

June 11, 2018

Dear Sir:

Attached is Addendum No. 6 dated June 11, 2018 to the Specifications for The Manitoba Water Services Board Contract No. M.W.S.B.1423, City of Portage la Prairie Phase 2A Water Treatment Plant Upgrades. Please verify receipt of this Addendum for our records by fax to (204) 726-6290.



**ACKNOWLEDGEMENT OF RECEIPT OF ALL ADDENDUMS
MUST BE INCLUDED IN THE TENDER SUBMISSION.**

Failure to include acknowledgement shall cause the tender to be rejected. If Tender is submitted before Addendum is issued, the Board will accept a faxed acknowledgement prior to the tender closing.

Yours truly,

R. Lytle
Construction Manager

The Manitoba Water Services Board
Unit #1A - 2010 Currie Blvd.
Brandon, MB R7B 4E7

Dear Sir:

We have received Addendum No. 6 dated June 11, 2018 to the Specifications for The Manitoba Water Services Board Contract No. M.W.S.B.1423, City of Portage la Prairie Phase 2A Water Treatment Plant Upgrades.

Yours truly,

Company

Per

THE MANITOBA WATER SERVICES BOARD

CONTRACT NO. M.W.S.B. 1423

**City of Portage la Prairie
Phase 2A Water Treatment Plant Upgrades**

ADDENDUM NO. 6

Date: June 11, 2018

1) PRECEDENCE

This Addendum is issued prior to Tender closing to provide for certain revisions as noted herein.

This addendum forms an integral part of the specifications describing all aspects of the work and is to be read in conjunction therewith.

All work shall be performed in accordance with the Contract Documents.

2) SCOPE

The purpose of this addendum is to amend the following sections of the Tender Documents:

.1 **Replace** Section 01005, Clause 1.1.1.1 with the following:

.1 Section 03150, 3.13.

.2 **Replace** Section 03150 with the attached Section 03150.

.3 **Replace** Section 03250, Clause 2.1.3 with the following:

.3 Non-ferrous grout: pre-mixed, non-shrink, Master Builders 713, Sika M-Bed, CPD Non Shrink Grout, Steel C1 Grout, W.R. Meadows CG-86, W.R. Meadows V3-10K/V1, minimum 35 MPa compressive strength.

.4 **Replace** Section 03250, Clause 2.1.6 with the following:

.6 Moisture retention film at: Master Builders Confilm, Sika Film, TK Products Tri-Film, or W.R. Meadows EVAPRE.

.5 Refer to Drawing 30-S102 (Addendum 3).

.1 **Amend** notes reading “HDPE LINER GLUED TO CONCRETE STRUCTURE, TYP. TO MANUFACTURER'S INSTRUCTIONS”

to read

“CONCRETE LINER ADHERED TO CONCRETE STRUCTURE, TYP. TO MANUFACTURER'S INSTRUCTIONS”.

.2 **Amend** note reading “REMOVE AND RE-INSTALL EXISTING VENT PIPE AS REQUIRED FOR INSTALLATION OF HDPE LINER”

to read

“REMOVE AND RE-INSTALL EXISTING VENT PIPE AS REQUIRED FOR INSTALLATION OF CONCRETE LINER”.

END OF ADDENDUM

CONCRETE LINING SYSTEM

1. GENERAL

1.1 Description

- .1 Provide concrete lining system (liner) to effectively protect the exposed concrete surfaces from corrosion in the Ozone Contactors and Recarbonation Chamber.
- .2 Liner material shall be impermeable to ozone gas and liquids and shall not promote bacterial or fungal growth.
- .3 Liner material shall meet the requirements of NSF/ANSI 61.
- .4 The liner shall be continuous and free of pinholes both across the joints and in the liner itself.
- .5 Liner shall have continuous surface without any visible joints.
- .6 Spray applied liner system shall be fully adhered to the concrete structure with pre-treatment process and primer products approved by the liner manufacturer.
- .7 Field inspection and testing of installed liner by the Manufacturer or qualified third party testing agency nominated by Manufacturer and paid by the Contractor.

1.2 Related Work

- .1 Section 03100 – Concrete Formwork.
- .2 Section 03200 – Concrete Reinforcement.
- .3 Section 03300 – Cast-in-Place Concrete.

1.3 Quality Assurance

- .1 Provide in accordance with Section 01400 and as specified herein.
- .2 Contractor shall take all necessary measures to prevent damage to installed lining from equipment and material used in or taken through the work.
- .3 Damage to the liner installation shall be repaired by the Contractor at no additional cost to the City.
- .4 Contractor Qualification:
 - .1 The Contractor shall obtain from the lining system manufacturer an affidavit attesting to the successful use of its material as a lining for water treatment structures for a minimum period of five (5) years in exposed to ozone recognized as corrosive or otherwise detrimental to concrete.
 - .2 All equipment used for lining system application and testing procedure shall be approved by liner manufacturer.

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1.4 Submittals for Review

- .1 Submit the following in accordance with Section 01300 – Submittals:
 - .1 Proposed details for liner installation at seams, terminations, corners, openings, pipe and cable penetrations, etc.
 - .2 Pre-inspection report.
- .2 Manufacturer's technical, performance data and installation procedures including pre-treatment, and primer, liner manufacturer physical and chemical testing data.
- .3 Submit a 0.10 square metre sample of the proposed liner material.
- .4 List of all equipment to be used in the liner system application and testing procedure. The Contractor shall obtain from the lining system manufacturer an affidavit confirming all equipment to be used in this project is approved by them.
- .5 Proof of installer's qualifications.

1.5 Submittals for Information Only

- .1 Submit the following in accordance with Section 01300 – Submittals:
 - .1 Applicable maintenance information.
 - .2 Evidence of installer's experience for similar installations; refer to Subsection 1.4.
 - .3 Certified warranty as specified below.
 - .4 Records of installation as described below.

1.6 Delivery, Storage and Handling

- .1 Transport, handle and deliver materials to the job site in the manufacturer's sealed bags, unopened containers or banded pallets.

2. PRODUCTS

2.1 General

- .1 Spray applied lining system with modified polyurea shall be installed on existing concrete surfaces as noted on Drawings.

2.2 Manufacturers

- .1 Approved manufacturer:
 - .1 Nukote Coating Systems or approved equal.

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2.3 Material

- .1 Pretreatment / Hydro Lock: Nukote HLT-SR by Nukote Coating Systems.
- .2 Primer: Nukote EP Prime II Epoxy (double priming) Nukote Coating Systems.
- .3 Coating: Nukote XT Plus Modified Polyurea Nukote Coating Systems.
- .4 Liner system once installed shall be free of cracks, cleavages, or other defects adversely affecting the protective characteristics of the material.
- .5 Liner material shall be medium gray in color.

2.4 Dimensions

- .1 Primer: Double priming.
- .2 Coating: Shall be minimum 3 mm / 120 mils thick.

2.5 Physical Properties Test Requirements

- .1 Liner shall have the physical properties listed in the table below when tested at 25° C plus:

TECHNICAL DATA (All values @ 77 °F / 25 °C)	US	Metric
Solids by volume (ASTM D2697)	100%	100%
Volatile organic compounds (ASTM D2369)	0 lb./gal	0 gm/ lit
Specific Gravity of materials (ASTM D792)	A: 9.35, B: 8.43 lbs./gal	A: 1.12, B: 1.01 kg/ liter
Viscosity at 158 °F/70 °C in cps ±10% (ASTM D4878)	A-260, B-450	A-260, B-450
Tensile strength (ASTM D412-C)	2250 to 2600 psi	14 to 21 MPa
Elongation (ASTM D412-C)	50-100 %	50-100 %
Hardness (ASTM D2240)	45 to 50 Shore D	45 to 50 Shore D
Flexibility	(2mm mandrel ASTM D522)	(2mm mandrel ASTM D522)
Water vapour transmission rate (ASTM E96)	0.035-0.038grains/hr-ft2	0.2 to 0.3gms/hr-m2
Water absorption -24 hours (ASTM D570)	~ 1 %	~1%
Tear strength (ASTM D642)	250 to 350 pli	40 to 45 Kn/m
Impact Resistance (ASTM G14), No Holidays	> 175 in-lbf	> 16 J (N-m)
Fire Rating (ASTM E108)	Meets Class A for Flame spread	
Flash point Pensky Martin	>200 °F	>93 °C
Service temperature (Dry)	-40 °F to 250 °F	-40 °C to 120 °C
Abrasion Resistance (ASTM D4060) weight loss	< 20 mg loss Taber CS 17 wheel 1Kg/1000 rev	

3. EXECUTION

3.1 Pre Inspection

- .1 Prior to the actual starting of the project there shall be a full final site inspection with all parties, to determine the extent of any surface or structural repairs, cracks that may require

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further rectification, inspection of the expansion joints, and treatment systems for different areas.

3.2 Surface Preparation

- .1 All concrete surfaces to be coated shall be Abrasive blasted or Ultra High pressure water blasted to expose voids (bug holes) and pin holes and to remove surface coatings, contaminants or other latent materials that can inhibit adhesion to the substrate. Reference SSPC SP13.
- .2 After exposure of the voids and removal of latent materials, filling of the exposed bug holes and pinholes is required using an approved skim coat material. Skim coat fillers to be trowelled over the affected areas and scrubbed into voids and pin holes, taking care to apply evenly and using only the minimum amount of filler necessary to fill the imperfection. The purpose of the skim coat filler is to fill voids, holes and defects only; it is not intended to resurface the concrete substrate. The skim coated areas area shall be sanded with an abrasive paper to remove any lumps and inconsistencies to ensure the repaired area is smooth and even to meld in with the general floor profile. The dry skim coating must be lightly abraded with rotary polisher sanders to remove any surface gloss prior to applying prime.

3.3 Concrete Repairs

- .1 Any repairs to the concrete or where loose spalled areas are present after high pressure blast, repaired to bring the surface to a flush finish. The repair medium must be epoxy in shallow areas and finished with a rough texture and with material approved by Nukote such as **Premera Polypatch CB Epoxy** prior to use. No Cement based repair products shall be used unless the thickness is in excess of 10mm and proprietary polymer modified repair product approved by Nukote.

3.4 Termination for Polyurea

- .1 The termination of the Nukote Polyurea is recommended to take place at the outside edge of the external chamfer.
- .2 All terminations have to be above a safe limit over maximum immersion level.
- .3 A masking tape shall be used at the outside edge and shall be removed immediately after spraying and gelling and before the material shall achieve any strength.
- .4 Alternatively a wire or fibre trim tape can be used to cut through the Polyurea whilst still curing and within a 2 – 4 hour period.

3.5 Treatment of Construction Joints

- .1 All construction joints shall be identified and a grinder shall be used to chase the joint the width of a Diamond blade cut (approximately 6mm wide) and a depth of 6mm.
- .2 This cut shall be cleaned dust and debris free.
- .3 The saw cut shall then be filled and tooled flush with a flexible sealant and is recommended to be **Nukote JF -HM** or Nukote approved equivalent.

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3.6 Treatment of Expansion Joints

- .1 Existing expansion joints shall be high pressure water blasted at a required pressure sufficient to remove existing joint sealant and backing rod.
- .2 After cleaning and allowed to dry, the expansion joints shall be reinstalled using the correct size closed cell circular backing rod, filled with **Nukote JF-HM** sealant and tooled flush. The thickness of sealant shall be as standard Sika data, dependent upon the joint width.

3.7 Products for Pretreatment, Hydro Lock and Concrete Protection

- .1 HLT-SR
 - .1 Apply at the rate of approx. 150 sq ft/gallon using a spray pump at 1500 psi after opening the pores by blasting or grinding and removal of any surface laitance. Leave it for 24 hours.

3.8 Primer Application

- .1 Apply **Nukote EP Prime II** concrete primer using single component high pressure airless spray equipment, brush or roller, ensuring gloss finish. Back roll if the primer is sprayed and work well into substrate. Prime all corners and edges with brush.
- .2 If spray application is utilized, ensure back rolling to work primer well into the substrate.
- .3 If the primer soaks in and exhibits dry areas, re-prime.
- .4 The **Nukote EP Prime II** shall be applied only on dry, well prepared concrete surfaces.
- .5 The **Nukote EP Prime II** shall be applied up and into the formed 6mm termination grooves.
- .6 The **Nukote EP Prime** primer shall be applied as per Nukote Product Data sheet and in conjunction with manufacturer's method statement.
- .7 Expansion joints shall have a 50mm wide Silicon Tape, PVC Tape or Waterproof backed cloth Duct Tape affixed centrally over the joint. Care shall be taken as to ensure air is not trapped under the tape when fixing. The tape shall be fixed just prior to application of the Polyurea. This tape is to act as a debonding mechanism over the joint to allow for greater movement capabilities.
- .8 All expansion joints shall be stripe coated over the affixed debonding tape with Nukote Polyurea at 3 – 4 mm at a 200mm width and allowed to gel prior to over coating with the specified thickness for the particular location. The thickness of Polyurea over the joint after completion shall be a minimum DFT of 5mm.

3.9 Polyurea Application

- .1 Using a Plural component Heated spray unit apply **Nukote Polyurea XT Plus** to the prepared surface area. Prior to applying the polyurea rebuild coat use a suitable ink marker to define the area to be coating ensuring the surface to be recoated has been thoroughly prepared. It is extremely important that only treated areas are recoated with no spray

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overlapped onto untreated polyurea surfaces or non-primed concrete surfaces. Masking of areas not to be coated is required.

- .2 The use of wire or fiber trim tape shall be used to create straight edges when terminating the sprayed Polyurea. Duct tape or masking tape can be used but **MUST BE REMOVED IMMEDIATELY** after spraying whilst the Polyurea is still gelling to form a defining straight edge.
- .3 The new areas being coated shall be split into sections only large enough to complete the spraying, to finish, within a shift. This is to include any adhesion or thickness testing (DFT) and patching.
- .4 All 90 degree internal corners shall be stripe coated over and allowed to gel prior to application of the finish coat of Polyurea.
- .5 If any application goes beyond the primer open time, then re-priming is required.
- .6 If membrane over coating is not completed within a 4 hour period of initial application, then repriming is required.
- .7 During application of coating, using a sharp trimming knife, cut 1cm squares from the new coating application (random every 20 m²) to establish that the new membrane thickness meets minimum thickness for that particular location.
- .8 Save the coupons and log the DFT measurements relevant to the areas sprayed for use in the QA ITP program that form part of these works.
- .9 Apply the full DFT application immediately in any one work area before moving on to the next work section. Repair DFT measurement areas immediately after coupons are logged.
- .10 A visual inspection shall take place for any pinholes and or defects that will require repair by re-spraying.
- .11 Any defects found shall be identified by marking with marker pen (not wax crayon) and immediately spot re-sprayed with Polyurea.
- .12 This operation shall be completed within a 4 hour window of initial application otherwise repriming will be a requirement.

3.10 Polyurea Surface Priming Preparation for Overlapping on Day Joints

- .1 Surface pre preparation is conducted by complete abrading by Industrial scotch pad and followed by thorough MEK washing. This is followed no longer than 20 minutes by Intercoat adhesion primer application using **Nukote IC Prime**.
- .2 The **Nukote IC Prime** is mixed and applied as per product data sheet, but shall be applied thinly (as per the PDS) with care taken not to miss any areas to ensure complete coverage.
- .3 Once the primer reaches a tacky stage (not stringy) and can be walked on without pick up or tack free, application of the Polyurea can take place.

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- .4 If any application goes beyond the primer open time of 8 – 12 hours (temperature dependent) then repriming is required.
- .5 If membrane to membrane over coating is not completed within a 4 hour period of initial application, then reactivation is required by MEK wiping only.

3.11 Sealing of Trimmed Edges of Newly Applied Nukote Polyurea

- .1 After the Polyurea has been applied and the edges trimmed neat by the use of trim tape or in some instances a trimming knife, the following method of sealing shall be completed.
 - .1 Edges must be checked for any minor loose edges that need to be trimmed off.
 - .2 The edge between the previous days' Polyurea and the new Polyurea shall be slightly abraded by 3M Scotch Pad (Industrial) or mechanical rotary wire brush.
 - .3 The edge shall be wiped using MEK or Acetone
 - .4 A bead of **Sika AT Bond Universal or approved equivalent** shall be applied to the prepared edge and tooled to flush finish.
 - .5 This seal shall be left to dry as per the manufacturers product data sheet before putting the facility back into use.

3.12 Inspection and Quality assurance

- .1 The Application Contractor shall provide a daily record of all application process information, including temperatures, relative humidity, dew point, procedures and inspection data and monitored by Nukote personnel or a Qualified Coating inspector nominated by Nukote Coatings.

3.13 Warranty

- .1 Contractor hereby warrants the Work of this Section for ten (10) years replacement warranty from the date of Final Completion.

END OF SECTION