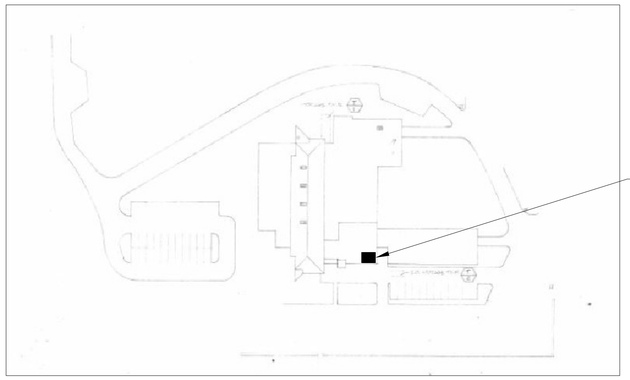
DFO – WEST VANCOUVER LABORATORY

BOILER PLANT UPGRADE

PROJECT NUMBER: 5DT18

SITE PLAN
NTS



MECHANICAL LEGEND

	SUPPLY OR OUTDOOR AIR DUCT UP	HWS	HOT WATER SUPPLY
SAD	SUPPLY OR OUTDOOR AIR DUCT DOWN	HWR	HOT WATER RETURN
	RETURN AIR DUCT UP	DCW	DOMESTIC COLD WATER
RAD	RETURN AIR DUCT DOWN	DHW	DOMESTIC HOT WATER
	EXHAUST AIR DUCT UP	DHWR	DOMESTIC HOT WATER RECIRC.
EAD	EXHAUST AIR DUCT DOWN	V	SANITARY VENT
	ROUND DUCT UP	SAN	SANITARY SEWER
	ROUND DUCT DOWN	ST	STORM SEWER
	TURNING VANES	A	COMPRESSED AIR
	ACOUSTIC INSULATION (INTERNALLY LINED)		DIRECTION OF FLOW
BD	BALANCING DAMPER		PIPE DROP
B.D.D.	BACK DRAFT DAMPER		PIPE RISE
M.D.	MOTORIZED DAMPER		PIPE TEE DOWN
			PIPE TEE UP
AP	ACCESS PANEL		PIPE UNION
			CAP OR PLUG
	ROOF FAN – EXHAUST AIR		FLEXIBLE CONNECTION
	DUCT OR PIPE CAP–OFF	N.O.	GATE VALVE (NORMALLY OPEN)
	SUPPLY AIR GRILLE OR DIFFUSER	N.C.	GATE VALVE (NORMALLY CLOSED)
	RETURN AIR GRILLE		CHECK VALVE
	EXHAUST AIR GRILLE		2–WAY CONTROL VALVE
	SUPPLY OUTLET		BALL VALVE
	RETURN OR EXHAUST INLET		BALANCING VALVE
U/C	DOOR GRILLE – UNDERCUT	P.R.V.	PRESSURE REDUCING VALVE
	TURNING VANES		BUTTERFLY VALVE
			STRAINER
	MANUAL DAMPER	B.F.P.	BACKFLOW PREVENTOR
M	MOTORIZED DAMPER (MODULATING)		

	P & T RELIEF VALVE
	PRESSURE GAUGE
	THERMOMETER
	PUMP
	OPEN DRAIN
H.B.	HOSE–BIBB
	FLOOR DRAIN
T	THERMOSTAT
S	SENSOR
FC-1	EQUIPMENT / FIXTURE TYPE
–	GENERAL NOTE
	GENERAL NOTE
(E)	EXISTING
	EXISTING TO BE REMOVED
	POC (POINT OF CONNECTION)

GENERAL NOTES

1. THE MECHANICAL AND PLUMBING SYSTEMS SHALL CONSIST OF ALL WORK SHOWN ON DRAWINGS, DIAGRAMS, AND AS DESCRIBED IN SPECIFICATIONS. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INTENDED TO INDICATE THE SCOPE AND GENERAL ARRANGEMENT OF WORK AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS.
2. INSTALL ALL MECHANICAL WORK AS HIGH AS POSSIBLE, TIGHT TO STRUCTURE ABOVE, EXCEPT WHERE CONFLICT OCCURS WITH REQUIREMENTS LISTED UNDER SPECIFICATION (VIBRATION ISOLATION).
3. THE MECHANICAL PLANS ARE DIAGRAMMATIC IN NATURE AND DO NOT ATTEMPT TO SHOW ALL REQUIRED OFFSETS.
4. ITEMS NOTED "TYPICAL" OR "TYP" ON ANY SHEET APPLY TO THAT PARTICULAR SHEET
5. COORDINATE WITH SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN SPECIFICATIONS AND DRAWINGS THE MORE STRINGENT SHALL APPLY.
6. PROVIDE NEC CODE MINIMUM HORIZONTAL AND VERTICAL WORKING CLEARANCE FOR ALL ELECTRICAL PANELS AND EQUIPMENT. OFFSET MECHANICAL WORK AS REQUIRED.
7. COORDINATE ALL MECHANICAL WORK WITH THAT OF OTHER TRADES TO ENSURE PROPER AND ADEQUATE INTERFACE OF THEIR WORK WITH THE WORK OF THIS CONTRACTOR. PROVIDE COORDINATED SHOP DRAWINGS PRIOR TO FABRICATION AND INSTALLATION.
8. VERIFY EXISTING CONDITIONS BEFORE COMMENCING ANY WORK ON A PREVIOUSLY INSTALLED EXISTING MECHANICAL SYSTEM.
9. COORDINATE EXACT LOCATIONS OF ALL TEMPERATURE SENSORS WITH CLIENT PRIOR TO INSTALLATION.
10. THE MECHANICAL CONTRACTOR SHALL INCLUDE FOR ALL PERMITS AS REQUIRED BY THE LOCAL AUTHORITY.
11. DO NOT SCALE THE DRAWINGS. OBTAIN ACCURATE MEASUREMENTS FROM SITE.
12. THE CONTRACTOR SHALL ALLOW FOR ALL AND ANY PIPING, VENTING OFFSETS REQUIRED TO AVOID THE EXISTING STRUCTURE, MECHANICAL OR ELECTRICAL INSTALLATIONS.

CIVIC ADDRESS

DEPARTMENT OF FISHERIES AND OCEANS
WEST VANCOUVER LABORATORY
4160 MARINE DRIVE
WEST VANCOUVER
V7V 1N6

FOR MECHANICAL CONTRACTOR

PRIOR TO COMMENCING INSTALLATION WITHIN THE BUILDING, THE MECHANICAL CONTRACTOR SHALL CHECK THE LOCATION AND INVERT ELEVATIONS OF ALL SERVICE LINES INCLUDING SANITARY SEWER, STORM SEWER, WATER MAINS, AND GAS MAINS WITH LOCAL AUTHORITIES TO INSURE THAT THESE SERVICES CAN BE INSTALLED AS SHOWN.
MINIMUM DISTANCE FROM METER VENTS TO OPERABLE WINDOWS, INTAKES OR DOORS SHALL BE 3 METERS (10 FEET).

DRAWING LIST

DWG. NO	DESCRIPTION	SCALE
M100	COVER SHEET AND SITE PLAN	AS NOTED
M201D	EXISTING MECHANICAL SCHEMATIC DEMOLITION PLAN	AS NOTED
M202	PROPOSED MECHANICAL SCHEMATIC	AS NOTED
M301D	BOILER ROOM DEMOLITION PLAN AND SECTIONS	AS NOTED
M302	BOILER ROOM PLAN AND SECTIONS	AS NOTED
M400	MECHANICAL EQUIPMENT SCHEDULES	AS NOTED
M500	MECHANICAL DETAILS	AS NOTED
E100	LEGEND AND ABBREVIATIONS	AS NOTED
E101	GENERAL NOTES	AS NOTED
E105	SITE PLAN BOILER ROOM	AS NOTED
E106	DETAILS MCCE1 ELECTRICAL	AS NOTED
E107	WIRING DIAGRAM VFD AND BOILER SYSTEM CONTROL WIRING	AS NOTED

FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS

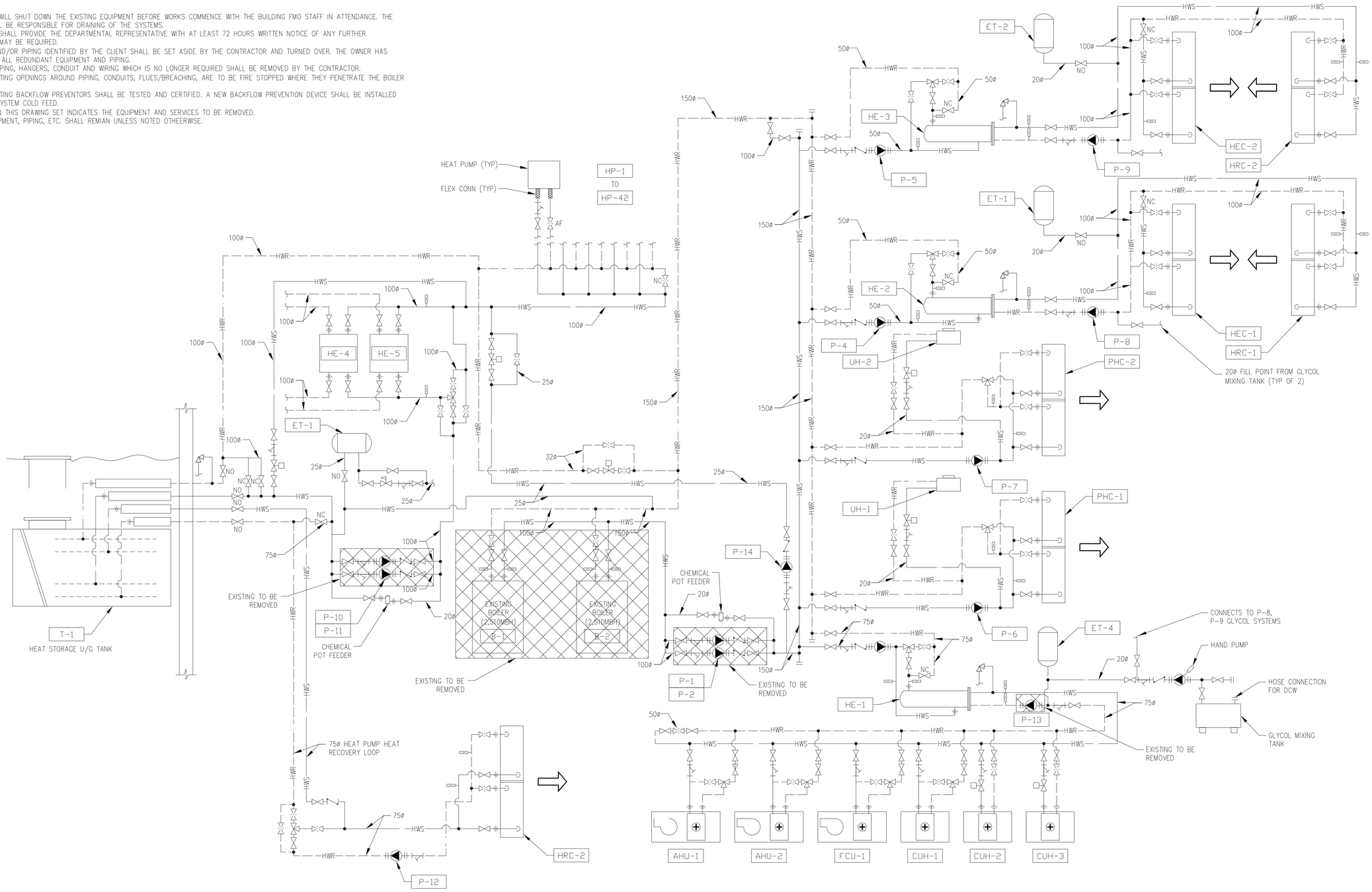
DESIGNED: SM
DRAWN: SA
CHECKED:
RECOMMENDED:
APPROVED:

WEST VANCOUVER LABORATORY
HEATING SYSTEM UPGRADE
COVER SHEET AND SITE PLAN

SCALE: AS_NOTED
DATE: 2016-MAR-31
DRAWING NUMBER: M100

GENERAL NOTES:

1. THE CONTRACTOR WILL SHUT DOWN THE EXISTING EQUIPMENT BEFORE WORKS COMMENCE WITH THE BUILDING FMO STAFF IN ATTENDANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINING OF THE SYSTEMS.
2. THE CONTRACTOR SHALL PROVIDE THE DEPARTMENTAL REPRESENTATIVE WITH AT LEAST 72 HOURS WRITTEN NOTICE OF ANY FURTHER SHUTDOWNS THAT MAY BE REQUIRED.
3. ANY EQUIPMENT AND/OR PIPING IDENTIFIED BY THE CLIENT SHALL BE SET ASIDE BY THE CONTRACTOR AND TURNED OVER. THE OWNER HAS FIRST REFUSAL OF ALL REDUNDANT EQUIPMENT AND PIPING.
4. ALL REDUNDANT PIPING, HANGERS, CONDUIT AND WIRING WHICH IS NO LONGER REQUIRED SHALL BE REMOVED BY THE CONTRACTOR.
5. ALL NEW AND EXISTING OPENINGS AROUND PIPING, CONDUITS, FLUES/BREACHING, ARE TO BE FIRE STOPPED WHERE THEY PENETRATE THE BOILER ROOM WALLS.
6. ALL NEW AND EXISTING BACKFLOW PREVENTORS SHALL BE TESTED AND CERTIFIED. A NEW BACKFLOW PREVENTION DEVICE SHALL BE INSTALLED ON THE HEATING SYSTEM COLD FEED.
7. HASHED AREA'S ON THIS DRAWING SET INDICATES THE EQUIPMENT AND SERVICES TO BE REMOVED.
8. ALL EXISTING EQUIPMENT, PIPING, ETC. SHALL REMIAN UNLESS NOTED OTHEERWISE.



FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

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DESIGNED: SM
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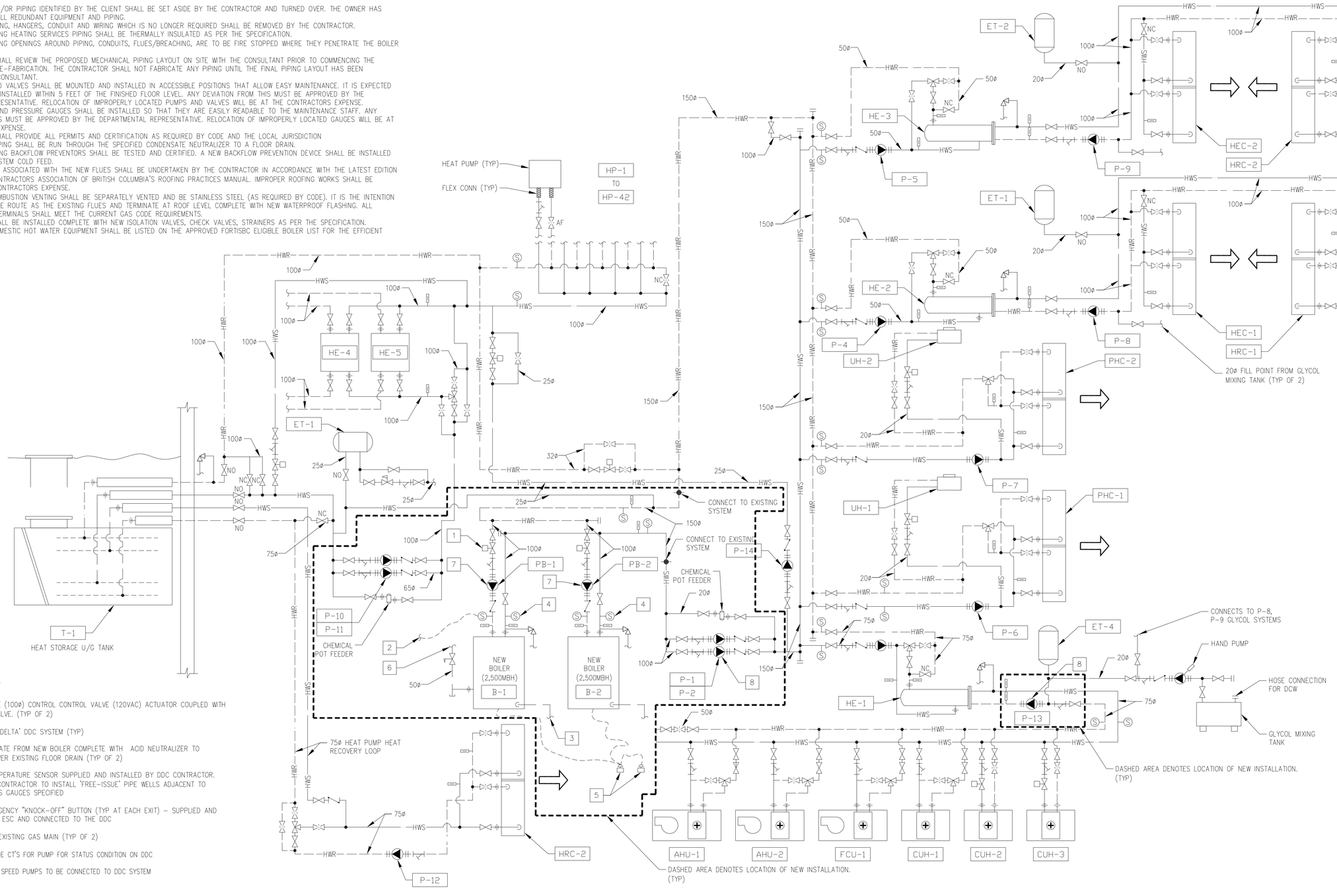
RECOMMENDED:
APPROVED:

WEST VANCOUVER LABORATORY HEATING SYSTEM UPGRADE EXISTING MECHANICAL SCHEMATIC DEMOLITION PLAN

SCALE: AS_NOTED
DATE: 2016-MAR-31
DRAWING NUMBER: M201D

GENERAL NOTES:

1. THE CONTRACTOR WILL SHUT DOWN THE EXISTING EQUIPMENT BEFORE WORKS COMMENCE WITH THE BUILDING FMO STAFF IN ATTENDANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINING OF THE SYSTEMS.
2. THE CONTRACTOR SHALL PROVIDE THE PROJECT MANAGER WITH AT LEAST 72 HOURS WRITTEN NOTICE OF ANY FURTHER SHUTDOWNS THAT MAY BE REQUIRED.
3. THE CONTRACTOR SHALL PROVIDE THE DEPARTMENTAL REPRESENTATIVE WITH AT LEAST 72 HOURS WRITTEN NOTICE OF ANY EQUIPMENT START-UP.
4. ANY EQUIPMENT AND/OR PIPING IDENTIFIED BY THE CLIENT SHALL BE SET ASIDE BY THE CONTRACTOR AND TURNED OVER. THE OWNER HAS FIRST REFUSAL OF ALL REDUNDANT EQUIPMENT AND PIPING.
5. ALL REDUNDANT PIPING, HANGERS, CONDUIT AND WIRING WHICH IS NO LONGER REQUIRED SHALL BE REMOVED BY THE CONTRACTOR.
6. ALL NEW AND EXISTING HEATING SERVICES PIPING SHALL BE THERMALLY INSULATED AS PER THE SPECIFICATION.
7. ALL NEW AND EXISTING OPENINGS AROUND PIPING, CONDUITS, FLUES/BREACHING, ARE TO BE FIRE STOPPED WHERE THEY PENETRATE THE BOILER ROOM WALLS.
8. THE CONTRACTOR SHALL REVIEW THE PROPOSED MECHANICAL PIPING LAYOUT ON SITE WITH THE CONSULTANT PRIOR TO COMMENCING THE INSTALLATION OR PRE-FABRICATION. THE CONTRACTOR SHALL NOT FABRICATE ANY PIPING UNTIL THE FINAL PIPING LAYOUT HAS BEEN APPROVED BY THE CONSULTANT.
9. ALL NEW PUMPS AND VALVES SHALL BE MOUNTED AND INSTALLED IN ACCESSIBLE POSITIONS THAT ALLOW EASY MAINTENANCE. IT IS EXPECTED THAT THEY WILL BE INSTALLED WITHIN 5 FEET OF THE FINISHED FLOOR LEVEL. ANY DEVIATION FROM THIS MUST BE APPROVED BY THE DEPARTMENTAL REPRESENTATIVE. RELOCATION OF IMPROPERLY LOCATED PUMPS AND VALVES WILL BE AT THE CONTRACTORS EXPENSE.
10. ALL TEMPERATURE AND PRESSURE GAUGES SHALL BE INSTALLED SO THAT THEY ARE EASILY READABLE TO THE MAINTENANCE STAFF. ANY DEVIATION FROM THIS MUST BE APPROVED BY THE DEPARTMENTAL REPRESENTATIVE. RELOCATION OF IMPROPERLY LOCATED GAUGES WILL BE AT THE CONTRACTORS EXPENSE.
11. THE CONTRACTOR SHALL PROVIDE ALL PERMITS AND CERTIFICATION AS REQUIRED BY CODE AND THE LOCAL JURISDICTION
12. ALL CONDENSATE PIPING SHALL BE RUN THROUGH THE SPECIFIED CONDENSATE NEUTRALIZER TO A FLOOR DRAIN.
13. ALL NEW AND EXISTING BACKFLOW PREVENTORS SHALL BE TESTED AND CERTIFIED. A NEW BACKFLOW PREVENTION DEVICE SHALL BE INSTALLED ON THE HEATING SYSTEM COLD FEED.
14. ALL ROOFING WORKS ASSOCIATED WITH THE NEW FLUES SHALL BE UNDERTAKEN BY THE CONTRACTOR IN ACCORDANCE WITH THE LATEST EDITION OF THE ROOFING CONTRACTORS ASSOCIATION OF BRITISH COLUMBIA'S ROOFING PRACTICES MANUAL. IMPROPER ROOFING WORKS SHALL BE RECTIFIED AT THE CONTRACTORS EXPENSE.
15. ALL NEW BOILER COMBUSTION VENTING SHALL BE SEPARATELY VENTED AND BE STAINLESS STEEL (AS REQUIRED BY CODE). IT IS THE INTENTION TO FOLLOW THE SAME ROUTE AS THE EXISTING FLUES AND TERMINATE AT ROOF LEVEL COMPLETE WITH NEW WATERPROOF FLASHING. ALL COMBUSTION VENT TERMINALS SHALL MEET THE CURRENT GAS CODE REQUIREMENTS.
16. ALL NEW PUMPS SHALL BE INSTALLED COMPLETE WITH NEW ISOLATION VALVES, CHECK VALVES, STRAINERS AS PER THE SPECIFICATION.
17. NEW BOILER AND DOMESTIC HOT WATER EQUIPMENT SHALL BE LISTED ON THE APPROVED FORTISBC ELIGIBLE BOILER LIST FOR THE EFFICIENT BOILER PROGRAM.



KEYED NOTES

1. NEW LINE SIZE (100ø) CONTROL CONTROL VALVE (120VAC) ACTUATOR COUPLED WITH BUTTERFLY VALVE. (TYP OF 2)
2. CONNECT TO 'DELTA' DDC SYSTEM (TYP)
3. 25ø CONDENSATE FROM NEW BOILER COMPLETE WITH ACID NEUTRALIZER TO DISCHARGE OVER EXISTING FLOOR DRAIN (TYP OF 2)
4. NEW DDC TEMPERATURE SENSOR SUPPLIED AND INSTALLED BY DDC CONTRACTOR. MECHANICAL CONTRACTOR TO INSTALL "FREE-ISSUE" PIPE WELLS ADJACENT TO TEMPERATURES GAUGES SPECIFIED
5. 2x NEW EMERGENCY "KNOCK-OFF" BUTTON (TYP AT EACH EXIT) - SUPPLIED AND INSTALLED BY ESC AND CONNECTED TO THE DDC
6. CONNECT TO EXISTING GAS MAIN (TYP OF 2)
7. ESC TO PROVIDE CT'S FOR PUMP FOR STATUS CONDITION ON DDC
8. NEW VARIABLE SPEED PUMPS TO BE CONNECTED TO DDC SYSTEM

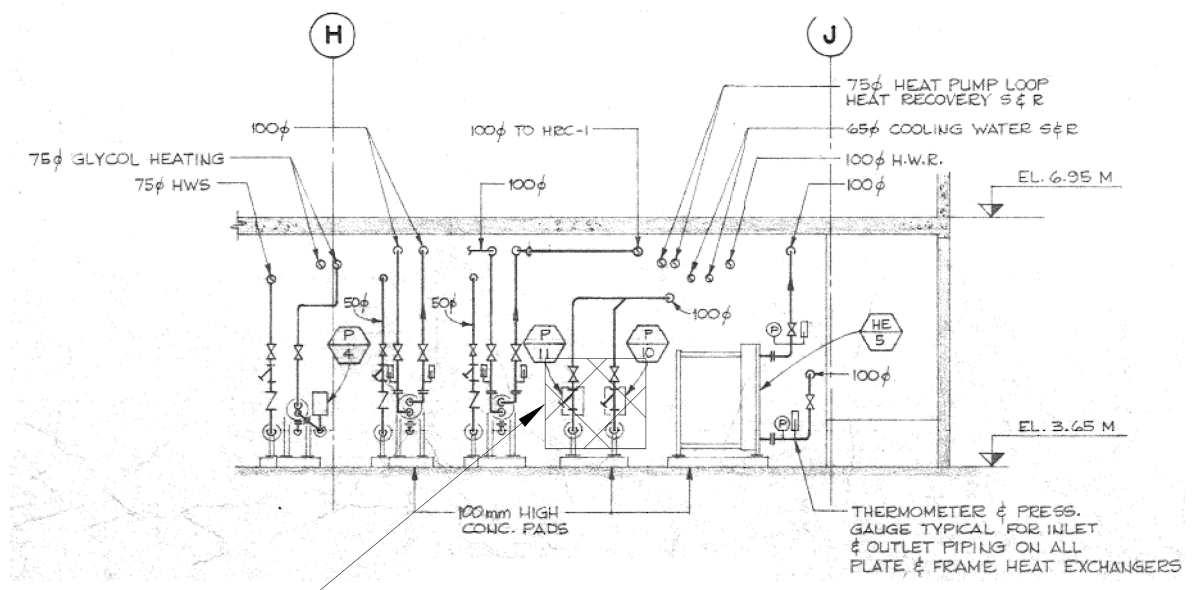
FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS

DESIGNED SM
DRAWN SA
CHECKED
RECOMMENDED
APPROVED

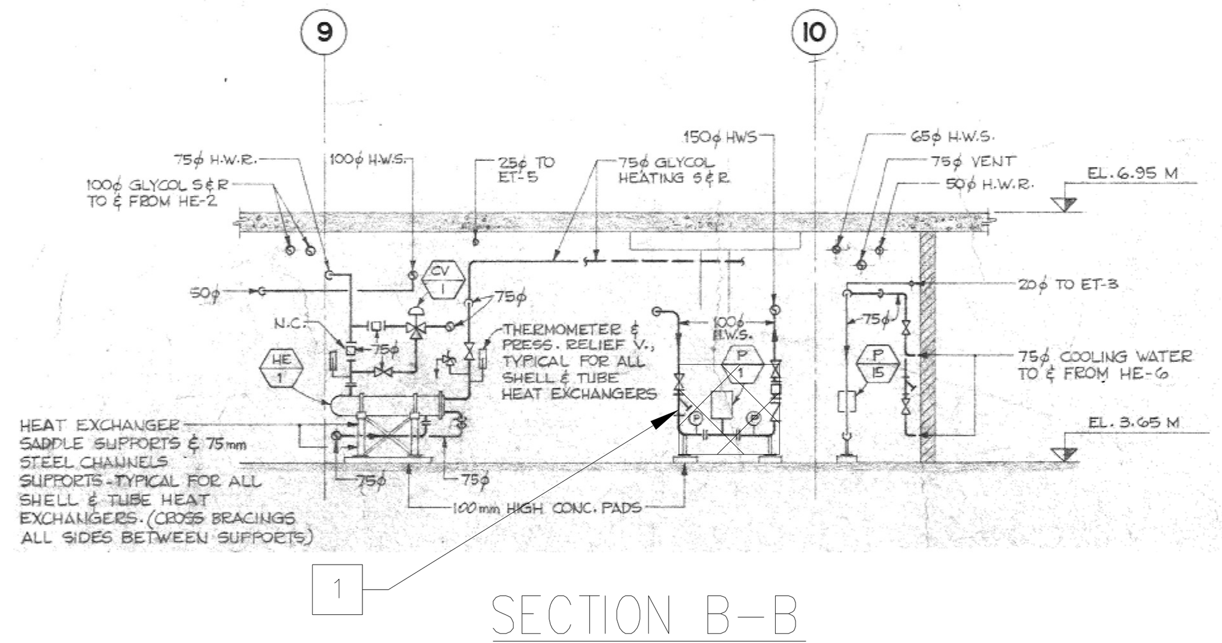
WEST VANCOUVER LABORATORY HEATING SYSTEM UPGRADE PROPOSED MECHANICAL SCHEMATIC

SCALE AS_NOTED
DATE 2016-MAR-31
DRAWING NUMBER M202



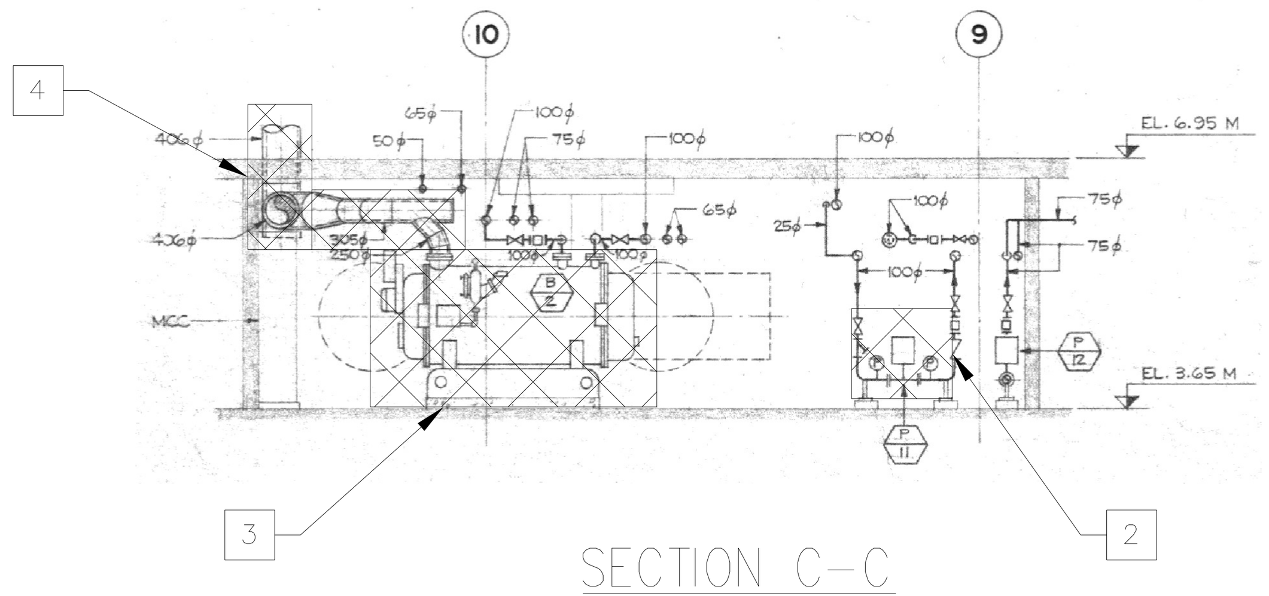
SECTION A–A

SCALE: 1:100



SECTION B–B

SCALE: 1:100



SECTION C–C

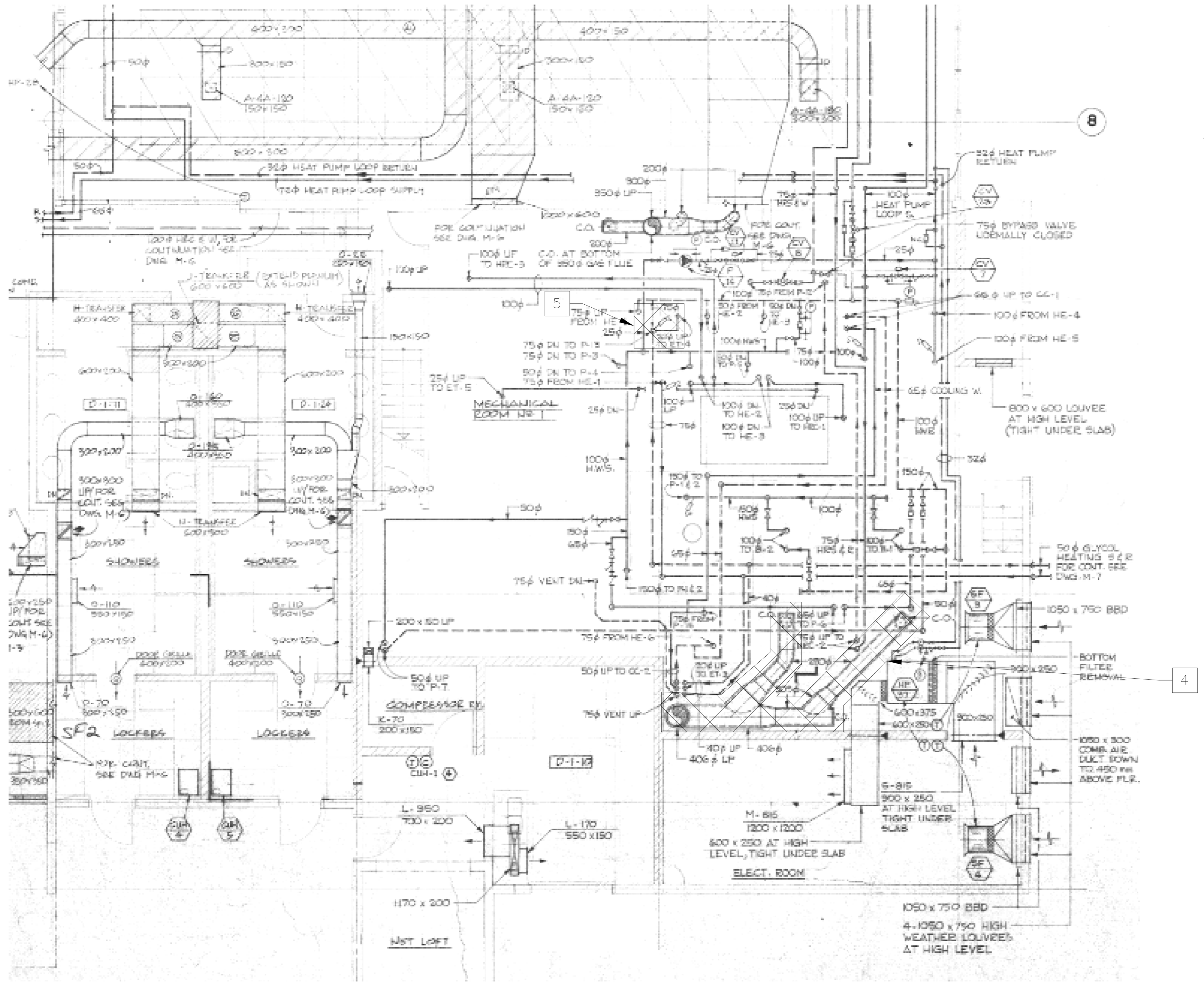
SCALE: 1:100

GENERAL DEMOLITION NOTES:

1. THE CONTRACTOR WILL SHUT DOWN THE EXISTING EQUIPMENT BEFORE WORKS COMMENCE WITH THE BUILDING FMO STAFF IN ATTENDANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINING OF THE SYSTEMS.
2. THE CONTRACTOR SHALL PROVIDE THE DEPARTMENTAL REPRESENTATIVE WITH AT LEAST 72 HOURS WRITTEN NOTICE OF ANY FURTHER SHUTDOWNS THAT MAY BE REQUIRED IN ORDER TO MINIMIZE THE IMPACT TO THE OPERATIONS IN THE ZONE/S AFFECTED.
3. ANY EQUIPMENT AND/OR PIPING IDENTIFIED BY THE CLIENT SHALL BE SET ASIDE BY THE CONTRACTOR AND TURNED OVER. THE OWNER HAS FIRST REFUSAL OF ALL REDUNDANT EQUIPMENT AND PIPING. ALL OTHER DEMOLITION AND CONSTRUCTION WASTE SHALL BE HANDLED AS PER SPECIFICATION SECTION 23 05 01.
4. ALL REDUNDANT PIPING, HANGERS, CONDUIT AND WIRING WHICH IS NO LONGER REQUIRED SHALL BE REMOVED BY THE CONTRACTOR.
5. ALL NEW AND EXISTING OPENINGS AROUND PIPING, CONDUITS, FLUES/BREACHING, ARE TO BE FIRE STOPPED WHERE THEY PENETRATE THE BOILER ROOM WALLS.
6. ALL OTHER COORDINATION AND SCHEDULING TASKS SHALL BE PERFORMED PER THE SPECIFICATION SECTION 23 05 01 "COMMON WORK RESULTS FOR MECHANICAL"

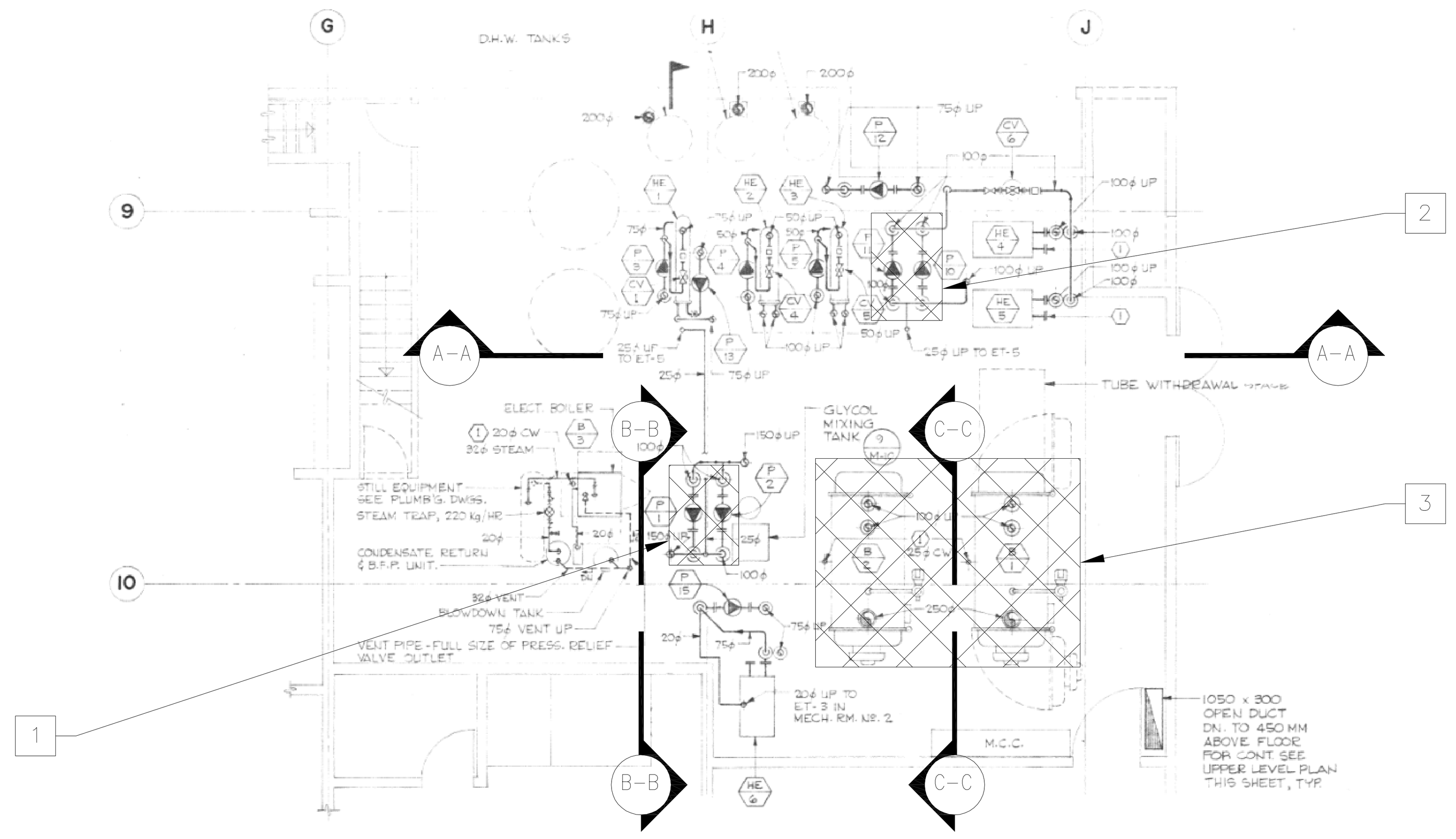
KEYED NOTES

1. REMOVE EXISTING HOT WATER CIRCULATION PUMPS (P–1 & P–2), INCLUDING ALL TEMPERATURE AND PRESSURE GAUGES, ISOLATION VALVES AND FLOW REGULATION VALVES.
2. REMOVE EXISTING HEAT PUMP LOOP PUMPS (P–10 & P–11), INCLUDING ALL TEMPERATURE AND PRESSURE GAUGES, ISOLATION VALVES AND FLOW REGULATION VALVES.
3. REMOVE EXISTING BOILERS (B–1 & B–2), INCLUDING ALL TEMPERATURE AND PRESSURE GAUGES AND ISOLATION VALVES.
4. REMOVE EXISITNG BOILER FLUE AND FLUE LINER IN CHIMNEY
5. REMOVE EXISTING HOT WATER CIRCULATION PUMP (P–13), INCLUDING ALL TEMPERATURE AND PRESSURE GAUGES, ISOLATION VALVES AND FLOW REGULATION VALVES.



MECHANICAL ROOM NO.1 HIGH LEVEL PLAN

SCALE: 1:100



MECHANICAL ROOM NO.1 LOWER LEVEL PLAN

SCALE: 1:100

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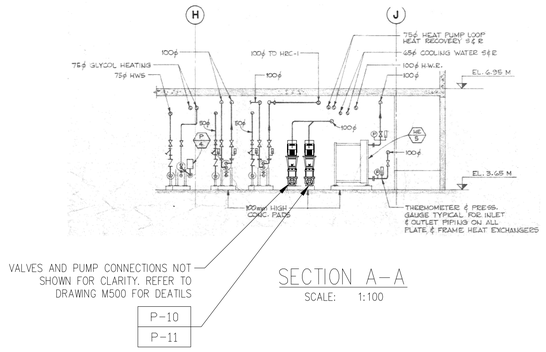
FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

DESIGNED: SM
DRAWN: SA
CHECKED:
RECOMMENDED:
APPROVED:

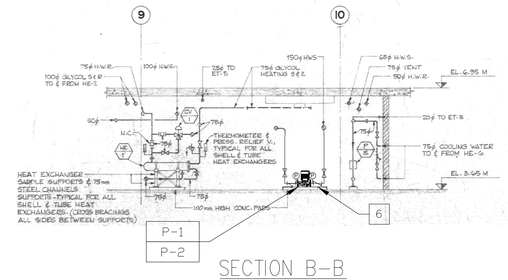
WEST VANCOUVER LABORATORY HEATING SYSTEM UPGRADE BOILER ROOM DEMOLITION PLAN AND SECTIONS

SCALE: AS_NOTED
DATE: 2016–MAR–31
DRAWING NUMBER: M301D



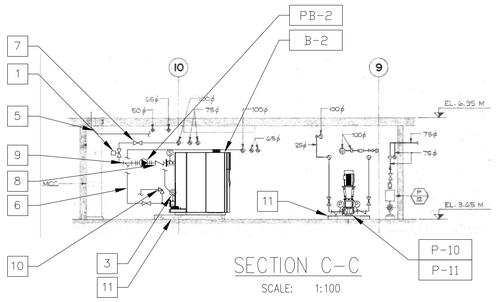
SECTION A–A

SCALE: 1:100



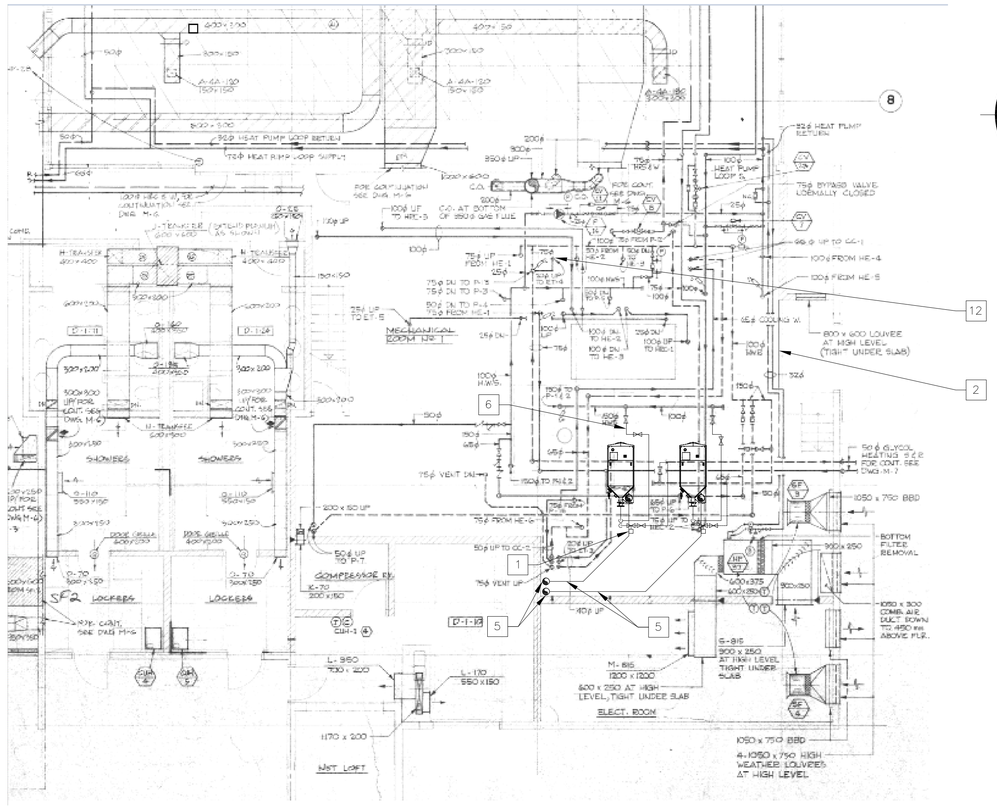
SECTION B–B

SCALE: 1:100



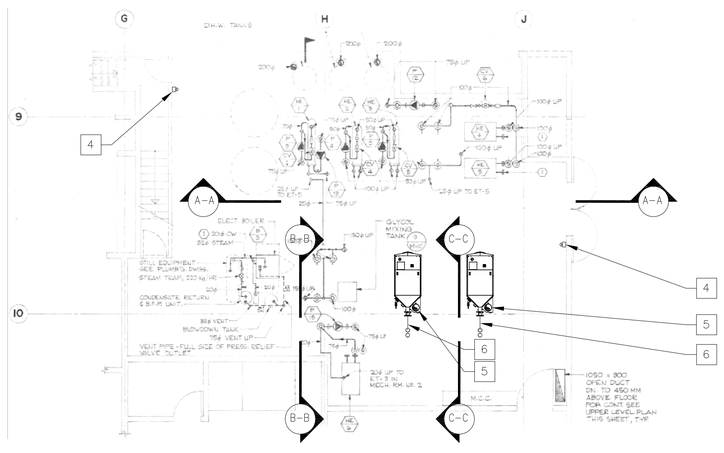
SECTION C–C

SCALE: 1:100



MECHANICAL ROOM NO.1 HIGH LEVEL PLAN

SCALE: 1:100



MECHANICAL ROOM NO.1 LOWER LEVEL PLAN

SCALE: 1:100

GENERAL NOTES:

1. THE CONTRACTOR WILL SHUT DOWN THE EXISTING EQUIPMENT BEFORE WORKS COMMENCE WITH THE BUILDING FMO STAFF IN ATTENDANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINING OF THE SYSTEMS.
2. THE CONTRACTOR SHALL PROVIDE THE DEPARTMENTAL REPRESENTATIVE WITH AT LEAST 72 HOURS WRITTEN NOTICE OF ANY FURTHER SHUTDOWNS THAT MAY BE REQUIRED.
3. THE CONTRACTOR SHALL PROVIDE THE DEPARTMENTAL REPRESENTATIVE WITH AT LEAST 72 HOURS WRITTEN NOTICE OF ANY EQUIPMENT START-UP.
4. ALL NEW AND EXISTING HEATING SERVICES PIPING SHALL BE THERMALLY INSULATED AS PER THE SPECIFICATION.
5. ALL NEW AND EXISTING OPENINGS AROUND PIPING, CONDUITS, FLUES/BREACHING, ARE TO BE FIRE STOPPED WHERE THEY PENETRATE THE BOILER ROOM WALLS.
6. THE CONTRACTOR SHALL REVIEW THE PROPOSED MECHANICAL PIPING LAYOUT ON SITE WITH THE CONSULTANT PRIOR TO COMMENCING THE INSTALLATION OR PRE-FABRICATION. THE CONTRACTOR SHALL NOT FABRICATE ANY PIPING UNTIL THE FINAL PIPING LAYOUT HAS BEEN APPROVED BY THE CONSULTANT.
7. ALL NEW PUMPS AND VALVES SHALL BE MOUNTED AND INSTALLED IN ACCESSIBLE POSITIONS THAT ALLOW EASY MAINTENANCE. IT IS EXPECTED THAT THEY WILL BE INSTALLED WITHIN 5 FEET OF THE FINISHED FLOOR LEVEL. ANY DEVIATION FROM THIS MUST BE APPROVED BY THE DEPARTMENTAL REPRESENTATIVE. RELOCATION OF IMPROPERLY LOCATED PUMPS AND VALVES WILL BE AT THE CONTRACTORS EXPENSE.
8. ALL TEMPERATURE AND PRESSURE GAUGES SHALL BE INSTALLED SO THAT THEY ARE EASILY READABLE TO THE MAINTENANCE STAFF. ANY DEVIATION FROM THIS MUST BE APPROVED BY THE DEPARTMENTAL REPRESENTATIVE. RELOCATION OF IMPROPERLY LOCATED GAUGES WILL BE AT THE CONTRACTORS EXPENSE.
9. THE CONTRACTOR SHALL PROVIDE ALL PERMITS AND CERTIFICATION AS REQUIRED BY CODE AND THE LOCAL JURISDICTION
10. ALL CONDENSATE PIPING SHALL BE RUN THROUGH THE SPECIFIED CONDENSATE NEUTRALIZER TO A FLOOR DRAIN.
11. ALL NEW AND EXISTING BACKFLOW PREVENTORS SHALL BE TESTED AND CERTIFIED. A NEW BACKFLOW PREVENTION DEVICE SHALL BE INSTALLED ON THE HEATING SYSTEM COLD FEED.
12. ALL ROOFING WORKS ASSOCIATED WITH THE NEW FLUES SHALL BE UNDERTAKEN BY THE CONTRACTOR IN ACCORDANCE WITH THE LATEST EDITION OF THE ROOFING CONTRACTORS ASSOCIATION OF BRITISH COLUMBIA'S ROOFING PRACTICES MANUAL. IMPROPER ROOFING WORKS SHALL BE RECTIFIED AT THE CONTRACTORS EXPENSE.
13. ALL NEW BOILER COMBUSTION VENTING SHALL BE SEPARATELY VENTED AND BE STAINLESS STEEL (AS REQUIRED BY CODE). IT IS THE INTENTION TO FOLLOW THE SAME ROUTE AS THE EXISTING FLUES AND TERMINATE AT ROOF LEVEL COMPLETE WITH NEW WATERPROOF FLASHING. ALL COMBUSTION VENT TERMINALS SHALL MEET THE CURRENT GAS CODE REQUIREMENTS.
14. THE NEW BOILER EQUIPMENT SHALL BE LISTED ON THE APPROVED FORTISBC ELIGIBLE BOILER LIST FOR THE EFFICIENT BOILER PROGRAM.

KEYED NOTES

1. PROVIDE NEW LINE SIZE (100ϕ) CONTROL CONTROL VALVE (120VAC) ACTUATOR COUPLED WITH BUTTERFLY VALVE. (TYP OF 2)
2. REMOVABLE RAILING TO ALLOW EGRESS OF EQUIPMENT IN AND OUT OF THE BOILER ROOM
3. SEPARATE TEMPERATURE AND PRESSURE GAUGES ON BOILER SUPPLY AND RETURN CONNECTIONS
4. NEW EMERGENCY "KNOCK-OFF" BUTTON (TYP AT EACH EXIT) – SUPPLIED AND INSTALLED BY ESC AND CONNECTED TO THE DDC
5. 228ϕ BOILER STAINLESS STEEL BOILER VENTING SHALL BE COMPATIBLE WITH THE NEW BOILER EQUIPMENT AND SHALL FOLLOW THE SAME ROUTE AS EXISTING (REMOVED) BOILER VENTING. THE BOILER VENT TO TERMINATE ABOVE ROOF LEVEL IN ACCORDANCE WITH GAS CODE.
6. PROVIDE NEW PIPING SECTIONS AND FITTINGS AS SHOWN
7. PROVIDE NEW ISOLATION VALVES (TYP)
8. PROVIDE NEW CHECK VALVES (TYP)
9. PROVIDE NEW Y TYPE STRAINER (TYP)
10. PROVIDE NEW SAFETY VALVES (TYP)
11. MODIFY THE EXISTING CONCRETE PAD AS REQUIRD TO MOUNT THE NEW EQUIPMENT (TYP)
12. NEW INLINE VARIABLE SPEED PUMP (P-13) SHALL BE LOCATED IN THE RISER TO HEAT EXCHANGER (HE-1) AND SHALL BE INSTALLED COMPLETE WITH NEW ISOLATION VALVES, CHECK VALVE AND STRAINER AS PER THE SPECIFICATIONS.

MECHANICAL NOTES:

1. THE NEW COMBUSTION VENTING SHALL CONFORM TO CURRENT CODE REQUIREMENTS AND THOSE OF THE BOILER MANUFACTURER REQUIREMENTS FOR APPROVED STAINLESS STEEL VENT MANUFACTURERS.
2. UTILIZE MANUFACTURERS RECOMMENDED SUPPORT TYPES (WALL SUPPORT, ANCHOR PLACE, ROOF SUPPORT, FLOOR SUPORT, SUSPENSION BAND) TO FULLY SUPPORT VENTS TO STRUCTURE.
3. TERMINATE VENTS A MINIMUM OG 3 METERS FROM ANY MECHANICAL VENTS OR BUILDING OPENINGS.
4. SEAL CURB AND INSTALL AS PER RCABC STANDARDS.
5. NEW STAINLESS STEEL SHEET METAL CAP FLASHING (20 GAUGE) SHALL BE PROVIDED AT TOP OF EXISTING CHIMNEY, WHERE NEW COMBUSTION VENTING (FLUES) PENETRATE THE STRUCTURE. SEAL OPENINGS WITH INSULATION MASTIC.
6. EXTEND NEW COMBUSTION VENTS TO A MINIMUM 600MM ABOVE ANY ROOF WITHIN 3.5 METERS OF VENTING.

FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

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RECOMMENDED:
APPROVED:

WEST VANCOUVER LABORATORY HEATING SYSTEM UPGRADE BOILER ROOM PLAN AND SECTIONS

SCALE: AS_NOTED
DATE: 2016-MAR-31
DRAWING NUMBER: M302

BOILER SCHEDULE

EQUIPMENT MARK	DESCRIPTION	LOCATION	SERVICE	GROSS HEATING CAPACITY (INPUT)	NETT HEATING CAPACITY (OUTPUT)	TURNDOWN	ELECTRICAL	BASIS OF DESIGN	REMARKS
B-1	GAS FIRED CONDESNING BOILER	BOILER ROOM	HYDRONIC HOT WATER	732 kW (2,500 MBH)	673 kW (2,300 MBH)	20:1	120V/1PH/60HZ	LOCHINVAR CREST FBN 2500	1, 2, 3, 4, 5, 6, 7, 8
B-2	GAS FIRED CONDESNING BOILER	BOILER ROOM	HYDRONIC HOT WATER	732 kW (2,500 MBH)	673 kW (2,300 MBH)	20:1	120V/1PH/60HZ	LOCHINVAR CREST FBN 2500	1, 2, 3, 4, 5, 6, 7, 8

NOTES:

1. THE BOILER SHALL BE ANSI Z21.13/CSA CERTIFIED. WATER SIDE VESSEL SHALL BE ASME COMPLIANT ("H"STAMPED). AND SHALL MEET OR EXCEED ASHRAE 90.1 (2013) REQUIREMENTS FOR CONDENSING BOILERS.
2. THE BOILER SHALL BE LISTED ON THE FORTISBC ELIGIBLE BOILER LIST FOR INCENTIVES.
3. THE BOILER FIRE TUBES SHALL BE CONSTRUCTED OF 316L STAINLESS STEEL OR BETTER AND BE ASME COMPLIANT ("H"STAMPED).
4. PROVIDE MANUFACTURER'S BMS GATEWAY – BACNET, CONDENSATE NEUTRALIZATION KIT, 50 PSI ASME RELIEF VALVE.
5. PROVIDE THE MANUFACTURER'S PLANT LEVEL CONTROLLER CAPABLE OF EFFICIENCY OPTIMIZED CASCADING CONTROL OF BOTH BOILERS. THIS UNIT SHALL ALSO BE CAPABLE OF DIRECT COMMUNICATION WITH THE EXISTING "DELTA"BUILDING AUTOMATION SYSTEM.
6. PROVIDE THE MANUFACTURER'S BOILER TWO-WAY MOTORIZED CONTROL VALVE TO BOTH BOILERS, COMPLETE WITH 120VAC ACTUATOR, 416 STAINLESS STEEL STEM AND EPDM SEAL.
7. PROVIDE THE MANUFACTURER'S VARIABLE SPEED BOILER CIRCULATION PUMPS TO BOTH BOILERS. THE BOILER CIRCULATION PUMPS SHALL BE LINE SIZE, 208V, 3PH WITH DIGITAL DISPLAY AND 316L STAINLESS STEEL SHAFT AND ALARM CONTACTS.
8. DELIVERY DEADLINES:
   a. SHOP DRAWINGS TO BE SUBMITTED 7 DAYS AFTER AWARD OF THIS CONTRACT.
   b. PURCHASE ORDER SHALL BE EXECUTED NO MORE THAN 2 DAYS AFTER RECEIPT OF ENGINEERS APPROVAL.

GENERAL EQUIPMENT SCHEDULE NOTES:

1. THE SPECIFIC EQUIPMENT MAKE AND MODELS ARE LISTED AS A "BASIS OF DESIGN" ONLY. ALL INSTALLED EQUIPMENT SHALL BE APPROVED BY THE ENGINEER PRIOR TO PURCHASE BY THE CONTRACTOR, PROVIDE COMPLETE AND CONCISE SHOP DRAWINGS PER SPECIFICATION.

GENERAL CONTROLS AND SEQUENCE OF OPERATION (SOO) REQUIREMENTS:

1. PUMP VFD CONTROLS:
   - 1.1 THE VFD SHALL CONTROL PUMP SPEED TO INSURE MINIMUM FLOWS AS FOLLOWS:
     - 1.1.1 3.5 L/S (55 GPM) WHEN ONE BOILER IS ENABLED
     - 1.1.2 7 L/S (110 GPM) WHEN TWO BOILERS ARE ENABLED
   - 1.2 THE VFD SHALL OTHERWISE CONTROL PUMP SPEED TO MAINTAIN MINIMUM PRESSURES ON EACH OF THE ΔP INPUTS FROM THE SELECT ZONES WHERE PRESSURE SENSORS ARE TO BE INSTALLED UNDER THIS PROJECT.
     - 1.2.1 THE SENSORS SHALL BE CONNECTED TO THE EXISTING BUILDING AUTOMATION SYSTEM (BAS) AND BOILER PLANT CONTROLLER VIA THE EXISTING INDIVIDUAL LOCAL CONTROLLERS ASSIGNED TO THAT ZONE.
     - 1.2.2 THE CONTROLS CONTRACTOR SHALL (IN ADDITION TO THE POWER AND CONNECTING ALL NEW AI, AO, BI, AND BO POINTS FROM/TO THE LOCAL CONTROLLERS) ALSO INSURE FULL INTEGRATION OF ALL POINTS TO THE EXISTING BAS.
2. THE CONDENSING BOILERS' CENTRAL CONTROLLER SHALL:
   - 2.1 BE FULLY CAPABLE OF PERFORMING AS LEAD, LAG, BACK-UP, AND OPTIMAL CASCADE FUNCTIONS FOR ALL 2 UNITS.
   - 2.2 BE ABLE TO COMMUNICATE WITH THE EXISTING BAS TO OBTAIN CRITICAL INPUTS SUCH AS WATER TEMPERATURES, PRESSURES, PUMP STATUS, AND OA-T TO DETERMINE OPTIMAL RETURN AND DELTA TEMPERATURES.
   - 2.3 EACH UNIT'S ON BOARD CONTROLLER SHALL BE CAPABLE OF STAND-ALONE OPERATION TO PROVIDE NOMINAL HEATING BASED ON ITS ON-BAS ANY INTERRUPTION OF COMMUNICATION FROM THE BAS OR THE BOILER MASTER CONTROLLER.

PUMP SCHEDULE

EQUIPMENT MARK	P-1 & P-2	P-10 & P-11	P-13	PB-1 & PB-2
LOCATION	BOILER ROOM	BOILER ROOM	BOILER ROOM	BOILER ROOM
SERVICE	HYDRONIC HOT WATER	HEAT PUMP LOOP	AHU CIRCULATION	BOILER CIRCULATION
STYLE	INLINE VARIABLE SPEED	INLINE VARIABLE SPEED	INLINE VARIABLE SPEED	INLINE VARIABLE SPEED
CAPACITY	12.6 L/S (200 GPM)	10.09 L/S (160 GPM)	4.73 L/S (75 GPM)	1.57-22.1 L/S (25-350 GPM)
HEAD	59.87 KPA (20.03 FT)	239.12 KPA (80 FT)	95.6 KPA (32 FT)	3.9-13.8 KPA (1.3-4.6 FT)
MOTOR	6.97 AMPS (MAX)	7.5HP	5.68 AMPS (MAX)	7 AMPS (MAX)
MOTOR POWER	208V, 1PH, 60HZ	575V, 3PH, 60HZ	208V, 1PH, 60HZ	208V, 1PH, 60HZ
SUCTION SIZE (in.)	65MM (2.5")	100MM (4")	65MM (2.5")	100MM (4")
DISCHARGE SIZE (in.)	65MM (2.5")	100MM (4")	65MM (2.5")	100MM (4")
BASIS OF DESIGN	GRUNDFOS MAGNA 100-120F	GRUNDFOS CRE 32-2-2-A-G-A-E-HQQE	GRUNDFOS MAGNA 65-150F	GRUNDFOS PUM20080
REMARKS	1, 2	1, 2	1, 2	1, 2

NOTES:

1. THE NEW VARIABLE SPEED PUMPS SHALL BE SUPPLIED WITH BACNET INTERFACE CARDS SO THAT THEY CAN BE CONNECTED TO THE EXISTING "DELTA" DDC SYSTEM.
2. DELIVERY DEADLINES:
   a. SHOP DRAWINGS TO BE SUBMITTED 7 DAYS AFTER AWARD OF THIS CONTRACT.
   b. PURCHASE ORDER SHALL BE EXECUTED NO MORE THAN 2 DAYS AFTER RECEIPT OF ENGINEERS APPROVAL.

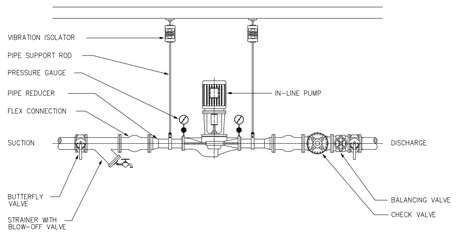
FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS

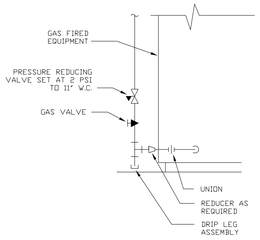
DESIGNED: SM
DRAWN: SA
CHECKED:
RECOMMENDED:
APPROVED:

WEST VANCOUVER LABORATORY
HEATING SYSTEM UPGRADE
MECHANICAL EQUIPMENT SCHEDULES

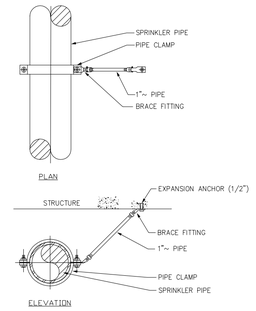
SCALE: AS_NOTED
DATE: 2016-MAR-31
DRAWING NUMBER: M400



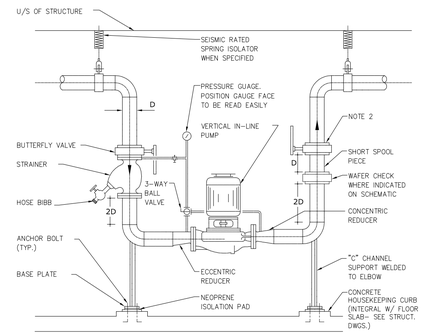
1 IN-LINE CIRCULATOR PUMP INSTALLATION DETAIL
SCALE: N.T.S.



2 GAS PIPING CONNECTION DETAIL
SCALE: NTS



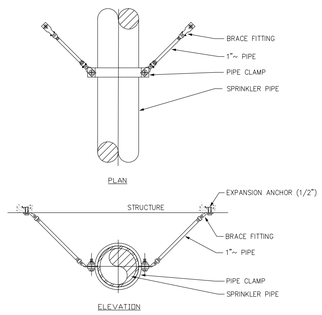
3 SEISMIC PIPE HANGER DETAIL (TWO-WAY RESTRAINT)
SCALE: NTS



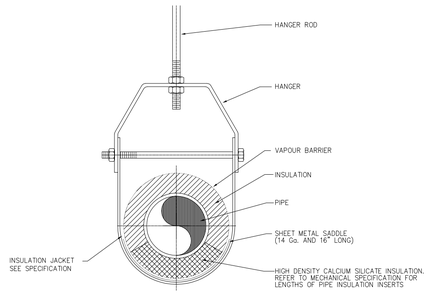
NOTE:

1) VALVES TO BE PIPE LINE SIZE AS INDICATED ON SCHEMATIC
2) FOR PIPE 50ø AND UNDER USE BALL VALVE C/W INFINITE MEMORY STOP
- FOR PIPE 65ø AND ABOVE USE BUTTERFLY VALVE C/W INFINITE MEMORY STOP

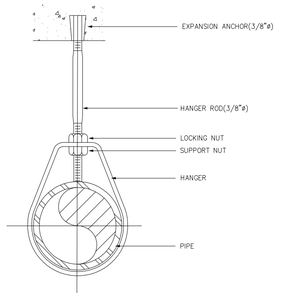
4 IN-LINE PUMP MOUNTED AT FLOOR LEVEL
SCALE: NTS



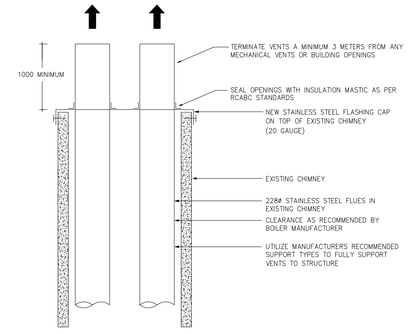
5 SEISMIC PIPE HANGER DETAIL (FOUR-WAY RESTRAINT)
SCALE: NTS



6 INSULATED PIPE HANGER DETAIL
SCALE: NTS



7 PIPE HANGER DETAIL
SCALE: NTS



8 FLUE PENETRATION DETAIL
SCALE: NTS

FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS

DESIGNED: SM
DRAWN: SA
CHECKED:
RECOMMENDED:
APPROVED:

WEST VANCOUVER LABORATORY HEATING SYSTEM UPGRADE MECHANICAL DETAILS

SCALE: AS_NOTED
DATE: 2016-MAR-31
DRAWING NUMBER: M500

SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	CABLE SPLICE
	GROUND ELECTRODE/ROD
	GROUNDING SYSTEM EXTENSION TAIL
	DUPLEX RECEPTACLE 120V
$	LIGHT OCCUPANCY SENSOR SWITCH
PX	PUMP "X"
PEC	PHOTOELECTRIC CELL
	SECURITY DOOR SWITCH
S	STROBE
H	HORN
	SMOKE DETECTOR WITH AUXILIARY CONTACTS MAPPED TO THE SECURITY ALARM
	TELEPHONE OUTLET
EXIT	EXIT SIGN
KP	KEYPAD – SECURITY ALARM
SA	SECURITY ALARM – DSC INSTALLED BY AUTHORIZED CONTRACTOR
	EMERGENCY LIGHTING UNIT WALL PACK
	DOUBLE REMOTE HEAD FOR EMERGENCY LIGHTING
H	UNIT HEATER
	LED WALLPACK
	GROUNDING
X	CONTACTOR/RELAY COIL
	FUSE
	POWER TRANSFORMER
	NORMAL OPEN CONTACT
	NORMAL CLOSED CONTACT

SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	PANELBOARD, MCC, CONTROL PANEL
	FLUORESCENT FIXTURE – 48", 2 TUBES
	DISCONNECT
	120V PLUG
27	UNDER VOLTAGE / PHASE LOSS RELAY
47	PHASE SEQUENCE RELAY
TB	CT SHORTING SWITCH OR TEST BLOCK
TX	TERMINAL BLOCK "X"
HMX	HOUR METER PUMP "X"
X	LOCATION IDENTIFICATION No. "X" IDENTIFIES THE ROOM OR EQUIPMENT AS PER DRAWING LEGEND
M	BC HYDRO METER
T	THERMOSTAT
MCD	MOTORIZED CONTROL DAMPER
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
PT	PRESSURE TRANSDUCER
IWH	IN–LINE WATER HEATER (FUTURE)
	CCTV CAMERA
FM	FLOWMETER
MD	MOTION ACTIVATED DETECTOR FOR OUTDOOR LIGHTING
FS	FLOW SWITCH
LS	WATER LEVEL FLOAT SWITCH
ET	PUMP HOUR METER
DPMX	DIGITAL PANEL METER "X"
G	STANDBY GENERATOR
	EMERGENCY STOP BUTTON

ABBREVIATIONS:

ADSL	ASYMMETRIC DIGITAL SUBSCRIBER LINE
ATS	AUTOMATIC TRANSFER SWITCH
BAT	BATTERY
BIX	BUILDING INDUSTRY CROSS CONNECT
BPX	BALANCING PUMP "X"
BRKR	BREAKER
C	COIL
CC	CONTROL CABINET
CEC	CANADIAN ELECTRICAL CODE, PART1, LATEST EDITION
CIS	CHLORINE INJECTION SYSTEM
CFL	COMPACT FLUORESCENT LAMP
CF	CHLORINE FACILITY
CTRL	CONTROL
DPM	DIGITAL PANEL METER
EF	EXHAUST FAN
F	FUSE
FILT	FILTER
FLU	FLUORESCENT (LIGHT FIXTURE)
FM	FLOW METER
FMC	FLEXIBLE METAL CONDUIT
FP	FIRE PUMP
GB	GROUND BUS
GBIC	GIGABIT INTERFACE CONVERTER
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRD	GROUNDING
H	HOT/ENERGIZED
HO	HIGH OUTPUT
HOA	HAND–OFF–AUTO CONTROL
HP	HORSE POWER
IP	INTERNET PROTOCOL
ITC	INSTRUMENT TRANSFORMER COMPARTMENT
LTG	LIGHT/LIGHTING
MCC	MOTOR CONTROL CENTRE
MGB	MASTER GROUND BAR
MH	METAL HALIDE (LIGHT FIXTURE)
MP	MOTOR PROTECTION
N	NEUTRAL
PCP	PLC CONTROL PANEL
PH, ø	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
PT	PRESSURE TRANSDUCER
R	RELAY
REC	RECEPTACLES
SA	SECURITY ALARM
SB	SERVICE BOX (TELUS)
SFP	SMALL FORM – FACTOR PLUGGABLE
SW	COMMUNICATIONS NETWORK SWITCH
T	THERMOSTAT
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
UH	UNIT HEATER
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE
WX	WELL "X"
WXP	WELL "X" PUMP
XFMR	TRANSFORMER

NOTES:

1. NOT EVERY SYMBOL, LINE TYPE OR ABBREVIATION IS APPLICABLE.

FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS

DESIGNED: B. WHITE
DRAWN: PBX
CHECKED: A. COSOVANU
RECOMMENDED:
APPROVED: I. STEELE

WEST VANCOUVER LABORATORY
HEATING SYSTEM UPGRADE
LEGEND AND ABBREVIATIONS

SCALE: NTS
DATE: 2016–MAR–31
DRAWING NUMBER: E100

1. GENERAL REQUIREMENTS:

THE GENERAL CONDITIONS, AMENDMENTS AND SUPPLEMENTS AND ADDITIONS TO THE GENERAL CONDITIONS OF THE CONTRACT SHALL FORM AN INTEGRAL PART OF THIS DIVISION OF THE SPECIFICATIONS.

1.1 GENERAL REQUIREMENTS:

1. IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO CALL FOR FINISHED WORK, TESTED AND READY FOR OPERATION.

2. UNLESS OTHERWISE NOTED OR SPECIFIED, PROVIDE ALL EQUIPMENT AND/OR MATERIALS SHOWN IN THE DRAWINGS AND DEFINED IN THE SPECIFICATIONS.

3. ANY APPARATUS, APPLIANCES, MATERIALS, OR WORK NOT SHOWN ON THE DRAWINGS, BUT MENTIONED IN THE SPECIFICATIONS, OR VICE VERSA OR ANY INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE AND FULLY FUNCTIONAL AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SPECIFIED, SHALL BE FURNISHED, DELIVERED AND INSTALLED BY THE ELECTRICAL DIVISION WITHOUT ADDITIONAL EXPENSE TO THE OWNER.

4. IT IS INTENDED THAT ALL WORK MENTIONED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL DIVISION UNLESS SPECIFICALLY NOTED AS THE WORK OF OTHERS. THOUGH NOT SPECIFICALLY MENTIONED, THE WORDS "PROVIDE", "SUPPLY", "FURNISH" AND "INSTALL" SHALL BE IMPLIED AND THE ELECTRICAL DIVISION SHALL PROVIDE ALL NECESSARY LABOR, MATERIALS, AND THE EQUIPMENT TO FURNISH AND INSTALL SUCH WORK AND TEST SAME TO THE SATISFACTION OF THE CONSULTANT.

2. LAWS, RULES, ORDINANCES AND INSPECTION:

1. THE ENTIRE ELECTRICAL INSTALLATION SHALL COMPLY WITH THE LATEST ADOPTED REVISION OF PART 1 OF THE CANADIAN ELECTRICAL CODE; CURRENT EDITION OF THE "SAFETY STANDARD FOR ELECTRICAL INSTALLATION" AND THE B.C. PROVINCIAL AMENDMENTS TO THIS CODE AND THE NATIONAL BUILDING CODE, ALL LOCAL BYLAWS, RULES, AND ORDINANCES APPLICABLE TO THIS INSTALLATION.

2. OBTAIN ALL NECESSARY PERMITS AND PAY ALL PERMIT FEES.

3. UPON COMPLETION, PRESENT TO THE ENGINEER A CERTIFICATE OF APPROVAL FOR ALL ELECTRICAL WORK FROM THE ELECTRICAL INSPECTION DEPARTMENT HAVING JURISDICTION.

3. SITE INSPECTION:

1. EXAMINE THE SITE AND THE LOCAL CONDITIONS AFFECTING THE WORK UNDER THIS CONTRACT. NO CLAIM SHALL BE CONSIDERED LATER DUE TO UNSATISFACTORY REVIEW OF EXISTING SITE CONDITIONS. CO-ORDINATE ALL SERVICES, PAY ALL FEE'S FOR HYDRO AND TELUS SERVICES.

4. RESPONSIBILITY:

1. SUPPLY AND INSTALLATION OF THE EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONNECTION OF ALL EQUIPMENT MENTIONED IN THE DRAWINGS. COORDINATE WITH AND OBTAIN APPROVAL, FOR THE SCHEDULING OF THE ABOVE WORK.

2. CUTTING, PATCHING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. ON COMPLETION OF THE WORK, THE ELECTRICAL CONTRACTOR SHALL CLEAN ALL EXPOSED SURFACES OF LIGHTING FIXTURES, LAMPS, PANEL BOARDS AND OTHER ELECTRICAL EQUIPMENT, OF DUST, PLASTER, PAINT (ETC).

5. TYPE AND QUALITY OF MATERIAL:

1. EQUIPMENT AND MATERIALS SHALL BE NEW AND BEAR THE APPROVAL OF C.S.A. OR EQUIVALENT ULC TAGS.

6. IDENTIFICATION:

1. ALL POWER OUTLETS, LIGHT SWITCHES, BREAKERS, PANEL BOARDS, DISCONNECTS (ETC) SHALL BE SUITABLY IDENTIFIED WITH "LAMICOID" NAMEPLATES LABELLED WITH CIRCUIT NUMBER. TYPEWRITTEN PANEL BOARD DIRECTORIES SHALL BE PROVIDED.

7. GUARANTEE:

1. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE THE SATISFACTORY INSTALLATION OF ALL WORK AND APPARATUS AND REPLACE, AT NO ADDITIONAL COST TO THE OWNER, ANY PART WHICH MAY FAIL OR PROVE DEFECTIVE WITHIN A PERIOD OF TWELVE CALENDAR MONTHS AFTER THE FINAL ACCEPTANCE OF THE COMPLETE PROJECT.

8. EQUIPMENT GROUNDING:

1. CONDUCTOR SHALL BE XLPE INSULATED GREEN ANNEALED COPPER WIRE RW90 (MIN. SIZE #12 AWG).

2. EACH BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL AND EQUIPOTENTIAL GROUND CONDUCTOR.

9. CONDUITS AND FITTINGS:

1. EXPOSED DUCTS SHALL BE ELECTRICAL METALLIC TUBING OR METAL FLEXIBLE CONDUIT (SEAL TITE).

2. ALL UNDERGROUND OR CONCRETE ENCASED DUCTS SHALL BE RPVC CONDUIT. RPVC CONDUIT SHALL BE UNPLASTICIZED POLYVINYL CHLORIDE AND CONFORM TO CSA C22.2 NO. 211.2. COUPLINGS, ADAPTERS, BENDS AND FITTINGS SHALL BE RPVC AND CONFORM TO CSA C22.2 No. 85. RPVC CONDUIT SHALL BE INSTALLED USING CSA CERTIFIED CEMENT.

3. EACH LOW VOLTAGE SYSTEM SHALL HAVE DEDICATED RACEWAYS THAT RUN CONTINUOUS FROM SOURCE TO DESTINATION AND BE A MINIMUM OF 18mm (EMPTY CONDUIT SHALL HAVE LABELED PULL CORDS INSTALLED). CONDUITS SHALL BE INSTALLED WITH RAINTIGHT CONNECTORS IF EMT IS USED. WEATHERPROOF TECK CONNECTORS SHALL BE SUPPLIED WHERE TECK90 IS USED. EXPLOSION PROOF CONNECTORS AND GLANDS SHALL BE INSTALLED WHERE REQUIRED.

4. ELECTRICAL AND TELEPHONE SERVICE CONDUIT AND CABLES SHALL BE INSTALLED TO BC HYDRO AND TELUS STANDARDS.

10. WIRES:

1. ALL CONDUCTORS SHALL BE COPPER. POWER WIRING SHALL BE RATED 600 VOLTS, RW90 X-LINK, STRANDED COPPER AND SHALL BE INSTALLED IN CONDUIT OR INSIDE ELECTRICAL CABINETS. REFER TO DRAWINGS FOR SPECIFIC WIRING SIZE AND QUANTITY.

11. CABLES:

1. DISTRIBUTION CABLES SHALL BE TECK 90 RATED FOR 600V TO CAN/CSA-C22.2 No. 131. ALL CONDUCTORS SHALL BE COPPER, SIZE AND QUANTITY AS SHOWN. CONNECTORS SHALL BE WATERTIGHT APPROVED FOR TECK CABLES. FASTENINGS SHALL BE ONE HOLE ZINC STRAPS FOR CABLES 50mm AND SMALLER, AND TWO HOLE STRAPS FOR CABLES LARGER THAN 50mm. PROVIDE CHANNEL SUPPORTS IF TWO OF MORE CABLES RUN PARALLEL.

FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS

DESIGNED B. WHITE
DRAWN PBX
CHECKED A. COSOVANU
RECOMMENDED
APPROVED I. STEELE

WEST VANCOUVER LABORATORY
HEATING SYSTEM UPGRADE
GENERAL NOTES

SCALE NTS
DATE 2016-MAR-31
DRAWING NUMBER E101

SCOPE OF WORK:

1 **PUMP P1:**
- REMOVE EXISTING PUMP P1 AND PUMP P1 CABLE CONNECTIONS.
- PROVIDE PROPOSED PUMP P1 AND TERMINATE POWER CABLES AND CONNECTIONS. (SEE MECHANICAL DRAWINGS FOR MOUNTING DETAILS)
- REMOVE P1 DISCONNECT SWITCH AND SPLICE FEEDER IN DISCONNECT BOX. PROVIDE BLANK COVER PLATE ON DISCONNECT BOX.
- TERMINATE FMC CONDUIT FROM P1/P2 COMM. JUNCTION BOX.
- TERMINATE BACNET AND PUMP CONTROL CABLING ON P1 VFD TERMINATION BOARD.

2 **PUMP P2:**
- REMOVE EXISTING PUMP P2 AND PUMP P2 CABLE CONNECTIONS.
- PROVIDE PROPOSED PUMP P2 AND TERMINATE POWER CABLES AND CONNECTIONS. (SEE MECHANICAL DRAWINGS FOR MOUNTING DETAILS)
- REMOVE P2 DISCONNECT SWITCH AND SPLICE FEEDER IN DISCONNECT BOX. PROVIDE BLANK COVER PLATE ON DISCONNECT BOX.
- TERMINATE FMC CONDUIT FROM P1/P2 COMM. JUNCTION BOX.
- TERMINATE BACNET AND PUMP CONTROL CABLING ON P2 VFD TERMINATION BOARD.

3 **P1/P2 COMM. JUNCTION BOX (PROPOSED):**
- PROVIDE 200x200x150mm JUNCTION BOX ON SUPPORTING COLUMN ADJACENT TO P1/P2 LOCATION.
- PROVIDE 25mm FMC CONDUIT BETWEEN P1/P2 COMM. JUNCTION BOX AND PUMP P1.
- PROVIDE 25mm FMC CONDUIT BETWEEN P1/P2 COMM. JUNCTION BOX AND PUMP P2.

4 **PUMP P10:**
- REMOVE EXISTING PUMP P10 AND PUMP P10 CABLE CONNECTIONS.
- PROVIDE PROPOSED PUMP P10 AND TERMINATE POWER CABLES AND CONNECTIONS. (SEE MECHANICAL DRAWINGS FOR MOUNTING DETAILS)
- REMOVE P10 DISCONNECT SWITCH AND SPLICE FEEDER IN DISCONNECT BOX. PROVIDE BLANK COVER PLATE ON DISCONNECT BOX.
- TERMINATE FMC CONDUIT FROM P10/P11 COMM. JUNCTION BOX.
- TERMINATE BACNET AND PUMP CONTROL CABLING ON P10 VFD TERMINATION BOARD.

5 **PUMP P11:**
- REMOVE EXISTING PUMP P11 AND PUMP P11 CABLE CONNECTIONS.
- PROVIDE PROPOSED PUMP P11 AND TERMINATE POWER CABLES AND CONNECTIONS. (SEE MECHANICAL DRAWINGS FOR MOUNTING DETAILS)
- REMOVE P11 DISCONNECT SWITCH AND SPLICE FEEDER IN DISCONNECT BOX. PROVIDE BLANK COVER PLATE ON DISCONNECT BOX.
- TERMINATE FMC CONDUIT FROM P10/P11 COMM. JUNCTION BOX.
- TERMINATE BACNET AND PUMP CONTROL CABLING ON P11 VFD TERMINATION BOARD.

6 **P10/P11 COMM. JUNCTION BOX (PROPOSED):**
- PROVIDE 200x200x150mm JUNCTION BOX ON SUPPORTING COLUMN ADJACENT TO P1/P2 LOCATION.
- PROVIDE 25mm FMC CONDUIT BETWEEN P10/ P11 COMM. JUNCTION BOX AND PUMP P10.
- PROVIDE 25mm FMC CONDUIT BETWEEN P10/ P11 COMM. JUNCTION BOX AND PUMP P11.

7 **PUMP P13:**
- REMOVE EXISTING PUMP P13 AND PUMP P13 CABLE CONNECTIONS.
- PROVIDE PROPOSED PUMP P13 AND TERMINATE POWER CABLES AND CONNECTIONS. (SEE MECHANICAL DRAWINGS FOR MOUNTING DETAILS)
- REMOVE P13 DISCONNECT SWITCH AND SPLICE FEEDER IN DISCONNECT BOX. PROVIDE BLANK COVER PLATE ON DISCONNECT BOX.
- TERMINATE FMC CONDUIT FROM EMT TO P13 PUMP/ VFD LOCATION.
- TERMINATE BACNET AND PUMP CONTROL CABLING ON P13 VFD TERMINATION BOARD.

8 **MCCE1:**
- REMOVE PUMP OVERLOAD PROTECTION AND AUTO PUMP CONTROL WIRING FOR PUMP P1, P2, P10, P11, AND P13 PUMP STARTERS.
- REMOVE PHASE CONDUCTORS FROM CIRCUIT AS REQUIRED FOR SINGLE PHASE 208V PUMP CONNECTIONS AND LABEL PUMP CABINETS AS REQUIRED.
- JUMPER CONNECTIONS AS REQUIRED.
- PROVIDE LAMECOIDS ON PUMP STARTER CUBICLE DOORS DESIGNATING PUMP CONTROL SPECIFICATIONS.
- TERMINATE BOILER 1 AND BOILER 2 CONTROL PANEL POWER CONNECTIONS ON SPARE CIRCUIT BREAKER LOCATIONS.
- LABEL PANEL SCHEDULE ACCORDINGLY.

9 **EMERGENCY PUSHBUTTON:**
- PROVIDE EMERGENCY PUSHBUTTON (BY ESC).

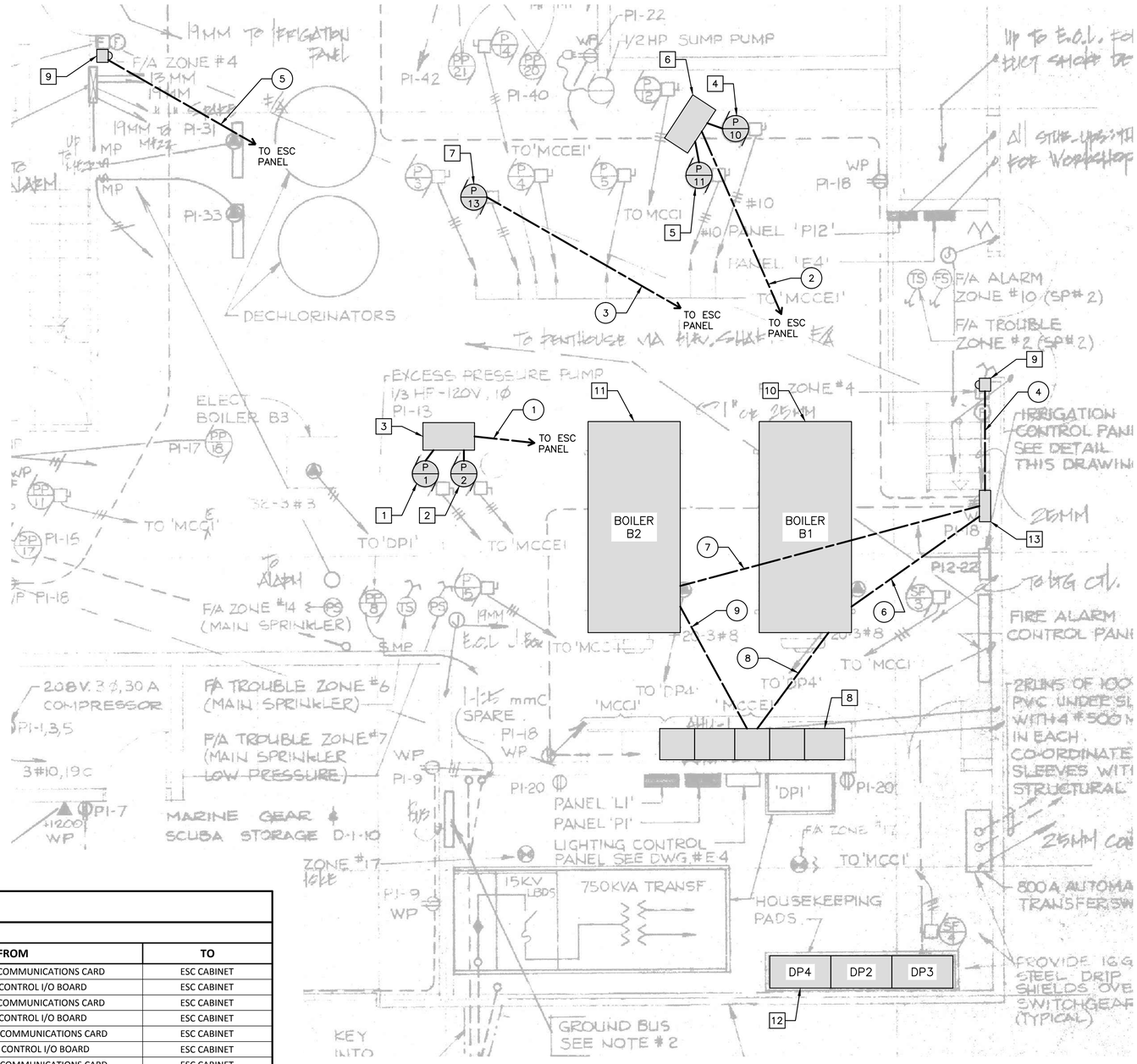
10 **BOILER B1:**
- REMOVE EXISTING BOILER ELECTRICAL CONNECTIONS.
- TERMINATE EXISTING POWER FEEDERS TO BOILER B1 PUMP VFD CONNECTIONS.
- TERMINATE COMMUNICATIONS CABLING TO BOILER B1 PUMP VFD CONNECTIONS.
- TERMINATE BOILER B1 CONTROL PANEL POWER CONNECTIONS TO POWER INPUT TERMINALS.
- TERMINATE BOILER B1 CONTROL PANEL COMMUNICATIONS CABLING IN BOILER CONTROL PANEL.

11 **BOILER B2:**
- REMOVE EXISTING BOILER ELECTRICAL CONNECTIONS.
- TERMINATE EXISTING POWER FEEDERS TO BOILER B2 PUMP VFD CONNECTIONS.
- TERMINATE COMMUNICATIONS CABLING TO BOILER B2 PUMP VFD CONNECTIONS.
- TERMINATE BOILER B2 CONTROL PANEL POWER CONNECTIONS TO POWER INPUT TERMINALS.
- TERMINATE BOILER B2 CONTROL PANEL COMMUNICATIONS CABLING IN BOILER CONTROL PANEL.

12 **DISTRIBUTION PANEL DP4:**
- REMOVE BOILER B1 50A, 3PH, 120/208V CIRCUIT BREAKER FROM DISTRIBUTION PANEL.
- PROVIDE BOILER B1 15A, 2PH, 208V CIRCUIT BREAKER IN DISTRIBUTION PANEL.
- REMOVE BOILER B2 50A, 3PH, 120/208V CIRCUIT BREAKER FROM DISTRIBUTION PANEL.
- PROVIDE BOILER B2 15A, 2PH, 208V CIRCUIT BREAKER IN DISTRIBUTION PANEL.
- TERMINATE BOILER B1 AND B2 PUMP CONDUCTORS ON 2PH CIRCUIT BREAKERS.
- LABEL DISTRIBUTION PANEL ACCORDINGLY.

13 **ESC BUILDING AUTOMATION SYSTEM PANEL:**
- (BY ESC AUTOMATION)
- TERMINATE ALL CONTROL AND PUMP COMMUNICATION WIRING IN ESC PANEL.
- PROVIDE ALL CONTROL RELAYS, POWER SUPPLIES, BACNET INTERFACE CARDS, TERMINAL BLOCKS, ETC. AS REQUIRED.

CABLE LEGEND	
——— ———	120V CONDUIT/CABLE
——— – ———	COMMUNICATIONS CONDUIT/CABLE



SITE PLAN – BOILER ROOM
N.T.S.

CABLE AND CONDUIT SCHEDULE

IDENTIFIER	CONDUIT					CABLE				
	TYPE	QTY	DESCRIPTION	FROM	TO	TYPE	QTY	DESCRIPTION	FROM	TO
1	35mm EMT	1	COMMUNICATIONS	P1/P2 COMM. JUNCTION BOX	ESC CABINET	BELDEN 3105A	1	P1 BACNET COMMUNICATIONS	PUMP P1 BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 9721	1	P1 PUMP CONTROLS	PUMP P1 VFD CONTROL I/O BOARD	ESC CABINET
						BELDEN 3105A	1	P2 BACNET COMMUNICATIONS	PUMP P2 BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 9721	1	P2 PUMP CONTROLS	PUMP P2 VFD CONTROL I/O BOARD	ESC CABINET
2	35mm EMT	1	COMMUNICATIONS	P10/P11 COMM. JUNCTION BOX	ESC CABINET	BELDEN 3105A	1	P10 BACNET COMMUNICATIONS	PUMP P10 BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 9721	1	P10 PUMP CONTROLS	PUMP P10 VFD CONTROL I/O BOARD	ESC CABINET
						BELDEN 3105A	1	P11 BACNET COMMUNICATIONS	PUMP P11 BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 9721	1	P11 PUMP CONTROLS	PUMP P11 VFD CONTROL I/O BOARD	ESC CABINET
3	27mm EMT	1	COMMUNICATIONS	P13 VFD CONTROL PANEL	ESC CABINET	BELDEN 3105A	1	P13 BACNET COMMUNICATIONS	PUMP P13 BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 9721	1	P13 PUMP CONTROLS	PUMP P13 VFD CONTROL I/O BOARD	ESC CABINET
4	-	-	-	-	-	2C No. 14 TECK	1	EMERGENCY PUSHBUTTON 1	EMERGENCY PUSHBUTTON 1	ESC CABINET
5	-	-	-	-	-	2C No. 14 TECK	1	EMERGENCY PUSHBUTTON 2	EMERGENCY PUSHBUTTON 2	ESC CABINET
6	27mm EMT	1	COMMUNICATIONS	BOILER 1 CONTROL PANEL	ESC CABINET	BELDEN 3105A	1	BOILER 1 BACNET COMMUNICATIONS	BOILER 1 PUMP BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 3105A	1	BOILER 1 PUMP BACNET COMMUNICATIONS	BOILER 1 PUMP BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 9721	1	BOILER 1 PUMP CONTROLS	BOILER 1 PUMP CONTROL I/O BOARD	ESC CABINET
7	27mm EMT	1	COMMUNICATIONS	BOILER 2 CONTROL PANEL	ESC CABINET	BELDEN 3105A	1	BOILER 2 BACNET COMMUNICATIONS	BOILER 2 PUMP BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 3105A	1	BOILER 2 PUMP BACNET COMMUNICATIONS	BOILER 2 PUMP BACNET COMMUNICATIONS CARD	ESC CABINET
						BELDEN 9721	1	BOILER 2 PUMP CONTROLS	BOILER 2 PUMP CONTROL I/O BOARD	ESC CABINET
8	-	-	-	-	-	2C No. 12 TECK	1	BOILER 1 CONTROL PANEL POWER	BOILER 1 CONTROL PANEL	MCCE1 DISTRIBUTION PANEL
9	-	-	-	-	-	2C No. 12 TECK	1	BOILER 2 CONTROL PANEL POWER	BOILER 2 CONTROL PANEL	MCCE1 DISTRIBUTION PANEL

ALL EQUIPMENT IS EXISTING UNLESS NOTED OTHERWISE

FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

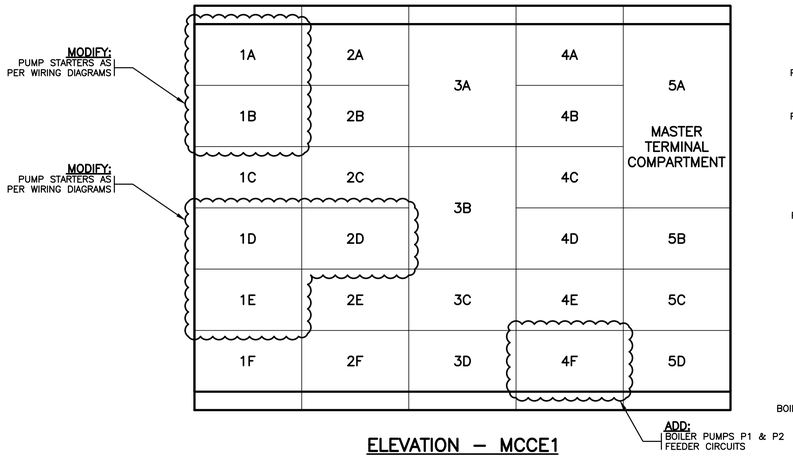
GENERAL NOTES:
1. CONTRACTOR TO SUPPLY ALL FLEXIBLE METAL CONDUITS (FMC) AS REQUIRED TO INTERCONNECT JUNCTION BOXES, CONDUIT STUB–OUTS AND PUMP CONTROLLERS/CABINETS.
2. CONTRACTOR TO REFER TO MECHANICAL DRAWINGS FOR EXACT EQUIPMENT PLACEMENT AND SPECIFICATIONS.
3. ALL CONDUIT TO BE INSTALLED ON CEILING AND EXISTING SUPPORTING STRUCTURES BETWEEN EQUIPMENT AND ELECTRICAL/BUILDING AUTOMATION PANELS. CONTRACTOR TO PROVIDE CONDUIT ROUTING PLAN PRIOR TO INSTALLATION.
4. CONTRACTOR TO FOLLOW ALL REQUIRED LOCK–OUT PROCEDURES PRIOR TO WORKING ON PUMPS AND ELECTRICAL EQUIPMENT.
5. CONTRACTOR TO TEST AND COMMISSION PUMPS AND BOILER SYSTEM.

DWG. NO. | DRAWING REFERENCES | NOTES | NO. | DATE | REVISIONS

DESIGNED B. WHITE
DRAWN PBX
CHECKED A. COSOVANU
RECOMMENDED
APPROVED I. STEELE

WEST VANCOUVER LABORATORY
HEATING SYSTEM UPGRADE
SITE PLAN - BOILER ROOM

SCALE NTS
DATE 2016-MAR-31
DRAWING NUMBER E105



ELEVATION – MCCE1

MOTOR CONTROL CENTRE – MCCE1 208V–3ø 4W

CIRCUIT No.	EQUIP. No.	NAMEPLATE	MOTOR KW/HP	MOTOR VOLTS	MOTOR PHASE	CIRCUIT BREAKER RATED AMP	CIRCUIT BREAKER POLE	CIRCUIT BREAKER FRAME	MOTOR STARTER SIZE	MOTOR STARTER COIL	MOTOR STARTER IND. LIGHT	MOTOR STARTER AUX. CONTACT N.O.	MOTOR STARTER AUX. CONTACT N.C.	MOTOR STARTER CONTROL	CONDUIT & WIRE	REMARKS
1A	P1	PRIMARY HEATING PUMP	2HP	208	1	15	3	MCP	VARIABLE FREQUENCY DRIVE					LOCAL	12–3#12	
1B	P2	PRIMARY HEATING PUMP	2HP	208	1	15	3	MCP	VARIABLE FREQUENCY DRIVE					LOCAL	12–3#12	
1C	P3	PUMP FOR HEAT EXH. No. 1	¾HP	208	3	7	3	MCP	1	120	R	1	1	H.O.A.	12–3#12	
1D	P10	PUMP FOR HEAT EXH. PUMP LOOP	7½HP	208	3	30	3	MCP	VARIABLE FREQUENCY DRIVE					LOCAL	12–3#10	
1E	P11	PUMP FOR HEAT EXH. PUMP LOOP	7½HP	208	3	30	3	MCP	VARIABLE FREQUENCY DRIVE					LOCAL	12–3#10	
1F		SPACE														
2A	P–6	PREHEAT COIL XXX PUMP	½HP	208	3	7	3	MCP	1	120	R	1	1	H.O.A.	12–3#12	
2B	P–8	HEAT RECOVERY PUMP	3HP	208	3	15	3	MCP	1	120	R	1	1	H.O.A.	12–3#12	
2C	P–9	HEAT RECOVERY PUMP	3HP	208	3	15	3	MCP	1	120	R	1	1	H.O.A.	12–3#12	
2D	P–13	PUMP FOR XXX HEATING LOOP	1½HP	208	1	15	3	MCP	VARIABLE FREQUENCY DRIVE					LOCAL	12–3#12	
2E	P–14	PUMP FOR HEATING LOOP HEATING	XHP	208	3	7	3	MCP	1	120	R	1	1	H.O.A.	12–3#12	
2F	EF–1	GENERAL EXH. FAN	5HP	208	3	30	3	MCP	1	120	R	1	1	H.O.A.	12–3#10	
3A	SF–1	SUPPLY FAN	25HP	208	3	100	3	MCP	3	120	R	1	1	H.O.A.	32–3#12	
3B	SF–2	SUPPLY FAN	15HP	208	3	100	3	MCP	3	120	R	1	1	H.O.A.	33–3#6	
3C	EF–3	TOILET EXH. FAN	¾HP	208	3	7	3	MCP	1	120	R	1	1	H.O.A.	12–3#12	
3D	PP–12	IRON REMOVAL FILTER PUMP	1½HP	208	3	15	3	MCP		120	R	1	1	H.O.A.	12–3#12	
4A	PP–1	IRON REMOVAL FILTER PUMP	1½HP	208	3	15	3	MCP	1	120	R	1	1	H.O.A.	32–3#12	
4B		SPACE														
4C		SPACE														
4D		SPACE														
4E		SPACE														
4F		MAIN BREAKER PANELBOARD	–	–	–	50	2	FB	–	–	–	–	–	–	–	
5A		MASTER TERMINAL COMPARTMENT														
5B	P–4	PUMP FOR HEAT EXCH. #2	½HP	120	1	15	1	BA	MST		R			H.O.A.	12–2#12	
5B	P–5	PUMP FOR HEAT EXCH. #3	¼HP	120	1	15	1			–						
5B	P–7	PREHEAT COIL XXX #2 PUMP	⅓HP	120	1	15	1			–						
5B	XP–4	MECH. XX EXH. FAN	⅓HP	120	1	15	1			–						
5C		12 CIRCUIT – 120/240V–1ø 2W PANEL C/W 12–15A, 1P XXXXX BREAKERS								–						

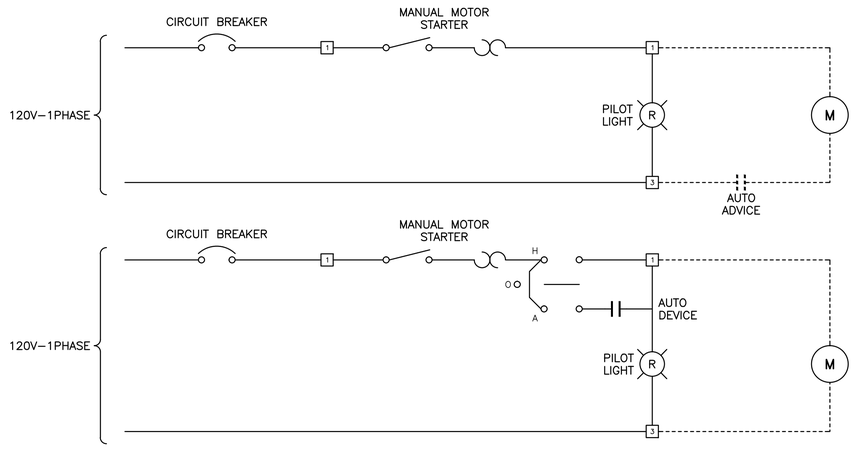
MODIFY: PUMP STARTERS AS PER WIRING DIAGRAMS

MODIFY: PUMP STARTERS AS PER WIRING DIAGRAMS

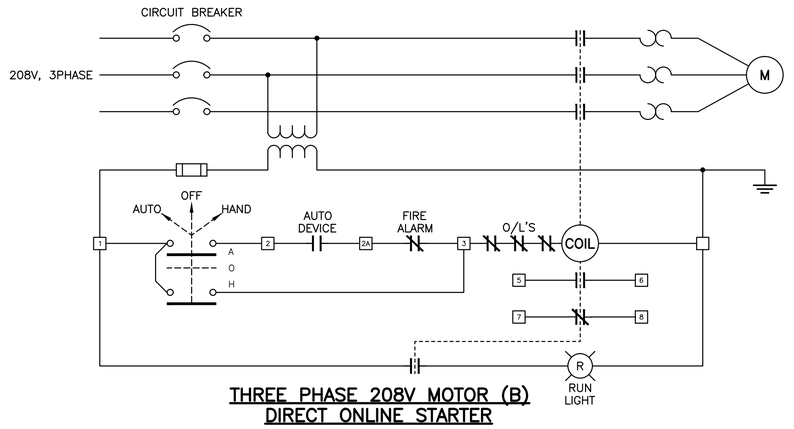
MODIFY: PUMP STARTERS AS PER WIRING DIAGRAMS

ADD: BOILER PUMPS P1 & P2 FEEDER CIRCUITS

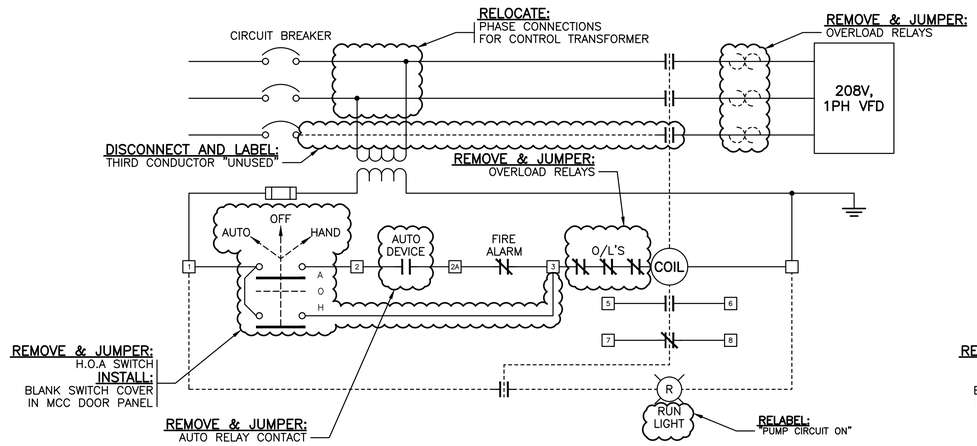
NOTE: "XX" IN TABLE REFERS TO ILLEGIBLE INFORMATION FROM AS–BUILT DRAWINGS.



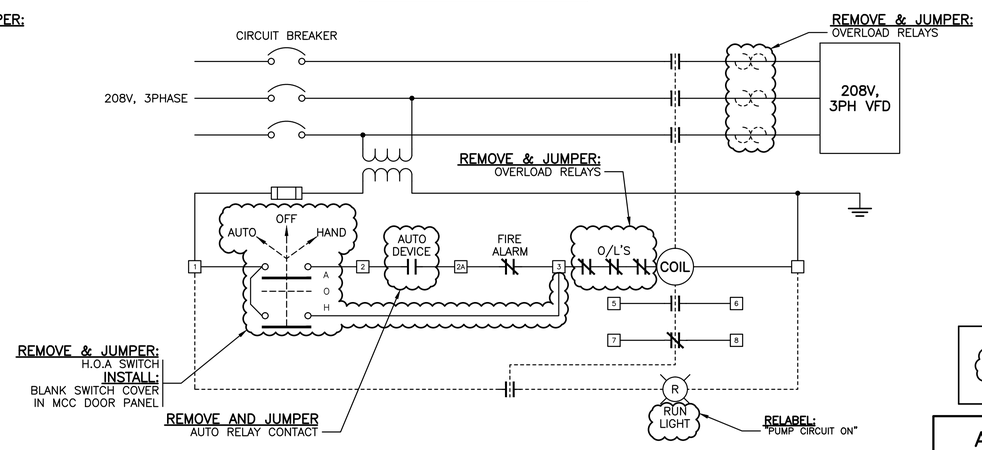
SINGLE PHASE 120V MOTOR (A)
DIRECT ONLINE STARTER



THREE PHASE 208V MOTOR (B)
DIRECT ONLINE STARTER



SINGLE PHASE 208V MOTOR (C)
LOCAL VFD STARTER (PROPOSED)



THREE PHASE 208V MOTOR (D)
LOCAL VFD STARTER (PROPOSED)

DENOTES WORK ADDED AS PART OF THIS CONTRACT

ALL EQUIPMENT IS EXISTING UNLESS NOTED OTHERWISE

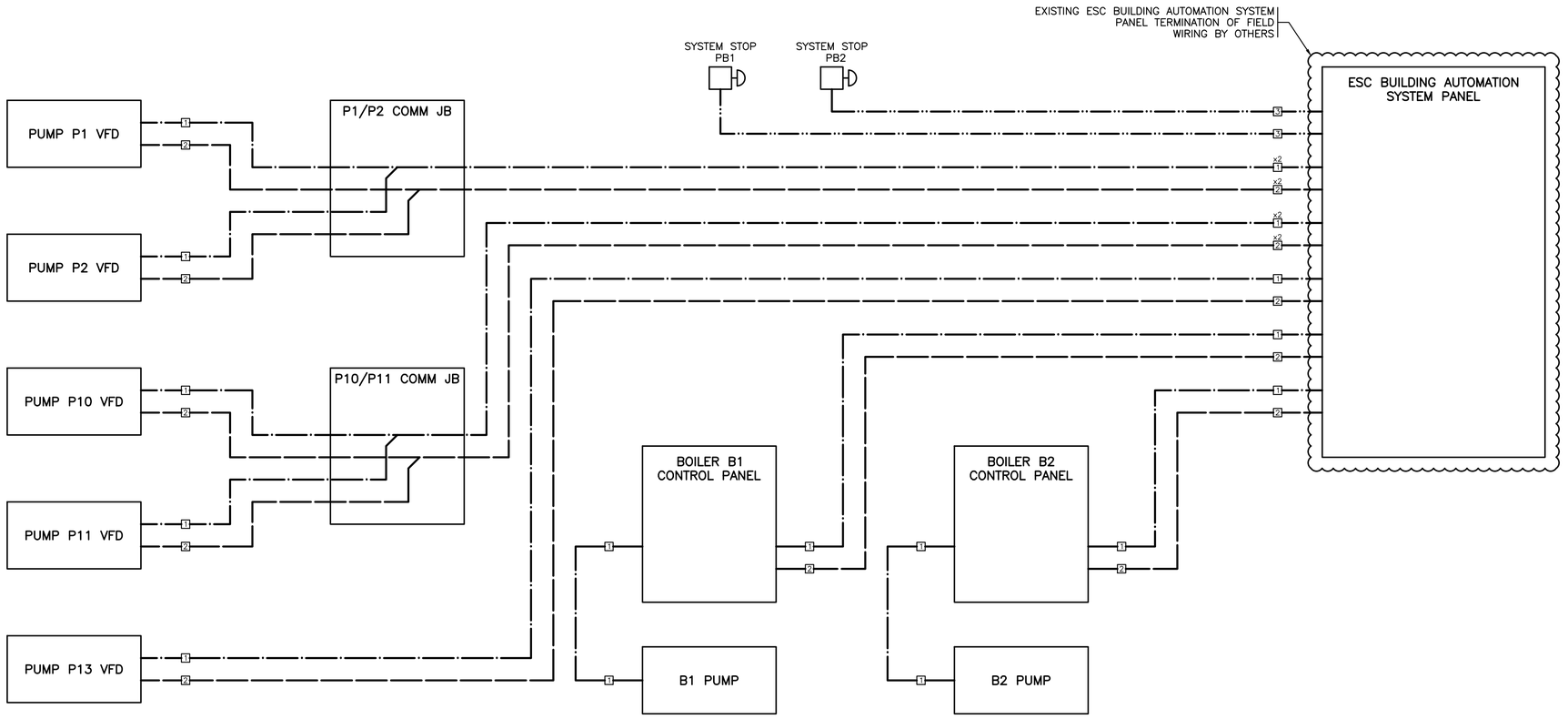
FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

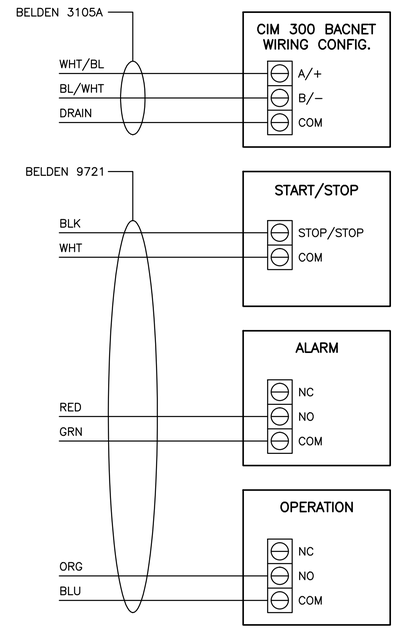
DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS

DESIGNED B. WHITE
DRAWN PBX
CHECKED A. COSOVANU
RECOMMENDED
APPROVED I. STEELE

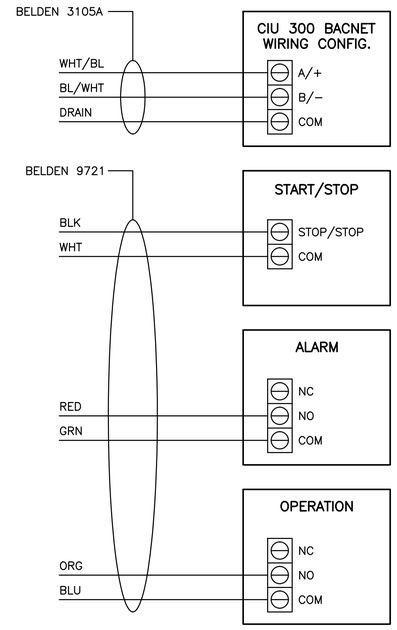
WEST VANCOUVER LABORATORY
HEATING SYSTEM UPGRADE
DETAILS - MCCE1 ELECTRICAL

SCALE NTS
DATE 2016–MAR–31
DRAWING NUMBER E106





MAGNA 3 PUMP CONTROL WIRING (P1,P2,P13)



CRE PUMP CONTROL WIRING (P10,P11)

CABLE LEGEND	
——·——	BACKNET COMMUNICATIONS
—— —— ——	CONTROL CABLE
——··——	2C No. 14 CABLE

CONDUCTOR SUMMARY		
CABLE I.D.	CONDUCTOR	DESCRIPTION
1	BELDEN 3105A (3 CONDUCTOR)	BACKNET COMMUNICATIONS
2	BELDEN 9721	CONTROLS I/O – 8 CONDUCTORS
3	2C No. 14 TECK	SYSTEM STOP

ALL EQUIPMENT IS PROPOSED UNLESS NOTED OTHERWISE

GENERAL NOTES:

1. ALL COMMUNICATIONS WIRING AND CABLES TO BE INSTALLED IN RIGID OR FLEXIBLE METAL CONDUIT.
2. CONTRACTOR TO CONFIRM COMMUNICATIONS PROTOCOLS AND WIRING REQUIREMENTS FOR PUMPS AND VFD's WITH ESC AUTOMATION PRIOR TO INSTALLATION.
3. REFER TO DWG. E106 FOR VFD FEEDER WIRING DIAGRAMS.

DWG. NO. | DRAWING REFERENCES | NOTES | NO. | DATE | REVISIONS

FISHERIES AND OCEANS CANADA
REAL PROPERTY AND SAFETY AND SECURITY

DESIGNED B. WHITE
DRAWN PBX
CHECKED A. COSOVANU
RECOMMENDED
APPROVED I. STEELE

WEST VANCOUVER LABORATORY HEATING SYSTEM UPGRADE WIRING DIAGRAM VFD AND BOILER SYSTEM CONTROL WIRING

SCALE NTS
DATE 2016-MAR-31
DRAWING NUMBER E107