SPECIFICATION

DFO
P/N F6879-209008
BERTH 30 REPAIRS
ST. JOHN'S, NL

ISSUED FOR TENDER

OWNER/AGENT:

FISHERIES AND OCEANS CANADA
10 BARTERS HILL
JOHN CABOT BUILDING
ST. JOHN'S, NL

DATE:

February 11, 2021

PROVINCE OF NEWFOUNDLAND AND LABRADOR

PEGNL Newfoundland and Labrador

PERMIT HOLDER
This Permit Allows
DILLON CONSULTING LIMITED

To Practice Professional Engineering
in Newfoundland and Labrador.
Permit No. as issued by PEGNL D0161
which is valid for the year 2021

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Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the furnishing of all plant, labour, equipment, and material for Berth 30 and 31 Repairs at the Coast Guard Base in St. John's, NL in strict accordance with specifications and accompanying drawings and subject to all terms and conditions of the contract.

1.2 MEASUREMENT FOR PAYMENT

.1 All costs associated with the work as indicated in the specifications and accompanying drawings shall be paid as a lump sum.

1.3 DESCRIPTION

.1 The work will consist of but will not necessarily be limited to the following:

- .1 Excavation to the limits as indicated on the drawings.
- .2 Installation of a new timber crib, and modifications to an existing timber crib.
- .3 Placement and compaction of backfill.
- .4 Installation of new slab-on-grade and asphalt.
- .5 Inspection of sewer as indicated on the drawings.
- .6 Demolition and reinstatement of existing concrete trench.
- .7 Removal and disposal of existing steel ladders.
- .8 Cutting off of existing metal protrusions at the west face of Berth 31.
- .9 Supply and installation of new timber ladder.
- .10 Supply and installation of new temporary wheelguard gap filler.
- .11 Cutting off of existing platform anchor bolts and installation of new platform anchor bolts.

1.4 SITE OF WORK

.1 Work will be carried out at Berth 30, St. John's Coast Guard Base, St. John's, Newfoundland in the location as shown on the accompanying drawings.

1.5 DATUM

.1 Datum used for this project shall be referenced to the existing wharf deck elevation as indicated on the drawings.

1.6 EXAMINATION OF SITE

.1 Parties intending to tender for this work are advised to visit site and make their own estimates of facilities and difficulties attending execution of work, actual site and soil conditions, severity, exposure and uncertainty of weather and all other contingencies.

.2 Contractors or bidders or any other personnel who intend to visit the site are to review specification Section 01 35 28 - Health and Safety Requirements before visiting the site. All visitors to the site shall be responsible for their own health and safety while on site.

1.7 TERM ENGINEER

.1 Unless specifically stated otherwise, the term Engineer where used in the Specifications or the Drawings shall mean the Departmental Representative as defined in the General Conditions of the Contract.

1.8 CONTRACTOR USE OF PREMISES

.1 All work is to be strictly coordinated with the Coast Guard and with the Departmental Representative.

.2 Any laydown area or equipment storage must be coordinated with the Coast Guard and with the Departmental Representative.

.3 At completion of work, restore area to its original condition. Damage to ground and property will be repaired and paid for by Contractor. Remove all construction materials, residue excess, etc. and leave site in a condition acceptable to Departmental Representative.

.4 Contractor will take adequate precautions to protect existing asphalt and concrete decks when operating tracked equipment or other equipment.

1.9 SITE OCCUPANCY

.1 Various harbour users will occupy premises during entire construction period for execution of normal operations.

.2 Co-operate with harbour users, Coast Guard, and Departmental Representative in scheduling operations to minimize conflict and to facilitate usage of the harbour facilities.

1.10 WORK SCHEDULE

.1 Immediately upon award of contract, Contractor will submit schedule of work. Each entry will show an intended start and completion date using a horizontal bar graph method.

.2 Should Contractor find that they cannot maintain schedule as originally intended, they will immediately submit a revised schedule without being requested to do so.

.3 All work on the project will be completed by end of day on November 30, 2019 as shown on the Construction Tender and acceptance form.

1.11 ABBREVIATIONS

.1 The following abbreviations of standard specifications have been used in this specification and on drawings:

CGSB – Canadian Government Specifications Board
CSA – Canadian Standards Association
NLGA – National Lumber Grades Authority
ASTM – American Society for Testing and Materials

.2 Where these abbreviations and standards are used in this project, latest edition in effect on date of tender call will be considered as applicable.

1.12 LAYOUT OF WORK

.1 Contractor to layout work based on the information provided in this specification and on the accompanying drawings.

.2 If there are any discrepancies between the specification and drawings and the site conditions, the Contractor shall report discrepancies to the Departmental Representative and request clarification.

1.13 PROJECT MEETINGS

.1 Departmental Representative will arrange all project meetings, including a project kickoff meeting with all parties included.

.2 All project meetings will take place on site of work unless so directed by Departmental Representative.

.3 Departmental Representative will assume responsibility for recording minutes of meetings and forwarding copies to all parties present at meetings.

.4 Contractor will have a responsible member of his firm present at all project meetings.

1.14 PROTECTION

.1 Store all materials and equipment to be incorporated into work to prevent damage by any means.

.2 Repair or replace all materials or equipment damaged in transit or storage to the satisfaction of and at no costs to the Departmental Representative.

.3 The Contractor shall be responsible to erect and maintain temporary fencing and barriers to enclose all work areas to prevent interaction between Contractor personnel and other harbour users. The temporary barriers shall be installed and remain in place protecting locations with ongoing work, open excavations, or newly placed concrete or asphalt has been installed. The fencing and barriers shall be to the satisfaction of the Departmental Representative.

1.15 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 List of Outstanding Shop Drawings.
- .6 Change Orders.
- .7 Other Modifications to Contract.
- .8 Field Test Reports.
- .9 Copy of Approved Work Schedule.
- .10 Health and Safety Plan and Other Safety Related Documents.
- .11 Other documents as specified.

1.16 ACCEPTANCE

.1 Prior to issuance of the Certificate of Substantial Performance, the Contractor shall, in company with the Departmental Representative, make a check of all work. Correct all discrepancies before final inspection and acceptance.

1.17 WORKS COORDINATION

.1 The Contractor shall be responsible for coordinating the work of the various trades, where the work of such trades interferes with each other.

.2 Convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required. Provide each trade with the plans and specifications of the interfacing trade, as required, to assist them in planning and carrying out their respective work.

.3 Canada will not be responsible for or held accountable for any extra costs incurred as a result of the failure to carry out coordination work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor and shall be resolved at no extra cost to Canada.

1.18 WORK COMMENCEMENT

.1 Contractors are advised that mobilization is to commence immediately after award and submission and acceptance of a health and safety plan.

.2 Project work on site is to commence as soon as possible, with a continuous reasonable work force, unless otherwise agreed by the Departmental Representative.

.3 The Contractor is to make every effort to ensure that sufficient material and equipment is delivered to site at the earliest possible date after award.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 CASH ALLOWANCES

.1 Include in Contract Price specified cash allowances.

.2 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation and other authorized expenses incurred in performing Work.

.3 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.

.4 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.

.5 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.

.6 Amount of each allowance, for Work specified in respective specification Sections is as follows:

.1 Section 03 30 00 include allowance of $750 for testing of concrete.

.2 Section 32 11 23 include allowance for $500 for compaction testing. Allowance for compaction testing may be used for testing of either sub-base or base course at the discretion 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

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 21 00 - Allowances.

.2 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under sections as follows:

.1 Section 03 30 00 - Cast-in-place Concrete for concrete testing.

.2 Section 32 11 23 - Aggregate Base Courses for compaction testing.

1.2 APPOINTMENT AND PAYMENT

.1 Contractor will pay for services of testing laboratory under a cash allowance under Section 01 21 00 - Allowances, with the exception of the following items which will be paid for by the Contractor separate from any cash allowance:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Mill tests and certificates of compliance.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, contractor shall pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

.1 Provide access to Work for inspection and testing.

.2 Facilitate inspections and tests.

.3 Make good Work disturbed by inspection and test.

.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Departmental Representative 4 days minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by 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

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow 7 days for Departmental Representative review of each submission.

.4 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.6 Accompany submissions with transmittal letter containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.7 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.8 After Departmental Representative review, distribute copies.

.9 Submit one (1) electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.10 Submit one (1) electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.11 Submit one (1) electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within three (3) years of date of contract award for project.

.12 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.13 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.14 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.15 Delete information not applicable to project.

.16 Supplement standard information to provide details applicable to project.

.17 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.18 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

.2 Province of Newfoundland and Labrador

.1 Occupational Health and Safety Act, R.S.N. – Latest Edition.

.3 FCC No. 301-1982 Standard for Construction Operations.

.4 FCC No. 302-1982 Standard for Welding and Cutting.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit site-specific Health and Safety Plan: Within 14 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation.

.3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.4 Submit copies of incident and accident reports.

.5 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within seven (7) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within three (3) days after receipt of comments from Departmental Representative.

.6 Departmental Representative'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.

.7 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

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

1.3 GENERAL PROTECTION

.1 Companies undertaking this work shall have a Certificate of Recognition (COR) from Newfoundland and Labrador Construction Safety Association (NLCSA).

.2 Carry out work placing maximum emphasis on safety, giving precedence to health and safety of public, site personnel, and protection of the environment over cost and schedule considerations of work.

.3 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.4 Be vigilant and ensure that non-authorized persons are not allowed to circulate in designated construction areas of work site. Provide appropriate means by use of barricades, fences, warning signs and temporary lighting as required. Secure site at night time (or provide security guard) as deemed necessary to protect site against entry.

1.4 FILING OF NOTICE

.1 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with 3 weeks of contract award.

1.5 SAFETY ASSESSMENT

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

.2 A site specific safety hazard assessment shall include but not be limited to the following:

.1 Working in close proximity of water.

.2 Using water craft.

.3 Working from heights.

.4 Wet and slippery conditions.

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.7 HEALTH AND SAFETY PLAN

.1 Based on hazard assessment, prepare Project Health and Safety Plan to include the following:

.1 Summary of health risk and safety hazards resulting from analysis, clearly identifying those of high risk;

.2 List special tasks and operations which are to be followed for activities or operations of high health and safety risk;

.3 List hazardous materials to be brought on site as required by work;

.4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards;

.5 Identify personal protective equipment to be used by workers as required to manage hazards that cannot be reasonably or practically managed by engineering and administrative control;

.6 State company's Safety Policy. Provide confirmation that General Contractor and subcontractors currently have in place Standard Operating Procedures (SOP) and Safe Work Practices (SWP), representative of the work type to be undertaken and meeting provincial safety regulations; that such procedures and practices will be stringently followed and enforced during work of this contract. Maintain a copy of all SOP and SWP on site at all times for own use and provide for inspection when requested by Engineer;

.7 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:

.1 Designated personnel from own company;

.2 Local emergency resources;

.3 Regulatory agencies applicable to work and as per legislated regulations;

.4 Corner Brook Port Corporation.

.8 Provide a communication plan or strategy of approved to be followed on site by all workers as to how project specific construction information and Health and Safety issues must flow and be shared between Workers, Subcontractors, General Contractor, Engineer, Building Manager and designated tenant representatives. Engineer will provide names of client contacts and their requirements for incorporation into the plan.

.2 Develop plan in collaboration with all sub-contractors. Ensure that all work and activities of sub-contractors are included in the hazard assessment and reflected within plan.

.3 Implement, maintain, and enforce compliance with requirements of the Health and Safety Plan until final completion of work and demobilization from site.

.4 As project progresses, continually review and evaluate work and construction site. Carry out additional hazard assessments, identifying new or potential health risk and safety hazards not previously known. Immediately revise and update Project Health and Safety Plan. Notwithstanding the above, carryout additional hazard assessments and revise the Health and Safety Plan when:

.1 New subtrade work, new subcontractor (s) or new workers arrive at the site to commence another portion of the work;

.2 The scope of work has been changed by Change Order;

.3 Errors or omissions are identified by Engineer or any authorized safety representative.

.5 Post a legibly typed copy of the Health and Safety Plan in a common visible area at the work site. Ensure that all workers and other authorized persons allowed access to the construction area (s) are aware of and abide by the rules and regulations indicated in the plan.

.6 Post all revisions to the plan and submit an updated copy to the Engineer in all instances.

.7 Maintain copies of all hazard assessments on site for the entire duration of work. Make available to Engineer for review upon request.

.8 Submission of the Health and Safety Plan, and any revised version, to the Engineer is for information and reference purposes only. It shall not be construed to imply approval by Engineer, be interpreted as a warranty of being complete, accurate and legislative compliant and shall not relieve Contractor of his legal obligations for the provision Health and Safety on the construction project.

1.8 GENERAL REQUIREMENTS

.1 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

.2 Deliver copies of WHMIS-MSDS data sheets to Engineer on delivery of materials.

.3 All data sheets must be posted on site, in a common area, visible to all workers (and in locations accessible to tenants employees when work of this contract includes construction activities adjacent to occupied areas).

.4 Make all efforts to select and use materials (i.e. adhesives, solvents, cleaners etc.) for the type and nature of work to be carried out which are the least hazardous products available, of low VOC content or low toxicity type products and emitting low noxious odours. Select products known to be friendly to the environment and to human health. Communicate this intent to sub-contractors, suppliers and manufacturers.

.5 Where the use of hazardous and toxic products cannot be avoided:

.1 Advise Engineer beforehand of the product (s) intended for use, submit WHMIS data sheets as per clause 11.1 above.

1.10 FIRE, SAFETY, AND HOT WORK REQUIREMENTS

.1 Comply with Federal and Provincial fire safety regulations, including the requirements of the following standards as issued by the Fire Protective Services of Human Resources Development Canada:

.1 FCC 301-Standard for Construction Operations.

.2 FCC 302-Standard for Welding and Cutting.

.2 Obtain Engineer's authorization before any welding, cutting or any other hot work operations can be carried out on site. Hot work includes all cutting with use of torch or other open flame devices and grinding with equipment which produces sparks.

.3 To obtain Port's authorization, Contractor shall develop, and implement use of written Hot Work Procedures and Safe Work Practices to be followed on the construction site for all hot work. Submit such procedures to Corner Brook Port Corporation for review and approval. Contractor must obtain Hot Work Permit from Corner Brook Port Corporation office.

.4 The Hot Work Procedures and Safe Work practices shall meet with fire safety regulations specified in clause (12.1) above and shall include the following criteria:

.1 Use of a Hot Work Permit system, between Contractor and each worker performing the hot work; consisting of a form to be filled out and issued for each and every hot work operation.

.2 Requirement for a hazard analysis to be carried out of the immediate area and on the nature and extent of the hot work required. The assessments must be done prior to and for each and every event where a Hot Work permit will be issued. Hazard analysis shall document in writing the following:

.1 Identified known and potential hazards;

.2 Protective controls and measures to be taken to minimize the risk of a fire;

.3 Planned emergency responses.

.3 Provision of a designated person (s) to carry out fire safety watch for a minimum of 30 minutes after completion of the hot work.

.5 Hot Work Permit Form to include, as a minimum, the following information:

.1 Project name and project number.

.2 Name and address of building or facility where work to be performed including specific floor or room etc.

.3 Description of hot work and nature of work to be carried out.

.4 Special precautions required, including the type of fire extinguisher needed.

.5 Worker (s) License or Certificate number when applicable in accordance with provincial regulations.

.6 Name and signature of Contractor, or his designated superintendent authorized to issue the permit, and the date when permit was prepared and issued.

.7 Name of worker (s) (clearly printed) to which the permit is being issued.

.8 Time duration when permit is in force (not to exceed 8 hours) indicating "Start" date and time and "completion" date and time.

.9 Worker signature with date and time when work has been completed.

.10 Name of fire safety watch person, with his signature, date and time at completion of safety watch, certifying that the surrounding area was under his watch and inspected for a minimum of (30 minutes) immediately upon hot work completion and found to be in a fire safe condition.

.6 The Hot Work Permit shall be completed in full before work commences, signed by the respective persons upon completion and returned to the contractor.

.7 Maintain Work Permits and Hazard analysis documentation on site for duration of Work. Upon request, make available for viewing by Engineer and by any person authorized by Engineer.

.8 Submit copy of Contractor's Hot Work Procedures and Safe Work Practices to obtain Engineer's authorization of such procedures in sufficient lead time before any hot work must be carried out so as not to delay work.

.9 In most cases, Engineer will issue only one written authorization covering the entire construction project and duration. However in some cases, depending on the nature or phasing of work, the quantity of various trades needing to perform welding and cutting, or other deemed situation, Engineer might designate certain portion of the construction work as separate entities each requiring its own written authorization. Follow Engineer's directives in this regard.

1.11 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.

1.12 COMPLIANCE REQUIREMENTS

.1 Comply with Occupational Health and Safety Act, Occupational Health and Safety Regulations, C. Nfld. Reg.

.2 Comply with Occupational Health and Safety Regulations, 1996.

.3 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

.4 Observe and enforce construction safety measures required by:

.1 National Building Code of Canada (Latest Edition), Part 8;

.2 Provincial Worker's Compensation Board;

.3 Municipal statutes and ordinances.

.5 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Engineer will advise on the course of action to be followed.

1.13 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 Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.14 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.

1.15 CORRECTION OF NON-COMPLIANCE

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

1.16 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Definitions:

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.2 GENERAL

.1 Conform to all federal, provincial, and municipal regulations and requirements for environmental protection.

1.3 FIRES

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

1.4 DRAINAGE

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

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

1.5 POLLUTION CONTROL

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

1.6 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Take action only after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

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

.2 Disposal of waste: Burying of rubbish and waste materials on site or allowing it to float away is not permitted. All waste materials must be disposed at a Government of Newfoundland and Labrador waste disposal site.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 INSPECTION

.1 Allow Departmental Representative 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 Consultant instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative 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. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work at the Departmental Representative's discretion.

.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 Departmental Representative at no cost to Departmental Representative. 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 appropriate agency and Departmental Representative 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 Contractor will rectify any defective Work to the satisfaction of the Departmental Representative.

.2 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 Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

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

.4 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative 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 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

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.2 SITE STORAGE

.1 Coordinate site storage of material with the Departmental Representative. Do not unreasonably encumber premises with products.

1.3 CONSTRUCTION PARKING

.1 Parking shall be coordinated with the Coast Guard and with the Departmental Representative.

.2 Clean all areas where used by Contractor's equipment.

1.4 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.5 CONSTRUCTION SIGNAGE

.1 Only notices of safety or instructions are permitted on site.

.2 Maintain signs and notices for duration of project. Remove and dispose of signs off site on completion of project.

1.6 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 11 00 - Summary of Work.

1.2 REFERENCES

.1 Not used.

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.4 HOARDING

.1 Provide secure barriers and signage to prevent any pedestrian or vehicle access around the following locations:

.1 Any areas with ongoing construction, open excavations, curing concrete, or recently placed asphalt.

.2 Any other locations that the Contractor or Departmental Representative deems necessary to protect the work.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Departmental Representative or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site containers for collection of waste materials and debris.

.5 Dispose of waste materials and debris off site.

.6 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.7 Provide adequate ventilation during use of volatile or noxious substances.

.8 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Not used.

1.2 STORAGE, HANDLING AND PROTECTION

.1 Unless specified otherwise, materials for removal become Contractor's property.

.2 Protect, stockpile, store and catalogue salvaged items.

.3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to approved local facility.

.4 Separate and store materials produced during dismantling of structures in designated areas.

.5 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.

.1 On-site source separation is recommended.

1.3 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of any waste into waterways, storm, or sanitary sewers.

.3 Do not dispose of treated wood through incineration. Dispose of trated wood, end pieces, wood scraps and sawdust at a sanitary landfill.

.4 Dispose of waste only at approved waste processing facility or landfill sites approved by authority have jurisdiction.

.5 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.6 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.4 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

1.5 SCHEDULING

.1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 NOT USED

.1 Not used

Part 3 Execution

3.1 APPLICATION

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

END OF SECTION

Part 1 General

1.1 RECORD DRAWINGS

.1 The Contractor shall print and provide two sets of white prints for record drawing purposes.

.2 Maintain project record drawings and record accurately deviations from Contract Documents.

.3 Mark changes in red coloured ink.

.4 Record following information:

.1 Field changes of dimension, detail, quantity or any other pertinent information.

.2 Changes made by change order or field order.

.5 At completion of project and prior to final inspection, neatly transfer notations to second set and submit both sets to 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

Part 1 General

1.1 DESCRIPTION

.1 This section specifies requirements for demolishing and removing wholly or in part various items designated to be removed.

.2 As indicated on the accompanying drawings and herein specified, demolition and removal will consist of but not necessarily limited to the following:

.1 Demolition and removal of concrete slab.

.2 Demolition and removal of asphalt.

.3 Demolition and removal of existing crib timbers.

.4 Demolition and removal of existing concrete trench and steel edge angles.

.5 Demolition and removal of existing steel ladders.

.6 Demolition and removal of existing platform anchor bolts.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 SITE CONDITIONS

.1 Protect existing objects designated to remain. In event of damage, immediately inform Departmental Representative and repair at no additional cost.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 PREPARATION

.1 Do Work in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.2 Inspect site and verify with Departmental Representative objects designated for removal.

.3 Protection:

.1 Prevent movement, settlement, or damage to adjacent structures.

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

.3 Do not disturb adjacent work designated to remain in place.

3.2 DEMOLITION SALVAGE AND DISPOSAL

.1 Remove items to be reused, store as directed by Departmental Representative and re-install as specified.

.2 Dispose of removed materials, except where specified otherwise, in accordance with authority having jurisdiction.

3.3 STOCKPILING

.1 Stockpile materials in coordination with the Departmental Representative and as approved by Departmental Representative.

3.4 REMOVAL FROM SITE

.1 Dispose of materials in accordance with applicable regulations. It is the sole responsibility of the Contractor to dispose of all demolished material to an approved dump site. Contractor shall ensure that the site is approved and willing to accommodate any materials disposed of from work site.

.2 Contractor shall obtain and pay for all necessary permits for use of approved dump site.

3.5 CLEANING AND RESTORATION

.1 Keep site clean and organized throughout demolition procedure.

.2 Upon completion of project, reinstate areas, affected by Work to condition which existed prior to beginning of Work.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 20 00 - Concrete Reinforcing.

.3 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

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

.2 CAN/CSA-O86-19, Engineering Design in Wood.

.3 CSA O121 (R2013), Douglas Fir Plywood.

.4 CSA O151-09 (R2014), Canadian Softwood Plywood.

.5 CSA O153-13, Poplar Plywood.

.6 CAN/CSA-O325.0-16, Construction Sheathing.

.7 CSA O437 Series-93(R2011), Standards for OSB and Waferboard.

.8 CSA S269.1-16 , Falsework and Formwork.

.9 CAN/CSA-S269.3-M92(R2003), Concrete Formwork.

.2 Council of Forest Industries of British Columbia (COFI)

.1 COFI Exterior Plywood for Concrete Formwork.

1.3 DELIVERY, STORAGE AND PROTECTION

.1 Deliver, handle and store formwork material and accessories to prevent weathering, warping or damage detrimental to the strength of the materials or to the surfaces to be formed.

.2 Ensure that formwork surfaces which will be in contact with concrete are not contaminated by foreign matter.

.3 Handle and erect the fabricated formwork to prevent damage.

Part 2 Products

2.1 MATERIALS

.1 General: material shall conform to the requirements of CAN/CSA-A23.1, except as amended or extended herein.

.2 Formwork materials:

.1 Formwork Lumber: use wood and wood product formwork materials to CSA-O121 and CAN/CSA-O86.1.

.3 Premoulded joint fillers:

.1 Bituminous impregnated fibreboard to ASTM D1751.

.4 Form release agent: Non-toxic, biodegradable chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluable soaps, preventing concrete from sticking to forms.

.5 Sealant: to Section 07 92 10 – Joint Sealing.

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 Ensure wall is cleaned of marine growth or other debris before enclosing the wall with formwork.

.3 Do not allow form release agent to come in contact with hardened concrete against which fresh concrete is to be placed, or where waterproofing, floor finishes, paint, etc. are applied directly to finished concrete surfaces. Remove with approved solvents any form coating which contacts reinforcing steel.

.4 Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.

.5 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.

.6 Align form joints and make watertight.

.1 Keep form joints to minimum.

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

.8 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.

.9 Inspect forms immediately prior to placing concrete. Remove any loose metal ties, chairs, wood or other foreign material. Ensure that reinforcement, ties, inserts, anchors, etc. are clear of the forms.

.10 Clean formwork in accordance with CAN/CSA-A23.1 and CAN/CSA-S269.3, before placing concrete.

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.

.1 Five (5) days for edges of slabs.

.2 Loosen wall forms sufficiently 12 to 24 hours after concrete is placed to permit curing.

.3 Exercise care in removing forms for concrete so that edges, corners, etc. are not damaged.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 10 00 - Concrete Forming and Accessories.

.3 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

.1 CSA International

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

.2 CAN/CSA-A23.3-14, Design of Concrete Structures.

.3 CAN/CSA-G30.18-09 (R2014), Carbon Steel Bars for Concrete Reinforcement.

.4 CAN/CSA-G40.21-13 (R2018), Structural Quality Steels.

.5 CAN/CSA-G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.

.6 CSA W186-M1990 (R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.

.2 Reinforcing Steel Institute of Canada (RSIC)

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.

.3 Shop Drawings shall include the following:

.1 Reinforcing placing drawings to a minimum scale of 1:50, showing size, location spacing and identification of all bars, and outline of all concrete surrounding steel, drawn to scale.

.2 Bar lists showing all detailed dimensions, number of bars, size and location, prepared in accordance with recommendations of "Reinforcing Steel Manual of Standard Practice" by Reinforcing Steel Institute of Canada.

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

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

Part 2 Products

2.1 MATERIALS

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

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

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.

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

.5 Mechanical splices: subject to approval of Engineer. Tapered threaded couplers, use "Lenton Rebar Splicing System" by Erco Products Inc., or Engineer approved equal.

2.2 FABRICATION

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

.2 Provide lapped splice lengths shown in the reinforcing lap length table on the drawings, or as detailed in the drawings.

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

.4 Upon approval of Engineer, weld reinforcement in accordance with CSA W186.

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

2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Engineer with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.

.2 Upon request inform Engineer of proposed source of material to be supplied.

Part 3 Execution

3.1 FIELD BENDING

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

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

.3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Deliver, handle and store reinforcing steel and accessories in accordance with CAN/CSA-A23.1.

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

.3 Tack welding of crossing bars and welding of pipe supports to reinforcing bars will not be permitted, unless approved by Engineer.

.4 Prior to placing concrete, obtain Engineer's approval of reinforcing material and placement. In the case of walls, notify Engineer before closing in wall forms.

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 - Concrete Forming and Accessories.

.2 Section 03 20 00 - Concrete Reinforcing.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM C109/C109M-20b, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50-mm Cube Specimens).
- .2 ASTM C260/C260M-10a(R2016), Specification for Air-Entraining Admixtures for Concrete.
- .3 ASTM C494/C494M-19, Specification for Chemical Admixtures for Concrete.

.2 Canadian Standards Association (CSA)

- .1 CAN/CSA-A5-98, Portland Cement.
- .2 CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.
- .3 CAN/CSA-A23.2-14, Test Methods and Standard Practises for Concrete.
- .4 CAN/CSA-A23.5-98, Supplementary Cementing Materials.
- .5 CAN/CSA A363-98, Cementitious Hydraulic Slag.
- .6 CAN/CSA-A3000-18, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 DEFECTIVE CONCRETE

.1 Concrete will be considered defective if concrete cylinder tests on any section of work fail to meet the acceptance standard specified in Clause 17.5.7 of CAN/CSA-A23.1. In such cases, concrete in place shall be checked by Engineer by obtaining core specimens, drilled and tested in accordance with CSA Test Method A23.2-14c.

.2 Concrete shall also be considered defective if it is structurally unsound, not watertight, excessively honeycombed or improperly finished as determined by the Engineer.

.3 The Engineer shall have the right to require, at his discretion, either replacement, strengthening or correction of defective portions of structure.

.4 Contractor to pay all costs resulting from defective concrete, including coring, testing, strengthening, demolishing and replacing.

1.4 SOURCE QUALITY CONTROL

.1 Sampling and testing of concrete materials shall be performed by an independent inspection and testing company specializing in this work and selected by the Engineer.

.2 Provide, at no cost, all material requested by the Engineer for sampling and testing.

.3 Sampling and testing of concrete materials shall be in accordance with the requirements of CAN/CSA-A23.2.

.4 The Engineer shall have access to the material source and batching plants at all times for inspection of materials and production methods, and the Contractor shall extend full cooperation.

1.5 MIX DESIGN AND TEST REPORTS

.1 Minimum 4 weeks before starting concrete work, submit the final mix design and results of tests for each class of concrete to the Engineer for review prior to placing any concrete. Mix designs shall be adjusted to prevent alkali aggregate reactivity problems.

.2 Minimum 4 weeks before starting concrete work, provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.

.3 Minimum 4 weeks before starting concrete work, provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.

1.6 INSPECTION AND TESTING COST

.1 Payment for initial sampling, inspection and testing of materials and concrete will be paid by under a cash allowance.

.2 Payment for retesting required due to unsatisfactory results shall be paid by the Contractor.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction Demolition Waste Management and Disposal.

.2 Ensure emptied containers are sealed and stored safely for disposal away from children.

.3 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

.4 Choose least harmful, appropriate cleaning method which will perform adequately.

Part 2 Products

2.1 MATERIALS

.1 General: material, storage of materials and testing of materials shall conform to requirements of CAN/CSA-A23.1 and CAN/CSA-A23.2, except as amended or extended herein.

.2 Coarse aggregate: hard crushed stone with maximum size for each class of concrete as given in Clause 2.2 and in accordance with CAN/CSA-A23.1, Clause 5.

.3 Portland Cement to CSA-3001 – Moderate Sulphate-Resistant Hydraulic Cement (Type MS).

.4 Blended hydraulic cement to CSA-3001- Blended Moderate Sulphate-Resistant Hydraulic Cement (Type MSb).

.5 Supplementary cementing materials: to CSA-A30001, maximum substitution of 25% for Portland Cement.

.6 Water: to CSA-A23.1.

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

.8 Air entraining admixture: to ASTM C260.

.9 Set Retarding Admixture: to ASTM C494. Engineer to approve use of accelerating admixtures.

.10 Accelerating Admixture: to ASTM C464. Engineer to approve use of accelerating admixtures.

.11 Curing compound: curing compounds not to be used.

.12 Superplasticizer: to ASTM C494.

.13 Steel edge angles and headed studs shall to CSA G40.21-14, grade 300W.

.14 Anchor bolts, nuts, and washers for new platform shall be Type 316 stainless steel and installed with Hilti RE-500 V3 epoxy.

2.2 PRODUCTION OF CONCRETE

.1 Measurement of materials, uniformity of concrete, mixing and delivery of concrete and concrete testing and sampling shall conform to requirements of CAN/CSA-A23.1 and CAN/CSA-A23.2, except as amended or extended herein.

.2 All concrete shall be proportioned on basis of Alternative No. 1 as defined in CAN/CSA-A23.1. Trial mix designs shall be made and specimens tested, by and at the Contractor's expense, prior to concreting operations. Once design mix has been established and reviewed by the Engineer, composition and source of materials shall not vary, unless approved by Engineer.

.3 Make adjustments to design mix, when requested by Engineer, to meet acceptance standards of strength, workability or other requirements.

.4 Class of concrete and concrete design criteria for mix proportions are given in table below:

Class	Location/ Exposure	28-Day Strength (MPa)	Minimum Cement Content (kg/m^3)	Maximum W/C Ratio (Note 1)	Maximum Coarse Aggregate (mm)	Slump (mm)	Notes

Class	Location/ Exposure	28-Day Strength (MPa)	Minimum Cement Content (kg/m^3)	Maximum W/C Ratio (Note 1)	Maximum Coarse Aggregate (mm)	Slump (mm)	Notes
I	Slab-on-grade/C-1 and S-3	35	-	0.40	20	60-90	See A23.1 Table 9 for air-entrained

Notes:

1) W/C ratio by weight based on total water content including moisture content of aggregates.

2) Properties listed above apply to concrete placed by conventional methods. Adjustments to design mixes shall be required for pumped concrete.

3) Do not use admixtures formulated with calcium chloride.

6. Fabrication and operation of batching plants shall conform to the requirements of CAN/CSA-A23.1. Batching plants shall be located within a 25 km radius of project site.

Part 3 Execution

3.1 COLD WEATHER REQUIREMENTS

.1 Concrete placement during cold weather as defined by CAN/CSA-A23.1 shall be in accordance with CAN/CSA-A23.1, Clause 21, "Curing and Protection". Given the timing of the work, concrete placement must be placed according to cold weather concreting requirements.

.2 General:

.1 Concrete placement during cold weather as defined by CAN/CSA-A23.1 shall be in accordance with CAN/CSA-A23.1, except as amended or extended herein.

.2 The ambient daily temperature will be obtained by Engineer from thermometer readings. Contractor shall supply and install thermocouples to obtain temperature readings. If wind velocity at site exceeds 25 km/hr, 5°C shall be deducted from thermometer readings in establishing ambient temperature, unless work is completely protected by a windproof shelter.

.3 When the air temperature is at or below 5°C or when there is a probability of it falling to that limit within 24 hours of placing, the temperature of the concrete as placed shall be more than 10°C, but not more than 25°C.

.4 Concrete shall not be placed against any surface or subgrade that is at a temperature less than 5°C or more than 7°C colder than the concrete at the time of the pour.

.3 Protection:

.1 Design protection for the worst conditions that can be reasonably anticipated from forecasts and local weather records. The protective systems shall retain the initial

heat of the concrete and produce the specified curing condition in the concrete by retention of the heat generated by hydration, plus where necessary, the supply of additional heat.

.2 Maintain the concrete as closely as possible to an optimum temperature of 20°C for a period of seven days. During the seven-day curing period, the concrete temperature shall not fall below 10°C.

.3 Loose or absorbent insulation material shall be completely contained in waterproof liners. Straw is not an acceptable insulation material.

.4 Concrete shall not be placed in insulated formwork when the air temperature is below the range for which it was designed. Insulating material shall be fastened tightly and secured against the forms. Seal all joints and tears.

.5 Protective housing shall be designed to take into account weather and construction procedures. Housing shall provide the required environment for the curing of concrete. Where heating is necessary, provide equipment of sufficient capacity to establish and maintain the specified curing conditions. The use of salamanders, coke stoves, oil or gas burners and similar spot heaters which have an open flame and intense local heat, shall not be permitted. Fresh concrete shall be protected from exposure to carbon dioxide. Properly vent heating equipment to the outside to avoid damage to the concrete. Have available at the site adequate fire protection at all times that heating equipment is required. A watchman or attendant shall be maintained to keep heating units in continuous operation.

3.2 HOT WEATHER REQUIREMENTS

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

3.3 PLACING CONCRETE

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

.2 Provide Engineer with 24 hours' notice prior to placing concrete.

.3 Handling, depositing and consolidation of concrete shall be in accordance with CAN/CSA-A23.1, except as amended or extended herein.

.4 All concrete shall be placed in the "dry". Any water shall be diverted from inside forms and excavation pits through proper side drains, or removed by other Engineer-approved methods.

.5 Placing of concrete by pumping equipment shall be permitted, provided properties of concrete are not altered by method of pumping and placing.

.6 Pumping equipment shall be of suitable kind with adequate pumping capacity. Loss of slump shall not exceed 50 mm. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy.

.7 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

3.4 FINISHING OF CONCRETE

.1 General:

.1 Finishing of non-formed concrete surfaces and treatment of formed concrete surfaces after formwork has been removed shall be in accordance with CAN/CSA-A23.1, except as amended or extended herein.

.2 Excessive honeycomb in any part of structure may be considered sufficient cause for rejection of honeycombed section. If Engineer gives permission for honeycombing and defects to be made good, the corrective method of treatment shall be carried out as directed by Engineer.

.3 Tops of walls, horizontal offsets, etc. adjacent to formed surfaces shall be struck smooth after concrete is placed and wood float finished, except as otherwise specified herein.

3.5 CONSTRUCTION JOINTS

.1 All joints shall be constructed in accordance with CAN/CSA-A23.1, except as amended or extended herein. Location and details of construction joints are shown on the Drawings.

.2 Preparation of construction joints before placing fresh concrete against set concrete shall conform to CAN/CSA-A23.1. Reinforcing bars extending through joints shall be cleaned of concrete and foreign matter prior to placing adjacent concrete.

3.6 FIELD QUALITY CONTROL

.1 The Engineer will arrange for inspection and testing to be performed by an independent Inspection and Testing Company specializing in this work.

.2 Provide, at no cost, all concrete samples requested by the Engineer for testing and allow access to the Engineer to all areas of work, and extend full co-operation. In addition, provide suitable storage facilities for the Engineer to conduct and store test equipment and specimens.

.3 Inspection and testing of concrete shall be in accordance with CAN/CSA-A23.1 and CAN/CSA-A23.2.

.4 Number and frequency of cylinder tests taken shall be as follows: two 28-day and one 7-day test specimen taken for each 50 cubic metres of concrete, or fraction thereof, for each class of concrete cast daily.

.5 Engineer may take additional test cylinders during cold weather concreting. Cure cylinders on site under same conditions as concrete which they represent.

.6 Frequency of slump and air content tests shall be determined by the Engineer.

.7 Inspection and testing by Engineer will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Wood-Preservers' Association (AWPA)

.1 Latest edition of AWPA M2, Standard Inspection of Treated Wood Products.

.2 Latest edition of AWPA M4, Standard for the Care of Preservative-Treated Wood Products.

.2 Canadian Standards Association (CSA)

.1 Latest edition of CSA O80 Series, Wood Preservation.

.2 Latest edition of CSA O80.201, Standard for Hydrocarbon Solvents for Preservatives. This Standard covers hydrocarbon solvents for preparing solutions of preservatives. This is not stand alone specification

.3 Latest edition of CSA O322, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

1.2 QUALITY ASSURANCE

.1 Testing of products treated with preservative by pressure impregnation will be carried out by the manufacturer's testing laboratory to AWPA M2, and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Inspection and testing of timber materials will be carried out by the manufacturer.

1.3 CERTIFICATES AND ASSAY RETENTION RESULTS

.1 Submit certificates and assay retention results in accordance with Section 01 33 00 - Submittal Procedures.

.2 For products treated with preservative by pressure impregnation submit following information certified by authorized signing officer of treatment plant:

.1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.

.2 Moisture content after drying following treatment with water-borne preservative.

.3 Assay retentions results representing each treated batch of supplied timber.

.4 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Do not dispose of preservative treated wood through incineration.

.2 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.

.3 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Departmental Representative.

.4 Dispose of unused wood preservative material at official hazardous material collections site approved by Departmental Representative.

.5 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Preservative: to CSA-O80 Series.

.2 Solvent: to CSA-O80.201.

2.2 PRESERVATIVE TREATMENTS

.1 Treat to CSA 080, commodity standard 080.18, Table 1 and its referenced standards, with the following minimum assay retentions:

Species	CCA kg/m^3	ACA kg/m^3
Dimension Timber		
-Coast Douglas Fir	24	24
-Western/Eastern Hemlock	24	24
-Hemlock, Douglas Fir (Wheelguard, Wheelguard Blocking)	10	10
-Birch or Maple	Treat to Refusal	

Note: Birch or maple must be air dried for six (6) months in weather protected environment or kiln dried.

Part 3 Execution

3.1 FIELD TREATMENT

.1 Handle pressure treated material in a manner that will avoid damage which may expose untreated material. Rejection of any damaged material may result and replacement will be at the Contractor's expense.

.2 Fill all bored bolt holes with preservative immediately after boring. Use a pressurized container with hose to apply preservative, or some alternate method acceptable to the Departmental Representative.

.3 Fill all unused bored holes and spike holes with tight fitting treated wooden plugs.

3.2 CUTTING

.1 Field cuts, if authorized, are to receive three (3) liberal coats of the applicable preservative applied to dry wood on each application.

3.3 FIELD QUALITY

.1 Timber which contain rot, splits exposing untreated wood, excessive wane, or timbers which cannot be fastened in the work so as to be structurally sound are unacceptable.

.2 The Departmental Representative reserves the right to carry out field testing of treated timber for penetration and retention of preservative. Timber not meeting the requirements of the specification may be rejected for use under the contract.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.3 Section 03 10 00 - Concrete Forming and Accessories.

.4 Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.2 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

.3 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

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

.1 Material Safety Data Sheets (MSDS).

.5 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's product to describe.

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.

.1 Instructions to include installation instructions for each product used.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material, in appropriate on-site bins, for recycling in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.7 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Departmental Representative.

.8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.9 Fold up metal banding, flatten, and place in designated area for recycling.

1.7 PROJECT CONDITIONS

.1 Environmental Limitations: Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

Part 2 Products

2.1 SEALANT MATERIALS

.1 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Polysulfide Two Part.

.1 Self-Leveling to CAN/CGSB-19.24, Type 1, Class B, colour to match concrete.

.2 Polysulfide Two Part.

.1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B, colour to match concrete.

.3 Preformed Compressible and Non-Compressible back-up materials.

.1 Polyethylene, Urethane, Neoprene or Vinyl Foam.

.1 Extruded closed cell foam backer rod.

.2 Size: oversize 30 to 50%.

.2 Neoprene or Butyl Rubber.

.1 Round solid rod, Shore A hardness 70.

.3 High Density Foam.

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond Breaker Tape.

.1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

Part 3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

.1 Sealant.

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing.

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

.3 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 Section 31 53 13 - Timber Cribwork.

1.2 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM C117-13, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-19, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-63(R2002, Standard Test Method for Particle-Size Analysis of Soils.

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

.5 ASTM D1557-07, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3) (2,700 kN-m/m^3).

.6 ASTM D4318-17, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 CSA Group (CSA)

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

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

Part 2 Products

2.1 Not Used.

Part 3 Execution

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 PREPARATION/PROTECTION

.1 Protect existing features.

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

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

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

3.3 STOCKPILING

.1 Stockpile fill materials in areas designated by Departmental Representative.

.1 Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.4 DEWATERING AND HEAVE PREVENTION

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

.2 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.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.

3.5 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions as indicated.

.2 Excavation must not interfere with bearing capacity of adjacent foundations.

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

.4 Restrict vehicle operations directly adjacent to open trenches or excavations.

.5 Dispose of surplus and unsuitable excavated material in approved location off site.

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

.7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.8 Notify Departmental Representative when bottom of excavation is reached.

.9 Obtain Departmental Representative approval of completed excavation.

.10 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.

3.6 FILL TYPES AND COMPACTION

.1 Use types of fill as indicated or specified below.

.1 Reuse existing excavated material, with the exception of material for sub-base and base course.

3.7 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 Departmental Representative has inspected and approved installations.

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

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 500 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation of polymeric geotextiles used in breakwaters, retaining wall structures, filtration, drainage structures and roadbeds, purpose of which is to:

- .1 Separate and prevent mixing of granular materials of different grading.
- .2 Act as hydraulic filters permitting passage of water while retaining soil strength of granular structure.

1.2 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.3 Section 31 23 10 - Excavating, Trenching and Backfilling.

.4 Section 31 53 13 - Timber Cribwork.

1.3 REFERENCES

.1 ASTM International

- .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM D4491-99a(2009), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- .3 ASTM D4595-09, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
- .4 ASTM D4716-08, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
- .5 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.2 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.

.3 CSA International

.1 CSA G40.20/G40.21-13(R2018) General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

1.4 DELIVERY AND STORAGE

.1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, and packaging material, in appropriate on-site bins, for recycling in accordance with Waste Management Plan.

.4 Fold up metal banding, flatten and place in designated area for recycling.

1.6 RELATED SECTIONS

.1 Section 31 53 13 – Timber Cribwork.

.2 Section 32 12 16.01 – Asphalt Paving.

Part 2 Products

2.1 MATERIAL

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

.1 Width: 3.5m minimum.

.2 Length: 50m minimum.

.3 Composed of: minimum 85% by mass of polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure.

.2 Physical properties:

.1 Thickness: to CAN/CGSB-148.1, No.3, minimum 2.5mm.

.2 Mass per unit area: to CAN/CGSB-148.1, No. 2, minimum 400g/m².

.3 Tensile strength and elongation (in any principal direction): to ASTM D4595.

.1 Tensile strength: minimum 1200 N, wet condition.

.2 Elongation at break: 50 to 100 percent.

.3 Seam strength: equal to or greater than tensile strength of fabric.

.4 Mullen burst strength: to CAN/CGSB-4.2, method 11.1, minimum 3100 kPa.

.3 Hydraulic properties:

.1 Apparent opening size (AOS): to ASTM D4751, 50 to 150 micrometres.

.2 Permittivity: to ASTM D4491, 0.25 cm per second.

.4 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to CAN/CSA G164.

Part 3 Execution

3.1 INSTALLATION

.1 Place geotextile material to the limits as indicated on the drawings.

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

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

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

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

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

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

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

3.2 CLEANING

.1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 30 00 - Cast-in-Place Concrete.

.2 Section 06 05 73 - Wood Treatment.

1.2 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM A307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 American Wood-Preserver's Association (AWPA)

.1 AWPA M4-02, Standard for the Care of Preservation - Treated Wood Products.

.3 CSA Group (CSA)

.1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.

.2 CSA-G40.20/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.3 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.4 CSA-O80 Series 08 (R2012), Wood Preservation.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.5 Canadian Wood Council

.1 Wood Design Manual.

.6 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber latest edition.

1.3 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

.2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Worker protection:

.1 Workers must wear dust masks, protective clothing, gloves, long sleeved clothing, and eye protection when handling, drilling, sawing, cutting or sanding preservative treated wood and applying preservative materials.

.2 Workers must not eat, drink or smoke while applying preservative material.

.3 Clean up spills of preservative materials immediately with absorbent material. Safely discard of adsorbent material to sanitary landfill.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Ensure emptied containers are sealed and stored safely.

.4 Do not dispose of preservative treated wood through incineration.

.5 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.

.6 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.

Part 2 Products

2.1 MATERIALS

.1 Timber: use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Accreditation Board of CSA.

- .1 Species: Douglas Fir, Pacific Coast Hemlock, or Eastern Hemlock.
- .2 Grade: No. 1 Structural.
- .3 Grading authority: NLGA.
- .4 Preservative treatment: To CSA O80 for coastal waters and Section 06 05 73 – Wood Treatment.

.2 Miscellaneous steel:

- .1 Hot dip galvanized: to CAN/CSA-G164.
- .2 Wire nails, spikes, staples: to CSA-B111.
- .3 Bolts, nuts, washers: to ASTM A307.
- .4 Drift Bolts: to G40.21 from round stock, button head and diamond or wedge point.
- .5 Washers: Round plate washers
  - .1 For 19 mm diameter bolts, 79 mm diameter by 7.9 mm thick.
- .6 All hardware to be galvanized.

.3 Ballast for filling cribs to following requirements:

- .1 Reuse existing excavated material and compact in maximum 500 mm lifts with a hand operated compaction tamper with a minimum weight of 250 kg.

.4 Gravel below new concrete slab:

- .1 To Section 32 11 23 – Aggregate Base Courses.

2.2 PREPARATION

.1 Excavate to crib base depth as indicated.

.1 In case of over excavation or unlevel cib seat, place and compact granular base to Section 32 11 23 – Aggregate Base Courses to obtain level crib seat.

2.3 CRIB CONSTRUCTION

.1 Bore holes for drift bolts 1.5 mm smaller diameter than bolt and for full length of bolt. Bore holes for machine bolts to same diameter as bolts.

.2 Longitudinals:

.1 No butt joints permitted. All timber be full length of crib.

.2 Secure blocking to longitudinals as indicated.

.3 Secure longitudinals to intersection of cross ties with drift bolt and to intersection of vertical posts with machine bolt as indicated on the drawings.

.4 Countersink all machine bolts on exterior face.

.3 Cross ties: one length across cribs.

.1 Secure cross ties to intersection of longitudinals with drift bolt and to intersection of vertical posts with machine bolt as indicated on the drawings.

.4 Vertical posts: one length from bottom of cribwork to top of cribwork.

.5 Fillers: place and fasten filler timber as indicated on all four faces of the crib.

2.4 HANDLING TREATED TIMBER

.1 Handle treated material without damaging original treatment.

.1 Replace treated timber with major damage to original treatment, as instructed by Departmental Representative.

.2 Field treatment: apply and saturate cuts, minor surface damage, abrasions, and nail and spike holes with preservative to CAN/CSA-O80.

2.5 BALLAST

.1 Place ballast to avoid damage to timber cribwork.

2.6 TOLERANCES

.1 1 in 300 in overall dimensions.

.2 Locate cribs within 25 mm of existing crib, existing wharf, and existing building.

2.7 CLEANING

.1 Proceed in accordance with Section 01 74 00 - Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section specifies requirements for supply and installation of structural timber as follows:

.1 Supply and installation of untreated timber hardwood ladders and ladder handgrips.

1.2 REFERENCES

.1 American Wood-Preserver's Association (AWPA)

.1 Latest edition of AWPA M4, Standard for the Care of Preservation – Treated Wood Products.

.2 Canadian Standards Association (CSA International)

.1 Latest edition of CAN/CSA-G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.

.2 Latest edition of CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 National Lumber Grades Authority (NLGA)

.1 Latest edition of Standard Grading Rules for Canadian Lumber.

1.3 DIMENSIONS

.1 Check existing site dimensions and report discrepancies to Departmental Representative before commencing work.

1.4 PROTECTION

.1 Avoid dropping, bruising or breaking of wood fibres.

1.5 DELIVERY AND STORAGE

.1 Store timber horizontally, evenly supported and open piled to permit circulation when stored for prolonged period.

.2 When handling long timber, provide support at sufficient number of points, properly located to prevent damage due to excessive bending.

.3 Handle treated timber with hemp, manila or sisal rope slings or other approved means of support that will not damage surface.

Part 2 Products

2.1 TIMBER MATERIALS

.1 Timber: Use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Administration Board of CSA.

.2 Species

.1 Ladder uprights: Birch or Maple untreated.

.3 Grade: No. 1 Structural Grade

.4 Grading Authority: NLGA

2.2 MISCELLANEOUS STEEL AND FASTENINGS

.1 Miscellaneous Steel: All steel and fastenings to be CSA G40.21, Grade 300W, galvanized.

.2 Galvanizing: will conform to CSA G164 "Hot Dip Galvanizing of Irregularly Shaped Articles." Unless otherwise specified, minimum weight of zinc coating will be as stated in Table 1 of this standard. Fabricator is to adhere to recommendations of Appendix A and Appendix B of standard.

.3 Ladder Rungs and Hand Grip: to CSA G40.21, galvanized.

Part 3 Execution

3.1 LADDERS

.1 Install ladders at locations as shown on the drawings.

.2 Fasten ladders to wharf as indicated.

.3 Install ladder handgrip as indicated.

END OF SECTION

1.1 RELATED SECTIONS

.1 Section 32 12 16.01 - Asphalt Paving.

1.2 REFERENCES

.1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

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

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

.4 ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.6 ASTM D1557-09, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).

.7 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.8 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

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

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

Part 2 Products

2.1 MATERIALS

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

.1 Crushed, pit run or screened stone, gravel or sand.

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

.3 Table

Sieve Designation	% Passing
100 mm	-
75 mm	-
50 mm	75-100
38.1 mm	-
25 mm	-
19 mm	-

15.9 mm	45-80
9.5 mm	-
4.75 mm	-
2.00 mm	-
1.20 mm	-
0.425 mm	-
0.180 mm	0-8
0.075 mm	

.4 Other properties as follows:

.1 Liquid Limit: to ASTM D4318, Maximum 25.

.2 Plasticity Index: to ASTM D4318, Maximum 6.

Part 3 Execution

3.1 PLACING

.1 Place granular sub-base after subgrade is inspected and approved by Departmental Representative.

.2 Construct granular sub-base to depth and grade in areas indicated.

.3 Ensure no frozen material is placed.

.4 Place material only on clean unfrozen surface, free from snow or ice.

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

.6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.

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

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

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities. For compaction below new asphalt, a single drum vibratory roller is required.

.2 Compact to density of not less than 98% maximum dry density in accordance with ASTM D698.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.4 Apply water as necessary during compaction to obtain specified density.

.5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.

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

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 SITE TOLERANCES

.1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.5 PROTECTION

.1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 31 53 13 - Timber Cribwork.

.2 Section 32 12 16.01 - Asphalt Paving.

1.2 REFERENCES

.1 ASTM International

.1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

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

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

.4 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.5 ASTM D1557-09, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).

.6 ASTM D1883-07e2, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.7 ASTM D4318-10, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

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

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

Part 2 Products

2.1 MATERIALS

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

.1 Crushed stone or gravel.

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

.1 Gradation Method #1 to:

Sieve Designation	% Passing
(1)	(2)
100 mm	-

75 mm	-
50 mm	-
37.5 mm	-
25 mm	-
19 mm	100
12.5 mm	-
9.5 mm	55-80
4.75 mm	35-60
2.00 mm	-
1.20 mm	17-35
0.425 mm	-
0.180 mm	-
0.075 mm	3-6

.2 Liquid limit: to ASTM D4318, maximum 25

.3 Plasticity index: to ASTM D4318, maximum 6.

.4 Los Angeles degradation: to ASTM C131. Max. % loss by weight: 45

.5 Crushed particles: at least 60% of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.

Passing	Retained on	
50 mm	to	25 mm
25 mm	to	19.0 mm
19.0 mm	to	4.75 mm

.6 Soaked CBR: to ASTM D1883, minimum 100, when compacted to 100% of ASTM D1557.

Part 3 Execution

3.1 PLACEMENT AND INSTALLATION

.1 Place granular base after sub-base surface is inspected and approved in writing by Departmental Representative.

.2 Placing:

.1 Construct granular base to depth and grade in areas indicated.

.2 Ensure no frozen material is placed.

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

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

.5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.

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

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

.3 Compaction Equipment:

.1 Ensure compaction equipment is capable of obtaining required material densities. For compaction below new asphalt, a single drum vibratory roller is required.

.4 Compacting:

.1 Compact to density not less than 100% maximum dry density to ASTM D698.

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

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

.4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Departmental Representative.

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

3.2 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.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 PROTECTION

.1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 11 16.01 - Granular Sub-base.

.2 Section 32 11 23 - Aggregate Base Courses.

1.2 REFERENCE STANDARDS

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

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

.2 AASHTO R29-08, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.

.3 AASHTO T245-97 (2008), Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

.2 Asphalt Institute (AI)

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

.3 ASTM International

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

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

.4 United States Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit asphalt concrete mix design to Departmental Representative for approval.

Part 2 Products

2.1 MATERIALS

.1 Asphalt concrete aggregates:

.1 Coarse aggregate is aggregate retained on 4.75 mm sieve and fine aggregate is aggregate passing 4.75 mm sieve when tested to ASTM C117.

.2 When dryer drum plant or plant without hot screening is used, process fine aggregate through 4.75 mm sieve and stockpile separately from coarse aggregate.

.3 Separate stock piles for coarse and fine aggregate are not required for sheet asphalt.

.4 Do not use aggregates having known polishing characteristics in mixes for surface courses.

.5 Aggregate: material to the following requirements:

.1 Crushed stone or gravel.

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

.3 Table:

Sieve Designation	% Passing
Asphalt Concrete	-
200 mm	-
75 mm	-
50 mm	-
38.1 mm	-
25 mm	-
19.0 mm	100
12.5	-
9.5 mm	60-80
4.75 mm	40-65
2.00 mm	30-50
0.180 mm	5-20
0.075 mm	3-8

.4 Sand equivalent: to ASTM D2419, Minimum 50.

.5 Magnesium Sulphate soundness: to ASTM C88. Max % loss by weight: coarse aggregate 12, fine aggregate 16.

.6 Los Angeles Degradation: to ASTM C131. Max % loss by weight: coarse aggregate, 35.

.7 Absorption: to ASTM C127. Max % by weight: coarse aggregate, 1.75.

.8 Lightweight particles: to ASTM C123. Max % by mass, with less than 1.95. Relative density (formally Specific Gravity): 1.5.

.9 Flat and elongated particles: to ASTM D4791, (with length to thickness ratio greater than 5): Max % by weight: coarse aggregate, 15.

.10 Crushed particles: at least 60 % of particles by mass within each of following sieve designation ranges to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C136.

.11 Table:

Passing	
19 mm	9.5 mm
9.5 mm	4.75 mm

.12 Regardless of compliance with specified physical requirements, fine aggregates may be accepted or rejected on basis of past field performance.

.2 Mineral filler for asphalt concrete:

.1 Finely ground particles of limestone, hydrated lime, Portland cement or other approved non-plastic mineral matter, thoroughly dry and free from lumps.

.2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed by Departmental Representative to improve mix properties.

.3 Asphalt cement: Penetration Grade 85-100 to ASTM D946.

.4 Asphalt prime: to ASTM D997.

.5 Sand blotter: clean granular material passing 4.75 mm sieve and free from organic matter or other deleterious materials.

.6 Asphalt tack coat: to ASTM D997.

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 rollers of type and weight to obtain specified density of compacted mix.

.3 Suitable hand tools.

2.3 MIX DESIGN

.1 Mix design to AI MS-2.

.2 Job mix formula to be approved by Departmental Representative.

.3 Design of mix: by Marshall method to requirements below:

.1 Compaction blows on each face of test specimens: 75.

.2 Mix physical requirements:

Property	Asphalt
Marshall Stability at 60 degrees C, kN minimum.	9.0
Flow Value, mm.	2-4
Air Voids in Mixture, %	3-5
Voids in Mineral Aggregate, % minimum	15
Index of Retained Stability, % minimum	75
Asphalt Contest (% by weight of total mixture)	4.5-6.5

.3 Measure physical requirements as follows:

.1 Marshall load and flow value: to ASTM D1559.

.2 Compute void properties on basis of bulk specific gravity of aggregate to ASTM C127 and ASTM C128. Make allowance for volume of asphalt absorbed into pores of aggregate.

.3 Air voids: to ASTM D3203.

.4 Voids in mineral aggregate: to AI MS-2, chapter 4.

.5 Index of Retained Stability.

.4 Do not change job-mix without prior approval of Departmental Representative. When change in material source proposed, new job-mix formula to be approved by Departmental Representative.

.5 Return plant dust collected during processing to mix in quantities acceptable to Departmental Representative.

Part 3 Execution

3.1 ASPHALT PRIME

.1 Emulsified asphalt:

.1 Dilute asphalt emulsion with clean water at 1:1 ratio for application. Mix thoroughly by pumping or other method approved in writing by Departmental Representative.

.2 Apply diluted asphalt emulsion at rate directed by Departmental Representative but do not exceed 5 L/m^2.

.3 Apply on damp surface unless directed by Departmental Representative.

.2 Do not apply primer when air temperature is below 5 degrees C or when rain is forecast within 2 hours.

.3 If asphalt prime fails to set within 24 hours, spread sand blotter material in amounts required to absorb excess material. Sweep and remove excess blotter material.

3.2 PLANT AND MIXING REQUIREMENTS

.1 In accordance with ASTM D995.

3.3 ASPHALT CONCRETE PAVING

.1 Place asphalt mix only when base or previous course is dry and air temperature is above 5 degrees C.

.2 Place asphalt concrete in compacted layers not exceeding 50 mm.

.3 Minimum 135 degrees C mix temperature required when spreading.

.4 Maximum 160 degrees C mix temperature permitted at any time.

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

.6 Compact asphalt concrete to density not less than 95% of density obtained with Marshall specimens prepared in accordance with ASTM D1559 from samples of mix being used. Roll until roller marks are eliminated.

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

.8 Moisten roller wheels with water to prevent pick up of material.

.9 Compact mix with hot tampers or other equipment approved in writing by Departmental Representative, in areas inaccessible to roller.

.10 Finish surface to be within 10 mm of design elevation and with no irregularities greater than 10 mm in 4.5 m.

.11 Repair areas showing checking, rippling or segregation as directed by Departmental Representative.

3.4 JOINTS

.1 No joints are permitted. All asphalt shall be placed at one time.

3.5 TESTING

.1 Departmental Representative will pay for testing, if desired.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.7 PROTECTION

.1 Keep vehicular traffic off newly paved areas until paving surface temperature has cooled below 38 degrees C.

.1 Do not permit stationary loads on pavement until 24 hours after placement.

END OF SECTION