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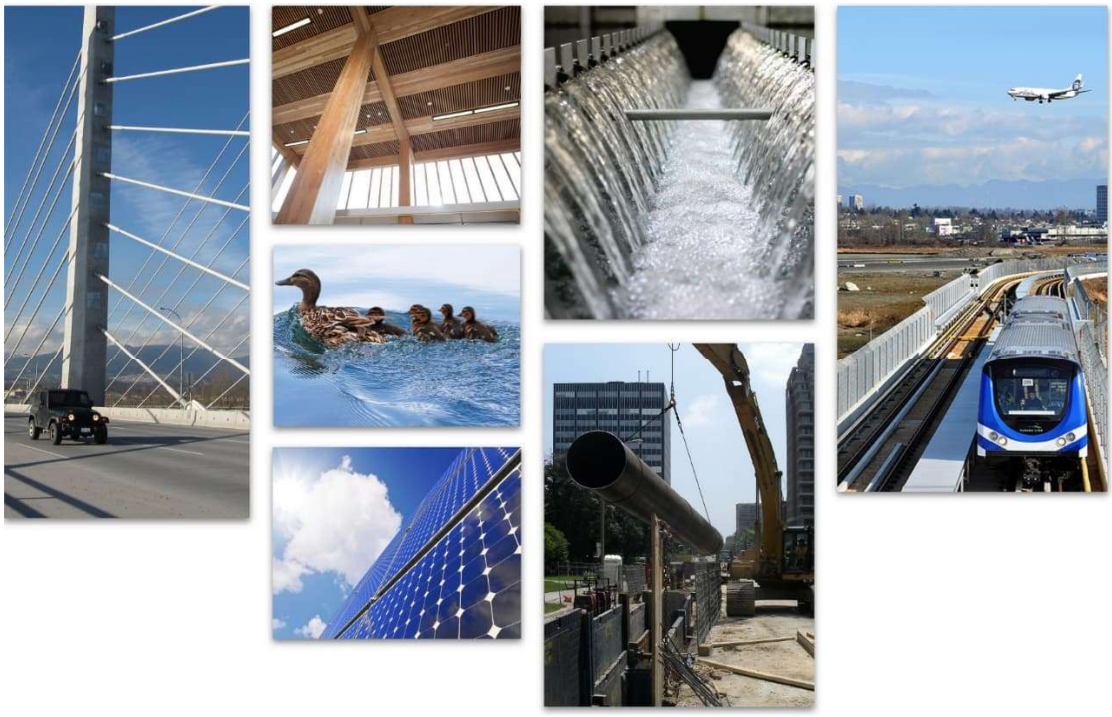
# CONTRACT DOCUMENTS

## Parks Canada
## Miette Hot Springs

## Source Water Collection Tank



FEBRUARY 2023

**CONTRACT SPECIFICATIONS**

**FOR**

**PARKS CANADA - MIETTE HOT SPRINGS**

**SOURCE WATER COLLECTION TANK**

**FEBRUARY 2023**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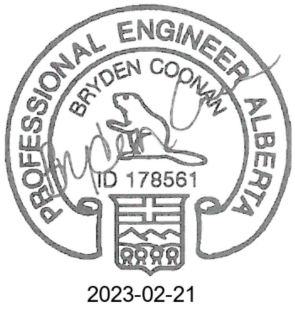
Project Manager/Electrical Engineer

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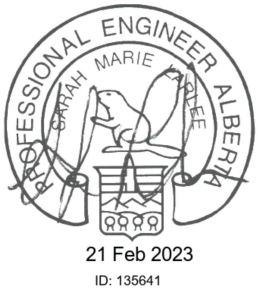


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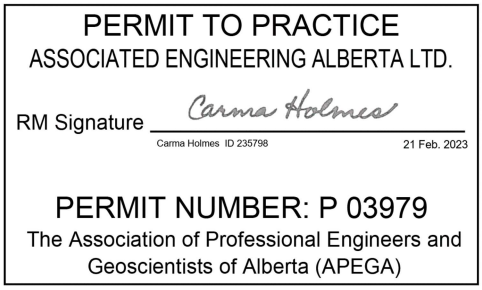


Prepared by Associated Engineering Alberta Ltd.

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| Drawing No. | Title |
|---|---|
| **PROCESS MECHANICAL** | |
| D-101 | Pump Room Source Water Collection Tank Plan and Section Views |
| D-501 | Standard Details |
| DD-101 | Pump Room Demolition Plan and Photo Views |
| **STRUCTURAL** | |
| DS-201 | Structural Location Plan and General Notes |
| DS-202 | Structural Demolition Plan, Section and Detail |

**END OF DOCUMENT**

# Part 1 General

## 1.1 SUMMARY OF WORK

.1 Requirements include:

.1 Title and description of work: Miette Hot Spring Source Water Tank Replacement.

.2 Contract method: Lump Sum.

.3 The contractor should plan their work and pre-order all materials so that construction starts no later than October 10, 2023 and end no later than January 31, 2024.

.4 The facility is to reopen as of May 5, 2024. Construction must not impact this reopening.

.2 Drawings and Specifications furnished

.1 Departmental Representative will provide electronic copies of drawings and specifications to Contractor.

.2 Contractor to maintain at Site one complete set of drawings and specifications. Make available to Departmental Representative at any time.

.3 Summary Overview of Work

.1 During the Works, provide air movers, as required, to mitigate dust and keep the workspace at a comfortable temperature.

.2 During the Works, provide hoardings and covers as required, to mitigate dust and prevent damage to all other equipment.

.3 Demolish, remove and dispose the existing reinforced concrete tank and associated mechanical and electrical to facilitate installation of the new tank, including but not necessarily limited to:

.1 Demolish and remove existing hoist and hoist beam above tank.

.2 Demolish and remove existing grated platform.

.3 Demolish and remove non-load bearing walls of existing concrete tank including concrete benching within. Patch remaining concrete and concrete surfaces and make level.

.4 Demolish ancillary mechanical and electrical equipment as noted on drawings, including, but not limited to, pump base, pump stand, filter vessel, and filter vessel piping. Confirm extents with Departmental Representative. A HMBA has been completed. Lead paint is present and will need to be handled appropriately during demolition. HMBA reports can be found in the appendices

.4 Protect ancillary pumps, piping, flooring, walls, and equipment from dust and damage during construction. Make good any peripheral damage done.

.5 Make good and finish surfaces affected by demolition to match adjacent surfaces.

.6 Supply and install new light industrial floor coating under new tank to extents noted on drawings.

.7 Supply and install coated steel bolted tank with appropriate coating as noted in Specifications.

.8 Provide all connections from the existing piping to the new steel bolted tank.

.9 Remove and replace pump header piping.

.10 Relocate existing LED light currently located on tank wall.

.11 Supply and install new sealed LED lighting as indicated.

.12 Remove, protect, and reinstall install existing level instrument. Custom bracketing will be required.

.13 Clean any dust, debris, and construction by-products when work is complete.

.14 The expected duration of this work, exclusive of lead times for materials, is 90 days.

## 1.2 PROJECT LOCATION AND TIMING

.1 The project is located in Jasper National Park Alberta. The project site is located at the Miette Hot Springs, SEC 8 TWP 48 RGE 26 W5M. The project site access road from Highway 16 is located approximately 34 km from Hinton and also serves as access for Pocahontas Bungalows, which are visible from the intersection.

.2 The access road to the project site is closed to the public between October Thanksgiving Weekend, each year to May 5, 2023.

.3 All work under the Contract shall be performed when the project is closed to the public.

.4 There is no cellular access at the project site. Contractors will need to plan for alternate communications and make arrangements that suit their schedule and project work plans as well as take this into account for safety planning.

.5 The access road to the project site is not maintained during the off season. It is the Contractor's responsibility to make special arrangements with the Departmental Representative to have the road cleared for project traffic. Road clearing will be at the Contractor's expense.

## 1.3 PROJECT COORDINATION

.1 Coordinate progress of the Work, progress schedules, submittals, use of site, temporary utilities, construction facilities and controls.

## 1.4 HOURS OF WORK

.1 Perform Work during hours approved by the Departmental Representative.

.2 Obtain written permission of the Departmental Representative before undertaking holiday work or night work.

## 1.5 CONTRACTOR USE OF PREMISES

.1 The Contractor shall limit use of premises for Work, for storage, and for access, to the limits of construction shown on drawings.

.2 The Contractor shall coordinate use of premises under direction of the Departmental Representative.

.3 The Contractor is to obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.4 The Contractor and any Subcontractors shall obtain a business license to operate within Jasper National Park. For more information as to submit a complete application, please contact the Business Liaison Officer/Realty and Municipal Services, Jasper National Park of Canada

.5 All Contractor's business and private vehicles are required to display a vehicle work pass. These permits may be obtained free of charge from Realty Services, located at the Jasper National Park Administration building.

.6 The Contractor shall leave the site in a clean and safe manner at the end of each work day.

.7 The Contractor is responsible for and shall limit the use of the laydown area to the area identified by Parks Canada. The primary access to the site will be via the north access road.

.8 Year-round accommodation and seasonal campgrounds are available at Pocahontas. Miette Cabins are seasonal. Contractor is to make their own accommodation. Camping is not allowed without prior approval by Departmental Representative.

.9 Contractor has restricted use of Site until Certificate of Substantial Performance is issued.

.10 Ascertain boundaries of Site within which work must be confined.

.11 Obtain written authorization from Departmental Representative to enter private lands which are the subject of easements or rights-of-way obtained by Departmental Representative.

.12 Ascertain and abide by conditions pertaining to use of easements or rights-of-way.

.13 Assume full responsibility and be responsible for all construction related deliveries and to provide site access for them.

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

.15 Limit use of premises for Work, for storage, and for access, to allow:

.1 Owner occupancy.

.2 Work by other contractors.

.16 Coordinate use of premises, under direction of Departmental Representative.

## 1.6 CONSTRUCTION PARKING

.1 Parking will be permitted on Site provided it does not disrupt the performance of Work, or operation of the facility and is anticipated to be available by the west loading door.

## 1.7 RELICS AND ANTIQUITIES

.1 Relics and antiquities and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found on site or in buildings to be demolished, remain property of Owner. Protect such articles and request directives from Departmental Representative.

.2 Notify Departmental Representative immediately if evidence of archaeological finds is encountered and await Departmental Representative's written instructions before proceeding with work in area.

## 1.8 CUTTING AND PATCHING

.1 Approvals

- .1 Submit written request in advance of cutting or alteration which affects:
  - .1 Structural integrity of any element of Project.
  - .2 Integrity of weather-exposed or moisture-resistant elements.
  - .3 Efficiency, maintenance, or safety of any operational element.
  - .4 Visual qualities of sight-exposed elements.
  - .5 Work of Owner or separate contractor.
- .2 Inspection
  - .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
  - .2 After uncovering, inspect conditions affecting performance of work.
  - .3 Beginning of cutting or patching means acceptance of existing conditions.
- .3 Execution
  - .1 Perform cutting, fitting, and patching to complete the Work and make good areas affected by the Work.
  - .2 Remove and replace defective and non-conforming work.
  - .3 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical work.
  - .4 Perform Work to avoid damage to other work.
  - .5 Prepare proper surfaces to receive patching and finishing.
  - .6 Perform cutting and patching for weather-exposed and moisture-resistant elements and sight-exposed surfaces equivalent to original or better.
  - .7 Cut rigid materials using power saw or core drill. Pneumatic or impact tools not allowed.
  - .8 Restore work with new products in accordance with Contract Documents.
  - .9 Fit work airtight and liquid-tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
  - .10 At penetration of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated material and to applicable codes and standards.
  - .11 Refinish surfaces to match adjacent finishes; for continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

## 1.9 QUALITY CONTROL

.1 Inspection

.1 Owner and Departmental Representative shall have access to Work at all times, including during manufacturing.

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

.2 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative if required for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Owner.

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

.3 Reports

.1 Submit electronic copies of any and all construction related reports, including inspection and test reports, promptly to Departmental Representative.

## 1.10 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

.1 Laydown

.1 The Contractor can use the area by the west loading door for laydown. This is roughly a 10m by 10m space. Additional on-site laydown should be requested from the Departmental Representative if required.

.2 The Contractor is solely responsible for any off-site laydown that may be required during the duration of the contract.

.2 Installation/Removal

.1 Provide construction facilities and temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

.3 Hoarding

.1 Erect hoarding around the entire perimeter of the work area to protect public, workers, public, and private property from injury or damage.

.4 Weather Enclosures

.1 Provide weathertight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work area for temporary heat.

.5 Dust Tight Screens

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such Work is complete.

.3 Ensure that all adjacent equipment is protected.

.4 Contractor is responsible for any damage and cleaning resulting from a failure to provide and maintain dust mitigating partitions and screens.

.6 Dewatering

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

.7 Site Storage/Loading

.1 Confine the Work and operations of employees to limits indicated by Contract Documents. Do not unreasonably encumber premises with Products.

.2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.

.8 Sanitary Facilities

.1 Existing facilities as designated may be used during construction period.

.9 Water Supply

.1 Owner will provide a continuous supply of non-potable water for construction use.

.2 The Contractor will need to provide any potable water required to complete the Works.

.10 Temporary Heating

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders not permitted.

.3 Maintain temperatures of minimum 10°C in areas where construction is in progress, unless indicated otherwise in specifications.

.4 Ventilate heated areas and keep building free of exhaust or combustion gases.

.11 Temporary Power

.1 Refer to Section 01 51 00 - Temporary Utilities.

.12 Equipment/Tool/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.

.13 Project Cleanliness

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

.2 Remove waste material and debris from site at end of each working day. Materials to be deposed or outside of the Jasper Park boundaries. Proof of proper disposal of any hazardous materials needs to be retained by the contractor and provided to the Departmental Representative upon request.

.3 Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

## 1.11 BASIC PRODUCT REQUIREMENTS

.1 Product and Material Quality

.1 Products, materials, equipment and articles (referred to as Products throughout specifications) incorporated in Work shall be new, not damaged or defective, and conforming with specifications for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.

.2 Defective Products, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.

.2 Storage, Handling and Protection

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

.2 Store packaged or bundled Products in original and undamaged condition with manufacturer's seals and labels intact.

.3 Store products subject to damage from weather in weatherproof enclosures.

.3 Manufacturer's Instructions

.1 Unless otherwise indicated in specifications, install or erect Products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative may establish course of action.

.3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and reinstallation at no increase in Contract Amount.

.4 Workmanship

.1 Execute Work by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ any unfit person or anyone unskilled in their required duties. Departmental Representative reserves the right to require the dismissal from site

of workers deemed incompetent, careless, insubordinate or otherwise objectionable.

.5 Concealment

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Departmental Representative if there is a contradictory situation. Install as directed by Departmental Representative.

## 1.12 PROJECT CLOSEOUT

.1 Systems Demonstration

.1 Prior to final inspection, demonstrate operation of each system to Owner and Departmental Representative.

.2 Instruct personnel in operation, adjustment, and maintenance of equipment and systems, using provided operation and maintenance data as basis for instruction.

.2 Documents

.1 Collect reviewed submittals and assemble documents executed by Subcontractors, suppliers, and manufacturers.

.2 Submit material prior to final Application for Payment.

.3 Submit operation and maintenance data, record drawings.

.4 Provide warranties fully executed and notarized.

.5 Execute transition of Performance and Labour and Materials Payment Bond(s) to substantial completion.

.6 Submit a final statement of accounting giving total adjusted Contract Amount, previous payments, and monies remaining due.

.3 Inspection/Takeover Procedures

.1 Prior to application for Certificate of Final Completion, carefully inspect the Work and ensure it is complete, that all construction deficiencies are complete, defects are corrected, and building is clean and in condition for occupancy. Notify Departmental Representative, in writing, of completion of the Work and request an inspection.

.2 During Departmental Representative's inspection, a list of deficiencies and defects will be tabulated. Correct same.

.3 Make application for Certificate of Final Completion.

## Part 2 Products

Not Used.

## Part 3 Execution

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 MEASUREMENT FOR PAYMENT

.1 For lump sum price item, Departmental Representative will calculate payment based on tendered price and Departmental Representative's estimate of percentage of work item completed.

.2 Where a method of measurement for payment for a work item is not specified, payment for that item will be deemed to be included in another pay item or other pay items. If lump sum, contractor needs to provide breakdown before first progress claim submission.

## Part 2 Products

Not Used.

## Part 3 Execution

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 DEPARTMENTAL REPRESENTATIVE TO ADMINISTER

.1 Departmental Representative will administer preconstruction meeting and progress meetings to be held at biweekly intervals.

.2 Contractor's superintendent, and senior representatives of major Subcontractors, to attend all meetings.

.3 Representatives of Contractor, Subcontractor and suppliers attending meetings shall be qualified and authorized to act on behalf of the party each represents.

.4 Contractor to provide physical space for meetings.

### 1.2 PRECONSTRUCTION MEETING

.1 The Departmental Representative will, 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 the Owner, Departmental Representative, Contractor, and major Subcontractors will be in attendance.

.3 Agenda to include the following:

- .1 Safety issues.
- .2 Appointment of official representative of participants in the Work.
- .3 Schedule of Work, progress scheduling.
- .4 Schedule of submission of shop drawings, samples, colour chips.
- .5 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences.
- .6 Delivery schedule of specified equipment.
- .7 Site security.
- .8 Contemplated change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .9 Record drawings.
- .10 Take-over procedures, acceptance, warranties.
- .11 Monthly progress claims, administrative procedures, photographs, holdbacks.
- .12 Insurance.

### 1.3 PROGRESS MEETINGS

.1 During course of Work and 2 weeks prior to project completion, schedule progress meetings biweekly.

.2 Contractor, major Subcontractors involved in Work, Departmental Representative and Owner are to be in attendance.

.3 Notify parties minimum 7 days prior to meetings.

.4 Agenda to include the following:

.1 Safety issues.
.2 Review, approval of minutes of previous meeting.
.3 Review of Work progress since previous meeting.
.4 Field observations, problems, conflicts.
.5 Problems which impede construction schedule.
.6 Review of off-site fabrication delivery schedules.
.7 Corrective measures and procedures to regain projected schedule.
.8 Revisions to construction schedule.
.9 Progress, schedule, during succeeding work period.
.10 Review submittal schedules: expedite as required.
.11 Maintenance of quality standards.
.12 Pending changes and substitutions.
.13 Review proposed changes for effect on construction schedule and on completion date.
.14 Other business.

## Part 2 Products

Not Used.

## Part 3 Execution

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 REQUIREMENTS INCLUDED

.1 Construction schedule.

.2 Shop drawings and product data.

.3 Samples.

.4 Operating and maintenance manuals.

.5 Record drawings.

.6 Progress photographs.

.7 Certificates.

### 1.2 PRECONSTRUCTION SUBMITTALS

.1 Prior to the commencement on any part of the Works, the contractor shall submit for approval by the Departmental Representative, the following documents

.1 A Health and Safety Plan customized to suit this project.

.2 All Materials Safety Data Sheets (or Safety Data Sheets) pertinent to this project

.3 An Emergency Response Plan customize to suit this project

.4 A Selective Demolition Plan for the demolition scope of work.

### 1.3 ADMINISTRATIVE

.1 Provide to Departmental Representative for review the submittals specified. Submit with reasonable promptness and in an orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed. The Departmental Representative will return the submission with comments within five business (5) days of receipt of the submission.

.2 At Departmental Representative's request, prepare and submit schedule fixing the dates for submission and return of shop drawings, product data or samples.

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

.4 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 coordinated with the requirements of the Work and the Contract Documents. Submittals not stamped, signed, dated and identified as to the specific project will be returned without being examined and shall be considered rejected.

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

.6 Verify that field measurements and affected adjacent Work are coordinated.

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

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

.9 Keep one reviewed copy of each submission on Site.

## 1.4 CONSTRUCTION SCHEDULE

.1 Prepare schedule in the form of a horizontal bar chart.

.2 Provide a separate bar for each trade or operation. Show proposed progress of all activities for main work items and subtrades of Contract. Where applicable, indicate labour, construction crews, plant and equipment to be employed. Show delivery dates of major pieces of equipment.

.3 Provide horizontal time scale identifying the first work day of each week.

.4 Submit copy of initial schedule within 15 days after award of Contract.

.5 Departmental Representative will review schedule and return reviewed copy within 5 days after receipt.

.6 Resubmit finalized schedule within 5 days after return of reviewed copy.

.7 Distribute copies of the finalized schedule to:

.1 Subcontractors.

.2 Departmental Representative.

.8 Instruct recipients to report to Contractor, within 5 days, any problems anticipated by the timetable shown in the schedule.

.9 Revise and resubmit schedule within 5 days after notification by Departmental Representative that previously reviewed schedule is not being met. Show changes in operations proposed to complete construction work within Contract Time.

.10 If, during course of work, Contract Time is extended, correct construction schedule to show revised commencement and completion dates of affected parts of work.

.11 No progress payment will be approved until receipt of a schedule acceptable to Departmental Representative.

## 1.5 WORK PLAN

.1 Provide Work Plan for each key activity, as requested by Departmental Representative, to show construction methods. Relate Work Plan to activities shown on Construction Schedule.

## 1.6 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 Detail all shop drawings using the metric system. Prepare to a drafting standard equivalent to Contract drawings.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, wiring diagrams, panel layouts with bills of material, 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 coordinated, regardless of the Section under which the adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

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

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

.6 Fill in the following information on the Shop Drawing Review Stamp on each shop drawing prior to submitting the drawing to Departmental Representative:

.1 Parks Canada – (PCA Project Number)

.2 Drawing Number -- (see description in next paragraph).

.3 Date of submission.

.7 Apply the following drawing numbers to Shop Drawings on this work:

.1 Civil Shop Drawings:
C-1001
C-1002
C-(etc.)

.2 Architectural Shop Drawings:
A-1001
A-1002
A-(etc.)

.3 Structural Shop Drawings:
S-1001
S-1002
S-(etc.)

.4 Mechanical Shop Drawings:
M-1001
M-1002
M-(etc.)

.5 Electrical Shop Drawings:
E-1001
E-1002

E-(etc.)

.6 Instrumentation Shop Drawings:
I-1001
I-1002
I-(etc.)

.7 General Shop Drawings and drawings not covered by the above discipline categories:
G-1001
G-1002
G-(etc.)

.8 Maintain a complete Shop Drawing Record showing the review status of all shop drawings on the work. Provide Departmental Representative with a copy of this record on a monthly basis or as requested by Departmental Representative.

.9 Submittal submissions:

.1 Submit shop drawings and other submittals to Departmental Representative for review with a Submittal Transmittal Form.

.2 One original hard copy or an electronic file of the Submittal Transmittal Form (at Contractor's choice) will be provided to Contractor by Departmental Representative. Make photocopies of the form as needed for use on the project.

.3 For each submittal or submittal package, type or print the appropriate information on the form to fully describe the submittal(s) being sent for review.

.4 Number each transmittal form in sequential order, for record and tracking purposes.

.5 Sign the form in the space provided to acknowledge Contractor review of the submittal(s).

.6 Retain one photocopy of the form for filing and record purposes.

.7 Forward the form and the accompanying submittal(s) to Departmental Representative.

.10 Submissions shall include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Apply shop drawing 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.

.11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections, in searchable PDF format, and as Departmental Representative may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic files of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.13 Submittals will be returned with one or more of the following notations. Take action as noted:

.1 "REVIEWED" - Make and distribute additional copies as required for execution of Work.

.2 "REVISE & RESUBMIT" - Make the necessary revisions and resubmit revised drawings for review. Show the drawing number of the first such revised drawing and show the latest revision number applicable to the drawing by adding a suffix to the drawing number as - "REV. 1", "REV. 2", etc.

.3 “REVIEWED AS NOTED” – This notation indicates when Departmental Representative has provided notations on the shop drawings that must be incorporated into the goods or work. Make and distribute additional copies as required for execution of the work.

.4 "NOT REVIEWED" - This notation indicates when Departmental Representative has not reviewed the drawing. It may also be used in combination with the notation to revise and resubmit the drawing where Departmental Representative lacks sufficient information to complete the review and requires to resubmit the drawing for review after revision.

.5 Drawings will be marked "REVIEWED" together with the notation to "REVISE & RESUBMIT" when Departmental Representative requires Contractor to resubmit a revised drawing showing corrections made as a result of Departmental Representative's notations on the shop drawings. This procedure will not relieve Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of Contract.

.14 Use only those shop drawings on the work that bear the "REVIEWED" notation.

.15 Do not revise shop drawings marked "REVIEWED" unless resubmitted to Departmental Representative for further review.

.16 Where more than one type of shop drawing has been specified for one item, e.g., wiring diagrams, layout details, and dimensional drawings, the shop drawings shall be submitted together, to enable Departmental Representative to review the drawings as a package.

.17 Catalogue pages or drawings applicable to an entire family or range of equipment will not be accepted as shop drawings unless they are clearly marked to show the pertinent data for the particular materials.

.18 Manufacturers' catalogues, manuals, or price lists will not be accepted as shop drawings. Such materials may be used as supplemental information to the shop drawings.

.19 Indicate the tag number of instruments and valves and clearly show the features and details applicable to the equipment being supplied.

.20 Determine which shop drawings have, in addition to those drawings specifically mentioned in the Contract, design elements requiring the seal of a Professional Engineer registered in the Province or Territory where the work is located, in accordance with the applicable provincial or federal engineering acts or other governing legislation. Seal such drawings before submitting them for review. Submit for review engineering calculations signed by the registered Professional Engineer responsible for the shop drawing design elements.

.21 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 the same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.22 Review by Departmental Representative is for the sole purpose of ascertaining conformance with the general design concept. This review does not mean that Departmental Representative approves the detail design inherent in the shop drawings, responsibility for which remains with Contractor, and such review does not relieve Contractor of the responsibility for errors or omissions in the shop drawings or of the responsibility for meeting all requirements of the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job-site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the work of all sub-trades.

## 1.7 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples as to origin and intended use in Work.

.2 Deliver samples prepaid to Departmental Representative's business address.

.3 Notify Departmental Representative in writing, at the time of submission, of deviations in samples from requirements of Contract Documents.

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

.5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

**1.8 PROGRESS PHOTOGRAPHS**

.1 On commencement of Work and at weekly intervals, thereafter, supply Departmental Representative with electronic copies of three (3) different view photographs to indicate progress of Work. Take photographs from locations selected by Departmental Representative.

.2 Photographs are to be provided in electronic format using either RAW or high-quality JPEG compression architectures and taken from a minimum 2MP digital camera. PDFs, scanned analog photos, and sketches are not acceptable.

.3 Submit progress photographs at weekly and with monthly application for payment.

**Part 2 Products**

Not Used.

**Part 3 Execution**

Not Used.

**END OF SECTION**

# SHOP DRAWING / SUBMITTAL TRANSMITTAL

Submittal Description: _____ File Number: _____

Submittal Number: _____

Specification Section: _____

| ENGINEER | CONTRACTOR |
|---|---|
| **Associated Engineering** | |
| 500, 9888 Jasper Avenue NW | |
| Edmonton, AB T5J 5C6 Tel: (780) 451-7666 | |
| Attention: Document Control | Attention: |
| Associated Engineering Project No.: 2021-3089 | Contractor Project No.: |

| **Routing:** | | | | | |
|---|---|---|---|---|---|
| | Date Sent | | **Contractor to Engineer** | | Date Received |
| | Date Sent | | **Engineer to Contractor** | | Date Received |

| | | | |
|---|---|---|---|
| **Owner:** | | **Contract:** | |
| **Project:** | | **Contract Number:** | |

Enclosed are the following ___ Submittals for Review ___ Submittals for Information ___ O&M Manual Data

Remarks: _____

| CONTRACTOR | | | ENGINEER | | | |
|---|---|---|---|---|---|---|
| **Item** | **Copies Submitted** | **Description (Drawing Number, Revision Number, Title, Item Description)** | **Copies Returned** | **Review Action[1]** | **Reviewer Initials** | **Comments Attached** |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |

[1] Review Action: **REV** = Reviewed; **RAR** = Revise and Resubmit; **NR** = Not Reviewed

**Contractor Certification** (certify either A or B):

☐ A. We have verified that the material or equipment covered by this submittal meets all specified requirements, including coordination with all related work.

☐ B. We have verified that the material or equipment covered by this submittal meets all specified requirements except for the noted deviations. (Record deviations below or on attachments. Be specific.)

| **Item Number** | **Deviation** |
|---|---|
| | |
| | |
| | |

**Certified by**: _____

Contractor's Signature

## Part 1 General

### 1.1 LATEST EDITIONS

.1 All references to specifications, standards, or methods of technical associations refer to the latest adopted revision, including all amendments, in effect on the date of submission of bids, except where a date or issue is specifically noted.

### 1.2 ABBREVIATIONS

| | |
|---|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| ACI | American Concrete Institute |
| AFBMA | Antifriction Bearing Manufacturers Association |
| AGA | American Gas Association |
| AGMA | American Gear Manufacturers Association |
| AISC | American Institute of Steel Construction |
| AMCA | Air Moving and Conditioning Association |
| ANSI | American National Standards Institute |
| API | American Petroleum Institute |
| ARI | Air-Conditioning and Refrigeration Institute |
| ASCE | American Society of Civil Engineers |
| ASHRAE | American Society of Heating, Refrigerating and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| AWMAC | Architectural Woodworkers Manufacturers Association of Canada |
| AWPA | American Wood Preservers Association |
| AWS | American Welding Society |
| AWWA | American Water Works Association |
| CAN | Canadian National Standard |
| CBM | Certified Ballast Manufacturers |
| CBTIC | Clay Brick and Tile Institute of Canada |
| CEC | Canadian Electrical Code |
| CEMA | Canadian Electrical Manufacturers Association |
| CGA | Canadian Gas Association |
| CGRA | Canadian Good Roads Association |
| CGSB | Canadian General Standards Board |
| CISC | Canadian Institute of Steel Construction |
| CITC | Canadian Institute of Timber Construction |
| CLA | Canadian Lumbermen Association |
| CMAA | Crane Manufacturers Association of America |
| CMHC | Canada Mortgage and Housing Corporation |
| CPCA | Canadian Painting Contractors Association |
| CPCI | Canadian Prestressed Concrete Institute |
| CRCA | Canadian Roofing Contractors Association |
| CRSI | Concrete Reinforcing Steel Institute |
| CSA | Canadian Standards Association |
| CSSBI | Canadian Sheet Steel Building Institute |
| CUA | Canadian Underwriters Association |
| CWB | Canadian Welding Bureau |
| CWC | Canadian Wood Council |
| CSPI | Corrugated Steel Pipe Institute |

| | |
|---|---|
| EEI | Edison Electric Institute |
| EEMAC | Electrical and Electronic Manufacturers of Canada |
| FFPC | Federal Fire Prevention Committee |
| FM | Factory Mutual Engineering Corporation |
| IAO | Insurers' Advisory Organization |
| IBRM | Institute of Boiler and Radiator Manufacturers |
| IEC | International Electrotechnical Commission |
| IEE | Institution of Electrical Engineers (U.K.) |
| IEEE | Institute of Electrical and Electronics Engineers |
| IES | Illuminating Engineering Society |
| IGMAC | Insulated Glass Manufacturers Association of Canada |
| IPCEA | Insulated Power Cable Engineers Association |
| ISA | Instrument Society of America |
| ISO | International Standardization Organization |
| LEMA | Lighting Equipment Manufacturers Association |
| LTIC | Laminated Timber Institute of Canada |
| MMA | Millwork Manufacturers Association |
| NAAMM | National Association of Architectural Metal Manufacturers |
| NBC | National Building Code of Canada |
| NEC | National Electrical Code |
| NESC | National Electric Safety Code |
| NFPA | National Fire Protection Association |
| NLGA | National Lumber Grade Authority |
| OECI | Overhead Electrical Crane Institute |
| PCA | Portland Cement Association |
| PCI | Prestressed Concrete Institute |
| RLM | RLM Standards Institute |
| RTAC | Road and Transportation Association of Canada |
| SAE | Society of Automotive Engineers |
| SBI | Steel Boilers Institute |
| SJI | Steel Joist Institute |
| SSPC | Steel Structures Painting Council |
| TTMAC | Terrazzo, Tile and Marble Association of Canada |
| ULC | Underwriters' Laboratories of Canada |
| USFG | United States Federal Government |
| WCB | Workers' Compensation Board |

## 1.3 CONFORMANCE

.1 Conform to these standards, in whole or in part as specifically requested in Specifications.

.2 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves the right to have such products or systems tested to prove or disprove conformance.

.3 The cost for such testing will be born by Owner in the event of conformance with Contract Documents or by Contractor in the event of non-conformance.

**Part 2 Products**

Not Used.

**Part 3 Execution**

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 INSTALLATION/REMOVAL

.1 Provide temporary utilities in order to execute the work expeditiously.

.2 Make necessary applications to authorities having jurisdiction, obtain required permits, and pay all fees and related charges.

.3 Remove from site all such work after use.

.4 Restore site to clean, sanitary condition.

### 1.2 POWER

.1 Maximum power supply of 15 kVA, at 208 V, 3 phase, 60 Hz is available and will be provided for construction use at no cost. Connect to existing power supply in accordance with Canadian Electrical Code. Contractor will need to provide breaker. Panel is located approximately 50m from the work area.

.2 Electrical power and lighting systems installed under this Contract may be used for construction requirements with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage. Replace lamps which have been used over period of 3 months.

### 1.3 WATER SUPPLY

.1 Non-potable water supply is available in existing building and will be provided for construction usage at no cost.

.2 Permanent water supply system installed under this Contract may be used for construction requirements with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage.

.3 Locate temporary water supply at a location acceptable to Departmental Representative.

.4 Potable water is not available on the site and the Contractor will need to provide and pay for any potable water needs for the construction activities.

### 1.4 TELEPHONE

.1 Telephone services are not available on the site

### 1.5 MAINTENANCE OF PUBLIC UTILITIES

.1 Arrange Work to avoid interruption of utilities serving the public. Pay for damage.

.2 Where interruption of public utilities is unavoidable, obtain prior approval for interruption from responsible authority.

.3 As required by utility authority, establish and pay for temporary relocation of utility during construction.

**Part 2 Products**

Not Used

**Part 3 Execution**

Not Used

**END OF SECTION**

## Part 1 General

### 1.1 QUALITY

.1 Products, materials, equipment and articles (referred to as Products throughout the specifications) incorporated in Work shall be new, not damaged or defective, and of the best quality (compatible with specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.

.2 Defective Products, whenever identified prior to the completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is a precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to the quality or fitness of Products, the decision rests strictly with the Departmental Representative based upon the requirements of the Contract Documents.

.4 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building.

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

.6 The Departmental Representative will be permitted access to manufacturing facilities upon request.

.7 The Department Representative will have unrestricted access to the Works at all time.

### 1.2 AVAILABILITY

.1 Immediately upon signing Contract, review Product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of Products are foreseeable, notify the Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In the event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character, at no increase in Contract Amount.

### 1.3 STORAGE, HANDLING AND PROTECTION

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

.2 Store packaged or bundled Products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in a heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged Products and to the satisfaction of Departmental Representative.

## 1.4 TRANSPORTATION

.1 Pay costs of transportation of Products required in the performance of Work.

## 1.5 FASTENINGS

.1 Provide stainless steel metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in the affected specification Section.

.4 Space anchors within their load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

## 1.6 QUANTITIES

.1 Schedules of piping, fittings, reinforcing, or other materials indicating quantity and/or dimension, which are shown on the drawings or in the specifications, are intended only to assist Contractor with quantity takeoff. Quantities and dimensions shown therein are not guaranteed to be accurate and must be checked by Contractor prior to placing an order for such materials.

.2 Claims for additional payment resulting from variations between quantities shown on the schedules and those actually installed will not be accepted.

**Part 2 Products**

Not Used.

**Part 3 Execution**

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 MOBILIZATION

.1 Mobilization shall consist of preparatory work and operations including, but not limited to, those necessary to the movement of personnel, equipment, supplies and incidentals to Site; and for all other work and operations which must be performed, or costs incurred prior to beginning work on the various items on Site.

.2 Submit all required pre-mobilization submittals prior to mobilization. This includes, but is not limited to insurance certificates, laydown plan, construction schedule, critical shop drawings, Health and Safety Program, and emergency response plan.

### 1.2 DEMOBILIZATION

.1 Demobilization shall consist of cleanup work, restoration of disturbed areas, repairs to adjacent areas, and operations including, but not limited to, those necessary to the removal of personnel, equipment, and incidentals from Site.

## Part 2 Products

Not Used.

## Part 3 Execution

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittals.

.2 Submit site specific Health and Safety Program: Within 14 days after date of Notice to Proceed and prior to mobilization. Health and Safety Program must include:

.1 Results of site specific safety hazard assessment.

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

.3 Submit weekly safety meeting minutes and daily toolbox talks to the Departmental Representative on a monthly basis.

.4 Submit Construction Safety Checklists after completion.

.5 Submit copies of all reports or directives issued by Federal and/or Provincial health and safety inspector(s).

.6 Submit copies of incident and accident reports.

.7 Submit on site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.

.8 Submit Safety Data Sheets (SDS).

.9 Submit personnel training requirements including names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.

.10 Submit, and post at the Work site, the emergency numbers for police, fire and ambulance for the locale of the Work, as well as the names and after hours numbers for key site personnel related to health, safety or security of the site.

### 1.2 SAFETY ASSESSMENT

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

.2 Submit hazard assessment report to Departmental Representative.

### 1.3 MEETINGS

.1 Attend health and safety pre construction meeting.

.2 Arrange for "tool box" safety meetings and submit reports.

### 1.4 REGULATORY REQUIREMENTS

.1 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.

## 1.5 GENERAL REQUIREMENTS

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

.2 Correct deficiencies and re submit Health and Safety Program when so requested by Departmental Representative.

## 1.6 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 Program.

## 1.7 COMPLIANCE REQUIREMENTS

.1 Comply with OH&S Legislation.

## 1.8 UNFORSEEN HAZARDS

.1 Should any unforeseen or peculiar safety related factor, hazard, or condition become evident during performance of Work, immediately stop work and follow procedures in place for employee's right to refuse work in accordance with the OH&S Legislation. Advise Departmental Representative verbally and in writing.

## 1.9 CORRECTION OF NON COMPLIANCE

.1 Immediately address health and safety non compliance issues identified by Departmental Representative or designated safety inspector.

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

.3 Be aware that Departmental Representative may stop Work if non compliance of health and safety regulations is not corrected.

## 1.10 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 Stop Work when necessary or advisable for reasons of health and safety.

.3 Be aware that Departmental Representative or designated safety inspector may stop Work when deemed necessary or advisable for reasons of Health and Safety. All costs attributed to such a stoppage are to be paid for by the Contractor.

**Part 2 Products**

Not Used.

**Part 3 Execution**

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting and patching means acceptance of existing conditions.

.4 Provide temporary structural supports to ensure structural integrity of surroundings.

.5 Provide devices and methods to protect other portions of project from damage.

.6 Provide protection from elements for areas which may be exposed by uncovering work.

.7 Maintain excavations free of water.

### 1.2 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in the specifications, install or erect Products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative, in writing, of conflicts between the specifications and manufacturer's instructions, so that Departmental Representative may establish the course of action.

.3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Amount.

### 1.3 WORKMANSHIP

.1 General:

.1 Execute work by workers experienced and skilled in the respective duties for which they are employed. Notify Departmental Representative immediately if required Work is such as to make it impractical to produce required results.

.2 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with Departmental Representative, whose decision is final.

.2 Co-Ordination:

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for co-ordination and placement of openings, sleeves and accessories.

.3 Protection of Work in Progress:

.1 Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by Departmental Representative, at no increase in Contract Amount.

.2 Prevent overloading of any part of the building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated, without written approval of Departmental Representative.

.4 Remedial Work:

.1 Perform remedial work required to repair or replace the parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with the materials affected. Perform in a manner to neither damage nor endanger any portion of Work.

.5 Location of Fixtures:

.1 Consider the location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of a conflicting installation. Install as directed.

.6 Concealment:

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Departmental Representative if there is a contradictory situation. Install as directed by Departmental Representative.

## 1.4 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with a minimum of disturbance to Work and building occupants.

.2 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in a manner approved by Authority having Jurisdiction, stake and record location of capped service.

# Part 2 Products

Not Used.

# Part 3 Execution

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 MATERIALS

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

### 1.2 FINAL CLEANING

.1 In preparation for Certificate of Completion of the project, perform final cleaning.

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

.3 Remove waste products and debris other than that caused by Owner or other Contractors.

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

.5 At the Contractor's expense, repair any damages that may have been caused to areas adjacent to the Works.

.6 Clean roofs, downspouts, and drainage systems if applicable.

.7 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from interior and exterior finished surfaces including glass and other polished surfaces.

.8 Clean lighting reflectors, lenses, and other lighting surfaces.

.9 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.10 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.11 Broom clean paved surfaces; rake clean other surfaces of grounds.

.12 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.13 Remove snow and ice from access to building.

.14 Inspect valve boxes, manholes and hydrants to check for debris and proper operation.

.15 Wash down and clean flooring in areas affected by construction.

.16 Operate valves, including those existing prior to construction, to ensure that no damage has occurred, or debris accumulated, due to cleanup activities.

**Part 2 Products**

Not Used.

**Part 3 Execution**

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 START-UP AND COMMISSIONING

.1 Test, adjust, balance and put into trial operation all mechanical, electrical, and control works and equipment.

.2 Pressure test all piping installed under the Works to on and a half (1.5) times their operating pressure, or to their maximum pressure, whichever is less, for four (4) hours. Provide results to the Departmental Representative.

.3 Leak test the new source water tank by filling the with tank to the overflow limits and holding for forty-eight (48) hours. The leak test shall be considered as successfully completed when:

.1 The tank level has not dropped more than 5mm during the test.

.2 No signs of water leaks are noted from the tank joint, connections, flanges, and sections during the test.

.4 Test water will be provided by the Departmental Representative.

.5 The Contractor is responsible for proper disposal of all test materials, including test water.

.6 The Contractor will provide the Departmental Representative with seventy-two (72) hours notice prior to beginning start-up and commissioning activity.

.7 Commissioning will not be allowed to commence until all tests have been completed and passed and all documentation has been provided to the Departmental Representative.

.8 The Departmental Representative can provide Commissioning Forms at the Contractor's request.

.9 The Contractor shall, with the support of the Departmental Representative, place the Works into continuous operation, first in a manual fashion and then in an automatic fashion, after all testing, balancing, and tuning has taken place.

.10 When the Works is in operation in an automatic fashion that is acceptable to the Departmental Representative and fully integrated into the process, the Commissioning Period will commence.

.11 The Works shall remain in continuous automatic operation during the commissioning period.

.12 The Commissioning Period will be defined as a period of not less than 720 continuous hours for which the Works operates in an automatic fashion.

.13 Should the Works suffer a major error, failure, or unplanned stoppage during the Commissioning Period, the Commissioning period will restart from the beginning once the Works is repaired and placed back into continuous operation.

.14 The Commissioning Period will be accepted as completed when the Works has been in operation in an automatic fashion for 720 continuous hours without error, failure, or unplanned stoppage.

.15 The Contractor will not be able to invoice more than 90% of the contract value (excluding allowances and PC sums), until the Commissioning Period has been successfully completed.

**1.2 ADJUSTING**

.1 Make adjustments to equipment and other works, as necessary to place the Work into operation.

.2 Trial operate all units. Check mechanical operation. Check for overload and undue vibration. Make necessary adjustments.

.3 Dowel equipment as directed by Departmental Representative.

.4 Loop check pneumatic lines to determine correct operation of controllers, control valves, and appurtenances.

.5 Blow down instrument pneumatic supply and signal lines prior to connection and leak testing.

.6 Adjust the setpoints of field mounted pressure, level and temperature switches.

**Part 2 Products**

Not Used.

**Part 3 Execution**

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 RECORD DRAWINGS

.1 Departmental Representative will provide drawings in electronic format for record drawing purposes.

.2 Identify drawings as "Project Record Copy".

.3 Maintain record drawings in new condition.

.4 Make record drawings available for inspection on-site by Departmental Representative.

.5 Record neatly and accurately deviations from Contract Documents.

.6 Mark changes in red.

.7 Record following information:

- .1 Depths of various elements of foundation in relation to Basement Level.
- .2 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
- .3 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
- .4 Field changes of dimension and detail.
- .5 Changes made by Change Order or field direction.

.8 At completion of project and prior to final inspection, submit record drawings to Departmental Representative.

## Part 2 Products

Not Used.

## Part 3 Execution

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 SUMMARY

.1 This Section includes the following:

.1 Demolition and removal of buildings and structures.

.2 Demolition and removal of site improvements adjacent to a building or structure being demolished.

.2 Drawings contain details that suggest directions for solving some of the major demolition and removal requirements for this project; contractor representative is required to develop these details further by submitting a demolition plan to Engineer for review.

### 1.2 REFERENCE STANDARDS

.1 National Research Council Canada (NRC)

.1 National Building Code of Canada (NBC).

.2 National Fire Code of Canada (NFC).

.2 Occupational Health and Safety (OHS)

.1 Occupational Health and Safety Act.

### 1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Action Submittals: Provide the following submittals before mobilization:

.1 Demolition Plan: Contractor to provide detailed plan for means and methods to be used in demolition activities. Include tools planned to be used.

### 1.4 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and other applicable provincial/federal legislation.

.1 Comply with hauling and disposal regulations of Authority Having Jurisdiction.

.2 Standards: Comply with ANSI A10.6 and NFPA 241.

.2 Regulatory Requirements: Perform work of this Section in accordance with the following:

.1 Federal Workers' Compensation Service.

.2 Government of Canada, Labour Program: Workplace Safety.

## Part 2 Products

### 2.1 EQUIPMENT

.1 Leave mechanical and electrical equipment running only while in use, except where extreme temperatures prohibit shutting down.

.2 Demonstrate that tools and machinery are being used in manner which allows for salvage of materials in best condition possible.

.3 Equipment for concrete demolition and removal must not include any vibrations that may induce cracking of adjacent structures.

## Part 3 Execution

### 3.1 EXAMINATION

.1 Review existing conditions and correlate with requirements indicated to determine extent of structure demolition required.

.2 Review Project Record Documents of existing construction provided by Consultant

.3 Consultant does not guarantee that existing conditions are the same as those indicated in Project Record Documents.

### 3.2 PREPARATION

.1 Protection:

.1 Keep noise, dust, and inconvenience to occupants to minimum.

.2 Protect building systems, services and equipment.

.3 Provide temporary dust screens, covers, railings, supports and other protection as required. Provide dust control measure to Consultant for review.

.4 Temporarily support all piping and equipment as required during demolition activities.

### 3.3 DEMOLITION SALVAGE AND DISPOSAL

.1 Remove parts of existing building to permit new construction.

.2 Trim edges of partially demolished building elements to tolerances as defined by Consultant to suit future use.

### 3.4 STOCKPILING

.1 Departmental Representative to review and approve all demolition material stockpile areas.

.1 Contractor to provide material stockpile locations as part of the demolition plan.

### 3.5 REMOVAL FROM SITE

.1 Transport material designated for alternate disposal by approved facilities and in accordance with applicable regulations.

.2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.

### 3.6 REPAIRS

.1 General: Promptly repair damage to adjacent construction caused by structure demolition operations.

.2 Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

.3 Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

## 3.7 CLEANING AND RESTORATION

.1 Keep site clean and organized throughout demolition procedure.

.2 Upon completion of project, make whole all affected existing portions of the facility to match the condition of adjacent not affected areas.

**END OF SECTION**

# Part 1 General

## 1.1 REFERENCE STANDARDS

.1 Conform to the latest edition of the following reference standards:

- .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .2 CAN/CSA-A23.3, Design of Concrete Structures.
- .3 CSA-G30.18, Carbon Steel Bars for Concrete Reinforcement.
- .4 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .5 ASTM A82/A82M, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- .6 RSIC, Reinforcing Steel Manual of Standard Practice.

## 1.2 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 Indicate placing of reinforcement and:
  - .1 Bar bending details.
  - .2 Lists.
  - .3 Quantities of reinforcement.
- .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3.
  - .1 Provide class B splice unless shown otherwise and stagger splices.

## 1.3 DELIVERY, STORAGE AND HANDLING

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

.2 Storage and Handling Requirements:

- .1 Store materials off ground and cover to keep dry.
- .2 Replace defective or damaged materials with new.

# Part 2 Products

## 2.1 MATERIALS

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

.2 Reinforcing steel: billet steel, grade 400R, deformed bars to CSA-G30.18 or equivalent.

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

.4 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.

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

**2.2 FABRICATION**

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2.

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

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

**2.3 SOURCE QUALITY CONTROL**

.1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.

.2 Upon request inform Departmental Representative 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 Departmental Representative.

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

.3 Replace bars, which develop cracks or splits.

**3.2 PLACING REINFORCEMENT**

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

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

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

.4 Provide tiers and spacers for slab reinforcing to prevent movement or displacement during concrete pour and to maintain specified reinforcing cover as shown on drawings.

.5 All reinforcing steel shall be cleaned to the satisfaction of the Departmental Representative, and free of any rust, scale, mortar, paint, oil mud, ice, or other foreign substances, which will reduce bond, prior to placement of concrete.

**END OF SECTION**

# Part 1 General

## 1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

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

.2 CSA A283 Qualification Code for Concrete Testing Laboratories.

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

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

.2 ICRI (International Concrete Repair Institute)

.1 ICRI Surface Preparation Guide Number 03732.

## 1.2 SUBMITTALS

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

.2 Shop Drawings:

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

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

.4 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete from batch time to time of discharge.

## 1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials as per manufacturer instructions.

.2 Delivery and acceptance requirements:

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

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

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

## Part 2 Products

### 2.1 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance.

### 2.2 MATERIALS

.1 Cement: to CSA A3001, Type GU.

.2 Supplementary cementing materials: to CAN/CSA-A23.1.

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

.4 Aggregates: Fine and coarse aggregates: to CAN/CSA-A23.1, stockpiled separately.

.5 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.2 Chemical admixture: to ASTM C494/494M or C1017. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

.6 Non-shrink compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2.

.1 Compressive strength: 35 MPa at twenty-eight (28) days.

.2 Maintain surfaces and ambient air temperatures of minimum 10°C for a minimum period of twenty-four (24) hours prior to, during and seventy-two (72) hours after application.

.3 Prevent loss of moisture from concrete by maintaining surfaces continuously moist for at least seven (7) days at a minimum temperature of 10°C after concreting.

.7 Curing compound: to CSA A23.1/A23.2.white.

### 2.3 MIXES

.1 Proportion normal density concrete in accordance with CAN/CSA-A23.1, Table 11.

.2 Volume stability to be considered in mix proportions to prevent creep and shrinkage in accordance with Clause 4.1.1.9 and Clause 4.3.6 of CSA A23.1.

.3 Mix design to minimize shrinkage.

.4 Do not change concrete mix without prior approval of Departmental Representative. Should change in material source be proposed, new mix design to be approved by Departmental Representative.

.5 Specified strength: 35 MPa at 28 days.

.6 Exposure class: C-1.

.7 Exposure to sulphates: No.

.8 Air content: 1-4%.

## Part 3 Execution

### 3.1 PREPARATION

.1 Obtain Departmental Representative's written approval before placing concrete.

.1 Provide forty-eight (48) hours minimum notice prior to placing of concrete.

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

.3 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing including provisions for adverse weather.

### 3.2 INSTALLATION/APPLICATION

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

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

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

.4 Do not place load upon new concrete until authorized by Departmental Representative.

.5 Minimum three (3) days to elapse between adjacent pours (continuous sequence pattern).

.6 Construction joints to be reviewed and approved by Departmental Representative.

.7 Temperature of the concrete during discharge into the forms is to CSA A23.1. Typical methods of reducing mix temperature include evaporative cooling of aggregate stockpiles, use chilled batch water or the inclusion of ice to the mix at the plant, taking care to maintain the design water/cementing material ratio. Obtain approval of Departmental Representative for proposed method of temperature control.

.8 Do not place concrete against any surfaces such as rebar, concrete or formwork that have a surface temperature of less than 5°C.

.9 Consolidate concrete using internal vibrators. Use pencil vibrators where larger sizes are unsuitable.

.10 Grout under machinery using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

### 3.3 CURING

.1 In accordance with CSA A23.1 - Concrete Materials and Methods of Concrete Construction.

.2 Provide wet curing for not less than seven (7) consecutive days in all cases, at not less than 10ºC.

.3 Acceptable curing methods:

.1 Ponding or continuous sprinkling.

.2 Absorptive mat or fabric kept continuously wet.

.3 Other moisture retaining method approved by the Departmental Representative.

## 3.4 SURFACE TOLERANCE

.1 Concrete tolerance to CSA A23.1.

## 3.5 FIELD QUALITY CONTROL

.1 Submit report as described in PART 1.2 - SUBMITTALS.

- .1 Concrete pours.
- .2 Slump.
- .3 Air content.
- .4 Compressive strength at seven (7), and twenty-eight (28) days.
- .5 Concrete temperature.

.2 Concrete testing: to CSA A23.1/A23.2 by testing laboratory approved by Departmental Representative and paid for by Contractor.

.3 Take concrete samples for testing in accordance with CSA A23.2. One strength test shall consist of test cylinders for each 50 $m^3$ of concrete, or portions of each mix type of concrete or each separate type of structural element in any one (1)-day's pour. For concrete with specified 28-day strength, strength test shall consist of minimum four test cylinders. Test first cylinder at seven (7) days and remaining two (2) at twenty-eight (28) days.

.4 Every load or batch of concrete shall be tested for air content and slump until satisfactory control is established and the Departmental Representative requires fewer tests. Whenever a test falls outside the specified limits, the testing frequency shall revert to one (1) test per load or batch until satisfactory control is re-established.

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

## 3.6 CLEANING

.1 Do not allow concrete wash water, 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.

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

.3 Dispose of waste in accordance with applicable local, Provincial and National regulations.

**END OF SECTION**

## Part 1 General

### 1.1 GENERAL

.1 This section contains detailed piping and valve specifications.

### 1.2 PIPING IDENTIFICATION

.1 Refer to drawings for line identification legend.

## Part 2 Products

### 2.1 GENERAL

.1 Line Code E4 as follows:

| **SERVICE: As shown on Drawings** | | **LINE CODE: E4** |
|---|---|---|
| **PRIMARY FLANGE RATING: CLASS 150** | | **DESIGN PRESSURE: 1900 kPa** |
| **TEMPERATURE (MAX): 60°C** | | **CORROSION ALLOWANCE: N/A** |
| **ITEM** | **SIZES** | **GENERAL DESCRIPTION** |
| Pipe | 200 mm & smaller | CPVC, rigid, to CSA B137.3, Sch. 80. |
| Fittings | 200 mm & smaller | CPVC, socket weld, Sch. 80. |
| Flanges | All sizes | Class 150, CPVC, socket weld. |
| Joints | All sizes | Solvent cement to be non-silicon. IPS 724 or approved equal. |
| Bolts | All sizes | Stainless steel, to ASTM A193 Grade B8. |
| Gaskets | 200 mm & smaller | Viton ring type for RF flanges, full face for FF flanges, 3 mm thick. |
| Nuts | All sizes | Stainless steel, hex head to ASTM A194. Grade 8 |
| Ball Valves | 65 mm & smaller | True union full port ball valve, CPVC body, PTFE (Teflon) seats, EPDM or Viton O-ring seals. Products: Chemline Type 21; or, equal of Hayward, or approved alternate. |

## Part 3 Execution

Not Used.

**END OF SECTION**

## Part 1 General

### 1.1 SUMMARY OF WORK

.1 This Section refers to the supply, on-site fabrication, installation, start-up and commissioning of the source water collection tank (SWCT) at the Miette Hot Springs, in Jasper, Alberta. The work shall include, but not be limited to, the following items:

.1 Supply and install one (1) modular steel-bolted SWCT complete with coating to withstand the spring water quality.

.2 The SWCT will be complete with all required piping connections as detailed in these specifications and drawings.

### 1.2 CODES AND STANDARDS

.1 The units shall be in compliance with the appropriate sections of the following codes:

.1 AISC, American Institute of Steel Construction.

.2 American Iron and Steel Institute (AISI).

.3 American Society of Mechanical Engineers (ASME).

.4 American National Standards Institute (ANSI).

.5 American Society for Testing and Materials (ASTM).

.6 American Water Works Association (AWWA).

.1 AWWA D-103 Factory-Coated Bolted Carbon Steel Tanks for Water Storage.

.7 Canadian Standards Association (CSA).

.8 ISA, Instrument Society of America.

.9 NEC, National Electrical Code.

.10 NFPA, National Fire Protection Association.

.11 National Electrical Manufacturers Association (NEMA).

.12 Steel Structures Painting Council (SSPC).

.13 Alberta Building Code.

.14 CPC, Canadian Plumbing Code.

.15 OSHA, Occupational Safety & Health Act.

### 1.3 SUBMITTALS

.1 Provide submittals in one (1) complete submittal in accordance with Division 01.

.2 Storage tank data to include:

.1 Manufacturer’s specifications for all equipment supplied.

.2 Outline and arrangement drawings showing size of the tank, and location and size of all connections, and size and location of tank support columns.

.3 Materials of construction.

.4 Equipment weight.

.5 Internal coating product, complete with maintenance instructions. Coating product will be approved at the discretion of the Departmental Representative.

.6 Bolted joint sealant product information.

## 1.4 OPERATING AND MAINTENANCE DATA

.1 Provide operating and maintenance data as specified in Division 01.

.2 Data to include:

.1 Details of operation, servicing and maintenance.

.2 Recommended spare parts list with names and addresses of suppliers, including coating information.

# Part 2 Products

## 2.1 STORAGE TANKS

.1 Supply and install one (1) SWCT and related appurtenances, refer to Contract Drawings for size constraints, arrangement, connection types, sizes and locations.

.1 Design Temperature Range: 0.5°C to 60°C.

.2 Withstand the following water quality parameters:

| Analyte | Sampling Results June 24, 2021 | Miette Hot Springs Historical Highlights Data | Units |
|---|---|---|---|
| Chloride | 16.7 | 4.2 | mg/L |
| Bicarbonate | 119 | 124.3 | mg/L |
| Calcium – Total | 333 | 407 | mg/L |
| Magnesium – Total | 63.4 | 56 | mg/L |
| Potassium – Total | 13.9 | 14.2 | mg/L |
| Sodium – Total | 9.56 | 10.5 | mg/L |
| Sulfate (Note: Varies throughout the year, past sampling results from 6/24/2021 are consistent with 1989, 2000 and 2001 sampling data) | 941 | 130 | mg/L |
| Fluoride | 2.72 | N/A | mg/L |
| Turbidity | 1.11 | N/A | NTU |
| pH | 8.05 | N/A | - |

.3 Withstand a chlorine concentration of up to 55 mg/L.

.4 Tanks to be closed top design.

.5 Tanks shall be modular bolted steel construction.

.6 Tanks shall be fabricated and erected on-site in the tank location.

.7 Tank sections must be small enough to fit through a traditional double person door.

.8 Tanks to be installed 3 ft. from the foundation walls.

.9 Tank dimensions as shown in the attached drawings.

.10 Tank lining and fittings shall include epoxy coating to protect tank material.

.11 Accessories:

.1 Tank shall have one (1) 800 mm (32″) manway located on the top of the tank.

.2 All connections shall have blinded flange connections.

.12 The tank shall have the following connections with locations as shown on the Contract Drawings:

.1 One (1) 150 mm flanged connection for influent spring water (south face of tank).

.2 One (1) 150 mm flanged connection for drain (south face of tank).

.3 One (1) 200 mm flanged connection for the overflow (south face of tank).

.4 One (1) 100 mm flanged connection for the effluent to the pools (south face of tank).

.5 One (1) 80 mm flanged connection for a future connection to a heat exchanger (east face of tank).

.6 One (1) 150 mm flanged connection for future venting (on top of tank).

.7 One (1) 100 mm flanged connection for LIT (on top of tank).

.8 One (1) 800 mm minimum manway access (on top of tank).

.13 Product to be held is water from the combined three hot spring sources.

## Part 3 Execution

### 3.1 QUALITY CONTROL

.1 Tank manufacturer to submit Quality Control documentation prior to shipping tank components:

.1 Quality control documentation must include material test reports and coating inspection reports.

### 3.2 SHIPMENT AND STORAGE

.1 Flanged connections shall be blanked with bolted wood or metal covers no smaller than the flange outside diameter. Threaded connections shall be fitted with pipe plugs.

.2 The packages containing the above shall be tagged individually with the name of the project and the purchase order number.

.3 Equipment shall be shipped in pieces to be assembled in-place on-site. The equipment components may be stored before installation and shall be prepared for storage before the shipment. The Supplier shall provide explicit instruction on the storage of the materials to prevent deterioration.

.4 Coordinate scheduling of equipment shipment, delivery, off-loading and storage.

.5 Store materials in dry, heated and secure enclosure.

.6 Protect equipment from damage, construction activities, dust, damp, adverse weather and temperatures.

## 3.3 INSTALLATION

.1 Make equipment installation and connections by tank manufacturer trained, skilled fabricators under the instruction and supervision of the tank manufacturer's field erection inspector and in accordance with the tank manufacturer's requirements.

.2 Contractor must allow for temporary hoisting equipment required to fabricate the tanks.

.3 Manufacturer's field erection inspector must submit in writing acceptance of the tank installation prior to hydrostatic testing.

.4 Tank internal visual inspection must be made available to the Departmental Representative prior to final closeup and hydrostatic testing.

## 3.4 HYDROSTATIC TESTING

.1 Clean tanks of debris and construction materials prior to testing.

.2 Hydrostatically test tanks to the maximum water level and fill tanks in strict accordance with tank manufacturer's requirements for the test fill rate – exceeding this rate may void the manufacturer's warranty.

.3 Hydrostatic test shall be a minimum of 12 hours at the maximum water level.

.4 All flanges and tank seam/joints shall be inspected for leakage.

.5 Any indication of leakage is not acceptable. Tank manufacturer shall provide written requirements for the corrective action if any indication of leakage is found. Tank shall be retested until no indication of leakage is found.

**END OF SECTION**