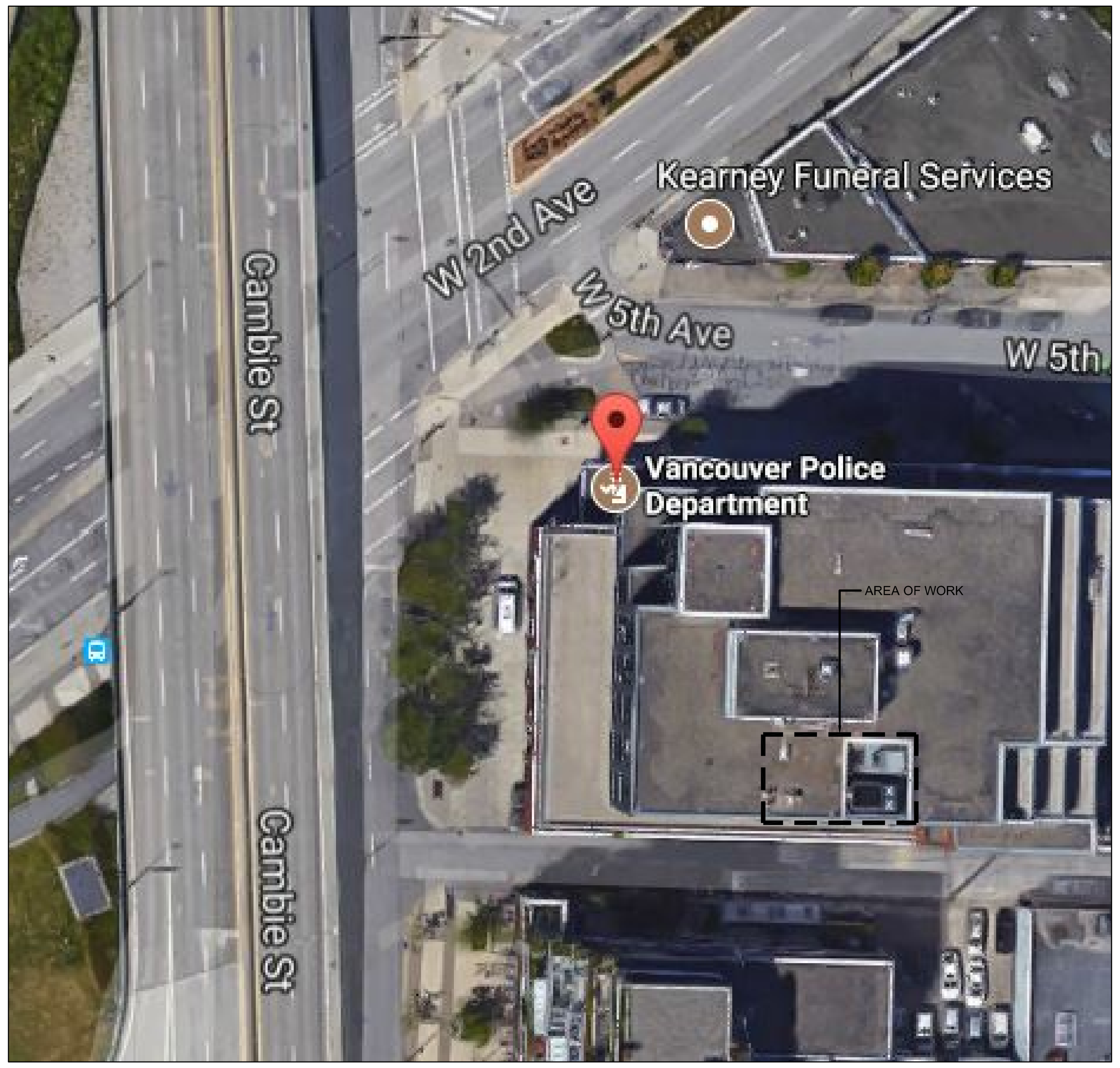


1 / M0.1 **SITE PLAN**
SCALE: NTS
NORTH

SYMBOL SCHEDULE

PIPING

DEMOLITION	EXISTING	NEW	
			DOMESTIC COLD WATER (DCW)
SAN	SAN	SAN	SANITARY SEWER ABOVE GRADE
SAN	SAN	SAN	SANITARY SEWER BELOW GRADE
			PIPE CLEAN-OUT
			PIPE CLEAN-OUT TO GRADE
CHWS	CHWS	CHWS	CHILLED WATER SUPPLY
CHWR	CHWR	CHWR	CHILLED WATER RETURN
C	C	C	CONDENSATE DRAIN
CONDS	CONDS	CONDS	CONDENSER WATER SUPPLY
CONDR	CONDR	CONDR	CONDENSER WATER RETURN

FITTINGS AND VALVES

DEMOLITION	EXISTING	NEW	
			DIRECTION OF FLOW
			PIPE DROP
			PIPE RISE
			PIPE TEE UP
			PIPE TEE DOWN
			PIPE UNION
NO	NO	NO	ISOLATION VALVE (NORMALLY OPEN)
NC	NC	NC	ISOLATION VALVE (NORMALLY CLOSED)
			CHECK VALVE
			2-WAY CONTROL VALVE
			3-WAY CONTROL VALVE
			BALANCING VALVE
			PRESSURE REDUCING VALVE (PRV)
			POOL FLOW CONTROL VALVE
			STRAINER
			RELIEF VALVE
			BACKFLOW PREVENTOR (BFP)
			AUTOMATIC AIR VENT (AAV)
			SEISMIC GAS SHUT-OFF VALVE
			TEMPERATURE GAUGE
			PRESSURE GAUGE
			THERMOMETER
			PUMP
EM	EM	EM	ENERGY METER
BTU	BTU	BTU	BTU METER

SYSTEM MONITORING

DEMOLITION	EXISTING	NEW	
FS	FS	FS	FLOW SWITCH
T	T	T	PIPE TEMPERATURE SENSOR
P	P	P	PRESSURE SENSOR

EQUIPMENT TAGS

DEMOLITION	EXISTING	NEW	
			GRILLE TYPE NECK / GRILLE SIZE AIR VOLUME (L/s)
			EQUIPMENT / FIXTURE TYPE
			GENERAL NOTE
			DRAWING REVISION
M-	M-	M-	DETAIL NUMBER DRAWING NUMBER
M-	M-	M-	SECTION NUMBER DRAWING NUMBER

OUTLETS AND DRAINS

DEMOLITION	EXISTING	NEW	
			OPEN DRAIN
			HOSE-BIBB (HB)
			FLOOR DRAIN (FD)
			FUNNEL FLOOR DRAIN
			ROOF DRAIN (RD)
			AREA DRAIN

MECHANICAL GENERAL NOTES:

1. FOR ALL RFI INQUIRIES CONTACT:
   ZLATKO PULJIC, AME CONSULTING GROUP LTD.
   PHONE (CELL): 604-364-3785
   EMAIL: ZLATKOPULJIC@AMEGROUP.CA
   AND
   JEANETTE FROST, AME CONSULTING GROUP LTD.
   PHONE : 604-684-5995
   EMAIL: JEANETTEFROST@AMEGROUP.CA
2. THE EXISTING DRAWINGS HAVE BEEN PREPARED, IN A PART, ON THE BASIS OF INFORMATION COMPILED AND FURNISHED BY OTHERS.
3. MAGNITUDE OF SCOPE OF WORK ON THIS PROJECT SHALL NOT BE BASED SOLELY ON PREPARED CONSTRUCTION DOCUMENTS (DRAWINGS AND SPECIFICATIONS), AS THESE DOCUMENTS ARE OF A DIAGRAMMATIC AND GENERAL DESCRIPTION NATURE, LIMITED IN AMOUNT OF DETAILS (SPECIFIC TO EXISTING SITE CONDITIONS), AND THEREFORE A “SITE WALK- THRU” IS STRICTLY “MANDATORY”, PRIOR TO PRICING. FURTHER SITE VERIFICATION WILL BE ALSO REQUIRED UPON CONTRACT AWARD.
4. "MANDATORY SITE WALK-THRU" SHOULD INCLUDE NOT ONLY "PRIME" MECHANICAL TRADES (SUCH AS MECHANICAL CONTRACTORS), BUT ALSO SUB TRADES (AS A MINIMUM ELECTRICAL CONTRACTORS AND CONTROL CONTRACTORS ARE REQUIRED TO ATTEND "MANDATORY SITE WALK THRU" AS WELL). ANY OTHER ADDITIONAL SITE VISIT (REQUESTED BY CONTRACTOR) IS TO BE DONE ON APPOINTMENT BASIS ONLY.
6. CONTRACTOR IS RESPONSIBLE FOR REVIEW AND VERIFICATION OF ACTUAL ONSITE CONDITIONS, AND EQUIPMENT LOCATIONS, PRIOR TO ANY AND ALL DEMOLITION WORK AND/OR EQUIPMENT REMOVAL.
7. IN GENERAL, THE PROJECT INTENT IS THE REPLACEMENT OF THE EXISTING COOLING TOWER. THE INSTALLATION OF A NEW HEAT EXCHANGER (HEX) IN PARALLEL WITH THE EXISTING HEX IS INCLUDED IN THE BASE PRICE. ALL WORK TO BE DONE DURING NORMAL WORKING HOURS M-F 8:00AM - 5:00PM. ALL TRADE WORKERS ON-SITE WILL BE REQUIRED TO GO THROUGH A MANDATORY BACKGROUND SECURITY CHECK BY SUBMITTING VALID ID. DURING WORKING HOURS ALL TRADES WILL NEED TO BE ESCORTED UP AND DOWN TO THE TOWER LOCATION BY THE BUILDING ENGINEER.
8. DEMOLITION SCOPE OF WORK SHALL INCLUDE THE REMOVAL AND DISPOSAL OF THE EXISTING COOLING TOWER, ASSOCIATED PIPING, AND MECHANICAL, ELECTRICAL, CONTROLS, AND STRUCTURAL COMPONENTS NECESSARY TO SATISFY THE SCOPE OF WORK OUTLINED ON THE DRAWINGS AND SPECIFICATIONS.
9. CONTRACTOR IS TO COORDINATE LOCATION OF ALL PIPING INSTALLATION WITH OTHER TRADES TO AVOID ANY MAJOR INTERFERENCE. ALL NEW EXTERIOR PIPING TO BE INSULATED WITH ALUMINUM JACKETING TO MATCH CURRENT INSTALLATION AND EXISTING BUILDING STANDARD. CLEARLY LABEL ALL PIPING.
10. CONTRACTOR IS TO ALLOW FOR FIELD RUNNING OF PIPE TO AVOID ANY MAJOR PIPING. ROUTING ON DRAWINGS IS DIAGRAMMATIC AND ONLY SUGGESTED ROUTING.
11. CONTRACTOR TO REFER TO "ANVIL" PRODUCT CATALOGUE FOR ALL HANGER & SUPPORT FIGURES.
12. COORDINATE WITH BUILDING OWNER STORING ON SITE ALL NEW EQUIPMENT AND MATERIALS.

MECHANICAL CONTRACTOR WORK:

13. MECHANICAL CONTRACTOR WILL BE THE PRIME CONTRACTOR AND THEREFORE, IS RESPONSIBLE FOR HIRING ALL OTHER SUB-CONTRACTORS AND/OR SUB-TRADES REQUIRED TO PERFORM ALL WORK TO MEET THE PROJECT INTENT. ANY STRUCTURAL WORK REQUIRED FOR THE DESIGN OF THE TOWER SUPPORT SYSTEM TO BE DESIGNED BY RJC.
14. MECHANICAL CONTRACTOR TO INCLUDE ALL DEMOLITION WORK, ELECTRICAL, CONTROLS, STRUCTURAL, CHEMICAL TREATMENT, STARTUP, AND ROOFING (BASE BUILDING ROOFING CONTRACTOR TO BE USED).
15. DEMOLISH ALL EXTERIOR EXISTING PIPING, INCLUDING COOLING TOWER WATER SUPPLY & RETURN, MAKE-UP WATER, AND OVER FLOW DRAINAGE.
16. DEMOLISH EXISTING COOLING TOWER INCLUDING STRUCTURAL STEEL SUPPORT SYSTEM & VIBRATION ISOLATION.
17. INSTALL NEW STEEL SUPPORTS & VIBRATION ISOLATORS ON EXISTING CONCRETE CURBS TO SUIT NEW COOLING TOWER.
18. CRANE HOIST THE NEW COOLING TOWER INTO PLACE.
19. INSTALL PIPING FOR COOLING TOWER WATER SUPPLY & RETURN, MAKE-UP WATER, AND OVER FLOW DRAINAGE. RE-WORK EXISTING COOLING TOWER PUMP (P-7) SUCTION PIPING TO SUIT THE LOWERED CT-1 POSITION.
20. START-UP AND COMMISSIONING.
21. COORDINATION AND MANAGEMENT OF ALL SUBTRADES.

ELECTRICAL WORK:

22. ELECTRICAL WORK IS INCLUDED AS A DESIGN BUILD SCOPE IN THE MECHANICAL CONTRACT INCLUDING THE DEMOLITION OF EXISTING WIRING , INSTALLATION OF NEW WIRING, & ANY MODIFICATIONS TO EXISTING MCC'S REQUIRED TO MEET THE PROJECT SCOPE. REVISE MCC AS REQUIRED TO SUIT REVISED ELECTRICAL LOAD. CURRENTLY THE EXISTING MCC PANEL INCLUDES BREAKERS FOR HIGH SPEED, LOW SPEED, AND HEATER. EXISTING COOLING TOWER HAS A 25 HP MOTOR.

INSULATION WORK:

23. ALLOW FOR ALL REQUIRED INSULATION WORK ASSOCIATED WITH THIS PROJECT SCOPE OF WORK.
24. INSULATE ALL NEW PIPING AND EXISTING BEING AFFECTED BY NEW WORK WITH 1" ALL SERVICE JACKET (VAPOR BARRIER) AND ALUMINUM JACKETING. ALLOW FOR HEAT TRACING.
25. REFER TO MECHANICAL SPECIFICATIONS FOR ANY ADDITIONAL REQUIREMENTS ON INSULATION SCOPE OF WORK.

STRUCTURAL & SEISMIC WORK:

26. STRUCTURAL DESIGN OF SUPPORT STEEL, AND SEISMIC RESTRAINT FOR ALL NEW EQUIPMENT & PIPING SHALL BE INCLUDED AS DESIGN BUILD SCOPE IN THE MECHANICAL CONTRACT. AS NOTED ABOVE RJC TO BE RETAINED FOR ALL STRUCTURAL DESIGN SCOPE.
27. AT THE END OF THE PROJECT, THE CONTRACTOR IS TO OBTAIN SIGNED SEISMIC SCHEDULE "S-C" CONFIRMING THAT ALL SEISMIC WORK ABOVE COMPLIES PER CODE AND AS SUCH IT HAS BEEN INSTALLED.
28. SEISMIC WORK SHALL NOT BE LIMITED ONLY TO SCOPE ABOVE BUT SHALL ALSO COVER OTHER ASSOCIATED WORK BEING PART OF THIS PROJECT OR BEING AFFECTED BY THIS PROJECT.

START-UP AND COMMISSIONING AND DEMONSTRATION TO OWNER:

29. THE NEW COOLING TOWER AND EXISTING SYSTEMS IMPACTED BY NEW SYSTEM INSTALLATION ARE TO BE COMMISSIONED / RE-COMMISSIONED. AT END OF PROJECT PROVIDE DEMONSTRATION/TRAINING TO OWNER.
30. EQUIPMENT START-UP WILL BE BY A CERTIFIED MANUFACTURE REPRESENTATIVE FROM TRANE NORTHWEST. MECHANICAL CONTRACTOR IS TO BE PRESENT AND TO ASSIST DURING THE START- AND COMMISSIONING PROCESS.

CONTROLS:

31. REFER TO SECTION 7 OF THE SPECIFICATIONS AND DRAWINGS FOR FULL DETAIL ON THE CONTROLS SCOPE.

CHEMICAL TREATMENT:

32. CHEMICAL TREATMENT CONTRACTOR ON THIS PROJECT SHALL BE SOLEY "IPAC CHEMICAL. (BASE CHEMICAL TREATMENT CONTRACTOR)
33. ENSURE CHEMICAL TREATMENT IS PREFORMED PRIOR TO CONSTRUCTION OF EACH PHASE INCLUDING TOPPING UP CHEMICALS OF EXISTING AUTOMATED CHEMICAL FEED SYSTEM AND PROVIDE A LETTER AT THE END OF THE PROJECT.
34. PROVIDE MECHANICAL CONTRACTOR WITH DEGREASING AGENT TO DEGREASE ALL NEW PIPING. ALL NEW AND EXISTING PIPING AFFECTED BY THIS SCOPE OF WORK TO BE CLEANED AND FLUSHED OUT.
35. TEST AND CERTIFY THAT ALL NEW PIPING HAS BEEN DEGREASED CLEANED AND FLUSHED OUT, INCLUDING A REPORT.
36. ADJUST CHEMICAL AGENTS AFTER EACH STAGE OF CONSTRUCTION DURING COOLING TOWER PASSIVATION PROCESS, AS PER COOLING TOWER MANUFACTURE'S INSTRUCTIONS.
37. HELP FACILITATE & RECHARGE CHEMICALS DURING THE COOLING PASSIVATION PERIOD UNTIL THE COOLING TOWERS HAVE BEEN PASSIFIED IN ACCORDANCE WITH EQUIPMENT MANUFACTURER.

BALANCING:

38. BALANCE FLOW TO EACH HEAT EXCHANGER & RE-BALANCE THE PUMP SERVING THE COOLING TOWER.
39. CONTRACTOR TO PROVIDE A WATER BALANCING REPORT.

CRANE AND HOISTING:

40. ALL BIDDING CONTRACTORS TO USE RETAIN A CRANE CONTRACTOR WHICH WILL INCLUDE THE FOLLOWING AS REQUIRED:
    40.1. ROAD CLOSURE PERMITS FROM COV.
    40.2. TRAFFIC CONTROL W/ TRAFFIC PLAN.
    40.3. ALL COORDINATION WITH THE COV AS REQUIRD.

GARBAGE REMOVAL:

48. IT IS REQUIRED THAT ANY WASTE GENERATED ON SITE AS PART OF CONSTRUCTION ACTIVITIES BE TRACKED AND ITS POINT OF RECYCLING RECORDED. THE GARBAGE AND CONSTRUCTION DEBRIS ON GENERATED BY WORK CARRIED OUT AS PART OF A PROJECT MUST, AT A MINIMUM, BE RECYLCED OF ACCORDING LOCAL REGULATIONS. TRACKING OF THIS WASTE DISPOSAL SHALL BE RECORDED IN A SIMILAR FORMAT SUCH AS "DATA, MATERIAL, DIVERSION METHOD, DESTINATION, VOLUME OR WEIGHT, UNITS". IT MUST BE SUBMITTED, ALONG WITH WEIGH BILLS FOR RECYLCING, AT THE END OF A PROJECT.
49. THE GARBAGE RECYCLING AND CONSTRUCTION DEBRIS GENERATED BY WORK BEING PART OF THIS PROJECT WILL BE THE TOTAL RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. CORRIDORS, ELEVATORS, LOBBIES, AND COMMON AREAS ARE TO BE KEPT CLEAR OF THE RESIDUAL DEBRIS INCURRED. ARRANGEMENTS MUST BE MADE FOR THE ELEVATOR TIME TO REMOVE SUCH DEBRIS TO THE APPROPRIATE LOADING DOCK AREA AND BECAUSE OF THE LIMITED SPACE, BE IMMEDIATELY TAKEN FROM THERE BY WHATEVER MEANS POSSIBLE BY THOSE CONTRACTORS RESPONSIBLE ON A DAILY BASIS. ARRANGEMENT FOR PLACING DISPOSAL BINS MUST BE MADE THROUGH THE OWNER. ONLY APPROVED GARBAGE DISPOSAL CONTRACTS WILL BE ALLOWED ON SITE.

CONTRACT PRICE:

50. CONTRACTOR TO INCLUDE IN THEIR TENDER PRICE COSTS FOR ALL WORK ASSOCIATED WITH THE REMOVAL AND INSTALLATION OF A NEW COOLING TOWER AND HEX-1.
51. THERE ARE 3 SEPARATE PRICES WHICH ARE ADDS TO THE BASE TENDER PRICE.
    SP#1: TO REPLACE EXISTING HEX-1 WITH NEW (SAME MODEL AS HEX-2).
    SP#2: TO CLEAN THE EXISTING 71 PLATE HEX-1 AND ADD AN ADDITIONAL 20 NEW PLATES.
    SP#3: TO REPLACE THE EXISTING 3 WAY MIXING VALVE WITH NEW.

LIST OF SOLE SOURCED VENDORS, SUBCONTRACTORS, AND CONSULTANTS WHICH MUST BE USED FOR THIS PROJECT:

COOLING TOWERS - MARLEY
EMAIL: IHOLDO@TRANE.COM
TELL: 604-473-5600

HEAT EXCHANGERS - SWEP

CONTROLS SOLUTIONS
DDC CONTROLS - ESC

CHEMICAL TREATMENT - IPAC

HEAT EXCHANGER 2 SCHEDULE

SPXFLOW ›APV®

Plate Heat Exchanger Customer Data Sheet

Quotation title:	VPD Heat Exchangers	Solution Number:	ASK002ZDAZ01-001-S01
Customer Name:	TRANE NORTHWEST	Item Responsible:	Dionisio Rivera
Customer Reference:	SPXF-5066-17	Revision date:	9/12/2017 8:45 AM
Item Title:	HX-1	Page:	1/1

Duty 1

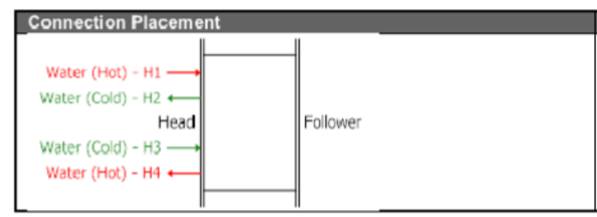
Process data		Hot	Cold
Fluid		Water	Water
Mass flow rate	lb/h	252,371	253,012
Volume flow rate	gal(US)/min	507	507
Inlet temperature	°F	94.0	79.0
Outlet Temperature, Duty	°F	84.0	89.0
Pressure drop, Calculated	psi	4.97	4.98
Heat Exchange Rate, Duty	BTU/h	2,518,415	
Fluid Volume in PHE	gal(U.S.)	11.4	11.4

Fluid Properties		Hot	Cold
		Liquid	Liquid
Density	lb/ft³	62.1	62.2
Specific Heat Capacity	BTU/lb °F	0.998	0.998
Thermal Conductivity	BTU/h°F ft	0.356	0.354
Inlet Viscosity	cP	0.725	0.867
Outlet viscosity	cP	0.815	0.768
Newtonian		Yes	Yes

Calculations are based on the specified fluid properties. Deviation from the specified properties might have influence on the thermal performance and/or pressure drops.

Plate Heat Exchanger Specifications					
PHE Type		O034 EnergySaver			
Frame Type / Size		MGS-10C (150psi)/3. Painted Floor Mount Tie:ZN, Carry:CS, max 142 plates			
Dimensions (H x W x L)	in	54 x 18 x 40			
Total Number of Plates		101			
Total Area	ft²	360.2			
Flow Arrangement (Hot/Cold)		1*50 / 1*50			
Plate Material		0.4 mm S. Steel AISI 304 EasyClip			
Gasket material		NBR per. (FDA) EasyClip			
Connection H1, H4, H3, H2		4 in Flange (Studded) SS 316L Class 150 ANSI B16.5 (Mates With)			
Design Code		ASME VIII, Division 1			
Certificate		ASME Inspection and U Stamp, Canadian Registration Number			
Design Temperature	°F	Max	284.0	Min	32.0
Design Pressure	psi	Hot	150	Cold	150
Test pressure	psi	Balanced	195	Differential	195
Mass	lbm	Flooded	1,051	Empty	861

Connection Placement | **Remarks**



Accessories
Basic Drawing (1); Classification Society Certificates (1); Standard Paint APV Blue (APV3196) (1);

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MECHANICAL DRAWING LIST

DRAWING NO.	DESCRIPTION	SCALE
M0.1	SITE PLAN, SCHEDULES & GENERAL NOTES	NTS
M1.1	FLOOR PLAN, IMAGES & SCHEMATICS	AS NOTED
M2.1	SPECIFICATIONS	NTS

MECHANICAL MOTORLIST

UNIT NUMBER	QTY	UNIT LOCATION	EMG PWR STANDBY (YES/NO)	EMG PWR REQUIRED (YES/NO)	ELEC LOAD (AS NOTED)	VOLT	PH	EQUIPMENT S	EQUIPMENT I	EQUIPMENT C	STARTER S	STARTER I	STARTER C	STARTER TYPE	CONTROL S	CONTROL I	CONTROL C	CONTROL TYPE	NOTES
COOLING TOWER - CT-1	1																		
FAN MOTOR		COOLING TOWER WELL	NO	NO	15 HP	575	3	M	M	E	M	M	E	VFD	M	M	M	VFD	1
BASIN HEATER		COOLING TOWER WELL	NO	NO	3.0 KW	575	3	M	M	E	M	M	E	CP	M	M	E	INT.	1

NOTES: 1 ELECTRICAL CONTRACTOR TO SUPPLY, INSTALL, AND CONNECT DISCONNECT.

VFD = VARIABLE FREQUENCY DRIVE
CP= CONTROL PANEL

COOLING TOWER

EQUIPMENT TAG	DESCRIPTION	SERVICE	MANUFACTURER	MODEL NO.	LxWxH (FT)	OPERATING WT. (LBS)	FLOW (GPM)	CLG CAP. (MBH)	FLUID P. DROP (FT. WG)	FLUID TYPE	TEMPERATURES (DEG C) INLET AIR (DEG F WB)	EWT (DWG F)	LWT (DWG F)	FAN MOTOR PER CELL AIR FLOW (CFM)	MOTOR (HP)	NOTES
CT-1	INLINE LOW SOUND COOLING TOWER	BUILDING COOLING	MARLEY	MD5006PAF1L	8.5 X 6 X 13	5,541	507	2.53	4.4	WATER	68.0	89.0	79.0	37,890	15	ALL

NOTES:
1. C/W FLOAT TYPE WATER LEVEL CONTROL.
2. C/W SUPPORTING STEEL BY MECHANICAL CONTRACTOR.
3. C/W VARIABLE SPEED DRIVE, SHIPPED LOOSE.
4. STAINLESS STEEL COLLECTION BASIN.
5. VIBRATION ISOLATION BY MECHANICAL CONTRACTOR.
6. 3.0 KW BASIN HEATER.
7. COOLING TOWER TO HAVE SIDE INLET, OUTLET, DRAIN & MAKE-UP WATER CONNECTIONS.
8. TOWER TO INCLUDE SAFTEY GUARD RAILS AND PLATFORM AS NEEDED TO MEET WORKSAFE BC REQUIREMENT.
9. AUTOMATIC BLOWDOWN AND SIDESTREAM SEPARATOR.
10. DDC CONTROL PANEL FOR SPEED TO CONTROL LWT.
11. ACCESS PANEL FOR SEVICING.

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VANCOUVER ☒ T. 604-684-5995 F. 604-684-5993 1100 - 808 W HASTINGS ST VANCOUVER, BC V6C 2X4
CALGARY T. 403-252-2333 F. 403-253-3324 710 - 1122 4TH STREET SW CALGARY, AB T2R 1M1

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE CONSULTANT PRIOR TO COMMENCING THE WORK.

THESE DRAWINGS ARE NOT TO BE SCALED.

REV.	DATE	DESCRIPTION
1.	2017.09.15	ISSUED FOR TENDER
2.	2017.11.09	RE-ISSUED FOR TENDER

CONSULTANT:

SEAL:

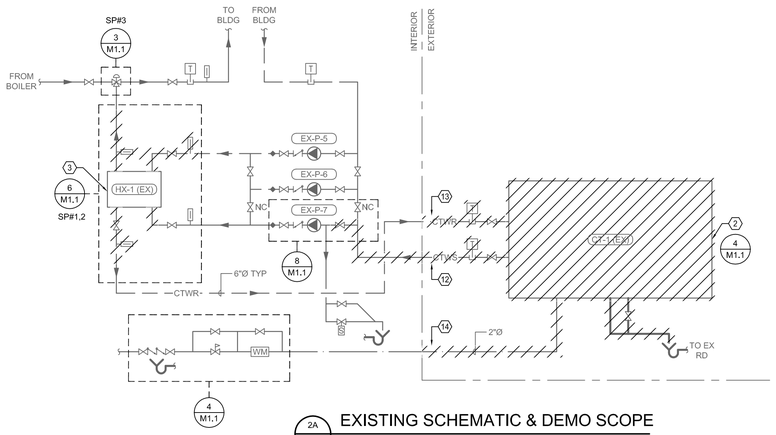
PROJECT TITLE:
VANCOUVER POLICE DEPARTMENT - COOLING TOWER & HEX REPLACEMENT

PROJECT ADDRESS:
VANCOUVER POLICE DEPARTMENT
2120 CAMBIE STREET
VANCOUVER BC
V5Z 4N6

DRAWN BY	T. WEARE
CHECKED BY	J. FROST
SCALE	AS NOTED
DATE	NOVEMBER 9, 2017

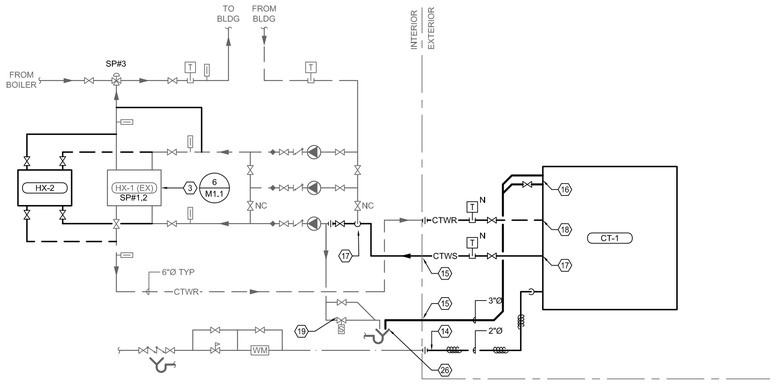
DRAWING TITLE:
SITE PLAN

PROJECT NO. 127b-029-17
DRAWING NO. M0.1



2A M1.1 EXISTING SCHEMATIC & DEMO SCOPE

SCALE: NTS



2B M1.1 EXISTING SCHEMATIC & NEW SCOPE

SCALE: NTS

12 M1.1 EXISTING CTW CHEMICAL TREATMENT TO REMAIN

SCALE: NTS

13 M1.1 EXISTING HPW CHEMICAL TREATMENT TO REMAIN

SCALE: NTS

14 M1.1 EXISTING CT DRAINDOWN SOLENOID VALVE

SCALE: NTS

11 M1.1 EXISTING CT-1 PIPING

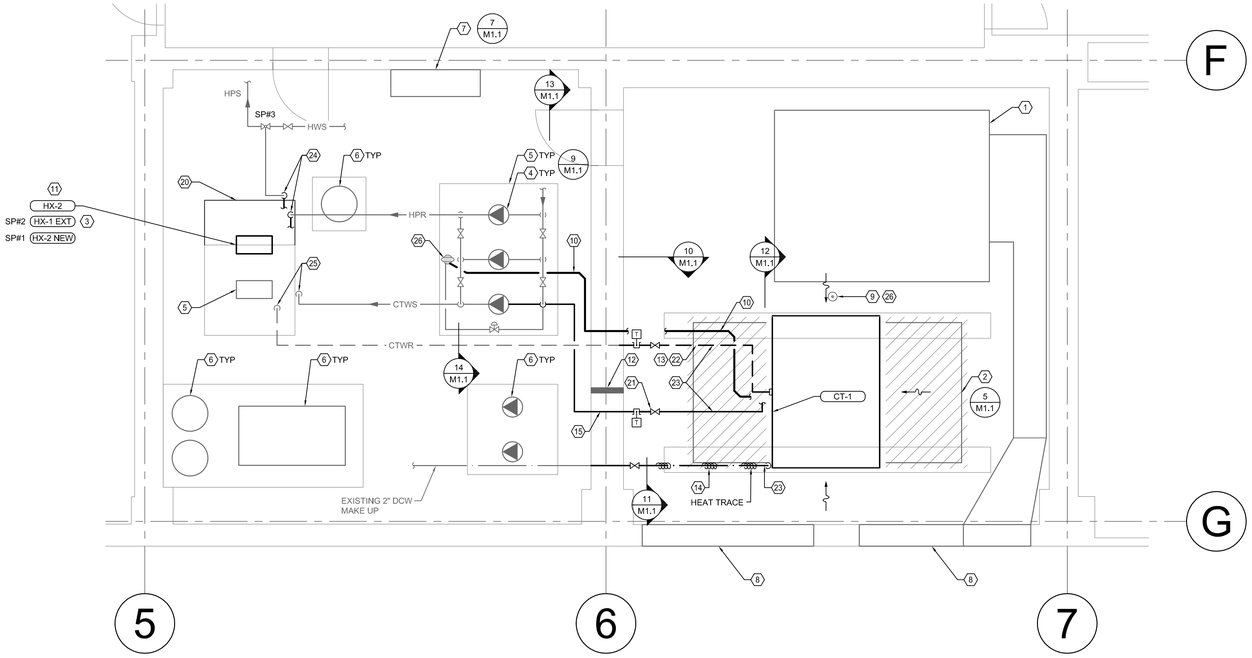
SCALE: NTS

10 M1.1 EXISTING CT-1 PIPING

SCALE: NTS

9 M1.1 EXISTING PUMPS

SCALE: NTS



1 M1.1 DEMO & NEW FLOOR PLAN

SCALE: 1/4" = 1'0"

GENERAL NOTES

1. NOTE ONE.
2. NOTE TWO.

KEYED NOTES

1. EXISTING AIR HANDLING UNIT TO REMAIN.
2. DEMO EXISTING COOLING TOWER & STEEL SUPPORT STRUCTURE. EXISTING CONCRETE CURB TO REMAIN. RECYCLE MATERIAL. PROVIDE WASTE REPORT.
3. EXISTING HX-1 REFER TO SP#1 AND SP#2. DEMO HEX PIPING TO ACCOMMODATE INSTALLATION OF SECOND HEX.
4. EXISTING COOLING TOWER & CONDENSER WATER PUMPS TO REMAIN.
5. EXISTING HOUSKEEPING PAD.
6. EXISTING BOILER, DHW TANKS AND HEATING WATER PUMPS TO REMAIN.
7. EXISTING MCC'S SERVING COOLING TOWER.
8. DEMO PLYWOOD OBSTRUCTING EXISTING LOUVERS.
9. EXISTING ROOF DRAIN TO REMAIN.
10. INSTALL NEW CT-1 AT LOW LEVEL INCLUDING NEW STRUCT. STEEL, VIBR. ISOLATORS & ELEC. CONNECTION.
11. INSTALL 2ND NEW HEX ADJACENT TO EXISTING HX-1. REFER TO SCHEMATIC.
12. DEMO EXISTING COOLING TOWER SUPPLY PIPING UP TO INLET OF PUMP, PATCH & MAKE GOOD OPENING IN CMU WALL.
13. DEMO EXISTING EXTERIOR COOLING TOWER RETURN PIPING. INTERIOR PIPING & EXISTING CMU WALL PENETRATION TO BE RE-USED.
14. DEMO DCW MAKE-UP PIPING BACK TO EXTERIOR WALL & RECONNECT NEW PIPING TO NEW CT-1 C/W HEAT TRACE. HEAT TRACE TO BE ON ENERGY POWER CIRCUIT.
15. NEW PENETRATION THRU CMU WALL AT LOW LEVEL.
16. RUN CT-1 OVERFLOW & LOW POINT DRAIN TO EX. FD IN MECHANICAL ROOM. PROVIDE NEW OPENING INN CMU WALL.
17. RUN NEW CTWS PIPING FROM LOW LEVEL OUTLET & CONNECT TO EX. P-7 AT LOW LEVEL. HEAT TRACE ALL EXTERIOR PIPING.
18. PROVIDE NEW HEAT TRACED CTWR PIPING & PROVIDE ALL NECESSARY OFFSETS TO CONNECT TO NEW CT-1 INLET.
19. EXISTING COOLING TOWER LOW TEMP SOLENOID VALVE DRAINDOWN SYSTEM.
20. NEW HOUSEKEEPING PAD: 4'x3'. RETAIN RJC TO DESIGN PAD AND ITS TIE0IN TO EXISTING STRUCTURE.
21. REMOVE HIGH LEVEL 6" CTWS AND INSTALL NEW 6" CTWS AT LOW LEVEL.
22. REMOVE EXTERIOR CTWR PIPING AND ADD NEW.
23. PROVIDE SUPPORT FOR DCW, CTWS & CTWR PIPING.
24. HPS&R PIPING TO HEX-1&2 TO BE RECONFIGURED AS PER SCHEMATIC TO SUIT ADDITION OF HEX-2.
25. CTWS&R PIPING TO HEX-1&2 TO BE RECONFIGURED AS PER SCHEMATIC TO SUIT ADDITION OF HEX-2.
26. REPLACE EXISTING FLOOR DRAIN GRATE WITH NEW GRATE C/W FUNNEL TO ACCOMMODATE EXISTING DRAINS AND NEW CT 3" DRAINDOWN LINE.

8 M1.1 EXISTING P-7

SCALE: NTS

6 M1.1 EXISTING HX-1 - SP#1,2

SCALE: NTS

7 M1.1 EXISTING MCC

SCALE: NTS

3 M1.1 EXISTING 3-WAY VALVE - SP#3

SCALE: NTS

4 M1.1 EXISTING DCW MAKE-UP

SCALE: NTS

5 M1.1 EXISTING CT-1

SCALE: NTS

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REV.	DATE	DESCRIPTION
1.	2017.09.15	ISSUED FOR TENDER
2.	2017.11.09	RE-ISSUED FOR TENDER

CONSULTANT:

SEAL:

PROJECT TITLE:

VANCOUVER POLICE DEPARTMENT - COOLING TOWER & HEX REPLACEMENT

PROJECT ADDRESS:
VANCOUVER POLICE DEPARTMENT
2120 CAMBIE STREET
VANCOUVER BC
V5Z 4N6

DRAWN BY	T. WEARE
CHECKED BY	J. FROST
SCALE	AS NOTED
DATE	NOVEMBER 9, 2017

DRAWING TITLE:
FLOOR PLAN, IMAGES & SCHEMATICS

PROJECT NO. 127b-029-17

DRAWING NO. **M1.1**

1. GENERAL

1.1 Intent

.1 The intent of this specification and the drawings is to provide a complete and fully operating mechanical system in complete accord with applicable codes. The Mechanical Contractor shall make provisions for labour, material, and equipment necessary to complete the mechanical work.

.2 Drawings and specifications are complementary to each other and what is called for in one is binding as if called for by both. Should any discrepancy appear between drawings and specifications which leaves doubt as to the true intent and meaning, obtain a ruling from the Consultant ten (10) days before submitting tender. Failing this, allow for most expensive alternative.

.3 Contract documents are diagrammatic only. They are to establish scope, material and quality. They are not detailed installation drawings. Minor details usually not shown or specified and any incidental accessories required for proper installation of the system are to be included in the work.

.4 Contractor is to ensure that all intended equipment will fit within given spaces. Make reference to the electrical, mechanical, architectural and structural drawings, when setting out work and before ordering equipment.

.5 The Contractor shall visit the site prior to tender and verify existing conditions. New piping, ductwork and insulation standards shall at least match the existing installation or be higher if specified herein.

.6 Consultant is defined as the AME Representative administering the project.

.7 For this project the contractor will be the Prime Contractor and be responsible to all work and tender pricing requirements as outlined in mechanical general notes on drawing M.01.

1.2 Code Compliance

.1 All work shall conform to current edition of National, Provincial and Municipal Codes, Standards and Acts; and will meet the requirements of Authorities having jurisdiction.

1.3 Liability

.1 Assume responsibility for layout of work; and for any damage caused to the Owner or other Tenants by improper execution of work.

.2 Protect finished and unfinished work from damage.

.3 Take responsibility for condition of materials and equipment supplied and protect until work is completed and accepted. Coordinate deliveries with the general contractor.

1.4 Certificates

.1 Give notices, obtain permits and approvals, and pay fees so work specified may be carried out. Furnish certificates if requested, as evidence that work conforms with laws and regulations of the authorities having jurisdiction.

1.5 Cutting And Patching

.1 All work shall be co-ordinated with other trades especially that related to cutting and patching of required openings; and locations and installation of sleeves, inserts, support, curbs, frames and access doors.

.2 Obtain approval from structural and electrical engineers before drilling and coring of existing structure.

.3 Provide X-ray of all required penetrations of the floor. X-ray use for locating in floor rebar and conduit to be done after normal working hours. Take necessary precautions to protect computer equipment when X-raying floors. Coordinate with Owner.

1.6 Compliance with Energy By-Law

.1 All equipment installed on this project shall comply with the 2010 performance recommendations of ASHRAE Standard 90.1 (latest edition) and to comply with the City of Vancouver Building By-Law Energy Utilization Requirements.

1.7 Alternative Materials And Equipment

.1 Contract price shall be based on materials and equipment specified. Approval by Consultant of equipment submitted by the mechanical trade as equal to that specified does not relieve the mechanical trade of any responsibility.

.2 Revisions required to adapt accepted equals and alternatives shall be included in the contract price. No increase in the contract price will be considered to accommodate the use of equipment other than that specified.

.3 Certain items of equipment and items of work (such as balancing, water treatment) may not have an approved equal due to the need to have a consistent type or source of maintenance. Refer to specific clauses in this specification.

1.8 Shop Drawings

.1 Submit one set of electronic of shop drawings to Consultant for all equipment specified in the specification or drawings for review.

Do not order equipment or materials until Consultant has reviewed shop drawings.

1.9 Guarantee

.1 Provide the Owner with a written guarantee that the equipment installed and work performed shall remain in serviceable condition for a period of one (1) year from the date of final acceptance by the Owner. The warranty shall cover material as well as labour.

1.10 Standard Of Materials And Workmanship

.1 Make and quality of materials used are subject to approval by the Consultant. Remove unacceptable materials and install suitable materials in their place.

.2 Materials shall be new and of uniform pattern throughout, unless noted otherwise.

.3 Employ only tradesmen properly licensed to perform the specific work. The Consultant may perform spot checks for trade tickets and accreditation.

1.11 Disposal

.1 Where equipment is removed and not re-used it shall be disposed. Contractor to include all costs for disposal of all materials to be demolished and recycled as indicated in these documents.

1.12 Record Drawings

.1 Keep on site an extra set of white prints and specifications, recording changes and deviations daily. These drawings shall be made available on a weekly basis for review by the Consultant.

.2 Upon completion of work, submit final record drawings to the Consultant. These must be submitted within two (2) weeks after acceptance of work. Failure to submit drawings will result in the work being done by the Owner and the cost deducted from the final payment.

.3 The cost of transferring as-builts onto reproducible media and AutoCAD files are this contractor's responsibility.

.4 If the contractor chooses to retain this consultant to produce as-builts, allow $300/sheet to cover costs of drafting and printing as-builts.

1.13 Substantial Completion Inspection

.1 Advise Consultant five (5) days prior to the date inspection is desired. All systems to be fully operational and any deficiencies should be noted to the Consultant.

.2 All deficiencies shall be completed within two (2) weeks after substantial completion and letter submitted to Consultant within that time advising that the work is complete. Failure to complete work will result in work being done by the Owner and the costs deducted from final payment.

.3 The following shall be an outline checklist of the minimum requirements to be met by the contractor prior to the Consultants' Substantial Performance by the contractor.

Inspection:

- ☐ Complete Water Balancing Report
- ☐ Complete Commissioning Checklists
- ☐ Controls Commissioning, Checklist and 15 day trend logs for all cooling tower fans and existing condenser water pumps
- ☐ Seismic Engineers inspection of all Seismic restraints and schedule B & C Letters of Assurances
- ☐ Chemical Treatment supplies final inspection and test certificate
- ☐ Condensor water piping flushing, chemical treatment, and passivation test certificate
- ☐ Major equipment - suppliers start-up test sheets and letters certifying start up.
- ☐ Final As-Built Drawings ready for review
- ☐ Maintenance and operation manuals, ready for review
- ☐ Final electrical inspection card from the City

1.14 Examination of Work

.1 This project involves renovations to existing building, therefore, examine the site and local conditions to determine the difficulties in carrying out the work indicated and specified prior to submitting final price. Extras will not be considered based on the grounds of differences on site.

1.15 Coordination With Electrical Division

.1 Contractor shall review all equipment requiring electrical hook-up with Electrical Contractor prior to ordering equipment. Ensure proper electrical characteristics are determined for all affected and related work. This is part of the contractors shop drawing review and no extras will be considered for Div. 15/16 power mismatches.

1.17 Performance Tests

.1 Operate each mechanical system after mechanical and electrical work has been completed, to demonstrate that each system fulfills the requirements of the contract and operates satisfactorily. These are performance tests and must be completed before work can be finally accepted. Coordinate with packaged equipment suppliers and the commissioning agent.

1.18 Operation and Maintenance Manuals

.1 Provide four (4) copies of manuals prepared by qualified and experienced personnel for use by Owner. Manuals form part of the contract and must be delivered to the Consultant before work will be considered complete. Each manual shall provide the following:

.1 Layman's description of all mechanical systems including operating maintenance and lubrication instructions,

.2 Certification of all equipment where required by local codes and authorities,

.3 Shop drawings and maintenance bulletins,

.4 List address and telephone numbers of all equipment suppliers and contractors.

.5 Performance details for all equipment including curves for fans and pumps with actual operating points noted.

.2 Provide this maintenance manual in electronic format documents, scanned drawings, AutoCAD files, Microsoft powerpoint…etc.

1.19 Water Balancing

.1 The approved balancing agencies are: Western Mechanical; K.D. Engineering.

.2 Balance all valves associated with new control towers and pumps.

.3 Completely balance the condensor water system

.4 Submit two (2) copies of the report to Engineer within two (2) weeks after substantial completion. Failure to submit the report within the specified time will result in the work being done by the Owner and the costs deducted from final payment.

.5 Balancing shall be performed to the following accuracies:

Condensor waters and Central Equipment ± 5%

1.20 Cooperate with the Balancing Agency as follows:

.1 Make any corrections as required by Balancing Agency.

.2 Allow Balancing Agency free access to site during construction phase. Inform Balancing Agency of any major changes made to systems during construction and provide a complete set of record drawings and specifications for their use.

.3 Operate automatic control system and verify set points during balancing.

.4 Provide and install balancing valves, dampers, and other materials requested by the Balancing Agency and/or necessary to properly adjust or correct the systems to design flows, without additional cost to Owner.

.5 Provide and install pulleys and sheaves for rotating equipment, as required to properly balance the systems to design flows, without additional cost to Owner.

.6 Allow in the contract price shaving of impellers as required to balance the pumps to design flow at operating condition.

1.21 System Cleaning and Chemical Treatment

.1 Employ services of IPAC which currently performs water treatment in the building. This firm shall submit a schedule of work to be performed, chemical types and quantity to be used. At the completion of the chemical treatment a report shall be submitted to outline the work performed, quality of water before and after the chemical treatment, amount and types of chemicals added. The report shall also include the details of procedures to be used by the building operator for water quality testing and chemical treatment.

.2 Provide test kits as required along with adequate chemicals and reagents for one year of testing.

Appropriate test kits will be provided to properly test each system installed under this contract.

.3 Flush, chemical treat, passivy new cooling tower piping (CTWS&R) and condenser water piping CWS&R.

1.22 Pipe and Identification

.1 Identify piping with labels and flow arrows. Provide identification at 50 ft. 15 m maximum intervals, before and after pipes passing through walls, at all sides of tees, behind access doors. Use Brady B-500 vinyl cloth labels for non insulated pipes and B-350 for insulated pipes.

.2 Provide 3/4" 20 mm diameter brass tags, secure to valve stems with key chain. Provide typed valve directories at all mechanical rooms in addition to computer copy as integrated into controls.

.3 Identify electric starting switches, thermostats controlling motors and equipment supplied under this division with lamacoid plates having 1/4" 6 mm minimum letter size.

1.23 Fire-Stopping

.1 Fire-stop all pipe penetrations through floor and walls, designated as fire and/or smoke separations.

.2 Fire-stopping materials to meet ULC CAN 2S115. Acceptable Materials: by "Tremco" or "National Firestopping".

.3 Preparation of surfaces and installation of fire-stopping materials shall be carried out as per manufacturer's instructions.

1.24 Roof Equipment supports

.1 New structural supports as required to span over existing sleepers for the new cooling towers. Retain RJC to design the structural support beams.

1.25 Seismic Control and Vibration

.1 Provide seismic restraint on all piping and equipment to satisfy all codes and authorities having jurisdiction.

.2 Submit shop drawings of all seismic restraint details prepared and sealed by a professional engineer. Prior to substantial completion, this professional engineer for seismic design shall visit the site to verify seismic restraint installation and provide a letter of conformance in accordance with the applicable Building Code.

.3 Piping and equipment shall be restrained in accordance with the latest edition of the Seismic Restraints Manual for Mechanical Systems produced by SMACNA, and the latest edition of the ASHRAE Application Handbook Chapter 49, Seismic Restraints.

.4 The contractor shall obtain approval for the location of all restraint fixing points from the structural engineer (RJC), on site, prior to installation.

.5 CT-1 is mounted on spring or R.I.S. mounts for vibration isolation it shall be the responsibility of the manufacturer of the mount to incorporate seismic restraint. These restraints shall be multi-directional. Provide steel frame bases where necessary to achieve this and also avoid overturning. The manufacturer shall supply certificates, signed by a Professional Engineer registered within the jurisdiction, verifying the design of the seismic restraints in accordance with this section. Coordinate with CT supplier for vibration and seismic restraint requirements.

.6 Where equipment is located without vibration isolation fittings all such equipment shall be rigidly fixed with holding down bolts of sufficient strength to restrain seismic action. Holding down bolts shall be packed within slots to prevent movement prior to restraint commencing. Bolts shall be of sufficient strength to withstand overturning of the equipment during seismic disturbance.

1.27 Non-Specific Date/Time Compliance

.1 All equipment, hardware, software and firmware (for the purposes of this clause #, the "Product") delivered or deliverables resulting from any services provided are fully Date Compliant and the Product will not adversely or materially effect the daily business operations as a result of a date related computer problem (for the purposes of this clause #, the "Warranty"). Date Compliant means that the Product accurately and correctly processes and stores date/time data (including, but not limited to, calculating, comparing, displaying, recording and sequencing operations) including year, century and leap year calculations.

.2 Provide documentary proof of Date Compliance prior to substantial completion listing all equipment and certifying their compliance.

.3 Notwithstanding any other remedy available under this agreement or at law for breach of the Warranty, any Product that is not Date Compliant shall, within twenty-four (24) hours of receipt of notice of the breach, be repaired or replaced at the Contractors sole cost and expense, including parts, labour, transportation and insurance, so as to correct any failure to meet the Warranty.

2. PIPING

2.1 Pipe Material

.1 Service: Condensor Water and Cooling Tower piping
Material: Steel Schedule 40 Victaulic

.2 Service: Equipment drains and overflows.
Material: Steel Schedule 40

.3 Service: Domestic water.
Material: Type K copper c/w soldered fittings.

3.2 Pipe Connections

.1 Welded or grooved (Victaulic Rigid 107 ZERO FLEX couplings only) joint SCHD 80 steel piping. Use dielectric type couplings when joining dissimilar metal pipes if applicable.

3.3 Pipe Hangers And Supports

.1 All piping shall be firmly supported and securely braced. Provide prime coated and painted hangers and supports suitable for outdoor applications.

.2 Use of perforated straps is not permitted for pipe hangers.

.3 Provide clevis type hangers for all piping.

3.4 Pipe Support Spacing

Pipe Size		Rod Diameter		Max Spacing	
(in.)	(mm)	(in.)	(mm)	(ft.)	(m)
6 to 12	150-300	7/8	22	14	4.3

Pipe hanger under cooling tower(s) will be supported by new cooling tower structural supports. Contractor to modify hanger spacing as per new cooling structural supports spanning existing sleepers.

4. VALVES

Refer to drawing schematic for valves associated with this project.

4.1 Condenser water valves

.1 Full line size, 8" , butterfly isoaltion valves up stream and down stream of each cooling tower.

.2 Full line size 8" digitally actuated balancing valves with remote controller / reader located inside balancing. Valve supplied by control solutions, installed by mechanical contractor. Remote reader wiring and control panel by Control solutions.

.3 Butterfly isolation valve up stream of new condesor water centrifugal separator. Globe valve down stream to isolate and balance.

.4 Ball valve for all make up water piping.

5. INSULATION

6.1 Piping Insulation

.1 All exterior piping to be insulated with 1" fine fibrous glass insulation with factory applied vapour barrier jacket, moulded to conform to piping, "K" value at 75°F24°C maximum 0.24 btu.in/ft² hr.°F0.035 w/m °C.

.2 All exterior piping to have aluminium jacketing.

6. PLUMBING

7.1 Plumbing General

.1 Insulate with jacketing to match condenser water.

.2 Check invert elevations prior to sanitary and drainage connections.

.3 Grade drainage lines 2% per foot, unless noted otherwise.

7. CONTROLS

7.1 Acceptable Contractors

.1 All controls work is to be done by a Reliable Controls Contractor / Vendor (Houle Electric or Webir Automation).

.2 The existing control system is a Reliable RC Studio system.

7.2 Controls

.1 Retain an authorized Reliable Controls Contractor to perform all controls scope shown on the drawings. Revise the existing DDC graphic and verify all control points to suit the cooling tower, HEX and system arrangement. Provide a new CTSW temperature sensor to control CT-1 fan VFD.

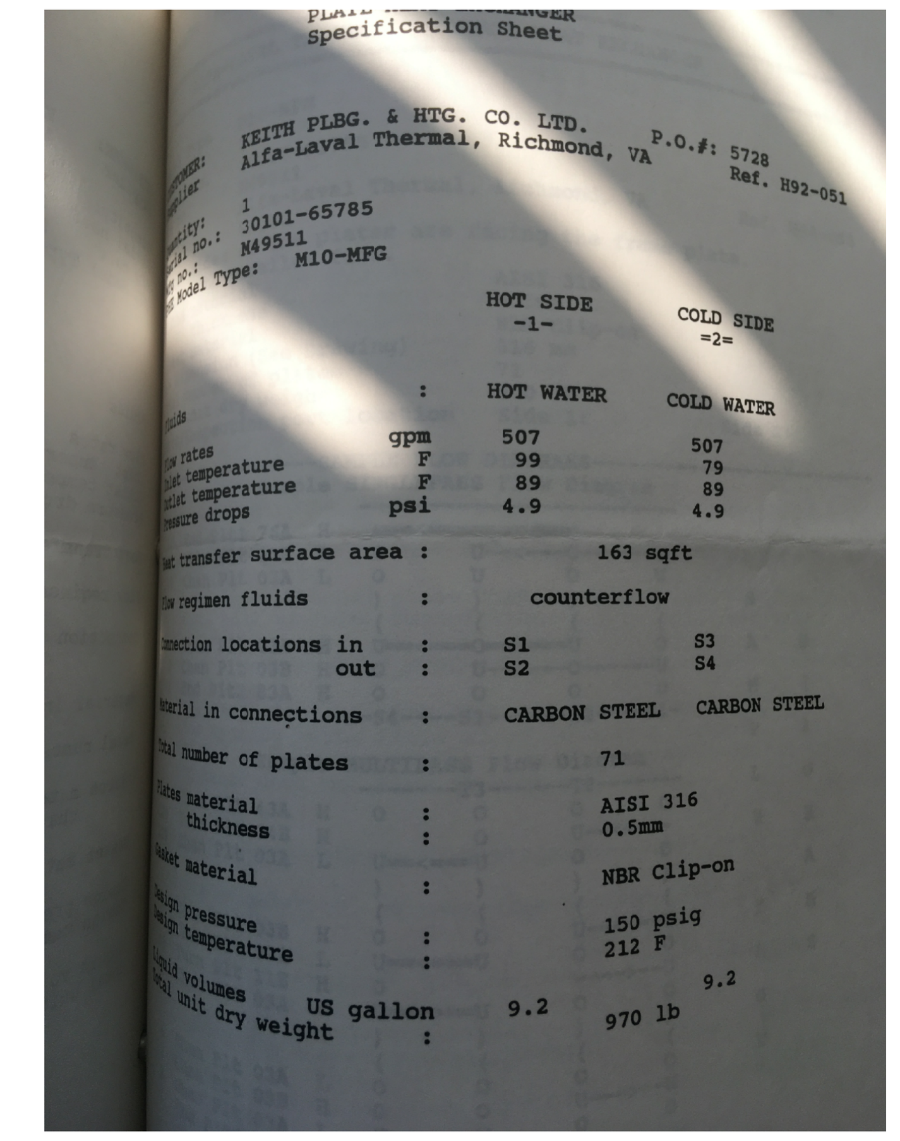
.2 Provide new temperature sensors and control valves.

.3 Provide new control sequence of operation and graphics to provide control of Tower VFD based upon supply water temperature.

.4 Confirm sequence of operation for water tower draindown system - Reliable Vendor to confirm solenoid valve operation to drain tower.

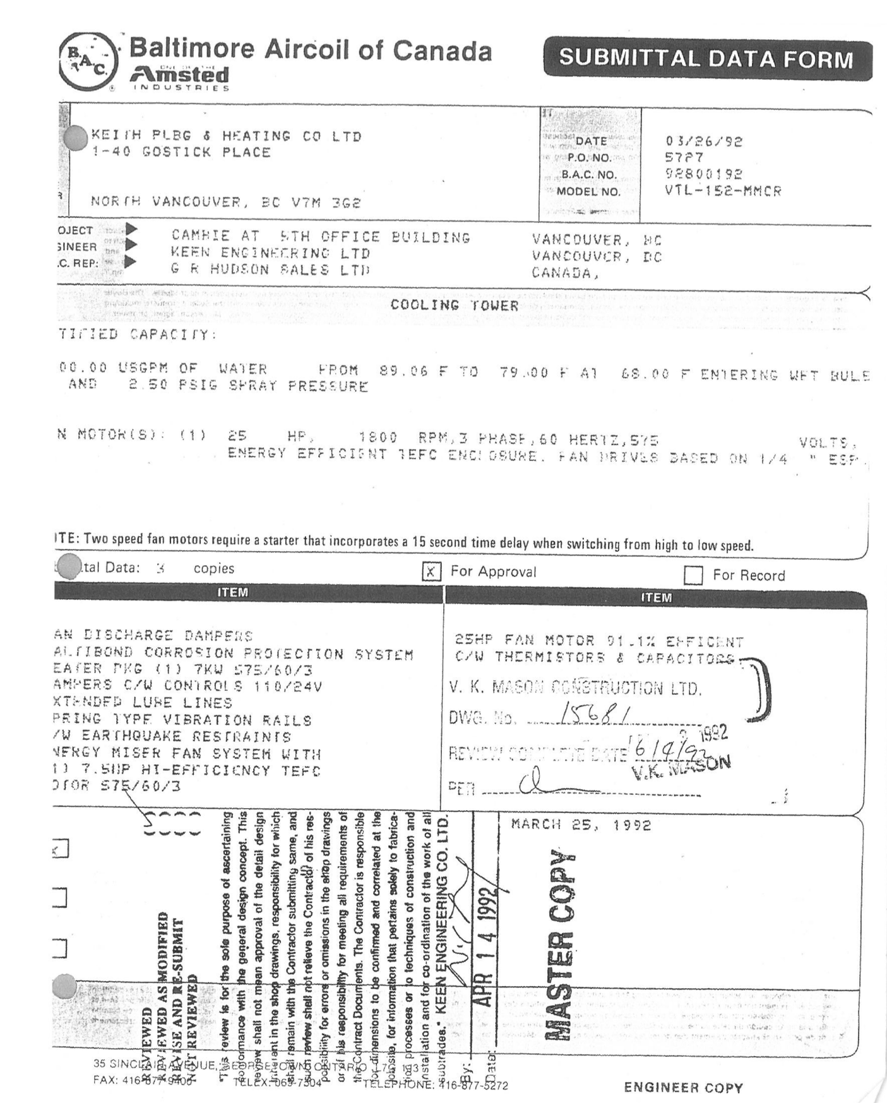
.5 Existing CT & condenser water loop DDC panel is outdated & requires upgrading. Panel is to be replaced with new Reliable Controls panel c/w sufficient point capacity for the following: existing points, additional points as required for the CT upgrade, and 20% additional point capacity for future upgrades.

END OF SECTION



EXISTING HX-1 INFO

1 / M2.1 SCALE: NTS


Baltimore Aircoil of Canada — Amsted Industries — SUBMITTAL DATA FORM

KEITH PLBG & HEATING CO LTD
1-40 GOSTICK PLACE
NORTH VANCOUVER, BC V7M 3G2

DATE 03/26/92
P.O. NO. 5727
B.A.C. NO. 92800192
MODEL NO. VTL-152-MMCR

CAMBIE AT 5TH OFFICE BUILDING — VANCOUVER, BC
KEEN ENGINEERING LTD — VANCOUVER, BC
G R HUDSON SALES LTD — CANADA,

COOLING TOWER

00.00 USGPM OF WATER FROM 89.06 F TO 79.00 F AT 68.00 F ENTERING WET BULB AND 2.50 PSIG SPRAY PRESSURE

N MOTOR(S): (1) 25 HP, 1800 RPM,3 PHASE,60 HERTZ,575 VOLTS, ENERGY EFFICIENT TEFC ENCLOSURE. FAN DRIVES BASED ON 1/4 " ESP.

NOTE: Two speed fan motors require a starter that incorporates a 15 second time delay when switching from high to low speed.

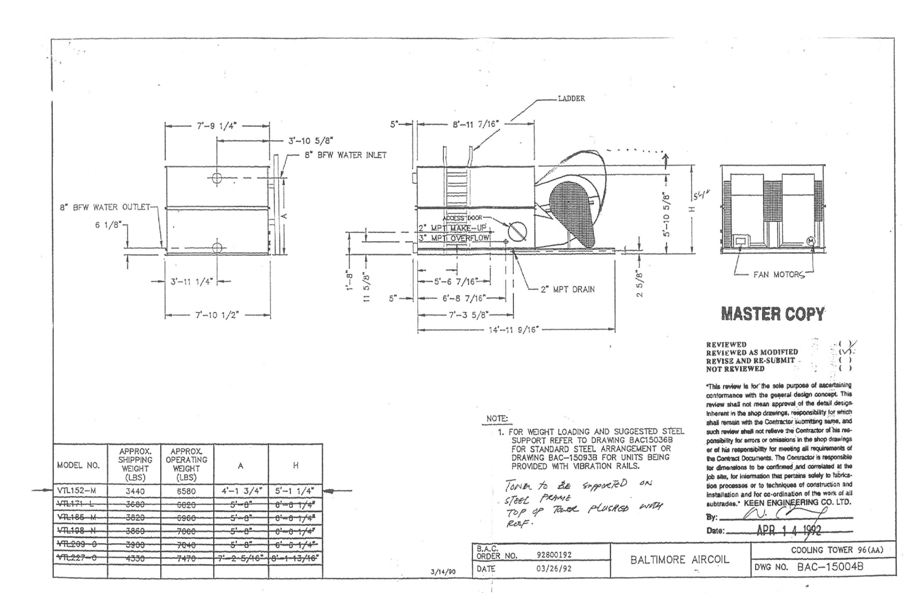
ITEM	ITEM
FAN DISCHARGE DAMPERS BALTIBOND CORROSION PROTECTION SYSTEM HEATER PKG (1) 7KW 575/60/3 DAMPERS C/W CONTROLS 110/24V EXTENDED LUBE LINES SPRING TYPE VIBRATION RAILS C/W EARTHQUAKE RESTRAINTS ENERGY MISER FAN SYSTEM WITH (1) 7.5HP HI-EFFICIENCY TEFC MOTOR 575/60/3	25HP FAN MOTOR 91.1% EFFICIENT C/W THERMISTORS & CAPACITORS V. K. MASON CONSTRUCTION LTD. DWG. No. 15681 V.K. MASON

MARCH 25, 1992

REVIEWED AS MODIFIED / REVISE AND RE-SUBMIT / NOT REVIEWED — KEEN ENGINEERING CO. LTD. — APR 14 1992

MASTER COPY

ENGINEER COPY



EXISTING CT-1 INFO

2 / M2.1 SCALE: NTS

AME Group consulting mechanical engineers

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VANCOUVER T. 604-684-5995 F. 604-684-5993 1100 - 808 W HASTINGS ST VANCOUVER, BC V6C 2X4 ☒
CALGARY T. 403-252-2333 F. 403-253-3324 710 - 1122 4TH STREET SW CALGARY, AB T2R 1M1 ☐

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE CONSULTANT PRIOR TO COMMENCING THE WORK.

THESE DRAWINGS ARE NOT TO BE SCALED.

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127b-029-17	M2.1