
SECTION 01110

SUMMARY OF WORK

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PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work to be carried out under this Contract is for the installation of standby Generator for critical loads and in general includes but is not limited to the following:

- .1 Supply and Install one (1) standby power generator system to the R.C. Harris Water Treatment Plant (WTP) including the installation of one (1) new water-cooled natural gas fueled generator system, associated new natural gas supply, air-intake, and exhaust system, cooling water supply and return, drain connections, cooling system, associated electrical instrumentation and SCADA/process control system and integration, associated structural and architecture rehabilitation. The scope includes cable and power tunnel upgrades including removal and replacement of cable trays, water leak treatment and creation of a sump pit with a pumping system.

Plant Name	Plant Address
R.C. Harris WTP	2701 Queen Street East, Scarborough Southwest, Toronto

- .2 Summary of work as follows:

- a. Conduct Preconstruction Survey and Post construction survey of all facilities and provide detailed report with photo documentation.
- b. Electrical Improvements: The works includes but not limited to:
- (a) Provide, Install, test, commission, and place into operation of one (1) new Standby generator system, complete with new automatic transfer switches, new cables, wiring, cable trays, conduits and supports as required along with the transferring of loads from the main existing system buses to the new standby system buses, as indicated in the contract documents, specifications and drawings, meeting all applicable CSA Standards and Codes. The work includes provision for temporary rigging/hoisting system for generator lifting into designated location.
- (b) Provide a new and complete short circuit, protection coordination and arc flash study for the single line works under this Project. The existing studies are provided in Appendix O. The new studies shall include the Standby generators side, and Normal utility side systems including the existing buildings main 13.8 kV switchgears down up to the 600V distribution system. This new study shall be signed and sealed by a Professional Engineer licensed in the Province of Ontario to be hired by the Contractor, and shall be provided, reviewed and approved, prior to shop drawing submittals and approval of any relevant electrical equipment.

- (c) The Contractor shall provide products, and perform installations, start-up, testing, commissioning procedures, as well as training services and warranty, and all other requirements as indicated in the contract documents, specifications and drawings according to all applicable CSA Standards and Codes. The Contractor shall include all required costs to do so into the tender price. The Contractor shall submit Factory and Site Acceptance Test procedures for all new electrical equipment for review and approval.
- (d) Provide one (1) new indoor (pad-mounted) natural gas generator system, one (1) remote annunciator panel for remote generator monitoring and annunciation, and associated materials and connection for portable load bank (load bank excluded), complete as indicated in the contract documents, specifications and drawings according to all applicable CSA Standards and Codes. Including delivery of the customized generator set to the designated indoor generator room from the building entrance via existing vertical chute and horizontal wall openings and assemble the generator parts on site.
- (e) Provide new Automatic Transfer Switches (ATS's), Motor Control Centers (MCC's)/Panelboards/Distribution panels, breakers and associated materials, complete as indicated in the contract documents, specifications and drawings meeting all applicable CSA Standards and Codes.
- (f) Provide all required power distribution, including retrofit of existing 600V Motor Control Centers as a result of the removal of existing cable feeder as required and all control components and connections from the new Motor Control Centers to the automatic devices, interlocking etc.
- (g) Provide all control components and connections from existing specified RPU's to new natural gas standby generators, new automatic transfer switches and new MCC's/Panel boards/Distribution panels as specified.
- (h) Provide new cables/wiring, conduit runs and cable trays for critical and essential circuit protection, and associated installation hardware, materials and supporting systems where required for a complete functional system, are to be completed with wiring as indicated in this specification and/or shown in the Contract documents and drawings according to all applicable CSA Standards and codes.

- (i) Provide a Sequence of Construction by the Contractor for the installation of the new Standby generator/ATS system, taking into account minimizing of the required hydro shutdowns at all times throughout construction. ~~The Successful bidder shall arrange for the rental of a temporary generator, where required, to provide backup power during shutdown and system changeover. The estimated temporary generator size is 150kW, 600V, 3 phase, 60Hz.~~
- (j) Testing and Commissioning of all equipment installed shall be completed as per all required procedures and requirements mentioned and indicated in this specification and in the contract documents and drawings according to all applicable CSA Standards and Codes. The Contractor shall also submit Factory and Site Test procedures for review and approval.
- (k) Provide two-year (2) minimum warranty from Total performance on all equipment provided under this project on labour and material unless otherwise indicated in this specification.
- (l) Demolition and Removal of all existing cables, and associated materials complete as specified and /or shown in the contract documents, specifications and/or drawings according to all applicable CSA Standards and Codes. Demolition of cables and wiring of existing electrical equipment shall be subsequent to the successful testing and commissioning of the overall new generator systems including generators/ATS's performance and new MCC's/panel boards/distribution panels and circuit connections. Demolition work shall be incorporated into the Contractor's Sequence of Construction documentation.
- (m) All other work and coordination effort required (with other works: Mechanical, Structural, Hydro and Enbridge Utility where required), to deliver a complete functional system to satisfy the intent of the design, whether or not detailed on the Contract documents, drawings and/or described in this specification.
- (n) Provide all cable tray/conduit systems as specified complete with supporting material and hardware.
- (o) Provide all grounding required by the Ontario Electrical Safety code – latest edition whether or not shown explicitly in the Contract documents, specifications and drawings. This includes all required grounding to the generator, new exhausts and metal parts.
- (p) Provide removal and replacement of cable trays identified in the drawings at the power tunnel. The work includes temporary re alignment and re-placement of existing cables to the new cable trays.

(g) Provide existing FHA-ELS-MCC-0400A/B upgrade c/w control signals for Filter Building CV (Control Valve) control upgrade including cables, conduits, wires, pull boxes, control panels, etc.

~~(e)~~(r) Replace existing two (2) 80kVA/kW UPS with (2) new 80kVA/kW UPS, upgrade associated UPS power distribution, SCADA monitoring and Filter Value control. Replacement to be carried in stages to have one UPS in operation during replacement.

- c. Structural Improvements: The works includes but not limited to:
- (a) Constructing a fire separation with the applicable fire resistance rating enclosure around the generator set room, meeting all applicable Codes. The walls will extend to the deck/roof above and will be constructed of concrete masonry units. Providing fire stopping for all service penetrations through the walls around the generator room. A top of the wall deflection connection to be provided as shown on drawings.
 - (b) Construction of a concrete ramp and finishes at the entrance door to the generator room as indicated in the contract drawings
 - (c) Coordination of all the work under structural scope with other engineering scope and with existing services in the project area.
 - (d) Support for new vent stacks.
 - (e) existing Monorail beam partial removal, reinstatement and splicing as shown on drawings.
 - (f) Create a sump pit at the power tunnel.
 - (g) Provide leak treatment around cables penetration at power tunnel as shown on drawings and specified.
 - (h) Any other work specified in the Contract documents.
 - (i) Structural supports and protection for air intake ducts as shown on drawings.
- d. Architectural Improvements: Works associated with the special mounting bracket, existing tile preservation, roof penetration, and new stake architecture features to preserve R.C. Harris WTP heritage features, as identified in the specifications and drawings. The work includes but not limited to:

- (a) Constructing a fire separation with the applicable fire resistance rating enclosure around the generator set room, meeting all applicable Codes. The walls will extend to the deck/roof above and will be constructed of concrete masonry units. Providing fire stopping for all service penetrations through the walls around the generator room.
 - (b) Provide one (1) hollow metal double door and frame into the generator room with the required fire protection rating as indicated in the contract documents.
 - (c) Construction of a concrete ramp and finishes at the entrance door to the generator room as indicated in the contract drawings
 - (d) Coordination of all the work under architectural scope with other engineering scope and with existing services in the project area.
 - (e) Any other work specified in the Contract documents.
 - (f) Provide of Heritage preservation features as identified in the drawings including roof air intake and exhaust enclosures.
- e. Building Mechanical Improvements: Works associated with providing the new standby generator water cooling system in both Screen building and RMF pipe gallery, generator air intake and exhaust systems, new natural gas piping from new natural gas meter to new standby generators, as identified in the specifications and drawings. The work includes but not limited to:
- (a) Provide mechanical services to the natural gas fired genset installed in the Pipe gallery. These include cooling water supply and discharge, combustion air supply, engine exhaust duct, natural gas supply, enclosure ventilation and cooling and pipe gallery ventilation.
 - (b) The natural gas fired genset is supplied and installed under Division16.
 - (c) Modify the existing plant's natural gas supply pipework by removing the piping from the wall in the vicinity of the generator building and reroute around the building and return to the plant wall.
 - (d) Modify the existing pipe gallery ventilation duct by removing the duct from the wall in the vicinity of the generator building and reroute around the building and return to the plant wall.

- (e) Provide standalone water-cooled air-conditioning system for the generator building mounted on the floor outside the Generator room and provide connecting ductwork, condensate drain and cooling water pipe connections. Provide fire dampers for the supply air and return air openings through the generator enclosure.
- (f) Connect to existing plant supply cooling piping and extend piping to the enclosure with flowmeter, pressure reducing valve and necessary solenoid control and isolation valves. Make connections to the generator skid and standalone air conditioning system. Connect to discharge side of genset and air conditioning system and direct piping to drain below the floor slab into the level below.
- (g) Connect takeoff from plant natural gas supply piping and extend piping to the enclosure with pressure reducing station and totalizing meter and connect to generator.
- (h) Provide combustion air supply to generator building from air intake on the roof of the RMF, through a roof penetration into the RMF, continue down inside wall of the RMF, penetrate the wall of the RMF below grade and trench to the pipe gallery roof and penetrate the roof into the engine building. Complete the air supply ductwork with inline propeller fan, motorized interlocked supply damper and fire damper. RMF roof air intake hood by architectural.
- (i) Provide engine exhaust ductwork from generator building to roof of RMF building. Connect to engine muffler, penetrate the roof of the engine building, trench underground towards the RMF, penetrate the wall of the RMF, continue up the inside wall of the RMF and penetrate the roof of the RMF. Roof exhaust discharge by architectural.
- (j) Provide generator enclosure ventilation inlet louvre and exhaust fan complete with fire dampers and interlocked with the natural gas detector.
- (k) Remove roof mounted hoist beam in the vicinity of the generator building as indicated on the drawings and replace portion as noted at the completion of the job. Re assembled hoist beam to retested and re certified as specified.
- (l) Provide a float switch to detect water or glycol leaks on the floor.
- (m) Provide a local control panel for power and connectivity of mechanical systems in the generator enclosure building as detailed on drawings and specified.

- (n) Provide sump pump system including piping connection to drain, electrical work for the power tunnel area as shown on drawings.
- f. Instrumentation and SCADA Improvements: The scope of work related to the Standby Generator Upgrades includes:
 - (a) Mechanical Control Panel (FHA-ELS-CP-0101):
 - (i) Supply and install a new control panel as per Contract Specifications and Drawings. Refer to drawing I005.
 - (ii) Connect interlock conditions from the new control panel to the exhaust fan, combustion air supply fan, combustion air supply flow switch, combustion air damper, and air damper switch, as shown on the Contract Drawings.
 - (iii) Commission the control panel and integrate it with the new generator control panel, new gas detection controller, and the existing FHA-SPC-RPU-2022 as shown as per the Contract Specifications and Drawings.
 - (iv) Coordinate with the generator control panel supplier all wiring interconnections between the two control panels. Perform testing and commissioning for all interconnections in accordance with the City's standards.
 - (b) Flowmeter Installation and Integration (FHA-ELS-FIT-0101 & FHA-ELS-FIT-0102):
 - (i) Supply and install a new magnetic flowmeter FHA-ELS-FIT-0101 for the cooling water and a new insertion thermal mass flowmeter FHA-ELS-FIT-0102 for the natural gas supply for the generator in the specified location as per Contract Specifications and Drawings.
 - (ii) Calibrate and commission the flowmeters and integrate with the existing FHA-SPC-RPU-2022 as shown as per the Contract Specifications and Drawings.
 - (c) Float Switch Integration (FHA-ELS-LSH-0101):
 - (i) Supply and install a new float switch FHA-ELS-LSH-0101 for monitoring the generator spill containment in the specified location as per Contract Specifications and Drawings.
 - (ii) Commission the float switch FHA-ELS-LSH-0101 and integrate it into the existing FHA-SPC-RPU-2022 as shown in Contract Specifications and Drawings.

- (d) Gas Detector (FHA-ELS-CT-0101 & FHA-ELS-AIT-0101 & FHA-ELS-AIT-0102):
- (i) Supply, install, configure, and commission the new gas detection system controller FHA-ELS-CT-0101 as shown on the Contract Specifications and Drawings.
 - (ii) Supply, install, calibrate, and commission the new gas detectors FHA-ELS-AIT-0101(methane gas) and FHA-ELS-AIT-0102 (CO gas) wired to the new gas detection controller FHA-ELS-CT-0101 as shown on M201B drawing and specified under Division 13.
 - (iii) Connect dry contacts for the gas detectors from the new gas detection system controller to the existing FHA-SPC-RPU-2022 as shown in the contract Specifications and Drawings.
 - (iv) Supply, install, and commission a new combination horn and beacon powered from the new gas detection controller FHA-ELS-CT-0101 as shown in the Contract Specifications and Drawings.
 - (v) Connect dry contacts from the new gas detection system controller FHA-ELS-CT-0101 to the horn and beacon as shown in the Contract Specifications and Drawings.
 - (vi) Configure the new gas detection system controller FHA-ELS-CT-0101 to actuate the horn and beacon on the following alarms:
 - Methane Hi-Hi alarm
 - CO Hi-Hi alarm
 - Flame detection alarm
- (e) Flame Detector (FHA-FDT-AIT-0101):
- (i) Supply, install, calibrate, and commission a new flame detector FHA-ELS-FDT-0101 wired to the new gas detection controller FHA-ELS-CT-0101 as shown on M201B drawing and specified under Division 13.
 - (ii) Connect dry contacts for the flame detector from the gas detection controller to the existing FHA-SPC-RPU-2022 as shown in the contract Specifications and Drawings.
- (f) Ambient Temperature Sensor (FHA-ELS-TIT-0101):

- (i) Connect dry contacts for the flame detector from the gas detection controller to the existing FHA-SPC-RPU-2022 as shown in the contract Specifications and Drawings.
 - (ii) Connect the sensor to the existing FHA-SPC-RPU-2022 as shown in the Contract Specifications and Drawings.
- (g) Power Monitor Installation and Testing:
 - (i) Supply and install one Eaton PXM1000 power meters inside each of the existing FHA-SPC-RPU-2022 and FHA-SPC-RPU-1223 as shown in the Contract Drawings.
 - (ii) Connect new power monitors to the new gateway in the existing FHA-SPC-RPU-2022 and the existing Multinet-FE gateway in the existing FHA-SPC-RPU-1223 as shown on the Contract Drawings.
 - (iii) Connect the new power meters into the existing network cabinets as shown on the Contract Drawings.
 - (iv) Provide all interconnecting cables for network connections including CAT 6 cable and connectors.
 - (v) Horizontal CAT6 cable segments shall meet the requirements of the TIA-568-C specification for CAT6 cable.
- (h) Integration of new Standby Generator and ATS:
 - (i) Connect new wiring from the new standby generator FHA-ELS-GEN-0100 and new ATSs FHA-ELS-TS-0400 and FHA-ELS-TS-0300 to the existing FHA-SPC-RPU-2022 and FHA-SPC-RPU-1223 as shown in the Contract Drawings. Refer to E202 and E205 for the location details of FHA-ELS-TS-0400, FHA-ELS-TS-0300, FHA-SPC-RPU-2022 and FHA-SPC-RPU-1223.

g. Instrumentation and SCADA Improvements: The scope of work related to the replacement of FLT-UPS-0001 and FLT-UPS-0002 includes:

- (a) Existing UPS's FLT-UPS-0001 and FLT-UPS-0002:
 - (i) Demolish and remove existing UPS's as specified under Divison 16.
 - (ii) Disconnect and remove existing control wiring from the UPS's to the PLC panel SPC-RPU-1521 and from the UPS's to the Filter Rate Valves Distribution Panels (FLT-CP-0005 and FLT-CP-0006)

- (iii) After installation of the new UPS's FLT-UPS-0001 and FLT-UPS-0002, supply and install conduit and wiring and connect the UPS relay outputs to the appropriate points covered in the next sections and as shown on the Contract Drawings.
- (iv) Supply and install two new 120VAC fuses in the existing PLC panel SPC-RPU-1521. Connect new power feeds from these fuses to the new Filter CV panels FLT-CP-0005 and FLT-CP-0006 as shown on the Contract drawings.
- (v) Supply and install two 120VAC relays wired to the new fuses. Wire N.O. contacts from the new relays to spare PLC digital inputs for monitoring of the fuse power as shown on the Contract drawings.
- (+)(vi) Supply and install conduit between the new UPS's to the existing PLC panel SPC-RPU-1521. Wire the UPS status outputs to existing spare PLC inputs as shown on the Contract drawings.

g-h. Instrumentation and SCADA Improvements: The scope of work related to the Filter CV Shutdown System includes:

- (a) Existing FLT-CP-0005 and FLT-CP-0006 Control Filter Rate Valves Distribution Panels:
 - (i) Demolish and remove interior components inside existing control Filter Rate Valves Distribution Ppanels FLT-CP-0005 and FLT-CP-0006. Retain existing enclosures and rename/retag them FLT-JB-0005 and FLT-JB-0006, respectively.
 - (ii) Install new conduit and wiring between existing panelthe new UPS FLT-UPS-0001 and the new Filter CV panel FLT-CP-0005 as shown on the Contract Drawings.
 - (iii) Install new conduit and wiring between existing panelthe new UPS FLT-UPS-0002 and the new Filter CV panel FLT-CP-0006 as shown on the Contract Drawings.
- (b) Filter CV Shutoff Control Panel:
 - (i) Supply and install the new Filter CV Shutoff Control Panel FLT-CP-0007 supplied under division 13 as shown on the Contract Drawings.
 - (ii) Install new conduit and wiring between existing MCC-0400 and the Filter CV Shutoff Control Panel FLT-CP-

0007 for the monitoring of: Source A power, Source B power, and Tie Breaker switchover, as shown on the Contract Drawings.

(c) Filter CV Panels:

- (i) Supply and install new Filter CV panels FLT-CP-0005 and FLT-CP-0006 supplied under division 13 as shown on the Contract Drawings.

H.I. Instrumentation and SCADA Improvements: The scope of work related to all Contract Drawing series includes:

(a) Field Wiring and Conduit:

- (i) Supply and install all conduit and field wiring for equipment supplied under division 13 as shown on the Contract Drawings.

(b) Tagging of Field Devices:

- (i) Provide all field device tags listed in The Contract Document And Drawings.
- (ii) Provide required tag spreadsheets for all equipment as per specification Section 13040.

(c) SCADA System:

- (i) Develop new process graphics, sub-pictures, devices sub-pictures, setpoints, trends, alarm pages, run-hour graphics, HMI database and menus. Comply with the City's SCADA Standards for software development as specified in the City's Process Control System Implementation Guidelines using City's standard modules.

(d) Commissioning and Training:

- (i) Comply with the requirements set out in Division 1.
- (ii) Demonstrate loop checks for the I/O identified by this scope of work. Before requesting witnessed loop checks, carry out Contractor's own field and loop check tests to verify that the equipment operates as intended. Correct any problems or deficiencies prior to requesting witnessed checks.
- (iii) On site loop check must exercise the entire loop, including the field equipment and SCADA screens. Each loop check must be witnessed by, and successfully demonstrated to the Engineer for sign-off approval.

- (iv) Provide Factory Acceptance Test (FAT) to demonstrate the operational functionality of PLCs, SCADA hardware, software and communications. Notify the Contract Administrator/Engineer ten (10) days in advance of FAT such that this test may be witnessed by the appropriate parties. Submit test report after the test duly signed by the Contract Administrator and contractor. Use only pre-approved test format. Comply with the Process Control System Implementation Guidelines for FAT requirements.
- (v) Provide Site Acceptance Test (SAT) to demonstrate the correct operation of control system with both hardware and software in place. Provide site support services upon request by System Integrator during system SAT. Notify the Contract Administrator ten (10) days in advance of SAT such that this test may be witnessed by the appropriate parties. Submit filled in test forms after commissioning. Comply with the Process Control System Implementation Guidelines for SAT requirements.
- (vi) Coordinate closely with the Engineer and System Integrator when carrying out all work to demonstrate overall system integrity, allowing sufficient time for the essential portions of SCADA and PLC software to be installed and tested.
- (vii) Maintain record drawings (As-Builts) for all drawings.
- (viii) Provide testing and verification services for all Network equipment as per the City's ITM standards and requirements.

1.2 CONTRACT METHOD

- .1 Construct the Work under a single lump sum price contract. Scope of work identified in in section 1.1, but not limited to including contract drawings and specifications, will be undertaken by a single contract. City will not assume operation of the new works until testing and commissioning has been completed to the satisfaction of the city.
- .2 Provisional items have been identified and will be included in the Form of Tender as individual lump sum items and brought into the Total Lump Sum Tender Price as a single lump sum item.

1.3 WORK BY OTHERS

- .1 Enbridge Gas installed the gas service from Queen Street to the metering station, including the meters.
- .2 Refer to the CCDC General Conditions and Supplementary Conditions to CCDC, Item GC 3.2 – Construction by Owner or Other Contractors.

1.4 WORK SEQUENCE

- .1 Construct Work in stages to accommodate the City's continued use of the existing water treatment plant and all associated processes and equipment during construction as described below in Section 1.5. At no time, will an interruption of water supply be allowed without express written approval from the City. Any utility or process shutdown plan are to be submitted 2 weeks prior to schedule of work for the Engineer and the plant review. Plant will provide shutdown form to be used.
- .2 Phase construction of Works as required to accommodate other construction activities on site.
- .3 Submit all construction submissions including but not limited to shop drawings, shut down requests, test results, O&M manuals in a timely fashion and in accordance with these Contract Specifications.
- .4 Coordinate construction of work with Construction Schedule and with City Occupancy.
- .5 The construction sequence is to be in conformance with the requirements of the project, the constraints identified below in Section 1.5 and is subject to the Engineer's approval.
- .6 Maintain fire access/control.

1.5 CONSTRUCTION SEQUENCING AND CONSTRAINTS

- .1 The Contractor is to coordinate the completion of the Work described in Section 1.1.1 as per Section 01140 – Work Restrictions, Section 01310 – Project Management and Coordination, and Specification 01312 – Project Meetings.
- .2 Contractor to provide a detailed price breakdown for billing purposes within 2 weeks of order to commence work in both electronic (native software format) and portable document format (PDF). Engineer is to provide a sample prior to contract order to commence. Breakdown is to be based on the specification divisions and provide adequate detail to monitor project basis. Mobilization and demobilization costs will be based on a prorated schedule based on overall timeline. The value designated for these services will be limited to a maximum of 2.5% of the total contract value.
- .3 Contractor to prepare a detailed time-task construction sequencing schedule using a computerized scheduling software package for the entire Contract. The baseline schedule is to be submitted within 2 weeks of order to commence work and based on Specific Conditions 5A in both electronic (native software format) and portable document format (PDF). All milestones are to be shown on schedule including the critical path. This includes and plant/utility/power shutdowns. Provide a preliminary schedule for review during the pre-construction meeting.
- .4 The Engineer will review and comment on the Contractor's construction sequence and schedule so as to minimize impact on operations, subject to approval of the City.
- .5 Contractor to coordinate construction and commissioning sequencing with the Engineer and City to ensure priority is given to the minimum impact to overall facility functions and production requirements.

- .6 The following constraints must be considered by the Contractor in preparing the construction schedule for the Contract:
- .1 Mobilization will not be permitted until completion of the Generator shop drawing review process in accordance with Section 01330 – Submittals and Section 16500 – Natural Gas Engine Indoor Generator. Note Anticipated generator Lead time is 40 Weeks.
 - .2 Refer to section 01510 – Temporary Utilities and 01570 – Temporary Controls.
 - .3 Power supply to the facility must be maintained at all times.
 - .4 All chemicals and materials used for the production of potable water, including process water (e.g., wash water tanks) must meet all applicable standards set by both the American Water Works Association (AWWA) and the American National Standards Institute (ANSI) safety criteria standards NSF/60 and NSF/61.
 - .5 Protection from dust and contamination of the WTP and its equipment must be maintained at all times. Appropriate physical barriers, maintenance of negative air pressure, and other measurements around the construction works must be implemented.
 - .6 The underground construction and relevant excavation shall be scheduled as such that an adequate time period is allowed for potential design modification of the underground construction after excavation and prior to any relevant work starts, such as order of material and equipment, labor schedule, etc.
 - .7 The contractor must maintain the plant operation and power at all times. The contractor must use standby power generators if switchgears or MCCs will be isolated at any time. The contractor is not allowed to use any existing generators currently on-site to maintain power. The contractor is to minimize the shutdown times of all equipment at all times.
 - .8 Equipment during the switchover procedure will be out of service for a maximum of two (2) hours, conditional on plant approval.
 - .9 Gradually, only one load at a time will be rewired from an existing panel to a new critical load panel, in a safe and orderly manner.
 - .10 When all existing loads have been shifted to their new power supplies, then the temporary power supply will be decommissioned and removed.
 - .11 In addition to the constraints described herein, the following information on the work to be undertaken is provided to assist the Contractor in developing a sequence of work. The information presented is not prescriptive. Work may proceed concurrently or separately in each area and may need to be adjusted to suit plant process timing restrictions, seasonal conditions, and equipment delivery restrictions. Work may proceed independently in each area exclusive of constraints and tie-in restriction noted.
 - .12 All the work under this contract must commence and must be completed within the timeframe described in Tender Document, or as otherwise agreed.

- .13 Ensure strict adherence to the plant's safety standards and the Occupational Health and Safety Act.
- .14 Co-ordinate tie-ins to existing services with Plant and Engineer and comply with Ministry of Labour requirements.
- .15 Minimize the number of disruptions to plant operations.
- .16 Contractor is fully responsible for equipment operation until it is fully commissioned.
- .17 No propane-or powered equipment is permitted inside the plant at anytime. Appropriate containment and mitigation measures must be in place to prevent the release of containments such as hydraulic fluid, oil and grease. This applies to equipment including, but not limited to, scissor lifts, pallet jacks and concrete milling machines. If hydraulic fluid is required, food grade oil must be used.

1.6 HOURS OF WORK

- .1 Perform Work in conformity with all municipal bylaws with respect to noise control, hours of work, night work and holiday work.
- .2 Work is to be restricted to the hours of 7:00 am to 5:00 pm during normal business days, with no work on holidays or weekends without written permission from the Engineer.
- .3 Large delivery trucks (e.g. flatbeds, concrete trucks, bin trucks) to be restricted to come onsite between the hours of 7:00 am to 5:00 pm during normal business days (including all deliveries to plant), with no work on holidays or weekends without written permission from the Engineer. These trucks are not permitted to idle on neighbourhood streets prior to or after these work hours.
- .4 Contractor is also referred to the Specific Conditions clause 5A for evening, Sundays and holiday work.
- .5 Contractor Use of Premises
- .6 Boundaries of the site are shown on the Contract Drawings. Restrict operations to designated site in order to ensure the safety of the public.
- .7 Provide approved security fencing and/or hoarding around the work and storage areas as shown on contract drawings and in accordance with the Occupational Health and Safety Act.
- .8 As provided in the Occupational Health and Safety Act, the Contractor must assume responsibility for all personnel on site. The Engineer may authorize others to have access to the site as necessary.
- .9 Obtain written authorization from City to enter private lands, which are the subject of easements or rights-of-way obtained by City.
- .10 Ascertain and abide by conditions pertaining to use of easements or rights-of-way.

- .11 Assume full responsibility for protection and safekeeping of products/equipment under this Contract.
- .12 Obtain and pay for use of additional storage, access or work areas needed for operations under this Contract. All storage areas must be approved by the Engineer prior to use. Materials must be stored to ensure the preservation of their quality and fitness for use.
- .13 Prior to final inspection, obtain and submit to Engineer written signed releases from all owners of lands affected by easements or rights-of-way, confirming that properties have been left in an acceptable condition and that owners have no further claims in this respect.
- .14 Protect all newly constructed work from damage of any form. Any portion of the work, which is damaged, must be rebuilt at the Contractor's expense to the satisfaction of the Engineer.

1.7 CITY OCCUPANCY

- .1 City will occupy premises during entire construction period for execution of normal operations.
- .2 Coordinate construction works with the City in order to minimize conflict and to facilitate continual operation of the existing R.C. Harris WTP until construction works are completed.

1.8 DRAWINGS AND SPECIFICATIONS FURNISHED

- .1 Contractor Responsibilities:
 - .1 Provide printed copies of drawings and specifications, as required.
 - .2 Maintain at site one complete set of red-line marked-up drawings. Make available to Engineer at any time.
 - .3 Maintain record drawings as per Section 01789 – Project Record Documents. Make available to Engineer at any time.

1.9 SUPPLEMENTARY DRAWINGS

- .1 Engineer may furnish supplementary drawings to assist proper execution of work. Such drawings will be issued for clarification only and will have same meaning and intent as if included with plans referred to in Contract Documents.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION