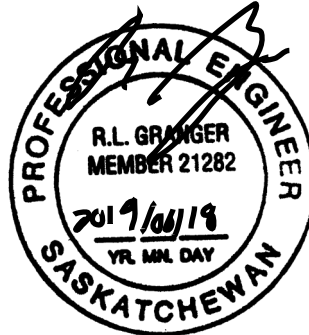


Part 1 General

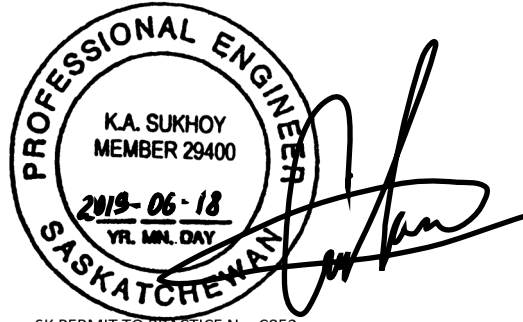
1.1 SEALING ENGINEERS

.1 Mechanical



SK PERMIT TO PRACTICE No. C852

.2 Electrical



SK PERMIT TO PRACTICE No. C852

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

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Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract involves the replacement of sanitary and storm sewer piping in the crawlspace of the Regional Psychiatric Centre in Saskatoon, Saskatchewan.
- .2 Perform work in accordance with CSC RPC Saskatoon Technical Requirements and Institutional Requirements for Contractors. Perform all work indicated on the drawings including, but not limited to, the following:
 - .1 Demolition:
 - .1 Remove and dispose of approximately 1500 feet of existing above ground sanitary and storm sewer piping and fittings from the crawlspace.
 - .2 Remove and dispose of 6 existing duplex sump pump and float systems (12 pumps total) and 1 single inline sump pump.
 - .3 Remove and dispose of existing electrical power wiring and conduit from sump pumps to existing duplex control panels.
 - .4 Remove and dispose of existing 30 A breakers in BOW building sump pump control panels (12 total).
 - .5 Remove and dispose of existing float systems (7 total).

Note: All existing hangers across crawlspace ceiling shall remain. Existing ceiling mounted hangers shall be reused where possible. Install new hangers where required due to damage, corrossions, or deterioration.
 - .2 Construction:
 - .1 Supply and install approximately 1500 feet of above ground sanitary and storm sewer piping and fittings in the crawlspace.
 - .2 Supply and install 6 – 1/2 hp duplex pumps with 4-float systems in existing sump pits
 - .3 Supply and install 1 – 1/3 HP inline centrifugal sump pump.
 - .4 Supply and install 12 – 20 A circuit breakers in existing BOW building control panels.
 - .5 Supply and install new power supply cable from new sump pumps to existing control stations.
- .3 Work includes demolition of all existing systems that are to be replaced in the above work. Any areas damaged during the demolition and renovation of the facility (cut-outs, patching, holes, etc.) must be repaired to its original state.
- .4 Remove all waste material off site and dispose of the waste according to Section 01 74 21 – Construction/Demolition Waste Management and Disposal, and in compliance with local regulations.
- .5 All work on site must be under supervision of Regional Psychiatric Center escorts.
- .6 Work also includes start-up, commissioning, and training of all new systems installed.

- .7 All materials and workmanship must be as per stamped plans and specifications within.

1.2 CONTRACTOR USE OF PREMISES

- .1 Limit use of premises for work to accommodate the continued use of the building as a secure minimum detention facility.
- .2 Co-ordinate use of premises under direction of Departmental Representative
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .4 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .5 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative
- .6 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.3 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations. Work is contained within the crawlspace of the Regional Psychiatric Center. These spaces are not accessible to inmates.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.4 EXISTING SERVICES

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions.
- .3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .4 Provide temporary services when directed by Departmental Representative to maintain critical building and systems.
- .5 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .7 Record locations of maintained, re-routed and abandoned service lines.

1.5 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 In accordance with specifications provided in each section.

Part 3 Execution

- 3.1 In accordance with specifications provided in each section.

END OF SECTION

Part 1 General

1.1 INTENT

- .1 Due to the nature of the facility where the Work is being performed, special procedures must be followed during the course of the Work.
- .2 Comply with requirements specified in this Section and as otherwise determined by the Departmental Representative to maintain the required degree of security and safety for the User, Contractor's Personnel, Departmental Representative's personnel and the public.

1.2 DEFINITIONS

- .1 User - means facility inhabitants and staff.
- .2 "CSC" – Correctional Service Canada
- .3 "Director"- means Director, Warden or Superintendent of the Institution as applicable.
- .4 Perimeter – means the fenced or walled area of the Institution that restrains the movement of the inmates.
- .5 Contractor's Personnel: means all members of the Contractor's work force, all members of Subcontractors' and Sub-contractors' work forces, and all other persons who require access to the facility for performance of Work.
- .6 "Contraband" refers to the following:
 - .1 An intoxicant, including alcoholic beverages, drugs and narcotics.
 - .2 Tobacco or associated tobacco products.
 - .3 An igniting device, lighter or matches,
 - .4 A weapon or component thereof, ammunition for a weapon and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization.
 - .5 An explosive, a bomb or a component thereof.
 - .6 Currency over \$25.00 when possessed by an inmate without prior authorization.
- .7 Any item not described in paragraphs 1.2.1 to 1.2.6 that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.

1.3 ACCESS AND EGRESS

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

1.4 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with DEPARTMENTAL Representative to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security, temporary security must be specified to be reviewed and approved by CSC.
- .4 DEPARTMENTAL Representative will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.
- .5 Closures: protect work temporarily until permanent enclosures are completed.

1.5 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to normal use of premises. Arrange with DEPARTMENTAL Representative to facilitate execution of work.

1.6 EXISTING SERVICES

- .1 Notify DEPARTMENTAL Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give DEPARTMENTAL Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum.

1.7 SPECIAL REQUIREMENTS

- .1 Perform Work in accordance with Regional Psychiatric Centre Technical Requirements and Institutional Requirements for Contractors.
- .2 Construction Escorts:
 - .1 DEPARTMENTAL Representative will provide construction escort as required
 - .2 Notify DEPARTMENTAL Representative 48 hours in advance of when an escort will be required
- .3 Carry out Work Monday to Friday from 8:00 to 16:00 hours unless otherwise approved by the Director.
- .4 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

1.8 ENTRY AND IDENTIFICATION

- .1 Upon each entry to the site, Contractor's Personnel shall contact appropriate staff and identify themselves.
- .2 Entrance may entail issuance of identification cards or badges, notation in a log book or other security procedures.
 - .1 Identification cards or badges, if issued, must be worn at all times and be visible while on site.

1.9 SECURITY

- .1 Comply with all security and safety regulations in force at the facility, at the Contractor's cost.
- .2 Security Clearances:
 - .1 Personnel employed and working on the site must provide a valid form of identification with picture, i.e. Driver's License or Passport.
 - .2 The Contractor must submit a bi-weekly list of staff names and the names any sub-trades and associated staff that will be working on site.
- .3 Security Escort:
 - .1 Personnel employed on this project must be escorted at all times when on site.
 - .2 Submit an escort request to DEPARTMENTAL Representative at least 7 days before service is needed. For requests submitted within time noted above, costs of security escort will be paid for by DEPARTMENTAL Representative. Cost incurred by late request will be Contractor's responsibility.
 - .3 The costs (minimum 4 hours) incurred by the result of the cancelation of Commissionaire escort with less than 48 notification will be Contractor's responsibility.
- .4 Be aware of and comply with the facility's standing orders in case of fire and other emergencies.
- .5 Contractor's Personnel shall confine themselves to their particular duties and areas of Work and shall not converse nor fraternize with facility inhabitants.

1.10 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is not permitted.

1.11 WORKING CONDITIONS

- .1 Subject to Institutional Security requirements, the Warden or designate shall permit the contractor as much freedom of action and movement as is reasonably possible and the contractor in turn shall be expected to cooperate with institutional personnel in ensuring that security requirements are observed by construction workers.

1.12 OBSERVATION AND INSPECTION

- .1 Construction activity and all related movement of personnel and vehicles shall be subject to observation and inspection by institutional staff to ensure that security requirements are met.

1.13 VEHICLE ACCESS AND PARKING AND OPERATION

- .1 The DEPARTMENTAL Representative shall assign the access routes to be used by the construction personnel.
- .2 The DEPARTMENTAL Representative shall assign the parking area for Contractor's Personnel.
- .3 All unattended vehicles must have windows closed, with doors locked, and keys removed

- .4 Vehicles must not contain any type of weapons or ammunition
- .5 Maintain parking areas in good condition during construction period. After completion of Work, restore parking areas to condition equal to that at start of Work.
- .6 Do not park vehicles in fire lanes or access areas unless absolutely necessary for the purpose of carrying out the Work.
- .7 Observe and follow posted speed limits and other traffic control signs on the facility grounds.
- .8 Do not leave vehicle running while unattended, regardless of how long the operator intends to be absent from the vehicle.
- .9 Secure vehicles left on site after normal working hours or overnight. Leave in designated parking area only. Secure tools, ladders, materials etc. when left in or on vehicle. Secure tools out of sight, not in passenger compartment of the vehicle.

1.14 SHIPPING AND ACCESS TO THE SITE

- .1 Contractor shall verify with the Warden or designate the hours during which vehicles will be allowed to enter or leave the institution. Normal construction Work hours on site are 8:00 to 16:00
- .2 Contractor shall have all project material and equipment addressed in his/her name
- .3 The Warden or designate may prohibit or restrict access to any part of the institution
- .4 Private vehicles will not be allowed within the institution's security wall or fence without special permission
- .5 Trucks delivering materials, equipment, and tools to the job will be allowed when the contents are certified at gate entrance. All vehicles are subject to search.

1.15 TOOLS AND EQUIPMENT

- .1 Contractor's Personnel will be personally responsible and accountable for tools carried onto the site, upon entry and upon departure each work day, and upon completion of the Work.
- .2 The contractor shall maintain inventory of all tools and equipment. A copy of these tools and equipment shall be left with the officer
- .3 All tools shall be permanently marked with the owner's name.
- .4 Contractor shall keep all tools and equipment under constant supervision and not leave them unattended without being shut off and properly secured.
- .5 Contractor shall store tools and equipment in places approved by DEPARTMENTAL Representative.
- .6 Do no deposit or allow to accumulate outside confines of work area, unused and waste material, rubbish, and debris, including nails, screws, etc. Remove material so deposited from site immediately.

1.16 PROCEDURES IN EVENT OF LOSS

- .1 If a key, tool, piece of equipment or item of personal property is lost or missing, or there is an unexplained material shortage, take the following action immediately:
 - .1 Notify appropriate facility staff and advise them of the loss. Do not attempt to search for the lost item(s) prior to this notification.
 - .2 Provide facility staff with as much detail about the lost item as possible, including where it was lost and how long it has been missing.
 - .3 Account for all other keys, tools, equipment and materials.

1.17 TELEPHONES

- .1 There will be no installation of telephones, facsimile machines and computers with internet connections permitted within the perimeter of the Institution unless prior approval of the Director is received.
- .2 The Director will ensure that approved telephones, facsimile machines and computers with internet connections are located where they are not accessible to inmates. All computers will have an approved password protection that will stop an internet connection to unauthorized personnel.
- .3 Wireless cellular and digital telephones, including but not limited to devices for telephone messaging, pagers, telephone used as 2-way radios, are not permitted within the Institution unless approved by the Director. If wireless cellular telephones are permitted, the user will not permit their use by any inmate.
- .4 The Director may approve but limit the use of two way radios.

1.18 PRESCRIPTION DRUGS

- .1 Employees of the contractor who are required to take prescription drugs during the workday shall obtain approval of the Director to bring a one a day supply only into the Institution.

1.19 CONTRABAND

- .1 Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on institutional property.
- .2 Discovery of contraband on the construction site and the identification of the person(s) responsible for the contraband shall be reported immediately to the director
- .3 Contractors shall be vigilant with both their staff and the staff of their sub-contractors and suppliers that the discovery of contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the institution for the duration of the construction.
- .4 Presence of arms and ammunition in vehicles of contractors, sub-contractors and suppliers or employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.

1.20 CONTACT WITH INMATES

- .1 Unless specifically authorized, it is forbidden for Workers to come into contact with inmates, to talk with them, to receive objects from them or to give them objects. Any employee doing any of the above will be removed from the site and his/her security clearance revoked.
- .2 It is forbidden to take pictures of inmates, of CSC staff members or of any part of the institution other than those required as part of this contract.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

- .1 Attend project meetings throughout the progress of the work at the call of Departmental Representative.
- .2 Consultant shall prepare agenda and minutes for construction meetings. Meeting minutes shall include significant proceedings and decisions and identify actions by parties.
- .3 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 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 Departmental Representative, Contractor, major Subcontractors, will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

1.3 PROGRESS MEETINGS

- .1 During course of Work and 1 weeks prior to project completion, schedule progress meetings.
- .2 Contractor, major Subcontractors involved in Work, Departmental Representative are to be in attendance.
- .3 Notify parties minimum 5 days prior to meetings.
- .4 Consultant to record minutes of meetings and circulate to attending parties and affected parties not in attendance .
- .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 Review of product/equipment delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.

- .10 Review proposed changes for effect on construction schedule and on completion date.
- .11 Other business.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 NOT USED.

1.2 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

1.3 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.5 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule.
 - .1 Initial site visit and inspection of existing conditions;
 - .2 Shop drawings, work plan, and pre-construction submissions;
 - .3 Site mobilization;
 - .4 Demolition (staged);
 - .5 Work (staged);
 - .6 Commissioning and testing;
 - .7 Final inspections (Consultant, AHJ, and Departmental Representative)
 - .8 Deficiencies;
 - .9 Training;
 - .10 Final certification;

1.6 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.7 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings, Samples.
 - .3 Permits.
 - .4 Mobilization.
 - .5 Excavation.
 - .6 Backfill.

- .7 Slab on grade.
- .8 Plumbing.
- .9 Electrical.
- .10 Piping.
- .11 Controls.
- .12 Testing and Commissioning.
- .13 Supplied equipment long delivery items.
- .14 Engineer supplied equipment required dates.

1.8 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.9 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 NOT USED.

1.2 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.

1.3 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 Contractor to Departmental Representative for review and approval.
- .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 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
 - .5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
 - .6 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
 - .7 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .2 Capacities.
 - .3 Performance characteristics.
 - .4 Standards.
 - .5 Operating weight.
 - .6 Wiring diagrams.
 - .7 Single line and schematic diagrams.
 - .8 Relationship to adjacent work.
 - .8 After Departmental Representative's review, distribute copies.
 - .9 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
 - .10 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
 - .11 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

- .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .12 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .13 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .14 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative
- .15 Delete information not applicable to project.
- .16 Supplement standard information to provide details applicable to project.
- .17 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .18 The review of shop drawings by Public Works and Government Services Canada (PSPC) is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that PSPC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 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

Part 3 Execution

3.1 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 Saskatchewan
 - .1 Occupational Health and Safety Act, SA 2017.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 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.
- .3 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to authority having jurisdiction, weekly Departmental Representative
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Departmental Representative 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 Departmental Representative within 3 days after receipt of comments from Departmental Representative
- .7 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .8 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

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

1.5 MEETINGS

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

1.6 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Operating equipment and mechanical and electrical service spaces.

1.7 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 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .3 Contractor must be COR certified.

1.8 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Saskatchewan Reg.
- .2 Comply with Occupational Health and Safety Regulations, 2003.
- .3 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORSEEN HAZARDS

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

1.11 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - Have site-related working experience specific to activities associated with the work & working knowledge of occupational safety and health regulations.

- .1 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.
- .2 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

1.12 POSTING OF DOCUMENTS

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

1.13 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 This Section references to laws, by laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction, and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

1.2 RELATED REQUIREMENTS

- .1 NOT USED

1.3 REFERENCES TO REGULATORY REQUIREMENTS

- .1 Perform Work in accordance with 2015 Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Specific design and performance requirements listed in the specifications or indicated on the Drawings may exceed the minimum requirements established by the referenced Building Code; these requirements will govern over the minimum requirements listed in the Building Code
 - .1 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.4 HAZARDOUS MATERIAL DISCOVERY

- .1 NOT USED

1.5 BUILDING SMOKING ENVIRONMENT

- .1 Smoking and vaping are not allowed at the Regional Psychiatric Centre.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: Except as otherwise specified, Constructor will apply for, obtain, and pay all fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:
 - .1 Regulatory requirements and fees in force on date of Bid submission, and
 - .2 Any change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 NOT USED.

1.2 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by 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.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.3 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies may be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection by contractor.
- .5 Notwithstanding any additional testing the Departmental Representative may undertake, the contractor is responsible to perform all required quality control testing as indicated in the plans and specifications and as required by all applicable codes

1.4 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative

1.7 REPORTS

- .1 Submit electronic copies of inspection and test reports to Departmental Representative.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 NOT USED.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location of staging area, if required.
- .2 Remove from site all such work after use.

1.4 SCAFFOLDING

- .1 NOT USED.

1.5 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.6 CONSTRUCTION PARKING

- .1 Parking will be permitted on site.

1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 All equipment and tools shall be removed from site daily.
- .2 Material storage shall not be allowed on-site unless approved otherwise. Provide requests for on-site material storage to Departmental Representative for review prior to start of construction.

1.8 SANITARY FACILITIES

- .1 Departmental Representative and Security will provide sanitary facilities for contractor use during construction. Keep facilities clean.

1.9 UTILITIES

- .1 Contractor may use existing site power. Contractor is responsible for setup of any required temporary service panels
- .2 Contractor may utilize existing site water supply.

1.10 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 Waste Management in accordance with Section 01 74 21.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 NOT USED.

1.2 REFERENCE STANDARDS

- .1 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .2 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .3 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.3 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Defective products, whenever identified prior to completion of Work, 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.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 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.

1.4 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify 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 event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 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 seal 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 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .7 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.6 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

1.7 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 will 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 re-installation at no increase in Contract Price or Contract Time.

1.8 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed 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 anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.9 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.

1.12 FASTENINGS

- .1 Provide 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 affected specification Section.
- .4 Space anchors within individual 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.

1.13 FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 PROTECTION OF WORK IN PROGRESS

- .1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

1.15 EXISTING UTILITIES

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

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 REFERENCE STANDARDS

- .1 NOT USED.

1.2 QUALIFICATIONS OF SURVEYOR

- .1 NOT USED.

1.3 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of existing equipment, fixtures and outlets indicated or specified are to be considered as approximate. Contractor shall verify on site.
- .2 Install equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative of impending installation and obtain approval for actual location, if actual location varies from the location specified.

1.4 RECORDS

- .1 Maintain a complete, accurate log of work as it progresses.

1.5 EXISTING SERVICES

- .1 NOT USED.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures and submittal requirements provided in each section.

1.2 MATERIALS

- .1 As specified on drawings and specifications.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.3 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 or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.4 EXECUTION

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .7 Restore work with new products in accordance with requirements of Contract Documents.
- .8 Fit Work tight and sealed to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 In accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 NOT USED.

1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or tenants.
- .2 Remove waste materials from site daily. Do not burn waste materials on site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Dispose of waste materials and debris off site.
- .5 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .6 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .7 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .8 Schedule cleaning operations so that resulting dust, debris and other contaminants will not contaminate building systems.

1.3 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or tenants.
- .5 Remove all waste materials from site when construction is complete.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

- .1 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste where practical.
- .2 Protect environment and prevent environmental pollution damage.

1.2 REFERENCE STANDARDS

- .1 NOT USED

1.3 DEFINITIONS

- .1 Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority.
- .2 Inert Fill: inert waste - exclusively asphalt and concrete.
- .3 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .4 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .5 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .6 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .7 Separate Condition: refers to waste sorted into individual types.
- .8 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.

1.4 DOCUMENTS

- .1 NOT USED

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 NOT USED

1.6 WASTE AUDIT (WA)

- .1 NOT USED

1.7 WASTE REDUCTION WORKPLAN (WRW)

- .1 NOT USED

1.8 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

- .1 NOT USED

1.9 WASTE SOURCE SEPARATION PROGRAM (WSSP)

- .1 NOT USED

1.10 USE OF SITE AND FACILITIES

- .1 Execute Work with minimal interference and disturbance to normal use of premises.
- .2 Maintain security measures established by facility provide temporary security measures approved by Departmental Representative

1.11 WASTE PROCESSING SITES

- .1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

1.12 QUALITY ASSURANCE

- .1 NOT USED

1.13 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be recycled on site, in a location approved by the Departmental Representative, until project completion.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect structural components not removed from movement or damage.
- .4 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative
- .5 Protect surface drainage, mechanical and electrical from damage and blockage.
- .6 Provide on-site facilities and containers for collection and storage of recyclable materials.
- .7 Separate and store materials produced during project in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to offsite processing facility for separation.

1.14 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste into waterways

- .3 Remove materials on-site as Work progresses.

1.15 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 APPLICATION

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

3.2 CLEANING

- .1 Clean in accordance with Section 01 74 11 – Cleaning.

3.3 DIVERSION OF MATERIALS

- .1 Separate materials that can be recycled from general waste in separate piles or containers.
.2 Remove recyclable materials from site and deliver to a municipal recycling facility.
.3 Sale of recyclable material is not permitted

3.4 NOT USED

3.5 WASTE AUDIT (WA)

- .1 NOT USED

3.6 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

- .1 NOT USED

3.7 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

- .1 Schedule G - Government Chief Responsibility for the Environment:

Province	Address	General Inquires	Fax
Saskatchewan	Saskatchewan Environment 3211 Albert Street, Regina SK S4S 5W6	1-800-567-4224	

3.8

SCHEDULES

.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 NOT USED.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative's inspection.
 - .2 Departmental Representative Inspection:
 - .1 Departmental Representative 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 that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted balanced and fully operational.
 - .4 Certificates required by Utility companies: submitted.
 - .5 Operation of systems: demonstrated to Owner's personnel.
 - .6 Commissioning of mechanical systems: completed in accordance with 01 91 13 - General Commissioning (Cx) Requirements and Departmental Representative
 - .7 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative
 - .2 When Work incomplete according to Departmental Representative complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when Departmental Representative 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 Departmental Representative 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 Clean in accordance with Section 01 74 11 - Cleaning.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 NOT USED.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with Departmental Representative to:
 - .1 Verify Project requirements.
 - .2 Review warranty requirements.
 - .2 Departmental Representative 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.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, two final copies of maintenance manuals in English.
- .3 Provide evidence, if requested, for type, source and quality of products supplied.

1.4 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .4 Arrange content by systems under Section numbers and sequence of Table of Contents.
- .5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .6 Text: manufacturer's printed data, or typewritten data.
- .7 Record Drawings:

- .1 The contractor will provide record drawings of all mechanical work. Show dimensioned layouts and schematics of sanitary and storm sewer piping, sump pumps and sump pump piping.
- .2 The contractor will provide record drawings for all electrical work. Show on record drawings the location and size of new conduits and wiring.
- .3 The contractor will provide record drawings of all controls work. Show schematics of control system configuration, layout, and all inputs and outputs.
- .8 Provide hard copy of record drawings with reinforced punched binder tab.
- .9 Bind in with text; fold larger drawings to size of text pages.

1.5 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.6 RECORD DOCUMENTS AND SAMPLES

- .1 Maintain, at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's 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 Departmental Representative.

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, 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 elements of foundation in relation to finish first floor datum.
 - .2 Field changes of dimension and detail.
 - .3 Changes made by change orders.
 - .4 Details not on original Contract Drawings.
 - .5 Referenced Standards to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain field test records, inspection certifications, manufacturer's certifications, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.8 MATERIALS AND FINISHES

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
 - .1 Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

1.9 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 15 days before planned pre-warranty conference, to Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint 6 month and 12 month warranty inspection, measured from time of acceptance, by Departmental Representative.
- .9 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 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roof metal
 - .3 Contractor's plans for attendance at 6 and 12 month post-construction warranty inspections.
- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.

- .11 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 91 13.16 – Commissioning Forms

1.2 SUMMARY

- .1 Section Includes:
 - .1 General requirements relating to commissioning of project's components and systems, specifying general requirements to PV of components, equipment, sub-systems, systems, and integrated systems.
 - .2 The commissioning process will be completed according to the commissioning sections in this document. Commissioning process will be conducted by the Contractor, under the review and supervision of the Departmental Representative. Final approval of the commissioning process will be granted by the Departmental Representative. The Contractor will provide a commissioning schedule to the Departmental Representative for review prior to the start of commissioning. The Contractor will complete the commissioning forms provided in Section 01 91 33 – Commissioning Forms and will submit the completed forms to the Departmental Representative for review. Acronyms:
 - .1 Cx – Commissioning
 - .2 O&M – Operation and Maintenance.
 - .3 PV – Performance Verification

1.3 GENERAL

- .1 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Objectives:
 - .1 Verify installed equipment, systems and integrated systems operate in accordance with Contract Documents and design criteria and intent.
 - .2 Effectively train O&M staff.
- .2 Contractor performs Cx process, operating equipment and systems, troubleshooting and making adjustments as required.
 - .1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactively with each other as intended in accordance with Contract Documents and design criteria.
 - .2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.
- .3 Design Criteria: To meet Project functional and operational requirements.

1.4 COMMISSIONING OVERVIEW

- .1 Cx to be a line item of Contractor's cost breakdown.
- .2 Cx activities supplement field quality and testing procedures described in relevant technical sections.
- .3 Departmental Representative will issue Substantial Acceptance Certificate when:
 - .1 Completed Cx documentation has been received, reviewed for suitability and approved by Departmental Representative
 - .2 Equipment, components, systems, and integrated systems have been fully commissioned and functional as per design intent within the context of the Owner Requirement and meeting all requirements of the authority having jurisdiction.
 - .3 Final O&M are received, reviewed and approved by the Departmental Representative for suitability

1.5 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

- .1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify equipment and components within the unfunctional system, including related systems as deemed required by Departmental Representative, to ensure effective performance.
- .2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.

1.6 PRE-CX REVIEW

- .1 Before start of Cx the contractor shall review the commissioning schedule, and forms provided in this document. The contractor shall notify the Departmental Representative if the plan, schedule, and forms are acceptable and shall offer recommendations for adjustments where necessary.
- .2 Commissioning will begin only after the contractor has verified that all work has been completed according to the contract documents.

1.7 CONFLICTS

- .1 Report conflicts between requirements of this section and other sections to the Departmental Representative before start-up and obtain clarification.
- .2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.

1.8 ACTION AND INFORMATIONAL SUBMITTALS

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

1.9 COMMISSIONING DOCUMENTATION

- .1 Refer to Section 01 91 99 – Commissioning (Cx) Forms.

- .2 Departmental Representative to review and approve Cx forms.

1.10 COMMISSIONING SCHEDULE

- .1 Provide detailed Cx schedule as part of construction schedule in accordance with Section 01 32 16 – Construction Progress Schedules – Bar (GANTT) Chart.
- .2 Provide adequate time for Cx activities prescribed in technical sections and commissioning section including:
 - .1 Approval of Cx process
 - .2 Verification of reported results
 - .3 Repairs, retesting, re-commissioning, re-verification.

1.11 COMMISSIONING MEETINGS

- .1 NOT USED.

1.12 STARTING AND TESTING

- .1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.13 WITNESSING OF STARTING AND TESTING

- .1 Provide 48 hour notice prior to commencement.

1.14 PROCEDURES

- .1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.
- .2 Conduct start-up and testing in following distinct phases:
 - .1 Included in delivery and installation:
 - .1 Verification of conformity to specification and approved shop drawings.
 - .2 Visual inspection of quality of installation.
 - .2 Start-up: follow accepted start-up procedures.
 - .3 Operational testing: document equipment performance.
 - .4 System performance verification: include repetition of tests after correcting deficiencies.
 - .5 Post-substantial performance verification: to include fine-tuning.
- .3 Correct deficiencies and obtain approval from Departmental Representative after distinct phases have been completed and before commencing next phase.
- .4 Document required tests on approved Functional Performance Testing sheets of Commissioning Forms.
- .5 Failure to follow accepted start-up procedures will result in re-evaluation of equipment by an independent testing agency selected by Departmental Representative. If results

reveal that equipment start-up was not in accordance with requirements, and resulted in damage to equipment, implement following:

- .1 Minor equipment/systems: implement corrective measures approved by Departmental Representative
- .2 Major equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by Departmental Representative.
- .3 If evaluation report concludes that major damage has occurred, Departmental Representative shall reject equipment.
 - .1 Rejected equipment to be removed from site and replaced with new.
 - .2 Subject new equipment/system to specified start-up procedures.

1.15 START-UP DOCUMENTATION

- .1 Assemble start-up documentation and submit to Departmental Representative for approval before commencement of commissioning.
- .2 Start-up documentation to include:
 - .1 Factory and on-site test certificates for specified equipment.
 - .2 Signed installation/start-up check lists (sheets in Commissioning Forms).
 - .3 Step-by-step description of complete start-up procedures, to permit Departmental Representative to repeat start-up at any time.

1.16 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS

- .1 After start-up, operate and maintain equipment and systems as directed by equipment/system manufacturer.
- .2 Operate and maintain systems for length of time required for commissioning to be completed.
- .3 After completion of commissioning, operate and maintain systems until issuance of certificate of substantial completion.

1.17 TEST RESULTS

- .1 If start-up or functional performance testing produces unacceptable results, repair, replace or repeat specified starting and/or functional performance testing produces until acceptable results are achieved.
- .2 Provide manpower and materials, assume costs for re-commissioning.

1.18 START OF COMMISSIONING

- .1 Notify Departmental Representative at least 5 days prior to start of Cx.
- .2 Start Cx after elements of building affecting start-up and performance verification of systems have been completed.

1.19 COMMISSIONING PERFORMANCE VERIFICATION

- .1 Carry out Cx:

- .1 Under accepted simulated operating conditions, over entire operating range, in all modes.
- .2 On independent systems and interacting systems.
- .2 Cx procedures to be repeatable and reported results are to be verifiable.
- .3 Follow equipment manufacturer's operating instructions.

1.20 WITNESSING COMMISSIONING

- .1 Departmental Representative is to oversee the commissioning process and approve results.

1.21 AUTHORITIES HAVING JURISDICTION

- .1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.
- .2 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.
- .3 Provide copies to Departmental Representative within 5 days of test and with Cx report.

1.22 EXTRAPOLATION OF RESULTS

- .1 Where Cx of weather, occupancy, or seasonal-sensitive equipment or systems cannot be conducted under near-rated or near-design conditions, extrapolate part-load results to design conditions when approved by Departmental Representative in accordance with equipment manufacturer's instructions, using manufacturer's data, with manufacturer's assistance and using approved formulae.

1.23 DEFICIENCIES, FAULTS, DEFECTS

- .1 Correct deficiencies found during start-up and Cx to satisfaction of Departmental Representative Report problems, faults or defects affecting Cx to Departmental Representative in writing. Stop Cx until problems are rectified. Proceed with written approval from Departmental Representative

1.24 COMPLETION OF COMMISSIONING

- .1 Upon completion of Cx leave systems in normal operating mode.
- .2 Except for warranty and seasonal verification activities specified in Cx specifications, complete Cx prior to issuance of substantial completion.
- .3 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by Departmental Representative

1.25 ACTIVITIES UPON COMPLETION OF COMMISSIONING

- .1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

1.26 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS

- .1 Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract.

1.27 OCCUPANCY

- .1 Cooperate fully with Departmental Representative during stages of acceptance and occupancy of facility.

1.28 OWNER'S PERFORMANCE TESTING

- .1 Performance testing of equipment or system by Departmental Representative will not relieve Contractor from compliance with specified start-up and testing procedures.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Contractor shall review the commissioning forms attached to this section prior to the start of commissioning. The contractor shall notify the Consultant if the forms are acceptable and shall offer recommendations for adjustments where necessary. The contractor shall provide manufacturers start-up and installation checklists to the Consultant so the checklists can be incorporated into the commissioning forms.
- .2 Commissioning will begin only after the contractor has verified that all work has been completed according to the contract documents.

1.2 COMMISSIONING FORMS

- .1 The commissioning forms are comprised of three sections:
 - .1 Static Verification
 - .1 Shall be used to verify the equipment and systems are installed in accordance with the drawings, specifications, approved shop drawings, and manufacturers` installation instructions.
 - .2 Start-Up
 - .1 Shall be used to verify the equipment operates as intended when activated. For example, is flow in the correct direction? Are all features of the equipment functioning?
 - .3 Functional Performance Verification
 - .1 Shall be used to verify that the performance of the equipment or systems satisfies the intent of the design and that the equipment or systems have been balanced and adjusted for optimal performance.
- .2 Strategy for Use:
 - .1 Confirm operation as per design criteria and intent.
 - .2 Identify variances between design and operation and reasons for variances.
 - .3 Verify operation in specified normal and emergency modes and under specified load conditions.
 - .4 Record analytical and substantiating data.
 - .5 Verify reported results.
 - .6 Form to bear signatures of recording technician and reviewed and signed off by Consultant.
 - .7 Submit immediately after tests are performed.
 - .8 Reported results in true measured SI unit values.
 - .9 Provide Departmental Representative with originals of completed forms.
 - .10 Maintain copy on site during start-up, testing and commissioning period.
 - .11 Duplicate attached forms as necessary, one copy for each item installed.

Part 2 Products

2.1 Commissioning forms are included on the following page.

Part 3 Execution

3.1 NOT USED

END OF SECTION

DUPLEX SUMP PUMPS

Static Verification



REVISION #: 01

NAME: _____
COMPANY: _____
ADDRESS: _____

CUSTOMER: PWGSC
PROJECT: RPC Crawlspace Plumbing
FILE NUMBER: R.100531.001
DATE: _____

NAMEPLATE			
MANUFACTURER		EQUIPMENT NO.	
SERVICE		LOCATION	

SUMP PUMP	SPECIFIED	SHOP DRAWINGS	INSTALLED
MANUFACTURER	-		
MODEL NO.	-		
SERIAL NO.	-		
TYPE	Submerged Sump Pump		
SIMPLEX OR DUPLEX	Duplex		
CAPACITY (USGPM)	30 USGPM		
HEAD (FT)	15 Feet w.c.		
MOTOR RPM	-		
MOTOR (HP)	1/2 Hp		
VOLTAGE / PHASE / FREQUENCY	120 V, 60 Hz, 1 Ph		

SUMP PUMP	STATUS	COMMENTS
INSTALLED AS PER DRAWINGS & SPECIFICATIONS		
INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS		
PUMP INSTALLED LEVEL		
PUMP ACCESSIBLE AND CAN BE REMOVED FOR SERVICING		
HIGH LEVEL ALARM INSTALLED AT CORRECT LEVEL AND VERIFIED		
PIPING AS PER SPECIFICATION		
ISOLATION & CHECK VALVES		
ALL SHIPPING CLIPS AND PLUGS HAVE BEEN REMOVED		
PUMP IS FREE OF PHYSICAL DAMAGE		

GENERAL COMMENTS:

--

POSITION/TITLE	SIGNATURE	DATE
Design Consultants		
Contractors/Subcontractor		

Start-Up



NAME:

COMPANY:

ADDRESS:

CUSTOMER: PWGSC

PROJECT: RPC Crawlspace Plumbing

FILE NUMBER: R.100531.001

DATE:

START-UP	STATUS	COMMENTS
MANUFACTURER STARTUP PROCEDURE COMPLETE		
CAPACITY (USGPM)		
SUMP CONTAINS WATER BEFORE PUMP STARTED		
PUMP PRIMED		
IMPELLER AND MOTOR ROTATION CORRECT		
FLOW DIRECTION CORRECT		
PUMP FLOAT SWITCHES AT CORRECT LEVEL		
NO LEAKAGE FROM MECHANICAL SEALS		
HIGH LEVEL ALARM INSTALLED AT CORRECT LEVEL AND VERIFIED		
PUMP RESPONDS TO CONTROLLER REQUEST FOR "ON"		
PUMP RESPONDS TO CONTROLLER REQUEST FOR "OFF"		

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE
Design Consultants		
Contractors/Subcontractor		

Functional Performance Testing



NAME:

COMPANY:

ADDRESS:

CUSTOMER: PWGSC

PROJECT: RPC Crawlspace Plumbing

FILE NUMBER: R.100531.001

DATE:

FUNCTIONAL PERFORMANCE TESTING	STATUS	COMMENTS
PUMP IS CAPABLE OF DISCHARGING TO DESIGNATED LOCATION		
PUMP IS WITHIN PUMP CURVE PARAMETERS		

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE
Design Consultants		
Contractors/Subcontractor		

CENTRIFUGAL SUMP PUMP

Static Verification



REVISION #: 01

NAME: _____
COMPANY: _____
ADDRESS: _____

CUSTOMER: PWGSC
PROJECT: RPC Crawlspace Plumbing
FILE NUMBER: R.100531.001
DATE: _____

NAMEPLATE			
MANUFACTURER		EQUIPMENT NO.	
SERVICE		LOCATION	

SUMP PUMP	SPECIFIED	SHOP DRAWINGS	INSTALLED
MANUFACTURER	-		
MODEL NO.	-		
SERIAL NO.	-		
TYPE	Centrifugal Pump		
SIMPLEX OR DUPLEX	Simplex		
CAPACITY (USGPM)	30 USGPM		
HEAD (FT)	25 Feet w.c.		
MOTOR RPM	-		
MOTOR (HP)	1/3 Hp		
VOLTAGE / PHASE / FREQUENCY	120 V, 60 Hz, 1 Ph		

SUMP PUMP	STATUS	COMMENTS
INSTALLED AS PER DRAWINGS & SPECIFICATIONS		
INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS		
PUMP INSTALLED LEVEL ON SUPPORT FRAME		
PUMP ACCESSIBLE FOR SERVICING		
NAMEPLATE VISIBLE		
PUMP FLOAT SWITCHES AT CORRECT LEVEL		
HIGH LEVEL ALARM INSTALLED AT CORRECT LEVEL AND VERIFIED		
PIPING AS PER SPECIFICATION		
ISOLATION & CHECK VALVES		
ALL SHIPPING CLIPS AND PLUGS HAVE BEEN REMOVED		
PUMP IS FREE OF PHYSICAL DAMAGE		

GENERAL COMMENTS:

--

POSITION/TITLE	SIGNATURE	DATE

CENTRIFUGAL SUMP PUMP

Start-Up



REVISION #: 01

NAME: _____
COMPANY: _____
ADDRESS: _____

CUSTOMER: PWGSC
PROJECT: RPC Crawlspace Plumbing
FILE NUMBER: R.100531.001
DATE: _____

START-UP	STATUS	COMMENTS
MANUFACTURER STARTUP PROCEDURE COMPLETE		
CAPACITY (USGPM)		
SUMP CONTAINS WATER BEFORE PUMP STARTED		
PUMP PRIMED		
IMPELLER AND MOTOR ROTATION CORRECT		
FLOW DIRECTION CORRECT		
NO LEAKAGE FROM MECHANICAL SEALS		
CONTROL CABLES WILL NOT INTERFERE WITH FLOAT		
PUMP RESPONDS TO CONTROLLER REQUEST FOR "ON"		
PUMP RESPONDS TO CONTROLLER REQUEST FOR "OFF"		

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE
Design Consultants		
Contractors/Subcontractor		

CENTRIFUGAL SUMP PUMP

Functional Performance Testing



REVISION #: 01

NAME: _____
COMPANY: _____
ADDRESS: _____

CUSTOMER: PWGSC
PROJECT: RPC Crawlspace Plumbing
FILE NUMBER: R.100531.001
DATE: _____

FUNCTIONAL PERFORMANCE TESTING	STATUS	COMMENTS
PUMP IS CAPABLE OF DISCHARGING TO DESIGNATED LOCATION		
PUMP FLOW (GPM)		

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE
Design Consultants		
Contractors/Subcontractor		

Static Verification



NAME:

COMPANY:

ADDRESS:

CUSTOMER: PWGSC

PROJECT: Crawlspace

FILE NUMBER: R.100531.001

DATE:

LOCATION

SYSTEM USE

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE
Design Consultants		
Contractors/Subcontractor		

Commissioning Issues Log

[illegible]

Part 1 General

1.1 SITE CONDITIONS

- .1 Review work including materials and procedures; identifying and taking precautions to protect environment.
- .2 Notify Departmental Representative before disrupting building access or services.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 EXAMINATION

- .1 Inspect building and systems with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

3.2 PREPARATION

- .1 Demolition/Removal:
 - .1 Remove items as indicated on drawings.
 - .2 Remove parts of existing system to permit new construction.
 - .3 Salvage and retain all items identified for salvage in accordance with Section 02 42 00 – Removal and Salvage of Construction Materials.

3.3 CLEANING

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

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 This section provides requirements for careful removal and salvage, and reconditioning of building components identified for retention and storage on the site

1.2 DEFINITIONS

- .1 Remove and Salvage: Detach items from existing construction and deliver them to the Departmental Representative.
- .2 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Confirm and coordinate with Departmental Representative as to which materials, components, and items of equipment will be identified for removal and salvage from their existing locations. Confirm the following with the Departmental Representative:
 - .1 Items that shall be removed and turned over to the Departmental Representative;
 - .2 On-site storage locations for items to be turned over;
 - .3 Items that will be renovated or refurbished and reinstalled as a part of the Work;
 - .4 Temporary on-site storage locations for items to be reinstalled.

Part 2 Products

2.1 SALVAGED ITEMS

- .1 Confirm with Departmental Representative any additional items that appear to be salvageable prior to disposal.
- .2 Turn over any salvageable item to building staff as directed by Departmental Representative.

Part 3 Execution

3.1 SALVAGE

- .1 Remove, handle, and store salvageable items to minimize damage and to ensure that usability is maintained.
- .2 Place materials on pallets or wrap in protective film to ensure that loose pieces and projections do not cause injury to personnel, and that salvaged items remain as complete units.
- .3 Clean all items of construction or building debris, or materials that are not a part of the salvaged work before delivering to Departmental Representative.

END OF SECTION

Part 1 General

1.1 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 and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings to Departmental Representative for review and approval prior to material procurement

1.2 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals
- .2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.
 - .1 Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
 - .2 Maintenance data to include:
 - .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
 - .2 Data to include schedules of tasks, frequency, tools required and task time.
 - .3 Additional data:
 - .1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.
 - .4 As-built drawings:
 - .1 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
 - .2 Submit to Departmental Representative for approval and make corrections as directed.
 - .3 Perform testing, adjusting and balancing using as-built drawings.
 - .4 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals

- .2 Provide one set of special tools required to service equipment as recommended by manufacturers.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect from nicks, scratches, and blemishes
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of works previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions including the existing sanitary and storm sewer piping which is not included in the scope of this project.
 - .1 Inform Departmental Representative of any unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative
 - .3 Do NOT replace any sanitary or storm sewer piping that is not included in the scope of this project without the written approval from Departmental Representative.

3.2 RESTORATION

- .1 Restore to new condition, finishes which have been damaged.

3.3 FIELD QUALITY CONTROL

- .1 Site Tests: conduct following tests in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 -ACTION AND INFORMATIONAL SUBMITTALS.

3.4 PRESSURE TESTING OF PIPEWORK

- .1 Advise Departmental Representative 48 hours minimum prior to performance of pressure tests.
- .2 Pipework: test as specified in Section 01 91 33 Commissioning Forms and Section 22 13 18 Drainage Waste and Vent Piping - Plastic.
- .3 Maintain specified test pressure without loss for 15 minutes minimum unless specified for longer period of time in relevant mechanical sections.
- .4 Prior to tests, isolate equipment and other parts which are not designed to withstand test pressure or media.
- .5 Conduct tests in presence of Departmental Representative.
- .6 Pay costs for repairs or replacement, retesting, and making good. Departmental Representative to determine whether repair or replacement is appropriate.

3.5 DEMONSTRATION

- .1 Departmental Representative will use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.
- .2 Trial usage to apply to following equipment and systems:
- .3 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
- .4 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.
- .5 Instruction duration time requirements as specified in appropriate sections.
- .6 Departmental Representative will record these demonstrations on video tape for future reference.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning
- .2 Waste Management in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 02 42 00 – Removal and Salvage of Construction Materials.
- .3 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 NOT USED

1.2 REFERENCE STANDARDS

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings.
 - .1 Submit shop drawings to Departmental Representative for review and approval prior to material procurement
 - .2 Submit shop drawings to indicate:
 - .1 Equipment, including connections, fittings, control assemblies and ancillaries. Identify whether factory or field assembled.
 - .2 Wiring and schematic diagrams.
 - .3 Dimensions and recommended installation.
 - .4 Pump performance and efficiency curves.
- .3 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals, include:
 - .1 Manufacturers name, type, model year, capacity and serial number.
 - .2 Details of operation, servicing and maintenance.
 - .3 Recommended spare parts list with names and addresses.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Store and handle materials and equipment in accordance with Manufacturer's written instructions.
- .2 Waste Management and Disposal:
 - .1 in accordance with Section 01 47 19- Construction/Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Unused sealant materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

2.2 PUMPS

.1 BOW BUILDING SUMP PUMPS:

- .1 Submersible sewage pump
- .2 Motor: 1/2 Hp, 120 V, 60 Hz, 1 Ph, hermetically sealed, with automatic overload protection
- .3 Capacity: 1.89 L/s (30 gpm)
- .4 Head: 45 kPa (15 feet)
- .5 Construction: duplex CSA approved, housing epoxy coated cast iron, bronze fitted stainless steel shaft, non-clog bronze impeller, mechanical shaft seal.
- .6 Discharge connection: 50 mm
- .7 Control: existing Myers duplex control panel.
 - .1 Model – CP4 -11D opt K

.2 KITCHEN SUMP PUMP

- .1 Centrifugal, self-priming inline pump
- .2 Motor: 1/3 Hp, 120 V, 60 Hz, 1 Ph, hermetically sealed, with automatic overload protection
- .3 Capacity: 1.89 L/s (30 gpm)
- .4 Head: 75 kPa (25 feet)
- .5 Required suction lift: 15 feet
- .6 Construction: CSA approved, housing epoxy coated cast iron, bronze fitted stainless steel shaft, non-clog bronze impeller, mechanical shaft seal.
- .7 Discharge Connection Size: 32 mm

2.3 Accessories

- .1 Galvanized (Hot-dipped) steel pump chains, fastened to wall of pits.

.2 BOW BUILDING Float System

- .1 Four control float switches:
 - .1 Stop Pumps Float
 - .2 Lead Pump Float
 - .3 Lag Pump Float
 - .4 High Level Alarm
- .2 Cable type and size as indicated on drawings.

.3 KITCHEN Float System:

- .1 Single control float switch to be wired directly to centrifugal pump.
- .2 Float cable and system to be part of the package with the centrifugal pump.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 INSTALLATION

- .1 Make piping and electrical connections to pump and motor assembly and controls as indicated.
- .2 Ensure pump and motor assembly do not support piping.

3.3 FIELD QUALITY CONTROL

- .1 Start-up, check for proper and safe operation.
- .2 Check settings and operation of hand-off-auto selector switch, operating, safety and limit controls, audible and visual alarms, over-temperature and other protective devices.

3.4 COMMISSIONING

- .1 Perform Static Verification, Start-Up and Performance Verification in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements and Section 01 9133 – Commissioning Forms.

3.5 REPORTS

- .1 In accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: reports, supplemented as specified.
- .2 Include:
 - .1 PV results on approved PV Report Forms.
 - .2 Product Information report forms.
 - .3 Pump performance curves (family of curves) with final point of actual performance.

3.6 TRAINING

- .1 In accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: Training of O&M Personnel, supplemented as specified.

3.7 CLEANING

- .1 Clean in accordance with Section 01 74 11 – Cleaning.
- .2 Waste Management in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA/CAN B1800-18
 - .1 Thermoplastic NonPressure Piping Compendium - B1800 Series
- .2 ASTM International Inc.
 - .1 ASTM D2564, Standard Specification for Solvent Cements for Poly(Vinyl-Chloride) (PVC) Plastic Piping Systems.
- .3 Green Seal Environmental Standards (GSES)
 - .1 Standard GS-36, Commercial Adhesives.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .5 National Research Council Canada (NRC)
 - .1 National Plumbing Code of Canada 2015 (NPC).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature and datasheets for piping and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 - Health and Safety Requirements

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .2 Store at temperatures and conditions recommended by manufacturer.

Part 2 Products

2.1 PIPING AND FITTINGS

- .1 For above ground DWV piping to:
 - .1 CAN/CSA B1800
 - .1 CAN/CSA-B181.2

2.2 JOINTS

- .1 Solvent weld for PVC: to ASTM D2564.

Part 3 Execution

3.1 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 In accordance with the Provincial and National Plumbing Codes and Regional Psychiatric Centre CSC Technical Criteria for Correctional Institutions.

3.3 TESTING

- .1 Pressure test sanitary sewer and storm systems for leaks.

3.4 PERFORMANCE VERIFICATION

- .1 Cleanouts:
 - .1 Ensure accessible and that access doors are correctly located.
 - .2 Open, cover with linseed oil and re-seal.
 - .3 Verify cleanout rods can probe as far as the next cleanout, at least.
- .2 Test to ensure traps are fully and permanently primed.

3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Related to all Sections in Division 26 Electrical.

1.2 REFERENCE STANDARDS

- .1 CSA Group:
 - .1 CSA C22.1-18, Canadian Electrical Code, Part 1 (24th Edition), Safety Standard for Electrical Installations.
 - .2 CSA C22.2 No. 0-10 (R2015) General Requirements - Canadian Electrical Code, Part II
 - .3 CSA B651-18 (2018) Accessible Design for the Built Environment.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 30 00 Administration and Submittals and Section 01 33 00 Submittal Procedure
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for electrical equipment and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Submit for review single line electrical diagrams and locate
 - .1 Electrical distribution system in main electrical room.
 - .2 Electrical power generation and distribution systems in power plant rooms.
- .4 Shop drawings:
 - .1 Submit in accordance with Section 01 33 23 - Shop Drawings
 - .2 Submit drawings to Departmental Representative for review and approval. Do not proceed with Work affected by submittal until review is complete.
 - .3 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
 - .4 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
 - .5 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.
 - .6 If changes are required, notify Departmental Representative of these changes before they are made.
- .5 Certificates:
 - .1 Provide CSA certified equipment and material

- .2 Where CSA certified equipment is not available, submit such equipment to inspection authorities for approval before delivery to site.
- .3 Submit test results of installed electrical systems and instrumentation.
- .4 Permits and fees: in accordance with General Conditions of contract.
- .5 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Departmental Representative.

1.4 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: submit operation and maintenance data for electrical equipment for incorporation into manual.
 - .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
 - .2 Operating instructions to include following:
 - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
 - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
 - .3 Safety precautions.
 - .4 Procedures to be followed in event of equipment failure.
 - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
 - .3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
 - .4 Post instructions where directed.
 - .5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
 - .6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.5 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 off ground in dry location indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect from nicks, scratches, and blemishes
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN REQUIREMENTS

- .1 Operating voltages: to CAN3-C235.
- .2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3 Language operating requirements: provide identification labels for control items in English

2.2 MATERIALS AND EQUIPMENT

- .1 Equipment & Material to be CSA certified.
- .2 Factory assemble control panels and component assemblies.

2.3 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

- .1 Verify installation and co-ordination responsibilities related to motors, equipment and controls, as indicated.

2.4 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.5 EQUIPMENT IDENTIFICATION

- .1 Identify electrical equipment with labels as follows:
 - .1 Nameplates: plastic laminate 3 mm melamine
 - .2 Sizes as follows:

NAMEPLATE SIZES			
Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.
- .3 Allow for minimum of twenty to indicate system and/or voltage characteristics.
- .4 Identify equipment with Size 3 labels engraved "ASSET INVENTORY NO."
"Disconnects, starters and contactors: indicate equipment being controlled and voltage.
- .5 Terminal cabinets and pull boxes: indicate system and voltage.

- .6 Transformers: indicate capacity, primary and secondary voltages.

2.6 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, numbered coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1.
- .4 Use colour coded wires in communication cables, matched throughout system.

2.7 CONDUIT AND CABLE IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

Type	Prime	Auxiliary
up to 250 V	Yellow	
up to 600 V	Yellow	Green
up to 5 kV	Yellow	Blue
up to 15 kV	Yellow	Red
Telephone	Green	
Other Communication Systems	Green	Blue
Fire Alarm	Red	
Emergency Voice	Red	Blue
Other Security Systems	Red	Yellow

2.8 FINISHES

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.
- .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

3.3 CONTROLS

- .1 Contractor or controls contractor retained by contractor to provide controls for mechanical system as described in mechanical plans for a fully operational mechanical system
- .2 Contractor to supply and install all low voltage wiring for controls.

3.4 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.5 CONDUIT AND CABLE INSTALLATION

- .1 Install cables and conduits as indicated on drawings and in Division 26 of the specifications

3.6 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Install electrical equipment at following heights unless indicated otherwise.
 - .1 As required by CSA B651 (201) or as indicated.

3.7 CO-ORDINATION OF PROTECTIVE DEVICES

- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.8 FIELD QUALITY CONTROL

- .1 Load Balance:
 - .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
 - .2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.
 - .3 Provide upon completion of work, load balance report as directed in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS, phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.

- .2 Conduct following tests in accordance with Section 01 45 00 – Quality Control.
- .3 Carry out tests in presence of Departmental Representative.
- .4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .5 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.9 SYSTEM STARTUP

- .1 Instruct Departmental Representative in operation, care and maintenance of systems, system equipment and components.
- .2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
- .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

3.10 CLEANING

- .1 Cleaning in accordance with Section 01 74 11 - Cleaning
- .2 Waste Management in accordance with Section 01 74 19 - Construction Waste Management & Disposal.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA International
 - .1 CAN/CSA-C22.2 No.18-98 (R2003), Outlet Boxes, Conduit Boxes and Fittings.
 - .2 C22.2 NO. 65-13 (R2018) - Wire connectors (Tri-national standard, with UL 486A-486B and NMJ-J-543- ANCE)
- .2 National Electrical Manufacturers Association (NEMA)

1.2 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 wire and box connectors and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals
- .2 Operation and Maintenance Data: submit operation and maintenance data for wire and box connectors for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect wire and box connectors from nicks, scratches, and blemishes
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Pressure type wire connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors as required.
- .2 Fixture type splicing connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors 10 AWG or less.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wire and box connectors installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative

3.2 INSTALLATION

- .1 Remove insulation carefully from ends of conductors cables and:
 - .1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.
 - .2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65.
 - .3 Install fixture type connectors and tighten to CAN/CSA-C22.2 No.65. Replace insulating cap.

3.3 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning
- .2 Waste Management in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 PRODUCT DATA

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

Part 2 Products

2.1 TECK 90 CABLE

- .1 Cable: in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Conductors:
 - .1 Grounding conductor: Uninsulated Class B Stranded grounding conductor.
 - .2 Circuit conductors: Class B Stranded bare soft copper.
- .3 Insulation:
 - .1 Cross-linked polyethylene XLPE.
- .4 Inner jacket: polyvinyl chloride material.
- .5 Armour: interlocking.
- .6 Overall covering: thermoplastic polyvinyl chloride, compliant to applicable Building Code classification for this project.
- .7 Fastenings:
 - .1 One hole aluminum straps to secure surface cables 50 mm and smaller. Two hole steel straps for cables larger than 50 mm.
 - .2 Channel type supports for two or more cables at
 - .3 Threaded rods: 6 mm diameter to support suspended channels.
- .8 Connectors:
 - .1 Watertight approved for TECK cable.

2.2 CONTROL CABLE

- .1 Type: low energy 300 V control cable: stranded annealed copper conductors sized as indicated on the drawings:
 - .1 Insulation: Ethylene Propylene Diene Monomer Rubber (EPDM).
 - .2 Overall covering: Neoprene.

Part 3 Execution

3.1 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

- .2 Perform tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

- .1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V)
- .2 Cable Colour Coding: to Section 26 05 00 - Common Work Results for Electrical, or to match existing.
- .3 Conductor length for parallel feeders to be identical.
- .4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.
- .5 Branch circuit wiring for surge suppression receptacles and permanently wired computer and electronic equipment to be 2-wire circuits only, i.e. common neutrals not permitted.
- .6 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

3.3 INSTALLATION OF TECK90 CABLE (0 -1000 V)

- .1 Group cables wherever possible on channels.
- .2 Install cable, securely supported by hangers
- .3 Support cables in accordance with CEC 2018 12-306

3.4 INSTALLATION OF CONTROL CABLES

- .1 Install control cables in conduit as indicated on drawings.
- .2 Ground control cable shield.

END OF SECTION

Part 1 General

1.1 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 hangers and supports and include product characteristics, performance criteria, physical size, finish and limitations.

1.2 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 off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect hangers and supports from nicks, scratches, and blemishes
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 SUPPORT CHANNELS

- .1 U shape, 2.5 mm thick, surface mounted

Part 3 Execution

3.1 INSTALLATION

- .1 Conduits and enclosures: wall or rack mounted.
- .2 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.
- .3 Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T bars are adequately supported to carry weight of equipment specified before installation.
- .4 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
- .5 Fasten exposed conduit or cables to building construction or existing support system using straps.
 - .1 One-hole steel straps to secure surface conduits and cables 50 mm and smaller.
 - .2 Two-hole steel straps for conduits and cables larger than 50 mm.

- .3 Beam clamps to secure conduit to exposed steel work.
- .6 Suspended support systems.
 - .1 Support individual cable or conduit runs with existing support system
- .7 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.
- .8 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
- .9 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .10 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade
- .11 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

3.2 CLEANING

- .1 Leave Work area clean at end of each day in accordance with Section 01 74 11 - Cleaning.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment
- .3 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 CSA International
 - .1 CSA C22.2 No. 5-16, Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, and NMX-J-266-ANCE-2010).

1.2 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 circuit breakers and include product characteristics, performance criteria, physical size, finish and limitations.

1.3 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 BREAKERS GENERAL

- .1 Circuit breakers to CSA C22.2 No. 5
- .2 Breaker size and type to drawings. Coordinate breaker compatibly to existing panels. Breaker type and/or model of existing panels shown on drawings.
- .3 Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation.

2.2 THERMAL MAGNETIC BREAKERS

- .1 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

Part 3 Execution

3.1 EXAMINATION

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

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Install circuit breakers as indicated.

3.3 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION