SUMMARY OF WORK

1.0 GENERAL

1.1 The Work in this contract includes, but is not limited to; the removal and disposal of existing timber piles, floats, and gangways; the replacement and installation of new timber piles, steel pipe piles, cross-bracing, stringers, decking, and pile caps; the design and installation of new floats and gangways; structural repairs and maintenance at Owen Bay, Port Neville, and Surge Narrows (provisional)*; and the installation of a post office building at Surge Narrows (provisional)*—all based on the findings of the inspection reports and Contract Drawings. This section must be referenced to, and interpreted simultaneously with, all other sections pertinent to the Work described herein.

*See Stipulated Price Bid Form item 1.1.4

1.1.1 Port Neville

1.1.1.1 Removal of existing pierhead, bent 15 and piles, and timber pile clusters as per the drawings

1.1.1.2 Repair of the existing pier/approach

1.1.1.2.1 Pile replacement (5)

1.1.1.2.2 Fresh head and install new single corbel (3)

1.1.1.2.3 Install galvanized steep pile clamps (2)

1.1.1.2.4 Modifications to trestle. See drawings

1.1.1.2.4.1 Replace all decking

1.1.1.2.4.2 New guardrail

1.1.1.2.5 Replace cross brace (1)

1.1.1.3 Existing Gangway to be replaced with new 15.25m gangway

1.1.1.4 Existing floats to be replaced

1.1.1.4.1 New 16.6m x 8.6m Composite Style Float as per S101 Drawing

1.1.1.4.2 Optional: New 19.5m x 2.4m Composite Style Float as per S101 Drawing

1.1.1.4.3 Supply and install new steel piles (4). Provide additional steel pile as per drawings to accommodate optional float.

1.1.1.5 Miscellaneous

1.1.1.5.1 Existing pump cabinet to be removed and reinstalled on structure adjacent to top of gangway

1.1.1.5.2 New load rating sign to be provided

1.1.2 Owens Bay

1.1.2.1 Removal of existing timber mooring piles as per the drawings

1.1.2.2 Repair of the existing pier/approach

1.1.2.2.1 Pile replacement (3)

1.1.2.2.2 Pile cap replacement (5)

1.1.2.2.3 Replace all decking

1.1.2.3 Existing floats to be replaced

1.1.2.3.1 Supply and install new steel piles (9)

1.1.2.3.2 New Composite Style Floats as per S201 Drawing

1.1.2.3.2.1 New 8.2m x 8.8m Composite Style Float

1.1.2.3.2.2 One 15.25m x 2.4m Composite Style Float

1.1.2.3.2.3 Two 13.3m x 2.4m Composite Style Floats

1.1.2.4 Miscellaneous

1.1.2.4.1 Existing pump cabinet to be removed and reinstalled on structure adjacent to top of gangway

1.1.2.4.2 New load rating sign to be provided

1.1.2.4.3 Paint markings over loading area

1.1.3 Surge Narrows (PROVISIONAL – See Stipulated Price Bid Form item 1.1.4)

1.1.3.1 Removal of existing timber piles as per the drawings and existing anchor chains on both sides of the float

1.1.3.2 Repair of the existing pier/approach

1.1.3.2.1 Pile replacement (4)

1.1.3.2.2 Pile cap replacement (11)

1.1.3.3 Existing gangway to be replaced with new 12.2m gangway

1.1.3.4 Existing floats to be replaced

1.1.3.4.1 Supply and install new steel piles (6)

1.1.3.4.2 New Composite Style Floats as per S301 Drawing

1.1.3.4.2.1 New 8.3m x 9.0m Composite Style Float

1.1.3.4.2.2 One 13.7m x 2.4m Composite Style Floats

1.1.3.5 Miscellaneous

1.1.3.5.1 Existing post office to be replaced as per S302 Drawing

1.1.3.5.2 New load rating sign to be provided

1.2 This summary of the Work is provided for ease of reference only and does not in any way limit the total scope of the Work which is set forth on the drawings and/or the Contract documents.

1.3 The Work under all sections of these documents, and unless otherwise stated, shall include supply of all labour, equipment, materials, and services necessary to supply, construct and complete the Work as specified herein.

1.4 For convenience of reference only, the specifications are separated into titled sections (see Table of Contents). Sections are identified by a title and a digit numbering system in General conformity with National Master Specifications.

1.5 In the case of ambiguity or of a dispute the Owner's representative will decide under which section of these specifications any item of work is to be performed.

1.6 The major items of work are:

- The Contractor and subcontractors are responsible for fully reviewing the entire contract document set (drawings, specifications, addenda, and supporting documentation) to ascertain the full scope and intent of the contract. Extras will not be entertained where it can be shown that said extras could have reasonably been avoided as a result of such a review.
- Scope and/or details shown in specifications but not on drawings, or shown on drawings but not detailed in specifications, does not constitute a contradiction or

conflict between the two documents. Drawings and specifications (including addenda) must be reviewed together as a whole. Extras will not be entertained for any scope that is detailed in either the specifications or drawings in which a contradiction does not exist.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

END OF SECTION 01 11 00

PROJECT MEETINGS

1.0 PRE-CONSTRUCTION MEETINGS

1.1 Following Notice of Award, the Owner's representative will request a pre-construction meeting of the parties to the Contract to discuss and resolve administrative procedures and responsibilities.

1.2 Representatives of the Owner, Owner's representative Contractor, any major Subcontractors, field inspectors, supervisors and surveyors shall be in attendance.

1.3 After the time of this meeting (assumed to be virtual) has been established, the Contractor shall notify all concerned parties a minimum seven days before the meeting.

1.4 The Owner's representative shall chair and record discussions and decisions and circulate the meeting notes to all parties concerned.

2.0 PROGRESS MEETINGS

2.1 Virtual Progress meetings (or in person if personnel are available or on site) will be held on a bi-monthly basis or more frequently if requested by the Contractor, Owner's representative or Owner.

2.2 Representatives of the Contractor, and any Subcontractors and Suppliers attending meetings, must be qualified and authorized to act on behalf of the party each represents.

2.3 Occupational Health and Safety incidents, records and procedures shall be part of the agenda for every progress meeting.

2.4 The Owner's representative shall schedule, chair and administer progress meetings throughout the progress of the Work, as required.

END OF SECTION 01 31 19

SUBMITTAL PROCEDURES

1.0 SHOP DRAWINGS

1.1 Shop Drawings are to clearly indicate materials, methods of construction and attachment of anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of the Work. Where articles or equipment attach or connect to other articles or equipment, clearly indicate that all such attachments and connections have been properly coordinated, regardless of the trade under which the adjacent articles or equipment will be supplied and installed. Shop Drawings are to indicate their relationship to Drawings and specifications. Notify the Owner's representative in writing of any deviations in Shop Drawings from the requirements of the Contract Documents.

1.2 Shop Drawings not stamped, signed and dated by the Contractor will be returned without being reviewed and will be stamped "Re-submit".

1.3 Failure to submit Shop Drawings in a timely manner shall not be considered sufficient reason for an extension to the Contract Time.

1.4 Shop Drawings will be returned to the Contractor with one of the following notations:

1.5 When stamped "NO EXCEPTIONS TAKEN", distribute additional copies as required for execution of the Work.

1.6 When stamped "REVIEWED AS MODIFIED - PROCEED", ensure that all copies for use are modified and distributed, same as specified for "NO EXCEPTIONS TAKEN".

1.7 When stamped REVISE & RE-SUBMIT", make the necessary revisions, as indicated, consistent with the Contract Documents and submit again for review.

1.8 When stamped "NOT REVIEWED", submit other drawings, brochures, etc. for review consistent with the Contract Documents.

1.9 Only Shop Drawings bearing "NO EXCEPTIONS TAKEN" or "REVIEWED AS MODIFIED - PROCEED" shall be used on the Work unless otherwise authorized by the Owner's representative.

1.10 After submittals are stamped "NO EXCEPTIONS TAKEN" or "REVIEWED AS MODIFIED - PROCEED", no further revisions are permitted unless re-submitted to the Owner's representative for further review.

1.11 Any adjustments made on Shop Drawings by the Owner's representative are not an authorization to change the Contract Price. If it is considered that such adjustments affect the Contract Price, the Contractor shall clearly state as such, in writing, and obtain the Owner's agreement prior to proceeding with fabrication and installation of work.

1.12 The Contractor shall make changes in Shop Drawings which the Owner's representative may require that are consistent with the Contract Documents. When re-submitting, notify the Owner's representative in writing of any revisions other than those requested by the Owner's representative.

1.13 The Owner's representative's review is for the sole purpose of ascertaining conformance with the general design concept. This review shall not constitute approval of the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same. Review by the Owner's representative shall not relieve the Contractor of its responsibility for errors or omissions in the Shop Drawings or of its responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction, for installation, and for co-ordination of the Work of all sub-trades.

1.14 All final versions of the Shop Drawings shall be delivered to the Owner's representative in a .pdf format a minimum of 30 days prior to commencement of the Work covered in the submittal. When the Contractor is responsible for engineering design of portions of the Work, this shall be clearly and specifically indicated in the drawings or in the specifications of the Contract Documents.

1.15 Where the Contractor is required, either by law or regulation or by the Contract to provide engineering design, it shall use the services of a Professional Engineer registered in the area in which the Work is to be performed, and it shall submit Shop Drawings bearing the Seal and Signature of that Registered Professional Engineer.

1.16 The Contractor shall arrange for the preparation of clearly identified Shop Drawings and submit Shop Drawings in the following form:

.1 Upload PDF files of each submission to the Project Website or email if size permits, as directed by the Owner's representative.

.2 Shop Drawings and submissions for each item of equipment shall be in a single file, do not combine submissions for more than one item in one file.

.3 Name each file with the following format: "YYYY-MM-DD- shop drawing XXXX item description", where the date is the date the file is issued to the owner and owner's representative.

.4 The title page of the Shop Drawings shall include the date, shop drawing number, name of equipment and reference the specification section where the equipment is specified.

1.17 Product Data shall include but not be limited to:

.1 Product assembly drawings
.2 Materials list
.3 Principal dimensions
.4 Parts and components details
.5 Letters of compliance with recognized standards where required
.6 Operation data
  .1 Operation curves
  .2 Operation manuals where specified
  .3 Product Name and Model Number
.7 Equipment tag numbers

1.18 Shop Drawings shall be accurately drawn to a scale sufficiently large to show all pertinent features of the item, and its method of connection to the Work and shall have sufficient space for the Contractor's stamp and the Owner's representative 's stamp.

1.19 Shop Drawings shall be in accordance with the International System of Units (S.I.) metric units.

2.0 SAMPLES

2.1 Submit samples for the Owner's representative's review as specified or as the Owner's representative may reasonably request. Clearly label samples as to origin and intended use in the Work. Reference samples to Contract Documents.

2.2 Submit samples with reasonable promptness and in orderly sequence so as to cause no delay in the Work.

2.3 Notify the Owner's representative in writing, at the time of submission, of any deviations in samples from requirements of Contract Documents.

2.4 The Owner's representative's review will be for conformity of design concept and general arrangement only. Such review is not to be considered relief of responsibility for errors or omissions in samples or of responsibility for meeting all requirements of the Contract Documents.

2.5 Make changes in samples which the Owner's representative may require consistent with Contract Documents.

3.0 RECORD DRAWINGS

3.1 Following Notice of Award, the Owner's representative will provide a complete set of Contract Drawings for the purpose of maintaining "as-built" record drawings. Accurately record deviations from Contract Documents caused by site conditions and changes approved by the Owner's representative. Update as required and at intervals not exceeding one month.

3.2 Identify drawings as "Project Record Copy". Maintain in good condition and make available for inspection on site by Owner's representative at all times.

3.3 Provide the Owner's representative with a clearly legible hand marked as-built set of Drawings, including a complete and accurate record of the details and precise locations of the Work as they have been constructed. The record drawings shall include:

.1 Confirmation of all material sizes, types and classifications;

.2 Precise locations and quantities of all materials used for repairs beyond the scope of the proposed rehabilitations.

.3 Locations, sizes, and penetration depths of all steel and timber piles used for the repair and rehabilitation works.

.4 Locations, sizes and inverts of all existing services and utilities exposed during the course of the construction.

.5 Final grades of all altered surfaces within construction areas;

.6 Changes made by Addenda and Change Order

.7 Details not on original Contract Drawings.

.8 Reference to related shop drawings and modifications.

3.4 Not less than two (2) weeks prior to application for Substantial Performance of the Work, submit record drawings to Owner's representative for review. A holdback in

the amount of $10,000 shall be held until the record drawings are provided to the satisfaction of the Owner's representative.

4.0 PHOTOGRAPHS AND PUBLICITY

4.1 The contractor shall take pre-construction photographs for the purposes of maintaining records of the pre-existing conditions within and adjacent to the project area.

4.2 No press or publicity releases will be permitted without prior approval of the Owner's representative.

END OF SECTION 01 33 00

ENVIRONMENTAL PROCEDURES

1 GENERAL

1.1 Summary

.1 This section describes environmental procedures required and expected to be adhered while performing the Work.

.2 Any discrepancy between the text within this document and regulatory approvals, permits, laws, technical specifications and construction Drawings shall be brought to the attention of the Owner's Representative for clarification and direction.

1.2 Related Sections

.1	Section 01 41 00	Regulatory Requirements
.2	*As Appended*	Port Neville Environmental Management Plan (EMP) December 2024
.3	*As Appended*	Surge Narrows Environmental Management Plan (EMP) October 2024
.4	*As Appended*	Owen Bay Environmental Management Plan (EMP) Oct 2024
.5	*As Appended*	Dock Upgrades, Owen Bay DFO Avoid and Mitigate Letter (23-HPAC-00677)

1.3 General

.1 Determine and comply with all environmental protection requirements necessary to carry out the Work.

.2 Contractors are expected to be aware of the typical environmental conditions imposed on the Contractor. These generally consist of, but are not limited to, containment and disposal of construction debris, seawater water quality, acoustic thresholds, and prevention and management of spills.

.3 Contractor shall comply with the project Environmental Management Plan (EMP). The Contractor shall develop plans and construction methodologies that satisfy the EMP, preparing a Construction Environment Management Plan (CEMP) for review and approval illustrating their ability to perform the works in a manner compliant with the understood contractual and/or regulatory requirements laid out in the Contract and federal, provincial, or municipal laws/regulations.

.4 Refer to Section 01 41 00 for additional regulatory requirements.

1.4 Contractor Submittals

.1 The Contractor shall submit a CEMP for review and approval as noted in the previous text.

1.5 Disposal of Wastes and Drainage

.1 Dispose of all rubbish, wastes, and used construction materials at an approved waste facility.

.2 The Contractor must ensure that debris or deleterious substances are not introduced to the marine environment during demolition or construction activities.

.3 Water quality within the Project footprint shall comply with the environmental requirements as indicated by the British Columbia Approved Water Quality Guidelines (BCAWQG) and other applicable federal, provincial and municipal bodies.

1.6 Pollution Control – Port Neville

.1 Control emissions from equipment to local authority's emission requirements and guidelines.

.2 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.3 A turbidity (silt) curtain may be installed to prevent the release of excess turbidity to the surrounding waters. The turbidity curtain should be maintained throughout Project activities during relevant works.

1.7 Pollution Control – Surge Narrows

.1 Control emissions from equipment to local authority's emission requirements and guidelines.

.2 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.3 A turbidity (silt) curtain or other sediment control measure may be installed to prevent the release of excess turbidity to the surrounding waters. The containment should be maintained throughout Project activities during relevant works.

1.8 Pollution Control – Owen Bay

.1 Control emissions from equipment to local authority's emission requirements and guidelines.

.2 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.3 A turbidity (silt) curtain or other containment measure (i.e. bubble curtain) may be required to prevent the release of excess turbidity to the surrounding waters. The sediment control should be maintained throughout Project activities during relevant works (pile driving).

1.9 Environmental Approval – Port Neville

.1 The Contractor shall complete the Work in accordance with DFO requirements and compliance documents. Owner shall provide any associated stipulations prior to the commencement of the Work.

.2 As the Work does not result in the development of any new footprint and measures to protect fish and fish habitat can be implemented, the work is not likely to result in contraventions of the *Fisheries Act.* Therefore, project review by Fisheries and Oceans Canada (DFO) was not required. If measures cannot be implemented or the scope of work changes, DFO project review may be required.

.3 Concerns by DFO include, but are not necessarily limited to, a prohibition on the death of fish, on the deposit of deleterious substances in waters frequented by fish and on the harmful alteration, disruption, or destruction of fish habitat (HADD), respectively. Specifically, restrictions will be imposed on turbidity and pH of seawater and the introduction of oil and grease due to the Work.

.4 The HADD shall not exceed the Project footprint on the seabed and shall not exceed the total area that is indicated on the Drawings. All barges or other vessels used during construction are not permitted to ground on the seabed or disturb the seabed or identified eelgrass bed as a result of vessel propeller wash. Vertical spuds and anchors may be used to hold barges in place but positioned to avoid any impacts to the eelgrass bed.

.5 The Contractor shall take the necessary precautions to maintain the adjacent seawater quality within limits acceptable to the regulatory agencies, which include but may not be limited to provincial BCAWQG thresholds.

1.10 <u>Environmental Approval – Surge Narrows</u>

.1 The Contractor shall complete the Work in accordance with DFO requirements and compliance documents. Owner shall provide any associated stipulations prior to the commencement of the Work.

.2 Concerns by DFO include, but are not necessarily limited to, a prohibition on the death of fish, on the deposit of deleterious substances in waters frequented by fish and on the harmful alteration, disruption, or destruction of fish habitat (HADD), respectively. Specifically, restrictions will be imposed on turbidity and pH of seawater and the introduction of oil and grease due to the Work.

.3 The HADD shall not exceed the Project footprint on the seabed and shall not exceed the total area that is indicated on the Drawings. All barges or other vessels used during construction are not permitted to ground on the seabed or disturb the seabed or identified eelgrass bed because of vessel propeller wash.

.4 The Contractor shall take the necessary precautions to maintain the adjacent seawater quality within limits acceptable to the regulatory agencies, which include but may not be limited to provincial BCAWQG thresholds.

.5 As the Work only includes the replacement and repair of the dock system within the same footprint and measures to protect fish and fish habitat can be implemented, the work is not likely to result in contraventions of the *Fisheries Act.* Therefore, project review by Fisheries and Oceans Canada (DFO) was not required. If measures cannot be implemented or the scope of work changes, DFO project review may be required

1.11 Environmental Approval – Owen Bay

.1 The Contractor shall complete the Work in accordance with DFO requirements and any conditions under the DFO Avoid and Mitigate Letter (23-HPAC-00677). Owner shall provide the DFO letter and associated stipulations prior to the commencement of the Work.

.2 Concerns by DFO include, but are not necessarily limited to, a prohibition on the death of fish, on the deposit of deleterious substances in waters frequented by fish and on the harmful alteration, disruption, or destruction of fish habitat (HADD), respectively. Specifically, restrictions will be imposed on turbidity and pH of seawater and the introduction of oil and grease due to the Work.

.3 The HADD shall not exceed the Project footprint on the seabed and shall not exceed the total area that is indicated on the Drawings. All barges or other vessels used during construction are not permitted to ground on the seabed or disturb the seabed because of vessel propeller wash. Vertical spuds and anchors may be used to hold barges in place.

.4 The Contractor shall take the necessary precautions to maintain the adjacent seawater quality within limits acceptable to the regulatory agencies, which include but may not be limited to provincial BCAWQG thresholds.

END OF SECTION 01 35 43

REGULATORY REQUIREMENTS

1 GENERAL

1.1 Summary

.1 This section describes regulatory requirements expected to be adhered while performing the Work.

.2 Any discrepancy between the text within this document and regulatory approvals, permits, laws, technical specifications and construction Drawings shall be brought to the attention of the Owner's Representative for clarification and direction.

1.2 Related Sections

.1	Section 01 35 43	Environmental Procedures
.2	*As Appended*	Port Neville Environmental Management Plan (EMP) December 2024
.3	*As Appended*	Surge Narrows Environmental Management Plan (EMP) October 2024
.4	*As Appended*	Owen Bay Environmental Management Plan (EMP) October 2024
.5	*As Appended*	Dock Upgrades, Owen Bay DFO Avoid and Mitigate Letter 23-HPAC-00677

2 CODES

.1 All Work must be executed in accordance with the Contract including all applicable codes, laws, and regulations of the national, provincial, and municipal building, plumbing and electrical codes, and other regulations pertinent to the Site.

.2 Unless the Drawings and Specifications otherwise provide, give all requisite notices in connection with the Work to the proper authorities or First Nations necessary for the construction and completion of the Work, and deliver to the Owner all certificates for any part of the Work for which such certificates may be required in connection with the Contract.

.3 In the event of a conflict between codes, standards, or other regulations, Owner's Representative shall determine which code, standard, or regulation shall govern, and that determination shall be conclusive and binding.

3 ANTIQUITIES AND ARCHAEOLOGY

.1 The Owner may implement archaeology monitors if there are reasonable expectations for archaeological impacts to occur.

.2 Take reasonable precautions to prevent workmen or persons from removing or damaging any fossils, coins, articles of value or antiquities, and structural and other remains or relics of geological or archaeological interest discovered on or in the area of the Site of the Work.

4 TRADEMARKS AND LABELS

.1 Keep intact all trademarks and labels as required by authorities having jurisdiction to enable identification of materials and equipment.

5 PERMITS

.1 Comply with all requirements stated in the permits and the regulatory approvals/procedures obtained for the Work, whether provided by Owner, Owner's Representative, or Contractor. Owner supplied permits shall be furnished to Contractor upon award, or as provided by applicable agency.

.2 The Contractor shall adhere to the jurisdictional constraints with respect to noise, this includes but is not limited to, noise levels and timing of Works. Contractor deviation from the requirements and constraints shall require any and all permits and operating procedure modifications; any costs associated with said deviation shall be done at no cost to Owner.

6 REGULATORY REQUIREMENTS – PORT NEVILLE

.1 The Contractor shall be responsible for ensuring that no discharge of raw or treated sewage to the marine environment occurs from vessels used for the Project. Sewage disposal from ships shall adhere to the Pleasure Craft Sewage Pollution Prevention Regulations and the Non-Pleasure Craft Sewage Pollution Prevention Regulations.

.2 The following information provides a summary of the legislation, guidelines, and best management practices that the regulatory authorities have identified during the environmental review and that are applicable to the marine construction activities associated with the Work. This summary is provided for Contractor convenience and does not provide a full account of all applicable legislation, regulations, guidelines, and best management practices:

.1 All Work associated with the proposed project must comply with requirements of the *Fisheries Act*, *Migratory Birds Convention Act*, *Species at Risk Act,* and the provincial *Wildlife Act* and all applicable legislation, regulations, guidelines, and best management practices contained therein.

.2 To meet the requirements of the *Migratory Birds Convention Act* the two nesting boxes should be relocated between August 15 and April 25, prior to the start of work. If the boxes must be moved during the Purple Martin nesting window, a Qualified Environmental Professional (QEP) should confirm that the boxes are not in use.

.3 Section 34.4 (1) of the *Fisheries Act*, administered by Fisheries and Oceans Canada (DFO), states "No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish". If the onsite environmental monitor (EM) determines the death of fish has occurred, DFO must be notified immediately through DFO's 'report a fisheries violation' contact line.

.4 Section 35 (1) of the *Fisheries Act*, administered by Fisheries and Oceans Canada (DFO), states "No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption, or destruction [HADD] of fish habitat". If the onsite environmental monitor (EM) determines a HADD may have occurred, DFO must be notified immediately through DFO's 'report a fisheries violation' contact line.

.5 Section 36 (3) of the *Fisheries Act*, and administered by Environment and Climate Change Canada (ECCC), prohibits the deposit of deleterious substances of any type in water frequented by fish. The Contractor must ensure that, at all times during the construction of the Works, deleterious substances are prevented from discharging into fish-bearing waters. Due diligence is required at all times to prevent such discharges and adherence to the provisions in the environmental assessment document and regulatory authorities' guidelines do not relieve the Contractor of ongoing responsibilities in this regard.

.6 As the Work does not result in the development of any new footprint and measures to protect fish and fish habitat can be implemented, the work is not likely to result in contraventions of the *Fisheries Act.* Therefore, no project review by Fisheries and Oceans Canada (DFO) was not required. If measures cannot be implemented or the scope of work changes, DFO project review may be required

.7 The Contractor shall ensure that sediment or sediment laden waters or other deleterious substances that would result in relevant BC Approved Water Quality Guidelines (BCAWQG) exceedances are not allowed to enter the aquatic environment during the Work. Work should be conducted in accordance with available best management practices and in compliance with Section 36 of the *Fisheries Act*. Sediment barriers or sediment traps shall be implemented to prevent direct sediment discharges to the marine environment. Any hydrocarbon spills shall be cleaned up immediately to reduce the harm to the marine environment.

.8 An Environmental Monitor (EM) is required on site full time during work below the high-water mark or with the potential to impact water quality (project activities that may result in potential negative effects to fish and fish habitat).

.9 All in-water work shall be completed within the recommended marine Reduced Risk Work Window for Fisheries and Oceans Canada (DFO) for Pacific Area 12. The summer reduce risk work window is from July 1 – August 15, while the winter reduce risk work window is from November 1 – February 15.

.10 The Contractor shall comply with Best Management Practices for Pile Driving and Related Operations (BC Marine and Pile Driving Contractors Association, March 2003). For vibratory pile driving, a 500 m exclusion zone is to be established for marine mammals and a dedicated marine mammal monitor must be on site prior to pile installation as directed in the EMP

.11 Acoustic monitoring to protect fish and marine mammals must be performed during all impact pile driving and comply with the EMP (and subsequently approved CEMP) which state.

.1 Installation of an effective sound attenuation device (e.g., bubble curtain) to be used prior to and during impact pile driving to ensure sound levels do not exceed 207 dB re 1 µPa and a SEL_{cum} 203 dB re μPa^2s outside of the sound attenuation device.

.2 Establish separate fish and marine mammal exclusion zones around the sound source prior to impact pile driving. The pinniped exclusion zone is to be a minimum of 75 m, and the cetacean exclusion zone a minimum of 500 m. An experiences and qualified marine mammal observer(s) must monitor for marine mammals in the exclusion zone for 30 minutes prior to the start of and during all impact pile driving.

.3 Continuous hydroacoustic monitoring will be conducted by a qualified environmental professional (QEP) during all impact pile driving activities to verify that underwater acoustic thresholds are not exceeded.

.4 If hydroacoustic monitoring indicates that these thresholds are being exceeded, work must be halted and additional measures (e.g., bubble curtain) implemented to effectively reduce sound levels below the above thresholds.

.12 A bubble curtain (or equivalent sound attenuation device) must be used at all times during impact pile driving. It must be installed around the full wetted length of the pile. This will be deployed to reduce the sound levels to below the above mentioned thresholds outside of the bubble curtain.

.13 Soft start procedures must be used during all impact pile driving, as detailed in the EMP.

.14 All Work and activities at the Site shall be carried out such that there is no discharge, either direct or indirect, of construction waste, oil, grease, or any substances deleterious to fish or aquatic life onto the bank of or into the waters of any watercourse.

.15 All equipment must arrive to site in good working order, clean, leak-free and equipped with a spill kit with contents appropriate for the volume and type of fluids contained within the equipment. Any materials from the spill kits that are used during the work must be disposed of appropriately and replaced within one working day. Further, the Contractor is responsible for responding to contain and / or clean-up any spills if it is deemed safe to do so. All Contractor personnel shall be familiar with implementing the spill contingency plan and the deployment of spill response materials.

.16 Fuels must be stored within double-walled tanks or secondary containment equal to or greater than 110 % of the total volume of the fuels.

.17 All equipment working below the high-water mark or from a barge must be equipped with environmentally friendly fluids.

.18 Construction wastes (existing dock structures) or other substances deleterious (creosote piles) to fish or aquatic life shall be placed and/or stored in such a manner as to prevent their entry into the marine environment (e.g, watertight storage, securely covered). The Contractor must develop and implement a sediment control plan to minimize sedimentation during all phases of the work, undertaking or activity.

.19 Handle, store and dispose of removed creosote piles so that deleterious substances do not enter the marine environment. Deploy containment booms around creosote piles prior to and during removal.

.20 Any material collected at the Site (i.e. on barges, derricks or other support vessels), shall be stored and transported from Site such that it is not released into any watercourse.

.21 The Contractor is responsible for development of a waste management plan for the removal of all non-hazardous debris and other deleterious substances generated during the Project. Waste shall be appropriately contained in the immediate work area, collected, and appropriately disposed of in accordance with all applicable legislation, guidelines, and best management practices.

.22 No tidal grounding of floating equipment shall be permitted.

.23 The Contractor must operate to avoid damage or disturbance of the existing eelgrass bed(s) present within and adjacent to the site. Boats and barges must maintain a minimum clearance at low tide of 1.5 m to avoid grounding on the seafloor or propeller wash of the eelgrass bed. Prior to the deployment of spuds and / or anchors the Contractor must confirm that the area is free of eelgrass.

.24 All piles shall be capped to prevent the entry of wildlife.

.25 No fishing or harvesting of sealife shall occur while mobilized on site.

7 REGULATORY REQUIREMENTS – SURGE NARROWS

.1 The Contractor shall be responsible for ensuring that no discharge of raw or treated sewage to the marine environment occurs from vessels used for the Project. Sewage disposal from ships shall adhere to the Pleasure Craft Sewage Pollution Prevention Regulations and the Non-Pleasure Craft Sewage Pollution Prevention Regulations.

.2 The following information provides a summary of the legislation, guidelines, and best management practices that the regulatory authorities have identified during the environmental review and that are applicable to the marine construction activities associated with the Work. This summary is provided for Contractor convenience and does not provide a full account of all applicable legislation, regulations, guidelines, and best management practices:

.1 All Work associated with the proposed project must comply with requirements of the *Fisheries Act*, *Species at Risk Act,* and the provincial *Wildlife Act* and all applicable legislation, regulations, guidelines, and best management practices contained therein.

.2 Section 34.4 (1) of the *Fisheries Act*, administered by Fisheries and Oceans Canada (DFO), states "No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish". If the onsite environmental monitor (EM) determines the death of fish has occurred, DFO must be notified immediately through DFO's 'report a fisheries violation' contact line.

.3 Section 35 (1) of the *Fisheries Act*, administered by Fisheries and Oceans Canada (DFO), states "No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption, or destruction [HADD] of fish habitat". If the onsite environmental monitor (EM) determines a HADD may have occurred, DFO must be notified immediately through DFO's 'report a fisheries violation' contact line.

.4 Section 36 (3) of the *Fisheries Act*, and administered by Environment and Climate Change Canada (ECCC), prohibits the deposit of deleterious substances of any type in water frequented by fish. The Contractor must ensure that, at all times during the

construction of the Works, deleterious substances are prevented from discharging into fish-bearing waters. Due diligence is required at all times to prevent such discharges and adherence to the provisions in the environmental assessment document and regulatory authorities' guidelines do not relieve the Contractor of ongoing responsibilities in this regard.

.5 As the Work does not result in the expansion or development of any new footprint and measures to protect fish and fish habitat can be implemented, the work is not likely to result in contraventions of the *Fisheries Act.* Therefore, project review by Fisheries and Oceans Canada (DFO) was not required. If measures cannot be implemented or the scope of work changes, DFO project review may be required

.6 The Contractor shall ensure that sediment or sediment laden waters or other deleterious substances that would result in relevant BC Approved Water Quality Guidelines (BCAWQG) exceedances are not allowed to enter the aquatic environment during the Work. Work should be conducted in accordance with available best management practices and in compliance with Section 36 of the *Fisheries Act*. Sediment barriers or sediment traps shall be implemented to prevent direct sediment discharges to the marine environment. Any hydrocarbon spills shall be cleaned up immediately to reduce the harm to the marine environment.

.7 An Environmental Monitor (EM) is required on site full time during work below the high-water mark or with the potential to impact water quality (project activities that may result in potential negative effects to fish and fish habitat).

.8 All in-water work shall be completed within the recommended marine Reduced Risk Work Window for Fisheries and Oceans Canada (DFO) for Pacific Area 13. The summer reduce risk work window is from July 1 – September 1, while the winter reduce risk work window is from November 1 – February 15.

.9 The Contractor shall comply with Best Management Practices for Pile Driving and Related Operations (BC Marine and Pile Driving Contractors Association, March 2003). For vibratory pile driving, A 500 m exclusion zone for marine mammals is to be established and a dedicated marine mammal monitor must beon site prior to pile installation as directed in the EMP (and subsequently approved CEMP).

.10 Acoustic monitoring to protect fish and marine mammals must be performed during all impact pile driving and comply with the EMP (and subsequently approved CEMP) which state.

.1 Installation of an effective sound attenuation device (e.g., bubble curtain) to be used prior to and during impact pile driving to ensure sound levels do not

exceed 207 dB re 1 µPa and a SEL_{cum} 203 dB re μPa^2s outside of the sound attenuation device.

.2 Establish separate fish and marine mammal exclusion zones around the sound source prior to impact pile driving. The pinniped exclusion zone is to be a minimum of 75 m, and the cetacean exclusion zone a minimum of 500 m. An experiences and qualified marine mammal observer(s) must monitor for marine mammals in the exclusion zone for 30 minutes prior to the start of and during all impact pile driving.

.3 Continuous hydroacoustic monitoring will be conducted by a qualified environmental professional (QEP) during all impact pile driving activities to verify that underwater acoustic thresholds are not exceeded.

.4 If hydroacoustic monitoring indicates that these thresholds are being exceeded, work must be halted and additional measures (e.g., bubble curtain) implemented to effectively reduce sound levels below the above thresholds.

.11 A bubble curtain (or equivalent sound attenuation device) must be used at all times during impact pile driving. It must be installed around the full wetted length of the pile. This will be deployed to reduce the sound levels to below the above mentioned thresholds outside of the bubble curtain.

.12 Soft start procedures must be used during all impact pile driving. EMP.

.13 All Work and activities at the Site shall be carried out such that there is no discharge, either direct or indirect, of construction waste, oil, grease, or any substances deleterious to fish or aquatic life onto the bank of or into the marine environment.

.14 All equipment must arrive to site in good working order, clean, leak-free and equipped with a spill kit with contents appropriate for the volume and type of fluids contained within the equipment. Any materials from the spill kits that are used during the work must be disposed of appropriately and replaced within one working day. Further, the Contractor is responsible for responding to contain and / or clean-up any spills if it is deemed safe to do so. All Contractor personnel shall be familiar with implementing the spill contingency plan and the deployment of spill response materials.

.15 Fuels must be stored within double-walled tanks or secondary containment equal to or greater than 110 % of the total volume of the fuels.

.16 All equipment working below the high-water mark or from a barge must be equipped with environmentally friendly fluids.

.17 Construction wastes (existing dock structures) or other substances deleterious (creosote piles) to fish or aquatic life shall be placed and/or stored in such a manner as to prevent their entry into the marine environment (e.g, watertight storage, securely covered). The Contractor must develop and implement a sediment control plan to minimize sedimentation during all phases of the work, undertaking or activity.

.18 Handle, store and dispose of removed creosote piles so that deleterious substances do not enter the marine environment. Deploy containment booms around creosote piles prior to and during removal.

.19 Any material collected at the Site (i.e. on barges, derricks or other support vessels), shall be stored and transported from Site such that it is not released into any watercourse.

.20 The Contractor is responsible for development of a waste management plan for the removal of all non-hazardous debris and other deleterious substances generated during the Project. Waste shall be appropriately contained in the immediate work area, collected, and appropriately disposed of in accordance with all applicable legislation, guidelines, and best management practices.

.21 No tidal grounding of floating equipment shall be permitted.

.22 All piles shall be capped to prevent the entry of wildlife.

.23 No fishing or harvesting of sealife shall occur while mobilized on site.

8 REGULATORY REQUIREMENTS – OWEN BAY

.1 An Application for Approval has been submitted for the Project to Transport Canada's *Navigation Protection Program* (NPP). Relevant project related information has been approved for display on the Common Project Search online registry. Public notice of the Project has already been submitted for publication by the Owner. The Contractor will be responsible for adhering to all requirements set out in the permit, subject to approval.

.2 The Contractor shall be responsible for ensuring that no discharge of raw or treated sewage to the marine environment occurs from vessels used for the Project. Sewage disposal from ships shall adhere to the Pleasure Craft Sewage Pollution Prevention Regulations and the Non-Pleasure Craft Sewage Pollution Prevention Regulations.

.3 The following information provides a summary of the legislation, guidelines, and best management practices that the regulatory authorities have identified during the environmental review and that are applicable to the marine construction activities associated with the Work. This summary is provided for Contractor convenience and does not provide a

full account of all applicable legislation, regulations, guidelines, and best management practices:

.1 All Work associated with the proposed project must comply with requirements of the *Fisheries Act*, the *Canadian Navigable Waters Act, Species at Risk Act,* and the provincial *Wildlife Act* and all applicable legislation, regulations, guidelines, and best management practices contained therein.

.2 Section 34.4 (1) of the *Fisheries Act*, administered by Fisheries and Oceans Canada (DFO), states "No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish". If the onsite environmental monitor (EM) determines the death of fish has occurred, DFO must be notified immediately through DFO's 'report a fisheries violation' contact line.

.3 Section 35 (1) of the *Fisheries Act*, administered by Fisheries and Oceans Canada (DFO), states "No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption, or destruction [HADD] of fish habitat". If the onsite environmental monitor (EM) determines a HADD may have occurred, DFO must be notified immediately through DFO's 'report a fisheries violation' contact line.

.4 Section 36 (3) of the *Fisheries Act*, and administered by Environment and Climate Change Canada (ECCC), prohibits the deposit of deleterious substances of any type in water frequented by fish. The Contractor must ensure that, at all times during the construction of the Works, deleterious substances are prevented from discharging into fish-bearing waters. Due diligence is required at all times to prevent such discharges and adherence to the provisions in the environmental assessment document and regulatory authorities' guidelines do not relieve the Contractor of ongoing responsibilities in this regard.

.5 Project review of the proposed Works was reviewed by DFO. The Works were determined to not likely result in the contraventions of the *Fisheries Act* provided measures in the associated DFO Avoid & Mitigate Letter (23-HPAC-00677) are incorporated.

.6 The Contractor shall ensure that sediment or sediment laden waters or other deleterious substances that would result in relevant BC Approved Water Quality Guidelines (BCAWQG) exceedances are not allowed to enter the aquatic environment during the Work. Work should be conducted in accordance with available best management practices and in compliance with Section 36 of the *Fisheries Act*. Sediment barriers or sediment traps shall be implemented to prevent direct sediment discharges to the marine environment. Any hydrocarbon spills shall be cleaned up immediately to reduce the harm to the marine environment.

.7 An Environmental Monitor (EM) is required on site full time during work below the high-water mark or with the potential to impact water quality (project activities that may result in potential negative effects to fish and fish habitat).

.8 All in-water work shall be completed within the recommended marine Reduced Risk Work Window for Fisheries and Oceans Canada (DFO) for Pacific Area 13. The summer reduce risk work window is from July 1 – September 1, while the winter reduce risk work window is from November 1 – February 15.

.9 The Contractor shall comply with Best Management Practices for Pile Driving and Related Operations (BC Marine and Pile Driving Contractors Association, March 2003) and the DFO Avoid & Mitigate Letter for pile driving operations.

.10 For vibratory pile driving, a 500 m exclusion zone for marine mammals must be established and a dedicated marine mammal monitor must be on site prior to pile installation as directed in the EMP and DFO Avoid and Mitigate Letter.

.11 Acoustic monitoring to protect fish and marine mammals must be performed during all impact pile driving and comply with the DFO Avoid and Mitigate Letter (and subsequently approved CEMP) which state.

.1 Installation of an effective sound attenuation device (e.g., bubble curtain) to be used prior to and during impact pile driving to ensure sound levels do not exceed 207 dB re 1 µPa and a SEL_{cum} 203 dB re μPa^2s outside of the sound attenuation device.

.2 Establish separate fish and marine mammal exclusion zones around the sound source prior to impact pile driving. The pinniped exclusion zone is to be a minimum of 75 m, and the cetacean exclusion zone a minimum of 500 m. An experienced and qualified marine mammal observer(s) must monitor for marine mammals in the exclusion zone for 30 minutes prior to the start of and during all impact pile driving.

.3 Continuous hydroacoustic monitoring will be conducted by a QEP during all impact pile driving activities to verify that underwater acoustic thresholds are not exceeded.

.4 If hydroacoustic monitoring indicates that these thresholds are being exceeded, work must be halted and additional measures (e.g., bubble curtain) implemented to effectively reduce sound levels below the above thresholds.

.12 A bubble curtain (or equivalent sound attenuation device) must be used during impact pile driving. It must be installed around the full wetted length of the pile. This will be

deployed to reduce the sound levels to below the above mentioned thresholds seaward of the bubble curtain.

.13 Soft start procedures must be used during all impact pile driving, as detailed in the DFO Avoid and Mitigate Letter.

.14 All Work and activities at the Site shall be carried out such that there is no discharge, either direct or indirect, of construction waste, oil, grease, or any substances deleterious to fish or aquatic life onto the bank of or into the waters of any watercourse.

.15 All equipment must arrive to site in good working order, clean, leak-free and equipped with a spill kit with contents appropriate for the volume and type of fluids contained within the equipment. Any materials from the spill kits that are used during the work must be disposed of appropriately and replaced within one working day. Further, the Contractor is responsible for responding to contain and / or clean-up any spills if it is deemed safe to do so. All Contractor personnel shall be familiar with implementing the spill contingency plan and the deployment of spill response materials.

.16 Fuels must be stored within double-walled tanks or secondary containment equal to or greater than 110 % of the total volume of the fuels.

.17 All equipment working below the high-water mark or from a barge must be equipped with environmentally friendly fluids.

.18 Construction and excavation wastes (including spoil piles) or other substances deleterious to fish or aquatic life shall be placed and/or stored in such a manner as to prevent their entry into watercourses (e.g, watertight storage, securely covered). The Contractor must develop and implement a sediment control plan to minimize sedimentation during all phases of the work, undertaking or activity.

.19 Handle, store and dispose of removed creosote piles so that deleterious substances do not enter the marine environment. Deploy containment booms around creosote piles prior to removal.

.20 Any material collected at the Site (i.e. on barges, derricks or other support vessels), shall be stored and transported from Site such that it is not released into any watercourse.

.21 The Contractor is responsible for development of a waste management plan for the removal of all non-hazardous debris and other deleterious substances generated during the Project. Waste shall be appropriately contained in the immediate work area, collected, and appropriately disposed of in accordance with all applicable legislation, guidelines, and best management practices.

.22 No tidal grounding of floating equipment shall be permitted.

.23 All piles shall be capped to prevent the entry of wildlife.

.24 No fishing or harvesting of sealife shall occur while mobilized on site.

.25 No live-aboard vessels shall be moored at the terminal. The Contractor shall be responsible for ensuring that no discharge of raw or treated sewage to the marine environment occurs from vessels moored at the terminal. Sewage disposal from ships shall adhere to the Pleasure Craft Sewage Pollution Prevention Regulations and the Non-Pleasure Craft Sewage Pollution Prevention Regulations.

9 ENVIRONMENTAL MONITORING – PORT NEVILLE

.1 A Qualified Environmental Professional (QEP), also known as, Environmental Monitor (EM) shall be retained by the Contractor and be on-Site to confirm adequate best management practices and mitigation measures are implemented by the Contractor during construction. The EM will follow mitigation and monitoring measures as outlined in the EMP – and subsequently approved Construction Environmental Management Plan (CEMP), which includes water quality and hydroacoustic sound monitoring during construction, in addition to establishing a marine mammal monitoring program, The EM has the authority to stop the Contractor's Work if harm to fish or fish habitat is imminent (i.e. exceedances to turbidity or overpressure thresholds) or if adequate mitigation measures are not being implemented by the Contractor to protect fish and fish habitat.

.2 A communication plan will be established with the Contractor, Owner and Owner's Representative to confirm appropriate notification of change management, stop works or non compliances.

.3 The EM shall be familiar with the project EMP, CEMP and all pertinent project permits and authorizations and understand his/her role as outlined therein.

.4 The EM is required to provide Owner and Owner's Representative with weekly reports, presenting any test results and observations. This EM shall also present a separate report for any incidents that require remediation/response.

.5 An environmental monitoring protocol shall be implemented for water quality and hydroacoustic sound monitoring during construction. Potential impacts to fish may result from induced turbidity and suspended sediments from construction activities related to the Work and/or excessive hydraulic shock pressures/underwater sound during pile installation. Preventative measures, such as timing of construction activities to occur within DFO's least risk work window applicable for the project site (**July 1 to August 15 and November 1 to February 15 for this site**), the use of silt curtains and fish barrier nets, and a "bubble

curtain" when and where appropriate, shall be used by the Contractor to minimize and prevent potential adverse effects. Environmental monitoring during construction activities in and around marine waters shall include testing pH, turbidity, and presence / absence of oil and grease.

.6 If monitoring test results are found to be unacceptable, construction activities shall be modified, and corrective actions taken by the Contractor such that no unacceptable negative impacts resulting from construction activities occur outside of the contained Work area. Examples of corrective actions include: adjusting construction activities until turbidity measured in the water column returns to acceptable conditions and checking the integrity of silt curtains or other containment barriers in use and re-adjusting or reinforcing as necessary. No "backsliding" in the level of turbidity generated during marine construction Work, nor will intentional increases in construction activity which temporarily exceed turbidity criteria be tolerated.

.7 The Owner's Representative will be the Environmental Auditor (EA) and shall be periodically on-Site to confirm adequate best management practices and mitigation measures are implemented by the Contractor during construction. This EA shall provide oversight of the EM for compliance such as liaison with regulatory authorities, review weekly reports, perform random site inspections, and consult with the Contractor and Owner. This EA has the authority to stop the Contractor's Work if harm to fish or fish habitat is imminent (i.e. exceedances to turbidity thresholds) or if adequate mitigation measures are not being implemented by the Contractor to protect fish and fish habitat. The presence of this EA does not absolve the need for the Contractor to have an EM present as outlined above. This EA has the authority to audit the Contractors EM's work.

10 ENVIRONMENTAL MONITORING – SURGE NARROWS

.1 A Qualified Environmental Professional (QEP), also known as, Environmental Monitor (EM) shall be retained by the Contractor and be on-Site to confirm adequate best management practices and mitigation measures are implemented by the Contractor during construction. The EM will follow mitigation and monitoring measures as outlined in the EMP – and subsequently approved Construction Environmental Management Plan (CEMP), which includes water quality and hydroacoustic sound monitoring during construction, in addition to establishing a marine mammal monitoring program, The EM has the authority to stop the Contractor's Work if harm to fish or fish habitat is imminent (i.e. exceedances to turbidity or overpressure thresholds) or if adequate mitigation measures are not being implemented by the Contractor to protect fish and fish habitat.

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11 ENVIRONMENTAL MONITORING – OWEN BAY

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.5 An environmental monitoring protocol shall be implemented for water quality and hydroacoustic sound monitoring during construction. Potential impacts to fish may result from induced turbidity and suspended sediments from construction activities related to the Work and/or excessive hydraulic shock pressures/underwater sound during pile installation. Preventative measures, such as timing of construction activities to occur within DFO's least risk work window applicable for the project site (**July 1 to September 1 and November 1 to February 15 for this site**), the use of silt curtains and fish barrier nets, and a "bubble curtain" when and where appropriate, shall be used by the Contractor to minimize and prevent potential adverse effects. Environmental monitoring during construction activities in and around marine waters shall include testing pH, turbidity, and presence / absence of oil and grease.

.6 If monitoring test results are found to be unacceptable, construction activities shall be modified, and corrective actions taken by the Contractor such that no unacceptable negative impacts resulting from construction activities occur outside of the contained Work area.

Examples of corrective actions include: adjusting construction activities until turbidity measured in the water column returns to acceptable conditions and checking the integrity of silt curtains or other containment barriers in use and re-adjusting or reinforcing as necessary.

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END OF SECTION 01 41 00

REFERENCE STANDARDS, ABBREVIATIONS & ACRONYMS

1.0 GENERAL

1.1 This section must be referenced to, and interpreted simultaneously with, all other sections pertinent to the Works described herein.

1.2 Abbreviations and Acronyms

.1 General

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ARCA	Alberta Roofing Contractors Association
ASCE	American Society of Civil Consultants
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Associations
AWS	American Welding Society
BCLMA	B.C. Lumber Manufacturer's Association
BCBC	BC Building Code
CAN	National Standard of Canada
CCA	Canadian Construction Association
CISC	Canadian Institute of Steel Construction
CITC	Canadian Institute of Timber Construction
CPCI	Canadian Prestressed Concrete Institute
CRCA	Canadian Roofing Contractors Association
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
ISO	International Organization for Standardization
NBC	National Building Code
PCI	Prestressed Concrete Institute
PMBC	Plywood Manufacturer's Association
SJI	Steel Joist Institute
SSPC	Steel Structures Painting Council
WCB	Worker's Compensation Board

.2 Utilities

API	American Petroleum Institute
AWWA	American Water Works Association
CGA	Canadian Gas Association
CGSB	Canadian General Standards Board
CSPI	Corrugated Steel Pipe Institute
IAO	Insurer's Advisory Organization
RTAC	Roads and Transportation Association of Canada
ULC	Underwriters Laboratories of Canada
USA	United States of America Standards (ASA)

.3 Mechanical

AFBMA	Anti Friction Bearing Manufacturer's Association
AGMA	American Gear Manufacturer's Association
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
ACR	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating Refrigerating and Air Conditioning Consultants
NFPA	National Fire Protection Association
SAE	Society of Automotive Consultants

.4 Electrical

AIEE	American Institute of Electrical Consultants
CEC	Canadian Electrical Code
EEMAC	Electrical and Electronic Manufacturers Association of Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Consultants
IES	Illuminating Consultants Society
IPCEA	Insulated Power Cable Consultant's Association
LEMA	Lighting Equipment Manufacturer's Association
NEC	National Electrical Code

NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code

1.3 Use of Abbreviations

.1 These abbreviations refer to Specifications, Methods and Standards issued by the respective Association, and the abbreviations are used in the specifications.

.2 Alphanumeric designations following the abbreviations denote the specification, method, or standard. Abbreviations - Metric

1.4 Units

.1 The specifications are metric and metric usage is based upon SI units in accordance with CSA Standard CAN/CSA-Z234.1 Canadian Metric Practice Guide. In this specification SI units are abbreviated in accordance with the Metric Units and Abbreviations below.

.2 Linear Measure

Metre	m
Millimetre	mm
Kilometre	km
micrometre	micro-m

.3 Area

Square metre	m^2
Square millimetre	mm^2
Hectare	ha

.4 Volume

Cubic metre	m^3
Litre	L

.5 Mass and Density

Kilogram	kg
Gram	g
Tonne	t
Kilogram per metre	kg/m
Gram per metre	g/m

	Kilogram per square metre	kg/m^2
	Gram per square metre	g/m^2
	Kilogram per cubic metre	kg/m^3
.6	Temperature	
	Degree Celsius	°C
.7	Force, Pressure, Stress	
	Newton	N
	Kilonewton	kN
	Pascal	Pa
	Kilopascal	kPa
	Megapascal	MPa
.8	Velocity, Rate of Flow	
	Metre per second	m/s
	Metre per hour	m/h
	Kilometre per hour	km/h
	Litre per second	L/s
	Cubic metre per second	m^3/s
.9	Power, Energy, Heat, Work	
	Watt	W
	Kilowatt	kW
	Kilowatt hour	kWh
	Joule	J
.10	Electricity	
	Ampere	A
	Volt	V

1.5 Referenced Specifications

.1 ACI

. 1	ACI 315R	Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.2 AI

.1 Asphalt Institute Manual SP-2 Superpave Level I Mix Design.

.3 ANSI

.1	ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800.
.2	ANSI B16.5	Pipe Flanges and Flanged Fittings.

.4 ANSI/ACI

.1	ANSI/ACI 117	Tolerances for Concrete Construction and Materials.
.2	ANSI/ACI 315	Details and Detailing of Concrete Reinforcement.

.5 ANSI/AWWA

.1	ANSI/AWWA	C151 Ductile-Iron Pipe, Centrifugally Cast, for Water.
.2	ANSI/AWWA	C219 Bolted, Sleeve-Type Couplings for Plain-end Pipe.
.3	ANSI/AWWA	C213 Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
.4	ANSI/AWWA	B300 Hypochlorites
.5	ANSI/AWWA	C300 Reinforced Concrete Pressure Pipe - Steel-cylinder Type.
.6	ANSI/AWWA	B301 Water Treatment — Liquid Chlorine.
.7	ANSI/AWWA	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
.8	ANSI/AWWA	Polyethylene encasement for Ductile-Iron Piping for Water and Other Liquids. C105/A21.5
.9	ANSI/AWWA C110/A21.10	Ductile-Iron and Gray Iron Fittings, 3 inches through 48 inches for Water and other Liquids.
.10	ANSI/AWWA	Rubber Gasket Joints for Ductile-Iron and Gray Iron Pressure Pipe C111/A21.11 and Fittings.

.11 ANSI/AWWA C150 Thickness Design of Ductile - Iron Pipe.

.12 ANSI/AWWA C151 Ductile-Iron Pipe, Centrifugally Cast in Metal Moulds or Sand Lined
C151/A21.51 Moulds for Water or other Liquids.

.13 ANSI/AWWA C151 Ductile-Iron Compact Fittings, 3 inches through 16 inches, for Water
C153/A21.53 and Other Liquids.

.14 ANSI/AWWA C200 Water Pipe 6 inches and Larger, Steel.

.15 ANSI/AWWA C203 Coal Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied.

.16 ANSI/AWWA C205 Cement Mortar Protective Lining and Coating for Steel Water Pipe - 4 inches and larger - Shop Applied.

.17 ANSI/AWWA C206 Field Welding of Steel Water Pipe.

.18 ANSI/AWWA C207 Steel Pipe Flanges for Waterworks Service, 4 inches through 144 inches.

.19 ANSI/AWWA C208 Fabricated Steel Water Pipe Fittings, Dimensions for.

.20 ANSI/AWWA C210 Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.

.21 ANSI/AWWA C301 Pre-stressed Concrete Pressure Pipe Steel Cylinder Type for Water and Other Liquids.

.22 ANSI/AWWA C303 Reinforced Concrete Pressure Pipe Steel Cylinder Type, Pretensioned for Water and Other Liquids.

.23 ANSI/AWWA C500 Gate Valves for Water and Sewage Systems.

.24 ANSI/AWWA C502 Dry-Barrel Fire Hydrants.

.25 ANSI/AWWA C504 Butterfly Valves.

.26 ANSI/AWWA C508 Swing-Check Valves for Waterworks Service. 2 in. (50mm) Through 24 in. (600mm) NPS.

.27 ANSI/AWWA C509 Resilent-Seated Gate Valves for Water and Sewerage Systems.

.28 ANSI/AWWA C510 Double Check Valve Backflow-Prevention Assembly.

.29 ANSI/AWWA C511 Reduced-Pressure Principle Backflow-Prevention Assembly.

.30 ANSI/AWWA C512 Air Release. Air/Vacuum, and Combination Air Valves for Waterworks Service.

.31 ANSI/AWWA C550 Protective Epoxy Interior Coatings for Valves and Hydrants.

.32 ANSI/AWWA C600 Installation of Ductile-Iron Water Mains, and their Appurtenances.

.33 ANSI/AWWA C602 Cement Mortar Lining of Water Pipelines - 100 mm and larger - In Place.

.34 ANSI/AWWA C605 Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.

.35 ANSI/AWWA C651 Disinfecting Watermains.

.36 ANSI/AWWA C800 Underground Service Line Valves and Fittings.

.37 ANSI/AWWA C900 Pressure Pipe, 4 inches through 12 inches for Water, Polyvinyl Chloride (PVC).

.38 ANSI/AWWA C901 Polyethylene (PE) Pressure Pipe and Tubing, Y2 inch through 3 inches for Water Service.

.39 ANSI/AWWA C902 Polybutylene (PB) Pressure Pipe and Tubing, ‘4 inch through 3 inches for Water Service.

.40 ANSI/AWWA C905 Pressure Pipe, 14 inches through 36 inches for Water, Polyvinyl Chloride (PVC).

.41 ANSI/AWWA C906 Polyethylene (PE) Pressure Pipe and Fittings, 4 inches through 63 inches, for Water Distribution.

.42 ANSI/AWWA C907 Standard for Polyvinyl Chloride (PVC) Pressure Fittings for Water -4 inches through 8 inches (100mm through 200mm).

.43 ANSI/AWWA M17 Installation, Field Testing, and Maintenance of Fire Hydrants.

.44 ANSI/AWWA M23 PVC Pipe - Design and Installation.

	.45	ANSI/AWWA M41	Ductile-Iron Pipe and Fittings.
.6	ASTM (A)		
	.1	ASTM A36	Standard Specification for Structural Steel.
	.2	ASTM A48	Specification for Gray Iron Castings.
	.3	ASTM A53	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
	.4	ASTM A90	Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
	.5	ASTM A120	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses.
	.6	ASTM A121	Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
	.7	ASTM A283/A283M	Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars.
	.8	ASTM A307	Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
	.9	ASTM A325	Standard Specification for High-Strength Bolts for Structural Steel Joints.
	.10	ASTM A354	Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners.
	.11	ASTM A536	Ductile Iron Castings.
	.12	ASTM A585	Specification for Aluminum-Coated Steel Barbed Wire.
	.13	ASTM A563	Carbon and Alloy Steel Nuts.
	.14	ASTM A615M	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
	.15	ASTM A653/A653M	Standard Specification for Steel Sheet. Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

	.16	ASTM A716	Specification for Ductile - Iron Culvert Pipe.
	.17	ASTM A746	Specification for Ductile - Iron Gravity Sewer Pipe.
	.18	ASTM A760	Corrugated Steel Pipe, Metallic-coated for Sewers and Drains.
	.19	ASTM A775/A775M	Specification for Epoxy-Coated Reinforcing Steel Bars.

.7 ASTM (B)

.1	ASTM B62	Specification for Composition Bronze or Ounce Metal Castings.
.2	ASTM B88M	Specification for Seamless Copper Water Tube.
.3	ASTM B221M	Specifications for Aluminium and Aluminium-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
.4	ASTM B633	Electodeposited Coatings of Zinc on Iron and Steel.
.5	ASTM B766	Electodeposited Coatings of Cadmium.

.8 ASTM (C)

.1	ASTM C14M	Specification for Concrete Sewer, Storm Drain and Culvert Pipe.
.2	ASTM C76M	Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
.3	ASTM C88	Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
.4	ASTM C109	Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inches or 50 mm Cube Specimens).
.5	ASTM C117	Test Method for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing.
.6	ASTM C123	Test Method for Lightweight Pieces in Aggregate.

.7	ASTM C127	Test Method for Specific Gravity and Absorption of Coarse Aggregate.
.8	ASTM C128	Test Method for Specific Gravity and Absorption of Fine Aggregate.
.9	ASTM C131	Test Method for Resistance to Degradation of Small Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
.10	ASTM C136	Method for Sieve Analysis of Fine and Coarse Aggregates.
.11	ASTM C139	Specification for Concrete Masonry Units for Construction of Catchbasins and Manholes.
.12	ASTM C171	Specification for Sheet Materials for Curing Concrete.
.13	ASTM C309	Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
.14	ASTM C332	Specification for Lightweight Aggregates for Insulating Concrete.
.15	ASTM C443M	Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
.16	ASTM C478M	Specification for Precast Reinforced Concrete Manhole Sections.
.17	ASTM C497	Test Methods for Concrete Pipe, Manhole Sections, or Tile.
.18	ASTM C506M	Specification for Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe.
.19	ASTM C507M	Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe.
.20	ASTM C827	Test Method for Early Volume Change of Cementitious Mixtures.
.21	ASTM C902	Specification for Pedestrian and Light Traffic Paving Brick.

	.22	ASTM C939	Test Method for Flow of Grout for Preplaced-Aggregate Concrete.
	.23	ASTM C1433	Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers.
	.24	ASTM C1103	Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.
.9	ASTM (D)		
	.1	ASTM D36	Test Method for Softening Point of Bitumen (Ring and Ball Apparatus).
	.2	ASTM D140	Method for Sampling Bituminous Materials.
	.3	ASTM D412	Test Method for Rubber Properties in Tension.
	.4	ASTM D570	Test Method for Water Absorption of Plastics.
	.5	ASTM D624-86	Test Method for Rubber Property -Tear Resistance.
	.6	ASTM D698	Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 2.49 kg Rammer and 304.8 mm Drop.
	.7	ASTM D790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Material.
	.8	ASTM D995	Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
	.9	ASTM D1190	Concrete Joint Sealer, Hot-Applied Elastic Type.
	.10	ASTM D1248	Specification for Polyethylene Plastics Molding and Extrusion Materials.
	.11	ASTM D1557	Specification for Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10 lb (4.54 kg) Rammer and 18 inch (457 mm) Drop.

.12	ASTM D1559	Test Method Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.
.13	ASTM D1751	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
.14	ASTM D1752	Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
.15	ASTM D1784	Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.
.16	ASTM D1862	Test Methods for Breaking Load and Elongation Textile Fabric.
.17	ASTM D2000	Classification System for Rubber Products in Automotive Applications.
.18	ASTM D2152	Test Method for Quality of Extruded Polyvinyl Chloride (PVC) Pipe by Acetone Immersion.
.19	ASTM D2241	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe (SDR-PR).
.20	ASTM D2310	Classification for Machine Made Reinforced Thermosetting Resin Pipe.
.21	ASTM D2321-05	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-flow Applications.
.22	ASTM D2412	Standard Test Method for External Loading Properties of Plastic Pipe by Parallel-Plate Loading.
.23	ASTM D2419	Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
.24	ASTM D2657	Standard Practice for Heat Fusion Joining of Polyoletin Pipe and Fittings.

.25	ASTM D2680	Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
.26	ASTM F2620-06	Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.
.27	ASTM D2774	Practices for Underground, Installation of Thermoplastic Pressure Piping.
.28	ASTM D2837	Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
.29	ASTM D2990	Standard Test Method for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.
.30	ASTM D2992	Method for Obtaining Hydrostatic Design Basis for Reinforced Thermosetting Resin Pipe and Fittings.
.31	ASTM D2996	Specification for Filament Wound Reinforced Thermosetting Resin Pipe.
.32	ASTM D3034	Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
.33	ASTM D3035-08	Standard Specifications for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
.34	ASTM D3139	Joints for Plastic Pressure Pipes using Flexible Elastomenc Seals.
.35	ASTM D3203	Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
.36	ASTM D3212	Specification for Joints for Drain and Sewer Plastic Pipes using Flexible Elastomic Seals.
.37	ASTM 3261	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
.38	ASTM 3405	Specification for Joint Sealants, Hot Poured for Concrete and Asphalt Pavements.

	.39	ASTM D3350	Standard Specification for Polyethylene Plastic Pipe and Fittings Materials.
	.40	ASTM D4101	Propylene Plastic Injection and Extrusion Materials.
	.41	ASTM D4318	Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
	.42	ASTM D4354	Practice for Sampling of Geosynthetics for Testing.
	.43	ASTM D4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
	.44	ASTM D4956	Standard Specification for Retroreflective Sheeting for Traffic Control.
	.45	ASTM D5813	Standard Specification for Cured-in-Place Thermosetting Resin Sewer Piping Systems.

.10 ASTM (E)

.1	ASTM E11	Specification for Wire Cloth Sieves for Testing Purposes.
.2	ASTM E1155M	Test Method for Determining Floor Flatness and Levelness Using the F-Number System.
.3	ASTM E1252	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis.

.11 ASTM (F)

.1	ASTM F436	Hardened Steel Washers.
.2	ASTM F477	Specification for Elastomeric Seals (Gaskets) for joining Plastic Pipe.
.3	ASTM F593	Stainless Steel Bolts, Hex Cap Screws, and Studs.
.4	ASTM F594	Stainless Steel Nuts.

.5	ASTM F679	Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.
.6	ASTM F714	Standard Specifications for Polyethylene (PE) Plastic (SDR-PR) Based on Outside Diameter.
.7	ASTM F738	Stainless Steel Metric Bolts, Screws, and Studs.
.8	ASTM F794	Specification for Polyvinyl Chloride (PVC) Ribbed Gravity Sewer Pipe and Fittings based on Controlled Inside Diameter.
.9	ASTM F836M	Style I Stainless Steel Metric Nuts.
.10	ASTM F1055	Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.
.11	ASTM F1216	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
.12	ASTM F1743	Standard Practice for the Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP).
.13	ASTM F2019	Standard Practice for the Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP).

.12 AWWA: (See ANSI/AWWA)

.13 BCLNA

.1 BC Landscape Standard 2008 (7th Ed)

.2 Canadian Standards for Nursery Stock – (8th Edition)

.3 Canadian system of Soil Classification – (3rd Edition)

.14 CAN3 = CAN/CSA

.1	CAN3-A165 Series	CSA Standards on Concrete Masonry Units.

.2 CAN3-B137.3	Rigid Poly (Vinyl chloride) (PVC) Pipe for Pressure Applications.
.3 CAN4-S543	Internal Lug, Quick-Connect Couplings for Fire Hose.
.4 CAN3-B70	Cast iron Soil Pipe and Fittings, and Means of Joining.
.5 CAN3-G401	Corrugated Steel Pipe Products.
.6 CAN3-A23.3	Design of Concrete Structures for Buildings.

.15 CAN/CSA = CAN3

.1 CSA A3000	Portland Cement.
.2 CSA A3000	Masonry Cement.
.3 CAN/CSA-A23.1	Concrete Materials and Methods for Concrete Construction.
.4 CAN/CSA-A23.2	Methods of Testing for Concrete.
.5 CAN/CSA-A23.5	Supplementary Cementing Materials.
.6 CAN/CSA-A231.2	Precast Concrete Payers.
.7 CAN/CSA-A266.1	Air-Entraining Admixtures for Concrete.
.8 CAN/CSA-A266.2	Chemical Admixtures for Concrete.
.9 CAN/CSA-A266.4	Guidelines for the use of Admixtures in Concrete.
.10 CSA A3000	Blending Hydraulic Cement.
.11 CSA A3000	Cementitious Hydraulic Slag.
.12 CAN/CSA-B182.1	Plastic Drain and Sewer Pipe and Pipe Fittings.
.13 CAN/CSA-B182.6M	Profile Polyolefin Sewer Pipe & Fittings.
.14 CAN/CSA-G40.21	Structural Quality Steels.

.16 CAN/CGSB

	.1	CAN/CGSB-8.1	Sieves Testing. Woven Wire.
	.2	CAN/CGSB-8.2	Sieves Testing. Woven Wire. Metric.
	.3	CAN/CGSB-138.1	Fence, Chain Link, Fabric.
	.4	CAN/CGSB-138.2	Fence, Chain Link, Framework, Zinc-Coated, Steel.
	.5	CAN/CGSB-138.3	Fence, Chain Link - Installation.
	.6	CAN/CGSB-138.4	Fence, Chain Link, Gates.
	.7	CAN/CGSB-37.2	Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Root Coatings.
	.8	CAN/CGSB-16.1	Asphalts, Liquids Petroleum, for Road Purposes.
	.9	CAN/CGSB-16.2	Asphalts, Emulsified, Anionic Type, for Road Purposes.
	.10	CAN/CGSB-16.3	Asphalt Cements for Road Purposes.
	.11	CAN/CGSB-16.5	Asphalt, Emulsified, High Float Type, for Road Purposes.
.17	CGSB		
	.1	CGSB 1-GP-12c	Standard Paint Colours.
	.2	CGSB 1-GP-56M	Enamel. Exterior Gloss Alkyd Type.
	.3	CGSB 1-GP-5M	Thinner, Petroleum Spirits, Low Flash (R184).
	.4	CGSB 1-GP-71	Method of Testing Paints and Pigments.
	.5	CGSB 1-GP-74M	Paint, Traffic, Alkyd.
	.6	CGSB 1-GP-149M	Paint, Traffic, Reflectorized Alkyd. White and Yellow.
	.7	CGSB 15.1-92	Standard for Calcium Chloride.
	.8	CGSB 1-GP-181M	Coating, Zinc-Rich, Organic, Ready Mixed.

	.9	CGSB 51-GP-51M	Polyethylene Sheet for Using in Building Construction.
	.10	CGSB 41-GP-25M	Pipe, Polyethylene, for the Transport of Liquids.
.18	CSA		
	.1	CSA 283	Standard Paint Colours.
	.2	CSA A14	Enamel, Exterior Gloss Alkyd Type.
	.3	CSA A82.5	Structural Clay Non-Load-Bearing Tile.
	.4	CSA A82.56	Aggregate for Masonry Mortar.
	.5	CSA A123.3	Asphalt or Tar Roofing Sheets.
	.6	CSA A257	Standards for Concrete Pipe and Manhole Sections (Consists of A257.O. A257.1.A257.2. A257.3 and A257.4).
	.7	CSA B137.0	Definitions. General Requirements. and Methods of Testing for Thermoplastic Pressure Piping.
	.8	CSA B137.1	Polyethylene Pipe, Tubing and Fittings for cold Water Pressure Services.
	.9	CSA B137.2	PVC Injection Moulded Gasketed Fittings for Pressure Applications.
	.10	CSA B137.3	Rigid Polyvinyl Chloride (PVC) Pipe for Pressure Application.
	.11	CSA B137.6	CPVC Pipe, Tubing and Fittings for Hot and Cold Water Distribution Systems.
	.12	CSA B137.7	Polybutylene (PB) Pipe for Cold Water Distribution Systems.
	.13	CSA B137.8	Polybutylene (PB) Pipe for Pressure Applications.
	.14	CSA B137.9.M91	Polyethylene I Aluminium Polyethylene Composite Pressure Pipe.
	.15	CSA B137.16	Recommended Practice for the Installation of CPVC Piping for Hot and Cold Water Distribution Systems.

.16	CSA B181.12	Recommended Practice for the Installation of PVC Drain, Waste and Vent Pipe Fittings.
.17	CSA 182.1	Plastic Drain and Sewer Pipe and Pipe Fittings.
.18	CSA 182.11	Recommended Practice for the Installation of Plastic Drain and Sewer Pipe and Pipe Fittings.
.19	CSA B182.2	Large Diameter, Type PSM PVC Sewer Pipe and Fittings.
.20	CSA B182.4	Large Diameter Ribbed PVC Sewer Pipe and Fittings.
.21	CSA C22.1	Safety Standard for Electrical Installations.
.22	CSA C22.2	Canadian Electrical Code, General Requirements.
	No.03	Test Methods for Electrical Wires and Cables.
	No.18.1	Metallic Outlet Boxes.
	No 18.4	Hardware for the Support of Conduit, Tubing and Cable.
	No 29	Panelboards and Enclosed Panelboards.
	No 38	Thermoset Insulated Wires and Cables.
	No 42	General Use Receptacles, Attachment Plus and Similar Wiring Devices.
	No 45	Rigid Metal Conduit.
	No 49	Flexible Cord and Cables.
	No 56	Flexible Metal conduit and Liquid Tight Flexible Metal Conduit.
	No 85	Rigid PVC Boxes and Fittings.
	No 89	Splitters.
.23	CSA C22.3	Canadian Electrical Code Outside Wiring.

	24	CSA G30.3	Cold Drawn Steel Wire for Concrete Reinforcement.
	.25	CSA G30.5	Welded Steel Wire Fabric for Concrete Reinforcement.
	26	CSA G30.12-M77	Billet-Steel Bars for Concrete Reinforcement.
	.27	CSA G30.14	Deformed Steel Wire for Concrete Reinforcement.
	.28	CSA G30.15	Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
	.29	CSA G30.16	Weldable Low Allow Steel Deformed Bars for Concrete Reinforcement.
	.30	CSA G164	Hot Dip Galvanizing of Irregularly Shaped Articles.
	.31	CSA S157	Strength Design in Aluminium.
	.32	CSA S269.3	Formwork.
	.33	CSA W59	Welded Steel Construction (Metal Arch Welding).
	.34	CSA W186	Welding of Reinforcing Bars in Reinforced Concrete Construction.
	.35	CSA G40.20	General Requirements for Rolled or Welded Structural Quality Steel I Structural Quality Steels.
.19	C-SHRP		
	.1		Superpave Series No 2 (SP-2) Superpave level 1 Mix Design.
	.2	Technical Brief #17	Superpave 2000 - Improved Standards for a new Millenium.
.20	MSA		
	.1	50-2	Polyethylene insulated, polyethylene jacketed. loop detector lead-in cable.
.21	NACE		National Association of Corrosion Engineers

.22 NEMA

.1	TS-@-2003	Traffic Controller Assemblies with NTCIP Requirements, Version 02.60.
.2	250-2003	Enclosures for Electrical Equipment (1000 Volts Maximum).

.23 BC Ministry of Transportation Standards

.1 Electrical and Signing Material Standards.

.2 Specifications for Standard Highway Sign Materials, Fabrication and Supply.

.24 Plastic Pipe Institute Handbook on Polyethylene Pipe

END OF SECTION 01 42 00

QUALITY ASSURANCE

1.0 INSPECTION AND TESTING OF WORK

1.1 Laboratories/Agencies

.1 With the exception of testing required of the Contractor pursuant to GC 2.3, Independent Inspection/Testing Agencies will be engaged by the Owner for the purpose of inspecting and/or testing portions of the Work. All costs of such services will be borne by the Owner.

.2 All equipment required for carrying out inspection and/or testing noted in paragraph 1.1.1 above will be provided by the respective Agencies.

.3 Employment of Inspection/Testing Agencies in no way relieves the Contractor of responsibility to perform the Work in accordance with the Contract Documents.

.4 The Contractor shall allow the Inspection/Testing Agencies access to all portions of the Work on site and manufacturing or fabrication plants, as may be necessary. Provide facilities for such access.

1.2 Design Standards, Code Requirements

.1 Inspection and/or testing will be performed in accordance with the standards described in the Contract Documents.

2.0 PROCEDURES

2.1 Notify the Owner's representative well in advance of the requirements for tests so that necessary arrangement can be made.

2.2 Provide facilities to allow inspection and/or testing.

2.3 The Owner will pay for successful tests only. Costs for re-inspection and/or testing of rejected work shall be borne by the Contractor.

END OF SECTION 01 43 00

CONSTRUCTION FACILITIES

1.0 FIELD OFFICES AND SHEDS

1.1 General

.1 The location of temporary structures and storage sites provided by the Contractor shall be subject to the approval of the Owner's representative.

.2 The Contractor shall maintain temporary structures and storage sites in good order and on completion of the Work shall remove all temporary structures from the site.

.3 The Contractor shall ensure that the wharf areas are securely closed to all unauthorized access during construction.

1.2 Contractor's Office

.1 Provide and maintain, in clean condition during entire progress of the Work, a suitable office adequately lighted, heated and ventilated, for own use. The location shall be subject to the approval of the Owner's representative.

.2 Provide within office space adequate first aid facilities as required under the Occupational Health and Safety Act.

1.3 Equipment and Tool Storage

.1 Provide and maintain in a clean and orderly condition adequate lockable storage sheds for tools and equipment.

1.4 Materials and Storage

.1 Provide and maintain in a clean and orderly condition suitable weatherproof and lockable sheds for storage and protection of materials which require such protection.

.2 Allocate storage areas on site for materials which do not require weatherproof sheds. Maintain areas in clean and orderly condition. Limit storage of materials and items to storage areas only.

2.0 UTILITIES

2.1 Sanitary Facilities

.1 Provide sanitary facilities for workers in accordance with health authorities. Maintain facilities in clean and tidy condition.

2.2 Water Supply

.1 Provide a supply of potable water for use during construction. Make necessary arrangements for connection with the appropriate utility.

2.3 Temporary Heating and Air Conditioning

.1 Provide all temporary heating and air conditioning required during construction period, including attendants, maintenance and fuel.

.2 Pay for all costs in maintaining and providing temporary heat.

.3 Be responsible for any damages to the Work due to failure in providing adequate heat and protection during construction.

2.4 Temporary Power and Light

.1 Provide temporary power and light. Install in accordance with regulations of governing authorities.

3.0 BARRIERS

3.1 Guard Rail and Barricades

.1 Provide guard railings and barricades, detour signs, watch persons, warning lights, flag persons around all excavations.

END OF SECTION 01 52 00

PRODUCTS WORKMANSHIP

1.0 PRODUCTS

1.1 Quality of Products

.1 If requested, furnish evidence as to type, source and quality of Products provided.

.2 Should any dispute arise as to the quality or fitness of materials, equipment or articles, the decision rests strictly with the Owner's representative based upon the requirements of the Contract Documents.

.3 Unless otherwise indicated in the Specifications, maintain uniformity of manufacturer for any particular or like Products.

.4 Permanent labels, trademarks, and nameplates on materials, equipment and articles are not acceptable in prominent locations except where required for operating instructions and when located in mechanical or electrical rooms.

1.2 Availability of Products

.1 Following Notice of Award, review Product requirements and anticipate foreseeable delivery delays in any items. If delays in deliveries of materials, equipment or articles are foreseeable, propose substitutions or other remedial action in ample time to prevent delay in performance of the Work.

.2 If such proposal is not provided to the Owner's representative, the Owner's representative reserves the right to substitute more readily available Products later in order to prevent delays, at no additional cost to the Owner.

.3 No substitution of any Product will be permitted unless the Product cannot be incorporated into the Work within the Contract Time.

.4 To receive approval, proposed substitutes must equal or exceed the quality, finish and performance of those specified and/or shown, and must not exceed the space requirements allotted on the Drawings.

.5 Provide documentary proof of equality, difference in price (if any) and delivery dates in the form of certified quotations from Suppliers of both specified Products and proposed substitutions.

.6 Include all costs in the difference in price (if any) for any required revisions to other structures and Products to accommodate such substitutions.

1.3 Storage, Handling, and Protection of Products

.1 Handle and store Products in a manner to prevent damage, contamination, deterioration and soiling and in accordance with manufacturer's recommendations when applicable.

.2 Store packaged or bundled Products in original and undamaged condition with manufacturers' seals and labels intact. Do not remove from packaging or bundling until incorporated into the Work.

.3 Products subject to damage from weather are to be stored in weatherproof enclosures.

.4 Remove and replace damaged Products at own expense.

1.4 Manufacturer's Directions

.1 Unless otherwise specified, install or erect all Products in accordance with manufacturers' recommendations. Do not rely on labels or enclosures provided with Products. Obtain instructions directly from manufacturers.

.2 Notify the Owner’s representative in writing, of any conflicts between the Contract Documents and manufacturers' instructions.

1.5 Transportation Costs of Products

.1 Pay all costs for transportation of Products required for the Work.

.2 Transportation costs for Products supplied by the Owner will be paid by the Owner. Be responsible for unloading, handling and storage of such Products unless specified otherwise

2.0 WORKMANSHIP

2.1 Co-ordination

.1 Co-ordinate the work of all Subcontractors, if such are engaged by the Contractor.

.2 Ensure that all Subcontractors examine the Contract Documents for other parts of the Work which may affect the performance of their work.

.3 Ensure that sleeves, openings and miscellaneous foundations are provided as required for the Work.

.4 Ensure that items to be built in are supplied, when required, with all necessary templates, measurements and Shop Drawings.

2.2 Cutting and Remedial Work

.1 Perform all cutting and remedial work that may be required to make the several parts of the Work come together properly. Co-ordinate and schedule the Work to ensure that cutting and remedial work are kept to a minimum.

.2 Should the Owner or anyone employed by them be responsible for ill-timed work necessitating cutting and/or remedial work to be performed, the cost of such work will be valued as provided in the General Conditions.

.3 Employ specialists familiar with the materials affected in performing cutting and remedial work. Perform in a manner to neither damage nor endanger any portion of the Work.

3.0 MEASUREMENTS

3.1 Metric Project

.1 Unless otherwise noted, this Project has been designed and is to be constructed in the S.I. metric system of measurements.

.2 During construction, when specified metric elements are unattainable at the time they are required to meet the Contract Time, the Contractor shall notify the Owner's representative in writing and suggest alternative substitutions. Costs due to these substitutions shall be borne by the Contractor.

END OF SECTION 01 63 00

FIELD ENGINEERING

1.0 REQUIREMENTS INCLUDED

1.1 The Contractor shall be responsible for:

.1 Field engineering survey services to measure and stake the site as required.

.2 Survey services to establish (and confirm) alignment and grade measurements for the Work as required.

2.0 RELATED REQUIREMENTS

2.1 Submittals

3.0 SURVEY REFERENCE POINTS

3.1 Locate, confirm, and protect control points. Preserve permanent reference points during construction.

3.2 Make no changes or relocations without prior written notice to the Owner's representative.

3.3 Report to Owner's representative when a reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

3.4 Contractor to replace control points in accordance with the original survey control.

4.0 SURVEY REQUIREMENTS

4.1 Establish at least two additional permanent benchmarks on site, referenced to established benchmarks by survey control points. Record locations with horizontal and vertical data in Project Record Documents.

4.2 Establish all lines and levels; locate and lay out by instrumentation.

4.3 Stake for excavation, abutment erection, and other related installations.

4.4 The Contractor shall provide the Owner's representative with assistance as required, to aid the Owner's representative in checking the layout surveys and the grades of the installed Work. There shall be no additional cost to the Owner for the provision of such assistance to the Owner's representative. The surveyors and the assistants provided by the Contractor shall be the same person or persons at all times for the duration of the Contract, or as otherwise approved by the Owner's representative.

4.5 The Contractor shall be charged with the cost of verifying or replacing any legal survey pins, monuments, or reference stakes damaged during construction by the Contractor's

operations. In the event that the Contractor requires the removal of any legal survey markers for the purpose of the Work, the cost of replacement will be borne by the Owner, provided the written consent of the Owner's representative is first received and the pin has been adequately referenced by a Professional Land Surveyor.

4.6 The Owner's representative will make "random checks" of the Contractor's work and will review the layout to ascertain general conformity with the intent of the Contract Documents. The Owner's representative's review shall in no way relieve the Contractor of his responsibilities for errors or omissions in the field surveys or of responsibility for meeting all requirements of the Contract.

END OF SECTION 01 71 23

CLOSEOUT PROCEDURES

1.0 FINAL CLEANING

1.1 Prior to Substantial Performance of the Work, remove surplus Products, tools, construction machinery and equipment not required for the performance of the remaining Work.

1.2 Remove waste Products and debris and leave the Work clean and suitable for occupancy by Owner.

1.3 Prior to Total Performance, remove surplus Products, tools, construction machinery, equipment, waste products and debris.

1.4 Leave the Work clean before the final inspection process commences.

1.5 Inspect finishes, fitments, and equipment and ensure specified workmanship and operation.

1.6 Broom clean and wash exterior walks, steps and surfaces.

1.7 Remove dirt and other disfigurations from exterior surfaces of structures.

1.8 Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.

2.0 DOCUMENTS

2.1 Collect reviewed submittals and assemble documents completed by Subcontractors, Suppliers, and Manufacturers.

2.2 Submit material prior to application for Substantial Performance of the Work. For equipment put into use with Owner's permission during construction, submit within ten (10) days after start-up.

2.3 Provide warranties fully executed and notarized.

2.4 Execute transition of Performance and Labour and Materials Payment Bond to warranty period requirements.

3.0 REMOVAL OF TEMPORARY FACILITIES

3.1 Prior to application for Substantial Performance of the Work remove all temporary offices and furniture, hoardings, fencing, tree and plant protection and all other items used to aid the performance of the Work. Make good surfaces.

4.0 INSPECTION/TAKEOVER PROCEDURES

4.1 During the final inspection, a list of deficiencies and defects will be tabulated. Correct same.

END OF SECTION 01 77 00