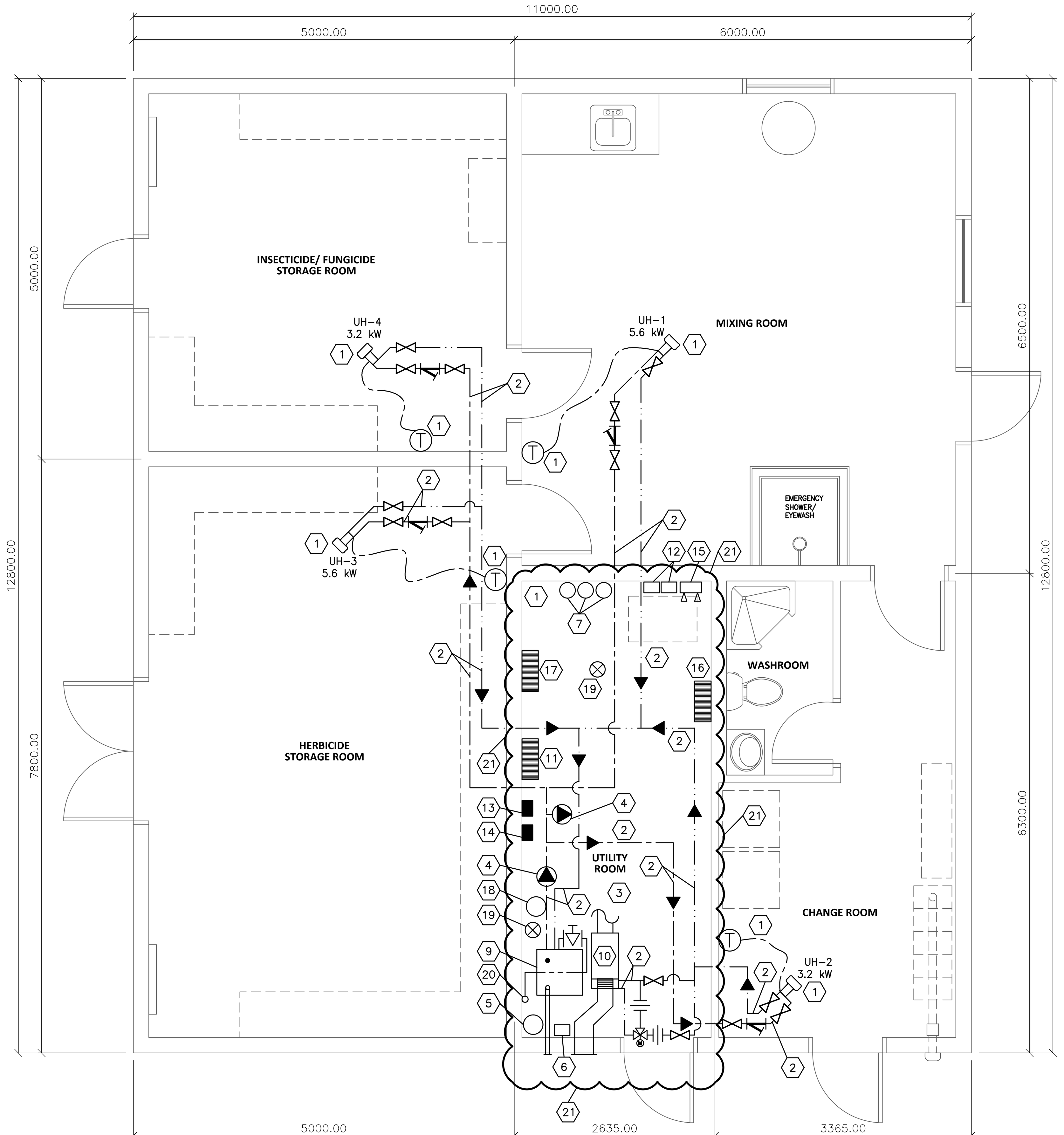


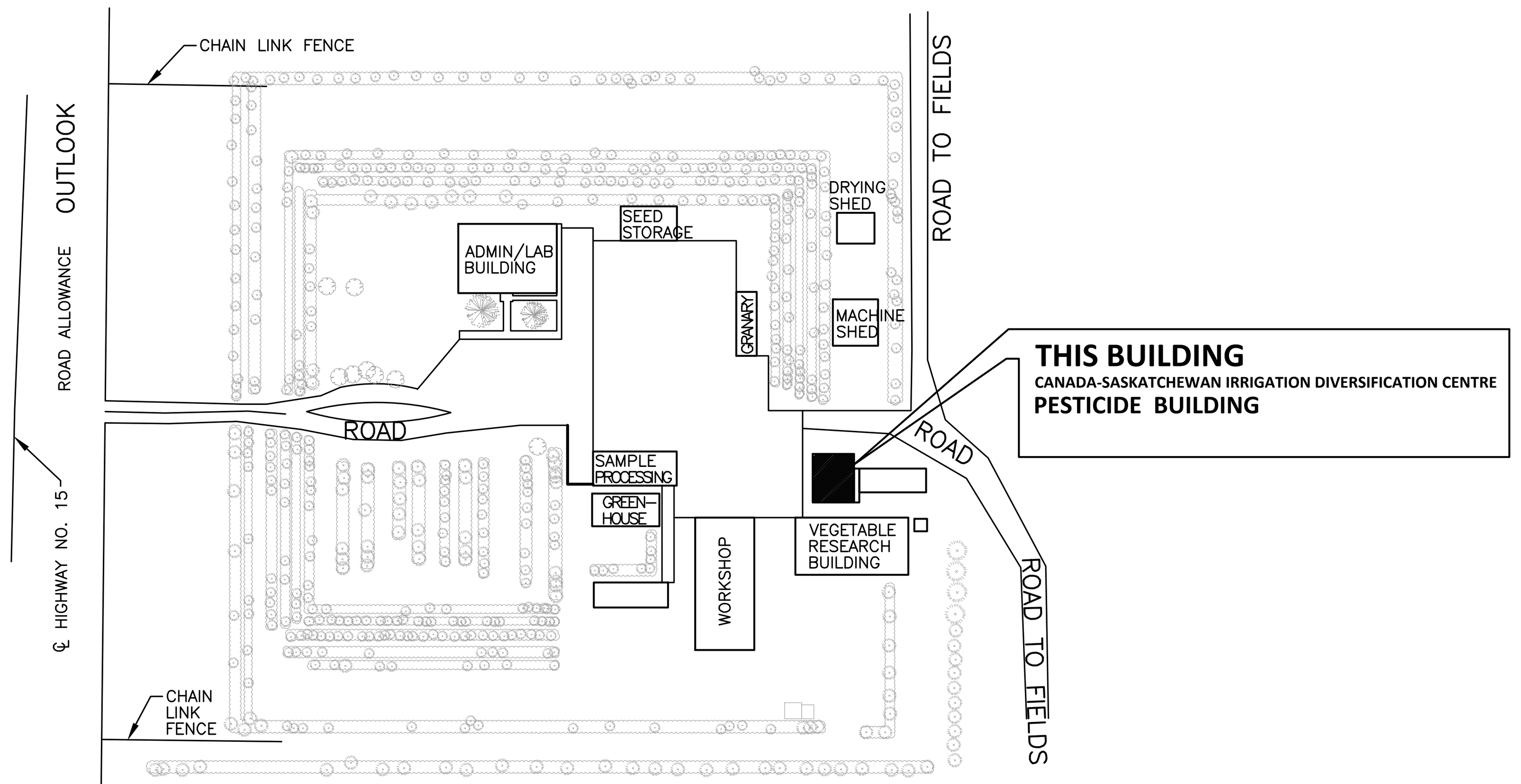
HEATING DEMOLITION PLAN

1 / M-01 SCALE 1:50

DRAWING INDEX

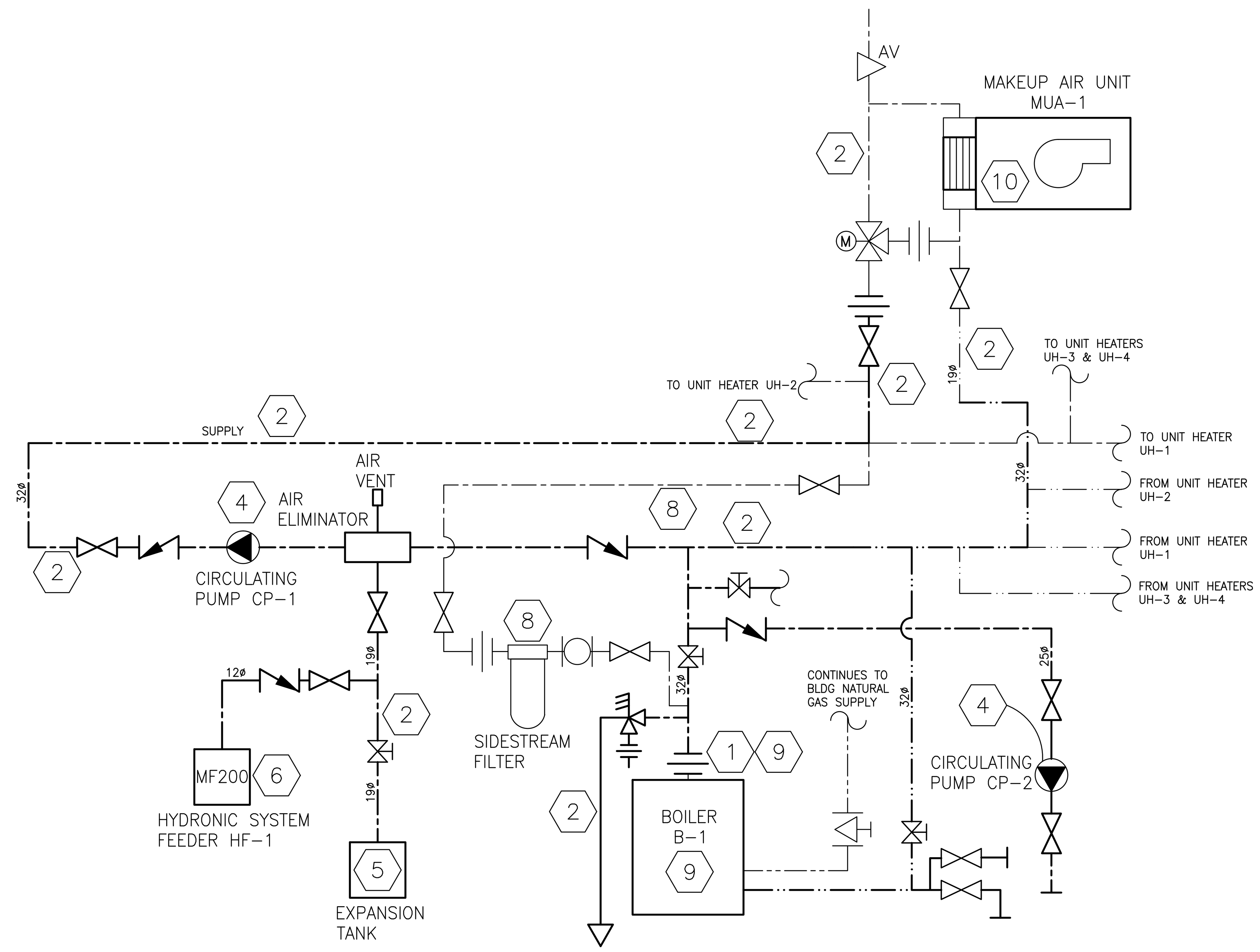
MECHANICAL

- M-01 HEATING DEMOLITION PLAN, KEY PLAN & EXISTING BOILER SCHEMATIC
- M-02 RENOVATED HEATING PLAN & PROPOSED BOILER SCHEMATIC
- M-03 MECHANICAL SPECIFICATIONS AND DETAILS



CSIDC KEY PLAN

2 / M-01 SCALE: NTS



NOTE:
ESSENTIALLY ENTIRE EXISTING HOT WATER HEATING SYSTEM TO BE REMOVED AS INDICATED. MAINTAIN EXISTING MAKE-UP AIR SYSTEM.

EXISTING BOILER SCHEMATIC

3 / M-01 SCALE: NTS

MECHANICAL DEMOLITION AND NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE REMOVAL AND DISPOSAL OF ALL EXISTING MECHANICAL EQUIPMENT. AS NOTED INCLUDING BOILERS, PUMPS, ACCESSORIES, PIPING ,FITTINGS, VALVES, INSULATION, BOILER SOLUTION, HEATING UNITS, CONTROLS, ETC.
2. PATCH ALL SURFACES DISTURBED AS A RESULT OF DEMOLITION IN CEILING, WALLS, FLOORS, ETC AND MAKE GOOD AND LEVEL TO EXISTING SURROUNDING.
3. THE CONTRACTOR SHALL PROTECT ALL OCCUPIED AREAS WITH BOARDING DUST BARRIERS, ETC AND CLEAN-UP WORK SPACE ON A DAILY BASIS.
4. THE CONTRACTOR IS RESPONSIBLE FOR FINAL CLEANING OF AFFECTED AREAS.
5. THE CONTRACTOR SHALL MAINTAIN A CLEAN, ORGANIZED WORK AND DISPOSAL STAGING AREAS. PROVIDE GARBAGE/REFUSE CONTAINER FOR DEMOLITION MATERIAL AND INCLUDE ALL COST FOR REMOVAL AND DISPOSAL. CO-ORDINATE LOCATION OF STAGING AREA WITH BUILDING OWNER.
6. ALL HAZARDOUS WASTE SUCH CHEMICALS, OILS ETC. TO BE DISPOSED OF IN ACCORDANCE WITH MINISTRY OF ENVIRONMENT AND TOWN OF OUTLOOK REQUIREMENTS.
7. LOCATION OF EXISTING EQUIPMENT, PIPING, ETC. WAS OBTAINED FROM EXISTING DRAWINGS AND SITE VISITS. CONTRACTOR TO DETERMINE AND VERIFY EXACT CONFIRMATION AND LOCATION OF EXISTING SYSTEM ON SITE.
8. TO THE BEST INFORMATION AVAILABLE , THERE DOES NOT APPEAR TO BE ANY MATERIAL CONTAINING ASBESTOS WHICH WILL BE AFFECTED BY THIS WORK. SHOULD THE CONTRACTOR ENCOUNTER ANY MATERIAL WHICH COULD POTENTIALLY CONTAIN ASBESTOS, THE TESTING REMOVAL/ABATEMENT OF THE SUSPECTED MATERIAL WILL BE COMPLETED AS AN ADDITION TO THE CONTRACTOR BY AN ASBESTOS ABATEMENT CONTRACTOR.

MECHANICAL DEMOLITION KEYNOTES

(XX) ← DENOTES KEYNOTE ON DWG

1. EXISTING HOT WATER UNIT HEATER TO BE REMOVED. CAP-OFF ELECTRICAL FOR RECONNECTION TO NEW UNIT. MAINTAIN CEILING HANGER FOR NEW UNIT. MAINTAIN THERMOSTAT FOR RECONNECTION TO NEW UNIT. SEE RENOVATED CEILING PLAN 1/M-02.
2. DRAIN SYSTEM AND REMOVE ALL EXISTING HOT WATER HEATING SYSTEM PIPING, FITTINGS, VALVES, ETC. COMPLETE WITH INSULATION.
3. SEE EXISTING BOILER SCHEMATIC 3/M-01 FOR DETAILED EXISTING PIPING SCHEMATIC.
4. EXISTING CIRCULATION PUMP TO BE REMOVED. CAP-OFF ELECTRICAL FOR NEW UNIT.
5. EXISTING EXPANSION TANK TO BE REMOVED COMPLETE WITH PIPING.
6. EXISTING GLYCOL FEED SYSTEM TO BE REMOVED COMPLETE WITH PIPING, FLUID, ETC.
7. EXISTING CONTAINER OF INHIBITED GLYCOL AND ACID FLUSH CHEMICAL TO BE REMOVED.
8. EXISTING SIDESTREAM FILTER ASSEMBLY TO BE REMOVED COMPLETE WITH SITE GLASS AND PIPING.
9. EXISTING LAARS BOILER TO BE REMOVED COMPLETE WITH PIPING, RELIEF VALVE, PRESSURE GAUGES, AIR VENTS, INTAKE AIR PIPE, VENT PIPE, ETC. CAP-OFF ELECTRICAL AND GAS SUPPLY FOR NEW BOILER EQUIPMENT.
10. EXISTING ENERGY SAVINGS PRODUCT LTD. MODEL MAKE-UP AIR FAN COIL TO REMAIN. REMOVE EXISTING HOT HEATING COOLING SECTION COMPLETE WITH PIPING, VALVES, FITTINGS, ETC. AND REPLACE WITH A NEW COIL. SEE DRAWING M-02 FOR ADDITIONAL DETAILS.
11. EXISTING ELECTRICAL PANEL LP-A 120/208 VOLT, 3-PHASE, 4 WIRE, 42 CIRCUIT TO REMAIN. PANEL HAS APPROXIMATELY 12 SPARE SLOTS.
12. EXISTING TELEPHONE/DATA BACKBOARD & EQUIPMENT TO REMAIN.
13. EXISTING BOILER TEKMAR 260 CONTROL PANEL TO BE REMOVED. CAP-OFF ELECTRICAL FOR CONNECTION TO NEW BOILER CONTROL PANEL. MAINTAIN BOILER @ TEKMAR CONTROLS TRANSFORMER.
14. EXISTING JOHNSON CONTROLS MAKE-UP AIR UNIT DISCHARGE AIR CONTROLLER TO REMAIN.
15. EXISTING BATTERY POWERED EMERGENCY LIGHT TO REMAIN.
16. EXISTING FIRE ALARM PANEL AND EQUIPMENT TO REMAIN.
17. EXISITING RELAY CONTROL PANEL TO REMAIN.
18. EXISTING ELECTRIC DOMESTIC HOT WATER HEATER TO REMAIN.
19. EXISTING FLOOR DRAIN TO REMAIN.
20. EXISTING GAS LINE CONTINUES UP THROUGH ROOF.
21. ON COMPLETION OF DEMOLITION, WASH DOWN ALL DRYWALL, WALLS & CEILING SURFACES WITH A DAMP CLOTH IN BOILER ROOM. PRIME WALL & CEILING WITH A WATER-BASED PRIMER. THEN PAINT WALLS AND CEILINGS WHITE WITH WATER-BASED PAINT. CLEAN BOILER ROOM FLOOR WITH A POWER SCRUBBER & MILD DETERGENT & RINSE. APPLY EPOXY-BASED CONCRETE FLOOR COATING/PAINT TO MATCH EXISTING. CO-ORDINATE WORK SCHEDULE WITH THE OWNER SUCH THAT ALL LOOSE OWNER ITEMS CAN BE REMOVED.

MECHANICAL LEGEND

EXISTING	PROPOSED		EXISTING	PROPOSED	
		HOT WATER HEATING SUPPLY			BALANCING VALVE
		HOT WATER HEATING RETURN			RELIEF VALVE
		CONTROL WIRING			FLOOR DRAIN
		NATURAL GAS LINE		AV	AIR VENT
		DRAIN LINE			3-WAY MOTORIZED VALVE
		ISOLATION VALVE			SITE GLASS
		CHECK VALVE			UNION
		PRESSURE GAUGE			NATURAL GAS ISOLATION VALVE
		THERMOMETER	T		THERMOSTAT
		PUMP		CC	CIRCUIT SETTER
		STRAINER		S	SENSOR
	LL	LOW WATER CUT-OFF		OS	OUTDOOR SENSOR
	FS	FLOW SWITCH			

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Permission to Consult held by:

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Project Title:
CANADA-SASKATCHEWAN IRRIGATION DIVERSIFICATION CENTRE (CSIDC)

PESTICIDE BUILDING

HEATING SYSTEM REPLACEMENT
OUTLOOK, SASKATCHEWAN

NOTES:

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Drawing Title:
HEATING DEMOLITION PLAN, KEY PLAN & EXISTING BOILER SCHEMATIC

Designed By:	MEL	Scale:	AS INDICATED
Drawn By:	DAN	Date:	SEPT. 2015
Checked By:	GAS	Date:	SEPT. 2015
Project No.:	4850		

M-01

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Issued For:	-		
Date Issued:	-		
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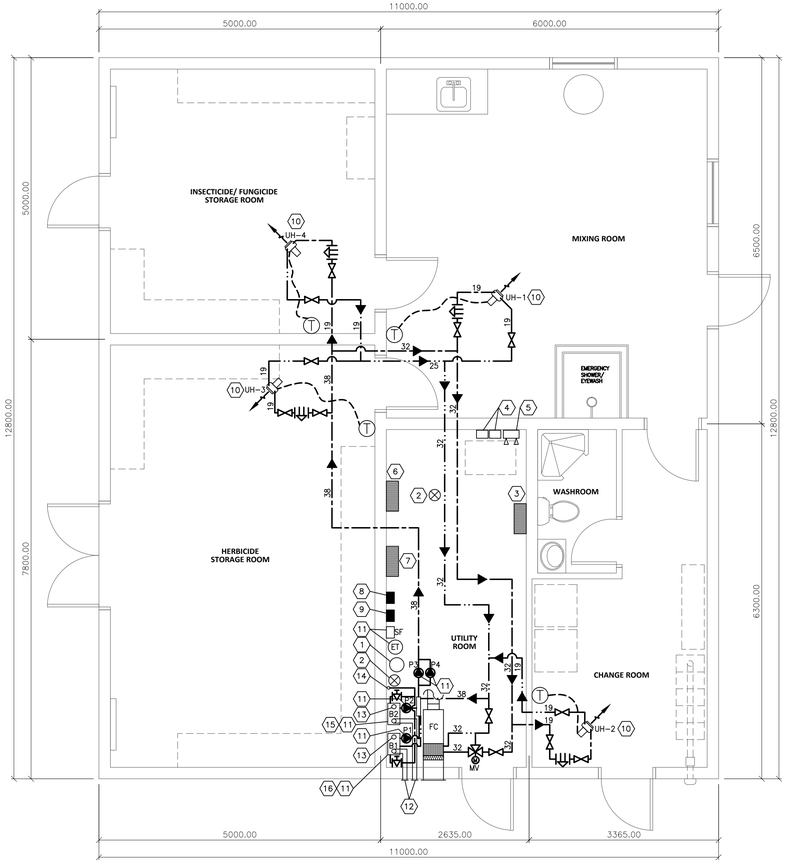


1 M-02 **RENOVATED HEATING PLAN**
SCALE 1:50

MECHANICAL RENOVATION KEYNOTES

(XX) —DENOTES KEYNOTE ON DWG

1. EXISTING ELECTRIC DOMESTIC HOT WATER HEATER TO REMAIN.
2. EXISTING FLOOR DRAIN TO REMAIN.
3. EXISTING FIRE ALARM PANEL AND EQUIPMENT TO REMAIN.
4. EXISTING TELEPHONE/DATA BACKBOARD AND EQUIPMENT TO REMAIN.
5. EXISTING BATTERY-POWERED EMERGENCY LIGHT TO REMAIN.
6. EXISTING RELAY CONTROL PANEL TO REMAIN.
7. EXISTING ELECTRICAL PANEL LP-A 120/208 VOLT, 3-PHASE, 4 WIRE, 42 CIRCUIT TO REMAIN. PANEL HAS APPROXIMATELY 12 SPARE SLOTS.
8. EXISTING CONTROLS TRANSFORMER/JUNCTION BOX TO REMAIN.
9. EXISTING JOHNSON CONTROLS MAKE-UP AIR UNIT DISCHARGE AIR CONTROLLER TO REMAIN.
10. CONNECT NEW HOT WATER UNIT HEATER TO EXISTING ELECTRICAL FEED AND THERMOSTAT CONTROL. HANG UNIT FROM EXISTING THREADED CEILING HANGERS.
11. SEE BOILER PIPING/CONTROL SCHEMATIC 2/M-02 FOR MORE DETAIL.
12. 50mm POLYPROPYLENE OR CPVC INLET OUT THROUGH EXTERIOR WALL COMPLETE WITH 90° ELBOW HORIZONTAL TERMINATION KIT AND INSECT SCREEN. SEE AT PIPE PENETRATION THRU WALL WEATHER TIGHT WITH CAULKING AND ESCUTCHEON.
13. 50mm POLYPROPYLENE OR CPVC BOILER VENT UP THRU ROOF COMPLETE WITH 90° VERTICAL TERMINATION KIT AND INSECT SCREEN. EXTEND ABOVE ROOF 450mm MIN. THAN NEAREST OBSTACLE WITHIN 1200mm. FLASH AND SEAL AT ROOF PENETRATION WEATHER TIGHT WITH DECKTITE.
14. CONNECT NEW 25mm NATURAL GAS SUPPLY TO BOILERS TO EXISTING 25mm GAS SUPPLY. CONTRACTOR TO DETERMINE EXACT LOCATION ON SITE.
15. WIRE NEW BOILER "B2" TO EXISTING BOILER'S 15amp CIRCUIT BREAKER IN PANEL LP-A CIRCUIT 19. WIRING TO BE MINIMUM 2-#12RW90 IN 1/2" EMT.
16. PROVIDE NEW 15amp SINGLE POLE CIRCUIT BREAKER IN PANEL LP-A IN CIRCUIT 30 AND WIRE TO NEW BOILER "B2" WITH 2-#12RW90 IN 1/2" EMT.

MECHANICAL GENERAL NOTES

1. ALL EQUIPMENT TO BE INSTALLED AS PER MANUFACTURES SPECIFICATIONS AND RECOMMENDATIONS.
2. ALL PIPING IS SHOWN SCHEMATICALLY.
3. CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS AND PAY PERMIT AND INSPECTION FEES.
4. CONTRACTOR TO CO-ORDINATE AND INCLUDE FOR THE COMMISSIONING AND START UP OF THE NEW BOILERS WITH THE BOILER MANUFACTURE.
5. CONTRACTOR SHALL SUBMIT ALL REQUIRED DOCUMENTATION TO THE MINISTRY OF ENVIRONMENT BOILER INCLUDING BOILER DOCUMENTATION. CONTRACTOR TO CO-ORDINATE ALL INSPECTION AND CERTIFICATION AS REQUIRED INCLUDING FEES.
6. ALL DEMOLITION AND CONSTRUCTION ACTIVITY TO BE CO-ORDINATE WITH THE BUILDING OWNER.
7. CONTRACTOR WILL BE RESPONSIBLE TO DRAIN AND DISPOSE OF THE HEATING SOLUTION FROM THE HEATING SYSTEM PRIOR TO DEMOLITION.
8. ON COMPLETION CONTRACTOR SHALL CLEAN/DEGREASE THE ENTIRE SYSTEM AS PER ITEM 3.9.2 ON DRAWING M-03. .
9. THE CONTRACTOR SHALL CHARGE THE NEW BOILER SYSTEM WITH A PREMIX 50/50 SOLUTION OF DEMINERALIZED WATER AND PROPYLENE GLYCOL AS PER THE RECOMMENDATION OF THE CHEMICAL TREATMENT SUPPLIER. SEE ITEM 3.9.3 ON DRAWING M-03.
10. GAS-FIRED EQUIPMENT TO BE IN INSTALLED AS PER NATURAL GAS INSTALLATION CODE B149 AND GAS UTILITY REQUIREMENT.
11. ALL PIPING TO BE INSULATED AS PER ITEM 4.0 ON DRAWING M-03..
12. ALL HOT WATER HEATING PIPING TO BE BLACK STEEL SCH. 40 WITH THREADED.
13. ALL WIRING TO BE INSTALLED AS PER THE CANADIAN ELECTRICAL CODE AND THE INSPECTION AUTHORITY.

MECHANICAL EQUIPMENT SCHEDULE

B1 & B2 –BOILERS #1 & #2

SUPPLY AND INSTALL A-NTI TRINITY MODEL TFT 110 HIGH EFFICIENCY GAS-FIRED MODULATING CONDENSING BOILER. EACH UNIT TO PROVIDE 31.65kW (108 MBH) HEATING INPUT, 29.02kW (99 MBH) HEATING OUTPUT WITH A THERMAL EFFICIENCY RATING OF 95%. THE BOILER TO BE CERTIFIED TO ANSIZ21.13/CSA4.9. THE BOILER TO BE DESIGNED AND CONSTRUCTED IN COMPLIANCE WITH ASME BOILER AND PRESSURE VESSEL CODE SECTION IV WITH PERMANENT NAME PLATE BEARING THE 'H' STAMP AND THE NATIONAL BOARD REGISTRATION NUMBER. HEAT ENGINE TO HAVE A LIMITED LIFETIME WARRANTY. ALL OTHER PARTS SHALL HAVE A 5 YEAR LIMITED WARRANTY. THE HEAT ENGINE SHALL BE A VERTICAL FIRE TUBE DOWN FIRE DESIGN. THE COMBUSTION CHAMBER, FIRE TUBES, TUBE SHEETS AND SHELL SHALL BE CONSTRUCTED OF TYPE 439 STAINLESS STEEL. THE HEAT ENGINE ASSEMBLY SHALL BE OF ALL-WELDED CONSTRUCTION. THE HEAT ENGINE SHALL BE RATED FOR 80 PSI OPERATING PRESSURE. THE HEAT ENGINE SHALL BE ABLE TO ACCEPT 50% MIXTURE OF INHIBITED PROPYLENE GLYCOL. THE HEAT ENGINE SHALL BE PROVIDED WITH AN AUTOMATIC HEAT VENT. A FACTORY SUPPLIED, FIELD INSTALLED ANTI-SYPHON TRAP SHALL BE CONNECTED TO THE COMBUSTION CHAMBER FOR COLLECTION AND REMOVAL OF CONDENSATE. THE COMBUSTION SYSTEM SHALL BE FULLY MODULATING WITH A 5:1 TURN DOWN RATIO. THE BOILER SHALL BE DESIGNED FOR VENTING BOTH A 50mm (2") DIAMETER SCHEDULE TO PVC, CPVC, AL29-4C, OR POLYPROPYLENE PIPE. THE COMBUSTION CHAMBER EXHAUST OUTLET SHALL INCLUDE A 13mm (1/2") DIAMETER PORT WITH A REMOVABLE EPDM PLUG TO PERMIT INSERTION OF A COMBUSTION ANALYZER PROBE. THE CABINET SHALL BE ON 16A. GALVANIZED STEEL WITH 20ga. REMOVABLE PANELS WITH FACTORY APPLIED COATING. BOILER TO BE 120 VOLT, SINGLE PHASE WITH A CURRENT DRAW OF 12 AMPS AND WITH A LINE VOLTAGE BARRIER STRIP TO POWER UP TO 3 PUMPS EACH WITH A MAXIMUM 1/6 H.P OR 3 AMPS @ 120 VOLT. (2) LOW VOLTAGE STRIPS SHALL BE PROVIDED FOR THE CONNECTION OF OUTDOOR TEMPERATURE SENSOR, SYSTEM TEMPERATURE SENSOR, DHW INDIRECT TANK AQUASTAT OR DHW TEMPERATURE SENSOR, 4 TO 20 MA FROM EXTERNAL CONTROL, ETA-485 FOR LEAD-LAG CASCADE CONTROL, 2-HEATERING THERMOSTAT, EXTERNAL SAFETY LIMIT, AND ALARM SYSTEM TO BUILDING AUTOMATION SYSTEM. THE BOILER CONTROL SYSTEM SHALL OPERATE ON 24 VAC AND SHALL PROVIDE OPERATION OF UP TO (3) PUMPS; DOMESTIC WATER PRIORITIZATION; FIELD ADJUSTABLE OUTDOOR RESET TO AUTOMATICALLY SET SYSTEM WATER TEMPERATURE BASED ON OUTDOOR AIR TEMPERATURE. THE OUTDOOR SENSOR SHALL BE FACTORY SUPPLIED FOR FIELD INSTALLATION; MANUAL FIRE RATE CONTROL; WARM WEATHER SHUTDOWN TO DISABLE HEATING; PUMP EXERCISING; AND FREEZE PROTECTION. THE CONTROLLER SHALL ALLOW FIELD SETTING OF LOW TEMPERATURE CENTRAL HEAT, HIGH TEMPERATURE CENTRAL HEAT, OUTDOOR RESET PARAMETERS, DOMESTIC HOT WATER SET POINT, BOILER PUMP OVER RUN TIME, CH AND DHW OVER RUN TIME, CH AND DWH PUMP START DELAY, WARM WEATHER SHUTDOWN, DHW PRIORITY OVERRIDE TIMER, CH MODULATION SOURCE, DHW MODULATION SOURCE, LEAD LAG SELECTION METHOD, LEAD ROTATION TIME, SLAVE ORDER PRIORITY METHOD, ANTI-SHORT CYCLE INTERVALS, AND TEMPERATURE UNITS. THE CONTROL SYSTEM SHALL INCLUDE A BUILT-IN COLOR TOUCH SCREEN DISPLAY TO PERMIT MONITORING OF UNIT OPERATION AND SET POINT PARAMETERS INCLUDING HEAT DEMAND SOURCE, BURNER STATE, DEMAND FIRING RATE, BLOWER RPM, ENTERING WATER TEMPERATURE, EXITING WATER TEMPERATURE, EXHAUST GAS TEMPERATURE, AND OUTDOOR TEMPERATURE. THE CONTROLLER SHALL BE CAPABLE OF LEAD-LAG STAGING OR UP TO 8 BOILERS WITH FIELD SUPPLIED CABLING. THE CONTROLLER SHALL PROVIDE INTEGRATED COMUNICATION CAPABILITY. THE BOILER TRIM KIT TO INCLUDE: OUTDOOR AIR TEMPERATURE SENSOR, SYSTEM SENSOR, PRESSURE GAUGE, 206.7 kPA (30 PSI) ASME RELIEF VALVE, LP CONVERSION KIT, 2-¾ BRASS BUSTINGS, 1-125mm (5") LENGTH CPVC SCHEDULE 40 PIPE, 1-13mm (1/2") NPT TEE, 2-50mm (2") DIAMETER ANTI-BIRD SCREEN, AND FLOOR SUPPORT FRAME. PROVIDE COMPLETE WITH ALL REFERENCE, INSTALLATION AND OPERATION MANUALS, UNIT TO BE COMPLETE WITH VERTICAL VENT AND INTAKE TERMINATION KITS. SEE BOILER PIPING/CONTROL SCHEMATIC 2/M02.

CN1 & CN2 – CONDENSATE NEUTRALIZERS #1 & #2

SUPPLY AND INSTALL AN AXIOM INDUSTRIES MODEL NC-1 NEUTRAL PAL CONDENSATE NEUTRALIZER OR EQUAL COMPLETE WITH INITIAL CHARGE OF LIPHTER NEUTRALIZING AGENTS. SEE BOILER PIPING/CONTROL SCHEMATIC 2/M-02.

AV – AUTOMATIC AIR VENTS

AUTOMATIC AIR VENTS TO BE TACO HY-VENT OR EQUAL. SEE BOILER PIPING/CONTROL SCHEMATIC 2/M-02.

LL – LOW WATER CUT-OFF

SUPPLY AND INSTALL A TACO LOW WATER CUT-OFF MODEL LFM 1203F OR EQUAL @ 120 VOLT WITH MANUAL RESET. SEE BOILER PIPING/CONTROL SCHEMATIC 2/M-02.

FS – FLOW SWITCH

SUPPLY AND INSTALL A TACO MODEL IFS01BF-1 OR EQUAL FLOW SWITCH. TO BE WIRED TO SHUTDOWN BOILER ON NO FLOW. SEE BOILER PIPING/CONTROL SCHEMATIC 2/M-02.

FC – FAN COIL

EXISTING HOT WATER HEATING FAN COIL/MAKE-UP AIR UNIT TO REMAIN. UNIT IS AN ENERGY SAVINGS PRODUCTS LTD. MODEL LV-70LU AND PROVIDES 1000CFM WITH A 1/2 HP FAN MOTOR @ 115 VOLT, SINGLE PHASE. REPLACE EXISTING HOT WATER HEATING COIL WITH A NEW COIL FROM THE MANUFACTURER TO BE PART NO. 201001070. NEW COIL TO PROVIDE 24.5kW HEATING AT 88°C ENTERING WATER TEMPERATURE AND A FLOW RATE OF 0.44L/S. SEE FAN COIL/CONTROL SCHEMATIC 2/M-03.

UH-1 & UH-3 – HOT WATER UNIT HEATERS #1 & #3

SUPPLY AND INSTALL A MODINE MODEL HSB-33-S-B-01-F-A HORIZONTAL DELIVERY HOT WATER UNIT HEATER. UNIT TO PROVIDE 6.3kW HEATING WITH AN ENTERING WATER TEMPERATURE OF 93°C, AN ENTERING AIR TEMPERATURE OF 15.5°C, A WATER TEMPERATURE DROP OF 11.1°C, A FLOW RATE OF 0.145L/S AND A PRESSURE DROP OF 0.6kPA. UNIT TO BE COMPLETE WITH 1/25H.P. TEFC FAN MOTOR AT 1550RPM,115VOLT, SINGLE PHASE TO PROVIDE 297L/S AIRFLOW. UNIT TO BE COMPLETE WITH FINGER PROOF FAN GUARD, CONTROL JUNCTION BOX, AND A VERTICAL DEFLECTOR BLADES. UNIT WEIGHT IS APPROXIMATELY 15.4KG. SEE UNIT HEATER PIPING/CONTROL SCHEMATIC 1/M-02.

UH-2 & UH-4 – HOT WATER UNIT HEATERS #2 & #4

SUPPLY AND INSTALL A MODINE MODEL HSB-18-S-B-01-F-A HORIZONTAL DELIVERY HOT WATER UNIT HEATER. UNIT TO PROVIDE 3.7kW HEATING WITH AN ENTERING WATER TEMPERATURE OF 93°C, AN ENTERING AIR TEMPERATURE OF 15.5°C, A WATER TEMPERATURE DROP OF 11.1°C, A FLOW RATE OF 0.082L/S AND A PRESSURE DROP OF 0.375kPA. UNIT TO BE COMPLETE WITH 1/60H.P. TEFC FAN MOTOR AT 1550RPM,115VOLT, SINGLE PHASE TO PROVIDE 160L/S AIRFLOW. UNIT TO BE COMPLETE WITH FINGER PROOF FAN GUARD, CONTROL JUNCTION BOX, AND A VERTICAL DEFLECTOR BLADES. UNIT WEIGHT IS APPROXIMATELY 7.26KG. SEE UNIT HEATER PIPING/CONTROL SCHEMATIC 1/M-02.

P1 & P2 – PUMPS #1 & #2

SUPPLY AND INSTALL A TACO MODEL 007-BFS CARTRIDGE CIRCULATOR OR EQUAL. UNIT TO PROVIDE 0.63L/S(10GPM) @ 1.79 kPA (7 FEET H2O) WITH A 1/25 H.P. MOTOR @ 115 VOLT, SINGLE PHASE. UNIT TO BE WIRED TO BOILER AND CONTROLLED BY BOILER. SEE BOILER PIPING/CONTROLS SCHEMATIC 2/M-02.

P3 & P4 – PUMPS #3 & #4

SUPPLY AND INSTALL A TACO MODEL 1610 INLINE HOT WATER CIRCULATOR OR EQUAL. UNIT TO PROVIDE 0.945L/S(15GPM) @ 5.89 kPA (23 FEET H2O) @ 1750RPM WITH A 120.65mm (4.75") IMPELLER AND A 1/3 H.P. MOTOR @ 115 VOLT, SINGLE PHASE. PUMP TO BE WIRED AND CONTROLLED THRU BOILER. ONE PUMP TO BE USED AS A STANDBY. SEE BOILER PIPING/CONTROLS SCHEMATIC 2/M-02.

CIRCUIT SETTERS

SUPPLY AND INSTALL A TACO MODEL ACUF-150-AT NPT 38mm (1 1/2") CIRCUIT SETTER OR EQUAL. BALANCE SYSTEM AT 0.945L/S (15GPM) WITH A 3.3kPA (13 FEET H2O). SEE BOILER PIPING/CONTROLS SCHEMATIC 2/M-02.

ET – EXPANSION TANK

SUPPLY AND INSTALL AN AMTROL MODEL SX-30V HOT WATER DIAPHRAM BOILER EXPANSION TANK OR EQUAL. UNIT TO BE 53L (14GAL) WITH A 42.71L (11.3GAL) ACCEPTANCE VOLUME AND A 82.7kPA (12PSI) PRECHARGE. UNIT WEIGHT IS 11.3KG (25LBS). SEE BOILER PIPING/CONTROLS SCHEMATIC 2/M-02.

AS – AIR SEPARATOR

SUPPLY AND INSTALL A TACO VORTECH MODEL VRTX150 38mm (1 1/2") AIR SEPARATOR OR EQUAL. UNIT TO HAVE A PRESSURE DROP OF 12Pa (0.4" H20) AT 0.945L/S (15GPM). UNIT TO BE COMPLETE WITH TACO 419 HYVENT. UNIT WEIGHT IS APPROXIMATELY 6.8KG (15LBS). SEE BOILER PIPING/CONTROLS SCHEMATIC 2/M-02.

SF – SYSTEM FEEDER

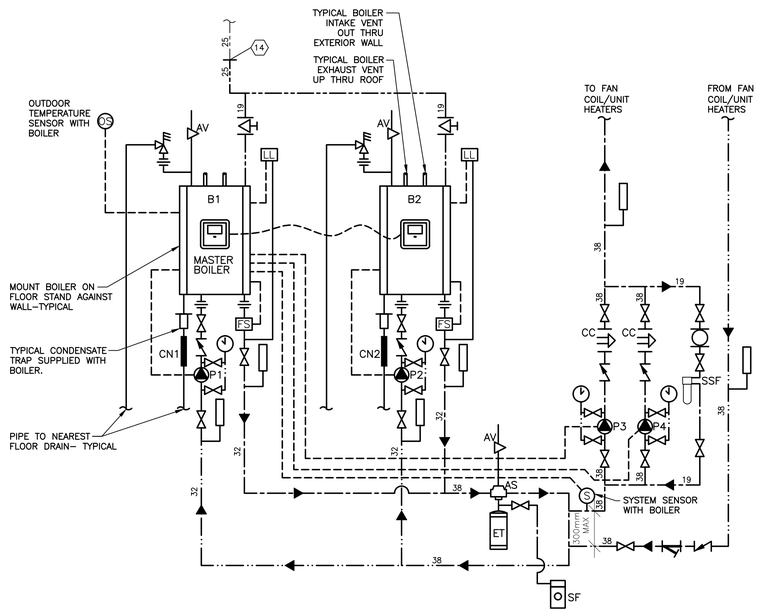
SUPPLY AND INSTALL AN AXIOM INDUSTRIES LTD. MODEL MF300 PRESSURE PAL MINI SYSTEM FEEDER OR EQUAL. UNIT TO BE COMPLETE WITH 65L (17GAL) TANK FOR STORAGE AND MIXING, PUMP SUCTION HOSE WITH INLET STRAINER AND CHECK VALVE, PRESSURE PUMP WITH FUSE PROTECTION @ 0.04L/S (0.7GPM) @ 115VOLT, SINGLE PHASE, LOW FLUID LEVEL CUT-OUT, MANUAL DIVERTER VALVE, POWER ADAPTOR AND INDICATOR LIGHTS.

MV – 3-WAY MOTORIZED VALVE

SUPPLY AND INSTALL A BELIMO 3-WAY MOTORIZED VALVE TO BE 32mm MODEL B322+LF24SR COMPLETE WITH 24VOLT ELECTRONIC NON-SPRING RETURN ACTUATOR, STAINLESS STEEL BALL VALVE AND STEM.

SSF – SIDE STREAM FILTER

SUPPLY AND INSTALL AN AXIOM INDUSTRIES LTD. MODEL SFP-10 19mm, 0.063L/S, 250mm SIDESTREAM HYDRONIC FILTER PACKAGE COMPLETE WITH SITE FLOW INDICATOR , BALL VALVE, BALANCING VALVE SET @ 0.063L/S (1GPM) AND NIPPLES. UNIT TO BE OF BRASS CONSTRUCTION WITH BRASS HEAD AND EPDM O-RINGS; BRASS SITE FLOW INDICATOR WITH EPDM O-RINGS AND TEMPERED GLASS WINDOWS, BRASS CAGE, TPX BALL AND CORK WASHERS; BRASS BALL VALVE, BRASS MANUAL VALVE WITH AIR VENT AND MEMORY STRAP. PROVIDE OPENING TOOL AND A CASE OF 30-25 MICRON FILTERS. SEE BOILER PIPING /CONTROL SCHEMATIC 2/M-02.



2 M-02 **PROPOSED BOILER PIPING/CONTROL SCHEMATIC**
SCALE: NTS

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PROVINCE OF SASKATCHEWAN

Project Title:

CANADA-SASKATCHEWAN IRRIGATION DIVERSIFICATION CENTRE (CSIDC)

PESTICIDE BUILDING

HEATING SYSTEM REPLACEMENT

OUTLOOK, SASKATCHEWAN

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Drawing Title:

RENOVATED HEATING PLAN AND PROPOSED BOILER SCHEMATIC

Designed By:	MEL	Scale:	AS INDICATED
Drawn By:	DAN	Date:	SEPT 2015
Checked By:	GAS	Date:	SEPT 2015
Project No.:	4850		

M-02

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MECHANICAL SPECIFICATIONS

1.0 GENERAL

1.1 GENERAL PROVISIONS

1.1.1
THE CONTRACTOR SHALL PROVIDE A COMPLETE AND FULLY OPERATIONAL MECHANICAL SYSTEM.

1.1.2
THE CONTRACTOR SHALL EXAMINE THE SITE PRIOR TO SUBMITTING THEIR QUOTE TO FAMILIARIZE THEMSELVES WITH THE WORK INVOLVED.

1.1.3
ANY DISCREPANCIES AND OMISSIONS DISCOVERED SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY AND PRIOR TO TENDER CLOSING FOR RECERTIFICATION BY ADDENDUM.

1.1.4
EACH CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR LAYING OUT THEIR WORK AND FOR ANY DAMAGE CAUSED BY IMPROPER EXECUTION OF THEIR WORK. CONTRACTOR TO CARRY ALL NECESSARY INSURANCE COVERAGE.

1.2.0 WARRANTY

1.2.1
THE MECHANICAL CONTRACTOR AS A CONDITION PRECEDENT TO FINAL PAYMENT AFTER COMPLETION OF THIS WORK SHALL PROVIDE THE OWNER WITH A WRITTEN GUARANTEE WARRANTING ALL MATERIALS, LABOUR, AND EQUIPMENT FOR ONE (1) FULL YEAR FROM DATE OF ACCEPTANCE.

1.3.0 WORK, PRODUCTS, AND QUALITY

1.3.1
EQUIPMENT AND MATERIALS TO BE NEW AND FREE FROM DEFECTS AND HAVE DESIGN CHARACTERISTICS AS SPECIFIED.

1.3.2
ALL WORK AND MATERIALS SHALL BE INSTALLED AS SHOWN AND IN ACCORDANCE WITH THE NATIONAL BUILDING CODE, OF CANADA 2010 AND ALL LOCAL CODES AND BUILDING REGULATIONS.

1.3.3
ALL EQUIPMENT SHALL BE C.S.A. APPROVED.

1.4.0 FEES AND PERMITS

1.4.1
THE MECHANICAL CONTRACTOR WILL OBTAIN AND PAY FEES FOR ALL PERMITS NECESSARY FOR COMPLETION OF THIS CONTRACT.

1.4.2
CONTRACTOR TO FURNISH ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK CONFORMS WITH STANDARDS AND REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.

1.5.0 TESTING

1.5.1
TEST ALL EQUIPMENT AND MATERIALS WHERE REQUIRED BY THE SPECIFICATIONS OR AUTHORITIES HAVING JURISDICTION TO DEMONSTRATE ITS PROPER OPERATION TO THE OWNER.

1.5.2
CARRY OUT ALL HYDRAULIC TESTS PRIOR TO COVERING PIPE IN ANY WAY.
– TEST HOT WATER HEATING PIPING, AT 700 KPA (100 PSI) PRESSURE FOR A PERIOD OF (2) HOURS WITH NO APPRECIABLE PRESSURE DROP.
–TEST GAS PIPING AS REQUIRED BY THE NATURAL GAS INSTALLATION CODE AND GAS UTILITY REQUIREMENTS.

1.6.0 CUTTING AND PATCHING

1.6.1
THE MECHANICAL CONTRACTOR SHALL CONFER. PROVIDE SLEEVES 200mm (8") DIAMETER AND SMALLER AS REQUIRED TO EXECUTE THE MECHANICAL INSTALLATION.

1.7.0 FLASHING AND COUNTERFLASHING

1.7.1
ALL MECHANICAL WORK PASSING THROUGH THE ROOF SHALL BE FLASHED AND COUNTERFLASHED BY THE MECHANICAL CONTRACTOR.

1.8.0 APPROVALS

1.8.1
REQUEST FOR APPROVAL OF EQUIVALENT EQUIPMENT FROM MANUFACTURER'S NOT SPECIFIED ON DRAWINGS SHALL BE MADE IN WRITING SEVEN DAYS PRIOR TO TENDER CLOSING.

1.9.0 SHOP DRAWINGS

1.9.1
PRIOR TO THE FABRICATION OF ANY MATERIALS AND EQUIPMENT, SUBMIT A MINIMUM OF SEVEN (7) COMPLETE SETS OF SHOP DRAWINGS AND DATA SHEETS COVERING ALL ITEMS OF MECHANICAL EQUIPMENT UNDER THIS CONTRACT FOR REVIEW BY THE ENGINEER. ELECTRONIC PDF FILES ARE ALSO ACCEPTABLE.

1.10.0 ELECTRIC MOTORS AND WIRING

1.10.1
SUPPLY ALL MECHANICAL EQUIPMENT WITH ELECTRIC MOTORS AS REQUIRED.

1.10.2
THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO SUPPLY ALL MOTOR STARTERS AND DISCONNECT SWITCHES FOR ALL MOTORS FOR THIS PROJECT AND INSTALL LINE VOLTAGE WIRING TO STARTERS AND FROM STARTERS TO MOTORS, EXCEPT WHERE PRE–WIRED IN PACKAGED EQUIPMENT. REFER TO ELECTRICAL DRAWINGS FOR POWER TO MECHANICAL EQUIPMENT.

1.10.3
ELECTRICAL CONTROLS CONNECTED TO MECHANICAL EQUIPMENT SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR AND SHALL BE INSTALLED, WIRED, AND CONNECTED BY THE MECHANICAL CONTROLS SUB CONTRACTOR.

1.11.0 MAINTENANCE MANUALS

1.11.1
FURNISH THREE (3) SETS OF MAINTENANCE MANUALS WITH INFORMATION OUTLINED BELOW TO THE ENGINEER PRIOR TO FINAL INSPECTION FOR APPROVAL.

1.11.2
MAINTENANCE MANUALS SHALL CONTAIN THE FOLLOWING:

- WARRANTY CERTIFICATE, BALANCING REPORT
- LIST OF CONTRACTORS, SUBCONTRACTOR, SUPPLIER WITH ADDRESS AND PHONE NUMBER AND CONSULTANTS
- LIST OF EQUIPMENT SUPPLIERS AND MANUFACTURERS
- DESCRIPTION OF ALL SYSTEMS
- DESCRIPTION OF CONTROL SYSTEM
- COMPLETE SET OF AS–BUILT DRAWINGS
- DETAILED MAINTENANCE AND LUBRICATION SCHEDULE
- OPERATING AND MAINTENANCE INSTRUCTIONS FOR MAJOR EQUIPMENT
- DATA TO BE ASSEMBLED IN HARD COVER BINDERS
- IDENTIFY FRONT COVER WITH PROJECT NAME & PROJECT LOCATION
- PROVIDE INDEX AND INDEX LABELS

1.12.0 OPERATING INSTRUCTIONS

1.12.1
ARRANGE AND PAY FOR THE SERVICE OF FULLY QUALIFIED PERSONNEL INCLUDING MANUFACTURER'S REPRESENTATIVES TO INSTRUCT THE OWNER IN OPERATION AND PREVENTIVE MAINTENANCE OF EACH PIECE OF EQUIPMENT AND SYSTEM SUPPLIED AND INSTALLED.

1.13.0 SUPPORTS, ANCHORS, AND SLEEVES

1.13.1
INSTALL SUPPORTS OF STRENGTH AND RIGIDITY TO SUIT LOADING WITHOUT UNDULY STRESSING OF BUILDING. LOCATE ADJACENT TO EQUIPMENT TO PREVENT UNDUE STRESS IN PIPING AND EQUIPMENT. USE PIPE CHANGER SUPPORTED BY COOPER B–LINEINC, GRINNEL MECHANICAL PRODUCTS, NATIONAL PIPE HANGER OR PORTION WITH SPACING AS PER THE NATIONAL PLUMBING CODE OF CANADA.

1.13.2
PROVIDE CHROME PLATED FLOOR, CEILING, AND WALL ESCUTCHEONS AS REQUIRED FOR PIPING IN FINISHED AREAS.

1.13.3
SIESMIC RESTRAINS SHALL BE PROVIDED AS REQUIRED BY LOCAL CODE. WHEN LOCAL HAS NO STANDARDS SIESMIC RESTRAINS SHALL BE PROVIDED AND INSTALLED AS PER SMACNA STANDARDS.

1.14.0 IDENTIFICATION

1.14.1
THE MECHANICAL CONTRACTOR SHALL SUPPLY AND PERMANENTLY INSTALL LAMACOIDS TO PROVIDE IDENTIFICATION OF ALL INSTALLED EQUIPMENT LIKE BOILERS, PUMPS, EXPANSION TANKS, UNIT HEATERS AND THEIR SWITCHES/CONTROLS.

1.14.2
IDENTIFY ALL PIPING BY MEANS OF COLORED, SELF–ADHESIVE LABELS AND DIRECTIONAL ARROWS USING 19mm (3/4") HIGH LETTERING. AS PER ASME AB.1 SCHEME FOR IDENTIFICATION OF PIPING SYSTEM FOR GAS, HOT WATER SUPPLY AND HOT WATER RETURN.

1.14.3
LABEL ALL VALVES LARGER THAN 25mm (1").

1.15.0 RECORD DRAWINGS

1.15.1
THE MECHANICAL CONTRACTOR SHALL KEEP ON SITE EXTRA SETS OF PRINTS AND SPECIFICATIONS ON WHICH ALL CHANGES AND DEVIATIONS FROM THE ORIGINAL DESIGN SHALL BE RECORDED DAILY. THESE CHANGES MUST BE NEATLY ADDED TO A CLEAN SET OF DRAWINGS AND GIVEN TO THE OWNERS MARKED "AS–BUILT".

1.16.0 EQUIPMENT AND MATERIALS CLEAN–UP

1.16.1
PIPING, FIXTURES, DUCTS, AND EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT, GREASE, ADHESIVE LABELS, AND FOREIGN MATERIALS.

1.17.0 BALANCING

1.17.1
BALANCING OF ALL HYDRONIC SYSTEMS SHALL BE DONE BY MECHANICAL CONTRACTOR WHEN ALL EQUIPMENT IS OPERATING UNDER FULL LOAD AND TO THE SATISFACTION OF THE OWNER AND ENGINEER.

1.17.2
BALANCING CONTRACTOR SHALL BALANCE ALL PUMP FLOWS, AND TO WITHIN 5% OF DESIGNED VALUES.

1.17.3
BALANCING CONTRACTOR SHALL SUBMIT FOR REVIEW THREE (3) COPIES OF THE REPORT CONTAINING THE FOLLOWING:

- FLOWS OF HOT WATER HEATING PUMPS.

1.18.0 GAS

1.18.1
MECHANICAL CONTRACTOR SHALL INSTALL GAS PIPING FROM EXISTING BUILDING GAS SERVICE TO ALL GAS–FIRED EQUIPMENT COMPLETE WITH ALUMINIZED PAINT COATING ON PIPING WHERE EXPOSED TO OUTDOORS. LINES TO BE BLACK STEEL SCHEDULE TO THREADED UP TO 50mm(2½") AND WELDED 2½" AND ABOVE AS PER THE NATIONAL GAS INSTALLATION CODE.

1.18.2
ALL GAS PIPE FITTINGS AND WORKMANSHIP SHALL BE IN ACCEPTABLE WITH CSA STANDARDS B–149 GAS INSTALL CODE.

2.0 PLUMBING

2.1.0 PIPE AND FITTINGS

2.1.1
ALL PIPING SHALL MEET THE REQUIREMENTS OF THE PROVINCIAL PLUMBING CODE AND NATIONAL BUILDING CODE.

2.1.2
DOMESTIC WATER ABOVE GROUND: TYPE K OR TYPE L, HARD COPPER, 95/5 SOLDER JOINTS, WROUGHT COPPER OR BRONZE FITTINGS. PEX/ AQUAPEX ALSO ACCEPTABLE.

2.1.3
WASTE AND VENT PIPING ABOVE GROUND: TYPE DWV OR HARD DRAWN DRAINAGE TUBE, CAST BRASS FITTINGS, 50/50 SOLDER JOINTS. CAST IRON SOIL PIPE AND FITTINGS, MECHANICAL JOINTS.

2.2.0 VALVES

2.2.1
VALVES ON WATER PIPING SHALL BE AS FOLLOWS:

- GATE VALVES 50mm (2") AND SMALLER: CRANE No. 1320C
- GATE VALVES 65mm (2½") AND LARGER: CRANE No. 465 1/2C
- GLOBE VALVES 50mm (2") AND SMALLER: CRANE No. 1310
- GLOBE VALVES 65mm (2½") AND LARGER: CRANE No. 351
- CHECK VALVES 50mm (2") AND SMALLER: CRANE No. 1342
- CHECK VALVES 65mm (2½") AND LARGER: CRANE No. 373
- BALL VALVES 6mm (1/4") THRU 50mm (2"): GRINNELL FIG. 1550

3.0 HOT WATER HEATING

3.1 PIPING

3.1.1
STEEL PIPE TO ASTM A53/A 53M, GRADE B SCHEDULE 40.

3.1.2
NPS 2" AND UNDER SCREWED FITTING WITH PTFE TAPE.

3.1.3
ROLLED GROOVED STANDARDS COUPLINGS TO CSA B242. ABOVE 2".

3.1.4
FLANGED PLAIN OR RAISED FACE OR SLIP ON TO ANSI/AWWA C111/A21.11.

3.1.5
FLANGE GASKETS TO ANSI/AWWI C111/A21.11.

3.1.6
BOLT AND NUTS TO ASME 18.2.1.

3.1.7
ROLLED GROOVE COUPLING GASKETS TO BE EPDM.

3.1.8
SCREWED FITTINGS MALLEABLE IRON TO ASME B16.3 CLASS 150.

3.1.9
PIPE FLANGES AND FLANGED FITTINGS CAST IRON TO ASME 16.1 CLASS 125, STEEL TO ASME B 16.5.

3.1.10
BUTT WELDING FITTINGS TO ASME 16.9.

3.1.11
UNIONS MALLEABLE CAST IRON TO ASME 16.3.

3.1.12
FITTING FOR ROUGH GROOVE PIPING MALLEABLE IRON TO ASTM A47/A47M OR DUCTILE IRON TO ASTM A536.

3.2
INSULATE PIPING AS PER INSULATION SECTION 4.0.

3.3
PROVIDE PIPING EXPANSION COMPENSATION BY MEANS OF EXPANSION LOOPS AND OFFSETTING OF PIPES.

3.4
BRANCH TAKE–OFFS OFF HEATING PIPES SHALL BE OFF THE TOP HALF OF MAINS.

3.5 VALVES

3.5.1
NPS 2 AND SMALLED SCREWED ENDS.

3.5.2
NPS 2½" AND LARGER FLANGED OR GROOVED ENDS.

3.5.3
SWING CHECK VALVE TO MSS–SP–71 FLANGED OR GROOVED CAST IRON NPS 2½" AND ONE.

3.5.4
DRAIN VALVES GATE CLASS 125 NON RISING STEM SOLID WEDGE DISK.

3.5.5
BALL VALVES NPS 2 AND UNDER BRONZE, FULL PORT.

3.5.6
BUTTERFLY VALVES NPS 2½" AND OVER GROOVE ENDS.

3.5.7
GATE VALVE NPS2 AND UNDER CLASS 125 RISING STEM WEDGE DISC, NPS 2½" AND OVER RISING STEM WEDGE DISC, BRONZE TRIM.

3.6 VENTS

3.6.1
INSTALL AUTOMATIC VENTS AT ALL HIGH POINTS.

3.7 THERMOMETERS

3.7.1
LIQUID IN GLASS GAUGE THERMOMETERS TO BE ASHCRAFT INC, MARSH BELLOFRAM, WEISS INSTRUMENT INC. OR EQUAL.

3.7.2
THERMOMETER TO BE DIECAST AND ALUMINUM FINISHED IN BAKED EPOXING ENAMEL, GLASS FRONT, SPRING SECURED, 9" LONG.

3.7.3
ADJUSTABLE JOINT WITH FINISH TO MATCH CASE, 180 DEGREE ADJUSTABLE IN VERTICAL PLANE, 360 DEGREE ADJUSTMENT IN HORIZONTAL PLANE WITH LOCKING DEVICE.

3.7.4
TUBE RED OR BLUE READING, MERCURY FILLED WITH MAGNIFYING LENS.

3.7.5
SCALE: SATIN FACED NON REFLECTING ALUMINUM WITH PERMANENTLY ITCHED MAKINGS.

3.7.6
STEM: BRASS FOR SEPARATE SOCKET OF LENGTH TO SUIT INSTALLATION.

3.7.7
SCALE RANGE 30 TO 240 DEGREE F WITH 2 DEGREE SCALE DIVISION AND ACCURACY OF PLUS OR MINUS 1 PERCENT OF RANGE SPAN.

3.8 PRESSURE GAUGE

3.8.1
ASME B40.100, PHOSPHOR BRONZE BOURDON–TUBE TYPE WITH BOTTOM CONNECTION, LIQUID FILLED CASE TYPE.

3.8.2
DRAWN STEEL, BRASS ,OR ALUMINUM CASE WITH 4½" DIAMETER GLASS LENS.

3.8.3
CONNECTOR: BRASS NPS ¼(DN8).

3.8.4
SCALE: WHITE COATED ALUMINUM WITH PERMANENTLY ETCHED MARKINGS.

3.8.5
RANGE: TWO TIMES OPERATING PRESSURE OR 0 TO 100PSI WITH GRADE A ACCURACY PLUS OR MINUS 1 PERCENT OF MIDDLE 50 PERCENT OF SCALE .

3.8.6
PRESSURE GAUGE FITTINGS TO INCLUDE VALVES NPS ¼(DN8) BRASS NEEDLE TYPE WITH ROUND KNURLED HANDLE AND SNUBBERS TO ASME B40.5 NPS ¼(DN8) EXTENDED STEM BRASS BUSHING WITH CORROSION RESISTANT POROUS METAL DISK OF MATERIAL SUITABLE FOR SYSTEM FLUID AND WORKING PRESSURE.

3.9 SYSTEM CLEANING AND CHEMICAL TREATMENT

3.9.1
SYSTEM CLEANING AND CHEMICAL TREATMENT TO BE PERFORMED BY A QUALIFIED CHEMICAL TREATMENT SUPPLIER.

3.9.2
CLEAN AND DEGREASE THE ENTIRE SYSTEM BY FLUSHING SYSTEM FOR TWENTY–FOUR (24) HOURS WITH A 4% SOLUTION OF PURGEX L24 DEGREASER WITH INHIBITOR. ENSURE ALL VALVES ARE OPEN. RINSE SYSTEM WITH SOFT WATER.

3.9.3
CHARGE SYSTEM WITH A PREMIX SOLUTION OF 50/50 DEMINERALIZED WATER AND INHIBITED PROPYLENE GLYCOL.

3.9.4
TREAT SYSTEM WITH PH ADJUSTMENT AND CORROSION INHIBITOR CHEMICALS AS RECOMMENDED BY CHEMICAL TREATMENT SUPPLIER. PROVIDE TEST KITS AS REQUIRED.

3.9.5
INSTRUCT BUILDING OPERATOR TO CHANGE FILTERS ON A MONTHLY BASIS.

3.10 SUPPORTS

3.10.1
MECHANICAL ROOM PIPING SHALL BE SUPPORTED WITH CLEVIS HANGERS FROM ROOF OR STEEL FLOOR STANDS TO PREVENT EXCESSIVE STRESS ON BOILERS AND CIRCULATING PUMPS.

3.11 EXPANSION JOINTS

3.11.1
INNER HOSE STAINLESS STEEL CORRUGATE, BRAIDED WINE MESH OUTER JACKET, LENGTH AS PER MANUFACTURE'S RECOMMENDATION.

3.11.2
THREE FLEXIBLE GROOVE COUPLING PLACED IN CLOSE PROXIMATE TO VIBRATION SOURCE FOR VIBRATION ATTENTION RELIEF.

3.11.3
PIPE ALL DRAIN LINES TO DRAINS.

3.11.4
PROVIDE GUARDS FOR ALL EXPOSED DRIVES.

4.0 INSULATION

4.1.0 GENERAL

4.1.1
ALL INSULATION AND MATERIALS ASSOCIATED WITH INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED CLASSIFICATION OF NOT MORE THAN 50.

4.1.2
ALL PIPING INSULATION SHALL BE FIBROUS GLASS WITH K VALUE MAXIMUM 0.3 W/m DEGREES CELSIUS AT 24 DEGREES CELSIUS WITH FACTORY APPLIED JACKET – MANSON AK PIPE INSULATION OR APPROVED EQUAL.

4.1.3
ALL EXPOSED INSULATED PIPING TO BE COVERED WITH PVC JACKET.

4.1.4
ENSURE INSUALTION IS CONTINUOUS THROUGH INSIDE WALLS. PACK AROUND PIPES WITH FIRE–PROOF, SELF SUPPORTING INSULATION MATERIALS.

4.1.5 INSULATION SCHEDULE:

HOT WATER SUPPLY AND RETURN LINES IN MECHANICAL ROOM – 38mm (1 1/2").

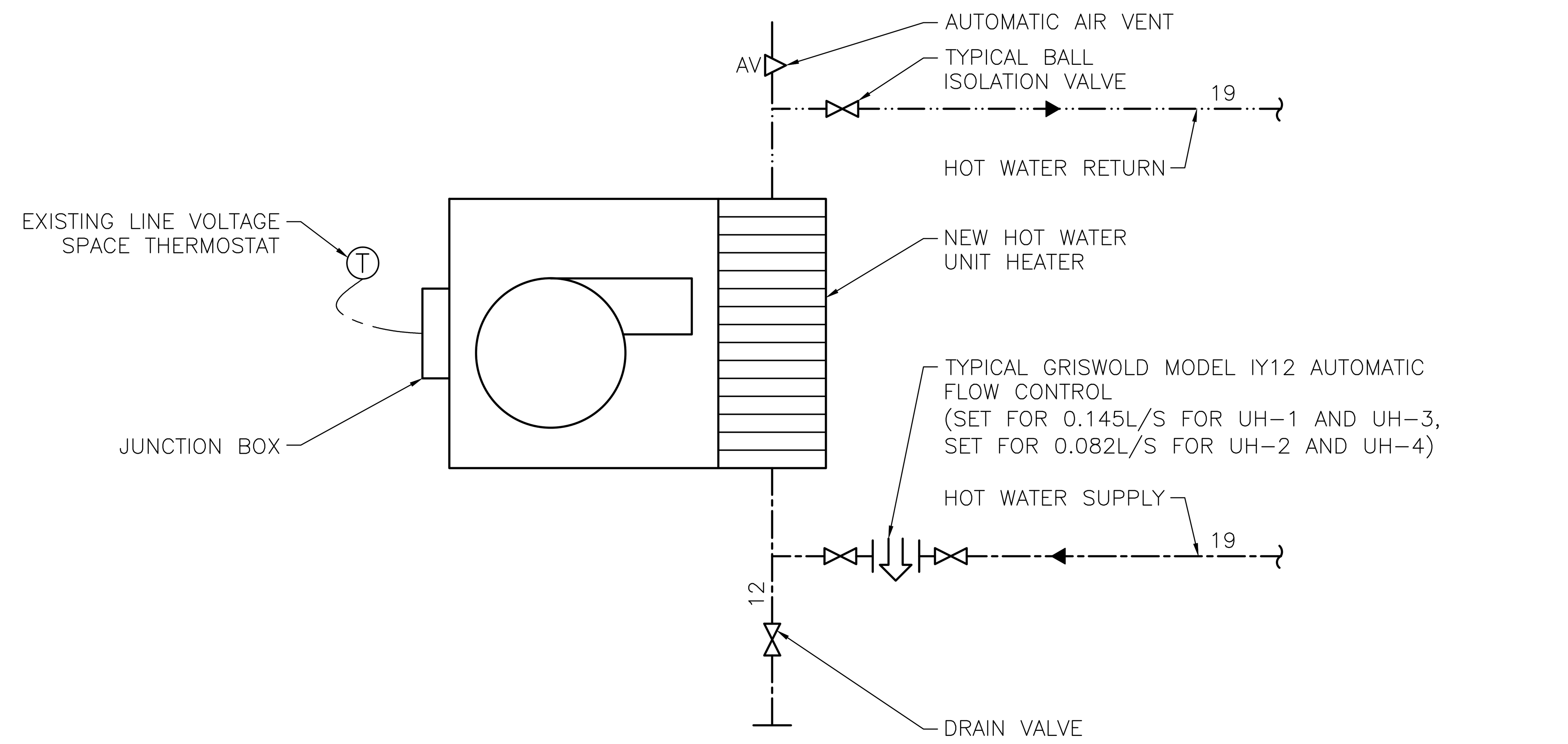
5.0 CONTROLS

CONTRACTOR TO INCLUDE THE PROVISION OF ALL BOILER SYSTEM CONTROLS INCLUDING DECOMMISSIONING, DISCONNECTION, RECONNECTION, PROGRAMMING, COMMISSIONING OF NEW BOILER. CONTROL SYSTEM TO BE INTEGRAL TO BOILERS.

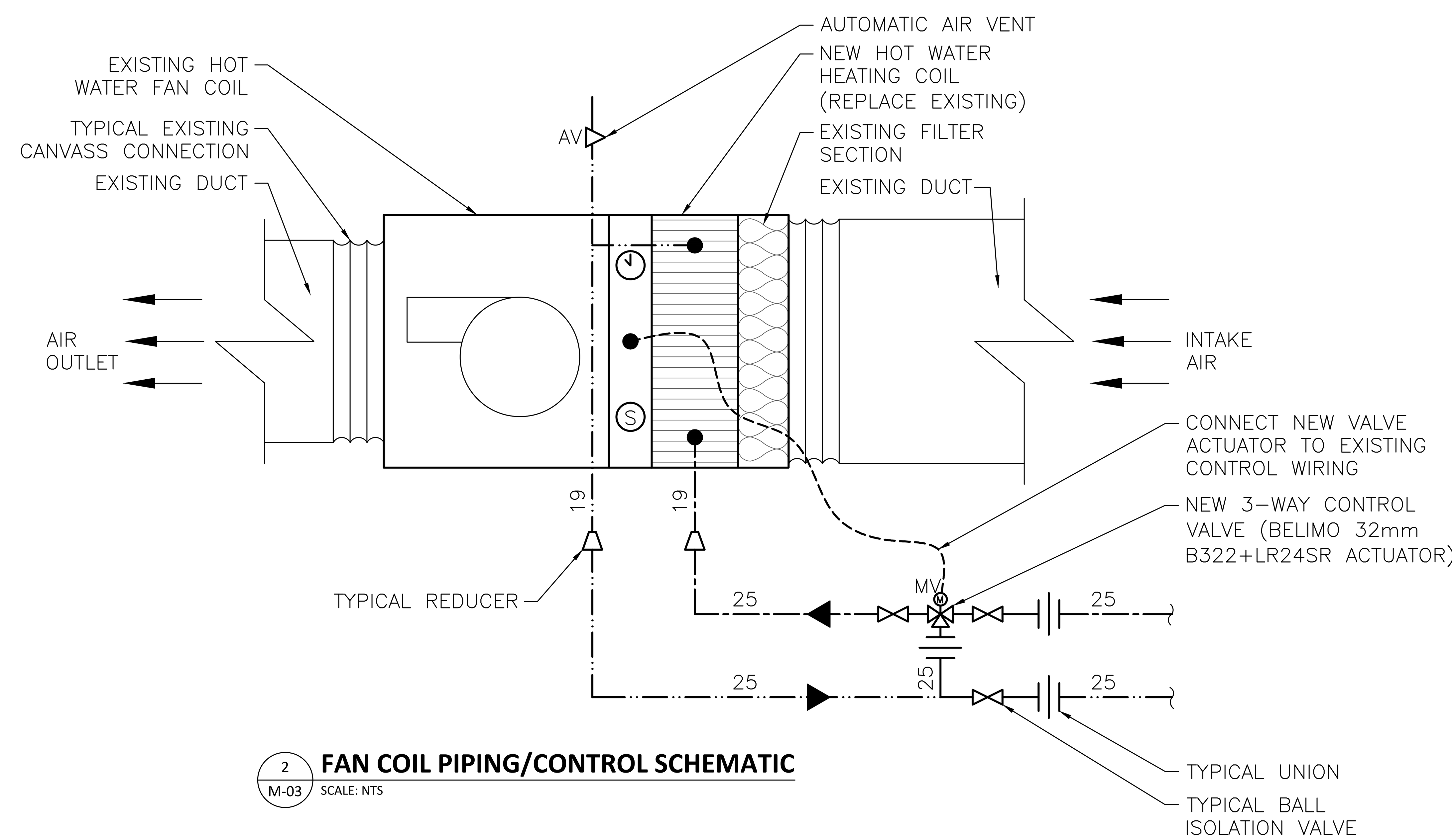
5.1.1
NEW BOILER SYSTEM CONTROLS TO INCLUDE: INDOOR/OUTDOOR CONTROL SCHEDULE, BOILER ON/OFF, BOILER STATUS, HOT WATER SUPPLY TEMPERATURE RESET, PUMP ON/OFF, PUMP STATUS, BOILER LEAD/LAG, ALARM POINTS, SUPPLY WATER TEMPERATURES, RETURN WATER TEMPERATURE, ETC.

5.1.2

BOILER SYSTEM SEQUENCE OF OPERATION.
HEATING IS ENABLED IF OUTSIDE AIR TEMPERATURE IS LESS THAN OR EQUAL TO THE OUTSIDE AIR HEATING ENABLE SET POINT(ADJUSTABLE).
BOILER– WHEN HEATING IS ENABLED, THE LEAD BOILER MODULATES TO MAINTAIN THE BOILER SUPPLY TEMPERATURE SET POINT. THE LAG BOILERS WILL MODULATE ONCE THE LEAD BOILER REACHES 100% CAPACITY. THE BOILER SUPPLY TEMPERATURE SET POINT IS CALCULATED BASED ON THE REQUIRED HOT WATER SUPPLY TEMPERATURE.
HOT WATER SUPPLY TEMPERATURE– THE HOT WATER SUPPLY TEMPERATURE SET POINT IS MODULATED ACCORDING TO AN OUTDOOR TEMPERATURE RESET SCHEDULE. THE HOT WATER SUPPLY TEMPERATURE IS CONTROLLED BY THE MODULATION OF THE BOILERS.
PUMP– WHEN HEATING IS ENABLED THE BOILER PRIMARY PUMP IS ENABLED, THE LAG BOILER AND LAG PRIMARY PUMPS ARE ENABLED ONCE THE LEAD BOILER REACHES 100% CAPACITY. THE LEAD HOT WATER SECONDARY SUPPLY PUMP WILL OPERATE CONTINUOUSLY. THE LAG HOT WATER SECONDARY PUMP TO BE NORMALLY OFF AND USED AS A SPARE.



1 / M-03 **UNIT HEATER PIPING/CONTROL SCHEMATIC**
SCALE: NTS



2 / M-03 **FAN COIL PIPING/CONTROL SCHEMATIC**
SCALE: NTS

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PESTICIDE BUILDING
HEATING SYSTEM REPLACEMENT
OUTLOOK, SASKATCHEWAN

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MECHANICAL SPECIFICATIONS AND DETAILS

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