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REVISION B	SECTION 01010 SUMMARY OF WORK	

PART 1. GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. The completed Work will provide the City of Winnipeg (City) with a new composting facility at the Brady Road Resource Management Facility (BRRMF) to handle both leaf and yard waste (L&YW) and dewatered biosolids and includes:
1. General
 - a. Supply and installation of tagging, labelling and identification of all new equipment.
 - b. Project documentation.
 - c. Testing, commissioning, operating training and start-up services.
 2. Leaf and Yard Waste Facility:
 - a. Civil
 - 1) Installation of geotextile fabric (supplied by City) on the L&YW pad.
 - 2) Surveying and staking for the applicable Work area.
 - 3) Supply, installation and compaction of granular for L&YW pad.
 - 4) Supply and installation of L&YW Pond inlet and outlet rip rap.
 - 5) Supply and installation of traffic signs posts and installation of traffic signs.
 - 6) Re-grading of Ditches 1, 2, 3, 4 and 5 (only if affected during the course of performing the Work of this Contract).
 - 7) Supply and installation of depth gauge in the L&YW Pond.
 - b. Structural
 - 1) Supply and installation of concrete Jersey barriers to delineate access road from pad working surface and material storage areas on east and west sides of the pad.
 - c. Mechanical
 - 1) Supply and installation irrigation water supply lines with associated fittings and valves along the south-east and north edges of the L&YW pad.
 - d. Electrical
 - 1) Supply and installation of exterior lighting and associated poles along the south and east sides of the L&YW pad.
 3. Biosolids Facility
 - a. Civil
 - 1) Surveying and staking out the applicable Work areas.
 - 2) Pad subgrade preparation including silt excavation and hauling and excavation, hauling, placement and compaction of clay fill for subgrade. Clay is to be obtained from an on-site designated clay borrow area.
 - 3) Dewatering on pad after silt removal (as required should

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- precipitation result in water accumulation in the pocket(s)).
- 4) Excavation, hauling, placement and compaction of clay for pad liner (Compacted Clay Liner (CCL)). Clay is to be obtained from an on-site designated clay borrow area.
 - 5) Supply and installation of leachate collection catch basin.
 - 6) Supply and installation of underground fiberglass leachate storage tank complete with associated tie-down straps, anchors, fittings, manholes risers, manhole lids, and accessories.
 - 7) Supply and installation of all bedding material, backfill and compaction for the installation of buried feed and vent lines to and from the leachate tank.
 - 8) Supply and installation of geotextile fabric.
 - 9) Supply, installation and compaction of granular for pad.
 - 10) Preparation of asphalt pad and ramp sub-grade and supply and installation of asphalt pad and ramp.
 - 11) Existing Pond(s)
 - a) Supply and installation of inlet and outlet rip rap.
 - 12) Biosolids Pond
 - a) Excavation for the construction of the Biosolids Pond.
 - b) Excavation, hauling, placement and compaction of clay for Biosolids Pond liner (Compacted Clay Liner (CCL)). Clay is to be obtained from an on-site designated clay borrow area.
 - c) Supply and installation of pond inlet and outlet rip rap.
 - d) Supply and installation of Biosolids Pond depth gauge.
 - 13) Supply and placement of biofilter media (woodchips).
 - 14) Supply and installation of temporary culverts and access ways from the built-up pad and clay borrow areas to the biosolids pad.
 - 15) Supply and installation of traffic signs posts and installation of traffic signs.
- b. Structural/Architectural
- 1) Arrange, obtain and pay for building permits and inspections.
 - 2) Aerated Static Pile (ASP) Bunkers
 - a) Supply and installation of reinforced concrete foundation.
 - b) Supply and installation of ASP interlocking concrete block walls.
 - 3) Mixing and Receiving Building
 - a) Supply and installation of reinforced concrete foundation and perimeter concrete wall.
 - b) Supply and installation of Mixing and Receiving Building complete with overhead doors, man-doors, louvers, door hardware, and supports for mechanical and electrical equipment.
 - 4) Biofilter

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- a) Supply and installation of reinforced concrete foundation and mud mat.
- b) Supply and installation of interlocking concrete block walls.
- 5) Supply and installation of reinforced concrete equipment pads for miscellaneous mechanical and electrical equipment and piping support pads.
- 6) Supply and installation of bollards by the building openings and near the leachate tank manholes.
- 7) Supply and installation of a reinforced concrete tank pad for the underground leachate tank.
- 8) Miscellaneous Concrete Blocks/Jersey Barriers
 - a) Supply and installation of interlocking concrete block walls for Mixed Feed Bunker.
 - b) Supply and installation of concrete Jersey barriers to delineate access road allowance on the west side of the Biosolids Pad.
 - c) Supply and installation of interlocking blocks to delineate working area within in the Mixing and Receiving Building.
 - d) Supply and installation of Jersey barriers around the transformer.
 - e) Supply and installation of Jersey barriers around the leachate tank manholes.
- c. Process Mechanical
 - 1) Supply and installation of Mixing and Receiving Building sump cover (floor plate), framing and removable basket.
 - 2) Supply and installation of catch basin removal basket and catch basin interior framing for basket installation.
 - 3) Supply and installation of four compost fans and drives suitable for variable speed control.
 - 4) Supply and installation of one biofilter fan with a constant speed drive.
 - 5) Supply and installation of a vertical auger mixer and two discharge conveyors complete with all accessories. Supply and installation of HDPE aeration piping and accessories (including metal aeration floor diffuser grate assemblies and cast-in-place metal cleanout frames and covers) cast into the ASP bunker foundation slabs.
 - 6) Supply and installation of HDPE aeration piping and accessories cast into the biofilter foundation slab (including cast-in-place metal cleanout frames and covers).
 - 7) Supply and installation of compost and biofilter fan intakes and discharge piping, complete with fittings, accessories, and valves (dampers).

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- 8) Supply and installation of irrigation water pump, and aboveground water supply lines with associated fittings and valves along the east edge of the Biosolids pad and tying into the L&YW water supply line.
 - 9) Supply and installation of irrigation hose reel.
 - 10) Supply and installation of HDPE leachate gravity lines to the leachate tank.
 - 11) Supply and installation of leachate tank vent.
 - 12) Supply and installation of the biofilter irrigation system including water storage tank, sprinkler irrigation pump station, sprinklers, and associated piping, valves and fittings.
 - 13) Supply and installation of piping supports systems.
 - 14) Supply and installation of aluminum ventilation ducting and intake louvers and all associated fittings and accessories in the Mixing and Receiving building.
 - 15) Supply and installation of Mixing and Receiving Building sump drainage piping.
- d. Electrical
- 1) Arrange, obtain and pay for electrical permits and inspections.
 - 2) Supply and installation of building and exterior lighting.
 - 3) Supply and installation of Customer Service Termination Enclosure (CSTE).
 - 4) Supply and installation of MCC as per drawings including (but not limited to):
 - a) 42 circuit distribution panel.
 - b) 30 KVA Lighting Transformer.
 - c) Irrigation pump soft start.
 - d) VFD's for the compost fans
 - 5) Power and control wiring as required for all equipment and instruments.
 - 6) Trenching, backfilling and supply and installation for all exterior wiring.
 - 7) Installation of soft starter for the compost mixer (supplied by mechanical with vertical auger mixer).
 - 8) Supply and installation of mast for remote monitoring antenna (antenna and cable supply and installation by City).
- e. Instrumentation and Control
- 1) Supply and installation of Plant Control System including: plant PLC panel, HMI computer, all associated software.
 - 2) Supply and installation of instruments and associated accessories.
 - 3) Integration of the Plant PLC/HMI with the City's SCADA system. Alarms and equipment status to be monitored and relayed via a secure radio link.

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- B. The Work is divided into the following schedules:
1. L&WY Schedule:
 - a. Completion of Granular Pad 35 Working Days
 - b. Completion of Exterior Lighting 35 Working Days
 - c. Completion of Concrete Barriers and Signage Installation 45 Working Days
 2. Biosolids Schedule:
 - a. Substantial Performance 160 Working Days
 - b. Total Performance 190 Working Days

1.02 WORK NOT COVERED BY CONTRACT DOCUMENTS

- A. Supply and installation of new primary electrical service, transformer and transformer pad (by Manitoba Hydro).
- B. Phase 2 L&YW compost pad, access road and drainage ditches.
- C. Construction of the Phase 1 L&YW Compost Pad compacted clay liner.
- D. Construction of drainage Ditches 1, 2, 3, 4 and 5 and associated culverts.
- E. Construction of 1:25 Year L&YW Pond, including inlet Ditch 3 and outlet drainage ditch.
- F. Construction of Landfill Gas Flare Building and associated access road.
- G. Moving existing L&YW compost windrows onto the new L&YW pad (by City).
- H. Supply and installation of HMI screens in the BRRMF Administration Building.
- I. Supply and installation of antenna and dual coax cable for remote monitoring.
- J. Supply of front-end loader, trommel screen and windrow turner.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

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PART 1. GENERAL

1.01 SUBMITTALS

A. Informational:

1. Statement of Qualification (SOQ) for land surveyor or civil engineer.

1.02 RELATED WORK AT SITE

A. General:

1. Other Work that is either directly or indirectly related to scheduled performance of the Work under these Contract Documents, listed henceforth, is anticipated to be performed at Site by others.
2. Coordinate the Work of these Contract Documents with Work of others as specified in General Conditions.
3. Include sequencing constraints specified herein as a part of progress schedule.
4. The Contractor will not have exclusive use of the Site. The Contractor shall coordinate activities with others and minimize disruptions where possible.
5. Where access requires relocation for installation of Works, the Contractor shall construct suitable all weather detours as required.
6. The Contractor shall note that Brady Road Resource Management Facility will be in use during the construction period. The Contractor shall provide all reasonable assistance to Operations personnel to provide safe secure access to operational facilities.

B. Power:

1. Agency and Contact Person: Brian Rempel, Energy Services Coordinator – Winnipeg, Manitoba Hydro, telephone number: 204-360-5168, brempe@hydro.mb.ca
2. Work to be performed by (agency):
 - a. Incoming aerial power lines.
 - b. Incoming underground power cables, materials, installation, termination, and connection.
 - c. Transformers supplying main electrical service to the facility.
 - d. Metering facilities.
 - e. Install Roadway Lighting along incoming service poles.
3. Work to be performed by Contractor:
 - a. Coordinate Contractor's Work with Manitoba Hydro.
 - b. Transformer Site preparation and pad.
 - c. As indicated.
 - d. Perform Work in accordance with agency requirements and codes.
4. City will be responsible for payment of direct charges of Manitoba Hydro.

C. Civil Works

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1. Contact Contract Administrator for further information on related Site Work.
2. Work to be performed by the City of Winnipeg using Hugh Munro Construction Ltd.:
 - a. Construction of L&YW Composting Pad compacted clay liner and associated L&YW pad east and west Site accesses subgrade.
 - b. Construction of L&YW Pond compacted clay liner and inlet and outlet ditches.
 - c. Construction of Ditches 1, 2, 3, 4 and 5 and associated culverts.
3. Work to be performed by Contractor:
 - a. Installation of geotextile fabric (supplied by City) on the L&YW pad.
 - b. Surveying and staking for Work to be performed as part of this Contract.
 - c. Supply, installation and compaction of granular for L&YW Composting Pad and associated east and west accesses off of Charette Road.
 - a. Supply and installation of Jersey barriers to delineate the east and west access allowances on the L&YW Composting Pad.
 - b. Supply and installation of lighting systems along the south and east edges of the L&YW Composting Pad.
 - c. Re-grading of ditches if impacted by the Work performed as part of this Contract.
 - d. Installation of irrigation system hose, valves and associated fittings along the edge of the L&YW Composting Pad.
4. Sequencing:
 - a. Hugh Munro Construction Ltd. is to complete their Work prior to the Contractor commencing their Work on the L&YW pad and associated accesses. The installation of the lighting system can be done prior to Munro completing the L&YW Composting Pad.

D. Remote Monitoring

1. Work to be performed by City:
 - a. Supply and installation of antenna and coax cable for remote monitoring.
2. Work to be performed by Contractor:
 - a. Coordination support and supply and installation of mast for the antenna.

E. Signage

1. Work to be performed by Contractor:
 - a. Supply of traffic signs.
 - b. Supply of sign posts and installation of signs and posts.

1.03 UTILITY NOTIFICATION AND COORDINATION

- A.** Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during Work.

1. Manitoba Hydro:
 - a. Contact Person: Brian Rempel

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b. Telephone: 204-360-5168

B. Remote Monitoring

2. Contact Contract Administrator for coordination requirements.

1.04 FACILITY OPERATIONS

A. Continuous operation of City's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified. In the event of conflict between construction activities and facility operations, facility operations have priority unless otherwise specified.

B. Do not proceed with Work affecting a facility's operation without obtaining City's and Contract Administrator's advance approval of the need for and duration of such Work.

1.05 ADJACENT FACILITIES AND PROPERTIES

A. Examination:

1. After Effective Date of the Agreement and before Work at Site is started, Contractor, Contract Administrator, and affected property owners and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations.
2. Periodic reexamination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions.

B. Documentation:

1. The Contract Administrator will record and provide documentation of observations made on examination inspections.
2. Upon receipt, Contractor is to review, sign, and return one record copy of documentation to Contractor Administrator to be kept on file in field office.
3. Such documentation shall be used as indisputable evidence in ascertaining whether and to what extent damage occurred as a result of Contractor's operations, and is for the protection of adjacent property owners, Contractor, and City.

1.06 CONSTRUCTION PHOTOGRAPHS

A. The Contractor must photographically document all phases of the project including preconstruction, construction progress, and post-construction.

B. Preconstruction and Post-construction:

1. After Effective Date of the Agreement and before Work at Site is started, and again upon issuance of Substantial Performance, take pictures of construction Site and property adjacent to perimeter of construction Site.
2. Particular emphasis shall be directed to structures both inside and outside the

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Site.

3. Format: Digital, minimum resolution of 5 megapixels.

C. Construction Progress Photos:

1. Photographically demonstrate progress of construction, showing every aspect of the Site and adjacent properties as well as interior and exterior of new or impacted structures.
2. Take a minimum of 20 digit photographs per week with a minimum resolution of 5 megapixels.
3. Include date and time photo on each photo.
4. Label each photo by location and area designation.
5. Compile digital photographs on a CD:
 - a. Save photographs into subfolders for each week of progress.
 - b. Label each subfolder in a DD_MM_YYYY format.
6. Label each CD with Client Name, Project Name, and week and year images were compiled.
7. Submit 4 copies of the CD to Contract Administrator.

1.07 REFERENCE POINTS AND SURVEYS

- A. Establish clearing limits, centerlines of roads and pipelines, set toe of fill and top of cut stakes, set grade hubs on minimum 15 m stations for subgrade, base course, and surfacing and set bench marks convenient for use as necessary to establish basic layout of Work.
- B. For gravity pipelines set offset stakes indicating cut-to-flow line at each manhole or alignment change and at approximate 10-m intervals along line.
- C. Location and elevation of the benchmark is shown on the Drawings. These coordinates are UTM Zone 14 North NAD83. The coordinates of the benchmark are:
 1. N – 5513375.752
 2. E – 629659.290
 3. Elev – 234.313 m
- D. Retain professional land surveyor or civil engineer registered in province of Manitoba to perform or supervise engineering surveying necessary to layout the Work.
- E. Maintain complete accurate log of survey Work as it progresses as a Record Document.
- F. On request of Contract Administrator, submit documentation.
- G. Provide competent employee(s), tools, total station equipment, stakes, and other equipment and materials as Contract Administrator may require to:
 1. Establish control points, lines, and easement boundaries.
 2. Check layout, survey, and measurement Work performed by others.
 3. Measure quantities for payment purposes.
 4. Be available at all times.

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PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 CUTTING, FITTING, AND PATCHING

- A. Cut, fit, adjust, or patch Work and Work of others, including excavation and backfill as required, to make Work complete.
- B. Obtain prior written authorization of Contract Administrator before commencing Work to cut or otherwise alter:
 - 1. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.
 - 2. Weather- or moisture-resistant elements.
 - 3. Work of others.
- C. Refinish surfaces to provide an even finish.
 - 1. Refinish continuous surfaces to nearest intersection.
 - 2. Refinish entire assemblies.
 - 3. Finish restored surfaces to such planes, shapes, and textures that no transition between existing Work and Work is evident in finished surfaces.
- D. Restore existing Work, underground facilities, and surfaces that are to remain in completed.
- E. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces and fill voids.

END OF SECTION

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PART 1. GENERAL

1.01 SUBMITTALS

- A. Quality Control Submittals: Submit certificates from inspecting authorities for electrical Work, and pressure piping among others.

1.02 APPLICABLE CODES

- A. Comply with the latest edition of the codes and standards referenced in Contract Documents and following statutes and codes and all amendments thereto:
 1. Manitoba Workplace Safety and Health Act.
 2. Manitoba Plumbing Code.
 3. The Boilers and Pressure Vessels Act.
 4. Canadian Electrical Code.
 5. Manitoba Building Code.
 6. The Drinking Water Safety Act.
 7. Environment Act, Manitoba.
 8. Canadian Environmental Protection Act.
 9. Codes and Standards of the National Fire Protection Association (NFPA).
 10. Canadian Electrical Code.
 11. Workers Compensation Board.
- B. For purposes of the Workplace Safety and Health Act, the Contractor will be designated the “Constructor” and assumes the responsibility of the “Constructor” as set out in the Act and its regulations.

1.03 PERMITS, APPROVALS, AND LICENCES

- A. Apply for, obtain, and pay for all other permits, approvals, and licenses required for the project, including but not limited to:
 1. Building permit.
 2. Plumbing permit.
 3. Electrical permit.
- B. Where electrical enclosures and panels do not have CSA labels, arrange for each such electrical enclosure or panel to be inspected by the provincial electrical safety inspector.
- C. Arrange for regular inspections and a final inspection with:
 1. The provincial electrical safety inspector.
 2. Plumbing Inspector.
 3. Building Inspector.

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- B. Arrange for all other regular inspections and final inspections required.
- C. The Contractor shall be solely responsible, without limitations, for any delays arising from the Contractor's failure to plan for the required inspections and to ascertain the availability of the Permit/Approval/Licensing Inspectors to complete the required inspections for the Works under this Contract. The related costs and expenses incurred by the Contractor shall be borne by the Contractor, with no change in the Contract Price and/or Contract Time.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

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REVISION 0	SECTION 01200 PROJECT MEETINGS	

PART 1. GENERAL

1.01 GENERAL

- A. Contract Administrator will schedule meetings throughout progress of the Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within 2 business days after each meeting to participants and parties affected by meeting decisions.
- B. The location of the meeting shall be the Brady Road Resource Management Facility Administration Building.

1.02 PRECONSTRUCTION CONFERENCE

- A. Contractor shall be prepared to discuss the following subjects, as a minimum:
 - 1. Required schedules.
 - 2. Preliminary schedule as set forth in Section 01310, Progress Schedules.
 - 3. Status of Bonds and insurance.
 - 4. Sequencing of critical path Work items.
 - 5. Progress payment procedures.
 - 6. Project changes and clarification procedures.
 - 7. Requirements for use of Site, access, Site signs, office and storage areas, security, utilities, hoarding and temporary facilities.
 - 8. Major product delivery and priorities.
 - 9. Contractor's safety plan and representative.
 - 10. Required Submittals.
 - 11. Quality Control Plan.
- B. The Preconstruction Meeting shall take place no later than ten 10 Working Days after the issuance of the Letter of Intent and shall be held at the Brady Road Resource Management Facility Administration Building.
- C. Attendees will include:
 - 1. City's representatives.
 - 2. Contractor's office representative.
 - 3. Contractor's resident superintendent.
 - 4. Subcontractors' representatives whom Contractor may desire or Contract Administrator may request to attend.
 - 5. Contract Administrator's representatives.

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6. Others as appropriate.

1.03 PROGRESS MEETINGS

- A. Contract Administrator will schedule regular progress meetings at Site, conducted bi-weekly to review the following:
 1. Health and safety issues.
 2. Review of any comments on the previous meeting summaries.
 3. Review of the progress of the Work including comments regarding the progress schedule.
 4. Schedule and status of Shop Drawing and Sample submittals.
 5. Status of Contractor-issued requests for information.
 6. Status of change orders.
 7. Status of Contractor claims.
 8. Status of Payment Certificates.
 9. Other matters needing discussion and resolution.

- B. Attendees will include:
 1. City's representative(s), as appropriate.
 2. Contractor, Subcontractors, and Suppliers, as appropriate.
 3. Contract Administrator's representative(s).
 4. Others as appropriate.

1.04 QUALITY CONTROL AND COORDINATION MEETINGS

- A. Scheduled by Contract Administrator on regular basis and as necessary to review test and inspection reports, and other matters relating to quality control of the Work and work of other contractors.

- B. Attendees will include:
 7. Contractor's Project Manager and Site Superintendent.
 8. Contractor's designated quality control representative.
 9. Subcontractors and Suppliers, as necessary.
 10. Contract Administrator's representatives.

1.05 PREINSTALLATION MEETINGS

- A. When required in individual Specification sections, convene at Site prior to commencing the Work of that section.

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- B. Require attendance of entities directly affecting, or affected by, the Work of that section.
- C. Notify Contract Administrator 4 days in advance of meeting date.
- D. Provide suggested agenda to Contract Administrator to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

1.06 FACILITY STARTUP MEETINGS

- A. Schedule and attend a minimum of two facility startup meetings. The first of such meetings shall be held prior to submitting Facility Startup Plan, as specified in Section 01810, Equipment Testing and Facility Startup, and shall include preliminary discussions regarding such plan.
- B. Agenda items shall include, but not be limited to, content of Facility Startup Plan, coordination needed between various parties in attendance, and potential problems associated with startup.
- C. Attendees will include:
 1. Contractor.
 2. Contractor's designated quality control representative.
 3. Subcontractors and equipment manufacturer's representatives whom Contractor deems to be directly involved in facility startup.
 4. Contract Administrator's representatives.
 5. City's operations personnel.
 6. Others as required by Contract Documents or as deemed necessary by Contractor.

1.07 OTHER MEETINGS

- A. In accordance with Contract Documents and as may be required by City and Contract Administrator.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

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PART 1. GENERAL

1.01 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by Contractor, that requires Contract Administrator's review.
- B. Informational Submittal: Information submitted by Contractor, that does not require Contract Administrator's review. Submittals not meeting conditions of the Contract will be returned.

1.02 PROCEDURES

- A. Direct submittals to Contract Administrator at the following address, unless specified otherwise.

CH2M HILL Canada Limited
211 Bannatyne Avenue, Suite 403
Winnipeg, MB R3B 3P2
Attn: Barry Williamson
E mail: Barry.Williamson@ch2m.com

- B. Electronic Submittals: Submittals shall be made in electronic format.
 - 1. Each submittal shall be electronic file in Adobe Acrobat Portable Document Format (PDF). Use latest version available at time of execution of Agreement.
 - 2. PDF files shall be set up to print legibly at 8.5 inches by 11 inches, 11 inches by 17 inches. No other paper sizes will be accepted.
 - 3. Submit new electronic files for each re-submittal.
 - 4. Include copy of Transmittal of Contractor's Submittal form, located at end of section, with each electronic file.
 - 5. Limit size of each electronic transmission to 8 MB.
- C. Transmittal of Submittal:
 - 1. Review each submittal and check for compliance with Contract Documents.
 - 2. Stamp each submittal with uniform approval stamp before submitting to Contract Administrator.
 - a. Stamp to include Project name, submittal number, Specification number, Contractor's reviewer name, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract Documents.
 - b. Contract Administrator will not review submittals that do not bear Contractor's approval stamp and will return them without action.
 - c. Contract Administrator will not review submittals received directly from a Subcontractor or Supplier and will return them without action.
 - 3. Complete, and transmit with each submittal package, one Transmittal of Contractor's Submittal form. Format to be as per Supplement-1 attached at end

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of this section or in alternate format approved by Contract Administrator.

4. Identify each submittal with the following:
 - a. Numbering and Tracking System:
 - 1) Sequentially number each submittal.
 - 2) Resubmission of submittal shall have original number with sequential alphabetic suffix.
 - b. Specification section and paragraph to which submittal applies.
 - c. Project title.
 - d. Date of transmittal.
 - e. Names of Contractor, Subcontractor or Supplier, and manufacturer as appropriate.
 2. Identify and describe each deviation or variation from Contract Documents.
 3. Include Contractor's written response to each of Contract Administrator's review comments with resubmission of submittals stamped "Exceptions Noted, Resubmit".
 4. Submit Contractor's written acknowledgement and acceptance of each of Contract Administrator's review comments on submittals stamped "Exceptions Noted".
- D. Format:
1. Do not base Shop Drawings on reproductions of Contract Documents.
 2. Package submittal information by individual Specification section. Do not combine different Specification sections together in submittal package, unless otherwise directed in Specification.
 3. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.
- E. Timeliness:
1. Schedule and submit in accordance with schedule of Shop Drawing and Sample submittals, and requirements of individual Specification sections.
 2. Submit Shop Drawings and Samples well in advance of scheduled delivery date for associated equipment or material.
 3. Coordinate submittals prepared by multiple trades such that information is available to allow prior review and sufficient review time where Work of one trade interfaces with or affects Work of another.
- F. Processing Time:
1. Time for review shall commence on Contract Administrator's receipt of submittal.
 2. Contract Administrator will act upon Contractor's submittal and transmit response to Contractor not later than 15 days after receipt, unless otherwise specified.
 3. Re-submittals will be subject to same review time.
 4. Allow additional review time for complex equipment and systems.

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G. Re-submittals:

1. Clearly identify each correction or change made and include revision date.
2. Provide clear response to each itemized comment by Contract Administrator on the submittal, whether or not action has been taken, and description of action.
3. No adjustment of Contract Times or Price will be allowed due to delays in progress of Work caused by rejection and subsequent re-submittals.

H. Incomplete Submittals:

1. Contract Administrator will return entire submittal for Contractor's revision if preliminary review deems it incomplete.
2. When any of the following are missing, submittal will be deemed incomplete:
 - a. Completed Contractor's review stamp.
 - b. Transmittal of Contractor's Submittal.
 - c. All requested information is not provided.
 - d. Submittals missing Professional Engineer's seal and signature, where it is required.

I. Submittals not required by Contract Documents:

1. Will not be reviewed and will be returned stamped "Not Subject to Review."
2. Contract Administrator will keep one copy and return all remaining copies to Contractor.

J. Do not revise submittals after they have been reviewed and stamped "No Exceptions Taken" or "Exceptions Noted".

K. Contract Administrator will complete up to two reviews of each submittal at no cost to Contractor. City will deduct cost of additional reviews from Contract Price.

1.03 ACTION SUBMITTALS

A. General:

1. Prepare and submit Action Submittals required by individual Specification sections.
2. Contract Administrator will review Action Submittals only for general conformance with design concept and general compliance with Contract Documents. Contract Administrator's review does not relieve Contractor from compliance with requirements of Contract Documents nor from errors in submittals or Contractor's design.
3. Contractor is responsible for confirmation of dimensions at jobsite; fabrication processes; means, methods techniques, sequences and procedures of construction; coordination of Work of all trades; and performance of Work in safe and satisfactory manner.
4. At Contract Administrator's option, Contract Administrator's review comments and review stamp will be placed either directly on submitted copies of Shop Drawings or on separate submittal review comment form.

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B. Shop Drawings:

1. Copies:
 - a. One electronic copy via email for review.
 - b. One hardcopy of final approved shop drawing.
2. Identify and Indicate:
 - a. Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.
 - b. Equipment and Component Title: Identical to title shown on Drawings.
 - c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
 - d. Project-specific information drawn accurately to scale.
3. Manufacturer's standard schematic drawings and diagrams as follows:
 - a. Modify to delete information that is not applicable to the Work.
 - b. Supplement standard information to provide information specifically applicable to the Work.
4. Product Data: Provide as specified in individual Specifications.
5. Foreign Manufacturers: When proposed, include following additional information:
 - a. Names and addresses of at least two companies that maintain technical service representatives close to Project.
 - b. Complete list of spare parts and accessories for each piece of equipment.
6. Units: Submit all Shop Drawings in SI metric units.
7. Required submittals include but are not limited to:
 - a. Catalogue Drawings: Include reprints of catalogue drawings of proprietary articles of standard fabrication and manufacture for the Work.
 - b. Shop Drawings: Include dimensioned line drawings and related specifications, information and literature for custom fabricated articles and equipment.
 - c. ISA data sheets for all instruments.

C. Samples:

1. Copies: Two, unless otherwise specified in individual Specifications.
2. Manufacturer's Color Chart: Units or sections of units showing full range of colors, textures, and patterns available.
3. Review of samples notwithstanding, materials that are unsound or imperfect when delivered to Site will be rejected.
4. Retain reviewed samples on Site readily available to Contract Administrator.

D. Action Submittal Dispositions: Contract Administrator will review, mark, and stamp as appropriate, and distribute marked-up copies or submittal review comment forms as noted:

1. No Exceptions Taken (NET):
 - a. Contractor may incorporate product(s) or implement Work covered by

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REVISION 0	SECTION 01300 SUBMITTALS	

- submittal.
- b. Distribution:
 - 1) One copy furnished City via email.
 - 2) One copy furnished to Resident Project Representative.
 - 3) One copy retained in Contract Administrator’s file.
 - 4) One copy returned to Contractor appropriately annotated via email.
- 2. Exceptions Noted (EN):
 - a. Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with Contract Administrator’s notations.
 - b. Distribution:
 - 1) One copy furnished to Resident Project Representative.
 - 2) One copy retained in Contract Administrator’s file.
 - 3) One copy returned to Contractor appropriately annotated via email.
 - 3. Exceptions Noted, Resubmit (ENR):
 - a. Make corrections or obtain missing portions, and resubmit.
 - b. Contractor may not incorporate product(s) or implement Work covered by submittal, except portions where indicated Contractor may begin to incorporate product(s) or implement Work covered by the submittal in accordance with the Contract Administrator’s notations.
 - c. Distribution:
 - 1) One copy retained in Contract Administrator’s file.
 - 2) One copy returned to Contractor appropriately annotated via email.

1.04 INFORMATIONAL SUBMITTALS

- A. General:
 - 1. Copies: Submit one electronic copy via email unless otherwise indicated in individual Specification section.
 - 2. Refer to individual Specification sections for specific submittal requirements.
 - 3. Where Work is to be designed by Contractor, comply with applicable codes and submit Shop Drawings signed and sealed by professional engineer licensed in province of Work.
 - 4. Contract Administrator will review each submittal for general conformance with design intent and general compliance with Contract Documents. Contract Administrator’s review does not relieve the Contractor from compliance with requirements of Contract documents nor from errors in the submittal or Contractor’s design.
- B. Application for Payment:
 - 1. Material and equipment delivered to Site of Work will not be paid for until pertinent Shop Drawings have been reviewed and accepted.

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- C. Certificates:
1. Provide notarized statement that includes signature of entity responsible for preparing certification.
 2. Signed by officer or other individual authorized to sign documents on behalf of that entity.
 3. Welding: In accordance with individual Specification sections.
 4. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.
 5. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
 6. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual Specification sections.
 7. Manufacturer's Certificate of Compliance: In accordance with Section 01640, Manufacturers' Services.
 8. Manufacturer's Certificate of Proper Installation: In accordance with Section 01640, Manufacturers' Services.
- D. Photographs: In accordance with Section 01040, Coordination, and as may otherwise be required in Contract Documents.
- E. Contract Closeout Submittals: In accordance with Section 01780, Contract Closeout.
- F. Contractor-Design Data:
1. Written and graphic information.
 2. List of assumptions.
 3. List of performance and design criteria.
 4. Summary of loads or load diagram, if applicable.
 5. Calculations.
 6. List of applicable codes and regulations.
 7. Name and version of software.
 8. Information requested in individual Specification section.
 9. Seal and signature of professional engineer licensed in the province of Manitoba.
- G. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.
- H. Operation and Maintenance Data: As required in Section 01430, Operation and Maintenance Data.
- I. Schedules:
1. Schedule of Shop Drawing and Sample Submittals: Prepare separately or in

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combination with Progress Schedule as specified in Section 01310, Progress Schedules.

- a. Show for each, at a minimum, the following:
 - 1) Specification section number.
 - 2) Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
 - 3) Estimated date of submission to Contract Administrator, including reviewing and processing time.
- b. On a monthly basis, submit updated schedule to Contract Administrator if changes have occurred or resubmittals are required.
2. Progress Schedules: In accordance Section 01310, Progress Schedules.
- J. Special Guarantee: Supplier's written guarantee as required in individual Specification sections.
- K. Statement of Qualification: Evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty Subcontractor, trade, Specialist, consultant, installer, and other professionals.
- L. Submittals Required by Laws, Regulations, and Governing Agencies:
 1. Submit promptly notifications, reports, certifications, and otherwise as may be required, directly to the applicable federal, provincial, or local governing agency or their representative.
 2. Transmit to Contract Administrator for City's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.
- M. Test and Inspection Reports:
 1. General:
 - e. Shall contain signature of person responsible for test or report.
 - f. Complete an equipment report prior to the Site testing each item of rotating mechanical equipment. During testing complete the remainder of the equipment report. A sample of the equipment report is included at the end of this Section. Submit the reports for inclusion in the Installation, Operation and Maintenance manual.
 - g. Before operating equipment, engage the services of a qualified manufacturer's service representative to inspect, operate, test, and adjust the equipment after installation.
 2. Factory:
 - a. Identification of product and Specification section, type of inspection or test with referenced standard or code.
 - b. Date of test, Project title and number, and name and signature of authorized person.
 - c. Description of inspection, test results, adjustments made, quantitative results, and suggestions for precautions to be taken for correct

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REVISION 0	SECTION 01300 SUBMITTALS	

- maintenance.
- d. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
 - e. Provide interpretation of test results, when requested by Contract Administrator.
 - f. Verify that the equipment and its installation conforms to the requirements of the Contract for the service intended and is ready for permanent operation. Submit copies of report for binding into the installation, operation and maintenance manuals.
 - g. Other items and requirements as identified in individual Specification sections.
3. Field: As a minimum, include the following:
- a. Project title and number.
 - b. Date and time.
 - c. Record of temperature and weather conditions.
 - d. Identification of product and Specification section.
 - e. Type and location of test, Sample, or inspection, including referenced standard or code.
 - f. Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
 - g. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
 - h. Provide interpretation of test results, when requested by Contract Administrator.
 - i. Other items as identified in individual Specification sections.
 - j. Inspection Includes:
 - 1) Soundness (without cracked or otherwise damaged parts).
 - 2) Completeness of installation as specified and as recommended by manufacturer.
 - 3) Correctness of setting, alignment, and relative arrangement of various parts of system.
 - k. Operate, test, and adjust equipment to prove it is correctly installed to operate under the intended conditions.
 - l. Equipment will only be accepted after receipt of the manufacturer's representative's report.
 - m. Submit notice in writing at least 48 hours before manufacturer's representative is scheduled to perform these services.
 - n. Modify or replace equipment or materials failing required tests.
 - o. Perform additional testing required due to changes of materials requested by Contractor or due to failure of materials or construction to meet specifications.
 - p. Mandatory forms follow this section include: Concrete Pour Release Form, Contractor Submittal Transmittal, Equipment Report Form, Extra

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Work Report, and Pressure Testing Report.

- N. Maintenance Materials:
1. Submit special tools, lubricants, maintenance materials, spare parts, Manuals, As-built Drawings, and reports to the Contract Administrator.
 2. Submissions to include a complete list of items delivered. Submissions must be acknowledged in writing as being received by the Contract Administrator.
 3. Submit manuals a minimum of one (1) week prior to commissioning of the equipment.
 4. Submission of manuals in a state as reviewed and accepted deficiency free is a prerequisite for Substantial Performance.
- O. Testing and Startup Data: In accordance with Section 01810, Equipment Testing and Facility Startup.
- P. Training Data: In accordance with Section 01640, Manufacturers' Services.
- Q. As-Built Documents: In accordance with Section 01780, Contract Closeout.
- R. Tender Breakdown:
1. Submit within 48 hours after award of the Contract, a complete breakdown of the total bid tender price by Sections of Divisions 2 to 16, inclusive. Show separately the costs for mobilization, demobilization, bonds, and insurance.
 2. This breakdown will be used for progress payment draws. As such, the breakdown will be subject to the review of the Contract Administrator.
- S. Spare Parts List:
1. Submit recommended spare parts list together with the first shop drawings submittal for all designated equipment. The detailed specifications state which equipment requires recommended spare parts lists. Where not stated in specifications, provide manufacturer's recommended list of spare parts. Reference specification section number for each designated equipment on spare parts list.
 2. The recommended spare parts list must include, but not limited to:
 - a. Item number.
 - b. Description of spare part or item.
 - c. Equipment vendor or suppliers name.
 - d. Reference specification section (and clause, if applicable).
 - e. Quantity of item or part.
 - f. Lead time.
 - g. Date received.
 - h. Date turned over to City.
 - i. Price of each part at time of submittal and delivery.
 - j. Comments.
 3. The recommended spare parts list will be used by the City as a guide for planning suitable spare parts inventory prior to acceptance of the equipment.

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4. Submit updated spare parts list indicating spare parts handed over to the City.

T. Information Submittal Dispositions:

1. If submittal meets requirements of Contract, Contract Administrator will forward copies to appropriate parties. Some copies will be marked "For Information Only" (FIO).
2. If Contract Administrator determines that submittal does not meet requirements of Contract, submittal will be considered unacceptable. Contract Administrator will retain one copy and return remaining copies with review comments to Contractor for correction and resubmission.

1.05 SUPPLEMENTS

A. The supplements listed below, following "End of Section", are part of this Specification.

1. Forms: Transmittal of Contractor's Submittal

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

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REVISION 0	SECTION 01300-01 TRANSMITTAL OF CONTRACTOR'S SUBMITTAL	

 TRANSMITTAL OF CONTRACTOR'S SUBMITTAL (ATTACH TO EACH SUBMITTAL)		DATE: _____
TO: Barry Williamson CH2M HILL Canada Limited 211 Bannatyne Avenue, Suite 403 Winnipeg, MB R3B 3P2 E mail: Barry.Williamson@ch2m.com		Submittal No.: _____ <input type="checkbox"/> New Submittal <input type="checkbox"/> Re-submittal Project: _____ Project No.: _____ Specification Section No.: _____ (Cover only one section with each transmittal) Schedule Date of Submittal: _____
FROM: _____ Contractor		
SUBMITTAL TYPE: <input type="checkbox"/> Shop Drawing <input type="checkbox"/> Sample <input type="checkbox"/> Informational		

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

Contractor hereby certifies that (i) Contractor has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: _____
 Contractor (Authorized Signature)

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REVISION 0	SECTION 01310 PROGRESS SCHEDULES	

PART 1. GENERAL

1.01 SUBMITTALS

- A. Informational Submittals:
 - 1. Preliminary Progress Schedule:
 - a. Submit at least 7 days prior to preconstruction conference showing a minimum of 30-day duration.
 - 2. Detailed Progress Schedule:
 - a. Submit initial detailed progress schedule as per the Supplemental Conditions.
 - b. Submit an updated progress schedule for each bi-weekly progress meeting.
 - 3. Submit with each progress schedule submission:
 - a. Contractor's certification that progress schedule submission is actual schedule being utilized for execution of the Work.
 - b. Progress Schedule:
 - 1) Six legible copies to be distributed at the bi-weekly meetings in 11x17 format.
 - 2) One electronic copy in Microsoft Project and PDF distributed by email a minimum of 2 days prior to each bi-weekly meeting.
 - 4. Prior to final payment, submit a final updated progress schedule.

1.02 PRELIMINARY PROGRESS SCHEDULE

- A. Show activities including, but not limited to the following:
 - 1. Notice of award.
 - 2. Permits.
 - 3. Submittals, with review time. Contractor may use schedule of Shop Drawings and Samples specified in Section 01300, Submittals
 - 4. Early procurement activities for long lead equipment and materials.
 - 5. Initial Site Work.
 - 6. Earthwork.
 - 7. Specified Work sequences and construction constraints.
 - 8. Contract Milestone and Completion Dates.
 - 9. Major structural, mechanical, equipment, electrical, architectural, and instrumentation and control Work.
 - 10. System startup summary.
 - 11. Project close-out summary.
 - 12. Demobilization summary.
- B. Update preliminary progress schedule bi-weekly; for the bi-weekly meetings and as part of progress payment process. Failure to do so may cause City to withhold all or part of the monthly progress payment until the preliminary progress schedule is updated in a

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REVISION 0	SECTION 01310 PROGRESS SCHEDULES	

manner acceptable to Contract Administrator.

- C. Format: CRITICAL PATH NETWORK.

1.03 DETAILED PROGRESS SCHEDULE

- A. In addition to requirements of Supplemental Conditions, submit detailed progress schedule beginning with Notice of Award and continuing through Completion.
- B. Show the duration and sequences of activities required for complete performance of the Work reflecting means and methods chosen by Contractor.
- C. When accepted by Contract Administrator, detailed progress schedule will replace preliminary progress schedule and become baseline schedule. Subsequent revisions will be considered as updated progress schedules.
- D. Format: CRITICAL PATH NETWORK.
- E. Update bi-weekly to reflect actual progress and occurrences to date, including weather delays.

1.04 PROGRESS SCHEDULE – CRITICAL PATH NETWORK

- A. General: Comprehensive computer-generated schedule using CPM, generally as outlined in Associated General Contractors of America (AGC) Publication No. 1107.1, “Construction Planning and Scheduling, latest edition. If a conflict occurs between the AGC publication and this specification, this specification shall govern.
- B. Contents:
1. Schedule shall begin with the date of Notice of Award and conclude with the date of Completion.
 2. Identify Work calendar basis using days as a unit of measure.
 3. Show complete interdependence and sequence of construction and Project related activities reasonably required to complete the Work.
 4. Identify the Work of separate stages and other logically grouped activities, and clearly identify critical path of activities.
 5. Reflect sequences of the Work, restraints, delivery windows, review times, Contract Times and Project Milestones set forth in the Bid Form and Section 01040, Coordination.
 6. Include as applicable, at a minimum:
 - a. Obtaining permits, submittals for early product procurement, and long lead time items.
 - b. Mobilization and other preliminary activities.
 - c. Initial Site Work.
 - d. Specified Work sequences, constraints, and Milestones, including Substantial Performance date(s).
 - e. Subcontract Work.
 - f. Major equipment design, fabrication, factory testing, and delivery dates.

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- g. Site Work.
 - h. Concrete Work.
 - i. Structural steel Work.
 - j. Architectural features Work.
 - k. Conveying systems Work.
 - l. Equipment Work.
 - m. Mechanical Work.
 - n. Electrical Work.
 - o. Instrumentation and control Work.
 - p. Interfaces with City-furnished equipment.
 - q. Leakage testing of tanks and structures.
 - r. Other important Work for each major facility.
 - s. Equipment and system startup and test activities.
 - t. Project closeout and cleanup.
 - u. Demobilization.
7. Activity duration for Submittal review shall not be less than review time specified unless clearly identified and prior written acceptance has been obtained from Contract Administrator.

1.05 PROGRESS OF THE WORK

- A. Updated progress schedule shall reflect:
 - 1. Progress of Work to within 5 working days prior to submission.
 - 2. Approved changes in Work scope and activities modified since submission.
 - 3. Delays in submittals or re-submittals, deliveries, or Work.
 - 4. Adjusted or modified sequences of Work.
 - 5. Other identifiable changes.
 - 6. Revised projections of progress and completion.
 - 7. Report of changed logic.
- B. Produce detailed sub -schedules during Project, upon request of City or Contract Administrator, to further define critical portions of the Work such as facility shutdowns.
- C. If Contractor fails to complete activity by its latest scheduled completion date and this failure is anticipated to extend Contract Times (or Milestones), Contractor shall, within 7 days of such failure, submit a written statement as to how Contractor intends to correct nonperformance and return to acceptable current progress schedule. Actions by Contractor to complete the Work within Contract Times (or Milestones) will not be justification for adjustment to Contract Price or Contract Times.
- D. City may order Contractor to increase plant, equipment, labour force, or working hours if Contractor fails to:
 - 1. Complete a Milestone activity by its completion date.
 - 2. Satisfactorily execute Work as necessary to prevent delay to overall completion of Project, at no additional cost to City.

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REVISION 0	SECTION 01310 PROGRESS SCHEDULES	

1.06 SCHEDULE ACCEPTANCE

- A. Contract Administrator's acceptance will demonstrate agreement that:
1. Proposed schedule is accepted with respect to:
 - a. Contract Times, including Completion and all intermediate Milestones are within the specified times.
 - b. Specified Work sequences and constraints are shown as specified.
 - c. Access restrictions are accurately reflected.
 - d. Startup and testing times are as specified.
 - e. Submittal review times are as specified.
 - f. Startup testing duration is as specified and timing is acceptable.
 2. In all other respects, Contract Administrator's acceptance of Contractor's schedule indicates that, in Contract Administrator's judgement, schedule represents reasonable plan for constructing Work in accordance with the Contract Documents. Contract Administrator's review will not make any change in Contract requirements. Lack of comment on any aspect of schedule that is not in accordance with the Contract Documents will not thereby indicate acceptance of that change, unless Contractor has explicitly called the nonconformance to Contract Administrator's attention in submittal. Schedule remains Contractor's responsibility and Contractor retains responsibility for performing all activities, for activity durations, and for activity sequences required to construct Work in accordance with the Contract Documents.
- B. Unacceptable Preliminary Progress Schedule:
1. Make requested corrections; resubmit within 10 days.
 2. Until acceptable to Contract Administrator as baseline progress schedule, continue review and revision process, during which time Contractor shall update schedule on a monthly basis to reflect actual progress and occurrences to date.
- C. Unacceptable Detailed Progress Schedule:
1. Make requested corrections; resubmit within 10 days.
 2. Until acceptable to Contract Administrator as baseline progress schedule, continue review and revision process.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

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REVISION 0	SECTION 01400 QUALITY CONTROL	

PART 1. GENERAL

1.01 QUALITY CONTROL

- A. City will provide services of independent inspection company to perform the following routine quality control services, at no cost to the Contractor:
 - 1. Compaction of granular base courses.
 - 2. Compaction of compacted clay liner.
 - 3. Testing as required by Manitoba Conservation for compacted clay liner.
- B. City's tests do not relieve Contractor of his own quality control. In addition to tests specified elsewhere, the Contractor is responsible for:
 - 1. Concrete cylinder testing, aggregate testing and cement testing for both cast-in-place concrete and precast concrete items by qualified third party.
 - 2. Subgrade examination for load bearing capability by qualified third party.
- C. City may request samples at any reasonable time. Cooperate with Contract Administrator. Provide concrete and other materials for tests as may be required.
- D. Additional testing required to prove the adequacy of construction shall be at Contractor's expense, where the routine test shows the construction to be inadequate or where Contractor's materials and procedures have not been as specified or when Work has proceeded without observation.
- E. Such additional testing or retesting will be performed by a testing agency approved by City.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

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REVISION 0	SECTION 01430 OPERATION AND MAINTENANCE DATA	

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Detailed information for the preparation, submission, and Contract Administrator's review of operations and maintenance (O&M) data, as required by individual Specification sections.

1.02 DEFINITIONS

- A. Preliminary Data: Initial and subsequent submissions for Contract Administrator's review.
- B. Final Data: Contract Administrator-accepted data, submitted as specified herein.
- C. Maintenance Operation: As used on Maintenance Summary Form is defined to mean any routine operation required to ensure satisfactory performance and longevity of equipment. Examples of typical maintenance operations include but are not limited to lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.
- D. Instructional Manual: An organized compilation of operating and maintenance data including detailed technical information, documents and records describing operation and maintenance of individual systems, subsystems and components as specified in individual sections of this specification.

1.03 SEQUENCING AND SCHEDULING

- A. Equipment and System Data:
 - 1. Preliminary Data:
 - a. Do not submit until Shop Drawing for equipment or system has been reviewed and accepted by Contract Administrator.
 - b. Submit draft manuals 2 weeks after shop drawing approval and a minimum of 3 months prior to start of commissioning of equipment.
 - 2. Final Data: Submit Compilation Formatted and Electronic Media Formatted data prior to Substantial Performance of Project.

1.04 DATA FORMAT

- A. Data Compilation Format:

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1. Compile all O&M data into a hardcopy, hard-bound sets:
 - a. Commercial quality, permanent, three-ring or three-post binders with durable plastic cover.
 - b. Three hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data
 - c. Size: 8-1/2 inches by 11 inches, minimum.
 - d. Cover: Identify manual with typed or printed title "OPERATION AND MAINTENANCE DATA, VOLUME NO. ___ OF ___", and list:
 - e. Project title.
 - f. Contractor's name, address, and telephone number.
 - g. If entire volume covers equipment or system provided by one Supplier include the following:
 - a. Identity of general subject matter covered in manual.
 - b. Identity of equipment number and Specification section.
 2. Provide each volume with title page and typed table of contents with consecutive page numbers. Place contents of entire set, identified by volume number, in each binder.
 3. Table of contents neatly typewritten, arranged in a systematic order:
 - a. Include list of each product, indexed to content of each volume.
 - b. Designate system or equipment for which it is intended.
 - c. Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
 4. Section Dividers:
 - a. Heavy, 80 pound cover weight, tabbed with numbered plastic index tabs.
 - b. Fly-Leaf:
 - a. For each separate product, or each piece of operating equipment, with typed description of product and major component parts of equipment.
 - b. List with each product:
 - 1) Name, address, and telephone number of Subcontractor, Supplier, installer, and maintenance contractor, as appropriate.
 - 2) Identify area of responsibility of each.
 - 3) Provide local source of supply for parts and replacement.
 - c. Identity of separate structure as applicable.
 - d. Maintenance Summary (Format in accordance with paragraph 1.6.D)
 5. Assemble and bind material in same order as specified in the Contract Documents.
 6. Material shall be suitable for reproduction, with quality equal to original.
- B. Electronic Media Format:
1. Portable Document Format (PDF):

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- a. After all preliminary data has been found to be acceptable to Contract Administrator, submit O&M data in PDF format on CD.
- b. Files to be exact duplicates of Contract Administrator - accepted preliminary data. Arrange by specification number and name.
- c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.
- d. PDF files to be indexed and searchable.
- e. Files are to be able to be copied by the City.
- f. CD Cover: Identify with typed or printed title "OPERATION AND MAINTENANCE DATA, VOLUME NO. ___ OF ___," and list:
 - a. Project title.
 - b. Contractor's name, address, and telephone number.
 - c. Identity of equipment number and Specification section.

1.05 SUBMITTALS

A. Informational:

1. Data Outline: Submit two copies of a detailed outline of proposed organization and contents of final data prior to preparation of preliminary data.
2. Preliminary Data:
 - a. Submit two copies for Contract Administrator's review.
 - b. If data meets conditions of the Contract:
 - c. One copy will be returned to Contractor.
 - d. One copy will be retained in Contract Administrator's file.
 - e. If data does not meet conditions of the Contract:
 - f. All copies will be returned to Contractor with Contract Administrator's comments (on separate document) for revision.
 - g. Contract Administrator's comments will be retained in Contract Administrator's file.
 - h. Resubmit two copies revised in accordance with Contract Administrator's comments.
3. Final Data: Submit four copies in format(s) specified herein.

1.06 DATA FOR SYSTEMS, SUBSYSTEM AND COMPONENTS

A. Content For Each Unit (or Common Units) and System:

1. Product Data:
 - a. Include only those sheets that are pertinent to specific product.
 - b. Clearly annotate each sheet to:
 - 1) Identify specific product(s) or part(s) installed.
 - 2) Identify data applicable to installation.
 - 3) Delete references to inapplicable information.
 - c. Function, normal operating characteristics, and limiting conditions.

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- d. Serial Numbers
 - e. Performance curves, engineering data, nameplate data, and tests reports for all pumps.
 - f. Complete nomenclature and commercial number of replaceable parts.
 - g. Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.
 - h. Spare parts ordering instructions.
 - i. Where applicable, identify installed spares and other provisions for future Work (e.g., reserved panel space, unused components, wiring, terminals).
2. Charts of valve tag numbers, with the location and function of each valve.
3. Drawings: Supplement product data with Drawings as necessary to clearly illustrate:
- a. Format:
 - 1) Provide reinforced, punched, binder tab; bind in with text.
 - 2) Reduced to 8-1/2 inches by 11 inches, or 11 inches by 17 inches folded to 8-1/2 inches by 11 inches.
 - 3) Where reduction is impractical, fold and place in 8-1/2-inch by 11-inch envelopes bound in text.
 - 4) Identify Specification section and product on Drawings and envelopes.
 - b. Relations of component parts of equipment and systems.
 - c. Control and flow diagrams.
 - d. Coordinate drawings with Project record documents to assure correct illustration of completed installation.
4. Instructions and Procedures: Within text, as required to supplement product data.
- a. Format:
 - 1) Organize in consistent format under separate heading for each different procedure.
 - 2) Provide logical sequence of instructions for each procedure.
 - 3) Provide information sheet for City's personnel, including:
 - 1) Proper procedures in event of failure.
 - 2) Instances that might affect validity of guarantee or Bond.
 - b. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
 - c. Operating Procedures:
 - 1) Startup, break-in, routine, and normal operating instructions.
 - 2) Test procedures and results of factory tests where specified.
 - 3) Regulation, control, stopping, and emergency instructions.
 - 4) Description of operation sequence by control manufacturer.
 - 5) Shutdown instructions for both short and extended duration.
 - 6) Summer and winter operating instructions, as applicable.
 - 7) Safety precautions.

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- 8) Special operating instructions.
 - d. Maintenance and Overhaul Procedures:
 - 1) Routine maintenance.
 - 2) Guide to troubleshooting.
 - 3) Disassembly, removal, repair, reinstallation, and re-assembly.
 - 2. Guarantee, Bond, and Service Agreement: In accordance with Section 01780, Contract Closeout.
- B. Content for Each Electric or Electronic Item or System:
- 1. Description of Unit and Component Parts:
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, nameplate data, and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 - d. Interconnection wiring diagrams, including control and lighting systems.
 - 2. Circuit Directories of Panelboards:
 - a. Electrical service.
 - b. Controls.
 - c. Communications.
 - 3. List of electrical relay settings, and control and alarm contact settings.
 - 4. Electrical interconnection wiring diagram, including control and lighting systems.
 - 5. As-installed control diagrams by control manufacturer.
 - 6. ISA S20 data sheets for all instruments.
 - 7. Operating Procedures:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Safety precautions.
 - d. Special operating instructions.
 - 8. Maintenance Procedures:
 - a. Routine maintenance.
 - b. Guide to troubleshooting.
 - c. Adjustment and checking.
 - d. List of relay settings, control and alarm contact settings.
 - 9. Manufacturer's printed operating and maintenance instructions.
 - 10. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- C. Content for Programmable Devices/Components/Sub-systems:
- 1. The following requirements are minimum requirements applicable to programmable equipment such as VFDs, ASDs, microprocessor based devices, PLCs, Human-Machine-Interfaces, computers, and other programmable devices. Additional requirements may be specified elsewhere.
 - 2. As-Constructed version of shop drawings.
 - 3. Functional description.

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4. Wiring details.
5. Configuration Records; record of switch settings, program listings and parameter settings, after commissioning.
6. Maintenance manuals.
7. User guides, technical reference and programming manuals.
8. CD-ROMs copies of:
 - a. Manuals.
 - b. Settings, databases and templates. Include both native format of files and ASCII-exported version.
 - c. Application programs.
9. Cable and software for use on City's notebook computer for revising/downloading the settings and software.

D. Maintenance Summary:

1. Compile individual Maintenance Summary for each applicable equipment item, respective unit or system, and for components or sub-units.
2. Format:
 - a. Use Maintenance Summary Form bound with this section or electronic facsimile of such.
 - b. Each Maintenance Summary may take as many pages as required.
 - c. Use only 8-1/2-inch by 11-inch size paper.
 - d. Complete using typewriter or electronic printing.
3. Include detailed lubrication instructions and diagrams showing points to be greased or oiled; recommend type, grade, and temperature range of lubricants and frequency of lubrication.
4. Recommended Spare Parts:
 - a. Data to be consistent with manufacturer's bill of materials/parts list furnished in O&M manuals.
 - b. "Unit" is the unit of measure for ordering the part.
 - c. "Quantity" is the number of units recommended.
 - d. "Unit Cost" is the current purchase price.

1.07 DATA FOR MATERIALS AND FINISHES

A. Content for Architectural Products, Applied Materials, and Finishes:

1. Manufacturer's data, giving full information on products:
 - a. Catalog number, size, and composition.
 - b. Color and texture designations.
 - c. Information required for reordering special-manufactured products.
2. Instructions for Care and Maintenance:
 - a. Manufacturer's recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods that are detrimental to

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- product.
 - c. Recommended schedule for cleaning and maintenance.
 - B. Content for Moisture Protection and Weather Exposed Products:
 - 1. Manufacturer's data, giving full information on products:
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 - 2. Instructions for inspection, maintenance, and repair.

1.08 SUPPLEMENTS

- A. The supplements listed below, following "End of Section", are part of this Specification.
 - 1. Forms: Maintenance Summary Form.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

END OF SECTION

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REVISION B	SECTION 01430-01 MAINTENANCE SUMMARY FORM	

PROJECT: _____ CONTRACT NO.: _____

1. EQUIPMENT ITEM _____

2. MANUFACTURER _____

3. MODEL _____

4. SERIAL NUMBER _____

5. EQUIPMENT/TAG NUMBER(S) _____

6. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 45 KG) _____

7. NAMEPLATE DATA (hp, voltage, speed, etc.) _____

8. MANUFACTURER'S LOCAL REPRESENTATIVE _____

a. Name _____ Telephone No. _____

b. Address _____

9. MAINTENANCE REQUIREMENTS

MAINTENANCE OPERATION COMMENTS	FREQUENCY	LUBRICANT (IF APPLICABLE)
List briefly each maintenance operation required and refer to specific information in manufacturer's standard maintenance manual, if applicable. (Reference to manufacturer's catalog or sales literature is not acceptable.)	List required frequency of each maintenance operation.	Refer by symbol to lubricant required.

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10. LUBRICANT LIST

REFERENCE SYMBOL	[SHELL]	[STANDARD OIL]	[GULF]	[ARCO]	OR EQUAL
List symbols used in No. 7. above.	List equivalent lubricants, as distributed by each manufacturer for the specific use recommended.				

11. RECOMMENDED SPARE PARTS FOR CITY’S INVENTORY.

PART NO.	DESCRIPTION	UNIT	QUANTITY	UNIT COST

Note: Identify parts provided by this Contract with two asterisks.

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REVISION 0	SECTION 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS	

PART 1. GENERAL

1.01 SUBMITTALS

A. Informational Submittals:

1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.

1.02 MOBILIZATION

A. Mobilization shall include, but not be limited to, these principal items:

1. Obtaining required permits.
2. Moving Contractor's field office and equipment required for first month operations onto Site.
3. Installing temporary construction power, wiring, and lighting facilities.
4. Providing onsite communication facilities, including telephones.
5. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
6. Providing sedimentation and erosion control measures, including silt fencing and the maintenance and repair (if necessary)..
7. Arranging for, and erection of Contractor's work and storage yard.
8. Posting Occupational Health and Safety Act required notices and establishing safety programs and procedures.
9. Having Contractor's superintendent at Site full time.
10. Modifying, extending and maintaining existing access roads and installing culverts for these access roads to maintain Site drainage.
11. Placing temporary signage to construction Site to guide deliveries, subcontractors, etc.

B. Use area designated for Contractor's temporary facilities. Two potential areas are available for use:

1. Option 1: Near intersection of the Biosolids and the L&YW Composting Pads in the North West corner of the Existing Built-up Pad (i.e. on Existing Built-up Pad). This area is closer to the project Site than Option 2, but requires an all weather granular road (by Contractor). Lay down area available is limited.
2. Option 2: South East corner of the Existing Built-up Pad, which has an existing all weather access road. This area is further from the existing power line along Charette Road for temporary power than Option 1. This location has a larger area available for lay down of materials than Option 1.

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1.03 ACCESS TO SITE

- A. Contractor's access to the Site is a contractor's gate at the old entrance of Charette Road and Brady Road (past main entrance on Brady Road) during operating hours at Brady Road Landfill as authorized by the Supervisor of Disposal.
- B. The access may or may not be supervised.
- C. The Contractor is responsible for opening the gate and then closing the gate immediately after entry.
- D. If prearranged with the Contractor, deliveries may be made through this gate if the Contractor is at the gate to meet the delivery vehicle. Otherwise, deliveries are to be made through the main secured gate (which may be backed-up depending on the time of year).
- E. Contractor is to post temporary signage with directions to Site. Signs are to be removed following construction completion.

1.04 PROTECTION OF WORK AND PROPERTY

- A. Comply with the City's Contractor or Constructor policy and guideline and all other applicable health and safety rules for contractors while working on City's property.
- B. Keep City informed of serious onsite accidents and related claims.
- C. Use of Explosives: No blasting or use of explosives will be allowed onsite.

1.05 VEHICULAR TRAFFIC

- A. The Contractor shall be responsible for snow clearance operations for:
 - 1. Their designated access roads, as shown on the Contract Drawings.
 - 2. All temporary roads within the Site.
 - 3. All temporary signage to the Site.

PART 2. PRODUCTS

2.01 CONTRACT ADMINISTRATOR'S FIELD OFFICES

- A. Furnish equipment specified for exclusive use of Contract Administrator and its

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representatives.

- B. Ownership of equipment furnished under this article will remain, unless otherwise specified, that of Contractor.
- C. Equipment furnished shall be new or like new in appearance and function.
- D. Minimum Features:
 - 1. 120-volt lighting and wall plugs.
 - 2. Weatherproof, insulated, electrically heated and electrically lit.
 - 3. Doors to be fitted with cylinder locks, with the Contract Administrator in possession of all keys.
 - 4. If Contract Administrator's office is to be located in same structure as superintendent's office, it shall be partitioned off and provided with separate, lockable entrance.
- B. Floor Space: Minimum 13 sq m.
- C. Equip with Contract Administrator's Office with a plan table; double desk, two 2-drawer steel file cabinets; shelving unit, wastepaper basket and computer chair.
- D. Contract Administrator to have use of the Contractors, water cooler, microwave, and coffeemaker.
- E. Telephone: One with incoming/outgoing line
- F. Provide separate high speed internet service.
- G. Provide Contract Administrator access to the Contractor's fax/scanner/printer.

PART 3. EXECUTION

3.01 FIELD OFFICES

- A. Make available for Contract Administrator's use prior to start of the Work at Site, to remain on the Site for minimum of 5 days after final acceptance of the Work.
- B. Locate where directed by Contract Administrator; level, block, tie down, skirt, provide stairways, and relocate when necessary and approved. Construct on proper foundations, provide proper surface drainage and connections for utility services.
- C. Provide minimum 10 sq m of gravel or crushed rock base, minimum depth of 100 mm, at

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each entrance.

- D. Raise grade under field office, as necessary, to elevation adequate to avoid flooding.
- E. Provide sanitary facilities in compliance with provincial and local health authorities.
- F. Maintain in good repair and appearance, and provide weekly cleaning service and replenishment, as required, of paper towels, paper cups, hand soap, toilet paper, first-aid kit supplies, and bottled water.
- G. Replenish, as needed, facsimile paper, typewriter and calculator ribbon, duplicator paper and toner, computer paper, printer ribbon/toner, and computer CDs.

3.02 TEMPORARY UTILITIES

- A. Power:
 - 1. Determine type and amount available and make arrangements for obtaining temporary electric power service from Manitoba Hydro, metering equipment, and pay all costs for the electric power used during contract period, except for portions of the Work designated in writing by Contract Administrator as substantially performed.
 - 2. Cost of electric power used in performance and acceptance testing will be borne by City.
 - 3. The Contractor shall replace any blown fuses or damaged breakers and repair any other damage caused. The Contractor shall provide extension cords as required. The Contractor shall not overload circuits beyond their rated capacities.
 - 4. The Contractor shall provide ground fault protection for all electrical equipment.
 - 5. The City will not be responsible, or entertain any claims, for the delay of Work resulting from power interruptions to the Site or loss of utility supply
- B. Lighting:
 - 1. Provide temporary lighting to meet all applicable safety requirements to allow erection, application, or installation of materials and equipment, and observation or inspection of the Work.
 - 2. The Contractor shall secure all temporary lighting and wiring from damage, falling or tripping hazards.
- C. Heating, Cooling, and Ventilating:
 - 1. Provide as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for installation of materials, and to protect materials, equipment, and finishes from damage due to

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temperature or humidity. Costs for temporary heat shall be borne by Contractor responsible for constructing structure or building as specified in Section 01010, Summary of Work.

2. Provide adequate forced air ventilation of enclosed areas to cure installed materials, to dispense humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
3. Pay all costs of installation, maintenance, operation, removal, and fuel consumed to execute the Work.
4. Provide portable unit heaters, complete with controls, oil- or gas-fired, and suitably vented to outside as required for protection of health and property.
5. The Contractor shall provide 24-hour monitoring of temporary heating, cooling and ventilating equipment.

D. Water:

1. No construction or potable water is available at Site. Make arrangements for and bear costs of providing water required for construction purposes and for drinking by construction personnel during construction.
2. Provide and bear costs of necessary water required for testing equipment, tank, and piping prior to Substantial Performance.

E. Sanitary and Personnel Facilities:

1. Provide and maintain facilities for Contractor's employees, Subcontractors, and all other onsite employer's employees. Service, clean, and maintain facilities and enclosures.

F. Communication Services:

1. Contractor: Provide onsite telephone service and Internet for the sole use of the Contractor during construction. Pay costs of installation and monthly bills. Contractor shall reinstate service outages resulting from construction activities within one business day.

G. Fire Protection: Furnish and maintain on Site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241).

3.03 PROTECTION OF WORK AND PROPERTY

A. General:

1. No landfill areas shall be cut off from vehicular traffic unless special arrangements have been made.
2. Maintain in continuous service all existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and all other utilities encountered along line of the

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Work, unless other arrangements satisfactory to owner of said utilities have been made.

3. Where completion of the Work requires temporary or permanent removal and/or relocation of existing utility, coordinate all activities with owner of said utility and perform all Work to their satisfaction.
 4. In areas where Contractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Contractor.
 5. Maintain Site drainage wherever possible.
- H. Barricades:
1. Provide as necessary to prevent unauthorized entry to construction areas and affected access roads, pads, ponds and excavations with acceptable warning signs.
 2. Locate barricades at the nearest intersecting public thoroughfare on each side of the blocked section.
- B. Equipment Fueling:
1. Equipment may be fuel at the Work Site.
 2. Equipment fueling may not be performed near the tipping face or existing ponds and drainage ditches.
 3. Only approved hydrocarbon fuel trucks are to be used on-site.
- C. Equipment Cleaning: Keep construction equipment clean so that no debris is deposited on roadways. Contain construction debris in designated area within working limits. Dispose of debris off-site as specified.
- D. Finished Construction: Protect finished floors and concrete floors exposed.
- E. Waterways:
1. Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.
- F. Dewatering:
1. Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection Works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.
 2. Discharge all water from dewatering operations to existing retention ponds prior to discharge to natural watercourse.

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3.04 TEMPORARY CONTROLS

- A. Air Pollution Control:
 - 1. Minimize air pollution from construction operations.
 - 2. Burning:
 - a. Of waste materials, rubbish, or other debris will not be permitted on or adjacent to Site.
 - 3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust.
- B. Noise Control:
 - 1. Use only vehicles and equipment equipped with effective muffling devices.
- C. Water Pollution Control:
 - 1. Prior to commencing excavation and construction, obtain Contract Administrator's agreement with detailed plans showing procedures intended to handle and dispose of groundwater, and storm water flow, including dewatering pump discharges.
 - 2. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in to streams or waterways. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.
- D. Erosion, Sediment, and Flood Control:
 - 1. Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

3.05 STORAGE YARDS AND BUILDINGS

- A. Coordinate requirements with Section 01600, Material and Equipment.
- B. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.
- C. Temporary Storage Buildings:
 - 1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
 - 2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
 - 3. Store combustible materials (paints, solvents, fuels) in a well-ventilated and remote building meeting safety standards.

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3.06 TEMPORARY ACCESS ROADS

- A. The access road from the L&YW pad will not be completed until approximately the end of August 2013 (by Contractor).
- B. Construct temporary access roads as required to complete Work.
 - 1. From Temporary Facilities:
 - a. An existing access road exists from the built-up pad to the existing pond.
 - b. Modify, extend and maintain the existing access road to gain access to the biosolids pad. Install a temporary culvert near the south end of Ditch 4 to gain access to the biosolids pad with the new access road.
 - 2. From Clay Borrow Area:
 - a. Install temporary culverts and access roads in the southern leg of Ditch 1 and in Ditch 5 to have access to the biosolids pad from the clay borrow area.
- C. Coordinate and obtain Approval from the Contract Administrator and the City prior commencing the construction of the access roads.
- D. Maintain drainage ways. Install and maintain culverts to allow water to flow beneath access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.
- E. Provide gravel, crushed rock, or other stabilization material to permit access by all motor vehicles at all times.
- F. Upon completion of construction, restore ground surface disturbed by access road construction to original grade.

3.07 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, City's operations, or construction operations.
- B. The Contractor's and Contractor's employees' vehicles are to be parked in a designated area near the Contractor's trailers subject to approval from the City (Supervisor of Disposal).

3.08 VEHICULAR TRAFFIC

- A. Conduct the Work to interfere as little as possible with City and public travel.

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- B. Coordinate traffic routing with that of others working in same or adjacent areas.

3.09 CLEANING DURING CONSTRUCTION

- A. In accordance with General Conditions, as may be specified in Specification sections, and as required herein.
- B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris. At least weekly, sweep all floors (basins, tunnels, platforms, walkways, roof surfaces), and pick up all debris and dispose.
- C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least at weekly intervals, dispose of such waste materials, debris, and rubbish at the allocated locations at BRRMF.

END OF SECTION

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PART 1. GENERAL

1.01 DEFINITIONS

- A. Place into Service: Complete in all respects, including all ancillary Work, successfully test and demonstrate to the satisfaction of Contract Administrator, and place into satisfactory operation, all in accordance with the requirements of the Contract, including the submittal of maintenance manuals.

1.02 SUBMITTALS

- A. Administrative Submittals: Proposed sequence of construction.

1.03 INTENT

- A. This Section includes mandatory construction sequencing constraints and a suggested sequence of construction that will satisfy the mandatory constraints required in the prosecution of the Work.
- B. The suggested sequence of construction described herein is general in nature and illustrates the design intent with respect to prosecution of the Work. Prepare and submit a proposed sequence of construction for review by City and Contract Administrator. This review will serve to satisfy City and Contract Administrator that all mandatory construction sequencing constraints have been properly addressed by Contractor in the proposed sequence of construction but shall in no way absolve Contractor of complete responsibility for prosecution of the Work in accordance with the requirements of the Contract Documents.
- C. Many other construction activities and work components, although not specifically noted in this Section, are integral parts of the Work and shall be scheduled and completed by Contractor in accordance with the Contract Documents.
- D. The broad grouping of parts of the Work under phases, stages, or similar divisions in the suggested sequence of construction is intended to illustrate the general sequence for prosecution of the Work as envisioned by Contract Administrator. Such grouping shall in no way absolve Contractor of complete responsibility for the construction means, methods, techniques, sequences, and procedures of construction, or the safety precautions and programs incidental thereto.

1.04 COORDINATION

- A. The built-up composting pad south of the Phase 1 L&YW Composting pad and east of the Biosolids Composting Pad will be maintained in continuous operation without interruption throughout the duration of the Contract. Cooperate with City and do not

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interfere unnecessarily with the day-to-day operations of the facility. At all times provide City with unhindered access to all portions of the facility that are in operation.

- B. Coordinate the requirements of this Section with the other requirements of the Contract Documents.

1.05 SUGGESTED SEQUENCE OF CONSTRUCTION

- A. Incorporate the construction constraints and sequence of construction in the Progress Schedules required in Section 01310, Progress Schedules.
- B. The suggested sequence of construction describes in general the sequence of installation and commissioning of major structures, processes, and equipment items. Be responsible for determining which ancillary services, such as electrical, instrumentation, plumbing, drainage, heating, and ventilation are also required to be completed to permit commissioning of the structures, processes, and equipment as described.

1.06 FIRE PROTECTION

- A. Provide adequate fire protection facilities including but not limited to ample hand-operated 15 to 20 pound multipurpose dry chemical extinguishers in each facility.
- B. Dispose of all combustible rubbish promptly and safely. Prompt disposal is particularly needed for material subject to spontaneous ignition such as oily waste and paint rags.
- C. Monitor and control probable ignition sources as necessary to prevent the threat of fire.
- D. Minimize hot Work including but not limited to operations involving open flames, heat, or sparks such as brazing, cutting, grinding, soldering, and torching. If there is a practical and safer way to do the Work without hot Work, the alternative method shall be used.

PART 2. PRODUCTS

2.01 GENERAL

- A. Unless specifically stated otherwise, provide all labour, materials, and equipment necessary to accomplish the Work of this Section.

PART 3. EXECUTION

3.01 CONSTRAINTS

- A. Substantial Performance of all L&YW associated Work is to be achieved within 35 Working Days after the completion of the of the L&WY clay liner testing (liner and

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testing by Others).

- B. Substantial Performance of all Biosolids associated Work is to be achieved by within 160 Working Days after project award.

3.02 SUGGESTED SEQUENCE OF CONSTRUCTION

A. L&YW Associated Work

1. Install of geotextile fabric (supplied by City) on the L&YW pad once Hugh Munro has completed the compacted clay liner and the City has performed the required testing.
2. Survey and stake the pad for the granular placement.
3. Place and compact the granular on the pad L&YW pad and accesses.
4. Install L&YW Pond inlet and outlet rip rap and depth gauge.
5. Install exterior lighting around L&YW Composting Pad.
6. Install irrigation water supply lines with associated fittings and valves along the south-east and north edges of the L&YW pad.
7. Install Jersey barriers on the L&YW Composting Pad and signage.

B. Biosolids Associated Work

1. Remove topsoil to sub-grade elevations in the Biosolids Pad area.
2. Remove silt pockets in the Biosolids Composting Pad sub-grade.
3. Survey and stake as required.
4. Excavate to required depths for the Biosolids Detention Pond (including silt pocket removal).
5. Excavate for and install Underground Leachate Tank
6. Install buried piping and electrical.
7. Construct Biosolids Composting Pad and Biosolids Pond compacted clay liners.
8. City and Contract Administrator to arrange for and pay for liner testing to meet the requirement of Manitoba Conservation.
9. Install geotextile and compacted granular over clay liner once testing results have been approved by the Contract Administrator.
10. Construct ASP Bunker, Biofilter and Mixing and Receiving Building foundations complete with associated mechanical and electrical.
11. Install ASP Bunker and Biofilter and Mix Feed Area concrete block walls.
12. Construct the Mixing and Receiving Building.
13. Install remaining process mechanical, HVAC, electrical and I&C equipment in the Biosolids Composting Pad Area.
14. Install irrigation water supply lines with associated fittings and valves.
15. Install Jersey barriers and signage.

- C. Re-grade ditches if disturbed.

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END OF SECTION

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PART 1. GENERAL

1.01 DEFINITIONS

A. Products:

1. New items for incorporation in the Work, whether purchased by Contractor or City for the Project, or taken from previously purchased stock and may also include existing materials or components required for reuse.
2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent and is not intended to change meaning of such other terms used in Contract Documents, as those terms are self-explanatory and have well recognized meanings in construction industry.
3. Items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of the date of the Contract Documents.

1.02 DESIGN REQUIREMENTS

- A. Be responsible for designing seismic attachments, braces, anchors to the structure, and anchors to bases for elements of architectural, mechanical, process, and electrical systems included in the Work in accordance with this Section unless a design is specifically provided within the Contract Documents. Seismic attachments, braces and anchors shall be designed by a qualified professional engineer licensed in the Province of Manitoba.
- B. Provide systems, equipment, and components, including supports and anchorages, in accordance with provisions of latest edition of National Building Code with Manitoba Amendments.

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at 233.0 m above sea level.
- B. Provide equipment and devices installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of 40 degrees C to minus 45 degrees C.

1.04 PREPARATION FOR SHIPMENT

- A. When practical, factory assemble products. Mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable protective coating.

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- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of Project and Contractor, equipment number, and approximate weight. Include complete packing list and bill of materials with each shipment.
- C. Extra Materials, Special Tools, Test Equipment, and Expendables:
1. Furnish as required by individual Specifications.
 2. Schedule:
 - a. Ensure that shipment and delivery occurs concurrent with shipment of associated equipment.
 - b. Transfer to City shall occur immediately subsequent to Contractor's acceptance of equipment from Supplier.
 1. Packaging and Shipment:
 - a. Package and ship extra materials and special tools to avoid damage during long term storage in original cartons insofar as possible, or in appropriately sized, hinged-cover, wood, plastic, or metal box.
 - b. Prominently displayed on each package, the following:
 - 1) Manufacturer's part nomenclature and number, consistent with Operation and Maintenance Manual identification system.
 - 2) Applicable equipment description.
 - 3) Quantity of parts in package.
 - 4) Equipment manufacturer.
 2. Deliver materials to Site:
Composting Construction Site
Brady Road Resource Management Facility
1901 Brady Road
Winnipeg, Manitoba
Note: There is no postal code for this Site.
 3. See Section 01500 for delivery access to Site.
 4. Notify Contract Administrator upon arrival for transfer of materials.
 5. Replace extra materials and special tools found to be damaged or otherwise inoperable at time of transfer to City.
- D. Request a minimum 7-day advance notice of shipment from manufacturer. Upon receipt of manufacturer's advance notice of shipment, promptly notify Contract Administrator of anticipated date and place of equipment arrival.
- E. Factory Test Results: Reviewed and accepted by Contract Administrator before product shipment as required in individual Specification sections.

1.05 DELIVERY AND INSPECTION

- A. Deliver products in accordance with accepted current progress schedule and coordinate

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to avoid conflict with the Work and conditions at Site. Deliver anchor bolts and templates sufficiently early to permit setting prior to placement of structural concrete.

- B. Deliver products in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable. Include ULC labels on products so specified.
- C. Unload products in accordance with manufacturer's instructions for unloading or as specified. Record receipt of products at Site. Inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from Site and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

1.06 HANDLING, STORAGE, AND PROTECTION

- A. Handle and store products in accordance with manufacturer's written instructions and in a manner to prevent damage. Store in approved storage yards or sheds provided in accordance with Section 01500, Construction Facilities and Temporary Controls. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by City.
- B. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered, but not installed in the Work.
- C. Store electrical, instrumentation, and control products, and equipment with bearings in weather-tight structures maintained above 15 degrees C. Protect electrical, instrumentation, and control products, and insulation against moisture, water, and dust damage. Connect and operate continuously all space heaters furnished in electrical equipment.
- D. Store fabricated products above ground on blocking or skids, and prevent soiling or staining. Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
- E. Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.

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- F. Hazardous Materials: Prevent contamination of personnel, storage building, and Site. Meet requirements of product specification, codes, and manufacturer's instructions.

PART 2. PRODUCTS

2.01 GENERAL

- A. Provide manufacturer's standard materials suitable for service conditions, unless otherwise specified in the individual Specifications.
- B. Where product specifications include a named manufacturer, with or without model number, and also include performance requirements, named manufacturer's products must meet the performance specifications.
- C. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement, manufacturer's services, and implement same or similar process instrumentation and control functions in same or similar manner.
- D. Equipment, Components, Systems, Subsystems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OHSA, provincial, and local health and safety regulations.
- E. Regulatory Requirement: Coating materials shall meet federal, provincial, and local requirements limiting the emission of volatile organic compounds and for worker exposure.
- F. Safety Guards: Provide for all belt or chain drives, fan blades, couplings, or other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier; galvanized steel, aluminum coated steel, stainless steel, or hot-dip galvanized or aluminum coated 12 mm mesh expanded steel. Provide hot-dip galvanized or stainless steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water. Eliminate sharp edges with suitable borders neatly welded.
- G. Provide materials and equipment listed by ULC wherever standards have been established by that agency.
- H. Equipment Finish:
1. Provide manufacturer's standard finish and color, except where specific color is indicated.
 2. If manufacturer has no standard color, provide equipment with gray finish as

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approved by Contract Administrator.

- I. Special Tools and Accessories: Furnish to City, upon acceptance of equipment, all accessories required to place each item of equipment in full operation. These accessory items include, but are not limited to, adequate oil and grease (as required for first lubrication of equipment after field testing), light bulbs, fuses, hydrant wrenches, valve keys, handwheels, chain operators, special tools, and other spare parts as required for maintenance.
- J. Lubricants:
 - 1. Provide initial lubricant recommended by equipment manufacturer in sufficient quantity to fill lubricant reservoirs and to replace consumption during testing, startup, and operation until final acceptance by Contract Administrator.
 - 2. Provide Canadian made lubricants readily available in Canada. To the extent possible, provide lubricants compatible with products currently used in City's maintenance operations.
 - 3. Furnish lubricants in original sealed containers, correctly identified as to brand and grade.
- K. Nameplates:
 - 1. Provide for all equipment and motors, securely mounted in a readily visible location.
 - 2. 16-gauge stainless steel with 6 mm high die-stamped inscriptions.
 - 3. Inscriptions to include the following as a minimum:
 - a. Motors: In accordance with the requirements of C22.2 No. 100.
 - b. Equipment: Model number, serial number, size, performance data at rated capacity, impeller diameter, speed, efficiency, and other pertinent data, as applicable.
 - 4. Data in SI metric units.
- L. Bolted Connections: Project bolt ends minimum 3 mm but not more than one bolt diameter beyond nut faces.
- M. Flanges: Arrange with bolt holes straddling vertical centreline. Provide flanges finished in accordance with MSS SP-6.
- N. Bearings: Unless otherwise specified, provide bearings for rotating equipment suitable for ABMA B-10 life expectancy of minimum 100,000 working hours at rated conditions of service.

2.02 FABRICATION AND MANUFACTURE

- A. General:
 - 1. Manufacture parts to North American standard sizes and gauges.

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2. Two or more items of the same type shall be identical, by the same manufacturer, and interchangeable.
3. Design structural members for anticipated shock and vibratory loads.
4. Use 6 mm minimum thickness for steel that will be submerged, wholly or partially, during normal operation.
5. Modify standard products as necessary to meet performance Specifications.

B. Lubrication System:

1. Require no more than weekly attention during continuous operation.
2. Convenient and accessible. Oil drains with bronze or stainless steel valves and fill-plugs easily accessible from the normal operating area or platform. Locate drains to allow convenient collection of oil during oil changes without removing equipment from its installed position.
3. Provide constant-level oilers or oil level indicators for oil lubrication systems.
4. For grease type bearings, which are not easily accessible, provide and install stainless steel tubing; protect and extend tubing to convenient location with suitable grease fitting.

C. Equipment Base Plates:

1. Common base plate for equipment and driver, fabricated from heavy cast iron or welded structural steel section minimum 13 mm thick.
2. Provided with mounting plates minimum 19 mm thick for equipment and driver with mounting surfaces machined to average arithmetical roughness height of 3.0 microns maximum.
3. Provided with grout holes, vent holes, and anchor bolt holes.
4. For equipment where leakage or condensation may occur, equipped with drip lip or gutter, 25 mm NPT bossed drain connection at low point, and drain piping to building drainage system.

2.03 SOURCE QUALITY CONTROL

- A. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous 12 months to a standard endorsed by the National Institute of Standards and Technology (NIST).
- B. Factory Tests: Perform in accordance with accepted test procedures and document successful completion.

PART 3. EXECUTION

3.01 INSPECTION

- A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install material or equipment showing such effects. Remove

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damaged material or equipment from the Site and expedite delivery of identical new material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays within Contractor's control.

3.02 INSTALLATION

- A. Equipment Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. No shimming between machined surfaces is allowed.
- C. Repaint painted surfaces that are damaged prior to equipment acceptance.
- D. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions, and as may be specified. Retain a copy of manufacturers' instruction at Site, available for review at all times.

3.03 FIELD FINISHING

- A. In accordance with Section 09900, Painting and individual Specification sections.

3.04 ADJUSTMENT AND CLEANING

- A. Perform required adjustments, tests, operation checks, and other startup activities.

3.05 LUBRICANTS

- A. Fill lubricant reservoirs and replace consumption during testing, startup, and operation prior to acceptance of equipment by Contract Administrator.

END OF SECTION

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PART 1. GENERAL

1.01 DEFINITIONS

- A. Person-Day: One person for 8 hours within regular Contractor working hours.

1.02 SUBMITTALS

- A. Informational Submittals:
 1. Training Schedule: Submit not less than 21 days prior to start of equipment installation and revise as necessary for acceptance.
 2. Lesson Plan: Submit proposed lesson plan not less than 21 days prior to scheduled training and revise as necessary for acceptance.
 3. Training Session Discs: Furnish City with two complete sets of discs fully indexed and cataloged with printed label stating session and date taped. Disks are not to be copy protected.

1.03 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

- A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified elsewhere.
- B. Representative subject to acceptance by Contract Administrator. No substitute representatives will be allowed unless prior written approval by such has been given.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

- A. Furnish manufacturers' services when required by an individual specification section, to meet the requirements of this Section.
- B. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, the time required to perform the specified services shall be considered incidental.

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- C. Schedule manufacturer' services to avoid conflict with other onsite testing or other manufacturers' onsite services.
- D. Determine, before scheduling services, that all conditions necessary to allow successful testing have been met.
- E. Only those days of service approved by Contract Administrator will be credited to fulfill the specified minimum services.
- F. When specified in individual specification sections, manufacturer's onsite services shall include:
 - 1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of Contractor's assembly, erection, installation or application procedures.
 - 2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish Manufacturer's Certificate of Proper Installation.
 - 3. Providing, on a daily basis, copies of all manufacturers' representatives field notes and data to Contract Administrator.
 - 4. Revisiting the Site as required to correct problems and until installation and operation are acceptable to Contractor Administrator.
 - 5. Resolution of assembly or installation problems attributable to, or associated with, respective manufacturer's products and systems.
 - 6. Assistance during functional and performance testing, and facility startup and evaluation.
 - 7. Training of City's personnel in the operation and maintenance of respective product as required.
 - 8. Additional requirements may be specified elsewhere.

3.02 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

- A. When specified in individual Specification section, submit prior to shipment of product or material.
- B. Contract Administrator may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.
- C. Signed by product manufacturer certifying that product or material specified conforms to or exceeds specified. Attach supporting reference data, affidavits, and certifications as appropriate.
- D. May reflect recent or previous test results on material or product, if acceptable to Contract Administrator.

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3.03 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

- A. When so specified, a Manufacturer's Certificate of Proper Installation form, a copy of which is attached to this section, shall be completed and signed by the equipment manufacturer's representative.
- B. Such form shall certify that the signing party is a duly authorized representative of the manufacturer, is empowered by the manufacturer to inspect, approve, and operate their equipment and is authorized to make recommendations required to assure that the equipment is complete and operational.

3.04 TRAINING

- A. General:
 - 1. Furnish manufacturers' representatives for detailed classroom and hands-on training to City's personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in applicable Specifications.
 - 2. Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with City, and familiar with operation and maintenance manual information specified in Section 01430, Operation and Maintenance Data.
 - 3. Manufacturer's representative shall be familiar with facility operation and maintenance requirements as well as with specified equipment.
 - 4. Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.
- A. Training Schedule:
 - 1. List specified equipment and systems that require training services and show:
 - a. Respective manufacturer.
 - b. Estimated dates for installation completion.
 - c. Estimated training dates.
 - 2. Allow for 2 sessions to cover 2 shifts for all training.
 - 3. Adjust schedule to ensure training of appropriate personnel as deemed necessary by City, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.
 - 4. Coordinate with Section 01310, Progress Schedules, and Section 01810, Equipment Testing and Facility Startup.
- B. Lesson Plan: When manufacturer or vendor training of City personnel is specified, prepare for each required course, a lesson plan containing but not limited to the following information:
 - 1. Title and objectives.

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2. Recommended types of attendees (e.g., managers, engineers, operators, maintenance).
3. Course description and outline of course content.
4. Format (e.g., lecture, self-study, demonstration, hands-on).
5. Instruction materials and equipment requirements.
6. Resumes of instructors providing the training.

C. Pre-startup Training:

1. Coordinate training sessions with City's representative and manufacturers' representatives, and with submission of operation and maintenance manuals in accordance with Section 01430, Operation and Maintenance Data.
2. Complete at least 14 days prior to beginning of facility startup.

D. Post-startup Training: If required in Specifications, furnish and coordinate training of City's operating personnel by respective manufacturer's representatives.

E. Recording of Training Sessions:

1. Furnish video recording of pre-startup and post-startup instruction sessions, including manufacturers' representatives' hands-on equipment instruction and classroom sessions.
2. Video training discs shall be produced by a qualified, professional video production company.
3. Use DVD format, suitable for playback on standard equipment available commercially in Canada.

3.05 SUPPLEMENTS

F. The supplements listed below, following "End of Section", are part of this Specification.

1. Forms: Manufacturer's Certificate of Proper Installation.

END OF SECTION

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OWNER _____	EQPT SERIAL NO: _____
EQPT TAG NO: _____	EQPT/SYSTEM: _____
PROJECT NO: _____	SPEC. SECTION: _____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- Installed in accordance with Manufacturer's recommendations.
- Inspected, checked, and adjusted.
- Serviced with proper initial lubricants.
- Electrical and mechanical connections meet quality and safety standards.
- All applicable safety equipment has been properly installed.
- Functional tests.
- System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.

Comments: _____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____, 20__

Manufacturer: _____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

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REVISION 0	SECTION 01780 CONTRACT CLOSEOUT	

PART 1. GENERAL

1.01 SUBMITTALS

A. Informational Submittals:

1. Submit prior to application for final payment.
 - a. Record Drawings: As required in General Conditions.
 - a. Approved Shop Drawings and Samples: As required in the General Conditions.
 - b. Special Bonds, Special Guarantees, and Service Agreements.
 - c. Releases or Waivers of Liens and Claims: As required in General Conditions.
 - d. Releases from Agreements.
 - e. Extra Materials: As required by individual Specification sections.

1.02 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record drawings.
2. Accuracy of Records:
 - a. Coordinate changes within record documents, making legible and accurate entries on each sheet of drawings and other documents where such entry is required to show change.
 - b. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive Site measurement, investigation, and examination.
2. Make entries within 24 hours after receipt of information that a change in the Work has occurred.
3. Prior to submitting each request for progress payment, request Contract Administrator's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by Contract Administrator to recommend whole or any part of Contractor's Application for Payment, either partial or final.

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PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

A. General:

1. Promptly following commencement of Contract Times, secure from Contract Administrator at no cost to Contractor, one complete set of Contract Documents. Drawings will be full size.
2. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
3. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.

B. Preservation:

1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
2. Make documents and Samples available at all times for observation by Contract Administrator.

C. Making Entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
 - a. Color Coding:
 - 1) Green when showing information deleted from Drawings.
 - 2) Red when showing information added to Drawings.
 - 3) Blue and circled in blue to show notes.
2. Date entries.
3. Call attention to entry by "cloud" drawn around area or areas affected.
4. Legibly mark to record actual changes made during construction, including, but not limited to:
 - a. Depths of various elements of foundation in relation to finished floor data if not shown or where depth differs from that shown.
 - b. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.

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- d. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
- e. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, Written Amendment, and Engineer’s written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.
- 5. Dimensions on Schematic Layouts: Show on record drawings, by dimension, the centerline of each run of items such as are described in previous subparagraph above.
 - a. Clearly identify the item by accurate note such as “cast iron drain,” “galv. water,” and the like.
 - b. Show, by symbol or note, vertical location of item (“under slab,” “in ceiling plenum,” “exposed,” and the like).
 - c. Make identification so descriptive that it may be related reliably to Specifications.

3.02 FINAL CLEANING

- A. At completion of the Work or of a part thereof and immediately prior to Contractor’s request for Certificate of Substantial Performance; or if no certificate is issued, immediately prior to Contractor’s notice of completion, clean entire Site or parts thereof, as applicable.
 - 1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to City and Contract Administrator.
 - 2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
 - 3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
 - 4. Broom clean exterior paved areas.
 - 5. Hose clean sidewalks, loading areas, and others contiguous with principal structures.
 - 6. Rake clean all other surfaces.
 - 7. Remove snow and ice from access to buildings.
 - 8. Clean ducts, blowers, and coils of ventilation units operated during construction.
 - 9. Leave water courses, gutters, and ditches open and clean.
- B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

3.03 RELAMPING

- A. If permanent lighting fixtures and lamps are used during construction period prior to Substantial Performance, supply and install new lamps in fixtures or turn over spare lamps to City.

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- B. Replace incandescent lamps, except in emergency lighting systems, or turn over complete set of spare lamps to City.
- C. Replace high intensity discharge (HID) or similar type lamps that fail during Period of Guaranteed Maintenance.

END OF SECTION

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PART 1. GENERAL

1.01 DEFINITIONS

- A. Facility: Entire Project, or an agreed upon acceptable portion, including all of its unit processes.
- B. Field Quality Control: Term, as used in individual Specification sections, which refers to specified on-site functional and performance testing of equipment.
- C. Functional Test: Test or tests in presence of Contract Administrator [and City] to demonstrate that installed equipment meets manufacturer's installation, calibration, and adjustment requirements and other requirements as specified.
- D. Performance Test: A test performed in presence of Contract Administrator and after any required functional test, to demonstrate and confirm that systems, subsystems and/or components meet the performance requirements specified in individual sections.
- E. Source Quality Control: Term, as used in individual Specification sections, which refers to specified testing performed on specified equipment at manufacturer's facility prior to shipment.
- F. Unit Process Unit process: As used in this section, a unit process is a portion of the facility that performs a specific process function, such as Mixing, Aerated Static Composting System and Biofiltration System.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Completed Manufacturer's Certificate of Proper Installation as required by individual Specification sections. Submit prior to beginning Facility Startup procedures.
 - 2. Testing:
 - a. Functional and performance test schedules, test plan, procedures, and log format. Submit at least 14 days prior to start of related testing.
 - b. Facility Startup and Performance Evaluation Plan: Submit at least 21 days prior to commencement of startup.
 - 3. Certification of calibration for testing equipment, when so specified.
 - 4. Documentation of HVAC systems balancing results, when so specified.

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1.03 COORDINATION WITH EXISING SYSTEM SUBSYSTEM AND/OR COMPONENTS

- A. Testing, Startup and Commissioning of new systems, subsystems and components must be coordinated with existing facilities as agreed upon by the City's representative and Contract Administrator.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 CONTRACTOR'S TESTING AND STARTUP REPRESENTATIVE

- A. Designate and furnish one or more Contractor's personnel to coordinate and expedite testing and facility startup.
- B. Such person or persons shall be present during equipment testing and facility startup meetings specified in Section 01200, Project Meetings, and shall be available at all times during the testing and the facility startup and performance evaluation period.

3.02 EQUIPMENT TESTING

- A. Preparation:
 - 1. General:
 - a. Complete installation of each unit and related processes before testing, including all related manufacturer's representative services.
 - b. Furnish qualified manufacturer's representatives, when required by individual Specification sections, to assist in testing.
 - c. Obtain from equipment manufacturer's representative the Manufacturer's Certificate of Proper Installation Form, in accordance with Section 01640, Manufacturers' Services, as specified by individual Specification sections.
 - d. Schedule equipment testing and facility startup meetings to discuss test schedule, plan of test, materials, chemicals and liquids required, facilities operations interface, and City involvement.
 - e. Provide temporary valves, gauges, piping, test equipment and other materials and equipment required to conduct testing.
 - a. Provide written documentation of functional and performance test results on Contractor's form for each piece of equipment tested. Provide space

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- on form for Contract Administrator's signature verifying that testing has been completed as per specification.
2. Equipment Test Report Form: Provide written test report form for each item of equipment to be tested, to include the minimum information:
 - a. City/Project Name.
 - b. Equipment or item tested.
 - c. Date and time of test.
 - d. Type of test performed (Functional or Performance).
 - e. Test conditions.
 - f. Test results.
 - g. Signature space for Contractor and Contract Administrator representatives.
 3. Cleaning and Checking: Prior to beginning functional testing:
 - a. Calibrate testing equipment in accordance with manufacturer's instructions.
 - b. Inspect and clean equipment, devices, connected piping, and structures to ensure they are free of foreign material.
 - c. Lubricate equipment in accordance with manufacturer's instructions.
 - d. Turn rotating equipment by hand when possible to confirm that equipment is not bound.
 - e. Open and close valves by hand and operate other devices to check for binding, interference, or improper functioning.
 - f. Check power supply to electric-powered equipment for correct voltage.
 - g. Adjust clearances and torque.
 - h. Test piping for leaks.
 - i. Balance HVAC systems, measuring airflow (L/s) static pressure, and component pressure losses in coordination with the requirements specified in individual sections.
 4. Ready-to-test determination will be by Contract Administrator based at least on the following:
 - a. Notification by Contractor of equipment readiness for testing.
 - b. Acceptable testing plan.
 - c. Acceptable Operation and Maintenance Manuals.
 - d. Receipt of Manufacturer's Certificate of Proper Installation, if so specified.
 - e. Adequate completion of Work adjacent to, or interfacing with, equipment to be tested.
 - f. Availability and acceptability of manufacturer's representative, when specified, to assist in testing of respective equipment.
 - g. Satisfactory fulfillment of other specified manufacturers' responsibilities.
 - h. Equipment and electrical tagging complete.

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i. Delivery of all spare parts and special tools.

B. Functional Testing:

1. Conduct as specified in individual Specification sections.
2. Notify City, Contract Administrator, and manufacturer's representative in writing at least 10 days prior to scheduled date of testing.
3. When, in Contract Administrator's opinion, equipment meets functional requirements specified, such equipment will be accepted for purposes of advancing to performance testing phase, if so required by individual Specification sections. Such acceptance will be evidenced by Contract Administrator's signature on Equipment Test Report.

C. Performance Testing:

1. Conduct as specified in individual Specification sections.
2. Notify Contract Administrator and City at least 14 days prior to scheduled date of test.
3. Performance testing shall not commence until equipment has been approved by Contract Administrator as having satisfied functional test requirements specified.
4. Follow approved testing plan and detailed procedures specified.
5. Source and type of fluid, gas, or solid for testing shall be as specified.
6. Unless otherwise indicated, furnish all labor, materials, and supplies for conducting the test and taking all Samples and performance measurements.
7. Prepare performance test report summarizing test method and results.
8. When, in Contract Administrator's opinion, equipment meets performance requirements specified, such equipment will be accepted as to conforming to Contract requirements. Such acceptance will be evidenced by Contract Administrator's signature on Equipment Test Report.

3.03 FACILITY STARTUP AND PERFORMANCE EVALUATION

A. General:

1. Support City's operations personnel throughout Facility Startup and Performance Evaluation Period.
2. Equipment shall be accepted by Contract Administrator as having met requirements of specified functional testing prior to facility startup.
3. Sequence each unit process to the point that the complete facility is operational for evaluation of unit process and facility performance.
4. Demonstrate proper operation of required interfaces within and between individual unit processes.
5. Provide Subcontractor and equipment manufacturers' staff adequate to prevent delays.

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6. Schedule ongoing Work so as not to interfere with or delay the completion of facility startup.
 7. After the facility is operating, complete performance testing of those items of equipment not previously tested where agreed upon by Contract Administrator.
- B. Facility Startup and Performance Evaluation Plan:
1. Develop a plan in conjunction with City's representative and Contract Administrator detailing step-by-step instructions for startup of each unit process and the complete facility including the order in which systems, sub-systems and components will be started.
 2. Include details of coordination with existing systems, sub-systems and components.
 3. Include a method of evaluation and overall performance report for each unit process.
 4. Plan shall consist of bound copies of Startup and Performance Evaluation Forms. Use one form for each unit process; use example form attached, or one designed by Contractor.
 5. Startup and Performance Evaluation Form will include, but not be limited to the following:
 - a. Description of unit process being started.
 - b. All equipment and devices included in the unit process.
 - c. Unit process startup procedures (i.e., valves to be open/closed, order of equipment startup).
 - d. Requirements for water, power, and chemicals needed for startup.
 - e. Contractor Certification that each unit process is capable of performing its intended function(s), including fully automatic operation.
 - f. Space for evaluation comments.
- C. City Responsibilities:
1. Assist Contractor in developing a Facility Startup and Performance Evaluation Plan as required.
 2. Provide water, power, chemicals, and other items as required for testing and facility startup, unless otherwise indicated.
 3. Operate process units and devices, with support of Contractor.
 4. Provide labor and materials as required for sampling and laboratory analyses.
- D. Facility Startup Period:
1. Startup sequencing of unit processes shall be as defined in the Facility Start-up Plan
 2. Make adjustments, repairs, and corrections necessary to complete facility startup.
 3. Startup of entire facility or any portion thereof shall be considered complete

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when, in opinion of Contract Administrator, facility or designated portion has operated in manner intended for 5 continuous days without significant interruption. This period is in addition to training, functional, or performance test periods specified elsewhere.

4. Significant Interruption: May include any of the following events:
 - a. Failure of Contractor to provide and maintain qualified on-site startup personnel as scheduled.
 - b. Failure to meet specified performance for more than 2 consecutive hours.
 - c. Failure of any critical equipment or unit process that is not satisfactorily corrected within 5 hours after failure.
 - d. Failure of any noncritical equipment or unit process that is not satisfactorily corrected within 8 hours after failure.
 - e. As determined by Contract Administrator.
 5. A significant interruption will require startup then in progress to be stopped and restarted after corrections are made.
- E. Facility Performance Evaluation:
1. During the Facility Startup Period, conduct a performance evaluation for purpose of evaluating full capabilities of facility and performance of computer system, until all unit processes are operable and under control of computer system.
 2. Certify, on the Facility Performance Evaluation Form, that each unit process is capable of performing its intended function(s), including fully automatic and computerized operation.

3.04 SUPPLEMENT

- A. Supplement listed below, following “End of Section,” is a part of this Specification:
 1. Startup and Performance Evaluation Form.

END OF SECTION

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REVISION B	SECTION 01810-01 START-UP AND PERFORMANCE EVALUATION FORM	

OWNER: _____	PROJECT: _____
Unit Process Description: (Include description and equipment number of all equipment and devices):	
Startup Procedure (Describe procedure for sequential startup and evaluation, including valves to be opened/closed, order of equipment startup, etc.):	
Startup Requirements (Water, power, chemicals, etc.):	
Evaluation Comments: _____	
Contractor Certification that Unit Process is capable of performing its intended function(s), including fully automatic operation:	
Firm Name: _____	
Startup Representative: _____	Date: _____, 20
(Authorized Signature)	