MACKIN PARK CONCESSION RENEWAL



SUB-CONSULTANT:

KEYPLAN:

	DOMESTIC COLD WATER PIPE
	DOMESTIC HOT WATER PIPE
SAN	SANITARY PIPE (ABOVE GRADE)
SAN	SANITARY PIPE (BELOW GRADE)
	DOUBLE CHECK VALVE ASSEMBLY
\bowtie	GATE VALVE
N	VALVE CHECK
اہا	STRAINER VALVE
Å	PRESSURE REDUCING VALVE
С	PIPE ELBOW DOWN
0	PIPE ELBOW/TEE UP
C	PIPE TEE DOWN
[PIPE CAP
5	PIPE BREAK
ıþi	PIPE UNION
-	PIPE FLOW DIRECTION ARROW
&-	PIPE TRAP
Y	FIXTURE DRAIN
Θ	PIPE CLEANOUT TO GRADE
\$	HOSE BIB
	FLOOR DRAIN
(1)	FAN SWITCH
- √-	FLOW DIRECTION ARROW
	BALANCE DAMPER
BDD.	BACKDRAFT DAMPER
	MOTORIZED DAMPER

1046 BRUNETTE AVENUE, COQUITLAM, BC - V3K 1E7

PLUMBING FIXTURE SCHEDULE

BOTTLE FILLER

FLOOR DRAIN

KITCHEN SINK

DOUBLE BOWL TOPMOUNT

HANDWASH SINK

SINGLE BOWL TOPMOUNT

AIR TERMINAL SCHEDULE

UNIT TAG | MANUFACTURER | MODEL

E.H. PRICE

E.H. PRICE

GREENHECK

DE439

CSP-A390-VG EXHAUST FAN

CONNECT TO EXISTING

DOUBLE CHECK VALVE ASSEMBLY

MANUFACTURER

ELKAY

WATTS

FRANKE

FRANKE

MODEL

FD-200-A

ALBS1306P-1-1

EXHAUST GRILLE

INTAKE/EHAUST LOUVRE

(CFM)

150

(IN WC)

0.25

C/w trap primer.

GENERAL NOTES

- THE MECHANICAL SYSTEM SHALL CONSIST OF ALL THE WORK SHOWN ON DRAWINGS, SCHEMATICS, AND AS DESCRIBED IN
- TO STRUCTURE ABOVE, EXCEPT WHERE CONFLICT OCCURS WITH REQUIREMENTS LISTED UNDER SPECIFICATION (VIBRATION ISOLATION). THE MECHANICAL PLANS ARE DIAGRAMMATIC IN NATURE AND
- TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR CONSTRUCTION DETAILS. ITEMS NOTED "TYPICAL" OR "TYP" ON ANY SHEET APPLY TO 20
- THAT PARTICULAR SHEET.
- COORDINATE WITH SPECIFICATION. IN CASE OF CONFLICT BETWEEN SPECIFICATIONS AND DRAWINGS THE MORE STRINGENT SHALL APPLY.
- PROVIDE ELECTRICAL CODE MINIMUM HORIZONTAL AND VERTICAL WORKING CLEARANCE FOR ALL ELECTRICAL PANELS AND EQUIPMENT. OFFSET MECHANICAL AS REQUIRED.
- COORDINATE ALL MECHANICAL WORK WITH THAT OF OTHER TRADES TO ENSURE PROPER AND ADEQUATE INTERFACE OF THEIR WORK WITH THE WORK OF THIS CONTRACTOR, PROVIDE 22 COORDINATED SHOP DRAWINGS PRIOR TO FABRICATION AND
- MECHANICAL EQUIPMENT SHALL NOT BE USED FOR TEMPORARY HEAT DURING CONSTRUCTION.
- 10. ALL DUCTWORK SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS. ADD APPROPRIATE DIMENSION FOR INSULATION OR DUCT LINER TO OBTAIN "TOTAL" DUCT SIZE.
- PROVIDE TRANSITIONS AS REQUIRED TO CONNECT DUCTWORK TO FANS AND OTHER MECHANICAL EQUIPMENT.
- COORDINATE EXACT LOCATIONS OF ALL ROOM THERMOSTATS AND/OR ROOM TEMPERATURE SENSORS WITH ARCHITECT PRIOR TO INSTALLATION.
- 3. COORDINATE EXACT LOCATION AND MOUNTING HEIGHTS OF ALL PLUMBING FIXTURES WITH CASEWORK AND ARCHITECTURAL DRAWINGS.
- 14. INSULATE DUCT PLENUMS FOR OUTSIDE AIR, RETURN AIR AND EXHAUST AIR. FOR ALL OTHER DUCTWORK INSULATION REFER TO SPECIFICATIONS.
- 15. REFER TO MECHANICAL DETAILS FOR ADDITIONAL
- ACOUSTICAL AND THERMAL INSULATION REQUIREMENTS FOR DUCT AND EQUIPMENT.

ALL WORK SHALL COMPLY WITH LOCAL CODES, BYLAWS AND | 16. SEISMIC RESTRAINTS FOR ALL EQUIPMENT AND PIPING SHALL STANDARDS, INCLUDING BUT NOT LIMITED TO THE 2024 BC BE COVERED BY MECHANICAL CONTRACTOR BUILDING CODE AND 2024 BC PLUMBING CODE. UNLESS NOTED OTHERWISE, ALL SANITARY AND STORM DRAINS OF SIZES 3 INCHES (75 MM) AND SMALL SHALL BE SLOPED TO

INSTALL ALL MECHANICAL WORK AS HIGH AS POSSIBLE, TIGHT | 18. REFER TO AND FOLLOW MANUFACTURER'S REFERENCE AND INSTALLATION LITERATURE, SUPPLEMENTED BY THE CONTRACT

2%, AND DRAINS OF SIZES 4 INCHES (100MM) AND LARGER TO

- CONTRACTOR SHALL PROVIDE ACCESS DOORS TO ALL EQUIPMENT/VALVES WHICH REQUIRE ACCESS. COORDINATE DO NOT ATTEMPT TO SHOW ALL REQUIRED OFFSETS. REFER WITH ARCH/GENERAL TRADE FOR LOCATIONS ON-SITE. DOOR SIZES SHALL BE LARGE ENOUGH TO FACILITATE SERVICE
 - CONTRACTOR SHALL BE RESPONSIBLE FOR BOOKING CONSULTANT INSPECTIONS BEFORE COVERING ANY INSTALLATION. ALL PIPING PRESSURE TESTS MUST BE WITNESSED/APPROVED BEFORE REMOVAL OF TEST. ANY SYSTEM COVERED WITHOUT INSPECTION IS SUBJECT TO BE REQUESTED TO BE EXPOSED FOR ENGINEER'S REVIEW.
 - ALL PIPING SYSTEMS SHALL BE INSTALLED SO THAT CONNECTED PIPING WILL IN NO WAY BE DISTORTED BY EXPANSION OR CONTRACTION OR SETTLING. ALL PIPING SHALL BE INSTALLED TO MANUFACTURER'S INSTALLATION MANUALS.

INCLUDING REQUIREMENTS FOR EXPANSION LOOPS.

- 2. INSTALL PIPING WITH ALL NECESSARY CHANGES OF DIRECTION, EXPANSION LOOPS, ANCHORS AND GUIDES TO PREVENT OVERSTRESSING THE PIPING AND EQUIPMENT PIPING CONNECTIONS FROM THERMAL EXPANSION AND CONTRACTION . ALL SERVICE ISOLATION/BALANCE/STRAINER VALVES SHALL BE
- INSTALLED TO ENSURE ACCESS IS MAINTAINED FOR 24. ALL DRAINAGE PIPING SHALL BE SLOPED PER BC PLUMBING
- . IN ADDITION TO THE PLUMBING CODE REQUIREMENT, PROVIDE CLEANOUTS ON DRAINAGE SYSTEMS AT CHANGES IN DIRECTION, BASE OF RISERS, MAINS EXITING THE BUILDING, FIXTURE DRAINS OF SINKS AND AT REGULAR INTERVALS. 25.1. CLEANOUTS SHALL BE FULL SIZE FOR PIPE UP TO 4"

(100MM) AND NOT LESS THAN 4" (100MM) FOR LARGER PIPE

WALLS, OR BE PROVIDED WITH GASKETED WATERPROOF

- 25.2. COORDINATE INSTALLATION OF CLEANOUTS WITH MILLWORK AND OTHER ARCHITECTURE OBSTRUCTIONS SLICH THAT THEY ARE LOCATED FOR EASY ACCESS WITH SUFFICIENT CLEARANCE FOR RODDING AND CLEANING.
- 25.3. EXTEND CLEANOUTS TO FINISHED FLOOR OR WALLS ABOVE THE MAIN FLOOR. 25.4. CLEANOUTS IN WET FLOOR AREAS SHALL EXTEND TO
- 25.5. CLEANOUTS ON OUTSIDE DRAIN SHALL BE BROUGHT TO

DRA	WING LIST
M0.0	COVER SHEET, SITE PLAN & SCHEDULES
M1.0	MECHANICAL PLANS & SCHEMATICS
M2.0	DETAILS
M3.0	SPECIFICATIONS

Elkay Lever Style Glass Filler. Overall dimensions are 2-1/2" x 1-1/8" x 9-1/2". Made of Stainless Steel. Chrome finish. 1lbs.

(standard) outlet. A5 - 5" dia., nickel broze strainer, -7 - Trap primer tapping, 3" pipe size.

C/w Symmon Sereno S-2302-PD Kitchen Faucet, finish option to be specified by architectural.

C/w Symmon Sereno S-2302-PD Kitchen Faucet, finish option to be specified by architectural.

RPM W V/PH/HZ MCA MOP

Overall. 11 x 13 x 6" Bowl. (FB x LR x D). 392 x 384 mm Overall. 279 x 330 x 152 mm Bowl. (FB x LR x D).

C/w Bradley S59-4000BY Navigator Thermostatic Mixing Valve with 3/8" Compression Cold Side bypass.

mm Overall. 406 x 356 x 203 mm Bowl. (FB x LR x D).

C/w McGuire Manufacturing Co. PW2000 Prowrap p-trap insulation kit.

C/w McGuire Manufacturing Co. PW2000 Prowrap p-trap insulation kit.

DUCT

941 20 115/60/1

NOMINAL FINISH MOUNTING

SEE DWG B12 WALL

SEE DWG B12

Watts FD-200-A epoxy coated cast iron floor drain with anchor flange, weepholes, adjustable round heel proof nickel bronze strainer, and no hub

Double compartment self rimming topmount sink less faucet ledge. 20 gauge (0.9 mm), type 302 (CNS 18/8) stainless steel. Exposed surfaces are #4 satin finished. Undercoated to reduce condensation and resonance. Includes waste fittings, factory applied rim seal, cutout template, and factory

installed EZ TORQUE™ fasteners. Certified to ASME A112.19.3-2008 / CSA B45.4-08. Centre back waste location. Includes 3 1/2" (89 mm) crumb cup strainer with 1 1/2" (DN38) brass tailpiece. Sink has Spillway® partition. 18 7/16 x 31 1/4" Overall. 16 x 14 x 8" Bowl. (FB x LR x D). 468 x 794

Single compartment, self rimming topmount sink with faucet ledge. 18 gauge (1.2 mm), type 304 (CNS 18/10) stainless steel. Exposed surfaces are #4 satin finished. Undercoated to reduce condensation and resonance. Includes waste fitting, factory applied rim seal, cutout template, and factory installed EZ TORQUE™ fasteners. Certified to ASME A112.19.3-2008 / CSA B45.4-08. Wheelchair accessible: meets ADA (Americans with disabilities act guidelines) and ANSI A117.1 (Accessible and usable buildings and facilities). Check local codes to ensure compliance. Centre waste

location. Includes 3 1/2" (89 mm) crumb cup strainer with 1 1/2" (DN38) brass tailpiece. Model ALBS1306P-1-1, 1 faucet hole, 1 1/2" diameter.

NOTES

REMARKS

3. INTERLOCK WITH MOTORIZED DAMPER

. BACKDRAFT DAMPER

2. DISCONNECT SWITCH

4. WALL TIMER SWITCH

SHIPPING WEIGHT

	Alternates List	Chan
Product	Approved Manufacturer	Shop Drawings Required
Access Doors	Acudor, E.H. Price, Maxam, Milcor, Mifab, Enpoco	
Air Vent (Automatic)	Spirax Sarco Ltd. Type 13W (up to 150 psi) or 13 WH (for over 150 psi) Hoffman, Braukman, Armstrong 1-AV, Maid-O-Mist	
Air Vent (Manual)	Cobraco 27 Series, Spirax Sarco Ltd,Hoffman, Braukman, Armstrong, Maid-O-Mist	
Control Dampers – Low Leakage	American Warming, Tamco, Ruskin	Υ
Domestic Hot Water Heaters (Electric)	Rheem Canada Ltd., John Wood (GSW Water Heating Co., A.O. Smith Water Products Co., Bradford White Canada Inc.	Υ
Duct Silencers	Vibro Acoustics, VAW Systems	Υ
Ductwork – Flexible	Thermaflex, Wiremold, Flexmaster, Canaflex	
Ductwork – Round and Oval Spiral	Spiro-Lock, Ecco	
Electric Terminal Heating Units		Υ
Baseboard / Convector / Wallfin / Unit Heaters / Force Flow Heaters	Chromalox, Q-Mark, Thermolec, Caloritech	Υ
Expansion Tanks – Domestic Water	Watts Canada, Amtrol Inc. "Term-x-trol", Xylem inc. "Bell & Gossett", Taco Inc., Wessels Co.	Υ
Fans – Cabinet	Greenheck, Cook, Delhi, Twin City	Υ
Grilles, Registers and Diffusers	Titus, Tuttle & Bailey, Metalaire, Price Industries Inc., Nailor Industries, Krueger Division of Air System Components Inc.	Υ
Pipe Couplings – Grooved	Victaulic, Grinnell, Shur Joint	
Pipe Couplings – Di-Electric	Watts, AG Specialties	
Pipe Couplings – Flexible	Mason, Flexonics, Hyspan, Goodall, Victaulic, Proco	
Pipe Fittings and Flanges	Crane, Grinnell, Jenkins	
Pipe Supports and Hangers	Crane, Unistrut, Myatt, Grinnell, Sarco, Hunt, Taylor	
Plumbing Fixtures - Vitreous China Fixtures	American Standard, Kohlr Co., Toto Ltd.	Y
Plumbing Fixtures - Fixture Water Supply and Drain Fittings	American Standard, Delta Faucet Co., Zurn Industries Ltd., Chicago Faucet, Cambridge Brass Inc., Moen Inc.	Υ
Plumbing Fixtures - Stainless Steel Sinks	Franke Kindred Canada Ltd., Elkay Manufacturing Co., Deschenes Group "Regionox", Kohler Co.	Υ
Pressure Reducing Valves	Watts, Singer	Y
Pressure Relief Valves	ITT Bell & Gossett 3301/4100 or 790/1170, Spirax Sarco ltd. SVI Series, McDonnell & Miller Models 250 & 260, Watts Industries (Canada) inc. 174A or 740, Conbraco 10-600 Series	Υ
Strainers	Red & White, Sarco, Armstrong, Mueller, Watts, Conbraco	
Testing, Adjusting and Balancing Agencies	MDT Systems, Scott Technical, Flotech, Honey's Technical, Western Mechanical, KD Engineering, BC Tech Engineering, Stasis, Airmec	
Valves (Ball, Gate, Globe,	Red & White/Toyo, Grinnell, Watts, Kitz, Crane,	

DOMESTIC COLD WATER LOAD = 7.9 FU EXISTING WATER ENTRY PRESSURE IN PUBLIC WASHROOM AFTER PRV = 60 PSI

Milwaukee, Conbraco

TOTAL EQUIVALENT LENGTH TO HAND SINK = 150 FT (46 M) MINIMUM PRESSURE NECESSARY AT THE HAND SINK: 20 PSI

PRESSURE LOSS DUE TO DCVA = 5 PSI TOTAL PRESSURE AVAILABLE FOR FRICTION LOSS FROM THE WATER SERVICE ENTRY TO THE MOST REMOTE WATER SUPPLY OUTLET = 60 PSI - 20 PSI - 5 PSI = 35 PSI (241 KPA)

AVAILABLE PRESSURE FOR FRICTION LOSS PER METER = 241 KPA / 46 M = 5.2 KPA / M > 2.6 KPA/M

AVERAGE PRESSURE LOSS METHOD IS USED FOR PIPE SIZING

SANITARY LOAD

SANITARY LOAD = 3 FU

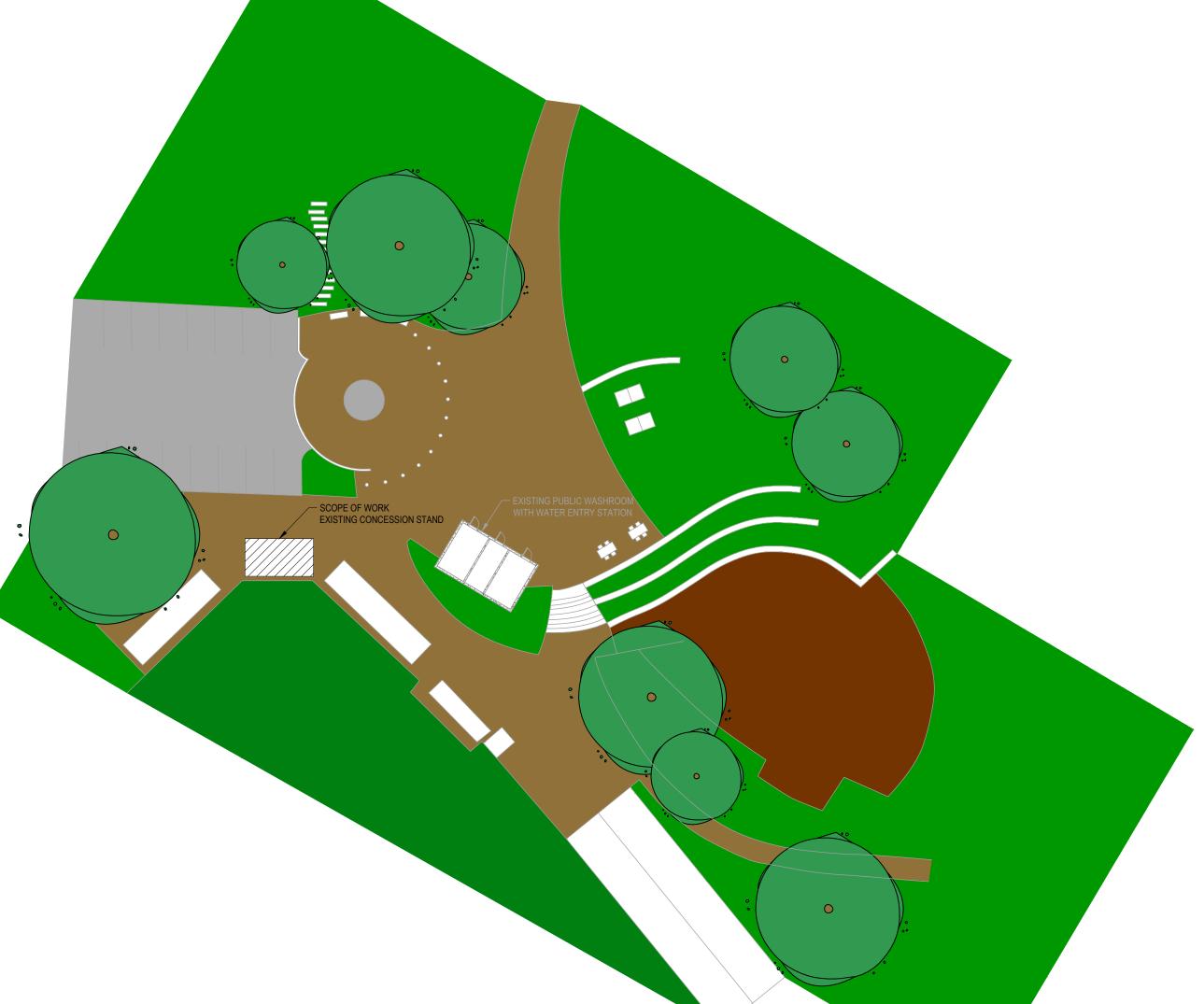
DOMESTIC WATER LOAD

ELECT	RIC BASEBO	OARD HE	ATER SCH	EDULE			
UNIT TAG	MANUFACTURER	MODEL	WATTS	ELECTRICAL (V/PH/HZ)	DIMENSION (IN) LxWxH	WEIGHT (LB)	NOTES
BBH-1	OUELLET	OPR2000	2000	240/1/60	82 1/16 x 3 1/8 x10 1/8	47.5	1. C/W BUILT-IN THERMOSTAT

ELECT	RIC CEILING	3 FAN HE	ATER SCHI	EDULE			
UNIT TAG	MANUFACTURER	MODEL	WATTS	ELECTRICAL (V/PH/HZ)	DIMENSION (IN) LxWxH	WEIGHT (LB)	NOTES
EFH-1	OUELLET	OACPU3000	3000	240/1/60	22 1/16 x 16 1/8 x5 7/16	24	1. C/W WALL THERMOSTAT

ELECT	RIC WATER	HEAT	ER SCHEDU	JLE					
UNIT TAG	MANUFACTURER	MODEL	TANK CAPACITY (GAL)	V/PH/HZ	INPUT (KW)	DIAMETER (IN)	HEIGHT (IN)	SHIPPING WEIGHT (LBS)	NOTES
WH-1	AO SMITH	DEL-10	10	240/1/60	3.5	18	18-1/4	54	1. SIDE INLET AND OUTLET

HOT W	/ATER EXPA	NSION	TANK SCHE	EDULE				
UNIT TAG	MANUFACTURER	MODEL	TANK VOLUME (GAL)	MAX ACCEPT. VOLUME (GAL)	DIAMETER (IN)	HEIGHT (IN)	SYSTEM CONNECTION (IN)	NOTES
ET-1	ATROL	ST-5	2.0	0.9	8	13	3/4	



Domestic Water (Above

Santiary Drain and Vent

Santiary Drain and Vent ABS

(Above Grade)

(Below Grade) Note:

Acceptable

PF2 Premium

Domestic &

Recirculation

Non-Potable Hot

Water & Hot Water

Cellular Core Piping Not

8	2025.07.11	ISSUED FOR RFP	 P
8 7	2025.07.11 2025.07.10	ISSUED FOR RFP RE-ISSUED FOR BUILDING PERMIT	P P
-			•

Mechanical drawings must be read with mechanical specifications. Drawing plot size is 36"x24". Drawings are to be read for the purpose identified in the revision/issue column. Drawings are not for pricing or construction unless specified. These documents are intellectual property of Rocky Point Engineering Ltd. and are for the project in the title block only. Reproduction in any form requires Rocky Point Engineering Ltd.'s express consent.

ISSUED FOR SCHEMATIC DESIGN

ISSUED FOR COORDINATION

ISSUED FOR COORDINATION

No. DATE

REVISIONS:



PROJECT:

Pipe and Pipe Fitting Materials

Cast Iron

XFR PVC

Run-Outs Less Than

(13ft Max)

System 15 PVC

Cross Linked Polyethylene (PEX) PEX, CPVC

Insulation - Hot Pipe

All concealed piping shall utilize All Service Jacket, and all outdoor piping shall use metal jacketing, unless noted otherwise

IPEX XFR PVC (plenum rated)

IPEX System 15 PVC

Mineral Fibre 111F - 140F 1/2"

Insulation thicknesses based on ASHRAE 90.1-2016 Zone 4 (Southern BC)

Fitting Material

Wrought Copper, Cast | Soldered, Mechanical Joint

Solvent Weld

Solvent Weld

Insulation Thickness

Manufacturer's Approved Joining Method

Mechancial Joints with stainless steel couplings

Mechancial Joints with stainless steel couplings

1" to 1-1/4" | 1-1/2" to 3" | 4" to 8" | Greater than 8"

Wrought Copper

Wrought Copper

MACKIN PARK CONCESSION RENEWAL

> 1046 BRUNETTE AVE. COQUITLAM BC, V3K 1E7

COVER SHEET, SITE PLAN &

PROJECT NUMBER:

DRAWING NAME:

DRAWN BY: DESIGNED BY: GH/PL APPROVED BY: GH

DRAWING:

REFER TO PLAN

EXHAUST FAN SCHEDULE UNIT TAG | MANUFACTURER



SUB-CONSULTANT:

KEYPLAN:

2025.07.11 ISSUED FOR RFP RE-ISSUED FOR BUILDING PERMIT PL ISSUED FOR TENDER REVIEW ISSUED FOR BUILDING PERMIT ISSUED FOR PRICING 4 2025.04.28 ISSUED FOR SCHEMATIC DESIGN PL 3 2025.04.15 ISSUED FOR COORDINATION 2 2025.04.11 1 2025.03.28 ISSUED FOR COORDINATION

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DESCRIPTION

SEAL:

CLIENT:

No. DATE

REVISIONS:

PROJECT: MACKIN PARK CONCESSION

> 1046 BRUNETTE AVE. COQUITLAM BC, V3K 1E7

RENEWAL

DRAWING NAME:

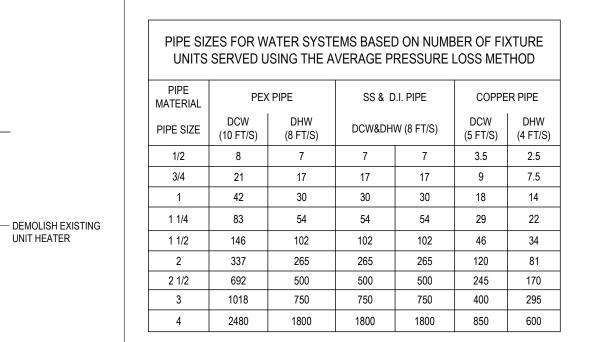
MECHANICAL PLANS, SCHEMATIC & DETAILS

PROJECT NUMBER:

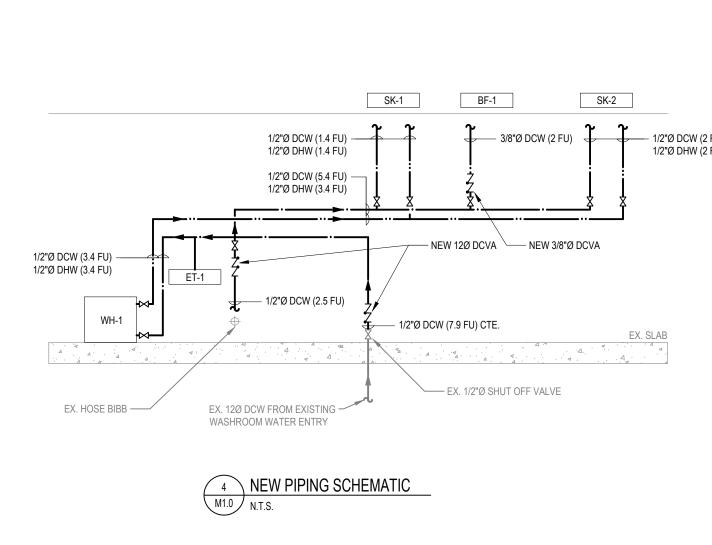
DESIGNED BY: GH/PL APPROVED BY: GH SCALE: REFER TO PLAN

DRAWING:

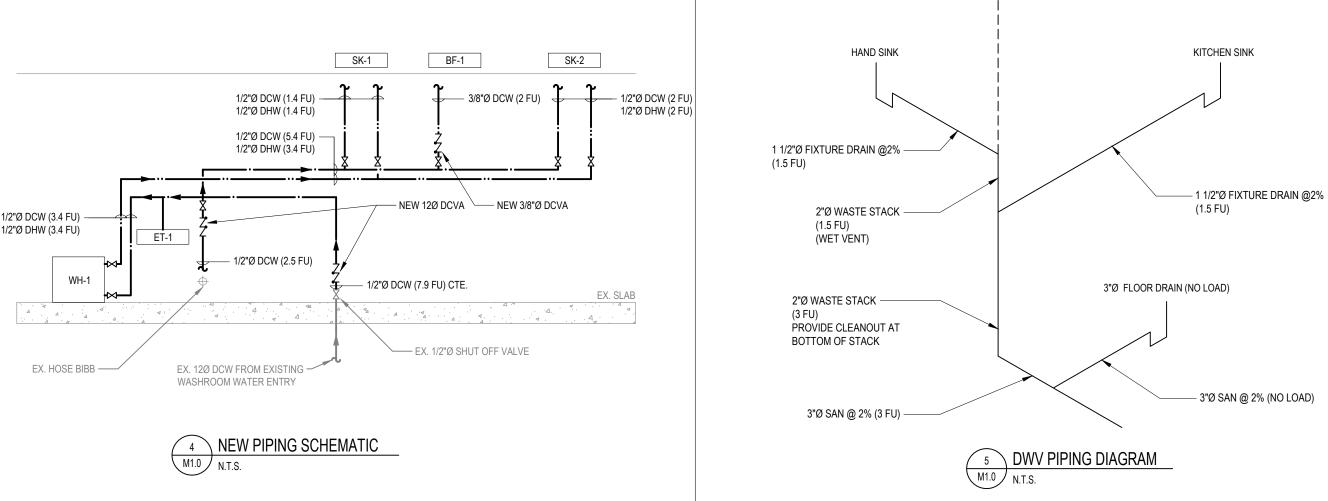




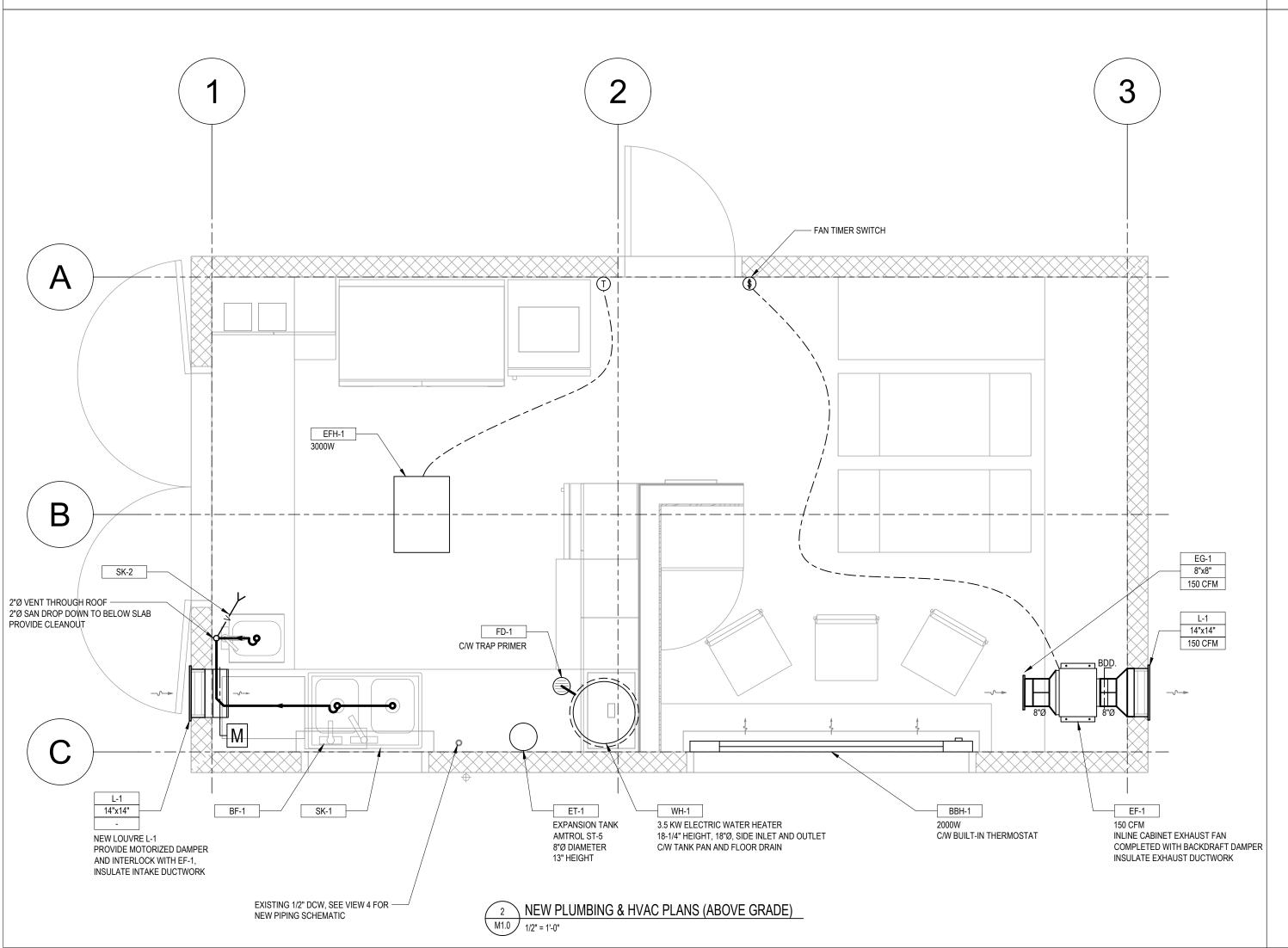
UNIT HEATER



EXISTING 1/2" DCW —



2"Ø STACK VENT



- DEMOLISH EXISTING SPACE SAVER

SANITARY PIPE TO BE CAPPED AND

ELECTRIC HOT WATER HEATER

EXISTING UNDERGROUND

В

DEMOLISH EXISTING KITCHEN SINK —

AND ASSOCIATED SANITARY

CAP OFF & ABANDON SANITARY

PIPING UNDER MILLWORK

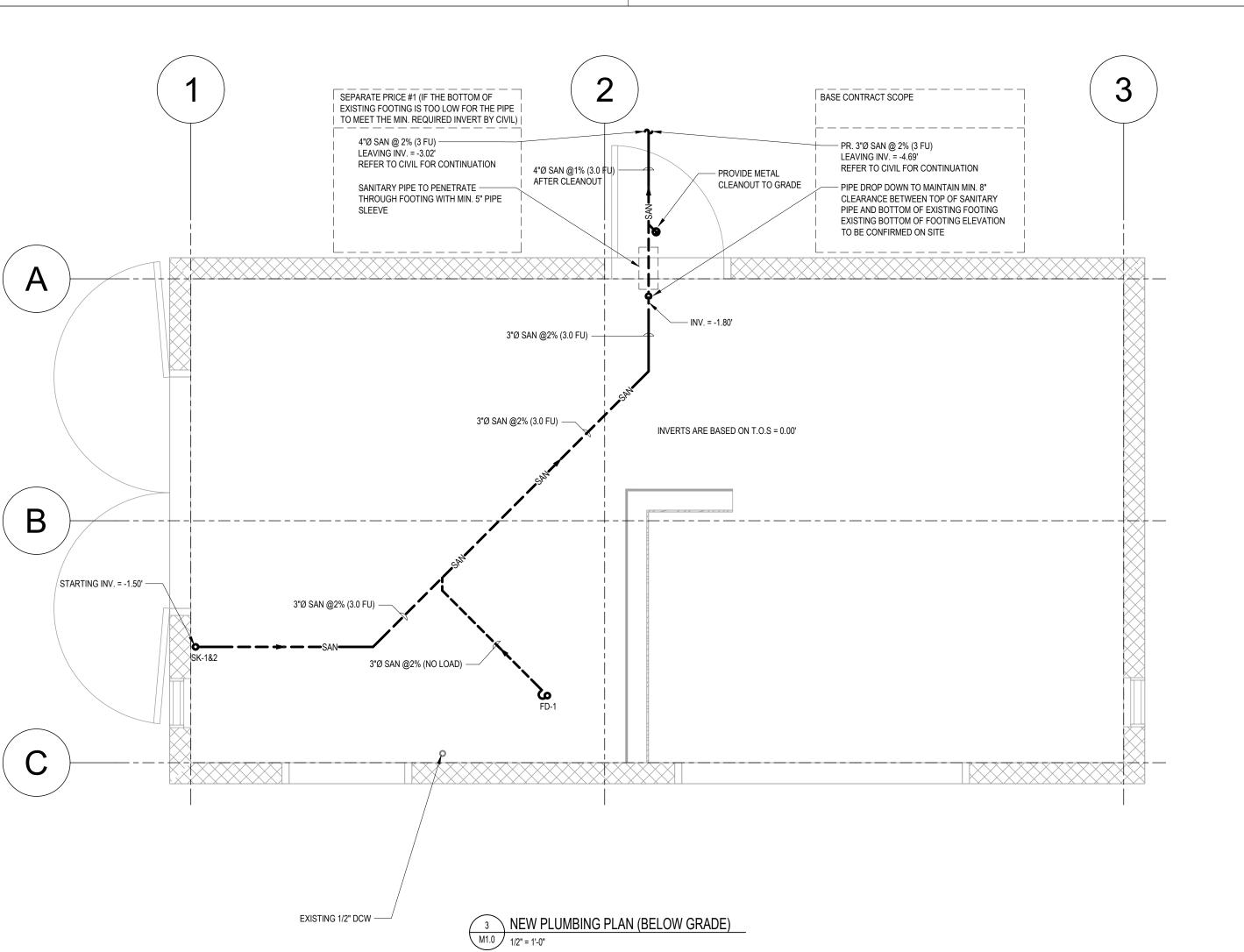
PIPING UNDERGROUND

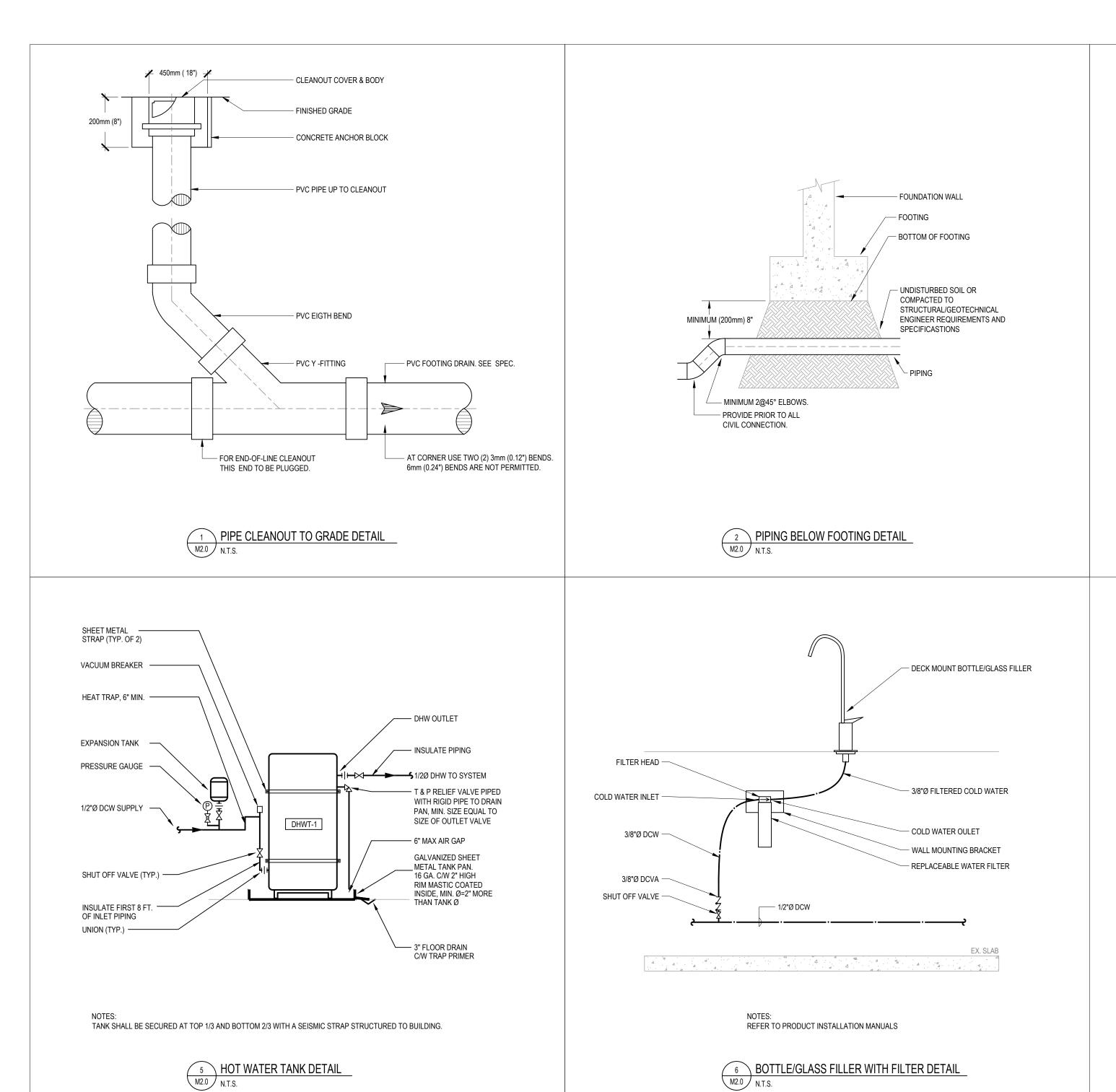
DEMOLISH EXISTING ALL HOT —

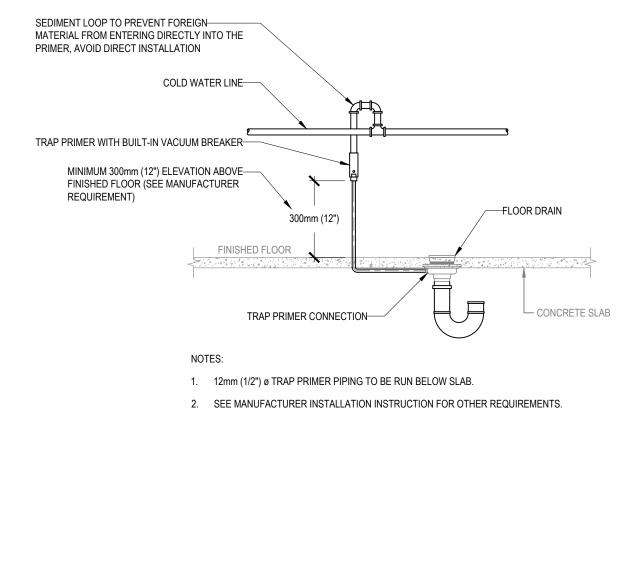
& COLD WATER PIPING BACK

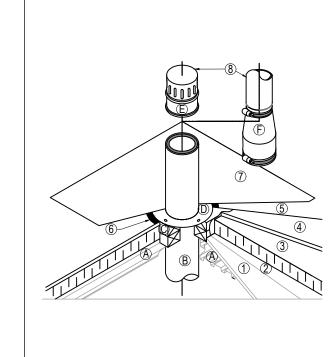
EXISTING HOSE BIB TO REMAIN -

TO MAIN ISOLATION VALVE









DETAIL NOTES

- GYPSUM OVERLAY BOARD
- VAPOUR RETARDER
- INSULATION: SEE LIST OF ACCEPTED MATERIALS IN RGC STANDARD INSULATION OVERLAY: SEE RGC STANDARD B4.1, B4.2 AND C4.1
- PRIMARY MEMBRANE AND MEMBRANE PROTECTION
 MASTIC: AS APPROVED BY MANUFACTURER
 MEMBRANE FLASHING: ONTO PRIMED METAL FLASHING FLANGE OR
- ADHESIVE COATED FOR NON-BITUMINOUS FLEXIBLE MEMBRANE SYSTEMS.

 8. STORM COLLAR, TYPICAL LEAD CAP OR TYPICAL ALUMINUM CAP:
 REROOFING ONLY. NON-BITUMINOUS FLEXIBLE MEMBRANE SKIRT COLLAR,
 SEALED WITH COMPATIBLE SEALANT AND STAINLESS STEEL HOSE CLAMPS
 FOR USE WITH PIPES THAT EXTEND ABOVE FLASHINGS.

RELATED WORK FOR COORDINATION BY TRADES

- A. ACCEPTABLE DECK
- PLUMBING STACK: EXTEND TO MATCH TOP OF METAL FLASHING. 75mm (3") DIA. UNLESS OTHERWISE NOTED.
- C. WOOD BLOCKING: OPTIONAL
 D. METAL FLASHING: APPLY IN A BED OF MASTIC . FASTENED OVER MEMBRANE
 TO WOOD BLOCKING OF POOL PERSON
- TO WOOD BLOCKING OR ROOF DECK.

 TYPICAL ALUMINUM CAP: FOR USE WITH ALUMINUM FLASHINGS.

 STORM COLLAR: NON-BITUMINOUS FLEXIBLE MEMBRANE SKIRT COLLAR, SEALED WITH COMPATIBLE SEALANT AND STAINLESS STEEL HOSE CLAMP.

NOTE: REFER TO RGC GUARANTEE STANDARDS FOR ADDITIONAL

USE WITH PIPES THAT EXTEND ABOVE FLASHINGS.

REQUIREMENTS.
ALUMINUM FLASHINGS REQUIRED FOR TORCH-APPLIED ROOF SYSTEMS.

VENT PIPE PENETRATION DETAIL

N.T.S.

ROCKY POINT
ENGINEERINGLTD.
Vancouver • Langley • Victoria • Nanaimo • Kelowna • Kamloops • Nelson • Smithers
Mechanical Consulting Engineers www.rpeng.ca
VANCOUVER OFFICE ph. 604.559.8809
#502-211 E GEORGIA
VANCOUVER, BC V6A 1Z6

SUB-CONSULTANT:

KEYPLAN:

8 2025.07.11 ISSUED FOR RFP PL
7 2025.07.10 RE-ISSUED FOR BUILDING PERMIT PL
6 2025.06.17 ISSUED FOR TENDER REVIEW PL
5 2025.05.30 ISSUED FOR BUILDING PERMIT PL
4 2025.04.28 ISSUED FOR PRICING PL
3 2025.04.15 ISSUED FOR SCHEMATIC DESIGN PL
2 2025.04.11 ISSUED FOR COORDINATION PL
1 2025.03.28 ISSUED FOR COORDINATION PL
No. DATE DESCRIPTION BY
REVISIONS:

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SEAL:

CLIENT:



PROJECT:

MACKIN PARK CONCESSION RENEWAL

1046 BRUNETTE AVE. COQUITLAM BC, V3K 1E7

DRAWING NAME:

DETAILS

PROJECT NUMBER:

246

DESIGNED BY: GH/PL

APPROVED BY: GH

SCALE: REFER TO PLA

DRAWING:

M2.0

- .1 The Mechanical Specifications form part of the project requirements and shall be read in conjunction with all other contractual documents, drawings and specifications.
- .2 The Contractor shall provide a complete, tested and fully operational Mechanical, heating, ventilation, air conditioning, plumbing, controls and fire suppression system installation, All installations shall be in accordance with all codes, contract documents and Client requirements. The Contractor shall be responsible for provision of all materials and labour to
- comprise a complete installation .3 All installations shall be in accordance with the manufacturer's installation instructions and
- .4 The layouts and arrangements shown on the Mechanical drawings are approximate and may
- be diagrammatic. The Contractor shall provide all additional fittings, equipment, material, labour, etc. to comprise a complete installation. .5 The Mechanical Drawings and Specifications are not detailed installation instructions, nor
- provide a method of construction. .6 Refer to and follow manufacturer's reference and installation literature, supplemented by the contract documents.
- .7 The Contractor shall be skilled and experienced in the Mechanical works relating to the project. Only licensed trades persons shall be retained to undertake the work. Where apprentices are utilized, work shall be under the direct supervision of an on-site licensed
- .8 Only new material shall be used of full weight and of first class quality, unless stated
- .9 Use the same brand or manufacturer for each specified application.
- .10 All installations and materials shall be to the approval of the Engineer and Authority Having Jurisdiction. Rejected materials or installations shall be removed and replaced by the Contractor at no cost to the Client.

2 DEFINITIONS

- .1 The following definitions shall apply to the Mechanical Drawings and Specifications: .1 AHJ - Authority Having Jurisdiction
- .2 Client The Company or Individual representing the project End User .3 Contractor - The Company undertaking the Mechanical scope of work.
- .4 Engineer Rocky Point Engineering Ltd. and their Representatives .5 Mechanical - Referring to the HVAC, Plumbing, Controls and/or Fire Suppression scope of
- .6 LOA Schedule Letters of Assurance
- .7 RPR Registered Professional of Record .8 SRP - Supporting Registered Professional

3 GENERAL DESCRIPTION OF WORK

- 1 The following is intended to provide a general description of the Mechanical works in order to assist in clarification of project requirements. This list is not comprehensive and is intended to be read in conjunction with the Mechanical Drawings, Mechanical Specifications and all other project related documents. .2 HVAC
- .1 Demolish existing unit heater.
- .2 Install new ventilation system with a new exhaust fan, intake exhaust louvres, backdraft damper, motorized damper.
- .1 Demolish existing kitchen sink, water, associated piping and valves, refer to demolition
- .2 Install new kitchen sink, bottle filler, handwash sink, water heater (with expansion tank, tank pan & floor drain), associated piping and valve in kitchen area, refer to new plan.

4 REGULATIONS

- 1 All materials, equipment and installations are to comply with applicable codes, regulations, bylaws and the AHJ requirements, including but not limited to: .1 British Columbia Building Code 2024
 - .2 City or District Bylaws .3 ANSI
- .4 ASHRAE
- .5 ASME .6 ASPE .7 AWWA
- .8 British Columbia Boiler and Pressure Vessel Act .9 British Columbia and Canadian Gas Code
- .10 British Columbia Plumbing Code
- .11 British Columbia and Canadian Refrigeration Code .12 Canadian Electrical Code
- .14 CSA Standards
- .15 Fall Protection Requirements .16 Fire Marshall
- .17 Insurers Assurance Organization (IAO)
- .18 National Fire Protection Agency (NFPA) .19 SMACNA
- .20 ULC Standards .21 WHMIS
- .22 WorkSafeBC 5 PERMITS, FEES AND INSPECTIONS
- The Contractor shall pay for and obtain all necessary permits and inspections in order to
- stallations. All cost shall be included in the Contractor's project pricing/tend .2 The Contractor shall provide the Engineer with proof of all obtained permits, certificates and
- inspections as requested.

6 CONTRACTOR QUERIES .1 Should there be a conflict between the Drawings. Specifications or contract documents, the

stage of the project. Should clarification not be provided, the Contractor shall allow for the higher quality or greater extent of work in their scope. .2 All queries shall be submitted in accordance with the Contract requirements

Contractor shall advise the Engineer in writing to seek clarification during the pricing/tendering

- .3 Ensure queries are submitted to the Engineer within [7] working days prior to the pricing/tender close to allow for response to all required parties. Should a response be
- deemed required, it will be made via addenda as per the project requirements. .4 Should no queries be made, materials and installations shall be governed by the reasonable
- interpretation of the Engineer.

PRICING/TENDERING

- .1 Prior to submitting their pricing/tender bid, the Contractor shall visit the site and make themselves thoroughly aware of all aspects relating to the work. Requested changes to contract scope, contract cost or contract time due to failure in reviewing the site conditions will not be considered. .2 Pricing/tenders are to be based on the equipment specified. Base bid refers to items specified
- by manufacturer and model number which meets the specifications in all respects regarding performance, quality of material and workmanship and is deemed acceptable to the Engineer without qualification. Base bid equipment and materials are as listed on the Mechanical Drawings and in the Mechanical Specifications. .3 Refer to the "Alternate Equipment" section of these specifications for further information
- .4 Request for review from manufacturers of equipment and materials not included on the "Alternate Equipment" list shall be made a minimum [7] working days prior to close o tender/pricing. All information required by the Engineer to evaluate the proposed manufacturer shall be provided at the time of request. .5 Separate prices/scope of work, unless stated otherwise, shall be included in the base/tender
- price. However, the cost and schedule values shall be identified separately for review by the 8 SCHEDULE
- .1 The Contractor shall undertake all works in accordance with the project schedule and in coordination with the General Contractor
- .2 Allow for all phasing of work as required and directed
- .3 Allow for all out of hours or premium labour to complete work in accordance with the project

9 WARRANTY, GUARANTEE, QUALITY ASSURANCE AND LIABILITY

- .1 The Contractor shall assume full responsibility for layout of the Mechanical work and for any damage caused by improper location or performance of work. .2 Protect work and building surfaces from damage due to the Contractor's performance of the
- work. Pay particular attention to protection of building vapour barriers and waterproof .3 The Contractor shall cover floors and other finished surfaces to avoid damage.
- .4 During periods of freezing or potential freezing, ensure all systems are protected and that
- mechanical openings in the building envelope are weather and temperature protected.
- .5 Maintain the site in a clean and orderly condition at all times.
- .6 At the completion of work remove tools, waste and surplus equipment/materials from the site.
- .7 The Contractor shall provide a written guarantee warranting that equipment, materials and

systems supplied as part of the project will be free of defects and in a servable condition in

- conjunction with the project requirements for a minimum [1 Year] from the date of the project Substantial Completion, which shall include one complete summer and one complete winter of
- .8 During the warrantee period the Contractor shall promptly remedy all defects in equipmen materials, systems or installations to the satisfaction of the Client, Engineer and at no cost.

10 LIABILITY INSURANCE

- the building, work by other trades and to the Client's staff, equipment and personnel.
- .2 Insurance deductible clause shall not be more than \$1,000.
- .3 Liability insurance shall be maintained in accordance with WorkSafeBC requirements. .4 Cost of insurance coverage shall be included in the contract price

.5 The Contractor shall provide proof of insurance to the Engineer if requested. 11 CONTRACT PRICE BREAKDOWN AND PROGRESS CLAIMS

- .1 At the request of the Engineer and within [10] days of award of contract, provide a price breakdown of all values associated with the scope of work pricing/tender
- .2 Price breakdowns shall identify cost of material and labour separately.
- .3 The sum of the cost breakdown shall be equal to the contract price.

.5 Cost breakdowns shall be provided for all changes in scope of work.

date and remaining amount to be completed.

appropriate Consultant.

being reviewed by the Engineer.

12 SHOP DRAWINGS

- 1 Prior to ordering any equipment the Contractor shall Submit Shop drawings to the Engineer for .2 All shop drawings shall be submitted a maximum of [30] days after award of contract.
- .3 Shop drawings shall include the name of the manufacturer, model number, performance/operating characteristics, electrical requirements, physical dimensions available/selection options, weight and controls connection requirements. Applicable heating output, cooling output, flow rates, pressure losses, power requirements, etc. to be identified .4 Submit weights of all major equipment for review such that the loads can be reviewed by the
- .5 Submit lists of all electrical motors and power requirements to the Electrical Trade and through the specified shop drawing process for review by the Electrical Consultant
- .6 Clearly mark shop drawing submittals with arrows, underlining or circling to show differences
- between specified and selected ratings. Cross out nonapplicable material.
- .7 Unless stated otherwise, all performance data is to be of net values and are to be external o any internal losses or gains of the equipment.
- .8 All shop drawings shall be in the same units as the project designs
- .9 The Contractor shall review all shop drawings prior to submittal to the Engineer. The Contractor shall stamp, sign and date all shop drawings as reviewed prior to submittal. The Contractor's stamp shall be their certification that shop drawings are accurate, in conformance with the project requirements and have been coordinated with site requirements. Shop drawings not stamped as reviewed will be rejected and returned to the Contractor without
- .10 Submit shop drawings in accordance with Engineers and Geoscientists of British Columbia (EGBC) Professional Practice Guidelines and in accordance with the Mechanical Contractors Association of British Columbia (MCABC).
- .11 The Contractor shall submit drawing to the General Contractor/Project Manager who shall then forward to the project Architect once reviewed. Thereon the Architect will forward shop drawings to the Engineer. Once reviewed, shop drawings will be returned from the Engineer to the Architect who shall forward to the General Contractor/Project Manager and thereon the
- .12 Review of shop drawings by the Engineer shall be understood to reflect the general project requirements and does not relieve the Contractor of fulfilling their contractual/project
- .13 The Contractor shall be responsible for errors or omissions in the shop drawings and for meeting all requirements of the Contract Documents .14 The Contractor shall be responsible for confirming and correlating system/equipment
- dimensions. .15 Submit shop drawings in electronic PDF format.

equipment itself to the supporting structure.

- 16. Should shop drawings be submitted in hard copy format, the Contractor shall ensure a suitable quantity of shop drawings are provided. Allow for one copy to be retained by the Engineer, Architect and General Contractor/Project manager, in addition to requirements of the project Operating and Maintenance Manuals
- .17 All equipment shall comply with the project and contract requirements regardless of having been reviewed.
- .18 Refer to the "Alternate Equipment" schedule for a list of required shop drawings. .19 If shop drawings of Alternate Equipment are rejected 3 times for technical reasons, the Contractor shall provide products as specified with no additional cost or impact to the project
- schedule. Costs for time incurred during the abortive shop drawings review process will be for the Contractor's account .20 The Engineer shall not be responsible for determining product quantities or handling.
- .21 The Contractor shall furnish samples of products or materials for the Engineer's review as .22 Equipment manufacturers shall ensure that the strength and anchorage of the internal components of the equipment exceeds the force level used to restrain and anchor the
- .23 Where required and requested, the Contractor shall submit Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) for products used on site.
- 13 ALTERNATE EQUIPMENT .1 All Contractor proposed equipment or materials shall be similar and equal in all respects to that specified.
- .2 The Contractor shall identify the cost and schedule differences for all proposed alternate equipment and materials for review and acceptance by the Engineer and Client prior to proceeding. List all and any revisions required to facilitate the alternate equipment and/or
- .3 All alternate equipment and materials shall not exceed space limitations. Replace all which does not meet the project documents or space limitations at no cost. .4 The Contractor shall assume all cost associated with redesign requirements of alternate proposed equipment or materials
- .1 Seismic restraint shall be provided for all mechanical systems and equipment forming part of the work. Work pertains to Mechanical, HVAC, Plumbing, Controls and Fire Protection
- .2 Seismic restraint measures shall be in accordance with SMACNA Guidelines for Seismic Restraints, NFPA, the British Columbia Building Code 2024 and the AHJ.
- .3 The Contractor shall retain the services of a British Columbia registered Professional Engineer who shall design the project specific restraint measures and provide Schedule Letters of
- .4 The Seismic Engineer shall act as a Supporting Registered Professional (SRP) providing ocumentation to the Engineer, acting as the Registered Professional of Record (RPR
- .5 The Seismic Engineer (SRP) shall carry liability insurance not less than \$1,000,000 and shall .6 The Contractor shall install seismic restraint measures in accordance with the Seismic
- .7 Seismic restraint measures shall not compromise vibration isolation of motor driven
- .8 Prior to construction commencement, the Contractor shall organize a meeting with the General Contractor, Mechanical Contractor, Structural Consultant and other appropriate parties. At that meeting the Contractor shall present in general the approaches/details used to provide seismic bracing for equipment, ductwork and piping, highlighting attachments to structure and

15 COORDINATION AND EXAMINATION

- .1 The Contractor shall be responsible for examination of all applicable site conditions
- .7 Caulk gaps between wall finishes great than 1/2" (12mm). For gaps larger than 1/2" (12mm) .2 Coordinate installation with the General Contractor and all other trades to avoid conflicts. Do ot proceed with installations until complete coordination has been made with all trades. .8 Patch and make good all openings and holes to the satisfaction of the Engineer and Client. .3 Field verify all building and site dimensions prior to any fabrication and installation of
- equipment or materials. No additional charge shall be entertained for failure to verify these dimensions on site. .4 Improperly coordinated installations shall be removed and reinstalled to the satisfaction of the
- Engineer, regardless of installation order. 5 The Contractor shall closely coordinate installations with all other trades to ensure that suitable access clearances and pipe/equipment slopes are maintained.
- 6 Report to the Engineer any conditions which may prevent the installation of equipment or systems in the manner intended.
- Alter location and routing of mechanical systems at the direction of the Engineer at no cost to the Engineer or Client, provided the revision is made before installation and does not

16 RESPONSIBILITIES, LAYOUT OF WORK AND STORAGE

- .1 The Contractor shall be responsible for layout for their work. .2 Prior to installations, the Contractor shall examine all associated existing conditions
- site and prior to final turn over to the Client. .4 Keep all material and equipment within factory provided covers until time of installation.

.3 Protect all material and equipment from damage during delivery, while temporarily stored on

- .5 Do not assume that the Client will provide storage space on site for materials.
- .6 Route mechanical systems in an orderly manner and as indicated on the drawings. Generally follow routes parallel and perpendicular to the building structure.
- .7 Where services are intended to be run within open web structural joists, the Contractor shall
- obtain shop drawings for the structural members and layout their work according to the building structure. 17 EXISTING SYSTEMS AND SERVICES
- .2 The Contractor shall notify the Engineer in writing should any existing systems, equipment or nstallation be found to be non-operational, defective, dangerous or deemed to impede the project requirements.

1 Maintain existing services throughout the course of construction, unless indicated otherwise.

- .3 The Contractor shall notify the Engineer in writing should any existing system be found deviating from those shown on the Drawings and Specifications. The Contractor shall seek clarification from the Engineer prior to proceeding further
- .5 Include premium time for connection to existing systems so that normal use of the existing systems will not be affected. .6 Before interrupting any services, complete all preparatory work as far as reasonably possible and have all necessary materials on site and prefabricated (where practical) and work

.4 Connect into existing systems with minimum disruption to the existing systems.

continuously to keep the length of interruption to a minimum

- The Contractor shall coordinate all required demolition work with the General Contractor and other trades.
- .2 Materials or equipment intended for reuse shall be carefully removed and stored in a dry, clean and safe area. Protect from damage. All equipment and materials being removed shall be disposed of in a suitable manner off site Equipment and materials shall be recycled as far as possible.
- .4 Should the Client request to retain any equipment or materials, the Contractor shall coordinate and obtain a receipt for such.
- .5 Systems or equipment requiring to be drained or purged, such as air conditioning refrigeran or fire suppression systems, shall be done so by a specialist in the field 6. All thermostats, temperature sensors, pressure sensors, control devices, etc. within the project area shall be carefully wrapped in poly sheet to protect from dust and dirt ingress during the construction process. Place thermostats and space temperature sensors coiled in plastic
- .7 Ductwork, diffuser, grille and register openings within the project area shall be wrapped in poly sheet to protect from dust and dirt ingress during the construction process .8 If ductwork or return air openings cannot be covered or wrapped, provide with temporary filter media during the construction process. Replace filter media if it becomes dirty.

.9 All equipment and systems within the project area shall be protected from damage or ingress

wrapping temporarily suspended adjacent to the associated equipment. Do not disconnec

thermostats or temperature sensors unless required to undertake the works.

of dirt and debris by suitable means of protection.

- .10 All ductwork or branch takeoffs that become redundant shall be capped and sealed.
- .11 Remove and reclaim refrigerant from demolished equipment in accordance with Refrigerant Management Canada guidelines and governing codes and regulations. Do not vent refrigeran to atmosphere. Dispose of reclaimed refrigerant by engaging the services of a licensed firm specializing in recycling of reclaimed refrigerant. If requested, provide documentation indicating refrigerant has been suitably removed, recycled and/or disposed of.

- 19 SYSTEM SHUT DOWNS AND CONNECTIONS
- 1 The Contractor shall coordinate with the Client any service shut downs or service interruptions during the construction works. Time and duration of all shut downs shall be agreed with the
- .2 All connections shall be made to minimize impacts or disruption to existing systems. .3 The Contractor shall be liable for any damages caused to the existing systems by the
- .4 The Contractor shall include in their pricing any associated regular or premium costs ssociated with shut down work .5 If existing isolation valves are not available to isolate sections of piping to be removed or modified, provide such valves as part of the connection and/or shut down work.
- 20 SITE UTILITY SERVICES .1 The Contractor shall coordinate with the Client any service shut downs or service interruptions
- The Contractor shall contact and coordinate all works with the utility providers as required. TEMPORARY FACILITIES AND SERVICES

to the site utility services during the construction works. Time and duration of all shut downs

- The Contractor shall provide any necessary temporary facilities such as buildings, workshops, torage areas, washrooms, layout areas, etc. to undertake the work .2 Location of temporary facilities shall be coordinated with the General Contractor and Client. Do
- .3 The Contractor shall provide temporary heating services as required throughout the project to facilitate the construction process. Coordinate with the General Contractor .4 Temporarily disconnect, remove and lift equipment and/or services as required to facilitate
- roofing work. Reinstall after working roof is complete. TEMPORARY USE OF EQUIPMENT AND SYSTEMS

not assume that the Client will provide space on site

shall be agreed with the Client

unless prior approved in writing by the Engineer and Client .2 Equipment or systems used during construction is to be thoroughly cleaned and overhauled as required and prior to Substantial Completion. Replace worn or damaged parts so equipment is in perfect condition to the satisfaction of the Engineer and Client

.1 Temporary use of permanent systems or equipment during construction shall not be permitted

.3 Temporary use of equipment and/or systems shall not impact or be deemed as project Substantial Completion, nor impact the Contractor's warranty/guarantee

HOISTING AND SCAFFOLDING .1 The Contractor shall be responsible to provide all hoisting, scaffolding, lifts, ladders, etc.

required to undertake the Mechanical installations.

2 All works to be in accordance with WorkSafeBC requirements. .3 Coordinate all works with the General Contractor ELECTRICAL COORDINATION AND REQUIREMENTS

.1 The Contractor shall be responsible for liaising with the Electrical Trade for provision of

- electrical connections to serve the mechanical equipment. Coordination to be completed prior to shop drawing submittals, ordering of equipment and installations. .2 The Contractor shall be responsible for supply of motors with proper voltage characteristics to suit the electrical distribution systems and of suitable construction, such as dust proof, explosion proof, etc. as required to suit operating conditions. Motors shall be designed for continuous services and to limit temperature rise to 104F (40C) for open housing and 122F (50C) for closed housing installations. Motors shall operate at 1200 or 1800 RPM unless specified otherwise. Motors shall have ball or roller type bearings with grease lubrication ttings. Motors greater than 20 hp (15 kW) shall have capacitor and thermistor over heat
- protection. Belt driven devices shall have motors mounted on adjustable bases to ensure proper belt tensioning can be achieved. Do not use air over motor ratings. .3 The Contractor shall be responsible for coordinating provision of power to the controls system. .4 All electrical equipment supplied by the Contractor shall bear a CSA or ULC label. Obtain special inspection labels required by the Provincial Authority or AHJ for equipment that does
- not have an appropriate label. All shall be in accordance with the Canadian Electrical Code and to the approval of the Provincial Electrical Inspector and AHJ. .5 The Electrical Trade shall provide all power wiring, connections and other electrical items required for operation of the mechanical systems, except for factory installed wiring, controls and equipment on packaged units provided by the Contractor
- .6 The Electrical Trade shall provide and install motor starters for electric motors, except where equipment is furnished with factory installed integral starters. .7 All motors shall conform to Electrical Equipment Manufacturers Association of Canada (EEMAC) Standard MG11, Institute of Electrical and Electronic Engineers (IEEE) Standards
- .8 Motors shall meet NEMA standards for the application and have associated maximum sound ratings under full load conditions. .9 Minimum motor efficiencies shall meet the requirements of CAN/CSA C747, CAN/CSA C390,

and applicable CSA C22.2 Standards.

IEE 112B and ASHRAE Energy Standard 90.1.

.4 Relocate improperly located holes, sleeves, hangers, brackets, etc.

.1 Identification of required openings for the mechanical services

1 The Contractor shall coordinate all painting with the General Contractor.

.6 Paint all visible ductwork through grilles and diffuser with a matt black finish.

2 X-ray or scanning (GPR ultrasonic pachometer impact-echo etc.) review of floors slabs

.3 Submit X-ray or scanning results to the project Structural Engineer for their review and

.6 Cast holes and openings greater than 4" (100mm) in diameter. Cast or field cut holes and

.2 Clean all exposed bare metal surfaces on Mechanical systems clear of dirt, dust, grease,

.3 All exposed bare metal surfaces exposed to outdoor weather conditions shall be painted with

.4 All outdoor gas and propane piping to be painted with suitable weatherproof paint. Coordinate

.5 All marred factory finished equipment shall be repainted to match the original factory finish.

.1 Provide temporary covers over ductwork, piping, diffusers, grilles, etc. during the course o

.2 Any dirt, rubbish or grease on walls, floor, fixtures, etc. which are caused by the Contractor

cleaning company to thoroughly vacuum and clean all outdoor air, supply air, return air,

In the interest of providing an acceptable level of indoor air qualify for the occupants, the air

.2 After all systems are fully operational and the building is clean, run the fan systems at 100%

outdoor air for a period of 10 days prior to occupancy. Maintain the building at 70F (21C) for

.1 Cease operations and notify the General Contractor, Client and Engineer in writing should any

naterials be discovered which are suspected of being hazardous material containing,

.2 Coordinate with the General Contractor any required special protective measures and/or

The Contractor shall contact the Engineer to coordinate review of the constructed work

.2 The Contractor shall notify the Engineer in writing a minimum of [3] working days prior to

.3 Completion of ductwork and piping installations prior to application of insulation.

.4 Should the Engineer prepare a written field review report, the Contractor shall complete all

outstanding works/deficiencies, initial field report items as being complete and return a copy to

.4 Completion of ductwork and piping insulation, prior to concealment.

.5 Completion of any and all works prior to backfill or concealment.

.6 Completion of fire stopping prior to concealment.

.2 Completion of ceiling mounted systems, prior to installation of suspended ceilings/t-bar

hroughout the project. The Engineer will conduct site reviews as deemed required and at their

systems shall be used to flush out fumes that may be present from the building products, such

.5 Protect bearings and shafts during the project construction. Grease shafts and sheaves to

prevent corrosion. Provide extended nipples for lubrication purposes as required

shall be removed and the premises left in a first class condition in every respect.

construction to prevent ingress of dust, dirt and debris. Protect all from damage during

and/or structural members prior to cutting. All works to be undertaken by specialists in this

.5 Cutting and patching work shall include, but not be limited to:

approval prior to proceeding.

opening less than 4" (100mm) diameter

scale, etc. in order to facilitate painting.

27 EQUIPMENT PROTECTION AND CLEAN-UP

exhaust air, transfer air, etc. ductwork.

as cabinets, carpets, paints, solvents, etc.

including but not limited to: asbestos, mould, lead paint, etc.

disposal instructions when working with hazardous materials.

heating and 75F (24C) for cooling.

INDOOR AIR QUALITY

29 HAZARDOUS MATERIALS

30 ENGINEER SITE REVIEWS

requested site review.

.3 The Contractor shall request site reviews for

.7 Final plumbing fixture connections.

.9 Fire suppression system trip test(s)

.10 For project Substantial Completion.

.11 For pre occupancy review.

.8 Testing and demonstration of systems

.1 Rough-in of plumbing systems.

paint colour in conjunction with system identificatio

.3 Clean all systems prior to testing and turn over to the Client.

.4 Undertake the cutting works

- 25 CUTTING AND PATCHING Unless noted otherwise, the Contractor shall be responsible for all cutting, patching and trench vork to facilitate the project requirements. Coordinate all works with the General Contractor
- .2 Include for all cutting and patching work to facilitate the installations, including that for beams, valls, floor slabs and masonry work necessary for hangers, brackets and s .3 The Contractor shall review with the project Structural Engineer locations and sizes of all roof

calibration factors entered.

- costs for performance verification will be carried by the Client. .3 Should the performance verification results indicate the equipment or systems do not meet the performance requirements, the Contractor shall:
- specified performance requirements. .2 Undertake further performance verification of replacement equipment and/or systems. Repeat until performance requirements are met.
- RECORD & AS-BUILT DRAWINGS
- revisions made by means of addenda, site instruction, change orders, or otherwise. .2 As-Built drawings shall include, but are not limited to: .1 Size, location, arrangement, route and extent of ductwork, piping, conduit, terminal units,
- equipment, fixtures, cleanouts, valves, rough-in, etc above and below grade inside the building, including locations of buried pipng. .2 Inverts and dimensional location for all buried systems and services. Inverts shall be
- .3 Location, tagging and numbering of all valves, except individual plumbing fixtures or equipment isolation valves. 3 Maintain As-Built drawing on site for review by the Engineer or Client.
- equipment and devices including fire dampers, valves and valve tags, cleanouts, access doors and actual room names.
- .6 The Contractor shall print [three] hard copy sets of Record Drawings and include with an The Contractor shall include [\$2,000] in their costs for preparation of the project Record
- .4 All ductwork to be clean from dust and debris. If in the Engineer's opinion the ductwork has not .8 Under no circumstances will the Engineer's AutoCAD files used to prepare permit, tender or been maintained in a clean condition the Contractor shall retain the services of a certified duct
 - construction drawings. The AutoCAD files will not be provided to any other third party. OPERATING AND MAINTENANCE MANUALS
 - for the Client's use. .2 Submit a draft copy of the Manuals to the Engineer for review and comment. Thereon, update the Manuals and provide [3] hard copies [and 1 soft copy in bookmarked PDF format on USB
 - .3 Unless stated otherwise, Operating and Maintenance Manuals shall be within a 3 "D" ring hard binder with the following tabbed sections: .1 Name of the Project, Client, General Contractor, Contractor, Architect, Engineer and
 - Agency preparing the Operating and Maintenance Manuals. .2 Name and contact information for Manufacturers, Trades and Equipment Suppliers.
 - .5 A copy of all shop drawings, including review comments. .6 Copy of all test and inspection reports. .7 All project related warranty and guarantee letters

.4 List of the Mechanical Drawings.

- requirements, preventative maintenance procedures, lubrication schedule and belt .9 Valve tag list noting service, location and size. .10 Commissioning reports.
- PROJECT AND SUBSTANTIAL COMPLETION 1 The Contractor shall provide the following documentation to the Engineer as part of the project
- required to be received by the Engineer prior to their issuance of the Mechanical Schedule C-B Letter of Assurance .2 The Contractor shall be responsible for assembling all documentation from their subtrades as required to fulfill the project requirements

.1 * Written certification by the Contractor that all installations are complete, functioning,

and prior to the project being deemed complete. Documents indicated with and asterisk "*" are

.2 Demonstration to the Client on system operations and maintenance. completed. Should the Engineer deem the list to be excessive, the project will not be deemed substantially complete.

- .5 * Equipment/System commissioning reports
- .6 As-Built/Record Drawings .7 * Contractor's Seismic Engineer's Schedule B and C-B Schedule Letters of Assurance

.3 The Contractor shall cooperate and coordinate with other trades to ensure that all equipment

headroom and leave maximum usable space. All systems shall be coordinated for elevation

.4 Locate distribution systems, equipment and materials to eliminate interference, conserve

height to ensure they are concealed within ceiling spaces, unless noted otherwise.

.5 All equipment must be in a location where it may be serviced, operated and maintained.

.6 Provide adequate access panels as required in ceilings, walls, partitions and/or finishes.

Install larger sized access doors are required and with the approval of the Engineer

Access panels to be minimum 12"x12" (300mm x 300mm) for hand access or otherwise

.8 Obtain approval from the project Architect for the access door type and style prior to installing.

requires maintenance or adjustment. Provide access doors as directed by the Engineer.

.11 Provide access door in ductwork upstream and downstream of all coils, square elbows, fire

maintain the fire integrity. All fire rated access doors shall be CSA or ULC listed for the

.1 Unless otherwise indicated, conceal all piping, ductwork and mechanical systems within the

.2 Revise the location of services if required to be concealed as described. The Contractor is to

consult the Engineer and obtain written approval prior to proceeding with revised location of

Refer to the Mechanical Drawings for Pipe and Ductwork Insulation requirements, which lists

.1 All ductwork insulation shall be in accordance with BCICA Quality Standards specifications

.2 Supply air ductwork shall be externally insulated unless provided with internal insulation

.4 Provide internal insulation liner on all ductwork as indicated and a minimum of 10 ft (3000

.5 All internal ductwork insulation to be provided with metallic Z nosing to avoid exposed

.8 Provide internal duct insulation lining for all transfer air ducts, unless noted otherwise

.1 All piping insulation shall be in accordance with BCICA Quality Standards specifications

.3 Provide calcium silicate insulation at locations of pipe hangers in conjunction with metal

.4 Provide insulation for drainage p-traps with removable cap within parkades or when

.9 Insulation system material inside the building shall not have a flame spread rating greater than

.10 Thermal insulation performance (conductivity, thickness, etc) shall meet or exceed the

.11 Mineral fibre insulation shall conform with the requirements of CAN/ULC-S114. Elastometric

.12 Blanket mineral fibre insulation to ASTM Standard C553. Apply to chilled or domestic cold

.13 Semi Rigid Mineral fibre insulation to ASTM Standard C1393. Apply to uninsulated hot water

.14 Removable insulation shall be ceramic fibre insulation between silicone impregnated

.1 Identify all ductwork, piping and systems in accordance with the specifications and base

.2 Unless specified otherwise utilize ANSI and CSA piping identification standards, including

.3 Each major component of equipment shall bear manufacturer's name, address, catalog, and

.4 Utilize WH Brady identification tapes, bands and markers made of vinyl film material unless

.5 All markings shall be suitable for the surface operating conditions in which they are installed

.6 Piping marking letters shall be 2" (50mm) high for pipes 3" (75mm) and larger diameter and

Pipe marking arrows shall be 6" (150mm) long x 2" (50mm) wide for pipes 3" (75mm) and

.8 Ductwork identification shall consist of 2" (50mm) high black stenciled letters indicating service

.9 All ductwork and piping to be labelled at minimum 20 ft (6000 mm) intervals with service and

direction of flow. Provide minimum one label per room, at major changes in direction, at

Marker and direction arrows shall be placed side by side on the bottom quarter of pipes.

.10 Provide ceiling dot identification for all balance dampers, fire dampers, valves, equipment, etc

.11 Provide valve tags in association with piping systems. Valve tags shall be lamacoid 1-1/2"

.14 Should there be no existing valve tag system in place, new valve tags shall be constructed of

plastic and provided with a six digit numbering systems; the first three digits indicating the

.17 Gas and propane piping shall be identified in accordance with code requirements incorporating

.18 All heat traced piping shall be identified on the exterior surface as "Electrical Heat Traced."

labelling. Size shall be 1/2" x 2" (12mm x 50mm) for small equipment. 1" x 2-1/2" (25mm x

65mm) for equipment and 2" x 4" (50mm x 100mm) for panels. Secure to equipment/panels

Drawings/Specifications, or in accordance with the Client's requirements when provided. The

Contractor shall request clarification from the Client prior to providing system identification.

.1 All ductwork shall be fabricated and installed in accordance with SMACNA, ASHRAE and

.2 All ductwork shall be galvanized steel lock forming with galvanized coating conforming to

.5 Any deviations in ductwork dimensions or sizes shall be based on SMACNA or ASHRAE

.3 Ductwork shall be lock formed and sealed to SMACNA Class B standards for low and medium

velocity ductwork in systems rated up to 2" (50mm) WG. Seal ductwork to SMACNA Class A

.19 Provide lamacoid labels for equipment and control panels with black backing and white

.20 Equipment terminology shall match with the system noted in the Mechanical

appropriate coloured paint over the entire length, banding at specified intervals and/or labeling

(40mm) diameter, unless noted otherwise, or in accordance with the base building

.15 All factory supplied equipment shall be installed with the manufacturer's nameplates.

.16 Provide equipment registration/nameplates (CSA, ULC, ASME, etc.) as required an ir

service and the last three digits indicating the individual valve number.

located above T-bar ceilings. Provide identification dots on T-bar rails and not on the ceiling

connections to equipment, on either side of floor penetrations and prior to enter/existing shafts

larger diameter and not less than 4" (100mm) long x 3/4" (20mm) wide for smaller pipes. Mini

storage tanks, shell and tube heat exchangers, heating water air separators, chilled water

fibreglass fabric and provided for plate heat exchangers and 6" (150mm) and larger strainers,

backflow preventers, etc. Overlap insulation and provide with double sided velcro stitched in

water pump casings, roof drain sumps inside the building, water meters, top of radiant ceiling

requirements of the National Energy Code of Canada and ASHRAE 90.1

25 or a smoke developed rating greater than 50 in accordance with code requirements and in

.6 Attach internal ductwork insulation as per SMACNA standards and with pins at 12" (300

nm) on centre. Pins to be spot welded to the inner surface of the ductwork. Do not use

.3 All ductwork shall be externally insulated a minimum of 5ft (1500 mm) from exterior

construction of walls, ceilings, furrings, chases and shafts.

insulation material, thicknesses and finishing requirements

openings/sheathing connections and within soffits.

.7 All ductwork insulation shall be adequately glued and strapped.

.2 Provide sheet metal shields between pipe insulation and piping supports.

.5 Provide insulation on sanitary waste arms and traps of barrier free lavatorie

.1 All equipment insulation shall be in accordance with BCICA Quality Standards

nm) upstream and downstream of all fans.

insulation edges within the air stream.

pressure sensitive adhesives.

subject to freezing conditions.

.7 Do not apply insulation prior to pressure testing of systems

.8 Ensure surfaces are clean and dry prior to application of insulation.

insulation shall conform with the requirements of ASTM C534

panel, top of ceiling active chilled water beams

specifications 1503.

conjunction with CAN/ULC S10

expansion tanks.

place.

39 SYSTEM IDENTIFICATION

serial number.

and direction of flow.

identification system.

.12 Prepare a valve tag chart.

accordance with the AHJ.

with type of service.

0 DUCTWORK & SHEET METAL

NFPA standards.

building standards.

nomenclature and colours.

not less than 3/4" (20mm) for smaller pipes

markers may be used for very small diameter pipe

.13 Valve tags are to match the existing building systems

with stainless steel screws or suitable epoxy cement.

ASTM A525 G90, unless specified otherwise.

.4 All ductwork to be clean and free of scale

standards for ductwork in systems in excess of 2" (20mm) WG.

.2 All insulation joints to be taped and vapour sealed to suit the application

.10 The Contractor shall demonstrate all or any reasonable access to the Engineer as requested.

.12 Where access doors are provided in fire rated separations, they shall meet the fire rating as to

.9 Provide access doors to any and all concealed mechanical equipment or systems which

18"x18" (450mm x 450mm), of metal construction, provided with a hinged door and cam lock

- .8 Contractors guarantee/warranty letter
- .1 Pressure test reports

- .2 Vibration isolation report
- .3 Final Electrical Certificate for electrical wiring by the Controls Trade .4 Controls system completion report

.1 Install all systems to provide maximum and adequate accessibility

and systems are properly placed without interference with other services.

.2 Maintain all code and manufacturer's required clearances.

- .1 * Final Plumbing inspection acceptance report from the AHJ

.4 Pressure test reports

.5 Plumbing valve tag schedule

7 Access door shall be similar to:

dampers, etc.

.3 Ductwork

7 PIPE CHASES AND DUCT SHAFTS

liner or noted otherwise

1 Milcor Style DW for drywall installations

.2 Milcor Style M for masonry tile surfaces

.3 Milcor Style K for plastered wall surface:

36 ACCESSIBILITY, ACCESS DOORS AND PANELS

- .2 All testing and demonstration procedures and durations shall be in accordance with applicable standards. Where multiple standards exist, apply the more stringent measures. .2 * Backflow prevention test reports .3 * Water cleanout and chlorination test reports
- .3 The following systems shall be demonstrated in regards to performance and safety features, to the fullest degree: .1 Heating Systems .2 Domestic Water systems and heating devices

.5 All final deficiencies to be completed a maximum of [15] working days after the project

.6 Should further site reviews be required by the Engineer after the Contractor has requested

review for final occupancy, cost for such will be paid by the Contractor to the Engineer at a

.1 Test and demonstrate operation of all equipment and systems as requested or required by the

Engineer, Client and/or AHJ. The Contractor shall coordinate all requirements with their

Substantial Completion, unless agreed upon with the Engineer and Client

.3 Plumbing Systems .4 Controls Systems .4 Do not pressure test mechanical equipment.

the Engineer for their records.

DEMONSTRATION AND TESTING

subtrades as required.

their performance verified.

minimum rate of [\$450] per site review.

arrangements prior to undertaking testing works. .6 If test procedures are not provided by standard or the AHJ, the Contractor shall seek clarification with the Engineer prior to proceeding

.5 The Contractor shall consider all necessary precautions in protecting existing systems and

- .7 The Contractor shall provide a minimum [3] working day's notice to the Engineer and AHJ prior to demonstration of any required systems
- .8 Upon completion of installations, the Contractor shall satisfactorily demonstrate all system operations and maintenance to the Client and/or their representative. Training time shall be a minimum of [4 hours]. The Contractor shall record the date of the demonstration and those in
- attendance. This written record to be included in the project close out documentation .9 The Contractor shall be responsible for pressure testing of all piping and tubing systems. .10 Pressure testing media shall be air, nitrogen or water, unless specified otherwise or required.
- .11 If a decrease in pressure occurs during the testing, the Contractor shall cease the test, identify the cause of pressure loss, rectify the issue and reconduct the test in its entirety. Repeat the process until pressure tests are successfully completed.
- .12 The following minimum pipe testing shall be performed: .1 Domestic water systems:150psig (1030 kPa) hydraulic test for 8 hours .2 Sanitary drainage and vent systems:10 ft (3000mm) standing water test for 8 hours .13 The Contractor shall arrange for a third party to witness pressure tests. A written copy of the pressure test results with date and signature of the Contractor, along with the third party
- acknowledgement, shall be included with the project close out document .14 All plumbing fixtures shall be tested for soundness, stability of support and correct operation. .15 Test operation of all fire, fire/smoke, smoke and motorized dampers. .16 Maintain building comfort conditions when equipment or systems are being tested or having
- 32 START-UP, COMMISSIONING AND PERFORMANCE VERIFICATION .1 The Contractor shall include for system Commissioning and Performance Verification by a
- .2 Prior to commissioning, and under the supervision of the equipment/system manufacturers representative, start-up equipment/systems, make required adjustments, document procedures and leave equipment/systems in proper operating condition .3 All equipment shall be commissioning in accordance with:
- .1 ASHRAE Standard 202 Commissioning Process for Buildings and Systems .2 ASHRAE Guideline 1.1 - HVAC&R Technical Requirements for the Commissioning

.3 ASHRAE Guideline 1.5 - The Commissioning Process for Smoke Control Systems

- .4 CSA Z320 Building Commissioning .5 Equipment manufacturer's requirements .4 The Contractor shall coordinate with the General Contractor sufficient time in the project schedule to undertake the commissioning process. .5 Complete equipment commissioning verifications forms as provided by the manufacturer or the commissioning agent. Include forms as part of the Operating and Maintenance Manuals.
- .6 Commissioning shall include the Equipment/System Manufacturer's authorized representative to attend the project site to review the installation. All to be coordinated by the Contractor at their cost. Correct any measures in accordance with the Manufacturer's instructions .7 All controls components and equipment shall be commissioned, tested, calibrated and
- adjusted to place the systems into automatic operation, subject to the approval of the Engineer and Client. .8 Commissioning shall include all end to end checks for all control points, verifying their proper operation. End to end checks are defined as visual confirmation that an input or output signal from the controls system results in correct operation of physical system components, not assumed operation as implied by output status indicated on system interface screens or graphics. Produce documents indicating date and results of all end to end checks, including
- .9 Undertake commissioning of systems in coordination and in conjunction with air and water .10 Installed equipment or systems whose performance is questioned by the Engineer may be subject to performance verifications.
- .11 Where requested by the Engineer, equipment or systems shall be tested by the Contractor to determine compliance with the specified performance requirements. Where requested the Engineer, testing shall be undertaken by an independent third party engaged by the .1 Promptly provide all performance verification results to the Engineer.
- .1 Remove and replace the associated equipment and/or systems with that meeting the
- .3 Carry all costs of performance verification and replacement of equipment and systems
- .1 The Contractor shall retain one legible set of Mechanical drawings on site for the purposes of recording as-constructed conditions. Update the As-Built drawings on a daily basis, including
- included at all cleanouts, manholes and changes in direction.
- .4 Upon completing the installations, the Contractor shall forward As-Built drawings to the Engineer for creation of Record Drawings. Drawings shall include all mechanical system
- .5 The Engineer will return the Record Drawings to the Contractor, who shall verify their correctness, stamp as reviewed and sign. electronic PDF copy of the Drawings when submitting Operating and Maintenance Manuals to
- awings. This amount shall be paid by the Contractor to the Engineer for preparation of the Record Drawings from the HVAC and Plumbing As-Built markups. The Contractor shall issue a Purchase Order to the Engineer or pay in full prior to proceeding with the Record Drawing
- The Contractor shall be responsible for preparation of Operating and Maintenance Manuals
- stick] to the Client. Obtain a receipt for delivery of the manuals and forward to the Engineer for
- .3 Description of the Mechanical systems including components and sequence of operations.
- .8 Operating and maintenance instructions including maintenance procedures, lubrication
- .11 Balancing reports. .12 Record Drawings.

operational and in compliance with the contract documents.

- .3 Provision of a list containing all outstanding or deficiency items which are required to be .4 * Operating and Maintenance Manuals

- sizing criteria. .6 All ductwork sizes shall represent interior dimensions. The Contractor shall make allowances
- for ductwork thickness, insulation, bracing, etc. .7 Ductwork shall be sealed and joints and seams in accordance with SMACNA Standards.
- ASHRAE Standards and code requirements. Use of duct tape will not be accepted .8 Ductwork penetrating through exterior wall assemblies shall be sealed to the weather barrier

with self-adhesive bituminous membrane and expanding foam sealant

- .9 Provide balancing dampers where branch ductwork is installed, at grilles and diffusers. Provide additional balancing dampers at the request of the Balancing Trade. Balance dampers to be provided with shaft, standoff bracket, locking hand quadrant and be constructed of
- minimum 1.6mm thick galvanized steel.
- .10 Provide turning vanes for all rectangular ductwork elbows as indicated, installed to SMACNA standards.
- .11 Roof mounted ductwork shall have standing seams and sealed water/weather tight. .12 Do not connect flexible ductwork directly to diffuser or grille outlets.
- sagging, sharp changes in direction or excessive pressure drops. Do not use flexible ductwork as offsets or elbows. Refer to specifications/schedules for insulation requirements.
- .14 The Contractor shall ensure that all cooling coils are installed to provide positive slope and complete drainage to the drain point. Demonstrate cooling coil drainage at the request of the
- .15 In slab ductwork systems shall be Ecco Heating Products EccoDuct or approved alternate .16 Ductwork serving as exhaust for dishwashing equipment shall be constructed of welded 304
- stainless steel or heavy gauge aluminum. The entire system shall be sloped back to the dishwasher or to a 2" (50mm) depressed drain par
- .17 All rectangular duct flat surfaces are to be cross broken .18 Provide a minimum of 5 diameters of straight ductwork prior to VAV boxes

.19 Install backdraft dampers on all exhaust outlets at exterior discharges, unless specified

.20 Provide [galvanized steel] [aluminum] bird screen mesh on all exterior intake and exhaust discharge points.

.21 Support roof mounted ductwork on factory fabricated aluminum support assemblies to suit the

- roof construction, spaced, sized and arranged to suit the ductwork. .22 At outdoor air intakes, where outdoors or otherwise required to be weathertight, construct ductwork without bottom longitudinal seams. Solder or weld the joints of bottom and side
- sheets. Seal all other joints with duct sealer. Slope horizontal duct to hoods, risers or drain points. Provide duct drain fittings at drain points.
- .23 Provide curb, flashing and counter flashing for all ductwork passing through roof and external
- envelope of the building. .24 Snaplock ductwork shall not be used unless approved by the Engineer.

.25 Install sheet metal drain pans under all hot water heater and storage tanks

- .26 Install sheet metal trip shields over electrical equipment to protect from fire protection 41 KITCHEN EXHAUST AND VENTILATION SYSTEMS
- .1 All kitchen exhaust and ventilation systems shall be in compliance with NFPA 96 and all applicable code requirements.

.2 All systems shall be suitable for removal of grease laden vapours and smoke associated with

commercial cooking operations. .3 Ensure clearances around all ductwork, systems and equipment are in accordance with NFPA 96 requirements.

4 Where specified or where there are reduced clearances to exhaust ductwork and systems

provide 3M "Fire Master" Fire Barrier Duct Wrap 615+. Installations shall be in accordance with the manufacturer's requirement .5 Exhaust ductwork connections to equipment to be made with bolted flanges and neoprene gaskets suitable for the application.

.6 Operation of kitchen exhaust and ventilation systems shall be in accordance with NFPA 96

VIBRATION ISOLATION .1 All components with rotating or dynamically operating components shall be provided with vibration isolators.

.3 Ductwork connected to fans or vibrating equipment shall be provided with flexible canvas

2 Vibration isolation products shall be suitable for the application in order to ensure that Average

greater. Provide neoprene grommets at support points for motor driven equipment with motors

Housekeeping pads to extend a minimum of 4" (100mm) beyond the extent of the equipment

connections. Flexible ductwork connections shall not have a metal gap more than 1-1/2" and be more than 1/2" (12 mm) out of alignment from the equipment. Ensure flex connections do not impede air flow and allows movement of the equipment without transmitting vibration to the .4 Provide spring vibration isolators on motor driven equipment with motors 0.5 hp (0.37 kW) and

Noise Criteria as published by ASHRAE are not exceeded

less than 0.5 hp (0.37kW).

44 GENERAL PLUMBING AND PIPING

and at the base of all risers.

changes in direction and tee connections.

in a manner to avoid splash over.

waterproof tops.

- 43 EQUIPMENT PADS & BASES Provide all necessary equipment bases to facilitate a complete installation .2 Install all base supported equipment on 4" (100 mm) high concrete house keeping pads.
- base at attachment location .3 Coordinate concrete works as required with the General Contractor .4 Concrete housekeeping pads shall be inclusive of all rebar, support and forming works.
- .1 Refer to the Mechanical Drawings for the Pipe and Fitting Material Schedule. .2 Avoid contact between dissimilar metallic components. Provide dielectric connections between

.3 Use only strap wrenches on chromium plated piping and fittings. Replace any surface damage

- .4 All piping systems, including all take offs, shall be installed within the building so that the connected piping and equipment will in no way be distorted by expansion, contraction or .5 Install piping with all necessary changes of direction, expansion loops, anchors and guides to
- prevent overstressing the piping and equipment piping connections from thermal expansion .6 Maintain minimum 1/2" (12mm) space between pipes, studs, electrical conduits, etc. to avoid rattling. If clearance must be reduced, utilize Armaflex insulation
- .8 Trenches shall be excavated slightly deeper than required grade of services in order to allow for sufficient slope, bedding and backfill. .9 Prior to commencing with underground installations, excavate and verify: .1 The location, elevation and size of service connections. .2 Sufficiently sloped drainage routing with adequate cover.

.7 Provide any excavations necessary for the installation of the mechanical work. Do not

undertake excavation, cutting, boring, etc. works which will weaken the structure or cause

damage. Obtain the written approval of the Project Structural Engineer prior to proceeding.

- .3 Routing of trap primer connections .10 Backfill services with a 6" (150mm) bedding and cover of sand or pea gravel where approved. Coordinate remainder of backfill requirements with the General Contractor. All shall meet the
- requirements of the buried service material manufactures .11 All water piping systems and components used on conjunction with domestic water systems shall not contain a weighted average lead content in excess of 0.25% as per CSA B125.1-2012 and CSA B125.3-2012. All systems and components shall be in accordance with
- 13 Provide isolation valves and unions at all equipment and fixtures in an accessible location to allow for shut off and removal. .14 Provide isolation valves as indicated on the Mechanical Drawings, at branch piping take offs

protect the piping with insulation 1.5 times the R-value of the building insulation of the

.12 Do not install domestic water piping in exterior walls. Where unavoidable, fur out chases and

.16 Valves to be minimum 150 PSI water pressure rating, unless stated otherwise. .17 Compression type fittings shall not be permitted unless approved by the Engineer .18 Provide water meters as indicated and in coordination with the AHJ. Coordinate provision and installation of water meter remote readers

.19 Provide stainless steel bellows hammer arrestors on water piping connected to groups of

.20 Provide backflow protection valves on water distribution systems as indicated on the

.22 Provide thrust blocking on all below grade pressure piping 3" (75mm) and larger. Provide

complete with blocks, supports, anchors, etc. at the water entry point to the building and

plumbing fixtures with fast acting/quick closing valves or operators and at the top of all

omestic cold water risers. Hammer arrestors to be installed with isolation valves upstream to

.15 Ball valves to be full port of brass construction with blow out proof stem, chrome plated brass

- Mechanical Drawings and in accordance with code requirements, the "cross connection control manual" latest edition as published by the BC Chapter of the American Water Works and at the direction of the AHJ. .21 Brace and secure domestic water services entering the building below grade. Paint below grade metallic devices with 2 coats of corrosion resistant black asphalt base coating prior to
- .23 Trap and vent all cooling coil condensate drain piping as per the equipment manufacturer's requirements. .24 Pipe all vent connections and differential relief outlets full size to drain. .25 Provide temperature and pressure relief valves at all boilers, domestic water heaters and

heating sources. All relief valves to be ASME rated and piped with full outlet pipe size to drain

.26 In addition to the Plumbing Code requirements provide cleanouts on drainage systems at

.4 Cleanouts in wet floor areas shall extend to walls, or be provided with gasketed

.3 Extend cleanouts to finished floor or walls above the main floor.

changes in direction, base of risers, mains exiting the building, fixture drains of sinks, where indicated on the drawings and at regular intervals .1 Cleanouts shall be full size for pipe up to 4" (100mm) and not less than 4" (100mm) for larger pipe sizes.

.2 Coordinate installation of cleanouts with millwork and other architectural obstructions such

that they are located for easy access with sufficient clearance for rodding and cleaning.

- .5 Cleanouts on outside drains shall be brought to grade and anchored in a concrete collar .27 Where drains are located over an occupied area, a membrane clamp is to be provided with the .28 All sanitary floor, area, funnel and hub drains shall be provided with and connected to trap
- .29 Trap primers shall be automatically activated and connected to the nearest cold water piping, complete with isolation valve. .30 Terminate vertical waste stacks and rain water leaders in two 45 degree bends at the bottom of vertical runs.

DISINFECTION OF POTABLE WATER SYSTEMS .1 At the completion of construction, or on a phased manner in conjunction with the construction

chlorination, flushing and cleaning process.

schedule, the domestic water systems are to be flushed, cleaned and chlorinated free of scale, sediment, construction debris, etc.

.3 All procedures are to be in accordance with AWWA Standards

and test procedure until satisfactory results are achieved.

actions taken and results of flushing and cleaning.

.2 All fixtures shall have a stamp bearing CSA or ULC listing

applicable codes and regulations.

plated, unless noted otherwise

MECHANICAL PIPING

joining dissimilar metals

attached to galvanized steel rods.

.31 Provide flashing and counter flashing for piping passing through exterior building components

.4 Introduce chlorine into the piping distribution system in accordance with the BC Drinking

Water Protection Act, Drinking Water Protection Regulation and to AHJ requirements.

.5 Completely flush and test the free chlorine content of the piping systems after the chlorination

.6 Two water samples to be taken and lab tested to confirm water is clear and clean less than 10

PPM of residual chlorine and less that 1 PPM of total coliform. If not, repeat the chlorination

7 The Contractor is to retain a testing agency to perform the work and provide a letter confirming

1 All fixtures and equipment for barrier free applications shall be provided in accordance with all

.3 All fixtures shall be free of flaws or blemishes. Surfaces shall be clear, smooth, bright and

 $. 4 \quad \text{Exposed trim, supplies, tubing, traps, escutcheons, valves, etc. to fixtures shall be chrome} \\$

.5 Provide wall carriers for wall hung fixtures. Coordinate backing and support with the General

.6 Where fixtures are in contact with wall and/or floor, joints shall be sealed and made watertight.

.7 Unless noted otherwise vitreous china, porcelain enameled and acrylic fixtures finishes shall

.9 Concealed traps for fixtures without integral traps, such as sinks, shall be provided with

.10 Provide fixtures for barrier free application in compliance with codes and regulations.

1 Ream piping to clean scale and dirt from inside and outside surfaces prior to installation

.3 Ensure no joints of dissimilar metals are provided. Brass adaptors to be provided where

.4 Provide 3/4" (20mm) drain valves with cap and chain at all low points in the piping to allow

.5 Provide automatic vents at all high points within mechanical rooms. Automatic vents to be

.6 Provide manual vents at all high points outside of mechanical rooms. Manual vents to be

constructed of a short vertical section of 2" (50mm) piping to form an air chamber and a 1/8"

.8 Fixture fittings in areas other than private washrooms shall be vandal resistant

.2 Provide eccentric pipe reducers to prevent collection of air pocket

provided with 1/2" (12mm) isolation valve and piped to drai

7 Slope horizontal piping upward to allow air to reach vent points.

.3 Hanger rods to be galvanized steel continuously threaded type.

.7 Provide suitable hangers and supports to avoid sagging.

.1 Provide plastic inserts between piping and steel studs.

- .2 The Contractor shall make allowances for all valves, fittings, ports, etc. to facilitate the
- - Vancouver Langley Victoria Nanaimo Kelowna Kamloops Nelson Smither Mechanical Consulting Engineers VANCOUVER OFFICE #502-211 E GEORGIA
 - SUB-CONSULTANT

PIPE HANGERS AND SUPPORT Pipe hangers and supports shall be in compliance with ANSI B31.9 and ANSI B31.1 for power piping as applicable. Were local requirements prevail the more stringent applications will apply. All shall comply with the pipe manufacturer's requirements

- dead loads and any vibration associated with the installed systems .5 Use of perforated metallic band support is not permitted. .6 Hangers for copper piping shall be copper plated and plastic dipped, or wrapped in Polyken
- .9 Support vertical piping at minimum intervals of 10 ft (3000mm) and at every floor unless noted otherwise or required by the manufacturer's requirements.

.11 Coordinate pipe support and hanger requirements in conjunction with seismic restraint

.8 Provide piping support hangers within 12" (300 mm) of piping joints and tees.

- .2 Hanger inserts shall be malleable iron case or galvanized steel shell with expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods and lugs for attaching to forms. .3 Cast in place concrete hanger inserts shall be galvanized malleable iron or steel to
- .4 Drilled concrete inserts shall be Hilti Model HSL or HVA. .5 All inserts shall be ICBO approved with ICBO design load ratings .6 Size hanger inserts to suit threaded hanger rods.

measures listed in these specifications and as required by code.

.12 Minimum pipe hanger spacing shall be as follows Pipe Size Hori. Max. Support Rod Dia. 1/2"- 11/2"(12- 40mm) 6'(1800mm) 3/8"(10mm)

3" - 4" (75- 100mm) 12'(3600mm) 5/8"(16mm)

CONTROLS

deemed complete.

2" - 21/2" (50- 65mm) 10'(3000mm) 3/8"(10mm)

6" - 12" (150- 300mm) 12'(3600mm) 3/4"(20mm)

Grinnell Fig 281 or Fig 282 or Unistrut.

.13 Size of pipe hangers shall allow for pipe insulation. .14 Strap hangers shall not be used. .15 Piping installed on the roof shall be suitably supported by means of floating support systems

similar to that produced by "Portable Pipe hangers (Canada) Inc" or "Quick Blocks" system.

- Provide all bases, galvanized structural steel frames, galvanized steel hangers, supports, etc. Roof piping supports shall tie into the roofing system where detailed by the project Architect. All shall be to the approval of the Contractor's Seismic Engineer's requirements. .16 Do not support piping from steel deck without written approval from the Engineer.
- 1 Provide a complete and operational controls system in accordance with the Mechanical Drawings, Specifications and project requirements. .2 Control systems are to generally be as indicated on the drawings, control diagrams, within the

specifications and are to have all elements therein indicated or implied.

.17 All below grade piping support, attachments, nuts, bolts, etc shall be of stainless steel

- .3 The controls drawings, diagrams and descriptions show only the principal components controlling the equipment and systems. Supplement each control system with relays. transformers, sensor, etc required to enable each system to perform as specified and to permit proper operation and supervision .4 The control system installation company shall have local parts and service ability on a 24/7
- warranty/guarantee period. Include internet support as requested by the Client in order to solve occupant comfort issues and equipment performance diagnosis and problem resolution. .6 Response time for on-site repair/replacement of controls components within the warranty/guarantee period shall be within 24 hours of the Client's request.

.5 The controls scope of work shall include all required service and support until the end of the

.11 Update all software and graphics associated with the project requirements. .12 All controls switchgear to be provided with lamacoid labelling. .13 Controls work and wiring above 24V shall be completed by an approved Electrical trade. Low

.14 All controls wiring to be installed within conduits, unless noted otherwise. The final 24"

(600mm) connection to sensors and transmitters, and where wiring extends across flexible

controlled by the Building Automation/DDC system.

voltage wiring shall be by the Controls Contract

shall be installed in an accessible path of trave

dynamic closing pressure, whichever is greate

shall not have a temperature display

they are located.

.9 Provide all required hardware and software to comprise a complete and operational controls

.10 Refer to the points list included on the Mechanical Drawings for equipment and systems to be

- duct connections, shall be provided with liquid tight conduit. .15 Control wiring and systems within ceiling spaces and wall cavities shall be plenum rated for the application. .16 All new and existing thermostats/temperature sensors within the project area shall be checke and calibrated.
- .19 Install vandal resistant thermostats in public areas. .20 Control dampers for modulating and mixing applications shall be parallel blade type. Dampers or open/closed applications shall be opposed blade type. Maximum blade length shall be 48"

.21 Motorized damper motors shall be sized to control the damper against maximum pressure or

.18 Pneumatic thermostats shall be complete with temperature setpoint adjustment. Thermostats

17 Thermostats/room temperature sensors shall be mounted 5ft (1500mm) above the finished

floor, unless noted otherwise. Thermostats intended to be operated by the occupants shall be

mounted 47" (1200mm) above the finished floor in accordance with barrier free access and

- .22 Motorized dampers connected to the building fire alarm systems or freeze protection measures shall be equipped to permit dampers to respond and move to the required position within 15 seconds from receipt of signal. .23 Motorized damper operators, seals and ratings shall be suitable for the environment in which
- .25 Motorized dampers are to be provided with end switches. 26 Automatic heating control valves shall be normally open unless noted otherwise. Automatic cooling control valves shall be normally closed, unless noted otherwise. Valves shall fail to the normal position, unless noted otherwise. .27 All control valves shall have position indicators.

.28 Controls valves and inline piping devices (wells, control valves, pressure switches, orifices,

.24 Controls shall operate motorized dampers open on outdoor air intakes and exhaust openings

prior to enabling the associated fan system. Dampers to close upon system shut down.

etc.) are to be provided by the Controls Trade and installed by the Mechanical Trade.

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VANCOUVER, BC V6A 1Z6

KEYPLAN:

3mm) needle valve on top. Provided with isolation valve at connection to main piping. ISSUED FOR RFP 2025.07.11 RE-ISSUED FOR BUILDING PERMIT PL 2025.07.10 .2 For non-combustible piping 3" (75mm) and larger use steel ring and clevis type hangers 2025.06.17 ISSUED FOR TENDER REVIEW ISSUED FOR BUILDING PERMIT 2025.05.30 .4 Hangers and supports shall be capable of withstanding dead loads, live loads, superimposed 2025.04.28 ISSUED FOR PRICING ISSUED FOR SCHEMATIC DESIGN PL 2025.04.15 ISSUED FOR COORDINATION 2025 04 11 2025 03 28

> in any form requires Rocky Point Engineering Ltd.'s express consent. SEAL:

CLIENT:

PROJECT:



MACKIN PARK CONCESSION RENEWAL

DRAWING NAME: **SPECIFICATIONS**

24664-V DRAWN BY:

DESIGNED BY: GH/PL

DRAWING:

End of Mechanical Specifications

ISSUED FOR COORDINATION DESCRIPTION

Mechanical drawings must be read with mechanical specifications. Drawing

plot size is 36"x24". Drawings are to be read for the purpose identified in

the revision/issue column. Drawings are not for pricing or construction

unless specified. These documents are intellectual property of Rocky Point

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No. DATE

REVISIONS

REFER TO PLAN

1046 BRUNETTE AVE. COQUITLAM BC, V3K 1E7

PROJECT NUMBER:

APPROVED BY: GH SCALE:

7 All controls work shall be undertaken by a Base Building approved Controls Contractor. .8 The controls system shall be commissioned and fully operational prior to the project being

.1 The Contractor shall maintain comprehensive Liability Insurance for an amount not less than \$2,000,000. Insurance to include non-owned car insurance and contractual liability with cross liability clause. Coverage shall include loss or damage caused by the Contractor to the project,

.4 The Contractor shall provide for each Progress Claim an updated contract price breakdown indicating for each value the contract price, amount previously billed, amount completed to

.13 Canadian Environmental Protection Ac