



# ADDENDUM 1 BID OPPORTUNITY NO. 74-2005

## NEWPCC SECONDARY EFFLUENT UV DISINFECTION FACILITY

ISSUED: March 18, 2005  
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### **URGENT**

**PLEASE FORWARD THIS DOCUMENT TO  
WHOEVER IS IN POSSESSION OF THE BID  
OPPORTUNITY**

**THIS ADDENDUM SHALL BE INCORPORATED  
INTO THE BID OPPORTUNITY AND SHALL  
FORM A PART OF THE CONTRACT  
DOCUMENTS**

Template Version: A20050301

Please note the following and attached changes, corrections, additions, deletions, information and/or instructions in connection with the Bid Opportunity, and be governed accordingly. Failure to acknowledge receipt of this Addendum in Paragraph 9 of Form A: Bid may render your Bid non-responsive.

### **PART A – BID SUBMISSION**

Replace Form B: Prices with Form B(R1): Prices

### **PART B – BIDDING PROCEDURES**

**B9 Prices** Revise to read:

B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B:Prices

B9.1.1 Notwithstanding GC.12.2.3(c), the Price on Form B:Prices shall include the Manitoba Retail Sales Tax (MRST, also known as PST), except for the supply and installation of process equipment, for which MRST shall be extra.

**B9 Prices** Add the following Clause:

B9.1.2 Further to B9.1.1, process equipment supply and installation shall be defined as the installation of all City-supplied equipment supplied under supply contract No 257-2004, the supply and installation of all 480 V electrical systems up to the load side of Breaker 52-UVT3 and Breaker 52-UVT2, and the installation and connection to the pump disconnect of the pumps only supplied under Bid Opportunity 89-2005. The installation of piping, draft tubes, pump cans, and the variable frequency drives and associated devices supplied under Bid Opportunity 89-2005 are specifically excluded from this definition.

### **PART D – SUPPLEMENTAL CONDITIONS**

**D8 Insurance** Replace with the following:

**D8.1** The City shall provide and maintain the following Project Insurance Coverages:

- (a) Builder’s Risk Insurance in the amount of one hundred percent (100%) of the total project cost.
  - (i) The Contractor shall be responsible for deductibles up to \$25,000.00 maximum of any one loss
- (b) Wrap-Up Liability Insurance in an amount of no less than 10 million dollars (\$10,000,000.00)
  - The Contractor shall be responsible for deductibles up to \$25,000.00 maximum of any one loss

- (c) City of Winnipeg will carry such insurance to cover all parties engaged in the Work in this Contract. Provision of this insurance by the City of Winnipeg is not intended in any way to relieve the Contractor from his obligations under the terms of the Contract. Specifically, losses relating to deductibles for insurance, as well as losses in excess of limits of coverage and any risk of loss that is not covered under the terms of the insurance provided by the City of Winnipeg remains with the Contractor.

**D8.2** The Contractor shall provide and maintain the following insurance coverage at all times during the performance of the Work:

- (a) Automobile liability insurance for owned and non-owned automobiles used for or in connection with the work in the amount of at least two million dollars (\$2,000,000.00).
  - (i) Deductibles shall be borne by the Contractor;
  - (ii) The Contractor shall not cancel, materially alter, or cause the policy to lapse without providing at least fifteen (15) Calendar Days prior written notice to the Contract Administrator;
  - (iii) The Contractor shall provide the Contract Administrator with evidence of insurance of the policy at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than seven (7) Calendar Days from notification of the award of Contract.

**PART E – SPECIFICATIONS**

- E1.2 Page 3 of 4 Revise Title of Drawing 66303D-CE1.03 Delete "...and Lighting Systems"; title to read "Electrical - Floor Plan Lighting"
- E1.2 The following Drawings are affected by this Addendum. Detailed descriptions of the changes are included subsequently in this document under the heading "DRAWINGS"

<u>Drawing No.</u>	<u>Drawing</u>	<u>Description of Change</u>
66303D-CA2.02	ARCHITECTURAL - REFLECTED CEILING PLANS, INTERIOR ELEVATION, & SCHEDULES	Existing drawing revised by comment
66303D-CA4.01	ARCHITECTURAL - BUILDING SECTIONS	Existing drawing revised by comment
66303D-A6.01	ARCHITECTURAL - PLAN ABOVE ELEVATION 233.520, ROOF PLAN, BUILDING SECTION & DETAILS	Existing drawing revised by comment

**STRUCTURAL**

66303D-CS1.01	STRUCTURAL - GENERAL NOTES AND SCHEDULES	Replace Rev 0 with Rev 1
66303D-CS2.01	STRUCTURAL - PILING PLAN	Replace Rev 0 with Rev 1
66303D-CS2.02	STRUCTURAL - PLAN ABOVE ELEVATION 225.478	Replace Rev 0 with Rev 1
66303D-CS2.03	STRUCTURAL - PLAN ABOVE ELEVATION 231.620	Replace Rev 0 with Rev 1
66303D-CS2.04	STRUCTURAL - PLAN ABOVE ELEVATION 233.520	Replace Rev 0 with Rev 1
66303D-CS2.05	STRUCTURAL - ROOF AND MEZZANINE FRAMING PLAN	Replace Rev 0 with Rev 1
66303D-CS3.01	STRUCTURAL - BUILDING SECTIONS	Replace Rev 0 with Rev 1
66303D-CS3.02	STRUCTURAL - BUILDING SECTIONS	Replace Rev 0 with Rev 1
66303D-CS4.01	STRUCTURAL - DETAILS	Replace Rev 0 with Rev 1
66303D-CS4.02	STRUCTURAL - DETAILS	Replace Rev 0 with Rev 1
66303D-CS4.03	STRUCTURAL – DETAILS	Replace Rev 0 with Rev 1
66303D-CS4.04	STRUCTURAL - SECTIONS AND DETAILS SHEET 1 OF 4	Replace Rev 0 with Rev 1
66303D-CS4.05	STRUCTURAL - SECTIONS AND DETAILS SHEET 2 OF 4	Replace Rev 0 with Rev 1
66303D-CS4.06	STRUCTURAL - SECTIONS AND DETAILS SHEET 3 OF 4	Replace Rev 0 with Rev 1
66303D-CS4.07	STRUCTURAL – STAIR SECTIONS AND DETAILS SHEET 4 OF 4	Replace Rev 0 with Rev 1
66303D-CS5.01	EFFLUENT GATE CHAMBER AND OUTFALL TIE-IN PLAN, SECTIONS AND DETAILS	Replace Rev 0 with Rev 1
66303D-CS5.02	STRUCTURAL - EFFLUENT SAMPLING BUILDING PLAN, SECTIONS AND DETAILS	Replace Rev 0 with Rev 1
66303D-CS5.03	STRUCTURAL - UV CHAMBER ACCESS COVERS PLAN, SECTIONS AND DETAILS	Replace Rev 0 with Rev 1

<u>Drawing No.</u>	<u>Drawing</u>	<u>Description of Change</u>
66303D-CS5.04	MASONRY WALL ELEVATIONS	New Drawing Added
<b>PROCESS</b>		
66303D-CP1.04	PROCESS - UV PUMP INFLUENT WETWELL/CHANNEL	Replace Rev 0 with Rev 1
66303D-CP1.05	PROCESS - AXIAL FLOW PUMP OUTLINE GENERAL ARRANGEMENT AND DETAILS	Existing drawing revised by comment
66303D-CP1.07	PROCESS - UV CHANNEL 1 - MODULES 110/120	Replace Rev 0 with Rev 1
66303D-CP1.10	PROCESS - UV EFFLUENT CHANNEL	Replace Rev 0 with Rev 1
66303D-CP1.11	PROCESS - U-410-AHU-1 SHEET 1 OF 2	Replace Rev 0 with Rev 1
66303D-CP1.12	PROCESS - U-410-AHU-1 SHEET 2 OF 2	Replace Rev 0 with Rev 1
66303D-CP1.13	PROCESS - ELECTRICAL ROOM EMERGENCY COOLING	Replace Rev 0 with Rev 1
66303D-CP1.15	PROCESS - U-430-AHU-1	Replace Rev 0 with Rev 1
66303D-CP1.16	PROCESS - U-430-AHU-2, U-440-EF, U-445-EF SHEET 1 OF 1	Replace Rev 0 with Rev 1
66303D-CP1.17	PROCESS - U453, U454 HEAT EXCHANGERS	Replace Rev 0 with Rev 1
66303D-CP1.18	PROCESS - U471, U472, U473 HEAT PUMPS	Replace Rev 0 with Rev 1
66303D-CP1.21	PROCESS - AIR HANDLING UNIT CHILLER COILS U416, U417, U420, U430	Replace Rev 0 with Rev 1
66303D-CP1.22	PROCESS - AIR HANDLING UNIT HEATING COILS U410, 420, U430, 433	Replace Rev 0 with Rev 1
66303D-CP2.01	PROCESS - PUMP STATION & UV PLAN	Existing dwg revised by comment
66303D-CP2.02	PROCESS - PUMP STATION & UV PLAN	Existing drawing revised by comment
<b>MECHANICAL</b>		
66303D-CM1.02	MECHANICAL - UV FACILITY SITE PLAN EFFLUENT SAMPLING BUILDING MECHANICAL	Replace Rev 0 with Rev 1
66303D-CM4.01	MECHANICAL - MAIN FLOOR VENTILATION PLAN	Replace Rev 0 with Rev 1
66303D-CM4.02	MECHANICAL - ROOF PLAN MECHANICAL PLAN	Replace Rev 0 with Rev 1
66303D-CM5.01	MECHANICAL - MECHANICAL MEZZANINE PLANS LOWER AND UPPER LEVELS	Clarification
66303D-CM8.03	MECHANICAL - VENTILATION SCHEMATICS SHEET 1 OF 2	Replace Rev 0 with Rev 1
66303D-CM8.04	MECHANICAL - VENTILATION SCHEMATICS SHEET 2 OF 2	Replace Rev 0 with Rev 1
<b>INSTRUMENTATION</b>		
66303D-CI1.01	INSTRUMENTATION - UV DISINFECTION CONTROL SYSTEM NETWORK	Replace Rev 0 with Rev 1; Rev 1 subsequently to be revised by comment
66303D-CI2.01	INSTRUMENTATION - LOCATION PLAN ABOVE EL. 232.238	Existing drawing revised by comment
<b>ELECTRICAL</b>		
66303D-CE1.03	ELECTRICAL – FLOOR PLAN LIGHTING	Existing drawing revised by comment
66303D-CE1.07	ELECTRICAL – SITE SECTIONS & DETAILS SHEET 1 of 3	Existing drawing revised by comment
66303D-CE2.01	ELECTRICAL - SINGLE LINE DIAGRAM	Replace Rev 0 with Rev 1

Section 01005 Clause 2.1 clarification:

The Qualified Registered Land Surveyor qualification is required for Work described in 01005 Clause 4.1 (establishment of permanent benchmarks) only.

Section 01010 Clause 4.3 Revise and add new Clause 4.3.2 to Read

4.3 Outfall Tie in

4.3.1 The outfall tie in may be made prior to the pumping and disinfection facilities being complete and fully tied in to the effluent system, provided the effluent passing through the outfall can be isolated from the new Works until such time that secondary effluent can be conveyed through the new Secondary Effluent Channel, through the UV Influent Pumps, through the UV Influent Channel, Distribution Chamber, UV Disinfection Channels and UV Disinfection Effluent Channel.

4.3.2 For illustrative purposes only, a suggested construction sequence is:

- .1 Excavate around outfall at tie in point, removing sufficient material to allow construction of the junction structure around the pipe.
- .2 Build the junction structure in accordance with the structural drawings and specifications.
- .3 Isolate the junction structure from the UV effluent channel with a temporary bulkhead
- .4 During a low-flow event, or over a series of low-flow events, cut and remove the outfall pipe from within the boundaries of the junction structure. Secondary effluent can be allowed to flow through while the temporary bulkhead described in 4.3.2.2 is in place
- .5 Prior to flow being introduced to the new UV building, coordinate plant shutdown with the City to allow removal of temporary bulkhead.

Section 01010 Clause 4.4 Revise and add new Clause 4.4.2 to Read

4.4 Effluent Gate Chamber Baffle Wall

4.4.1 Preparatory Work in the Effluent Gate Chamber may be undertaken at any time when convenient when conditions are suitable (i.e. during low-flow periods), but the dividing structure shall not be permanently fixed until the pumping and disinfection facilities are complete and fully tied in to the effluent system to the point that secondary effluent can be conveyed through the new Secondary Effluent Channel, through the UV Influent Pumps, through the UV Influent Channel, Distribution Chamber, Disinfection Channels, Effluent Channel, Outfall Tie-in and Outfall.

4.4.2 For illustrative purposes only, a suggested construction sequence is:

- .1 Coordinate plant shutdown(s) with the City, dewater the effluent gate chamber as required.
- .2 Install baffle wall framework.
- .3 Repeat 4.4.2.1 and 4.4.2.2 until all required frame installation Work is complete. Do not install the baffle wall stop logs.
- .4 At such time that the UV facility is ready to accept flow (pumps are operational, outfall tie-in in place), Coordinate plant shutdown to allow placement of the baffle wall stop logs in the previously installed framework.
- .5 Request that the City close gate YG-12A at the primary effluent bypass structure to cut off secondary effluent flow into the north conduit which is now dedicated to feeding the UV

Disinfection facility. Request that the City open the gate YG-12B which allows effluent to pass directly to the outfall via the south conduit.

- .6 Remove the knock-out panel isolating the effluent gate chamber from the newly constructed UV influent channel.
- .7 Gate YG-12B may then be opened to admit flow into the UV Disinfection facility. YG-12A may be kept open until such time as the UV disinfection facility is fully operational and able to and required to disinfect the full secondary effluent flow, at which time Gate YG-12A shall be closed..

Section 01210 Clause 1.2 Revise to read:

- .2 The equipment supplied under both of these Bid Opportunities will be delivered to, off-loaded and stored at the City's North End Water Pollution Control Centre (NEWPCC). It is the Contractor's responsibility to accept delivery, offload the equipment under the supply contractor's supervision, place the equipment in the City's storage area, and remove the equipment from the City's storage area for installation.

Section 03250. Add the following clauses:

- 2.1.14 Bituminous Rope Seal: Ramnek Seal or accepted alternate.
- 2.1.15 Epoxy Rope Seal: Oakum rope dipped in low viscosity epoxy.

Section 07525 Clause 3.2.6.1 Revise to read:

Install additional base ply over initial base ply and under cap sheet where walkway is to be laid.

Section 07525 Clause 3.2.6.2 Delete this clause

Section 08100 Clause 2.6 Revise to Read

- 2.6 Roll-up Doors
  - .1 Steel exterior & Interior skin: minimum 18 ga, 24 ga back panels, roll-formed, hot-dipped galvanized; foamed-in-place polyurethane core.
  - .2 Insulation to be as per Manufacturer's specifications (R-value 7.58 or greater)
  - .3 Deleted
  - .4 Springs: 25,000 cycles
  - .5 Track: As per manufacturers specifications w/ weatherstripping & windlock bars.
  - .6 Lock: Electric gear and slide-bolt locks on bottom bar operable from both sides.
  - .7 Weatherstrip: As per manufacturers specifications w/ optional weatherstripping.
  - .8 Finish: Galvanized
  - .9 Operation: Electric Motor c/w electric safety edge (stop & reverse)
  - .10 Standard of Acceptance: Model 800C as manufactured by Kinnear, and installed according to manufacturer's specifications.

Section 09225 Clause 1.6.2 Revise to read:

Perform, maintain cement stucco Work at ambient and substrate temperature above 10 degrees C, below 30 degrees C for a minimum of twenty-four (24) hours prior, during application, and for twenty-four (24) hours after.

Section 09225 Clause 1.6.3 Revise to read:

Stop cement stucco, parging Work when ambient temperature might be expected to drop below 5 degrees C within four (4) weeks after application.

Section 09510 Delete this Section

Section 09730 Clause 2.2.1 Revise to read:

100 % solids, 0 VOC, two-component general service epoxy coating *c/w broadcast texture*. Acceptable manufacturer: Stonhard, STONKOTE GS4.

Section 09730 Clause 3.2.1 Revise first sentence to read:

Coating: Mix coating *with broadcast* according to Manufacturer's recommended procedures.

Section 09730 Clause 3.2.2 Revise first sentence to read:

Coved Mortar Base: Height: 150 mm; trowelled epoxy mortar with coating, feathered to meet floor.

Section 09730 Add new Clause 3.2.3:

Provide Stonhard Texture #2 to Contract Administrator's approval.

Section 11183 Clause 3.2.4

Delete this Clause

Clarification: Fixed weir plate details are shown on Drawing CP1.01, Standard Detail 620

Section 11313A Clause 1.1.4.5

Add "couplings" after "draft tubes"

Section 11313A Clause 2.2.1 Revise to Read:

The equipment will be delivered and off-loaded at the North End Water Pollution Control Centre, under the UV Influent Pump Supply Contract. The City will take custody and store the equipment on-site until required by the Contractor.

Section 11548A Clause 2.2.1 Revise to Read:

The UV equipment will be delivered and off-loaded at the North End Water Pollution Control Centre, under the supervision of Trojan Technologies Inc. The City will take custody and store the equipment on-site until required by the Contractor.

Section 11313A Renumber Clauses 1.1.4.6 through 1.1.4.12 to 1.1.4.7 through 1.1.4.13 and Add new Clause 1.1.4.6

1.1.4.6 Touch up painting of draft tubes, pipework and couplings after installation. Tape wrap couplings and joints with material provided by the pump supplier.

Section 11990A:

Replace Section 11990A with the attached Section 11990A-Rev1.

Section 11990B Clause 1.10

Fourth bulleted line: Replace "...disinfection feed pumps..." with "...UV Influent Pumps...".

Section 11990B Clause 2.2.5

First bulleted line: Replace "The influent pumps..." with "The main plant influent pumps...".

Section 11990B Clause 2.2.6

First bulleted line: Replace "The influent pumps..." with "The main plant influent pumps...".

Section 15800 Clauses 2.2.1 Revise Table to read:

<b>UNIT SOUND (Hz)</b>	63	125	250	500	1000	2000	4000	8000
Radiated	67	66	63	59	53	44	41	36
Unit discharge	81	83	83	81	79	75	75	70
Unit return	82	85	85	85	79	77	77	72

Section 15800 Clause 2.8 Add the following Clause:

.12 Provide ElectroFin coating for corrosion protection on both heating and cooling coils in units located in wastewater treatment process areas.

Section 15800, add the following clause:

**2.13 Air Blender**

- .1 Performance: Capable of 70% range, as determined by the mixed air temperature ratio in relation to the outside air temperature and return air temperature, mixing effectiveness at 25% outside air, one mixer diameter downstream of mixer.
- .2 Pressure Drop: Shall include the pressure loss due to mixer design and the mixer-to-plenum area ratio.
- .3 Material: 2 to 3 mm (0.080 to 0.125 inch) thick aluminum.
- .4 Construction: welded construction.

Section 15940 Clause 4.4.3 Revise as follows:

- 4.4.3 Condenser circulation pump, **U-461-P** will run continuously for temperature control of the condenser loop. The control system shall provide a weekly lead-lag changeover of **U-461-P** and **U-481-P**.

Section 15940 Clauses 4.4.4 Revise as follows:

- 4.4.4 Heating season (Condenser Loop Temperature below 20 degrees C (68 degrees F)):

The condenser supply loop temperature shall be measured with a temperature transmitter located at the glycol inlet piping to the effluent heat exchangers.

Upon the condenser supply loop temperature dropping to the lower setpoint of 3.3 degrees C (38 degrees F), the lead effluent pump shall be energized.

Upon the condenser supply loop temperature dropping to the lower setpoint of 0 degrees C (32 degrees F), the alternate effluent pump shall also be energized.

Upon the condenser supply loop temperature rising to the upper setpoint of 5.6 degrees C (42 degrees F), both effluent pumps **U-451-P** and **U-452-P** shall be de-energized.

Section 15940 Clauses 4.4.5 Revise as follows:

- 4.4.5 Cooling Season (Condenser Loop Temperature above 20 degrees C (68 degrees F)):

Upon the condenser loop temperature rising to the upper setpoint of 27.8 degrees C (82 degrees F), the lead effluent pump shall be energized.

Upon the condenser loop temperature rising to the upper setpoint of 31 degrees C (87.8 degrees F), the alternate effluent pump shall also be energized.

Upon the condenser loop temperature dropping to the lower setpoint of 25.6 degrees C (78 degrees F), both of the effluent pumps **U-451-P** and **U-452-P** shall be energized.

Section 15940, Clause 4.5.3.4 and Clause 4.5.3.5 Revise as follows:

- .3 System Setpoints:

- .4 Space Pressurization +5 Pa (0.02 inches wg) relative to Outside  
.5 Space Pressurization +4 Pa (0.016 inches wg) relative to UV Process Room

Section 15940, Clause 4.5.4.4 Revise as follows:

- .4 Heating Mode:

- .4 The two-way control valve on the heating glycol supply to the heating coil U-410-HC will modulate to maintain a minimum supply air temperature of 11.1 degrees C (52 degrees F) and modulate fully open on a call for heat in the electrical room.

Section 15940, Add Clause 4.5.5.7:

- .5 Cooling Mode:
  - .7 Economizer mode operation will occur when there is a cooling load in the Electrical Room and the outside air temperature is below the return air temperature. During economizer mode, the outside air damper and the waste heat damper will be fully open, and the exhaust damper will be 50% open and the economizer damper is fully closed and the 2-way valve on the chilled glycol supply for the cooling coil will be modulated to provide the required supply air temperature for the duration of the call for cooling. When the outside air temperature is greater than the return air temperature, the outside air damper, waste heat and the exhaust dampers shall close to minimum position and the economizer damper shall open fully.

Section 15940, Clause 4.5.7.1 Revise as follows:

- .7 Freezestats:
  - .1 An averaging-type Freezestat(s) shall be located on the downstream side of the glycol heating coil U-410-HC mounted in the ductwork. Upon sensing a low temperature the outside air damper, the exhaust damper, and waste heat damper shall fully close and the return air damper shall fully open.

Section 15940 Clause 4.7.3.4. Revise to read:

- .3 System Setpoints:
  - .4 Space Pressurization -4 Pa (0.016 inches wg) relative to Electrical Room

Section 15940 Add Clause 4.7.5.6:

- .5 Cooling Mode:
  - .6 Economizer mode operation will occur when the outside air temperature is below the return air temperature. During economizer mode, the outside air damper and exhaust damper will be fully open and the economizer damper fully closed and the cooling coil will be modulated to provide the required supply air temperature. When the outside air temperature is greater than the return air temperature, the outside air damper, waste heat and the exhaust dampers shall close to minimum position and the economizer damper shall open fully.

Section 15940 Clause 4.7.8. Revise to read:

- .8 Waste Heat Ventilation System:
  - .1 When the UV Process Room is in heating mode and the space temperature is below 20 degrees C (68 degrees F), the waste heat damper in U-410-AHU-1 shall modulate open (damper position is controlled by electrical room space pressurization setpoint).
  - .2 During waste heat ventilation mode, the motorized damper on the inlet duct to U-426-EF shall modulate open to maintain a building pressure within the UV Process Room of 0.5 Pa.
  - .3 When the motorized damper on the inlet duct to U-426-EF has been modulated to the fully open position and the UV Room space is pressurized above 1 Pa., the exhaust fan, U-426-EF shall be energized and the VFD shall modulate between minimum and maximum speed to maintain the building pressurization setpoint. In the event that the building pressure drops below 0.5 Pa, the exhaust fan, U-426-EF shall be de-energized.

- .4 When the space temperature in the UV Process Room reaches the upper limit, 20 degrees C (68 degrees F), the waste heat ventilation system shall be de-energized. To de-energize this system, the exhaust fan U-426-EF shall be de-energized, the waste heat damper on U-410-AHU-1 shall be closed and finally the motorized damper on the inlet duct to the exhaust fan shall be modulated fully closed.
- .5 When the indoor space temperature is between 15.6 degrees C (60 degrees F) and 20 degrees C (68 degrees F) with a relative humidity below 30% RH in the UV Process Room, the UV air handling unit U-420-AHU-1 shall be de-energized and the waste heat ventilation system shall heat and ventilate the UV Process area. The air handling unit, U-420-AHU-1 shall be energized, if the space temperature rises above, or below the temperature setpoints or the humidity rises above the setpoint.

Section 15940 Clause 4.7.9.3 and Clause 4.7.9.4 Revise to read:

.9 Humidity Control:

- .3 When the humidity level in the UV Process Room, as measured by the sensor (% RH) in the space, rises 2% above setpoint, the supply and return fans in the air handling unit shall speed up to 100% speed. The outside air and exhaust dampers shall modulate to the maximum open position and the economizer damper shall fully close to minimum position to provide maximum air exchange rates while maintaining a constant supply air temperature of 15.6 degrees C (60 degrees F).
- .4 When the space condition drops 2% below to the humidity space setpoint (% RH), the outside air damper and exhaust damper shall close to minimum position and the economizer damper shall modulate open to maximum position.

Section 15940 Clause 4.8.4.2 and 4.8.4.4 Revise as follows:

.4 Heating Mode:

- .2 The two-way control valve on the heating glycol supply shall modulate the flow of heated glycol to the heating coil to maintain a supply air temperature of 14.4 degrees C (58 degrees C).
- .4 When the space conditions are satisfied, the two-way control valve on the heating coil shall modulate to maintain the supply air temperature of 14.4 degrees F (58 degrees C).

Section 15940 Clause 4.8.5.2 and 4.8.5.4 Revise as follows:

.5 Cooling Mode:

- .2 The two-way control valve on the cooling glycol supply will modulate the flow of chilled glycol to the cooling coil to maintain a supply air temperature of 15.6 degrees C (60 degrees C) during a call for cooling only.
- .4 Economizer mode operation will occur when the outside air temperature is below the return air temperature. During economizer mode, the outside air damper will be fully open and the return air damper fully closed and the cooling coil will be modulated to provide the required supply air temperature for the duration of the call for cooling. When the outside air temperature is greater than the return air temperature, the outside air damper, waste heat and the exhaust dampers shall close to minimum position and the economizer damper shall open fully.

Section 15940 Add Clause 4.8.8 as follows:

.8 Freezestats:

- .1 An averaging-type Freezestat shall be located on the downstream side of the glycol heating coil U-430-HC mounted in the ductwork. Upon sensing a low temperature the outside air damper shall fully close and the return air damper shall fully open.

Section 15940 Clause 4.9.5.1 Revise as follows:

.5 Alarms:

- .1 There shall be a low building temperature alarm signal sent to the DCS when the Washroom space temperature drops below 4.4 degrees C (40 degrees F).

Section 15999 Clause 1.1 Air Handling Unit Schedule: Replace Page 2 with the attached revised Page 2

Air handling unit U-420-AHU-1 revised as follows:

Change Supply Fan U-424-SF and Return Fan U-421-RF as per revised schedule.  
Change length of air handling unit as per revised schedule  
Add "Air Blender" data section to air handling unit

Section 16111 Conduit Raceway Schedule Remarks column revise to read:

"distribution" for conduits C001 through to C006.

Section 16121 Clause 1.2.2

Revise "...privately owned pole coolest to..." to read "...privately owned pole closest to..."

Section 16121 Clause 1.2.6

Revise "...cables shall be placed at least one (1) cable diameter apart..." to read "...cables shall be placed at least 300 mm apart..."

Section 16121 Add Clause 2.1.2

2.1.2 Underground conductors shall be sized to Manitoba Hydro Standards.

Section 16122

Replace Power Cable Schedule with the attached Revised Power Cable Schedule.

Power Cable Schedule Clarification, Cables P012, P013, P014, P015, P016, P017:

The 100 % ground cable (same size as power cables) will have to be taken to each PDC. This will be a separate insulated ground cable

The 200 % neutral could be another cable set which would contain 3 conductor of the same size as the Power Cables (one additional neutral for each phase). The second neutral could run directly past the disconnect switch and into the PDC.

Replace Control Cable Schedule with the attached Revised Control Cable Schedule.

Section 16321 Add this new Section

Section 16330 Clause 1.5.12 Revise to read:

Notify the Contract Administrator three (3) weeks in advance, in writing, of the time, date, and place of the tests. This test will be attended by the Contract Administrator at the Contract Administrator's expense. Any subsequent witness tests due to test failure shall be at the expense of the equipment Manufacturer, but at the direction of the Contract Administrator.

Section 16330 Clause 2.2.1 Revise to read:

.1 Type: FR3 liquid insulated, self-cooled:

Section 16330 Clause 2.2.12 Revise to read:

.12 The low voltage terminals shall be ANSI 389 900 amp dead break live front suitable for underground conductor cables.

Section 16330 Clause 2.8.1 Revise to read:

.1 To be fire-retardant, non-corrosive, chemically, thermally stable FR3, designed to operate with a 65 degree F rise insulation system.

Section 16330 Clause 2.11.1 Revise to as follows

Revise "...25 Amps continuous rated..." to read "...25 Amp 10 second rated..."

Section 16330 Clause 2.15.5 Revise to read:

.5 Pressure-vacuum gauge.

Section 16330 Delete Clause 2.15.7

Section 16330 Delete Clause 2.15.13

Section 16330 Clause 3.1.11 Revise to read:

.11 Wire one (1) set of contacts on liquid temperature measuring device, liquid level gauge, gas detector relay, winding temperature detector relay, to a terminal box and DCS System.

Section 16330 Delete Clause 3.1.12

Section 16330 Delete Clause 3.1.13

Section 16341 Clause 2.2.4 Revise to read:

.4 Outdoor Type

Section 16361 Delete Clause 2.3

Section 16471 Clause 2.2.1 Revise to read:

Replace Panel 100 Schedule with the attached Revised Panel 100 Schedule.

Replace Panel A Schedule with the attached Revised Panel A Schedule.

Section 16721 Clause 3.4.5

Delete the word "building" so that the text reads "...number of hours necessary to provide a seminar on the system for the City".

Section 16811 Clause 1.3.1

Add the word "three" so that the text reads "In general there are **three** categories of starting equipment for three phase motors".

Section 16811 Clause 2.6.1

Revise "...installed in with starter as indicated" to read "...installed in each starter as indicated".

Section 16811

Replace Motor Schedule with attached Revised Motor Schedule

Valve actuator tag numbers modified. U-473-HP circuit references changed from 55, 57, 59 to 56, 58, 60.

Section 16815 Clause 1.4.2.6 Replace with the following:

6. The Contractor shall conduct an harmonic analysis of the entire electrical system upon completion of fine-tuning and commissioning of the installation. The harmonic analysis shall be conducted at 50%, 75%, and 100% speed of all VFDs, and at 50%, 75%, and 100% loading of all other non-linear loads and perform a Fourier (FFT) transform analysis spectrum for each waveform covering the fundamental to the 31st harmonic. The Contractor shall submit a report to the Contract Administrator. The harmonic analysis shall be done by J.R. Stephenson Mfg. Ltd.

Should the waveform analysis indicate that the harmonic levels (voltage and current) at the various points and under various load conditions as defined in the previous paragraph exceed recommended level as stated in the IEEE 519 Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems, then the Contractor shall provide all the necessary line filtering equipment to correct the harmonic distortion.

The Contractor shall allow in his bid a lump sum of \$80,000 to cover the cost of additional filtering equipment, if the additional filtering is required.

Section 16815 Clause 3.1.2.4 Revise to read:

Contractor shall connect all necessary process and electrical interlocks to the VFD. These might typically be (but not be limited to) fire alarms. These interlocks will be active in both the Hand (local) and Auto (remote) configurations.

Section 16820 Delete Clause 3.1.20

Section 16820 Delete Clause 3.1.22

Section 16820 Delete Clause 3.1.23

Section 16990

Replace Page 4 with the attached System Completion and Commissioning form.

Section 17110 Add Clause 2.5.12

12. All PLC inputs and outputs (including spares) must be wired to terminal blocks. Terminal blocks shall be grouped according to I/O type. Each I/O point shall be individually fused with indicating fused type terminal blocks. All analogue loops shall contain disconnect type blocks for current loop verification.

Section 17124 Clause 3.3.5 Revise to read:

- .5 Splices in instrumentation cable runs shall not be allowed without obtaining prior approval from the Contract Administrator.

Section 17500 Clause 2.1 .14

Revise "...system suitably sized to maintain the panel load for at least sixty minutes" to read "...system suitably sized to maintain the panel load for at least 30 minutes".

Section 17600

Replace UV PLC I/O Index with the attache Revised UV PLC I/O Index

Replace DCS I/O Index with attached Revised DCS I/O Index

Section 17700

Replace Instrument Index with attached Revised Instrument Index

Section 17702 Clause 1.2 .1 Revise to read

- .1 The following Drawings show typical instrument loop wiring diagrams, they are not included as a definitive list, and any other drawings required will be supplied by the Contractor. One (1) Drawing per loop will be completed and submitted for approval after award of Contract. The following twenty (20) example Drawings are an integral part of this Specification Section.

**DRAWINGS**

**Drawing 66303D-CA2.02 Rev. 0 Revise as Follows**

Detail 1: Interior Elevation – Control: Window note to read; “6 mm tempered glass window c/w center mullion & hollow metal frame”.

Revise Finish Schedule as follows:

Effluent Sampling Building Wet Room revise Ceiling Material to read "R. Deck"

Effluent Sampling Building Dry Room revise Ceiling Material to read "R. Deck"

Insert the following into the Finish Schedule

Room No	Room Name	Floor				Walls												Ceiling			
		Flooring		Base		North			East			South			West						
		Mat	Col	Mat	Col	Mat	Fin	Col	Mat	Fin	Col	Mat	Fin	Col	Mat	Fin	Col	Mat	Fin	Col	HGT
201	Mechanical (Mezz)	Epoxy	A	Epoxy CV	A	CB	PT	C	CB	PT	C	CB	PT	C	CB	PT	C	OWSJ	PT	N/A	2600

**Drawing 66303D-CA4.01 Rev. 0 Revise as Follows**

Typical Roof Construction Listing to read “2 layers 1/8” recovery board – staggered joints”.

**Drawing 66303D-A6.01 Rev. 0 Revise as Follows**

Typical Roof Construction Listing to read “2 layers 1/8” recovery board – staggered joints”.

**Drawing 66303D-CS1.01 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Standard Abbreviations - add “Concrete Masonry Unit C.M.U.”
3. Masonry Wall Schedule - delete MW-3 and add the word “CONC.” to the “TYPE” column.
4. Concrete Beam Schedule - add new concrete beam type “CB-5” and revise reinforcing to concrete beams CB-1, 2, 3, and 4.
5. Concrete Slab Schedule - revise reinforcing to slab types S-1, S-8, and S-9.
6. Concrete Wall Schedule - add new concrete wall type “CW-9”.

**Drawing 66303D-CS2.01 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Piling Plan - add notes to dimension from piles to existing interceptor pipe and revise dimension “25561” to “25560” between grid lines 1 and 2.

**Drawing 66303D-CS2.02 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Detail A/S2.02 and Section 1/S2.02 - add the new Detail and Section and slab pour sequence for the Outfall Chamber.
3. Plan Above Elevation 225.478

Revise note to "PUMP BASE SLABS" at west of grid line 1.

Plan Above Elevation 225.478 - Revise wall type no. 6 on the north wall of the UV Effluent Channel and on the south wall of the UV Effluent Channel from grid line A to the intersection with the Bypass Channel to wall types 2 and 9 as shown.

Delete stop log and related information in the UV Effluent Channel south of grid line A.

Add note to indicate unloading excavation.

Revise last line of "SUGGESTED CONSTRUCTION SEQUENCE" to "REFER TO DETAIL A/CS2.02".

Revise note "EL. SECTION 4/CS3.02" to outfall chamber at east of grid line 2.

**Drawing 66303D-CS2.03 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Plan Above Elevation 231.620

Revise note for slab elevation to "EL. SEE SECTION 4/CS3.02" for Outfall Chamber.

Add note "EXISTING – NEW" at intersection of the existing Effluent Gate Chamber and the Secondary Effluent Channel.

Revise CB-1 to CB-5 at secondary effluent cross over south of Secondary Effluent Channel.

Add note "\*FROM EL. 228.178" at east of grid line 2.

Add note at the north of grid line A.

**Drawing 66303D-CS2.04 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Notes - delete Note No.3.
3. Plan Above Elevation 233.520

Revise note to "EFFLUENT SAMPLING BLDG. REFER TO DWG 5.02 FOR PLAN AND SECTIONS" at the Effluent Sampling Building.

Revise slab notation from "S-10" to "S-1" at the UV Effluent Channel.

Remove slab indication S-10 from the Transformer Pad located south of UV Building.

Add note "REFER TO SECTION GG/S5.01" to the Transformer Pad located south of UV Building.

Add note "SEE MECH. DWG." to hidden lines running south of grid line A.

Revise note to Transformer Pad located at north of grid line A.

**Drawing 66303D-CS2.05 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Roof Framing Plan - revise elevation notation for parapets and revise roof deck support angle notation.

**Drawing 66303D-CS3.01 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.

**Drawing 66303D-CS3.02 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.

**Drawing 66303D-CS4.01 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Concrete Slab Construction Joint - delete detail.
3. Floor Expansion Joint Typ. – add the new Detail.
4. Expansion Joint Typ. – revise title to read "Wall Expansion Joint Typ." and delete the note "12 x 25 REGLET".
5. Typical Aluminium Bolted Cover & Frame Detail and Aluminum HSS Framed Cover & Frame Detail - classify details to be "Top Seat" and "Side Seat", and add detail numbers.

**Drawing 66303D-CS4.02 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. OWSJ to Masonry Connection - show roof deck support angle and revise the "U" block.
3. Typical Vertical Reinforcing Detail - revise 15M bar to 20M bar.
4. Steel Beam Bearing on Masonry Wall - delete masonry and deck angle above steel beam.
5. Masonry Support at Foundation and Masonry Support at Wall - label the weld plates.
6. Typical Bond Beam Details, Typical Lintel, and Lintels (Table) - revise lintel and bond beam details and information.

**Drawing 66303D-CS4.03 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Aluminum Handrail – replace with Aluminum Handrail/Guardrail detail.
3. Aluminum Ladder Detail - delete reference to "GALV."

**Drawing 66303D-CS4.04 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Detail F/S3.01 - add expansive waterstop to intersection of slab to foundation wall.
3. Details A/S3.01, B/S3.01, and G/S.301 - revise rebar spacing.

4. Detail C/S3.01 - revise upstand reinforcing.
5. Detail F/S3.01 - revise aluminum floor cover details.
6. Details A/S3.01 and B/S3.01 - revise "HANDRAIL" to "GUARDRAIL".

**Drawing 66303D-CS4.05 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Details R/S3.02 and S/S3.02 - miscellaneous revisions.
3. Add Detail RR/S4.05 and Sections 1/S4.05 and 2/S4.05.

**Drawing 66303D-CS4.06 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Sections U/S3.02 and X/S3.02 - revise reinforcing in upstand.
3. Section V/S3.02 - add dowel to concrete floor expansion joint along with note.
4. Sections Y/S3.02 and Z/S3.02 - add keyways with note.

**Drawing 66303D-CS4.07 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. General revision to entire sheet.

**Drawing 66303D-CS5.01 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Plan (Effluent Gate Chamber) - revise the notation to "ALUMINUM W200x27 EACH END (GALV.)".
3. Detail KK/S5.01 - add dowels to concrete expansion joints
4. Section 2/S5.01 – add dowels with note to expansion joints.
5. Detail JJ/S5.01 - add dowel.
6. Section 2/S5.01 and Details HH/S5.01 and JJ/S5.01 - add expansive waterstop.
7. Detail GG/S3.02 - revise dimensions.
8. Plan Detail AB/S5.01 and Elevation AC/S5.01 - general revisions.
9. Section 1/S5.01 - revise note concerning the seal.
10. Plan (Outfall Tie-In) - revise notes under the plan and delete pour strip dimension string and pour strip lines.

**Drawing 66303D-CS5.02 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. General revision to entire sheet.

**Drawing 66303D-CS5.03 Replace Rev. 0 with Rev. 1.**

1. Title Block – "Sheet \_ of 18" notation revised.
2. Section 3/S5.03 - add note "SECURE TO CONC."
3. Partial Main Floor Plan
  - Revise weir gate access floor cover at east end of UV Channels into 2 sections.
  - Relocate section mark "2/S5.03".
  - Add section mark "7/S5.03".
  - Add section mark 1SIM/S5.03 for PLT. 5 north of grid line B.
  - Add notes "300x300 SAMPLING DOOR IN COVER PL.", "750x750 FRAME AND COVER (HINGED) SEE DETAIL 3/CS4.01", and "900x900 FRAME AND COVER (HINGED) SEE DETAIL 3/CS4.01".
4. Section 4/S5.03 - revise the word "REMOVABLE" to "OPERABLE".
5. Section 5/S5.03 - add operable floor cover support arms.
6. Detail B/S5.03 - revise dimension.
7. Section 7/S5.03 – add the new Section.

**Drawing 66303D-CS5.04 Rev 0. Added**

1. Add New Drawing 66303D-CS5.04 Masonry Wall Elevations to Part E Drawing set.

**Drawing 66303D-CP1.04 Replace Rev. 0 with Rev. 1**

Fault output added from level transmitter LIT- U005.

**Drawing 66303D-CP1.05 Rev 0. Revise as Follows**

A third flexible coupling is to be supplied by the City for each pump. Install these couplings at the centre of each 1200 mm diameter lateral intake pipe.

**Drawing 66303D-CP1.07 Replace Rev. 0 with Rev. 1**

Fault outputs added from transmitters FIT- U060 and LIT- U170.

**Drawing 66303D-CP1.10 Replace Rev. 0 with Rev. 1**

Valve tag numbers revised

**Drawing 66303D-CP1.11 Replace Rev. 0 with Rev. 1**

Dampers U-413-MD and U-414-MD transposed on drawing.

Second Room Differential Pressure Transmitter UA-410-PDT-2 added.

**Drawing 66303D-CP1.12 Replace Rev. 0 with Rev. 1**

Supply fan tag number changed to U-416-SF.

Temperature switch U417-TSL moved to supply air duct and re-numbered U410-TSL.

**Drawing 66303D-CP1.13 Replace Rev. 0 with Rev. 1**

Fan U-419-EF computer input identifier changed from YC to YS.

**Drawing 66303D-CP1.15 Replace Rev. 0 with Rev. 1**

Pressure switch U430-PDSH deleted.

Fan coil unit positions moved to supply air side of fan.

Temperature switch U430-TSL moved to supply air duct.

**Drawing 66303D-CP1.16 Replace Rev. 0 with Rev. 1**

Pressure switch U433-PDSH deleted.

Fan coil unit positions moved to supply air side of fan.

**Drawing 66303D-CP1.17 Replace Rev. 0 with Rev. 1**

HX extension added to heat exchanger tag numbers.

Level switch deleted on Glycol feed unit U474.

**Drawing 66303D-CP1.18 Replace Rev. 0 with Rev. 1**

Tag number of Fan U-460 changed to U-466

**Drawing 66303D-CP1.21 Replace Rev. 0 with Rev. 1**

Descriptions on cooling coils changed.

PBV-1 changed to actuated valve, differential pressure transmitter added, connections to PBV-1 modified

**Drawing 66303D-CP1.22 Replace Rev. 0 with Rev. 1**

Descriptions on heating coils changed.

PBV-2 changed to actuated valve, differential pressure transmitter added, connections to PBV-2 modified.

**Drawing 66303D-CP2.01 Rev 0. Revise as Follows**

Note 2: replace "Drawing P1.02" with "Drawing CP1.05".

**Drawing 66303D-CP2.02 Rev 0. Revise as Follows**

Note 2: replace "Drawing P1.02" with "Drawing CP1.05".

**Drawing 66303D-CM1.02 Replace Rev. 0 with Rev. 1**

Provide one 150 mm x 300 mm Door Grill in each of the 2 doors in the Sampling Building.

Clarification: All of the compressed air piping from the UV facility to the Sampling Building is to be 900 mm below grade and rise up within each of the buildings. The compressed air piping shall not rise up the exterior of the building and penetrate the wall above grade.

**Drawing 66303D-CM4.01 Replace Rev. 0 with Rev. 1.**

Relocated return air duct and return and outside air dampers for the Control Room air handling unit U-430-AHU-1.

Clarification: The supply air duct for U-420-AHU-1 and the exhaust duct for U-426-EF within the UV Process area shall be constructed of Type 316 stainless steel in accordance with SMACNA duct construction standards.

**Drawing 66303D-CM4.02 Replace Rev. 0 with Rev. 1**

Increased roof opening sizes by 150 mm for all of the duct penetrations as shown.

**Drawing 66303D-CM5.01 Rev 0.**

Clarification: All supply air duct from the discharge of both of the supply fans in U-410-AHU-1 to the heating coil (U-410-HC) located in the supply air duct shall be externally insulated with 50 mm insulation complete with a PVC jacket.

**Drawing 66303D-CM8.03 Replace Rev. 0 with Rev. 1.**

Deleted one freezeostat from U-410-AHU-1. Relocated one freezeostat from within air handling unit U-410-AHU-1 to location downstream of duct mounted heating coil U-410-HC.

**Drawing 66303D-CM8.04 Replace Rev. 0 with Rev. 1.**

Relocated freezeostat from within air handling unit U-430-AHU-1 to location in duct downstream of heating coil U-430-HC. Relocated temperature transmitter from mixed air location to return air location.

Clarification: The heating and cooling coils shall be downstream of the supply fan.

**Drawing 66303D-CI1.01 Replace Rev. 0 with Rev. 1**

CCTV cables from Process Control Wiring Closet identified. Modbus cables from UV System Control Centre added.

**Drawing 66303D-CI1.01 Rev 1**

Add note "Operator Workstation provided by Others"

**Drawing 66303D-CI2.01 Rev. 0 Revise as Follows**

Change "U060 LIT" to "U060 FIT"

Add one additional level element and level transmitter at the upstream end of each UV Channel, for a total of three: U170 LE/U170 LIT, U270 LE/U170 LIT, and U370 LE/U370 LIT

Add NOTE 1: Locations and installation methods for LE, RE and Transmitters to be agreed upon on site.

**Drawing 66303D-CE1.03 Rev 0 Revise as Follows**

Luminaire specified for Type "G1" shall be replaced with the following:

Keen-Widelite Flood Pak Series, Catalogue Number FP-M-150-PS-L-1-B

Lamp and Mounting shall remain as indicated on the Luminaire Schedule

**Drawing 66303D-CE1.07 Rev 0 Revise as Follows**

Modify Section D/E1.02 to have two additional 75 mm ducts within the concrete envelope, for control wiring between the 5 MVA transformer and associated equipment to the 5 kV switchgear in the building. One duct will contain Cable #U930-1 (10/C #14). The second duct will be a spare. Cable U930-1 will be extended to UV Control Panel UVCP1 as indicated on Drawing ILD-07

**Drawing 66303D-CE2.01 Replace Rev. 0 with Rev. 1**

Revised as follows:

1. Transformers LST-4 and LST-5 shall be rated at 1.25MVA in lieu of 1.5MVA.
2. Cables connecting the Pump Station VFD to the Harmonic Filter shall be as indicated below:

Pump P5 - Cable between Filter and VFD – P023  
Pump P4 - Cable between Filter and VFD – P024  
Pump P3 - Cable between Filter and VFD – P025  
Pump P2 - Cable between Filter and VFD – P026  
Pump P1 - Cable between Filter and VFD – P027