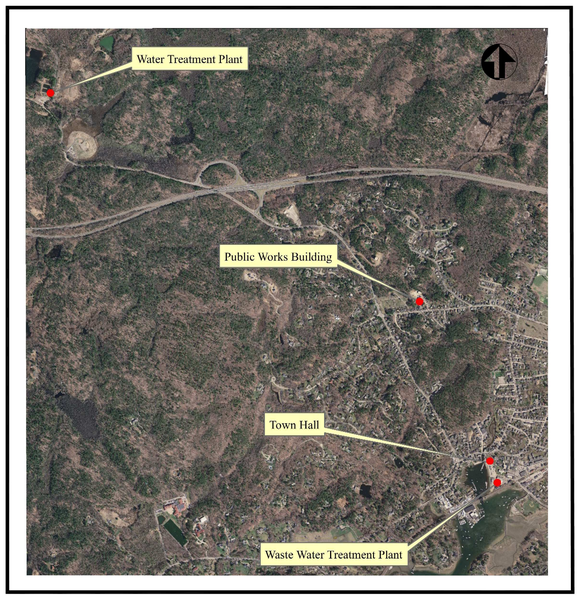
TOWN OF MANCHESTER BY THE SEA, MASSACHUSETTS

HEATING SYSTEM REPLACEMENT

CONTRACT NO. 2018-5



LOCATION PLAN
SCALE: 1" = 1500'

SHEET INDEX

COMMONWEALTH OF MASSACHUSETTS
PAUL E. COTE
CIVIL
No. 30972
REGISTERED PROFESSIONAL ENGINEER
11 Sept 2019

TATA & HOWARD

TATA & HOWARD, INC. • CONSULTING ENGINEERS • MARLBOROUGH, MA

AIR HANDLING UNIT																			
UNIT	LOCATION	AREA SERVED	CFM	EXTERNAL S.P. IN. WG	FAN SIZE TYPE	FAN HP VOLT/PHASE	HEATING COIL					CIRCULATING FLUID					ACCESSORIES	UNIT COMPONENTS
							FACE VEL.	MBH	S.P. LOSS	EAT	LAT	FLUID	GPM	TEMP. IN	TEMP. OUT	PD. FT.		
AHU-1	HEADWORKS GRIT ROOM PRETREARMENT ROOM	SAME	2,500	0.375	10B/FC	1.0/460/3ø	427	203	0.12	-15°F	60°F	WATER	13.5	180°F	150°F	.56	XP MOTOR, ISOLATORS, AMCA-B CONSTRUCTION, HERESITE COATING ON EXTERIOR OF UNIT, EQUAL TO TRANE #6 MODULAR AIR HANDLER	FAN MODULE, COIL MODULE, ANGLE FILTER MODULE
AHU-2	OPERATIONS BUILDING BLOWER ROOM	BLOWER ROOM	5,750	1.0	15A/FC	3.0/460/3ø	596	246.7	0.20	-5°F	60°F	WATER	24.5	180°F	150°F	2.56	EQUAL TO TRANE #10 MODULAR AIR HANDLER, VIBRATION ISOLATORS	FAN MODULE, COIL MODULE, FACE & BY-PASS DAMPERS, FILTER/MIXING BOX MODULE

NOTE: REPLACE THE ENTIRE AHU-1 UNIT AND REPLACE ONLY THE AHU-2 HEATING COIL.

NOTE:
DETAILS, SCHEDULES AND SCHEMATICS ARE FOR REFERENCE ONLY FOR HVAC EQUIPMENT REPLACEMENT

HEATING COIL											
LOCATION	TAG	COIL	COIL SIZE	ROWS/FS	AIR△ P	FLUID△ P	LVG AIR TEMP.	MBH	GPM	CFM	WTD
OPERATIONS BLDG ATTIC SPACE	HC-1	SUPPLY	18"x18"	2/161/NO TURBS	.21"	0.08"	* 70.0°F	89.47	6.0	1100	30°F
HEADWORKS BLDG PRETREATMENT RM	HC-2	SUPPLY	24"x24"	2/156/W/ TURBS	.47"	0.49"	** 115.0°F	149.1	9.9	2500	30°F

* BASED ON ENTERING AIR TEMPERATURE OF -5°F

** BASED ON ENTERING AIR TEMPERATURE OF 60°F

SCOPE OF WORK :

- REMOVE AND REPLACE ALL UNIT HEATERS WITH NEW CORROSION RESISTANCE AND EXPLOSION PROOF (HEAD WORKS) INCLUDING SHUT - OFF, BALANCING VALVES AND THERMOSTATS AND CONTROL WIRING. TOTAL OF 14 UNIT HEATERS PER DRAWING SCHEDULE.
- REMOVE AND REPLACE INDUCT HOT WATER COILS HC -1 (IN AHU 1) AND HC -2 (IN HEAD WORKS ROOM). INCLUDING SHUT - OFF VALVES, BALANCING, CONTROL VALVES AND STRAINERS . REPLACE WALL MOUNTED THERMOSTATS AND WIRING. PROVIDE NEW CEILING/WALL MOUNTING BRACKETS FOR THE UNIT HEATERS. (MATCH EXISTING EQUIPMENT TYPE AND MATERIAL)
- SERVICE THE EXISTING GAS -FIRED BOILER.
- SERVICE THE HOT WATER PUMPS. REMOVE AND CLEAN STRAINERS.
- PRESSURE TEST ALL HOT WATER SUPPLY AND RETURN PIPING FOR 24 H OURS. REPLACE DAMAGED PIPING AS NEEDED FIELD VERIFY THE QUANTITY.
- INSTALL NEW FIBERGLASS INSULATION ON HOT WATER SUPPLY AND RETURN PIPING THAT IS MISSING INSULATION, FIELD VERIFY THE QUANTITY.
- FLUSH OUT THE BOTH PIPING LOOPS AND RE -CHARGE THE HOT WATER PIPING LOOP WITH GLYCOL (MINIMUM 30%)

NOTE:
SERVICE WORK SHALL BE DONE IN ACCORDANCE OF ASHRAE STANDARD 180-2012 "STANDARD PRACTICE FOR INSPECTION AND MAINTENANCE OF COMMERCIAL BUILDING HVAC SYSTEMS" TABLE 5-6 BOILERS, TABLE 5-14 FAN COIL AND UNIT HEATERS AND TABLE 5-19 PUMPS

HOT WATER UNIT HEATER SCHEDULE								
UNIT NO.	SPACE SERVED	MBH	GPM	P.D. H.W.	CFM	HP WATTS	VOLTS-PHASE	MODEL AND REMARKS
UH-1	HEADWORKS BLDG PRETREATMENT ROOM	18.0	1.9	2.2	500	16 WATTS	115-1ø	STERLING MODEL HS-118A NOTES 1 & 3
UH-2	HEADWORKS BLDG SCREENINGS ROOM	18.0	1.9	2.2	500	16 WATTS	115-1ø	STERLING MODEL HS-118A NOTES 1 & 3
UH-3	HEADWORKS BLDG ELECT./UTILITY ROOM	18.0	1.9	2.2	500	16 WATTS	115-1ø	STERLING MODEL HS-118A NOTES 1 & 2
UH-4	HEADWORKS BLDG CHEMICAL ROOM	15.5	1.2	2.1	420	1/20	115-1ø	STERLING MODEL HS-118A NOTES 1 & 2
UH-5 & 6	HEADWORKS BLDG INFLUENT PUMP ROOM	113.0	11.3	0.53	2600	1/3	115-1ø	STERLING MODEL HS-156 NOTES 1 & 2
UH-7 & 8	OPERATIONS BLDG MEZZANINE/MAIN.	15.5	1.2	2.1	420	16 WATTS	115-1ø	STERLING MODEL HS-118A NOTES 1 & 2
UH-9	OPERATIONS BLDG BLOWER ROOM	15.5	1.2	2.1	420	16 WATTS	115-1ø	STERLING MODEL HS-118A NOTES 1 & 2
UH-10, 11 & 12	OPERATIONS BLDG THICKENING ROOM	18.0	1.9	2.2	500	16 WATTS	115-1ø	STERLING MODEL HS-118A NOTES 1 & 2
UH-13	OPERATIONS BLDG PUMP ROOM	15.5	1.2	2.1	420	16 WATTS	115-1ø	STERLING MODEL HS-118A NOTES 1 & 2
UH-14	OPERATIONS BLDG SLUDGE PUMP ROOM	15.5	1.2	2.1	420	16 WATTS	115-1ø	STERLING MODEL HS-118A NOTES 1 & 2

*BASED OF 180 F ENTERING WATER TEMPERATURE. 60°F EAT AND 20°F WATER TEMP DROP.

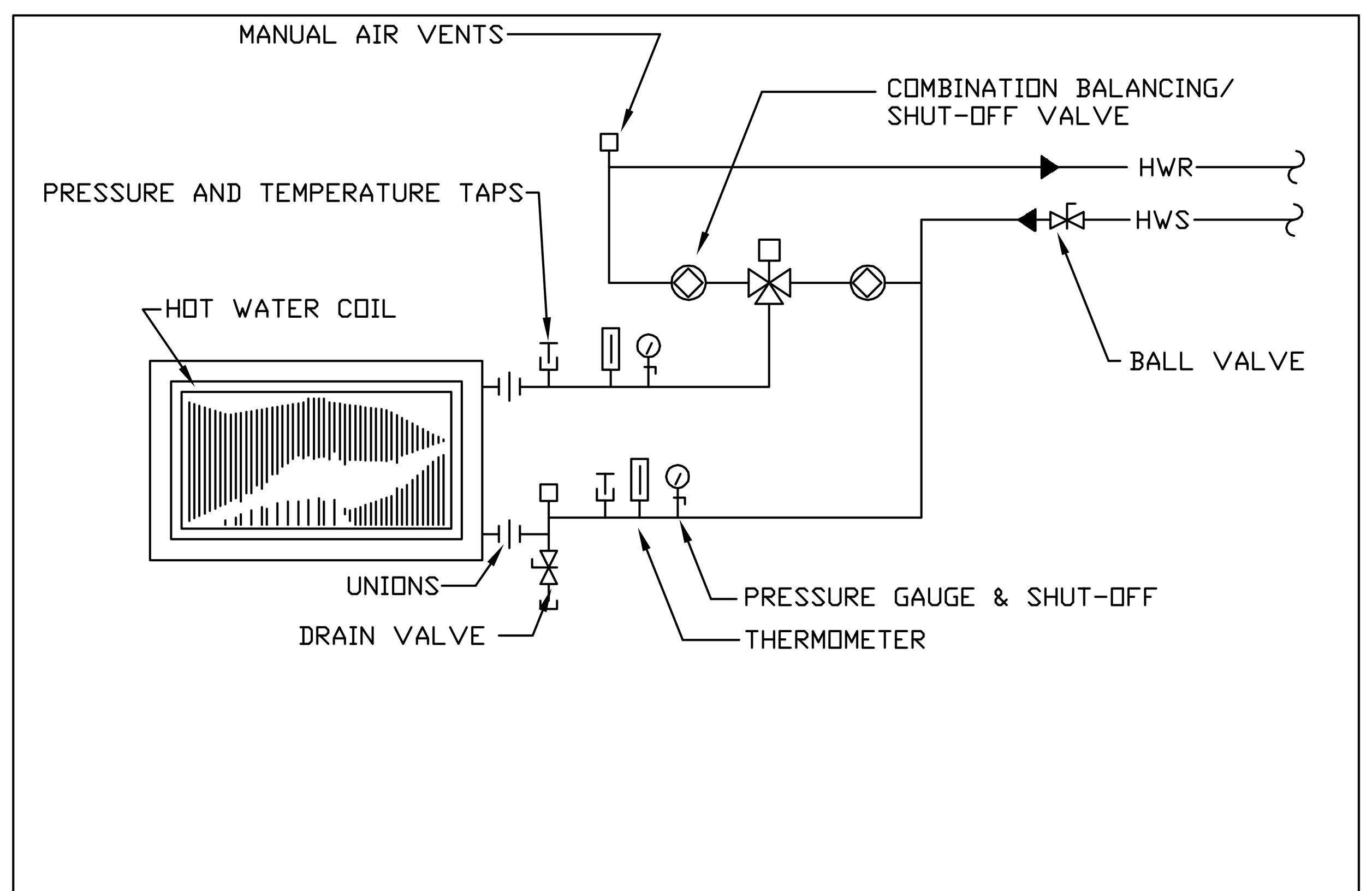
NOTES:
1. HANGER KIT, OSHA FAN GUARD, AIR DEFLECTION LOUVERS, PHENOLIC COATING (BAKED).
2. WALL MOUNTED THERMOSTAT.
3. EXPLOSION PROOF MOTOR AND WALL MOUNTED THERMOSTAT. (CLASS 1 DIV.1)

MECHANICAL DEMOLITION NOTES

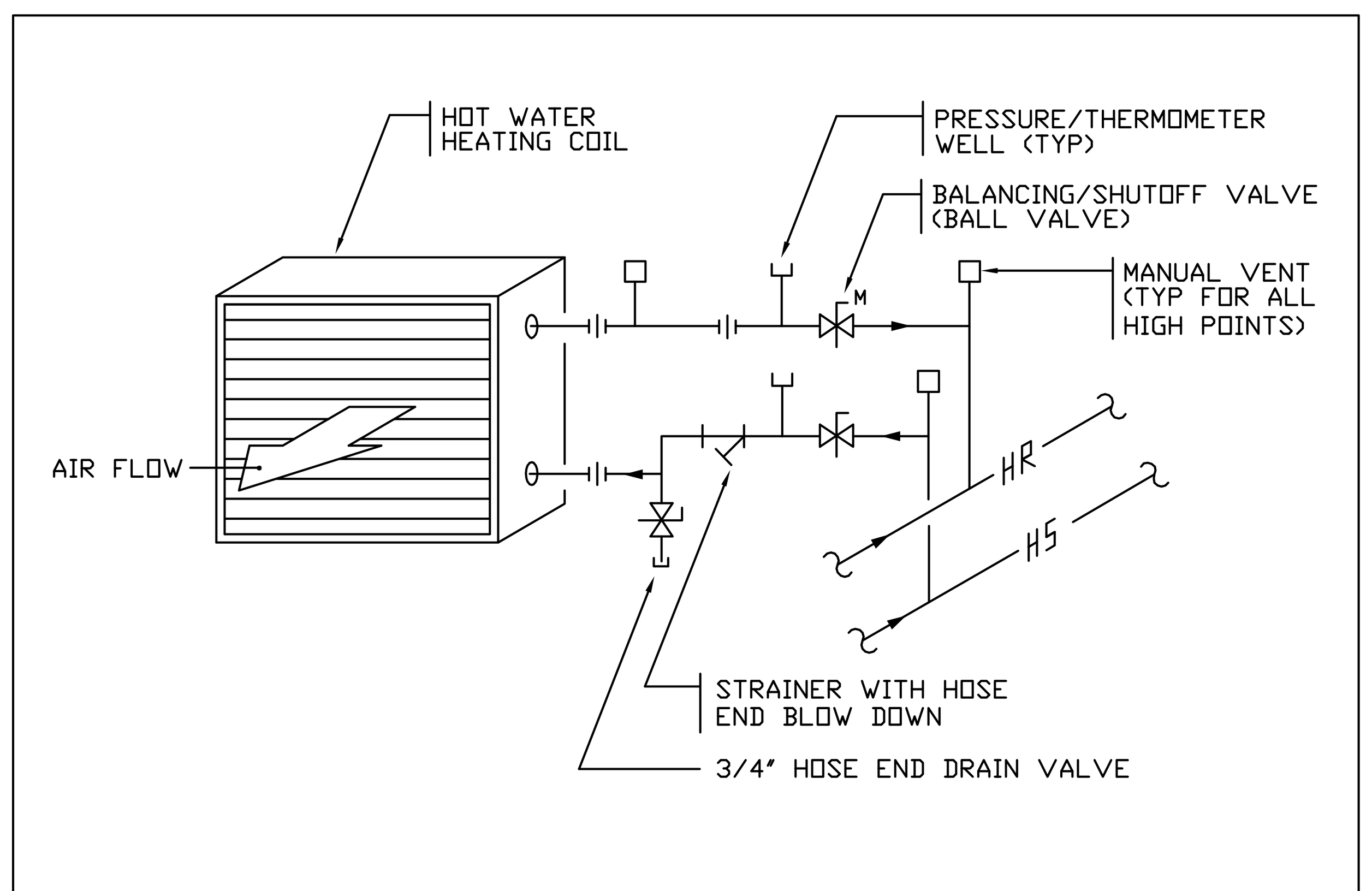
1. THE CONTRACTOR SHALL EXAMINE THE SITE PRIOR TO THE SUBMISSION OF PROPOSAL, AND BE FULLY COGNIZANT OF ALL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LAWS, ORDINANCES, STATE AND LOCAL CODES AND SHALL BE SUBJECT TO CONTROL OF PUBLIC AUTHORITIES HAVING JURISDICTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND BEARING COSTS OF NECESSARY PERMITS, BONDS, AND FEES FOR WORK. SECURE AND PAY ALL FEES FOR PERMITS, UTILITY CONNECTIONS, AND INSPECTION OF WORK.
4. ALL EXISTING PIPING, CONTROLS AND HVAC EQUIPMENT TO BE REMOVED SHALL BE PROPERLY DISPOSED OF FROM THE SITE.
5. ALL MATERIAL SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND TOWN LAWS INCLUDING ANY LIQUID.

HVAC GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL PROVIDE A SCHEDULE AND INSTALLATION OF WORK TO BE DONE AND APPROVED BY THE BUILDING MANAGEMENT.
2. HVAC CONTRACTOR SHALL PERFORM RIGGING OF EQUIPMENT DURING OFF-HOURS. A MOP WILL BE SUBMITTED TO THE CLIENT AND COORDINATE WITH THE PLANT MANAGER..
3. ALL WORK SHALL BE DONE IN MANNER SO AS NOT TO DAMAGE IN ANY WAY REMAINING STRUCTURE, WALLS, ROOF, ETC., THAT ARE TO BE REMAIN. THE WORK AREA SHALL BE PROTECTED BY THE HVAC CONTRACTOR. HE SHALL BE RESPONSIBLE FOR ANY DAMAGE.
4. THE HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP DUE TO HIS DEMOLITION AND LEAVE THE AREAS CLEAN NIGHTLY.
5. COORDINATE DUCTWORK AND PIPING WITH PLUMBING, FIRE PROTECTION AND ELECTRICAL. MAKE OFFSETS AND TRANSITIONS TO COORDINATE WITH OTHER TRADES WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND BEARING COSTS OF NECESSARY PERMITS, BONDS, AND FEES FOR WORK. SECURE AND PAY ALL FEES FOR PERMITS, UTILITY CONNECTIONS, AND INSPECTION OF WORK.
7. EXAMINE THE SITE PRIOR TO THE SUBMISSION OF PROPOSAL, AND BE FULLY COGNIZANT OF ALL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING AS REQUIRED FOR PROPER INSTALLATION OF THE MATERIAL AND EQUIPMENT.
9. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LAWS, ORDINANCES, STATE AND LOCAL CODES AND SHALL BE SUBJECT TO CONTROL OF PUBLIC AUTHORITIES HAVING JURISDICTION.
10. THE FINAL ARRANGEMENT OF THE WORK SHALL SUIT FIELD CONDITIONS. THE EXISTING SYSTEM MUST BE INSPECTED AND REVIEWED PRIOR TO BIDS. NO ADDITIONAL COSTS BEYOND THE PROPOSAL PRICE WILL BE ACCEPTED FOR FIELD CONDITIONS THAT COULD HAVE BEEN DETERMINED BY AN INSPECTION OF THE PREMISES.
11. THIS CONTRACTOR SHALL BALANCE ALL HEATING EQUIPMENT TO INDICATED GPM'S PER NEBB GUIDELINES. FURNISH BALANCING REPORT.
    AN INDEPENDENT TESTING, ADJUSTING, AND BALANCING AGENCY CERTIFIED BY ASSOCIATED AIR BALANCE COUNCIL (AABC) IN THOSE TESTING AND BALANCING DISCIPLINES REQUIRED FOR THIS PROJECT, AND HAVING AT LEAST ONE PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE SERVICES ARE TO BE PERFORMED, CERTIFIED BY AABC AS A TEST AND BALANCE ENGINEER.
    CODES AND STANDARDS:
    A. NEBB: "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS."
    B. AABC: "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE".
    C. ASHRAE: ASHRAE HANDBOOK, 2012 SYSTEMS VOLUME, CHAPTER 37, TESTING, ADJUSTING, AND BALANCING.
12. ALL HWS&R PIPING SHALL BE INSULATED WITH 1-1/2" THICK FIBERGLASS INSULATION, OR APPROVED EQUAL.
13. ALL NEW HWS&R PIPING, FITTING AND VALVES SHALL MATCH THE EXISTING PIPING MATERIAL FIELD VERIFY ALL EXISTING MATERIAL..
14. ALL HWS&R EXTERIOR PIPING SHALL HAVE PVC JACKET AND FITTING OVER INSULATION.
15. ANY AND ALL GLYCOL THAT IS REMAINING DUE TO REMOVAL AND OR INSTALLATION OF THE HEATING WILL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.



TYPICAL AHU HOT WATER COIL PIPING DETAIL NTS



UNIT HEATER HOT WATER COIL PIPING DETAIL NTS

MANCHESTER BY THE SEA MASSACHUSETTS

HEATING SYSTEM REPLACEMENT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

HVAC SCHEDULES DETAILS AND NOTES WASTE WATER TREATMENT

Rev.	Date	Description

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

WWTP-M1

CLEAN, SERVICE AND VERIFY THE GAS-FIRED BOILER IS FUNCTIONING PROPERLY INCLUDING ALL ASSOCIATED PUMPS VALVES, AND CONTROLS.
SERVICE AND VERIFY THE HOT WATER PUMPS ARE OPERATIONAL, REMOVE AND CLEAN STRAINERS.

PRESSURE TEST ALL HOT WATER SUPPLY AND RETURN PIPING FOR 24 HOURS. FLUSH OUT THE PIPING LOOP AND RE-CHARGE THE LOOP WITH 30% PROP. GLYCOL

REFER TO M-1 FOR PIPING SCHEMATIC, DETAILS, NOTES AND SCOPE OF WORK

3 5 6 8 E

AERATION BASIN NO 1

AERATION BASIN NO 2

BOILER ROOM

CIRCULATING PUMPS CP-1, 2, 3 & 4

1 1/2"

2 1/2"

BLR-1

2 1/2" HWS & HWR DN TO PUMP ROOM

BLOWER ROOM

20"x18"

2"

G

NOTE:
ALL EXISTING DUCTWORK, PIPING, WIRING SHALL REMAIN UNLESS OTHERWISE NOTED. ALL EXISTING SYSTEM IS SHOWN FOR FOR REFERENCE ONLY.

AHU-2 REMOVE AND REPLACE THE HOT WATER COIL AND ALL ASSOCIATED VALVES, PIPING COMPONENTS AND THERMOSTAT. REFER TO DRAWING M-1 FOR NOTES SCHEDULES AND RELATED WORK.

2" 2"

AHU-2

MEZZANINE

MAINTENANCE SHOP

AHU-3 TOP AT EL 23.75'

UH-7 UH-8

3/4"

3/4" DROP

1"

1 1/4"

1"

3/4"

ROOM TEMP SENSOR (TYP)

S

UH-9

UH-12

UH-10

REMOVE AND REPLACE ALL UNIT HEATERS AND ALL ASSOCIATED VALVES, PIPING COMPONENTS AND THERMOSTAT. REFER TO DRAWING M-1 FOR NOTES SCHEDULES AND RELATED WORK.

3/4"

UH-11

SLUDGE PUMP ROOM

SEPTAGE STORAGE TANK

WASTE SLUDGE STORAGE TANK

THICKENED SLUDGE STORAGE TANK NO 1

THICKENED SLUDGE STORAGE TANK NO 2

KEY PLAN

H

FIRST FLOOR PLAN II

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

MANCHESTER BY THE SEA
MASSACHUSETTS

HEATING SYSTEM REPLACEMENT

HVAC PLAN
WASTE WATER TREATMENT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

Rev.	Date	Description

TODD M MASON MECHANICAL No. 51230 REGISTERED PROFESSIONAL ENGINEER

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

WWTP-M2

NOTES:
1.CONTRACTOR TO EXCAVATE THE PIPING, INSTALL NEW PIPING, BACKFILL PER PIPING MANUFACTURES REQUIREMENT. THE PIPING DEPTH IS A MINIMUM OF 30" BELOW GRADE.
2. CONTRACTOR SHALL PAVE THE AREA WHICH WAS EXCAVATED, PER THE TOWNS PAVING GUIDELINES.

PROVIDE DRAIN POINT AT BASE OF RISE (TYP 2)

AERATION BASIN NO 1

AERATION BASIN NO 2

HEAT TRACE CONTROL PANEL AND ELECTRICAL 120/1/60 20 AMP CIRCUIT

RUN STACKED ON WALL AT CEILING BELOW BEAMS

2 1/2" HWS & HWR UP TO MEZZANINE

REMOVE AND REPLACE EXISTING 2-1/2" HWS & HWR UNDERGROUND PIPING BETWEEN THE TWO BUILDING APPROXIMATELY 45 FT WITH NEW PIPING. NEW PIPING IS 2-1/2" COPPER WITH 3/4" SELF REGULATING HEAT TRACE WITH 2" THICK PRE-INSULATED PIPING WITH FRP RESIN JACKET. PIPING BASED ON POLY-THERM PERMA-PIPE. PROVIDE 120/1/60 20 AMP CIRCUIT FOR HEAT TRACE. CARRY PIPING 12" INSIDEWALL ON BOTH ENDS. SEAL OPEN WALL OPENING.

UH-13

REMOVE AND REPLACE ALL UNIT HEATERS AND ALL ASSOCIATED VALVES, PIPING COMPONENTS AND THERMOSTAT. REFER TO DRAWING M-1 FOR NOTES SCHEDULES AND RELATED WORK.

PUMP ROOM

3/4"

RUN INTERFERENCE FREE AT CEILING

3/4"

ROOM TEMPERATURE SENSOR 7'-0" AFF

S

3/4" UP

CORE DRILL HOLES

3/4"

NOTE:
ALL EXISTING DUCTWORK, PIPING, WIRING SHALL REMAIN UNLESS OTHERWISE NOTED. ALL EXISTING SYSTEM IS SHOWN FOR FOR REFERENCE ONLY.

SLUDGE PUMP ROOM

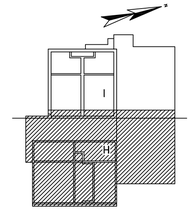
SEPTAGE STORAGE TANK

UH-14

WASTE SLUDGE STORAGE TANK

THICKENED SLUDGE STORAGE TANK NO 1

THICKENED SLUDGE STORAGE TANK NO 2



KEY PLAN

LOWER LEVEL FLOOR PLAN
SCALE: 1/4" = 1'-0"

MANCHESTER BY THE SEA
MASSACHUSETTS

HEATING SYSTEM REPLACEMENT

HVAC PLAN
WASTE WATER TREATMENT

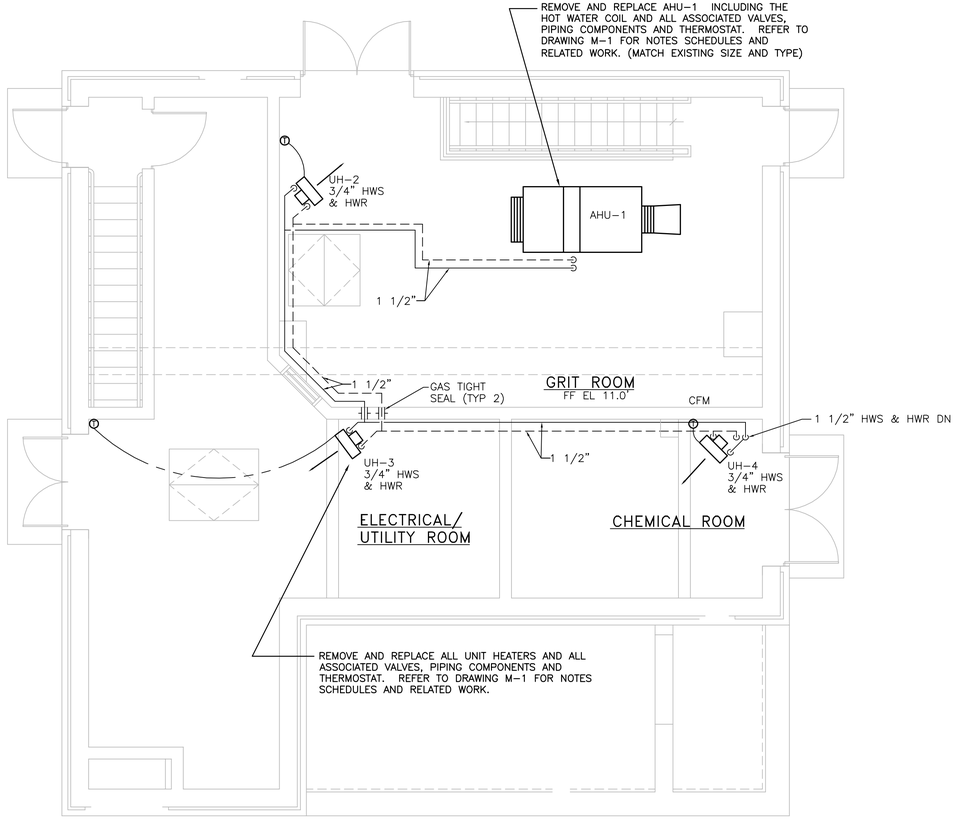
Rev.	Date	Description	Drawn By: MW	Designed By: TMM	Checked By: TMM	Approved By: TMM

TODD M. BASONI MECHANICAL NO. 41330 REGISTERED PROFESSIONAL ENGINEER

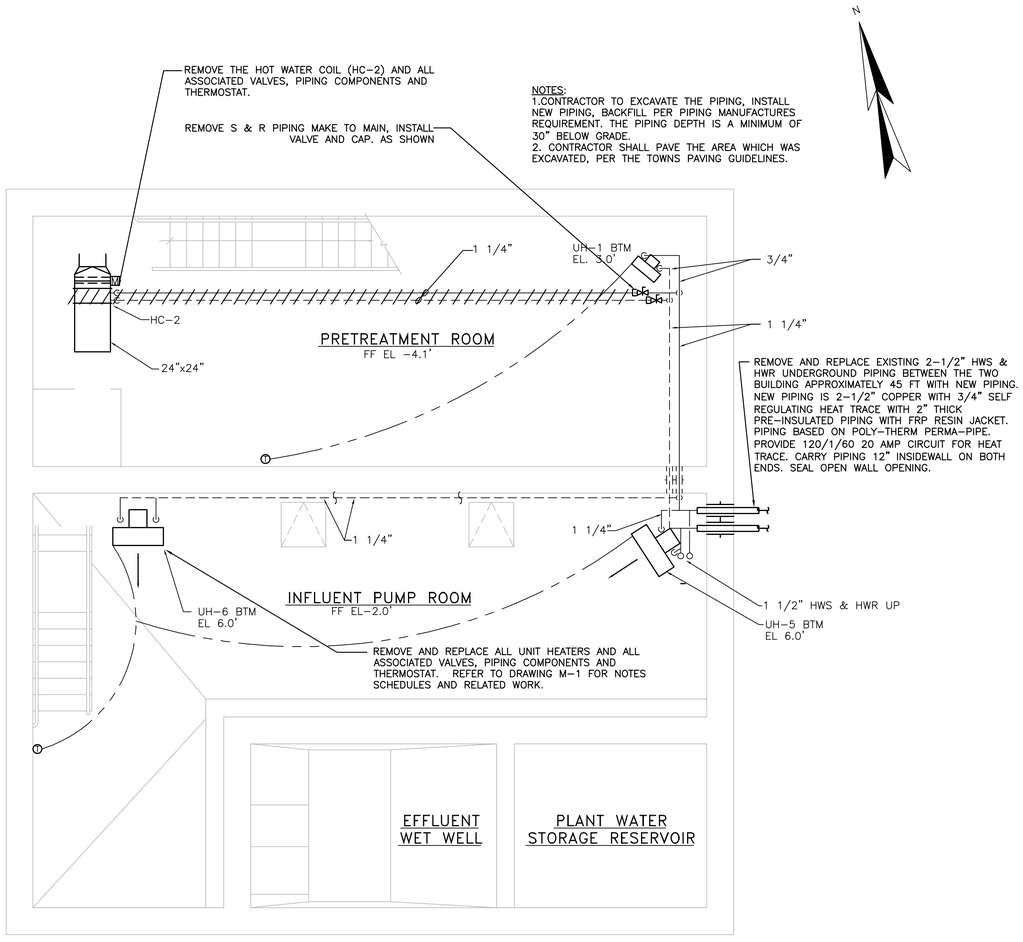
TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

WWTP-M3



PLAN-EL. 11.0'
SCALE: 1/4" = 1'-0"



NOTE:
ALL EXISTING DUCTWORK, PIPING, WIRING SHALL REMAIN UNLESS OTHERWISE NOTED. ALL EXISTING SYSTEM IS SHOWN FOR FOR REFERENCE ONLY.

PLAN-EL.-2.0' & -4.0
SCALE: 1/4" = 1'-0"

MANCHESTER BY THE SEA
MASSACHUSETTS

HEATING SYSTEM REPLACEMENT

HVAC PLAN
WASTE WATER TREATMENT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

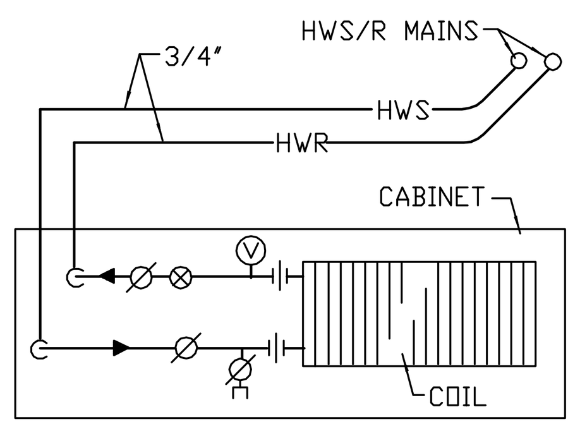
Rev.	Date	Description

COMMONWEALTH OF MASSACHUSETTS
TODD M MASON
MECHANICAL
NO. 51330
REGISTERED PROFESSIONAL ENGINEER

TATA & HOWARD

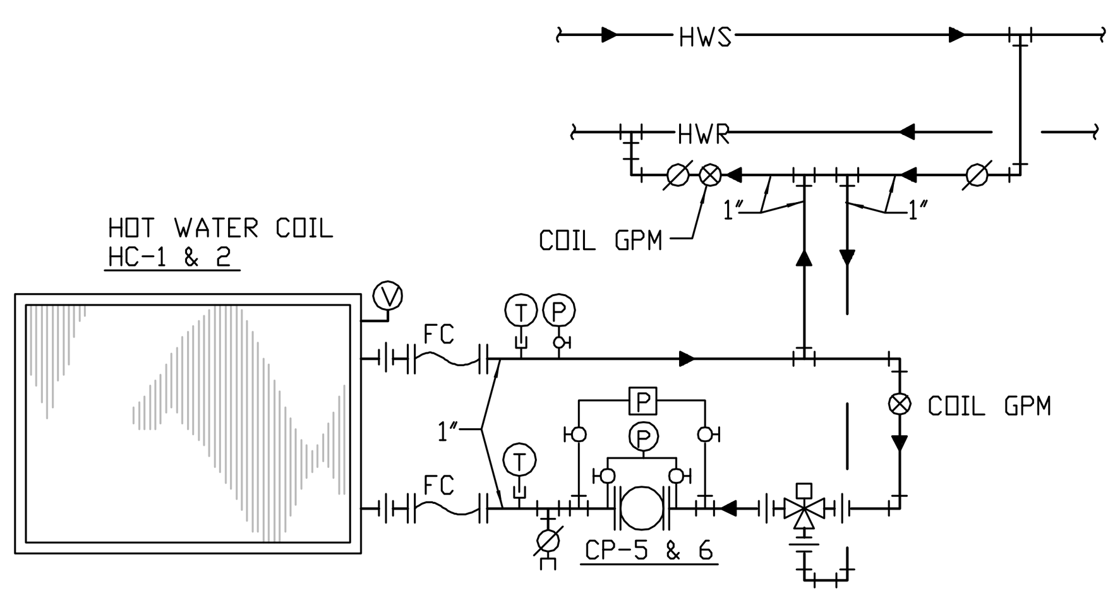
T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

WWTP-M4



CABINET UNIT HEATER PIPING DETAIL

NTS WALL HEATERS TYPICAL.
SEE FINTUBE DETAIL FOR CUH-4.



SECONDARY PUMPING HEATING COIL PIPING SCHEMATIC

NTS

SCOPE OF WORK:

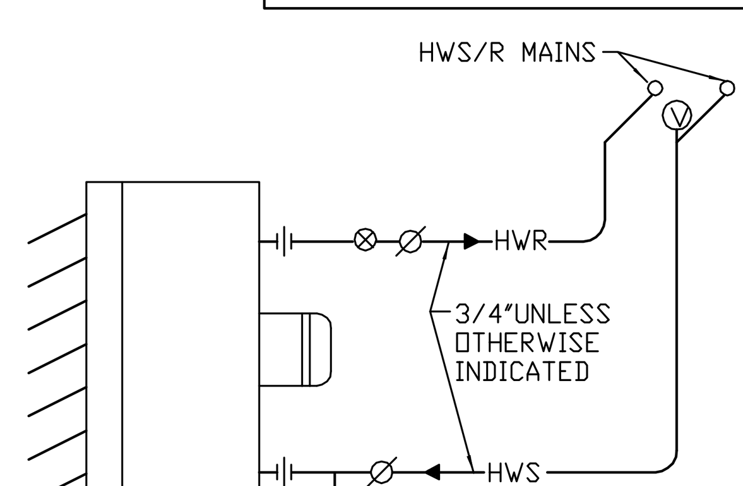
- CLEAN AND SERVICE AND VERIFY ALL ASSOCIATED VALVES ARE FUNCTIONING PROPERLY IN ALL THE HOT WATER HEATING COILS INCLUDING UNIT HEATERS, CABINET UNIT HEATER CUH-5 AND AHU-1 & AHU-2 COILS. VERIFY THE ASSOCIATED THERMOSTATS ARE WORKING PROPERLY.
- PERFORM A FULL SERVICE AND CLEANING ON THE EXISTING OIL-FIRED BOILER: INCLUDING REPLACING THE FUEL OIL FILTER, PRESSURE AND TEMPERATURE RELIEF VALVE. REPLACE EXISTING OIL BURNER INCLUDING THE CONTROL TRANSFORMER.
- SERVICE AND VERIFY THE HOT WATER PUMPS ARE OPERATING PROPERLY. REMOVE AND CLEAN STRAINERS.
- PRESSURE TEST ALL HOT WATER SUPPLY AND RETURN PIPING FOR 24 HOURS. REPLACE PIPING AS NEEDED.
- INSTALL NEW FIBERGLASS INSULATION ON HOT WATER SUPPLY AND RETURN PIPING THAT IS MISSING INSULATION.
- FLUSH OUT THE PIPING LOOP AND RE-CHARGE THE HOT WATER PIPING LOOP WITH GLYCOL (MINIMUM 20%)

DURING THE INITIAL HEATING SYSTEM INSPECTION IF ANY HEATING COMPONENTS FAIL OR NOT WORKING PROPERLY THEN PROCEDURE WITH THE FOLLOWING BULLETS LISTED BELOW:

- REMOVE AND REPLACE ALL UNIT HEATERS WITH NEW CORROSION RESISTANCE INCLUDING SHUT-OFF, BALANCING, CONTROL VALVES AND THERMOSTATS AND CONTROL WIRING. TOTAL OF 12 UNIT HEATERS PER DRAWINGS.
- REMOVE AND REPLACE CABINET UNIT HEATER CUH-5 WITH NEW CORROSION RESISTANCE INCLUDNG SHUT-OFF, BALANCING, CONTROL VALVES AND THERMOSTATS. REFER TO CABINET UNIT HEATERS SCHEDULE PER DRAWINGS.
- REMOVE AND REPLACE INDUCT HOT WATER COILS HC-1 (IN AHU-1) AND HC-2 (INCLUDING SHUT-OFF VALVES, BALANCING, CONTROL VALVES AND STRAINERS.
- REPLACE WALL MOUNTED THERMOSTATS. PROVIDE NEW CEILING/WALL MOUNTING BRACKETS FOR THE UNIT HEATERS.
- VERIFY OIL-PIPING LEAK DETECTION SYSTEM SERVING THE BOILER IS FUNCTIONAL.

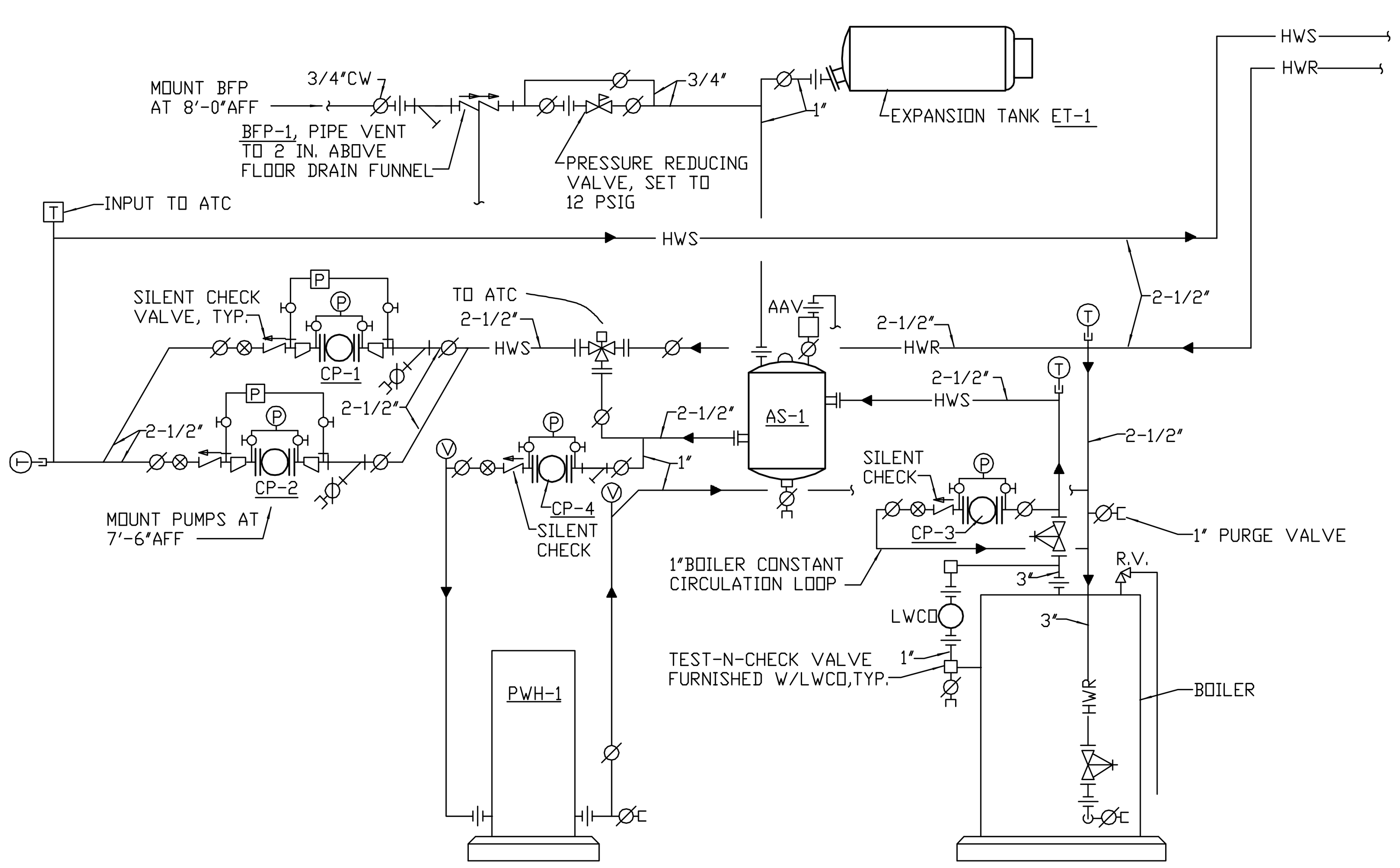
NOTE:
SERVICE WORK SHALL BE DONE IN ACCORDANCE OF ASHRAE STANDARD 180-2012 "STANDARD PRACTICE FOR INSPECTION AND MAINTENANCE OF COMMERCIAL BUILDING HVAC SYSTEMS" TABLE 5-6 BOILERS, TABLE 5-14 FAN COIL AND UNIT HEATERS AND TABLE 5-19 PUMPS

NOTE:
DETAILS, SCHEDULES AND SCHEMATICS ARE FOR REFERENCE ONLY IF THE HVAC EQUIPMENT, AND ALL ASSOCIATED PIPING NEED TO BE REPLACED AFTER THE TESTING OF THE SYSTEM HAS BEEN COMPLETED



HORIZONTAL UNIT HEATER PIPING DETAIL

NTS



BOILER PIPING SCHEMATIC

NTS

EXISTING PUMP SCHEDULE FOR REFERENCE ONLY										
PUMP NO.	LOCATION	SYSTEM	CIRCULATING FLUID			TYPE	MOTOR			
			FLUID	GPM	PUMP HEAD FEET FLUID		NOM. HP.	VOLT PHASE	RPM	COMMENTS
CP-1 & 2	BOILER ROOM	HEATING SYSTEM	WATER	61	48	IN-LINE	1.5	460/3ø	1750	EQUAL TO TACO MODEL
CP-3	BOILER ROOM	HEATING SYSTEM	WATER	61	48	IN-LINE	1/15	120/1ø	3250	EQUAL TO TACO MODEL
CP-4	BOILER ROOM	HEATING SYSTEM	WATER	61	48	IN-LINE	1/9	120/1ø	3250	EQUAL TO TACO MODEL
CP-5	BOILER ROOM	HEATING SYSTEM	WATER	61	48	IN-LINE	1/25	120/1ø	3250	EQUAL TO TACO MODEL
CP-6	BOILER ROOM	HEATING SYSTEM	WATER	61	48	IN-LINE	1/15	120/1ø	3250	EQUAL TO TACO MODEL

EXISTING HEATING COIL SCHEDULE											
LOCATION	TAG	COIL	COIL SIZE	ROWS/FS	AIR △ P	FLUID △ P	LVG AIR TEMP.	MBH	GPM	CFM	WTD
AHU-1	HC-1	SUPPLY	FIELD VERIFY	FIELD VERIFY	.10"	0.21'	* 80.0°F	184.8	8.0	2,840	30°F
AHU-2	HC-2	SUPPLY	FIELD VERIFY	FIELD VERIFY	.08"	0.55'	** 95.0°F	113.9	6.0	1,000	30°F

* BASED ON ENTERING AIR TEMPERATURE OF 20°F
** BASED ON ENTERING AIR TEMPERATURE OF -10.0°F

EXISTING HOT WATER UNIT HEATER SCHEDULE								
UNIT NO.	SPACE SERVED	MBH	CFM	GPM	P.D. H.W.	HP	VOLTS-PHASE	REMARKS
UH-1	FILTER ROOM	83.7	2800	3.5	.07	1/6	115-1ø	DUNHAM-BUSH NOTES 1 & 2
UH-2	FILTER ROOM	83.7	2800	3.5	.07	1/6	115-1ø	DUNHAM-BUSH NOTES 1 & 2
UH-3	FILTER ROOM	83.7	2800	3.5	.07	1/6	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2
UH-4	FILTER ROOM	83.7	2800	3.5	.07	1/6	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2
UH-5	CHEMICAL FEED	17.6	600	1.2	.02	1/30	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2
UH-6	POLYMER ROOM	17.6	600	1.2	.02	1/30	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2
UH-7	STORAGE ROOM	48.0	1700	2.0	.04	1/8	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2
UH-8	STORAGE ROOM	48.0	1700	2.0	.04	1/8	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2
UH-9	GARAGE PUMP ROOM	83.7	2800	3.5	.07	1/6	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2
UH-10	BOILER ROOM	17.6	600	1.2	.02	1/25	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2
UH-12	LOADING STORAGE	48.0	1700	1.55	.04	1/8	115-1ø	DUNHAM-BUSH MODEL NOTES 1 & 2

*BASED OF 180 F ENTERING WATER TEMPERATURE. 60°F EAT AND 20°F WATER TEMP DROP.
NOTES: 1. HANGER KIT, OSHA FAN GUARD, AIR DEFLECTION LOUVERS, PHENOLIC COATING (BAKED).
2. WALL MOUNTED THERMOSTAT.

HVAC GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL PROVIDE A SCHEDULE AN INSTALLATION OF WORK TO BE DONE AND APPROVED BY THE BUILDING MANAGEMENT.
2. HVAC CONTRACTOR SHALL PERFORM RIGGING OF EQUIPMENT DURING OFF-HOURS. A MOP WILL BE SUBMITTED TO THE CLIENT AND BUILDING MANAGEMENT.
3. ALL WORK SHALL BE DONE IN MANNER SO AS NOT TO DAMAGE IN ANY WAY REMAINING STRUCTURE, WALLS, ROOF, ETC., THAT ARE TO BE REMAIN. THE WORK AREA SHALL BE PROTECTED BY THE HVAC CONTRACTOR. HE SHALL BE RESPONSIBLE FOR ANY DAMAGE.
4. THE HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP DUE TO HIS DEMOLITION AND LEAVE THE AREAS CLEAN NIGHTLY.
5. COORDINATE DUCTWORK AND PIPING WITH PLUMBING, FIRE PROTECTION AND ELECTRICAL. MAKE OFFSETS AND TRANSITIONS TO COORDINATE WITH OTHER TRADES WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND BEARING COSTS OF NECESSARY PERMITS, BONDS, AND FEES FOR WORK. SECURE AND PAY ALL FEES FOR PERMITS, UTILITY CONNECTIONS, AND INSPECTION OF WORK.
7. EXAMINE THE SITE PRIOR TO THE SUBMISSION OF PROPOSAL, AND BE FULLY COGNIZANT OF ALL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING AS REQUIRED FOR PROPER INSTALLATION OF THE MATERIAL AND EQUIPMENT.
9. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LAWS, ORDINANCES, STATE AND LOCAL CODES AND SHALL BE SUBJECT TO CONTROL OF PUBLIC AUTHORITIES HAVING JURISDICTION.
10. THE FINAL ARRANGEMENT OF THE WORK SHALL SUIT FIELD CONDITIONS. THE EXISTING SYSTEM MUST BE INSPECTED AND REVIEWED PRIOR TO BIDS. NO ADDITIONAL COSTS BEYOND THE PROPOSAL PRICE WILL BE ACCEPTED FOR FIELD CONDITIONS THAT COULD HAVE BEEN DETERMINED BY AN INSPECTION OF THE PREMISES.
11. THIS CONTRACTOR SHALL BALANCE ALL HEATING EQUIPMENT TO INDICATED GPM'S PER NEBB GUIDELINES. FURNISH BALANCING REPORT.
AN INDEPENDENT TESTING, ADJUSTING, AND BALANCING AGENCY CERTIFIED BY ASSOCIATED AIR BALANCE COUNCIL (AABC) IN THOSE TESTING AND BALANCING DISCIPLINES REQUIRED FOR THIS PROJECT, AND HAVING AT LEAST ONE PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE SERVICES ARE TO BE PERFORMED, CERTIFIED BY AABC AS A TEST AND BALANCE ENGINEER.
CODES AND STANDARDS:
A. NEBB: "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS."
B. AABC: "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE".
C. ASHRAE: ASHRAE HANDBOOK, 2012 SYSTEMS VOLUME, CHAPTER 37, TESTING, ADJUSTING, AND BALANCING.
12. ALL HWS&R PIPING SHALL BE INSULATED WITH 1-1/2" THICK FIBERGLASS INSULATION, OR APPROVED EQUAL.
13. ALL NEW HWS&R PIPING, FITTING AND VALVES SHALL MATCH THE EXISTING PIPING MATERIAL FIELD VERIFY ALL EXISTING MATERIAL..
14. ALL HWS&R EXTERIOR PIPING SHALL HAVE PVC JACKET AND FITTING OVER INSULATION.
15. ANY AND ALL GLYCOL THAT IS REMAINING DUE TO REMOVAL AND OR INSTALLATION OF THE HEATING WILL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

MECHANICAL DEMOLITION NOTES

1. THE CONTRACTOR SHALL EXAMINE THE SITE PRIOR TO THE SUBMISSION OF PROPOSAL, AND BE FULLY COGNIZANT OF ALL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LAWS, ORDINANCES, STATE AND LOCAL CODES AND SHALL BE SUBJECT TO CONTROL OF PUBLIC AUTHORITIES HAVING JURISDICTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND BEARING COSTS OF NECESSARY PERMITS, BONDS, AND FEES FOR WORK. SECURE AND PAY ALL FEES FOR PERMITS, UTILITY CONNECTIONS, AND INSPECTION OF WORK.
4. ALL EXISTING PIPING, CONTROLS AND HVAC EQUIPMENT TO BE REMOVED SHALL BE PROPERLY DISPOSED OF FROM THE SITE.
5. ALL MATERIAL SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND TOWN LAWS INCLUDING ANY LIQUID.

MANCHESTER BY THE SEA
MASSACHUSETTS

HEATING SYSTEM
REPLACEMENT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

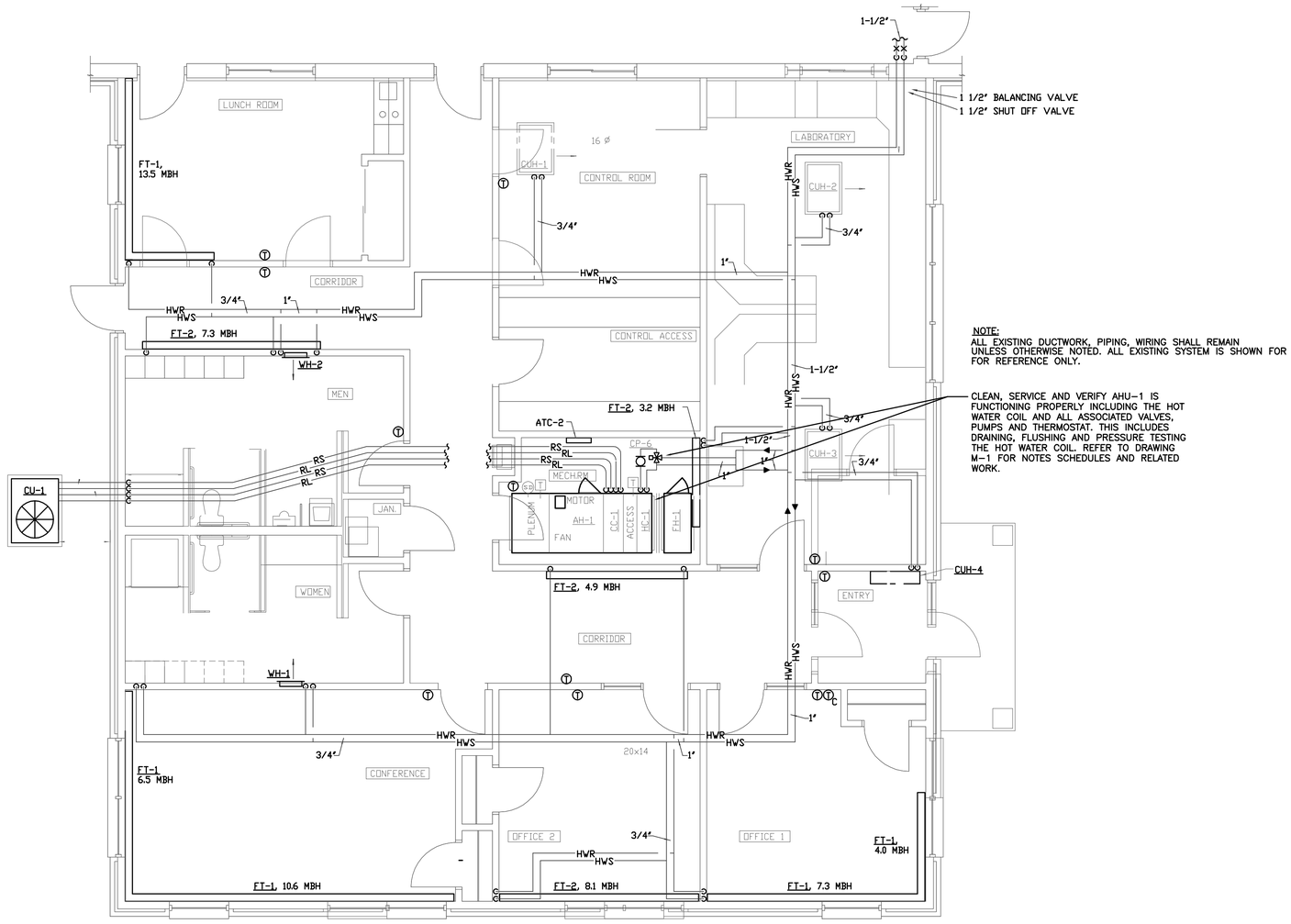
HVAC SCHEDULES
DETAILS AND NOTES
WATER TREATMENT PLANT

Rev.	Date	Description

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

WTP-M1



NOTE:
ALL EXISTING DUCTWORK, PIPING, WIRING SHALL REMAIN UNLESS OTHERWISE NOTED. ALL EXISTING SYSTEM IS SHOWN FOR FOR REFERENCE ONLY.

CLEAN, SERVICE AND VERIFY AHU-1 IS FUNCTIONING PROPERLY INCLUDING THE HOT WATER COIL AND ALL ASSOCIATED VALVES, PUMPS AND THERMOSTAT. THIS INCLUDES DRAINING, FLUSHING AND PRESSURE TESTING THE HOT WATER COIL. REFER TO DRAWING M-1 FOR NOTES SCHEDULES AND RELATED WORK.

HVAC PLAN, ADMINISTRATION AREA

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

MANCHESTER BY THE SEA
MASSACHUSETTS

HEATING SYSTEM
REPLACEMENT

HVAC PLAN
WATER TREATMENT PLANT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

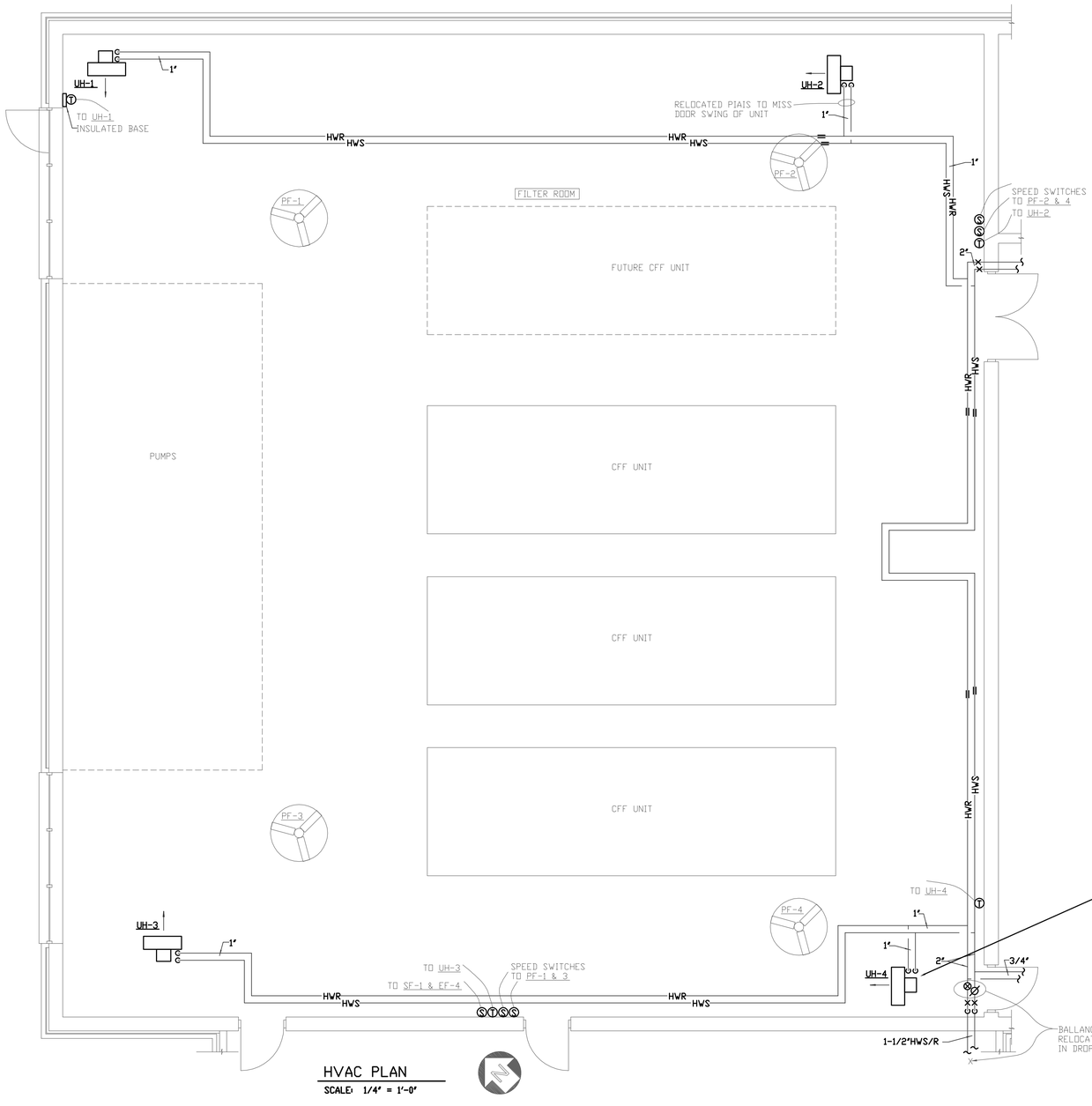
Rev.	Date	Description

TODD H MASON MECHANICAL

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

WTP-M2



HVAC PLAN

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

NOTE:
ALL EXISTING DUCTWORK, PIPING, WIRING SHALL REMAIN UNLESS OTHERWISE NOTED. ALL EXISTING SYSTEM IS SHOWN FOR FOR REFERENCE ONLY.

CLEAN, SERVICE AND VERIFY ALL UNIT HEATERS ARE FUNCTIONING PROPERLY INCLUDING ALL ASSOCIATED VALVES, AND THERMOSTAT. THIS INCLUDES DRAINING, FLUSHING AND PRESSURE TESTING THE HOT WATER COIL. REFER TO DRAWING M-1 FOR NOTES SCHEDULES AND RELATED WORK.

MANCHESTER BY THE SEA
MASSACHUSETTS

HEATING SYSTEM
REPLACEMENT

HVAC PLAN
WATER TREATMENT PLANT

Rev.	Date	Description

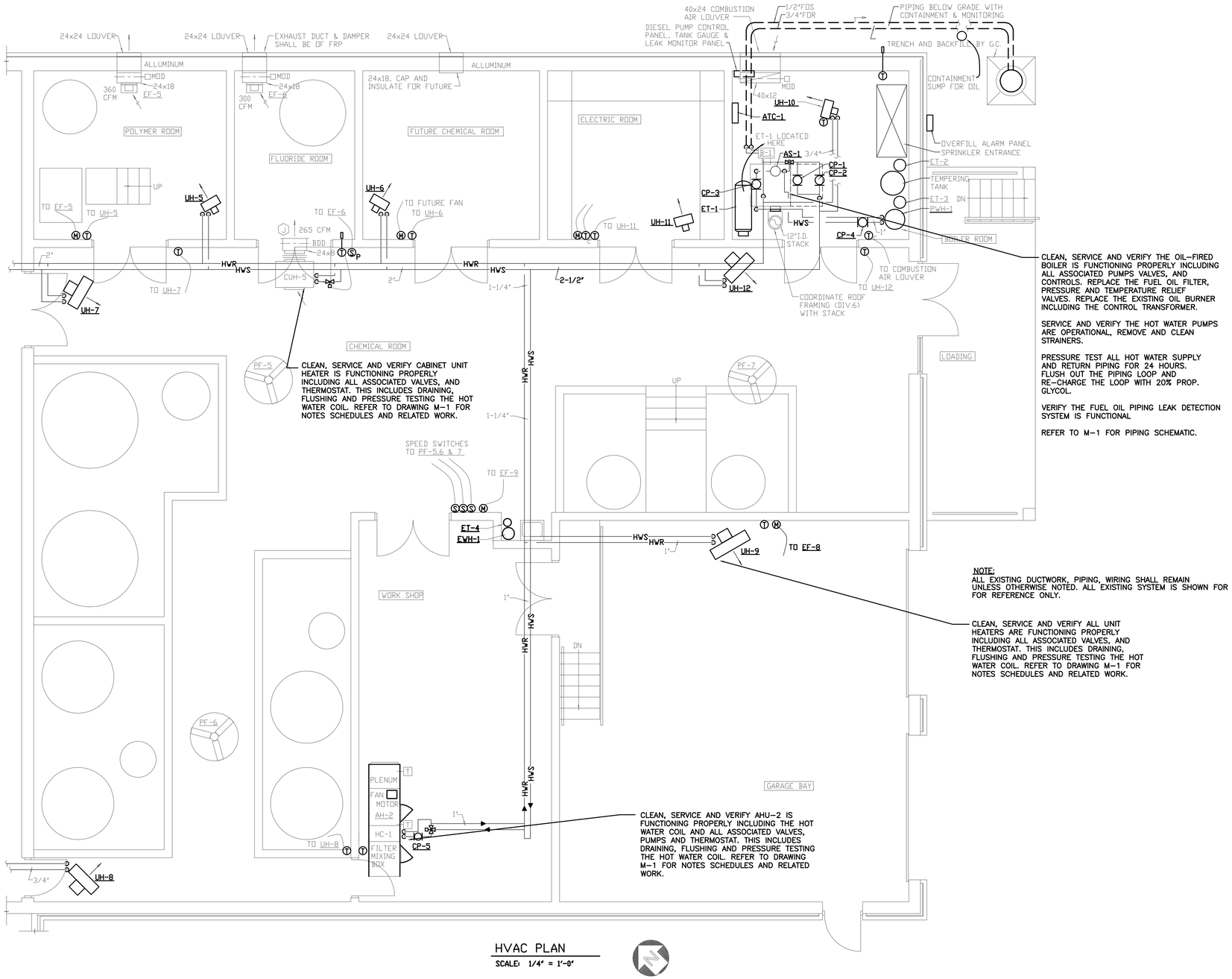
Designed By: TMM
Drawn By: MW
Checked By: TMM
Approved By: TMM

TODD M MASON MECHANICAL

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

WTP-M3



HVAC PLAN

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

MANCHESTER BY THE SEA
MASSACHUSETTS

HEATING SYSTEM REPLACEMENT

HVAC PLAN
WATER TREATMENT PLANT

Rev.	Date	Description	Drawn By: MW	Designed By: TMM	Checked By: TMM	Approved By: TMM

TODD M MASON MECHANICAL No. 51,520 REGISTERED PROFESSIONAL ENGINEER

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

WTP-M4

MODEL GVU-6
GAS DETECTOR
GUIDE SPECIFICATION

GUIDE SPECIFICATION

PROVIDE TOXALERT MODEL GVU-6 GAS DETECTION & CONTROL SYSTEM AS SPECIFIED.

REMOTE SENSORS:

CARBON MONOXIDE SENSOR
PROVIDE A MODEL GVU-CO REMOTE CARBON MONOXIDE (CO) SENSOR(S) AS LOCATED ON THE DRAWINGS. THE REMOTE CO SENSOR SHALL UTILIZE A SOLID STATE SENSING ELEMENT, BE MICRO PROCESSOR BASED AND BE BOTH TEMPERATURE AND HUMIDITY COMPENSATED FOR LONG LIFE AND STABILITY. PILOT LIGHTS OR LEDS (LIGHT EMITTING DIODES) SHALL INDICATE: A) UNIT NORMAL OPERATION/NOT IN ALARM, B) HIGH CO/UNIT IN ALARM, AND C) SHALL INDICATE UNIT MALFUNCTION.

IN THE UNIT MALFUNCTION CONDITION THE CO SENSORS OUTPUT SHALL BE FAIL-SAFE AND INDICATE STEADY HIGH CO CONDITION. THE CO SENSOR RANGE SHALL BE 0 TO 250 PPM AND SHALL BE POWER BY LOW VOLTAGE FROM THE GVU-6 CONTROL UNIT.

THE SENSOR SHALL BE MODEL GVU-CO AS MANUFACTURED BY TOXALERT INTERNATIONAL.

NITROGEN DIOXIDE SENSOR
PROVIDE A MODEL GVU-NO2 NITROGEN DIOXIDE (NO2) SENSOR(S) AS LOCATED ON THE DRAWINGS. THE REMOTE NO2 SENSOR SHALL UTILIZE AN ELECTRO-CHEMICAL ELEMENT AND HAVE RANGE OF 0-10 PPM. THE SENSOR SHALL BE HOUSED IN AN IMPACT-RESISTANT, NON-FLAMMABLE, IP66 RATED HOUSING. THE SENSOR RESPONSE TIME SHALL REACH 90% OF LEVEL BEING SENSED WITHIN 30 SECONDS. THE SENSOR SHALL BE POWERED BY LOW VOLTAGE FROM THE GVU-6 CONTROL UNIT AND HAVE A SELF CHECK CAPABILITY AND AN LED TO INDICATE SENSOR OKAY.

THE SENSOR SHALL BE MODEL GVU-NO2 AS MANUFACTURED BY TOXALERT INTERNATIONAL.

SYSTEM VENTILATION CONTROLLER:

THE SYSTEM CONTROLLER SHALL CONTINUOUSLY MONITOR ITS REMOTE SENSORS. WHEN AN ALARM CONDITION IS DETECTED THE CONTROLLER SHALL DELAY EXHAUST FAN CONTACT CLOSURE FOR 30 SECONDS. IF THE HIGH GAS LEVEL CONDITION PERSISTS FOR MORE THAN 30 SECONDS THE EXHAUST FAN CONTACTS SHALL CLOSE. THE MINIMUM FAN ON TIME SHALL BE FIELD SETTABLE FROM 5 TO 55 MINUTES, IN 5 MINUTE INCREMENTS. SHOULD THE ALARM CONDITION REMAIN AFTER THE MINIMUM RUN TIME HAS TIMED OUT, THE EXHAUST FAN CONTACTS SHALL REMAIN CLOSED (ON) AND A SECONDALARM SET OF CONTACTS SHALL CLOSE.
AN AUDIBLE ALARM IS SOUNDED AND ALARM LIGHT(S) ARE LIGHTED. THIS CONDITION IS MAINTAINED UNTIL THE HIGH GAS LEVEL DROPS.

THE CONTROLLER SHALL BE POWERED BY 120 VAC, 60HZ, 1A (FUSED) AND PROVIDE ALL LOW VOLTAGE POWER TO REMOTE SENSORS. 24 VAC, 2A RESISTIVE, 1.5A INDUCTIVE AUXILIARY RELAY CONTACTS SHALL BE PROVIDED FOR REMOTE CONTROL.

THE CONTROLLER SHALL BE MODEL GVU-6 AS MANUFACTURED BY TOXALERT INTERNATIONAL.

OPTIONS THAT WILL BE ADDED TO THE GVU-6 CONTROLLER:

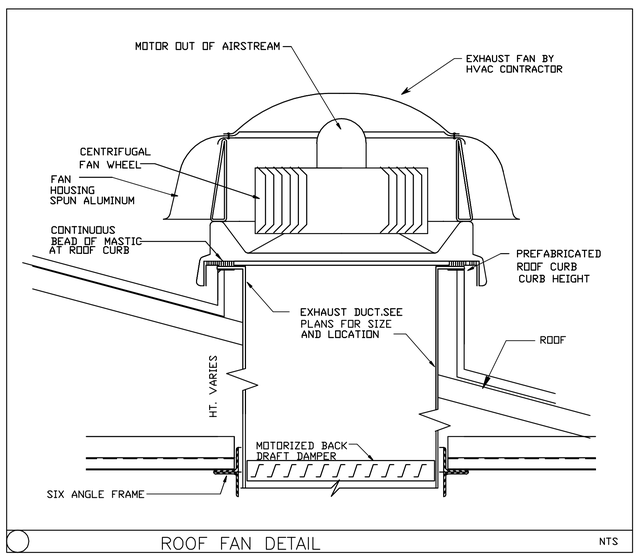
- POWER "ON" INDICATOR ON FACE OF CONTROLLER TO INDICATE POWER TO SYSTEM.
- LED ON FACE OF PANEL TO INDICATE HIGH GAS ALARM CONDITION. ONE FOR EACH SENSOR.
- FAN "ON" INDICATOR ON FACE OF CONTROLLER TO INDICATE FAN STAGE.
- AUDIBLE AND VISUAL ALARM. HORN HAS SILENCE SWITCH.
- KEYED PANEL LOCK
- REMOTE ALARM PANEL.

SPECIFICATION PARAGRAPHS FOR ABOVE OPTIONS.
1) PROVIDE CLEARLY LABELED LIGHT EMITTING DIODES (LED'S) ON FACE OF THE CONTROLLER PANEL TO INDICATE THE FOLLOWING:

a) POWER "ON" TO SYSTEM – GREEN LED
b) RED LED FOR EACH SENSOR TO INDICATE HIGH GAS LEVEL CONDITIONS (WARNING & ALARM LEVELS).
c) AMBER LED TO INDICATE FAN ON.
d) RED LED TO INDICATE ALARM CONDITION.

2) PROVIDE AN AUDIBLE ALARM WITH A MINIMUM SOUND INTENSITY OF 68DB, ON THE FACE OF THE CONTROL PANEL. PROVIDE AN "AUDIBLE RESET" PUSH BUTTON SWITCH TO SILENCE THE AUDIBLE. AUDIBLE SILENCE CIRCUIT SHALL BE SELF RESETTING SO THAT AFTER ALARM IS CLEARED THE AUDIBLE ALARM WILL AUTOMATICALLY RESOUND ON THE NEXT ALARM ACTIVATION.

3) PROVIDE A REMOTE ALARM PANEL AND MOUNT WHERE INDICATED ON THE PLANS. THE REMOTE ALARM PANEL SHALL INCLUDE A RED LED ALARM INDICATOR AND AN AUDIBLE ALARM, WITH A MINIMUM SOUND INTENSITY OF 68DB. PROVIDE AN "AUDIBLE RESET" MOMENTARY PUSH SWITCH TO SILENCE THE AUDIBLE. THE ALARM LED MUST STAY LIGHTED AS LONG AS THE ALARM CONDITION PERSISTS.



ROOF FAN DETAIL NTS

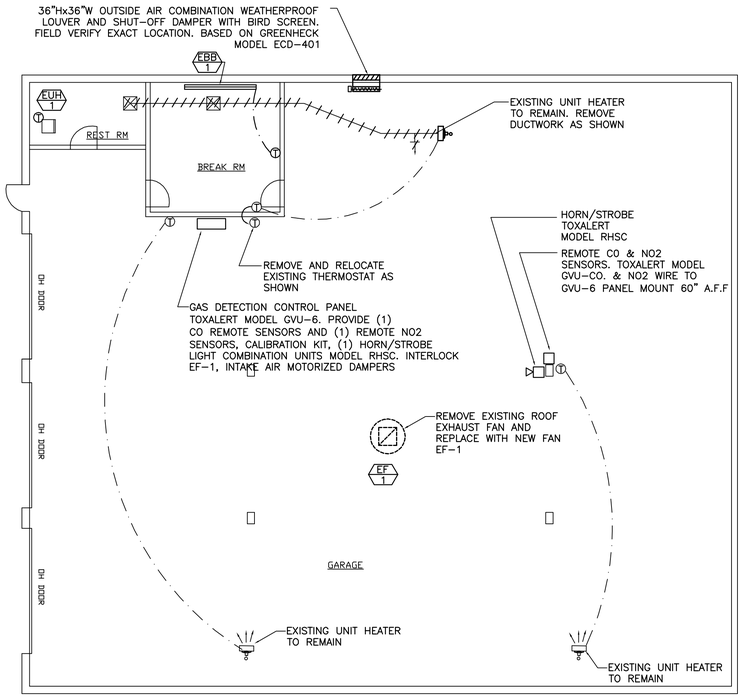
ELECTRIC HEATER SCHEDULE (EUH)

UNIT NO.	TYPE	MBH	ELEC COIL			MOTOR DATA @ 60 HZ				SELECTION BASED ON	REMARKS
			CFM	KW	AMPS	HP	RPM	VOLT	PH		
EUH-1	ELECT. CLG. HEATER	5.1	100	1.5	12.5	1/10	1550	120	1	QMARK EFI 1500	SURFACE MOUNT FRAME BUILD IN THERMOSTAT
EBB-1	ELECT. BASEBOARD	6.8	–	2.0	9.6	–	–	208	1	QMARK CBD2008	WALL MOUNTED THERMOSTAT

FAN SCHEDULE (EF)

MARK	CFM	S.P.	RPM	ELECTRICAL			HP	TYPE	SERVICE	MFG	ROOF/WALL OPENING	ACCESSORIES
				VOLT	Ø	HZ						
EF-1	4000	1.0	1420	480	3	60	1-1/2	ROOF BELT DRIVE	GARAGE	GREENHECK	20.5"x20.5"	ROOF CURB, BIRD SCREEN MOTORIZED DAMPER

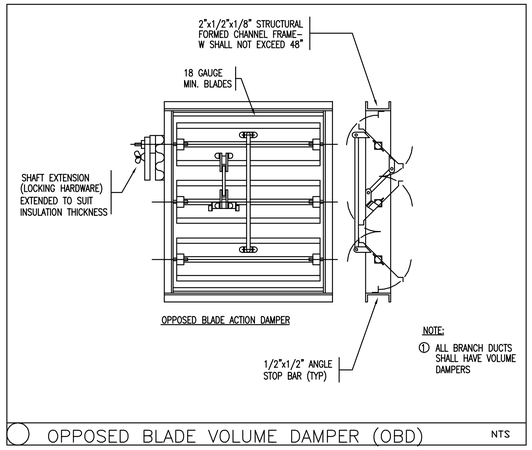
NOTES: 1. PROVIDE EF-1 WITH PERMATECTOR COATING AND INTERLOCK WITH THE VENTILATION SYSTEM.



GARAGE PLAN

HVAC CONSTRUCTION NOTES

1. DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH 2012 2ND EDITION SMACNA STANDARDS.
2. COORDINATE DUCTWORK AND PIPING WITH PLUMBING, FIRE PROTECTION AND ELECTRICAL. MAKE OFFSETS AND TRANSITIONS TO COORDINATE WITH OTHER TRADES WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND BEARING COSTS OF NECESSARY PERMITS, BONDS, AND FEES FOR WORK. SECURE AND PAY ALL FEES FOR PERMITS, UTILITY CONNECTIONS, AND INSPECTION OF WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING AS REQUIRED FOR PROPER INSTALLATION OF THE MATERIAL AND EQUIPMENT.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LAWS, ORDINANCES, STATE AND LOCAL CODES AND SHALL BE SUBJECT TO CONTROL OF PUBLIC AUTHORITIES HAVING JURISDICTION.
6. AFTER INSTALLATION ALL EQUIPMENT AND PIPING SYSTEMS SHALL BE TESTED TO DEMONSTRATE CAPABILITY TO PERFORM SATISFACTORILY. ANY DEFICIENCIES SHALL BE CORRECTED AND RETESTED. ALL EQUIPMENT, MATERIAL, AND LABOR REQUIRED FOR TESTING SHALL BE FURNISHED BY THE CONTRACTOR.



OPPOSED BLADE VOLUME DAMPER (OBD) NTS

MANCHESTER BY THE SEA
MASSACHUSETTS

HEATING SYSTEM REPLACEMENT

HVAC PLAN
PUBLIC WORKS BUILDING

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

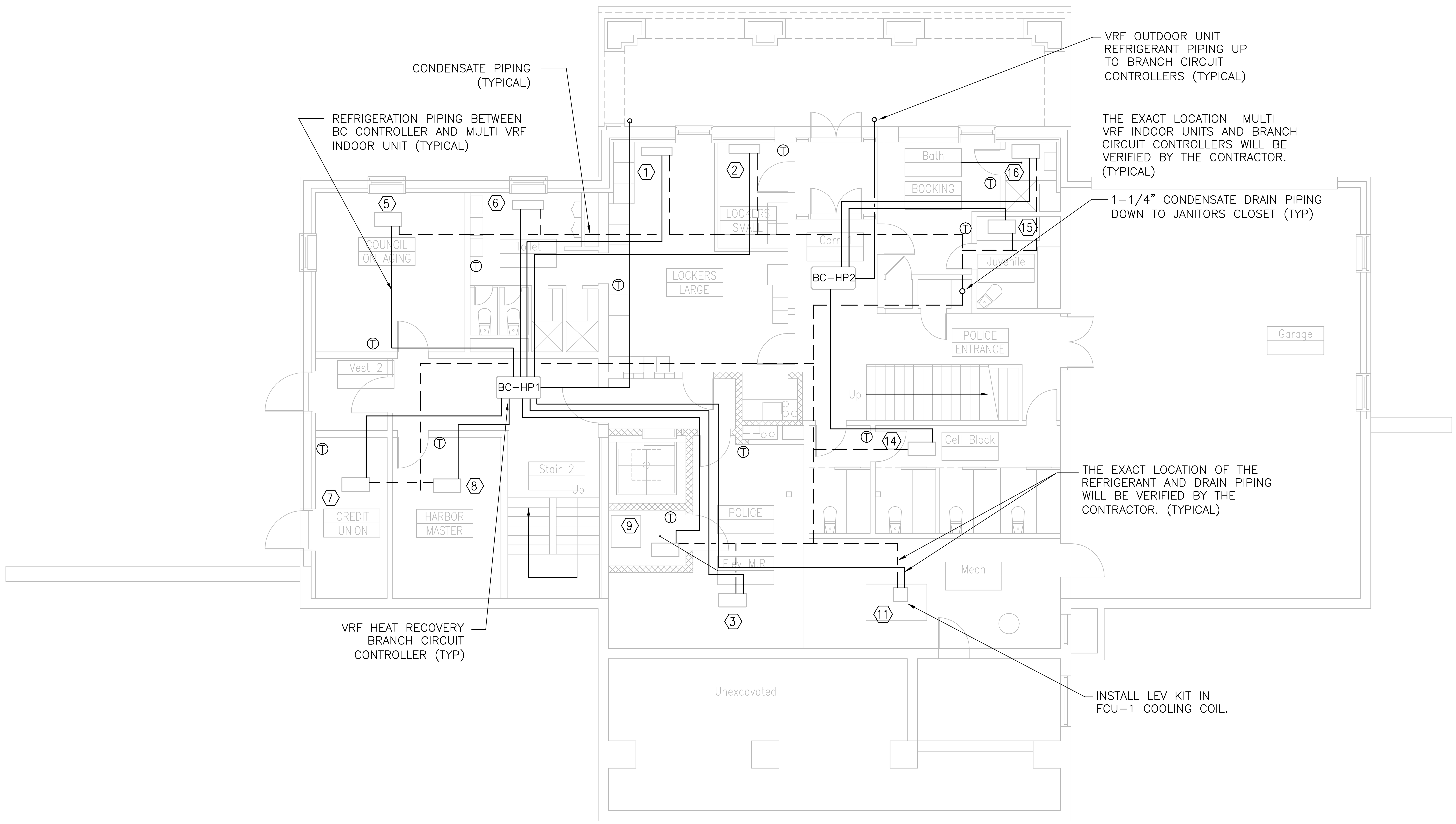
Rev.	Description	Date

COMMONWEALTH OF MASSACHUSETTS
TODD M. MASON
MECHANICAL
No. 41330
REGISTERED PROFESSIONAL ENGINEER

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

DPW-M1



1 Ground Floor Plan

SCALE: 3/32" = 1'-0"

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM
REPLACEMENT

HVAC GROUND FL PLAN
TOWN HALL BUILDING

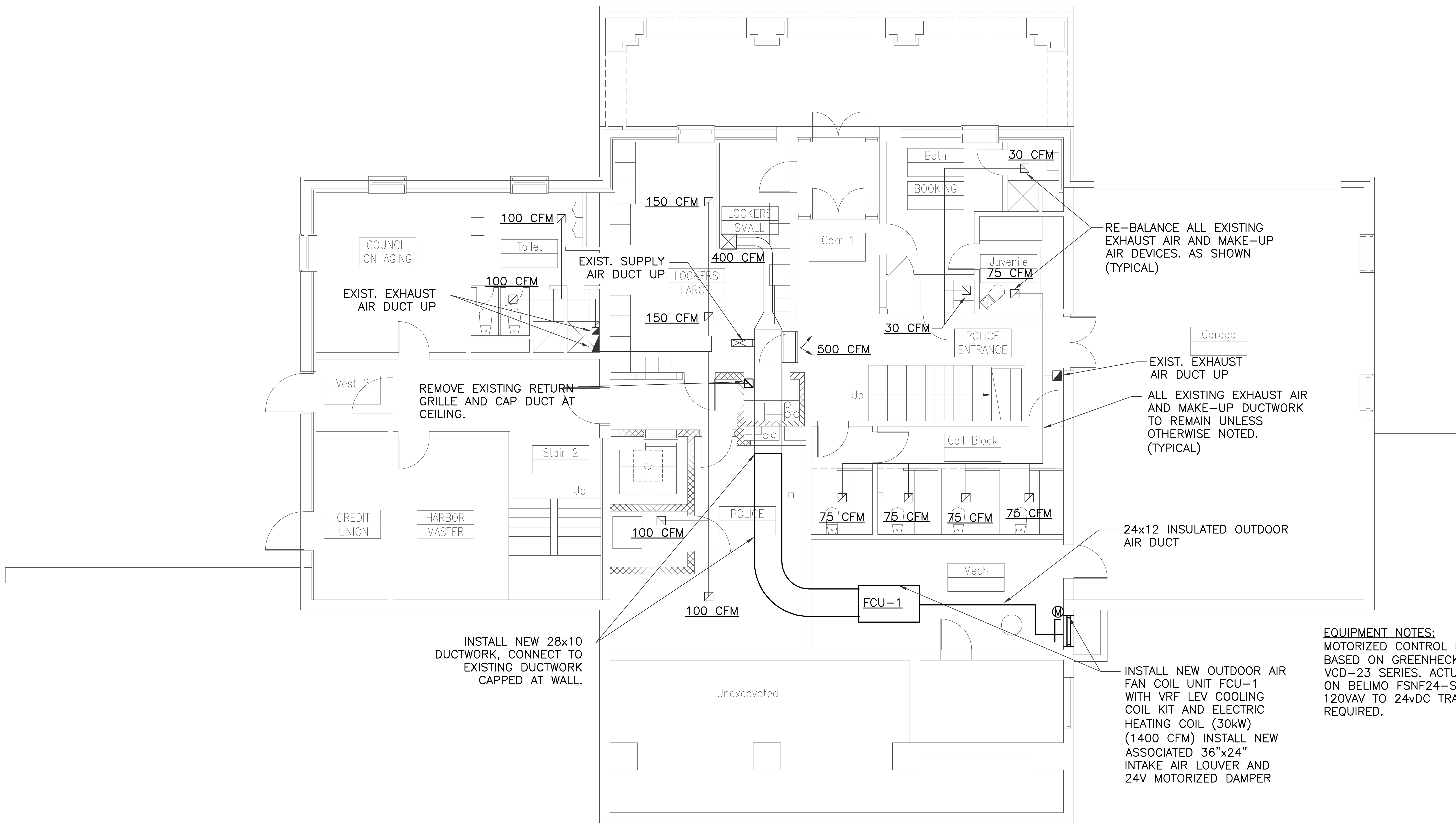
Drawn By: MJW | Designed By: TMM | Checked By: TMM | Approved By: TMM

Rev.	Date	Description

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

TH-M1



EQUIPMENT NOTES:
MOTORIZED CONTROL DAMPER (MOD) BASED ON GREENHECK LOW LEAKAGE VCD-23 SERIES. ACTUATOR BASED ON BELIMO FSNF24-S 24V. PROVIDE 120VAV TO 24vDC TRANSFORMER AS REQUIRED.

1 Ground Floor Plan
SCALE: 3/32" = 1'-0"

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM
REPLACEMENT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

HVAC VENTILATION PLAN
TOWN HALL BUILDING

Rev.	Date	Description

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

TH-M1A

MULTI VRF OUTDOOR UNITS
MOUNT ON FACTORY FURNISHED STAND ON A CONCRETE PAD. FIELD VERIFY PROPOSED LOCATION AND COORDINATE EXACT LOCATION WITH BUILDING OWNER. MAINTAIN MANUFACTURERS RECOMMENDED EQUIPMENT CLEARANCES. (TYPICAL)

VRF OUTDOOR UNIT REFRIGERANT PIPING TO BRANCH CIRCUIT CONTROLLERS (TYPICAL)

THE EXACT LOCATION MULTI VRF INDOOR UNITS AND BRANCH CIRCUIT CONTROLLERS WILL BE VERIFIED BY THE CONTRACTOR. (TYPICAL)

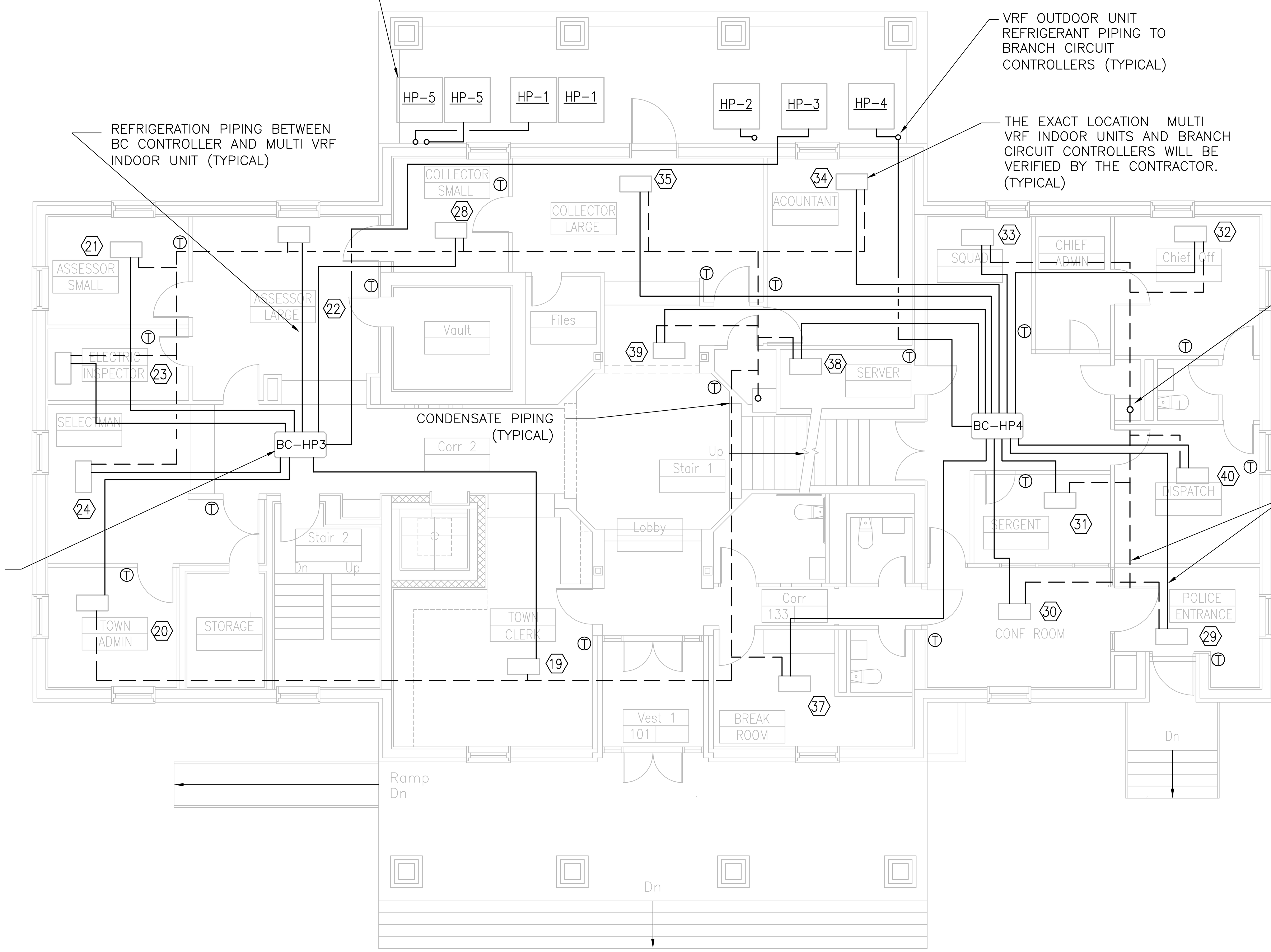
REFRIGERATION PIPING BETWEEN BC CONTROLLER AND MULTI VRF INDOOR UNIT (TYPICAL)

1-1/4" CONDENSATE DRAIN PIPING DOWN TO JANITORS CLOSET (TYP)

CONDENSATE PIPING (TYPICAL)

VRF HEAT RECOVERY BRANCH CIRCUIT CONTROLLER (TYP)

THE EXACT LOCATION OF THE REFRIGERANT AND DRAIN PIPING WILL BE VERIFIED BY THE CONTRACTOR. (TYPICAL)



1 First Floor Plan

SCALE: 3/32" = 1'-0"

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM REPLACEMENT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

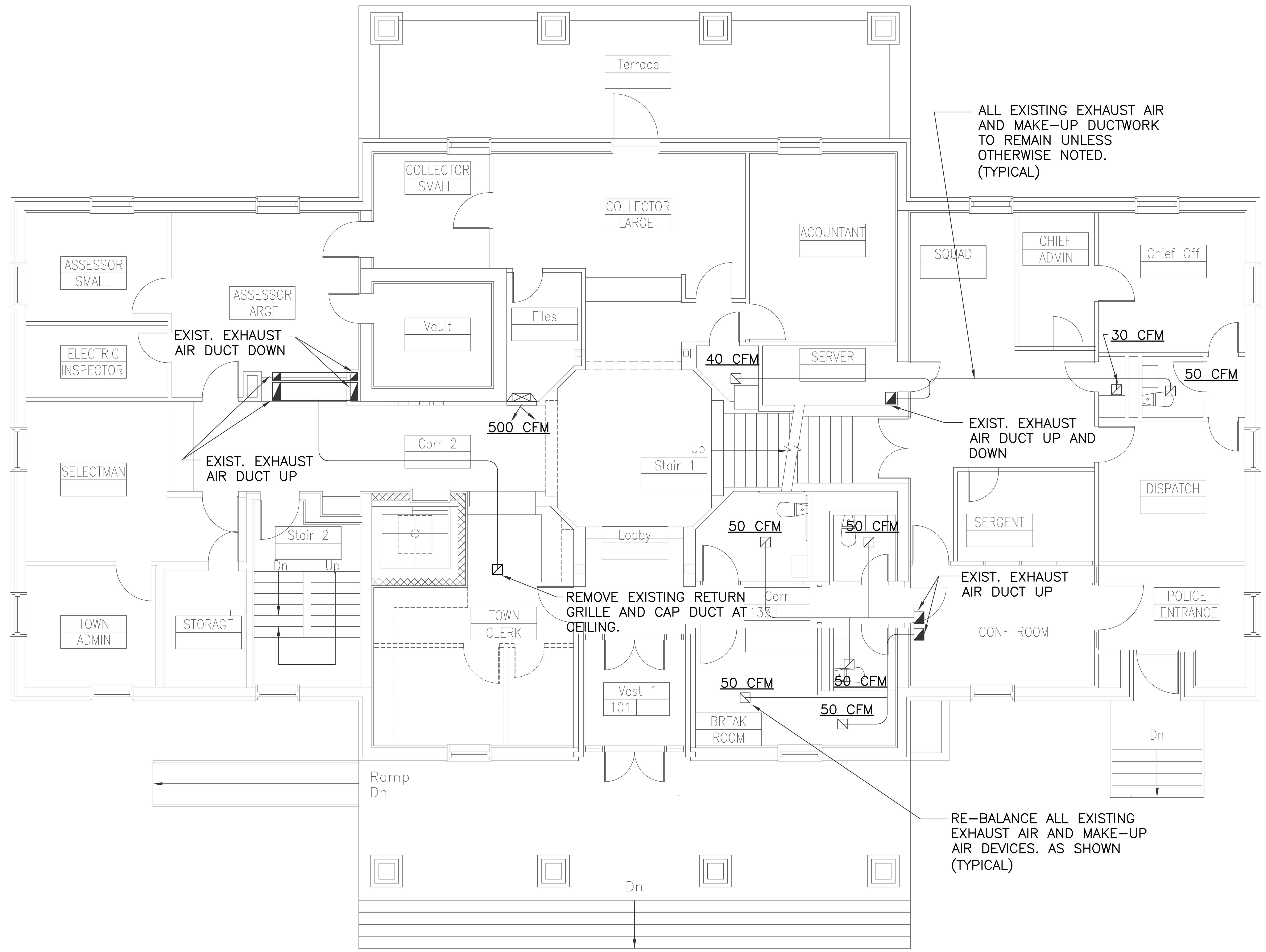
HVAC FIRST FL PLAN
TOWN HALL BUILDING

Rev.	Date	Description

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

TH-M2



1 First Floor Plan

SCALE: 3/32" = 1'-0"

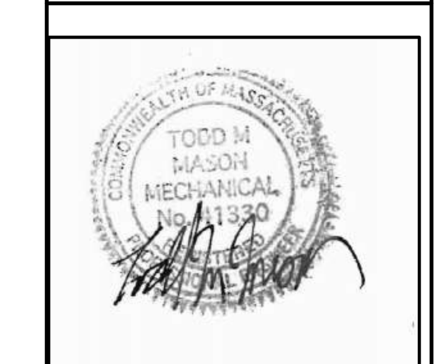
MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM
REPLACEMENT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

HVAC VENTILATION PLAN
TOWN HALL BUILDING

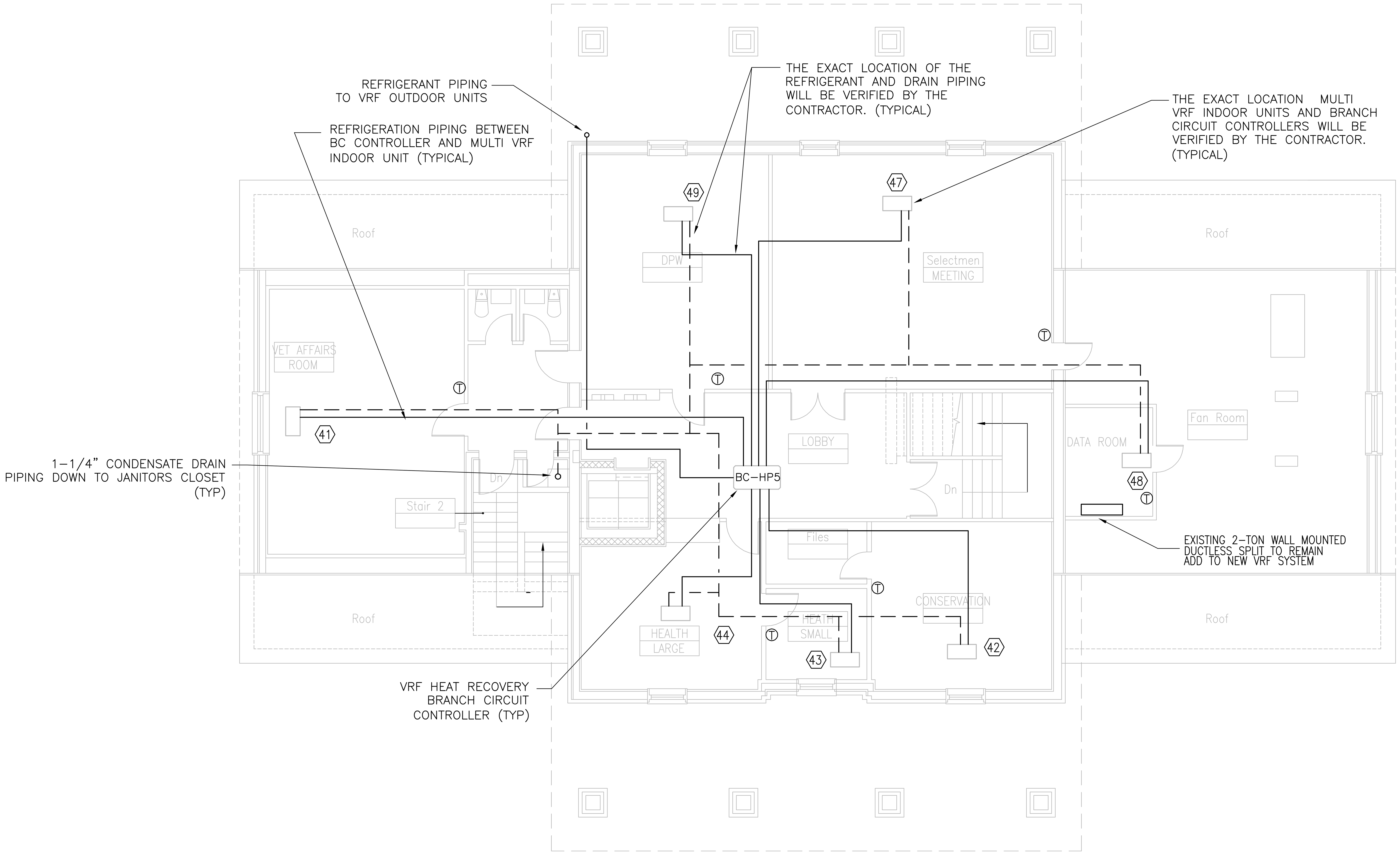
Rev.	Date	Description



TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

TH-M2A



1 Second Floor Plan

SCALE: 3/32" = 1'-0"

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM
REPLACEMENT

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

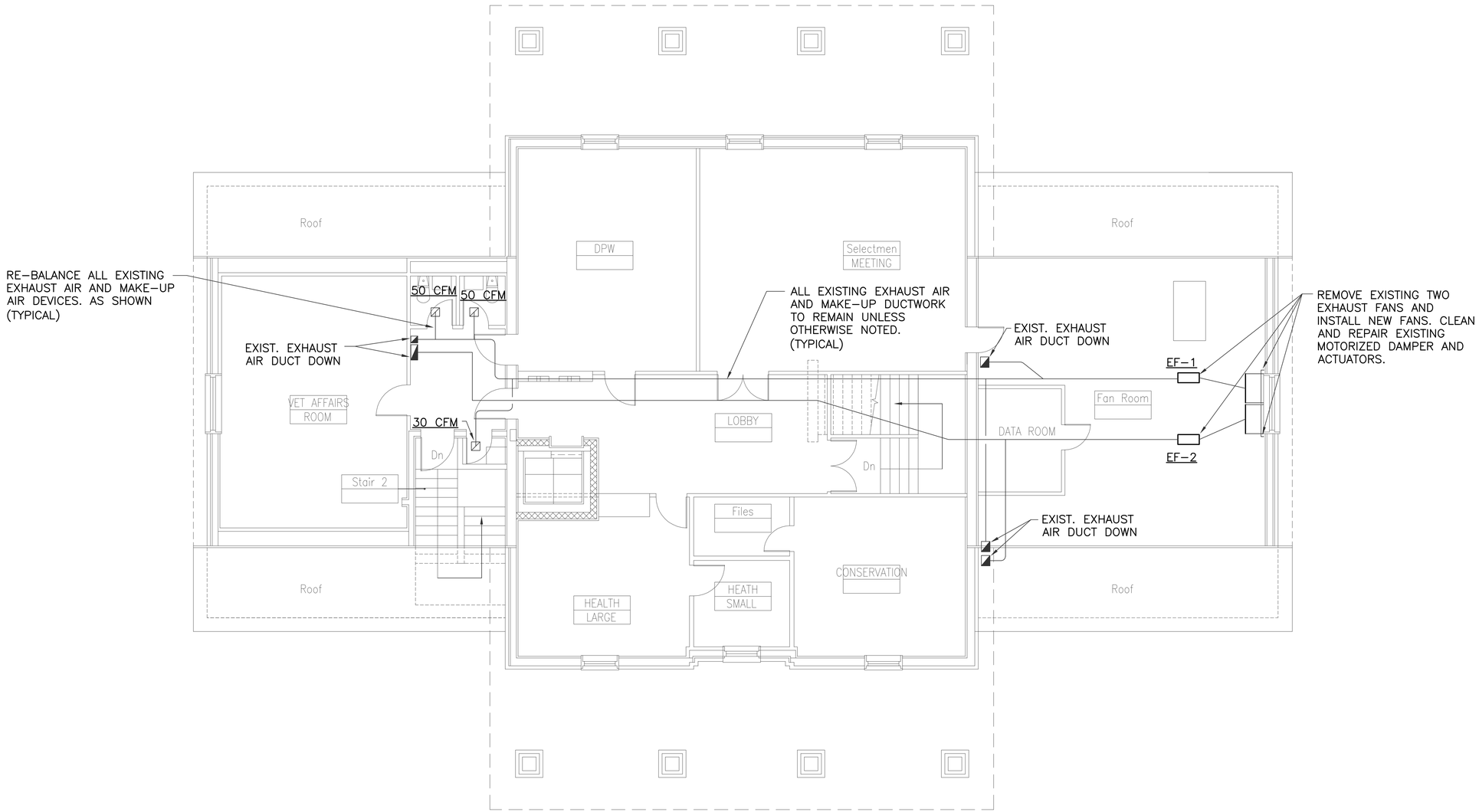
HVAC SECOND FL PLAN
TOWN HALL BUILDING

Rev.	Date	Description

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

TH-M3



1 Second Floor Plan

SCALE: 3/32" = 1'-0"

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM
REPLACEMENT

HVAC VENTILATION PLAN
TOWN HALL BUILDING

Rev.	Date	Description

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

TODD M MASON MECHANICAL No. 31390

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

TH-M3A

MITSUBISHI CITY MULTI VRF INDOOR UNIT SCHEDULE

System Tag	Room Name	Tag Reference	Model	Type	Nominal Cooling Capacity (BTU/h)	Nominal Heating Capacity (BTU/h)	Cooling Design Entering Temp DB/WB (°F) / [Water in temp]	Heating Design Entering Temp DB/WB (°F) / [Water in temp]	Corrected Capacity: Cooling Diversity Full/Partial (See Note 5, 6)	Corrected Capacity: Cooling Total Capacity (BTU/h)	Corrected Capacity: Cooling Sensible Capacity (BTU/h)	Corrected Capacity: Heating Diversity Full/Partial (See Note 5, 6)	Corrected Capacity: Heating Capacity (BTU/h)	Refrig Pipe Dim Liquid/Suction (inch)	Peak Fan Airflow (cfm) / [Design gpm G(US)/min]	Max Fan ESP Setting 208V/230V (IN WG)	Voltage / Phase	Power Cooling 208V/230V (kW)	Power Heating 208V/230V (kW)	Electrical MCA/MFS	Notes / Options
HP-1	1	Locker Room Large	PKFY-P12NHMU-E2	Wall mounted type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	12,089.1	8,865.6	FULL DEMAND	13,020.0	1/4 / 1/2	413		208/230V/1-phase	0.03	0.03	0.38(208V)/0.38(230V)/15	1, 2, 3, 4, 5, 6
HP-1	2	Locker Room Small	PKFY-P06NBMU-E2R1	Wall mounted type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	6,044.6	4,276.9	FULL DEMAND	6,461.8	1/4 / 1/2	208		208/230V/1-phase	0.03	0.03	0.19/0.19/15	1, 2, 3, 4, 5, 6
HP-1	3	Police	PMFY-P12NBMU-ER5	Ceiling cassette (1-way airflow) type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	12,089.1	7,941.9	FULL DEMAND	13,020.0	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.26/15	1, 2, 3, 4, 5, 6
HP-1	4 NOT USED	~~Stairs east side~~	~~PMFY-P08NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~8,000.0~~	~~9,000.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~8,059.4~~	~~6,238.9~~	~~FULL DEMAND~~	~~8,680.0~~	~~1/4 / 1/2~~	~~328~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.25/15~~	~~1, 2, 3, 4, 5, 6~~
HP-1	5	Council on Aging	PMFY-P12NBMU-ER5	Ceiling cassette (1-way airflow) type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	12,089.1	7,941.9	FULL DEMAND	13,020.0	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.26/15	1, 2, 3, 4, 5, 6
HP-1	6	Restroom Eastside	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	6,044.6	5,100.1	FULL DEMAND	6,461.8	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-1	7	Credit Union	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	8,059.4	6,238.9	FULL DEMAND	8,680.0	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-1	8	Harbor Master	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	6,044.6	5,100.1	FULL DEMAND	6,461.8	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-1	9	Machine Room	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	8,059.4	6,238.9	FULL DEMAND	8,680.0	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-1	10 NOT USED	~~Entrance East Side~~	~~PMFY-P08NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~8,000.0~~	~~9,000.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~8,059.4~~	~~6,238.9~~	~~FULL DEMAND~~	~~8,680.0~~	~~1/4 / 1/2~~	~~328~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.25/15~~	~~1, 2, 3, 4, 5, 6~~
HP-1	11	LEV Kit for 1200 CFM Lossnay	FCU-1		36,000.0	40,000.0	80.0/67.0	70.0	FULL DEMAND	36,267.3	28,073.1	FULL DEMAND	38,577.8	3/8 / 5/8							
HP-2	12 NOT USED	~~Garage Area~~	~~PEFY-P48NMAU-E3~~	~~Ceiling concealed type (ducted)~~	~~48,000.0~~	~~54,000.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~38,314.1~~	~~31,846.4~~	~~FULL DEMAND~~	~~39,156.5~~	~~3/8 / 5/8~~	~~1412~~	~~0.6/0.6~~	~~208/230V/1-phase~~	~~0.34~~	~~0.32~~	~~3.51(208V)/3.51(230V)/15~~	~~1, 2, 3, 4, 5, 6~~
HP-2	13 NOT USED	~~Entrance from Gagrage~~	~~PMFY-P06NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~6,000.0~~	~~6,700.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~4,789.3~~	~~4,635.1~~	~~FULL DEMAND~~	~~4,858.3~~	~~1/4 / 1/2~~	~~307~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.25/15~~	~~1, 2, 3, 4, 5, 6~~
HP-2	14	Jail Cell Room	PKFY-P06NBMU-E2R1	Wall mounted type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,789.3	3,776.5	FULL DEMAND	4,858.3	1/4 / 1/2	208		208/230V/1-phase	0.03	0.03	0.19/0.19/15	1, 2, 3, 4, 5, 6
HP-2	15	Juvenile Cell	PKFY-P06NBMU-E2R1	Wall mounted type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,789.3	3,776.5	FULL DEMAND	4,858.3	1/4 / 1/2	208		208/230V/1-phase	0.03	0.03	0.19/0.19/15	1, 2, 3, 4, 5, 6
HP-2	16	Booking Room	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	6,385.7	5,599.7	FULL DEMAND	6,526.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-2	17 NOT USED	~~Entrance Corridor~~	~~PMFY-P08NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~8,000.0~~	~~9,000.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~6,385.7~~	~~5,599.7~~	~~FULL DEMAND~~	~~6,526.1~~	~~1/4 / 1/2~~	~~328~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.25/15~~	~~1, 2, 3, 4, 5, 6~~
HP-2	18 NOT USED	~~Mechanical Room~~	~~PMFY-P06NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~6,000.0~~	~~6,700.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~4,789.3~~	~~4,635.1~~	~~FULL DEMAND~~	~~4,858.3~~	~~1/4 / 1/2~~	~~307~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.25/15~~	~~1, 2, 3, 4, 5, 6~~
HP-3	19	Town Clerk	PMFY-P12NBMU-ER5	Ceiling cassette (1-way airflow) type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	9,185.4	6,727.5	FULL DEMAND	10,450.8	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.26/15	1, 2, 3, 4, 5, 6
HP-3	20	Town Admin	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	6,123.6	5,502.2	FULL DEMAND	6,967.2	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-3	21	Assessors Office Small	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,592.7	4,563.9	FULL DEMAND	5,186.7	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-3	22	Assessors Office Large	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,592.7	4,563.9	FULL DEMAND	5,186.7	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-3	23	Electrical Inspector	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,592.7	4,563.9	FULL DEMAND	5,186.7	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-3	24	Selectman	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,592.7	4,563.9	FULL DEMAND	5,186.7	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-3	25 NOT USED	~~Storage/Unit 1~~	~~PMFY-P06NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~6,000.0~~	~~6,700.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~4,592.7~~	~~4,563.9~~	~~FULL DEMAND~~	~~5,186.7~~	~~1/4 / 1/2~~	~~307~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.25/15~~	~~1, 2, 3, 4, 5, 6~~
HP-3	26 NOT USED	~~First Floor Stairs east side /Unit2~~	~~PMFY-P12NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~12,000.0~~	~~13,500.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~9,185.4~~	~~6,727.5~~	~~FULL DEMAND~~	~~10,450.8~~	~~1/4 / 1/2~~	~~328~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.26/15~~	~~1, 2, 3, 4, 5, 6~~
HP-3	27 NOT USED	~~Vestibule Erntrance north side~~	~~PMFY-P12NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~12,000.0~~	~~13,500.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~9,185.4~~	~~6,727.5~~	~~FULL DEMAND~~	~~10,450.8~~	~~1/4 / 1/2~~	~~328~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.26/15~~	~~1, 2, 3, 4, 5, 6~~
HP-3	28	Collector office small east side	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,592.7	4,563.9	FULL DEMAND	5,186.7	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	29	Police Entrance	PMFY-P12NBMU-ER5	Ceiling cassette (1-way airflow) type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	8,957.9	6,636.4	FULL DEMAND	8,313.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.26/15	1, 2, 3, 4, 5, 6
HP-4	30	Police Conf Room	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	5,971.9	5,446.1	FULL DEMAND	5,542.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	31	Police Sergant Office	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,478.9	4,478.9	FULL DEMAND	4,125.8	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	32	Police Chief Office	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	5,971.9	5,446.1	FULL DEMAND	5,542.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	33	Squad Room	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,478.9	4,478.9	FULL DEMAND	4,125.8	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	34	Accountant	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,478.9	4,478.9	FULL DEMAND	4,125.8	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	35	Collector	PMFY-P12NBMU-ER5	Ceiling cassette (1-way airflow) type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	8,957.9	6,636.4	FULL DEMAND	8,313.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.26/15	1, 2, 3, 4, 5, 6
HP-4	36 NOT USED	~~Main Entrance/Lobby~~	~~PMFY-P12NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~12,000.0~~	~~13,500.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~8,957.9~~	~~6,636.4~~	~~FULL DEMAND~~	~~8,313.1~~	~~1/4 / 1/2~~	~~328~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.26/15~~	~~1, 2, 3, 4, 5, 6~~
HP-4	37	Break Room	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	5,971.9	5,446.1	FULL DEMAND	5,542.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	38	Server Room Small	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	5,971.9	5,446.1	FULL DEMAND	5,542.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	39	Stairs west side	PMFY-P08NBMU-ER5	Ceiling cassette (1-way airflow) type	8,000.0	9,000.0	80.0/67.0	70.0	FULL DEMAND	5,971.9	5,446.1	FULL DEMAND	5,542.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-4	40	31A Dispatch	PMFY-P12NBMU-ER5	Ceiling cassette (1-way airflow) type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	8,957.9	6,636.4	FULL DEMAND	8,313.1	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.26/15	1, 2, 3, 4, 5, 6
HP-5	41	Second Floor east side Vet Affairs	PLFY-EP36NEMU-E	Ceiling cassette (4-way airflow) type	36,000.0	40,000.0	80.0/67.0	70.0	FULL DEMAND	29,506.5	22,422.1	FULL DEMAND	28,486.0	3/8 / 5/8	1095		208/230V/1-phase	0.07	0.07	0.92/0.92/15	1, 2, 3, 4, 5, 6
HP-5	42	Conservation	PMFY-P12NBMU-ER5	Ceiling cassette (1-way airflow) type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	9,835.5	6,991.0	FULL DEMAND	9,614.0	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.26/15	1, 2, 3, 4, 5, 6
HP-5	43	Health Office Small	PMFY-P06NBMU-ER5	Ceiling cassette (1-way airflow) type	6,000.0	6,700.0	80.0/67.0	70.0	FULL DEMAND	4,917.8	4,681.9	FULL DEMAND	4,771.4	1/4 / 1/2	307		208/230V/1-phase	0.04	0.04	0.25/15	1, 2, 3, 4, 5, 6
HP-5	44	Health Office large	PMFY-P12NBMU-ER5	Ceiling cassette (1-way airflow) type	12,000.0	13,500.0	80.0/67.0	70.0	FULL DEMAND	9,835.5	6,991.0	FULL DEMAND	9,614.0	1/4 / 1/2	328		208/230V/1-phase	0.04	0.04	0.26/15	1, 2, 3, 4, 5, 6
HP-5	45 NOT USED	~~Second Floor Stair east side~~	~~PMFY-P12NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~12,000.0~~	~~13,500.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~9,835.5~~	~~6,991.0~~	~~FULL DEMAND~~	~~9,614.0~~	~~1/4 / 1/2~~	~~328~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.26/15~~	~~1, 2, 3, 4, 5, 6~~
HP-5	46 NOT USED	~~Second Floor stair west side~~	~~PMFY-P12NBMU-ER5~~	~~Ceiling cassette (1-way airflow) type~~	~~12,000.0~~	~~13,500.0~~	~~80.0/67.0~~	~~70.0~~	~~FULL DEMAND~~	~~9,835.5~~	~~6,991.0~~	~~FULL DEMAND~~	~~9,614.0~~	~~1/4 / 1/2~~	~~328~~		~~208/230V/1-phase~~	~~0.04~~	~~0.04~~	~~0.26/15~~	~~1, 2, 3, 4, 5, 6~~
HP-5	47	Meeting Room 2nd Floor	PLFY-EP48NEMU-E	Ceiling cassette (4-way airflow) type	48,000.0	54,000.0	80.0/67.0	70.0	FULL DEMAND	39,342.0	29,797.0	FULL DEMAND	38,456.1	3/8 / 5/8	1236		208/230V/1-phase	0.11	0.11	1.27/1.27/15	1, 2, 3, 4, 5, 6
HP-5	48	Data Room	PKFY-P24NKMU-E2.TH	Wall mounted type	24,000.0	27,000.0	80.0/67.0	70.0	FULL DEMAND	19,671.0	17,981.3	FULL DEMAND	19,228.1	3/8 / 5/8	918		208/230V/1-phase	0.07	0.07	0.63(208V)/0.63(230V)/15	1, 2, 3, 4, 5, 6
HP-5	49	DPW Room	PKFY-P18NHMU-E2	Wall mounted type	18,000.0	20,000.0	80.0/67.0	70.0	FULL DEMAND	14,753.3	10,615.6	FULL DEMAND	14,243.0	1/4 / 1/2	424		208/230V/1-phase	0.03	0.03	0.38/0.38/15	1, 2, 3, 4, 5, 6

Notes & Options:
1 Nominal cooling capacities are based on indoor coil EAT of 80/67°F (DB/WB), outdoor of 95°F (DB)
2 Nominal heating capacities are based on indoor coil EAT of 70°F (DB), outdoor of 43°F (WB)
3 See outdoor unit schedule for outdoor ambient conditions, connected capacity, and other factors associated with corrected capacities
4 See schematic piping/control diagram for indication of required indoor unit remote controllers, system controllers, and integration devices.
5 Full demand corrected capacity includes de-rate associated with indoor vs. outdoor connected capacity indicated on outdoor unit schedule for associated system. Partial corrected capacity assumes sufficient diversity exists such that the connected capacity de-rate does not apply. It is the designer's responsibility to ensure "Diamond System Builder" is set in the appropriate output capacity setting (full demand/partial demand) prior to generating this schedule.
6 It is recommended to always base heating corrected capacity on full demand.

VRF HEAT RECOVERY BRANCH CIRCUIT CONTROLLER

System Tag	Tag Reference	M-Net Address	Model Number	Type (double / Main / Sub)	Number of Ports	Connected Capacity to BC	Voltage / Phase	MCA 208/230	Notes / Options
HP-1		53	CMB-P1013NU-GA1	Main	13	122,000.0	208/230V/1-phase	1.08/0.97	1, 2
HP-2		63	CMB-P108NU-G1	Single	8	88,000.0	208/230V/1-phase	0.68/0.61	1, 2
HP-3		70	CMB-P1013NU-G1	Single	13	80,000.0	208/230V/1-phase	1.08/0.97	1, 2
HP-4		52	CMB-P1013NU-G1	Single	13	106,000.0	208/230V/1-phase	1.08/0.97	1, 2
HP-5		65	CMB-P1010NU-HA1	Main	10	180,000.0	208/230V/1-phase	1.60/1.70	1, 2

Notes & Options:
1 Include Diamondback Ball Valves BV-Series, 700PSIG working pressure, full port, 410A rated.
2 For sub BC controller CMB-P-NU-GB1 or -GB, the total connectable indoor unit capacity can be 126,000 BTUs or less. If two sub BC controllers are used, the total indoor unit capacity connected to BOTH sub BC controllers also cannot exceed 126,000 BTUs. For sub BC controller CMB-P1016NU-HB1 the total connectable indoor unit capacity can be 126,000 BTUs or less. However, if two sub controllers are used, and one of them is CMB-1016NU-HB1, the total indoor unit capacity connected to BOTH sub controllers must NOT exceed 168,000 BTUs.

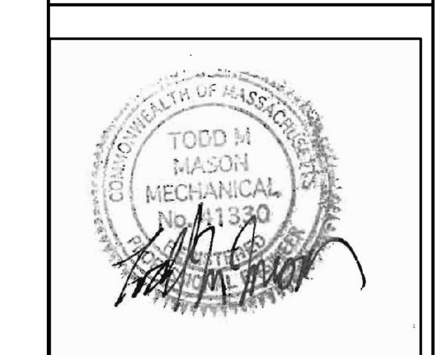
MANCHESTER BY THE SEA MASSACHUSETTS

HVAC SYSTEM REPLACEMENT

HVAC SCHEDULES TOWN HALL BUILDING

Drawn By: MW | Designed By: TMM | Checked By: TMM | Approved By: TMM

Rev.	Date	Description



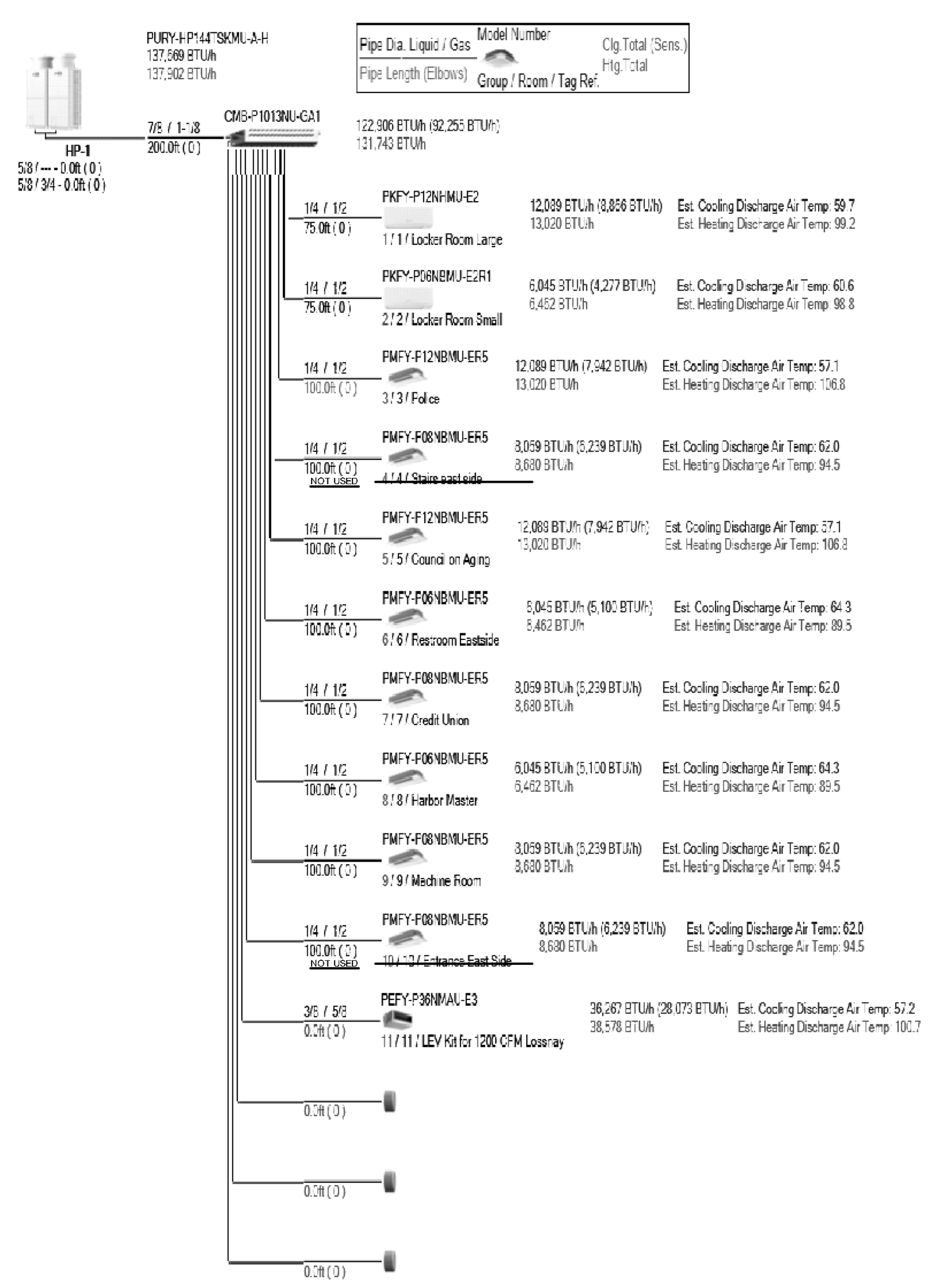
TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

TH-M4

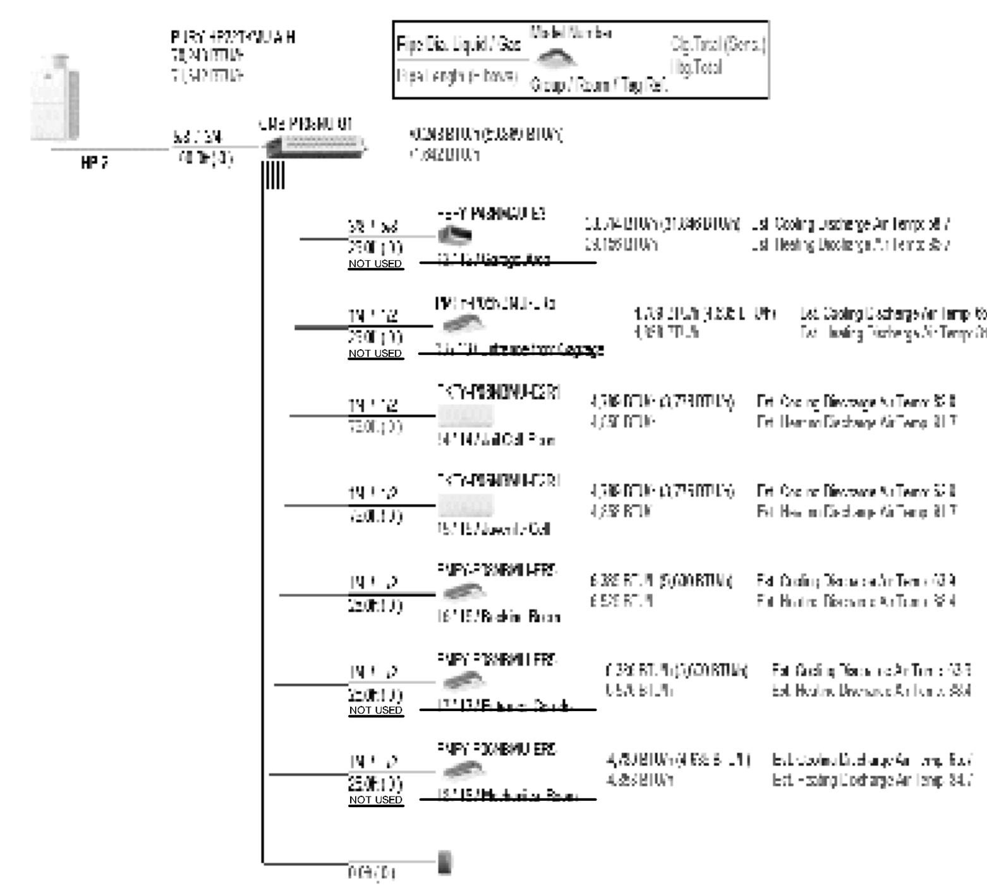
Centralized System - 1 : HP-1

Piping Diagram Image (Design View)



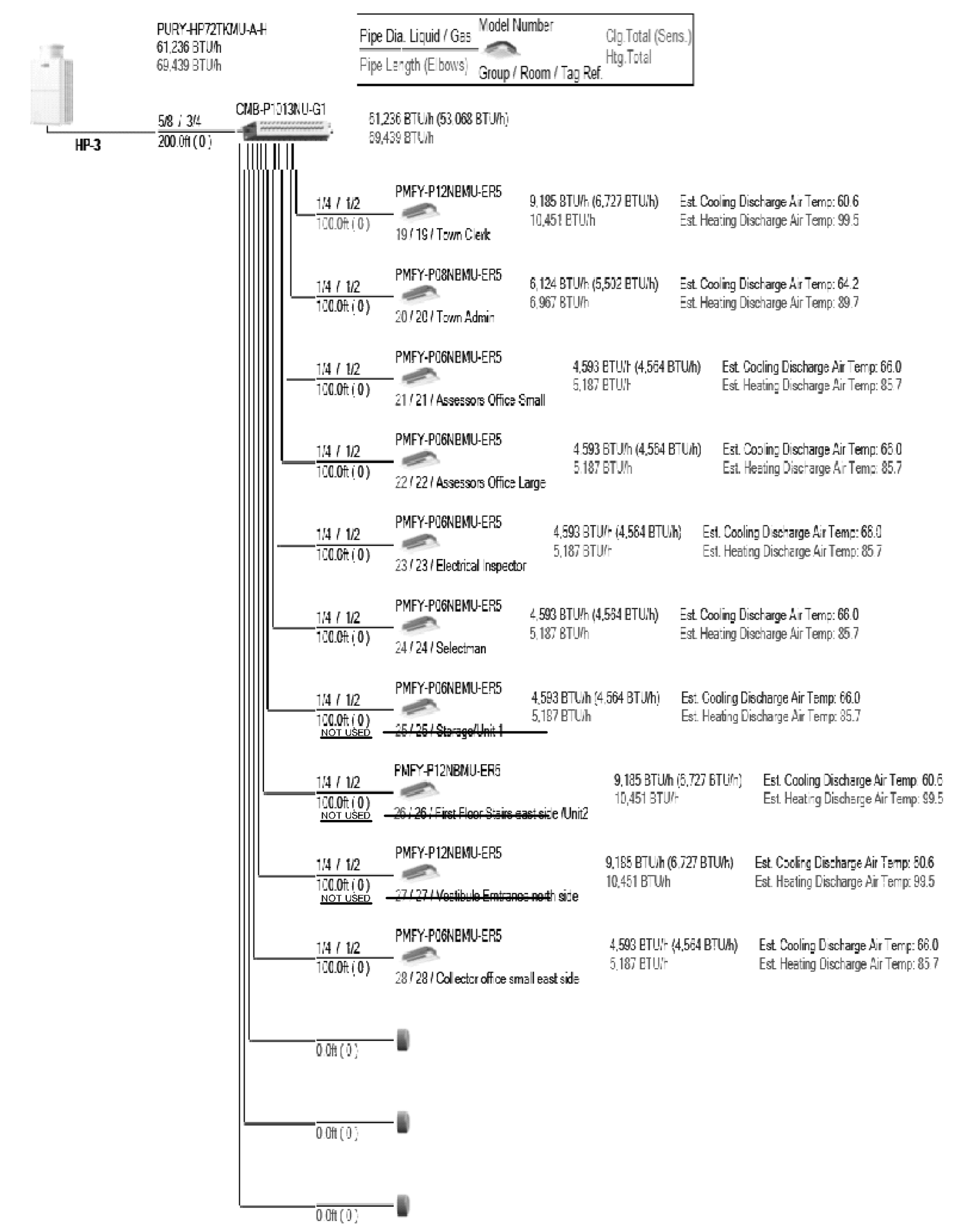
Centralized System - 1 : HP-2

Piping Diagram Image (Design View)



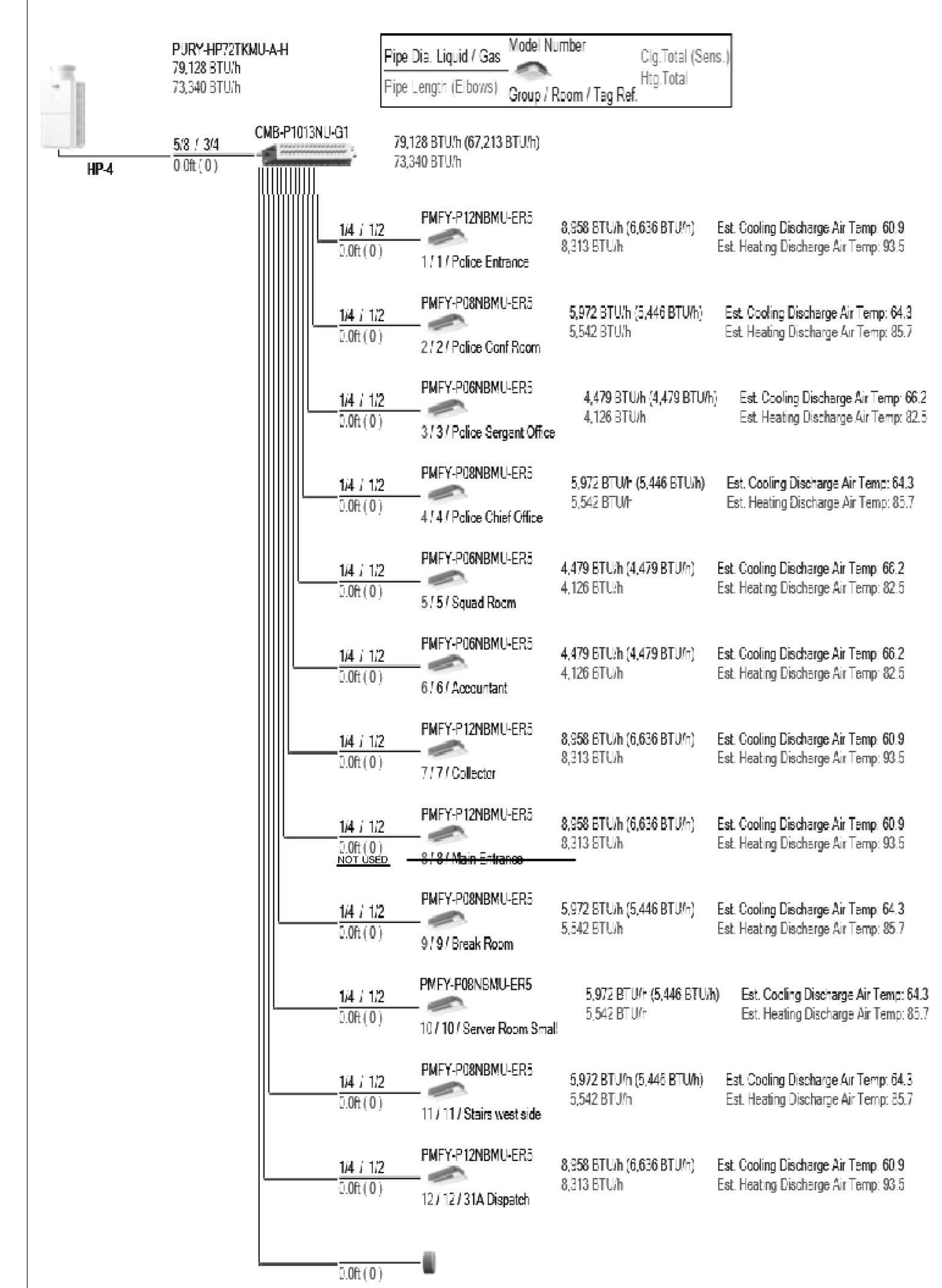
Centralized System - 1 : HP-3

Piping Diagram Image (Design View)



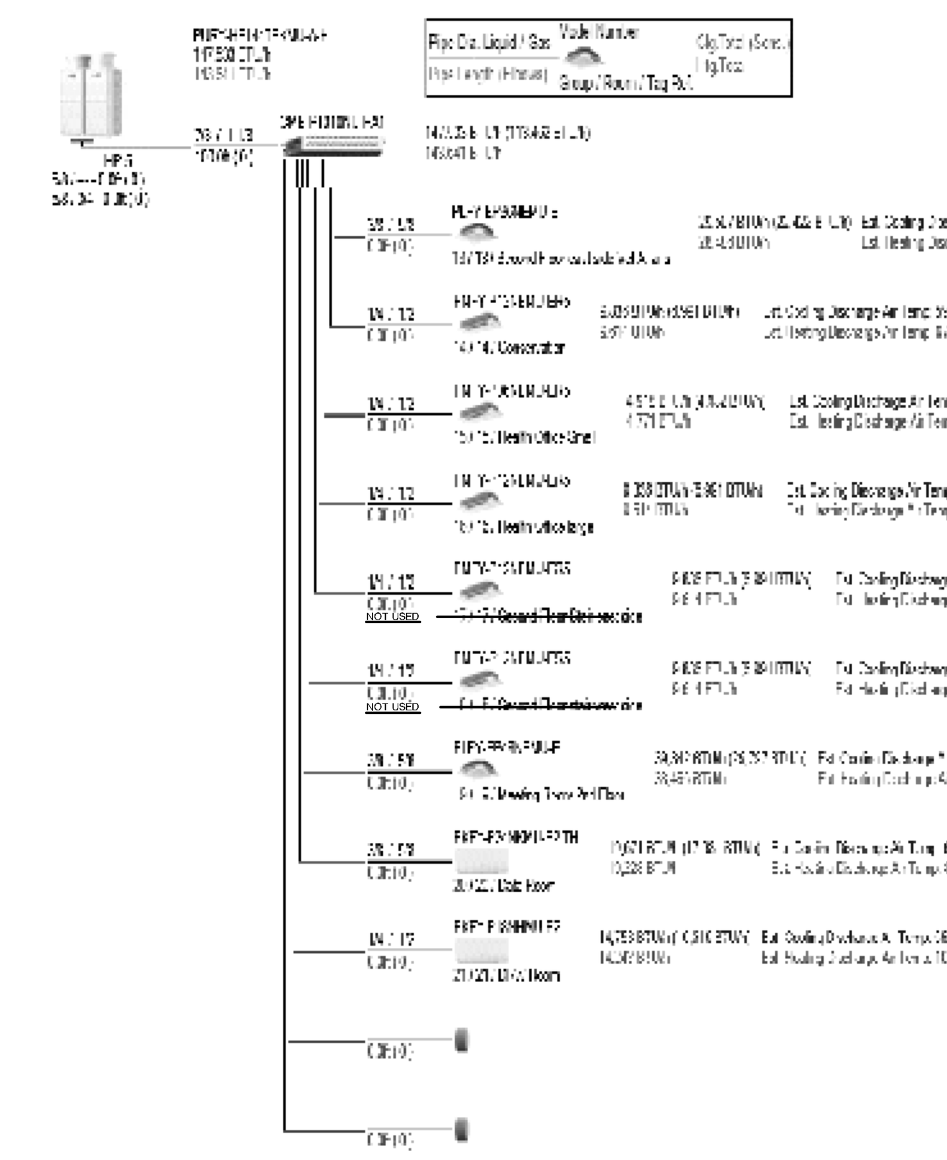
Centralized System - 2 : HP-4

Piping Diagram Image (Design View)



Centralized System - 2 : HP-5

Piping Diagram Image (Design View)



MITSUBISHI CITY MULTI VRF OUTDOOR UNIT SCHEDULE

System Tag	Tag Reference	M-Net Address	Model Number	Modules	Nominal Cooling Capacity (BTU/h)	Nominal Heating Capacity (BTU/h)	Cooling Efficiency IEER/EER [SEER]	Nom System Connected Capacity (% of NOM)	Design Cooling Outdoor Temp DB (°F)	Design Heating Outdoor Temp WB (°F)	Corrected Cooling Total Capacity (BTU/h)	Corrected Heating Capacity (BTU/h)	Sound Pressure (dBA)	Electrical-Per Module 208/230 or [460V]: Voltage / Phase	MCA 208/230 or [460V]	RFS	MOCP	Notes / Options
HP-1		51, 52	PURY-HP144TSKMU-A-H	HP72, HP72	144,000.0	160,000.0	17.1 / 12.6	84.7%	95.0	-1.0	137,669.3	137,902.4	61	208/230V / 3-phase 3-wire	44/40, 44/40	50, 50	60/60, 60/60	1, 2, 3, 4, 5
HP-2		62	PURY-HP72TKMU-A-H	HP72	72,000.0	80,000.0	18.4 / 13	122.2%	95.0	-1.0	70,242.5	71,641.8	58	208/230V / 3-phase 3-wire	44/40	50	60/60	1, 2, 3, 4, 5
HP-3		69	PURY-HP72TKMU-A-H	HP72	72,000.0	80,000.0	18.4 / 13	111.1%	95.0	-1.0	61,236.0	69,439.5	58	208/230V / 3-phase 3-wire	44/40	50	60/60	1, 2, 3, 4, 5
HP-4		51	PURY-HP72TKMU-A-H	HP72	72,000.0	80,000.0	18.4 / 13	147.2%	95.0	-1.0	79,127.8	73,339.8	58	208/230V / 3-phase 3-wire	44/40	50	60/60	1, 2, 3, 4, 5
HP-5		63, 64	PURY-HP144TSKMU-A-H	HP72, HP72	144,000.0	160,000.0	17.1 / 12.6	125.0%	95.0	-1.0	147,532.6	143,640.8	61	208/230V / 3-phase 3-wire	44/40, 44/40	50, 50	60/60, 60/60	1, 2, 3, 4, 5

Notes & Options:
1 Nominal cooling capacities are based on indoor coil EAT of 80/67°F (DB/WB), outdoor of 95°F (DB)
2 Nominal heating capacities are based on indoor coil EAT of 70°F (DB), outdoor of 43°F (WB)
3 Efficiency values for EER, IEER, COP are based on AHRI 1230 test method for mixture of ducted & non-ducted indoor units.
4 For systems with multiple modules, refrigerant pipe dimensions indicate total system combined piping downstream of module
5 Added field charge listed is in addition to factory charge, this must be updated based upon final as-built piping layout.

FAN COIL UNIT SCHEDULE

UNIT NO.	TOTAL AIRFLOW CFM	EXI STATIC IN WG	DRIVE	CABINET TYPE	MOTOR DATA: FLA	MCA	MOP	V	PH	HZ	COOLING COIL WITH LEV KIT: TOTAL MBH	EAT DB/WB	PRE HEAT ELECTRIC COIL DATA: TOTAL MBH	EAT DB	LAT DB	KW	V	PH	HZ	BASED ON MFR/MODEL
FCU-1	1400	0.75	DIRECT	CONCEALED DUCT	--	1.8	15	208	1	60	36.0	95/78	98.2	0.0°F	68.0°F	30	208	3	60	--

NOTE: 1. FAN COIL UNIT FCU-1 SHALL BE PROVIDED WITH DUCT MOUNTED THERMOSTAT AND SCR CONTROLS, FILTER BOXES, MERV 8 FILTERS. INTERLOCK WITH INTAKE AIR MOTORIZED DAMPER AND EF-1 & EF-2.

FAN SCHEDULE

MARK	CFM	S.P.	RPM	ELECTRICAL: VOLT	Ø	HZ	HP	TYPE	SERVICE	MFG	NOTE
EF-1	1200	1.1	1357	208	3	60	1/2	SWSI UTILITY	TOILETS	GREENHECK	1,2
EF-2	900	1.0	1240	208	3	60	1/2	SWSI UTILITY	GENERAL EXH.	GREENHECK	1,2

NOTES: 1. PROVIDE WALL MOUNTED TIMECLOCK INTERLOCK WITH FCU-1.
2. EF-1 & EF-2 TO REPLACE EXISTING FANS LOCATED IN FAN ROOM, FIELD VERIFY AND MATCH TYPE.

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM
REPLACEMENT

Approved By: TMM
Checked By: TMM
Designed By: TMM
Drawn By: MW

HVAC DIAGRAMS
TOWN HALL BUILDING

Rev.	Date	Description

TATA & HOWARD

T&H NO.: 05621
DATE: 6-14-2019
SCALE: AS NOTED

TH-M5

GENERAL NOTES

1. ALL WORK SHALL BE IN COMPLIANCE WITH NFPA–70, NATIONAL ELECTRICAL CODE.
2. ALL MOTOR SAFETY SWITCHES, DISCONNECTS AND MOTOR STARTERS ARE FURNISHED BY DIVISION 16000 UNLESS NOTED AS FURNISHED WITH EQUIPMENT (FWE).
3. ALL PENETRATIONS THROUGH FLOORS, RATED WALLS AND PARTITIONS SHALL BE SEALED WITH A UL APPROVED FIRE SEALANT MATERIAL TO MAINTAIN THE RATING OF THE SEPARATION.
4. CONVENIENCE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE UNLESS SHOWN OTHERWISE, GROUNDING TYPE, NEMA 5–20R, SIDE WIRED, AS MANUFACTURED BY LEVITON, PASS & SEYMOUR, OR APPROVED EQUAL.
5. UNLESS OTHERWISE NOTED ALL HOMERUNS FOR 15 OR 20A CIRCUITS SHALL BE 2#12AWG & #12GND. HOMERUNS FED FROM 20A, 1P CIRCUITS IN EXCESS OF 100 FEET (FOR 120V CIRCUITS) SHALL BE #10AWG. ALL WIRING SHALL BE COPPER.
6. CONDUIT SYSTEMS: EXPOSED INTERIOR CONDUITS SHALL BE EMT, 3/4" MINIMUM. PROPERLY SUPPORTED MC CABLE ASSEMBLIES MAY BE USED ABOVE CEILINGS AND IN WALLS. FLEXIBLE LIQUIDTIGHT CONDUIT WHIPS SHALL BE USED FOR CONNECTION TO VIBRATING EQUIPMENT IN THE MECHANICAL ROOM.

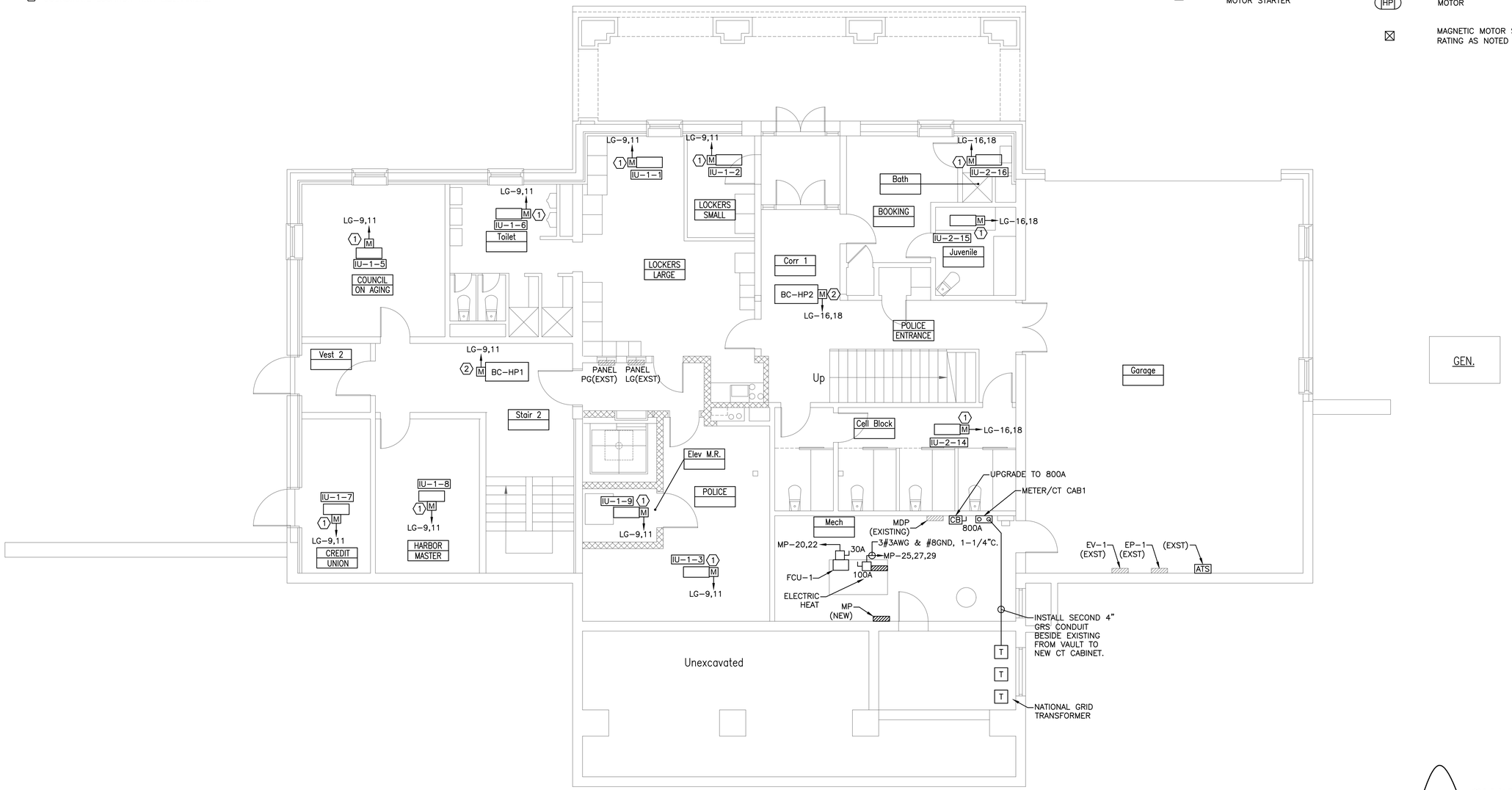
KEYED NOTES:

(1) TO INDOOR UNIT IN THIS ROOM. SEE MECHANICAL DRAWINGS FOR DETAIL.

(2) COORDINATE LOCATION WITH MECHANICAL.

POWER SYMBOLS

- CIRCUIT BREAKER
- GROUND CONNECTION
- LP1–2 — HOME RUN TO PANEL (CKT. NO. AS SHOWN)
- CT — CURRENT TRANSFORMER
- PT — POTENTIAL TRANSFORMER
- WP — 20 AMPERE, 120 VOLT DUPLEX GFCI RECEPTACLE, +18" AFF; WEATHER PROOF
- ELECTRICAL PANEL
- M — MANUAL TOGGLE OPERATED MOTOR STARTER
- METER
- 3R F XXAF XXAT — FUSED SAFETY SWITCH, RATING AS NOTED; FRAMESIZE; FUSE/TRIP; NEMA RATING
- CB — CIRCUIT BREAKER
- 200/3 — UNFUSED SAFETY SWITCH, RATING AS NOTED; POLES; AMPERES
- T — TRANSFORMER
- HP — MOTOR
- MAGNETIC MOTOR STARTER, RATING AS NOTED



1 ELECTRICAL GROUND FLOOR PLAN
SCALE: 3/16"=1'

N

SWIFTCURRENT
Engineering Services
10 Forest Falls Dr.
Unit 4b
Yarmouth, ME 04096
Tel: (207) 847–9280

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM REPLACEMENT

ELECTRICAL GROUND FLOOR PLAN

Rev.	Date	Description
	09/4/19	REVISED EQUIPMENT
	06/14/19	ISSUED FOR BIDDING

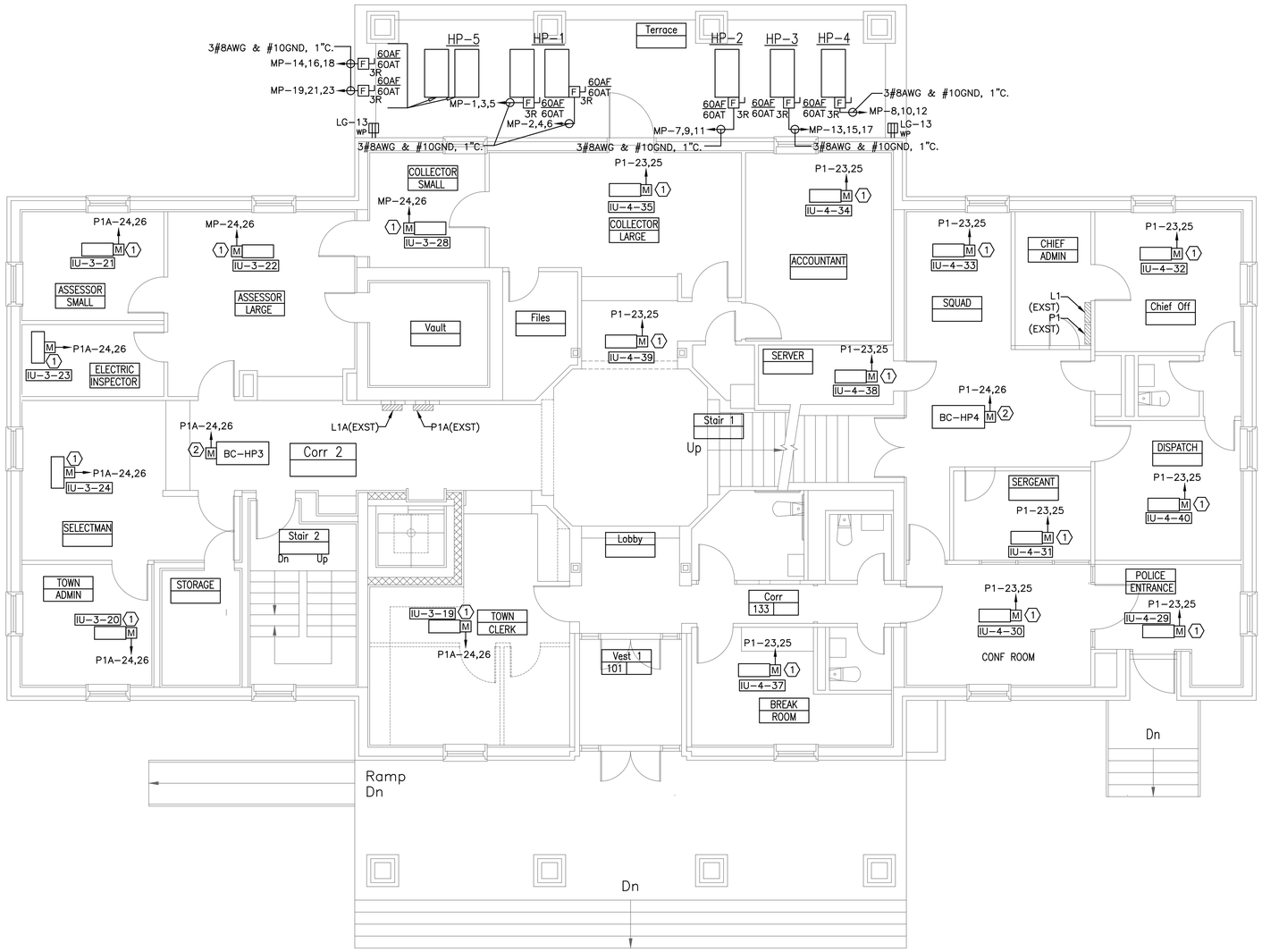
Drawn By: JMD | Designed By: TDM | Checked By: TDM | Approved By: TDM

COMMONWEALTH OF MASSACHUSETTS — TIMOTHY D. MATTHEWS — ELECTRICAL — NO. 42491 — REGISTERED PROFESSIONAL ENGINEER

TATA & HOWARD

T&H NO.: 05621
DATE: 9–4–2019
SCALE: AS NOTED

E1.0



1 ELECTRICAL FIRST FLOOR PLAN

SCALE: 3/16"=1'

NOTES:

1. SEE E1.0 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

KEYED NOTES:

1. TO INDOOR UNIT IN THIS ROOM. SEE MECHANICAL DRAWINGS FOR DETAIL.
2. COORDINATE LOCATION WITH MECHANICAL.

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM
REPLACEMENT

ELECTRICAL FIRST FLOOR
PLAN

Rev.	Date	Description
	09/4/19	REVISED EQUIPMENT
	06/14/19	ISSUED FOR BIDDING

Drawn By: JMD | Designed By: TDM | Checked By: TDM | Approved By: TDM

COMMONWEALTH OF MASSACHUSETTS
TIMOTHY D. MATHEWS
ELECTRICAL
NO. 42491
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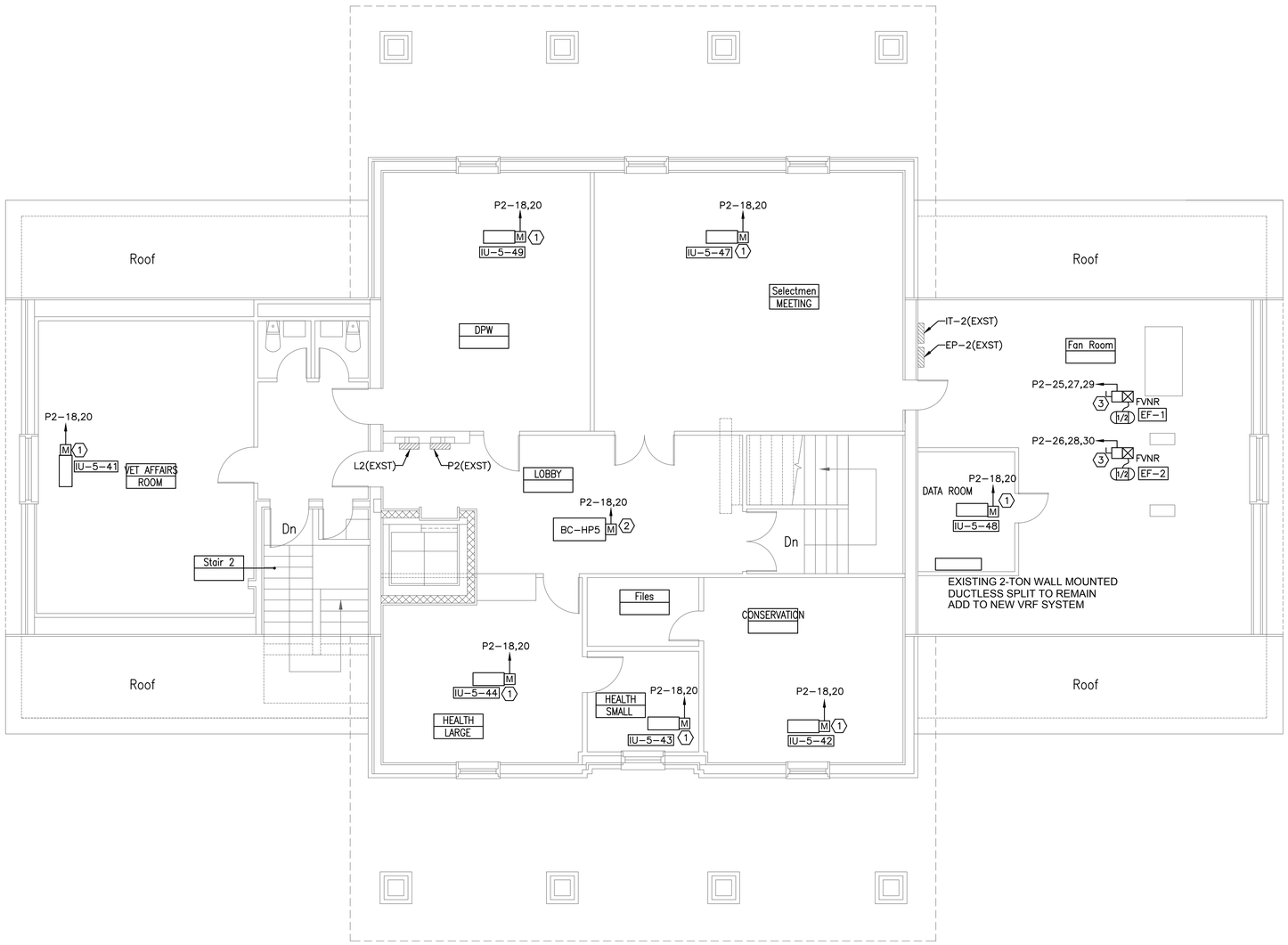
TATA & HOWARD

T&H NO.: 05621
DATE: 9-4-2019
SCALE: AS NOTED

E1.1



1 ELECTRICAL SECOND FLOOR PLAN

SCALE: 3/16"=1'

NOTES:

1. SEE E1.0 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

KEYED NOTES:

1. TO INDOOR UNIT IN THIS ROOM. SEE MECHANICAL DRAWINGS FOR DETAIL.
2. COORDINATE LOCATION WITH MECHANICAL.
3. INTENT IS TO DISCONNECT EXISTING FAN TO BE REMOVED AND RECONNECT NEW FAN FROM SAME CIRCUIT IN SAME LOCATION FURNISH NEW MOTOR STARTER IF REQUIRED.

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM
REPLACEMENT

ELECTRICAL SECOND
FLOOR PLAN

Rev.	Date	Description
	09/4/19	REVISED EQUIPMENT
	06/14/19	ISSUED FOR BIDDING

Drawn By: JMD | Designed By: TDM | Checked By: TDM | Approved By: TDM

COMMONWEALTH OF MASSACHUSETTS
TIMOTHY D. MATTHEWS
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TATA & HOWARD

T&H NO.: 05621
DATE: 9-4-2019
SCALE: AS NOTED

E1.2

NOTES:

1. SEE E1.0 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. PANEL SCHEDULES ARE BASED ON PANEL MOUNTED DIRECTORIES. CONFIRM ALL CIRCUIT WIRING IN FIELD.

KEYED NOTES:

(1) VERIFY EXISTING 20A, 2P BREAKER IS SPARE. REUSE TO PROVIDE CIRCUIT TO CMB AND INDOOR UNITS NOTED.

(2) REUSE EXISTING CIRCUIT TO DISCONNECT OLD FAN/RECONNECT NEW FAN.

(3) NEW BREAKER IN EXISTING PANEL.

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
SPARE	*			1	20	A	20	2	*			COPIER TOWN HALL
SPARE		*		3	20	B		4		*		
A/C DISPATCH			*	5	20	C	20	6			*	A/C CHIEF
DISPATCH HEAT	*			7	20	A	20	8	*			HEAT
		*		9		B		10		*		
HEAT			*	11	20	C	20	12			*	WEST #2 HEAT
	*			13		A		14	*			
HEAT		*		15	20	B	20	16		*		LOCKER RM HEAT
			*	17		C		18			*	
HEAT	*			19	20	A	20	20	*			A/C
		*		21		B	20	22		*		SPARE
BC-HP4; IU-4-29 TO 35, IU-4-37 TO 40			0.4	23	(1) 20	C	40	24			*	CAB HEATER GND FLR CORR.
	0.4			25		A		26	*			
GARAGE HEATER		*		27	40	B	40	28		*		GARAGE HEAT
			*	29		C		30			*	
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A-PHASE	###	PANEL P1
MAIN LUGS ONLY BUS AMPS: 225A	TOTAL KVA B-PHASE	###	
MOUNTING: RECESSED	TOTAL KVA C-PHASE	###	LOCATION FIRST FLR POLICE DEPT.
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING GE PANEL BOARD. TYPE NLAB

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
SPARE	*			1	20	A	20	2	*			SPARE
OFF #5-FILE RM		*		3	20	B	20	4		*		VAULT #2
			*	5		C		6			*	
OFF #2	*			7	20	A	20	8	*			SPARE
		*		9		B		10		*		
OFF #3			*	11	20	C	20	12			*	OFF #7
	*			13		A		14	*			
OFF #4		*		15	20	B	20	16		*		OFF #8
			*	17		C		18			*	
BUSINESS MACH.	*			19	20	A	20	20	*			TRASURES A.C.
		*		21		B		22		*		
TC HEAT			*	23	30	C	(1) 20	24			0.3	BC-HP3; IU-3-19 TO 24, IU-3-28
	*			25		A		26	0.3			
FRONT VEST		*		27	40	B		28		*		SPACE
			*	29		C		30			*	SPACE
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A-PHASE	###	PANEL P1A
MAIN LUGS ONLY BUS AMPS: 225A	TOTAL KVA B-PHASE	###	
MOUNTING: RECESSED	TOTAL KVA C-PHASE	###	LOCATION FIRST FLR CORR.
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING GE PANEL BOARD. TYPE NLAB.

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
SPARE	*			1	20	A	20	2	*			FAN RM HEAT
SPARE		*		3	20	B		4		*		
CONF. HEATER			*	5	20	C	20	6			*	OFF 207 HEAT
	*			7		A		8	*			
PLANNING HEAT		*		9	20	B	20	10		*		TOILET HEAT
			*	11		C		12			*	
OFF 204 HEAT HALL	*			13	20	A	20	14	*			SELECTMAN HEAT
		*		15		B		16		*		
SPARE			*	17	20	C	(1) 20	18			0.6	BC-HP5; IU-5-41 TO 44, IU-5-47 TO 49
	*			19		A		20	0.6			
OFF 205		*		21	20	B	20	22		*		SPARE
			*	23		C		24			*	
	0.3			25		A		26	0.3			
EF-1 (1/2 HP) (2)		0.3		27	20	B	20	28		0.3		EF-2 (1/2 HP) (2)
			0.3	29		C		30			0.3	
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A-PHASE	###	PANEL P2
MAIN LUGS ONLY BUS AMPS: 225A	TOTAL KVA B-PHASE	###	
MOUNTING: RECESSED	TOTAL KVA C-PHASE	###	LOCATION SECOND FL CORR.
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING GE PANEL BOARD. TYPE NLAB

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
CREDIT UNION ALARM	*			1	20	A	20	2	*			TOILET & OFF. B
STORAGE		*		3	20	B	20	4		*		CUSTODIAN
CREDIT UNION			*	5	20	C	20	6			*	SPARE
CREDIT UNION	*			7	20	A	20	8	*			SPARE
BC-HP1; IU-1-1 TO 3, IU-1-5 TO 9, IU-1-11		0.7		9	(3) 15	B	20	10		*		SPARE
			0.7	11		C	20	12			*	SPARE
OUTSIDE RECEPTS	0.4			13	(3) 20	A	30	14	*			NOT LABELED
WATER HEATER		*		15	30	B	(3) 15	16		0.1		BC-HP2; IU-2-14 TO 16
			*	17		C		18			0.1	
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A-PHASE	###	PANEL LG
MAIN LUGS ONLY BUS AMPS: 225A	TOTAL KVA B-PHASE	###	
MOUNTING: ********	TOTAL KVA C-PHASE	###	LOCATION GRND FLR CORR.
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING GE PANEL BOARD. TYPE NLAB.

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
HP-1 (CKT-1)	5.3			1	60	A	60	2	5.3			HP-1 (CKT-2)
		5.3		3		B		4		5.3		
			5.3	5		C		6			5.3	
HP-2	5.3			7	60	A	60	8	5.3			HP-3
		5.3		9		B		10		5.3		
			5.3	11		C		12			5.3	
HP-4	5.3			13	60	A	60	14	5.3			HP-5 (CKT-1)
		5.3		15		B		16		5.3		
			5.3	17		C		18			5.3	
HP-5 (CKT-2)	5.3			19	60	A	15	20	0.2			FCU-1
		5.3		21		B		22		0.2		
			5.3	23		C	20	24			*	SPARE
FCU-1 ELECTRIC REHEAT	10.0			25	100	A	20	26	*			SPARE
		10.0		27		B	20	28		*		SPARE
			10.0	29		C		30			*	SPACE
SPACE	*			31		A		32	*			SPACE
SPACE		*		33		B		34		*		SPACE
SPACE			*	35		C		36			*	SPACE
SPACE	*			37		A		38	*			SPACE
SPACE		*		39		B		40		*		SPACE
SPACE			*	41		C		42			*	SPACE
SUBTOTAL	31.2	31.2	31.2						16.1	16.1	15.9	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A-PHASE	47.3	PANEL MP
MAIN LUGS ONLY BUS AMPS: 400A	TOTAL KVA B-PHASE	47.3	
MOUNTING: SURFACE	TOTAL KVA C-PHASE	47.1	LOCATION MECH RM GND FLR
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	141.7	

NOTES: NEW PANEL

1 PANEL SCHEDULES
SCALE: NOT TO SCALE

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM REPLACEMENT

ELECTRICAL PANEL SCHEDULES

Rev	Date	Description
	09/4/19	REVISED EQUIPMENT
	06/14/19	ISSUED FOR BIDDING

Drawn By: JMD | Designed By: TDM | Checked By: TDM | Approved By: TDM

COMMONWEALTH OF MASSACHUSETTS
TIMOTHY D. MATTHEWS
ELECTRICAL
NO. 42491
REGISTERED
PROFESSIONAL ENGINEER

TATA & HOWARD

T&H NO.: 05621
DATE: 9-4-2019
SCALE: AS NOTED

E1.3

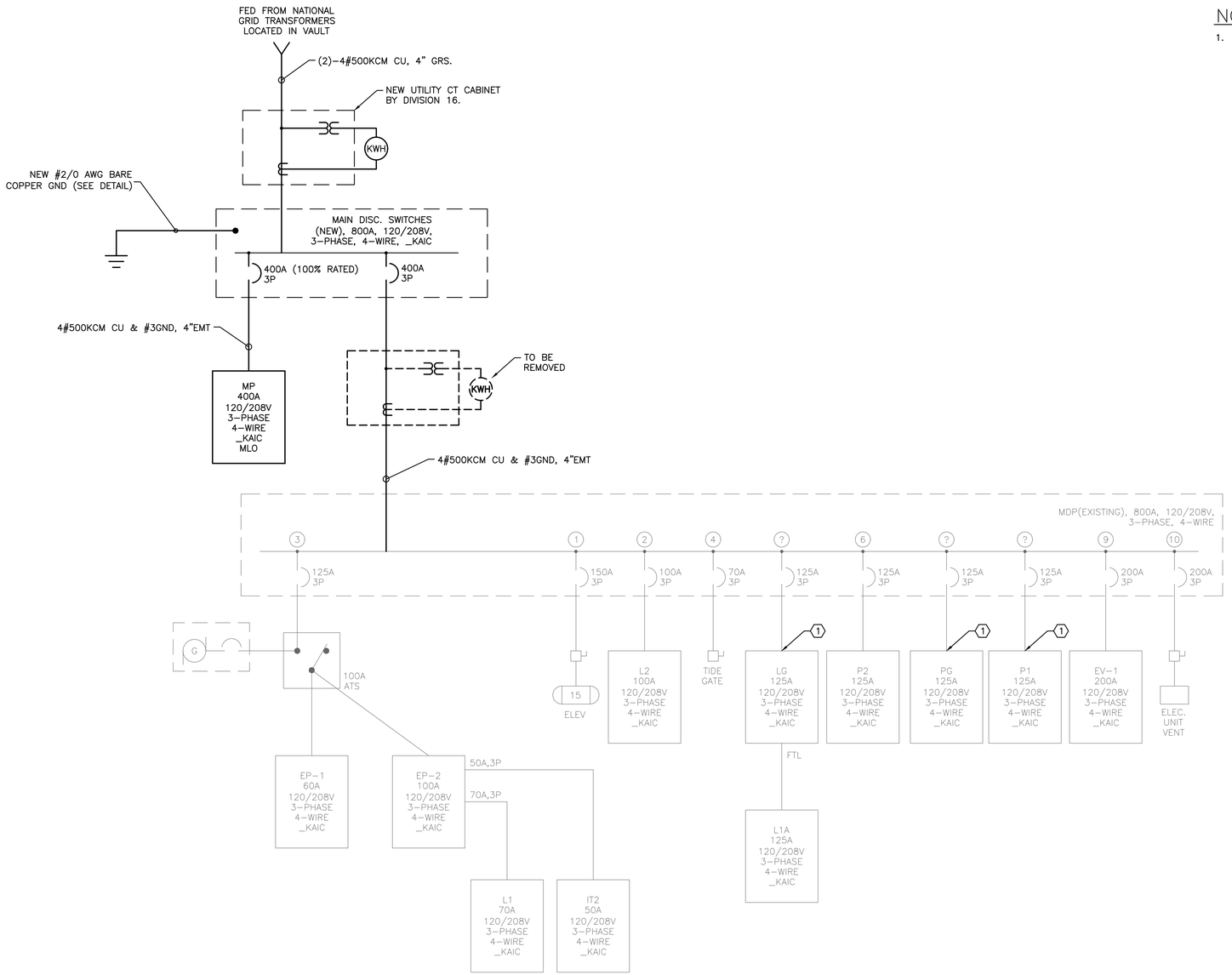
SWIFTCURRENT
Engineering Services
10 Forest Falls Dr.
Unit 4b
Yarmouth, ME 04096
Tel: (207) 847-9280

NOTES:

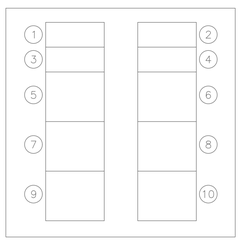
1. SEE E1.0 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

KEYED NOTES:

(1) VERIFY IN FIELD WHICH BREAKER FEEDS WHICH PANEL AND LABEL IN MDP (EXIST).

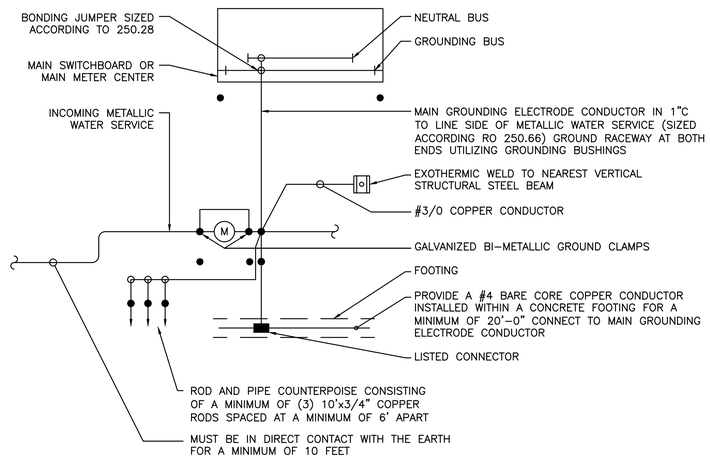


1 ONE–LINE DIAGRAM
SCALE: NOT TO SCALE



2 EXISTING SWITCHGEAR DETAIL
SCALE: NOT TO SCALE

NOTE: PROVIDE A GROUNDING ELECTRODE SYSTEM AS DETAILED BELOW (IF AVAILABLE ON PREMISES) UNTIL A MAXIMUM RESISTANCE LEVEL OF 25 OHMS TO GROUND IS ATTAINED PERFORM A GROUND RESISTANCE TEST AND PROVIDE A COPY OF THE TESTING REPORT TO THE ENGINEER.



3 ELECTRICAL GROUNDING DETAIL
SCALE: NOT TO SCALE

MANCHESTER BY THE SEA
MASSACHUSETTS

HVAC SYSTEM REPLACEMENT

ELECTRICAL ONE–LINE DIAGRAM & GROUNDING DETAIL

Rev.	Date	Description
	09/4/19	REVISED EQUIPMENT
	06/14/19	ISSUED FOR BIDDING

Drawn By: JMD | Designed By: TDM | Checked By: TDM | Approved By: TDM

COMMONWEALTH OF MASSACHUSETTS
TIMOTHY D. MATTHEWS
ELECTRICAL
NO. 42491
REGISTERED PROFESSIONAL ENGINEER

TATA & HOWARD

T&H NO.: 05621
DATE: 9–4–2019
SCALE: AS NOTED

E1.4

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