

GENERAL NOTES

- THE CONTRACTOR SHALL CO-ORDINATE WITH STRUCTURAL TO PROVIDE OPENINGS AND SLEEVES THROUGH STRUCTURAL ELEMENTS WHERE REQUIRED.
- DO NOT SCALE DRAWINGS FOR INSTALLATION PURPOSES. OBTAIN ALL DIMENSIONS FROM 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 INTERFERENCE'S BETWEEN PIPING, DUCTWORK, CONDUIT, LIGHTING FIXTURES, ETC.
- WORK SHALL BE CO-ORDINATED THROUGH THE GENERAL CONTRACTOR PRIOR TO INSTALLATION OF ANY EQUIPMENT, PIPING AND CONTROLS.
- PROPERLY SUPPORT CEILING MOUNTED EQUIPMENT AND ANY OTHER EQUIPMENT INDEPENDENT OF CEILING SUPPORT SYSTEM. CO-ORDINATE WITH STRUCTURAL TRADE.
- REFER TO MECHANICAL PLANS FOR OWNER SUPPLIED EQUIPMENT. CONFIRM ALL MECHANICAL REQUIREMENTS AND PROVIDE TO SUIT.
- REVIEW MECHANICAL, ELECTRICAL, AND STRUCTURAL DRAWINGS 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.
- 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.
- 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.
- RECONNECT VENTS FROM EXISTING EQUIPMENT AND PLUMBING FIXTURES WHICH ARE TO REMAIN TO NEW VENTS AS REQUIRED.
- 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.
- ALL WATER 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 AS REQUIRED TO FACILITATE ISOLATION AND MAINTENANCE OF INSTALLED EQUIPMENT AND SYSTEMS.

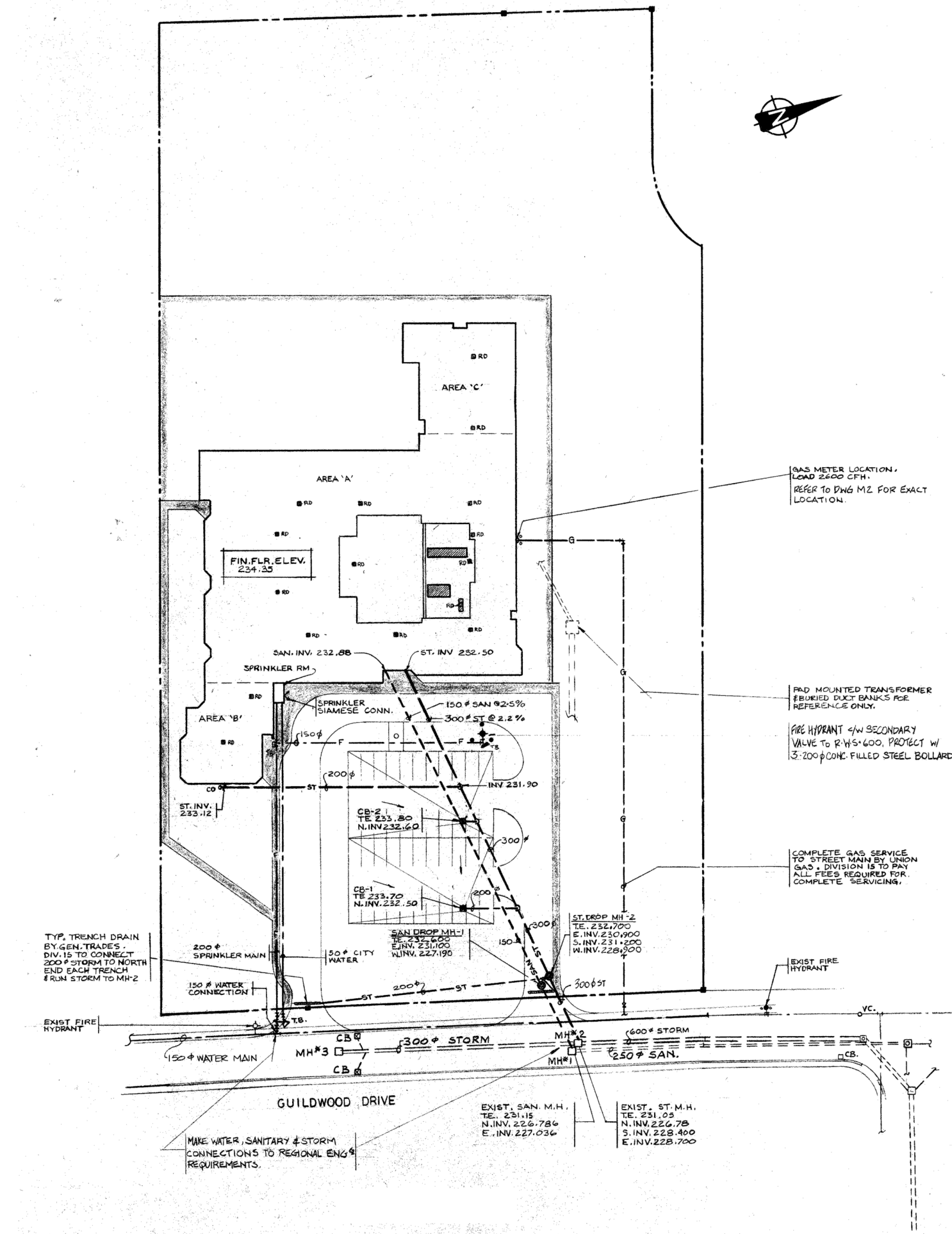
GENERAL DEMOLITION NOTES

- 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 BY PROVIDING CONSTRUCTION HOODING OR SUFFICIENT MEANS OF PROTECTION TO THE SATISFACTION OF THE CLIENT (HWDSB).
- 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
(TS)	TEMPERATURE SENSOR	AD	ACCESS DOOR
(CB)	REVERSE ACTING THERMOSTAT	CB	CATCHBASIN
(CBV)	STATIC PRESSURE SENSOR	CBV	CIRCUIT BALANCING VALVE
(V)	VENT	CTE	CONNECT TO EXISTING
(Q)	FLOOR DRAIN	ESH	EMERGENCY SHOWER
(L)	CAP/PLUG	EX	EXISTING
(=)	CLEANOUT-IN LINE OR STACK	FD	FIRE DAMPER/FLOOR DRAIN
(=)	PIPE ELBOW DOWN	FFD	FUNNEL FLOOR DRAIN
(=)	PIPE BOTTOM TAKE OFF	GPM	GALLONS PER MINUTE
(=)	PIPE ELBOW UP	HD	HUB DRAIN
(=)	PIPE BOTTOM TAKE OFF	INV. ELEV.	INVERT ELEVATION
(=)	FLEXIBLE CONNECTION	LSV	LOCKED SERVICE VALVE
(=)	UNION	PF	PLUMBING FIXTURE
(=)	THERMOMETER	RWL	RAIN WATER LEADER
(=)	PUMP	SMV	SHOWER MIXING VALVE
(=)	PIPE FLOW DIRECTION	SS	SOIL STACK
(=)	BALANCING VALVE	TYP.	TYPICAL
(=)	BUTTERFLY VALVE	VS	VENT STACK
(=)	CHECK VALVE	DCW	DOMESTIC COLD WATER
(=)	ISOLATING (SHUT-OFF) VALVE	DHW	DOMESTIC HOT WATER
(=)	STRAINER	SAN	SANITARY DRAIN
(=)	PRESSURE REGULATING VALVE	HWS	HEATING WATER SUPPLY
(=)	2-WAY MODULATING CONTROL VALVE	HWR	HEATING WATER RETURN
(=)	3-WAY 2-POSITION CONTROL VALVE	CWS	CHILLED WATER SUPPLY
(=)	3-WAY MODULATING CONTROL VALVE	CWR	CHILLED WATER RETURN
(=)	2-WAY 2-POSITION CONTROL VALVE	CTS	COOLING TOWER SUPPLY
(=)	RELIEF VALVE	CTR	COOLING TOWER RETURN
(=)	MANUAL VENT	RCS	RECOVERY CHILLER SUPPLY
(=)	METER	RCR	RECOVERY CHILLER RETURN
(=)		VFD	VARIABLE FREQUENCY DRIVE
(=)		FIS	FLOW SENSOR
(=)		T/S	TEMPERATURE SENSOR
(=)		PD	DIFFERENTIAL PRESSURE SENSOR

MECHANICAL DRAWING LIST				
DWG. No.	DRAWING NAME	CURRENT REVISION	CURRENT REVISION DESCRIPTION	DATE
M0.01	GENERAL NOTES, DRAWING LIST, MECHANICAL LEGEND, SCHEDULES & SITE PLAN	6	ISSUED FOR TENDER	2024/06/05
M1.01	MECHANICAL DEMOLITION PLANS	6	ISSUED FOR TENDER	2024/06/05
M2.01	MECHANICAL PLANS	6	ISSUED FOR TENDER	2024/06/05
M3.01	MECHANICAL SCHEMATICS	6	ISSUED FOR TENDER	2024/06/05
M4.01	DETAILS & DIAGRAMS	6	ISSUED FOR TENDER	2024/06/05
M4.02	DETAILS & DIAGRAMS	6	ISSUED FOR TENDER	2024/06/05
M5.01	MECHANICAL SPECIFICATIONS	6	ISSUED FOR TENDER	2024/06/05
M5.02	MECHANICAL SPECIFICATIONS	1	ISSUED FOR TENDER	2024/06/05



SITE PLAN
N.T.S. M0.01

CHILLED WATER BUFFER TANK SCHEDULE

TAG	MFG	MODEL	FLUID	VOLUME (GAL)	TANK HEIGHT (IN)	DIAMETER (IN)	SHIPPING WEIGHT (lbs)	NOTES
CST-1	WESSELS COMPANY	CBT-700	CHILLED WATER	700	100	48	1500	CONSTRUCTION: SHELL: CARBON STEEL, EXTERIOR: PRIMER PAINTED DESIGN PARAMETERS: MAXIMUM DESIGN PRESSURE: 125 PSIG, TEMPERATURE RANGE: 0°F TO 450°F

PUMP SCHEDULE

TAG	SERVICE	MFG.	MODEL	FLUID	FLOW		HEAD FT OF H2O	PUMP SPEED (RPM)	ELECTRICAL			NOTES			
					L/S	GPM			KW	HP	V		PH	Hz	
P-CW-7	CHILLER	B&G	E-80-4x4x7B	WATER	14.0	222	119.6	40.0	1750	3.7	5	575 V	3	60 Hz	COMPLETE WITH (CW) VFD
P-CW-8	COOLING TOWER	B&G	E-80-4x4x7B	WATER	17.7	281	110.6	37.0	1750	3.7	5	575 V	3	60 Hz	COMPLETE WITH (CW) VFD
P-CW-9	COOLING TOWER	UNITED INDUSTRIES INC.	TOWER-FLO TFSP-065	WATER	17.7	281	110.6	37.0	1750	3.7	5	575 V	3	60 Hz	COMES AS A PACKAGE WITH SIDE STREAM CENTRIFUGAL SEPARATOR MANUFACTURER UNITED INDUSTRIES INC. MODEL TOWER-FLO TFSP-065

CHILLER SCHEDULE

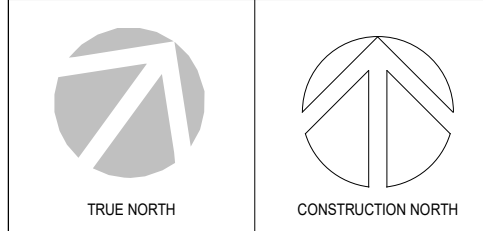
TAG	MFG.	MODEL	COOLING CAPACITY AT 95 F AMBIENT TEMPERATURE			EVAPORATOR FLUID			ELECTRICAL				OPERATING WEIGHT		NOTES	
			REFRIGERANT	KW	Tons	IPLV/IP	TYPE	FLOW RATE	VOLUME	V	PH	HZ	MCA	MOCP		Kg
CH-1	TRANE	RTWD090G222A1A1A2A1A1Y1D02B00A00000000700250DXX****2000	R513A	319	90.71	0.5267 kW/ton	WATER	222	575	3	60	85 A	110 A	2627	5792	WATER COOLED CHILLER, ACCEPTABLE ALTERNATES: WATER FURNACE BY HTS, SMARTD.

COOLING TOWER SCHEDULE

TAG	MFG.	MODEL	COOLING CAPACITY AT 95 F AMBIENT TEMPERATURE			EVAPORATOR FLUID		ELECTRICAL				OPERATING WEIGHT		NOTES
			MEDIUM	KW	Tons	TYPE	FLOW RATE	V	PH	HZ	HP	Kg	lbs	
CT-1	EVAPCO	AT 14-2F9	WATER	330	93.83	WATER	280 GPM	575	3	60	6	1658	3655	CW SIDE STREAM CENTRIFUGAL SEPARATOR MANUFACTURER UNITED INDUSTRIES INC. MODEL TOWER-FLO TFSP-065, CW ELEMENT HEATER, 2 SPACE HEATERS, LADDER AND LADDER EXTENSION, SLIMP SWEEPER PIPING, TWO PREMIUM EFFICIENT MOTORS.

EXHAUST FAN SCHEDULE

TAG	MFG	MODEL	FAN TYPE	AIRFLOW		E.S.P. Pa	I.P.-WG	HP	ELECTRICAL			OPERATING WEIGHT		NOTES
				L/S	CFM				V	PH	Hz	kg	lbs	
EF-5	GREENHECK	SQ-120	INLINE CABINET	472	1000	137	0.55	0.5	575 V	3	60 Hz	38	84	CW VFD. PROVIDE ALL ACCESSORIES FOR CEILING MOUNTED IN JOIST SPACE. CONTROL VIA REVERSE ACTING THERMOSTAT AND REFRIGERANT GAS DETECTION SYSTEM. PLEASE REFER TO SEQUENCE OF OPERATIONS ON PLAN M5.01. FAN TO BE CONNECTED TO BAS ONLY FOR MONITORING. ACCEPTABLE ALTERNATES: PENNBARRY.

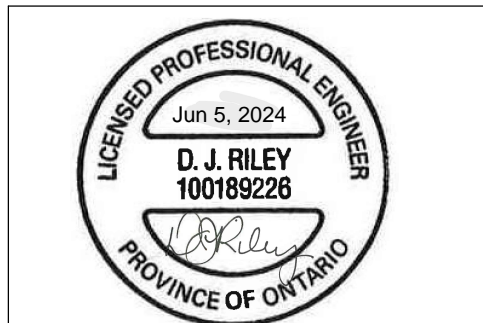


No.	DESCRIPTION	DATE
6	ISSUED FOR TENDER	2024/06/05
5	ISSUED FOR PERMIT	2024/05/10
4	ISSUED FOR REVIEW	2024/05/03
3	ISSUED FOR PERMIT	2024/05/14
2	ISSUED FOR PERMIT REVIEW	2024/03/08
1	ISSUED FOR 90% PROGRESS SET	2024/02/02

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CONSULTANTS:

PROJECT:
GORDON PRICE ELEMENTARY SCHOOL

11 GUILDWOOD DR.
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DRAWING TITLE:
GENERAL NOTES, DRAWING LIST, MECHANICAL LEGEND, SCHEDULES & SITE PLAN

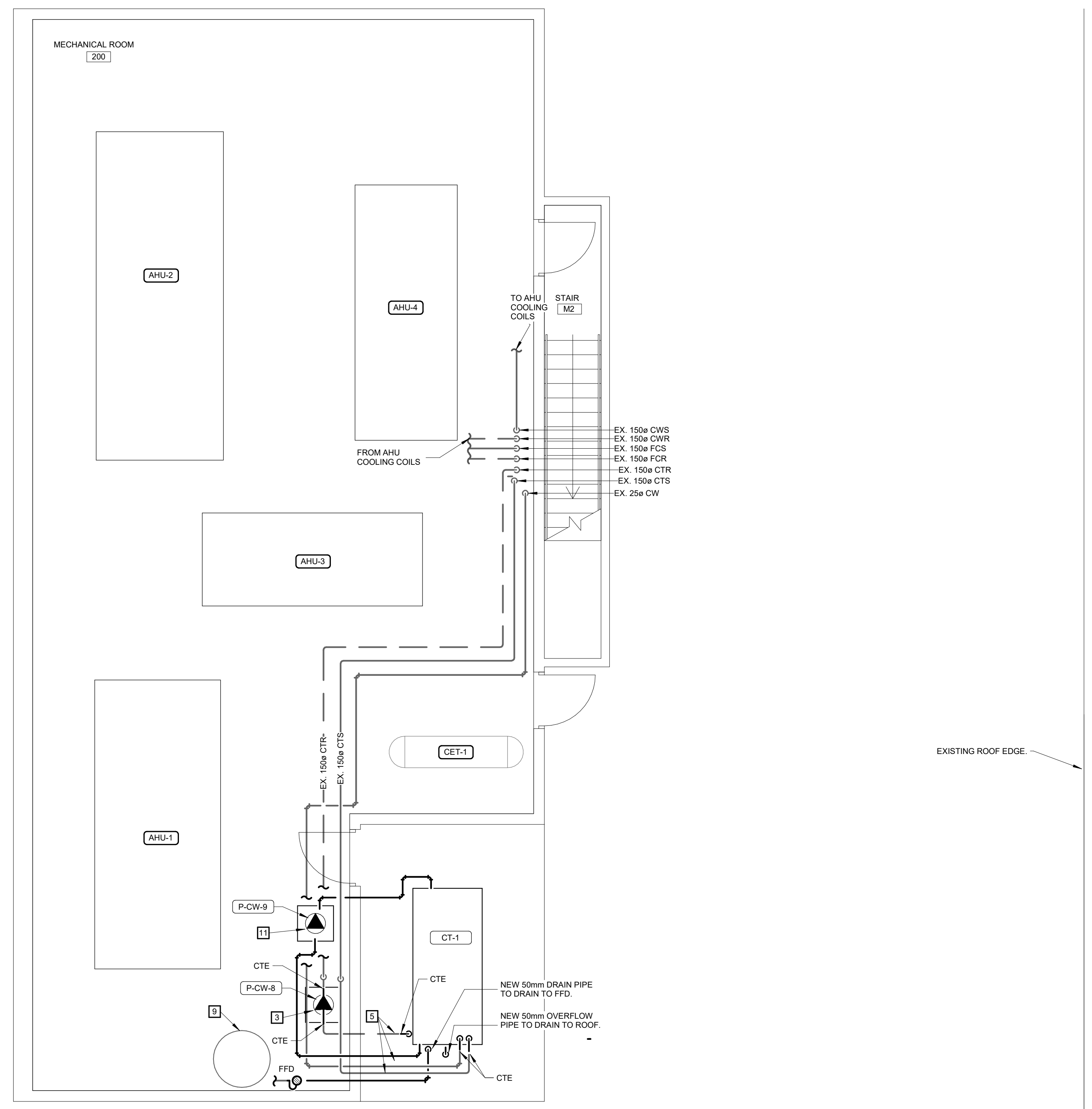
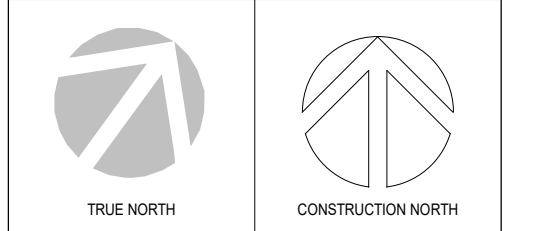
DRAWN BY: FSRM DATE: 23/04/20
CHECKED BY: DR SCALE: As indicated

PROJECT No: **23080**

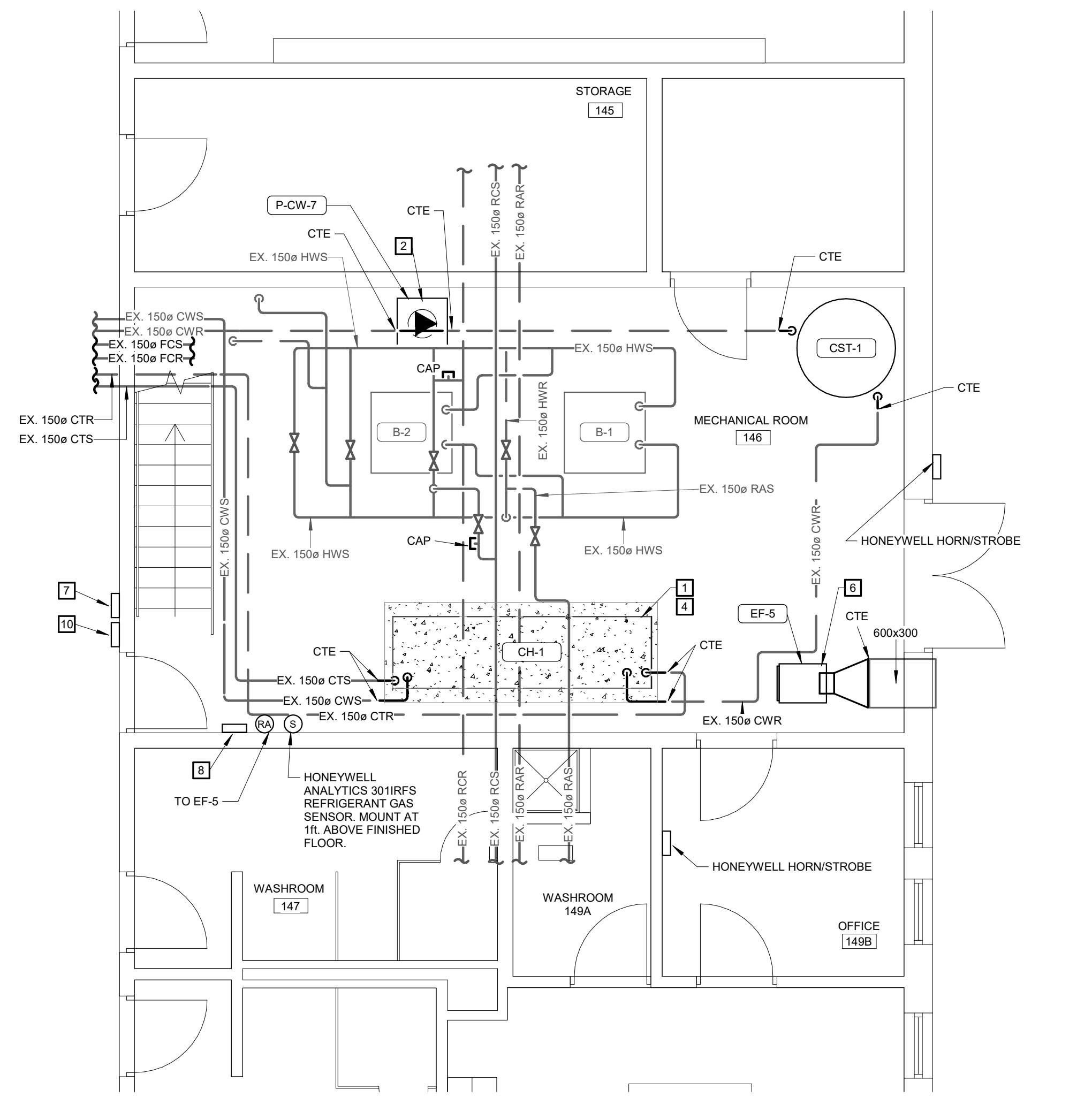
DRAWING No: **M0.01**

CONSTRUCTION NOTES

- A. ALPHABETICAL NOTES ARE GENERAL TO THE PLAN(S) ON THIS SHEET
 - [1]** 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 TO REPLACE ISOLATION VALVES THAT ARE FOUND DEFICIENT WITHIN THE APPROVED SCOPE WORK IN ORDER TO PROVIDE A WORKING AND FULLY OPERATIONAL SYSTEM.
1. EXISTING HOUSEKEEPING PAD TO REMAIN.
 2. NEW CHILLED WATER DISTRIBUTION PUMP P-CW-7 TO BE INSTALLED ON NEW HOUSEKEEPING PAD. REFER TO SCHEMATICS ON DRAWING M3.01 FOR FURTHER INSTALLATION DETAILS.
 3. NEW AIR-COOLED CHILLER CIRCULATION PUMP P-CW-8 TO BE INSTALLED ON NEW HOUSEKEEPING PAD. REFER TO SCHEMATICS ON DRAWING M3.01 FOR FURTHER INSTALLATION DETAILS.
 4. NEW CHILLER ON NEW HOUSEKEEPING PAD. HOUSEKEEPING PAD BY STRUCTURAL.
 5. SUPPORT ROOF MOUNTED CHILLED WATER SUPPLY & RETURN PIPING. REFER TO SHEET M4.02 FOR FURTHER DETAILS.
 6. MOUNT EF IN JOIST SPACE TO REPLACE EXISTING AND POSITION FOR EASE OF RE-CONNECTION TO EXISTING EXHAUST DUCTWORK. LEAVE OPEN ENDED EXHAUST INLET OF EF.
 7. HONEYWELL MODEL 301EMRP-RFSA ANNUNCIATOR PANEL WITH INTEGRATED HORN/STROBE. INTEGRATED WITH HONEYWELL GAS DETECTION SYSTEM AND REVERSE ACTING THERMOSTAT. REFER TO SEQUENCE OF OPERATIONS ON MECHANICAL SPECIFICATIONS PAGE M5.01.
 8. HONEYWELL MODEL 301EM-RFSA-CA2 CONTROL PANEL WITH INTEGRATED HORN/STROBE. INTEGRATED WITH HONEYWELL GAS DETECTION SYSTEM AND REVERSE ACTING THERMOSTAT. REFER TO SEQUENCE OF OPERATIONS ON MECHANICAL SPECIFICATIONS PAGE M5.01.
 9. EXISTING COOLING TOWER CHEMICAL TREATMENT SYSTEM, AND ASSOCIATED CONTROLS AND COMPONENTS TO REMAIN.
 10. SWITCH FOR MANUAL EMERGENCY CHILLER SHUTDOWN.
 11. NEW COOLING TOWER SIDE STREAM CENTRIFUGAL FILTER PUMP P-CW-9. RE-WORK AND PROVIDE ADDITIONAL PIPING AS REQUIRED. REFER TO SCHEMATICS ON DRAWING M3.01 FOR FURTHER INSTALLATION DETAILS.



LEVEL 2 MECH ROOM 3
1:50 M2.01



LEVEL 1 MECH ROOM 2
1:50 M2.01



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1	ISSUED FOR 90% PROGRESS SET	2024/02/02

REVISIONS:

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SEAL

CONSULTANTS:

PROJECT:
GORDON PRICE ELEMENTARY SCHOOL

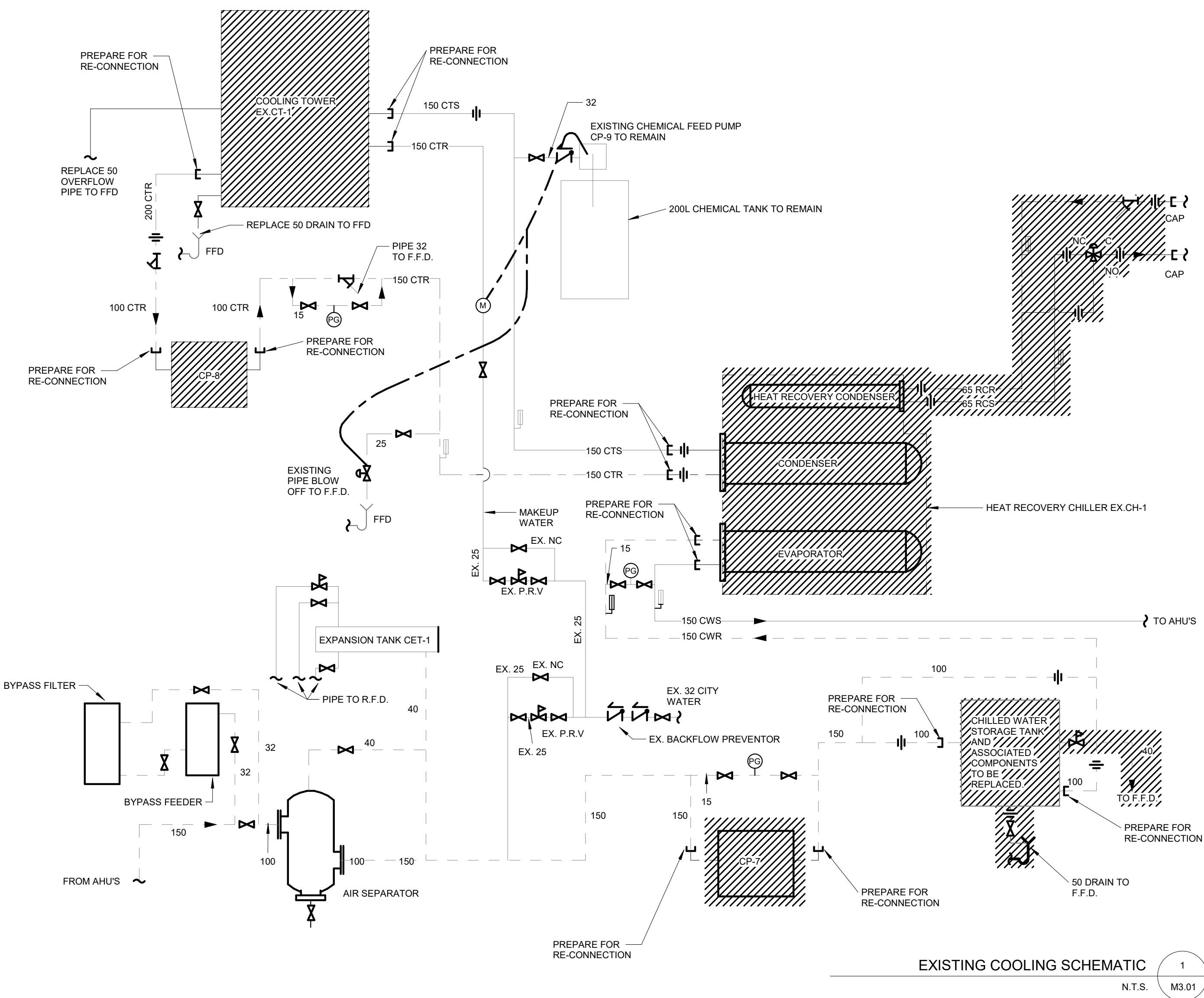
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DRAWING TITLE:
MECHANICAL PLANS

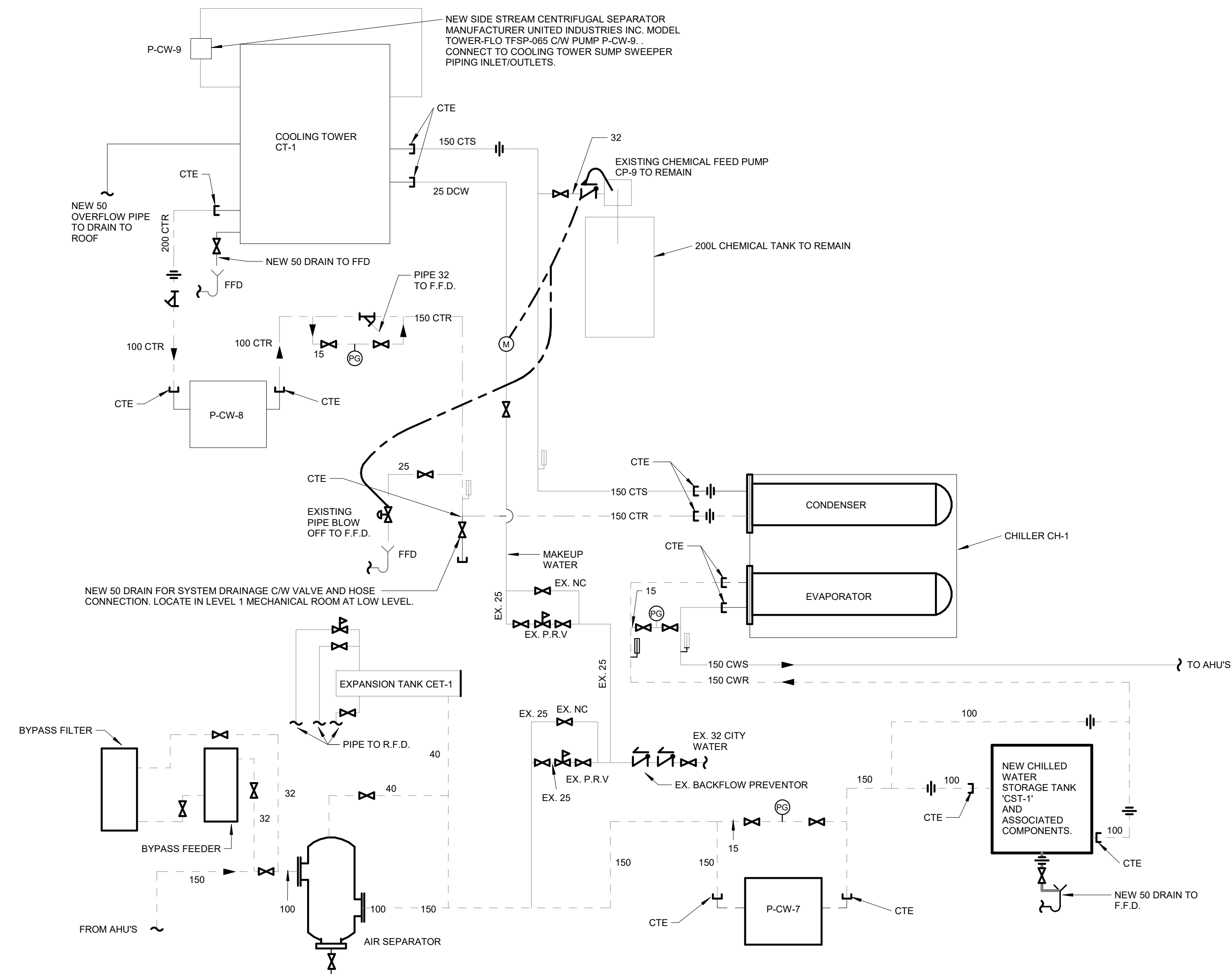
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PROJECT NO: **23080**

DRAWING NO: **M2.01**



EXISTING COOLING SCHEMATIC 1
N.T.S. M3.01



PROPOSED COOLING SCHEMATIC 2
N.T.S. M3.01



No.	DESCRIPTION	DATE
6	ISSUED FOR TENDER	2024/06/05
5	RE-ISSUED FOR PERMIT	2024/05/10
4	ISSUED FOR REVIEW	2024/05/03
3	ISSUED FOR PERMIT	2024/03/14
2	ISSUED FOR PERMIT REVIEW	2024/03/08
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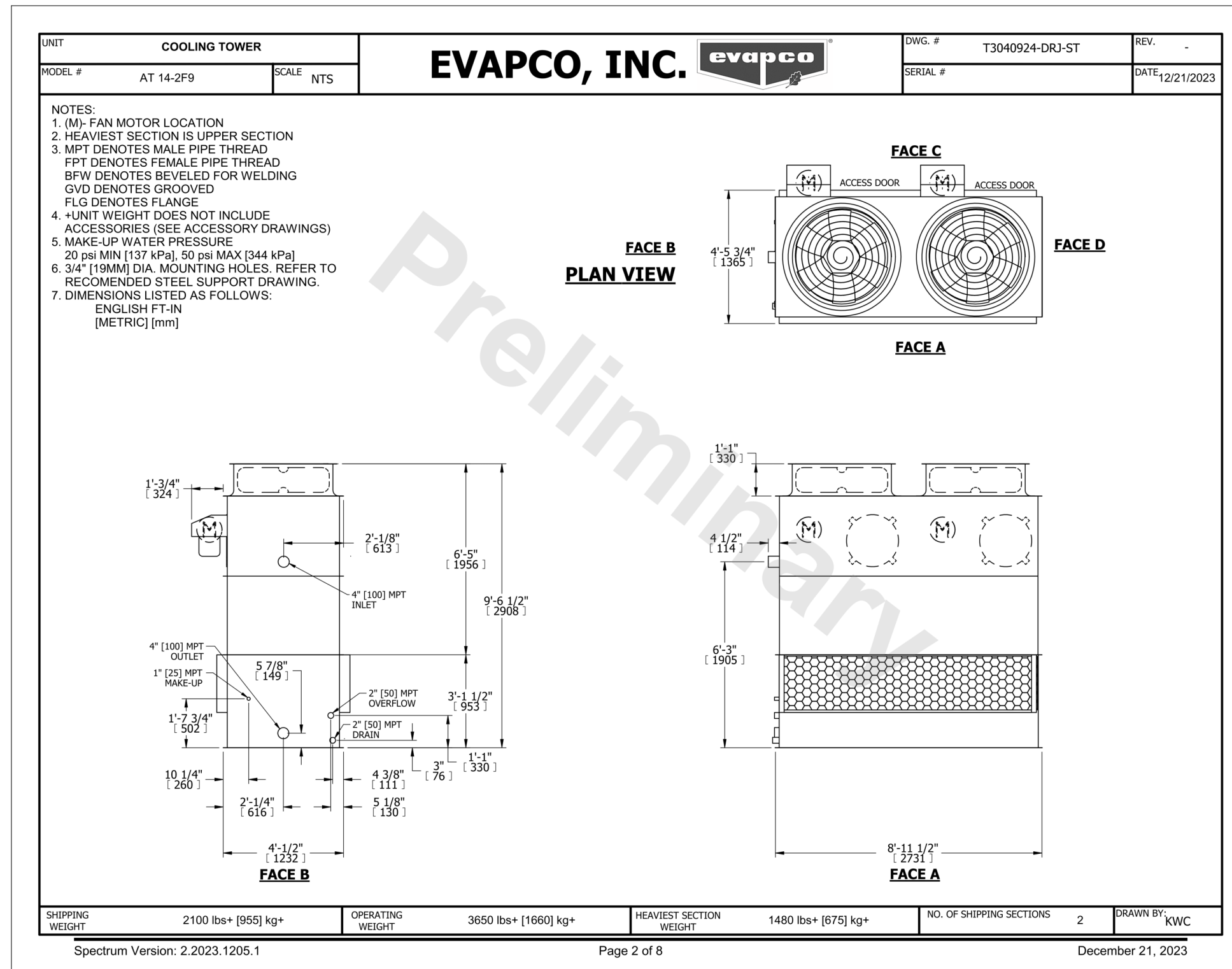
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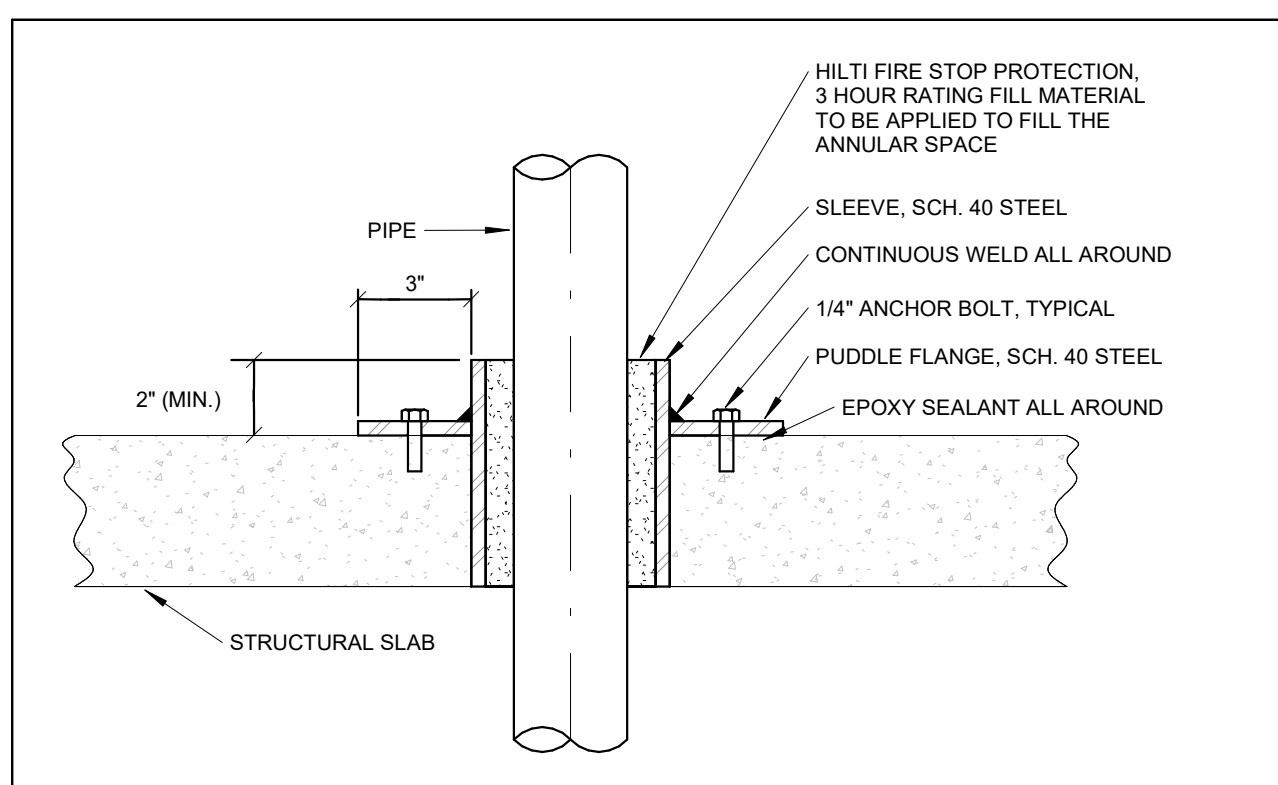
CONSULTANTS:
PROJECT:
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DRAWING TITLE:
MECHANICAL SCHEMATICS

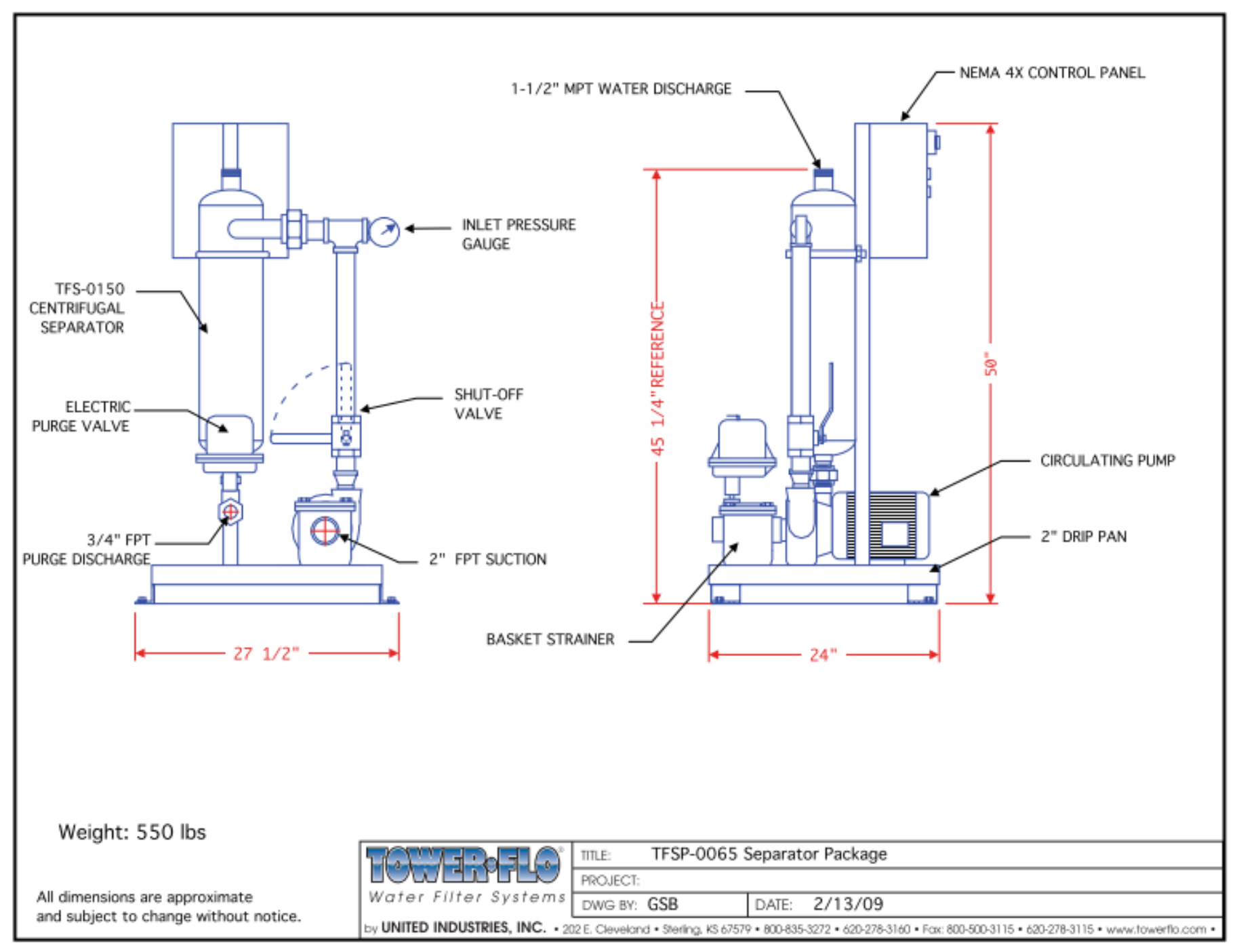
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PROJECT NO.:	23080		
DRAWING NO.:	M3.01		



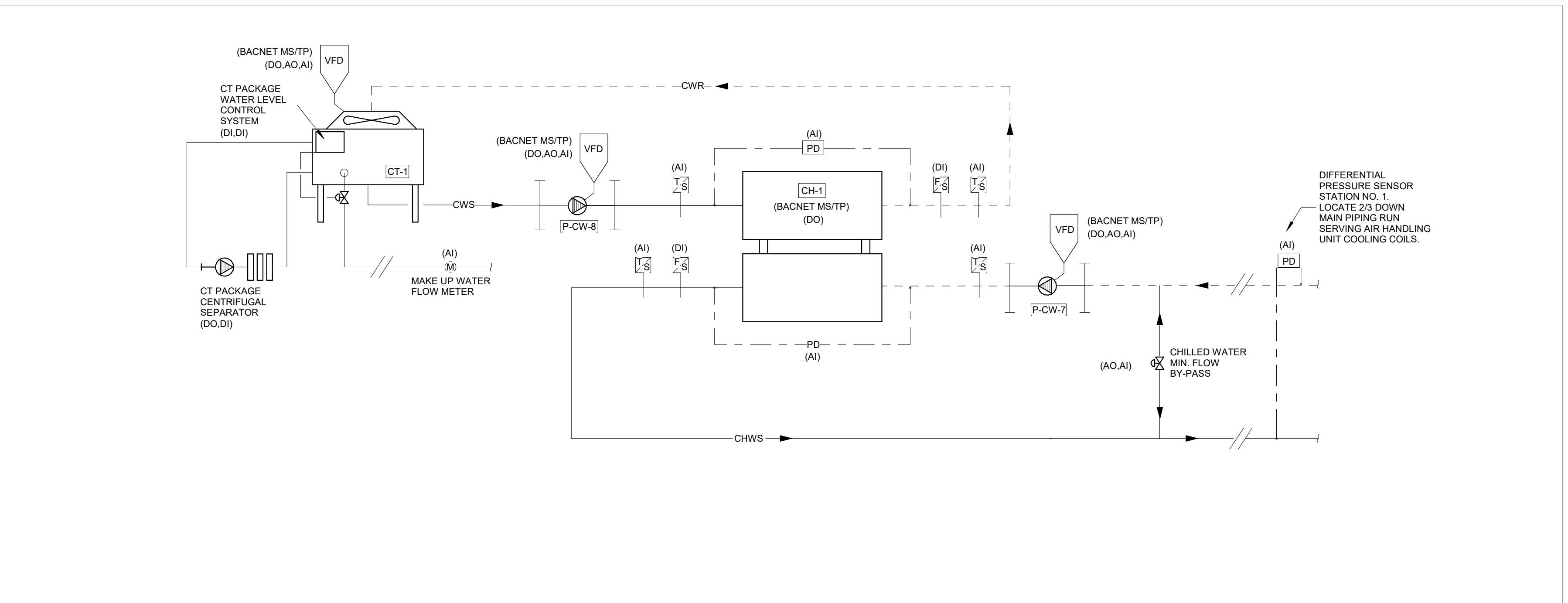
COOLING TOWER 2
N.T.S. M4.01



DETAIL OF PIPE PENETRATION THROUGH SLAB 5
N.T.S. M4.01



COOLING TOWER SEPARATOR 6
N.T.S. M4.01



SEQUENCE OF OPERATION:

SYSTEM IS ENABLED THROUGH THE BAS BASED ON AN OPERATOR DEFINED OUTDOOR AIR TEMPERATURE SETPOINT AND SCHEDULE. ONCE ENABLED THE SYSTEM SHALL OPERATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE OF OPERATION. CHILLED WATER SHALL BE AVAILABLE CONTINUOUSLY THROUGHOUT THE COOLING SEASON.

CONDENSER WATER PUMP P-CW-8 CONTROL:

WHENEVER THE CHILLED WATER PLANT IS ENABLED THE CONDENSER WATER PUMP SHALL BE ENABLED AND OPERATE CONTINUOUSLY. CIRCULATING PUMP SHALL MODULATE TO MAINTAIN PRESSURE DIFFERENTIAL SETPOINT ACROSS CHILLER CONDENSER SECTION, AS RECOMMENDED BY SUCCESSFUL MANUFACTURER TO MAINTAIN DESIGN CONDENSER WATER FLOW.

STATUS OF CONDENSER WATER CIRCULATING PUMP SHALL BE MONITORED BY THE BAS. IF THE PUMP FAILS TO OPERATE THE BAS SHALL GENERATE AN ALARM.

COOLING TOWER CT-1 SYSTEM(S) CONTROL:

WHENEVER THE CHILLED WATER PLANT IS ENABLED THE COOLING TOWER SYSTEM(S) SHALL BE ENABLED. COOLING TOWER FAN SHALL MODULATE THROUGH REMOTE VFD TO MAINTAIN CONDENSER WATER SUPPLY TEMPERATURE SETPOINT. CONDENSER WATER SUPPLY TEMPERATURE SETPOINT SHALL BE RESET BASED ON OUTDOOR AIR WET BULB TEMPERATURE AS FOLLOWS:

- ▶ OA-WB HIGH = 80°F, CWS RESET HIGH = 85°F
- ▶ OA-WB LOW = 55°F, CWS RESET LOW = 60°F

COOLING TOWER WATER LEVEL CONTROL SYSTEM SHALL OPERATE UNDER ITS OWN SYSTEM OF CONTROLS AND SAFETIES. WATER LEVEL CONTROL SYSTEM SHALL BE PROVIDED WITH FOUR (4) FLOAT SWITCHES TO CARRY OUT CONTROL AND MONITORING FUNCTIONS AS FOLLOWS:

- ▶ UPON "LOW WATER LEVEL" DETECTION MAKE-UP WATER VALVE SHALL OPEN
- ▶ UPON "HIGH WATER LEVEL" DETECTION MAKE-UP WATER VALVE SHALL CLOSE
- ▶ UPON "LOW WATER LIMIT" DETECTION A LOW WATER LEVEL ALARM SHALL BE GENERATED BY THE BAS
- ▶ UPON "HIGH WATER LIMIT" DETECTION A HIGH WATER LEVEL ALARM SHALL BE GENERATED BY THE BAS

PULSE OUTPUT GENERATED BY THE COOLING TOWER MAKE-UP WATER FLOW METER SHALL BE CORRELATED TO VOLUME AND TOTALIZED BY THE BAS.

COOLING TOWER CENTRIFUGAL SEPARATOR SHALL BE ENABLED THROUGH THE BAS WHENEVER THE CHILLED WATER PLANT IS ENABLED. ONCE ENABLED THE SYSTEM SHALL OPERATE CONTINUOUSLY UNDER ITS OWN SYSTEM OF CONTROLS AND SAFETIES. PUMP STATUS SHALL BE MONITORED BY THE BAS, GENERATE AN ALARM IF STATUS DOES NOT MATCH COMMAND.

CHILLED WATER PUMP P-CW-7 CONTROL:

WHENEVER THE CHILLED WATER PLANT IS ENABLED THE CHILLED WATER PUMP SHALL BE ENABLED AND OPERATE CONTINUOUSLY. CIRCULATING PUMP SHALL MODULATE TO MAINTAIN PRESSURE DIFFERENTIAL SETPOINT AS SENSED BY DIFFERENTIAL PRESSURE SENSOR STATION NO. 1. AS PRESSURE INCREASES PUMP SPEED SHALL DECREASE. AS PRESSURE DECREASES PUMP SPEED SHALL INCREASE.

STATUS OF CHILLED WATER CIRCULATING PUMP SHALL BE MONITORED BY THE BAS. IF THE PUMP FAILS TO OPERATE THE BAS SHALL GENERATE AN ALARM.

CHILLED WATER FLOW METER MONITORS FLOW THROUGH SYSTEM AND MODULATES 2-WAY BY-PASS CONTROL VALVE AS REQUIRED TO MAINTAIN MINIMUM REQUIRED EVAPORATOR FLOW, AS RECOMMENDED BY THE SUCCESSFUL CHILLER MANUFACTURER.

TWO-WAY CONTROL VALVE STATUS/POSITION SHALL BE MONITORED BY THE BAS.

CHILLER CH-1 CONTROL:

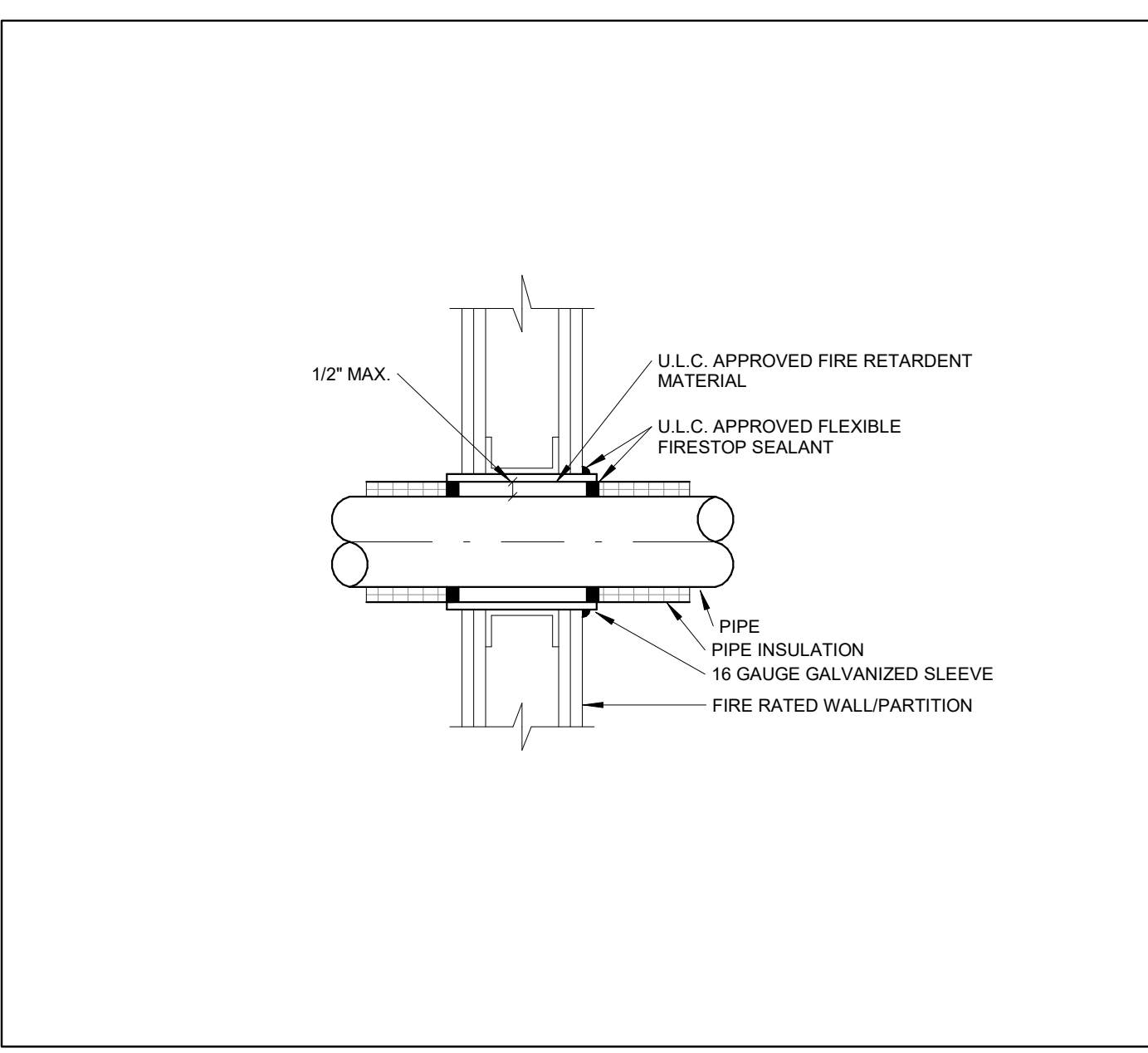
WHENEVER THE CHILLED WATER PLANT IS ENABLED, CONDENSER WATER FLOW STATUS AND CHILLED WATER FLOW STATUS SHALL BE CONFIRMED. ONCE CONFIRMED, THE CHILLER SHALL BE ENABLED THROUGH THE BAS AND OPERATE UNDER ITS OWN SYSTEM OF CONTROLS AND SAFETIES TO MAINTAIN A CHILLED WATER TEMPERATURE SETPOINT OF 46°F (ADJUSTABLE). CHILLED WATER SHALL BE AVAILABLE CONTINUOUSLY THROUGHOUT THE COOLING SEASON.

CHILLER STATUS AND INDICATION OF VARIOUS ALARMS SHALL BE THROUGH THE INTEGRAL CHILLER CONTROLLER WITH OUTPUT TO THE BAS THROUGH A BACNET MS/TP CONNECTION.

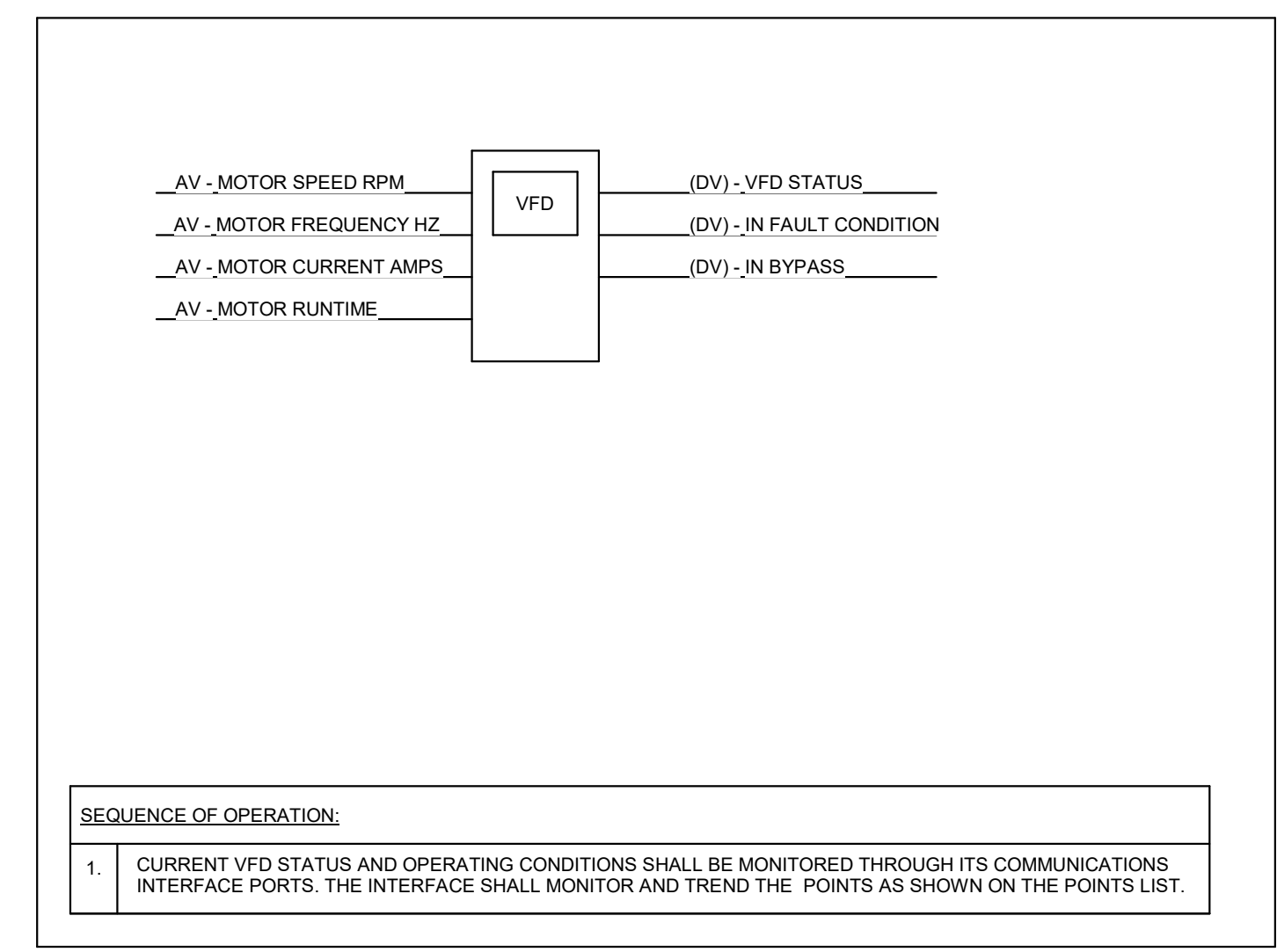
NOTES:

REFER TO POINT SCHEDULES INCLUDED WITHIN THE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

CD - M4 CHILLED WATER PLANT CONTROL SCHEMATIC 1
N.T.S. M4.01



DETAIL OF PIPE SLEEVE THROUGH FIRE RATED WALL 4
N.T.S. M4.01



SEQUENCE OF OPERATION:

1. CURRENT VFD STATUS AND OPERATING CONDITIONS SHALL BE MONITORED THROUGH ITS COMMUNICATIONS INTERFACE PORTS. THE INTERFACE SHALL MONITOR AND TREND THE POINTS AS SHOWN ON THE POINTS LIST.

VARIABLE FREQUENCY DRIVE INTERFACE CONTROL SCHEMATIC 3
N.T.S. M4.01

KEY PLAN

6	ISSUED FOR TENDER	2024/06/05
5	RE-ISSUED FOR PERMIT	2024/05/10
4	ISSUED FOR REVIEW	2024/05/03
3	ISSUED FOR PERMIT	2024/05/14
2	ISSUED FOR PERMIT REVIEW	2024/03/08
1	ISSUED FOR 90% PROGRESS SET	2024/03/02

No.	DESCRIPTION	DATE

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

DO NOT SCALE THE DRAWINGS.

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www.mccallumsather.com



CONSULTANTS:

PROJECT:
GORDON PRICE ELEMENTARY SCHOOL

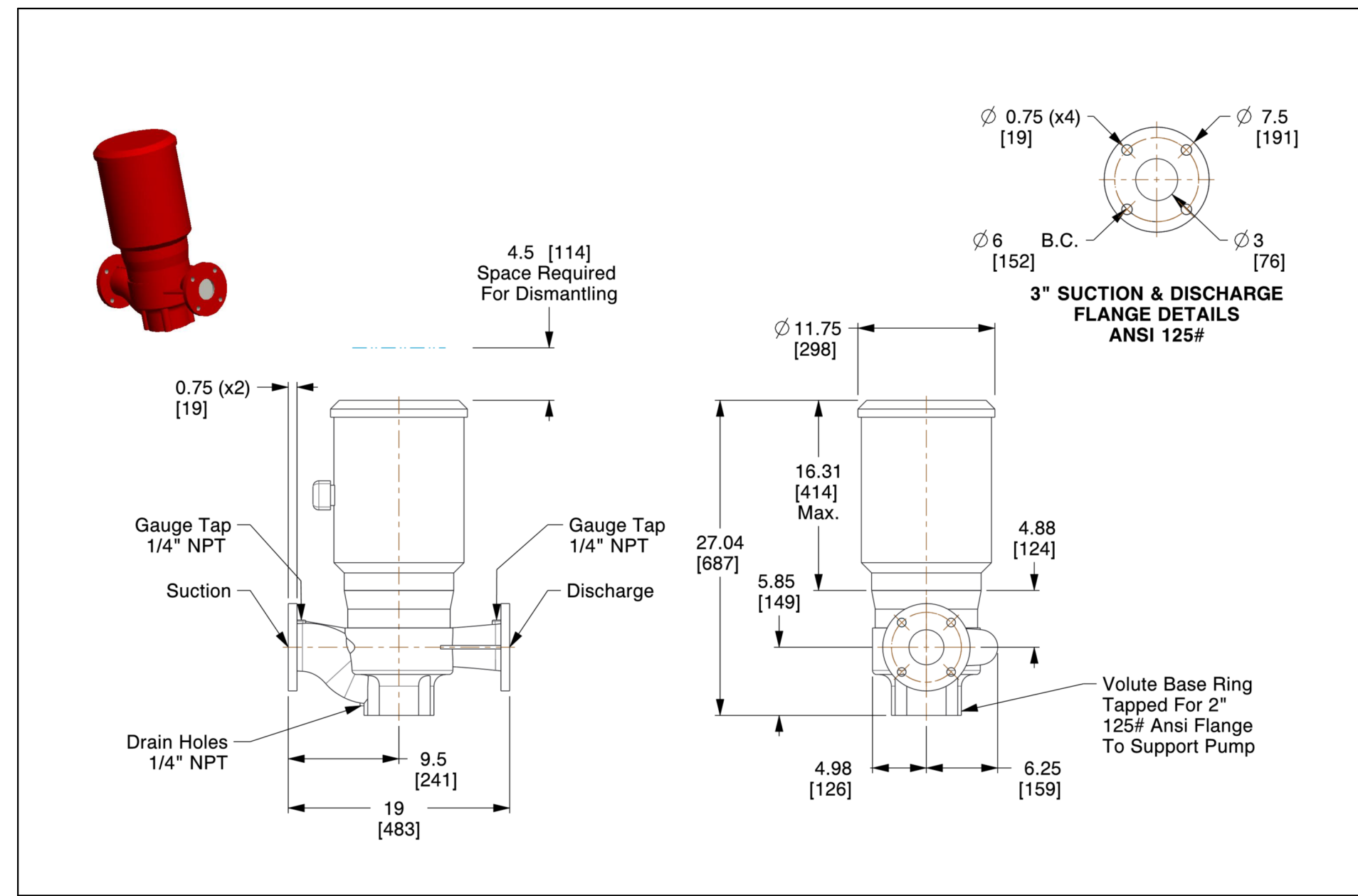
11 GUILDWOOD DR.
HAMILTON, ON L9C 7K2

DRAWING TITLE:
DETAILS & DIAGRAMS

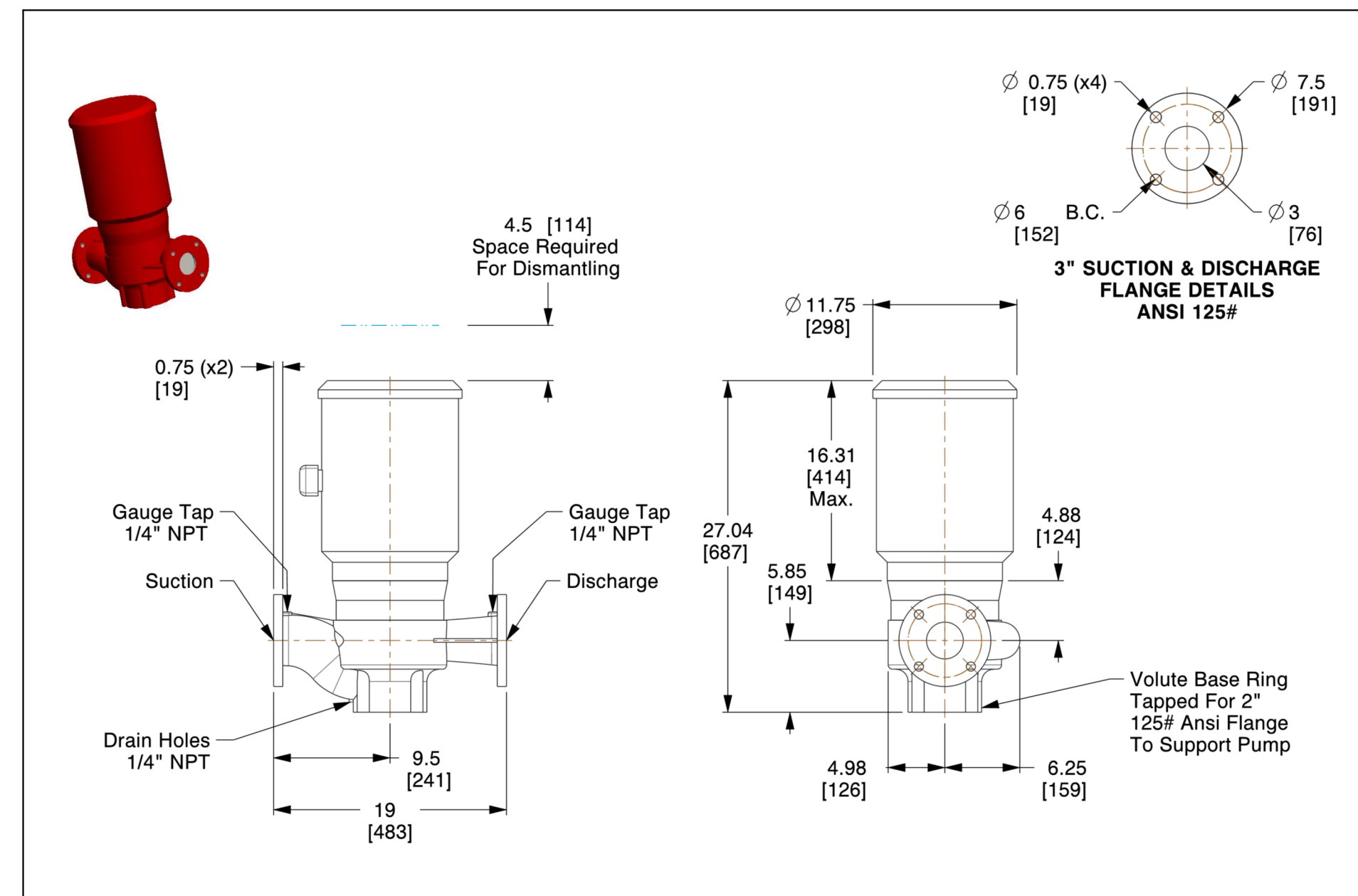
DRAWN BY: FS DATE: 23/04/20
CHECKED BY: DR SCALE: As Indicated

PROJECT NO: **23080**

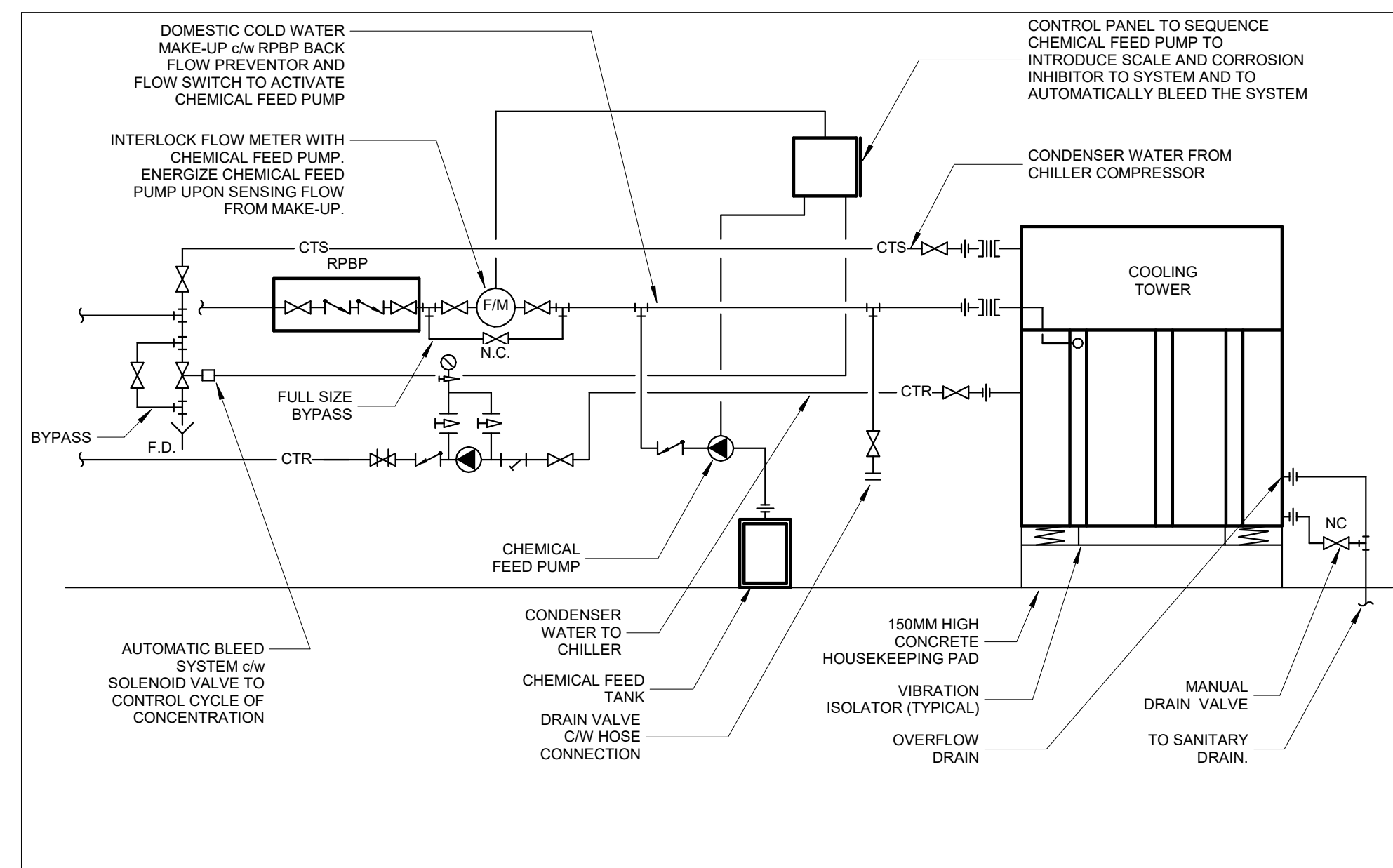
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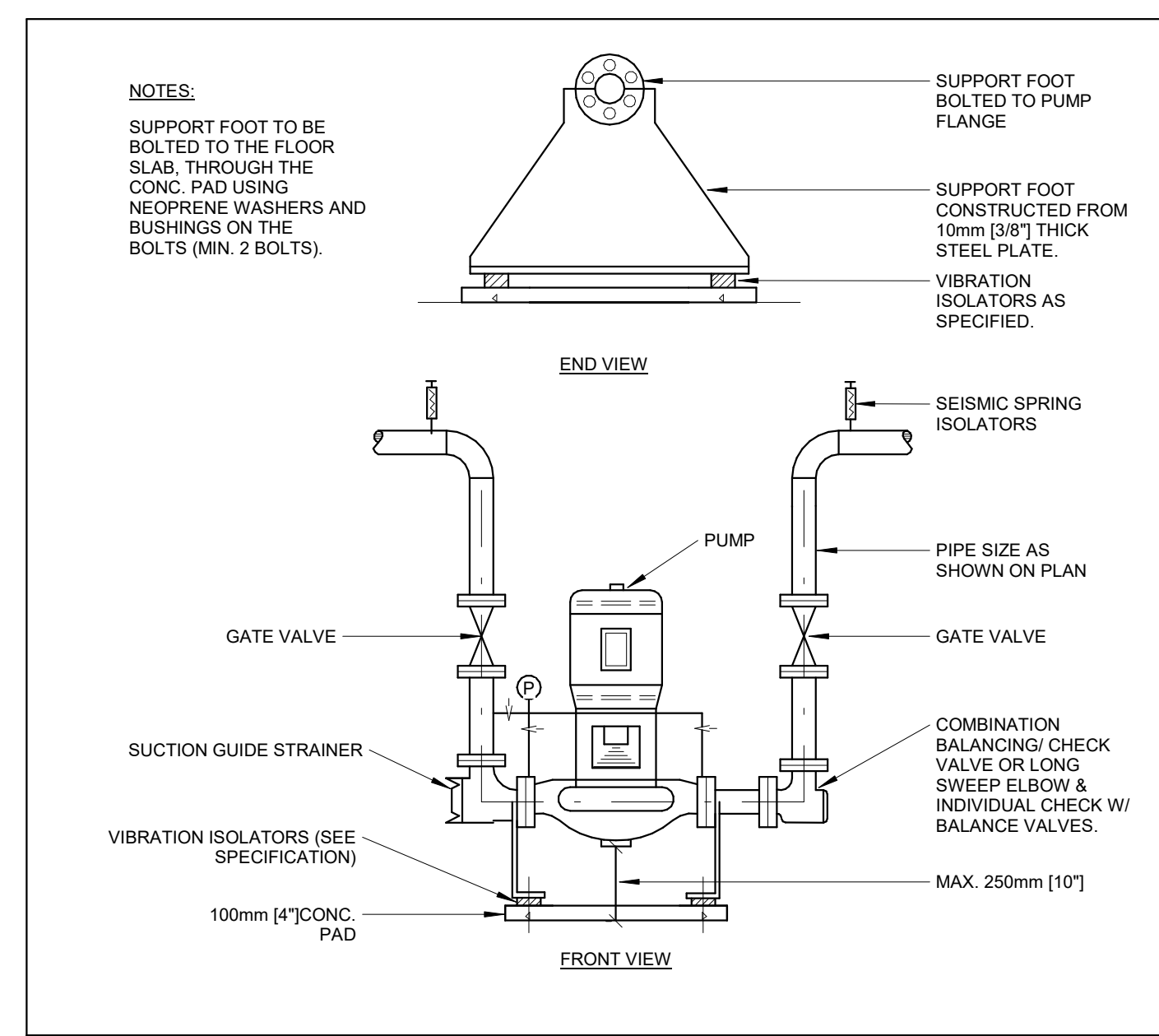
VERTICAL INLINE PUMP P-CW-7 3 N.T.S. M4.02



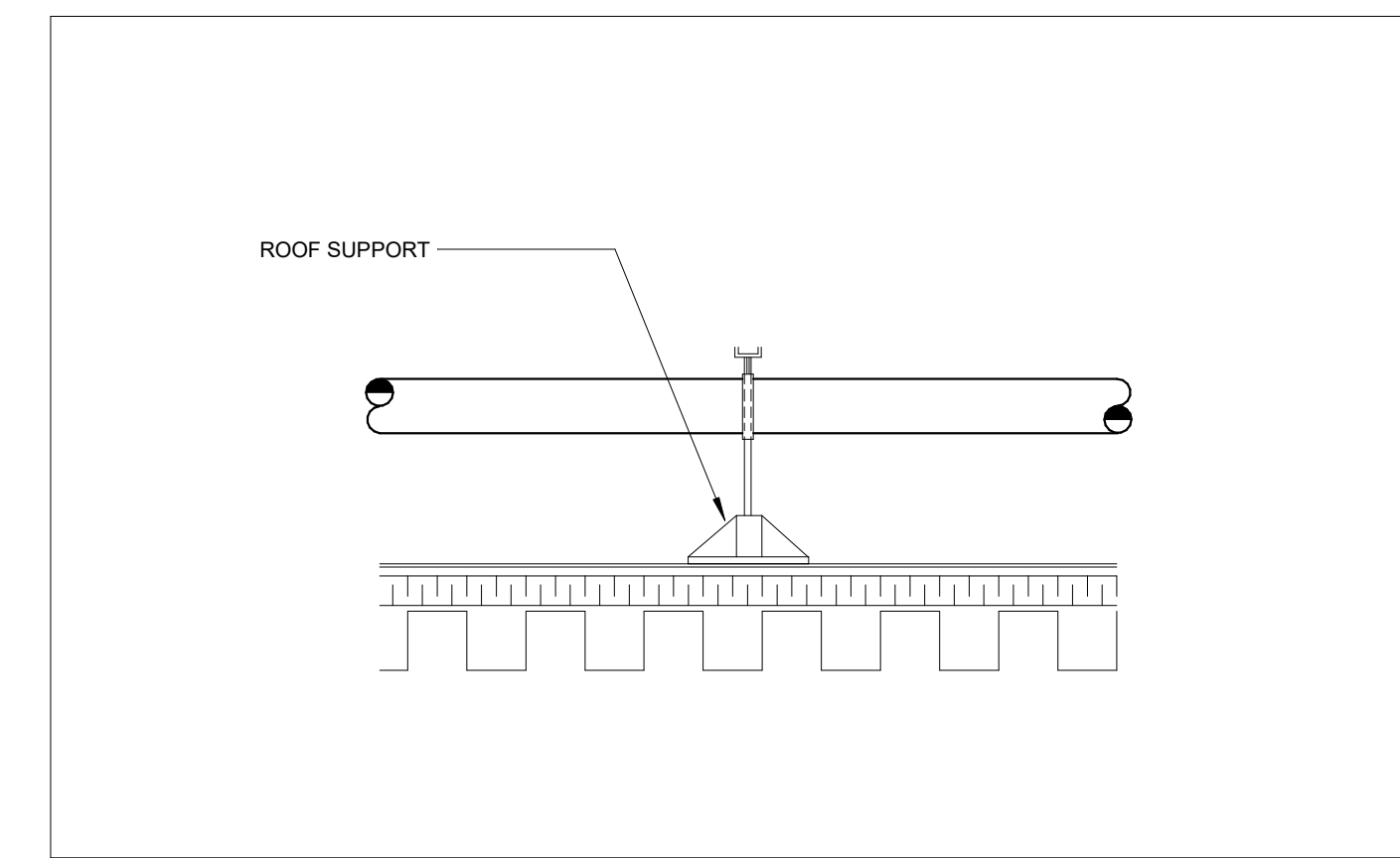
VERTICAL INLINE PUMP P-CW-8 5 N.T.S. M4.02



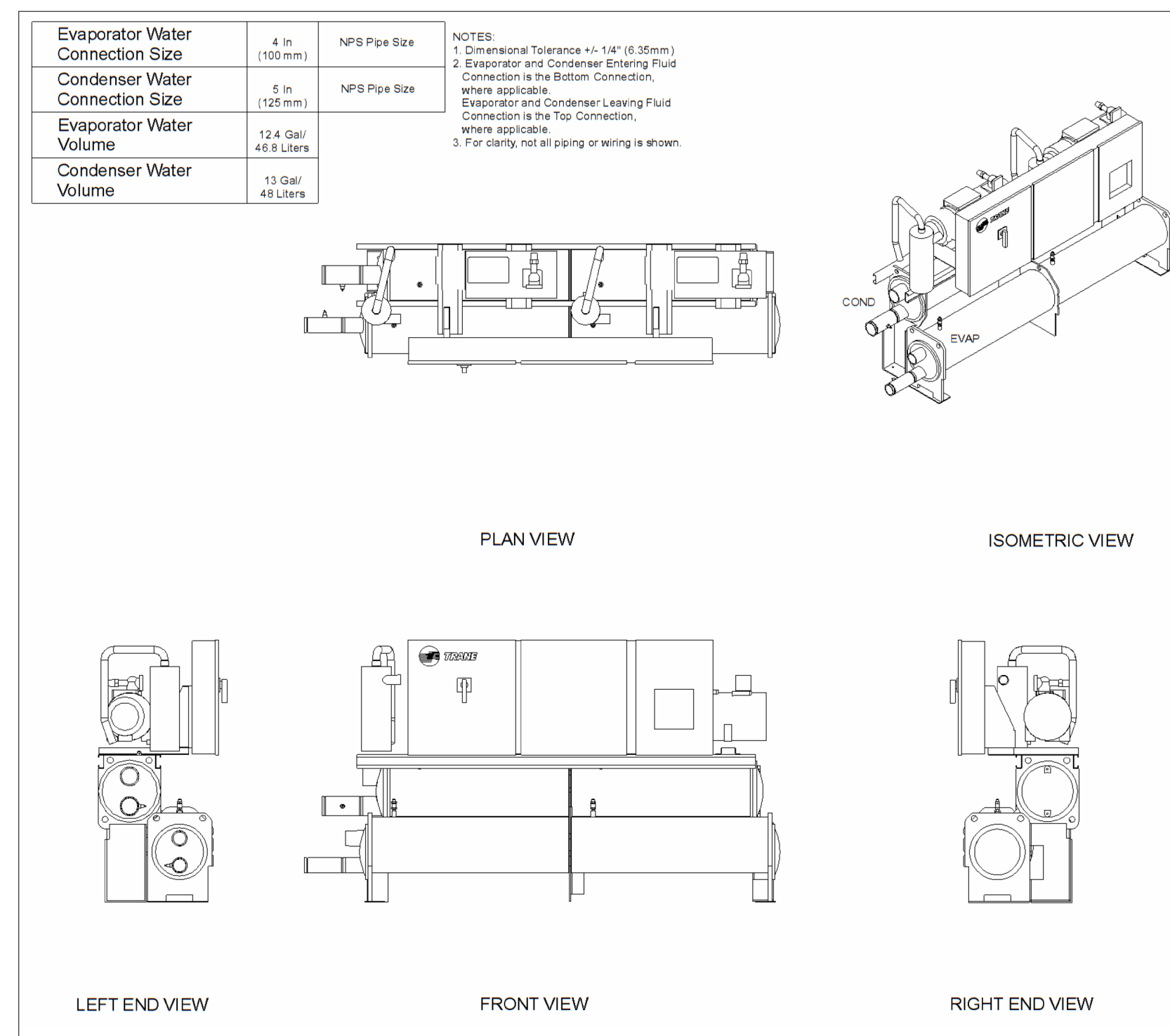
HYDS - 2 COOLING TOWER PIPING SCHEMATIC 8 N.T.S. M4.02



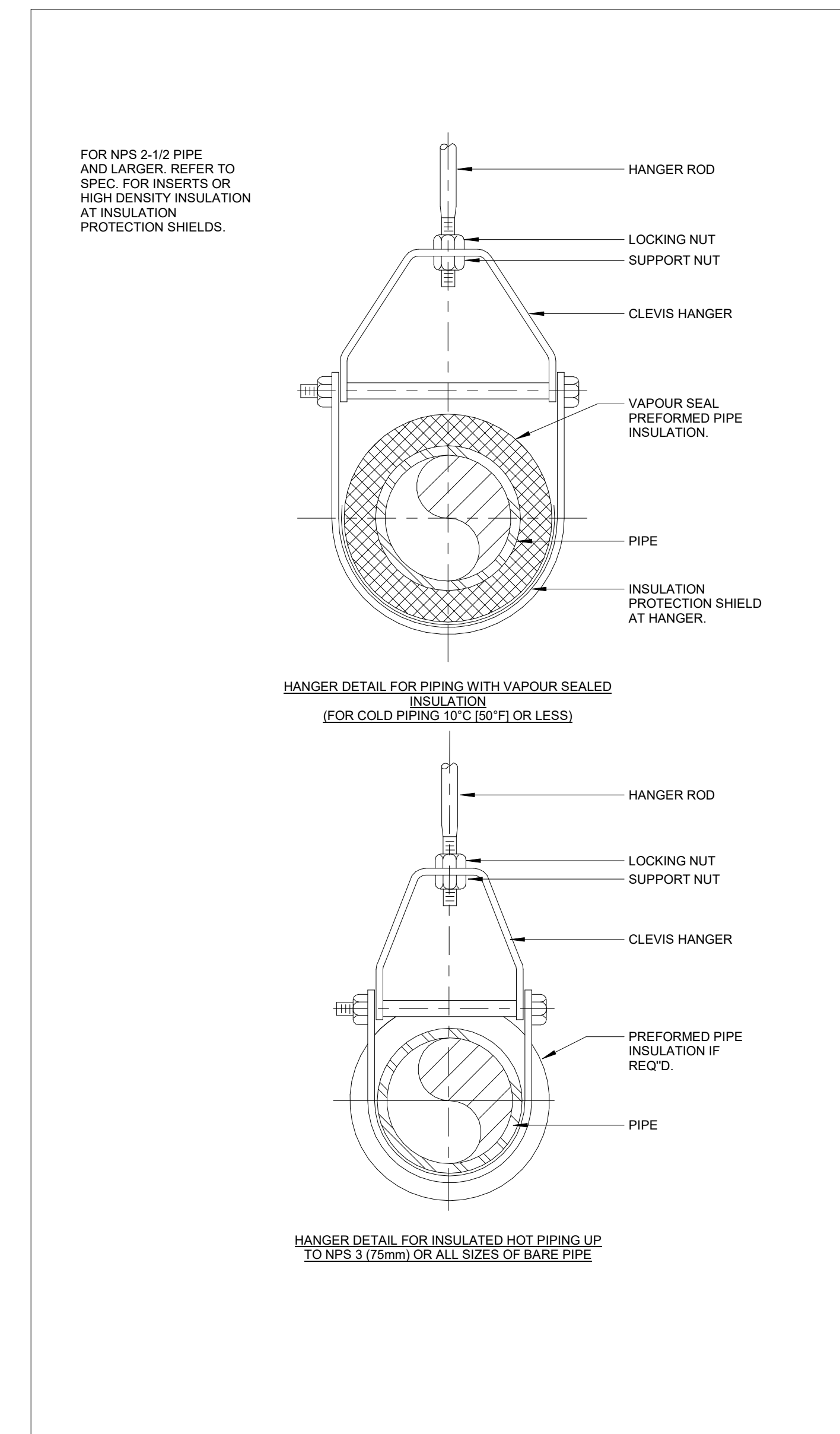
VERTICAL IN LINE PUMP INSTALLATION 2 N.T.S. M4.02



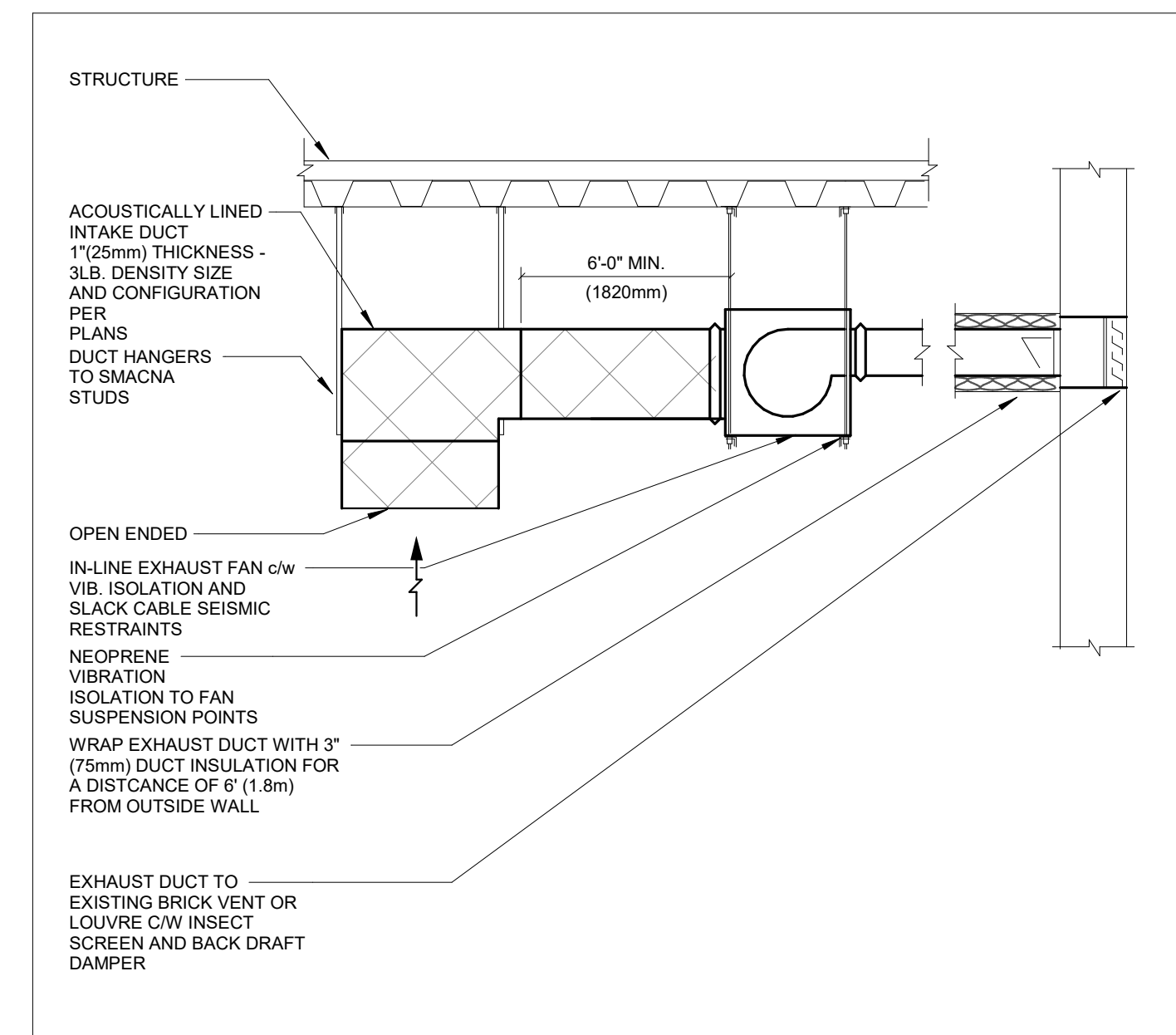
PIPING ROOF SUPPORT 4 N.T.S. M4.02



WATER-COOLED CHILLER 7 N.T.S. M4.02



PIPE HANGER DETAIL 1 N.T.S. M4.02



IN-LINE EXHAUST FAN DETAIL W EXTERNAL LOUVER 6 N.T.S. M4.02

KEY PLAN
HWDSB

No.	DESCRIPTION	DATE
6	ISSUED FOR TENDER	2024/06/05
5	RE-ISSUED FOR PERMIT	2024/05/10
4	ISSUED FOR REVIEW	2024/05/03
3	ISSUED FOR PERMIT	2024/03/14
2	ISSUED FOR PERMIT REVIEW	2024/03/08
1	ISSUED FOR 90% PROGRESS SET	2024/02/02

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

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SEAL

CONSULTANTS:
PROJECT:
GORDON PRICE ELEMENTARY SCHOOL

11 GUILDWOOD DR.
HAMILTON, ON L9C 7K2

DRAWING TITLE:
DETAILS & DIAGRAMS

DRAWN BY: FS DATE: 02/01/24
CHECKED BY: DR SCALE: As indicated

PROJECT NO: **23080**

DRAWING NO:

M4.02

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, INCLUSIVE OF ALL LABOUR, MATERIALS, INSTALLATION, TESTING, AND CONNECTIONS" FOR THE ITEM TO WHICH IT REFERS.
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 SERVICES 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. PROVIDE 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 FOR INSTALLATION OF INSERTS AND ALL CONCRETE CONSTRUCTION ITEMS INCLUDING PADS, CURBS, SILLS, BASINS, ANCHORS, INSERTS ETC.
1.8. DO NOT SCALE MECHANICAL DRAWINGS. 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 SHOP DRAWINGS (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 KEPT OPERATIONAL AT ALL TIMES. INTERRUPTIONS 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. ALL POWER WIRING BY ELECTRICAL CONTRACTOR, 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 IN WALLS AND CEILING. 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 CALL-OW 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 SYSTEM IN PLACE. UNLESS NOTED 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) DIRECTED BY THE OWNER AND/OR MECHANICAL CONSULTANT WITHOUT ADJUSTMENT TO THE CONTRACT PRICE, PROVIDED THAT THE CHANGES ARE REQUESTED BEFORE INSTALLATION.
1.25. PLEASE REFER TO THE FRONT END FOR PROPOSED ALTERNATIVES OR SUBSTITUTIONS.
1.26. IDENTIFY ALL SYSTEMS AND LABEL ALL EQUIPMENT WITH LAMACOID LABELS. IDENTIFY REMOTE CONTROLS FOR ALL PERTINENT EQUIPMENT INCLUDING ALL ASSOCIATED DISCONNECTS. PRODUCTS NOT SPECIFICALLY IDENTIFIED SHALL BE OF A QUALITY CONSISTENT WITH THE REMAINDER OF THE SPECIFICATION.
1.27. 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.
1.28. PROVIDE ALL MISCELLANEOUS METALS REQUIRED FOR MECHANICAL WORK. PROVIDE DIELECTRIC FITTINGS TO SEPARATE ALL DISSIMILAR METALS. 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.
1.29. PROVIDE FLASHING AND COUNTER FLASHING FOR ALL DUCTS, PIPES, ETC., PASSING THROUGH EXTERIOR WALLS, WATERPROOF FLOORS AND ROOF.
1.30. 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.
1.31. IDENTIFY ALL PIPING WITH STENCILED LETTERS OR COLOR CODES AND DIRECTIONAL ARROWS.
1.32. 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.
1.33. 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.
1.34. FOR DEFINITIONS REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-142-P01997 GORDON PRICE CHILLER & COOLING TOWER REPLACEMENT PROJECT.
1.35. FOR HAZARDOUS MATERIALS REFERENCE THE GORDON PRICE CHILLER & COOLING TOWER REPLACEMENT PROJECT DESIGNATED SUBSTANCES AUDIT REPORT BY MTE CONSULTANTS INC., DATED FEBRUARY 22, 2024, AND SPECIFICATION SECTION 02 82 00 ASBESTOS ABATEMENT FOR GORDON PRICE CHILLER & COOLING TOWER REPLACEMENT PROJECT BY MTE CONSULTANTS INC..
1.36. FOR PAYMENT TERMS REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-142-P01997 GORDON PRICE CHILLER & COOLING TOWER REPLACEMENT PROJECT.
1.37. FOR INSURANCE, BONDING AND WSIB REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-142-P01997 GORDON PRICE CHILLER & COOLING TOWER REPLACEMENT PROJECT.
1.38. INCLUDE FOR ANY AND ALL CURRENT HEALTH & SAFETY REQUIREMENTS AS PER THE PROVINCE OF ONTARIO.
1.39. FOR RELEASE OF HOLDBACK REFERENCE HWDSB REQUEST FOR TENDER DOCUMENT 2024-142-P01997 GORDON PRICE CHILLER & COOLING TOWER REPLACEMENT PROJECT.
1.40. 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.
1.41. USE OF THE SCHOOL'S ELECTRICAL SERVICE IS ALLOWED TO FACILITATE THE SCOPE OF WORK, IF REQUIRED AND APPROVED VIA EMAIL BY HWDSB.
1.42. 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.
1.43. 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 2024-142-P01997 GORDON PRICE CHILLER & COOLING TOWER 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 SECURITY 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. PROVIDE A WRITTEN WARRANTY FOR ONE YEAR COVERING ALL EQUIPMENT, MATERIALS AND WORKMANSHIP FROM THE DATE OF ACCEPTANCE OF THE INSTALLATION BY THE OWNER. INCLUDE IN THE OPERATION AND MAINTENANCE MANUAL.
2.4. 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 REDLINE AS-BUILT DRAWINGS OF THE INSTALLATION TO THE CONSULTANT FOR REVIEW.
3.2. INCORPORATE ALL CHANGES AND DEVIATIONS FROM THE TENDER DRAWINGS IN THE REDLINE AS-BUILTS.
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.
3.5. SUBMIT A PRINT TO CONSULTANT TO REVIEW, WHEN FOUND ACCEPTABLE BY THE CONSULTANT, SUBMIT THREE (3) SETS OF PRINTS TOGETHER WITH AUTO CAD DISKS FOR PRESENTATION TO LANDLORD AND TENANT.

4. OPERATION AND MAINTENANCE MANUALS

- 4.1. PROVIDE ELECTRONIC SETS OF OPERATION AND MAINTENANCE MANUALS, TO BE PROVIDED TO THE LANDLORD. INCLUDE THE FOLLOWING INFORMATION IN THE OPERATION AND MAINTENANCE MANUALS:
-TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS, COMPONENT ILLUSTRATIONS, EXPLODED VIEWS, TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS. ADVERTISING OR SALES LITERATURE IS NOT ACCEPTABLE.
-THE 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 AN BASE BUILDING SYSTEMS. -AIR BALANCING REPORTS
-WRITTEN GUARANTEE.
-AS-BUILT DRAWINGS.
-CONTACT LIST.
4.1. REVIEW INFORMATION PROVIDED IN THE MAINTENANCE INSTRUCTIONS AND MANUALS WITH THE LANDLORD'S OPERATING PERSONNEL WHERE BASE BUILDING SYSTEMS ARE REVISED, TO ENSURE A COMPLETE UNDERSTANDING OF THE MECHANICAL EQUIPMENT AND SYSTEMS AND THEIR OPERATION.

5. PLUMBING

- 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. 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 IPEX IN ACCORDANCE WITH CANULC S102.2 AND CSA B181.2. 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.
5.3. 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.
5.4. 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 JACKETTING FOR ALL EXPOSED PIPE INSULATION.
5.5. 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.
5.6. 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.
5.7. PROVIDE PIPE LABELING AS PER HWDSB STANDARD ON ALL NEW & MODIFIED SERVICE PIPING INCLUDED UNDER THIS SCOPE OF WORK

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 AIR AND WATER SYSTEMS.
6.3. 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. COOLING SYSTEMS: TAG OF COOLING SYSTEMS IS ALSO TO INCLUDE ALL PIPING AND EQUIPMENT FLUID TEMPERATURES, FLOWS AND CONTROL, AND IF TAB IS NOT DONE DURING THE COOLING SEASON, A FOLLOW-UP SITE VISIT DURING THE COOLING SEASON WILL BE REQUIRED TO CONFIRM PROPER FLOWS AND TEMPERATURES, AND ANY REQUIRED SYSTEM "FINE TUNING".
2. PREPARATION OF REPORTS: PREPARE REPORTS AS INDICATED BELOW.

DRAFT REPORTS: UPON COMPLETION OF TESTING, ADJUSTING, AND BALANCING PROCEDURES, PREPARE DRAFT REPORTS ON ABC OR NEBB FORMS. DRAFT REPORTS MAY BE HAND WRITTEN, 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.

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. HYDRONIC

- 7.1. HYDRONIC SYSTEMS TO 150 PSIG, ABOVE GROUND
1. NOMINAL OPERATING PRESSURE 125 PSIG
2. DESIGN PRESSURE 150 PSIG
3. TEST PRESSURE 225 PSIG
4. DESIGN TEMPERATURE 350°F
5. CORROSION ALLOWANCE 0.0625 IN.
6. STEEL PIPE ASTM A53 GR. B ERW OR ASTM A106 GR.B SMLS, SCH 40.
7. JOINTS, 2" AND SMALLER SCREWED
8. SCREWED FITTINGS 150 LB. MALLEABLE IRON
9. UNIONSCL 150, ASTM A-47 MALLEABLE IRON, ASTM A-153 GALVANIZED, ANSI B2.1 THREADS.
10. JOINTS, 2-1/2" AND LARGER WELDED, WITH FLANGES AT CONNECTIONS TO EQUIPMENT
11. BUTT WELD FITTINGS ASTM A234 GR. WFB
12. FLANGES ASTM A105, CLASS 150, RAISED FACE, WELD NECK OR SLIP ON
13. BOLTS ASTM A307 C.S. BOLTS, SO. HEAD, ASTM A563 NUTS, HEX HEAD
14. GASKETS 1/16" (1.6 MM) THICK PREFORMED NON-ASBESTOS GRAPHITE FIBRE.
15. COPPER TUBING, 2" AND SMALLER ASTM B88, TYPE L, HARD DRAWN
16. JOINTS: SOLDER, LEAD FREE, ASTM B32, 95-5 TIN-ANTIMONY, OR TIN AND SILVER, WITH MELTING RANGE 220 °C TO 280 °C.
17. FITTINGS: ASME B16.18, CAST BRASS, OR ASME B16.22, SOLDER WROUGHT COPPER
18. DIELECTRIC UNIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.
19. VALVES, 2" AND SMALLER ASTM A105
20. GATE VALVES (ISOLATING) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, SOLID W EDGE DISC, RISING STEM, BRONZE TRIM, THREADED ENDS, KITZ #25
21. GLOBE VALVES (THROTTLING) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, COMPOSITION (TEFLON) BURIED STEM, BRONZE TRIM, THREADED ENDS, KITZ #69
22. CHECK VALVES (BACKFLOW) 300 PSIG NON-SHOCK WOG, ASTM B62 BRONZE BODY, Y-PATTERN HORIZONTAL, SWING TYPE DISC, THREADED ENDS, KITZ #29
23. 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 HANDLE, THREADED ENDS, KITZ #68AC.

8. CONTROLS

- 8.1. PROVIDE ALL CONTROLS, INCLUDING WIRING, APPROVED 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 ANY OTHER DEVICES AS REQUIRED.
8.2. 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.
8.3. EQUIPMENT MANUFACTURER TO PROVIDE DDC BASED EQUIPMENT CONTROLLER PROVIDED WITH THE EQUIPMENT FOR INTEGRATION INTO THE EXISTING BAS SYSTEM.
8.4. PROVIDE ALL CONNECTIONS AND DEVICES NECESSARY TO INTERLOCK OR MAINTAIN THE INTENT OF ALL HVAC SYSTEMS, EQUIPMENT, AND ASSOCIATED ZONE CONTROL OF CHILLED WATER COOLING SYSTEMS AS REQUIRED.
8.5. ALL CONTROL WORK SHALL BE PERFORMED BY JOHNSON CONTROLS INC.
RAY KAMPEN
HVAC SMART BUILDING ACCOUNT EXECUTIVE
JOHNSON CONTROLS CANADA LP
(905) 730-9695
RAYMOND.A.KAMPEN@JCI.COM
8.6. CHILLED WATER SYSTEM BAS POINTS LIST:

COOLING TOWER 'CT-1':

- 1. STATUS
2. TEMPERATURE (SUPPLY & RETURN)
3. FLOW
4. RUN TIME TOTAL
5. PUMP P-CW-8 STATUS
6. PUMP P-CW-8 VFD SPEED

CHILLER 'CH-1':

- 1. STATUS
2. ALARM
3. ENABLE/DISABLE
4. TEMPERATURE (SUPPLY & RETURN)
5. FLOW
6. RUN TIME TOTAL
7. PUMP P-CW-7 STATUS
8. PUMP P-CW-7 VFD SPEED
9. BY-PASS VALVE POSITION (MIN CHILLER FLOW)

9. REFRIGERANT GAS DETECTION SYSTEM SEQUENCE OF OPERATION

- 9.1 EF-5 NORMALLY SHALL HAVE ON/OFF OPERATION VIA A REVERSE ACTING THERMOSTAT AND WHEN ON RUN AT LOW SPEED 500 CFM.
9.2 WHEN THE SENSOR DETECTS LEVELS OF REFRIGERANT ABOVE 19.1 LBS/1000 CU.FT. AS PER CSA B52, THE HONEYWELL PANEL IS TO REVERSE ACTING THERMOSTAT TO OVERRIDE TEMPERATURE SETTING AND TURN ON EF-5 AND RAMP UP EF-5 TO HIGH SPEED 1000 CFM. HORN/STROBE AT EACH INTERIOR DOOR SHALL BE ACTIVATED.
9.3 WHEN THE SENSOR CLEARS, EF-5 SHALL BE TURNED OFF. EACH HORN/STROBE SHALL DE-ACTIVATE.

10. WATER TREATMENT

- 10.1. WATER TREATMENT SHALL BE PERFORMED BY AQUARIAN CHEMICALS INC.:
MAURO CESA
788 WESTGATE ROAD, UNIT 8, OAKVILLE, ONTARIO L6L 5N2
TEL: 416-540-1883
FAX: 905-825-0177
MAIL-TO: 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. 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. OPERATING 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 LIKE.
4. 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. REFER TO SPECIFICATION SECTION 01 79 00 FOR FURTHER DETAILS.

KEY PLAN



Table with 3 columns: No., Description, Date. Contains revision history for the drawing.

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

DO NOT SCALE THE DRAWINGS.

McCallumSather logo and contact information: Westinghouse HQ, 2nd Floor, 286 Sanford Ave. N, Hamilton, ON L8L 6A1, 905.526.6700, www.mccallsather.com



SEAL

CONSULTANTS

PROJECT: GORDON PRICE ELEMENTARY SCHOOL
11 GUILDWOOD DR. HAMILTON, ON L9C 7K2

DRAWING TITLE: MECHANICAL SPECIFICATIONS

DRAWN BY: FS DATE: 23/04/20
CHECKED BY: DR SCALE: As Indicated

PROJECT NO: 23080

DRAWING NO: M5.01

12. REFRIGERANT LEAK DETECTION SYSTEM

SCOPE OF WORK

PROVIDE ALL LABOR, MATERIALS, PRODUCTS, EQUIPMENT AND SERVICE TO SUPPLY AND INSTALL A REFRIGERANT DETECTION AND CONTROL SYSTEM FULLY COMPLIANT WITH CURRENT B52 CODE, AS INDICATED ON THE DRAWINGS AND SPECIFIED IN THIS SECTION.

THE SYSTEM SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

- 1. FUTURE EXPANDABILITY
2. DISPLAY OF REFRIGERANT GAS CONCENTRATION
3. ABILITY TO MODIFY ALARM SET POINTS
4. INTERLOCK WITH EMERGENCY CHILLER SHUT-DOWN
5. AUTOMATIC AND MANUAL FAN START/STOP
6. DISPLAY OF ALARM STATUS
7. 2 INPUTS FOR THE EMGB BREAKGLASS SWITCH FOR EMERGENCY SHUTDOWN.

DEVICES

Table with 2 columns: DEVICE and LOCATION. Includes items like CONTROL PANEL, ANNUNCIATOR PANEL, REFRIGERANT GAS SENSOR, etc.

CONTROL PANEL: 301EM-RFSA-CA2

- 1. THE CONTROL PANEL SHALL BE INSTALLED INSIDE THE MECHANICAL ROOM AND BE CAPABLE OF COMMUNICATING DIGITALLY WITH THE SENSORS VIA MODBUS RS-485 FOR UP TO 20 NETWORKED SENSORS.
2. THE SYSTEM SHALL OPERATE ON 24VAC 2A MAX; ONE POWER SUPPLY (BRINGING EITHER 17-27 VAC OR 24-38 VDC) WILL BE SUFFICIENT TO POWER THE ENTIRE GAS DETECTION NETWORK (EXPANSION MODULE AND SENSORS).
3. THE CONTROL PANEL WILL HAVE 4 DPDT RELAY PROGRAMMABLE TO ALARM LEVELS
4. THE RELAYS SHALL BE FORM C AND HAVE A MINIMUM RATING OF 5 A, 30 VDC OR 250 VAC (RESISTIVE LOAD).
5. THE CONTROL PANEL MUST PROVIDE ALL THE FUNCTIONALITIES NECESSARY TO COMPLY WITH CURRENT ASHRAE 15 GUIDELINES AND CSA B-52 MECHANICAL CODES. THIS INCLUDES A INTEGRATED BUTTON FOR MANUAL FAN START/STOP OPERATION, A SILENCE BUTTON TO ACKNOWLEDGE THE 105DB HORN (AUDIBLE ALARM OPERATION WILL AUTOMATICALLY RESET AND SOUND AGAIN AT THE NEXT ALARM OCCURRENCE), AND A RED STROBE ON TOP OF THE UNIT.
6. CONTROLLER TO VISUALLY INDICATE THE EXACT CONCENTRATION OF REFRIGERANT GAS DETECTED AND CONTINUOUSLY DISPLAY THE SPECIFIED REFRIGERANT CONCENTRATION OF EACH SENSOR VIA A SCROLLING LCD SCREEN. THE LCD SCREEN SHOULD INDICATE MULTIPLE ALARM LEVELS FOR EACH SENSING POINT.
7. THERE SHALL BE 3 RELAYS CORRESPONDING TO THREE ALARM LEVELS. THE ALARM 'A' RELAY SHALL BE ENERGIZED AND THE FIRST ALARM (ALARM A) SHALL BE INITIATED WHEN THE REFRIGERANT GAS CONCENTRATION REACHES OR EXCEEDS THE PROGRAMMED ALARM A LEVEL. ALARM 'A' SHALL START THE MECHANICAL ROOM VENTILATION EQUIPMENT. THE ALARM 'B' RELAY SHALL BE ENERGIZED AND THE SECOND ALARM (ALARM B) SHALL BE INITIATED WHEN THE REFRIGERANT CONCENTRATION LEVELS REACH OR EXCEED THE PROGRAMMED ALARM 'B' LEVEL. ALARM B SHALL ENERGIZE THE ONBOARD RED HORN STROBE OF THE CONTROLLER OR A REMOTE ALARM HORN STROBE.

THE LED INDICATORS SHALL ALSO PROVIDE VISUAL FEEDBACK IN THE FOLLOWING MANNER:

Table mapping LED colors to alarm states: NORMAL OPERATION: GREEN LED, ALARM LEVEL A: RED LED, ALARM LEVEL B: RED LED, ALARM LEVEL C: RED LED, FAILURE: YELLOW LED, TX: YELLOW LED

THE STANDARD THREE HIGH/LOW ALARM LEVELS WILL BE COMPLEMENTED WITH A FAULT RELAY.

- 1. CERTIFIED TO UL AND CSA STANDARDS.

ANNUNCIATOR PANEL: 301EMRP-RFSA

- 1. ANNUNCIATOR PANEL MUST BE INSTALLED OUTSIDE MAIN ENTRANCE TO THE MER.
2. THE REMOTE ANNUNCIATOR PANEL WILL HAVE 4 INTERNAL DPDT RELAYS AT FULLY PROGRAMMABLE ALARM LEVELS. THE RELAY RATING WILL BE NO LOWER THAN 5 A, 30 VDC OR 250 VAC (RESISTIVE LOAD).
3. THE REMOTE PANEL MUST PROVIDE ALL THE FUNCTIONALITIES NECESSARY TO COMPLY WITH CURRENT ASHRAE 15 AND CSA B-52 MECHANICAL CODES. THIS INCLUDES A BUTTON FOR MANUAL FAN START ONLY OPERATION, A SILENCE KEY TO ACKNOWLEDGE THE INTERNAL 65 DB AUDIBLE ALARM AND A INTEGRATED RED STROBE/HORN.
4. THE REMOTE ANNUNCIATOR PANEL WILL INDICATE THE EXACT CONCENTRATION OF REFRIGERANT GAS AND THE REFRIGERANT GAS DETECTED. THE LCD DISPLAY SCREEN WILL INDICATE MULTIPLE ALARM LEVELS FOR EACH SENSING POINT. THE LED INDICATOR LIGHTS OF THE ANNUNCIATOR PANEL WILL ALSO PROVIDE VISUAL FEEDBACK AS FOLLOWS:

Table mapping LED colors to alarm states: NORMAL OPERATION: GREEN LED, ALARM LEVEL A: RED LED, ALARM LEVEL B: RED LED, ALARM LEVEL C: RED LED, FAILURE: YELLOW LED, TX: YELLOW LED

THE STANDARD THREE HIGH/LOW ALARM LEVELS WILL BE COMPLEMENTED WITH A FAULT RELAY.

- 5 THE UNIT WILL BE CERTIFIED TO UL AND CSA STANDARDS.

INFRARED REFRIGERANT GAS SENSOR: S301-IRF-R513A

- 1 THE SENSOR WILL BE POWERED BY THE CONTROL PANEL.
2 THE DETECTOR SHALL BE OF DIFFUSION TYPE WITH NO INTERNAL SAMPLE PUMP OR FILTER THAT REQUIRE REGULAR MAINTENANCE.
3 THE GAS SENSOR WILL HAVE RESOLUTION LEVELS OF 1 PPM WITH A STANDARD RANGE OF 0-1000
4 TEMPERATURE AND RELATIVE HUMIDITY VARIATIONS WILL HAVE NO EFFECT ON THE UNIT'S ACCURACY. THE SENSOR WILL BE CAPABLE OF OPERATING WITHIN RELATIVE HUMIDITY RANGES OF 5-95% AND TEMPERATURE RANGES OF 32OF-100OF (0OC-40OC).
5 THE UNIT WILL BE EQUIPPED WITH A NEMA 4X POLYCARBONATE-ABS IMPACT-RESISTANT ENCLOSURE.
6 THE SYSTEM MUST PROVIDE A MENU DRIVEN METHOD OF CHECKING BOTH ZERO AND SPAN CALIBRATIONS OF THE DETECTOR; ADJUSTMENTS MUST BE MADE THROUGH THE CONTROLLERS' FRONT PANEL KEYBOARD.
7 THE DETECTORS SHALL REQUIRE NO PERIODIC MAINTENANCE OTHER THAN YEARLY ZERO AND SPAN CHECKING WITH CALIBRATED ZERO AND SPAN GAS. PERIODIC CHECKING OR ADJUSTMENTS OF THE UNIT SHALL BE CAPABLE OF BEING ACCOMPLISHED BY ONE PERSON AT THE UNIT LOCATION.
8 STABILITY- THE 30 DAY ZERO AND SPAN DRIFT SHALL BE LESS THAN 1% F.S. WITHOUT THE AID OF AUTOMATIC OR MANUAL RECALIBRATION. THE SYSTEM SHALL NOT REQUIRE ANY TYPE OF AUTO-ZERO TECHNIQUES IN ORDER TO MAINTAIN STABILITY.
9 THE UNIT WILL BE MANUFACTURED TO UL AND CSA STANDARDS.

THE SENSOR ALARM LEVELS AND UNIT ARE TO BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING PARAMETERS:

Table with 5 columns: GASES, FIRST ALARM SET POINT, SECOND ALARM SET POINT, TRANSMITTER LOCATION, RADIUS OF COVERAGE. Row 1: R-513a, 250 PPM, 500 PPM, 300mm (1ft) A.F.F., 8 Meters

INSTALLATION AND EXECUTION

- 1 PROVIDE COMPLETE COMMISSIONING SERVICE BY THE MANUFACTURER'S AUTHORIZED REPRESENTATIVE. PROVIDE A FACTORY GENERATED CERTIFICATION DOCUMENT CERTIFYING THE OPERATION OF THE UNIT AND THE ALARM SYSTEM.
2 SIGNAGE TO BE PROVIDED OUTSIDE OF EACH ENTRANCE TO CHILLER ROOM INDICATING "CAUTION: DO NOT ENTER IF STROBE IS FLASHING". INSIDE CHILLER AND BOILER ROOM "CAUTION: EXIT IMMEDIATELY IF STROBE IS FLASHING."

13. VIBRATION ISOLATION

PART 1: PRODUCTS

- A. SPRINGS: ALL SPRINGS SHALL HAVE A MINIMUM ADDITIONAL TRAVEL TO SOLID EQUAL TO 50% OF THE RATED DEFLECTION. ALL SPRINGS EXCEPT INTERNAL NESTED SPRINGS SHALL HAVE AN OUTSIDE DIAMETER NOT LESS THAN 0.9 OF THE COMPRESSED HEIGHT OF THE SPRING. ENDS OF SPRINGS SHALL BE SQUARE AND GROUND FOR STABILITY. LATERALLY STABLE SPRINGS SHALL HAVE K/Kc RATIOS OF AT LEAST 0.9. ALL SPRINGS SHALL BE FULLY COLOR-CODED TO INDICATE CAPACITY - COLOR STRIPING IS NOT CONSIDERED ADEQUATE.
B. CORROSION PROTECTION: ALL SPRINGS SHALL BE POWDER-COATED ENAMEL. HOUSINGS SHALL BE GALVANIZED, POWDER-COATED ENAMEL, OR PAINTED WITH RUST-RESISTANT PAINT. HOT-DIPPED GALVANIZED HOUSINGS SHALL BE PROVIDED AS INDICATED ON THE SCHEDULE.
C. STEEL EQUIPMENT BASE: BASES SHALL BE OF WELDED CONSTRUCTION WITH CROSS MEMBERS TO FORM AN INTEGRAL SUPPORT PLATFORM. STRUCTURAL STEEL MEMBERS SHALL BE DESIGNED TO MATCH SUPPORTED EQUIPMENT.
1. VIBRATION BASES FOR FANS SHALL HAVE ADJUSTABLE MOTOR SLIDE RAILS AS INDICATED ON THEIR SCHEDULE, AND SHALL ACCOMMODATE MOTOR OVERHANG.
2. BASES FOR EXTERIOR USE SHALL BE PAINTED OR HOT-DIPPED GALVANIZED FOR COMPLETE CORROSION RESISTANCE.
3. MINIMUM CLEARANCE UNDER STEEL EQUIPMENT BASES SHALL BE 25MM (1").

D. ISOLATORS:

- 1. RESTRAINED SPRING FLOOR MOUNTED ISOLATORS: TYPE FLS - VIBRATION ISOLATORS FOR EQUIPMENT WHICH IS SUBJECT TO LOAD VARIATIONS AND LARGE EXTERNAL OR TORQUING FORCES SHALL CONSIST OF LARGE DIAMETER LATERALLY STABLE STEEL SPRINGS ASSEMBLED INTO FORMED OR WELDED STEEL HOUSING ASSEMBLIES DESIGNED TO LIMIT VERTICAL MOVEMENT OF THE SUPPORTED EQUIPMENT. SPRINGS SHALL BE SUPPORTED EITHER WITH A NEOPRENE CUP OF A METAL BASE PLATE COMPLETE WITH A RIBBED NEOPRENE PAD, MINIMUM 6 MM (0.25") THICK, BONDED TO THE BASE PLATE. HOUSING ASSEMBLY SHALL BE FORMED OR FABRICATED STEEL MEMBERS AND SHALL CONSIST OF A TOP-LOAD PLATE COMPLETE WITH ADJUSTING AND LEVELING BOLTS, VERTICAL RESTRAINTS, ISOLATION WASHERS AND A BOTTOM PLATE WITH NON-SKID NOISE STOP PADS AND HOLES PROVIDED FOR ANCHORING TO SUPPORTING STRUCTURE. HOUSING SHALL BE HOT DIPPED GALVANIZED. SPRING ELEMENTS SHALL MEET ALL THE SPECIFIED CHARACTERISTICS DESCRIBED IN SECTION 2.1E.1 PARAGRAPH.
2. RUBBER-IN-SHEAR / FIBERGLASS FLOOR MOUNTS:

- A. VIBRATION ISOLATORS SHALL BE PRE-COMPRESSED MOLDED FIBERGLASS PADS INDIVIDUALLY COATED WITH A FLEXIBLE, MOISTURE IMPERVIOUS ELASTOMERIC MEMBRANE. VIBRATION ISOLATION PADS SHALL BE MOLDED FROM GLASS FIBERS WITH ALL STRANDS ORIENTED HORIZONTALLY. NATURAL FREQUENCY OF FIBERGLASS VIBRATION ISOLATORS SHALL BE ESSENTIALLY CONSTANT FOR THE OPERATING LOAD RANGE OF THE SUPPORTED EQUIPMENT. VIBRATION ISOLATORS SHALL BE COLOR CODED OR OTHERWISE IDENTIFIED TO INDICATE THE LOAD CAPACITY. VIBRATION ISOLATORS SHALL BE SELECTED BY THE MANUFACTURER FOR EACH SPECIFIC APPLICATION.
B. VIBRATION ISOLATORS SHALL BE AS DESCRIBED AS IN SECTION 2.1E.1 PARAGRAPH BONDED TO A STEEL LOAD TRANSFER PLATE AND A FORMED STEEL BOLT-DOWN BRACKET, AND SHALL ALSO INCLUDE AN EQUIPMENT-MOUNTING BOLT WITH AN ANTI-SHORT CIRCUIT NEOPRENE GROMMET.

- C. VIBRATION ISOLATORS SHALL BE NEOPRENE, MOLDED FROM OIL-RESISTANT COMPOUNDS, WITH CAST-IN-TOP STEEL LOAD TRANSFER PLATE FOR BOLTING TO SUPPORTED EQUIPMENT, AND A BOLT-DOWN PLATE WITH HOLES PROVIDED FOR ANCHORING TO SUPPORTING STRUCTURE. TOP AND BOTTOM SURFACES SHALL HAVE NON-SKID RIBS. NEOPRENE VIBRATION ISOLATORS SHALL HAVE MINIMUM OPERATING STATIC DEFLECTIONS AS SHOWN ON THE VIBRATION ISOLATION SCHEDULE OR AS INDICATED ON THE PROJECT DOCUMENTS BUT NOT EXCEEDING PUBLISHED LOAD CAPABILITIES.

- 3. SPRING HANGERS: VIBRATION ISOLATOR HANGER SUPPORTS WITH STEEL SPRINGS AND WELDED STEEL HOUSINGS. THE HANGER BRACKET SHALL BE DESIGNED TO CARRY A 500% OVERLOAD WITHOUT FAILURE AND TO ALLOW A SUPPORT ROD MISALIGNMENT THROUGH A 30-DEGREE ARC WITHOUT METAL-TO-METAL CONTACT OR OTHER SHORT CIRCUIT. HANGERS SERVING LIGHTWEIGHT LOADS 0.90 KN (200 LBS) AND LESS MAY BE EXEMPT FROM THIS REQUIREMENT. (WHEN USED IN A SEISMIC APPLICATION(S), A VERTICAL LIMIT STOP WASHER SIZED TO FIT THE HANGER ROD IS TO BE PROVIDED BY OTHERS).

- A. VIBRATION ISOLATORS FOR SUSPENDED EQUIPMENT, WITH MINIMUM STATIC DEFLECTION REQUIREMENT EXCEEDING 4", SHALL BE HANGERS CONSISTING OF A FREE-STANDING, LATERALLY STABLE STEEL SPRING AND ELASTOMERIC WASHER IN SERIES, ASSEMBLED IN A STAMPED OR WELDED STEEL BRACKET. THE SPRING ELEMENT SHALL MEET ALL THE SPECIFIED CHARACTERISTICS DESCRIBED IN SECTION 2.1E.1 PARAGRAPH. THE STAMPED OR WELDED HANGER BRACKET SHALL MEET ALL THE SPECIFIED CHARACTERISTICS DESCRIBED IN SECTION 2.1E.7 PARAGRAPH. SHALL ALSO BE FITTED WITH A SELF-CENTERING LOAD CAP FOR THE HANGER ROD.

4. VIBRATION ISOLATION PADS:

- A. ISOLATION PADS SHALL BE NEOPRENE ELASTOMER IN-SHEAR PADS, USED IN CONJUNCTION WITH STEEL SHIMS WHERE REQUIRED, HAVING STATIC DEFLECTIONS AS TABULATED. KINETICS RSP NEOPRENE PADS ARE PRODUCED FROM A HIGH QUALITY NEOPRENE ELASTOMER. PADS ARE 50 DIAMETER AND ARE DESIGNED FOR A MAXIMUM OF 60 PSI (4.2 KG / SQ. CM) LOADING. PADS ARE DESIGNED FOR A MAXIMUM DEFLECTION OF APPROXIMATELY 20% OF ITS UNLOADED THICKNESS. 0.15" (0.38 CM). SEVERAL LAYERS OF RSP PADS CAN BE STACKED FOR ADDITIONAL DEFLECTION WHEN STEEL SEPARATION SHIM STOCK IS USED. THE ELASTOMER IS OIL AND WATER RESISTANT, OFFERS A LONG LIFE EXPECTANCY CONSISTENT WITH NEOPRENE COMPOUNDS, AND HAS BEEN DESIGNED TO OPERATE WITHIN THE SAFE STRESS LIMITS OF THE MATERIAL. RSP PADS ARE AVAILABLE UP TO 18" X 18" X 3/4" (457 MM X 457 MM X 19 MM) THICK SHEETS AND ARE PRE-SCORED INTO 2' X 2' (51 MM X 51 MM) SQUARES AND CAN BE EASILY CUT-TO-FIT AS NEEDED. ALL PADS SHALL BE ELASTOMER IN-SHEAR AND SHALL BE MOLDED USING 2500 PSI MINIMUM TENSILE STRENGTH, OIL RESISTANT NEOPRENE COMPOUNDS WITH NO COLOR ADDITIVES. NEOPRENE VIBRATION ISOLATORS SHALL HAVE MINIMUM OPERATING STATIC DEFLECTIONS AS SHOWN ON THE VIBRATION ISOLATION SCHEDULE, OR AS INDICATED ON THE PROJECT DOCUMENTS, BUT NOT EXCEEDING PUBLISHED LOAD CAPABILITIES.

PART 2: EXECUTION

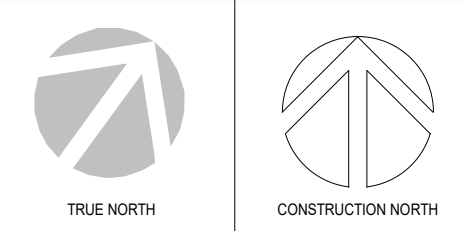
2.1 VIBRATION INSTALLATION

- A. INSTALLATION OF ALL VIBRATION ISOLATION MATERIALS AND SUPPLEMENTAL EQUIPMENT BASES SPECIFIED IN THIS SECTION SHALL BE ACCOMPLISHED AS PER THE MANUFACTURER'S WRITTEN INSTRUCTIONS AND ADJUST MOUNTINGS TO LEVEL EQUIPMENT.
B. ON COMPLETION OF INSTALLATION (AS PER KNC PROVIDED INSTALLATION DOCUMENTS) OF ALL ISOLATION MATERIALS AND BEFORE STARTUP OF ISOLATED EQUIPMENT ALL DEBRIS SHALL BE CLEARED FROM AREAS SURROUNDING AND FROM BENEATH ALL ISOLATED EQUIPMENT, LEAVING EQUIPMENT FREE TO MOVE ON THE ISOLATION SUPPORTS.
C. NO RIGID CONNECTIONS BETWEEN EQUIPMENT AND BUILDING STRUCTURE SHALL BE MADE THAT DEGRADES THE NOISE AND VIBRATION ISOLATION SYSTEM HEREIN SPECIFIED. ELECTRICAL CONDUIT CONNECTIONS TO ISOLATED EQUIPMENT SHALL BE LOOPED TO ALLOW FREE MOTION OF ISOLATED EQUIPMENT.
D. ENSURE PIPE, DUCT AND ELECTRICAL CONNECTIONS TO ISOLATED EQUIPMENT DO NOT REDUCE SYSTEM FLEXIBILITY. ENSURE THAT PIPE, CONDUIT AND DUCT PASSING THROUGH WALLS AND FLOORS DO NOT TRANSMIT VIBRATIONS.
E. UNLESS INDICATED OTHERWISE, PIPING CONNECTED TO ISOLATED EQUIPMENT SHALL BE ISOLATED AS FOLLOWS:

- 1. UP TO (NPS) 4" DIAMETER: FIRST 3 POINTS OF SUPPORT. (NPS) 5" DIAMETER TO (NPS) 8" DIAMETER: FIRST 4 POINTS OF SUPPORT. (NPS) 10" DIAMETER AND OVER: FIRST 6 POINTS OF SUPPORT.
2. FIRST POINT OF SUPPORT SHALL HAVE A STATIC DEFLECTION EQUAL TO THE DEFLECTION OF ISOLATED EQUIPMENT, WITH A MAXIMUM OF 2" (50 MM). SUBSEQUENT SUPPORT POINTS SHALL HAVE A STATIC DEFLECTION NO LESS THAN 1" (25MM).
3. DEFLECTION SHALL BE NOT LESS THAN THAT FOR THE EQUIPMENT TO WHICH THE PIPING IS CONNECTED.
4. BLOCK AND SHIM LEVEL BASES SO THAT THE DUCTWORK AND PIPING CONNECTIONS CAN BE MADE TO A RIGID SYSTEM AT THE OPERATING LEVEL, BEFORE ISOLATOR ADJUSTMENT IS MADE. ENSURE THAT THERE IS NO PHYSICAL CONTACT BETWEEN ISOLATED EQUIPMENT AND BUILDING STRUCTURE.

2.2 VIBRATION ISOLATION INSPECTION

- A. THE CONTRACTOR SHALL NOTIFY THE LOCAL REPRESENTATIVE OF THE VIBRATION ISOLATION MATERIALS MANUFACTURER PRIOR TO INSTALLING ANY VIBRATION ISOLATION DEVICES. THE CONTRACTOR SHALL SEEK THE REPRESENTATIVE'S GUIDANCE IN ANY INSTALLATION PROCEDURES WITH WHICH HE IS UNFAMILIAR.
B. THE LOCAL REPRESENTATIVE OF THE VIBRATION ISOLATION MATERIALS MANUFACTURER SHALL CONDUCT PERIODIC INSPECTIONS OF THE INSTALLATION OF MATERIALS HEREIN SPECIFIED, AND SHALL REPORT IN WRITING TO THE CONTRACTOR ANY DEVIATIONS FROM GOOD INSTALLATION PRACTICE OBSERVED.
C. ON COMPLETION OF INSTALLATION OF ALL NOISE AND VIBRATION ISOLATION DEVICES HEREIN SPECIFIED, THE LOCAL REPRESENTATIVE OF THE ISOLATION MATERIALS MANUFACTURER SHALL (ONLY UPON REQUEST AS REQUIRED) INSPECT THE COMPLETED SYSTEM AND REPORT IN WRITING ANY INSTALLATION ERRORS, IMPROPERLY SELECTED ISOLATION DEVICES, OR OTHER FAULT IN THE SYSTEM THAT COULD AFFECT THE PERFORMANCE OF THE SYSTEM.



KEY PLAN



Table with 3 columns: No., DESCRIPTION, DATE. Row 1: ISSUED FOR TENDER, 2024/06/05

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

DO NOT SCALE THE DRAWINGS.

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SEAL

CONSULTANTS

PROJECT: GORDON PRILE ELEMENTARY SCHOOL

11 GUILDWOOD DR. HAMILTON, ON L9C 7K2

DRAWING TITLE: MECHANICAL SPECIFICATIONS

Table with 2 columns: DRAWN BY, CHECKED BY, DATE, SCALE. Row 1: RM, DR, 05/23/24, As Indicated

PROJECT NO: 23080

DRAWING NO: M5.02

LEGEND
THIS LEGEND REPRESENTS THE SYMBOLS COMMONLY USED. NOT ALL SYMBOLS MAY APPEAR ON THE DRAWINGS. SHOULD A SYMBOL BE FOUND ON THE DRAWING AND NOT APPEARING ON THE LEGEND, THE CONTRACTOR SHALL SUBMIT A QUESTION TO HAVE THE SYMBOL CLARIFIED IN AN ADDENDUM PRIOR TO SUBMITTING A BID.

ABBREVIATIONS

ZDA	DENOTES 5-ZOR DEVICE
AC	ABOVE COUNTER
ADO	AUTOMATIC DOOR OPENER
AE	APPROVED EQUAL
AF	ABOVE FINISHED FLOOR
AN	FIRE ALARM ANNUNCIATOR
BED	RECEPTACLE DEDICATED FOR PATIENT BED
BH	BASEBOARD HEATER
CB	CIRCUIT BREAKER
ER	EXISTING TO BE RELOCATED
EX	EXISTING TO REMAIN
FH	FORCED-AIR HEATER
GFI	EQUIPMENT SO NOTED TO BE SUPPLIED WITH A GROUND FAULT CIRCUIT INTERRUPTER
HSKP	HOUSEKEEPING
JB	JUNCTION BOX
PD	POWER DOOR
R	RELAY WITH AUXILIARY CONTACTS
REL	RELOCATED ITEM IN NEW LOCATION
REM	EXISTING TO BE REMOVED IN ITS ENTIRETY
T	TRANSFORMER
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
W	WALL MOUNT - VERIFY HEIGHT
WP	EQUIPMENT SO NOTED TO BE SUPPLIED WITH THE MANUFACTURER'S WEATHER-PROOFING OPTION(S)

POWER LAYOUT

	DISCONNECT SWITCH (DS)
	COMBINATION STARTER (CS)
	MAGNETIC STARTER (MG)
	MANUAL STARTER (CS)
	POWER PANEL
	POWER TRANSFORMER
	ELECTRIC HEATING EQUIPMENT
	EQUIPMENT SUPPLIED BY OTHERS REQUIRING ELECTRICAL POWER CONNECTION REFER TO EQUIPMENT SCHEDULE
	EQUIPMENT SUPPLIED BY OTHERS REQUIRING ELECTRICAL POWER CONNECTION REFER TO OWNER EQUIPMENT SCHEDULE
	ALL MODES OF OPERATION OF EQUIPMENT SO NOTED TO BE SHUT DOWN BY THE ALARM CONDITION OF THE FIRE ALARM CONTROL PANEL
	PUSH BUTTON
	PUSH BUTTON STATION
	THERMOSTAT
	TIME CLOCK
	JIFFY POLE
	120V HARDWIRE CONNECTION
	208V, 1Ø HARDWIRE CONNECTION
	208V, 3Ø HARDWIRE CONNECTION
	600V, 3Ø HARDWIRE CONNECTION
	JUNCTION BOX
	HAND DRYER
	FLOOR BOX

DEMOLITION NOTES

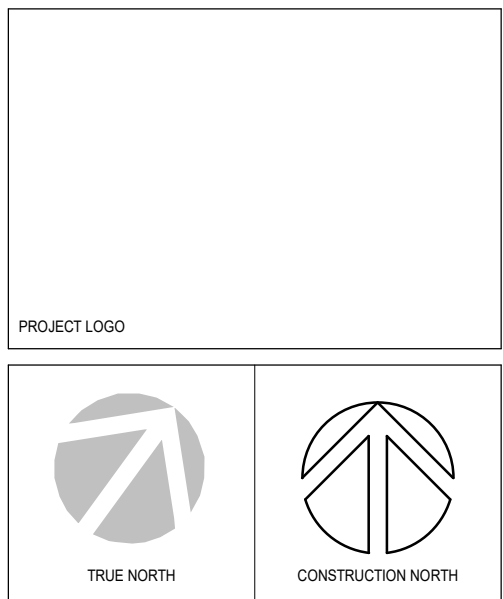
- THE CONTRACTOR SHALL ARRANGE TO TOUR THE FACILITY WITH THE MAINTENANCE STAFF PRIOR TO STARTING DEMOLITION.
- DURING THE CONTRACTORS SITE TOUR THEY SHALL BECOME FAMILIAR WITH THE EXISTING BUILDING CONSTRUCTION AND THE LOCATIONS OF THE EXISTING COMMUNICATION CLOSETS, LOCAL POWER PANELS, FIRE ALARM AND OTHER SYSTEMS BEING WORDED ON AS PART OF THIS CONTRACT.
- THE CONTRACTOR AND MAINTENANCE STAFF SHALL OPEN EXISTING PANELS AND SYSTEMS TO BECOME FAMILIAR WITH THE EXISTING SYSTEMS AND TO DETERMINE THE FULL SCOPE OF WORK REQUIRED TO CARRY OUT THE PROJECT. THE CONTRACTOR SHALL PROVIDE NEW BREAKERS, DATA/VOICE COMPONENTS, FIRE ALARM DEVICES, LIGHTING SYSTEM COMPONENTS, ETC TO FACILITATE A COMPLETE AND FUNCTIONING SYSTEM AT PROJECT COMPLETION.
- THE CONTRACTOR SHALL MEASURE OFF ANY DISTANCES NOT INDICATED FOR HOME RUNNING NEW SERVICES (POWER, FIRE ALARM, SECURITY ETC) AND INCLUDE MATERIALS AND LABOUR REQUIRED IN THEIR BID PRICE.
- COORDINATE ALL DEMOLITION WITH GENERAL CONTRACTOR. EVERY EFFORT HAS BEEN MADE TO OUTLINE THE DEMOLITION SCOPE OF WORK, HOWEVER THE DEMOLITION DRAWINGS REPRESENT ONLY THE GENERAL LOCATION AND NUMBER OF FITTINGS, FIXTURES, DEVICES, EQUIPMENT ETC. TO ASSIST IN EVALUATING THE DEMOLITION SCOPE OF WORK. DRAWINGS ARE BASED ON PREVIOUS AS-BUILTS OR FIELD EVALUATIONS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE DURING THE TENDER PERIOD TO DETERMINE THE EXACT SCOPE OF DEMOLITION WORK, QUANTITIES AND THOROUGHLY UNDERSTAND THE SITE CONDITIONS FOR CARRYING OUT THE SAME. REQUESTS FOR EXTRAS DUE TO FAILURE TO PROPERLY EVALUATE THE CONDITIONS THAT AFFECT DEMOLITION SCOPE OF WORK WILL NOT BE CONSIDERED.
- THE CONTRACTOR SHALL SUBMIT QUESTIONS IN WRITING 5 DAYS PRIOR TO TENDER CLOSING TO ALLOW FOR QUESTIONS TO BE FORMALLY ANSWERED IN AN ADDENDUM.
- UNLESS EXISTING CIRCUITS NUMBERS ARE INDICATED ON THE DEMOLITION PLANS, ALL CIRCUITS SHOWN ON THE NEW LAYOUTS ARE NEW CIRCUITS. EXCEPTIONS TO THIS INCLUDE CIRCUITS SHOWN ON THE DEMOLITION PLAN AND AGAIN ON THE NEW LAYOUT. THE CIRCUIT SHOWN BOTH TIMES IS EXISTING AND LOCALIZED IN THE AREA OF WORK. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING FOR ALL NEW CIRCUITS: NEW CONDUIT, WIRING, BREAKERS, SUPPORTS, BACKBOXES, FACEPLATES, RECEPTACLES, ETC FOR A COMPLETE SYSTEM.
- EXISTING CIRCUITS BEING REUSED WILL BE INDICATED BY A CIRCUIT NUMBER (IE 2A15) OR A GENERIC NUMBER (IE CCT7). CCT 7 INDICATES THAT THE LIGHTING OR DEVICE IS TO BE CONNECTED TO 1 OF 7 EXISTING CIRCUITS IN THE AREA THAT HAS BECOME FREE AFTER DEMOLITION. THE CONTRACTOR SHALL BALANCE LOADS AND SHUFFLE BREAKERS AFTER THE PANEL LOADS HAVE BEEN CONNECTED TO EQUALLY LOAD EACH PHASE.
- WHERE EXISTING LIGHTING CIRCUITS HAVE BEEN REUSED, CONTRACTOR SHALL VERIFY EXISTING VOLTAGE OF CIRCUITS PRIOR TO SUBMITTING ANY SHOP DRAWINGS OR ORDERING OF FIXTURES, SENSORS, CONTROLS, ETC. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES IN FIXTURE VOLTAGE AND EXISTING CIRCUIT VOLTAGE.

GENERAL NOTES

- THE ELECTRICAL DRAWINGS REPRESENT A PORTION OF THE CONTRACT. THE CONTRACTOR IS TO FAMILIARIZE THEMSELVES WITH ALL OF THE DRAWINGS IN THE PACKAGE AS SOME WORK MAY BE SHOWN ON OTHER DRAWINGS IN THE PACKAGE. CONTRACTOR IS TO DETERMINE FULL EXTENT OF PROJECT PRIOR TO SUBMITTING BID.
- THE DRAWINGS ARE NOT TO BE SCALED FOR INSTALLATION PURPOSES. ALL MEASUREMENTS ARE TO BE OBTAINED FROM ELEVATIONS, SHOP DRAWINGS OR BE OBTAINED FROM FIELD MEASUREMENTS.
- CONTRACTOR IS TO REMOVE ALL EXISTING DEAD AND ABANDONED CONDUIT AND WIRING BACK TO SOURCE. WHERE NOT POSSIBLE TO REMOVE EXISTING CONDUIT, CONDUIT IS TO BE LEFT BEHIND AND EXISTING WIRE IS TO BE REMOVED AND REPLACED WITH A PULL ROPE.
- CONTRACTOR IS TO PROVIDE ELECTRONIC AUTOCAD AS-BUILT DRAWINGS IN .DWG AND PDF FORMAT AT THE COMPLETION OF THE PROJECT. VERSION OF AUTOCAD FILES TO BE CONFIRMED WITH PRIME CONSULTANT AND PROVIDED TO MATCH ACCORDINGLY.
- UNLESS NOTED OTHERWISE ALL WIRING SHALL BE IN CONDUIT AND CONCEALED IN WALLS AND CEILING SPACES. SIX IS PERMITTED IN SPECIAL CIRCUMSTANCES AND SHORT DROPS FROM JUNCTION BOXES TO LIGHT FIXTURES, REFER TO SPECIFICATIONS. CONDUIT RUNS ARE TO BE PARALLEL TO WALL STUDS AND DROP FROM JUNCTION BOXES MOUNTED IN THE CEILING SPACE. HORIZONTAL RUNS IN WALLS WILL ONLY BE ACCEPTED UNDER SPECIAL CIRCUMSTANCES (IE OFFSET TO AVOID STRUCTURAL ABOVE) WITH WRITTEN APPROVAL FROM THE OWNER/CONSULTANT.
- ALL DATA/COMM WIRING FROM EACH OUTLET IS TO BE PROVIDED IN MIN. 1" (25mm) CONDUITS FROM OUTLET TO THE SOURCE (RACK AND/OR SIX BLOCK). CONTRACTOR CAN GROUP CABLING AND INSTALL A LARGER RUN BACK TO THE SOURCE. WHERE CABLE IS PERMITTED TO RUN FREE-AIR, A CONDUIT SHALL BE INSTALLED FROM THE OUTLET INTO AN ACCESSIBLE CEILING SPACE. PROVIDE BUSHINGS AT TOP OF WALL AND TRANSITION TO J-HOOKS (WITHIN ROOM) OR CABLE TRAY (AT CORRIDOR). CABLE IS NOT PERMITTED TO BE LAYING ON CEILING. COMM WIRING SHALL BE IN CONDUIT FOR ALL EXPOSED AREAS. FREE AIR COMM WIRING TRANSITIONING FROM ACCESSIBLE CEILINGS TO EXPOSED CEILINGS SHALL BE IN CONDUIT THROUGHOUT THE EXPOSED AREA. PROVIDE 12" (300mm) STUBS INTO THE EXPOSED AREAS WITH BUSHINGS. CONDUIT SHALL NOT EXCEED 40% FILL.
- UNLESS SPECIFICALLY NOTED AS 'CABLING BY OTHERS' THE CONTRACTOR SHALL INCLUDE FOR ALL CABLING TO DEVICES, OUTLETS, ETC AS SHOWN FOR A COMPLETE AND FUNCTIONING SYSTEM(S).
- CONTRACTOR IS TO MAINTAIN POWER AND COMMUNICATION CIRCUITS IN AREAS OUTSIDE OF THE CONSTRUCTION AREA. PROVIDE TEMPORARY CONNECTIONS AS REQUIRED, COORDINATE WITH OWNER.
- EQUIPMENT BEING REMOVED AND NOT BEING REUSED REMAIN THE PROPERTY OF THE OWNER AND IS TO BE STORED ON SITE. ANY EQUIPMENT THE OWNER DEEMS NO INTEREST IN IS TO BE DISPOSED OF IN A LAWFUL AND SAFE MANNER BY THIS TRADE.

DRAWING LIST

E000	GENERAL NOTES, LEGENDS, DRAWING LIST AND SCHEDULES
E050	SPECIFICATIONS
E200	ELECTRICAL DEMOLITION PLANS
E300	ELECTRICAL PROPOSED PLANS



KEY PLAN

2	ISSUED FOR TENDER	2024 05 31
1	ISSUED FOR PERMIT	2024 05 10
No.	DESCRIPTION	DATE

REVISIONS:
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PROJECT:
GORDON PRICE ELEMENTARY SCHOOL

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HAMILTON, ON. L9B 7K2**

DRAWING TITLE:
GENERAL NOTES, LEGENDS, DRAWING LIST AND SCHEDULES

DRAWN BY:	SJBM	DATE:	JUNE 3, 2020
CHECKED BY:	KS	SCALE:	NTS

PROJECT NO: **23-181**

DRAWING NO: **E000**

1. GENERAL

1. THIS SPECIFICATION SHALL APPLY TO AND GOVERN ALL WORK OF DIVISION 16. THE ELECTRICAL CONTRACTOR SHALL BE A SUBCONTRACTOR TO THE GENERAL CONTRACTOR AND HIS BID SHALL BE TENDERED DIRECTLY TO THE GENERAL CONTRACTOR. THE CONTRACTOR SHALL SUPPLY, INSTALL, WIRE AND CONNECT ALL EQUIPMENT, ACCESSORIES, DEVICES ETC SHOWN UNLESS SPECIFICALLY NOTED OTHERWISE. REFER TO FRONT END DOCUMENTS FOR TENDER REQUIREMENTS.

2. IT IS THE CONTRACTORS RESPONSIBILITY TO OBTAIN ALL DRAWINGS AND SPECIFICATIONS PRIOR TO TENDER SUBMITTAL. ELECTRICAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS. REFER TO FRONT END TENDER DOCUMENTS FOR QUESTION SUBMITTAL.

3. LIABILITY INSURANCE:
1. REFER TO FRONT END TENDER DOCUMENTS.

4. CODES, PERMITS AND INSPECTION
1. BE RESPONSIBLE FOR AND OBTAIN ALL PERMITS, INSPECTION, ETC., AS REQUIRED BY ALL AUTHORITIES HAVING JURISDICTION OVER THIS WORK AND PAY FOR ALL FEES RELATED TO SAME.
2. DELIVER ALL PERMITS TO THE ENGINEER AS SOON AS THEY BECOME AVAILABLE.

5. CLOSE OUT DOCUMENTS AND AS-BUILT DRAWINGS:
1. THE CONTRACTOR SHALL SUBMIT AN ENQUIRY TO THE PRIME CONSULTANT/OWNER TO OBTAIN THE FINAL ROOM NAMES AND NUMBERS TO BE USED IN ALL THE CLOSE OUT DOCUMENTS, REPORTS, FIRE ALARM/NURSE CALL PROGRAMMING, PANEL SCHEDULES ETC. FAILURE TO USE THE FINAL NAMES AND NUMBERS WILL REQUIRE THE CONTRACTOR TO REPLACE DOCUMENTATION/REPRODUCTION AS REQUIRED AT THEIR EXPENSE. THEY SHALL KEEP A SEPARATE SET OF WHITE PRINTS ON THE SITE AND NOTE ALL CHANGES AND DEVIATIONS FROM THE ORIGINAL DESIGN. DEVICES ETC NOTED AS 'EX' (EXISTING) AND 'REL' (RELOCATED) ARE TO HAVE THE CIRCUIT TRACED AND DESIGNATED ON THE DRAWINGS. DEVICES ETC DESIGNATED AS CONNECT TO EXISTING CIRCUIT IN AREA ARE TO HAVE THE CIRCUIT INDICATED ON THE PLANS. PROVIDE AS-BUILT DRAWINGS IN AUTOCAD FORMAT (MIN. RELEASE 2010), PDF FORMAT AND (2) TWO SETS OF THESE PLANS SHOWING ALL AS-BUILT CONDITIONS TO THE OWNER AT THE COMPLETION OF THIS CONTRACT AND BEFORE APPLYING FOR FINAL PAYMENT. (INCLUDE IN-SLAB CONDUIT RUNS). SHOULD NO MARKUPS BE REQUIRED TENDER AND/OR SEALED PLANS BY THE ENGINEER WILL NOT BE ACCEPTED.
2. CLOSE OUT BINDERS SHALL BE PROVIDED WITH ALL TEST RESULTS, WARRANTY LETTERS AND SHOP DRAWINGS. A PDF COPY SHALL BE PROVIDED ALONG WITH THE HARD COPY VERSIONS. PDF VERSION SHALL BE ASSEMBLED VERSIONS WHERE POSSIBLE. SHOULD A DOCUMENT REQUIRE SCANNING, IT SHALL BE PROVIDED IN HIGH RESOLUTION AND BE CLEARLY LEGIBLE. ILLEGIBLE DOCUMENTS WILL NOT BE ACCEPTED.

6. CODES AND STANDARDS: (CURRENT EDITIONS)
1. DO COMPLETE INSTALLATION IN ACCORDANCE WITH C.S.A. C22.1 EXCEPT WHERE SPECIFIED OTHERWISE.
2. COMPLY WITH C.S.A. ELECTRICAL BULLETINS IN FORCE AT TIME OF TENDER SUBMISSION, WHILE NOT IDENTIFIED AND SPECIFIED BY NUMBER IN THIS DIVISION, ARE TO BE CONSIDERED AS FORMING PART OF RELATED C.S.A. PART II STANDARD.
3. DO OVERHEAD AND UNDERGROUND SYSTEMS IN ACCORDANCE WITH C.S.A. C22.3 NO. 1 EXCEPT WHERE SPECIFIED OTHERWISE.
4. ABBREVIATIONS FOR ELECTRICAL TERMS: TO C.S.A. Z85.
5. COMPLY ALSO WITH THE FOLLOWING CODES:
1. ONTARIO ELECTRICAL SAFETY CODE
2. NATIONAL BUILDING CODE
3. ONTARIO BUILDING CODE
4. LOCAL HYDRO UTILITY REQUIREMENTS
5. CAN/ULC 5224, 5537 AND 51001

7. VISITING THE SITE:
1. VISIT THE SITE OF THE PROJECT AND BECOME FAMILIAR WITH THE SITE CONDITIONS. REPORT ANY DEVIATION AND/OR CONFLICTS BETWEEN TENDER DOCUMENTS AND SITE CONDITIONS PRIOR TO STARTING WORK.

8. LOCATION OF OUTLETS:
1. CHANGE LOCATION OF OUTLETS, EQUIPMENT AT NO EXTRA COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED 10'-0" (3m) AND INFORMATION IS GIVEN BEFORE INSTALLATION.

9. CUTTING AND PATCHING:
1. PROVIDE ALL CUTTING, PATCHING AND PAINTING FOR ELECTRICAL WORK, UNLESS NOTED OTHERWISE.

10. EQUIPMENT AND MATERIAL:
1. ALL EQUIPMENT AND MATERIAL, UNLESS SPECIFICALLY NOTED OTHERWISE, SHALL BE NEW AND WITHOUT BLEMISH OR DEFECT. ALL MATERIAL AND EQUIPMENT SHALL BEAR U.L.C. OR C.S.A. LABELS.

11. WARRANTY:
1. WARRANTY ALL WORK AND APPARATUS INSTALLED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF SAME BY THE OWNER.

12. MAINTENANCE OF SERVICE:
1. PROVIDE ALL LABOUR AND MATERIALS NECESSARY TO INSURE THAT POWER, LIGHTING AND ALL OTHER MISCELLANEOUS ELECTRICAL SERVICES ARE MAINTAINED IN FULL OPERATING CONDITION, IN ALL AREAS OF THE EXISTING BUILDING, DURING THE CONSTRUCTION PERIOD. DISCONNECT, MOVE, RELOCATE, AND RECONNECT CONDUIT AND WIRING AS NECESSARY TO ACCOMMODATE THE NEW WORK AND MECHANICAL INSTALLATION.

13. CLEANING
1. DO FINAL CLEANING.
2. AT TIME OF FINAL CLEANING, CLEAN EQUIPMENT SURFACES THAT HAVE BEEN EXPOSED TO CONSTRUCTION DUST AND DIRT.
3. VACUUM INSIDE OF ALL PANEL BOARDS, ETC., ON COMPLETION OF THE PROJECT.

14. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
1. SUBMIT SHOP DRAWINGS, PRODUCT DATA AND/OR SAMPLES FOR ALL EQUIPMENT, POWER DISTRIBUTION, POWER DEVICES, COMMUNICATIONS DEVICES, RACEWAY, LIGHT FIXTURES, EMERGENCY LIGHTING, ETC. THE DRAWINGS ARE TO BE REVIEWED AND STAMPED BY BOTH THE GENERAL AND ELECTRICAL CONTRACTOR PRIOR TO SUBMITTAL.
2. SHOP DRAWINGS SHALL INCLUDE ALL RELEVANT ACCESSORIES AND LAYOUTS WHERE REQUESTED.
3. SHOP DRAWINGS THAT ARE ILLEGIBLE AND OF POOR QUALITY WILL BE REJECTED.
4. SHOP DRAWINGS WILL BE REVIEWED AND RETURN MARKED "REVIEWED", "REVIEWED AS MODIFIED" OR "REVISE AND RESUBMIT". THE DRAWING REVIEW DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ITS ACCURACY OR FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS.
5. INSTALLATION OF ANY EQUIPMENT SHALL NOT START UNTIL AFTER FINAL REVIEW OF SHOP DRAWINGS BY THE CONSULTANT HAS BEEN OBTAINED.
6. INCOMPLETE OR INCORRECT SHOP DRAWINGS THAT ARE REJECTED, WHICH ADVERSELY CAUSE OR RESULT IN ANY DELAY OF THE DELIVER SCHEDULE OF ANY EQUIPMENT SHALL BE THE CONTRACTORS RESPONSIBILITY.
7. IF INCORRECT SHOP DRAWINGS ARE SUBMITTED AND REJECTED ANY SUBSEQUENT DELIVERY DELAY WILL RESULT IN THE CONTRACTOR PROVIDING TEMPORARY FACILITIES UNTIL SAID EQUIPMENT IS DELIVERED AND INSTALLED AT NO EXTRA COST TO THE OWNER.
8. PROVIDE SPACE FOR SHOP DRAWING REVIEW STAMPS FOR THE CONTRACTOR AND CONSULTANT. THIS SPACE SHALL BE CLEAR OF ALL TECHNICAL INFORMATION AND SHALL NOT BE ON THE BACK OF ANY SHEETS.
9. SUBMIT SHOP DRAWINGS IN DIGITAL (PDF) FORMAT.
10. ONE (1) ORIGINAL COPY IN DIGITAL FORMAT (PDF) WILL BE RETURNED. ALL COPIES REQUIRED BY TRADES, SUPPLIERS OR OTHER CONSULTANTS WILL BE PROVIDED AND/OR PRINTED BY THE CONTRACTOR.
11. FAILURE TO SUBMIT SHOP DRAWINGS WILL NOT RELIEVE THIS CONTRACTOR FROM ENSURING THAT ALL INSTALLED EQUIPMENT MEETS THE INTEND OF DESIGN DOCUMENTS. ALL COSTS ASSOCIATED WITH ANY ISSUES ASSOCIATED WITH ALTERNATE OR NOT SUBMITTED EQUIPMENT WILL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR.
12. SHOP DRAWING SUBMITTAL SHALL BE (BUT NOT LIMITED TO) FOR ANY EQUIPMENT AS LISTED:
1. HIGH VOLTAGE EQUIPMENT
2. SWITCHBOARD, METER CENTERS, PANEL BOARDS
3. FIRE ALARM SYSTEMS
4. LUMINAIRES INCLUDING LAMPS AND BALLASTS
5. LIGHTING CONTROLS
6. EMERGENCY BATTERY UNITS AND FIXTURES
7. ELECTRICAL HEATERS
8. SECURITY SYSTEM
9. MASTER CLOCK AND PROGRAM
10. INTERCOM SYSTEM
11. PUBLIC ADDRESS SYSTEM
12. MILLWORK
13. DEVICES

15. DRAW BREAKDOWNS:
1. REFER TO FRONT END TENDER DOCUMENTS.
2. PROGRESS DRAWS, WHEN SUBMITTED, ARE TO BE ITEMIZED AGAINST EACH OF THE DRAW BREAKDOWNS AND SHALL BE IN TABLE FORM IDENTIFYING CONTRACT AMOUNT, AMOUNT OF THIS DRAW, TOTAL TO DATE, PERCENTAGE COMPLETE AND BALANCE.
3. BREAKDOWN SHALL FOLLOW, BUT NOT BE LIMITED TO:
1. PERMITS AND FEES
2. MOBILIZATION
3. DEMOLITION
4. DISTRIBUTION EQUIPMENT (IE. SWITCHBOARDS, PANELBOARDS, ETC.)
5. INCOMING FEEDERS AND CONDUITS
6. BRANCH WIRING CONDUITS
7. BRANCH WIRING
8. MECHANICAL EQUIPMENT WIRING
9. FIRE ALARM DEVICES
10. FIRE ALARM WIRING
11. FIRE ALARM VERIFICATION AND CERTIFICATION
12. EXIT AND EMERGENCY LIGHTING
13. LIGHTING
14. LIGHTING CONTROLS
15. VOICE AND COMMUNICATION CONDUITS

16. VOICE AND COMMUNICATION WIRING AND TERMINATIONS
17. ACCESS CONTROL AND SECURITY
18. MISCELLANEOUS AND SPECIALTY EQUIPMENT (IE. PUBLIC ADDRESS, SOUND, ETC.)

4. ABOVE BREAKDOWN MUST BE APPROVED BY THE CONSULTANT PRIOR TO SUBMISSION OF THE FIRST DRAW. MOBILIZATION AMOUNT MAY ONLY BE DRAWN WHEN ALL REQUIRED SHOP DRAWINGS HAVE BEEN REVIEWED BY THE CONSULTANT.

16. REVISIONS TO CONTRACT:
1. PROVIDE ITEMIZED LISTS OF MATERIALS/ASSOCIATED COSTS, LABOUR RATE/LABOUR FOR EACH ITEM, COPY OF MANUFACTURERS INVOICE, IF REQUESTED, FOR EACH ITEM GIVEN CHANGE NOTICE.

17. ROOF AND WALL OPENINGS:
1. LOCATION OF CONDUITS PASSING THROUGH ROOF AND WALLS TO BE COORDINATED WITH DIVISION 15. ALL OPENINGS TO BE MADE WATERTIGHT.

18. SCHEDULE OF CONSTRUCTION:
1. CONSULT GENERAL DIVISION FOR SCHEDULE OF CONSTRUCTION BEFORE COMMENCING WORK AND COORDINATE DETAILS WITH ENGINEER, OWNER AND ALL TRADES DURING CONSTRUCTION.

19. DIRECTORIES AND LABELLING:
1. IDENTIFY ALL ELECTRICAL EQUIPMENT. IDENTIFICATION SHALL CONSIST OF ENGRAVED LAMACOID NAMEPLATES HAVING BLACK BACKGROUND WITH WHITE LETTERS. FASTEN NAMEPLATES TO DEVICE USING SELF-TAPPING, COUNTERSUNK SCREWS. TAPE-TYPE NAMEPLATES WILL NOT BE ACCEPTED.
2. ALL RECEPTACLE COVER PLATES SHALL BE LABELED WITH TAPE-TYPE NAMEPLATES. THE LABEL SHALL INDICATE THE PANEL DESIGNATION AND CIRCUIT NUMBER. (IE A19). TAPE SHALL BE NEATLY TRIMMED ON EACH END AND PLACED PLUMB AND LEVEL ON THE FACE PLATE. LABELS SHALL HAVE A HEAT, CLEAN AND PROFESSIONAL APPEARANCE. LABELS NOT TRIMMED OR POORLY POSITIONED WILL NOT BE ACCEPTED.
3. ALL PANELS WITH CIRCUITS ADDED OR REMOVED SHALL HAVE NEW COMPUTER-GENERATED PANEL SCHEDULES PLACED IN THEM. SCHEDULE SHALL INDICATE PANEL DESIGNATION, WHERE PANEL IS FED FROM, VOLTAGE, PHASE, BRANCH CIRCUIT NUMBERS, BREAKER AMPERAGE AND CIRCUIT DESCRIPTION.

20. GROUNDING:
1. GROUND ALL EQUIPMENT IN ACCORDANCE WITH CODE REQUIREMENTS AND AS INDICATED.
2. GROUNDING CONDUCTORS: COPPER, INSULATED (GREEN); SIZE PER CODE.
3. GROUNDING LUGS, CONNECTORS: APPROVED GROUNDING TYPE.
4. ALL GROUND CONDUCTORS #8AWG OR SMALLER SHALL BE RUN IN EMT.

21. FIREPROOFING:
1. WHERE CABLES PASS THROUGH FLOORS OR FIRE RATED WALLS, PACK SPACE BETWEEN WIRING AND SLEEVE FULL WITH APPROVED RATED FIRE STOPS AND SEAL WITH CALKULING COMPOUND CONFORMING TO CGSB 19-GP-99a.

22. MOUNTING HEIGHTS:
1. MOUNTING HEIGHT OF EQUIPMENT IS FROM FINISHED FLOOR TO CENTRELINE OF EQUIPMENT UNLESS SPECIFIED OR INDICATED OTHERWISE.
2. IF MOUNTING HEIGHT OF EQUIPMENT IS NOT SPECIFIED OR INDICATED, VERIFY BEFORE PROCEEDING WITH INSTALLATION.
3. INSTALL ELECTRICAL EQUIPMENT AS SPECIFIED IN THE OBC FOR BARRIER FREE DESIGN. IF NOT NOTED, INSTALL AT FOLLOWING CENTRELINE HEIGHTS:
1. LOCAL SWITCHES: 3'-5" (1050mm).
2. WALL RECEPTACLES:
1. GENERAL: 1'-6" (450mm).
2. ABOVE TOP OF CONTINUOUS BASEBOARD HEATER: 10" (250mm).
3. ABOVE TOP OF COUNTERS OR COUNTER SPLASH BACKS: 6" (150mm).
4. MECHANICAL ROOMS: 3'-5" (1050mm).
3. PANELBOARDS: AS REQUIRED BY CODE OR AS INDICATED.
4. TELEPHONE AND INTERPHONE OUTLETS: 1'-6" (450mm).
5. TELEVISION OUTLETS: 1'-6" (450mm).
6. FIRE ALARM PULL STATIONS: 3'-9" (1150mm).

23. LOAD BALANCE:
1. MEASURE PHASE CURRENT TO PANELBOARDS WITH NORMAL LOADS (LIGHTING) OPERATING AT TIME OF ACCEPTANCE. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO OBTAIN BEST BALANCE OF CURRENT BETWEEN PHASES AND RECORD CHANGES.
2. MEASURE PHASE VOLTAGES AT LOADS AND ADJUST TRANSFORMER TAPS TO WITHIN 2% OF RATED VOLTAGE OF EQUIPMENT.
3. SUBMIT, AT COMPLETION OF WORK, REPORT LISTING PHASE AND NEUTRAL CURRENTS ON PANELBOARDS, DRY-CORE TRANSFORMERS AND MOTOR CONTROL CENTRES, OPERATING UNDER NORMAL LOAD. STATE HOUR AND DATE ON WHICH EACH LOAD WAS MEASURED, AND VOLTAGE AT TIME OF TEST.

25. CONDUIT AND CABLE INSTALLATION:
1. INSTALL CONDUIT AND SLEEVES PRIOR TO POURING OF CONCRETE. SLEEVES THROUGH CONCRETE: SCHEDULE 40 STEEL PIPE, SIZED FOR FREE PASSAGE OF CONDUIT, AND PROTRUDING 2" (50mm).
2. IF PLASTIC SLEEVES ARE USED IN FIRE RATED WALLS OR FLOORS, REMOVE BEFORE CONDUIT INSTALLATION.
3. INSTALL CABLES, CONDUITS AND FITTINGS TO BE EMBEDDED OR PLASTERED OVER, NEATLY AND CLOSE TO BUILDING STRUCTURE SO FURRING CAN BE KEPT TO MINIMUM.

26. DEFINITIONS:
1. THE FOLLOWING ARE DEFINITIONS OF WORDS FOUND IN THE SPECIFICATION AND ON ASSOCIATED DRAWINGS:
1. "CONCEALED" - HIDDEN FROM NORMAL SIGHT IN FURRED IN SPACES, SHAFTS, CEILING SPACES, WALLS, UNDERFLOOR AND PARTITIONS.
2. "EXPOSED" - ALL ELECTRICAL WORK EXPOSED TO BUILDING OCCUPANTS. WIRE AND CABLING SHALL BE IN CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE.
3. "PROVIDE" (AND ALL TENSES OF "PROVIDE") SUPPLY, INSTALL, WIRE AND CONNECT COMPLETE.
4. "INSTALL" (AND ALL TENSES OF "INSTALL") INSTALL WIRE AND CONNECT COMPLETE, PRODUCTS AND SERVICES SPECIFIED.
5. "SUPPLY" SUPPLY ONLY
6. "OR APPROVED EQUAL" - MATERIAL OR EQUIPMENT PROPOSED BY THE CONTRACTOR IN LIEU OF THAT SPECIFIED AS APPROVED BY THE CONSULTANT. MATERIAL OR EQUIPMENT SHALL MEET OR EXCEED THE SAME QUALITY, MATERIAL, EFFICIENCY, ETC AS THE SPECIFIED PRODUCTS.
7. "AS INDICATED" AS SHOWN ON DRAWINGS AND/OR NOTED IN SPECIFICATIONS.

2. PRODUCTS
1. ELECTRICAL EQUIPMENT
1. EQUIPMENT SHALL HAVE 1.0m (39") CLEARANCE IN FRONT OF SAID EQUIPMENT
2. ELECTRICAL EQUIPMENT RATED AT 1200A AND OVER SHALL HAVE 1.5m (59") CLEARANCE IN FRONT OF SAID EQUIPMENT.
3. ALL EQUIPMENT INSTALLED IN SPRINKLERED AREAS ARE TO BE COMPLETE WITH DRIP SHIELDS.

3. BREAKERS GENERAL
1. BOLT-ON MOLDED CASE CIRCUIT BREAKER, FULL MODULE (I.E. 1" MINIMUM WIDTH), QUICK-MAKE, QUICK-BREAK TYPE, FOR MANUAL AND AUTOMATIC OPERATION WITH TEMPERATURE COMPENSATION FOR 400C AMBIENT. (MINI-BREAKERS NOT ACCEPTABLE)
2. MAGNETIC INSTANTANEOUS TRIP ELEMENTS IN CIRCUIT BREAKERS, TO OPERATE ONLY WHEN THE VALUE OF CURRENT REACHES SETTING.

4. DISCONNECT SWITCHES FUSED AND UNFUSED
1. ENCLOSED MANUAL AIR BREAK SWITCHES IN NON-HAZARDOUS LOCATIONS: TO C.S.A. C22.2 NO. 4.
2. FUSE HOLDER ASSEMBLIES TO C.S.A. C22.2 NO. 39.
3. FUSIBLE AND NON-FUSIBLE DISCONNECT SWITCHES AS INDICATED.
4. PROVISION FOR PADLOCKING IN ON/OFF SWITCH POSITION BY THREE LOCKS
5. MECHANICALLY-INTERLOCKED DOOR TO PREVENT OPENING WHEN HANDLE IN "ON" POSITION
6. QUICK-MAKE, QUICK-BREAK ACTION.
7. ON/OFF SWITCH POSITION INDICATION ON SWITCH ENCLOSURE COVER.
8. C.S.A. ENCLOSURE 1 UNLESS NOTED OTHERWISE.
9. EATON CUTLER HAMMER, SQUARE D, SIEMENS CANADA MANUFACTURE.

5. CONDUCTORS
1. ALL CONDUCTORS SHALL BE COPPER UNLESS INDICATED OTHERWISE.
2. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS #8 AND LARGER SHALL BE STRANDED.
3. CONDUCTORS SHALL BE SIZED #12 AWG MINIMUM, EXCEPT FOR CONTROL CIRCUITS WHERE #14 AWG MINIMUM SIZE IS PERMITTED. FEEDER SIZES AS INDICATED.
4. PANEL FEEDER LENGTHS SHALL BE CONTRACTOR VERIFIED FOR LENGTH OF PROPOSED INSTALLATION PATH SO AS NOT TO EXCEED 3% VOLTAGE DROP ON INSTALLATION. FEEDERS EXCEEDING THE LENGTH OF THE ALLOWABLE AMPACITY SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BEGINNING ANY ROUGH-INS.
5. SIZE CONDUCTORS FOR A 2% MAXIMUM VOLTAGE DROP FROM OVERCURRENT DEVICE TO FARTHEST OUTLET.
6. CONDUCTOR INSULATION RATED FOR 600V MINIMUM UNLESS STATED OTHERWISE.
7. CONDUCTOR TYPES:
1. TW75, TWU TO C.S.A. #C22.2 NO. 75
2. RW90, RWU90 (XLPE) TO C.S.A. #C22.2 NO. 38
3. TW75, RW90 (XLPE) - INSIDE BUILDING.
4. TWU, RWU90 (XLPE) - CONDUCTORS DIRECT BURIED OR IN CONDUIT OUTSIDE BUILDING.
5. BX (ARMOURED CABLE) IS ONLY PERMITTED FOR LIGHT FIXTURE DROPS IN ACOUSTIC CEILINGS (MAX LENGTH 5'-0"), AND MAY BE USED IN HOLLOW PARTITIONS FOR SWITCH [AND/OR RECEPTACLE DROPS] OR SUSPENDED CEILING FOR FIXTURE DROPS ONLY. ANY DROPS SHALL NOT EXCEED 3.0m (10'-0"). AC-90 (BX ARMOURED CABLE) IS NOT TO BE INSTALLED IN OPEN CEILINGS OR ANY OTHER EXPOSED APPLICATION. ALL CABLES ARE TO BE PROPERLY FASTENED TO BUILDING STRUCTURE IN A NEAT AND PROFESSIONAL MANNER. [USE OF AC-90 IN METAL STUD CONSTRUCTION HOLLOW PARTITION IS TO BE LIMITED TO A MAXIMUM OF 3.0m (10'-0").] EXCESSIVE USE OF AC-90, IN THE OPINION OF THE ENGINEER, WILL REQUIRE ELECTRICAL CONTRACTOR TO REPLACE ALL NEW WIRING WITH PROPER CONDUIT AND WIRE AT CONTRACTORS EXPENSE.

6. FASTENINGS AND SUPPORTS
1. SUPPORT EQUIPMENT, CONDUIT OR CABLES USING CLIPS, SPRING-LOADED BOLTS, CABLE CLAMPS DESIGNED AS ACCESSORIES TO BASIC CHANNEL MEMBERS.

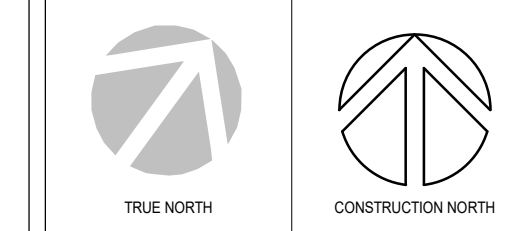
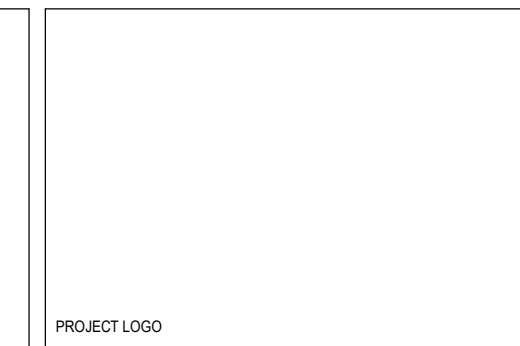
2. INSTALL FASTENINGS AND SUPPORTS AS REQUIRED FOR EACH TYPE OF EQUIPMENT CABLES AND CONDUIT AND IN ACCORDANCE WITH MANUFACTURERS INSTALLATION.

7. CONDUITS
1. RIGID, GALVANIZED STEEL THREADED CONDUIT TO C.S.A. C22.2, NO. 45, SIZE AS INDICATED.
2. ELECTRICAL METALLIC TUBING (EMT) WITH COUPLINGS AND EXPANDED ENDS AS REQUIRED, TO C.S.A. C22.2, NO. 83, SIZE AS INDICATED.
3. RIGID PVC (UNPLASTICIZED) CONDUIT FOR EXPOSED, ABOVE GROUND WORK, TO C.S.A. C22.2, NO. 211.2, SIZE AS INDICATED. FLEXIBLE PVC IS NOT PERMITTED.
4. FLEXIBLE METAL CONDUIT AND LIQUID-TIGHT FLEXIBLE METAL CONDUIT TO C.S.A. C22.2, NO. 56.
5. EMT CONDUIT FITTINGS, IE. CONNECTORS, COUPLINGS, TO C.S.A. C22.2, NO. 18, ZINC-PLATED STEEL/MALLEABLE IRON CONSTRUCTION. ALL CONNECTIONS AND COUPLINGS TO BE SET SCREW TYPE, IE. CONCRETE TIGHT.
6. CONDUIT SIZES SHALL BE A MINIMUM OF 3/4" AND CONFORM TO ELECTRICAL SAFETY CODE. WHERE SIZES ARE INDICATED AND THEY EXCEED CODE, THEY SHALL NOT BE REDUCED.
7. USE RIGID, GALVANIZED STEEL, THREADED CONDUIT WHERE CONDUIT IS SUBJECT TO MECHANICAL INJURY.
8. RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES.
9. USE EMT FOR ALL WIRING FROM OUTLET BOX TO SOURCE.
10. INSTALL NYLON FISH WIRE IN EMPTY CONDUITS AND TERMINATE UNDER SCREW LEAVING 12' SLACK. TAG FISH WIRE IDENTIFYING SYSTEM.
11. DO NOT LOCATE CONDUITS LESS THAN 3" (75 MM) PARALLEL TO STEAM OR HOT WATER LINES WITH A MINIMUM OF 1" (25 MM) AT CROSS-OVERS.
12. IN-SLAB CONDUIT: LOCATE TO SUIT REINFORCING STEEL. INSTALL IN CENTRE 1/2 OF SLAB.
13. PROVIDE AND INSTALL 4-38mm (4 1-1/2") SPARE CONDUITS UP TO CEILING SPACE FROM EACH FLUSH MOUNTED ELECTRICAL PANEL. TERMINATE IN 300mm X 300mm (12"x12") JUNCTION BOXES IN ACCESSIBLE CEILING SPACE.

8. JUNCTION AND PULL BOXES
1. WELDED STEEL CONSTRUCTION WIRE SCREW-ON FLAT COVERS FOR SURFACE MOUNTING.
2. COVERS WITH 1" (25 MM) MINIMUM EXTENSION ALL AROUND, FOR FLUSH-MOUNTED PULL AND JUNCTION BOXES.
3. INSTALL PULL BOXES IN CONDUIT RUNS SO AS NOT TO EXCEED 30 M OF CONDUIT RUN OR THE EQUIVALENT OF TWO (2) 90° BENDS BETWEEN PULL BOXES.

9. OUTLET AND CONDUIT BOXES:
1. ALL LIGHTING FIXTURES, RECEPTACLES AND OTHER WIRING DEVICES FOR ANY CONDUIT SYSTEM SHOWN SHALL BE PROVIDED WITH AN OUTLET BOX.
2. 4" (102 MM) OCTAGON OR SQUARE OUTLET BOXES OR LARGER, COMPLETE WITH FITTINGS FOR LIGHTING FIXTURES AND AS REQUIRED FOR SPECIAL DEVICES.
3. WALL OUTLET BOXES SHALL BE:
1. NO. 1104 SERIES, FLUSH MOUNTED IN DRYWALL PARTITIONS, U.N.O.
2. M85 SERIES MASONRY BOXES (GALVANIZED STEEL) FLUSH MOUNTED IN MASONRY WALLS (BLOCK WALLS).
3. GANG BOXES SHALL BE USED AT LOCATIONS WHERE DEVICES ARE GROUPED. PROVIDE BARRIERS AS REQUIRED.
4. BLANK COVER PLATES FOR BOXES WITHOUT WIRING DEVICES.

2.12 ROOF TOP EQUIPMENT
1. COORDINATE SIZE OF BREAKERS AND FEEDERS WITH MECHANICAL. FEEDERS ON DRAWINGS ARE BASED ON DESIGN LOADS PROVIDED IN MECHANICAL DRAWINGS. CONTRACTOR SHALL CONFIRM THE FEEDER SIZES AND BREAKERS ON SHOP DRAWINGS PRIOR TO ROUGH-IN AND PURCHASE OF MATERIAL/EQUIPMENT TO POWER UP UNITS. DISCREPANCIES ARE TO BE NOTED TO THE ENGINEER.
2. PROVIDE MAINTENANCE RECEPTACLES AS REQUIRED BY ESA. COORDINATE WITH MECHANICAL; SHOULD THE EQUIPMENT NOT INCLUDE A MAINTENANCE RECEPTACLE AS AN OPTION, THE CONTRACTOR SHALL INCLUDE TO PROVIDE A 15/20R GFI RECEPTACLE AND A 1-P-20A BREAKER FROM THE LOCAL PANEL FOR EACH GROUP OF UNITS. UNITS MORE THAN 50'-0" APART SHALL HAVE ITS OWN RECEPTACLE. RECEPTACLE SHALL BE MOUNTED TO A PEDESTAL OR ROOF CURB AND SEALED WATERTIGHT. PROVIDE AN IN-USE COVER FOR THE RECEPTACLE.



KEY PLAN

Table with 2 columns: No., Description, Date. Includes rows for ISSUED FOR TENDER (2024 06 31) and ISSUED FOR PERMIT (2024 06 10).

REVISIONS

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SEAL

CONSULTANTS: sei logo and address: 12 Aryle Street N, Cambridge, ON N1W 1S5, www.sei-ea.com

PROJECT: GORDON PRICE ELEMENTARY SCHOOL

11 GUILDWOOD DR. HAMILTON, ON. L96 7K2

DRAWING TITLE: SPECIFICATIONS

Table with 2 columns: DRAWN BY, CHECKED BY, DATE, SCALE. Includes values: SUBM, KS, JUNE 3, 2020, NTS.

PROJECT NO: 23-181

DRAWING NO: E050

PROJECT LOGO



KEY PLAN

2	ISSUED FOR TENDER	2024 05 31
1	ISSUED FOR PERMIT	2024 05 10
No.	DESCRIPTION	DATE

REVISIONS:

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SEAL



PROJECT:
GORDON PRICE ELEMENTARY SCHOOL

11 GUILDWOOD DR.
 HAMILTON, ON. L9B 7K2

DRAWING TITLE:
ELECTRICAL DEMOLITION PLANS

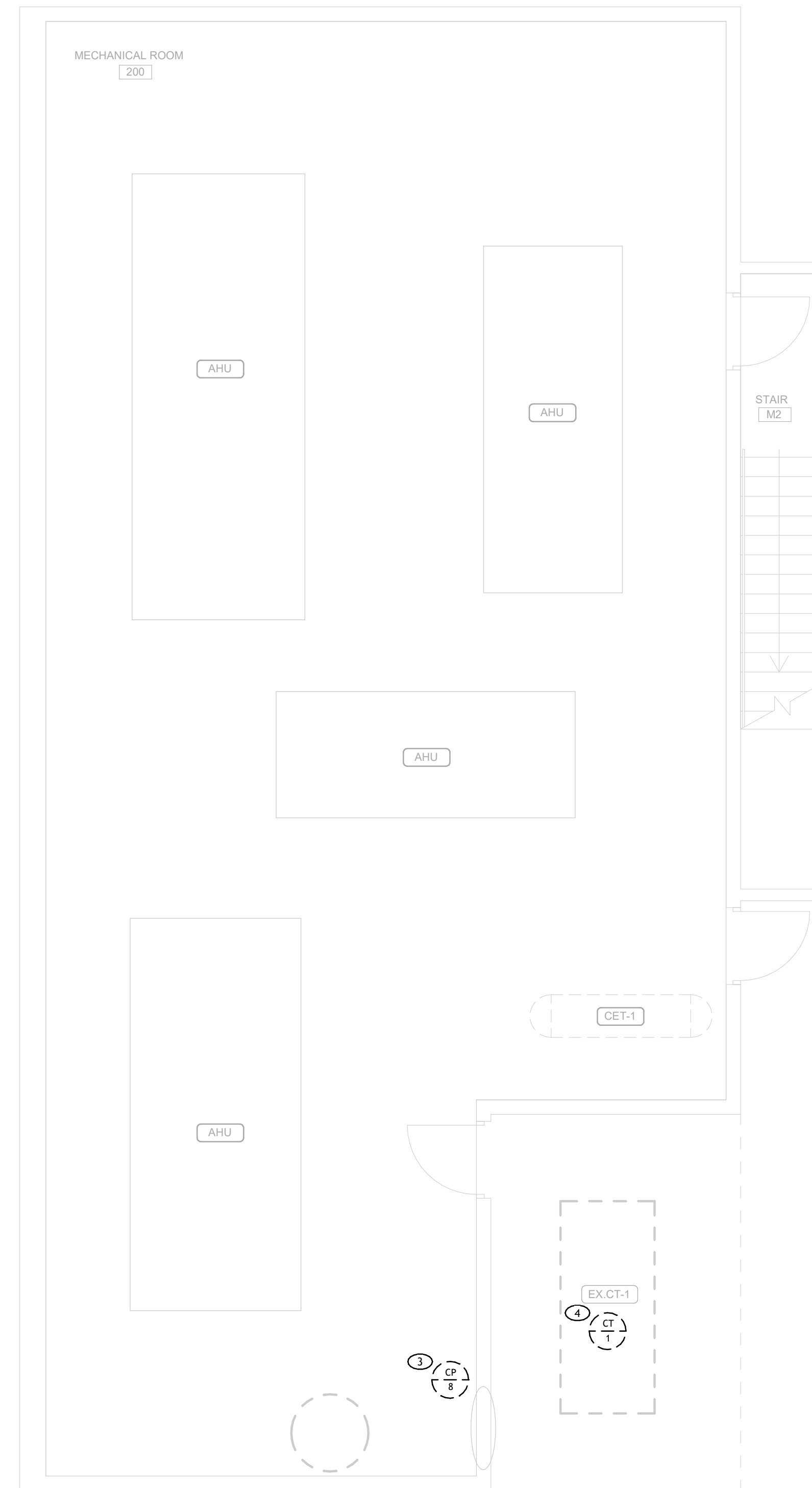
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CHECKED BY:	KS	SCALE:	1:50

PROJECT NO: **23-181**

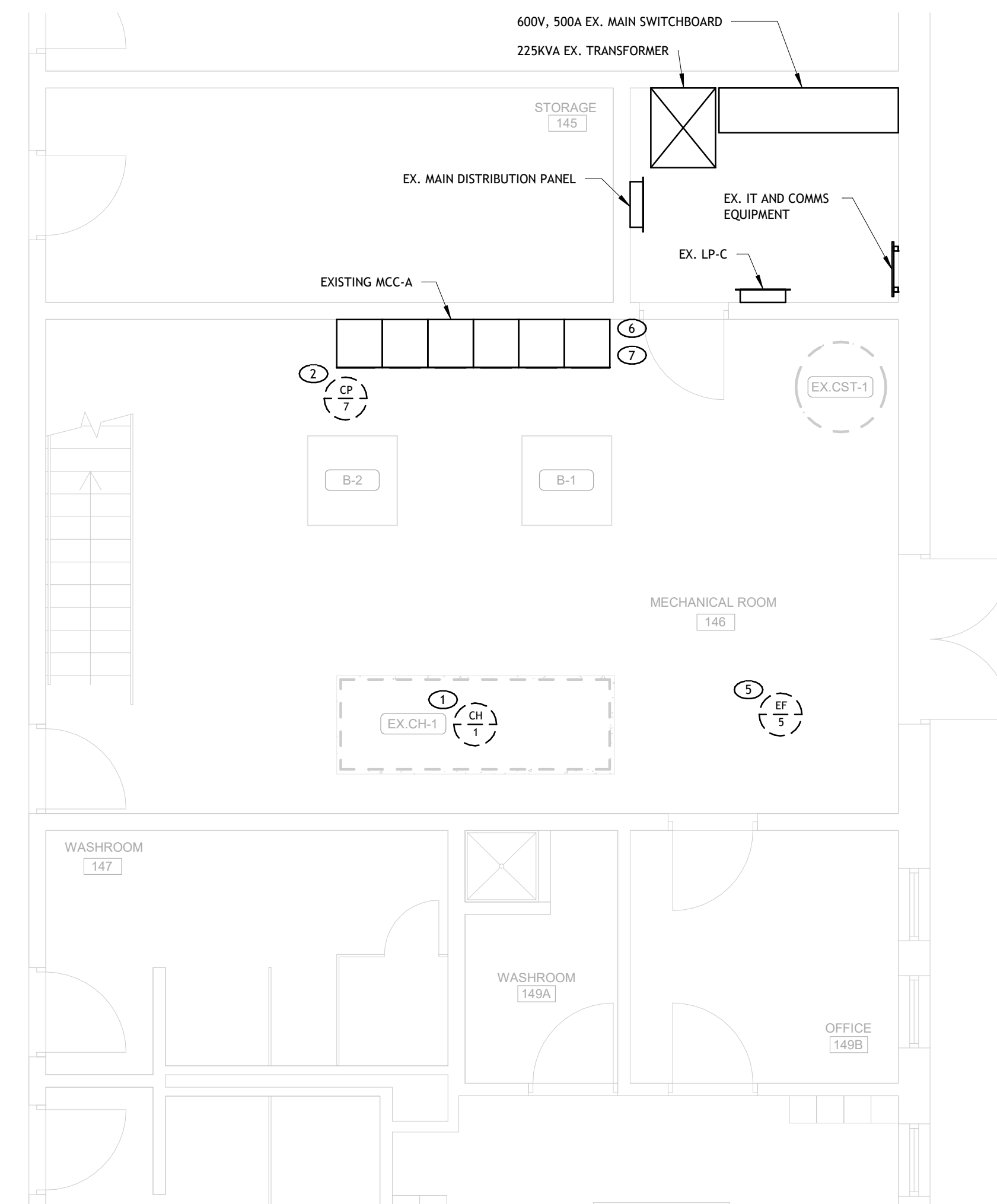
DRAWING NO: **E200**

DRAWING NOTES:

- EXISTING CHILLER (CH-1) TO BE REMOVED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO REMOVE POWER AND CONTROLS WIRING. EXISTING 150A BREAKER FOR CH-1, LOCATED IN THE ELECTRICAL ROOM ON THE MAIN SWITCHBOARD, IS TO BE REMOVED AND REPLACED NEW WITH 110A BREAKER FOR NEW REPLACEMENT CHILLER.
- EXISTING CHILLER PUMP (CP-7) TO BE REMOVED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO REMOVE POWER AND CONTROLS WIRING. EXISTING BUCKET FOR CP-7, LOCATED IN THE MECHANICAL ROOM ON MCC - A, TO BE REUSED FOR NEW REPLACEMENT CHILLER PUMP.
- EXISTING CHILLER PUMP (CP-8) TO BE REMOVED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO REMOVE POWER AND CONTROLS WIRING. EXISTING BUCKET FOR CP-8, LOCATED IN THE MECHANICAL ROOM ON MCC - A, TO BE REUSED FOR NEW REPLACEMENT CHILLER PUMP.
- EXISTING COOLING TOWER (CT-1) TO BE REMOVED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO REMOVE POWER AND CONTROLS WIRING. EXISTING BUCKET FOR CP-1, LOCATED IN THE MECHANICAL ROOM ON MCC - A, TO BE REUSED FOR NEW REPLACEMENT COOLING TOWER.
- EXISTING BOILER ROOM EXHAUST FAN (EF-5) TO BE REMOVED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO REMOVE POWER AND CONTROLS WIRING. EXISTING BUCKET FOR EF-5, LOCATED IN MECHANICAL ROOM ON MCC-A, TO BE REUSED FOR NEW REPLACEMENT EXHAUST FAN.
- REPLACEMENT UNITS FOR CP-7, CP-8, AND CT-1 ARE BEING SUPPLIED WITH VFD'S, EXISTING CAPACITORS FOR CP-7, CP-8, AND CT-1 ARE NO LONGER REQUIRED. MCC-A BUCKETS FOR THESE CAPACITORS ARE TO BE DISCONNECTED AND MARKED AS SPARE.
- REPLACEMENT UNITS FOR CP-7, CP-8, AND CT-1 ARE BEING SUPPLIED WITH VFD'S, EXISTING HAND/OFF/AUTO SWITCHES ON MCC BUCKETS FOR CP-7, CP-8, AND CT-1 ARE NOT REQUIRED. SWITCHES ARE TO BE REMOVED AND TURNED OVER AS SPARE PARTS. HOLES IN MCC BUCKET FACEPLATE FROM REMOVED SWITCHES ARE TO BE PATCHED.



LEVEL 2 MECH ROOM DEMOLITION 2
 1:50 E200



LEVEL 1 BOILER ROOM DEMOLITION 1
 1:50 E200

PROJECT LOGO



KEY PLAN

2	ISSUED FOR TENDER	2024 05 31
1	ISSUED FOR PERMIT	2024 05 10
No.	DESCRIPTION	DATE

REVISIONS:

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CONSULTANTS



PROJECT:
GORDON PRICE ELEMENTARY SCHOOL

11 GUILDWOOD DR.
 HAMILTON, ON. L9B 7K2

DRAWING TITLE:
ELECTRICAL PROPOSED PLANS

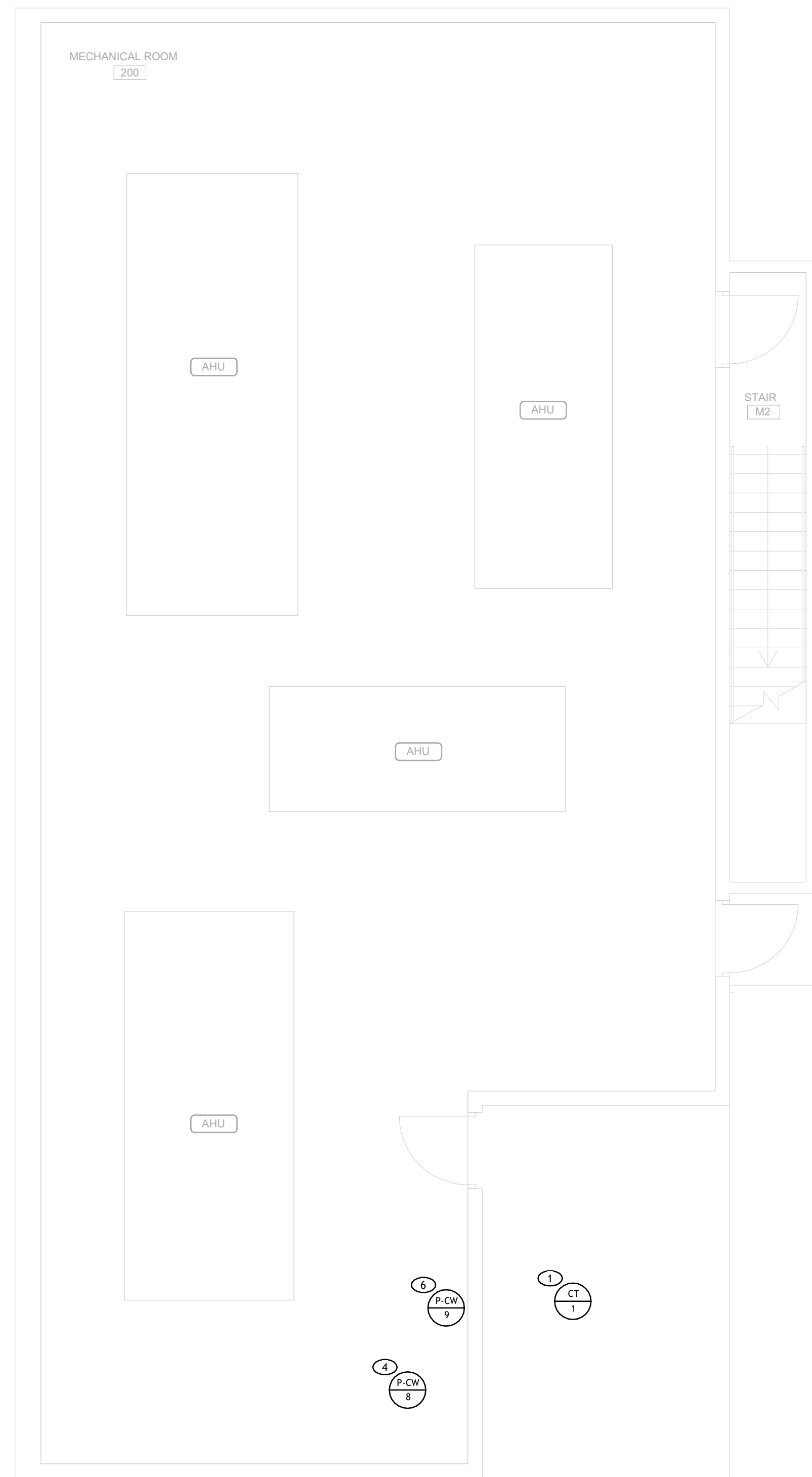
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PROJECT NO: **23-181**

DRAWING NO:

E300

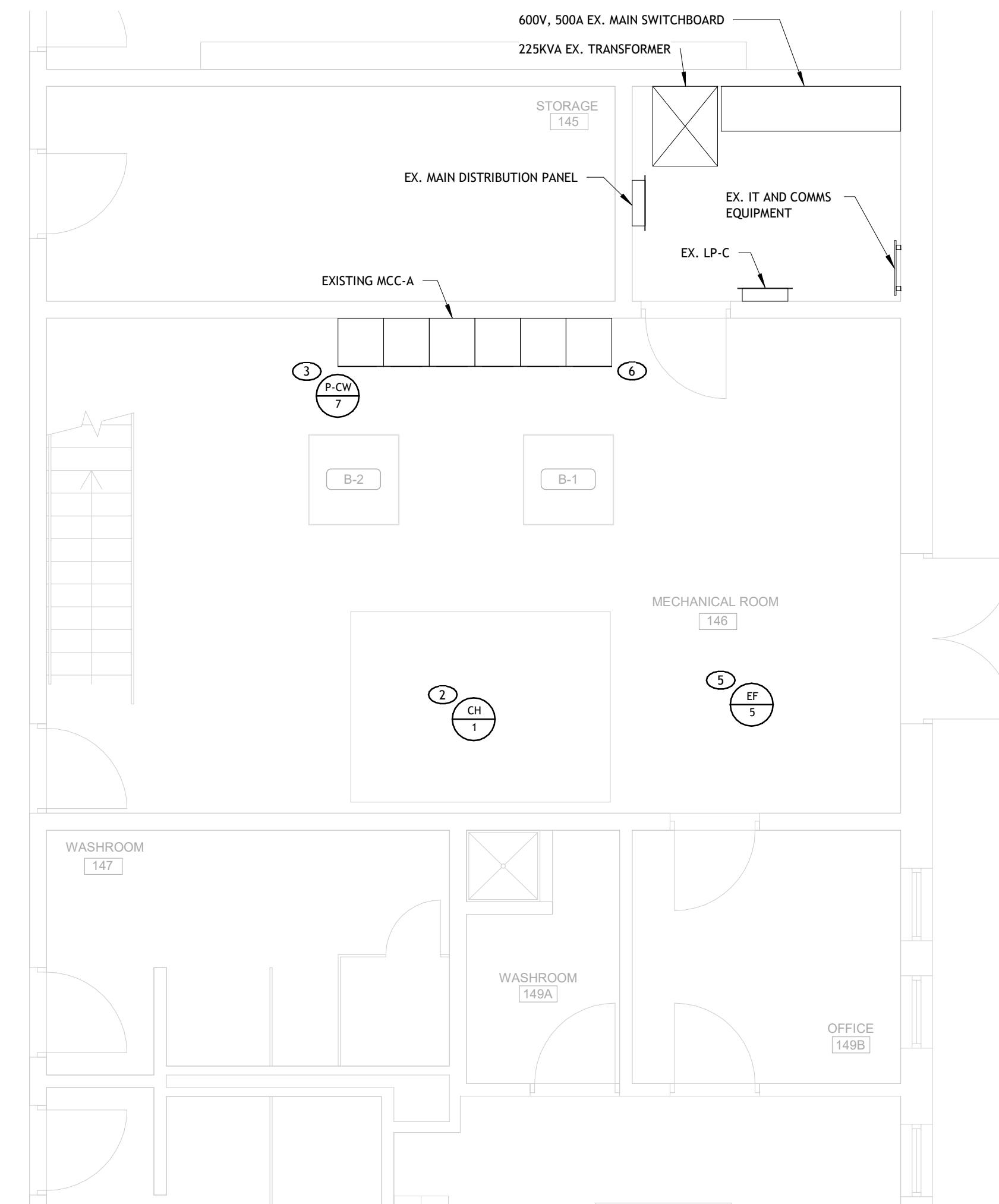
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LEVEL 2 MECH ROOM PROPOSED 2
 1:50 E300

DRAWING NOTES:

- 1 NEW COOLING TOWER (CT-1) TO BE INSTALLED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO CONNECT POWER AND CONTROLS WIRING. CONNECT TO EXISTING MCC - A BUCKET PREVIOUSLY USED FOR REMOVED CT - 1.
- 2 NEW CHILLER (CH-1) TO BE INSTALLED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO CONNECT POWER AND CONTROLS WIRING. PROVIDE NEW 110A BREAKER ON THE MAIN SWITCHBOARD FOR CH-1.
- 3 NEW CHILLED WATER DISTRIBUTION PUMP (P-CW-7) TO BE INSTALLED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO CONNECT POWER AND CONTROLS WIRING. CONNECT TO EXISTING MCC - A BUCKET PREVIOUSLY USED FOR REMOVED CP-7, UPDATE LABEL TO MATCH.
- 4 NEW CHILLED WATER DISTRIBUTION PUMP (P-CW-8) TO BE INSTALLED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO CONNECT POWER AND CONTROLS WIRING. CONNECT TO EXISTING MCC - A BUCKET PREVIOUSLY USED FOR REMOVED CP-8, UPDATE LABEL TO MATCH.
- 5 NEW BOILER ROOM EXHAUST FAN (EF - 5) TO BE INSTALLED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO CONNECT POWER AND CONTROLS WIRING. CONNECT TO EXISTING MCC-A BUCKET PREVIOUSLY USED FOR REMOVED EF-5.
- 6 NEW CHILLED WATER SEPARATION PUMP (P-CW-9) TO BE INSTALLED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO COORDINATE TO CONNECT POWER AND CONTROLS WIRING. PROVIDE NEW MCC BUCKET IN MCC - A WITH 15A FUSED DISCONNECT SWITCH. LOCATE BUCKET IN SPACE PREVIOUSLY USED FOR CP-7 CAPACITOR.



LEVEL 1 BOILER ROOM PROPOSED 1
 1:50 E300