

GENERAL NOTES

- THE CONTRACTOR SHALL CO-ORDINATE WITH THE STRUCTURAL TO PROVIDE OPENINGS AND SLEEVES THROUGH STRUCTURAL ELEMENTS WHERE REQUIRED.
- DO NOT SCALE DRAWINGS FOR INSTALLATION PURPOSES. OBTAIN ALL DIMENSIONS FROM ARCHITECTURAL PLANS, MANUFACTURER'S SHOP DRAWINGS AND ON SITE INSPECTIONS.
- MECHANICAL, DIV. 2-14 AND ELECTRICAL TRADES SHALL WORK IN CONJUNCTION WITH ONE ANOTHER SO AS TO AVOID INTERFERENCES BETWEEN PIPING, DUCTWORK, CONDUIT, LIGHTING FIXTURES, ETC.
- WORK SHALL BE CO-ORDINATED THROUGH THE GENERAL CONTRACTOR PRIOR TO INSTALLATION OF ANY EQUIPMENT, DUCTWORK AND CONTROLS.
- PROPERLY SUPPORT CEILING MOUNTED EQUIPMENT AND ANY OTHER EQUIPMENT INDEPENDENT OF CEILING SUPPORT SYSTEM. REFER TO ARCHITECTURAL DETAILS AND CO-ORDINATE WITH STRUCTURAL TRADE.
- REFER TO MECHANICAL FOR OWNER SUPPLIED EQUIPMENT. CONFIRM ALL MECHANICAL REQUIREMENTS AND PROVIDE TO SUIT.
- REVIEW ELECTRICAL DRAWING AND PROVIDE ON SITE INSPECTIONS TO DETERMINE FULL EXTENT OF PROJECT PRIOR TO SUBMITTING BID.
- ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH CODES, BULLETINS ETC. AND REQUIREMENTS OF ALL INSPECTION AUTHORITIES FOR THE CITY OF HAMILTON.
- CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL MECHANICAL SERVICES TO THE OCCUPIED AREA THROUGHOUT THE PHASING OF THE WORK. PROVIDE CONSTRUCTION VALVES, TEMPORARY DUCTWORK AND PIPING AS REQUIRED TO LIMIT THE SHUT DOWN OF SERVICES TO ONE TIME.
- AIR BALANCE TECHNICIAN TO TAKE ALL MEASUREMENTS NECESSARY TO DETERMINE CURRENT SYSTEMS PERFORMANCE IN AREAS THAT WILL CONTINUE TO BE SERVED BY EXISTING AIR HANDLING EQUIPMENT AND SHALL REPORT ALL MEASUREMENTS MADE PRIOR TO START OF DEMOLITION.
- ON COMPLETION OF EACH PHASE OF DUCT ALTERATIONS, AIR BALANCE TECHNICIAN SHALL REBALANCE ALL EXISTING SYSTEMS TO DELIVER PRE-CONSTRUCTION FLOWS.
- EXISTING MECHANICAL SERVICES SHOWN ON THESE DRAWINGS WERE TAKEN FROM THE ORIGINAL CONTRACT DRAWINGS. THE CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES ON SITE AND SHALL REMOVE ALL REDUNDANT SERVICES IN THE AREAS OF CONSTRUCTION.

PLUMBING NOTES

- CONTRACTOR IS TO VERIFY CONNECTION POINTS TO EXISTING SERVICES ON SITE.
- CONTRACTOR IS TO CLEAR EXISTING DUCTWORK WHEN INSTALLING NEW PIPING. CLEARANCES TO BE VERIFIED ON SITE.
- PROVIDE A CLEANOUT FROM EACH PLUMBING FIXTURE WHERE REQUIRED BY LATEST ONTARIO BUILDING CODE.
- ALL PLUMBING FIXTURES INCLUDING FLOOR DRAINS (HUB, FUNNEL FLOOR DRAINS) TO BE TRAPPED AND VENTED AS REQUIRED BY ONTARIO LATEST BUILDING CODE.
- CONTRACTOR IS TO REMOVE ALL OBSOLETE PIPING WHEREVER POSSIBLE.
- BEFORE CUTTING ANY HOLES THROUGH THE EXISTING SLAB REFER TO STRUCTURAL DRAWINGS FOR GENERAL REQUIREMENTS.
- AFTER PIPE REMOVAL ALL EXISTING OPENINGS IN FIRE SEPARATION ARE TO BE FILLED-IN TO MAINTAIN INTEGRITY OF THAT FIRE SEPARATION PIPE.
- RECONNECT VENTS FROM EXISTING EQUIPMENT AND PLUMBING FIXTURES WHICH ARE TO REMAIN TO NEW VENTS AS REQUIRED.
- PROVIDE A CLEANOUT AT THE BOTTOM OF EVERY SOIL AND WASTE STACK THAT CONNECTS TO A HORIZONTAL DRAINAGE PIPE.
- CHECK AND VERIFY LOCATION OF ALL PIPES, DUCTS AND EQUIPMENT WITH ALL OTHER TRADES TO PREVENT INTERFERENCE. REMOVAL OR RELOCATION OF ANY SUCH WORK INTERFERING WITH WORK OF OTHER TRADES IS THE RESPONSIBILITY OF THE MECHANICAL TRADE CONCERNED UNLESS OTHERWISE APPROVED IN WRITING.
- WHENEVER COLD AND HOT WATER DISTRIBUTION TO LAVATORIES IS TO RUN UNDER COUNTER, PIPING DISTRIBUTION IS TO BE INSTALLED AS TIGHT TO UNDER SIDE OF THE COUNTER AS POSSIBLE.
- ALL WATER, SANITARY, SEWER AND VENT COPPER PIPING WITH SOLDER JOINTS SHALL BE LEAD FREE. DO NOT INSTALL WATER LINES IN OUTSIDE WALL WHERE THEY MAY FREEZE, UNLESS BOTH THE WALL AND THE PIPES ARE PROPERLY INSULATED.
- INSTALL SHUT-OFF VALVES AT EACH PLUMBING FIXTURE.

GENERAL DEMOLITION NOTES

- CONTRACTOR IS TO ENSURE THAT ALL EXISTING PIPING AND DUCTWORK SERVING EXISTING AREAS REMAIN IN SERVICE UNTIL THESE AREAS ARE RECONNECTED TO NEW SERVICES. ONLY THEN OBSOLETE PIPING IS TO BE REMOVED AS SHOWN.
- ALL DISTURBED SURFACES AFTER PIPE AND DUCT REMOVAL OR REROUTING TO BE FILLED-IN WITH APPROPRIATE MATERIAL TO MAINTAIN FIRE SEPARATION AND PATCHED TO MATCH EXISTING OR NEW MATERIALS AND FINISHES.
- CONTRACTOR IS TO ENSURE THAT ALL EXISTING REMOVED FIXTURES AND EQUIPMENT REMAIN THE PROPERTY OF THE OWNER. IF THE OWNER DECLARES NO INTEREST IN THE REMOVED ITEMS, ASSUME OWNERSHIP AND REMOVE THE ITEMS FROM THE SITE.
- PROTECT ALL AREAS AFFECTED BY CONSTRUCTION FROM DIRT, DUST AND DEBRIS.
- REMOVE ALL RUBBISH AND CLEAN SITE DAILY.
- DEMOLITION AND REMOVAL OF PLUMBING AND DRAINAGE PIPING SHALL BE TAKEN BACK TO THE NEAREST WORKING MAIN AND BE CAPPED AS CLOSE TO THE WORKING MAIN AS POSSIBLE TO AVOID DEAD LEG LENGTHS OF PIPING.

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	ABBREVIATION	DESCRIPTION
	METER	AD	ACCESS DOOR
	TEMPERATURE SENSOR	CB	CATCHBASIN
	STATIC PRESSURE SENSOR	CBV	CIRCUIT BALANCING VALVE
	VENT	CTE	CONNECT TO EXISTING
	FLOOR DRAIN	ESH	EMERGENCY SHOWER
	CAP/PLUG	EX	EXISTING
	CLEANOUT- IN LINE OR STACK	FD	FIRE DAMPER/FLOOR DRAIN
	FLOOR CLEANOUT	FFD	FUNNEL FLOOR DRAIN
	PIPE ELBOW DOWN	GPM	GALLONS PER MINUTE
	PIPE BOTTOM TAKE OFF	HD	HUB DRAIN
	PIPE ELBOW UP	INV. ELEV.	INVERT ELEVATION
	PIPE BOTTOM TAKE OFF	LSV	LOCKED SERVICE VALVE
	TRAP	PF	PLUMBING FIXTURE
	UNION	RWL	RAIN WATER LEADER
	THERMOMETER	SMV	SHOWER MIXING VALVE
	PUMP	SS	SOIL STACK
	PIPE FLOW DIRECTION	TYP.	TYPICAL
	BALANCING VALVE	VS	VENT STACK
	BUTTERFLY VALVE		
	CHECK VALVE		
	ISOLATING (SHUT-OFF) VALVE		
	STRAINER		
	PRESSURE INDEPENDENT CONTROL (PIC) VALVE	DWC	DOMESTIC COLD WATER
	PRESSURE REGULATING VALVE	DHW	DOMESTIC HOT WATER
	2-WAY MODULATING CONTROL VALVE	SAN	SANITARY DRAIN
	3-WAY 2-POSITION CONTROL VALVE	HWS	HEATING WATER SUPPLY
	2-WAY 2-POSITION CONTROL VALVE	HWR	HEATING WATER RETURN
	RELIEF VALVE		
	APPROVED DOUBLE CHECK VALVE BACKFLOW PREVENTOR ASSEMBLY		
	TEMPERATURE SENSOR		
	PRESSURE SWITCH OR SENSOR		
	FLOW SENSOR		
	SUPPLY DUCT DOWN		
	SUPPLY DUCT UP		
	RETURN DUCT DOWN		
	RETURN DUCT UP		

HVAC NOTES

- PROPERLY SUPPORT CEILING MOUNTED EQUIPMENT AND ANY OTHER EQUIPMENT INDEPENDENT OF CEILING SUPPORT SYSTEM. REFER TO ARCHITECTURAL DETAILS AND CO-ORDINATE WITH STRUCTURAL TRADE.
- FOR USE OF FLEXIBLE DUCTWORK REFER TO MECHANICAL SPECIFICATIONS.
- CONTRACTOR TO CARRY FOR ADDITIONAL DUCTS AND DUCT FITTING REQUIRED TO CLEAR THE INTERFERENCES IN THE CEILING SPACE.
- PROVIDE BALANCING DAMPER FOR EACH DIFFUSER AND CHILLED BEAM AND AIR VALVE. ALL LOCATIONS MAY NOT BE SHOWN ON PLANS.

MECHANICAL DRAWING LIST

DWG. No.	DRAWING NAME	CURRENT REVISION	CURRENT REVISION DESCRIPTION	DATE
M0.01	GENERAL NOTES, DRAWING LIST, MECHANICAL LEGEND, SCHEDULES & SITE PLAN	4	ISSUED FOR TENDER	2024/02/29
M1.01	MECHANICAL DEMOLITION PLAN	4	ISSUED FOR TENDER	2024/02/29
M1.02	MECHANICAL PROPOSED PLAN	4	ISSUED FOR TENDER	2024/02/29
M3.01	DETAILS & DIAGRAMS	4	ISSUED FOR TENDER	2024/02/29
M6.01	MECHANICAL SPECIFICATIONS	4	ISSUED FOR TENDER	2024/02/29

AIR SEPARATOR SCHEDULE

TAG	MFG	Model	MAX. FLOW RATE FOR LINE VELOCITY			WEIGHT		STRAINER SCREEN FREE AREA		NOTES
			4 ft/s	6 ft/s	8 ft/s	lbs	kg	in ²	cm ²	
AS-1	ARMSTRONG	VAS-4	160 GPM	240 GPM	320 GPM	151	68	76	490	APPROVED EQUIVALENT: BELL & GOSSET, TACO

EXPANSION TANK SCHEDULE

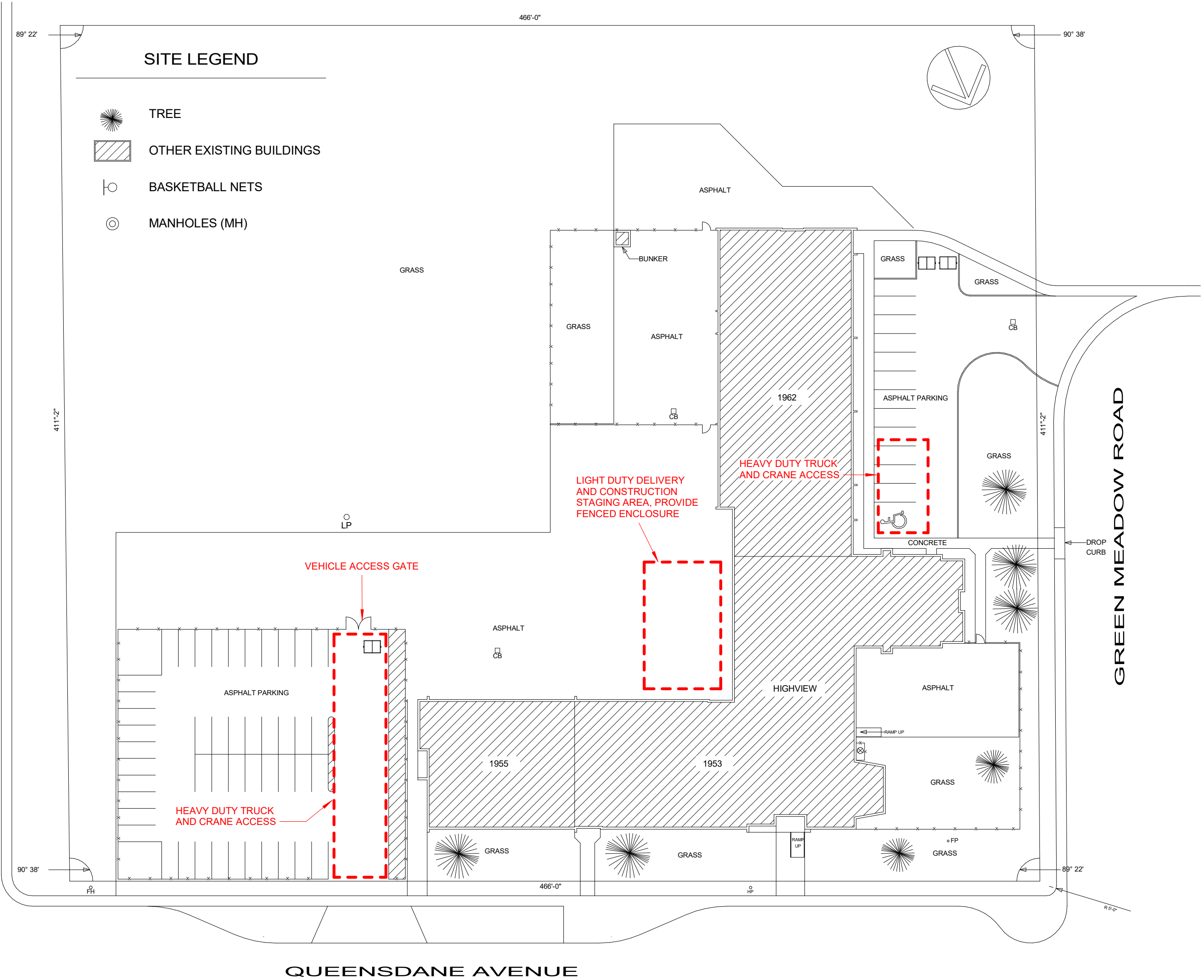
TAG	MFG	MODEL	FLUID	MAXIMUM WORKING PRESSURE	MAXIMUM OPERATING TEMPERATURE	SYSTEM CONNECTION	TANK			SHIPPING WEIGHT	NOTES
							VOLUME	LENGTH	DIAMETER		
ET-1	AMTROL	AX-144	WATER	125 psig	240 °F	1"	77 gal	46"	24"	218 lb	HEAD & SHELL HORIZONTAL AVAILABLE WITH OPTIONAL SIGHT GLASS AND SEISMIC RESTRAINTS (SAGDES) ASME APPROVED STEEL. APPROVED EQUIVALENT: BELL & GOSSET, TACO

PUMP SCHEDULE

TAG	SERVICE	MFG.	MODEL	FLUID	FLOW				PUMP SPEED (RPM)	ELECTRICAL					NOTES
					L/s	GPM	kPa	FT OF H2O		POWER	HP	V	PH	Hz	
P-4	BOILER 1	ARMSTRONG	1060-3D	WATER	9.2	146	44.8	15.0	1750	1.1	1.5	115 V	1	60 Hz	ENCLOSURE: ODP. EFFICIENCY: STD. LEAD FREE BRONZE. BEARINGS: OIL LUBRICATED. APPROVED EQUIVALENT: BELL & GOSSET, GRUNDFOS
P-5	BOILER 2	ARMSTRONG	1060-3D	WATER	9.2	146	44.8	15.0	1750	1.1	1.5	115 V	1	60 Hz	ENCLOSURE: ODP. EFFICIENCY: STD. LEAD FREE BRONZE. BEARINGS: OIL LUBRICATED. APPROVED EQUIVALENT: BELL & GOSSET, GRUNDFOS
P-6	SOUTH AND EAST WING STANDBY	ARMSTRONG	E43801503-001.5-12	WATER	5.7	90	119.6	40.0	4368	1.1	1.5	575 V	3	60 Hz	VFD, CENTRIFUGAL VERTICAL IN-LINE, NON-POTABLE WATER, 140 °F LIQUID TEMPERATURE. APPROVED EQUIVALENT: BELL & GOSSET, GRUNDFOS

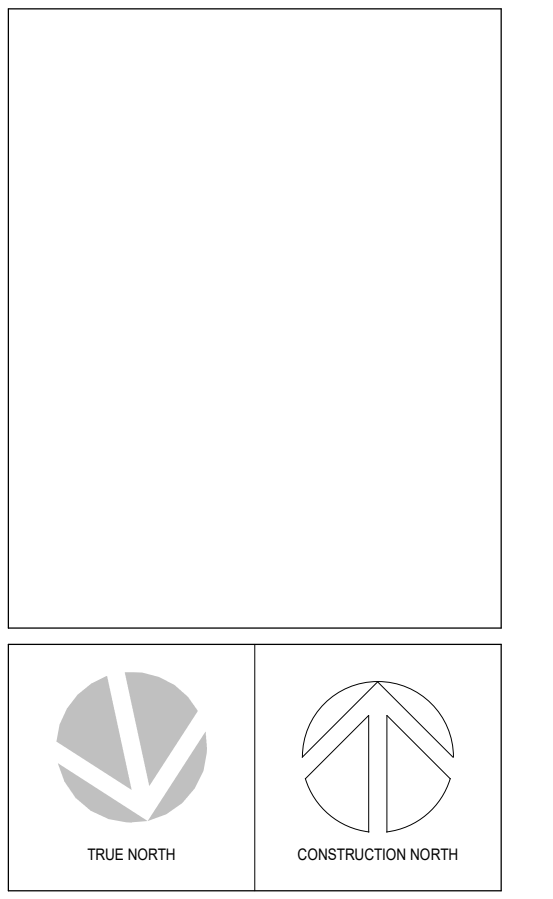
BOILER SCHEDULE

TAG	MFG.	MODEL	TOTAL HEATING CAPACITY		HEATING INPUT		GAS SUPPLY PRESSURE		FLOW RATE MAX		OPERATING PRESSURE MAX		ELECTRICAL			NOTES	
			kW	MBH	kW	MBH	MIN (IN WC)	MAX (IN WC)	L/s	GPM	PSIG	BAR	CURRENT	FREQUENCY	PHASE		VOLTAGE
B1	VISSMANN	VITOCROSSAL 200, C12-1500	428	1460	440	1501	4.0	14.0	9.2	146.0	80.0	5.5	20 A	60 Hz	1	120 V	APPROVED EQUIVALENT MANUFACTURER: PK AND LOCHINVAR
B2	VISSMANN	VITOCROSSAL 200, C12-1500	428	1460	440	1501	4.0	14.0	9.2	146.0	80.0	5.5	20 A	60 Hz	1	120 V	APPROVED EQUIVALENT MANUFACTURER: PK AND LOCHINVAR



SITE PLAN

1 : 500 M0.01



REVISIONS

No.	DESCRIPTION	DATE
4	ISSUED FOR TENDER	2024/02/29
3	ISSUED FOR PERMIT	2024/02/23
2	ISSUED FOR FINAL REVIEW	2024/02/18
1	ISSUED FOR 90% PROGRESS SET	2024/02/02

HWDSB

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REVISIONS

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CONSULTANTS:

PROJECT:
HAMILTON WENTWORTH DISTRICT SCHOOL BOARD (HWDSB)

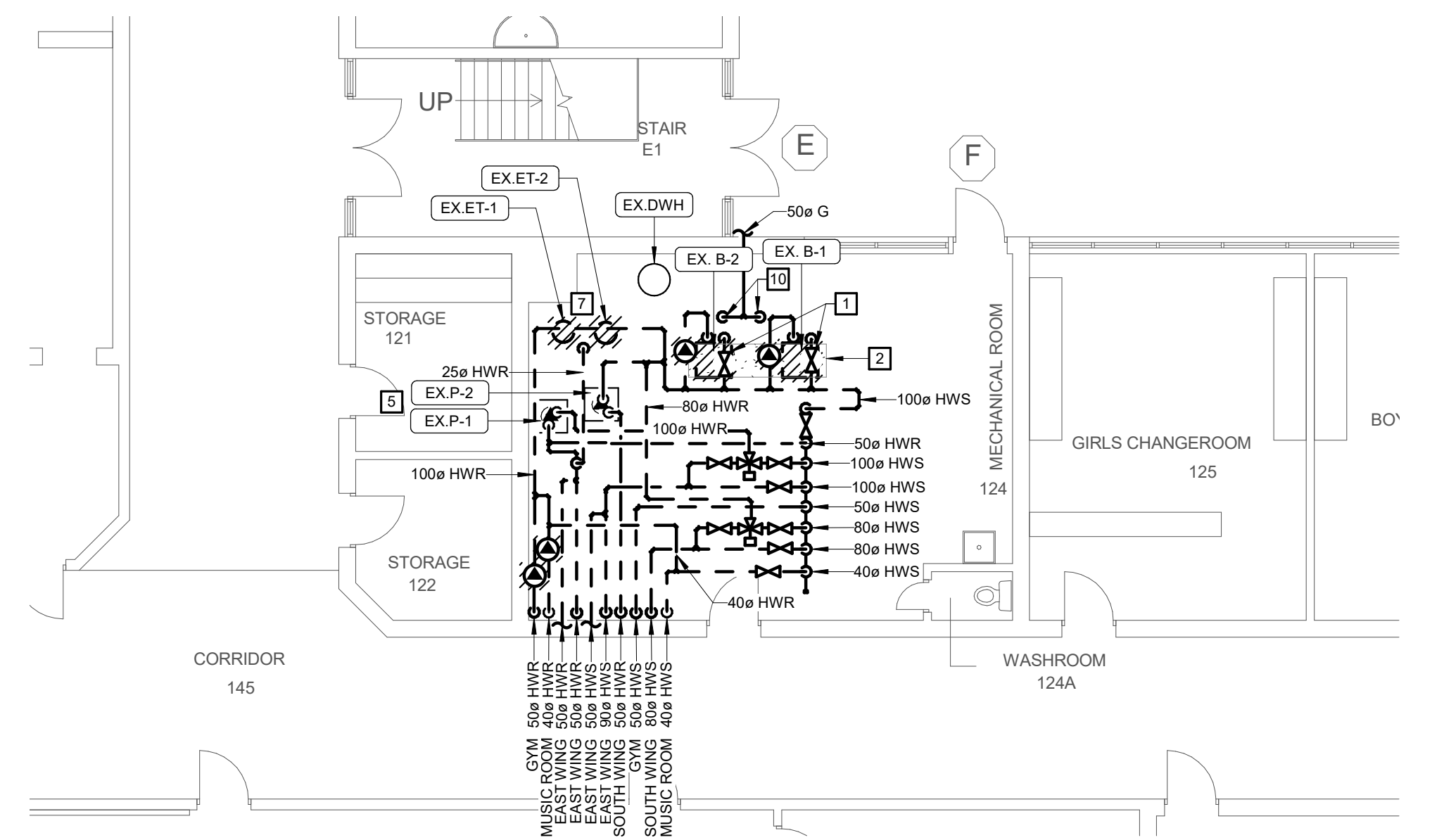
HIGHVIEW ELEMENTARY SCHOOL - 1040 QUEENSDALE AVENUE EAST, HAMILTON, ON

DRAWING TITLE:
GENERAL NOTES, DRAWING LIST, MECHANICAL LEGEND, SCHEDULES & SITE PLAN

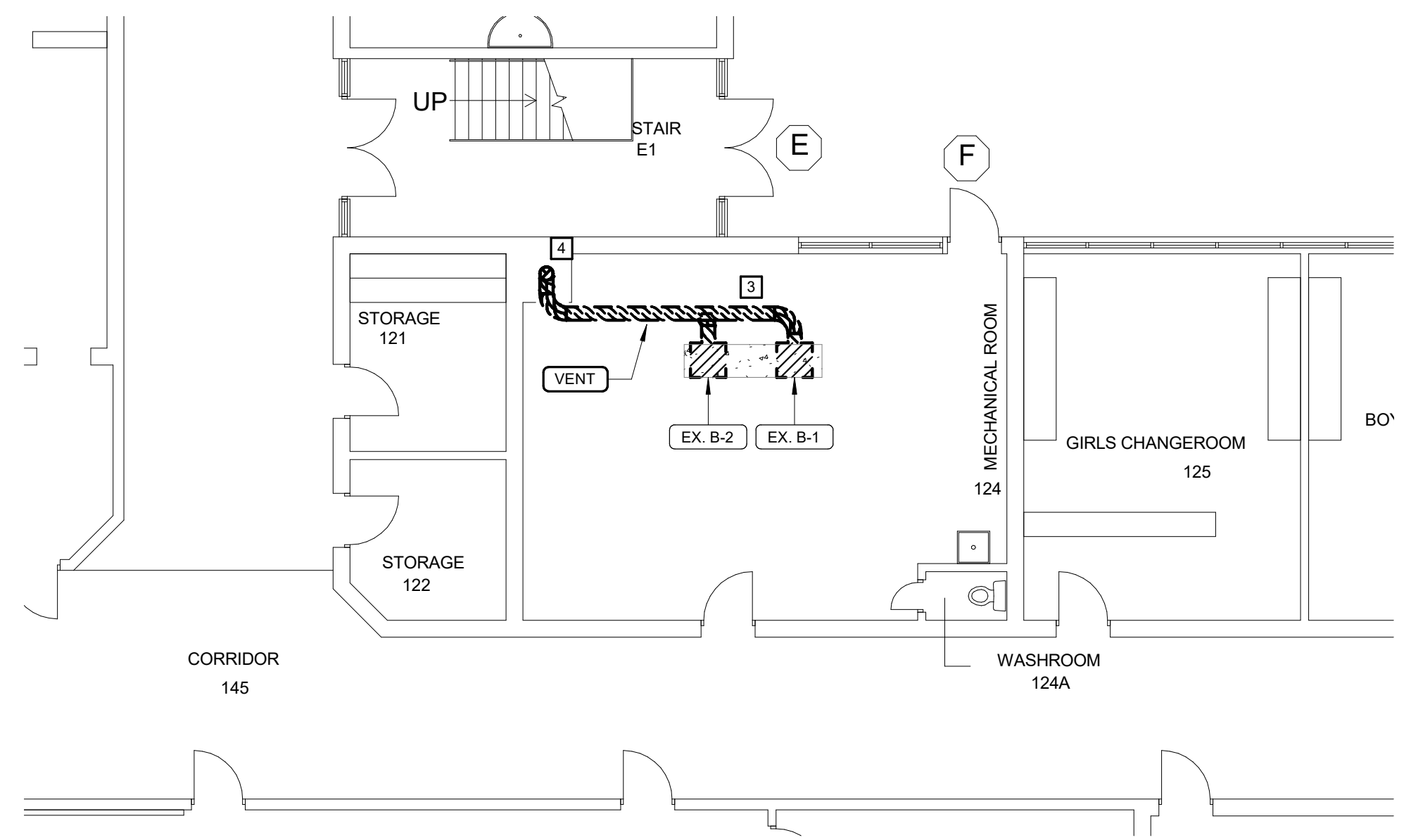
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CHECKED BY: Checker SCALE: As indicated

PROJECT NO: **23082**

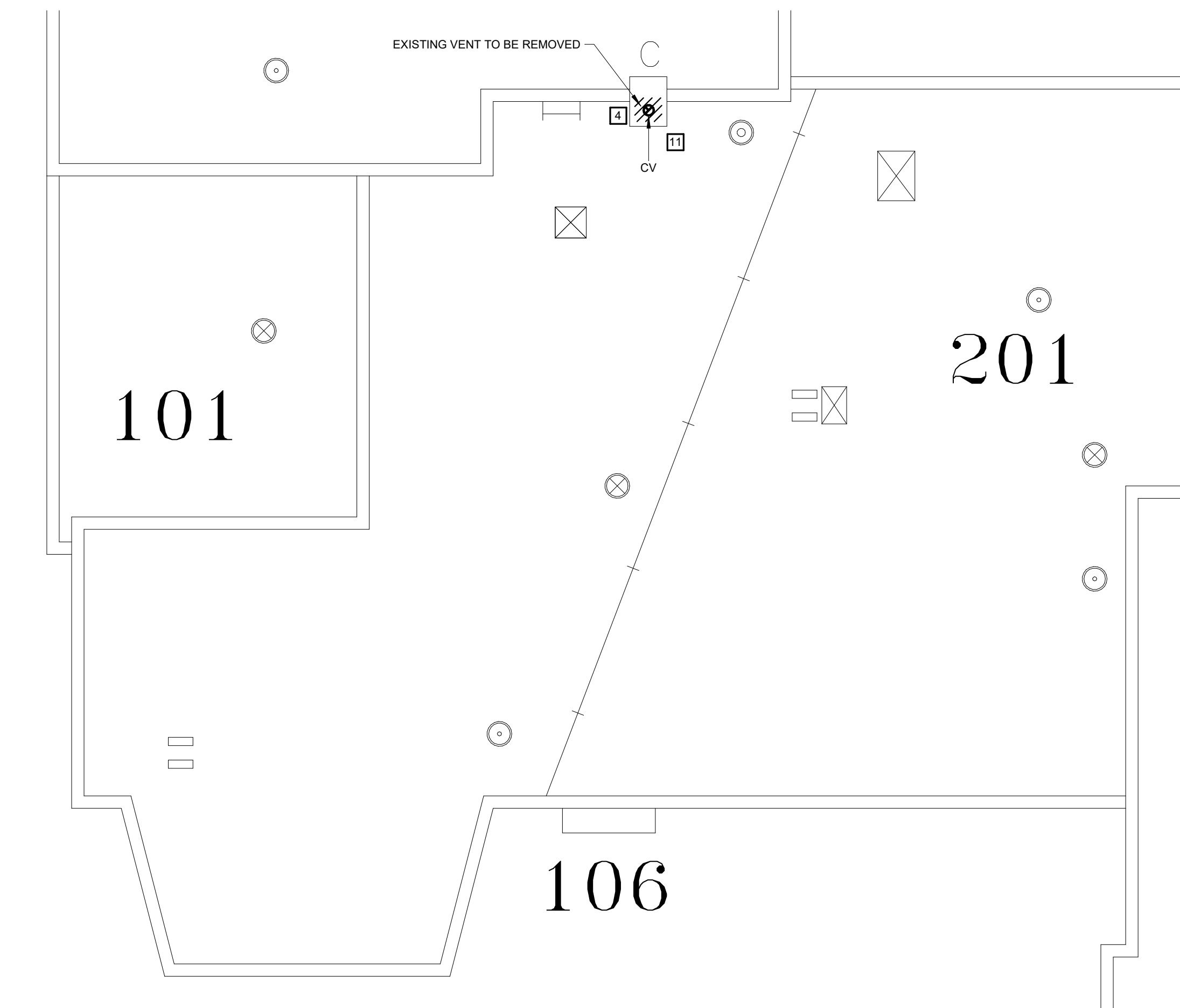
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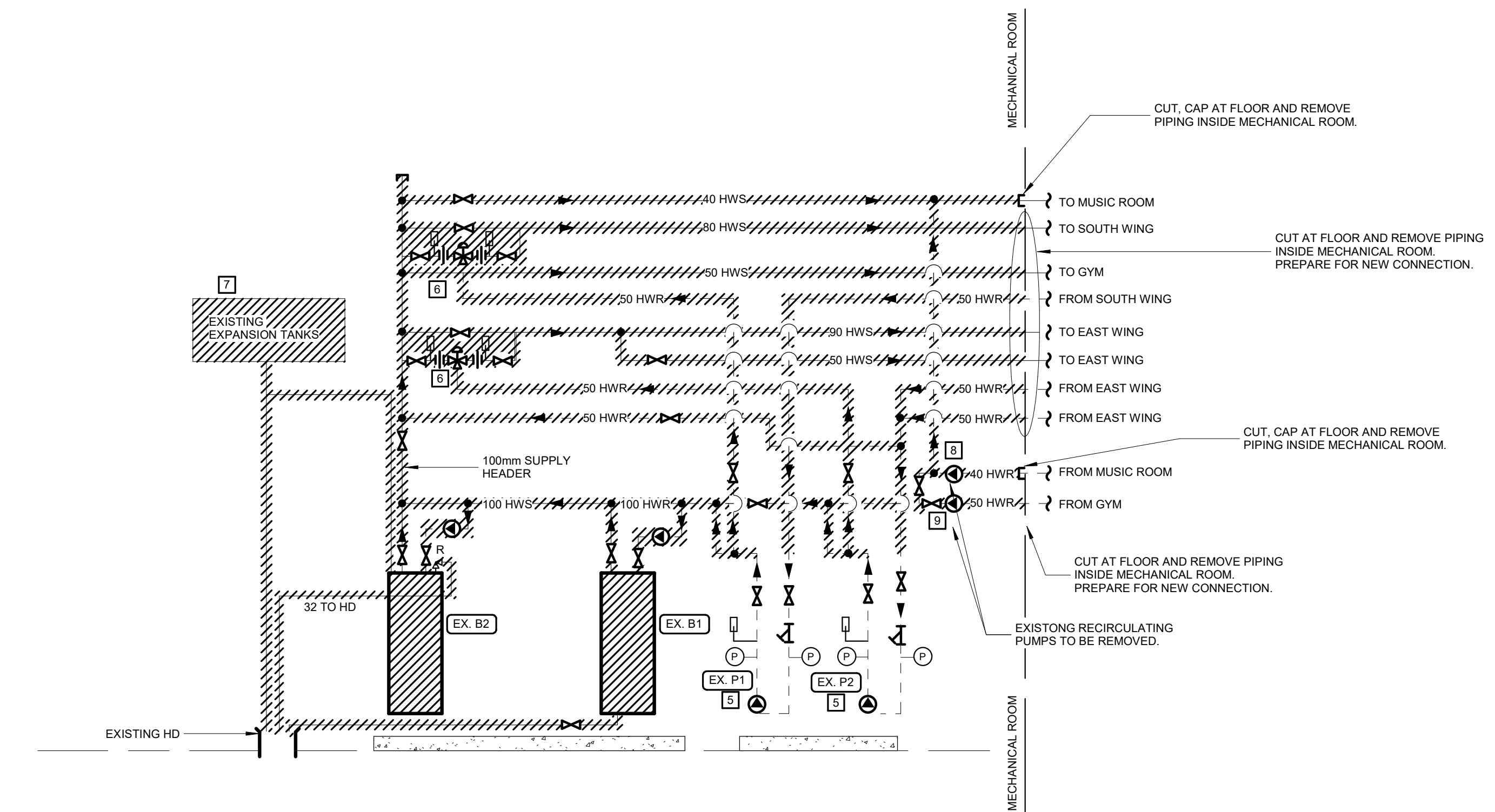
MECHANICAL DEMOLITION PLAN 1
1:100 M1.01



HVAC DEMOLITION PLAN 2
1:100 M1.01



ROOF DEMOLITION PLAN 3
1:100 M1.01



EXISTING BOILER SCHEMATIC 4
1:1 M1.01

DEMOLITION NOTES

A. ALPHABETICAL NOTES ARE GENERAL TO THE PLAN(S) ON THIS SHEET

B. NUMERICAL NOTES ARE KEYED NOTES CORRESPONDING TO KEYED NOTES ON PLAN(S) ON THIS SHEET.

A. DOMESTIC WATER PIPING AND EQUIPMENT TO REMAIN.

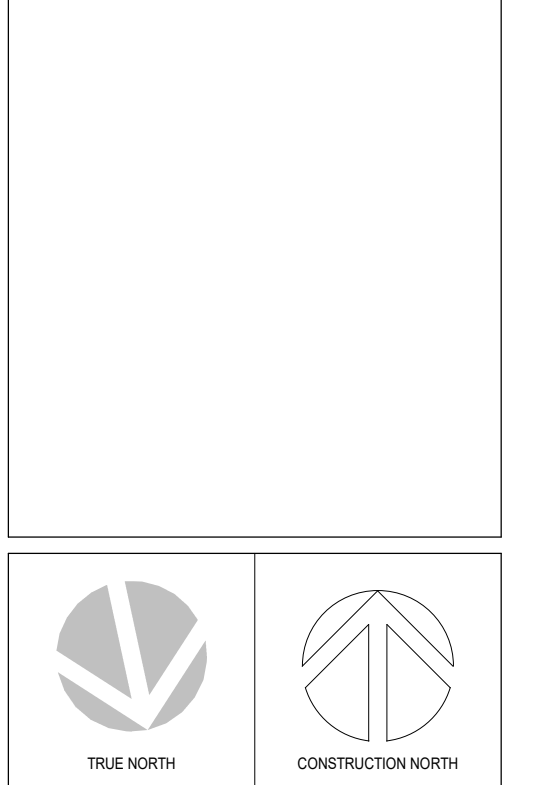
B. CONTRACTOR IS TO REFER TO SCHEMATIC DIAGRAMS THIS DRAWING FOR DETAILED INFORMATION ON DISCONNECTION & CONNECTION POINTS TO THE EXISTING SYSTEM.

C. CONTRACTOR IS TO ALLOW FOR PIPE FREEZING AS NEEDED TO ISOLATE THE EXISTING SYSTEM TO FACILITATE PIPING REMOVAL AND EQUIPMENT REPLACEMENT. CONTRACTOR SHALL NOT ASSUME EXISTING ISOLATION VALVES ARE OPERATIONAL AND IN GOOD WORKING ORDER.

D. CONTRACTOR IS REQUIRED TO REPLACE EXISTING ISOLATION VALVES THAT ARE FOUND DEFICIENT WITHIN THE APPROVED SCOPE WORK IN ORDER TO PROVIDE A WORKING AND FULLY OPERATIONAL SYSTEM.

- EXISTING BOILERS 'B-1 & B-2', ASSOCIATED CONTROLS, PIPING AND COMPONENTS ARE TO BE REMOVED. CONTRACTOR TO CUTBACK EXISTING PIPING AS SHOWN IN DEMOLITION SCHEMATIC ON THIS DRAWING. CONTRACTOR TO ISOLATE/CAP PIPING AND MAKE READY FOR NEW CONNECTION.
- EXISTING HOUSE KEEPING PAD FOR BOILERS TO BE REMOVED.
- EXISTING BOILER VENTING IN MECHANICAL ROOM TO BE REMOVED.
- EXISTING BOILER VENTING RUNNING VERTICAL THROUGH ROOF TOP CHIMNEY TO BE REMOVED.
- EXISTING HEATING WATER CIRCULATION PUMPS 'P-1 & P-2' TO REMAIN. REFER TO DEMOLITION SCHEMATIC ON THIS DRAWING FOR FURTHER DETAILS.
- EXISTING HEATING WATER 3-WAY CONTROL VALVES, ASSOCIATED CONTROLS AND COMPONENTS TO BE REMOVED. REFER TO DEMOLITION SCHEMATIC ON THIS DRAWING FOR FURTHER DETAILS.
- EXISTING HEATING WATER EXPANSION TANK 'ET-2', ASSOCIATED CONTROLS AND COMPONENTS TO BE REMOVED. REFER TO DEMOLITION SCHEMATIC ON THIS DRAWING FOR FURTHER DETAILS.
- EXISTING HEATING WATER DISTRIBUTION PUMP SERVING THE MUSIC ROOM, ASSOCIATED CONTROLS AND COMPONENTS TO BE REMOVED. REFER TO DEMOLITION SCHEMATIC ON THIS DRAWING FOR FURTHER DETAILS.
- EXISTING HEATING WATER DISTRIBUTION PUMP SERVING THE GYMNASIUM, ASSOCIATED CONTROLS AND COMPONENTS TO BE REMOVED. REFER TO DEMOLITION SCHEMATIC ON THIS DRAWING FOR FURTHER DETAILS.
- REMOVE EXISTING GAS PIPING UP TO ISOLATION VALVES IN VERTICAL DROP TO EXISTING BOILERS. PREPARE PIPING FOR NEW CONNECTION.
- REFER TO DETAIL #9 ON DRAWING M3.01 FOR SCOPE OF WORK REQUIREMENTS FOR THE REMOVAL AND REPLACEMENT OF CHIMNEY ARCHITECTURAL CLADDING

TO BE DEMOLISHED



KEY PLAN

HWDSB

ISSUED FOR TENDER 2024/02/29

ISSUED FOR PERMIT 2024/03/23

ISSUED FOR FINAL REVIEW 2024/05/15

ISSUED FOR 90% PROGRESS SET 2024/05/12

REVISIONS:

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SEAL

CONSULTANTS:

PROJECT:

HAMILTON WENTWORTH DISTRICT SCHOOL BOARD (HWDSB)

HIGHVIEW ELEMENTARY SCHOOL - 1040 QUEENSDALE AVENUE EAST, HAMILTON, ON

DRAWING TITLE:

MECHANICAL DEMOLITION PLAN

DRAWN BY: Author DATE: 23/04/20

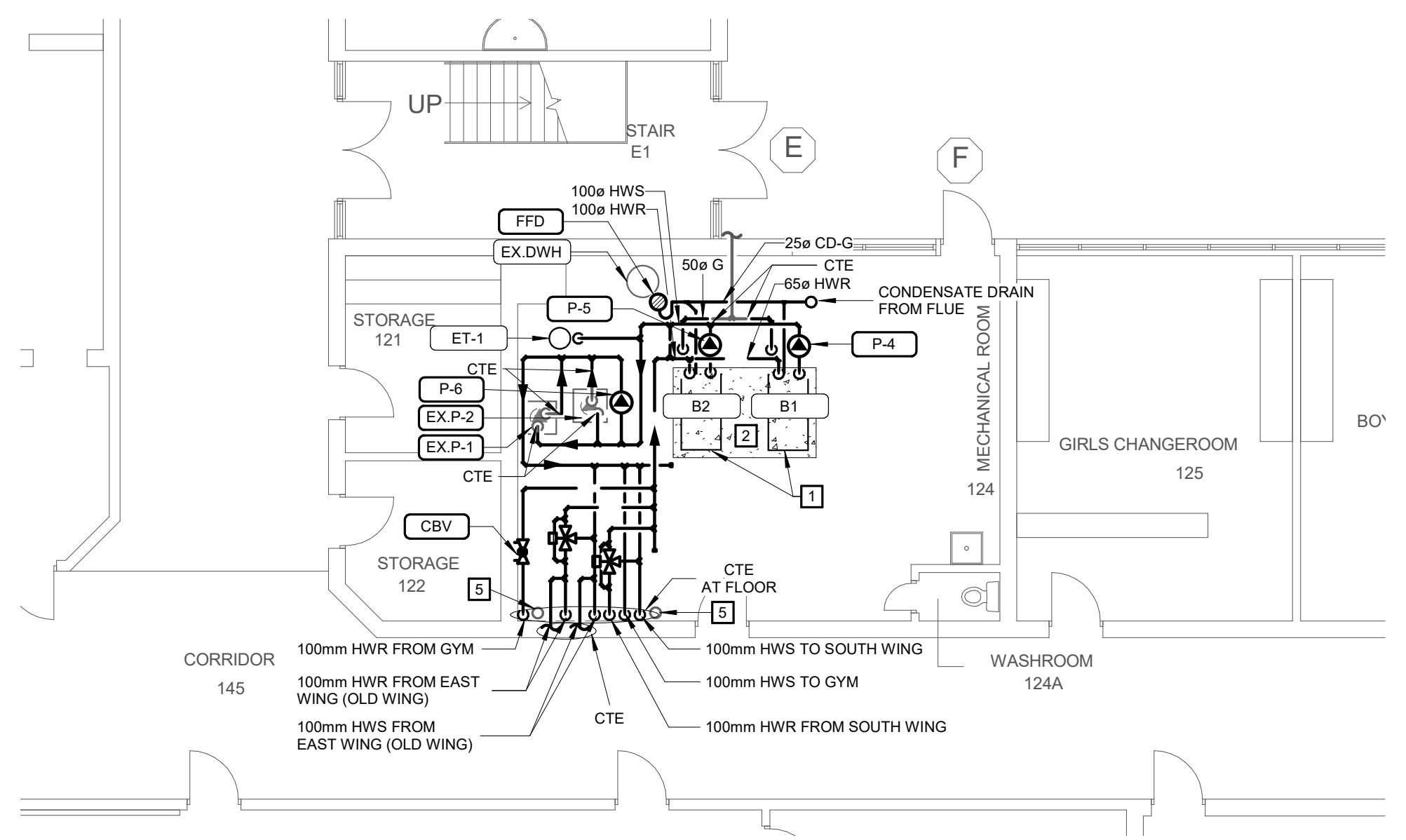
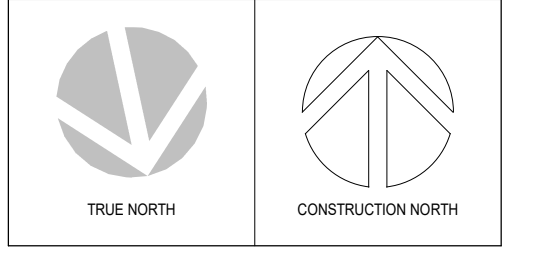
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PROJECT NO: **23082**

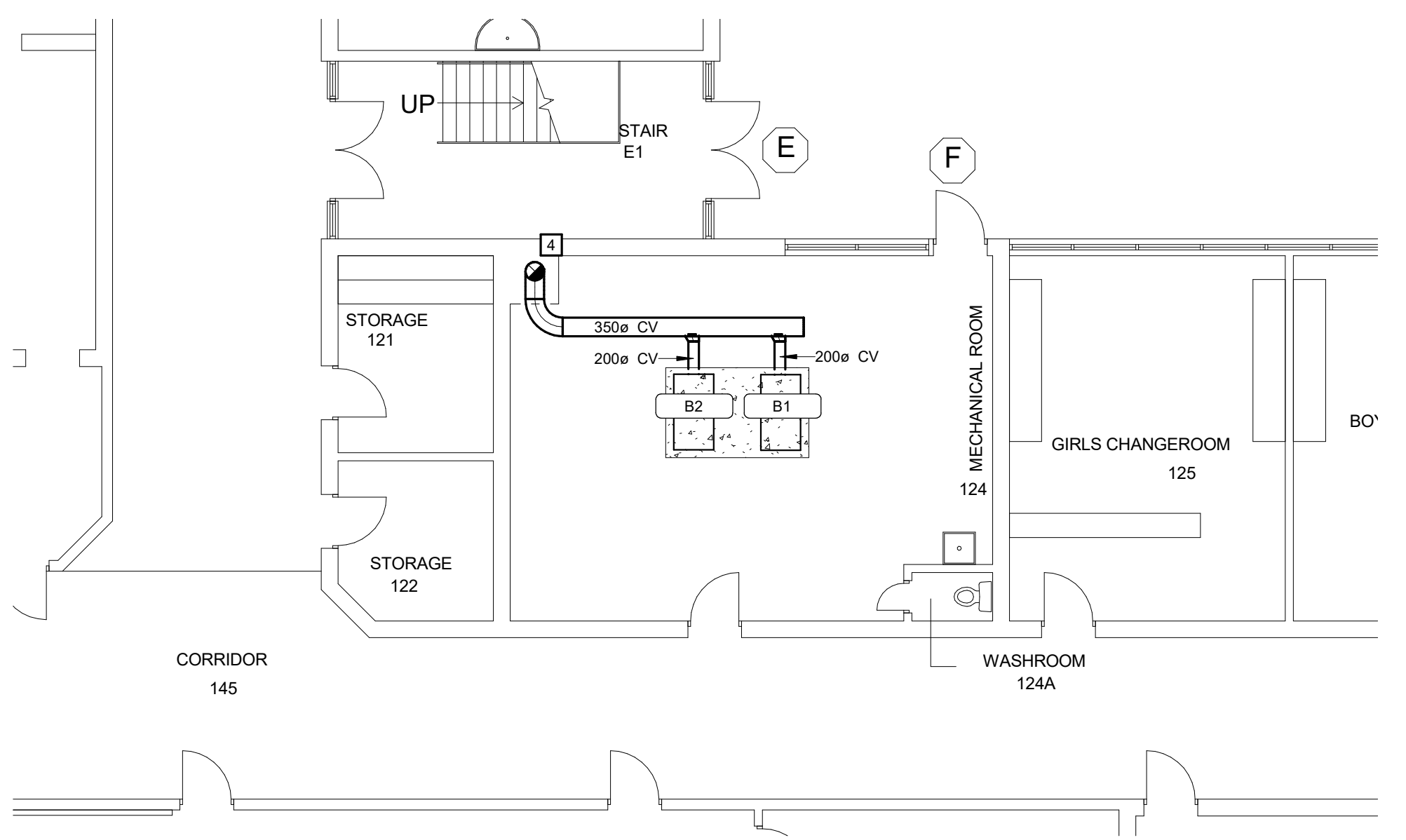
DRAWING NO: **M1.01**

CONSTRUCTION NOTES

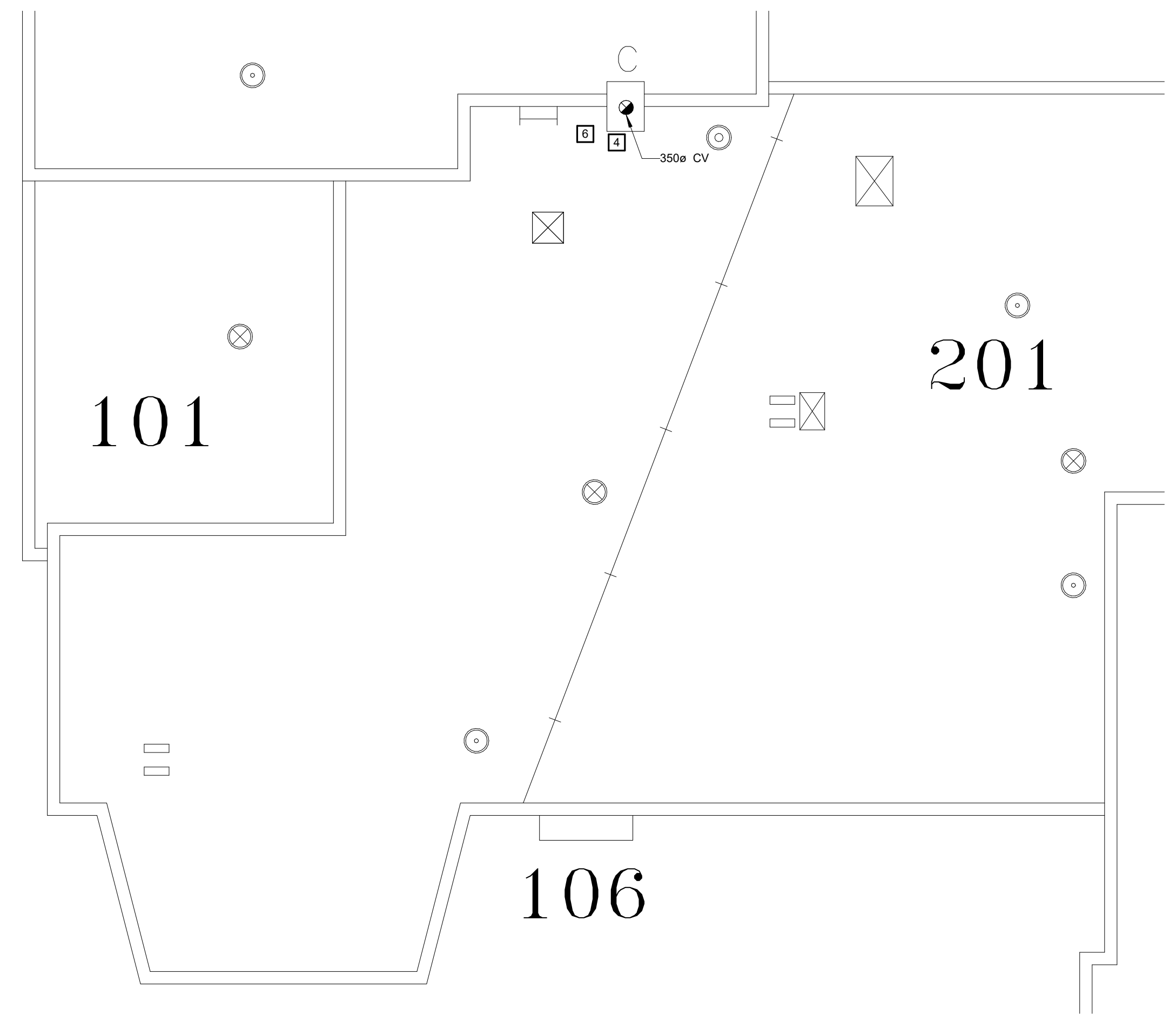
- A. ALPHABETICAL NOTES ARE GENERAL TO THE PLAN(S) ON THIS SHEET
- B. NUMERICAL NOTES ARE KEYED NOTES CORRESPONDING TO KEYED NOTES ON PLAN(S) ON THIS SHEET
- A. CONTRACTOR IS TO REFER TO SCHEMATIC DIAGRAMS ON DRAWING M3.01 FOR DETAILED INFORMATION ON DISCONNECTION & CONNECTION POINTS TO THE EXISTING SYSTEM.
- B. CONTRACTOR IS TO ALLOW FOR PIPE FREEZING AS NEEDED TO ISOLATE THE EXISTING SYSTEM TO FACILITATE PIPING REMOVAL AND EQUIPMENT REPLACEMENT. CONTRACTOR SHALL NOT ASSUME EXISTING ISOLATION VALVES ARE OPERATIONAL AND IN GOOD WORKING ORDER.
- C. CONTRACTOR IS REQUIRED TO REPLACE EXISTING ISOLATION VALVES THAT ARE FOUND DEFICIENT WITHIN THE APPROVED SCOPE WORK IN ORDER TO PROVIDE A WORKING AND FULLY OPERATIONAL SYSTEM.
- D. COMMON BOILER FLUE EXHAUST VENT UP TO ROOF THRU EXISTING SHAFT. SIZE AS PER MANUFACTURER RECOMMENDATIONS. VENTS SHALL BE AL29-4C. MAINTAIN MANUFACTURER'S RECOMMENDED VENT CLEARANCES. VENTING SHALL BE PROVIDED BY BOILER SUPPLIER AS AN ACCESSORY TO THE BOILERS. SUPPLIER OF VENTING IS RESPONSIBLE TO SITE MEASURE AND VERIFY ALL VENTING REQUIREMENTS INCLUDE SIZE BASED ON BOILER MANUFACTURER'S OPERATING REQUIREMENTS.
- 1. NEW BOILERS 'B-1 & B-2' TO BE INSTALLED ON NEW HOUSEKEEPING PAD. REFER TO SCHEMATICS ON THIS DRAWING FOR FURTHER INSTALLATION DETAILS.
- 2. CONTRACTOR TO PROVIDE NEW HOUSEKEEPING PAD TO SUPPORT BOILERS AND PRIMARY PUMPS. REFER TO STRUCTURAL PLANS FOR FURTHER DETAILS.
- 3. NEW GYMNASIUM DISTRIBUTION PUMP TO BE INSTALLED IN-LINE AT HIGH LEVEL. REFER TO SCHEMATICS ON THIS DRAWING FOR FURTHER INSTALLATION DETAILS.
- 4. NEW BOILER VENTING TO BE AL29-4c GRADE, TYPE IV, STAINLESS STEEL, COMPATIBLE FOR CONDENSING BOILERS. NEW BOILER VENTING TO BE INSTALLED IN PLACE OF EXISTING BOILER VENTING THAT WAS REMOVED. REFER TO DETAIL 4 ON M3.01 FOR FURTHER INFORMATION.
- 5. CAP MUSIC ROOM HEATING WATER SUPPLY AND RETURN AT FLOOR. MAKE GOOD AND FLUSH.
- 6. REFER TO DETAIL #9 ON DRAWING M3.01 FOR SCOPE OF WORK REQUIREMENTS FOR THE REMOVAL AND REPLACEMENT OF CHIMNEY ARCHITECTURAL GLADDING.



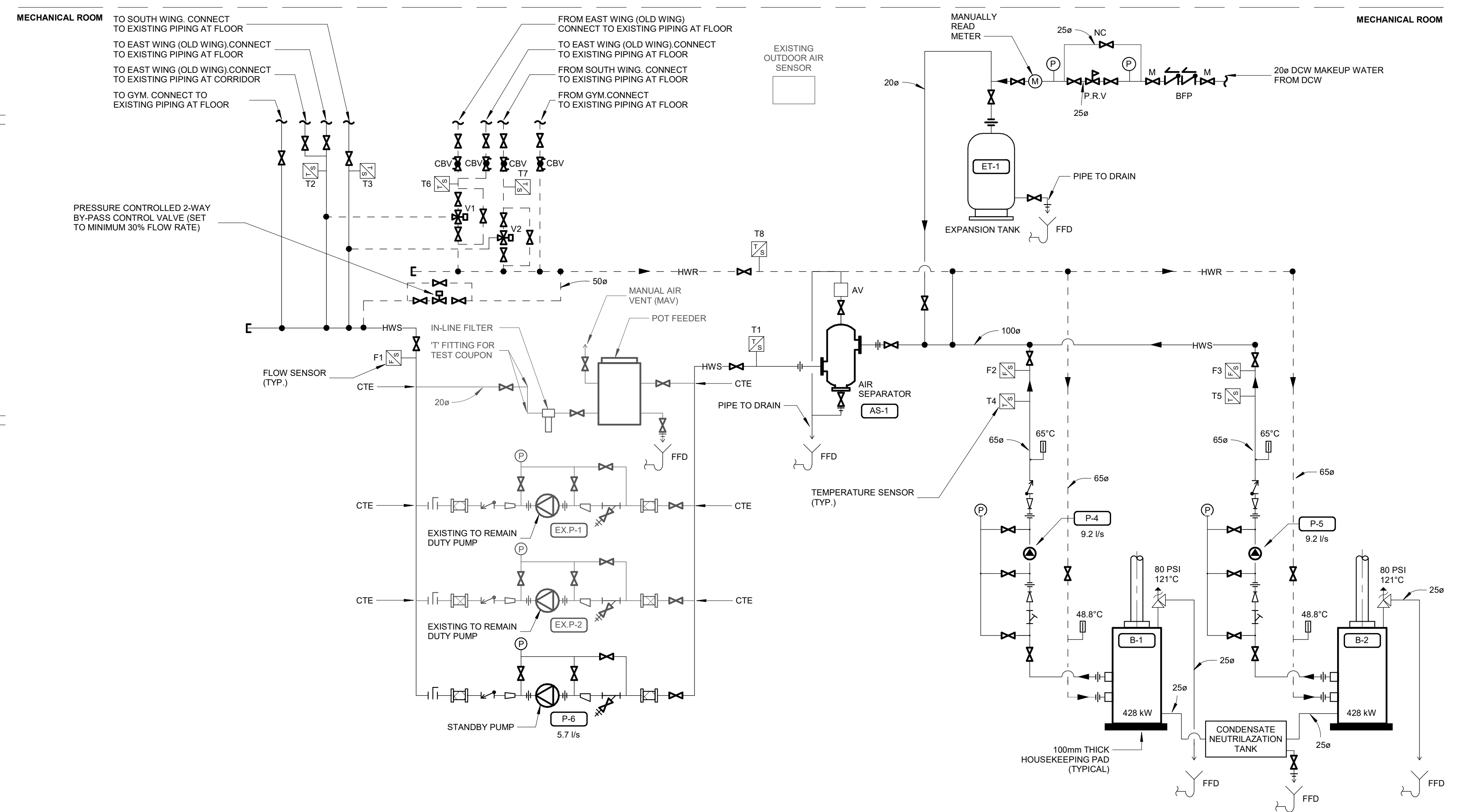
MECHANICAL PROPOSED PLAN 1
1:100 M1.02



HVAC PROPOSED PLAN 2
1:100 M1.02



ROOF PROPOSED PLAN 3
1:100 M1.02



PROPOSED BOILER SCHEMATIC & CONTROL DIAGRAM 4
1:1 M1.02

KEY PLAN



No.	DESCRIPTION	DATE
1	ISSUED FOR TENDER	2024/02/29
2	ISSUED FOR PERMIT	2024/03/23
3	ISSUED FOR FINAL REVIEW	2024/05/16
4	ISSUED FOR 90% PROGRESS SET	2024/05/12

REVISIONS:
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SEAL
CONSULTANTS:

PROJECT:
HAMILTON WENTWORTH DISTRICT SCHOOL BOARD (HWDSB)

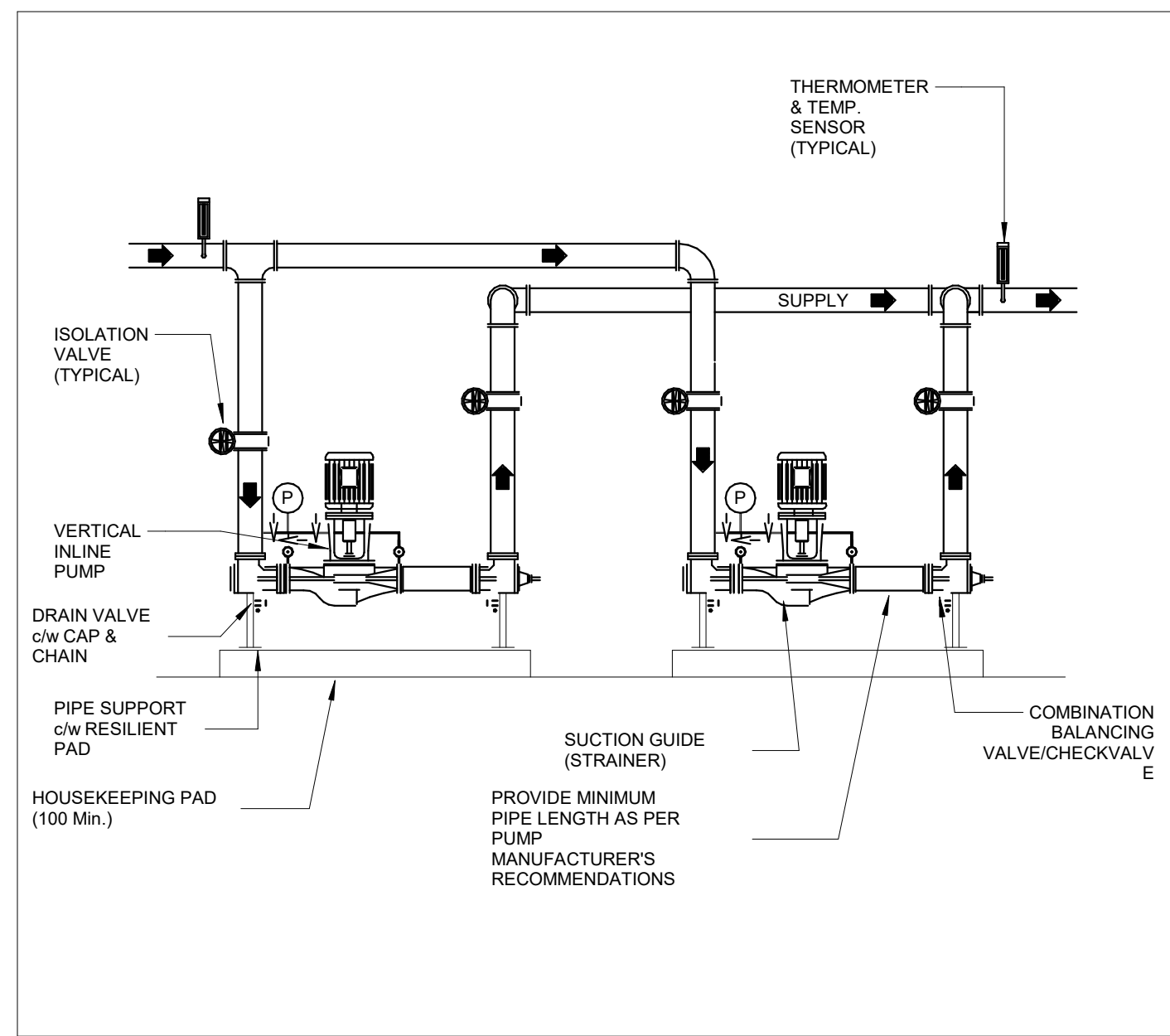
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DRAWING TITLE:
MECHANICAL PROPOSED PLAN

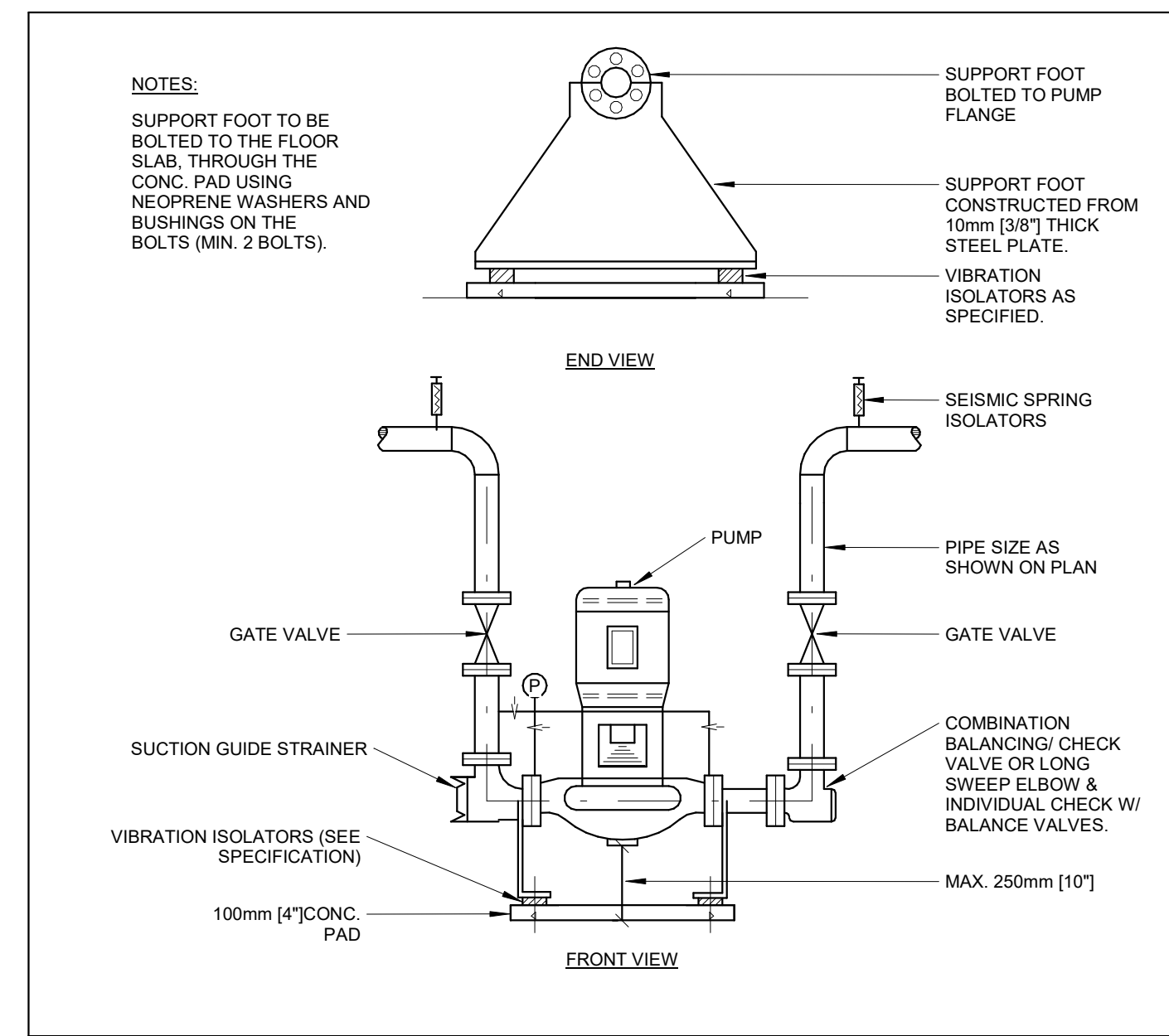
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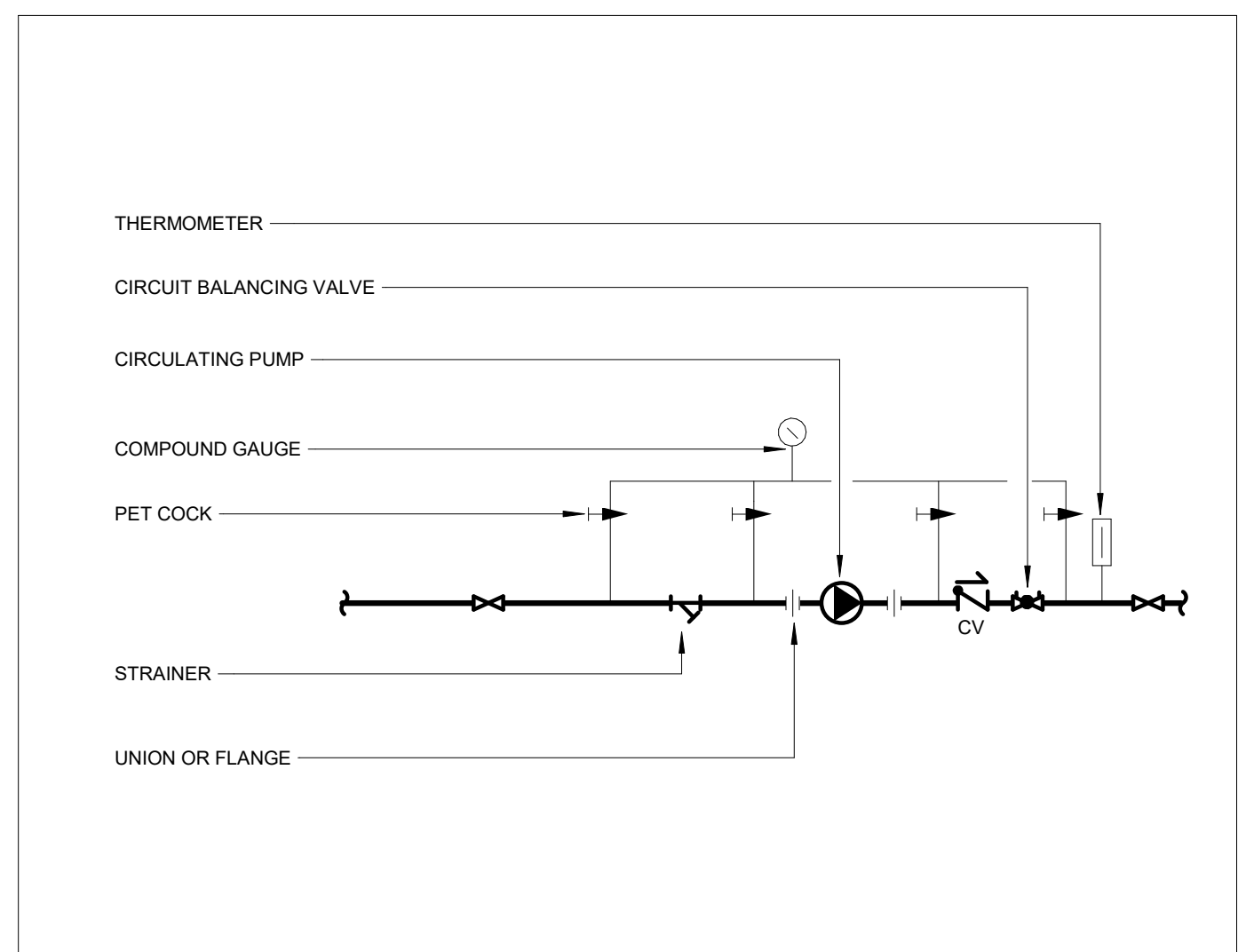
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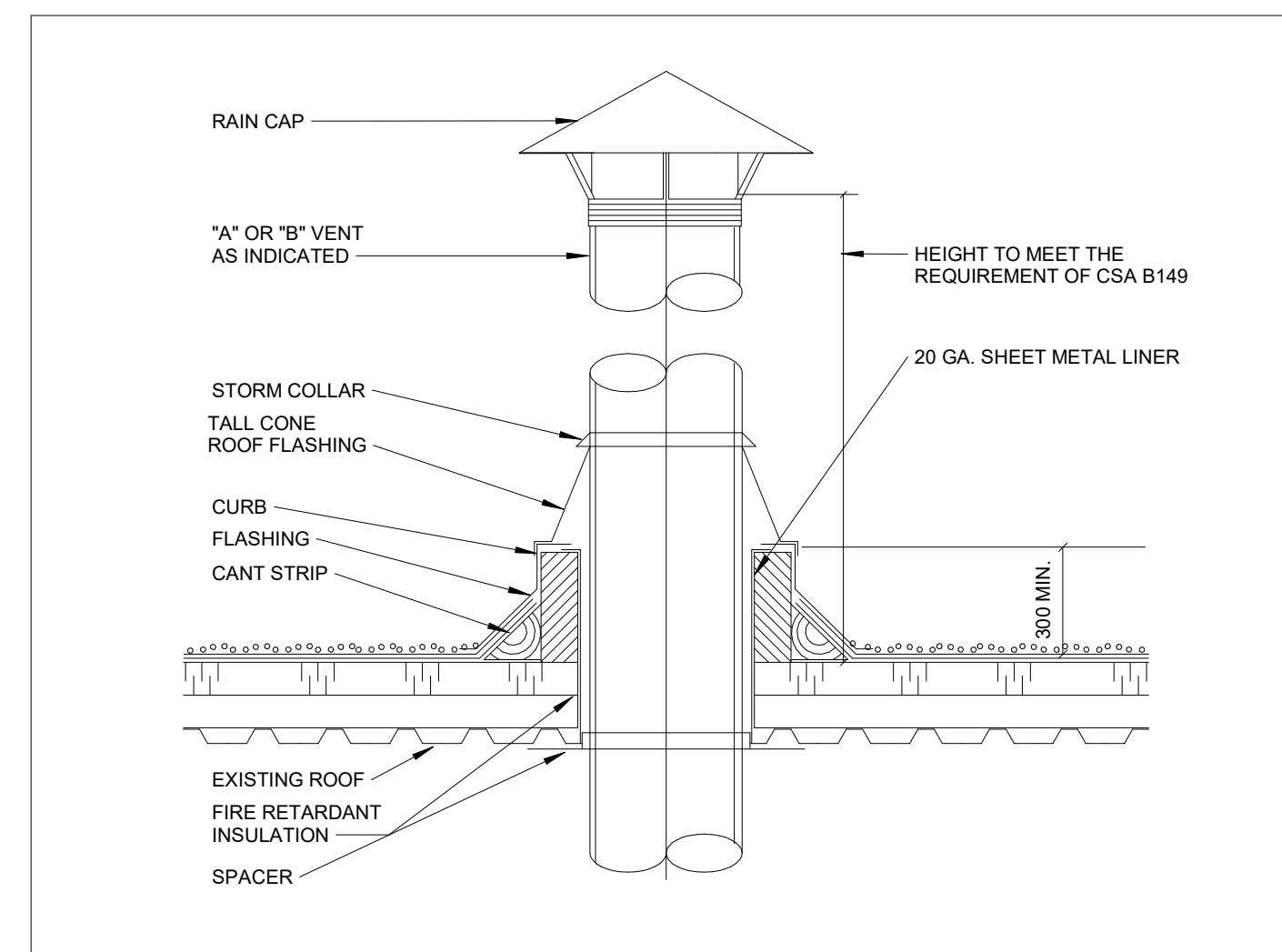
PUMP PIPING ARRANGEMENT 3
1:1 M3.01



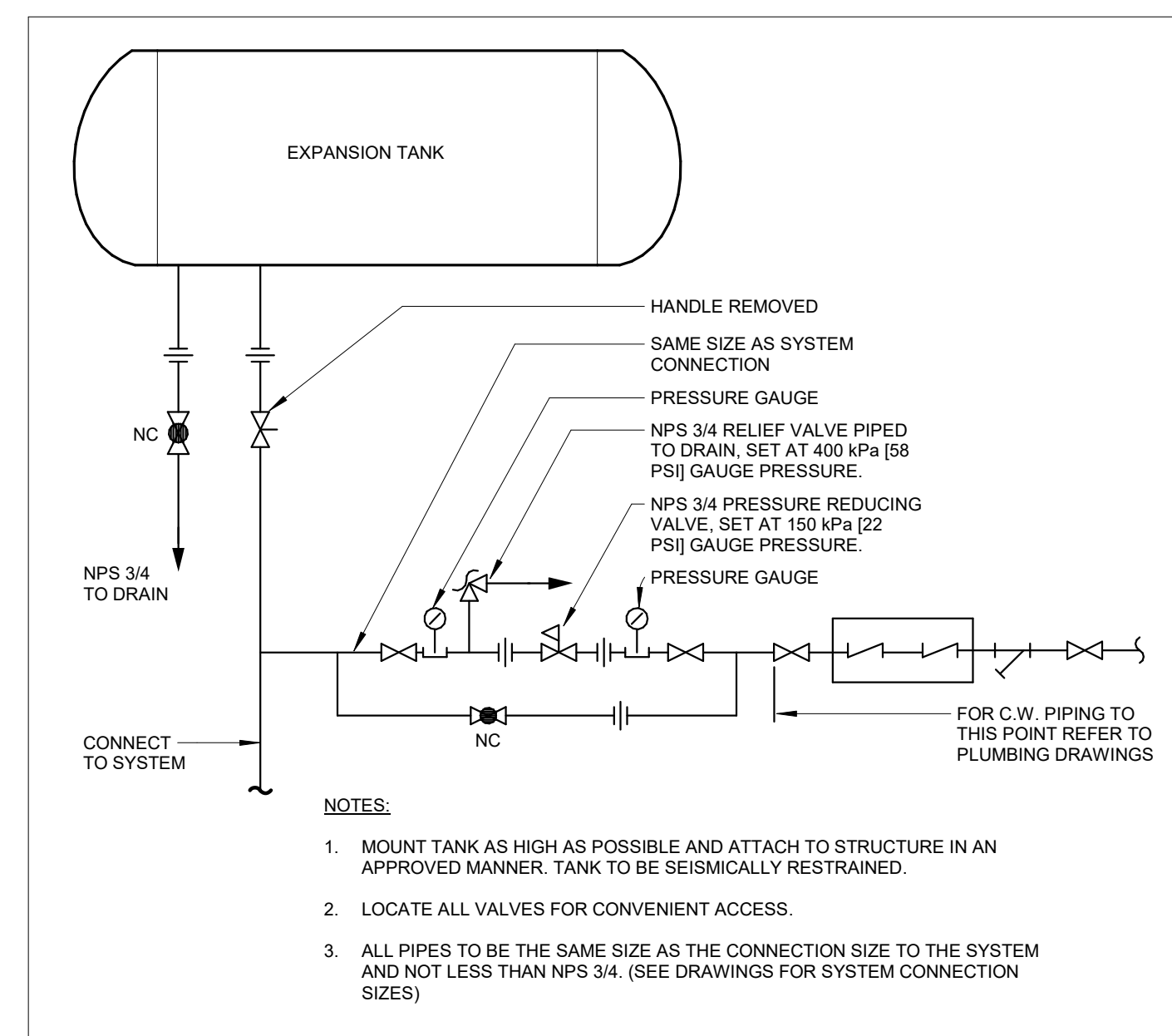
VERTICAL IN LINE PUMP INSTALLATION 2
1:1 M3.01



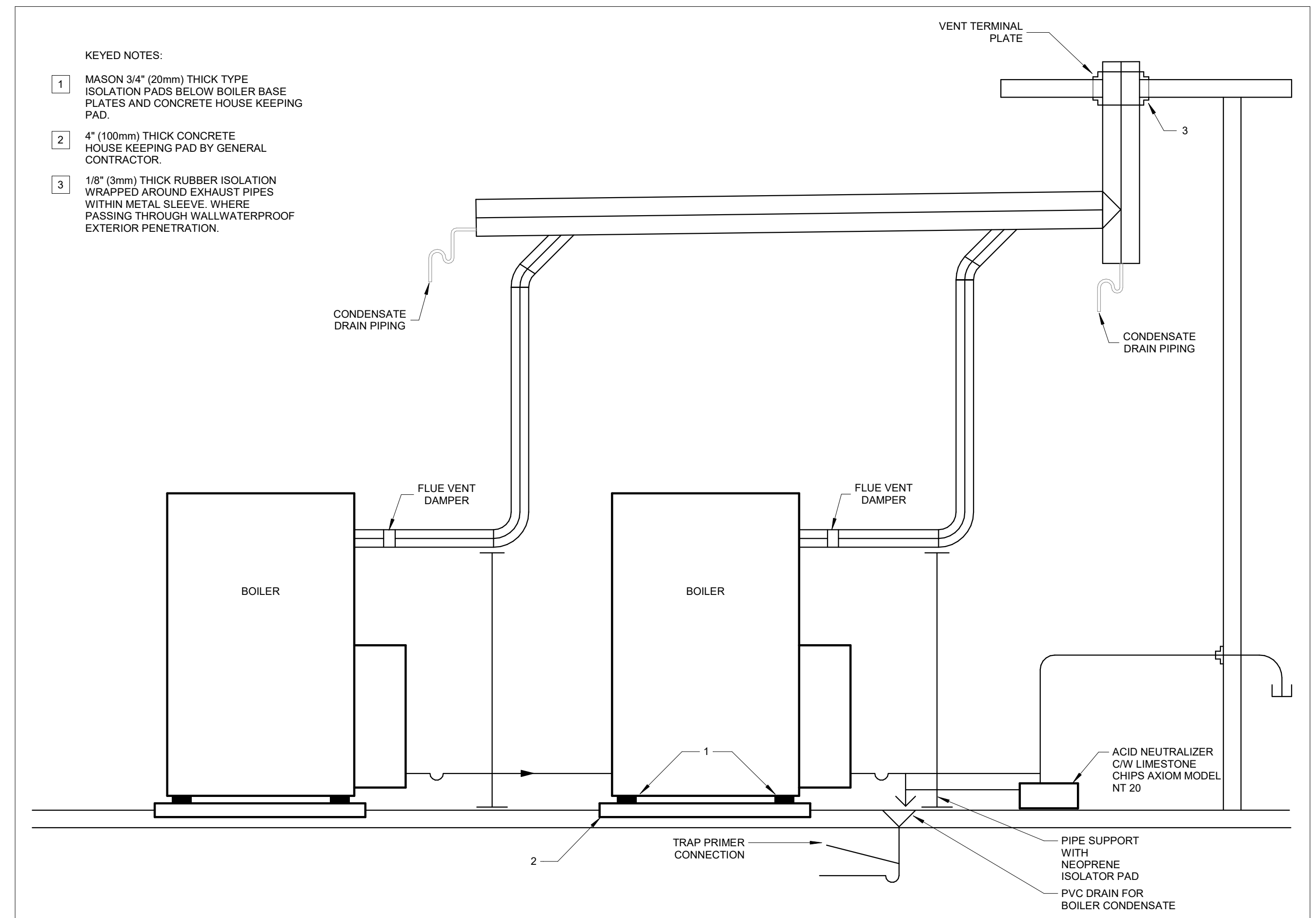
PIPING SCHEMATIC OF INLINE CIRCULATING PUMP 5
1:1 M3.01



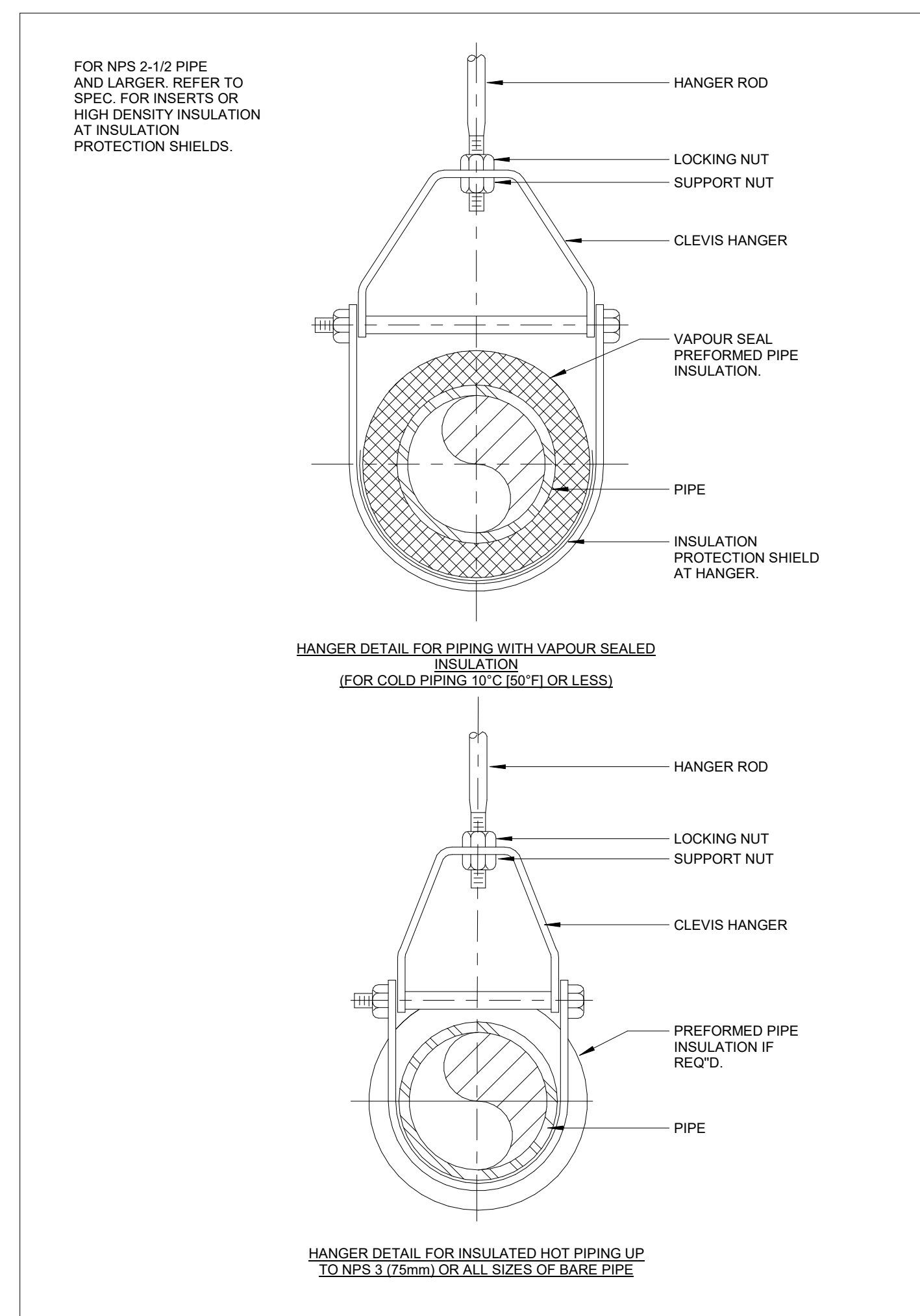
BOILER FLUE PENETRATION DETAIL 4
1:1 M3.01



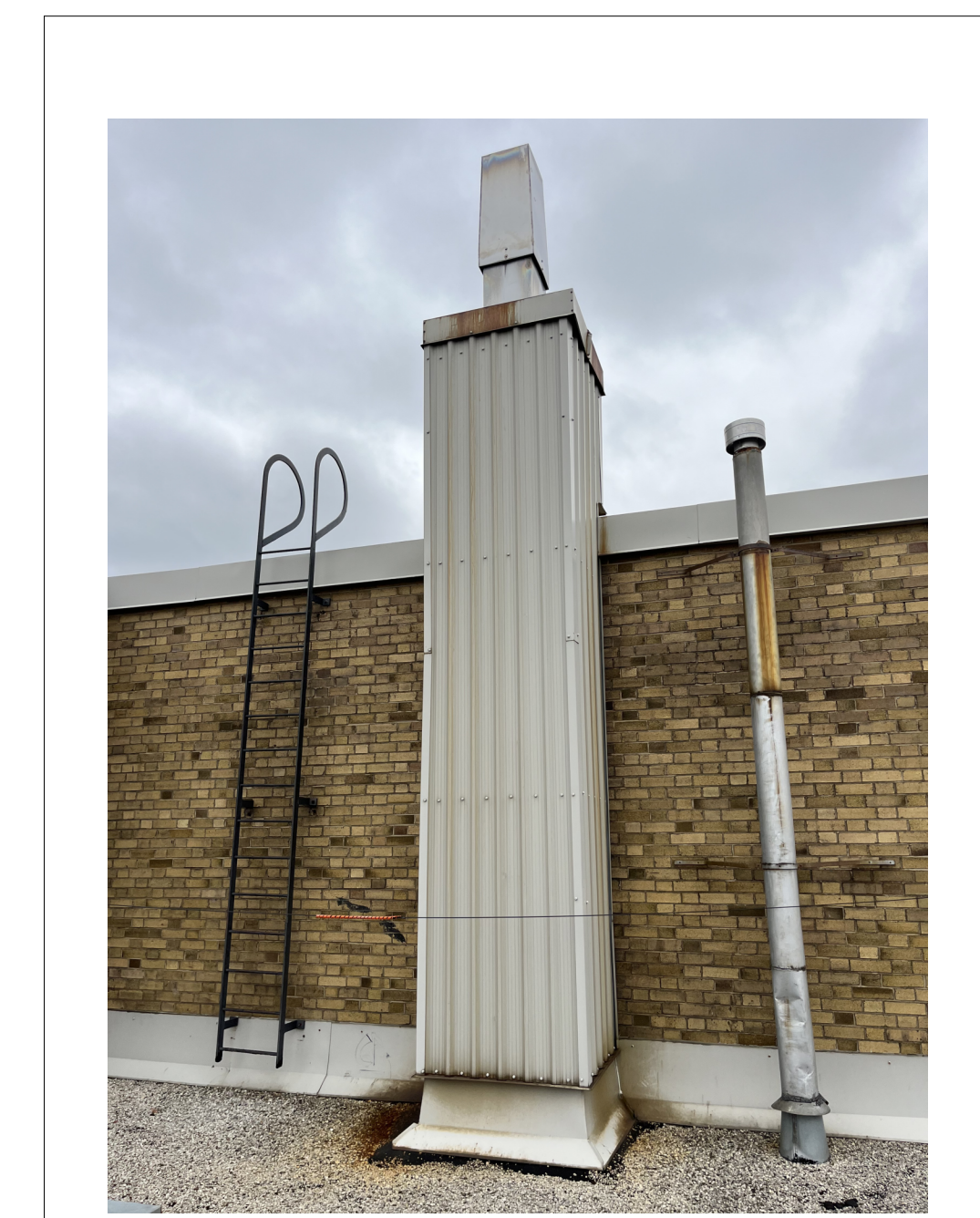
HORIZONTAL EXPANSION TANK 7
1:1 M3.01



CONDENSING BOILER TYPICAL MOUNT DETAIL 1
1:1 M3.01

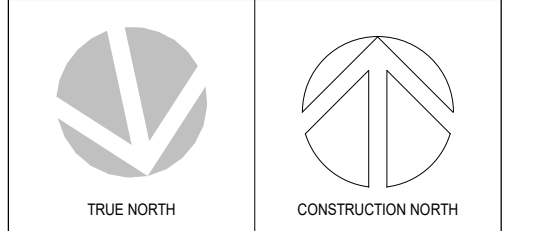


PIPE HANGER DETAIL 6
1:1 M3.01



- NOTES:**
- DEMOLISH EXISTING BOILER FLUE EXTERIOR METAL CLADDING AND ROOF FLASHING TO FACILITATE REMOVAL OF BOILER FLUE.
 - NEW BOILER VENT MUST BE INSTALLED OBSERVING LOCAL REGULATIONS IN ADDITION TO NATIONAL CODES. CAN/CSA-B149.1 OR 2, NEW VENT TO BE EXPOSED AND SECURED TO 2ND STOREY WALL.
 - NEW BOILER VENTING TO TERMINATE MINIMUM 7 FT. (2100MM) ABOVE SECOND STOREY ROOF LEVEL. PROVIDE RAIN CAP.
 - PROVIDE NEW METAL FLASHING, ROOF CURB, STRIP AS SHOWN IN DETAIL #4 ON THIS DRAWING. INTEGRATE NEW FLASHING INTO EXISTING ROOF ASSEMBLY. PROVIDE INSULATED METAL CAP ON FLASHING CURB TO CLOSE OFF ROOF OPENING AROUND NEW BOILER VENTING.

BOILER FLUE VENT 9
M3.01



No.	DESCRIPTION	DATE
4	ISSUED FOR TENDER	2024/02/29
3	ISSUED FOR PERMIT	2024/02/23
2	ISSUED FOR FINAL REVIEW	2024/02/18
1	ISSUED FOR 90% PROGRESS SET	2024/02/12

REVISIONS:
DISCREPANCIES MUST BE REPORTED IMMEDIATELY TO THE ENGINEER BEFORE PROCEEDING. ONLY TITLED DIMENSIONS MUST BE USED. THE CONTRACTOR MUST CHECK THE DIMENSIONS ON SITE. THIS DRAWING IS PROTECTED BY COPYRIGHT. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

DO NOT SCALE THE DRAWINGS.
mcCallumSather
Westinghouse HQ, 2nd Floor
286 Sanford Ave. N
Hamilton, ON L8L 6A1
905.526.6700
www.mccallumsather.com

PLACEHOLDER IMAGE
REPLACE IN TITLEBLOCK FAMILY
SEE FAQ

SEAL
CONSULTANTS

PROJECT:
HAMILTON WENTWORTH DISTRICT SCHOOL BOARD (HWDSB)

HIGHWAY ELEMENTARY SCHOOL - 1040 QUEENSDALE AVENUE EAST, HAMILTON, ON

DRAWING TITLE:
DETAILS & DIAGRAMS

DRAWN BY: Author DATE: 23/04/20
CHECKED BY: Checker SCALE: 1:1

PROJECT NO: **23082**

DRAWING NO: **M3.01**

1. GENERAL

- 1.1. COMPLETE THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE LATEST EDITIONS OF THE ONTARIO BUILDING CODE, ONTARIO FIRE CODE, C.S.A. STANDARDS, U.L.C., N.F.P.A., O.S.H.A. AND OTHER CODES AS REQUIRED.
1.2. WHEREVER THE WORDS "PROVIDE" OR "SUPPLY AND INSTALL" ARE USED, IT SHALL BE UNDERSTOOD TO MEAN "PROVIDE AND INSTALL, INCLUDING ALL LABOUR, MATERIALS, INSTALLATION, TESTING, AND CONNECTIONS" FOR THE ITEM TO WHICH IT REFERENCES.
1.3. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, C.S.A. CERTIFIED AND MANUFACTURED TO THE STANDARDS SPECIFIED.
1.4. THE DRAWINGS FOR THE MECHANICAL WORK ARE DIAGRAMMATIC PERFORMANCE DRAWINGS ONLY, INTENDED TO SHOW THE GENERAL INTENT OF THE WORK, NOT THE DETAILS OF INSTALLATION. CO-ORDINATE THE ROUTING AND INSTALLATION OF ALL MECHANICAL SYSTEMS WITH ALL EXISTING CONDITIONS, STRUCTURE AND THE WORK OF ALL OTHER TRADES.
1.5. PROVIDE SLEEVING DRAWINGS SHOWING ALL OPENINGS IN THE STRUCTURE WITH ALL REQUIRED DIMENSIONS.
1.6. FOR RE-INSTALLATION DRAWINGS OF ALL WORK WITH DIMENSIONS, DRAWN TO SCALE AND CO-ORDINATED WITH ALL TRADES AND DIVISIONS, SHOW ALL REQUIREMENTS FOR EQUIPMENT INSTALLED, AREA ACCESS, CLEARANCES AND CONNECTIONS BY OTHER TRADES.
1.7. PROVIDE STRUCTURAL LOADS WITH ALL DETAILS NECESSARY FROM INSTALLATION OF INSERTS AND ALL CONCRETE CONSTRUCTION ITEMS INCLUDING PADS, CURBS, SILLS, BASINS, ANCHORS, INSERTS ETC.
1.8. PROVIDE MECHANICAL DRAWINGS, REFERS TO ARCHITECTURAL OR INTERIOR DESIGN DRAWINGS FOR THE EXACT LOCATION OF ANY DEVICES, FIXTURES, ETC. OBTAIN ALL SITE DIMENSIONS FROM SITE MEASUREMENTS.
1.9. MAKE APPLICATION, PROVIDE, OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND INSPECTIONS.
1.10. ENSURE THAT FEDERAL TAXES ARE INCLUDED WHERE REQUIRED, H.S.T. TO BE SHOWN AS EXTRA.
1.11. PROVIDE A COMPLETE ITEMIZED BREAKDOWN OF MATERIAL, LABOUR, OVERHEAD, PROFIT, ETC. WHEN SUBMITTING QUOTATIONS FOR CHANGE NOTICES ON THIS PROJECT. THE HOURLY LABOUR RATE SHALL BE INCLUSIVE OF ALL CHARGES FOR SUPERVISION, VARIABLE LABOUR FACTORS, HAND TOOLS, PAYROLL BURDENS, HEIGHT FACTORS, WARRANTIES, STORAGE, RENTALS, ADDITIONAL BONDING, PARKING, CLEAN-UP, AS-BUILT DRAWINGS, HOISTING, FREIGHT AND DELIVERY, BUT EXCLUSIVE OF OVERHEAD AND PROFIT.
1.12. PROVIDE A WRITTEN WARRANTY FOR ALL MATERIALS, EQUIPMENT AND LABOUR FOR A ONE-YEAR PERIOD TO BEGIN AT DATE OF SUBSTANTIAL PERFORMANCE PER SGC 12.3.3.
1.13. PROVIDE OR DRAWING (4 COPIES) OF ALL PRODUCTS FOR REVIEW.
1.14. CO-ORDINATE ALL SHUTDOWNS OF EXISTING BASE BUILDING SYSTEMS WITH THE LANDLORD OR REPRESENTATIVE, ADVISE THE LANDLORD OR REPRESENTATIVE AT LEAST 48 HOURS PRIOR TO ANY SHUTDOWN AND PAY FOR ANY COSTS INCURRED INCLUDING PREMIUM TIME OUTSIDE OF NORMAL WORKING HOURS.
1.15. CO-ORDINATE THE MECHANICAL WORK WITH ALL OTHER TRADES.
1.16. PROVIDE IN THE TENDER PRICE ANY COSTS FOR PREMIUM TIME OUTSIDE OF NORMAL WORKING HOURS TO COMPLETE THE WORK ON SCHEDULE AND TO MAINTAIN ALL EXISTING MECHANICAL SYSTEMS IN OPERATION. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY INTERRUPTIONS OR DISRUPTIONS TO THE EXISTING SERVICES. ALL EXISTING BUILDING SERVICES MUST BE MAINTAINED AT ALL TIMES. ANY INTERRUPTION SHALL BE PERFORMED ONLY AFTER REGULAR SCHOOL HOURS. ARRANGE WORK SUCH THAT INTERRUPTIONS IN SERVICES OCCUR ONLY AT SCHEDULED TIMES SUITABLE TO THE LANDLORD.
1.17. CHECK AND VERIFY EXISTING ELECTRICAL VOLTAGE AND ENSURE THAT ALL MECHANICAL EQUIPMENT SUPPLIED IS SUITABLE FOR THE AVAILABLE VOLTAGE.
1.18. NOTIFY ELECTRICAL CONTRACTOR OF ALL ELECTRICAL CONTROL AND INTERLOCK WIRING BY MECHANICAL CONTRACTOR. VERIFY LOCATIONS OF ALL MECHANICAL EQUIPMENT WITH ELECTRICAL CONTRACTOR BEFORE WORK COMMENCES.
1.19. PROVIDE STARTERS WITH REQUIRED OVERLOAD PROTECTION FOR ALL MECHANICAL EQUIPMENT. PROVIDE LINE VOLTAGE REVERSE ACTING THERMOSTATS WHERE SPECIFIED. STARTERS AND LINE VOLTAGE THERMOSTATS SHALL BE TURNED OVER TO DIVISION 16 FOR INSTALLATION. WHERE SWITCHES ARE USED ON FINISHED WALLS PROVIDE TO MATCH LIGHTING SWITCH AND TYPE.
1.20. PROVIDE ALL DEMOLITION, CLEAN-UPS, STORAGE, LIFTING, FLASHING, DRILLING, CUTTING AND PATCHING AS REQUIRED. ALL CUTTING AND PATCHING REQUIRED TO THE EXISTING BUILDING STRUCTURE FOR THE WORK SHALL BE INCLUDED UNDER THIS CONTRACT, AND BE ACCEPTABLE TO THE OWNER. PROVIDE X-RAY OF SLAB PRIOR TO CORING AND CUTTING OF FLOOR. SUBMIT WRITTEN CONFIRMATION THAT X-RAY HAS BEEN PERFORMED.
1.21. PROVIDE ALL EQUIPMENT PADS, CURBS, SILLS, BASINS, ANCHORS, INSERTS, SUPPORTS, SLEEVES, ETC. AS REQUIRED FOR MECHANICAL EQUIPMENT AND PIPING.
1.22. PROVIDE ACCESS AS REQUIRED IN WALLS AND CEILINGS. ENSURE THAT ACCESS IS PROVIDED FOR ALL EQUIPMENT. PROVIDE ACCESS DOORS COMPATIBLE WITH THE ADJACENT FINISHES AND WITH FIRE RATING EQUAL TO SURFACES IN WHICH INSTALLED. PROVIDE ACCESS PANELS IN PLASTER AND DRYWALL SURFACES WITH RECESSED DOOR WITH WELDED METAL LATH READY TO ACCEPT PLASTER/ DRYWALL INSERT AND WITH A PLASTER GROMMET FOR DOOR KEY ACCESS. MIFAB SERIES CAD-DW OR EQUIVALENT.
1.23. RE-USE AND RELOCATE EXISTING MATERIALS SUCH AS PIPING, FIXTURES, DUCTWORK, DIFFUSERS, EQUIPMENT ETC. WHERE SHOWN, CAP AND DISCONNECT ALL EXISTING PIPING AND DUCTWORK NOT REQUIRED AT CEILING, WALLS OR FLOOR, OR TO A LOCATION AS DIRECTED BY THE LANDLORD. MAINTAIN INTEGRITY OF ALL INSULATION INCLUDING VAPOUR BARRIERS WHEN CONNECTING TO EXISTING SERVICES. MAINTAIN THE INTEGRITY OF ALL EXISTING SYSTEMS ASSOCIATED WITH THE BUILDING IN PLACE. UNLESS OTHERWISE OTHERWISE OBTAIN PERMISSION FROM THE LANDLORD AND REMOVE FROM THE SITE ALL MATERIALS WHICH ARE NOT TO REMAIN OR BE RE-USED.
1.24. ADJUST THE LOCATION OF DEVICES AND/OR EQUIPMENT (UP TO 10"-0" IN ANY DIRECTION) AS DIRECTED BY THE OWNER AND/OR MECHANICAL CONSULTANT WITHOUT ADJUSTMENT TO THE CONTRACT PRICE. NO CHANGES ARE REQUESTED BEFORE INSTALLATION.
1.25. NO ALTERNATIVES FOR EQUIPMENT SHALL BE ACCEPTED PRIOR TO THE TENDER QUESTION DEADLINE.
1.26. IDENTIFY ALL SYSTEMS AND LABEL ALL EQUIPMENT WITH LAMACOID LABELS. IDENTIFY REMOTE CONTROLS FOR ALL PERTINENT EQUIPMENT INCLUDING ALL ASSOCIATED DISCONNECTS.
1.27. PRODUCTS NOT SPECIFICALLY SPECIFIED SHALL BE OF A QUALITY CONSISTENT WITH THE REMAINDER OF THE SPECIFICATION.
1.28. PROVIDE OVERSIZED PIPE HANGERS AND INSULATION SHIELDS FOR INSULATED COLD PIPE. PROVIDE PLASTIC COATED PIPE HANGERS WHERE HANGER IS IN DIRECT CONTACT WITH COPPER PIPE.
1.29. PROVIDE ALL MISCELLANEOUS METALS REQUIRED FOR MECHANICAL WORK.
1.30. PROVIDE DIELECTRIC FITTINGS TO SEPARATE ALL DISSIMILAR METALS.
1.31. PROVIDE AND INSTALL PIPING WITH ALL NECESSARY EXPANSION LOOPS, OFFSETS, GUIDES, JOINTS, ANCHORS ETC. AS MAY BE REQUIRED SO THAT PIPING WILL NOT BE OVERSTRESSED DURING EXPANSION AND CONTRACTION.
1.32. PROVIDE FLASHING AND COUNTER FLASHING FOR ALL DUCTS, PIPES, ETC., PASSING THROUGH EXTERIOR WALLS, WATERPROOF FLOORS AND ROOF.
1.33. PATCH AND SEAL ALL OPENINGS IN FLOORS, WALLS AND PARTITIONS. SEAL ALL VERTICAL SLEEVES AND CORE DRILLED OPENINGS THROUGH ROOF, MECHANICAL ROOMS AND FLOORS ETC. WITH PERMANENTLY RESILIENT WATERPROOF SILICONE BASE SEALING COMPOUND.
1.34. IDENTIFY ALL PIPING WITH STENCILED LETTERS OR COLOR CODES AND DIRECTIONAL ARROWS.
1.35. PROVIDE MANUFACTURER'S START-UP OF ALL MAJOR EQUIPMENT. MANUFACTURER REPRESENTATIVE TO PROVIDE WRITTEN CONFIRMATION THAT EQUIPMENT IS PROPERLY INSTALLED AND TESTED IN ACCORDANCE WITH MANUFACTURER'S REPRESENTATIVES.
1.36. CONTRACTOR SHALL COORDINATE WORK SO THAT AS MUCH CONTROLS WORK AS POSSIBLE IS COMPLETED PRIOR TO INSTALLATION OF NEW EQUIPMENT. DELAY COSTS THAT RESULT FROM FAILURE TO DO THIS SHALL BE INCURRED AT THE CONTRACTORS COST.
1.37. FOR DEFINITIONS REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-00-P01942 HIGHVIEW MECHANICAL DISTRIBUTION REPLACEMENT PROJECT.
1.38. FOR HAZARDOUS MATERIALS REFERENCE THE HIGHVIEW ELEMENTARY SCHOOL MECHANICAL DISTRIBUTION REPLACEMENT DESIGNATED SUBSTANCES AUDIT REPORT BY MTE CONSULTANTS INC., DATED FEBRUARY 22, 2024, AND SPECIFICATION SECTION 02 82 00 ASBESTOS ABATEMENT FOR HIGHVIEW ELEMENTARY SCHOOL MECHANICAL DISTRIBUTION REPLACEMENT PROJECT BY MTE CONSULTANTS INC..
1.39. FOR PAYMENT TERMS REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-00-P01942 HIGHVIEW MECHANICAL DISTRIBUTION REPLACEMENT PROJECT.
1.40. FOR INSURANCE, BONDING AND WSIB REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-00-P01942 HIGHVIEW MECHANICAL DISTRIBUTION REPLACEMENT PROJECT.
1.41. INCLUDE FOR ANY AND ALL CURRENT HEALTH & SAFETY REQUIREMENTS AS PER THE PROVINCE OF ONTARIO.
1.42. FOR RE-USE OF HOLDBACK REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-00-P01942 HIGHVIEW MECHANICAL DISTRIBUTION REPLACEMENT PROJECT. ACCESS TO SCHOOL WASHROOMS IS NOT AVAILABLE. VENDORS NEED TO HAVE THEIR OWN PORTABLE TOILET. LOCATION TO BE PROVIDED BY THE SUCCESSFUL VENDOR AND REVIEWED/APPROVED BY HWDSB VIA EMAIL PRIOR TO CONSTRUCTION.
1.44. USE OF THE SCHOOL'S ELECTRICAL SERVICE IS ALLOWED TO FACILITATE THE SCOPE OF WORK, IF REQUIRED AND APPROVED VIA EMAIL BY HWDSB.
1.45. PARKING IS ALLOWED ON PROPERTY DURING THE SUMMER, AFTER SCHOOL HOURS AND ON WEEKENDS. FOR PARKING DURING THE SCHOOL YEAR/DAY SUCCESSFUL VENDORS ARE TO PROVIDE A LOCATION FOR REVIEW /APPROVAL BY HWDSB.
1.46. SMOKING, VAPING, DRUGS AND ALCOHOL ARE NOT PERMITTED ON SCHOOL PROPERTY. ANYONE SEEN DOING THESE WILL BE REMOVED FROM THE PROPERTY AND NOT ALLOWED BACK.

- 1.47. FOR SCHOOL ACCESS REQUIREMENTS REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-00-P01942 HIGHVIEW MECHANICAL DISTRIBUTION REPLACEMENT PROJECT.
1.48. CONTRACTOR TO PROVIDE CONSTRUCTION SIGNAGE, FENCING, ETC. AS REQUIRED TO FACILITATE SCOPE OF WORK.
1.49. CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY INCLUDING FLAG PERSONS, SAFETY LOGS, MEETINGS, ETC.
1.50. CONTRACTOR IS RESPONSIBLE FOR SITE SECURITY INCLUDING SECURING EQUIPMENT, MATERIAL ETC. SECURITY OF ANY MATERIALS, EQUIPMENT, PORTABLE TOILETS, GARBAGE BINS, VEHICLES ETC. ARE THE CONTRACTOR'S RESPONSIBILITY.
1.51. HWDSB CARETAKING EQUIPMENT IS NOT TO BE USED BY GENERAL CONTRACTOR OR SUBTRADEES.
1.52. CONTRACTOR TO FOLLOW ALL CITY OF HAMILTON BY-LAWS IN TERMS OF NOISE, DUST, DEBRIS ETC., AS REQUIRED TO FACILITATE SCOPE OF WORK.
1.53. CONTRACTOR TO PROVIDE MUD MATS, STREET CLEANING REQUIREMENTS ETC. TO ENSURE THE SURROUNDING COMMUNITY HAS THE LEAST DISTURBANCE FROM CONSTRUCTION, AS REQUIRED TO FACILITATE SCOPE OF WORK.

2. COMPLETION OF CONTRACT

- 2.1. ALL EQUIPMENT MUST BE CLEANED AND TESTED BEFORE FINAL ACCEPTANCE BY CONSULTANT.
2.2. PRIOR TO CONTACTING THE CONSULTANT FOR FINAL INSPECTION, THE CONTRACTOR MUST CORRECT ALL DEFICIENCIES AS SPECIFIED ON THE DEFICIENCY LIST.
2.3. ANY DEFECTS OR DEFICIENCIES WHICH ORIGINATE OR BECOME EVIDENT DURING THE WARRANTY PERIOD MUST BE REPAIRED OR CORRECTED AT NO COST TO THE OWNER.

3. AS-BUILT DRAWINGS

- 3.1. AT THE COMPLETION OF WORK AND BEFORE FINAL ACCEPTANCE, PROVIDE AS-BUILT DRAWINGS OF THE INSTALLATION IN AUTO CAD FORMAT. DRAWING FILES CAN BE OBTAINED FROM THE CONSULTANT.
3.2. INCORPORATE ALL CHANGES AND DEVIATIONS FROM THE TENDER DRAWINGS, UTILIZING NORMAL RECOGNIZED DRAFTING PROCEDURES THAT MATCH THE ORIGINAL DRAFTING METHODOLOGY.
3.3. ALL CONCEALED PIPING RUNS, VALVE AND DAMPER LOCATIONS, SERVICE LOCATIONS, ETC. MUST BE REFLECTED ON THE DRAWINGS.
3.4. REMOVE THE MECHANICAL ENGINEER'S STAMP AND COMPANY NAME FROM ALL DRAWINGS. CLEARLY INDICATE THE WORDS "AS-BUILT" IN THE TITLE BLOCK COLUMN OF THE DRAWINGS AS WELL AS THE MECHANICAL CONTRACTOR'S NAME AND ADDRESS.
3.6. SUBMIT A PRINT TO CONSULTANT TO REVIEW. WHEN FOUND ACCEPTABLE BY THE CONSULTANT, SUBMIT DIGITAL COPIES AND CAD FILES.

4. OPERATION AND MAINTENANCE MANUALS

- 4.1. PROVIDE DIGITAL OPERATION AND MAINTENANCE MANUALS. INCLUDE THE FOLLOWING INFORMATION IN THE OPERATION AND MAINTENANCE MANUALS:
-TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS, COMPONENT ILLUSTRATIONS, ELECTRICAL DIAGRAMS, TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS.
-ADVERTISING OR SALES LITERATURE IS NOT ACCEPTABLE.
-CONSULTANTS REVIEWED SHOP DRAWINGS.
-CERTIFICATE(S) OF ACCEPTANCE FROM AUTHORITIES HAVING JURISDICTION.
-VERIFICATION REPORTS AND CERTIFICATE(S) FOR ANY NEW LIFE SAFETY COMPONENTS OR TIE-INS TO ANYBASE BUILDING SYSTEMS. (AIR BALANCING REPORTS)
-WRITTEN GUARANTEE.
-AS-BUILT DRAWINGS.
4.1. REVIEW INFORMATION PROVIDED IN THE MAINTENANCE INSTRUCTIONS AND MANUALS WITH HWDSB MAINTENANCE AND PROVIDE TRAINING WHERE BASE BUILDING SYSTEMS ARE REVISED, TO ENSURE A COMPLETE UNDERSTANDING OF THE MECHANICAL EQUIPMENT AND SYSTEMS AND THEIR OPERATION.

5. PLUMBING & HYDRONIC

- 5.1. PROVIDE COMPLETE PLUMBING AND DRAINAGE SYSTEMS INCLUDING ALL NECESSARY LABOUR, SERVICES, PRODUCTS, MATERIALS AND EQUIPMENT.
5.2. PROVIDE ALL WORK IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO PLUMBING CODE AND ALL AUTHORITIES HAVING JURISDICTION INCLUDING ALL APPLICABLE BY-LAWS.
5.3. ABOVE GROUND SANITARY DRAINAGE AND VENT PIPING 2" AND SMALLER SHALL BE DWV COPPER PIPE WITH DRAINAGE FITTINGS AND 95/5 TIN/ANTIMONY SOLDER JOINTS. SYSTEM XFR 15-50 PIPING AND FITTINGS BY W/PEX IN ACCORDANCE WITH CANULC S102.2 AND CGCS 8181.2, IS ACCEPTABLE IN LIEU OF COPPER DRAINAGE PIPING. PROVIDE APPROVED FIRESTOP DEVICES AND MATERIALS WHERE PENETRATING FLOORS. PVC DR 35 GRAVITY SEWER PIPE WITH SOLVENT JOINTS IS ACCEPTABLE FOR BELOW GRADE DRAINAGE PIPING.
5.4. ABOVE GROUND DOMESTIC WATER PIPING SHALL BE TYPE "L" HARD COPPER WITH WROUGHT COPPER FITTINGS AND 95/5 TIN/ANTIMONY SOLDER JOINTS. TYPE "K" PIPING SHALL BE USED BELOW GROUND.
5.5. PROVIDE AND COVER ALL DOMESTIC WATER PIPING, VALVES, FITTINGS, APPURTENANCES, ETC. WITH RIGID PREFORMED FIBRE GLASS INSULATION. PROVIDE VAPOUR BARRIER FOR COLD WATER PIPING. INSULATION SHALL BE 1" THICK FOR COLD WATER PIPING AND FOR HOT WATER AND HOT WATER RECIRCULATING PIPING. DO NOT USE STAPLES. ENSURE COMPLETE COVERAGE AND SEAL WITH AN APPROVED VAPOUR BARRIER CEMENT. MAINTAIN THE INTEGRITY OF ALL EXISTING THERMAL INSULATION WHEN CONNECTING NEW PIPING TO EXISTING PIPING. PROVIDE PVC JACKETING FOR ALL EXPOSED PIPE INSULATION.
5.6. APPLY ONE-PIECE MOLDED TYPE PVC JACKET TO ALL INSULATED PIPING SERVICES IN EXPOSED AREAS. USE SOLVENT WELD ADHESIVE COMPATIBLE WITH INSULATION TO SEAL LAP AND JOINTS. JACKETING TO BE PAINTED BY GENERAL TRADES.
5.7. PROVIDE BALL VALVES AT PIPING CONNECTIONS TO ALL EQUIPMENT TO ALLOW EQUIPMENT TO BE REMOVED FOR SERVICING. PROVIDE BALL VALVES ON ALL MAIN AND BRANCH DOMESTIC WATER PIPING LINES. PROVIDE CHECK VALVES ON SUPPLY SIDE OF EQUIPMENT.

6. TESTING, BALANCING, ADJUSTING AND COMMISSIONING

- 6.1. PROVIDE TESTING, BALANCING AND COMMISSIONING OF ALL SYSTEMS. COMMISSIONING SHALL INCLUDE PUTTING INTO SERVICE, ADJUSTING, CALIBRATING AND VERIFYING ALL SYSTEMS, BOTH NEW AND EXISTING.
6.2. PROVIDE AN INDEPENDENT BALANCING COMPANY ACCEPTABLE TO THE CONSULTANT TO TEST, BALANCE AND ADJUST THE WATER SYSTEMS.
1. PERFORM TOTAL MECHANICAL SYSTEMS TESTING, ADJUSTING, AND BALANCING. REQUIREMENTS INCLUDE MEASUREMENT AND ESTABLISHMENT OF THE FLUID QUANTITIES OF THE MECHANICAL SYSTEMS AS REQUIRED TO MEET DESIGN SPECIFICATIONS AND COMFORT CONDITIONS, AND RECORDING AND REPORTING THE RESULTS.
2. MECHANICAL SYSTEMS TO BE TESTED, ADJUSTED AND BALANCED INCLUDE:
1. HEATING SYSTEMS: TAB OF HEATING SYSTEMS IS TO INCLUDE ALL PIPING AND EQUIPMENT FLUID TEMPERATURES, FLOWS AND CONTROL, AND IF TAB IS NOT DONE DURING THE HEATING SEASON, A FOLLOW-UP SITE VISIT DURING THE HEATING SEASON WILL BE REQUIRED TO CONFIRM PROPER FLOWS AND TEMPERATURES, AND ANY REQUIRED SYSTEM "FINE TUNING".
3. PREPARATION OF REPORTS: PREPARE REPORTS AS INDICATED BELOW.
1. DRAFT REPORTS: UPON COMPLETION OF TESTING, ADJUSTING, AND BALANCING PROCEDURES, PREPARE DRAFT REPORTS ON A4BC OR NEBB FORMS. DRAFT REPORTS MAY BE HANDWRITTEN, BUT MUST BE COMPLETE, FACTUAL, ACCURATE, AND LEGIBLE. ORGANIZE AND FORMAT DRAFT REPORTS IN THE SAME MANNER SPECIFIED FOR THE FINAL REPORTS. SUBMIT TWO COMPLETE SETS OF DRAFT REPORTS. ONLY ONE COMPLETE SET OF DRAFT REPORTS WILL BE RETURNED.
2. FINAL REPORT: UPON VERIFICATION AND APPROVAL OF DRAFT REPORTS, PREPARE FINAL REPORTS, TYPE WRITTEN, AND ORGANIZED AND FORMATTED AS SPECIFIED BELOW. SUBMIT 2 COMPLETE SETS OF FINAL REPORTS, USE UNITS OF MEASUREMENT (SI OR IMPERIAL) AS USED ON THE PROJECT DOCUMENTS.

7. CONTROLS

- 7.1. PROVIDE ALL CONTROLS, INCLUDING WIRING, APPROVED PLENUM CABLE, FITTINGS, THERMOSTATS, RELAYS AUTOMATIC CONTROL VALVES, TRANSFORMERS, DAMPERS, FIRE STATS, FREEZE STATS, SWITCHES AND ACCESSORIES AS REQUIRED FOR COMPLETELY OPERATIONAL SYSTEMS. PROVIDE ALL NECESSARY CONNECTIONS, INTERLOCKS AND COMPONENTS FROM MAINS TO DAMPERS, CONTROL VALVES, THERMOSTATS, AND CARBON DIOXIDE SENSORS OR ANY OTHER DEVICES AS REQUIRED.
7.2. ALL EXPOSED WIRING SHALL BE INSTALLED IN RIGID CONDUIT. WIRING INSTALLED ABOVE ACCESSIBLE CEILINGS SHALL BE SECURED TO STRUCTURAL MEMBERS. WIRING SHALL NOT BE SECURED TO MECHANICAL OR ELECTRICAL EQUIPMENT OR DEVICES, AND SHALL NOT BE REST ON CEILING TILES. ALL THERMOSTAT WIRING LOCATED WITHIN PARTITION WALLS SHALL BE INSTALLED IN RIGID CONDUIT.
7.3. EQUIPMENT MANUFACTURER TO PROVIDE DDC BASED BOILER CONTROLLER AND THE FOLLOWING LIST OF SENSORS TO FACILITATE BOILER SEQUENCE OF OPERATION LISTED BELOW:
BOILER CONTROL:
- DISCHARGE WATER TEMPERATURE
- OUTDOOR AIR TEMPERATURE
- RETURN WATER TEMPERATURE
- PIPE DIFFERENTIAL PRESSURE SENSOR
- FLOW SENSOR
- CONDENSATE OVERFLOW
7.4. PROVIDE ALL CONNECTIONS AND DEVICES NECESSARY TO INTERLOCK OR MAINTAIN THE INTENT OF ALL ERIMETER HVAC SYSTEMS AND ASSOCIATED ZONE CONTROL OF PERIMETER HEATING SYSTEM AS REQUIRED.
7.5. ALL CONTROL WORK SHALL BE PERFORMED BY SIEMENS.
JAKE RENDULIC, ACCOUNT EXECUTIVE BUILDING AUTOMATION SIEMENS CANADA LTD.
SMART INFRASTRUCTURE 28 TORONTO ST.
1577 NORTH SERVICE ROAD EAST, OAKVILLE, ON L6H 0H6
TEL: 905-465-7208
FAX: 905-465-8167
MOBILE: 905-541-7433 (PRIMARY #)
MAILTO: JAKE.RENDULIC@SIEMENS.COM

8. NATURAL GAS & HYDRONICS

- NATURAL GAS PIPING:
8.1. CONFORM TO CSA B149.1 NATURAL GAS AND PROPANE INSTALLATION CODE
8.2. PROVIDE TWO REPACKING KITS FOR EACH SIZE VALVE.
8.3. ABOVE GROUND PIPING
8.3.1. COPPER TUBING: ASTM B88, TYPE K, HARD DRAWN.
8.3.1.1. FITTINGS: ASME B16.18, CAST COPPER ALLOY OR ASTM B16.22 WROUGHT COPPER AND BRONZE.
8.3.1.2. JOINTS: AWS A5.8 CLASSIFICATION BCUP-3 OR BCUP-4 SILVER BRAZE.
8.3.2. STEEL PIPE: ASTM A53/A53M GR. B, ERW OR A106 SMLS, SCHEDULE 40.
8.3.2.1. FITTINGS: ASTM B16.3, MALLEABLE IRON CLASS 150, SCREWED OR FLANGED OR ASTM A234/A234M, WROUGHT CARBON STEEL AND ALLOY STEEL WELDING TYPE.
8.3.2.2. JOINTS: NFPA 30, THREADED, FLANGED OR WELDED TO ANSI B31.1.
8.3.2.2.1. ILLUSTRATED TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS.
8.3.2.2.2. WELDED FITTINGS: BUTT-WELDING FITTINGS TO CSA W47.1.
8.3.2.2.3. FLANGE GASKETS: NON-METALLIC FLAT, TO ASME B16.5.
8.3.2.2.4. UNIONS: MALLEABLE IRON, BRASS TO IRON, GROMMET SEAT, TO ASTM A 47/A47M.
8.3.2.2.5. BOLTS AND NUTS: TO ASME B18.2.1
8.3.2.2.6. NIPPLES: SCHEDULE 40, TO ASTM A53/A53M.
8.4. ISOLATION VALVES
8.4.1. 2" (50 MM) AND SMALLER: SEMI-STEEL LUBRICATED PLUG VALVES, SCREWED, WRENCH OPERATED, ROCKWELL "NORDSTRUM" FIG. 142, NEWMAN-MILLIKEN 170M.
8.4.2. 2-1/2" (65 MM) AND 3" (75 MM): SEMI-STEEL LUBRICATED PLUG VALVES, FLANGED, WRENCH OPERATED, ROCKWELL "NORDSTRUM" FIG. 143, NEWMAN-MILLIKEN 171M.
8.4.3. PROVIDE TWO (2) STANDARD PATTERN, CAST HANDLE WRENCHES TO OPERATE VALVES.
8.5. HYDRONIC SYSTEMS TO 150 PSIG, ABOVE GROUND
8.5.1. NOMINAL OPERATING PRESSURE 125 PSIG
8.5.2. DESIGN PRESSURE 150 PSIG
8.5.3. TEST PRESSURE 225 PSIG
8.5.4. DESIGN TEMPERATURE 350°F
8.5.5. CORROSION ALLOWANCE 0.0625 IN.
8.5.6. STEEL PIPE ASTM A53 GR. B ERW OR ASTM A106 GR.B SMLS, SCH 40.
8.5.7. JOINTS: SOLDER, LEAD FREE, ASTM B32, 95-5 TIN-ANTIMONY, OR TIN AND SILVER, WITH SCREWED FITTINGS 150 LB. MALLEABLE IRON UNIONS/CL.150, ASTM A-47 MALLEABLE IRON, ASTM A-153 GALVANIZED, ANSI B2.1 THREADED.
8.5.1. JOINTS, 2-1/2" AND LARGER WELDED, WITH FLANGES AT CONNECTIONS TO EQUIPMENT
8.5.12. FLANGES ASTM A105, CLASS 150, RAISED FACE, WELD NECK OR SLIP ON
8.5.13. BOLTS ASTM A307 C.S. BOLTS, SQ. HEAD; ASTM A563 NUTS, HEX HEAD
8.5.14. GASKETS 1/16" (1.6 MM) THICK PREFORMED NON-ASBESTOS GRAPHITE FIBRE.
8.5.15. COPPER TUBING, 2" AND SMALLER ASTM B88, TYPE L, HARD DRAWN.
8.5.16. JOINTS: SOLDER, LEAD FREE, ASTM B32, 95-5 TIN-ANTIMONY, OR TIN AND SILVER, WITH MELTING RANGE 220°C TO 280°C
8.5.17. FITTINGS: ASME B16.18, CAST BRASS, OR ASME B16.22, SOLDER WROUGHT COPPER DIELECTRIC UNIONS; UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.
8.5.19. VALVES: 2" AND SMALLER ASTM A105
8.6. GATE VALVES (ISOLATING) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, SOLID W EDGE DISC, RISING STEM, BRONZE TRIM, THREADED ENDS, KITZ #25
8.7. GLOBE VALVES (THROTTLING) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, COMPOSITION (TEFLON) DISC, RISING STEM, BRONZE TRIM, THREADED ENDS, KITZ #09
8.8. CHECK VALVES (BACKFLOW) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, Y-PATTERN HORIZONTAL, SWING TYPE DISC, KITZ #29
8.9. BALL VALVES (DRAIN) 600 PSIG NON-SHOCK WOG, FORGED BRASS, 2-PIECE, CHROME BALL AND STEM, FULL PORT, BLOW-OUT PROOF PTFE SEATS & STEM, LEVER

9. BOILER SEQUENCE OF OPERATION

- 9.1. SYSTEM ENABLE: THE HEATING SYSTEM WILL AUTOMATICALLY START WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW THE SYSTEM ENABLE SET-POINT (18 °C - USER ADJUSTABLE). WHEN THE OUTSIDE AIR TEMPERATURE RISES ABOVE THIS SET-POINT THE HEATING SYSTEM WILL BE DISABLED.
9.2. BOILER HEATING WATER SUPPLY TEMPERATURE CONTROL
1. SUPPLY WATER TEMPERATURE WILL BE SCHEDULED BASED ON OUTSIDE AIR TEMPERATURES. OUTDOOR AIR RESET SCHEDULE AS FOLLOWS:
OAT = -15 °C, HWS = 80 °C
OAT = 0 °C, HWS = 50 °C
OAT = 15 °C, HWS = 40 °C
2. BOILERS TO CONTROL TO HEATING WATER SUPPLY TEMPERATURE AS SENSED BY T1. IN UNOCCUPIED MODE, THE SUPPLY WATER TEMPERATURE SET-POINT SHALL BE REDUCED BY A PRE-DETERMINED AMOUNT. AN EXTERNAL DEMAND SIGNAL SHALL OVERRIDE THIS SET-POINT TO PRE-DETERMINED VALUES.
3. CONTROL LOGIC SHALL BE EQUIPPED TO PROTECT THE HEATING SYSTEM FROM FREEZE-UP IF LEFT POWERED DURING THE OFF SEASON.
9.3. EAST & SOUTH WING HEATING WATER SUPPLY TEMPERATURE CONTROL
1. SUPPLY WATER TEMPERATURE WILL BE SCHEDULED BASED ON OUTDOOR AIR TEMPERATURE. OUTDOOR AIR RESET SCHEDULE AS FOLLOWS:
OAT = -15 °C, HWS = 80 °C
OAT = 15 °C, HWS = 60 °C
2. 3-WAY MIXING VALVES V1 & V2 TO CONTROL TO SCHEDULED HEATING WATER SUPPLY TEMPERATURE AS SENSED BY T2 & T3 RESPECTIVELY.
3. IN UNOCCUPIED MODE THE SUPPLY WATER TEMPERATURE SET-POINT SHALL BE REDUCED BY A PRE-DETERMINED AMOUNT. AN EXTERNAL DEMAND SIGNAL SHALL OVERRIDE THIS SET-POINT TO PRE-DETERMINED VALUES.
4. CONTROL LOGIC SHALL BE EQUIPPED TO PROTECT THE HEATING SYSTEM FROM FREEZE UP IF LEFT POWERED DURING THE OFF-SEASON.
9.4. FAULT MANAGEMENT
1. IF A FAULT OCCURS ON A BOILER, THE FAULT CODE SHALL BE INDICATED IN THE DISPLAY WINDOW AND BY THE FLASHING RED FAULT LAMP. A COMPILLED FAILURE ALARM CONTACT SHALL CLOSE IN ORDER TO SIGNAL THE ALARM CONDITION TO A BUILDING AUTOMATION SYSTEM (BAS). THE MESSAGE SHALL ALSO BE BROADCASTED ON THE LOW COMMUNICATION BUS. THE ERROR HISTORY SHALL BE SAVED TO MEMORY.
9.5. BOILER ROTATION
1. THE BOILERS SHALL BE ROTATED ACCORDING TO AN EQUAL RUN-TIME STRATEGY OR ON A SCHEDULE EVERY 200 TO 2000 HOURS (USER ADJUSTABLE). A DRY CONTACT SHALL BE INCORPORATED TO MAKE THE CURRENT LEAD BOILER THE LAG BOILER WHENEVER CONTACT IS CLOSED.

9.6. AUXILIARY INPUTS

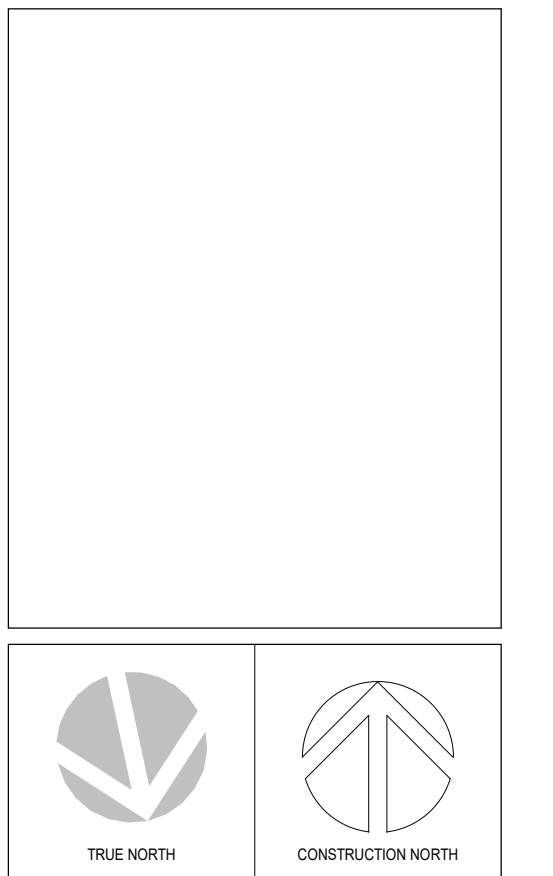
- 1. THE FOLLOWING DRY CONTACT INPUTS SHALL BE AVAILABLE TO BE WIRED TO EACH BOILER TO CONTROL THE FOLLOWING FUNCTIONS (FUNCTIONALITY DEPENDANT ON OPERATING MODE):
1.1. BOILER DISABLE.
1.2. CHANGE BETWEEN MODULATING TO STAGED BURNER CONTROL.
1.3. EXTERNAL HEAT DEMAND.
1.4. BOILER SEQUENCING.
1.5. EXTERNAL ENABLE.
1.6. EXTERNAL BLOCKING.
1.7. HEATING PROGRAM CHANGEOVER.
9.7. BOILER SYSTEM PUMPS
1. PROVIDE START/STOP CONTROL AND STATUS INDICATION FOR ALL PUMPS.
2. TOTALIZE RUN TIME AND ALARM WHEN AN OPERATOR PREDETERMINED TIME LIMIT HAS BEEN EXCEEDED.
3. PROVIDE ROTATING LEAD/LAG/STANDBY AUTOMATIC CONTROL. START THE LAG PUMP ON A FAILURE OF THE LEAD PUMP. INITIATE AN ALARM ON PUMP FAILURE.
4. BOILER PUMP CONTROL: WHEN ENABLED, THE PRIMARY PUMP FOR THE LEAD BOILER WILL BE STARTED. ONCE PRIMARY BOILER PUMPS ARE PROVED ON (THROUGH FEEDBACK FROM FLOW SENSOR) THE LEAD SECONDARY BOILER PUMPS ARE ENABLED. AFTER THE BOILER IS COMMANDED OFF, THE PUMPS WILL CONTINUE TO RUN FOR A PERIOD OF 10 MINUTES TO ALLOW THE EQUIPMENT TO COAST DOWN. IF THE PUMP STATUS DOES NOT MATCH THE COMMAND, AN ALARM WILL BE GENERATED AND THE PUMP WILL BE STOPPED. UPON LOSS OF STATUS, THE PUMP WILL RESTART AFTER THE SYSTEM RESET IS ACTIVATED.
5. SECONDARY BOILER PUMP SPEED CONTROL (EX. P-1 & EX. P-2):
1. EX. PUMPS P-1 & P-2 TO CONTROL TO EXISTING DIFFERENTIAL PRESSURE SENSORS LOCATED IN THE EAST AND SOUTH WING HEATING WATER LOOPS. PUMPS ARE TO CONTROL SPEED TO SATISFY THE WORSE CASE SCENARIO (HIGHEST DIFFERENTIAL PRESSURE REQUIRED) BETWEEN THE 2 EXISTING SENSORS.
2. SHOULD A DECREASE BELOW SYSTEM DIFFERENTIAL SENSOR SET-POINT BE SENSED, PUMPS SPEED TO INCREASE TO SATISFY DIFFERENTIAL PRESSURE SET-POINT. SHOULD AN INCREASE IN DIFFERENTIAL PRESSURE SET-POINT BE SENSED, PUMPS SPEED TO DECREASE TO SATISFY DIFFERENTIAL PRESSURE SET-POINT.
3. SECONDARY PUMPS TO OPERATE IN LEAD/LAG/STANDBY CONFIGURATION.
4. SYSTEM DIFFERENTIAL PRESSURE SET-POINTS TO BE DETERMINE BY BALANCER THROUGH COMPLETE SYSTEM HYDRONIC BALANCING TO THE CLOSE-OUT OF THIS PROJECT.
9.8. BAS POINTS LIST
1. EAST WING HEATING WATER RETURN TEMPERATURE (T6)
2. EAST WING HEATING WATER SUPPLY TEMPERATURE (T2)
3. SOUTH WING HEATING WATER RETURN TEMPERATURE (T7)
4. SOUTH WING HEATING WATER SUPPLY TEMPERATURE (T3)
5. HEATING WATER SYSTEM SUPPLY TEMPERATURE (T1)
6. HEATING WATER SYSTEM RETURN TEMPERATURE (T8)
7. BOILER 1 HEATING WATER SUPPLY TEMPERATURE (T4)
8. BOILER 2 HEATING WATER SUPPLY TEMPERATURE (T5)
9. PUMP P-1 SPEED/ENABLE/STATUS/ALARM
10. PUMP P-2 SPEED/ENABLE/STATUS/ALARM
11. PUMP P-4 SPEED/ENABLE/STATUS/ALARM
12. PUMP P-5 SPEED/ENABLE/STATUS/ALARM
13. PUMP P-6 SPEED/ENABLE/STATUS/ALARM
14. BOILER 1 ENABLE/STATUS/ALARM/FIRING RATE
15. BOILER 2 ENABLE/STATUS/ALARM/FIRING RATE
16. BOILER 1 FLOW RATE (F2)
17. BOILER 2 FLOW RATE (F3)
18. HEATING WATER SYSTEM FLOW RATE (F1)
19. EAST WING MIXING VALVE STATUS/POSITION/ALARM (V1)
20. SOUTH WING MIXING VALVE STATUS/POSITION/ALARM (V2)
21. OUTDOOR AIR TEMPERATURE (EXISTING)
22. SOUTH WING DIFFERENTIAL PRESSURE (EXISTING)
23. EAST WING DIFFERENTIAL PRESSURE (EXISTING)

10. WATER TREATMENT

- 10.1. WATER TREATMENT SHALL BE PERFORMED BY AQUARIAN CHEMICALS INC.:
MAURO CESA
768 WESTGATE ROAD, UNIT 8, OAKVILLE, ONTARIO L6L 5N2
TEL: 416-540-1893
FAX: 905-825-0177
MAILTO: MCESA@AQUARIANCHEMICALS.COM

11. EQUIPMENT & SYSTEM TRAINING

- 11.1. TRAIN THE OWNER'S DESIGNATED PERSONNEL IN ALL ASPECTS OF OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS AS SPECIFIED IN MECHANICAL WORK SECTIONS OF THE SPECIFICATION. ALL DEMONSTRATIONS AND TRAINING IS TO BE PERFORMED BY QUALIFIED TECHNICIANS EMPLOYED BY THE EQUIPMENT/SYSTEM MANUFACTURER/SUPPLIER.
11.2. FOR EACH ITEM OF EQUIPMENT AND FOR EACH SYSTEM FOR WHICH TRAINING IS SPECIFIED, PREPARE TRAINING MODULES AS SPECIFIED BELOW. OPERATING AND MAINTENANCE MANUALS ARE TO BE USED DURING THE TRAINING SESSIONS, AND TRAINING MODULES ARE TO INCLUDE:
1. OPERATIONAL REQUIREMENTS AND CRITERIA: REQUIREMENTS AND CRITERIA ARE TO INCLUDE BUT NOT BE LIMITED TO EQUIPMENT FUNCTION, STOPPING AND STARTING, SAFETIES, OPERATING STANDARDS, OPERATING CHARACTERISTICS, PERFORMANCE CURVES, AND LIMITATIONS.
2. TROUBLESHOOTING: TROUBLESHOOTING IS TO INCLUDE BUT NOT BE LIMITED TO DIAGNOSTIC INSTRUCTIONS, TEST AND INSPECTION PROCEDURES.
3. DOCUMENTATION: DOCUMENTATION IS TO INCLUDE BUT NOT BE LIMITED TO EQUIPMENT/SYSTEM WARRANTIES, AND MANUFACTURER'S/SUPPLIER'S PARTS AND SERVICE FACILITIES, TELEPHONE NUMBERS, EMAIL ADDRESSES, AND THE MAINTENANCE, MAINTENANCE REQUIREMENTS ARE TO INCLUDE BUT NOT BE LIMITED TO INSPECTION INSTRUCTIONS, TYPES OF CLEANING AGENTS TO BE USED AS WELL AS CLEANING METHODS, PREVENTIVE MAINTENANCE PROCEDURES, AND USE OF ANY SPECIAL TOOLS.
5. REPAIRS: REPAIR REQUIREMENTS ARE TO INCLUDE BUT NOT BE LIMITED TO DIAGNOSTIC INSTRUCTIONS, DISASSEMBLY, COMPONENT REMOVAL AND REPAIR INSTRUCTIONS, INSTRUCTIONS FOR IDENTIFYING PARTS AND COMPONENTS, AND REVIEW OF ANY SPARE PARTS INVENTORY.
11.3. ASSEMBLE THE TRAINING MODULES INTO A TRAINING MANUAL AND SUBMIT A COPY TO THE CONSULTANT FOR REVIEW PRIOR TO SCHEDULING TRAINING. ENSURE THAT EACH PARTICIPANT IN EACH TRAINING SESSION HAS ALL REQUIRED TRAINING MATERIAL.
11.4. SCHEDULE DEMONSTRATIONS AND TRAINING AT MUTUALLY AGREED TO TIMES WITH A MINIMUM OF SEVEN WORKING DAYS NOTICE.



KEY PLAN



Table with 2 columns: No., Description, Date. Includes revision history for 'ISSUED FOR TENDER', 'ISSUED FOR PERMIT', 'ISSUED FOR FINAL REVIEW', and 'ISSUED FOR 90% PROGRESS SET'.

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PLACEHOLDER IMAGE. REPLACE IN TITLEBLOCK FAMILY. SEE TAB 2.

SEAL

CONSULTANTS

PROJECT: HAMILTON WENTWORTH DISTRICT SCHOOL BOARD (HWDSB)

HIGHVIEW ELEMENTARY SCHOOL - 1040 QUEENSDALE AVENUE EAST, HAMILTON, ON

DRAWING TITLE: MECHANICAL SPECIFICATIONS

Table with 2 columns: DRAWN BY, CHECKED BY, PROJECT NO., DRAWING NO. Values: Author, Checker, 23082, M6.01

DATE: 23/04/20 SCALE: 1:1

PROJECT NO: 23082 DRAWING NO: M6.01