAPOR BARRIER REQUIRED	NOTES
			THICKNESS INCH	R VALUE			
INTERIOR DUCT LINER (ACOUSTICAL)(WHERE NOTED)	0-150	75	1/2"	NA	FC	YES	1
SUPPLY DUCT FROM FCU TO DIFFUSERS (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
RETURN DUCT FROM RETURN BOOT TO FCU (CONDITIONED SPACE, EXPOSED)	0-150	75	0"	NONE			3
EXTERIOR OUTSIDE AIR DUCT FROM INTAKE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR VENTILATION AIR DUCT FROM ERV TO REHEAT COIL	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM SPACE TO ERV	0-150	75	2-1/2"	R-12	FC & RB	YES	1, 5
EXTERIOR EXHAUST DUCT FROM ERV TO GARAGE	0-150	75	0"	NONE			
VENTILATION DUCTWORK FROM REHEAT COIL TO DIFFUSERS	0-150	75	0"	NONE			
EXHAUST DUCT IN SPACE TO EXTERIOR WALL	0-150	75	0"	NONE			

NOTES:

1.THE TABLE ABOVE APPLIES TO DUCTWORK. THE BASIS OF THE ABOVE SCHEDULE IS ECONOMIC THICKNESS, PREVENTION OF CONDENSATION, AND COMPLIANCE WITH ASHRAE 90.1-2013 MINIMUM INSULATION THICKNESSES. BRANCH RUNOUTS LESS THAN 10FT CAN BE R-3.5.

2. UNCONDITIONED SPACES INCLUDE LOADING DOCKS, WAREHOUSES, MECHANICAL ROOMS, NON-PLENUM CEILINGS, VESTIBULE CEILING AREA.

3. DUCTWORK IS EXPOSED IN SPACE. DUCTWORK MAY BE PAINTED BLACK.

4. PROVIDE PVC OR OTHER PROTECTIVE COVER WHERE DUCTWORK IS EXPOSED AND SUBJECT TO IMPACT

5. PROVIDE WITH PROTECTIVE/WEATHERPROOF EXTERIOR WRAP. WRAP SHALL BE MINIMUM OF 40 MIL, SELF-ADHERING,

6. PROVIDE UL LISTED GREASE DUCT ASSEMBLY TO MEET CLEARANCE TO COMBUSTABLES

DUCT INSULATION SPECIFICATIONS:

FLEXIBLE ELASTOMERIC INSLATION (FC): CLOSED-CELL, FIBER-FREE, ELASTOMERIC FOAM INSULATION, ARMSTRONG AP ARMAFLEX, OR APPROVED EQUAL. COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MANUFACTURER'S RECOMMENDATIONS.

RIGID BOARD (RB): RIGID POLYISOCYANURATE FOAM CORE DUCT BOARD WITH FACTORY APPLIED VAPOR RETARDER FACING BOTH SIDES. DUCT BOARD SHALL BE "ENERGY 3 FOIL FACE" BY JOHN MANSVILLE OR EQUIVALENT. R-6 PER INCH, k-VALUE = 0.16 AT 50 DEG F. ASTM C 1289, TYPE I, CLASS I.

MINERAL-FIBER DUCT-WRAP INSULATION (MF): FORMELDEHYDE-FREE, TYPE 1, MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 1290, TYPE 1, GRADE A. INSULATION SHALL HAVE A FACTORY-APPLIED FSK (FOIL-SCRIM-KRAFT). FOIL WILL BE 0.02 PERMS; COMPLY WITH ASTM E 84 AT 25/50 FOR USE IN AIR PLENUMS. INSTALL INSULATION PER THE MAUFACTURER'S RECOMMENDATIONS

DUCT COIL SCHEDULE

Tag	DESCRIPTION	HEATING	COIL SIZE			HEATING	AIRSIDE			ELECTRICAL			MANU. & MODEL	NOTES
		AIRFLOW	WIDTH	HEIGHT	AREA	CAPACITY	EAT	LAT	VEL	V	PH	HZ		
		CFM	IN	IN	SF	KW / MBH	DEG F	DEG F	FPM					
DC 6-1	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4 / 13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL
DC 6-2	ELECTRIC DUCT COIL - VENTILATION RE-HEAT	350	12	12	1	4 / 13.6	45	81	350	208	1	60	RENEWAIRE EK SERIES	ALL

NOTES:
1. PROVIDE DISCHARGE AIR TEMPERATURE CONTROL W/ OA RESET SCHEDULE
2. PROVIDE SCR STAGING OF COIL
3. PROVIDE AIR-FLOW PROVING WITH FAN RELAY
4. UNIT IS HORIZONTAL AIRFLOW

FAN COIL UNIT (FCU)

TAG	DESCRIPTION	NOM. TONS	INDOOR UNIT							ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
			TYPE	AIRFLOW (CFM)	ESP (IN)	SENSIBLE COOLING	HEATING (MBH)	REFRIG.	SOUND (dBA)	WEIGHT (LBS)	VOLTS	PH	MCA	MOP		
SCU-6-1	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-4-2	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
SCU-6-3	PERIMETER	2.5	CEILING CASSETTE	600/690/775	-	30	34	R-410A	30/34/39	42	208	3			TRANE 4TVC0030B100N	ALL
FCU-4-4	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-6-4	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-6-5	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-6-6	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-6-7	CONFERENCE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-6-8	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL
FCU-6-9	OFFICE	1	WALL CASSETTE	255/295/325	-	12	13.5	R-410A	29/33/37	20	208	1			TRANE 4TVW0012B100N	ALL

NOTES:
1. PROVIDE GRAVITY CONDENSATE DRAIN TO APPROVED LOCATION.
2. PROVIDE UNIT WITH WIRED REMOTE THERMOSTAT MOUNTED ON WALL AS SHOWN (WIRED BY MC).
3. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.
*VENTILATION AIR IS PROVIDED THRU ERV 6-1 & ERV 6-2 AND DUCTED DIRECTLY INTO THE SPACE.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

TAG	DESCRIPTION	AIRFLOW	NECK	FACE SIZE	NC	SP	THROW (FT)	MATRL	VOL DAMP	MOUNTING	AIR PATTERN	MODEL	NOTES
		CFM	INCHES	INCHES		W.G.	@ 22-1/2						
SR-1	SUPPLY - SIDEWALL	100	6"	8"X8"	<20	0.01	6-9-19	ALUM	YES	SURFACE	ADJ	PRICE 22DAL	1
EG-6	EXHAUST - CEILING	125	6"	12"X12"	<20	0.011	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1
EG-8	EXHAUST - CEILING	250	8"	12"X12"	<20	0.025	NA	ALUM	YES	SURFACE	45 DEG	PRICE 630	1

NOTES:
1. CORRDINATE FINISH WITH ARCHITECTURAL

CONDENSER SCHEDULE (CN)

TAG	DESCRIPTION	NOM. TONS	TYPE	REFRIG.	EER	SOUND (dBA)	WEIGHT (LBS)	ELECTRICAL DATA				MANUFACTURER & MODEL	NOTES
								VOLTS	PH	MCA	MOP		
CN 6-1	SERVES FCU 6-1 THRU 6-5	14	INVERTER COMPRESSOR	R-410A	20.8	63	740	460	3	31.3	40	TRANE 4TVR0169C400N	ALL

NOTES:
1. OUTDOOR HEATPUMP UNIT MOUNTED ON 12" STAND.
2. POWER WIRING & DISCONNECT PROVIDED TO OUTDOOR UNIT BY EC.

ENERGY RECOVERY VENTILATOR SCHEDULE (ERV)

TAG	DESCRIPTION	SUPPLY/VENTILATION AIR			EXHAUST/RETURN AIR			SUMMER					WINTER					EFFECTIVENESS				ELECTRICAL DATA					INSTALLED WEIGHT (LBS)	MANUFACTURER & MODEL	NOTES
		AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	TOTAL CAPACITY	LATENT CAPACITY	OA AT	EXH. AT	ERV LAT	TOTAL CAPACITY	LATENT CAPACITY	EAT	EXH. AT	ERV LAT	SUMMER CONDITIONS		WINTER CONDITIONS		VOLTS	PH	HZ	MCA	MOP			
								MBH	MBH	DB/WB	DB/WB	DB/WB	MBH	MBH	DB/WB	DB/WB	DB/WB	SENSIBLE	TOTAL	SENSIBLE	TOTAL								
ERV 6-1	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL
ERV 6-2	STATIC PLATE HX	350	0.5	0.75	250	0.5	0.75	5.9	2.8	88/71	75/62.6	79.6/66.4	24.6	5.1	-10/-11	70/54.4	41.6/36.1	90%	80%	90%	88%	208	1	60	10.1	15	275	RENEWAIRE HE1XINV	ALL

NOTES:
1. UNIT HAS DUAL MOTORS, DUAL ECM FANS.
2. PROVIDE STANDARD 2" MERV 8 FILTERS WITH UNIT.

JOHNSON & JORDAN
MECHANICAL CONTRACTORS
18 MUSSEY ROAD
SCARBOROUGH, ME 04074
TEL. (207) 883-8345

STATE OF MAINE — JACOB R. MARTIN — No. 12013 — LICENSED PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE

ISSUE STATUS:
ISSUED FOR CONSTRUCTION 3-28-19

PROJECT:
OCEAN GATEWAY ADDITION
PORTLAND, ME

SHEET TITLE:
6TH FLOOR MECHANICAL SCHEDULES

DATE: 3-28-19 | PROJECT#: 17150
DRAWN: MAC | CHECKED: JRM | SCALE: NOT TO SCALE

SHEET #
M-606