PARKS CANADA AGENCY

MERRICKVILLE WEIR REHABILITATION

TENDERING DOCUMENT

Division 1 – General Requirements

Division 2 – Existing Conditions

Division 3 – Concrete

July 2015

Prepared by KGS Group

TABLE OF CONTENTS

Part 1 General

1.1 RELATED REQUIREMENTS

.1 024116 – Structure Demolition

.2 031000 – Concrete Forming and Accessories

.3 032000 – Concrete Reinforcing

.4 033000 - Cast-in-Place Concrete

1.2 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises rehabilitation of Merrickville Weir, located at the intersection of Highway 43 and Main Street in Merrickville-Wolford, Ontario. The concrete pier and abutments of the Weir have suffered extensive deterioration downstream of the stoplogs and gate. The intent of the contract is to remove the deteriorated concrete to a minimum depth of 200 mm from the original face of the pier and abutments and to install a new reinforced concrete facing anchored with dowels to the original concrete structure.

.2 The Work includes all measures necessary to achieve the refacing Work including installation and maintenance of dewatering and water control measures.

1.3 WORK SEQUENCE

.1 Parks Canada Agency needs to have access to operate one sluice at all times. The Work schedule shall be organized so that one sluice is rehabilitated at a time. Take measures to keep the Work area dry. On completion of the first sluice rehabilitation, re-establish dewatering and Work areas to facilitate the second part of the Work.

.2 Parks Canada Agency will supply one set of stoplogs suitable to assist in sealing one sluiceway. Contractor shall be responsible for arranging delivery of stoplogs to site, installation in one sluice, take additional measures to stop water flow through the sluice. On completion of Work in the first sluice, the Contractor shall relocate and seal the stoplogs in the second sluice. Alternative water control measures may be submitted for consideration by the Consultant at no extra cost.

1.4 CONTRACTOR USE OF PREMISES

.1 Unrestricted use of site until Substantial Performance subject to Parks Canada Agency needs for control of the Weir.

.2 Limit use of premises for Work, to allow:

.1 Access by Parks Canada Agency personnel for gate and stoplog operations when necessary.

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

1.5 EXISTING SERVICES

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

.2 Provide alternative temporary routes for pedestrian and vehicular traffic as required.

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

.4 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.

.5 Protect, relocate or maintain existing active services. Take measures to protect power cables and ducts in the left South abutment as shown on the Drawings.

.6 When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

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

.8 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.6 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.

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 024116 – Structure Demolition

.2 031000 – Concrete Forming and Accessories

.3 032000 – Concrete Reinforcing

1.2 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.3 USE OF SITE AND FACILITIES

.1 Parks Canada Agency needs to have access to operate one sluice at all times. The Work schedule shall be organized so that one sluice is rehabilitated at a time. Take measures to keep the Work area dry. On completion of the first sluice rehabilitation, re-establish dewatering and Work areas to facilitate the second part of the Work.

.2 Parks Canada Agency will supply one set of stoplogs suitable to assist in sealing of one sluiceway. Contractor shall be responsible for arranging delivery of stoplogs to site, installation in one sluice and any additional measures necessary to stop water flow through the sluice and make the work area safe.

.3 On completion of Work in the first sluice, the Contractor shall relocate and seal the stoplogs in the second sluice. Alternative water control measures may be submitted for consideration by the Consultant at no extra cost.

.4 Maintain existing services to site and provide for personnel and vehicle access.

.5 Where security is reduced by work provide temporary means to maintain security.

.6 Provide temporary sanitary facilities for use by Contractor's personnel. Keep facilities clean.

1.4 EXISTING SERVICES

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

.2 Overhead cables are present along the side of the adjacent roadway and may restrict crane and other operations.

.3 Protect existing services in left (looking upstream) Weir abutment.

.4 Provide for pedestrian and vehicular traffic.

.5 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.5 SPECIAL REQUIREMENTS

.1 Submit construction progress schedule.

.2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.3 Keep within limits of work and avenues of ingress and egress.

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 This section provides a list of work items that need to be covered under the Contract Lump Sum Price and the procedures for payment that will be applied to these work items.

.2 This section covers the measurement of work for payment purposes, and the scope of work included in the pay items in the Unit Price Table

1.2 LUMP SUM PRICE ITEMS

.1 Lump Sum Price – All work other than that which is specifically designated in the Unit Price Table, shall be included in Contract Lump Sum Price. This item includes all costs to undertake the Work.

.2 The items of work listed below are not intended to be complete, but are provided to give an indication to the Contractor how the Contract Lump Sum Price will be broken down for payment purposes. As such, it is the Contractor's responsibility to ensure that all items of work not covered under the Unit Price Table are covered in the Contract Lump Sum Price.

.3 Items of work to be considered in the Contract Lump Sum Price are, but not limited to:

.1 Mobilization/Demobilization (Payment Group 1), including:

.1 general site preparation, clearing and grubbing, soils stripping etc;

.2 general maintenance and cleaning of work site, site access, and haul routes;

.3 site security;

.4 snow removal;

.5 construction control and monitoring;

.6 temporary utilities;

.7 temporary facilities;

.8 Contractor's and Departmental Representative's Site Office;

.9 construction fencing and perimeter security measures around work area;

.10 shop drawings;

.11 submittals, approvals, permits and fees(other than specified below);

.12 close—out submission;

.13 other items in Contract Documents that are noted as being included in Lump Sum Price;

.2 Environmental Protection (Payment Group 2), including:

.1 temporary drainage, sediment and erosion control and treatment at work area, construction, maintenance and removal, for items such as silt fencing around staging area(s), etc.;

.2 dust and noise management;

.3 control work to provide effective environmental water body protection such as turbidity curtain(s), etc.;

.3 Temporary Construction Access Roads (Payment Group 3), including:

.1 design and approvals and construction and deconstruction of temporary works for access to work area;

.4 Water Diversion System (Payment Group 4), including:

.1 design and approvals, construction, maintenance, operation (including record keeping), deconstruction and full land restoration (including backfilling, fine grading and vegetation restoration)

.5 Excavating and Backfilling (Payment Group 5), including:

.1 excavation of work area as required, including hauling, stockpiling, backfilling and disposal.

.6 Demolition (Payment Group 5); including

.1 Removal and disposal of concrete from pier and abutments as shown on the drawings, including overbreak concrete and associated works;

.7 Concrete Works (and associated works, excluding miscellaneous steel embedded components) (Payment Group 5), including:

.1 pier and abutments;

.8 General Landscaping (Payment Group 5), including:

.1 rough grading and subgrade preparation;

1.3 CONTRACT LUMP SUM PRICE WORK ITEMS PAYMENT PROCEDURES

.1 Items of Work will be paid within Contract Lump Sum Price at completion of the particular item of work, as set out below.

.2 Payment Group 1 :"Mobilization/Demobilization" 40% initial mobilization, 30% on completion of demobilization/acceptance of submittals, and 30% pro—rated over duration of contract.

.3 Payment Group 2 : "Environmental Protection' 20% initial activities (program development and approvals/installation of measures/initial work) 10% removal of measures/reporting and 70% maintenance/monitoring pro—rated over duration of the work item.

.4 Payment Group 3: "Temporary Construction Access Roads" — 70% construction activity and 30% on completion of Deconstruction work.

.5 Payment Group 4: "Water Diversion System" – 5% Design and approvals, 50%construction activities, 30% deconstruction activities, and 15% operation and maintenance activities pro-rated over duration of of diversion system usage.

.6 Payment Group 5: "Excavating and Backfilling", "Demolition", "Concrete Works", "General Landscaping" 100% pro—rated over duration of the work item. Work items with multi—items may be broken into individual items.

.7 Payment Group 6: "Salvage" 50% for removal and storage, 50% for re—installation.

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 Not Used

1.2 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work at the call of Consultant.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative and Consultant.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 The Consultant will record the meeting minutes including significant proceedings and decisions. Actions by parties will be identified.

.7 The Consultant will reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of Parks Canada Agency, Consultant, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work.

.3 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.

.4 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.5 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.

.6 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.

.7 Monthly progress claims, administrative procedures, photographs, hold backs.

.8 Appointment of inspection and testing agencies or firms.

.9 Insurances, transcript of policies.

1.4 PROGRESS MEETINGS

.1 During course of Work and two weeks prior to project completion, schedule progress meetings bi-weekly.

.2 Contractor, major Subcontractors involved in Work Parks Canada Agency and Consultant are to be in attendance.

.3 Notify parties minimum 4 days prior to meetings.

.4 Consultant will record minutes of meetings and circulate to attending parties and affected parties not in attendance within 4 days after meeting.

.5 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Corrective measures and procedures to regain projected schedule.

.6 Revision to construction schedule.

.7 Progress schedule, during succeeding work period.

.8 Review submittal schedules: expedite as required.

.9 Maintenance of quality standards.

.10 Review proposed changes for affect on construction schedule and on completion date.

.11 Other business.

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 024116 – Structure Demolition

.2 031000 – Concrete Forming and Accessories

.3 032000 – Concrete Reinforcing

.4 033000 – Cast-in-Place Concrete

1.2 REFERENCES

.1 Not used

1.3 ADMINISTRATIVE

.1 Submit Consultant 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 Consultant. 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 Consultant, 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 are co-ordinated.

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

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

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

1.4 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 Submit drawings stamped and signed by Professional Engineer registered or licensed in Province of Ontario.

.3 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.

.4 Allow 4 days for Consultant's review of each submission.

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

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

.7 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.

.8 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 Standards.
  - .4 Relationship to adjacent work.

.9 After Consultant's review, distribute copies.

.10 Submit electronic copy and 4 prints of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

.11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested Consultant where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic copy and 3 hard copies of test reports for requirements requested in specification Sections and as requested by Consultant.

.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 1 year of date of contract award for project.

.13 Submit electronic copy of certificates for requirements requested in specification Sections and as requested by Consultant.

.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.

1.5 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement as directed Consultant.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: 2 locations.

.1 Viewpoints and their location as determined Consultant.

.4 Frequency of photographic documentation: weekly.

.1 Upon completion of: Concrete removal, surface preparation, reinforcement installation and after form removal and as directed by Consultant.

1.6 CERTIFICATES AND TRANSCRIPTS

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

.2 Submit transcription of insurance immediately after award of Contract.

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 Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O. Reg. 213/91 as amended - Updated 2005, and

.1 Regulations for Construction Projects, 0. Reg. 213/91 as amended.

.2 Regulations for Diving Operations, 0. Reg. 629/94 as amended.

.2 Workplace Safety and Insurance Act, 1997.

.3 Municipal statutes and authorities.

.3 Canadian Standards Association (CSA) Canada

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

.4 National Building Code 2010 (NBC)

.1 NBC 2010, Division B, Part 8 Safety Measures at Construction and Demolition Sites.

.5 Health Canada/workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS)

.6 Fire Commissioner of Canada (FCC):

.1 FC—301 Standard for Construction Operations, June 1982.

.2 FC—302 Standard for Welding and Cutting, June 1982.

Labour Program
Fire Protection Engineering Services
4900 Yonge Street 8th Floor
North York, Ontario M2N 6A8

Copies may be obtained from:

Human Resources and Social Development Canada
Labour Program
Fire Protection Enoineerino Services
Ottawa, Ontario K1A 0J2

1.3 SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan:

Within 7 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 and measures to be taken to address the anticipated hazards.

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

.4 Safety communication plan including contact information for all key contacts.

.5 Emergency Preparedness Plan (EPP) to be prepared by the Contractor for external use, defining hazards posed by the working situation, the role and responsibilities of all parties and notification to be made. The EPP is to be prepared in accordance with the latest edition of the Canadian Dam Association Dam Safety Guidelines. Coordinate plan with local municipalities and Provincial Authorities.

.6 Contactor's Health and Safety Policy.

.7 Name of Health and Safety Coordinator and his/her alternate.

.1 Submit 4 copies of Contractor's authorized representative's work site health and safety inspection reports to Consultant.

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

.3 Submit copies of incident and accident reports.

.4 Submit WHMIS MSDS - Material Safety Data Sheets for materials brought to site.

.5 Consultant and PCA will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within days after receipt of comments Consultant.

.6 Consultant'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 Consultant.

1.4 FILING OF NOTICE

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

.2 Submit copies of Notice of Project to Consultant.

.3 File all other required notices in accordance with Acts and Regulations of Province of Ontario.

.4 Keep copy of Notice of Project on site at all times.

1.5 SAFETY ASSESSMENT

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

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting Consultant prior to commencement of Work.

1.7 REGULATORY REQUIREMENTS

.1 Do Work in accordance with National and Provincial Regulatory Requirements.

1.8 PROJECT/SITE CONDITIONS

.1 Hazards on—site include but are not limited to:

.1 Working near or under electrical wires.

.2 working around moving equipment.

.3 Working near or above water.

.4 Icy surfaces.

.5 Falling hazards.

.6 Animals and pests.

.7 Extreme temperatures or weather conditions.

.2 Hazardous Materials:

.1 Silica in concrete (from concrete demolition).

.2 Bird droppings on the structure.

.3 Steep and slippery embankments can make accessing the downstream side of the dam hazardous.

1.9 GENERAL REQUIREMENTS

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

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

1.10 REPONSIBILITY

.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 Contractor will be responsible and assume the role of Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

.3 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

1.11 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.

1.12 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, immediately stop work and advise Consultant verbally and in writing.

.2 Follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Consultant verbally and in writing.

1.13 HEALTH AND SAFETY COORDINATOR

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

.1 Have site—related working experience specific to activities associated with similar dam reconstruction projects.

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

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

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

.5 Be on site during execution of Work and report directly to Site Supervisor.

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 Consultant.

1.15 CORRECTION OF NON-CONFORMANCE

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

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

.3 Consultant may stop Work if non-compliance of health and safety regulations or a potential issue is not corrected

1.16 BLASTING

.1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by Consultant

1.17 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Consultant.

1.18 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.

.2 Assign responsibility and obligation to Health and Safety Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative or his/her designate may also stop Work for health and safety considerations

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 011400 – Work Restrictions

.2 013300 – Submittal Procedures

.3 015200 – Construction Facilities

.4 024116 – Structure Demolition

.5 031000 – Concrete Forming and Accessories

.6 033000 – Cast-in-Place Concrete

1.2 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.

.2 Reference Standards:

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

.1 EPA 832/R-92-005-[92], Storm Water Management for Construction Activities, Chapter 3.

.2 EPA General Construction Permit (GCP) 2012.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for admixtures, curing compounds, epoxy grouts and include product characteristics, performance criteria and limitations.

.2 Submit 2 copies of WHMIS MSDS

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.3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and acceptance by Consultant.

.4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.

.5 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.6 Include in Environmental Protection Plan:

.1 Name of person responsible for ensuring adherence to Environmental Protection Plan.

.2 Name and qualifications of person responsible for manifesting hazardous waste to be removed from site.

.3 Name and qualifications of person responsible for training site personnel.

.4 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.5 Drawings indicating locations of proposed temporary methods to control runoff and to contain materials on site.

.6 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

.7 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.8 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.9 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.10 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.11 Waste Water Management Plan identifying methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering, disinfection water, and water used in flushing of lines.

1.4 FIRES

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

1.5 DRAINAGE

.1 Develop and submit Sediment Control Plan (SC) identifying type and location of sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005, Chapter 3.

.2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for sediment control plan.

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

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

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

1.6 SITE CLEARING AND PLANT PROTECTION

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

.2 Protect trees and shrubs adjacent to construction work and storage areas and encase with protective wood framework from grade level to height of 2 m minimum.

1.7 WORK ADJACENT TO WATERWAYS

.1 Construction equipment to be operated on land only.

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

1.8 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

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

.1 Provide temporary enclosures where Consultant requires.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.9 NOTIFICATION

.1 Consultant will notify Contractor in writing of observed non-compliance 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 Consultant]of proposed corrective action and take such action for approval by Consultant.

.1 Take action only after receipt of written approval by Consultant.

.3 Consultant 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 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

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

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 024116 – Structure Demolition

.2 031000 – Concrete Forming and Accessories

.3 032000 – Concrete Reinforcing

.4 033000 – Cast-in-Place Concrete

1.2 INSPECTION

.1 Allow Consultant 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.

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

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies shall be employed by the Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be included in the bid price.

.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, the Consultant will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Parks Canada Agency. Pay costs for re-testing and re-inspection.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, and off-site supplier facilities.

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

1.5 PROCEDURES

.1 Notify appropriate agency and Consultant in advance of requirement for tests, in order that attendance arrangements can be made.

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

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

1.6 REJECTED WORK

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

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

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

1.7 REPORTS

.1 Submit 4 copies of inspection and test reports to Consultant.

1.8 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Consultant and may be authorized as recoverable.

1.9 MILL TESTS

.1 Submit mill test certificates as required in these specifications.

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 031000 – Concrete Forming and Accessories

.2 032000 – Concrete Reinforcing

.3 033000 – Cast-in-Place Concrete

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA-A23.1/A23.2-[04], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-0121-[M1978(R2003)], Douglas Fir Plywood.

.3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.

.4 CAN/CSA-Z321-96(R2001)] Signs and Symbols for the Occupational Environment.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

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

.5 Remove from site all such work after use.

1.5 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs as required for the Work.

1.6 HOISTING

.1 Provide, operate and maintain barge, crane or hoists required for moving of workers, materials and equipment.

.2 Barge, hoists or crane to be operated by qualified operator.

1.7 Site Storage/Loading

.1 Do not unreasonably encumber premises with products

.2 Do no load or permit to load any part of Work with weight or force that will endanger Work.

1.8 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

1.9 OFFICES

.1 Provide office heated to 22 degrees C, lighted and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table. Provide work space in office for Consultant and Parks Canada Agency representatives

.2 Provide marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors to provide their own offices as necessary.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.11 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.

1.12 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Consultant.

.2 Construction sign 1.2 x 2,5 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.

.3 Indicate on sign, name of Owner and Contractor. Design to be approved by Parks Canada Agency

.4 No other signs or advertisements, other than warning signs, are permitted on site.

.5 Direct requests for approval to erect Consultant/Contractor signboard to Parks Canada Agency. For consideration general appearance of Consultant/Contractor signboard must conform to project identification site sign. Wording in both official languages.

.6 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.7 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed Consultant.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Consultant. Temporary measures as required for short term operations only will be permitted.

.2 Provide measures for temporary protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.

.3 Protect public from damage to person and property.

.4 Construct access as necessary.

.5 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.6 Dust control: adequate to ensure safe operation at all times.

.7 Lighting: to assure full and clear visibility for work areas during night work operations.

.8 Provide snow removal during period of Work.

1.14 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 TEMPORARY EROSION AND SEDIMENTATION CONTROL

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

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

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

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 Canadian Standards Association (CSA International)

.1 CSA-O121-M1978 (R2003), Douglas Fir Plywood.

1.2 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.3 HOARDING

.1 Erect temporary site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm centres and 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121.

.2 Apply plywood panels vertically flush and butt jointed.

.3 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades as required by governing authorities.

1.5 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.6 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.7 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling or safe disposal.

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 024116 – Structure Demolition

.2 031000 – Concrete Forming and Accessories

.3 032000 – Concrete Reinforcing

.4 033000 – Cast-in Place Concrete

1.2 PROJECT CLEANLINESS

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

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.

.3 Clear snow and ice from access to work area, bank/pile snow in designated areas only or remove from site as directed.

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

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

.6 Provide and use marked separate bins for recycling.

.7 Dispose of waste materials and debris off site.

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

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

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

.11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces.

.12 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.

1.3 FINAL CLEANING

.1 Reinstate all work, storage and laydown areas on completion of the Work including reseeding of affected grassed areas.

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

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

.4 Prior to final review remove surplus products, tools, construction machinery and equipment.

.5 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.6 Remove dirt and other disfiguration from exterior surfaces..

.7 Sweep and wash clean paved areas.

.8 Remove snow and ice from access to weir deck.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling

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 011100 – Summary of Work

.2 013119 – Project Meetings

.3 013300 – Submittal Procedures

.4 013543 – Environmental Procedures

.5 015200 – Construction Facilities

.6 017800 – Closeout Submittals

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor shall conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Consultant's inspection.

.2 Consultant's Inspection:

.1 Consultant and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English and French that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Consultant and Contractor.

.2 When Work is incomplete according to Consultant, complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when Consultant considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment:

.1 When Consultant considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.3 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment and reinstate the site.

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 REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting one week prior to contract completion Consultant, in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify Project requirements.

.2 Review warranty requirements.

.2 Consultant to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

.3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 AS -BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site Consultant one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.2 Store record documents and samples in field office apart from documents used for construction.

.1 Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.

.1 Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition.

.1 Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Consultant.

1.4 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Consultant .

.2 Use felt tip marking pens for recording information.

.3 Record information concurrently with construction progress.

.1 Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured depths of concrete removal..

.2 Field changes of dimension and detail.

.3 Changes made by change orders.

.4 Details not on original Contract Drawings.

.5 References to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:.

.1 Changes made by Addenda and change orders.

.6 Other Documents: maintain inspection certifications, field test records required by individual specifications sections.

.7 Provide digital photos, if requested, for site records.

1.5 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Consultant approval.

.3 Warranty management plan to include required actions and documents to assure that Consultant receives warranties to which it is entitled.

.4 Submit, warranty information made available during construction phase, to Consultant for approval prior to each monthly pay estimate.

.5 Conduct joint 9 month warranty inspection, measured from time of acceptance, by Consultant.

.6 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Contractor's plans for attendance at 9 month post-construction warranty inspections.

.7 Respond in timely manner to oral or written notification of required construction warranty repair work.

.8 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Consultant to proceed with action against Contractor.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 031000 – Concrete Forming and Accessories

.2 032000 – Concrete Reinforcing

.3 033000 – Cast-in-Place Concrete

1.2 REFERENCES

.1 Definitions:

.1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.

.2 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating related, required submittal and reporting requirements.

.2 Reference Standards:

.1 CSA International

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

.2 Department of Justice Canada (Jus)

.1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.

.2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:

.1 Convene pre-installation meeting 1 week prior to beginning concrete removal, with Consultant in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify project requirements.

.2 Confirm dewatering procedures

.3 Verify existing site conditions adjacent to demolition work.

.4 Co-ordination with other construction subtrades.

.2 Hold project meetings every week.

.3 Ensure key personnel attend.

.4 Provide written report on status of waste diversion activity at each meeting.

.5 Consultant will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

.2 Scheduling:

.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.

.1 In event of unforeseen delay notify Consultant in writing.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Contractor is responsible for fulfilment of reporting requirements.

.2 Submit detailed dewatering program including dewatering procedures, sequencing, safety procedures, and sediment control..

.3 Prior to beginning of Work on site submit detailed Waste Reduction Workplan and indicate:

.1 Descriptions of and anticipated quantities of materials to be salvaged reused, recycled and landfilled.

.2 Schedule of selective demolition.

.3 Number and location of dumpsters.

.4 Anticipated frequency of tippage.

.5 Name and address of haulers, waste facilities and/or waste receiving organizations.

.4 Submit copies of certified receipts from authorized disposal sites and reuse and recycling facilities for material removed from site on a weekly basis.

.1 Written authorization from Consultant is required to deviate from haulers, facilities and/or receiving organizations listed in Waste Reduction Workplan.

.5 Shop Drawings:

.1 Submit for review and approval concrete removal and dewatering drawings, diagrams or details showing sequence of dewatering and demolition work and support of structures during demolition.

.2 Submit temporary support drawings stamped and signed by professional engineer registered or licensed in Ontario.

.6 Sustainable Design Submittals:

.1 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with EPA 832/R-92-005 and authorities having jurisdiction.

.2 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with applicable Provincial and Municipal regulations.

1.6 SITE CONDITIONS

.1 Environmental protection:

.1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.

.2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.3 Fires and burning of waste or materials is not permitted on site.

.4 Do not bury rubbish waste materials.

.5 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.

.1 Ensure proper disposal procedures are maintained throughout project.

.6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.

.7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction.

.8 Protect trees, plants and foliage on site and adjacent properties.

.9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

.10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.7 EXISTING CONDITIONS

.1 Structures to be demolished are based on their condition at time of examination prior to tendering.

.1 Remove, protect and store salvaged items as directed Consultant. Salvage items as identified by Consultant. Deliver to Parks Canada Agency as directed.

Part 2 Products

2.1 EQUIPMENT

.1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

2.2 STOPLOGS

.1 Stoplogs for dewatering will be supplied by the Owner for use in dewatering of the Work areas. On completion of project remove stoplogs and store as directed by the Consultant.

Part 3 Execution

3.1 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

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

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.2 Dewatering

.1 Install stoplogs in upstream emergency gains and seal to minimize water flow into work area. Control any water still entering work area. Reinforce and support stoplogs if necessary to ensure safety of the downstream work areas. Should alternative water control measures be proposed, submit to Consultant for approval 2 weeks prior to installation of the measures.

.2 The existing control gate shall be raised during construction and protected to ensure gate is not damaged during the Work.

.3 Remove working stoplogs during construction and store and protect as required during construction.

.4 Control and channel seepage water as necessary to maintain work area in a dry condition.

.5 Provide pumps and all necessary equipment to maintain safe and dry working conditions.

.6 Create temporary settling ponds downstream of the work area to contain water contaminated with drilling fines and/or cementitious materials from the demolition and concreting process.

.3 Protection of in-place conditions:

.1 Work in accordance with Section 01 35 43 - Environmental Procedures and Sedimentation Control Plan.

.2 Prevent movement, settlement or damage of adjacent structures, paths and landscaping.

.1 Provide bracing, shoring as required.

.2 Repair damage caused by demolition as directed Consultant.

.3 Support affected structures, control gates and stoplogs and, if safety of structure being demolished or adjacent structures appears to be endangered, take preventative measures, stop Work and immediately notify Consultant.

.4 Prevent debris from blocking surface drainage system.

3.2 DEMOLITION

.1 Do demolition work in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.2 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

.3 At end of each day's work, leave Work in safe and stable condition.

.4 Select removal procedures to minimize dusting. Keep materials wetted as directed by Consultant.

.5 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

.6 Use natural lighting to do Work where possible.

3.3 CLEANING

.1 Develop Construction Waste Management Plan related to Work of this Section.

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

.2 Designate appropriate security resources / measures to prevent vandalism, damage and theft.

.3 Remove stockpiled material as directed Consultant when it interferes with operations of project construction.

.4 Dispose of materials in accordance with applicable regulations.

.1 Disposal facilities must be those approved of and listed in Waste Reduction Workplan.

.2 Written authorization from Consultant is required to deviate from disposal facilities listed in Waste Reduction Workplan.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 032000 – Concrete Reinforcing

.2 033000 - Cast-in-Place Concrete

.3 REFERENCES

.4 Canadian Standards Association (CSA International)

.1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.

.3 CSA O121-M1978 (R2003), Douglas Fir Plywood.

.4 CSA O151-04, Canadian Softwood Plywood.

.5 CSA O153-M1980 (R2003), Poplar Plywood.

.6 CAN/CSA-O325.0-92 (R2003), Construction Sheathing.

.7 CSA O437 Series-93 (R2006), Standards for OSB and Waferboard.

.8 CSA S269.1-1975 (R2003), Falsework for Construction Purposes.

.9 CAN/CSA-S269.3-M92 (R2003), Concrete Formwork, National Standard of Canada

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701-[05], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.2 SUBMITTALS

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

.2 Submit shop drawings for formwork and falsework.

.1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario.

.3 Submit WHMIS MSDS - Material Safety Data Sheets for review by the Consultant.

.4 Co-ordinate submittal requirements and provide submittals required by Section 01 33 00 – Submittal Procedures.

.5 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings. Comply with CAN/CSA-S269.3 for formwork drawings.

.6 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms. Where Self Consolidating Concrete is used, show that the formwork

has been designed to withstand the full hydrostatic pressure of the concrete in addition to other applicable forces.

.7 Indicate sequence of erection and removal of formwork/falsework as directed by Consultant

1.3 DELIVERY, STORAGE AND HANDLING

.1 Store and manage hazardous materials in accordance with applicable Canadian and Ontario standards.

.2 Waste Management and Disposal:

.1 Separate waste materials for recycling and dispose of at a certified disposal facility.

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

.3 Divert wood materials from landfill to a recycling facility as approved by Consultant.

.4 Divert plastic materials from landfill to a recycling Consultant

.5 Divert unused form release material from landfill to an official hazardous material collections site as approved by the Consultant

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

.1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121-M, CAN/CSA-O86, and CSA-O153.

.2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.

.2 Form ties:

.1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

.2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.3 Form liner:

.1 Plywood: high density overlay Douglas Fir to CSA O121, Canadian Softwood Plywood to CSA O151, Poplar to CSA O153.

.4 Form release agent: non-toxic, biodegradable, low VOC.

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

Part 3 Execution

3.1 FABRICATION AND ERECTION

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

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

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

.4 Align form joints and make watertight.

.1 Keep form joints to minimum.

.5 Use 25mm chamfer strips on external corners.

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

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

3.2 REMOVAL AND RESHORING

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

.1 4 days for pier and abutments.

.2 For Self Consolidating Concrete see requirements in Section 03 30 00.

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.2 Remove formwork when concrete has reached 50 % of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 024116 – Structure Demolition

.2 031000 – Concrete Forming and Accessories

.3 033000 - Cast-in-Place Concrete

1.2 PRICE AND PAYMENT PROCEDURES

.1 Measurement and Payment:

.1 Include reinforcement costs in items of concrete work in Section 03 30 00 - Cast-In-Place Concrete.

1.3 REFERENCES

.1 American Concrete Institute (ACI)

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

.1 ACI 315-99, Details and Detailing of Concrete Reinforcement.

.2 ACI 315R-04, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.

.2 ASTM International

.1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.3 CSA International

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

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

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

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

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

.4 Reinforcing Steel Institute of Canada (RSIC)

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

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

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario.

.1 Indicate placing of reinforcement and:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

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

.5 Indicate sizes, spacings and locations of chairs, spacers and hangers.

.2 Detail lap lengths and bar development lengths to CSA-A23.3.

1.5 QUALITY ASSURANCE

.1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.

.1 Mill Test Report: To Consultant with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning, reinforcing work.

.2 Submit in writing to Consultant proposed source of reinforcement material to be supplied.

1.6 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan related to Work of this Section.

Part 2 Products

2.1 MATERIALS

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

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

.3 Cold-drawn annealed steel wire ties: to CSA-G30.3, 1.6 mm or heavier.

.4 Chairs, bolsters, bar supports, spacers: to CSA-A23 and RSIC Manual of Standard Practice Chapter 8

.5 Mechanical splices: subject to approval Consultant.

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

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

2.3 SOURCE QUALITY CONTROL

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

.2 Submit to Consultant for review 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 Consultant.

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

.3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

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

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

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

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.

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 024116 – Structure Demolition

.2 031000 – Concrete Forming and Accessories

.3 032000 – Concrete Reinforcing

.

1.2 PRICE AND PAYMENT PROCEDURES

.1 Measurement and Payment:

.1 Measurement Procedures: in accordance with Section 01-22-01- Measurement and Payment.

.2 The unit of measurement for Merrickville Weir Rehabilitation will be lump sum.

1.3 REFERENCES

.1 Abbreviations and Acronyms:

.1 Portland cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement.

.1 Type MS and MSb - Moderate sulphate-resistant cement.

.2 Fly ash:

.1 Type F - with CaO content less than 15%.

.2 Type CI - with CaO content ranging from 15 to 20%.

.3 Type CH - with CaO greater than 20%.

.3 GGBFS - Ground, granulated blast-furnace slag.

.4 SCC – Self Consolidating Concrete

.2 Reference Standards:

.1 ASTM International

.1 ASTM C260/C260M-[10a], Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-[07], Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-[10a], Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C1017/C1017M-[07], Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.5 ASTM C1610. Standard Test method for Static Segregation of Self Consolidating Concrete by Column Technique

.6 ASTM C1621. Standard Test for Passing Ability of Self-Consolidating Concrete by J-Ring.

.2 CSA International

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

.2 CSA A283-[06], Qualification Code for Concrete Testing Laboratories.

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

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation Meetings: Convene pre-installation meeting one week prior to beginning concrete work.

.1 Ensure site Parks Canada Representative and Consultant attend.

.1 Verify project requirements.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide testing results for review by the Parks Canada Representative and Consultant and do not proceed without written approval when deviations from mix design or parameters are found.

.3 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

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

.5 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements, 01 35 43 - Environmental Procedures.

.6 The Contractor shall submit the following supporting documentation for Self Consolidating Concrete:

a) Trial batch test data, including the following:
Plastic concrete test results:
i. Concrete temperature
ii. Air content including target value for air content
iii. Slump flow including target value for slump flow
iv. Visual stability index
v. J-ring flow
vi. Column segregation

Hardened concrete test results:
i. 28-Day compressive strength
ii. Air void system
iii. Rapid chloride permeability
iv. Linear shrinkage
v. Visual evaluation of segregation

The trial batch test data shall not be more than 12 months old at the time it is submitted.

b) A certificate from the manufacturer of the viscosity modifying admixture (if used), verifying that no chlorides were added to the viscosity modifying admixture during its manufacture and that it meets the requirements for Type S admixture when tested according to ASTM C 494. The admixture and its dosage shall be identified.

1.6 QUALITY ASSURANCE

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

.2 Provide Consultant a minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Consultant on following items:

.1 Falsework erection.

.2 Dowel installation and testing

.3 Hot weather concrete.

.4 Cold weather concrete.

.5 Curing.

.6 Finishes.

.7 Formwork removal.

.8 Joints.

.4 Quality Control Plan: provide written report to Consultant verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

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

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

.2 Deviations to be submitted for review by Consultant.

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

Part 2 Products

2.1 DESIGN CRITERIA

.1 Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

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

2.3 MATERIALS

.1 Portland cement: to CSA A3001, Type MS

.1 Reduction in cement from Base Mix to Actual Supplementary Cementing Materials (SCMs) Mix, as percentage.

.2 Blended hydraulic cement: Type MSb to CSA A3001.

.3 Supplementary cementing materials: with minimum 20% Type F fly ash replacement, by mass of total cementitious materials to CSA A3001.

.4 When silica fume is used it shall be in the form of a blended hydraulic cement.

.5 Water: to CSA A23.1.

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

.7 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.2 Chemical admixture: to ASTM C494, ASTM C1017. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.

.3 Superplasticizer shall be used in SCC, added at the plant or job site.

.4 A viscosity modifying admixture (VMA) may be used in SCC.

.8 Curing compound: to CSA A23.1/A23.2, white or with fugitive dye.

2.4 MIXES

.1 Concrete shall be self-consolidating concrete (SCC) as defined in CSA A-23.1, Clause 8.6. and shall meet the requirements of CSA A 23.1.

.2 Concrete mixes shall be designed in accordance with CSA A23.1 so that concrete will be homogeneous, uniformly workable, readily placeable into corners and angles of forms and around and around reinforcement by methods of placing and consolidation employed on the Work but without permitting materials to segregate or excessive free water to collect on the surface. The concrete, when hardened shall have the qualities specified as proved by previous mix experience documented by an independent testing agency satisfactory to the Consultant.

.3 The equivalent sodium oxide (Na_2O) content of the concrete mix shall not exceed 3.0 kg in any cubic metre of concrete where Equivalent Na_2O = Equivalent Na_2O (cement, flyash, slag, admixtures and water) + 0.76 Chloride (Cl) ions (aggregates).

.4 The use of calcium chloride is not permitted.

.5 Any non-SCC concrete used shall have a maximum slump of 60±20 mm measured at point of placement. Required placement slump is to be achieved by the addition of high range water reducer (superplasticizer). Care shall be taken when adding superplasticizer that segregation does not occur.

.6 Minimum Specified Strength: 30 MPa at 28 days

.7 Entrained Air Content: 5 – 8% at point of placing.

.8 Maximum Water/Cement Ratio: 0.4.

.9 Nominal Maximum Aggregate Size: 13.2 mm or 20 mm. Nominal size of coarse aggregate: 13.2 – 5 mm or 20 – 5 mm.

.10 For SCC concrete, target fresh concrete properties shall meet the values given in CSA A23.1, Table 23.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Consultant's written approval before placing concrete.

.1 Provide 24 hours minimum notice prior to placing of concrete.

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

.3 During concreting operations:

.1 Development of cold joints not allowed.

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

.4 Pumping of concrete is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 No vibrators shall be used to consolidate SCC.

.7 For placement of SCC, the maximum horizontal distance between the discharge point of the SCC and its final position shall be 10 m.

.8 Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing.

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

.10 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.

.1 Place steel dowels of deformed L-bar steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.

.11 Do not place load upon new concrete until authorized by Consultant.

3.2 INSTALLATION/APPLICATION

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

.2 Anchoring of Dowels:

.1 The batching and mixing system shall thoroughly blend the grout ingredients and the applicator shall be capable of injecting grout to the full depth of the hole.

.2 All holes shall be cleaned and flushed prior to grouting. Holes shall be drilled using percussion drills. No core or diamond drills shall be used. The annular space around the dowel shall be no greater than that specified by the grout manufacturer.

.3 All standing water shall be removed by vacuum evacuation prior to grouting. The ambient temperature surrounding the hole shall not be less than 10^{O}C when grout is placed in the hole and shall not fall below 10^{O}C for three days following placement of the grout.

.4 Templates or wedging shall be used to retain dowels in the centre of the drill hole during setting of the grout and initial curing. Templates or wedges shall remain in place for one day after placement of grout.

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.3 Finishing and curing:

.1 Finish concrete to CSA A23.1/A23.2.

.2 SCC shall be moist cured for a minimum of 4 days. SCC containing silica fume shall be moist cured for a minimum period of 7 days.

3.3 COLD WEATHER CONCRETING

.1 It is anticipated that the construction will take place during a period when cold weather conditions can be expected. Cold Weather Concreting shall be in accordance with CSA A23.1, Section 7.4.1.5 and to the satisfaction of the Consultant.

3.4 SURFACE TOLERANCE

.1 Concrete tolerance to CSA A23.1.

3.5 FIELD QUALITY CONTROL

.1 Prior to commencing significant segments of the Work, give the Consultant and inspection and testing agencies at least 24 hours notification so as to afford reasonable opportunity to review the Work.

.1 Slump and temperature shall be measured at point of discharge for every truck prior to addition of superplasticizer. Slump shall also be tested at point of placement.

.2 Air content shall be tested at point of discharge after addition of superplacticizer. Cylinder specimens for air void analysis shall be cast and tested as required by the Consultant. Random tests for air content following addition of superplasticizer shall be performed at point of placement or point of discharge as required by the Consultant.

.3 Compressive strength testing specimens shall be prepared on each day that concrete is placed at 7, 28 and 56 days. Separate testing shall be performed for each pier. Four standard cylinders shall be cast for laboratory curing and testing. One specimen shall be tested at 7 days, two shall be tested at 28 days. One

cylinder shall be retained for 56 days for testing as considered necessary by the consultant.

.4 Additional specimens shall be prepared and cured on site for estimating in-place concrete strength for form removal purposes.

.5 Placement temperature of concrete shall not be higher than 27 ^{O}C.

.2 Inspection and testing of concrete and concrete materials will be carried out by independent testing laboratory approved Consultant.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Ensure test results are distributed for discussion at pre-placement concrete meeting between testing laboratory and Consultant.

.4 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

.5 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.6 CLEANING

.1 Clean in accordance with Section 017411 - Cleaning.

.2 Waste Management: separate waste materials for recycling.

.1 Provide appropriate area on job site where concrete trucks can be safely washed.

.2 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

.3 Prevent admixtures and additive materials from entering drinking water supplies or streams.

.4 Using appropriate safety precautions collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.

.5 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION