



ADDENDUM

PROJECT TITLE: Sea Wall Refurbishment	ADD. NO: 2
TENDER NO: 2021-081201T	DATE: February 24, 2021
PAGE 1 of 6 (Including Confirmation Sheet)	

Make the following modifications to the above project. Include in the amount of the Tender, any additions to or deductions from the cost of the work by reason of these instructions.

Sign and attach this Addendum to the Tender documents and submit with your Tender. Failure to do so may result in the rejection of your Tender.

1. Section 03 20 00 2.1.6.1 – “Red Head Epcon S7” shall be replaced by “Read Head Epcon C6+”. See attached revised Section 03 20 00.
2. Section 03 30 00 2.1.15.1 – W. R. Meadows “Rezi-Weld 1000” is added as an approved bonding agent. See attached revised Section 03 30 00.
3. Section 03 30 00 2.1.9 – Incorrect reference to corrosion inhibitor deleted. See attached revised Section 03 30 00.
4. Section 03 30 00 2.1.16 – New section added requiring use of anti washout admixture in concrete placed below the water level.
5. Drawing C1 notes:
 - a. **Delete:** Supply and install 1800mm dia. Redvalve Tideflex Series 37G thimble insert with downstream flange c/w all mounting hardware, or approved equal. Valve to have min. 5.5m backpressure rating, measured from invert. See Check Valve Flange detail, Sheet C2.
 - b. **ADD:** Supply and install 1800mm dia. **Redvalve Tideflex CheckMate Ultraflex** inline check valve with downstream flange c/w all mounting hardware, or approved equal. Valve to have **Min. 4.57m** back pressure rating, measured from invert. See Check Valve Flange detail, Sheet C2.
6. The attached “Check Valve Flange Detail” shall supersede the “Check Valve Flange Detail” shown on drawing C2.

SIGN AND RETURN THIS ADDENDUM WITH YOUR TENDER

Chris Roberts, SCMP CPPB
Supervisor
Supply Chain Management

Contractor’s Signature



ADDENDUM

PROJECT TITLE: Sea Wall Refurbishment	ADD. NO: 2
TENDER NO: 2021-081201T	DATE: February 24, 2021
PAGE 2 of 6 (Including Confirmation Sheet)	

7. 3.1.12 Decorative Traffic Pole, Conduit and Duct Relocation

ADD:

Where the Contractor is required to realign existing traffic and electrical ducts as shown on Drawing C1, the Contractor shall assume the following for bidding purposes:

a) North of Traffic Light

i. Traffic Duct :

3-50mm diameter Polyethylene ducts;
1-Fibre Cable;
1-Pedestrian signal cable;
2-C #14 AWG Push-button cable, 1-C #10AWG IGRD;
1-26C #14AWG traffic signal cable.

ii. Electrical Lighting Duct:

1-50mm diameter Polyethylene duct;
3-C #6 AWG, 1-C #10AWG IGRD.

b) South of Traffic Light

i. Traffic Duct :

4-50mm diameter Polyethylene ducts;
1-Fibre Cable;
1-Pedestrian signal cable;
2-C #14 AWG Push-button cable, 1-C #10AWG IGRD;
2-26C #14AWG traffic signal cable.

ii. Electrical Lighting Duct:

1-50mm diameter Polyethylene duct;
3-C #6 AWG, 1-C #10AWG IGRD.

c) East of Traffic Light

i. Traffic Duct :

SIGN AND RETURN THIS ADDENDUM WITH YOUR TENDER

Chris Roberts, SCMP CPPB
Supervisor
Supply Chain Management

Contractor's Signature



ADDENDUM

PROJECT TITLE: Sea Wall Refurbishment	ADD. NO: 2
TENDER NO: 2021-081201T	DATE: February 24, 2021
PAGE 3 of 6 (Including Confirmation Sheet)	

3-50mm diameter Polyethylene ducts;
1-Fibre Cable;
1-Pedestrian signal cable;
2-C #14 AWG Push-button cable, 1-C #10AWG IGRD;
1-26C #14AWG traffic signal cable.

ii. Electrical Lighting Duct:

1-50mm diameter Polyethylene duct;
3-C #6 AWG, 1-C #10AWG IGRD.

- d) New wire shall be supplied and installed within the entire limits of conduit disturbance and realignment.
- i. Splicing to connect new wires to existing wiring shall only occur at each limit/end of the work.
 - ii. Splicing may only occur within a junction box.
- e) Ducts are direct bury in sand except where crossing under driveways and roadways.
- f) Ducts are encased in 32MPa reinforced concrete where crossing under driveways and roadways with a minimum 75mm concrete cover.
- i. Concrete encasement shall be reinforced longitudinally and transversely along the bottom of encasement.
 - ii. Minimum 50mm concrete cover around all reinforcement.
 - iii. Longitudinal reinforcement: 10M bars in both lower corners of encasement.
 - iv. Transverse reinforcement: 10M bars at 300 mm C/C.

Prior to construction, the Contractor shall exposed and confirm the location, quantity, size and material of existing ducts and shall confirm the size, type and quantity of all existing wiring and cabling in the field. Confirming existing duct, wiring and cabling information in the field

SIGN AND RETURN THIS ADDENDUM WITH YOUR TENDER

Chris Roberts, SCMP CPPB
Supervisor
Supply Chain Management

Contractor's Signature



ADDENDUM

PROJECT TITLE: Sea Wall Refurbishment	ADD. NO: 2
TENDER NO: 2021-081201T	DATE: February 24, 2021
PAGE 4 of 6 (Including Confirmation Sheet)	

shall be considered incidental to the work and will not be measured for payment.

8. Add the following New Particular Specification Sections to Division 3.1:

3.1.16 Reinforced Concrete Sewer Pipe

All concrete pipe for storm sewers installed under this Contract shall have approved synthetic nitrile rubber gasket joints that comply with the latest ASTM C443 Standard. Nitrile gaskets shall be stored and installed in strict compliance with the manufacturer's recommendations.

All 1800mm diameter concrete pipe installed under this Contract shall have joints sealed using an approved synthetic nitrile rubber gasket AND joints shall be externally sealed using an approved hydrocarbon resistant external seal mastic pipe-joint wrap. Pipe joint wraps shall be WA-BSJ RCP Pipe Bell Joint Wrap (Westatlantic Tech Corp.), or approved equal.

Supply and installation of Nitrile Gaskets and Pipe Bell Joint Wraps shall be considered incidental to the pipe and will not be measured for payment.

3.1.17 Waterproofing Precast Concrete Structures and Tee Bases

A hydrocarbon-resistant waterproofing membrane system shall be applied on the exterior of all precast concrete bases, sections, covers and grade rings, rendering all precast concrete structures and tee bases waterproof. Waterproofing membrane shall be WR Meadows MEL-ROL, or approved equal. The membrane shall be applied with MEL-Prim primer/adhesive. The Contractor shall supply and install all primer/adhesive and joint sealants to provide a complete waterproofing system. Adhesives and joint sealants shall be from the same manufacturer as the waterproofing membrane.

Supply and installation of waterproofing membrane system, including all adhesives, primers and joint sealants shall be considered incidental to the work and will not be measured for payment.

SIGN AND RETURN THIS ADDENDUM WITH YOUR TENDER

Chris Roberts, SCMP CPPB
Supervisor
Supply Chain Management

Contractor's Signature



ADDENDUM

PROJECT TITLE: Sea Wall Refurbishment	ADD. NO: 2
TENDER NO: 2021-081201T	DATE: February 24, 2021
PAGE 5 of 6 (Including Confirmation Sheet)	

All non-gasket pipe connections made to new precast concrete structures shall be initially sealed inside and outside using non-shrink grout (CPD Fastcrete Ultra, or approved equal). Once grout is cured, the connection shall be made watertight using a hydrophilic polyurethane grout injection (Avanti AV-202 Multigrout, or approved equivalent).

Sealing non-gasket pipe connections in precast concrete structures using non-shrink grout and hydrophilic polyurethane grout injection shall be considered incidental to the work and will not be measured for payment.

3.1.18 Backfilling Pipe Trench

Station 0+000 to Station 0+045 (Parking Lot)

The top 150mm of trench from Station 0+000 to 0+044 shall be backfilled using crushed gravel base, which shall be brought to flush to the adjacent asphalt grade on each side of the trench. The remaining trench depth within this area shall be backfilled using pit run gravel subbase as specified in the City of Saint John General Specifications Division 13.4.05.

The trench area from Station 0+044 to 0+045 will be reinstated with a 1.0m wide strip of asphalt concrete to match flush along the back of sidewalk. Asphalt in this area shall be reinstated to 75mm compacted thickness using Superpave 9.5. The granular backfill shall include 150mm layer of crushed gravel base to 75mm below finish grade. The remaining trench depth shall be backfilled using pit run gravel subbase as specified in the City General Specifications Division 13.4.05.

The supply, placement and compaction of all pit run gravel subbase and crushed gravel base in this area shall be incidental to the work and will not be measured for payment.

Backfilling All Other Areas

Backfilling of all other areas within the Contract limits shall be as specified in the City of Saint John General Specifications Backfilling shall be considered incidental to the work and will not be measured for payment.

SIGN AND RETURN THIS ADDENDUM WITH YOUR TENDER

Chris Roberts, SCMP CPPB
Supervisor
Supply Chain Management

Contractor's Signature



ADDENDUM

PROJECT TITLE: Sea Wall Refurbishment	ADD. NO: 2
TENDER NO: 2021-081201T	DATE: February 24, 2021
PAGE 6 of 6 (Including Confirmation Sheet)	

CONFIRMATION - RECEIPT OF ADDENDUM

**Upon receipt of this document, fax this page to
(506) 658-4742 to confirm receipt of this addendum.**

CONTRACTOR'S NAME: _____

ADDRESS: _____

PHONE: _____ FAX: _____

RECEIVER NAME (PRINT) _____

RECEIVER SIGNATURE: _____

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Shop Drawings and Submittals.
- .2 Section 03 10 00 - Concrete Forming and Accessories.
- .3 Section 03 30 00 - Cast-in-Place Concrete.
- .4 Section 03 41 00 - Precast Structural Concrete.

1.2 MEASUREMENT FOR PAYMENT

- .1 With the exception of dowels into concrete, no measurement for payment will be made for this section. Include costs in unit price for which reinforcement is required.
- .2 Dowels into concrete will be measured per each.

1.3 REFERENCES

- .1 CSA International
 - .1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3-14, Design of Concrete Structures.
 - .3 CAN/CSA-G30.18-09 (R2014), Carbon Steel Bars for Concrete Reinforcement.
 - .4 CAN/CSA-G40.21-13 (R2018), Structural Quality Steels.
 - .5 CAN/CSA-G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .6 CSA W186-M1990 (R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .2 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00 – Shop Drawings and Submittals.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
- .3 Shop Drawings shall include the following:
 - .1 Reinforcing placing drawings to a minimum scale of 1:50, showing size, location spacing and identification of all bars, and outline of all concrete surrounding steel, drawn to scale.
 - .2 Bar lists showing all detailed dimensions, number of bars, size and location, prepared in accordance with recommendations of “Reinforcing Steel Manual of Standard Practice” by Reinforcing Steel Institute of Canada.
 - .3 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.

- .4 Reproduction of Engineer's drawings to produce shop drawings will not be permitted.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Engineer.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .4 Mechanical splices: subject to approval of Engineer. Tapered threaded couplers, use "Lenton Rebar Splicing System" by Erco Products Inc., or Engineer approved equal.
- .5 Plain round bars: to CSA-G40.21, grade 300W.
- .6 Doweling Adhesive:
- .1 Doweling adhesive used below the high water mark shall be Hilti HIT-RE 500 V3, Red Head Epcon C6+ or Dayton Superior Unitex Pro-Poxy 400.
- .2 Doweling adhesive used at locations above the high water mark shall be Hilti HIT-HY 200, Red Head A7 or Dayton Superior Sure Anchor J51.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Provide lapped splice lengths shown in the reinforcing lap length table on the drawings, or as detailed in the drawings.
- .3 Obtain Engineer's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .4 Upon approval of Engineer, weld reinforcement in accordance with CSA W186.
- .5 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Engineer with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform Engineer of proposed source of material to be supplied.

Part 3 Execution

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Engineer.

- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Deliver, handle and store reinforcing steel and accessories in accordance with CAN/CSA-A23.1.
- .2 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1.
- .3 Tack welding of crossing bars and welding of pipe supports to reinforcing bars will not be permitted, unless approved by Engineer.
- .4 Use plain round bars as slip dowels in concrete. Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint. When paint is dry, apply a thick even film of mineral lubricating grease. Install expansion cap at end of plain round bar before placement of new concrete.
- .5 Prior to placing concrete, obtain Engineer's approval of reinforcing material and placement. In the case of walls, notify Engineer before closing in wall forms.
- .6 Ensure cover to reinforcement is maintained during concrete pour.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories.
- .2 Section 03 15 00 - Joints.
- .3 Section 03 20 00 - Concrete Reinforcing.
- .4 Section 03 30 50 - Concrete Curing.

1.2 MEASUREMENT PROCEDURES

- .1 Keyway wall extensions shall be measured per wall extension required. The cost per keywall wall extension shall include all costs including but not limited to doweling, formwork, joint filler, reinforcing steel, concrete, and bond breaker installed on front face of extended keyway wall.
- .2 Concrete refacing of existing concrete cribs, existing cope wall, existing gravity wall and existing concrete-encased steel sheet pile wall shall be by the square meter. Include as incidental to the unit price excavation and replacement of harbour bottom material as required to install new refacing at existing concrete-encased steel sheet piling. There will be no additional measurement for payment for additional concrete at areas where concrete removals were completed.
- .3 Concrete facing of the new steel sheet pile wall shall be measured by the square meter. The unit cost shall include concrete placed between the existing steel sheet pile and the new steel sheet pile and concrete placed behind the new steel sheet pile wall above the concrete-encased wale up to an elevation of +5.50 m. Include in unit price cost of drilling holes in steel sheet piling for rebar to tie in new raised wall as shown on the drawings. Include as incidental to the unit price excavation and replacement of harbour bottom material as required to install new facing.
- .4 The new raised wall and new mooring bollard bases shall be measured by the cubic meter. The division between concrete paid under the raised wall and concrete paid under the mooring bollard base shall be as shown on the drawings. With the exception of the raised wall at the existing concrete-encased sheet pile wall, only concrete placed above elevation +5.50 m will be measured for payment. At the concrete-encased sheet pile wall, concrete will be measured to the limits as shown on the drawings.
- .5 Unit prices under this section shall include compensation for protection required for hot weather and cold weather. No additional payment will be made for measures required to comply with the requirements of Clauses 3.1 and 3.2. Unit prices shall also include removal and cleaning of marine growth or other debris from existing surfaces prior to placing new concrete.
- .6 Mock-up for architectural form liner finish will be paid as a lump sum item.
- .7 Mock-up for crib refacing will be paid as a lump sum item.

- .8 Supply of form liners for architectural pattern will be measured in square meters of form liner required.
- .9 Installation of form liners will be measured in square meters to the limits of form liner panels installed. Include all costs associated with installation and removal of form liner and achieving of architectural concrete requirements specified herein. There will be no additional measurement for payment for extension of architectural concrete requirements 150 mm beyond the edges of form liners.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C109/C109M-20b, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50-mm Cube Specimens).
 - .2 ASTM C260/C260M-10a(R2016), Specification for Air-Entraining Admixtures for Concrete.
 - .3 ASTM C494/C494M-19, Specification for Chemical Admixtures for Concrete.
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A5-98, Portland Cement.
 - .2 CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.
 - .3 CAN/CSA-A23.2-14, Test Methods and Standard Practises for Concrete.
 - .4 CAN/CSA-A23.5-98, Supplementary Cementing Materials.
 - .5 CAN/CSA A363-98, Cementitious Hydraulic Slag.
 - .6 CAN/CSA-A3000-18, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.4 DEFINITIONS

- .1 Architectural Concrete: all formed surfaces in contact with or within 150 mm of the edges of form liners.

1.5 DEFECTIVE CONCRETE

- .1 Concrete will be considered defective if concrete cylinder tests on any section of work fail to meet the acceptance standard specified in Clause 17.5.7 of CAN/CSA-A23.1. In such cases, concrete in place shall be checked by Engineer by obtaining core specimens, drilled and tested in accordance with CSA Test Method A23.2-14c.
- .2 Concrete shall also be considered defective if it is structurally unsound, not watertight, excessively honeycombed or improperly finished as determined by the Engineer.
- .3 The Engineer shall have the right to require, at his discretion, either replacement, strengthening or correction of defective portions of structure.
- .4 Contractor to pay all costs resulting from defective concrete, including coring, testing, strengthening, demolishing and replacing.

1.6 SOURCE QUALITY CONTROL

- .1 Sampling and testing of concrete materials shall be performed by an independent inspection and testing company specializing in this work and selected by the Engineer.
- .2 Provide, at no cost, all material requested by the Engineer for sampling and testing.
- .3 Sampling and testing of concrete materials shall be in accordance with the requirements of CAN/CSA-A23.2.
- .4 The Engineer shall have access to the material source and batching plants at all times for inspection of materials and production methods, and the Contractor shall extend full cooperation.

1.7 MIX DESIGN AND TEST REPORTS

- .1 Minimum 4 weeks before starting concrete work, submit the final mix design and results of tests for each class of concrete to the Engineer for review prior to placing any concrete. Mix designs shall be adjusted to prevent alkali aggregate reactivity problems.
- .2 Minimum 4 weeks before starting concrete work, provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.
- .3 Minimum 4 weeks before starting concrete work, provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.

1.8 MOCK UPS

- .1 Architectural concrete:
 - .1 Submit drawings indicating details of proposed mock-up for review and approval by Engineer before proceeding with mock-up construction.
 - .2 Provide one site mock-up for architectural concrete finish at form liners using the Contractor's proposed mix design, formwork methods and materials and procedures to place concrete. Mock-up to comply with following requirements:
 - .1 Build mock-up in location on site approved by Engineer.
 - .2 The mock-up shall represent the conditions of a full form liner panel (1981 mm wide x 1219 mm tall), including 150 mm additional area around the edges of the panel.
 - .3 The thickness of concrete placed in the mock-up shall be 300 mm.
 - .4 The form liner and form liner backing used in the mock-up shall be the same form liner and form liner backing used throughout construction.
 - .5 The method of concrete placement used for the mock-up shall represent the Contractor's proposed concrete placement methodology for actual construction, including but not limited to form liner release agent application.
 - .3 Obtain Engineer's acceptance of mock-up before starting construction; mock-up shall be used throughout construction period as standard of acceptance for subsequent refacing work.

- .4 If results of mock-up concrete placement produce unsatisfactory results, the Engineer may require a second mock-up to be completed with revisions to the mix design, formwork methods, or concrete placement methods. Alternatively, the Engineer may accept adjustments to the mix design, formwork methods, or concrete placement methods without requiring completion of a second mock-up. The acceptance of the Contractor's proposed formwork and concrete placement methodology shall be the sole discretion of the Engineer. There will be no additional payment if additional mock-ups are required.
- .2 Crib refacing:
 - .1 Submit drawings indicating details of proposed mock-up for review and approval by Engineer before proceeding with mock-up construction.
 - .2 Provide one site mock-up for crib refacing using the Contractor's proposed mix design, formwork methods and materials and procedures to place concrete. Mock-up to comply with following requirements:
 - .1 Build mock-up in location on site approved by Engineer.
 - .2 The mock-up shall represent the conditions of the first concrete placement at the bottom of the required crib refacing, including but not limited to size and spacing of dowels, size and spacing of vertical and horizontal reinforcing, formwork ties, formwork release agent and height of water above the bottom of the proposed concrete placement.
 - .3 The Contractor shall design a method for maintaining a water height in the mock-up formwork during concrete placement to represent the approximate water level during concrete placement at the bottom of the crib refacing.
 - .4 The height of the mock-up, including the height of concrete placed, shall be equal to the proposed height of the Contractor's first concrete placement at the base of the crib refacing.
 - .5 The width of the mock-up shall be the width of the Contractor's proposed placement with, or 5 meters, whichever is less. The Contractor may choose to complete a mock-up with a width greater than 5 meters, at no additional cost.
 - .6 The formwork used in the mock-up shall be the same formwork proposed for use for crib refacing.
 - .7 The method of concrete placement used for the mock-up shall represent the Contractor's proposed concrete placement methodology for crib refacing, including but not limited to diameter and horizontal spacing of proposed tremie pipes.
 - .3 Obtain Engineer's acceptance of mock-up before starting construction; mock-up shall be used throughout construction period as standard of acceptance for subsequent refacing work.
 - .4 If results of mock-up concrete placement produce unsatisfactory results, the Engineer may require a second mock-up to be completed with revisions to the mix design, formwork methods, or concrete placement methods. Alternatively, the Engineer may accept adjustments to the mix design, formwork methods, or concrete placement methods without requiring completion of a second mock-up. The acceptance of the Contractor's proposed formwork and concrete placement methodology shall be the sole discretion of the Engineer. There will be no additional payment if additional mock-ups are required.

- .5 The formwork and placement methodology at the gravity wall refacing shall be the same as accepted based on the mock-up for crib refacing.

1.9 LOADING OF STRUCTURE

- .1 Do not laterally load concrete walls until 14 days after placing concrete

1.10 INSPECTION AND TESTING COST

- .1 Payment for initial sampling, inspection and testing of materials and concrete will be paid by Engineer.
- .2 Payment for retesting required due to unsatisfactory results shall be paid by the Contractor.

1.11 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Construction Demolition Waste Management and Disposal.
- .2 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .3 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.
- .4 Choose least harmful, appropriate cleaning method which will perform adequately.

Part 2 Products

2.1 MATERIALS

- .1 General: material, storage of materials and testing of materials shall conform to requirements of CAN/CSA-A23.1 and CAN/CSA-A23.2, except as amended or extended herein.
- .2 Coarse aggregate: hard crushed stone with maximum size for each class of concrete as given in Clause 2.2.4 and in accordance with CAN/CSA-A23.1, Clause 5.
- .3 Portland Cement to CSA-3001 – Moderate Sulphate-Resistant Hydraulic Cement (Type MS).
- .4 Blended hydraulic cement to CSA-3001- Blended Moderate Sulphate-Resistant Hydraulic Cement (Type MSb).
- .5 Supplementary cementing materials: to CSA-A30001, maximum substitution of 25% for Portland Cement.
- .6 Water: to CSA-A23.1.
- .7 Aggregates: to CSA A23.1/A23.2.

- .8 Air entraining admixture: to ASTM C260.
- .9 Corrosion-inhibiting admixture: Concrete to contain 1.0 L per cubic meter of MCI 2005 NS, with the exception of concrete for the precast anchor walls.
- .10 Set Retarding Admixture: to ASTM C494. Engineer to approve use of retarding admixtures.
- .11 Accelerating Admixture: to ASTM C464. Engineer to approve use of accelerating admixtures.
- .12 Curing compound: curing compounds not to be used.
- .13 Superplasticizer: to ASTM C494.
- .14 Grout: Non-metallic, non-shrink and pre-mixed with a compressive strength of 50 Mpa at 28 days.
- .15 Bonding Agent:
 - .1 "Sikadur 32 Hi-Mod" two component epoxy bonding agent by Sika Canada Inc. or Engineer approved equal. "Rezi-weld 1000" by W. R. Meadows is an approved equal.
- .16 Anti-washout admixture: All concrete placed below the high water mark shall contain 2.58 L per cubic meter of Sikament 100 SC by Sika.

2.2 PRODUCTION OF CONCRETE

- .1 Measurement of materials, uniformity of concrete, mixing and delivery of concrete and concrete testing and sampling shall conform to requirements of CAN/CSA-A23.1 and CAN/CSA-A23.2, except as amended or extended herein.
- .2 All concrete shall be proportioned on basis of Alternative No. 1 as defined in CAN/CSA-A23.1. Trial mix designs shall be made and specimens tested, by and at the Contractor's expense, prior to concreting operations. Once design mix has been established and reviewed by the Engineer, composition and source of materials shall not vary, unless approved by Engineer.
- .3 Make adjustments to design mix, when requested by Engineer, to meet acceptance standards of strength, workability or other requirements.
- .4 Class of concrete and concrete design criteria for mix proportions are given in table below:

Class	Location/ Exposure	28-Day Strength (MPa)	Minimum Cement Content (kg/m ³)	Maximum W/C Ratio (Note 1)	Maximum Coarse Aggregate (mm)	Slump (mm)	Notes
I	Crib, Gravity Wall, Concrete- Encased and Exposed SSP Wall Refacing	35	-	0.40	20	150- 225++	See A23.1 Table for air- entrained

Class	Location/ Exposure	28-Day Strength (MPa)	Minimum Cement Content (kg/m ³)	Maximum W/C Ratio (Note 1)	Maximum Coarse Aggregate (mm)	Slump (mm)	Notes
	/C-1 and S-3						
II	Raised Wall and Mooring Bollard Bases/C-1 and S-3	35	-	0.40	20	60-90	See A23.1 Table 9 for air- entrained

Note:

++ Slump shown is after superplasticizer is added.

Notes:

- 1) W/C ratio by weight based on total water content including moisture content of aggregates.
- 2) Properties listed above apply to concrete placed by conventional methods. Adjustments to design mixes shall be required for pumped concrete.
- 3) Do not use admixtures formulated with calcium chloride.
5. Fabrication and operation of batching plants shall conform to the requirements of CAN/CSA-A23.1. Batching plants shall be located within a 25 km radius of project site.

2.3 ADMIXTURES

- .1 Dosages of all admixtures to be submitted with mix designs required in Clause 1.7 of this Section.
- .2 Air-entraining admixture shall be used only in concrete specified in Clause 2.2.4 of this Section.
- .3 Superplasticizer shall be added to concrete in wall refacing and new steel sheet piling facing.
- .4 All concrete admixtures shall be supplied by the same manufacturer, compatible with one another and used in accordance with the manufacturer's instructions.
- .5 Admixtures other than air-entraining, set-retarding and superplasticizing shall be used only with written approval of the Engineer and shall be without additional cost to the Owner. When an admixture is permitted, it shall be used without alteration to requirements of "Production of Concrete", specified in Clause 2.2 of this Section.

Part 3 Execution

3.1 COLD WEATHER REQUIREMENTS

- .1 Concrete placement during cold weather as defined by CAN/CSA-A23.1 shall be in accordance with CAN/CSA-A23.1, Clause 21, "Curing and Protection".
- .2 General:
 - .1 Concrete placement during cold weather as defined by CAN/CSA-A23.1 shall be in accordance with CAN/CSA-A23.1, except as amended or extended herein.
 - .2 The ambient daily temperature will be obtained by Engineer from thermometer readings. If wind velocity at site exceeds 25 km/hr, 5°C shall be deducted from thermometer readings in establishing ambient temperature, unless work is completely protected by a windproof shelter.
 - .3 When the air temperature is at or below 5°C or when there is a probability of it falling to that limit within 24 hours of placing, the temperature of the concrete as placed shall be more than 10°C, but not more than 25°C.
 - .4 Concrete shall not be placed against any surface or subgrade that is at a temperature less than 5°C or more than 7°C colder than the concrete at the time of the pour.
- .3 Protection:
 - .1 Design protection for the worst conditions that can be reasonably anticipated from forecasts and local weather records. The protective systems shall retain the initial heat of the concrete and produce the specified curing condition in the concrete by retention of the heat generated by hydration, plus where necessary, the supply of additional heat.
 - .2 Maintain the concrete as closely as possible to an optimum temperature of 20°C for a period of seven days. During the seven-day curing period, the concrete temperature shall not fall below 10°C.
 - .3 The protection systems shall provide the conditions for curing as specified in Concrete Curing, Section 03 30 50.
 - .4 Loose or absorbent insulation material shall be completely contained in waterproof liners. Straw is not an acceptable insulation material.
 - .5 Concrete shall not be placed in insulated formwork when the air temperature is below the range for which it was designed. Insulating material shall be fastened tightly and secured against the forms. Seal all joints and tears.
 - .6 Protective housing shall be designed to take into account weather and construction procedures. Housing shall provide the required environment for the curing of concrete. Where heating is necessary, provide equipment of sufficient capacity to establish and maintain the specified curing conditions. The use of salamanders, coke stoves, oil or gas burners and similar spot heaters which have an open flame and intense local heat, shall not be permitted. Fresh concrete shall be protected from exposure to carbon dioxide. Properly vent heating equipment to the outside to avoid damage to the concrete. Have available at the site adequate fire protection at all times that heating equipment is required. A watchman or attendant shall be maintained to keep heating units in continuous operation.

3.2 HOT WEATHER REQUIREMENTS

- .1 Concrete placement during hot weather as defined by CAN/CSA-A23.1 shall be in accordance with CAN/CSA-A23.1, Clause 21, "Curing and Protection".

3.3 PLACING CONCRETE

- .1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1.
- .2 Provide Engineer with 24 hours' notice prior to placing concrete.
- .3 Ensure face of wall is clean of all marine growth or other debris before placing concrete.
- .4 Handling, depositing and consolidation of concrete shall be in accordance with CAN/CSA-A23.1, except as amended or extended herein.
- .5 With the exception of tremie concrete, all concrete shall be placed in the "dry". Any water shall be diverted from inside forms and excavation pits through proper side drains, or removed by other Engineer-approved methods.
- .6 Placing of concrete by pumping equipment shall be permitted, provided properties of concrete are not altered by method of pumping and placing.
- .7 Pumping equipment shall be of suitable kind with adequate pumping capacity. Loss of slump shall not exceed 50 mm. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy.
- .8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .9 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and pack solidly with adhesive according to Section 03 20 00 – Concrete Reinforcing to anchor and hold dowels in positions as indicated.
- .10 At locations with wall refacing, the existing concrete surface shall be pre-wetted and continuously maintained in a wet condition for a minimum period of 6 hours immediately prior to placement of the concrete refacing.

3.4 INSERTS

- .1 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Engineer before placing of concrete.
- .2 Anchor bolts:
 - .1 Place anchor bolts to templates under supervision of trade supplying anchors prior to placing concrete.

3.5 FINISHING OF CONCRETE

- .1 General:

- .1 Finishing of non-formed concrete surfaces and treatment of formed concrete surfaces after formwork has been removed shall be in accordance with CAN/CSA-A23.1, except as amended or extended herein.
 - .2 Fill tie holes solid and patch defects with grout to match adjacent concrete in texture and colour. Completely remove all fins.
 - .3 Excessive honeycomb in any part of structure may be considered sufficient cause for rejection of honeycombed section. If Engineer gives permission for honeycombing and defects to be made good, the corrective method of treatment shall be carried out as directed by Engineer.
 - .4 Tops of walls, horizontal offsets, etc. adjacent to formed surfaces shall be struck smooth after concrete is placed and wood float finished, except as otherwise specified herein.
- .2 Architectural concrete: the quality of finish shall be such that when forms are stripped, it meets the standards set out below, without further finishing work other than clean-up:
- .1 Dense, even concrete free of major defects such as deep or extreme honeycombing, inconsistencies in plane, severe cold joint lines and major loss of fines. Minor imperfections may be acceptable. Major defects will necessitate replacement. The judgment as to what constitutes major or minor defects will be the Engineer's decision. Patching will not be permitted and if used, will constitute a major defect. Repairs, i.e., removal of sections of a member, may be carried out if approved by the Engineer, but the repair shall match the colour and texture of the surrounding concrete.
 - .2 Concrete members of generally uniform colour.
 - .3 Concrete members with sharp, accurate definition at corners, arrises, reglets and the like, generally free of chipped or spalled areas and within dimensional tolerances set out in CAN/CSA-A23.1. Members shall be visually straight.
 - .4 Plane surfaces without protuberances, indentations, ridges or bulges.
 - .5 Under no circumstances shall repair to any architectural concrete be undertaken without Engineer's written consent. Concrete members which are repaired without the Engineer's consent will be classified as defective work and the Engineer may require their removal and replacement.

3.6 CONSTRUCTION JOINTS

- .1 All joints shall be constructed in accordance with CAN/CSA-A23.1, except as amended or extended herein. Location and details of construction joints are shown on the Drawings.
- .2 Preparation of construction joints before placing fresh concrete against set concrete shall conform to CAN/CSA-A23.1. Where construction joints are made in the raised wall or above elevation +2.0 m in wall refacing or new wall facing, apply concrete bonding agent to previously placed concrete immediately before placing fresh concrete. Reinforcing bars extending through joints shall be cleaned of concrete and foreign matter prior to placing adjacent concrete.

3.7 GROUT

- .1 Grout between mooring bollard bases and concrete supports and other locations shown on the Drawings using non-metallic non-shrink grout.

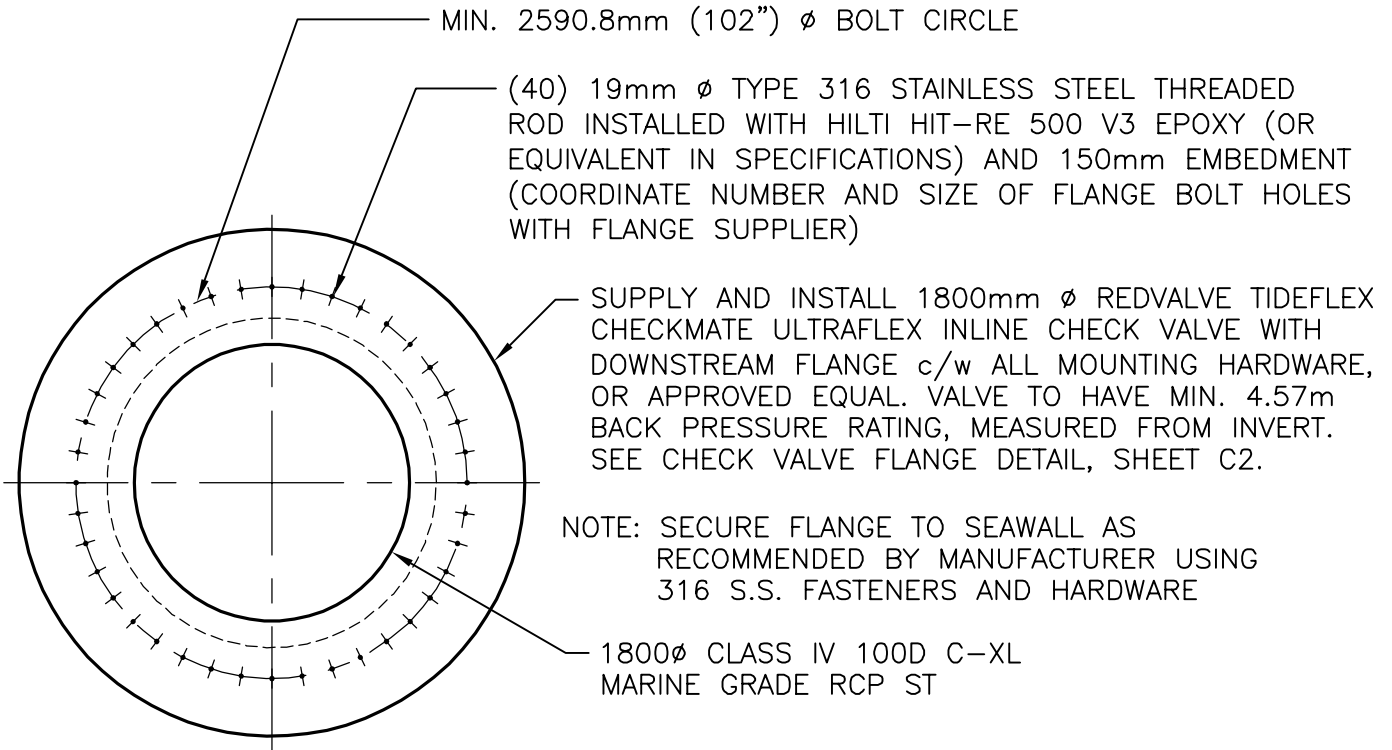
- .2 Ensure that all voids are completely filled with grout.

3.8 FIELD QUALITY CONTROL

- .1 The Engineer will arrange for inspection and testing to be performed by an independent Inspection and Testing Company specializing in this work.
- .2 Provide, at no cost, all concrete samples requested by the Engineer for testing and allow access to the Engineer to all areas of work, and extend full co-operation. In addition, provide suitable storage facilities for the Engineer to conduct and store test equipment and specimens.
- .3 Inspection and testing of concrete shall be in accordance with CAN/CSA-A23.1 and CAN/CSA-A23.2.
- .4 Number and frequency of cylinder tests taken shall be as follows: two 28-day and one 7-day test specimen taken for each 50 cubic metres of concrete, or fraction thereof, for each class of concrete cast daily.
- .5 Engineer may take additional test cylinders during cold weather concreting. Cure cylinders on site under same conditions as concrete which they represent.
- .6 Frequency of slump and air content tests and any other tests shall be determined by the Engineer.
- .7 Inspection and testing by Engineer will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.


END OF SECTION

File Name: c:\pwworking\directory\projects\2020\55\pmb\dms\78826\202454-check valve flange detail.dwg



CHECK VALVE FLANGE DETAIL

1:50

	1	ISSUED FOR ADDENDUM	22-02-2021	PB
 <p>DILLON CONSULTING</p>	PROJECT		PROJECT NO.	
	SEAWALL REFURBISHMENT SAINT JOHN, NB		20-2454	
DATE	TITLE		FIGURE NO.	
February 2021	DETAIL		1	



Fish and Fish Habitat Protection Program
343 University Avenue
P.O. Box 5030
Moncton, New Brunswick
E1C 9B6

June 30, 2020

Our file

20-HGLF-00182

Samir Yammine
15 Market Square
P.O. Box 1971
Saint John, New Brunswick
E2L 4L1

Subject: Courtenay Bay – Tributary to Saint John River – City of Saint John Sea Wall Refurbishment Project – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Mr. Yammine:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on May 28, 2020. We understand that you propose to:

- Repair and raise the existing sea wall with a new Steel Sheet Pile wall and concrete cribs in the Saint John Harbour (45.271554N, 66.064853W);
- Complete the works between March 1, 2021 to December 6, 2021.

We understand the following aquatic species listed under the *Species at Risk Act* may use the area in the vicinity of where your proposal is to be located:

- Shortnose sturgeon (*Acipenser brevirostrum*) listed as Special Concern.

In addition, the following aquatic species are subject to the *Aquatic Invasive Species Regulations* and may be found in the vicinity of your proposed work, undertaking, or activity:

- European green crab (*Carcinus maenas*)
- Golden star tunicate (*Botryllus schlosseri*)
- Violet tunicate (*Botrylloides violaceus*)

Our review considered the following information:

- The Request for Review package received May 28, 2020;

- Supporting information package including Underwater Benthic Habitat Survey, photos and plans prepared by Dillon Consulting;
- Additional information received by email on June 25, 2020.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*; and
- the introduction of aquatic species into regions or bodies of water frequented by fish where they are not indigenous, which is prohibited under section 10 of the *Aquatic Invasive Species Regulations*.

The aforementioned outcomes are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- Limit the duration of in-water works, undertakings and activities so that it does not diminish the ability of fish to carry out one or more of their life processes (spawning, rearing, feeding, migrating);
- Operate machinery on land or from barges in the dry;
- Monitor the watercourse for signs of sedimentation during all phases of the work, undertaking or activity and take corrective action;
- Stop work, contain sediment-laden water and other deleterious substances and prevent their further migration into the watercourse;
- Keep an emergency spill kit on site during the work, undertaking or activity;
- Report any spills of sewage, oil, fuel or other deleterious material, whether near or directly into a water body;
- Ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse;
- Clean-up and appropriately dispose of the sediment-laden water and deleterious substances;
- Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse;
- Schedule work to avoid any impact on the commercial gaspereau fishery located adjacent to the Project area, within the Harbour;

- Plan in-water works, undertakings and activities to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and migrate:
 - Pile driving should not be undertaken at night (between an hour before sunset and an hour after sunrise) between the months of April and October inclusively to allow for elver (juvenile eel) and adult American Eel migration as well as Atlantic Salmon smolt and adult migrations;
 - Pile driving should be restricted to 4 hours on and 4 hours off between May 1 and July 15 to allow for the migration of Gaspereau.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal is not likely to result in the contravention of the above mentioned prohibitions and requirements.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, the *Species at Risk Act* and the *Aquatic Invasive Species Regulations*.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to (<http://www.dfo-mpo.gc.ca/pnw-ppe/contact-eng.html>).

It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact me at our Moncton office at (506) 851-6914, or by email at renelle.doucette@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,



Renelle Doucette
A\ Senior Biologist, Regulatory Reviews