SPECIFICATIONS FOR

PARKING LOT SURFACING

GIMLI, MB

Department of Fisheries & Oceans
Small Craft Harbours Branch
Winnipeg, Manitoba

February 2017

TABLE OF CONTENTS

01 11 05 – GENERAL INSTRUCTIONS

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 DESCRIPTION OF WORK

.1 The work site described in this specification is located in Gimli, Manitoba. Gimli is approximately 100 kilometres north of Winnipeg via Highway 9.

.2 The scope of work under this Contract, includes but is not limited to the following:

- .1 Establish temporary environmental protection.
- .1 Establish temporary traffic and pedestrian protection.
- .2 Demolish designated timber post and chain fence, existing parking curbs and identified trees and shrubs and remove off site.
- .3 Excavate to subgrade extent indicated on drawings and dispose of excess material off site.
- .4 Construct new concrete barrier curb as indicated.
- .5 Construct new asphalt areas by the following:
  - .1 Proof roll and compact subgrade base.
  - .2 Provide and compact granular base c/w geotextile where indicated. Granular base varies. Refer to drawings for details.
  - .3 Place 2-50 mm lifts of asphalt.
- .6 Provide 150 mm topsoil and seed at disturbed areas along edge of new pavement and new concrete curb.
- .7 Supply and install new precast parking curbs.
- .8 Remove temporary traffic and pedestrian protection.
- .9 Remove temporary environmental protection.

.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.

1.3 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.

1.4 WORK SCHEDULE

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

.2 Provide sufficient details in schedule to clearly illustrate entire instrumentation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.

.3 As a minimum, work schedule to be prepared and submitted indicating work activities, tasks and other projects elements, their anticipated durations and planned dates for achieving key activities and major project milestones. It shall include sufficient details and supported by narratives to demonstrate a reasonable plan for completion of project within designated time.

.4 Submit schedule updates on a minimum monthly basis and more often, when requested by Engineer. Provide a narrative explanation of necessary changes and schedule revisions at each update. Take all necessary measures to complete work within approved time.

.5 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 completed by **October 1, 2017.**

.1 On site work will only be permitted during period of **August 9, 2017** to **September 30, 2017**. Obtain Engineer's approval prior to scheduling any weekend work.

.6 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.

1.5 CERTIFICATES AND TRANSCRIPTS

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

1.6 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.

1.7 MEASUREMENT FOR PAYMENT

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

.2 Submit to Engineer, at least 14 days before Information for first application for payment, cost breakdown, Progress Payment in detail as directed by Engineer, for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment. After approval by Engineer, cost breakdown will be used as basis for progress payments.

1.8 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.

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

.4 Move stored products or equipment which interfere with operations of Engineer or other harbour users.

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

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

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

.8 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.10 EXISTING SERVICES

.1 Notify 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 Engineer 72 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions.

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

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

.5 Where unknown services are encountered, immediately advise 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.

1.11 DOCUMENTS REQUIRED

.1 Maintain at 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.

1.12 CONTRACT METHOD

.1 Construct Work under a combined price contract. All costs for work not specifically identified as a unit price item shall be included in the lump sum arrangement.

1.13 CODES AND STANDARDS

.1 Perform work in accordance with latest editions of 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.

1.14 PROJECT MEETINGS

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

1.15 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 engineer seven days 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 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 Engineer's inspection of work.

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

1.16 ADDITIONAL DRAWINGS

.1 Engineer may furnish additional drawings for clarification. These additional drawings have 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.

1.17 EXAMINATION

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

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

1.18 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.

1.19 MATERIAL AND EQUIPMENT

.1 Use new products unless otherwise specified.

.2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.

.3 When material or equipment specified by standard performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.20 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.

1.21 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.

.2 Contractor shall provide appropriate signage for vehicle and pedestrian protection.

.3 All barriers shall include delineation and reflectors to stand out at nightfall.

1.22 DRAWINGS

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

.1 C-1, C-2, C-3, C-4 Parking Lot Surfacing

1.27 CLEANING

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials off site at regular intervals for disposal.

.3 Do not burn waste materials on site. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 When Work is substantially completed, remove surplus products, tools, and equipment not required to complete remaining Work.

1.28 CLOSEOUT

.1 Request Engineer inspection after Contractor has substantially completed the work, inspected the work and has repaired the deficiencies.

.2 Engineer and Contractor will conduct a joint inspection to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Request Engineer Final Inspection after all deficiencies have been corrected. Repair all Works outstanding as observed by Engineer during this inspection.

.4 Commencement of lien and Warranty Period is the date of Owner’s Acceptance of declaration of Substantial Performance unless otherwise required by lien statute at Place of Work.

.5 Submit to Engineer as-built, shop drawings, product data, field test records, inspection and manufacturers certification at time of Substantial Performance.

.6 Submit to Engineer copy of warranties applicable for this project.

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 Manitoba

.1 The Workers Compensation Act (latest edition).

1.3 SUBMITTALS

.1 Submit site-specific Health and Safety Plan: Within 10 days after date of Notice to Proceed and prior to commencement of Work.

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

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

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

.5 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 UNFORSEEN 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 associated with dock reconstruction 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 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 Departmental Representative.

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

.3 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 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Payment for environmental protection shall be included in the lump sum amount for the project and shall include all labour, equipment and materials required for environmental protection as outlined in this section.

1.2 FIRES

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

1.3 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.

1.4 WORK ADJACENT TO WATERWAYS

.1 No in-water work or shoreline work is permitted between April 15 and June 30.

.2 Construction equipment shall not enter the lake.

.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 Do not use waterway beds for borrow material.

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

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

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

.8 Avoid damage to shoreline.

.9 Supply, install, and maintain approved erosion control blankets to unprotected slopes until revegetation is established.

.10 Any impacts below 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.

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

.12 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.

.13 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.

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

.15 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.

.16 The Contractor shall not disturb migratory bird nests.

1.5 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.

.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. Contractor to ensure all equipment operating on project is free of external fluid leaks, grease, oil, and mud.

.6 Contractor 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.

.9 Keep an emergency spill kit for in-water use on site during construction.

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

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

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

1.7 PLANT PROTECTION

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

.2 Avoid disturbance of topsoil and vegetation unless otherwise specified. 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. Theses areas shall be revegetated as quickly as possible following construction to prevent soil erosion and establishment of noxious weeds.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

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

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

.3 Engineer will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with 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 Engineer for purpose of inspecting and/or testing portions of 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 Work in accordance with Contract Documents.

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

1.4 ACCESS TO WORK

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

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

1.5 PROCEDURES

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

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

.3 If in opinion of Engineer it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by 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 82 01 – WEIGH SCALES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Weigh all stone placed in the Work and measured in tonnes at the quarry or project site on a scale approved and certified as correct. Prior to use, have weigh scale certified as meeting requirements of Statutes of Canada, Chapter 36, Weights and Measures Act 1971 and subsequent amendments. Provide the Departmental Representative with a copy of the certificate and display certificate in prominent location. Costs for maintenance and operation of scale shall be considered incidental to the work.

.2 Provide the Departmental Representative with weigh tickets at time of delivery to site.

Part 2 Products

2.1 EQUIPMENT

.1 Provide weigh scales of sufficient capacity to weigh loaded vehicles in a single operation.

.2 Provide scale house to enclose mass indicator and in which Contractor's representative can perform work and maintain records.

.3 Scale house to be waterproof and have one sliding window facing scale platform. Entrance door not face scale platform.

Part 3 Execution

3.1 INSTALLATION

.1 Provide, install and maintain scale at quarry or project site at location approved by Engineer.

.2 Remove scale and scale house when no longer required and level approach ramps.

3.2 OPERATION

.1 Contractor's representative will be responsible for weighing materials.

3.3 MAINTENANCE

.1 Maintain scale platform and scale mechanism clean and free from gravel, snow, ice and debris.

.2 Maintain approach roads in good condition free from sags and ruts.

.3 Have scales retested and recertified if requested by Engineer.

END OF SECTION

02 41 13 – SELECTIVE SITE DEMOLITION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Mobilization and Demobilization

.1 Payment for mobilization and demobilization shall be included in the lump sum amount for the project and shall include all works required to:

.1 Mobilize equipment, materials, tools, supplies, labour and supervisors.

.2 Insurance(s) required for the duration of construction.

.3 Fees, certificates and work permits.

.4 Temporary construction facilities.

.5 Signage.

.6 Securing work and storage areas.

.7 Vehicle and pedestrian protection.

.8 Daily site cleaning, and

.9 Demobilization of aforementioned items upon completion of construction.

.2 Demolition and removal from site for items identified on the plans including timber post and chain fence, existing concrete curbs and identified trees and shrubs shall be included in the lump sum amount for the project.

1.2 DELIVERY, STORAGE AND HANDLING

.1 Storage and Protection.

.1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Engineer and at no cost to Engineer.

.2 Remove and store materials to be salvaged, in manner to prevent damage.

.3 Store and protect in accordance with requirements for maximum preservation of material.

.4 Handle salvaged materials as new materials.

1.3 SITE CONDITIONS

.1 Site Environmental Requirements:

.1 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.2 Ensure proper disposal procedures are maintained throughout the project.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 PREPARATION

.1 Inspect site and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

3.2 REMOVAL OPERATIONS

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place.

3.3 REMOVAL FROM SITE

.1 Dispose of materials not designated for salvage or re-use in work, off-site at location acceptable to Engineer.

3.4 RESTORATION

.1 Remove debris, trim surfaces and leave work site clean, upon completion of Work.

.2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

END OF SECTION

03 10 00 – CONCRETE FORMING AND ACCESSORIES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

- .1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
- .3 CSA O121-M1978(R2003), Douglas Fir Plywood.
- .4 CSA O151-04, Canadian Softwood Plywood.
- .5 CSA O153-M1980(R2003), Poplar Plywood.
- .6 CAN/CSA-O325.0-92(R2003), Construction Sheathing.
- .7 CSA O437 Series-93(R2006), Standards for OSB and Waferboard.
- .8 CSA S269.1[1975(R2003), Falsework for Construction Purposes.
- .9 CAN/CSA-S269.3-M92(R2003), Concrete Formwork, National Standard of Canada

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit shop drawings for formwork and falsework.

.2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, and locations of temporary embedded parts.

.3 Indicate sequence of erection and removal of formwork/falsework as directed by Engineer.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

- .1 For concrete without special architectural features, use wood and wood product formwork materials to CAN/CSA-O86.

.2 Form release agent: non-toxic.

.3 Form stripping agent: colourless mineral oil, non-toxic, free of kerosene, with viscosity between 15 to 24 mm^2/s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.

.4 Falsework materials: to CSA-S269.1.

Part 3 Execution

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Fabricate and erect falsework in accordance with CSA S269.1.

.3 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.4 Align form joints and make watertight.

.1 Keep form joints to minimum.

.5 Use 25 mm chamfer strips on external corners unless specified otherwise.

.6 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.7 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.8 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

.9 Relative alignment between adjacent formed concrete surfaces shall be less than or equal to 5 mm.

.10 Plumbness of slab edges shall be within 1:400 measured at any one surface.

3.2 REMOVAL AND RESHORING

.1 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

03 20 00 – CONCRETE REINFORCING

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section.

1.2 REFERENCES

.1 American Concrete Institute (ACI)

.1 SP-66-04, ACI Detailing Manual 2004.

.2 CSA International

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

.2 CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.

.3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.

.4 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

.3 Reinforcing Steel Institute of Canada (RSIC)

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice SP-66.

.2 Shop Drawings:

.1 Submit drawings with the following:

.1 Indicate placing of reinforcement and:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Engineer, with identifying code marks to permit correct placement without reference to structural drawings.

.2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.

.1 Provide Type B unless otherwise indicated.

1.4 DELIVERY, STORAGE AND HANDLING

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

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

.2 Replace defective or damaged materials with new.

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 A82/A82M.

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

.5 Mechanical splices: subject to approval of Engineer.

.6 Plain round bars: to CSA-G40.20/G40.21.

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 Engineer’s written approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Engineer’s, 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

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

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

.3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain Engineer's approval of reinforcing material and placement.

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

3.3 CLEANING

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

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

END OF SECTION

03 30 00.01 – CAST-IN-PLACE CONCRETE SHORT FORM

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Measurement Procedures:

.1 Payment for the concrete barrier curb shall be by linear metres of concrete poured in place.

.2 Payment for formwork and falsework, reinforcing steel, and joints are incidental and are deemed to be included with the reinforced concrete items.

1.2 RELATED REQUIREMENTS

.1 Section 03 10 00 Concrete Forming and Accessories

.2 Section 03 20 00 Concrete Reinforcing

1.3 REFERENCES

.1 ASTM International

.1 ASTM D1751-04, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.

.3 CSA International

.1 CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.3 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 11 05 – General Instructions.

.2 Shop Drawings:

.1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and necessary details of reinforcing.

.2 Submit drawings showing formwork and falsework design to: CSA A23.1/A23.2.

.3 Provide testing and inspection results reports for review by Engineer upon request and do not proceed without written approval when deviations from mix design or parameters are found.

.4 Concrete hauling time: provide for review by Engineer deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.5 QUALITY ASSURANCE

.1 Provide to Engineer, four weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.1 Quality Control Plan: provide written report to Engineer verifying compliance that concrete in place meets performance requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from Engineer and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by the Engineer.

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

Part 2 Products

2.1 DESIGN CRITERIA

.1 To CSA A23.1/A23.2.

2.2 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Engineer and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

.1 Use Type 10 cement for all applications.

.2 Compressive strength when tested in accordance with CAN/CSA-A23.2, (9C): average 28 day compressive strength to be minimum 30 MPa with 7% +/- 1.5% air entrainment.

.3 Cementing materials content: 290 to 335 kg/m^3 of concrete mix.

.4 Air content when tested in accordance with CAN/CSA-A23.2, (4C), immediately after discharge: in accordance with CSA A23.1 Table 10.

.5 Class of exposure: Class C-2

.6 Use of chemical admixture will be approved only when specified mix requirements or workability cannot be achieved by proportioning of aggregates, water, cement and air entraining admixture.

.7 Water: to CSA A23.1/A23.2.

.8 Reinforcing bars: to CAN/CSA-G30.18, Grade 400.

.9 Premoulded expansion joint filler:

.1 In slab - Bituminous impregnated fibreboard: to ASTM D1751.

.10 Expansion joint sealer/filler: grey to CAN/CGSB-19.24, Type 1, Class B.

.11 Control joint sealer/filler: BASF Masterseal SL 1.

.12 Other concrete materials: to CSA A23.1/A23.2.

Part 3 Execution

3.1 PREPARATION

.1 Provide Engineer 24 hours notice before each concrete pour.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

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

3.2 FORMWORK

.1 Install in accordance with Section 03 10 00 – Concrete Forming and Accessories and to following requirements:

.1 Provide forms of sufficient strength to support and keep alignment under weight of spreading and finishing machines.

.2 Set forms true to line and grade, join neatly and tightly and secure to resist concrete pressure and impact from tampers without springing.

.3 Clean and oil forms before each use.

.4 Obtain Engineers approval of forms before placing concrete.

3.3 SUBGRADE AND SUBBASE PREPARATION

.1 Subbase to consist of specified material and have a compacted thickness of not less than specified.

.2 Subbase shall be compacted to specified density.

.3 Prepared subbase shall be checked for conformity with the cross-section and grade tolerances. Finished surface of subbase shall not deviate more than 0 mm above and 20 mm below specified grade and cross-section, and surface shall not deviate more than 10 mm at any place on a 3 mm template.

.4 Repair damage to subbase resulting from hauling or equipment operations.

.5 Prior to placing concrete, subbase shall be thoroughly wetted. Wetting shall be carried out, such that standing water is not present on grade.

.6 Surface condition of base to be approved by Engineer before placing concrete.

3.4 REINFORCING STEEL AND DOWELS

.1 Placing reinforcing steel as indicated and to Section 03 20 00 – Concrete Reinforcing.

.2 Remove oil, grease, dirt and deleterious material from reinforcing bars before placing concrete.

.3 Steel placement to be approved by Engineer before placing concrete.

3.5 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.

.2 Place concrete to lines, grades and depths as indicated.

.3 Discharge concrete into forms as soon as practical after mixing.

.4 Use hand placing where machine spreading is not feasible.

.5 Spread uniformly with approved equipment to thickness sufficient to allow for proper consolidation and finishing.

.6 When completing concrete placement for day, carry placement through to scheduled control joint location.

.7 Where concrete placement is stopped for more than 30 minutes due to breakdowns, weather or other reasons, construct extra bulkhead and construction joint as directed by Engineer.

.8 Do not place concrete on frozen surface.

.9 No concrete shall be placed during rain.

.10 When rain appears imminent pouring operation should cease. Protect freshly laid concrete from rain damage and adverse weather condition and in accordance with CAN/CSA A23.1. Extend protective coverings over edges of concrete and arrange so as not to bear on unprotected edges.

.11 Concrete placed when the ambient temperature is at or above 27 degrees C to be cured by continuous water curing from soaker hoses providing complete coverage of the pavement to minimize the temperature rise of the concrete.

.12 When concrete has been placed in cold weather and the air temperature is expected to drop below 5 degrees C, insulating curing blankets or other suitable material shall be placed on the concrete pavement and weighted to prevent movement. Curing to continue until the cumulative number of days, or fraction thereof, during which the temperature of the concrete is 10 degrees C, has totalled a minimum of 7 days.

.13 Tolerances:

.1 The average thickness of the deck shall be no more than 10 mm less thickness than the specified thickness, and no individual thickness measurement shall be more than 20 mm less than the specified thickness.

.2 Finished elevation of deck shall be within ± 5 mm from design elevations.

.3 The average slope of the finished floor shall not exceed 1:400 from the design centerline profile and deck-fall.

3.6 CONTROL JOINTS

.1 Cut control joints in deck at locations indicated, to CSA A23.1/A23.2. Install specified joint sealer and silica sand inside joints.

3.7 EXPANSION AND ISOLATION JOINTS

.1 Install premoulded joint filler in expansion and isolation joints full depth of slab to CSA A23.1/A23.2. Install sealant on top of joint flush with finished surface.

3.8 CURING

.1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and to CSA A23.1/A23.2.

3.9 SITE TOLERANCES

.1 Concrete floor slab finishing tolerance to CSA A23.1/A23.2.

3.10 FIELD QUALITY CONTROL

.1 Concrete testing: to CSA A23.1/A23.2 by testing laboratory designated and paid for by Owner.

END OF SECTION

03 41 02 – PRECAST CONCRETE

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 Supply and installation new precast concrete curbs will be paid for per unit supplied and installed. Any dowels or connection hardware require shall be considered incidental to this item.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-A23.3-04, Design of Concrete Structures.

.3 CSA-A23.4-05, Precast Concrete - Materials and Construction.

.4 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.1 CSA-A3001-03, Cementitious Materials for Use in Concrete.

.5 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.

.6 CSA-W59-03, Welded Steel Construction (Metal Arc Welding) (Metric version).

1.3 PERFORMANCE REQUIREMENTS

.1 Length of precast elements not to vary from design length by more than plus or minus 50 mm.

.2 Cross sectional dimensions of precast elements not to vary from design dimensions by more than plus or minus 50 mm.

.3 Precast elements not to vary by more than plus or minus 50 mm from true overall cross sectional shape as measured by difference in diagonal dimensions.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Transport concrete base with points of support and direction of reactions approximately same as when they will be in final position in work.

.2 Handle, store and protect concrete base in order to avoid damage to concrete.

.3 Identify lifting points by inserting hooks during manufacture.

Part 2 Products

2.1 MATERIALS

.1 Cement to CAN/CSA-A3001, Type GU.

.2 Water: to CSA-A23.1/A23.2.

.3 Reinforcing steel: to CAN/CSA-G30.18.

.4 Hardware and miscellaneous materials: to CSA-A23.1/A23.2.

.5 Anchors and supports: to CAN/CSA-G40.21 Type 300 W.

.6 Welding materials: to CSA W48.

.7 Air entrainment admixtures: to ASTM C260.

2.2 MIXES

.1 Concrete:

.1 Alternative 1 - Performance Method for specifying concrete: to meet Engineer performance criteria in accordance with CAN/CSA-A23.1/A23.2.

.1 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-1.

.2 Minimum compressive strength at 28 days: 30 MPa.

.3 Surface texture: steel trowel finish.

.2 Provide quality management plan to ensure verification of concrete quality to specified performance.

.3 Concrete supplier's certification.

2.3 MANUFACTURED UNITS

.1 Manufacture units in accordance with CSA-A23.4.

.2 Provide hardware suitable for handling elements.

2.4 SOURCE QUALITY CONTROL

.1 Upon request, provide Engineer with certified copies of quality control tests related to this project as specified in CSA-A23.4.

.2 Upon request, provide Engineer with certified copy of mill test report of reinforcing steel supplied, showing physical and chemical analysis.

Part 3 Execution

3.1 VERIFICATION

.1 Quality Control Plan: ensure concrete supplier meets performance criteria and provide verification of compliance.

END OF SECTION

31 23 33 – EXCAVATING, TRENCHING AND BACKFILLING

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Excavated materials will be by lump sum and shall include all labour, equipment and materials required to excavate to the limits indicated and dispose excavated materials off site.

.2 Payment for providing new 'A' limestone granular material shall be in tonnes and checked by tickets supplied from quarry of material incorporated into Work and accepted in writing by Engineer. It shall include labour, equipment and materials required to:

.1 Provide new 'A' limestone granular material to complete the overall thickness of the base course below the new parking area.

.2 Compact base course to 100% SPD.

.3 Contractor to make own arrangements with Provincial authorities, municipalities and owners of private properties, for the quarrying and transportation of rock materials and machinery for work over their property, roads or streets.

1.2 SUBMITTALS

.1 Submit to Engineer for approval, two weeks before excavation, the proposed location of spoil area for excavated material.

.2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field, clearance record from utility authority, and location plan of relocated and abandoned services, as required.

1.3 SOURCE SAMPLING

.1 Inform Engineer of proposed source of materials and provide access for sampling at least 2 weeks prior to commencing work

1.4 DEFINITIONS

.1 Class A material: solid rock requiring drilling and blasting to loosen, which cannot be removed by means of heavy duty mechanical excavating equipment, and boulders or rock fragments of individual volumes 1.5 m; or more.

.2 Class B material: loose or shale rock, layered limestone rock, silt, sand, quick sand, mud, shingle, gravel, clay, sand, gumbo, boulders, hardpan and debris of individual volumes less than 1.5 m.

1.5 EXISTING CONDITIONS

.1 Buried services:

.1 Before commencing work verify location of buried services on and adjacent to site.

.2 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.3 Where utility lines or structures exist in area of excavation, obtain direction of Engineer before removing or re-routing.

.4 Record location of maintained, re-routed and abandoned underground lines.

.2 Existing buildings and surface features:

.1 Conduct, with Engineer, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Engineer.

Part 2 Products

2.1 MATERIALS

.1 Granular base: material in accordance with the following requirements:

.1 Type ‘A’ limestone.

.2 Gradations to be within limits specified when tested to ASTM C136 ASTM C117. Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.

.1 Gradation Method #1 to:

% Passing	
Sieve Designation	Type ‘A’
19 mm	100
4.75 mm	35-70
0.425 mm	10-30
0.075 mm	8-17

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties, walkways and waterways.

.2 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PREPARATION/PROTECTION

.1 Keep excavations clean, free of standing water, and loose soil.

.2 Protect buried services that are required to remain undisturbed.

3.3 DEWATERING

.1 Keep excavations free of water while Work is in progress.

.2 Provide for Engineer approval details of proposed dewatering methods, including dikes, well points, and sheet pile cut-offs.

.3 Protect open excavations against flooding and damage due to surface run-off.

.4 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures and in manner not detrimental to public and private property, or portion of Work completed or under construction.

3.4 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions shown on drawings.

.2 Excavation must not damage or interfere with adjacent foundations.

.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.

.6 Notify Engineer when bottom of excavation is reached.

.7 Obtain Engineer approval of completed excavation.

3.5 PLACEMENT AND INSTALLATION

.1 Proof roll subgrade and compact to 95% SPD.

.2 Place granular base after sub-grade surface is tested and inspected and approved by Engineer.

.3 Provide new ‘A’ limestone granular material:

.1 Ensure no frozen material is placed.

.2 Place material only on clean unfrozen surface, free from snow and ice.

.3 Place material using methods which do not lead to segregation or degradation of aggregate.

.4 Place material to full width in uniform layers not exceeding 200 mm compacted thickness.

.5 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.6 Remove and replace that portion of layer in which material becomes segregated during spreading.

.4 Compacting:

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Ensure compaction equipment is capable of obtaining required material densities.

.3 Compact to density not less than 100% corrected maximum dry density.

.4 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.5 Apply water as necessary during compacting to obtain specified density.

.6 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Engineer.

.7 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.6 PROOF ROLLING

.1 For proof rolling use standard roller of 45400 kg gross mass with four pneumatic tires each carrying 11350 kg and inflated to 620 kPa. Four tires arranged abreast with centre to centre spacing of 730 mm maximum.

.2 Obtain written approval from Engineer to use non-standard proof rolling equipment.

.3 Proof roll subgrade as indicated.

.4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.

.5 Where proof rolling reveals areas of defective subgrade:

.1 Remove sub-base material and compact to depth and extent as directed by Departmental representative.

.2 Replace sub-base material and compact.

.6 Where proof rolling reveals areas of defective sub-base, remove and replace in accordance with this section at no extra cost.

3.7 SITE TOLERANCES

.1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.8 CLEANING

.1 Progress Cleaning.

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

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.9 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 – 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 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-4.2 No. 11.2-[2004], Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).

.2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.

.1 No.2-M85 Methods of Testing Geosynthetics - Mass per Unit Area.

.2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.

.3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.

.4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.

.5 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

.2 Ontario Provincial Standard Specifications (OPSS)

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Test and Evaluation Reports:

.1 If requested, submit copies of mill test data and certificate at least 4 weeks prior to start of Work.

1.4 SAMPLES

.1 Submit to the Engineer the following samples at least 1 week prior to commencing work:

.1 Minimum of 1 m of roll width of geotextile

1.5 DELIVERY, STORAGE AND HANDLING

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

.2 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, 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 Non-woven geotextiles shall be Class II and consist of a manufactured sheet, web, or batt of directionally or randomly oriented fibres, filaments, or other elements produced by bonding or interlocking the elements by mechanical, thermal, or chemical means.

.2 Tensile strength, Marv, minimum 660 N to CAN/CGSB 148.1, Method No. 7.3.

.3 Elongation at break, typical, >50% to CAN/CGSB 148.1, Method No. 7.3.

.4 Tear strength, MARV, minimum, 250 N to CAN/CGSB 4.2, Method No. 12.2.

.5 Puncture strength, MARV minimum, 1375 N to ASTM D 6241.

.6 Permittivity, minimum, to 0.05 CAN/CGSB 148.1, Method No. 4 s^{-1}.

.7 Ultraviolet stability, minimum, 50% retained tensile strength at 500 hours to ASTM D 4355.

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.

.1 Visually inspect substrate in presence of Engineer.

.2 Inform Engineer of unacceptable conditions immediately upon discovery.

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

3.2 INSTALLATION

.1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with securing pins and washers.

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

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

.4 Pin successive strips of geotextile with securing pins at 2000 mm interval at midpoint of lap as indicated.

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

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

.7 Replace damaged or deteriorated geotextile to approval of Engineer.

.8 Place and compact soil layers in accordance with relevant specification sections.

3.3 CLEANING

.1 Progress Cleaning:

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

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

32 12 16.01 – ASPHALT PAVING – SHORT FORM

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Payment for asphalt paving shall be by square metres and shall include all labour, equipment, and materials required to:

.1 Place and compact two-50 mm lifts of asphalt at areas indicated.

.2 Overlap top lift with existing base lift after scraping at limits of construction as indicated.

1.2 REFERENCES

.1 American Association of State Highway and Transportation Officials (AASHTO)

.1 AASHTO M320-10, Standard Specification for Performance Graded Asphalt Binder.

.2 Asphalt Institute (AI)

.1 AI MS-2-1994 Sixth Edition, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.

.3 ASTM International

.1 ASTM C88-05, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.

.2 ASTM C127-07, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.

.3 ASTM C128-07a, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.

.4 ASTM C131-06, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.5 ASTM C136-06, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

.6 ASTM D995-95b (2002), Standard Specification for Mixing Plants for Hot-Mixed, Hot Laid Bituminous Paving Mixtures.

.7 ASTM D3203-94 (2005), Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate and include product characteristics, performance criteria, physical size, finish and limitations.

Part 2 Products

2.1 MATERIALS

.1 Asphalt concrete: Hot Laid HL4 - maximum aggregate size 19 mm, BIT Type B or approved equivalent.

Part 3 Execution

3.1 PREPARATION

.1 Inspect site with Engineer and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

3.2 REMOVAL OPERATIONS

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place.

.3 Salvage and reinstall:

.1 Items to be salvaged: Traffic signs.

3.3 CLEANING

.1 Progress Cleaning:

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

.2 Remove debris, trim surfaces and leave work site clean, upon completion of work.

.3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

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

3.4 PAVEMENT THICKNESS

.1 Pavements for parking area:

.1 Base course: 50 mm.

.2 Wear course: 50 mm.

3.5 PAVEMENT CONSTRUCTION

.1 Obtain Engineer approval of base prior to placing asphalt.

.2 Place asphalt concrete to thicknesses, grades and lines as indicated.

.3 Placing conditions:

.1 Place asphalt mixtures only when air temperature is 5 degrees C minimum.

.2 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.4 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300 mm.

.5 Compact by rolling asphalt continuously using established rolling pattern.

.6 Operate roller slowly initially to avoid displacement of material.

.7 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.

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

END OF SECTION

32 91 19.13 – TOPSOIL PLACEMENT AND GRADING

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Payment for topsoil and sod shall be lump sum and shall include all labour and equipment required to:

- .1 Strip existing grassed areas adjacent to areas of work.
- .2 Prepare sub-grade for placing of topsoil at disturbed areas.
- .3 Supply, place, and spread topsoil to specified thickness and finished grade.
- .4 Provide new sod.

1.2 REFERENCES

.1 Agriculture and Agri-Food Canada

- .1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment

- .1 PN1340-[2005], Guidelines for Compost Quality.

.3 U.S. Environmental Protection Agency (EPA)/Office of Water

- .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 DEFINITIONS

.1 Compost:

- .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
- .2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
- .3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminates.
- .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling.

.2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Engineer.

.3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 TOPSOIL

.1 Topsoil for sodded areas: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70 % sand, minimum 7 % clay, and contain 2 to 10 % organic matter by weight.

.2 Contain no toxic elements or growth inhibiting materials.

.3 Finished surface free from:

.1 Debris and stones over 50 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.4 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

.1 Fertilizer:

.1 Fertility: major soil nutrients present in following amounts:

.2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.

.3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.

.4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.

.5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.

.6 Ph value: 6.5 to 8.0.

.2 Peatmoss:

.1 Derived from partially decomposed species of Sphagnum Mosses.

.2 Elastic and homogeneous, brown in colour.

.3 Free of wood and deleterious material which could prohibit growth.

.4 Shredded particle minimum size: 5 mm.

.3 Sand: washed coarse silica sand, medium to course textured.

.4 Organic matter: compost Category [A], [B] in accordance with [CCME PN1340], unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.5 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.

.6 Limestone:

.1 Ground agricultural limestone.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.7 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOD

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Turf Grass Nursery Sod types:

.1 Number One Kentucky Bluegrass Sod: Nursery Sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.

.2 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivar[s].

.3 Number One Named Cultivars: Nursery Sod grown from certified seed.

.2 Turf Grass Nursery Sod quality:

.1 Not more than 1 broadleaf weed and up to 1% native grasses per 40 square metres.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

.2 Commercial Grade Turf Grass Nursery:

.1 Mow sod at height directed by Departmental Representative within 36 hours prior to lifting, and remove clippings.

.2 Not more than 5 broadleaf weeds and up to 20% native grasses per 40 square metres.

.3 Water:

.1 Supplied by Engineer at designated source.

.4 Fertilizer:

.1 To Canada "Fertilizers Act" and Fertilizers Regulations.

.2 Complete, synthetic, slow release with 65 % of nitrogen content in water-insoluble form.

2.4 SOURCE QUALITY CONTROL

.1 Advise Engineer of sources of topsoil to be utilized with sufficient lead time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P and K, and organic matter.

.4 Testing of topsoil will be carried out by testing laboratory designated by Engineer.

.1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

.1 Begin topsoil stripping of areas as indicated.

.2 Strip topsoil to depths as indicated.

.1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.

.3 Stockpile in locations as directed by Engineer.

.1 Stockpile height not to exceed 2 m.

.4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.

.5 Protect stockpiles from contamination and compaction.

3.3 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

.1 If discrepancies occur, notify Engineer and do not commence work until instructed by Engineer.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.

.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.

.2 Remove debris which protrudes more than 75 mm above surface.

.3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.

.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

.1 Place topsoil after Engineer has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm.

.3 For sodded areas keep topsoil 15 mm below finished grade.

.4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by Engineer.

.1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.6 SOD PLACEMENT

.1 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.3 Roll sod as directed by Engineer. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.7 SOD PLACEMENT ON SLOPES AND PEGGING

.1 Start laying sod at bottom of slopes.

.2 Peg sod on slopes steeper than 3horizontal to 1 vertical, within 1 m of catch basins and within 1 m of drainage channels and ditches to following pattern:

.1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.

.2 Not less than 3-6 pegs per square metre.

.3 Not less than 6-9 pegs per square metre in drainage structures.

.4 Drive pegs to 20 mm above soil surface of sod sections.

3.8 PROTECTION BARRIERS

.1 Protect newly sodded areas from deterioration with snow fence on rigid frame.

.2 Remove protection 2 weeks after installation.

3.9 ACCEPTANCE

.1 Engineer will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.10 SURPLUS MATERIAL

.1 Dispose of materials except topsoil not required off site.

3.11 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION