TENDER 16-20

WATER TREATMENT BUILDING

ADDENDUM NO. 6

October 12th, 2016

This addendum forms part of the Tender Documents and shall be read, interpreted, and coordinated with all other parts. The costs of all elements contained herein shall be included in the submission. The following revisions, changes, corrections, additions, and or deletions supersede the information contained in the original Documents to the extent referenced and shall become part thereof.

Addendum Item 1
Questions & Answers

230. **Proponent Question:**

I cannot find BBH 4, 5 & 6 on electrical drawings. Please confirm location.

Response:

BBH 4,5 and 6 are no longer part of the design. Remove reference on drawing layouts and lighting panel schedule.

231. **Proponent Question:**

Please identify location point of electrical connection for crane motors 1, 2 & 3.

Response:

Identify location of power connection points on West wall near Gridline 1-B (hoists for cranes leaving west wall) and on south wall near Gridline 4-C. Hoist provider to terminate to junction at roof height and allow for coiled power cable to traverse the movement of the hoist along the trolley beam. Utilize Lighting Panel A for available circuits.

232. **Proponent Question:**

We require some clarification on the Siemens Ultrasonic level:

a. Is the MultiRanger to be panel mounted or wall mounted?
b. Is the MultiRanger 100…230vac or 12…30vdc powered?
c. How many output relays are needed on the MultiRanger?

Response:

Contractor to allow for a panel mounted 12-30Vdc Multiranger 100 with 3 relay outputs to monitor the waste tank level. Intent is to install transmitter in MCP-100 front door.

233. **Proponent Question:**

What cable length is required for the XPS-15? Choices are 5, 10, 30, 50 or 100meters.

Response:

Contractor to allow for 10m cable length from XPS-15, to wire back to building edge. Cable will be terminated with other power and instrumentation signals at the building wall, with interior cable brining the power/signal wires back to the respective termination points in the electrical room.

234. **Proponent Question:**

Masonry sub has request clarification on colour and finish of the 90mm CMU Veneer.

Response:

The block colour is listed in spec 042200, section 2.1.2.5.1
.3 Colour:
.1 Integrally coloured pre-finished architectural concrete block with one or more faces ground to expose variegated colours of natural aggregates, Pietra Antica Terrazo.

This is a ground face block veneer. The basis of design is listed as Expocrete Concrete Products. A sample of the finish can be found here:
http://www.expocrete.com/pdf/masonry/burnished-terrazzo/Terrazzo_Brochure_2012_web.pdf

235. **Proponent Question:**

Process valve tags on drawings differ from that in section 40 06 23, do you know which is to be correct?

Response:

Updated layout drawings and spec provided.

236. **Proponent Question:**

Be advised that there is NO possible radio link to the Chlorination Plant on Highway 28 from the new Intake Site, impossible by any means.

Response:

John Hart Water Quailty Centre (i.e. the current City chlorination plant on Highway 28) is on an ADSL Link. No modifications to the communications is required at this site.

237. **Proponent Question:**

Please revise Section 33 11 25, 2.1.8.1 to read 150 psi/ 1035 kPa, as both 'General Note 1' on dwg. C305 and Q&A# 164, Addendum #5 indicate this is to be the actual working pressure of the 1000mmΦ watermain

Response:

See Specification Revision Section in Addendum 6.

238. **Proponent Question:**

Respectfully requesting that 0.250"/6.3mm minimum wall thickness be allowed on all pipe Φs <=900mm

Response:

Pipe wall thickness will be as required to withstand the working pressures at the location at which the pipe is installed. See Specification Revision Section in Addendum 6 for clarification on the working pressures at various locations where pipe is to be installed under this contract.

239. **Proponent Question:**

Please revise unit quantities on the *"Detailed Schedule of Quantities and Prices"* for the Epoxy Lined Surge Tank to read: ~65m for 900mm Φ pipe; ~54m for 1000mm Φ pipe

Response:

Refer to Addendum Item 3.

240. **Proponent Question:**

1000mm Φ tie-in details for the Epoxy Lined Surge Tank are missing (yet a new bid item has been created); please provide

Response:

Notes have been added to the drawings. Tie in to the tank is via a penetration through the base slab and base of the tank.

241. **Proponent Question:**

Why is the spec asking for constant torque when the VFD's are meant for pumping station?

Response:

Drive spec is clear. Please clarify question

242. **Proponent Question:**

In regards to ADD #5 Q159 – your response for all SS pipe above 600mm-HS Schedule (wall thickness .05 inches) Are you sure this is correct as this is very outside of the norm – the norm would be S/40 - It will be very expensive to get ½" wall pipe and fittings. Please confirm that you do not want Schedule 40 pipe and fittings.

Response:

Due to a new water tank and in combination with the PRV valves the following are critical pressures in the system

1. 600mm pump discharge - 634.8 psi @ 45 MLD,
2. 750mm UV influent - 874 psi @ 92 MLD (capacity)
3. 900mm Surge Tank Piping (Inf & Eff) - 576 psi @ 92 MLD (design flow)
4. 1050mm Header - 594 psi @ 135MLD (Maximum)

Therefore, the following pipe ratings can be applied:

For all SS pipes up to 600 mm – 10S schedule
For all SS pipes above 600 mm – 40S schedule

243. **Proponent Question:**

With respect to the Sanitary Sewer Lift Station:

a. Where does the electrical service come from?
b. How many amps is the service?
c. The current WTP electrical documents showing the MCC lineup do not contain any reference to the duplex sewer lift station.
d. Is a hydro meter, pullbox, and main service entrance breaker, transfer switch etc. required?
e. Are the starters to be across line non reversing starters with overloads or softstarters/vfd? Again this may depend on the service.

Response:

a. The electrical room MCC houses (currently) a single size 1 starter for P-901 (see E202)
b. See E202
c. Please price for a second pump. Refer to electrical single line drawing, and accommodate for a second pump similar to P901. Contractor to price a second starter, power feed and disconnect.
d. With respect to the sanitary sewer lift station, shown on drawing C303, no, there is no second service required.
e. With respect to the sanitary sewer lift station, shown on drawing C303, see E202 and reference FVNR servicing P-901.

244. **Proponent Question:**

With the reference to "Provide control system in pump control kiosk in accordance with Section 25 14 00" does this mean plc controlled or is it to be relay logic? Are there other control drawings or details to be made available?

Response:

With respect to the sanitary sewer lift station, shown on drawing C303, all control will be handled by the PLC in MCP-100. Please note control station reference in E101 and E003(detail#15). Reference control drawings for MCP-100.

245. **Proponent Question:**

The recommended pavement structure in the geotech report differs from Detail 1 – C301. Detail 1 indicates the subbase is to be a 300mm thick layer of “Crushed Granular Sub-Base” the geotech report recommends the sub-base be “75mm minus select granular sub-base” – Are both products acceptable as sub-base?

Response:

Sub-base to be "Crushed Granular Sub-base" as per MMCD Platinum Spec Section 31 05 17. S"Select granular sub-base" or "Piut-run gravel" as per MMCD Platinum Spec Section 31 05 17 may be used as fill to underside of sub-base.

246. **Proponent Question:**

The geotech report indicates that “It is anticipated that a considerable portion of the excavated native sand material will be suitable as backfill material” – Will native soils be permitted as backfill for:

a) Bulk Building Backfill
b) Trench Backfill
c) Fills under roadway structure (below 300mm thick sub-base)

Response:

This is entirely dependent on geotech approval of the material. If it is good, free of organics, and meets the technical specifications of the aggregate material specificed for those areas, then there should be no issues reusing.

247. **Proponent Question:**

Detail 3 of drawing C301 indicates there is to be a 100mm thick layer of “100mm Crushed Base Gravel” below topsoil and seed – can topsoil and seed be placed directly on approved subgrade or, can Pitrun Gravel be used as an alternative to the Crushed Base Gravel?

Response:

Pitrun gravel or approved subgrade may be used.

248. **Proponent Question:**

Can 200mm Minus Blast Rock be used as an alternative to Pit Run Gravel as a fill material?

Response:

If the gradation specifications are met, yes.

249. **Proponent Question:**

Can bedding sand or pea gravel be used as an alternative to the MMCD spec for “Granular Pipe Bedding and Surround Material”

Response:

Bedding sand is acceptable.

250. **Proponent Question:**

Can you please inquire if there are any other specifications for block veneer (90mm). (i.e. colour or texture).

Response:

The block colour is listed in spec 042200, section 2.1.2.5.1
.3 Colour:
.1 Integrally coloured pre-finished architectural concrete block with one or more faces ground to expose variegated colours of natural aggregates, Pietra Antica Terrazo.

This is a ground face block veneer. The basis of design is listed as Expocrete Concrete Products. A sample of the finish can be found here:
http://www.expocrete.com/pdf/masonry/burnished-terrazzo/Terrazzo_Brochure_2012_web.pdf

251. **Proponent Question:**

Section 07 52 11:

1.5 System Description:
Torch welded base and cap

2.3 Base sheet membrane materials listed are not designed to be mechanically fastened or self-adhered as they are a torch down product

3.2 normally not necessary to use an adhesive as all materials are mechanically fastened

Response:

Follow section 2.3 and the selected manufacturer’s recommendations for installation.

252. **Proponent Question:**

Is the SS above 600mm really to be. 500 wall thickness? Suppliers are having difficulties sourcing over. 375 wall.

Response:

Wall thickness as required to withstand the working pressures present at the site. Working pressure at treatment building site to be 150psi

253. **Proponent Question:**

Detail 4 drawing C-105 does not show a sump below the invert of CDS-1. Can you please clarify whether a sump is required, and if so, what is the sump depth below the outlet invert and what is the elevation of the bottom of the sump?

Response:

The sump will be as per the manufacturer's requirements for a CDS unit model 2015-4.

254. **Proponent Question:**

On C101/109, orientation of north arrow/magnetic compass direction is not consistent.

Response:

Addressed in drawings issued in Addendum 5.

255. **Proponent Question:**

Penetrations & tie-in locations do not agree between the two drawings.

Response:

Addressed in drawings in Addendum 5.

256. **Proponent Question:**

1000mm tie-in details are missing; note that a new item has been allotted per the *"Detailed Schedule of Quantities and Prices"* for these locations yet no detail was provided.

Response:

Addressed in drawings in Addendum 5.

257. **Proponent Question:**

1000mm x 900mm reducers are shown as both eccentric and concentric.

Response:

They are eccentric.

258. **Proponent Question:**

If the minimum wall thickness per 33 11 25/2.1.25 states 0.250”/6.3mm for pipe >=750mmΦ, why are pipe Φs <750mm to be 0.375”/9.5mm in thickness? **Respectfully requesting that 0.250”/6.3mm minimum thickness is allowed on all pipe Φs <=900mm.**

Response:

See specification revision in Addendum 6.

259. **Proponent Question:**

A ‘phantom’ design working pressure of 290 psig will add significant & unnecessary costs to the project. ie.- Class F flanges vs. Class D, crotch plate reinforcements for tees vs. collars/wrappers, etc… Respectfully requesting the design working pressure is reviewed & redefined for this project (a pipe schedule may help to clarify all design aspects including pressures, thicknesses, end prep, flanges, couplings, etc.)

Response:

See specification revision section in Addendum 6.

Addendum Item 2
Amend Supplementary Specification 33 11 25 as follows:

- Amend Clause 2.1.8.1 to read “Maximum Operating Pressure: John Water Quality Centre – 1270kPa and new Water Treatment Plant – 1034kPa
- Amend Clause 2.1.8.2 to read “Maximum Temperature: 25 degrees Celsius
- Amend Clause 2.1.25 to read “To match the wall thickness of the existing welded steel pipeline the wall thickness shall be: 6.4 mm [0.25"] at the Water Treatment Plant and 9.5 mm [0.375"] at the John Hart Water Quality Centre, unless noted otherwise on the Contract Drawings.

Addendum Item 3
Amend Detailed Schedule of Quantities items (Appendix 1A) as follows:

- Waterworks Pipeline – Item 33.5: Welded Steel Pipe – 1000mm dia. 6.4mm thick wall; all depths. Revise Quantity to 54m
- Waterworks – Surge Tank and Valve Chamber – Item A3: 900mm diameter 6.4mm thick wall; all depths. Revise quantity to 33m

Addendum Item 4
Drawings & Specifications

Refer to the attached drawings and specifications that address the valve labeling discrepancy.

Addendum Item 5
Addendum No. 5, Question 145 Revised

The response to the Question of "Is the duct fully installed into the Chlorination building" was incorrect. The correct response is "No, refer to drawing #C201".

Addendum Item 6
Question & Answer Period Extended

All questions, clarifications, requests, etc. regarding this Tender must be made in writing and received by **3:00 p.m.** (Campbell River local time) **Friday October 14th, 2016.**

End of Addendum

Acknowledgement of this Addendum in your Tender submission is required.

Clinton J. Crook, SCMP, CPSM
Senior Buyer

PART 1 GENERAL

1.1 Description

1.1.1 This Section specifies the supply, installation and testing of valves used for isolation, manual throttling, and pressure relief or bypass.

1.2 Definitions

1.2.1 Valve Identification: Valves are identified in the drawings by valve symbols. Refer to the Drawings for lists of valve symbols and labels.

1.2.2 Actuators: Valves are supplied with their standard operators as detailed in Clause 4.2 of this Section.

1.2.3 Detailed Valve Specification Sheets:

.1 Detailed Valve Specification Sheets are provided in Clause 4.2 of this Section

.2 Where there is a conflict between valves described in this Section and other specifications of the Contract, conform to the most stringent requirements.

1.3 Submittals for Review

1.3.1 Shop Drawings: Submit the following information in accordance with Division 1:

.1 Catalog cuts and/or shop drawings for each type of valve indicating the valve number, materials of construction, dimensions, head loss characteristics through the valve, operating torque and valve end configuration.

.2 An amended Detailed Valve Specification Sheet for all valves. Indicate with check marks where the valve supplied meets the requirements specified and with written amendments where the product differs from the specification.

1.3.2 Operating and Maintenance data for incorporation in operation and maintenance manual, as specified in Division 1. Include complete description of operation together with detailed drawings, a complete list of replacement and repair parts, and parts manufacturer's identifying numbers.

1.3.3 Affidavits and registration numbers described below in Quality Assurance.

1.4 Quality Assurance

1.4.1 Provide Canadian Registry Number (CRN) designated by the Province of British Columbia for each valve type.

1.4.2 Valves are to be marked in accordance with MSS SP-25.

1.5 Shipment, Protection and Storage

1.5.1 Deliver valves to site in accordance with Division 1 and using loading methods which do not damage casings or coatings.

1.5.2 Clearly tag valves stating size, type, coatings and mating parts.

1.5.3 Store on-site until ready for incorporation in the work using methods recommended by the manufacturer to prevent damage, undue stresses, or weathering.

PART 2 PRODUCTS

2.1 General

2.1.1 Provide valves of the same type, size range and service from a single manufacturer.

2.1.2 Provide new, unused valves for the work.

2.1.3 Valve materials to be free from defects or flaws, with true alignment and bores.

2.1.4 Unless otherwise indicated on the Process and Instrumentation drawings, use valves that are the same size as the pipe run in which they are to be installed.

2.1.5 Clearly mark valve bodies in raised lettering to indicate the valve type, rating, and where applicable, the direction of flow. Conform to MSS SP25.

2.1.6 Provide padlockable lockout feature on all sizes of the following valve types:

.1 Automated Control Valves (electric)

.2 Specialty Valves; FV and PRV only

.3 Manual Isolation and Shut-off Valves

2.1.7 Specific requirements for the materials, ratings and service conditions for each valve are listed in Clause 4.2 of this Section.

2.1.8 Valves to open counter-clockwise.

2.2 Drawings

2.2.1 The process schematics indicate major process valves required for the process to operate as intended.

2.2.2 The detailed process drawings and process standard drawings indicate the valves on the process schematics plus other valves required for isolation.

2.2.3 In pipe runs carrying sludge or scum tap bottom of pipe at low point of runs and install short nipple and isolation valve.

2.2.4 Provide valves and taps on top of pipe at high point in all liquid pipe runs greater than 60 m length where the change in slope exceeds 4 percent.

2.2.5 Provide flushing connections and valves as shown on drawings

2.2.6 Where a valve may be required for the process to function correctly or is required to satisfy fire and safety codes but it is not shown in the drawings, inform the Owner’s Representative and provide details and suggestions for remedial action. Do not commence piping in the related pipe run until obtaining the Owner’s Representative's approval.

2.3 Valve Ends

2.3.1 In pipe runs less than 75 mm diameter provide valves with female threaded ends, unless indicated otherwise. Threads to conform to ANSI B1.20.1.

2.3.2 Valves in pipe runs equal to or greater than 75 mm diameter to be flanged unless indicated otherwise.

2.3.3 For cast iron body valves, drill flanges to Class 125 pattern conforming to ANSI B16.1. For steel body valves, flanges to be Class 150 pattern or Class 300 pattern conforming to ANSI B16.5 or as noted in Clause 4.2 of this Section.

2.3.4 Lug style wafer body valves shall have tapped holes, suitable for the bolt spacing of the pipe flanges placed on either side.

2.3.5 Wafer body valves shall have positioning holes, suitable for the bolt spacing of the pipe flanges placed on either side.

2.4 Manual Operators

2.4.1 Provide valves with manual operators unless specifically indicated otherwise on the process schematic drawings, mechanical drawings or in Clause 4.2 of this Section.

2.4.2 For hand wheels, clearly show the direction of opening in raised lettering and symbols.

2.4.3 Hand wheel diameter to conform to the following:

Nominal Valve Diameter (mm)	Minimum Hand Wheel Diameter (mm)
12	50
20	50
25	60
38	75
50	85
65	105
75	200
100	250
150	300
200	350
250	400
300	450
350	450
400	550

2.4.4 The maximum rim pull on a hand wheel not to exceed 300 N when one side of the valve is at test pressure and the other side is at atmospheric pressure. Where a shaft mounted hand wheel would require greater than this force to operate, provide a gear operator.

2.4.5 Provide two (2) eight-point operating wrenches to match operating nuts.

2.4.6 Supply stem extensions for valves specified in the drawings and in Clause 4.2 of this Section.

2.4.7 Lever operators to conform to the following dimensions:

Nominal Valve Diameter (mm)	Minimum Length of Lever (mm)
6	80
12	80
20	100
38	150
50	150
65	150
75	175
100	225
150	250
200	300
250	450

300	450

2.4.8 Quarter turn lever operators to be perpendicular to the pipe run when the valve is closed.

2.4.9 The maximum pull at the end of the lever arm not to exceed 300 N when one side of the valve is at test pressure and one side is at atmospheric pressure. Where greater than this force would be required to operate the valve with a lever, provide a gear operator

.1 Plug Valves and Ball Valves: less than 150 mm, lever operator; greater than or equal to 150 mm, gear operator

.2 Butterfly Valves: less than 250 mm, lever operator; greater than or equal to 250 mm, gear operator

2.4.10 Gear operator to be worm gear type, equipped with a hand wheel and a visual indicator of the valve position. Equip operators with adjustable mechanical stop-limiting devices to prevent overtravel of the disc/ball in the open and closed positions and which are self-locking and designed to hold the valve in any intermediate position between full open and full closed. Gear operators shall be grease lubricated. Where gear operators are intended for direct bury or submergence, seal units with long life lubricant.

2.4.11 For manual valves on lines 75 mm and greater, mounted over 2.0 m above the operating floor, provide chain wheel gear operators. Design the operator so that a force of 150 N is sufficient to open the valve when one side of the valve is at test pressure and the other side is at atmospheric pressure. The chain pulley to mesh positively with the chain. Extend the chain from the valve operator to operating height 1.2 m above the floor or as directed by the Owner's Representative. The exact dimensions field determined. Provide approved chain hooks where required to prevent chain from hanging within traffic paths.

2.5 Valve Actuators

2.5.1 Refer to Division 26 for electric operator and solenoid valve requirements.

2.6 Valve Stem Extensions

2.6.1 Provide valve stem extensions where additional clearance is required for pipe insulation, where valve operation without the extension is difficult.

2.7 Insulation

2.7.1 In insulated pipe runs, insulate valves in accordance with Section 40 05 13.

2.7.2 Recovering to be as specified in Section 40 05 13, with transition sections for the joints between the valve insulation and the pipe insulation.

2.7.3 Insulation to be removable and reusable without destroying insulation or recovering.

2.8 Protective Coatings

2.8.1 Unless otherwise specified, provide valves coated in accordance with Division 9.

2.9 Spare Parts

2.9.1 Provide spare parts in accordance with Division 1.

PART 3 EXECUTION

3.1 Preparation

3.1.1 The valve and piping arrangement indicated in the drawings is based on typical dimensions for valves of the specified type. Make the necessary modifications in the piping to allow for discrepancies between the valve dimensions shown and those supplied for the work.

3.1.2 Prior to the installation of the valves, field measure and check all equipment locations, pipe alignments, and structural installation. Ensure that the valve location and orientation provides suitable access to manual operators and that sufficient space and accessibility is available for actuators.

3.1.3 Where conflicts are identified, inform the Owner's Representative and initiate the necessary piping modifications at no cost.

3.2 Valve Installation

3.2.1 Install valves in conjunction with the piping described in Section 40 05 13.

3.2.2 In horizontal pipe runs other than in locations where space does not permit, mount all valves except for butterfly valves and true union ball valves with a vertical operating shaft with the actuator at the top. In no case install a valve with the operator shaft pointing down.

3.2.3 Mount butterfly valves and true union ball valves with the shaft in a horizontal orientation.

3.2.4 When joining valves to pipe or fittings, do not over torque bolts to correct for misalignment.

3.2.5 Support valves in position using temporary supports until valves are fixed in place.

3.2.6 Permanently support valves to prevent transmission of loads to adjacent pipework and/or equipment.

3.2.7 Where valves are installed in FRP or PVC pipework greater than 100 mm diameter, support valves independently and brace against operating loads and torque to prevent transmission of stresses to the adjacent pipework.

3.2.8 Install valves which are bubble tight in one direction to seal in a direction opposite to normal flow unless otherwise noted or directed by the Owner / Owner's Representative.

3.2.9 Install all valves in accordance with the manufacturer's recommendations.

3.2.10 Install valves and adjacent pipework in such a manner to be easily replaced in the future.

3.3 Valve Extensions

3.3.1 Install valve stem extensions where necessary to provide clearance from insulation.

3.4 Valve Testing

3.4.1 Operate valves under simulated and/or real process conditions to ensure they operate as intended.

3.4.2 Pressure test the valves in conjunction with the pipes in which the valves are installed as specified in Section 40 05 13.

PART 4 VALVE SCHEDULE

4.1 General

4.1.1 The attached schedule of valves identifies the major valves (100 mm and larger) included in the work.

4.1.2 Minor valves such as sampling line valves or chemical lines valves etc., are not detailed in this schedule, but shall be accounted for by the Contractor. Refer to Division 40 for description of locations where other valves are required.

4.1.3 For sodium hypochlorite lines use PVC valves and use vented ball valves.

4.1.4 Pressure relief / low flow bypass valves:

.1 PRV-623 is a pressure relief and low flow bypass equipped with flow metering interface. The design is based on 12” Cla-Val 133-32 with anti-cavitation trim.

.2 PRV-632 is a backup to valve PRV-623 that is hydraulically operated and without flow metering interface. The design is based on 12” Cla-Val 650-01.

4.1.5 Install either dual orifice valves (APCO 1500C – Combination vacuum relief air inlet and air release valve), triple acting air valves (ARI D D-060-C HF NS LP, equipped with non-slam option), or triple-orifice valves (Vent-O-Mat RBX) on:

.1 The pump station discharge header and

.2 Immediately downstream of the motor-operated butterfly valves at the UV reactors (prior to the 90 degree vertical downward bend)

.3 Engineer approved valves will be acceptable.

.4 Install other air/vacuum relief valves less than 100 mm diameter as shown on drawings

4.1.6 Valve specification number relates to valve specification sheets included in Part 5 of this section.

4.2 Valve Schedule - new valves only

Valve No.	Valve Type	Valve Spec No.	Actuator	Nominal Diameter (mm)
BFV-011 BFV-013 BFV-014	Butterfly valve	BF01	Hand wheel	200
CHK-012	Check valve	CV01	N/A	200
BFV-109 BFV-119 BFV-129 BFV-139	Butterfly valve	BF01	Hand wheel	600
CHK-108 CHK-118 CHK-128	Check valve	CV01	N/A	600
AVV-104 AVV-114 AVV-124	Air/Vacuum Valve	AVV01	N/A	100
BFV-103 BFV-113 BFV-123	Butterfly valve	BF01	Hand wheel	100
BFV-305 BFV-405	Butterfly valve	BF01	Hand wheel	750
AVV-313 AVV-413 AVV-513	Air/Vacuum Valve	AVV01	N/A	100
BFV-313 BFV-413 BFV-513	Butterfly valve	BF01	Hand wheel	100
FCV-604	Flow control valve	BF02	Electric	1050
BFV-606	Butterfly valve	BF01	Hand wheel	1050
BFV-620 BFV-622 BFV-631	Butterfly valve	BF01	Hand wheel	300
PRV-623	Pressure relief / recirculation	PSV01	Electric / Hydraulic	300
PRV-632	Pressure relief / recirculation	PSV02	Hydraulic	300
BFV-811	Butterfly valve	Provided by Compressed air system supplier	Hand wheel	150
FCV-820 FCV-830	Flow control valve		Pneumatic	150

PART 5 DETAILED VALVE SPECIFICATION SHEETS

TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			Pressure (kPa)	Temp. (°C)	Pressure (kPa)	Temp. (°C)
Butterfly Valve	BF01	Water	340	5-30	510	50

TYPICAL SERVICE

Isolation valve on service line inside the building for clean and raw water.

VALVE MATERIALS		**VALVE DESCRIPTION**	
ITEM	MATERIAL	REFERENCE DOCUMENT	API 609
Body	Ductile Iron or Cast Iron	SIZE RANGE	100 mm to 1050 mm
Disc	Ductile Iron with Stainless Steel Edge	RATING	750 kPa CWP
Disc Trim	316 Stainless Steel	BODY/VALVE ENDS	Lugged to fit B16.5 Class 150 flanges
Seats	Reinforced PTFE or EPDM	TYPE OF DISC	
Shaft	316 Stainless Steel	OPERATOR	Hand wheel
		ACTUATOR	Manual
		LINING	SP10 & Epoxy 10 mils
		COATING	Tnemec 141 NSF61 / AWWA C210 Epoxy

NOTES:

1. Comply with NSF/ANSI 61
2. Where required provide local indication and limit switches.
3. Valve BFV-605 can be owner supplied; verify valve condition and suitability

ACCEPTABLE PRODUCTS

Bray	DeZurik	Keystone	Pratt	Approved equivalent

TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			Pressure (kPa)	Temp. (°C)	Pressure (kPa)	Temp. (°C)
Butterfly Valve	BF02	Water	340	5-30	510	50

TYPICAL SERVICE

Isolation valve on service line inside the building for clean and raw water.

VALVE MATERIALS		**VALVE DESCRIPTION**	
ITEM	MATERIAL	REFERENCE DOCUMENT	API 609
Body	Ductile Iron or Cast Iron	SIZE RANGE	100 mm to 1050 mm
Disc	Ductile Iron with Stainless Steel Edge	RATING	750 kPa CWP
Disc Trim	316 Stainless Steel	BODY/VALVE ENDS	Lugged to fit B16.5 Class 150 flanges
Seats	Reinforced PTFE or EPDM	TYPE OF DISC	
Shaft	316 Stainless Steel	OPERATOR	Hand wheel
		ACTUATOR	Electric
		LINING	SP10 & Epoxy 10 mils
		COATING	Tnemec 141 NSF61 / AWWA C210 Epoxy

NOTES:

1. Comply with NSF/ANSI 61
2. Where required provide local indication and limit switches.
3. Valve FCV-604 without actuator can be owner supplied; verify valve condition and suitability

ACCEPTABLE PRODUCTS

Bray	DeZurik	Keystone	Pratt	Approved equivalent

GENERAL

TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			Pressure (kPa)	Temp. (°C)	Pressure (kPa)	Temp. (°C)
Check Valve	CV01	Water	340	5-30	510	50

TYPICAL SERVICE

Check valve for clean water without stringy material.

VALVE MATERIALS		**VALVE DESCRIPTION**	
ITEM	MATERIAL	REFERENCE DOCUMENT	
Body	Cast Iron or Ductile Iron	SIZE RANGE	600 mm
Plug & Seat	316 Stainless Steel	RATING	Class 125
Spring	316 Stainless Steel	BODY/VALVE ENDS	Flanged to fit Class 150 Flanges
		TYPE OF DISC	Silent check
		OPERATOR	
		ACTUATOR	
		LINING	
		COATING	

NOTES:
1. Comply with NSF/ANSI 61

ACCEPTABLE PRODUCTS

APCO	Val-Matic	Pratt	Victaulic	Approved equivalent

GENERAL

TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			Pressure (kPa)	Temp. (°C)	Pressure (kPa)	Temp. (°C)
Pressure Reducing / Recirculation Valve	PSV01	Water	0-500	5-25	750	30

TYPICAL SERVICE

Electrically (solenoid valve) and hydraulically operated, pilot-controlled, modulating valve designed to maintain constant upstream pressure within close limits. This valve is used for pressure relief, flow-bypass and flow measurement.

VALVE MATERIALS		**VALVE DESCRIPTION**	
ITEM	MATERIAL	REFERENCE DOCUMENT	
Body	Ductile Iron	SIZE RANGE	300 mm
Disc Retainer	Cast Iron	RATING	Class 150
Seat	316 Stainless Steel	VALVE ENDS	Flanged
Diaphragm	Reinforced Synthetic Rubber	TYPE OF OPERATION	
Stem	316 Stainless Steel	OPERATOR	
Bearing	316 Stainless Steel	ACTUATOR	Electric / Hydraulic
Pilot Body	Brass or Bronze	COATING	

NOTES:

1. Comply with NSF/ANSI 61
2. Sizing to be confirmed by transient analysis (preliminary sizing 100-200 L/s with 340 kPa static pressure
3. Provide with anti-cavitation trim

ACCEPTABLE PRODUCTS

Singer	Cla-Val 133-32	Approved equivalent	

GENERAL

TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			Pressure (kPa)	Temp. (°C)	Pressure (kPa)	Temp. (°C)
Pressure Reducing / Recirculation Valve	PSV02	Water	0-500	5-25	750	30

TYPICAL SERVICE

Hydraulically operated, pilot-controlled, modulating valve designed to maintain constant upstream pressure within close limits. This valve is used for pressure relief and flow-bypass.

VALVE MATERIALS		**VALVE DESCRIPTION**	
ITEM	MATERIAL	REFERENCE DOCUMENT	
Body	Ductile Iron	SIZE RANGE	300 mm
Disc Retainer	Cast Iron	RATING	Class 150
Seat	316 Stainless Steel	VALVE ENDS	Flanged
Diaphragm	Reinforced Synthetic Rubber	TYPE OF OPERATION	
Stem	316 Stainless Steel	OPERATOR	
Bearing	316 Stainless Steel	ACTUATOR	Hydraulic
Pilot Body	Brass or Bronze	COATING	

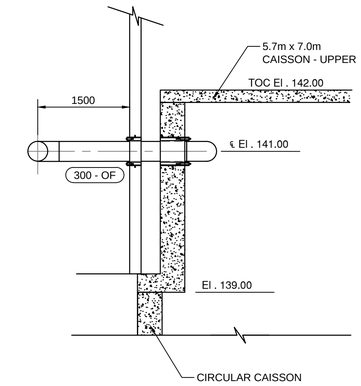
NOTES:

1. Comply with NSF/ANSI 61
2. Sizing to be confirmed by transient analysis (preliminary sizing 100-200 L/s with 340 kPa static pressure
3. Provide with anti-cavitation trim

ACCEPTABLE PRODUCTS

Singer	Cla-Val 650-01	Approved equivalent	

END OF SECTION



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A - OVERFLOW - SECTION

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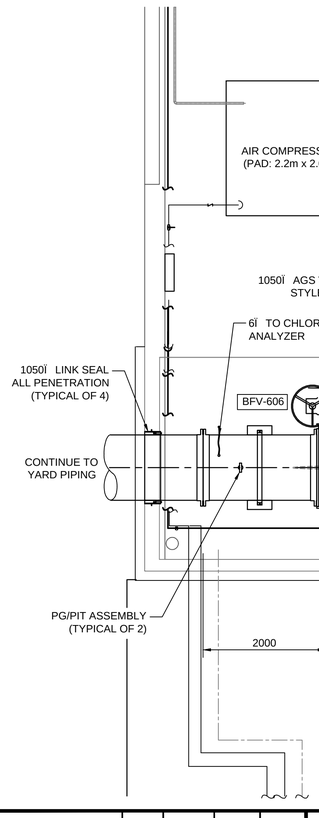

NOTES:

1. PROVIDE UNIONS ON PVC PIPING TO ALLOW REMOVAL OF CHLORINE INJECTOR ASSEMBLY (SAF.T.FLO, SEE P022 DRAWING FOR THE DETAILS).

1 P-101 MECHANICAL PROCESS

SCALE: 1:50

5

0 0.5 1 2.5m

1:50

NOT FOR CONSTRUCTION

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BC 1 CALL 1-800-474-6886

NO.	REVISION/ISSUE	APP'D BY	DATE	CONST'D BY	DATE
6	ADDENDUM 6	BP	16/10/12		
5	ADDENDUM 3	BP	16/09/30		
4	ISSUED FOR TENDER	BP	16/09/02		
3	ISSUED FOR FINAL REVIEW	BP	16/08/12		
2	ISSUED FOR 90% SUBMISSION	BP	16/04/18		
1	ISSUED FOR 50% SUBMISSION	BP	15/10/27		

DESIGNED: BP	SCALE: 1:50
DRAWN: BZ	DATE: 16/10/07
CHECKED: BP	DATE: 16/10/07
APPROVED: BP	DATE: 16/10/07

Stantec
400-655 Tyee Road
Victoria, BC V9A 6X5
www.stantec.com

TITLE: PROPOSED RAW WATER SUPPLY MAIN HIGHWAY #28 TREATMENT BUILDING – CONTRACT 2

MECHANICAL PROCESS PIPING

DRAWING NO. 15-508- P102

PROJECT: 112311316

REV. 6

DESTROY PRINTS OF PREVIOUS REVISION

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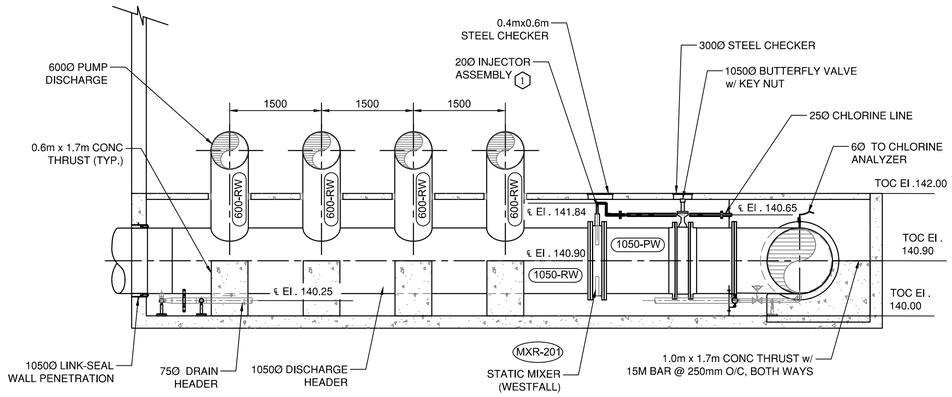

C / P101 SECTION
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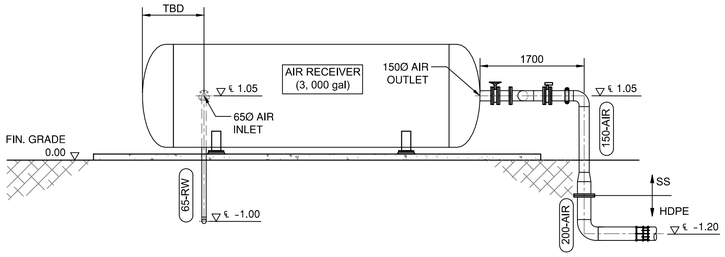

F / P101 SECTION - AIR RECEIVER
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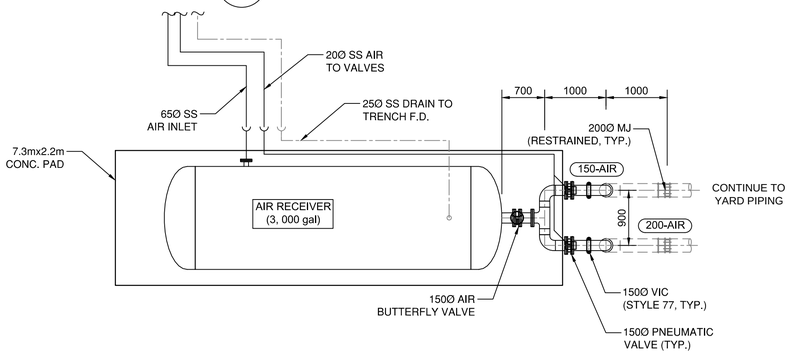

1 / - PLAN - AIR RECEIVER
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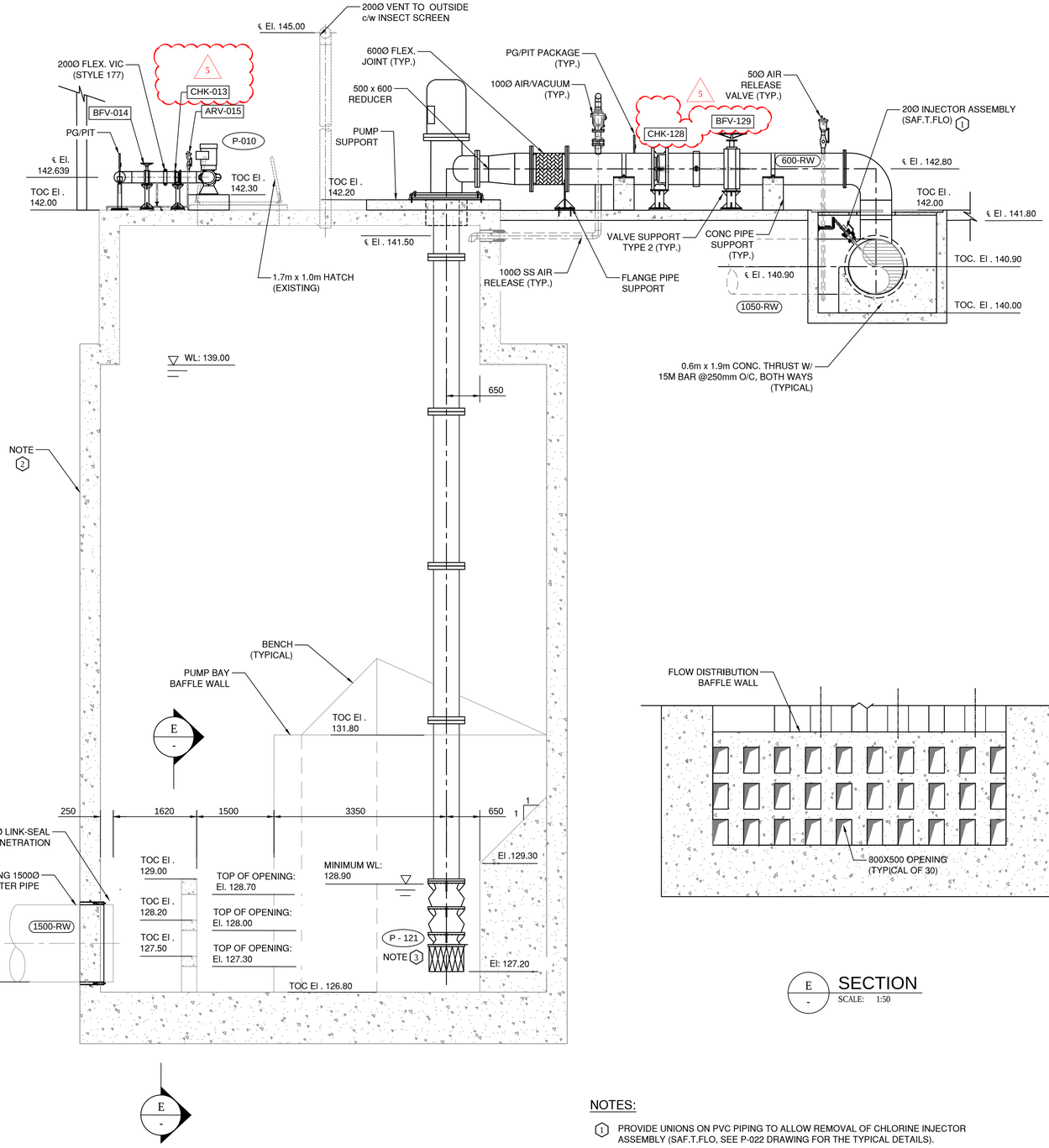

D / P101 SECTION
SCALE: 1:50

E / - SECTION
SCALE: 1:50

NOTES:

1. PROVIDE UNIONS ON PVC PIPING TO ALLOW REMOVAL OF CHLORINE INJECTOR ASSEMBLY (SAF.T.FLO, SEE P-022 DRAWING FOR THE TYPICAL DETAILS).
2. EXISTING CONCRETE CAISSON.
3. INSTALL OWNER SUPPLIED VERTICAL TURBINE PUMPS

1:50 0 0.5 1 2.5m

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BC 1 CALL 1-800-474-6886

NO.	REVISION/ISSUE	APP'D BY	DATE	CONST'D BY	DATE
5	ADDENDUM 6	BP	16/10/12		
4	ISSUED FOR TENDER	BP	16/09/02		
3	ISSUED FOR FINAL REVIEW	BP	16/08/12		
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1	ISSUED FOR 50% SUBMISSION	BP	15/10/27		

DESIGNED: BP | SCALE: 1:50
DRAWN: BZ | DATE: 16/10/12
CHECKED: BP | DATE: 16/10/12
APPROVED: BP | DATE: 16/10/12

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Victoria, BC V9A 6X5
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TITLE: PROPOSED RAW WATER SUPPLY MAIN HIGHWAY #28 TREATMENT BUILDING – CONTRACT 2

MECHANICAL PROCESS SECTIONS – SHEET 2 OF 2

DRAWING NO. 15-508- P105
PROJECT: 112311316
REV. 5

DESTROY PRINTS OF PREVIOUS REVISION

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