RESURGAM. CITY OF PORTLAND, MAINE

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 02/24/16

SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Boiler Replacement at Washington Gardens in Portland, Maine.

B. Owner's Name (Local Housing Authority): Portland Housing Authority.

C. Designer's Name: Facility Strategies Group, LLC

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on the base bid as described in Document 00 5200 - Agreement Form.

1.03 DESCRIPTION OF ALTERATIONS WORK

The scope of work includes the removal and replacement of 7 existing boiler and domestic hot water systems at Washington Gardens (Buildings 1, 3, 4, 7, 9, 10, & Community Building). Work will include installation of new equipment pads as needed, new condensing tankless water heaters, new condensing boilers, new combustion air and flue vent piping, new boiler primary and secondary pumps, and associated valves and piping accessories. Testing and balancing will be required for all systems.

Bids must include all materials, labor, and disposal fees for equipment, pumps, piping, and peripheries that are to be installed as part of this scope of work. Piping will be required to be insulated only after inspection and acceptance of the work by Owner or Engineer. All materials and packaging shall be recycled or disposed of per the required construction waste management plan.

1.04 OWNER OCCUPANCY

A. Portland Housing Authority intends to continue to occupy adjacent portions of the existing building during the entire construction period.

B. Portland Housing Authority intends to occupy the Project upon Substantial Completion.

C. Cooperate with Portland Housing Authority to minimize conflict and to facilitate Portland Housing Authority's operations.

D. Schedule the Work to accommodate Portland Housing Authority, occupancy of the units will be through the complete job.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to Washington Gardens, Portland, ME.

B. Arrange use of site and premises to allow:
   1. Portland Housing Authority occupancy.
   2. Use of site and premises by the public.

C. Provide access to and from site as required by law and by Portland Housing Authority:

D. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.

E. Existing building spaces may not be used for storage.

F. Time Restrictions:
   1. Limit conduct of especially noisy interior work to the hours of 8:00am to 5:00pm.

G. Limit shutdown of utility services to hours at a time, arranged at least 24 hours in advance with Portland Housing Authority.
   1. Prevent accidental disruption of utility services to other facilities.

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SCOPE SUMMARY

INCLUDES THE DEMOLITION OF EXISTING BOILER AND INDIRECT DHW SYSTEMS FOR 6 RESIDENTIAL BUILDINGS AND THE COMMUNITY BUILDING AT WASHINGTON GARDENS.
INCLUDES THE INSTALLATION OF A SINGLE CONDENSING LOCHINVAR BOILER, BOILER PRIMARY AND SECONDARY
NSION TANK, CONDENSATE NEUTRALIZATION KIT AND DRAIN, AND ASSOCIATED VALVES AND PIPING FOR EACH BOILER
INCLUDED IS THE INSTALLATION OF A SETBACK-CAPABLE THERMOSTAT IN THE COMMUNITY BUILDING.
INCLUDES THE INSTALLATION OF A TANKLESS CONDENSING RINNAI WATER HEATER IN EACH BOILER ROOM (TWO IN
TY BUILDING), ASSOCIATED PIPING, EXPANSION TANK, AND CONDENSATE NEUTRALIZATION KIT AND DRAIN. THE
CIRCULATING PUMP IS TO BE REUSED IN EACH BOILER ROOM.
INCLUDES THE REPLACEMENT OF ALL HEATING HOT WATER, DOMESTIC HOT WATER, AND NATURAL GAS PIPING IN
ROOM TO THE POINT OF DEMOLITION AND CONSTRUCTION DETAILED IN THIS DRAWING SET.
INCLUDES DEMOLISHING AND REBUILDING AS NECESSARY CONDENSATE PIPING IN BUILDINGS ALREADY RETROFITTED
8,11,12,13,14,15). CONDENSATE PIPING WILL BE REBUILT OR MODIFIED AS NECESSARY TO MATCH THE DETAIL SHOWN
ING SET, INCLUDING ADDING HEAT TRACE CABLE AND INSULATION WHERE NOT ALREADY PRESENT AND REROUTING
HE SIDEWALL OF THE BOILER ROOM.

DEMOLITION NOTES:

1. ALL EXISTING ITEMS SHOWN ON DRAWINGS ARE AS EXACT AS COULD BE SECURED. THE CONTRACTOR SHALL OBTAIN EXACT LOCATIONS, SIZES, ELEVATIONS, ETC. AT THE SITE AND SHALL SATISFACTORILY ADAPT THE NEW WORK TO THE ACTUAL CONDITIONS AS REQUIRED. THE INSTALLING CONTRACTOR SHALL DEMOLISH THE EXISTING BOILERS, WATER HEATERS, AS WELL AS ALL ASSOCIATED PIPING, FITTINGS, VALVES, HANGERS, SUPPORTS, ETC. IN A CODE APPROVED MANNER WHETHER SHOWN, OR NOT.
2. PRIOR TO COMMENCEMENT OF WORK – THE CONTRACTOR SHALL COORDINATE THE FOLLOWING WITH THE OWNER:
   a. SCHEDULE OF ALL ITEMS TO BE SALVAGED, SORTED, AND/OR REUSED.
   b. SCHEDULE OF WORK TO BE DONE SO PROVISIONS CAN BE MADE TO ACCOMMODATE ANY TEMPORARY RELOCATIONS.
   c. ANY AND ALL INTERRUPTIONS OF UTILITIES SHALL BE SCHEDULED AT THE OWNER'S CONVENIENCE AND WELL IN ADVANCE.
3. THE CONTRACTOR SHALL USE EXTREME CAUTION TO PROTECT EXISTING FACILITIES FROM DAMAGE. SEAL OFF AND PROTECT UNAFFECTED AREAS OF THE EXISTING BUILDING FROM DUST AS REQUIRED AND COORDINATE IN ADVANCE WITH THE OWNER. DO NOT ALLOW CONSTRUCTION DUST TO BE DRAWN INTO EQUIPMENT, DUCTWORK, PIPING AND OTHER SYSTEMS.
4. ANY EXISTING CONSTRUCTION OR UTILITIES THAT ARE DAMAGED BY THE CONTRACTOR OR SUB-CONTRACTORS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST. UNLESS OTHERWISE INDICATED, ALL EXISTING UTILITIES TO REMAIN IN PLACE.
5. WHERE EXISTING DOMESTIC WATER AND HYDRONIC PIPING IS NOT REQUIRED, REMOVE PIPING UP TO WITHIN 12" OF ACTIVE LINES. INSTALL NEW SHUTOFF VALVES AND CAPS FOR FUTURE.
6. FIELD VERIFY EXACT LOCATION AND FUNCTION OF EXISTING DOMESTIC WATER AND HYDRONIC LINES SCHEDULED TO BE DEMOLISHED. COORDINATE DEMOLITION OF WATER HEATERS, BOILERS, HVAC EQUIPMENT, PUMPS AND ASSOCIATED PIPING AND APPURTENANCES WITH OWNER TO MINIMIZE DISRUPTION AND REQUIRED SHUTDOWN TIME OF THE MECHANICAL AND PLUMBING SYSTEMS.
7. DEMOLISH ALL SUPPORTS, HANGERS, MISCELLANEOUS PIPING AND EQUIPMENT NOT INCORPORATED INTO THE NEW WORK, IN A CODE APPROVED MANNER, WHETHER SHOWN OR NOT.
8. CONTRACTOR TO COORDINATE ALL DEMOLITION AND NEW WORK WITH ALL OTHER DISCIPLINES AND WITH PHASING PLANS. INSTALL TEMPORARY EQUIPMENT, PIPING, VALVES, ETC. AS NECESSARY TO PROVIDE SERVICE TO SPACES TO BE COMPLETED UNDER LATER EFFORTS WHILE EARLIER WORK IS UNDER CONSTRUCTION.
9. DEMOLISH ALL PIPING, CONTROLS, VALVES, FITTINGS, INSULATION, AND OTHER APPURTENANCES ASSOCIATED WITH MECHANICAL EQUIPMENT SCHEDULED FOR DEMOLITION WHETHER SHOWN, OR NOT. LIGHT FIXTURES, OUTLET RECEPTACLES, CONDUIT, AND OTHER ELECTRICAL DEVICES THAT ARE NOT SCHEDULED FOR DEMOLITION SHALL BE RELOCATED IF AFFECTED BY THE NEW WORK AT NO ADDITIONAL COST TO THE OWNER. FIELD VERIFY EXISTING DEVICE LOCATIONS.

NEW CONSTRUCTION NOTES:

1. FURNISH ALL LABOR, MATERIALS, TRANSPORTATION, AND PERFORM ALL REQUIRED OPERATIONS TO PROVIDE COMPLETE AND OPERABLE MECHANICAL SYSTEM IN ACCORDANCE WITH THE FULL INTENT AND MEANING OF THE DRAWINGS AND SPECIFICATIONS.
2. ALL EQUIPMENT SHALL BE INSTALLED WITH SUFFICIENT ACCESS TO CONTROLS, FILTERS, ELECTRIC MOTORS, ETC. ACCESS CLEARANCE SHALL BE 30-IN. OR AS REQUIRED BY THE EQUIPMENT MANUFACTURER, WHICHEVER IS GREATER.
3. THE EXISTING ELECTRICAL PANEL FOR THE BOILER ROOM IS TO BE USED FOR NEW CONNECTIONS. VERIFY EXISTING CAPACITY, OBTAIN ALL REQUIRED APPROVALS AND PERMITS, MAKE ANY REQUIRED NEW CONNECTIONS PER CODE AND LOCAL REQUIREMENTS.
4. THE EXISTING NATURAL GAS SERVICE SHALL BE MODIFIED AS NECESSARY TO SERVICE THE NEW BOILER(S) AND WATER HEATERS IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. VERIFY OPERATION OF EXISTING GAS METER PRESSURE REGULATOR. FURNISH AND INSTALL PRESSURE REGULATORS, AND OTHER APPURTANCES, AS REQUIRED TO COMPLY WITH ALL LOCAL AUTHORITIES HAVING JURISDICTION INCLUDING UTILITY RULES, REGULATIONS, AND RECOMMENDATIONS. CONTRACTOR SHALL COORDINATE ANY CHANGES TO THE GAS SERVICE WITH THE UTILITY COMPANY SO THAT UTILITY WORK CAN BE SCHEDULED WELL IN ADVANCE AND SEQUENCED TO MINIMIZE INTERRUPTIONS TO THE BUILDING'S GAS SERVICE.
5. FLUSH ALL EXISTING HOT WATER HEATING PIPING AND ALL DOMESTIC HOT WATER HEATING PIPING PRIOR TO INSTALLATION OF NEW EQUIPMENT.ALL DOMESTIC WATER PIPING WORK TO BE PROPERLY CLEANED, AND DISINFECTED PER CODE.
6. INSULATE ALL EXPOSED BOILER ROOM HOT WATER PIPES AND DOMESTIC HOT WATER PIPES PER SPECIFICATIONS. (INSULATION TO BE INSTALLED AFTER INSPECTION AND COMMISSIONING.)
7. INSULATE ALL EXPOSED BOILER ROOM HOT WATER AND DOMESTIC HOT WATER FITTINGS, VALVES, AND PUMPS PER SPECIFICATIONS. (INSULATION TO BE INSTALLED AFTER INSPECTION AND COMMISSIONING.)
8. ROUTE NEW EQUIPMENT SUPPLY AND VENT PIPING (PER MANUFACTURER'S RECOMMENDATIONS) AS SHOWN ON FLOOR PLANS. REUSE EXISTING BOILER EXHAUST PENETRATIONS WHERE FEASIBLE. REMOVE AND SEAL EXISTING SIDEWALL EXHAUST PENETRATIONS THAT ARE NOT REUSED.
9. SEAL EXISTING BOILER ROOM OUTSIDE-AIR VENT WITH METAL AND FOAM AS REQUIRED TO MINIMIZE INFILTRATION.
10. WALL MOUNT INSTANTANEOUS WATER HEATERS PER MANUFACTURER'S RECOMMENDATIONS.
11. ROUTE AND TERMINATE ALL OUTDOOR AIR TEMPERATURE SENSORS ON NORTH FACING OUTSIDE WALL OR SUPPLY SOLAR SHIELD. KEEP ROUTING INSIDE BOILER ROOM AS MUCH AS POSSIBLE TO MINIMIZE AMOUNT OF SENSOR WIRE CONDUIT EXPOSED OUTSIDE.

GENERAL NOTES

1. DRAWINGS ARE SCHEMATIC IN NATURE SHOWING GENERAL ROUTING OF PIPING. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETELY COORDINATE MECHANICAL/PLUMBING WORK WITH ALL TRADES. OFFSETS REQUIRED SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
2. CONTRACTOR TO PROVIDE OR MODIFY MECHANICAL CONDENSATE DRAIN(S) AS REQUIRED IN ALL BUILDINGS AT WASHINGTON GARDENS, INCLUDING BUILDINGS PREVIOUSLY RETROFITTED. CONTRACTOR WILL BE RESPONSIBLE FOR ROUTING OF THESE CONDENSATE DRAINS TO OUTSIDE BOILER ROOM THRU SIDEWALL AS HIGH AS POSSIBLE WHILE MAINTAINING PROPER SLOPE. CONTRACTOR WILL INSTALL THERMOSTATICALLY CONTROLLED HEAT TRACE CABLE AND INSULATION ON ALL CONDENSATE DRAINS.
3. BEFORE INSTALLATION AND ERECTION OF PIPING, VERIFY ALL DIMENSIONS AND ROUTING IN THE FIELD. ESTABLISH SLOPES AND INVERT ELEVATIONS BEFORE ANY PIPE IS INSTALLED IN ORDER THAT PROPER SLOPES WILL BE MAINTAINED.
4. ALL PIPING SHALL BE CLEAN AND FREE FROM SCALE AND DIRT AT THE TIME OF INSTALLATION. CONTRACTOR SHALL TAKE CARE TO ENSURE THAT ALL PIPING REMAINS CLEAN AND FREE OF DIRT, SAND, DEBRIS, ETC. ONCE INSTALLED.
5. PROVIDE FINAL CONNECTION TO ALL EQUIPMENT FURNISHED BY OWNER AND OTHERS. COORDINATE ROUGH-IN WITH ALL OTHER TRADES AND EQUIPMENT MANUFACTURERS.
6. CONTRACTOR SHALL INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. INSTALL EQUIPMENT COMPLETE WITH ALL ACCESSORIES NECESSARY FOR THE FULL OPERATION OF THE EQUIPMENT, UNLESS NOTED OTHERWISE.
7. CONTRACTOR SHALL REVIEW ALL EXISTING CONDITIONS PRIOR TO COMMENCING WORK. VERIFY SIZE AND LOCATION OF ALL EXISTING PIPING IN THE FIELD.
8. REFER TO ALL NOTES AND SPECIFICATIONS FOR DETAILS AND REQUIREMENTS.
9. CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS AND LOCAL APPROVALS REQUIRED TO PERFORM WORK AND PAY ANY RELATED FEES.
10. ALL DOMESTIC WATER PIPING LOCATED IN EXTERIOR WALLS SHALL BE RUN ON THE ROOM SIDE OF WALL OR CEILING INSULATION.
11. CONTRACTOR SHALL PROVIDE NEW PIPE TO EXISTING CONNECTIONS WITHIN 5'-0" OF LOCATIONS SHOWN AT NO ADDITIONAL COST TO OWNER.
12. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
13. WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
14. CONTRACTOR MUST COMPLETE WORK BEFORE SEPTEMBER 15, 2015, OR CONTRACTOR TO PROVIDE TEMPORARY SERVICE UNTIL WORK IS COMPLETE. ANY TEMPORARY SERVICE MUST RECEIVE PRIOR PHA PERMISSION.
15. PROVIDE OWNER WITH ONE SET OF AS-BUILT DRAWINGS, AND EQUIPMENT OPERATION AND MAINTENANCE MANUALS, UNLESS NOTED OTHERWISE. INCLUDE A LIST OF ALL EQUIPMENT MODELS AND SERIAL NUMBERS; MANUFACTURER'S OPERATION MANUALS AND PARTS LISTS; EQUIPMENT WARRANTY DATES; EQUIPMENT WARRANTY CERTIFICATES; AND SUGGESTED SERVICE PROCEDURES AND INTERVALS. INCLUDE WARRANTY SERVICE CONTACT INFORMATION. IN ADDITION TO ABOVE, PROVIDE A CD WITH ALL REQUIRED DOCUMENTS PROVIDED IN ELECTRONIC FORMAT.
16. TRAINING OF MAINTENANCE STAFF TO BE PROVIDED BY MANUFACTURER'S REPRESENTATIVE AS PER SPECIFICATIONS.
17. START-UP TESTING TO BE BY MANUFACTURER OR QUALIFIED MANUFACTURER'S REPRESENTATIVE.
18. ALL WORK SHALL COMPLY WITH CURRENT ADOPTED STATE AND LOCAL CODES AS WELL AS LOCAL UTILITY COMPANY REQUIREMENTS AND SHALL BE ACCEPTED BY THE AUTHORITY HAVING JURISDICTION.

MECHANICAL NOTES

1. NO CHANGES ARE TO BE MADE IN LAYOUT WITHOUT WRITTEN PERMISSION BY THE ENGINEER.
2. PIPE AND FITTINGS SHALL CONFORM TO THE LATEST ANSI, ASTM, ASME, AND COMMERCIAL STANDARDS.
3. INDOOR DOMESTIC WATER SUPPLY PIPING SHALL BE TYPE "L" COPPER, UNLESS OTHERWISE NOTED.
4. GAS PIPING (AS REQUIRED) SHALL BE SCHEDULE 40 BLACK STEEL WITH CLASS 150 MALLEABLE IRON FITTINGS, UNLESS OTHERWISE NOTED.
5. INSULATE ALL DOMESTIC WATER PIPING IN UNCONDITIONED AREAS WITH FIBERGLASS INSULATION AND NON-COMBUSTIBLE UL RATED VAPOR BARRIER OR CLOSED CELL FLEXIBLE INSULATION EQUAL TO AP/ARMAFLEX PIPE. INSULATION LEVELS 1" OR PER CODE.
6. INSULATE ALL HEATING HOT WATER PIPING IN UNCONDITIONED AREAS WITH FIBERGLASS INSULATION AND NON-COMBUSTIBLE UL RATED VAPOR BARRIER OR CELLULAR GLASS INSULATION EQUAL TO PITTSBURGH CORNING CORP. FOAMGLAS. FIBERGLASS INSULATION THICKNESS SHALL BE:
   - 1-1/2" MINIMUM FOR NOMINAL PIPE DIA. LESS THAN OR EQUAL TO 1.5"
   - 2" MINIMUM FOR NOMINAL PIPE DIA. GREATER THAN 1.5" AND LESS THAN 4".
7. LABEL BOTH DOMESTIC AND HEATING WATER PIPING PER SPECIFICATIONS.
8. PROVIDE SHUT-OFF VALVES FOR WATER HEATER BRANCH.
9. PROVIDE DIELECTRIC FITTINGS OR COUPLINGS WHERE EVER DISSIMILAR METALS ARE JOINED.
10. PROVIDE DRAIN VALVES FOR ALL HOT AND COLD WATER LINES TO ALLOW FOR WINTER FREEZE PROTECTION.
11. INSTALL ALL REQUIRED CLEANOUTS TO CLEAN EQUIPMENT AND FIXTURES.
12. ALL WORK TO BE PROPERLY TESTED AND BALANCED PER SPECIFICATIONS.
13. PROVIDE A FIVE YEAR WARRANTY FROM DATE OF FINAL INSPECTION ON ALL PARTS AND LABOR IN ADDITION TO ANY MANUFACTURER WARRANTIES.

ELECTRICAL NOTES

1. PROVIDE ALL WORK AND MATERIALS FOR THE INSTALLATION OF COMPLETE WIRING SYSTEM PER CURRENT NATIONAL ELECTRICAL CODE AND ALL LOCAL REQUIREMENTS.
2. CONTRACTOR TO PROVIDE ALL INCIDENTAL ITEMS REQUIRED FOR WORK (INCLUDING, BUT NOT LIMITED TO; J-BOXES, WIRE NUTS, GROUNDING SCREWS, FASTENERS, ELECTRICAL TAPE, AND CLIPS.
3. ANY REQUIRED CONDUIT SHALL BE ZINC-COATED EMT. SUPPORT ALL CONDUITS WITH STRAPS AND CLAMPS. RUN ALL CONDUIT IN STRAIGHT LINES PARALLEL OR PERPENDICULAR TO BUILDING WALLS.
4. EXISTING WIRE WAYS/CONDUIT SHALL BE USED WHENEVER POSSIBLE. IF EXISTING WIRE WAYS/CONDUIT CANNOT BE USED, INSTALL NEW CONDUIT AS REQUIRED
5. CONTROL WIRING AND POWER WIRING SHALL BE IN ELECTRICAL CONDUIT.
6. JUNCTION AND PULL BOXES SHALL BE CODE GAUGE GALVANIZED STEEL.
7. ALL LINE VOLTAGE AND LOW VOLTAGE WIRE SHALL BE INSTALLED IN METAL CONDUIT.
8. CONNECT HEATING BOILERS AND ALL PUMPS TO EXISTING CIRCUITS. ANY JUNCTION BOXES REQUIRED FOR BOILERS ARE TO BE SECURELY ATTACHED TO BOILERS. SOME OF THE NEW REPLACEMENT BOILERS MAY REQUIRE FUSED DISCONNECTS. FOLLOW MANUFACTURER'S RECOMMENDATIONS AND PROVIDE AS NEEDED.
9. CONNECT PUMP P-2 TO EXISTING CIRCUITS ON EXISTING POWER PANEL. POWER PUMP P-1 FROM BOILER.
10. MARK SAFETY SWITCH WITH ARROW POINTING TO LOCATION OF POWER PANEL.
11. RE-USE EXISTING BOILER EMERGENCY STOP SWITCH (VERIFY IN GOOD WORKING CONDITION OR REPLACE WITH LIKE.)
12. LABEL ALL ELECTRICAL DEVICES THAT ARE INSTALLED WITH THE ELECTRICAL CIRCUIT SERVING THE DEVICE. THIS WILL AID IN MAINTENANCE PROCEDURES.
13. CONTRACTOR TO PROVIDE ACCURATE PANEL SCHEDULES AT COMPLETION OF WORK.
14. PROVIDE DISCONNECTING MEANS WITHIN SITE OF ALL DEVICES.

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Seals

STATE OF MAINE
MATTHEW M. PESCE
No. 12069
LICENSED
PROFESSIONAL ENGINEER
4/9/15

Project Name:
Boiler/DHW Renovation,
Washington Gardens
Portland, Maine

Revisions

Rev	Date	Description
0	04/09/15	Bid set

Drawn by: PJM

Checked by: MMP

Sheet Name

MECHANICAL & ELECTRICAL NOTES

Sheet Number

M-0.1

Reviewed for Code Compliance
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BOILER SCHEDULE

LOCATIONS	TAG	MANUFACTURER & MODEL NO.	BOILER TYPE	NATURAL GAS INPUT MBH	NET OUTPUT MBH	EFF (%) AFUE	BOILER GPM @ 20°F/DT	HEAD LOSS (FT.)	LWT–°F @ 0°F OAT	WATER INLET (IN.)	G IN (I				
BLDG 1,3,4,7,9, 10 & COMMUNITY	B–1	LOCHINVAR KBN 151	CONDENSING	150	139	95	14.0	20	160	1	1/2	3"	3"	1.5	120/1

NOTES:
1. ALL DATA IS MINIMUM REQUIRED MECHANICAL LOAD PERFORMANCE
2. SCHEDULES BASED ON LOCHINVAR (SUPPLIED WITH 50 PSI RELIEF VALVES), SUBSTITUTIONS NOT PERMITTED
3. INTAKE FLUE, EXHAUST STACK, TO BE FACTORY APPROVED SCHEDULE 40 PVC COMBINED INTO SIDEWALL TERMINATION PER MANUFACTURER'S AND AHJ REQUIREMENTS. MAINTAIN MANUFACTURER'S REQUIRED CLEARANCES OPENINGS, WALLS, GROUND AND TO ADDITIONAL FLUE TERMINATIONS.
4. BURNER: FORCED DRAFT WITH COMBUSTION CONTROL; SEALED COMBUSTION SYSTEM. INLET GAS PRESSURE 4.0" WC TO 14.0" WC.
5. GAS CONTROL SHALL BE FULL MODULATION FIRING CONDITIONS, WITH MINIMUM 5:1 TURNDOWN.
6. PROVIDE GAS TRAIN AND CONTROLS TO MEET FM AND UL (PLUS XL GAP FOR BOILERS OVER 400,000 MBH) REQUIREMENTS.
7. PROVIDE EACH BOILER WITH CONTROLS TO MODULATE FIRING RATES.
8. PROVIDE CONDENSATE NEUTRALIZATION KIT BY MANUFACTURER. ROUTE CONDENSATE DRAIN AS HIGH AS POSSIBLE WHILE MAINTAINING PROPER SLOPE THRU THE SIDEWALL TO OUTSIDE THE BOILER ROOM LOCATION.
9. HEAT EXCHANGER AND INTERNAL BOILER EXHAUST PIPES SHALL BE 316L STAINLESS STEEL FOR CONDENSING APPLICATION.
10. BOILER SYSTEM CONTROLS AND CONTROL WIRING BY CONTRACTOR.

INSTANTANEOUS GAS WATER HEATER SCHEDULE

LOCATIONS	TAG	MANUFACTURER MODEL NUMBER	TANK CAPACITY	TEMP. RISE	POWER SUPPLY	GAS		WATER CONNECTION		CONCENTRIC VENT DIA.–IN.
						LINE	BTUH DEMAND	CW	HW	
BLDG 1,3,4,7,9, 10& COMMUNITY	WH–1	RINNAI RU98i	TANKLESS	4.8 GPM @ 77°F RISE	120VAC/2A	3/4"	199,000	3/4"	3/4"	5

NOTES:
1. ALL DATA IS MINIMUM REQUIRED PERFORMANCE.
2. SCHEDULES BASED ON RINNAI, SUBSTITUTIONS NOT PERMITTED.
3. DOE ENERGY FACTOR TO BE 0.95 OR BETTER.
4. INTAKE FLUE, EXHAUST STACK, TO BE FACTORY APPROVED SCHEDULE 40 PVC CONCENTRIC PER MANUFACTURER'S AND AHJ REQUIREMENTS. MAINTAIN MANUFACTURER'S REQUIRED CLEARANCES OPENINGS, WALLS, GROUND AND TO ADDITIONAL FLUE TERMINATIONS.
5. PROVIDE WITH MANUFACTURER'S RECOMMENDED CONDENSATE NEUTRALIZATION KIT. ROUTE CONDENSATE DRAIN LINE AS HIGH AS POSSIBLE WHILE MAINTAINING PROPER SLOPE THRU THE SIDEWALL TO OUTSIDE THE BOILER ROOM.
6. HEAT EXCHANGER AND INTERNAL EXHAUST PIPES SHALL BE COPPER OR STAINLESS STEEL FOR CONDENSING APPLICATION.

EXPANSION TANK SCHEDULE

LOCATIONS	TAG	TYPE	SERVIVCE	LOCATION	TANK VOLUME GALLONS	ACCEPT. VOLUME GALLONS	SIZE (INCHES)		MANUFACTURER/ MODEL NUMBER
							DIA.	LENGTH	
BLDG 1,3,4,7,9, 10 & COMMUNITY	X–1	PRESSURIZED	HEAT. HW	MECHANICAL ROOM	7.6	2.5	11	23	AMTROL/EX–60

NOTES:
1. ALL DATA IS MINIMUM REQUIRED PERFORMANCE.
2. VERIFY BOILER RELIEF PRESSURE SETTING IN CONJUNCTION WITH MANUFACTURER'S RECOMMENDATIONS FOR PRECHARGE PRESSURE REQUIREMENT.
3. VERIFY DOMESTIC COLD WATER LINE PRESSURE AND PRECHARGE DOMESTIC HOT WATER EXPANSION TANK TO THIS PRESSURE. SUBMIT EXPANSION TANK TO ENGINEER FOR APPROVAL.
4. SCHEDULES BASED ON AMTROL, SUBSTITUTIONS NOT PERMITTED.

HEATING HOT WATER PUMP SCHEDULE

LOCATIONS	TAG	SERVICE	TYPE	GPM	HEAD (FT)	B.H.P.	H.P.	VOLT	PH	RPM	SUCT. (IN)	DISCH. (IN)	IMP. DIA. (IN)	PUMP EFF. (%)	MANUFACTURER/MODEL
BLDG 1,3,4,7,9, 10 & COMMUNITY	P–1	HOT WATER HEATING	IN–LINE	33	29	–	1/6	115	1	3380	1–1/2	1–1/2	–	–	GRUNDFOS UPS 26–99FC
	P–2	HOT WATER HEATING	IN–LINE	31	31	–	1/8	115	1	3250	1–1/2	1–1/2	–	–	TACO 0011–F4

NOTES:
1. ALL DATA IS MINIMUM REQUIRED PERFORMANCE.
2. SCHEDULES BASED ON TACO AND GRUNDFOS, SUBSTITUTIONS NOT PERMITTED.
3. STARTERS TO BE PROVIDED WITH EQUIPMENT, DISCONNECTS BY E.C..
4. CONNECT TO HW HEATER CONTROLS AS DETAILED
5. PUMP P–1 TO BE CONTROLLED BY STARTER RELAY INTEGRAL TO BOILER.

CONTROLS POINTS LIST

LOCATIONS	RESET SCHEDULE	
	OSA	SETPOINT
BLDG 1,3,4,7,9, 10 & COMMUNITY	65°F	120°F
	0°F	160°F

NOTES:
1. REFER TO DIVISION 23 SPECIFICATIONS FOR DETAILS.
2. P–1 PUMPS OPERATE INTERMITTENTLY PER BOILER FIRING, P–2 PUMPS OPERATE 24 HOURS PER DAY 7 DAYS PER WEEK.
3. BOILERS CYCLE TO MAINTAIN SECONDARY LOOP TEMPERATURE DURING HEATING SEASON.
4. BOILER TEMPERATURE SET–POINT VARIES PER BOILER RESET SCHEDULE.

Sheet Number: M-0.2
2 of 4
Sheet Name: MECHANICAL SCHEDULES
Checked by: MMP
Drawn by: PJM
Revisions: Rev. Date 0 04/29/15 Description Issued for set

Project Name:
Boiler/DHW Renovation, Washington Gardens Portland, Maine

STATE OF MAINE
MATTHEW M. PESCE
No. 12069
LICENSED PROFESSIONAL ENGINEER
4/29/15

Scale

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