SPECIFICATIONS FOR

APPROACH REPAIRS

DYER'S BAY, ON

Department of Fisheries & Oceans
Small Craft Harbours Branch
Burlington, Ontario

2019

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01 11 05 – GENERAL INSTRUCTIONS

Part 1 General

1.1 DESCRIPTION OF WORK

.1 The project site is the government wharf in Dyer's Bay, Ontario. The wharf is located on the west shore of Georgian Bay approximately 30 km southeast of Tobermory.

.2 The work under this contract covers:

- .1 Replacing a section of the concrete launch ramp.
- .2 Installing a retaining wall, head wall and spillway on the north side of the approach.
- .3 Installing a new asphalt approach.
- .4 Installing new concrete curbs on the north side of the launch ramp.
- .5 Minor concrete repairs to the existing wharf.

.3 The work to be done by the Contractor under this Contract shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, insurance, and all things necessary for and incidental to the satisfactory performance and completion of all work as specified herein. All work to be done in accordance with details shown on the accompanying plans as specified herein.

1.2 DEFINITIONS

.1 The word "provide" means "supply and install".

.2 For purposes of this contract, "Departmental Representative", "Architect/Engineer" and "Engineer" shall have the same meaning.

1.3 WORK SCHEDULE

.1 Provide, within 10 working days after Contract award, schedule(s) showing anticipated progress stages and final completion of work within time period required by contract documents.

.2 Interim reviews of work progress based on work schedule will be conducted at the discretion of the Engineer and schedule updated by Contractor in conjunction with and to approval of the Engineer.

.3 Work under this contract is to be performed in a timely manner. Commence planning and preparatory work immediately upon receipt of official notification of acceptance of Contract and schedule the work so that the project will be complete by dates shown in contract documents.

.4 Work sequence:

- .1 Before work is undertaken, ensure that all materials and trades required are available to finish work in as short a period as possible.
- .2 No area to be renovated shall be placed out of service until it is confirmed that there shall be no need to stop the work waiting for receipt of materials, equipment or labour.

1.4 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

1.5 FEES, PERMITS AND CERTIFICATES

.1 Provide authorities having jurisdiction with information requested.

.2 Pay fees and obtain certificates and work permits required.

.3 Furnish certificates and permits when requested.

1.6 MEASUREMENT FOR PAYMENT

.1 Items measured for payment are in metric (SI) units.

.2 Submit requests for payment in metric units corresponding with items on the Unit Price Table.

.3 All costs for work not specifically identified as a unit price item shall be included in the lump sum arrangement.

.4 Notify the Engineer sufficiently in advance of operations to permit required measurements for payment.

.5 Submit to the Engineer, at least 7 days before Information for first application for payment, cost breakdown, Progress Payment in detail as directed by the Engineer, for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment. After approval by the Engineer, cost breakdown will be used as basis for progress payments.

.6 Provide, within 10 working days after Contract award, a detailed list together with associated costs, of all items included as part of the Lump Sum Amount.

1.7 INTERPRETATION OF DOCUMENTS

.1 In the event of discrepancies or conflicts in interpreting the Plans (drawings) and Specifications, Specifications take precedence over drawings bound with specifications.

.2 Drawings and specifications are complementary. When work is shown or mentioned on the drawings but is not indicated in the specifications, or when work is indicated in the specifications but is not shown or mentioned on the drawings, it shall nevertheless be included in the Contract.

.3 The sub-division of the Specification into sections, identified by title and number, is for convenience only and does not modify the singularity of the document, nor does it operate to make or imply that the Engineer is an arbiter to establish the limits or extent of contract between Contractor and Subcontractors or to determine the limits or extents of work that may be decided by trade unions or contractors' organizations. Extras to the Contract will not be considered on the grounds of differences in interpretation of the Specification and/or Drawings as to which trade performs the work.

.4 Do not scale off drawings.

1.8 CONTRACTOR'S USE OF SITE

.1 Co-ordinate use of premises under direction of the Engineer.

.2 Do not unreasonably encumber the site with materials and equipment.

.3 Do not block local roads or driveways.

.4 Assume full responsibility for protection and safekeeping of products under this Contract.

.5 Move stored products or equipment which interfere with operations of the Engineer, local residents or other harbour users.

.6 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.7 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.8 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by the Engineer.

.9 At completion of operations the condition of the existing work shall be equal to or better than that which existed before new work started.

1.9 EXISTING SERVICES

.1 Notify the Engineer and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give the Engineer 72 hours notice for necessary interruption of mechanical or electrical service throughout the course of work. Minimize duration of interruptions.

.3 Establish location and extent of service lines in area of work before starting Work. Notify the Engineer of findings.

.4 Submit schedule to and obtain approval from the Engineer for any shut-down or closure of active service or facility including power and communications services. Adhere to the approved schedule and provide notice to affected parties.

.5 Where unknown services are encountered, immediately advise the Engineer and confirm findings in writing.

.6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.7 Record locations of maintained, re-routed and abandoned service lines.

1.10 DOCUMENTS REQUIRED

.1 Maintain at the job site, one copy each document as follows:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Reviewed Shop Drawings.

.5 Change Orders.

.6 Other Modifications to Contract.

.7 Copy of Approved Work Schedule.

.8 Health and Safety Plan and Other Safety Related Documents.

.9 Other documents as specified.

1.11 CODES AND STANDARDS

.1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of Provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

.2 Work to meet or exceed requirements of contract documents, specified standards, codes and referenced documents.

.3 Codes, standards, polices, guidelines, publications, manuals, installation, application and maintenance instructions, and other guiding documents referred to in the Contract documents, unless otherwise specified, shall be the latest published editions as of the tender close date.

1.12 PROJECT MEETINGS

.1 The Engineer will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

1.13 CONSTRUCTION PHOTOGRAPHS

.1 Submit photographs of construction progress to the Departmental Representative.

.2 Frequency: daily, or as otherwise directed by the Departmental Representative.

1.14 SETTING OUT OF WORK

.1 Engineer will provide only those survey control points and set such stakes as necessary to define general location, alignment and elevations of work. Give the Engineer reasonable notice of requirements for such control points and stakes.

.2 Set grades and lay out work in detail from control points and grades established by the Engineer.

.3 Provide devices needed to lay out and construct work.

.4 Supply such devices needed to lay out and construct work.

.5 Supply such devices as straight edges and templates required to facilitate the Engineer's inspection of work.

.6 Supply stakes and other survey markers required for laying out work.

1.15 ADDITIONAL DRAWINGS

.1 The Engineer may furnish additional drawings for clarification. These additional drawings have the same meaning and intent as if they were included with plans referred to in Contract documents.

.2 When additional drawings and instructions are required by the Contractor, provide reasonable notice in writing to the Engineer in advance of the date they are required.

1.16 EXAMINATION

.1 Before submitting your tender, examine the existing conditions and determine conditions affecting work.

.2 Obtain all information which may be necessary for proper execution of the Contract.

1.17 SITE INSPECTION

.1 The submission of a tender is deemed to be a confirmation of the fact that the Tenderer has inspected the site and is fully conversant with all the conditions under which the work is to be carried out.

1.18 MATERIAL AND EQUIPMENT

.1 Use new products unless otherwise specified.

1.19 SECURING WORK AREA

.1 Secure the work areas in each stage in an approved manner. This includes fencing or barricades to prevent public access to any areas where construction activities occur and construction materials are stored.

1.20 VEHICLE AND PEDESTRIAN PROTECTION

.1 Provide snow fencing, wooden barriers, or other approved barriers to prevent vehicles and pedestrians from accessing the site during construction.

1.21 DRAWINGS

.1 The following drawings are to be read in conjunction with this specification:

.1 MA-01 Dyer's Bay Approach Repairs

.2 Before proceeding with the work, check and verify all dimensions and elevations shown on the drawings and report and discrepancies.

1.22 DATUM

.1 Elevations and soundings shown on Drawings are expressed in metres relative to chart datum.

.2 Chart datum for Lake Huron is 176.0 metres I.G.L.D (1985).

1.23 OVERLOADING

.1 No part of Work shall be loaded with load which will endanger its safety or will cause permanent deformation.

.2 Repair to original condition any part of work damaged due to overloading at no cost to Engineer.

1.24 TAXES

.1 Pay applicable Federal, Provincial and Municipal taxes.

1.25 SECURITY REQUIREMENTS

.1 The supplier(s) and all individuals assigned to the Work shall not:

.1 have access to protected or classified information/assets.

.2 have unescorted access to restricted access areas of Fisheries and Oceans Canada facilities, or Canadian Coast Guard vessels.

.3 remove any protected or classified information/assets from DFO site(s).

.2 Subcontracts or arrangements with a third party are not to be awarded without the prior written permission of the Departmental Representative.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

01 35 29 – HEALTH AND SAFETY REQUIREMENTS

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

.1 The Workers Compensation Act

1.3 SUBMITTALS

.1 Submit site-specific Health and Safety Plan, to the Engineer, within 10 days of the Notice to Proceed and prior to commencement of Work.

.2 Submit copies of incident and accident reports to the Engineer.

.3 Submit WHMIS MSDS – Material Safety Data Sheets to Engineer.

.4 The Engineer will review Contractor's site-specific Health and Safety Plan and provide comments to the Contractor, if any. Revise the plan as appropriate and resubmit plan to the Engineer within 5 days after receipt of comments from the Engineer.

.5 The Engineer's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.6 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.5 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.6 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Observe and enforce construction safety measures required by Canadian Construction Safety Code, Provincial Government, Worker's Compensation Board and municipal statutes and authorities.

.3 In the event of a conflict between any provisions of above authorities having the most stringent provision will apply.

1.7 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.8 UNFORESEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province having jurisdiction and advise Engineer verbally and in writing.

1.9 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have site-related working experience specific to activities outlined in this Contract at an active harbour site.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of Work.

1.10 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with the Departmental Representative verbally and in writing.

1.11 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or the Departmental Representative.

.2 Provide the Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 The Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

01 35 43 – ENVIRONMENTAL PROCEDURES

Part 4 General

4.1 MEASUREMENT FOR PAYMENT

.1 No separate measurement will be for work of this section. Work is incidental to the project cost.

4.2 FIRES

.1 Fires and burning of rubbish on site not permitted.

4.3 DRAINAGE

.1 Provide temporary drainage and pumping required to keep excavations and site free from water.

.2 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

4.4 WORK ADJACENT TO WATERWAYS

.1 Construction equipment may not enter the lake.

.2 Temporary access road may be constructed with native stone and newly imported stone to be used in the construction.

.3 No construction debris from work activities will be allowed to enter the lake. The work site must be cleaned daily. Every effort will be made to minimize the introduction of sediment to the lake during work activities.

.4 All materials and equipment used for the purpose of site preparation and project completion shall be operated, maintained, and stored in a manner that prevents any deleterious substance (e.g. petroleum products, silt etc.) from entering the water.

.5 Construction equipment will enter and leave the project site at such a location and in such a manner that disturbance to the lakeshore is minimized.

.6 Do not use waterway beds for borrow material.

.7 Waterways to be free of excavated fill, waste material and debris.

.8 Design and construct temporary crossings to minimize erosion to waterways.

.9 Do not skid logs or construction materials across waterways.

.10 Avoid damage to the shoreline.

.11 Any impacts below the ordinary high water mark that are not shown on the site plan are not permitted without written approval from the Engineer. Up to 30 days may be required for approval.

.12 Reclaim and restore disturbed areas to previous or better condition.

.13 Areas used for stockpiling construction materials, including fill or other equipment storage will be well back from the edge of the water body and, if possible, in areas which have already been disturbed or are devoid of vegetation.

.14 All required machinery should be supplied with appropriate spill containment kits as a precaution in the event of accidental fuel spills or hydraulic leaks. Additional kits should be available on site with the capacity to contain any spills of deleterious substances that may be reasonably expected to occur. Contractors should ensure that all personnel are familiar with the spill kits.

.15 The Contractor shall report spills of fuels or other contaminants to the Engineer.

.16 The Contractor shall not remove, destroy or disturb species pursuant to Provincial Threatened Endangered and Extirpated Species regulation, or species listed in the federal Species at Risk Act.

.17 The Contractor shall not disturb migratory bird nests.

4.5 POLLUTION CONTROL

.1 Control emissions from equipment and plant to local authorities' emission requirements.

.2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads. The Contractor shall not use chemical dust suppressant materials on roads within 100 metres of the construction site.

.4 Locate temporary fuel storage 100 metres from shore and comply with Provincial Environmental Legislation.

.5 Refueling, servicing, or cleaning of equipment on ice or within 100 metres of shore is prohibited. The Contractor to ensure all equipment operating on project is free of external fluid leaks, grease, oil, and mud.

.6 The Contractor is to contain all oil leaks from equipment working adjacent to waterways.

.7 No maintenance of vehicles or equipment in construction areas.

.8 Use drip pans to catch leaking oil from compressors, pumps, etc.

4.6 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways.

.3 Hazardous wastes including fuels, oils and lubricants must be disposed of by a licensed hazardous waste carrier/handler in accordance with Provincial Environment Legislation.

.4 Collect all rubbish and waste material and dispose of in accordance with applicable governing authorities.

.5 The Contractor shall dispose of non-reusable construction debris and solid waste from construction at a waste disposal ground operating under the authority of a permit under Provincial regulation.

.6 Do not allow debris of any type to enter waterway.

4.7 PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties.

.2 Avoid disturbance of topsoil and vegetation unless otherwise specified. The Contractor is responsible to restore all impacted areas to original state.

.3 The Contractor shall revegetate soil in areas exposed by construction with vegetation species native to the area. These areas shall be revegetated as quickly as possible following construction to prevent soil erosion and establishment of noxious weeds.

Part 5 Products

5.1 NOT USED

.1 Not Used.

Part 6 Execution

6.1 NOT USED

.1 Not Used.

END OF SECTION

01 45 00 – QUALITY CONTROL

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 INSPECTION

.1 Allow the Engineer access to the Work. If part of the Work is in preparation at locations other than the Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if the Work is designated for special tests, inspections or approvals by the Engineer.

.3 The Engineer will order part of the Work to be examined if the Work is suspected to be not in accordance with the Contract Documents. If, upon examination such work is found not in accordance with the Contract Documents, correct such Work and pay cost of examination and correction.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies may be engaged by the Engineer for purpose of inspecting and/or testing portions of the Work.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform the Work in accordance with the Contract Documents.

.4 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct the defect and irregularities as advised by the Engineer at no additional cost. Pay costs for retesting and reinspection.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to the Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify the Engineer in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

.1 Remove defective Work, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected by the Engineer as failing to conform to the Contract Documents. Replace or re-execute, in accordance with the Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of the Engineer it is not expedient to correct the defective Work or the Work is not performed in accordance with the Contract Documents, Owner will deduct from Contract Price the difference in value between the Work performed and that called for by the Contract Documents, the amount of which will be determined by the Engineer.

1.7 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

1.8 MILL TESTS

.1 Submit mill test certificates as requested.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

01 77 00 – CLOSEOUT PROCEDURES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

- .1 Contractor's Inspection: the Contractor is to conduct an inspection of the Work, identify deficiencies and defects, and repair as required to conform to the Contract Documents.
- .2 Final Inspection:
  - .1 When completion tasks are done, request final inspection of the Work by the Engineer.
  - .2 When the Work is incomplete, according to the Engineer, complete the outstanding items and request re-inspection.
- .3 Final Payment:
  - .1 When the Engineer considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
- .4 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.3 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

03 20 00 – CONCRETE REINFORCING

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 Include reinforcement costs in items of concrete work in Sections 03 30 00 – Cast-in-Place Concrete and 03 41 02 – Precast Concrete,

1.2 RELATED SECTIONS

.1 Section 03 30 00 – Cast-in-place Concrete

.2 Section 03 41 02 – Precast Concrete

1.3 REFERENCES

.1 Canadian Standards Association (CSA International).

- .1 CSA-A23.1-04/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-A23.3, Design of Concrete Structures.
- .3 CAN/CSA-G30.18-09 (R2014), Carbon Steel Bars for Concrete Reinforcement

.2 Reinforcing Steel Institute of Canada (RSIC)

- .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

.3 ASTM International

- .1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- .2 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .3 ASTM A775/A775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

1.4 SUBMITTALS

.1 Prepare and submit detailed reinforcement placement drawings in accordance with RSIC manual of Standard Practice

1.5 QUALITY ASSURANCE

.1 Provide certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, prior to beginning reinforcing work.

Part 2 Products

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Engineer.

.2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.

.3 Cold-drawn annealed steel wire ties: to ASTM A497/A497M.

.4 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.2 Obtain Departmental Representative written approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

Part 3 Execution

3.1 FIELD BENDING OF REINFORCEMENT

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Accurately place reinforcing steel in the positions shown on detailed reinforcement placement drawings and in accordance with CSA-A23.1/A23.2.

.2 Prior to placing concrete, allow for sufficient time for the review and approval of reinforcing steel and arrangement of the Departmental Representative.

.3 Ensure reinforcement is not disturbed during concrete placement.

.4 Ensure cover to reinforcement is maintained during concrete pour.

END OF SECTION

03 30 00 – CAST-IN-PLACE CONCRETE

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Reinforced concrete shall be measured by volume in cubic meters of concrete placed, as calculated from neat dimensions as indicated on the drawings, and shall include all labour, materials, and equipment necessary to complete the work.

.2 Concrete for voids shall be measured by the volume of cubic metres of concrete placed. Contractor to measure voids under concrete at construction joints and confirm quantity of concrete required. Notify Departmental Representative of estimated concrete quantity prior to ordering concrete. No compensation will be made for concrete quantities exceeding 10% of the estimated quantity, without prior approval from the Departmental Representative.

.3 Expansion joints, control joints, reinforcing steel, splices, wire ties, bar supports, chairs, spacers, dowels, and other accessories shall be considered included in the placing of the concrete and will not be measured separately for payment.

.4 No deduction will be made for volume of concrete displaced by reinforcing steel.

.5 Hot and cold weather protection is considered included in the installation of concrete and will not be measured separately for payment. It shall be the full responsibility of the Contractor to review the schedule, anticipate the impacts of works / concreting, and incorporate the cost for such weather protection schemes and associated works (For example, this may include incorporating measure such as ice or liquid nitrogen for concrete in hot weather concrete).

.6 Concrete wastage, including concrete remaining on truck after completion of pouring, will not be included in the volume for payment.

1.2 RELATED SECTIONS:

.1 Section 01 35 43 – Environmental Procedures

.2 Section 03 20 00 – Concrete Reinforcing

.3 Section 03 41 00 – Precast Concrete

1.3 REFERENCES

.1 ASTM International:

.1 ASTM A497/A497M-07,Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.

.2 ASTM D1751-04(2013)e1, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.2 CSA International:

.1 CSA A23.1-09/A23.2-14, Concrete Materials and Methods of Concrete Construction/ Methods of Test for Concrete.

.2 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.4 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CAN/CSA S269.1-16, Falsework and Formwork

1.4 SUBMITTALS

.1 At least 2 weeks prior to beginning Work, submit to Departmental Representative product data for the following materials: aggregate, concrete mix design, non-shrink grout, joint sealer, joint filler, backer rod and bond breaker.

.2 Provide concrete supplier certification that the plant is certified with Concrete Ontario (formerly Ready-Mix Concrete Association of Ontario). Submit gradations of the coarse and fine aggregates.

.3 Provide concrete mix designs including statement that the admixtures are compatible with each other.

.4 Provide documentation that the aggregate comply with CSA A23.1.

.5 Submit Weather Protection Plans (hot and cold temperature weather conditions).

.1 When concrete is to be placed and cured in extreme weather temperature conditions (less than 5 degrees Celsius and more than 25 degrees Celsius), the Contractor shall submit written description of proposed methods of providing appropriate concreting conditions, and preventing hot or cold weather damage (with drawings or sketches, as required).

1.5 QUALITY ASSURANCE

.1 Check dimensions at site before commencing work and report discrepancies to Departmental Representatives in writing.

.2 Submit to Departmental Representative, minimum 2 weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.3 Quality control plan: Submit written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in Part 2 - Products.

.4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.

.5 No water is to be added to the mix following initial batching at the plan without the consent of the Concrete Supplier designated representative and the Departmental Representative.

1.6 PROTECTION

.1 Protect work from damage resulting from work of other sections and from damage resulting from environmental conditions.

.2 Existing items removed during demolition should be carefully noted and stored safely in order for them to be reused and incorporated into the new work. Ensure no additional damage is caused by a result of poor workmanship.

1.7 CLEANING

.1 Pressure wash concrete, steel and timber surfaces that will be in contact with new concrete. Water pressure is to be sufficient to remove any loose concrete, grout, marine vegetation, moss and algae from various surfaces.

1.8 DELIVERY

.1 Concrete hauling time: maximum allowable time for concrete to be delivered to site of work and discharged not to exceed 120 minutes after batching.

.2 Modifications to maximum time limit must be agreed to Departmental Representative and concrete supplier as described in CAN/CSA-A23.1/A23.2.

.3 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2

.4 Deviations to be submitted for review by Departmental Representative.

.5 Deliver, store, and handle materials in accordance with manufacturer's written instructions.

Part 2 Products

2.1 MATERIALS

.1 Concrete:

.1 Cement: to CAN/CSA-A3001, type GU.

.2 Compressive strength: 30 MPa at 28 days.

.3 Exposure class: F-1 to CAN/CSA-A23.1/A23.2.

.4 Aggregate confirming to CSA Standard A23.1, size: 20 mm.

.5 Slump: 80 mm at time of deposit, +/- 20 mm.

.6 Air content: Table 4, Category 1, 6%.

.7 Admixtures: air entraining to ASTM C233. Standard Test Method for Air-Entraining Admixtures for Concrete. Calcium chloride or compounds containing calcium chloride not permitted.

.8 Water: potable, to Table 9.

.2 Reinforcing: as per Section 03 20 00 – Concrete Reinforcing.

.3 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.

.4 Chairs, bolsters, bar supports, spacers: to CSA Standard A23.1/A23.2.

.5 Formwork materials: Wood product formwork materials so CSA Standard O86.

.6 Formwork: to CAN/CSA-A23.1/A23.2.

.7 Joint filler: non-extruding, preformed, asphalt saturated fibre to ASTM D1751.

.8 Joint sealer: chemical curing, multi- component compound to CAN/CGSB-19.24, type 1.

.9 Backer rod: extruded closed-cell polyethylene foam backer rod to Departmental Representative's approval.

Part 3 Execution

3.1 FORMWORK

.1 Provide temporary structural supports as required to complete the concrete repairs.

.2 Erect formwork to CAN/CSA-A23.1/A23.2.

.3 Fabricate and erect formwork to produce finished concrete confirming to shape, dimensions, locations and levels indicated within tolerances required by CSA Standard A23.1.

.4 For chases, slots, openings, drips, recesses, expansion and control joints as indicated.

3.2 PLACING CONCRETE

.1 Provide Departmental Representative 48 hours notice prior to placing concrete.

.2 Plan concrete pours to suit the weather conditions. Adjust pour sequences or schedule to avoid adverse weather conditions. Do not cast concrete during rainfalls. Do not cast slab during high winds. Follow cold and hot weather procedures when those temperatures exist or may be expected.

.3 Do not pour concrete on soil which has been allowed to dry out. If soil is exposed to drying for three or more days, moisten by sprinkling water on it before any concrete is placed.

.4 During concrete operations:

.1 Development of cold joints is not allowed

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling and without damage to existing structure or Work.

.5 In no case deposit concrete against frozen material.

.6 Carry out the placing of concrete continuously from joint to joint. Unless otherwise specified vibrate the concrete mechanically. Do not move concrete laterally with vibrators. Lower the vibrators vertically.

.7 Deposit concrete in a manner that prevents segregation in accordance with CSA Standard A23.1

.8 During freezing conditions, protect holes from water accumulations at all times.

.9 Thoroughly clean joints to receive sealant. Place foam backer rod. Do not apply sealant to wet or damp concrete.

.10 Complete work to following tolerances: Straight to 1:500. Thickness to 6 mm. Plumb to 1:600.

3.3 JOINTS

.1 Control joint:

.1 Provide control joints in slab at locations indicated, in accordance with CSA A23.1/A23.2.

.2 Sawcut control joints within 24 hours of final concrete time. Install 25 mm bead of silicone sealant in each joint.

.2 Expansion joint: Install joint filler, backer rod and joint sealant at all expansion joints as detailed. Locations and thickness of expansion joints as shown on drawings.

.3 Construct joints plumb, straight and square to details indicated.

3.4 FINISHING

.1 Finish concrete to CAN/CSA-A23.1/A23.2 and CAN/CSA-A438.

.2 Wood float and broom sweep at exposed horizontal surface locations.

.3 Steel trowel to smooth dense surfaces (Cont'd) elsewhere.

.4 Apply smooth rubbed finish to formed surface exposed to view.

3.5 CURING

.1 Cure concrete in accordance with CAN/CSAA23.1/A23.2, Clause 7.4 and Appendix D CAN/CSA-A438.

.2 Provide cold weather protection during curing period.

.3 Keep concrete surfaces moist continuously while the concrete is protected.

.4 When finishing is complete immediately cover the concrete with a continuous polyethylene sheet.

.5 In addition to cold weather requirements listed in CSA Standard A23.1, protect concrete against drying shrinkage and plastic shrinkage for slabs. Take special precautions to control and eliminate initial drying shrinkage and plastic shrinkage for slab. Provide wind breaks, shelters or shade.

.6 Leave formwork in place for 5 days following placing of concrete.

.7 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later.

3.6 HOT WEATHER WORK

.1 Take hot weather precautions when the concrete temperature at any time exceeds 25 degrees Celsius and do not place concrete whose temperatures exceeds 30 degrees Celsius in the mixer.

.2 Concrete, who temperature in the mixer is between 27 degrees Celsius and 30 degrees Celsius must contain a retarder which reduces mixing water requirements and increases strength, and must contain high early strength cement.

3.7 COLD WEATHER WORK

.1 Take cold weather precautions whenever the ambient temperature is, or is expected to be, at or below 5 degrees Celsius.

.2 Have protection measures in place, or adjacent to the Work, and approved by the Departmental Representative before any concrete is mixed or ordered.

.3 Maintain concrete temperatures between 10 degrees Celsius and 20 degrees Celsius for a minimum of 3 days for unloaded areas, and 6 days for areas receiving partial load.

.4 At the termination of the protection period, do not drop the concrete temperature more than 20 degrees Celsius in the first 24 hours.

3.8 REPAIRS

.1 Upon review of concrete finish, undertake all preventative and correction actions to prevent further concrete defects from occurring.

.2 Concrete elements having one or more defects and deficiencies shall be repaired according to an acceptable procedure with the Departmental Representative. Standard finishing shall be completed after such repairs are carried out.

.3 Concrete defects are defined as:

.1 Air voids, honeycombing, cavities, spalling, delaminations, greater than 5 mm in size in any direction.

.2 Bugholes greater than 10 mm in diameter or 5 mm in depth.

.3 Plastic shrinkage cracking with a width greater than 0.4 mm.

.4 General shrinkage cracking with a width greater than 0.7 mm.

3.9 CO-OPERATION AND ASSISTANCE TO ENGINEER

.1 Cooperate with Engineer on inspection of work and provide assistance requested.

3.10 MONITORING OF WORK

.1 Contractor is responsible to monitor effectiveness and productivity of his own work on an ongoing basis.

3.11 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

31 00 29 – EXCAVATING AND BACKFILLING

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Excavation is considered part of the lump sum arrangement and shall include all labour, equipment and material necessary to complete the work.

.2 Supply and installation of granular A will be measured by the tonnes of the material placed and shall include all labour, materials and equipment necessary to do the work.

.3 Supply and installation of rip rap will be measured by the tonnes of the material placed and shall include all labour, materials and equipment necessary to do the work.

.4 Supply and installation of gabion baskets, including all labour, equipment and materials necessary to complete the work, shall be considered part of the lump sum arrangement.

.5 Grading, compaction and compaction testing shall be considered incidental and not will not be measured separately for payment.

.6 Supply and installation of the culvert extension, including connection to existing culvert, shall be considered part of the lump sum arrangement and shall include all labour, equipment and material necessary to complete the work.

1.2 RELATED SECTION

.1 Section 31 00 29 – Geotextile

.2 Section 32 12 16 – Asphalt Paving

1.3 REFERENCES

.1 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation

- .1 OPSS.MUNI 1004, Ontario Provincial Standard Specification, Material Specification for Aggregates - Miscellaneous.
- .2 OPSS.MUNI 1010, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.
- .3 OPSS.MUNI 1854, Ontario Provincial Standard Specification, Material Specification for High Density Polyethylene (HDPE) and Expanded Polystyrene (EPS) Adjustments Units for Maintenance Holes, Catch Basins and Valve Cambers.

.2 American Society for Testing and Materials (ASTM)

- .1 ASTM A313/A313M-[98], Standard Specification for Stainless Steel Spring Wire.
- .2 ASTM A764-[95(2001)], Standard Specification for Metallic Coated Carbon Steel Wire, Coated at Size and Drawn to Size For Mechanical Springs.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

1.4 SUBMITTALS

.1 Provide the source of aggregates and provide access for sampling at least 2 weeks prior to commencing production.

Part 2 Products

2.1 MATERIALS

.1 Granular A: to Ontario Provincial Standard Specification OPSS.MUNI.1010

.2 Gabion baskets:

.1 Factory fabricated so that sides, ends, lid and internal diaphragms can be readily assembled at site into rectangular baskets of sizes as indicated.

.2 Single unit construction or with joints having strength and flexibility equal to that of mesh.

.3 Provide diaphragms of same mesh as gabion walls, when length exceeds horizontal width. Diaphragms to divide basket into equal cells of length not to exceed horizontal width.

.4 Wire mesh gabions:

.1 Wire mesh: uniform hexagonal pattern wire woven in triple twist pattern with openings of approximately 80 x 100 mm, non-ravelling.

.2 Securely selvedge perimeter edges to form joints connecting selvedges with same strength as mesh body.

.3 Wire to have following dimensions:

.1 Mesh: 3.0mm diameter.

.2 Selvedges: 3.8mm diameter.

.3 Binding: 2.0mm diameter.

.4 Wire: hot dip galvanized with minimum coverage of 260 g/m^2 to CAN/CSA G164.

.5 Interlocking wire fasteners: galvanized steel to ASTM A764, finish 1, class 1, type 3

.3 Gabion Stone and Rip Rap:

.1 Produced from fractured bedrock fragment with 100% fractured faces or crushed from cobbles or boulders greater than 300 mm diameter.

.2 Shall not deteriorate when exposed to air and water.

.3 Shall be resistant to deterioration by cycles of wetting, drying, freezing and thawing.

.4 Free from clay lumps, organic material and other deleterious materials.

.5 Gabion stone: well graded with size ranging from 150 – 200 mm.

.6 Rip Rap: well graded with size ranging from 150 – 200 mm.

.4 Culvert extension: HDPE to Ontario Provincial Standard Specification OPSS.MUNI.1854

2.2 SOURCE QUALITY CONTROL

.1 If, in the opinion of the Departmental Representative, materials from the proposed source do not meet, or cannot reasonably be processed to meet, the specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.2 Advise Departmental Representative 4 weeks in advance of proposed change of material source.

.3 Acceptance of material at source does not preclude future rejection if it fails to conform to specified requirements, lacks uniformity, or if its field performance is found to be unsatisfactory.

Part 3 Execution

3.1 UTILITY LOCATES

.1 Before commencing work, establish location and extent of underground utility lines and culverts in the area of excavation.

3.2 PLACEMENT

.1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.2 Where indicated on the drawings, place geotextiles free from wrinkles, and support until covered with aggregates. Provide minimum overlap of 1m.

.3 Generally work from the lower elevation and working progressively up the slope.

3.3 EXCAVATION

.1 Excavate existing fill material as required.

.2 Excavation must not damage or interfere with adjacent structures or culverts.

.3 Keep excavated and stockpiled materials safe distance away from edge of excavation.

.4 Dispose of surplus and unsuitable excavated material off site.

.5 Do not obstruct flow of surface drainage or natural watercourses.

3.4 BACKFILLING

.1 Do not commence backfilling until areas of work have been inspected and approved by Engineer.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Place Granular A material in areas as indicated. Place material in to full width in uniform layers not exceeding 150 mm compacted thickness up to grades indicated and be uniformly compacted to at least 98% SPMDD.

.4 Ensure no frozen material is placed.

.5 Place granular materials using methods which do not lead to segregation or degradation.

.6 Shape each layer to smooth contour and compact before succeeding layer is placed.

.7 Remove and replace portion of layer in which material has become segregated during spreading.

.8 Prevent movement of geotextile fabric after final placement

3.5 JOINTING HDPE PIPE

.1 Pipe shall be jointed by the thermal butt fusion process

.2 Joint in accordance with manufacturer's written instructions.

3.6 SITE TOLERANCES

.1 Finished granular surface to be within 50 mm of elevation as indicated but not uniformly high or low.

3.7 PROTECTION

.1 Maintain finished granular surface in condition conforming to this section until granular surfacing is accepted by Engineer.

END OF SECTION

31 32 19.01 – GEOTEXTILES

Part 1 General

1.1 MEASUREMENT AND PAYMENT

.1 Measure geotextiles in square metres of surface covered by material. No allowance will be made for seams and overlaps.

1.2 REFERENCES

.1 ASTM International

.1 ASTM D4491-99a(2009), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

.2 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.2 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 1860-November 2010, Material Specification for Geotextiles.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, well-ventilated area.

.2 Store and protect geotextiles from direct sunlight and UV rays.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIAL

.1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.

.2 Physical properties:

.1 OPSS MUNI 1860, November 2018, Table 1 (Class II)

.2 Width: 2 m minimum.

.3 Length: 10 m minimum.

.3 Factory seams: sewn in accordance with manufacturer's recommendations.

.4 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied Departmental Representative.

3.2 INSTALLATION

.1 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.2 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.3 Overlap each successive strip of geotextile 600 mm over previously laid strip.

.4 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.5 After installation, cover with overlying layer within 4 hours of placement.

.6 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

.7 Place and compact soil layers in accordance with Section 31 00 29 – Excavating and Backfilling.

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

32 12 16 – ASPHALT PAVING

Part 1 General

1.1 MEASUREMENT AND PAYMENT

.1 Asphalt base course will be measured by the tonnes used and accepted in the work and shall include all labour material and equipment necessary to complete the work. Saw cutting and compaction is considered incidental and will not be measured separately for payment.

.2 Asphalt surface course will be measured by the tonnes used and accepted in the work and shall include all labour material and equipment necessary to complete the work. Saw cutting and compaction is considered incidental and will not be measured separately for payment.

.3 Granular A shall be measured under Section 31 00 29 – Excavating and Backfilling.

.4 Asphalt primer and tack coat will be considered incidental to asphalt base and asphalt surface courses and will not be measured separately for payment.

.5 All compaction testing and grading related to granular base, asphalt base and asphalt surface shall be considered incidental and will not be measure separately for payment.

1.2 RELATED SECTIONS

.1 Section 31 00 29 – Excavating and Backfilling.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM International)

.1 ASTM D140/D140M-15, Standard Practice for Sampling Bituminous Materials.

.2 ASTM D698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 302, Construction Specification for Primary Granular Base.

.2 OPSS 314, Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling.

.3 OPSS 1103 November 2012, Ontario Provincial Standard Specifications, Material Specification for Emulsified Asphalt.

.4 OPSS 1010, Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material.

.5 OPSS 1150 November 2010, Material Specification for Hot Mix Asphalt.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Test and Evaluation Reports:

.1 Submit manufacturer's test data and certification that asphalt cement meets specification requirements.

.2 Submit asphalt concrete mix design and trial mix test results to Departmental Representative for review at least 2 weeks prior to beginning Work.

.3 Submit printed record of mix temperatures at end of each day.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions and ASTM D140.

1.6 PROTECTION

.1 Protect harbour structures and adjacent property that may be damaged by paving machinery, equipment or personnel. Make good property damaged due to paving operations.

.2 Take necessary precautions to protect workmen and public from hazards of paving operations.

.3 Keep vehicular traffic off newly paved areas until paving surface has cooled below 38°C. Do not permit stationary loads on pavement until 24 hours after placement.

.4 Arrange paving schedule so as not to interfere with normal use of premises.

1.7 QUALITY ASSURANCE

.1 Provide quality control testing and inspection requirements under this section including but not limited to:

.1 Test results that verify compliance to the specification of the materials to be supplied under this section from each source. Testing to include Marshall Compliance.

.2 Contractor is responsible for compaction testing and shall employ an independent Testing company. Compaction testing conducted every 50 m² maximum of surface area of granular base, asphalt base course and asphalt surface course.

.3 Test results are to be submitted to Departmental Representative with one hour of compaction testing.

Part 2 Products

2.1 MATERIALS

.1 Asphalt base course: to OPSS 1150 for type HL8. Maximum aggregate size 26.5 mm.

.2 Asphalt surface course: to OPSS 1150 for type HL3. Maximum aggregate size 16 mm.

.3 Aggregates: in accordance with Section 31 00 29 – Excavating and Backfilling.

.4 Asphalt primer shall be polymer modified asphalt diluted 1 part emulsion to 3 parts water by volume. The emulsified asphalt shall meet the requirement for CSS-1H1 according to OPSS MUNI 1103 November 2013 in addition to requirements of Table 2.

.5 Water: clean, potable, free from foreign matter.

2.2 EQUIPMENT

.1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: sufficient number of type and weight to obtain specified density of compacted mix.

.3 Vibratory rollers:

.1 Drum diameter: 1200 mm minimum.

.2 Amplitude of vibration (machine setting): 0.5 mm maximum for lifts less than 40 mm thick.

.4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:

.1 Boxes with tight metal bottoms.

.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.

.3 In cool weather or for long hauls, insulate entire contact area of each truck box.

.4 Use only trucks which can be weighed in single operation on scales supplied.

.5 Hand tools:

.1 Lutes or rakes with covered teeth for spreading and finishing operations.

.2 Tamping irons having mass 12 kg minimum and bearing area not exceeding 310 cm^5 for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Departmental Representative, may be used instead of tamping irons.

.3 Straight edges, 4.5 m in length, to test finished surface.

Part 3 Execution

3.1 PREPARATION

.1 Mill existing pavement 40 mm depth and 600 mm wide along joint between new and existing pavement.

.2 Place Granular A material in areas as indicated. Place material in to full width in uniform layers not exceeding 150 mm compacted thickness up to grades indicated and be uniformly compacted to 100% Standard Proctor Density.

.3 Do not place asphalt base course until compaction test results for granular base have been submitted and reviewed by Departmental Representative.

3.2 PLACING

.1 Obtain approval of granular base and primer from Departmental Representative before placing asphalt.

.2 Do not place asphalt surface course until compaction test results for asphalt base course have been submitted and reviewed by Departmental Representative.

.3 Place asphalt mix only when granular base is dry and air temperature is above 7°C.

.4 Place 50 mm of compacted HL8 base course.

.5 Place 50 mm of compacted HL3 surface course.

.6 Minimum 118°C mix temperature required when spreading.

.7 Maximum 149°C mix temperature permitted at any time.

.8 Compact each course with roller as soon as it can support roller weight without undue cracking or displacement.

.9 Roller, power driven, minimum mass of 9 tonnes, minimum wheel width 600 mm.

.10 Roll until roller marks are eliminated. Compact to density not less than 99% laboratory density.

.11 Keep roller speed slow enough to avoid mix displacement and do not stop roller on fresh pavement.

.12 Moisten roller wheels with water to prevent mix adhesion.

.13 Compact mix with hot tampers or other approved equipment in areas inaccessible to roller.

.14 Finish surface smooth, true to grade and free from deviations exceeding 1:1000 when measured in any direction with a 3 m straight edge.

.15 Carefully place and compact hot asphaltic material against joints.

.16 Place surface course flush to existing pavement surface.

3.3 TACK COAT APPLICATION

.1 Obtain Departmental Representative's approval of surface before applying asphalt tack coat.

.2 Tack coat shall be applied to all vertical asphalt surfaces.

.3 Apply asphalt tack coat only on clean and dry surface.

.4 Dilute asphalt emulsion with water at 1:1 ratio for application.

.1 Mix thoroughly by pumping or other method approved by Departmental Representative.

.5 Do not apply asphalt tack coat when air temperature is less than 10°C or when rain is forecast within 2 hours of application.

.6 Apply asphalt tack coat only on unfrozen surface.

.7 Evenly distribute localized excessive deposits of tack coat by brooming as directed by Departmental Representative.

.8 Re-tack contaminated, or disturbed areas as directed by Departmental Representative.

.9 Permit asphalt tack coat to set before placing asphalt pavement.

.10 Environmental conditions:

.1 Apply tack coat when air temperatures are 10°C or higher.

.2 Do not apply when weather is foggy or rainy.

.3 Apply tack coat within the temperature ranges recommended by the Canadian General Standards Board for the material supplied.

3.4 FINISH TOLERANCES

.1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction.

3.5 DEFECTIVE WORK

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required.

.1 If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.

.2 Repair areas showing checking, rippling, or segregation.

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

3.6 CLEANING

.1 Progress Cleaning:

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment from site.

END OF SECTION