



**THE CITY OF WINNIPEG**

# **SPECIFICATIONS**

**TENDER NO. 581-2023**

**MAIN AND HENRY COMMUNITY CORNER PLAZA – 715 MAIN STREET**

**SURVEY**

- SURVEY

**LANDSCAPE**

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L100 EXISTING CONDITIONS & DEMOLITION PLAN  
L200 LANDSCAPE SITE PLAN  
L300 PLANTING PLAN  
L400 LAYOUT PLAN  
L500 LANDSCAPE DETAILS  
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**Part 1 General**

**1.1 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Refer to City of Winnipeg Bid Opportunity No. 581-2023, Section D2 Scope of Work.

**1.2 EXISTING SERVICES**

- .1 Notify Contract Administrator and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Contract Administrator 48 hours' notice for necessary interruption of mechanical or electrical service throughout course of Work. Minimize duration of interruptions. Carry out Work at times as directed by governing authorities with minimum disturbance to pedestrian, vehicular traffic, and tenant operations.
- .3 Establish location and extent of service lines in area of Work before starting Work. Notify Contract Administrator of findings.
- .4 Submit schedule to and obtain approval from Contract Administrator for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide temporary services when directed by Contract Administrator to maintain critical building and tenant systems.
- .6 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.
- .9 Construct barriers in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

**1.3 WORK SEQUENCE**

- .1 Construct Work in stages to accommodate City's intermittent continued use of public washroom premises during construction.
- .2 Co-ordinate Progress Schedule and co-ordinate with City's Occupancy during construction.
- .3 Maintain fire access/control.

**1.4 CONTRACTOR USE OF PREMISES**

- .1 Limit use of premises for access, for Work, for storage, to allow:
  - .1 Work by other contractors.
- .2 Co-ordinate use of premises under direction of Consultant.
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

**1.5 OWNER FURNISHED ITEMS**

- .1 City's Responsibilities:
  - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.

- .2 Deliver supplier's bill of materials to Contractor.
  - .3 Arrange and pay for delivery to site in accordance with Progress Schedule.
  - .4 Inspect deliveries jointly with Contractor.
  - .5 Submit claims for transportation damage.
  - .6 Arrange for replacement of damaged, defective or missing items.
  - .7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.
- .2 Contractor Responsibilities:
- .1 Designate submittals and delivery date for each product in progress schedule.
  - .2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
  - .3 Receive and unload products at site.
  - .4 Inspect deliveries jointly with City; record shortages, and damaged or defective items.
  - .5 Handle products at site, including uncrating and storage.
  - .6 Protect products from damage, and from exposure to elements.
  - .7 Assemble, install, connect, adjust, and finish products.
  - .8 Provide installation inspections required by public authorities.
  - .9 Repair or replace items damaged by Contractor or subcontractor on site (under his control).
- .3 Refer to Drawings for Owner furnished item, Custom Metal Planter by Streetlife.

## 1.6 GLASS BREAKAGE

- .1 Contractors shall be responsible for all glass that is broken, scratched or cracked during the execution of the work and shall replace such glass at their own expense.

## 1.7 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Health and Safety Plan and Other Safety Related Documents.
  - .11 Other documents as specified.

## 1.8 NOTICES

- .1 All notices, consents, approvals, statements, authorizations, documents of other communication required or permitted to be given under this Contract shall be in writing and shall be delivered personally or mailed by registered mail, postage prepaid to the City at the address set out in the Contract Documents; and to the Contractor at the

address set out in the Form of Tender; or at such other address or addresses as the party to whom such notice, consent, approval, statement, authorization, document or other communications is to be given may designate by notice in writing so given to the other party hereto as provided herein.

- .2 Any notice, consent, approval, statement, authorization, documents or other communication given as provided herein shall:
  - .1 in the case of personal delivery, be deemed to have been received on the day of delivery, if a business day, or if not a business day, on the business day next following the day of delivery; and
  - .2 in the case of delivery by registered mail, be deemed to have been received on the second business day on which mail is delivered by Canada Post following the date of mailing.
  - .3 in the event of a postal dispute or threat of a postal dispute, all notices required to be given hereunder shall be personally delivered.

## **1.9 INDEPENDENT CONTRACTOR**

- .1 The City and the Contractor acknowledge and agree that the Contractor is an independent contractor and neither the Contractor, nor any officer, servant or agent of the Contractor, shall be deemed to be an employee, agent, representative or servant of the City.

## **1.10 FORFEITURE OF CONTRACT**

- .1 The City shall have the full right and power to take the whole of the Work, or any part or parts thereof out of the hands of the Contractor, without process or action at law, upon giving the Contractor written notice, a copy of which notice shall be given to the Surety, or the Winnipeg agent of the latter, in the event that the Contractor:
  - .1 abandons the Work; or
  - .2 is adjudged bankrupt or insolvent; or
  - .3 makes a general assignment for the benefit of his creditors; or
  - .4 should have a receiver or liquidator appointed in respect of his assets; or
  - .5 is in the judgement of the City not executing or has not executed the Work, or any part thereof, in a sound and workmanlike manner and to his satisfaction and in all respects in strict conformity with the Contract; or
  - .6 in the judgement of the City, is not progressing with the Work or any part thereof continuously and in such a manner as to ensure its entire completion of the Work or any part thereof, within the time stipulated; or
  - .7 refuses or neglects forthwith, when so ordered, to conduct the Work so as to ensure its completion, in the opinion of the City, within the time stipulated; or
  - .8 has not completed the Work within the time required; or
  - .9 refuses or neglects to take down, rebuild, repair, alter or amend any defective or unsatisfactory Work, or to remove any condemned material or workmanship, or to comply with any reasonable order in connection therewith he may receive from the City; or
  - .10 fails to make prompt payment of wages to his Subcontractor or accounts for the purchase or rental of material or plant; or
  - .11 fails to promptly secure a discharge of a lien or trust claim, served upon the City, pursuant to The Builders' Lien Act, within Thirty (30) Calendar Days after receipt of written Notice of the claim from the Solicitor; or
  - .12 persistently disregards any laws, by-laws and statutory regulations; or

- .13 commits any other material breach of this Contract, which in the opinion of the City indicates an unwillingness or inability upon the part of the Contractor to carry out the terms thereof.
- .2 Upon such Notice being given to the Contractor, he shall immediately discontinue the Work or any part or parts thereof specified in the said Notice.
- .3 The Surety may, at its option, assume this Contract in respect of the whole of the Work, or the portion thereof specified in the Notice on which the City has ordered the Contractor to discontinue the Work, as the case may be, and proceed to perform same, and may with the written consent of the City sublet the Work or portion of the Work so taken over; provided however that the Surety shall exercise its option, if at all, within Fourteen (14) Calendar Days after written notice to discontinue the Work has been served upon the Contractor and a copy of same upon the Surety or the Winnipeg agent of the latter.
- .4 The Surety in such event shall take the Contractor's place in all respects, shall be bound by all terms and conditions of the Contract Documents and shall be paid by the City in accordance with the terms of the Contract for all Work performed by it.
- .5 In case the Surety does not within Fourteen (14) Calendar Days exercise its right and option to assume the Contract as aforesaid or in the event that there is no Surety, then the City shall have the power to complete by contract or otherwise as it may determine, the Work hereinbefore referred to or such portion of it as the City may deem necessary, and the Contractor agrees that the City shall have the right to take possession of and use any of the materials, plant, supplies and property of every kind provided by the Contractor for the purpose of the Work and to procure other plant and materials for the completion of the same. The City shall not be required to obtain the lowest price for the Work taken over from the Contractor.
- .6 In case the cost to the City of completing the Work or portion thereof as aforesaid is less than the amount to which the Contractor would have been entitled under the Contract for so doing, the Contractor shall have no claims in respect thereof against the City, but if such certified cost of the Work performed by the City is more than the amount to which the Contractor would have been entitled under the Contract for the same Work, then the City shall have a claim against the Contractor for all additional costs of the Work which have been incurred by the City in addition to the amount of any liquidated damages that the City is entitled to hereunder from the date fixed for the Total Performance of the Work in the Contract Documents. The Contractor shall pay the amount of such additional cost of the Work together with liquidated damages as provided for herein to the City setting out the amount so due. When any particular part of the Work is being performed by the City, by contract or otherwise, under the provisions of this clause, the Contractor shall continue the remainder of the Work in conformity with the terms and conditions of this Contract, and in such manner as in no way to hinder or interfere with the persons, other Contractors, other Sub-Contractors, or workmen employed by the City.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**



**Part 1 General**

**1.1 CASH ALLOWANCES – GENERAL**

- .1 Include in Contract Price specified cash allowances.
- .2 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing Work.
- .3 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.
- .4 Obtain three quotations for each Cash Allowance, and for each type of inspection and testing service paid for by Cash Allowance, and submit to Consultant for review. City and Consultant reserve right to select quotation.
- .5 Include progress payments on accounts of work authorized under cash allowances in Consultant's monthly certificate for payment.
- .6 Prepare schedule jointly with Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.
- .7 Unless stated otherwise, all Cash Allowances are to include products, labour and materials to fully execute the intended Work.
- .8 Unless explicitly stated otherwise, Cash Allowances pertain to those scopes of work which are not defined elsewhere in the contract documents.

**1.2 CASH ALLOWANCES – LUMP SUM FOR TESTING & INSPECTIONS:**

- .1 Include in Contract Price, allowances to cover net costs of engaging certified testing agencies, testing and inspections, and reporting results, listed below.
- .2 Cash Allowance No. 1 – Lump Sum for Testing and Inspections:
  - .1 Compaction testing
  - .2 Concrete testing & inspections.
- .3 Cash Allowance No. 1 Total: \$3,000.00

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used

**END OF SECTION**

**Part 1 General**

**1.1 ADMINISTRATIVE**

- .1 Schedule and administer project meetings [throughout the progress of the work] at the call of Consultant.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Consultant.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants Consultant affected parties not in attendance.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

**1.2 PRECONSTRUCTION MEETING**

- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of Consultant, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
  - .1 Appointment of official representative of participants in the Work.
  - .2 Schedule of Work: in accordance with Section 01 32 16 - Construction Schedule.
  - .3 Schedule of submission of shop drawings, samples, colour chips.
  - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences.
  - .5 Delivery schedule of specified equipment.
  - .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
  - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  - .8 Owner provided products.
  - .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
  - .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.

- .12 Monthly progress claims, administrative procedures, photographs, hold backs.
- .13 Appointment of inspection and testing agencies or firms.
- .14 Insurances, transcript of policies.

**1.3 PROGRESS MEETINGS**

- .1 During course of Work schedule progress meetings bi-weekly. Prior to project completion, schedule meetings more often to facilitate project completion and take over.
- .2 Contractor, major Subcontractors involved in Work, Consultant & City are to be in attendance.
- .3 Notify parties minimum 5 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 7 days after meeting.
- .5 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for affect on construction schedule and on completion date.

**Part 2 Products**

**2.1 NOT USED**

**Part 3 Execution**

**3.1 NOT USED**

**END OF SECTION**

**Part 1 General**

**1.1 DEFINITIONS**

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

**1.2 REQUIREMENTS**

- .1 Ensure Project Schedules is practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

**1.3 REQUIRED SUBMITTALS**

- .1 Refer to City of Winnipeg Bid Opportunity 581-2023.

**1.4 FORMAT**

- .1 Prepare schedules in the form of a horizontal bar chart.
- .2 Provide separate bar for each trade or operation.
- .3 Provide horizontal time scale identifying the first work day of each week.
- .4 Format for listings: the chronological order of the start of each item of work.
- .5 Identification of listings: by specification subject.

**1.5 PROJECT SCHEDULE**

- .1 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award.

- .2 Shop Drawings, Samples.
  - .3 Material & Product Delivery
  - .4 Permits.
  - .5 Cash Allowances
  - .6 Mobilization.
  - .7 Excavation.
  - .8 Backfill.
  - .9 Lighting.
  - .10 Electrical.
  - .11 Owner Furnished Products
  - .12 Testing and Commissioning.
  - .13 Owner Supplied Items
  - .14 Long delivery items.
  - .15 Concrete pavement and sandblasting
  - .16 Site Furnishings
  - .17 Landscaping
- .2 Include dates for commencement and completion, including testing and commissioning.
  - .3 Allow for preparation and review of mock-ups in schedule.

#### **1.6 PROJECT SCHEDULE REPORTING**

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Show projected percentage of completion for each item as of the first day of each month.
- .3 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.
- .4 Indicate dates for submitting, review time, resubmission time, float time, last date for meeting fabrication schedule.
- .5 Include dates when submittals, delivery will be required for Owner-furnished products.
- .6 Include dates when reviewed submittals will be required from the Consultant.
- .7 Show progress of each activity, and changes occurring since previous submission of schedule:
  - .1 Major changes in scope.
  - .2 Activities modified since previous submission.
  - .3 Revised projections of progress and completion.
  - .4 Other identifiable changes.
- .8 In the event that a legitimate reason requires rescheduling of the Work, provide a narrative report to define:
  - .1 Problem areas, anticipated delays, and impact on schedule.
  - .2 Corrective action recommended and its effect.
  - .3 Effect of changes and schedules of other contractors.
- .9 Initial schedule shall form baseline information. Subsequent updated schedules shall show initial schedule along with up-to-date changes.

- .10 Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

**1.7 PROJECT MEETINGS**

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**Part 1 General**

**1.1 ADMINISTRATIVE**

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

**1.2 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in the province in which the Work takes place.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow a minimum of ten (10) working days for Consultant's review of each submission.
- .5 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

- .6 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter or stamp containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Capacities.
    - .5 Performance characteristics.
    - .6 Standards.
    - .7 Operating weight.
    - .8 Wiring diagrams.
    - .9 Single line and schematic diagrams.
    - .10 Relationship to adjacent work.
- .9 After Consultant's review, distribute copies.
- .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
- .11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Consultant.
  - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .2 Testing to be in compliance with most recent version of the listed third party standard.



- .13 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Consultant.
  - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
  - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Consultant.
  - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed as noted. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

### **1.3 CONSULTANT DRAWINGS**

- .1 Electronic files of drawings for the purpose of shop drawing preparation may be obtained from the Consultants provided a waiver is signed by the person or company requesting the drawings.

### **1.4 SAMPLES**

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Consultant's business address as noted in the title sheet.
- .3 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .6 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

**1.5 MOCK-UPS**

- .1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

**1.6 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: Minimum 2 locations, more for critical path and complex elements.
- .4 Frequency of photographic documentation: monthly or as directed by Consultant.
  - .1 At minimum produce site photos upon completion of: of Work, excavation, pile and pile caps, structural steel, services before concealment and concrete.
- .5 Provide digital photographs of site, immediate public services and existing and neighboring buildings prior to construction to serve as record for possible damages.

**1.7 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 GENERAL REQUIREMENTS**

- .1 Bid Opportunity 581-2023 and all Sections of Division 01 apply to and form part of this section of the specification.
- .2 The Contractor is solely responsible for all safety on site. They shall monitor, apply, reinforce, regulate, educate and report all aspects of site safety.
- .3 This specification section shall be a guide for the minimum standard of safety practice and shall not be considered an overriding authority relating to standards required by the local authorities having jurisdiction.

**1.2 REFERENCE STANDARDS**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Manitoba
  - .1 The Workers Compensation Act RSM 1987 - Updated 2013.
- .3 City of Winnipeg
  - .1 Contractor Safety – A Shared Responsibility; available on the information Connection page at the City of Winnipeg, Corporate Finance, materials Management Division website at <http://www.winnipeg.ca/matmgt/safety/>
  - .2 City of Winnipeg Safe Work Plan: available on the Information Connection page of the City of Winnipeg, Corporate Finance Materials Management Divisions website at <http://www.winnipeg.ca/matmgt/safety/>

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit digital copy of Contractor's authorized representative's work site health and safety inspection reports to Consultant upon request.
- .3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .4 Submit copies of incident and accident reports upon request.
- .5 Submit WHMIS MSDS - Material Safety Data Sheets.
- .6 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

**1.4 SAFETY ASSESSMENT**

- .1 Perform and document site specific safety hazard assessment related to project. Submit document upon request.

**1.5 REGULATORY REQUIREMENTS**

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.
- .2 Comply with the requirements for Building Construction operations FCC No. 301-1982 - Standard for Construction Operations.
- .3 Comply with The Workers Compensation Act, Workplace Safety Regulation, Manitoba.

- .4 Workplace Safety & Health Act:**
- .1** The Workplace Safety and Health Act and all related workplace safety and health regulations apply to this project. For purposes of the Contract, the Contractor is the sole “prime contractor” as defined in the WSH Act, and is therefore required and agrees to co-ordinate, organize and oversee the performance of all Work at the construction project site and to conduct its own activities in such a way as to ensure, so far as is reasonably practicable, that no person is exposed to risks to his or her safety or health arising out of, or in connection with, activities at the construction project site. In addition, the Contractor as prime contractor, is required and agrees to ensure, so far as is reasonably practicable, that every person involved in Work on the project complies with the WSH Act, and in turn to co-operate with any other person who is exercising its, his or her duty to comply with the WSH Act.
  - .2** The WSH Act also requires certain employers to establish written workplace safety and health programs, and that the Contractor, as prime contractor, co-ordinate the programs of such employers. The Contractor, as prime contractor, agrees to co-ordinate the workplace safety and health programs of all employers on the project site.
  - .3** The foregoing is not a comprehensive description of the Contractor’s duties as prime contractor under the WSH Act. The Contractor, as prime contractor, agrees to comply at all times with the requirements of the WSH Act and to provide the City with any information it may reasonably request regarding the Contractor’s compliance with such requirements. The Contractor agrees that any right that the City or its Consultant may have to monitor or inspect the Work is only for the purpose of determining the progress and quality of work as a basis for payment to the Contractor and to assess the Contractor’s compliance with the terms and conditions of the Contract.
  - .4** The Contractor must supply and install signs at the project site, advising in writing that the project site is a “Hard Hat Area”.
- .5** Observe construction safety measures of National Building Code, Provincial Government, Worker’s Compensation Board and municipal authority provided that in the case of conflict or discrepancy, more stringent requirements shall apply.

**1.6 RESPONSIBILITY**

- .1** Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2** Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .3** Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

**1.7 UNFORSEEN HAZARDS**

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

procedures in accordance with Acts and Regulations of Province having jurisdiction and advise Consultant verbally and in writing.

**1.8 HEALTH AND SAFETY CO-ORDINATOR**

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
  - .1 Have site-related working experience specific to activities associated with the Work.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work.

**1.9 POSTING OF DOCUMENTS**

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

**1.10 CORRECTION OF NON-COMPLIANCE**

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

**1.11 WORK STOPPAGE**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES TO REGULATORY REQUIREMENTS**

- .1 Perform Work in accordance with the latest issue of the applicable regulations and standards as listed in the project specifications and as listed below:
  - .1 Manitoba Building Code
  - .2 Manitoba Fire Code
  - .3 Federal, Provincial and Municipal government laws, ordinances and codes, where such standard laws, rules, ordinances and codes are applicable
  - .4 City of Winnipeg Electrical By-Law
- .2 Where specified standards are not dated, conform to the most recent active standard.
- .3 Specific design and performance requirements listed in the specifications or indicated on the Drawings may exceed the minimum requirements established by the referenced Building Code; these requirements will govern over the minimum requirements listed in the Building Code
  - .1 Meet or exceed requirements of:
    - .1 Contract documents.
    - .2 Specified standards, codes and referenced documents.
- .4 Electrical components and equipment which are not CSA approved shall be approved by the Manitoba Department of Labour prior to connection to the electrical service. Pay for all costs associated with obtaining the necessary approval.

**1.2 HAZARDOUS MATERIAL DISCOVERY**

- .1 Stop work immediately, identify types & extent, and notify Consultant if any of the following hazardous materials are discovered:
  - .1 Asbestos
  - .2 PCB: Polychlorinated Biphenyl
  - .3 Mould

**1.3 BUILDING SMOKING ENVIRONMENT**

- .1 No smoking allowed on Site.

**1.4 QUALITY ASSURANCE**

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

**Part 2**

**Products**

**2.1**

**NOT USED**

.1 Not Used.

**2.2**

**PERMITS**

- .1 Development Permit: Consultant has applied for, obtained, and paid for a development permit.
- .1 The successful bidder shall request a letter from the Consultant for the city, identifying the general contractor as being fully responsible for the development permit.
- .2 Contractor will require that specific Subcontractors obtain and pay for permits required by authorities having jurisdiction, where their Work is affected by Work requiring permits.
- .3 Contractor shall be responsible for the procurement of permits, licenses, inspections and certificated which are necessary for the performance of the Work.
- .4 Contractor to display permits (development, electrical and others) in a conspicuous location at Place of Work.

**Part 3**

**Execution**

**3.1**

**NOT USED**

.1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 SECTION INCLUDES**

- .1 Inspection and testing, administrative and enforcement requirements.
- .2 Tests and mix designs.
- .3 Mock-ups.

**1.2 INSPECTION**

- .1 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

**1.3 INDEPENDENT INSPECTION AGENCIES**

- .1 Independent Inspection/Testing Agencies will be engaged by Consultant for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Contractor.
- .2 Independent Inspection/Testing Agencies shall be certified by an industry recognized organization in the field of work to which their inspections/testing pertains
- .3 Allocated costs: refer to Section 01 21 00 – Allowances for costs for inspections/testing unless otherwise noted in individual specification sections.
- .4 Provide equipment required for executing inspection and testing by appointed agencies.
- .5 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .6 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant no cost to the City. Pay costs for retesting and reinspection.

**1.4 ACCESS TO WORK**

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

**1.5 PROCEDURES**

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



- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

## **1.6 REJECTED WORK**

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

## **1.7 REPORTS**

- .1 Submit electronic copies of inspection and test reports to Consultant.
- .2 Provide copies to manufacturer or fabricator of material being inspected or tested, Contractor & subcontractor of work being inspected or tested.

## **1.8 TESTS AND MIX DESIGNS**

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

## **1.9 MOCK-UPS**

- .1 Mock-ups shall be full-size physical assemblies that are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mock-ups are not Samples. Unless otherwise indicated, approved mock-ups establish the standard by which the Work will be judged.
- .2 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .3 Construct in locations as specified in specific Section or which are acceptable to Consultant.
- .4 Prepare mock-ups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .5 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .6 If requested, Consultant will assist in preparing schedule fixing dates for preparation.
- .7 Remove mock-up at conclusion of Work or when acceptable to Consultant.

- .8 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 INSTALLATION AND REMOVAL**

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, site service locations, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Provide temporary utilities controls to execute work expeditiously.
- .3 Remove from site all such work after use.

**1.2 DEWATERING**

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

**1.3 WATER SUPPLY**

- .1 Provide continuous supply of potable water for construction use.
- .2 Arrange with the City and pay costs for installation, maintenance and removal.
- .3 Pay for utility charges at prevailing rates.

**1.4 TEMPORARY HEATING AND VENTILATION**

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
  - .1 Facilitate progress of Work.
  - .2 Protect Work and products against dampness and cold.
  - .3 Prevent moisture condensation on surfaces.
  - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .5 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Ventilate temporary sanitary facilities.
  - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

- .6 Permanent heating system of building, to be used only after confirmation by Consultant and credit applied to contract. Be responsible for damage to heating system if use is permitted. On completion of Work for which permanent heating system is used, replace filters, and clean ducts, vents and louvres.
- .7 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.
- .8 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform with applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct-fired combustion units to outside.
- .9 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

#### **1.5 TEMPORARY POWER AND LIGHT**

- .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Provide and maintain temporary lighting throughout project.
- .4 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.
- .5 For construction activities within existing facilities:
  - .1 Do not use existing electrical receptacles without permission from the City. Once permission is granted, use only designated receptacles. Do not exceed 80% of rated circuit capacity. Repair damage.
  - .2 When using power extension cords outside of hoarded construction areas take necessary precautions to ensure power cords do not pose a safety hazard to public, patients or staff. Locate power cords in a manner that does not restrict fire doors from closing automatically upon fire alarm signal. Where cords are placed on floors in public areas secure to floor surface with duct tape or other suitable means acceptable to the City, or hang from ceiling 2400 mm above finished floor.

#### **1.6 TEMPORARY COMMUNICATION FACILITIES**

- .1 Provide and pay for temporary data & telephone hookup lines for own use and use of Consultant.

#### **1.7 FIRE PROTECTION**

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction, governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

**Part 2            Products**

**2.1                NOT USED**

.1                Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1                Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCE STANDARDS**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-S269.2, Access Scaffolding for Construction Purposes.
  - .2 CAN/CSA-Z321, Signs and Symbols for the Occupational Environment.

**1.2                ACTION AND INFORMATIONAL SUBMITTALS**

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

**1.3                INSTALLATION AND REMOVAL**

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be gravelled to prevent tracking of mud.
- .3 Provide construction facilities in order to execute work expeditiously and remove from site all such work after use.

**1.4                SCAFFOLDING**

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain ramps, scaffolding, temporary stairs, swing staging, ladders, platforms.

**1.5                SITE STORAGE/LOADING**

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.
- .3 The General Contractor is to restore the existing site finishes/services affected by the construction equipment, material deliveries, contractor site trailers etc. Restoration of the existing finishes such as pavement, grass, gravel etc., shall be completed to the approval of the Prime Consultant and the City and will be done so at no extra cost to the City. This includes all interior finishes affected by the delivery of materials and access of site personnel.

**1.6                CONSTRUCTION PARKING**

- .1 Provide and maintain adequate access to project site.
- .2 Clean runways and taxi areas where used by Contractor's equipment.
- .3 All contractors will be responsible for the cost of parking permits if required.
- .4 The contractor, its suppliers, servants and agents, when upon the property of the City shall use only such streets, roads and parking lots and follow such course going to and from the actual site of the work, as the City and authorities having jurisdiction shall designate. The Contractor shall not permit any vehicle under its control to stand or be parked upon the property of the City's without authorization of the City. Vehicles parked in unauthorized areas may be towed away at the vehicle owner's expense.

- .5 Contractor to submit parking and site use plan to Contract Administrator for approval.

**1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE**

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

**1.8 SANITARY FACILITIES**

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of Consultant.

**1.9 CONSTRUCTION SIGNAGE**

- .1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Consultant.
- .2 Format, location, and quantity signs and notices to be approved by Consultant.
- .3 No other signs or advertisements, other than warning signs, are permitted on site.
- .4 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

**1.10 CLEAN-UP**

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 HOARDING AND SITE FENCING**

- .1 Erect and maintain hoarding as required to protect the public, workers, public and private property from injury or damage.
- .2 Site Enclosure Fence:
  - .1 Before construction operations begin, provide site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
  - .2 Modular welded wire fencing, minimum 1.8 metres high. Use privacy screening/scrim which is approved by the fencing manufacturer where public may be exposed to dust or debris, the protection of adjacent building finishes is required, or where the City/Contractor privacy conditions are required.
  - .3 Provide a lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
  - .4 Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to the City. Ensure gate is locked after work hours
  - .5 Provide concrete barriers when diverting public traffic.
- .3 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .4 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

**1.2 GUARD RAILS AND BARRICADES**

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

**1.3 WEATHER ENCLOSURES**

- .1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- .2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
- .3 Design enclosures to withstand wind pressure and snow loading.

**1.4 DUST TIGHT SCREENS**

- .1 Provide dust tight screens or [insulated] partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.

**1.5 ACCESS TO SITE**

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



**1.6 PUBLIC TRAFFIC FLOW**

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

**1.7 FIRE ROUTES**

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

**1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

**1.9 PROTECTION OF BUILDING FINISHES**

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Consultant locations and installation schedule 3 days prior to installation.
- .4 Be responsible for any damage incurred due to lack of or improper protection.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCE STANDARDS**

- .1 Within text of each specifications section, reference may be made to reference standards. List of standards reference writing organizations is contained in Section.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications. Conform to the current active version of all listed standards.
- .3 If there is question as to whether products or systems are in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.
- .4 Cost for such testing will be born by Consultant in event of conformance with Contract Documents or by Contractor in event of non-conformance.

**1.2 QUALITY**

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Procurement policy is to acquire, in a cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building. Failure to do so will result in rejection of the product and replacement will be required Contractor's at own expense and the Contractor will be responsible for delays and expenses caused by rejection.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

**1.3 AVAILABILITY**

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

**1.4 STORAGE, HANDLING AND PROTECTION**

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber and any other material prone to warpage on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of City and Consultant.
- .9 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

**1.5 TRANSPORTATION**

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by the Downtown Winnipeg BIZ. Contractor to unload, handle and store such products.

**1.6 MANUFACTURER'S INSTRUCTIONS**

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no increase in Contract Price or Contract Time.

**1.7 QUALITY OF WORK**

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

**1.8 CO-ORDINATION**

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.
- .3 Be responsible for cost to Contract Price and Time due to lack of coordination.

**1.9 CONCEALMENT**

- .1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation inform Consultant if there is interference. Install as directed by Consultant.

**1.10 REMEDIAL WORK**

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

**1.11 LOCATION OF FIXTURES**

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

**1.12 FASTENINGS**

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

**1.13 FASTENINGS - EQUIPMENT**

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

**1.14 PROTECTION OF WORK IN PROGRESS**

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

**1.15 EXISTING UTILITIES**

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and pedestrian and vehicular traffic. and/or building occupants.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 PROJECT CLEANLINESS**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than including that caused by the City or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only or remove from site as required by the City.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Dispose of waste materials and debris off site.
- .7 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

**1.2 FINAL CLEANING**

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by the City or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors, ceilings.

- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .11 Broom clean and wash exterior walks and surfaces; rake clean other surfaces of grounds.
- .12 Remove dirt and other disfiguration from exterior surfaces.
- .13 Sweep and wash clean paved areas.
- .14 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .15 Clean roofs, downspouts, and drainage systems.
- .16 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .17 Remove snow and ice from access to building.

**1.3 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and/or recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                DEFINITIONS**

- .1        Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .2        Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .3        Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .4        Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
  - .1        Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
  - .2        Returning reusable items including pallets or unused products to vendors.
- .5        Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .6        Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.

**1.2                WASTE PROCESSING SITES**

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

**1.3                STORAGE, HANDLING AND PROTECTION**

- .1        Store, materials to be reused, recycled and salvaged in locations as directed by Consultant.
- .2        Recycle all recyclable materials. Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .3        Unless specified otherwise, materials for removal become Contractor's property.
- .4        Protect, stockpile, store and catalogue salvaged items.
- .5        Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .6        Protect structural components not removed and salvaged materials from movement or damage.
- .7        Support affected structures. If safety of building is endangered, cease operations and immediately notify Consultant.
- .8        Protect surface drainage, mechanical and electrical from damage and blockage.
- .9        Separate and store materials produced during project in designated areas.
- .10      Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
  - .1        On-site source separation is recommended.
  - .2        Remove co-mingled materials to off site processing facility for separation.



- .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
- .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

**1.4 DISPOSAL OF WASTES**

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of oil, volatile materials, mineral spirits, paint thinner, waste into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
  - .1 Number and size of bins.
  - .2 Waste type of each bin.
  - .3 Total tonnage generated.
  - .4 Tonnage reused or recycled.
  - .5 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.

**1.5 SCHEDULING**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse, recycling and salvage.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
  - .2 Source separate materials to be reused/recycled into specified sort areas.

**3.2 DIVERSION OF MATERIALS**

- .1 Separate recyclable materials from general waste stream and stockpile in separate piles or containers, as reviewed by Consultant, and consistent with applicable fire regulations.
  - .1 Mark containers or stockpile areas.
  - .2 Provide instruction on disposal practices.

**END OF SECTION**

**Part 1 General**

**1.1 ADMINISTRATIVE REQUIREMENTS**

- .1 Acceptance of Work Procedures:
  - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
    - .1 Notify Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
    - .2 Request Consultant's inspection.
  - .2 Consultant's Inspection:
    - .1 Consultant and Contractor to inspect Work and identify defects and deficiencies.
    - .2 Contractor to correct Work as directed.
  - .3 Completion Tasks:
    - .1 Submit written certificates confirming that tasks have been performed as follows:
      - .1 Work: completed and inspected for compliance with Contract Documents.
      - .2 Defects: corrected and deficiencies completed.
      - .3 Equipment and systems: tested, balanced, adjusted and fully operational.
      - .4 Certificates required by all Authorities Having Jurisdiction, Boiler Inspection Branch, Fire Commissioner, Utility companies: submitted.
      - .5 Operation of systems: demonstrated to the City's personnel.
      - .6 Work: complete and ready for final inspection.
  - .4 Submit written confirmation that following tasks have been performed
    - .1 Operation and Maintenance Manuals.
    - .2 Record and "as-built" drawings.
    - .3 Keys for equipment and building as specified, including related keying information and keying charts.
    - .4 Spare parts and maintenance materials have been turned over to the City.
    - .5 Written agreement on Service/Maintenance Contracts identified in project specifications.
    - .6 Warranty and Bond Certificates
  - .5 Final Inspection:
    - .1 When completion tasks are done, request final inspection of Work by Consultant, and Contractor. Allow for a 10 working day notice.
    - .2 When Work is incomplete according to Consultant, complete outstanding items and request re-inspection.
  - .6 Declaration of Substantial Performance: when Consultant considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

- .7 Commencement of Lien and Warranty Periods: date of the City's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .8 Final Payment:
  - .1 When Consultant considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
- .9 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

**1.2 WARRANTY**

- .1 Contractor shall promptly correct any defects within warranty time period. Failure to do so will make Contractor financially responsible to the City for material and labour required for repairs by qualified personnel. The warranty shall not be nullified by emergency or other repairs by qualified personnel under the direction of the City.
- .2 The City, Consultant and Contractor shall conduct an inspection of project one month prior to the conclusion of the warranty period. Contractor shall promptly correct defects of the Work of Contract. Contractor shall remedy defects within time period mutually agreed to between the City and Contractor. Failure to do so will make Contractor financially responsible to the City for material and labour required for repairs by qualified personnel.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Bid Opportunity 581-2023
- .2 Section 01 33 00 - Submittal Procedures
- .3 Section 01 45 00 - Quality Control
- .4 Section 01 77 00 - Closeout Procedures
- .5 Individual Specifications Sections: Specific requirements for operation and maintenance data.

**1.2 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-warranty Meeting:
  - .1 Convene meeting at least one week prior to contract completion with Consultant, in accordance with Section 01 31 19 - Project Meetings to:
    - .1 Verify Project requirements.
    - .2 Review warranty requirements manufacturer's installation instructions.
    - .3 Determine priorities for type of defects.
    - .4 Determine reasonable response time.
  - .2 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
  - .3 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit preliminary copies of operating manuals to the Consultant six weeks in advance of Substantial Performance for review and comment by Consultant.
- .3 Revise operating and maintenance manuals as requested and submit final copies to the Consultant two weeks prior to Substantial Performance of the Work.
- .4 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .5 Provide evidence, if requested, for type, source and quality of products supplied.
- .6 Provide all submittals required by any Authorities Having Jurisdiction governing the Work.

**1.4 FORMAT**

- .1 Organize data as instructional manual and submit in both digital and paper formats in accordance with the following:
  - .1 Binders:
    - .1 Vinyl, hard covered, 3 'D' ring, with spine and face pockets.
    - .2 When multiple binders are used correlate data into related consistent groupings.

- .3 Identify contents of each binder on spine.
- .4 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .5 Text: manufacturer's printed data, or typewritten data.
- .6 Drawings: provide with reinforced punched binder tab.
- .7 Bind in with text; fold larger drawings to size of text pages.
- .8 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .2 Digital Storage:
  - .1 Either CDs or a single USB flash drive of suitable size.
  - .2 Organize into separate folders for each Section, subfolders to be separated by products and/or systems.
- .2 Arrange content by systems under Section numbers and sequence of Table of Contents.
- .3 Provide 1:1 scaled CAD files in dwg format on CD or USB flash drive.

## **1.5 CONTENTS - PROJECT RECORD DOCUMENTS**

- .1 Table of Contents for Each Volume: provide title of project;
  - .1 Date of submission; names.
  - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
  - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
  - .2 Warranty for each product or system, organized as follows:
    - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
    - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
    - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work in addition to their inclusion in the project record binder.
    - .4 Verify that documents are in proper form, contain full information, and are notarized.
    - .5 Co-execute submittals when required.
    - .6 Retain warranties and bonds until time specified for submittal.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
  - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

## **1.6 AS-BUILT DOCUMENTS AND SAMPLES**

- .1 Maintain, in addition to requirements in General Conditions, at site for Consultant one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates and warranties.
  - .9 List of spare parts, extra stock material, special tools.
- .2 Store record documents and samples in field office apart from documents used for construction.
  - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
  - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
  - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Consultant.
- .6 The General Contractor will be responsible for supplying the City and Prime Consultant "as built" drawings in the following format:
  - .1 Complete "As Built" set to include all construction drawings whether modified or not during construction and shall be in both hard copy and digital format.
  - .2 Each "As Built" drawing shall be provided in both dwg format and portable document format file (PDF) on CD or USB flash drive.
  - .3 As Built drawings to reflect all changes made by change order and change directive as reflected on record documents.
  - .4 Each drawing document shall contain only that information related to that drawing number. All layers shall be active. All non-related layers and information to be removed. PDFs of drawing documents to be legible greyscale.
  - .5 Provide an AutoCAD font file of all fonts used.
  - .6 As Built drawings shall be completed to the satisfaction of the Consultant.
  - .7 Submit to Consultant within a reasonable timeframe as determined in conjunction with Consultant.
- .7 Cost to obtain drawing files in dwg file format from the Consultant shall be set at \$100.00 per drawing and the Contractor will be required to sign a waiver to be eligible to obtain the drawings for use as electronic As-Builts.

## **1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS**

- .1 Record information on set of opaque drawings, and in copy of Project Manual, provided by Consultant.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.

- .1 Do not conceal Work until required information is recorded.
  - .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
    - .1 Measured depths of elements of foundation in relation to finish first floor datum.
    - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
    - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
    - .4 Field changes of dimension and detail.
    - .5 Changes made by change orders.
    - .6 Details not on original Contract Drawings.
    - .7 Referenced Standards to related shop drawings and modifications.
  - .5 Specifications: mark each item to record actual construction, including:
    - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
    - .2 Changes made by Addenda and change orders.
  - .6 Other Documents: maintain field test records, manufacturer's certifications, inspection certifications, required by individual specifications sections.
  - .7 Provide digital photos, if requested, for site records.
  - .8 Final payment on the Contract will not be made until correct record documents are received.
- 1.8 FINAL SURVEY**
- .1 Submit final site survey certificate certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.
- 1.9 MATERIALS AND FINISHES**
- .1 Products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
    - .1 Provide information for re-ordering custom manufactured products.
  - .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
  - .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
  - .4 Additional requirements: as specified in individual specifications sections.
- 1.10 MAINTENANCE MATERIALS**
- .1 For all maintenance materials deliver to site, receive and catalogue items, submit inventory listing to Consultant and include approved listings in Maintenance Manual.
  - .2 Spare Parts:
    - .1 Provide spare parts, in quantities specified in individual specification sections.
    - .2 Provide items of same manufacture and quality as items in Work.
    - .3 Obtain receipt for delivered products and submit prior to final payment.

- .3 Extra Stock Materials:
  - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Obtain receipt for delivered products and submit prior to final payment.
- .4 Special Tools:
  - .1 Provide special tools, in quantities specified in individual specification section.
  - .2 Provide items with tags identifying their associated function and equipment.

**1.11 DELIVERY, STORAGE AND HANDLING**

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and for review by Consultant.

**1.12 WARRANTIES AND BONDS**

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Consultant approval. If no plan is submitted, Contractor to ensure all warranty conditions are met and documented in advance of pre-warranty conference.
- .3 Warranty management plan to include required actions and documents to assure that Consultant receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, Consultant for approval prior to each monthly pay estimate in addition to inclusion of a complete set of warranty documents as part of the O&M manual.
- .6 Assemble approved information in project record binder in addition to obtaining warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- .7 Except for items put into use with the City's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint warranty inspections by Consultant.
- .9 Respond in timely manner to oral or written notification of required construction warranty repair work and ensure written verification to follow oral instructions. Failure to verify or respond will be cause for the Consultant to proceed with action against Contractor.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.



**Part 3            Execution**

**3.1                NOT USED**

.1                Not Used.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Design, labour, products, equipment and services necessary for exterior cast-in-place concrete work in accordance with the Contract Documents.
- .2 Concrete Paving
- .3 Footings and Bases for future Story Markers (Base plate to be coordinate with fabricator in this scope of work)

### **1.2 RELATED WORK**

- .1 All Division 1 Section
- .2 Section 32 14 13 – Aggregate Materials
- .3 Section 32 33 00 – Site Furnishings
- .4 Structural Drawings

### **1.3 REFERENCES**

- .1 City of Winnipeg Standard Details and Specifications, CW 3310 Portland Cement Concrete Pavement Works.
- .2 Concrete materials and methods of construction: to current CAN/CSA-A23.1 standards.
- .3 Construct work in accordance with applicable current ASTM and ASTI standards.
- .4 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A5, Portland Cement.
  - .2 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
  - .3 CAN/CSA-A23.2, Methods of Test for Concrete.
  - .4 CAN/CSA-A23.5, Supplementary Cementing Materials.

### **1.4 INSPECTION AND TESTING**

- .1 Obtain approval from the Consultant and/or Contract Administrator of the concrete bases or subbases before proceeding.
- .2 Arrange and pay for testing of the concrete by an independent testing agency approved by the Consultant and/or Contract Administrator. Submit all test reports to the Consultant and/or Contract Administrator in a timely manner to prevent delays to the Work.
- .3 Concrete testing: to conform to current CSA Standard CAN3-A23.2-M90
- .4 Give the testing agency minimum 24h notice before each concrete pour.
- .5 Comply with the requirements of Section 01 45 00 - Quality Control and Testing.
- .6 Concrete testing will include:
  - .1 A standard strength test for concrete placed but not less that one test for concrete placed each day. Each strength test sample will consist of three cylinders with proper identification and field data. One specimen will be tested at 7 days and 28 days. Cylinders will be field cured prior to shipping to the test laboratory.
  - .2 One standard air entrainment test for each standard strength test.
  - .3 One or more standard slump test with each standard strength test. The Consultant may require additional testing for each truck load placed, as deemed necessary.

- .7 Concrete may be rejected prior to placement if:
  - .1 Concrete fails to conform with the specified mix design.
  - .2 The concrete placement does not begin within 2 hours from plant batch time.
  - .3 The concrete is older than 2 hours from plant batch time.
  - .4 The concrete has undergone less than 70 or more than 100 revolutions at the mixing speed.
  
- .8 Test concrete for compressive strength: Concrete will be considered under strength if:
  - .1 The average of any day's tests of each class of concrete is below specified strength.
  - .2 Any single test falls below 80 percent of the specified strength.
  - .3 In case of dispute, the Contractor may have two 100mm DIA cores from the concrete drilled and tested at their own expense, in accordance with the current CSA Standard CAN3-A23.2-M90. The results shall be applied in the manner outlined above.
  
- .9 Concrete will be considered defective by the Consultant if it is not watertight, shows evidence of honeycombing, is improperly finished or is contrary to the drawings and details and shall be replaced by the Contractor at their own expense.

#### **1.5 SHOP DRAWINGS**

- .1 Submit shop drawings as per general requirements.
- .2 Submit engineer stamped shop drawings for all footings and reinforced structures.
- .3 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing.
- .4 Submit placing drawings prepared in accordance with plans to clearly show type, size, shape and location of all concrete joints.
- .5 Detail reinforcing steel in accordance with the current ACI Detailing Manual.
- .6 Each drawing submitted showing formwork design shall be in accordance with the current CAN/CSA-A23.1, and bearing stamp and signature of professional engineer registered or licensed in province Manitoba, Canada.

#### **1.6 MOCK-UPS**

- .1 Construct mock-up in accordance with general requirements
- .2 Install: a mock-up of each of the following concrete finishes
  - .1 3 x 3 m area of Concrete paving with Heavy-Sandblast Finish and diamond-shaped control and expansion joints.
- .3 Mock-up area will be used to determine joint sizes, lines, color and finishing texture.
- .4 Acceptance of work will be determined by Consultant / City.

#### **1.7 QUALITY ASSURANCE**

- .1 The Contractor must have a minimum 10 years experience in the construction of concrete pavements and landscape concrete features of a similar nature as specified for the project.

- .2 Obtain approval from the Consultant and/or Contract Administrator of site layout required for the execution of the work including grade stakes indicating finished elevations on the site, layout of all false work, reinforcing and concrete surfaces.
- .3 Any work not meeting the standards of the approved sample or the specifications herein shall be corrected by the Contractor at their own expense.
- .4 Do not allow concrete to be contaminated by foreign materials or hardened concrete.
- .5 Field Quality Control:
  - .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Consultant in accordance with CAN/CSA-A23.1 and Section 01 45 00 - Quality Control.
  - .2 Cost of tests to be paid for in contract through Cash Allowance.
  - .3 Consultant will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete, which they represent.
  - .4 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.2.
  - .5 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve them of their contractual responsibility.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Concrete work materials and measurements to conform to applicable details.
- .2 Portland cement: to current CAN/CSA-A5, Type 10.
- .3 Shrinkage compensating grout: pre-mixed, non-metallic aggregate, 50 MPa at 28 days.
- .4 Reinforcing bars: to current CAN/CSA-G30.18, Grade 400.
- .5 Welded steel wire fabric: to current CSA-G30.5
- .6 Premoulded joint filler: bituminous impregnated fibreboard to current ASTM D 1751.
- .7 Joint sealer/filler:
  - .1 Paving: Colour Matched, cold applied, to current CAN/CGSB-19.20, Type 1.
- .8 Sealer: proprietary poly-siloxane resin blend.
- .9 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel, insulation filled.
- .10 Non-shrink grout: premixed compound consisting of metallic aggregate, cement, water, reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 45 MPa at 28 days.
- .11 Dry pack: premixed or non-premixed composition of non-metallic aggregate, cement and sufficient water for the mixture to retain its shape when made into a ball of hand and capable of developing compression strength of 32 MPa at 28 days.
- .12 All other concrete materials: to current CAN/CSA-A23.1.

- .13 Base plate (supplied by Story Marker fabricator) to be coordinated prior to formwork, Refer to Section 32 33 00 for contact information.

## **2.1 CONCRETE MIXES**

- .1 The proportions and qualities of cement, water and aggregate shall conform to the CSA Specifications A23.1-M, latest revision, for "READY MIX CONCRETE".
- .2 Use of calcium chloride not permitted.
- .3 Proportion normal density concrete in accordance with CAN-A23.1-M94 to give the properties shown on Structural drawings.
- .4 The City reserves the right to take whatever corrective action is needed if the concrete fails to meet the requirements of this specification or shows defects after placing. The Contractor shall facilitate any needed investigation or inspection of the work.

## **2.2 MIX PROPORTIONS**

- .1 Method: Alternative 1 of current CAN/CSA-A23.1.
- .2 Cement type: as specified under 2.1.
- .3 Minimum 28 day compressive strengths and exposure classifications:
  - .1 Pavements and walks: 32 MPa; C-2.
  - .2 Pile caps and piles: 32 MPa; S-22.
  - .3 All other concrete: 25 MPa; C-4.
- .4 Nominal size of coarse aggregate: Clause 14 of current CAN/CSA-A23.1.
- .5 Slump: to Table 6 of current CAN/CSA-A23.1.
- .6 Air content: all concrete to contain purposely entrained air in accordance with Table 10 of current CAN/CSA-A23.1.
- .7 Admixtures: to Clause 6 of current CAN/CSA-A23.1.

## **PART 3 EXECUTION**

### **3.1 WORKMANSHIP**

- .1 Obtain Consultant approval before placing concrete.
- .2 Place concrete in accordance with current CAN3-A23.1-M90.
- .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .4 Obtain Consultant approval of proposed method for protection of concrete during placing and curing in adverse weather, prior to placing of concrete.
- .5 Maintain accurate records of cast-in-place concrete items to indicate date, location of pour, air temperature and test samples taken.
- .6 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and epoxy grout to anchor and hold dowels in positions as indicated.

- .7 Do not place load upon new concrete until authorized by Consultant.
- .8 Place reinforcing steel and install dowels as per Structural Drawings.
- .9 Provide dowels at locations shown on the drawings.
- .10 Provide temporary bridging as required to permit access to all areas during placement, finishing and curing.

### 3.2 INSTALLATION

- .1 Contractor to coordinate schedule and delivery of base plate for future story markers (supplied by Story Marker fabricator). Base plate to be on site prior to formwork, refer to Structural Drawings and Section 32 33 00 for fabricator's contact information.
- .2 Backfilling: Backfill the underside of the curbs, walls, etc. compacted to 98% Standard Proctor Maximum Dry Density, as detailed.
- .3 Placing Formwork: design, fabrication, erection and use of concrete formwork shall conform to the current requirements of CSA Standard S269.3.
  - .1 Forms shall be constructed with temporary ports or openings at the bottom of all deep units such as columns and walls to facilitate cleaning and inspection.
  - .2 For treated formwork surfaces the materials used as a parting agent shall be non-staining. The amount of material used shall be kept to a minimum and any that adheres to reinforcing steel shall be removed. When the concrete surfaces are to receive a permanent finish coating, the parting agent shall be compatible with the coating.
  - .3 Unless indicated, forms for exposed finish concrete shall be made of panel type materials to provide continuous, straight, smooth, exposed surfaces.
  - .4 Form Sealers: Non-staining and shall not impair the bond of paint, waterproofing or other required surface coatings.
  - .5 Releasing Agents: Chemically active, non-staining, VOC compliant, release agents containing compounds that react with free lime present in concrete forming water insoluble soaps, preventing concrete from sticking to forms
- .4 Prior to placing concrete, a suitable means for checking the alignment and elevations of forms during placing shall be provided. These checks shall be made frequently during the placing of the concrete, and adjustments to the formwork and falsework made as required until all concrete is in place.
- .5 Forms where used shall remain in place at least 8 hours after the concrete has been placed against them. Where the air temperature drops below 10°C at any time during the 8 hour period the forms shall be left in place for such additional time as is necessary to prevent damage to the edges. Curing of the exposed concrete shall begin immediately upon removal of the forms.
- .6 Placing Joints: Crack-control joints shall be cut within 24 hours using power-driven abrasive or diamond blades. Cutting of joints shall begin as soon as the cut is made and before shrinkage cracks form in the concrete.
  - .1 Control of construction joints to the surface plane, as shown on drawings.
  - .2 Maximum interval not to exceed 2 metres.
  - .3 Placing Expansion Joint: material should be placed to full depth to isolate any rigid structure encountered in the line of the work, and place expansion joints to the full depth of the concrete curb at a maximum of 6 metres spacing.

- .7 Placing Concrete: All concrete shall be placed under the following conditions:
  - .1 Each load shall have correct air content.
  - .2 Slump tests shall be taken on the first load of concrete arriving on the job site, and thereafter at the discretion of the City.
  - .3 In dry forms accepted by the Testing Agency.
  - .4 As near as possible to its final position.
  - .5 Maximum vertical drop from chutes shall be 1.5m.
  - .6 Evenly on both sides of the expansion joints so as to retain their vertical position.
  - .7 Forms shall be filled with an excess of concrete thoroughly spaded, compacted and struck off to its required level in such a manner as to force the coarse aggregate below the surface of the mortar.
  - .8 Air temperature shall be 5°C and rising, and all necessary precautions shall be taken during cold weather.
  - .9 No concrete shall be placed on frozen ground.
  - .10 Concrete shall have a temperature of no less than 10°C and no more than 38°C at the time of the placing, and means acceptable to the Testing Agency shall be provided to maintain these limits for 72 hours after placing.
  - .11 Concrete shall be continuously vibrated (formwork or internal) during placement to eliminate all air pockets and ensure sufficient coverage throughout formwork.
- .8 Place concrete in its final position as soon as possible after mixing. A maximum time limit of 120 minutes from the time of initial mixing to complete discharge shall be observed. Do not use any concrete more than 120 minutes from initial mixing or having a partial set before placing. Exemptions to the maximum time limit, if required, shall be submitted to the Consultant in writing a minimum of 2 weeks prior to placement of concrete. Proposed methods and materials used to extend the maximum time limit shall be agreed upon by the Consultant and the concrete supplier prior to placement of the concrete.
- .9 Pour concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur. Install a construction dam or bulkhead in case of a delay longer than 60 minutes. During delays between 5 and 60 minutes, protect the end of the placement with damp burlap.
- .10 Protect freshly placed concrete from exposure to dust, debris and precipitation.
- .11 Concrete Finishing and Form Stripping: The formwork may be stripped after initial set of the concrete has been achieved.
- .12 On exposed formed surfaces, neatly chip off fins, unsightly ridges or other imperfections; fill small surface voids with grout and rub flush with the general surfaces.
- .13 All exposed walls, bench bases, and curb surfaces to have an architectural smooth finish.
- .14 Rub exposed sharp edges of concrete with Carborundum to produce 3mm radiused edges unless otherwise detailed.
- .15 Slope surfaces as indicated on plan.

### **3.3 CONCRETE COVER TO REINFORCEMENT**

- .1 Conform to the requirements of CSA Standard A23.1 (latest version) and the following for cover to reinforcement (mm):
  - .1 Concrete cast against and permanently exposed to earth:
    - 35M Bars and Smaller: 75mm
  - .2 Concrete exposed to chlorides:
    - 30M Bars and Smaller: 60mm
  - .3 Exposed to earth or weather:
    - 25M and smaller: 40mm

### 3.4 INSERTS

- .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100mm x 100mm not indicated, must be approved by the Consultant / City.

### 3.5 COLD WEATHER WORK

- .1 Take cold weather precautions whenever the ambient temperature is, or is expected to be, at or below 5 °C.
- .2 Have protective measures in place, or adjacent to the work before any concrete is mixed or ordered.
- .3 In methods employed to maintain the concrete temperature, provide suitable access for inspection.
- .4 Special provisions for cold weather concrete placement shall be in accordance with Clause 7.4 of CSA A23.1-04 unless specifically noted otherwise.
- .5 When the air temperature is at or below 5°C, or when there is a probability of it falling below 5°C within the entire curing period following placement, all materials and equipment needed for adequate protection and curing shall be on hand and ready for use before the concrete placement is started.
- .6 During cold weather, as defined above, adequate protection of the concrete shall be provided for the duration of the required curing period. Protection shall be provided by means of heated enclosures, coverings, insulation, or a suitable combination of these methods as defined in clause 7.4 of CSA A23.1-04.
- .7 During cold weather concrete placement, after curing period, any water curing shall be terminated minimum 12 hours before removal of protection. To avoid cracking of the concrete due to a sudden temperature change near the end of the curing period, the protection shall not be completely removed until the concrete has cooled to a maximum temperature difference with the ambient air of 12 degrees Celsius.

### 3.5 FINISHES

- .1 All exposed vertical surfaces of concrete to be architectural grade with a totally smooth, free of air pockets, stains, roughness, chipped corners, etc.
- .2 Pavements, walks, curbs and exposed site concrete: screed to plane surfaces and float using aluminum, magnesium, or wood floats. Round edges and provide joint spacing using standard tools. Trowel smooth followed by heavy sandblast non-slip finish as per patterning supplied by Landscape Architect.
  - .1 Surfaces shall be blasted using abrasive achieving an even and uniform exposure of aggregate.
  - .2 Sandblasted surfaces shall have uniform depth of cut-back, distribution of aggregate and colour and texture matching the sample accepted by the Consultant and/or Contract Administrator.
  - .3 Individual concrete members shall be sandblasted at the same age to ensure reasonable colour uniformity.

### 3.6 CONTROL JOINTS



- .1 Cut or form control joints in slabs on grade at locations indicated, in accordance with current CAN/CSA-A23.1. Fill with specified joint sealer/filler.

### **3.7 EXPANSION AND ISOLATION JOINTS**

- .1 Install pre-moulded joint filler in expansion and isolation joints full depth of slab flush with finished surface.
- .2 Caulk joints as indicated on drawings.

### **3.8 CURING**

- .1 Cure and protect concrete in accordance with current CAN/CSA-A23.1, except that curing compounds shall not be used where bond is required by subsequent topping or coating.
- .2 Concrete surfaces to be cured at a minimum temperature of 10°C for the entire curing period.
- .3 Curing methods shall be in accordance with Tables 2 and 20 of CSA A23.1 unless otherwise indicated.
- .4 Unless noted otherwise the curing regime shall be consistent with the Class of Exposure. See General Notes on structural drawing for Class of Exposure.

### **3.9 GROUT**

- .1 Grout voids under baseplates.
- .2 Grout into place, bolts and other items of concrete hardware, that are not placed prior to pouring concrete.
- .3 Mix and place grout.

### **3.10 SEALING**

- .1 Following curing, apply silane sealer treatment to exposed surfaces.
- .2 Apply silane sealer per manufacturer instructions.
- .3 Products:
  - .1 Pentreat 244-100, by W.R. Meadows, Inc. (800) 342-5976
  - .2 Or approved equal.

**END OF SECTION**

**Part 1 General**

**1.1 SECTION INCLUDES**

- .1 Shop fabricated metal items as follows:
  - .1 Lighting bracket mounted to existing public washroom at roof eaves. Refer to Landscape Plans and Electrical.

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2 ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service. ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .5 ASTM A588 Corten Steel (weathering Steel)
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
  - .2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
  - .2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
  - .4 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5 CSA W59-1989(R2001), Welded Steel Construction (Metal Arc Welding) (Imperial Version).
  - .6 CSA G 4021 Weathering Resistant Steel
- .4 The Environmental Choice Program
  - .1 CCD-047a-98, Paints, Surface Coatings.
  - .2 CCD-048-98, Surface Coatings - Recycled Water-borne.

**1.3 SUBMITTALS FOR REVIEW**

- .1 Submit shop drawings in accordance with Section 01 33 00 – Submittals Procedures.
- .2 Shop Drawings: Indicate profiles, gauges, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
- .3 Each drawing submitted shall be bearing stamp and signature of professional engineer registered or licensed in province Manitoba, Canada.
- .4 Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.
- .5 Samples: Submit powder coated sample, 300 mm in length.
- .6 Metal Fabricators:
  - .1 Submit proof of qualification of metal fabricators prior to engagement.
    - .1 For steel elements, the fabricator must have demonstrated expertise with the fabrication of custom steel works.

.2 Recommended Fabricator:

1. Prairie Pole Inc. in collaboration with RD Sales  
Contact: Andy Kennett, RD Sales  
Phone 204-480-0714  
[akennett@rdsales.ca](mailto:akennett@rdsales.ca)

#### 1.4 MOCK-UPS

- .1 Provide one (1) full size bracket section with mounting details and attachment hardware and finishes specified in accordance with the approved sample for approval in accordance with general requirements.

#### 1.4 QUALITY ASSURANCE

- .1 Conform to CSA W59.

#### 1.5 QUALIFICATIONS

- .1 Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

### Part 2 Products

#### 2.1 MATERIALS

- .1 Steel
  - .1 Steel Sections: ASTM A36.1, alloy and temper
  - .2 Steel Tubing: ASTM A500, Grade B
  - .3 Plates: ASTM A283
  - .4 Pipe: ASTM A53, Grade B
  - .5 Steel Grating: ASTM A 1011A; ASTM A 510
  - .6 Bolts, Nuts, and Washers: ASTM A307
  - .7 Welding Materials: Type required for materials being welded
  - .8 Touch-Up Primer: to SSPC SP 15
- .2 For all items:
  - .1 Submit engineered shop drawings for review by the Landscape Architect prior to manufacture and installation.
  - .2 All weathering steel to be pre-weathered.
- .3 Welds: conform to CSA W59-03.
- .4 Welding electrodes: to CSA Standards.
- .5 Bolts and anchor bolts: to ASTM A325, as indicated on drawings and in accordance with shop drawings.
- .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.
- .7 Angles: Conform to the requirements of CSA G40.21 Grade 350W.

- .8 All Other: Conform to the requirements of CSA G40.21 Grade 300W

## **2.2 FABRICATION GENERAL**

- .1 Fit and shop assemble items in largest practical sections, for delivery to site.
- .2 Fabricate items with joints tightly fitted and secured.
- .3 Continuously seal joined members by continuous welds.
- .4 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- .5 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- .6 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- .7 Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
- .8 Accurately form components to suit stairs and landings, to each other and to building structure.
- .9 Accommodate for expansion and contraction of members and building movement without damage to connections or members.

## **2.3 FABRICATION – STEEL PAN STAIRS AND LANDINGS**

- .1 Fabricate stairs and landings with closed risers and treads of metal pan construction, ready to receive concrete.
- .2 Form treads and risers with minimum 3 mm thick sheet steel stock.
- .3 Secure reinforced tread pans to stringers with clip angles, weld in place.
- .4 Form stringers with rolled steel channels. Refer to Drawings.
- .5 Form landings with minimum 3 mm thick sheet stock. Reinforce underside with steel framing to attain design load requirements.
- .6 Form balusters with round steel sections, weld to stringers.
- .7 Prime paint components

## **2.4 FABRICATION TOLERANCES**

- .1 Squareness: 3 mm maximum difference in diagonal measurements.
- .2 Maximum offset between faces: 1.5 mm.
- .3 Maximum misalignment of adjacent members: 1.5 mm.
- .4 Maximum bow: 3 mm in 1.2 m.

- .5 Maximum deviation from plane: 1.5 mm in 1.2 m.

## **2.5 FINISHES**

### **.1 Steel:**

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA S 16 and SSPC SP-2
- .2 Clean all members of loose mill scale, rust, grease, oil, dirt, slag, flux deposits and foreign matter prior to finishing.
- .3 Apply one coat of grey primer in shop to all steel surfaces to achieve a minimum dry film thickness of not less than 1 mil except:
  - .1 Galvanized steel
  - .2 Surfaces to be incased in concrete
  - .3 Surfaces and edges to be field welded
- .4 Do not prime surfaces in direct contact with concrete or where field welding is required.
- .5 Surface preparation, including sandblasting, as recommended by finish manufacturer.
- .6 Galvanizing:
  - .1 Hot dip galvanize steel where indicated to CAN/CSA G164, minimum zinc coating of 600 g/m<sup>2</sup>
  - .2 Touch up filed cut, welded and/or damaged galvanized surfaces with Zinc rich paint in accordance with STM A780
  - .3 Provide smooth galvanizing coating to surfaces of all steel items installed outdoors, free of blisters, lumpiness and runs.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verify that field conditions are acceptable and are ready to receive work.

### **3.2 PREPARATION**

- .1 Clean and strip primed steel items to bare metal where site welding is required.
- .2 Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

### **3.3 INSTALLATION**

- .1 For manufactured items, install to manufacturer's instructions.
- .2 Install items plumb and level, accurately fitted, free from distortion or defects.
- .3 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- .4 Field weld components indicated on Drawings, Shop Drawings.
- .5 Perform field welding in accordance with AWS D1.1.

- .6 Obtain approval prior to site cutting or making adjustments not scheduled.
- .7 After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

**3.4 ERECTION TOLERANCES**

- .1 Maximum variation from plumb: 6 mm per story, non-cumulative.
- .2 Maximum offset from true alignment: 6 mm.
- .3 Maximum out-of-position: 6 mm.

**3.5 FINISHES**

- .1 Powdercoated, Color: To be confirmed by Consultant.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED SECTIONS**

- .1 All Division 1 Specification Sections
- .2 Section 32 11 23 – Aggregate Base Courses
- .3 Section 32 91 21 – Topsoil Placement and Grading

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 Current ASTM D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m<sup>3</sup>).

### **1.3 EXISTING CONDITIONS**

- .1 Verify underground and surface utility lines and buried objects that are indicated on drawings and report discrepancies.
- .2 Refer to dewatering in Section 31 23 33 – Trenching and Backfilling.

### **1.4 PROTECTION**

- .1 Protect existing fencing, trees, landscaping, natural features, benchmarks, buildings, pavement, surface or underground utility lines which are to remain as indicated on drawings. If damaged, restore to original or better condition.
- .2 Protect newly graded and filled areas from washouts and settlement caused by rain and water drainage. Correct any damage as necessary.
- .3 Maintain access roads to prevent accumulation of construction related debris on roads.
- .4 Place filter fabric over catch basins and manholes to prevent clogging with sediment during the rough and fine grading operations. Maintain filter fabric clean of sediment throughout the duration of construction.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Excavated or graded material existing on site to be used as fill for grading work to be in accordance with Geotechnical Investigations Report.
- .2 Fill material Type in accordance with Section 32 11 23 – Aggregate Base Courses and Section 31 23 33 – Trenching and Backfilling.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for rough grading installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

### **3.2 STRIPPING OF TOPSOIL**

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
- .2 Commence topsoil stripping of areas as indicated on drawings after site has been cleared and temporary silt protection fencing has been properly installed.
- .3 Strip topsoil to depths indicated on the drawings.
- .4 Do not mix topsoil with subsoil.
- .5 Dispose of unused topsoil off site.

### **3.3 ROUGH GRADING**

- .1 Verify rough grades and notify the Consultant of discrepancies prior to performing work.
- .2 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated on drawings.
- .3 Ensure positive drainage at all times throughout the site and notify the Consultant immediately of potential problem/ponding areas.
- .4 Rough grade to specific depths below finish grades and to accommodate as sub-surface drainage lines as indicated on drawings.
- .5 Place fill material in maximum 250mm lifts.
- .6 Slope rough grade away from structures.
- .7 Grade slopes for landscape areas to a maximum of 3:1 unless otherwise specified on drawings.
- .8 Grade ditches and swales to depths indicated on drawings. Ensure gradient transitions are smooth and drain in the direction indicated on drawings.
- .9 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
- .10 Compact filled and disturbed area as specified in the Geotechnical Report.
- .11 Do not disturb soil within tree protection zone of trees and shrubs to remain.
- .12 Finished rough-grade surface to be free of debris or stones larger than 50mm diameter.
- .13 Remove surplus material and material unsuitable for fill, grading or landscaping off site at Contractor's expense.

### **3.4 VERIFICATION OF CONSTRUCTED ROUGH GRADE**

- .1 Obtain approval from Client and/or Consultant of rough grades before commencing finish grading. Correct discrepancies to the approval of the Consultant.



**3.5 TESTING**

- .1 Inspection and testing of soil compaction will be carried out by testing laboratory designated by ULC. Costs of tests will be paid under a Cash Allowance. Refer to Section 01 45 00 - Quality Control.
- .2 Submit testing procedure, frequency of tests, testing laboratory as designated by ULC or certified testing personnel to Consultant for approval.

**3.6 SURPLUS MATERIAL**

- .1 Remove surplus material and material unsuitable for fill, grading or landscaping off-site, in accordance with local authorities having jurisdiction.

**3.7 PROTECTION**

- .1 Protect existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines, which are to remain, as indicated on Drawings or directed by Consultant. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED SECTIONS**

- .1 All Division 1 Specification Sections
- .2 Section 31 22 13 – Rough Grading
- .3 Section 32 11 23 - Aggregate Base Courses
- .4 Section 32 91 21 – Topsoil Placement and Grading
- .5 Appendix – Geotechnical Report

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 Current ASTM D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m/m<sup>3</sup>).
  - .2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D422-63, Standard Test Method for Particle-Size Analysis of Soils.
  - .4 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .5 ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).
  - .6 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/ CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/ CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/ CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
    - .1 CSA- A3001-03, Cementitious Materials for Use in Concrete.
  - .2 CSA- A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

### **1.3 EXISTING CONDITIONS**

- .1 Before commencing work, establish location and extent of underground utility lines in areas of excavation. Notify Consultant of findings.
- .2 Remove abandoned utility lines to distance of 1800 mm from foundations. Cap or otherwise seal lines at cut-off points.
- .3 Record locations of maintained, re-routed and abandoned underground utility lines.
- .4 Make good and pay for damage to existing utility lines resulting from work.

### **1.4 PROTECTION**

- .1 Protect bottoms of excavations from softening. Should softening occur, remove softened soil and replace with compacted Type 5 Fill.
- .2 Protect bottoms of excavations from freezing.
- .3 Construct banks in accordance with local by laws.

- .4 Provide adequate protection around benchmarks, and geodetic monuments.
- .5 Provide protection to ensure no damage to existing facilities and equipment situated on site.
- .6 Effect approved measures to minimize dust as result of work.
- .7 Do not stockpile excavated material to interfere with site operation or drainage.
- .8 Provide shoring as required to protect adjacent property and structures. All shoring design and drawings to be submitted under seal for review and approval.

### **1.5 COMPACTION DENSITIES**

- .1 Compaction densities are percentages of maximum densities obtainable from ASTM D698-70 and correct as noted.

### **1.6 UNSATISFACTORY SOIL CONDITIONS**

- .1 Any unsatisfactory or questionable soil conditions revealed during excavation shall be reported immediately to the Consultant. Refer to Geotechnical Report.
- .2 All foundation and sub-structural work shall cease until the condition has been examined and approval to proceed has been issued.

### **1.7 MATERIAL UNSUITABLE FOR BACKFILL**

- .1 The Contractor shall be responsible for all costs associated with the excavation and removal of all materials unsuitable for backfill.

### **1.8 WATER**

- .1 Keep excavation free from water at all times. Provide drainage trenches and sumps as necessary and pump water well away from excavation. Do not discharge water onto private property.

### **1.9 INSPECTION AND TESTING**

- .1 Testing of materials and compaction will be carried out by testing laboratory designated by Consultant and as described in Division 0.
- .2 Sieve analysis: Proposed fill materials will be tested to confirm suitability for intended use and conformity with specifications.
- .3 Frequency of Tests:
  - .1 Excavated surfaces: When undisturbed excavated surface is being prepared, make a series of 3 test of surface for each 500m<sup>2</sup> area.
  - .2 Fills under floor or other slabs on grade: Make 3 tests for every 2 lifts of compacted fill.

## **PART 2 PRODUCTS**

### **2.1 GRANULAR MATERIALS**

- .1 Type 1 Fill (Base Course): (Grade A) Clean, angular crusher run natural stone, free from shale clay, friable materials, roots and vegetable matter and graded within the following limits:

| <u>Screen Size:</u> | <u>% Passing:</u> |
|---------------------|-------------------|
| 25.4 mm             | 100               |
| 19 mm               | 85 – 100          |
| 13.2 mm             | 65 – 90           |
| 9.5 mm              | 50 – 73           |
| 4.75 mm             | 35 – 55           |
| 1.18 mm             | 15 – 40           |
| 300 um              | 5 – 11            |
| 75 um               | 2 – 8             |

- .2 Type 2 Fill (Sub-base): (Granulars – Type 1) Hard, durable, granular aggregate to be within the following limits when tested to ASTM C117-80 and ASTM C136-76 (aashto T27-78 and T11-78) and giving smooth curve without sharp breaks when plotted on semi-log grading chart:

| <u>Screen Size:</u> | <u>% Passing:</u> |
|---------------------|-------------------|
| 75 mm               | 95 - 100          |
| 25.4 mm             | 50 – 90           |
| 4.75 mm             | 20 – 60           |
| 425 um              | 5 - 35            |
| 75 um               | 0 – 5             |

- .3 Type 3 Fill: Low plastic clay or low plastic clay till.

- .4 Type 4 Fill: Clean, washed, coarse sand free from clay, shale and organic matter and less than 5% passing the 75 um sieve.

- .5 Type 5 Fill: Pitrun gravel free from silt, clay, loam, friable or soluble materials, vegetative matter and graded as follows:

| <u>Screen Size:</u> | <u>% Passing:</u> |
|---------------------|-------------------|
| 75 mm               | 100               |
| 4.75 mm             | 40 – 80           |
| 0.075 mm            | 3 – 10            |

- .6 Type 6 Fill: Durable and well graded, crushed stone, maximum sieve size 100 mm with 5 – 10% passing the 75 um sieve.

- .7 Type 7 Fill (Filter Gravel): Free draining, river washed “pea” gravel, clean natural stone, free from shale, clay, friable materials, sand and fine particles, organic matter and other deleterious materials. Maximum size aggregate 12mm.

## 2.2 STOCKPILING

- .1 If required stockpile fill materials in areas designated by Landscape Architect. Stockpile granular materials in manner to prevent segregation. Protect stockpile fill materials from freezing.

- .2 Protect fill materials from contamination.

## **PART 3 EXECUTION**

### **3.1 PREPARATION/ PROTECTION**

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Consultant approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

### **3.2 REMOVAL OF TOPSOIL**

- .1 Remove topsoil of horticulture value from areas to be excavated, paved, re-graded.
- .2 Strip topsoil when dry enough to prevent contamination of sub-grade material.
- .3 Stockpile topsoil on site where directed.

### **3.3 EXCAVATING**

- .1 Excavate to lines, grades, elevations and dimensions as indicated for installation, construction and inspection of work specified, and in accordance with the documents.
- .2 Excavate to well defined lines to minimize quantity of fill material required.
- .3 Earth bottoms of excavations to be dry undisturbed soil, level, free from loose or organic matter.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 For trench excavation, unless otherwise authorized by Consultant in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .6 Dispose of surplus and unsuitable excavated material off site.
- .7 Do not obstruct flow of surface drainage or natural watercourses.
- .8 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .9 Notify Consultant when bottom of excavation is reached.
- .10 Obtain Consultant approval of completed excavation.
- .11 Remove unsuitable material from trench bottom to extent and depth directed by Consultant.
- .12 Correct unauthorized excavation at no extra cost as follows:
  - .1 Fill under bearing surfaces and footings with concrete specified.

- .2 Fill under other areas with Type 2 fill compacted to 100% maximum dry density to ASTM 0698-78.
- .13 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw. Seal cuts with approved tree wound dressing.
- .14 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
- .15 Provide shoring to Provincial Safety Standards.

### **3.4 BACKFILLING**

- .1 Areas to be backfilled shall be free from debris, snow, ice, water or frozen ground. Backfill and filling material shall not be frozen or contain ice, snow or debris.
- .2 Do not backfill around or over cast-in-place concrete within 2 days of placing.
- .3 Backfill simultaneously each side of walls and other structures to equalize soil pressure.
- .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by the Engineer.
- .5 Place and compact fill materials in continuous horizontal layers not exceeding 300 mm loose depth. Use methods to prevent disturbing or damaging buried services, insulation, dampproofing. Make good any damage.

### **3.5 FILL TYPES AND COMPACTION**

- .1 Dimensions specified in following paragraphs are minimum dimensions of fill after compaction.
- .2 Under slabs on grade (walks) that occur over backfill areas: Provide minimum 150 mm Type 1 Fill compacted to 95% density.

### **3.6 RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Consultant.
- .2 Replace topsoil as indicated by Consultant.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Consultant.
- .6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED WORK**

- .1 All Division 1 Specification Sections.
- .2 Section 03 30 01 – Exterior Cast-In-Place Concrete
- .3 Section 31 23 13 - Rough Grading
- .4 Section 31 23 33 - Trenching and Backfilling.
- .5 Section 32 11 23 – Aggregate Base Courses
- .6 Section 32 15 40 - Crushed Stone Surfacing
- .7 Section 32 16 15 - Concrete Walks, Curbs and Gutters
- .8 Section 32 91 21 – Topsoil Placement and Grading
- .9 Appendix – Geotechnical Report

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 Current ASTM D 4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  - .2 Current ASTM D 4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
  - .3 Current ASTM D 4716, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
  - .4 Current ASTM D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
  - .1 Current CAN/CGSB-4.2, Textile Test Methods.
  - .2 Current CAN/CGSB-148.1, Methods of Testing Geotextiles and Geomembranes.
    - .1 No.2, Mass per Unit Area.
    - .2 No.3, Thickness of Geotextiles.
    - .3 No.7.3, Grab Tensile Test for Geotextiles.
    - .4 No.6.1, Bursting Strength of Geotextiles Under No Compressive Load.
- .3 Canadian Standards Association (CSA)
  - .1 Current CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
  - .2 Current CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

### **1.3 SUBMITTALS**

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Provide manufacturer's instructions, printed product literature and data sheets for geotextiles and geogrid. Include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Current CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 Test and Evaluation Reports:
  - .1 Submit copies of mill test data and certificate at least 2 weeks prior to start of Work

### **1.4 DELIVERY, STORAGE, AND HANDLING**

- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.
- .2 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .3 Storage and Handling requirements:
  - .1 Store materials off ground and in a dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect geotextiles from direct sunlight and UV rays.
  - .3 Replace defective or damaged materials with new.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 35 43 - Environmental Protection.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Geotextile to conform to applicable details.
- .2 Geotextile to be synthetic fibre fabric, supplied in rolls:
  - .1 Width: minimum 2000 mm
  - .2 Composed of: minimum 85% by mass of polypropylene.
  - .3 Physical Properties based on MARV (Minimum Average Roll Values) determined in accordance with ASTM 4759, the geotextile fabrics shall meet the minimum material properties as shown in Table 1 below.
  - .4 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m<sup>2</sup> to CAN/CSA G164.
  - .5 Factory seams: sewn in accordance with manufacturer's recommendations.
  - .6 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

**Table 1 - Non-Woven Geotextiles:** for drain tile and drain trenches, beneath base or sub-base of pavements, behind retaining walls, within planter boxes and under unit pavers. Normal Duty is typical unless otherwise indicated in the Drawings:

| Physical Property (unit)                | ASTM Test Method | Light Duty | Normal Duty | Heavy Duty |
|---|------------------|------------|-------------|------------|
| Grab Tensile Strength (N)               | D4632            | 500 min.   | 700 min.    | 900 min.   |
| Elongation (%) at Grab Tensile Strength | D4632            | 50 min.    | 50 min.     | 50 min.    |
| CBR Puncture (N)                        | D6241            | 1350 min.  | 1800 min.   | 2200 min.  |
| Trapezoid Tear (N)                      | D4533            | 180 min.   | 250 min.    | 350 min.   |
| Apparent Opening Size (mm)              | D4751            | 0.25 max.  | 0.25 max.   | 0.25 max.  |
| Permittivity (per sec.)                 | D4491            | 0.50       | 0.50        | 0.50       |
| Flow Rate (L/min/m <sup>2</sup> )       | D4491            | 4880 min.  | 4480 min.   | 3650       |
| U.V. Resistance (per 500 hrs)           | D4355            | 70% min.   | 70% min.    | 70% min.   |



## **PART 3 EXECUTION**

### **3.1 MATERIALS**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

### **3.2 INSTALLATION**

- .1 Install geotextile as indicated on drawings.
- .2 Place geotextile by unrolling onto graded surface in orientation, manner and locations indicated.
- .3 Place geotextile smooth and free of tension stress, folds, wrinkles and creases.
- .4 Place geotextile on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .5 Overlap each successive strip of geotextile 450 mm over previously laid strip.
- .6 Join successive strips of geotextile as recommended by approved manufacturer and as indicated on drawings.
- .7 Protect installed geotextile from displacement, damage or deterioration before, during and after placement of layers.
- .8 After installation, cover with overlying layer within 4 hours of placement.
- .9 Replace damaged or deteriorated geotextile to approval of the Consultant.

### **3.3 CLEANING**

- .1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

### **3.4 PROTECTION**

- .1 No vehicles are permitted directly on geotextile.
- .2 Do not overlap soil or aggregate covering on geotextile.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Limestone Landscape Blocks

### **1.2 RELATED SECTIONS**

- .1 Section 31 32 19.23 – Geotextiles
- .2 Section 32 11 23 – Aggregate Base Courses
- .3 Section 32 91 21 – Topsoil Placement and Grading

### **1.3 INTENT**

- .1 Final placement and arrangement of stone may vary from the drawings.
- .2 Final placement and arrangement on-site shall be directed by the Consultant. Consultant supervision shall encompass the selection and placement of all stonework.
- .3 The Contractor shall be responsible for reviewing the placement of all stonework with the Consultant at the time of installation.

### **1.4 SAMPLES**

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit a photo of landscape rock to Consultant at least 2 weeks prior to beginning Work.
- .3 Provide the following samples for approval by the Consultant, or arrange for the Consultant to approve the samples at the source in advance of delivery to the site:
  - 1. Limestone Landscape Block (image with dimensions)

### **1.5 DELIVERY AND STORAGE**

- .1 All stone shall be stored at the source until installation on-site.
- .2 Limestone blocks delivered to site shall all be stockpiled and handled in a manner that will prevent breakage or scarring.
- .3 All delivery of stone shall be coordinated by the Contractor with the supplier.

### **1.6 NOTIFICATION**

- .1 Stone shall be approved by the Consultant in writing prior to its delivery to site.
- .2 Notify the City's representative ten (10) working days and again forty-eight (48) hours prior to commencing placement of any rock on site.

## **PART 2 PRODUCTS**

### **2.1 LIMESTONE LANDSCAPE BLOCK**

- .1 Landscape boulders to conform with applicable details.
- .2 Acceptable material: Limestone, rustic surface
- .3 Supplier: Gillis Quarries, Jackie Ilagan email: [jilagan@gillisquarries.com](mailto:jilagan@gillisquarries.com)  
Or approved alternate.

- .4 Size: Type 1: ±1100x500x600mm (LxWxH)  
Type 2: ±600x500x600mm (LxWxH)
- .5 All stone shall be clean and free of fines, organic and deleterious materials.

## **2.2 GEOTEXTILES**

- .1 Refer to Section 31 32 21 Geotextiles.

## **2.3 SELECTION**

- .1 Imported materials shall be sourced by the Contractor and selected and approved at the source by the Consultant prior to delivery and installation.

## **PART 3 EXECUTION**

### **3.1 STONE PLACING**

- .1 Large boulders and blocks to be placed as shown on Drawings.
- .2 The Contractor shall layout the stone for approval by the Consultant prior to setting into grade and placing the growing medium.
- .3 Contractor shall provide a minimum of two (2) experienced and qualified staff for all phases of the stonework.
- .4 Material damaged by the Contractor during installation, as determined by the Consultant, shall be removed and replaced by the Contractor at no additional cost to the City.
- .5 Stones shall be placed in a horizontal orientation where possible, typically projecting 150 mm below finished grade unless otherwise shown on drawings.
- .6 Stones shall be placed to the lines, levels and top elevations indicated on the drawings unless otherwise directed by the Consultant. The plans do not intend to show exact boulder size.
- .7 Stones shall be machine placed by use of belts and chains or an approved alternate method. Stones shall not be dumped or pushed into place.
- .8 The placement and the overall uniform appearance of the stone is critical. The Contractor may be required to remove or reset stones at their own expense in order to obtain the appearance approved to the Consultant.
- .9 Have the granular base compacted, inspected and approved by the Consultant prior to placing the stones.
- .10 Stones damaged during installation or transportation shall be disposed of and replaced with new ones at the Contractor's expense, unless otherwise directed by the Consultant.
- .11 The Contractor shall be responsible for any damage made to newly installed work or existing conditions during construction and the placement of boulders.
- .12 Prevent soiling, chipping or defacing of material.
- .13 Place stone in depths and arrangements to ensure material and equipment below is non-visible.

**3.2 EXCESS MATERIAL**

- .1 The Contractor shall be responsible for the removal of excess stone from the site at no additional cost to the City. The City and Consultant shall determine if stone is in excess.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED SECTIONS**

- .1 All Division 1 Specification Sections
- .2 Section 31 23 13 - Rough Grading
- .3 Section 31 23 17 - Excavating, Trenching and Backfilling
- .4 Section 32 91 21 - Topsoil Placement and Grading

### **1.2 REFERENCES**

- .1 Canadian Nursery Landscape Association (CNLA) – Canadian Standards for Nursery Stock - 8<sup>th</sup> Edition.
- .2 Council of Tree and Landscape Appraisers (CTLA) – Guide for Plant Appraisal – 9<sup>th</sup> Edition, 2000.
- .3 Department of Justice Canada
  - .1 Fertilizers Act (R.S. 1985, c. F-10).
  - .2 Fertilizers Regulations (C.R.C., c. 666).

### **1.3 SUBMITTALS**

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

### **1.4 QUALIFICATIONS**

- .1 Arboricultural work (e.g. pruning, root cutting, fertilizing, tree maintenance, removal, etc.) by a Certified Arborist or approved tree care professional.
- .2 A Certified Arborist shall hold a certification in good standing through the International Society of Arboriculture (ISA).

## **PART 2 PRODUCTS**

### **1.1 MATERIALS**

- .1 Temporary Protection Fencing: to conform with applicable details (City of Oshawa P-604);
  - .1 Plastic snow fence: 1200mm height, in good condition;
  - .2 Steel T-bar posts: 38 x 38 x 2400mm length;
- .2 Fill:
  - .1 Type (A): clean, natural river sand and gravel material, free from silt, clay, loam, friable or soluble materials and organic matter.
  - .2 Type (B): pervious soil, free from roots, rocks larger than 75 mm, building debris, and toxic ingredients (salt, oil, etc).
- .3 Mulch:
  - .1 Shredded cedar bark: varying in size from 25 to 75 mm in length.
  - .2 Free of diseased wood, invasive species, weed seeds and deleterious material that could inhibit growth.

**PART 3 EXECUTION**

**3.1 IDENTIFICATION AND PROTECTION**

- .1 Identify plants and the limit of their root system to be preserved as approved by City and/or Consultant.
- .2 The location and installation of tree protection fencing must be reviewed and approved in writing by the City and/or Consultant prior to commencement of construction.
- .3 No work and/or equipment shall be permitted on site until written approval by the City and/or Consultant has been issued.
- .4 Protect plants and root systems from damage, compaction and contamination resulting from construction as approved by City and/or Consultant.
- .5 Contractor is not permitted to change, alter, modify, or relocate the tree protection fencing without written approval by the City and/or Consultant.

**3.2 TREE PROTECTION ZONE**

- .1 Install tree protection fencing in accordance with Table 1 unless indicated otherwise. The following is a chart showing minimum required distances for determining a tree protection zone (TPZ). Some trees and some site conditions may require a larger or smaller TPZ. Any form of deviation shall be approved in writing by the City and/or Consultant.

Table 1 – Tree Protection Zone (TPZ)

| Trunk Diameter (DBH)* | Minimum Protection Distance Required** | Barrier Height |
|-----------------------|--|----------------|
| < 10 cm               | 2.0 m                                  | 1.2 m          |
| 11-40 cm              | 2.4 m                                  | 1.2 m          |
| 41-50 cm              | 3.0 m                                  | 2.4 m          |
| 51-60 cm              | 3.6 m                                  | 2.4 m          |
| 61-70 cm              | 4.2 m                                  | 2.4 m          |
| 71-80 cm              | 4.8 m                                  | 2.4 m          |
| 81-90 cm              | 5.4 m                                  | 2.4 m          |
| 91-100+ cm            | 6.0 m                                  | 2.4 m          |

\* DBH means diameter at breast height when measured at 1.4m above grade

\*\* Tree Protection Zone distances are measured from outside edge of tree base towards the dripline

- .2 The following activities are not permitted within the Tree Protection Zone (TPZ) unless indicated otherwise:
  - .1 Alteration or disturbance to existing grades of any kind;
  - .2 Changes to the grade by adding fill, excavating or scraping;
  - .3 Stripping of topsoil or grubbing of understory;
  - .4 Storage of construction materials or equipment;
  - .5 Storage or stockpiling of soil, construction waste or debris;
  - .6 Disposal of any liquids (i.e. concrete slush, gas, oil, paint);
  - .7 Compaction from vehicles, equipment or pedestrians;

- .3 Temporary attachments or supports for signs, lights, cables, etc., are not permitted on existing trees and shrubs.
- .4 When roots are encountered outside the TPZ the contractor shall excavate by hand and cut roots with sharp disinfected cutting tools. Backfill with appropriate material without delay to prevent desiccation of the exposed roots.
- .5 Locate storage for equipment and materials, access roads to the site, and traffic patterns within the site well away from preserved trees to avoid unnecessary root injury and soil compaction.

### **3.3 TREE PROTECTION FENCING**

- .1 Erect temporary tree protection fencing in accordance with applicable detail.
- .2 Inspect tree protection fencing daily. Any failure, alteration, relocation or breach of the tree protection fencing shall be rectified within 24 hours.
- .3 Tree protection fencing must remain in place until all construction activities are completed and approvals for removals have been granted by the City / Consultant.
- .4 Failure to install and maintain tree protection fencing will automatically place affected trees under warranty as noted in the contract documents.

### **3.4 PRUNING**

- .1 Prune in accordance with City requirements.
- .2 Pruning of tree roots and branches must be performed by a Certified Arborist or approved tree care professional and in accordance with good arboricultural standards.
- .3 Prune and remove broken and/or dead branches that have become damaged during construction operations.
- .4 Where limbs or portions of trees need to be removed to accommodate construction work, obtain written approval from the City prior to removal.
- .5 Trees being removed shall be cut rather than pushed over or pulled out with equipment.

### **3.5 WATERING**

- .1 Water preserved trees weekly in the absence of natural rainfall during the growing season. Soak area immediately below the tree crown.
- .2 Water entire root zone to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

### **3.6 MULCHING**

- .1 Apply a 100mm layer of shredded cedar mulch over the root system of trees within the confines of the TPZ prior to the commencement of construction. Do not apply mulch any deeper than 100mm and do not pile against trunk. Refer to contract drawings for specific locations.

### **3.7 TRENCHING AND TUNNELLING FOR UNDERGROUND SERVICES**

- .1 Centre line location and limits of trench/tunnel excavation to be marked on site and approved by City and/or Consultant prior to excavation. Tunnel excavation to extend 2000 mm from edge of trunk on either side unless indicated otherwise.
- .2 Manually excavate the instant when tree roots are encountered during construction. Do not sever roots greater than 40 mm diameter except when root depth is greater than 500 mm below existing grade. Protect roots, and cut roots cleanly with sharp disinfected tools.
- .3 Minimum acceptable depth to top of tunnel: 1000 mm.
- .4 Backfill for tunnel and trench to 85% Standard Proctor Density. Avoid damage to trunk and roots of tree.

### **3.8 DAMAGE TO TREES**

- .1 Any damage or injury to trees shall be reported to the City immediately so that mitigation can take place without delay.

### **3.9 POST-CONSTRUCTION INSPECTION AND ASSESSMENT**

- .1 The City and/or Consultant shall assess the condition of all preserved trees and shrubs prior to Substantial Performance.
- .2 Should any trees or shrubs exhibit damage due to an unauthorized breach of the TPZ, including but not limited to unauthorized grade changes, surface treatment, compaction, excavation, stockpiling of any kind, or physical injury to trunk, crown or roots, then the contractor shall be responsible for the damage.
- .3 The contractor shall be responsible to have a Certified Arborist monitor the changes to the health of all affected trees during the growing season and submit annual inspection reports for the entire warranty period at not cost to the City.

### **3.10 ACCEPTANCE**

- .1 Tree and shrub preservation zones will be accepted by the City at Substantial Performance provided that:
  - .1 Preserved trees and shrubs exhibit healthy and vigorous growth;
  - .2 Trees have been watered during construction.
  - .3 Existing edge grades have been blended with new construction grades and surfaces.
  - .4 Entire edge has been cleared of debris.
  - .5 All broken or dead branches have been removed.
  - .6 Tree preservation zone has not been breached.
  - .7 All remediation work as recommended by a Certified Arborist has been completed.

### **3.11 WARRANTY**

- .1 If the TPZ has been breached during construction without the written approval from the City and/or Consultant the protected tree(s) will automatically be included with the 12 month warranty period of the contract. Any damage or deterioration that occurs by the end of the warranty period will be the responsibility of the Contractor to replace in accordance with the Section 3.10 – Compensation



**31.12 MAINTENANCE DURING CONSTRUCTION PERIOD**

1. Shredded wood mulch shall be maintained to a depth of 75mm throughout construction period. Mulch and placement shall be monitored on a weekly basis.
2. Orange snow fencing shall be maintained, stand upright and be secure throughout construction period. Shall be monitored on a weekly basis and any breaches shall be corrected immediately.
3. Prune any dead or damages branches from trees and shrubs, maintain all plant material in a healthy growing condition and rectify and damage that occurs as a result of construction activities.

**END OF SECTION**

## 1 General

### 1.1 RELATED SECTIONS

- .1 All Division 1 Specification Sections
- .2 Section 03 30 01 – Exterior Cast-in-Place Concrete
- .3 Section 31 32 21 – Geotextiles
- .4 Section 31 37 00 - Boulders
- .5 Section 32 13 16 – Concrete Walks
- .6 Section 32 15 40 - Crushed Stone Surfacing

### 1.2 REFERENCES

- .1 ASTM International
  - .1 ASTM C117-[17], Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C131-[14], Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
  - .3 ASTM C136-[19], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .4 ASTM D698-[12e2], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
  - .5 ASTM D1557-[12e1], Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft<sup>3</sup>) (2,700kN-m/m<sup>3</sup>).
  - .6 ASTM D1883-[16], Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.
  - .7 ASTM D4318-[17e1], Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
  - .8 ASTM D6938-[17a], Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-[88], Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-[M88], Sieves, Testing, Woven Wire, Metric.

### 1.3 SAMPLES

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.
- .2 Submit to the Consultant, samples of material for sieve analysis at least three (3) weeks before commencing asphalt work.

### 1.4 TESTING

- .1 Contact the testing agency for compaction and materials tests as per Section 01 45 00 – Quality Control and Testing.
- .2 Testing to be conducted for this section of work is as follows:
  - a) Sieve designation of specified aggregate.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver and stockpile aggregates.
- .2 Storage and Handling Requirements:

- .1 Stockpile minimum 50% of total aggregate required prior to beginning operation.
- .3 Processing
  - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
  - .2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified.
  - .3 Wash aggregates, if required to meet specifications.
  - .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.
- .4 Handling
  - .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
- .5 Stockpiling
  - .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by the Consultant. Do not stockpile on completed pavement surfaces.
  - .2 Stockpile aggregates in sufficient quantities to meet project schedule.
  - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
  - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300mm of pile into the Work.
  - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
  - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Landscape Architect within 48h of rejection.
  - .7 Stockpile materials in uniform layers of thickness as follows:
    - .1 Max 1.5m for coarse aggregate and base course materials.
    - .2 Max 1.5m for fine aggregate and sub-base materials.
    - .3 Max 1.5m for other materials.
  - .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
  - .9 Do not cone piles or spill material over edges of piles.
  - .10 Do not use conveying stackers.
  - .11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.
  - .12 Restore stockpile areas to pre-construction condition or as otherwise specified.

## 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert unused granular materials from landfill to local facility, in accordance with local authorities having jurisdiction.

## 2 Products

### 2.1 MATERIALS

- .1 Bedding – Subdrain Pipe
  - .1 Open graded, hard, durable particles, 19mm diameter clear stone
- .2 Granular sub-base and base material will be in accordance with the City of Winnipeg's Standard Construction Specification CW 3110-R19 requirements:
  - .1 Crushed stone or gravel: hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious

materials

**TABLE CW 3110.1 - Crushed Sub-Base Material Grading Requirements**

| CANADIAN METRIC SIEVE SIZE | PERCENT OF TOTAL DRY WEIGHT PASSING EACH SIEVE |            |            |
|----------------------------|--|------------|------------|
|                            | 50 mm MAX.                                     | 100mm      | 150 mm     |
| 200 000                    |  |            | 100%       |
| 150 000                    |  |            | 90% - 100% |
| 100 000                    |  | 97% - 100% | 65% - 85%  |
| 50 000                     | 100%   |            |            |
| 25 000                     |  | 30% - 50%  | 0% - 40%   |
| 5 000                      | 25% - 60%                                      |            |            |
| 80                         | 4% - 15%                                       | 8% max.    |            |

**TABLE CW 3110.2 – Base Course Material Grading Requirements**

| CANADIAN METRIC SIEVE SIZE | PERCENT OF TOTAL DRY WEIGHT PASSING EACH SIEVE |                  |                   |
|----------------------------|--|------------------|-------------------|
|                            | Granular                                       | Crushed Concrete | Crushed Limestone |
| 25 000                     | 100%   |                  |                   |
| 20 000                     | 80% - 100%                                     | 100%             | 100%              |
| 5 000                      | 40% - 70%                                      | 40% - 70%        | 40% - 70%         |
| 2 500                      | 25% - 55%                                      | 25% - 60%        | 25% - 60%         |
| 315                        | 13% - 30%                                      | 8% - 25%         | 8% - 25%          |
| 80                         | 5% - 15%                                       | 6% - 17%         | 6% - 17%          |

.3 Water:

- .1 The Contractor shall supply water for the construction of granular base course. No direct payment will be made for water as this work will be considered incidental to the unit price for Surface Preparation or Granular Base Course.

**3 Execution**

**3.1 PLACEMENT AND INSTALLATION**

- .1 Place granular base after subgrade and sub-base surface is inspected.
- .2 Placing:
  - .1 Construct granular base to depth and grade in areas on Drawings.
  - .2 Ensure no frozen material is placed.
  - .3 Place material only on clean unfrozen surface, free from snow and ice.
  - .4 Begin spreading base material on crown line or on high side of one-way slope.
  - .5 Place material using methods which do not lead to segregation or degradation of aggregate.
  - .6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
  - .7 Place material to full width in uniform layers not exceeding 150mm compacted thickness.
    - .1 Consultant may authorize thicker lifts (layers) if specified compaction can be achieved.

- .8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .9 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .3 Compaction Equipment:
  - .1 Ensure compaction equipment is capable of obtaining required material densities.
  - .2 Efficiency of equipment not specified to be proved at least as efficient as specified equipment at no extra cost and written approval must be received from Consultant before use.
  - .3 Equipped with device that records hours of actual work, not motor running hours.
- .4 Compacting:
  - .1 Compact to density not less than 98% maximum dry density.
  - .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
  - .3 Apply water as necessary during compacting to obtain specified density.
  - .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Consultant.
  - .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.
- .5 Proof rolling:
  - .1 Lock Where proof rolling reveals areas of defective subgrade:
    - .1 Remove base, sub-base and subgrade material to depth and extent as directed by Consultant.
    - .2 Backfill excavated subgrade with sub-base material and compact to 95% SPD using non-vibratory equipment.
    - .3 Replace sub-base material and compact to 95% SPD.
    - .4 Replace base material and compact in accordance with this Section.
  - .2 Where proof rolling reveals defective base or sub-base, remove defective materials to depth and extent as directed by Consultant and replace with new materials in accordance with this section at no extra cost.

### 3.1 SITE TOLERANCES

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

### 3.2 PROTECTION

- .1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by Consultant.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 RELATED WORK**

- .1 Section 31 32 21 – Geotextiles
- .2 Section 32 11 23 – Aggregate Base Courses

### **1.2 REFERENCES**

- .1 Current American Society for Testing and Materials (ASTM)
  - .1 Current ASTM C 136, Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .2 Current ASTM C 117, Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .3 ASTM E 11, Specification for Wire - Cloth Sieves for Testing Purposes.
  - .4 Current ASTM D 4318, Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
  - .5 Current ASTM D 698, Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49-kg) Rammer and 12-in (304.8-mm) Drop.
- .2 Current Canadian General Standards Board (CGSB)
  - .1 Current CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
  - .2 Current CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

### **1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Separate and recycle waste materials in accordance with local regulations.

### **1.4 TESTING**

- .1 Testing to be conducted for this section of work is as follows:
  - a) sieve designation of specified aggregate
  - b) compaction to be minimum 98% Standard Proctor Density

## **PART 2 PRODUCTS**

### **2.1 Materials**

- .1 Limestone aggregate materials for stabilized aggregate area is to be 19mm clean limestone.
- .2 Granular base as indicated on drawings and as per Section 32 11 23 – Aggregate Base Courses.
- .3 Stabilizer – Klingstone 400 paths Klear supplied by Klingstone Paths, LLC. Email: [sales@klingstonepaths.com](mailto:sales@klingstonepaths.com), or approved alternate.
- .4 Edging: 5" Permaloc CleanLine XL Aluminum Landscape Edging, Mill finish.

- .5 Geotextile to be in accordance with Section 31 32 21 and as indicated on drawings.

**PART 3 EXECUTION**

**3.1 Subgrade**

- .1 Set out work to lines and levels shown on Drawings. Gain approval from the landscape architect of lines and levels prior to granular base installation. Maintain such lines and levels for duration of work.
- .2 Excavate and prepare all subgrade as noted on details. Remove and dispose of existing unsuitable subgrade materials off site.
- .3 Verify grades of subgrade for conformity with elevations and sections before placing base material.
- .4 Disturbed subgrade or clean fill shall be compacted to 98% of Standard Proctor Density in accordance with ASTM D698-70.
- .5 Obtain subgrade approval from the landscape architect prior to placing granular base material.

**3.2 Geotextile**

- .1 Install geotextile in accordance with Section 31 32 21 – Geotextiles and as indicated on drawings.

**3.3 Granular Base**

- .1 Exercise caution at all times to prevent base material from becoming contaminated by clay or other deleterious materials.
- .2 Place base material to compacted thickness as indicated on drawings.
- .3 Place in layers not exceeding 150mm compacted thickness. Compact to density not less than 98% of Standard Proctor Density in accordance with ASTM D698-70.
- .4 The granular base surface shall be rolled continuously, compacted and bladed as necessary.
- .5 The granular base surface shall be within 10 mm of specified grade, but not uniformly high or low.

**3.4 Edging**

- .1 Install edging true to grade, in location, layout and pattern as indicated on drawings.
- .2 Mask all adjacent surfaces with polyethylene film to prevent staining from stabilizer.

**3.6 Limestone Paving**

- .1 Spread limestone aggregate in layer(s) of 50 mm compacted thickness. Compact layer to 98% Standard Density in accordance with current ASTM D 698.

- .2 Ensure aggregate is completely dry prior to applying Klingstone stabilizer.
- .3 Apply Klingstone stabilizer in accordance with manufacturers specifications.

**END OF SECTION**



## **PART 1 GENERAL**

### **1.1 RELATED WORK**

- .1 All Division 1 Specifications.
- .2 Section 03 30 01 – Exterior Cast-in-Place Concrete

### **1.2 PRODUCT DATA**

- .1 Submit product data as per Submittal Procedures.

### **1.3 SHOP DRAWINGS**

- .1 Submit shop drawings as per Submittal Procedures.
- .2 Engineered shop drawing must be provided for custom fabricated elements. Stamp must be provided to cover environmental and unexpected live loads related to climbing, wind, rain, snow, etc. Engineer must be in good standing with local Regulatory Board.
- .3 Indicate dimensions, sizes, assembly, anchorage finishes, colours and installation details for each product specified.
- .4 Include erection drawings, elevations and details
- .5 Ensure dimensions indicated on shop drawings are based on field measurements.

### **1.4 CLOSEOUT SUBMITTALS**

- .1 Provide maintenance data for care and cleaning of all products for incorporation into the maintenance manual.

## **PART 2 PRODUCTS**

### **2.1 ALUMINUM EDGER**

- .1 **Aluminum Edger around stabilized aggregate (fire pit area):**  
Permaloc Cleanline XL  
Size: 3/16" x 5"  
Color: Mill finish  
Contact: SiteOne Landscape Supply  
(204) 694-9442

### **2.2 BIKE RACK**

- .1 **Bike Rack (Qty. 2):**  
Model: Sentry bike rack, BRWA-101  
Mounting: Surface mounted to concrete paving  
Color: Custom Ral, To be confirmed by Consultant  
Manufacturer: Wausau  
Contact: Kevin Bettridge, Park Street Solutions  
Email: kevin@parkst.ca  
Phone: 1-888-788-7408

### **2.3 WASTE RECEPTACLE**

- .1 **Waste bin (Qty. 2):**  
Model: Ren Side-Door Bin, REN-45SDSD  
With solid steel side panels  
Manufacturer: Victor Stanley  
Color: Custom RAL, To be confirmed by Consultant

Mounting: Surface mounted to concrete paving  
Contact: Kevin Bettridge, Park Street Solutions  
Email: kevin@parkst.ca  
Phone: 1-888-788-7408

**.2 Earthbin Silo Bins (Qty. 2):**

Model: EB130T, 1300 Litre capacity In-Ground Waste Container  
Manufacturer: Earthbin  
Mounting: In-Ground Mounting (Refer to Detail 8/L500)  
Bag: Rigid container  
Contact: Richard Sagan, Underground Disposal Systems Ltd.  
Email: richard@uds.ca  
Phone: 604-362-1899

**2.4 PICNIC TABLE**

**.1 Picnic Table (Qty. 3):**

Model: TF3125 4-Seat Round Concrete Table Set, 66" dia.  
Materials: Concrete, 1100lbs.  
Manufacturer: Wausau  
Contact: Wausau Tile  
Email: wtile@wausautile.com  
Phone: 1-800-388-8728

**2.5 METAL PLANTER W/ INTEGRATED SEATING (SUPPLIED BY DOWNTOWN WINNIPEG BIZ, INSTALLATION BY CONTRACTOR)**

.1 Custom Metal Planter with Integrated Bench Seating:  
Model: Rough&Ready Free Form Tree Isles with Bench Seating  
TI-Custom-CT Shape 2 & TI-Custom-CT-Shape 3  
Materials: Planter – Weathering Steel (delivered unweathered)  
Integrated Bench Slat – FSC Louro Gamela Hardwood  
Backrest and Arm  
Mounting: Anchored to concrete paving as per Landscape Details (7/L500)  
Manufacturer: Streetlife  
Contact: Peter Koning  
Email: pkoning@streetlife.com  
Phone: 1-484-496-8281

**2.6 STORY MARKER (NOT IN CONTRACT – FOR INFORMATION ONLY)**

.1 Supplier: Wood Anchor  
Description: 2.75m ht. Corten & Stainless Steel Vertical Story Markers with integrated lighting, Lighting fixture to be supplied by Wood Anchor  
Installation: Wood Anchor to install Story Marker in coordination with Community Corner Plaza Contractor. **Electrical connections to each of the story markers (Qty. 4) to be done by Contractor, refer to Electrical. Base plate to be coordinated with concrete pour of foundations, Refer to 1/L502 and Structural Drawings.**  
Contact: j@woodanchor.com

**PART 3 EXECUTION**

**3.1 Installation**

- .1 Assemble all products in accordance with manufacturer's instructions.
- .2 Assemble play structures in accordance with manufacturer's specifications and in compliance with CSA standards.
- .3 Install all products true, plumb, and firmly anchored.
- .4 Damaged products will be rejected.
- .5 Field-verify location and alignment of all furnishings and obtain approval from the Consultant and/or contract administrator prior to mounting.

### **3.2 Installation of Owner Supplied Items and Future Story Markers**

- .1 Coordinate schedule with Downtown Winnipeg BIZ and Streetlife for the custom metal planter with integrated seating.
- .2 Coordinate schedule with Wood Anchor and Downtown Winnipeg BIZ for the Story Markers installation date. Base plate for Story Marker to be coordinated prior to concrete formwork. Refer to Section 03 30 01 and Drawings.
- .3 Electrical connections and hook up to be done by Contractor, coordinate schedule of this work with Wood Anchor.
- .4 Install all products true, plumb, and firmly anchored.
- .5 Damaged products will be rejected.
- .6 Field-verify location and alignment of all furnishings and obtain approval from the Consultant and/or contract administrator prior to mounting.

**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 31 22 13 - Rough Grading
- .3 Section 32 93 00 – Trees, Shrubs and Ground Cover Planting

### **1.2 REFERENCE STANDARDS**

- .1 Agriculture and Agri-Food Canada
  - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
  - .1 PN1340-[2005], Guidelines for Compost Quality.
- .3 U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

### **1.3 DEFINITIONS**

- .1 Compost:
  - .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
  - .2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss on Ignition (LOI) test.
  - .3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25), and contain no toxic or growth inhibiting contaminants.
  - .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

### **1.4 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality control submittals:
  - .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
  - .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

### **1.5 QUALITY ASSURANCE**

- .1 Advise Contract Administrator of sources of topsoil to be utilized 7 days in advance of starting work.
- .2 Contractor is responsible for soil analysis and requirements for amendments to supply topsoil as specified.

## Part 2 Products

### 2.1 TOPSOIL

- .1 Topsoil for planting beds and seeded areas shall consist of a well-mixed and screened 3-way combination: mixture of particulates, microorganisms and organic matter which provides suitable medium for supporting intended plant growth.
  - .1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.
  - .2 Contain no toxic elements or growth inhibiting materials.
  - .3 Finished surface free from:
    - .1 Debris and stones over 30mm diameter.
    - .2 Course vegetative material, 10mm diameter and 100mm length, occupying more than 2% of soil volume.
  - .4 Consistence: friable when moist.
  - .5 The pH range shall be between 6.0 and 8.0.

### 2.2 STRUCTURAL SOIL

- .1 A uniformly blended mixture of approved granular material, Clay Loam and Hydrogel, mixed to the following proportion:

| MATERIAL           | UNIT OF WEIGHT (either metric or English)      |
|--------------------|--|
| Granular Materials | 100  |
| Clay Loam (dry)    | (Approx. 20) determined by the test of the mix |
| Hydrogel           | 0.03   |

The initial mix design for testing shall be determined by adjusting the ratio between the Granular Material and the Clay Loam. Adjust final mix dry weight mixing proportion to decrease soil in mixture if CBR test results fail to meet acceptance (CBR #50).

- .2 Clay Loam:
  - .1 Soil component shall be "Clay Loam" based on the USDA classification system as determined by mechanical analysis (ASTM D-422). Uniform composition, without admixture of subsoil, free of stones greater than 12 mm, lumps, plants and their roots, debris and other extraneous matter over one 25 mm in diameter or excess of smaller pieces of the same materials as determined by the Contract Administrator. Free from toxic substances harmful to plant growth. Obtained from naturally well drained areas, never stripped of topsoil with a history of satisfactory vegetative growth. Clay Loam shall contain not less than 2% nor more than 5% organic matter as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 110 degrees C., plus or minus 9 degrees.
  - .2 Mechanical Analysis
    - Textural Class % of total weight
    - Gravel less than 5%
    - Sand 20 - 45%
    - Silt 20 - 50%
    - Clay 20 - 40%

- .3 Chemical Analysis
  - (a) pH between 5.5 to 6.5
  - (b) Percent organic matter 2 -5% by dry weight.
  - (c) Nutrient levels as required by the testing laboratory recommendations for the type of plants to be grown in the soil.
  - (d) Toxic elements and compounds below the United States Environmental Protection Agency Standards for Exceptional Quality sludge or local standard; whichever is more stringent.
  - (e) Soluble salt less than 1.0 Millimho per cm.
  - (f) Cation Exchange Capacity (CEC) greater than 10
  - (g) Carbon/Nitrogen Ratio less than 33:1.
  
- .3 Granular Material:
  - .1 Granular material will consist of natural gravel, crushed stone or other materials of similar characteristics having clean, hard, strong, durable, uncoated particles free from injurious amounts of soft, friable, thin, elongated or laminated pieces, alkali, organic or other deleterious matter. Quarried limestone and dolomite are not acceptable.
  
- .4 Hydrogel:
  - .1 Hydrogel shall be a potassium propenoate-propenamide copolymer Hydrogel as manufactured by Gelscape by Amereq Corporation. (800) 832-8788, or approved equal.
  
- .5 Water:
  - .1 The Contractor shall be responsible to furnish his own supply of water to the site at no extra cost. All work injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

## 2.3 BIORETENTION GROWING MEDIUM

- .1 Bioretention Filter Media Composition:
  - .1 Use imported bioretention filter media for bioswale planting area. Advise the City/ City's Representative of bioretention filter media source to be utilized with sufficient lead time for testing. Bioretention filter media to be one part planting medium, one part peat moss, one part compost, two parts sand (2.0 to 0.050mm dia.) – 85-88% by weight, and organic matter – 3-5% by weight.
  - .2 Engineered soil (bioretention filter media) shall have to following properties:
    - .1 Phosphorus soil test (p-index) value is between 10-30ppm. Cationic exchange capacity (cec) exceeding 10 milliequivalents per 100 grams (meg/100g). The mixture should be free of stones, stumps, roots, or other similar objects larger than 50mm. pH between 5.5-7.5.

## 2.4 SOIL AMENDMENTS

- .1 Peatmoss:
  - .1 Derived from partially decomposed species of Sphagnum Mosses.

- .2 Elastic and homogeneous, brown in colour.
- .3 Free of wood and deleterious material, which could prohibit growth.
- .4 Shredded particle minimum size: 5 mm.
- .2 Sand: washed course silica sand, medium to course textured.
- .3 Organic matter: compost Category A, in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
- .4 Limestone:
  - .1 Ground agricultural limestone.
  - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .5 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

## **2.5 SOURCE QUALITY CONTROL**

- .1 Advise Consultant of sources of topsoil to be utilized with sufficient lead time for testing.
- .2 Contractor is responsible for amendments to supply topsoil as specified.
- .3 Conduct soil testing by recognized testing facility for PH, P and K, and organic matter.
- .4 Soil sampling, testing and analysis to be in accordance with Provincial standards.

## **Part 3 Execution**

### **3.1 STRIPPING OF TOPSOIL**

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
- .1 Commence topsoil stripping of areas as directed by Consultant after area has been cleared of brush weeds and grasses and removed from site.
- .2 Strip topsoil to depths as indicated and as directed by Consultant. Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended applications.
- .3 Stockpile in locations as directed by Consultant or as indicated. Stockpile height not to exceed 2m.
- .4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill.
- .5 Protect stockpiles from contamination and compaction.

### **3.2 PREPARATION OF EXISTING GRADE**

- .1 Verify that grades are correct. If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.
- .2 Grade soil, eliminating uneven areas and low spots, to ensure positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris, which protrudes more than 75mm above surface. Dispose of removed material off site.

- .4 Cultivate entire area which is to receive topsoil to minimum depth of 100mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

### **3.3 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL**

- .1 Place topsoil after Consultant has accepted subgrade.
- .2 Spread topsoil in uniform layers not less than 100mm and not exceeding 150mm, over unfrozen subgrade free of standing water.
- .3 For sodded areas keep topsoil 15mm below finished grade.
- .4 Spread topsoil as indicated on the Drawings to minimum depths after settlement and 80% compaction.
- .5 Manually spread topsoil/planting soil around trees, shrubs, and obstacles.
- .6 Avoid spreading or grading in wet, frozen, or saturated state.

### **3.4 INSTALLATION OF STRUCTURAL SOIL MATERIAL**

- .1 Install Structural Soil in 150mm lifts and compact each lift. All structural soil trench depths to be a minimum of 900mm deep from top of structural soil profile to bottom of structural soil profile, as per Drawings.
- .2 Compact all materials to a minimum of 95% Standard Proctor Density.
- .3 Bring Structural Soils to finished grades as shown on the Drawings. Immediately protect the Structural Soil materials from contamination by toxic materials, trash, debris, water containing cement, clay, silt or materials that will alter the particle size distribution of the mix with plastic or plywood as directed by the Consultant. Remove and replace and contaminated material as directed by the Consultant and the City.
- .4 The Consultant may periodically check the material that is delivered to site and installed at the site for colour and texture consistency with the approved sample. In the event that the installed material varies significantly from the approved sample, the Consultant may request that the Contractor test the installed Structural Soil. Any soil that varies significantly from the approved testing results, as determined by the Consultant, shall be removed and new Structural Soil installed that meet these Specifications.

### **3.5 SOIL AMENDMENTS**

- .1 For planting beds and sodded areas: apply and thoroughly mix soil amendments and fertilizer into full specified depth of topsoil and top 50mm of existing soil as recommended by topsoil supplier.

### **3.6 FINISH GRADING**

- .1 Grade to eliminate rough spots and low areas to ensure positive drainage is achieved. Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Consultant. Leave surfaces smooth, uniform and firm against deep foot-printing.

### **3.7 ACCEPTANCE**

- .1 Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.
- .2 The Consultant will inspect the Structural Soil installation upon the request of the Contractor. Request for inspection shall be received by the Contract Administrator at least 2 days before the



anticipated date of inspection. Consultant will issue a report to the Contractor and City advising if the structural soil is accepted or has deficiencies to be addressed.

**3.8 SURPLUS MATERIAL**

- .1 Dispose of materials except topsoil not required off site.

**3.9 CLEANING**

- .1 Proceed with cleaning in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area organized and tidy at end of each day.
  - .2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.
- .2 Upon completion remove surplus materials, rubbish, tools and equipment.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 All Division 1 Specification Sections.
- .2 Section 32 91 21 - Topsoil Placement and Grading

**1.2 SCHEDULING**

- .1 Schedule delivery and sod laying to follow shortly after finish grading.
- .2 Schedule sod installation when frost is not present in ground.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Number One Turf Grass Nursery Sod: Sod that has been especially sown and cultivated in nursery fields as turfgrass crop.
  - .1 Turfgrass Nursery Sod Type:
    - .1 Mixed stand of Improved Kentucky B Number One Kentucky Bluegrass Sod: Nursery Sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.
    - .2 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivars.
  - .1 Turfgrass Nursery Sod Quality:
    - .1 Sod shall be a minimum of 2 years old and have no more than 12.5mm of thatch
    - .2 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.
    - .3 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.
    - .4 Mowing height limit: 35 to 65 mm.
    - .5 Soil portion of sod: 6 to 15 mm in thickness.
  - .2 Sod establishment support:
    - .1 Biodegradable starch pegs: 17 x 8 x 200 mm.
  - .3 Water:
    - .1 Potable water.
  - .4 Fertilizer:
    - .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
    - .2 Complete, synthetic, slow release with 65 % of nitrogen content in water-insoluble form.

**2.2 SOURCE QUALITY CONTROL**

- .1 Obtain approval from the Consultant of sod source.
- .2 When proposed source of sod is approved, use no other source is acceptable without written authorization.

**Part 3 Execution**

**3.1 PREPARATION**

- .1 Verify that grades are correct and prepared in accordance with Section 32 91 19.13 - Topsoil Placement and Grading. If discrepancies occur, notify Consultant and commence work when instructed by Consultant.
- .2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.
- .3 Fine grade surface free of humps and hollows to smooth, even grade, elevations indicated, and to a tolerance of plus or minus 8 mm. Surface to drain naturally.
- .4 Remove and dispose of weeds; debris; stones 25 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials off site.

**3.2 DELIVERY AND STORAGE**

- .1 Deliver, unload and store sod on pallets.
- .2 Deliver sod to site within 24 hours of being lifted.
- .3 Do not deliver small, irregular or broken pieces of sod.
- .4 During wet weather allow sod to dry sufficiently to prevent tearing during lifting and handling.
- .5 During dry weather, protect sod from drying out and water sod as necessary to ensure its vitality and prevent dropping of soil in handling. Dry sod will be rejected.

**3.3 SOD PLACEMENT**

- .1 Lay sod within 36 hours of being lifted.
- .2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.
- .3 Roll sod to provide close contact between sod and soil.
- .4 The use of heavy roller to correct irregularities in grade is not permitted.

**3.4 SOD PLACEMENT ON SLOPES & SWALES AND PEGGING**

- .1 Start laying sod at bottom of slopes.
- .2 Lay sod sections longitudinally along contours of slopes.
- .3 Peg sod on slopes steeper than 3 horizontal to 1 vertical, and to following pattern:
  - .1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes.
  - .2 Not less than 4 pegs per square metre.
  - .3 Drive pegs to 50 mm above soil surface of sod sections.

### 3.5 FERTILIZING PROGRAM

- .1 Fertilize during establishment period to following program, or as otherwise required by the University.

| <u>Month</u> | <u>Day</u> | <u>Day</u> | <u>Rate</u> | <u>Ratio</u> |
|--------------|------------|------------|-------------|--------------|
| Sept         | 15         | to 30      | 350 kg/ha   | 6:6:12       |
| April        | 15         | to 30      | 350 kg/ha   | 12:8:8       |

### 3.6 MAINTENANCE DURING ESTABLISHMENT PERIOD

- .1 Perform following operations from time of installation.
- .2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100mm until Substantial Performance.
- .3 Cut grass, as many times as required, but not less than two (2) times until Substantial Performance, to 50mm when or prior to it reaching height of 75mm. Remove clippings which will smother grassed areas as.
- .4 Maintain sodded areas 95% weed free.
- .5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.
- .6 Restrict pedestrian traffic on grass for an establishment period of 2 weeks following installation.

### 3.7 ACCEPTANCE

- .1 Turfgrass Nursery Sod areas will be accepted by the University at Substantial Performance provided that:
- .1 Sodded areas are properly installed.
  - .2 Sod is free of bare and dead spots and without weeds.
  - .3 No surface soil is visible when grass has been cut to height of 50mm.
  - .4 Sodded areas have been cut a MINIMUM OF TWO (2) TIMES after sod has knit, approximately 4 weeks after sod laying.
- .2 Areas sodded in fall will be accepted the following spring one month after start of growing season, provided acceptance conditions are fulfilled.
- .3 Remove wooden sod pegs from knitted grass areas.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 All Division 1 Specification Sections.
- .2 Section 31 23 13 – Rough Grading
- .3 Section 31 32 21 – Geotextiles
- .4 Section 32 91 21 – Topsoil Placement and Grading

**1.2 REFERENCES**

- .1 Canadian Nursery Landscape Association (CNLA) – Canadian Standards for Nursery Stock - Latest Edition.
- .2 Agriculture and Agri-Food Canada (AAFC), Plant Hardiness Zones in Canada-[2000].
- .3 City of Winnipeg Principles and Guidelines for Tree Planting Options.

**1.3 PRODUCT DATA**

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data for:
  - .1 Fertilizer.
  - .2 Anti-desiccant.
  - .3 Mulch.
  - .4 Guying assembly including clamps, collar, guying wire, anchors and wire tightener.

**1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Scheduling: obtain approval from Consultant of schedule 7 days in advance of shipment of plant material.
- .2 Schedule to include:
  - .1 Quantity and type of plant material.
  - .2 Shipping dates.
  - .3 Arrival dates on site.
  - .4 Planting Dates

**1.5 SUBMITTALS**

- .1 Scheduling: Obtain approval from Consultant of planting schedule 7 days in advance of shipment of plant material. Scheduling of planting installation to precede any site elements within or adjacent to planting beds that require excavation. Schedule to include:
  - .1 Date for selection of plant material at source by Consultant.
  - .2 Quantity and type of materials
  - .3 Shipping dates.
  - .4 Arrival dates on site.
  - .5 Date of planting

**1.6 SOURCE QUALITY CONTROL**

- .1 Obtain approval from the Contract Administrator of plant material at source prior to digging.

**1.7 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Landscape Contractor: to be a Member in Good Standing of Manitoba Horticultural Trades Association.
  - .2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

- .3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.
- .2 Trees and shrubs are to be planted in accordance with CLNA recommendations, ANSI A-300 Planting Standards.

## **1.5 STORAGE AND PROTECTION**

- .2 Protect plant material from frost, excessive heat, wind and sun during delivery.
- .3 Immediately store and protect plant material which will not be installed within 1 hour after arrival in an approved site storage location.
- .4 Protect plant material from damage during transportation:
  - .1 When delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.
  - .2 When delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.
  - .3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.
- .5 Protect stored plant material from frost, wind and sun and as follows:
  - .1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.
  - .2 For pots and containers, maintain moisture level in containers. Heel-in fibre pots.
  - .3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

## **1.6 WARRANTY PERIOD**

- .2 The Contractor shall warrant all plants for TWO (2) FULL GROWING SEASONS from date of Substantial Performance.
- .3 Consultant reserves the right to inspect all plant material any time during the warranty period and require replacements at that time, at the sole discretion of the City / Consultant.
- .4 At the end of warranty, the Contractor shall:
  - .1 Remove all tree stakes and guys
  - .2 Remove and replace all dead plant material, as required by the Consultant, when seasonal conditions are likely to ensure survival and make replacements in the same manner as specified for the original plants.
  - .3 Remove trunk protection.
- .4 Plant material replacements that occur during the warranty period will require extended warranties equal to the original warranty period. Extended warranty period will commence when the City / Consultant has accepted the plant material replacements.

## **PART 2 PRODUCTS**

### **2.1 PLANTING SOIL MEDIUM**

- .1 Use topsoil and planting medium in accordance with Section 32 91 21 – Topsoil Placement and Grading.

### **2.2 PLANT MATERIAL**

- .1 Plant material to conform to the applicable details and as listed in the "Plant Schedule" on drawings.
- .2 Substitutions for specified plants require the Consultant's written approval prior to delivery.
- .3 Type of root preparation, sizing, grading and quality: comply to Canadian Nursery Stock Standards, latest edition.
  - .1 Source of plant material: grown in Zone 2 (a or b) or 3 (a or b) will be accepted. Nursery stock that has grown in plant hardiness zones 1 and 4 or greater will be rejected.
  - .2 Plant material must be planted in zone specified as appropriate for its species.
  - .3 Plant material in location appropriate for its species.
- .4 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.
- .5 Trees: with straight trunks, well and characteristically branched for species.
- .6 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.
- .7 Collected stock by trained individuals: maximum 40 mm in caliper, with well-developed crowns and characteristically branched; no more than 40% of overall height may be free of branches.

During collection, ensure 10% maximum seed crop (or plants) are collected from healthy population of many individuals, and from several plants of same species.  
Leave remainder for natural dispersal and as food for dependent organisms.
- .8 Do not deliver more plants to the site than there is space with adequate storage conditions. Provide a suitable remote staging area for plants and other supplies.
- .9 Provide protective covering over all plants during transportation to prevent wind burn.

## **2.3 WATER**

- .1 Potable water, free of impurities that would inhibit plant growth.

## **2.4 ACCESSORIES**

- .1 Wood stakes, wire tightener, guying wire, clamps, anchors, guying collar and flagging tape as per applicable detail.

## **2.5 TRUNK PROTECTION**

- .1 Perforated flexible PVC pipe (45mm Cal or larger). Height of guard shall be 450-850mm above mulch level.
- .2 Beaver protection near water courses:
  - .1 Hardware Cloth: 6mm x 6mm x 23 Gauge Welded Galvanized Wire Mesh, minimum height 450mm-900mm, bury 50mm below grade, place around but not touching tree, secure with galvanized wire fastenings or zip ties.
- .3 Bottom of guard to meet flush with rootball. Check and adjust guards every fall to ensure they are free of gaps, trash and not interfering with root or trunk development.

## **2.6 MULCH**

- .1 Shredded cedar bark: varying in size from 25 to 75 mm in length. Mulch shall be free of leaves and any branches greater than 75 mm long and 20 mm thick.
- .2 Mulch to be installed in shrub planting bed and around tree plantings, all other areas to be stabilized aggregate as per Drawings.

## **2.7 FERTILIZER**

- .1 Synthetic commercial type as recommended by manufacturer.

## **2.8 ANTI-DESSICANT**

- .1 Wax-like emulsion.

## **PART 3 EXECUTION**

### **3.1 PRE-PLANTING OPERATIONS**

- .1 Ensure plant material on site is acceptable to Consultant.
- .2 Deliver all materials in their original containers with all labels intact and legible. Containers with additives shall clearly indicate contents, weight, analysis and manufacturer's name.
- .3 Prune damaged roots and branches from plant material.
- .4 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

### **3.2 EXCAVATION AND PREPARATION OF PLANTING BEDS**

- .1 Stake out location of tree pits and shrub beds and obtain approval from the Consultant prior to excavating.
- .2 Establish sub-grade and prepare planting beds as specified.
- .3 Excavate to depth and width as per applicable detail.
- .4 Remove rocks, roots, debris and toxic material from material that will be used as planting soil for trees and individual shrubs. Dispose of excess material as directed by Consultant.
- .5 Scarify sides and bottom of tree pits and shrub beds.
- .6 Remove water which enters planting pits and beds prior to planting. Notify Consultant if water source is ground water.

### **3.3 PLANTING**

- .1 For bare root stock, place 50 mm backfill soil in bottom of hole. Plant trees and shrubs with roots placed straight out in hole.
- .2 Hand dig planting pits for bare root trees and shrubs as indicated on drawings.
- .3 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.
- .4 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.
- .5 Plant vertically in locations as indicated. Orient plant material to give best appearance as directed by Consultant in relation to structure, roads and walks.



- .6 For trees :
  - .1 Backfill soil in 150 mm lifts. Tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade.
  - .2 Form watering saucer as per applicable detail.
  - .3 Trunk protection and filter cloth shall be installed on all trees planted within a naturalized/no-mow zone.
  - .4 Install all trees 50-75mm high relative to finish grades to allow for natural settlement

- .7 For shrubs:
  - .1 Backfill soil evenly to finish grade and tamp to eliminate air pockets.

.8 Water plant material thoroughly.

.9 Dispose of burlap, wire and container material off site.

### **3.4 INSTALLATION OF ACCESSORIES AND TRUNK PROTECTION**

- .1 Install tree supports, accessories, and trunk protection as per applicable detail.
- .2 Install trunk protection prior to installation of tree supports when used.
- .3 After tree supports have been installed, remove broken branches with clean, sharp tools

### **3.5 MULCHING**

- .1 Ensure soil settlement has been corrected prior to mulching.
- .2 Spread mulch as per applicable detail.

### **3.6 PRUNING**

- .1 Prune all plants to remove dead and broken branches.
- .2 Preserve the natural character of the plant and do not remove leader.
- .3 Use clean, sharp tools and make cuts clean and flush without leaving stubs.
- .4 Cut back to living tissue all cuts, scars and bruises and shape so as not to retain water.

### **3.7 MAINTENANCE DURING ESTABLISHMENT PERIOD**

- .1 Perform following maintenance operations from time of planting to Substantial Performance:
  - .1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.
  - .2 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.
  - .3 Remove weeds monthly.
  - .4 Replace or respread damaged, missing or disturbed mulch.
  - .5 For non-mulched areas, cultivate as required to keep top layer of soil friable.
  - .6 Remove dead or broken branches from plant material.
  - .7 Keep trunk protection and guy wires in proper repair and adjustment.
  - .8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plants.

### **3.8 MAINTENANCE DURING WARRANTY PERIOD**

- .1 Perform following maintenance operations from time of Substantial Performance to the end of warranty period:
  - .1 Submit monthly written reports to the Consultant identifying:
    - .1 Maintenance work carried out.
    - .2 Maintenance requirements
    - .3 Development and condition of plant material.
    - .4 Preventative or corrective measures required which are outside Contractor's responsibility.
  - .2 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.
  - .3 Apply fertilizer in early spring as indicated by soil test.
  - .4 Prune dead, broken or hazardous branches from plant material.
  - .5 Keep trunk protection and tree supports in proper repair and adjustment.

### **3.9 ACCEPTANCE**

- .1 All plant material will be accepted by the Consultant after the entire project has received Substantial Performance and the planting operation is completed, if in the sole discretion of the Consultant, the plant material exhibits healthy vigorous growth and is free from disease, insects and fungal organisms.
- .2 All Plant material installed less than 90 days prior to frost will be accepted in following spring, 30 days after the start of the growing season provided that acceptance conditions are fulfilled.

**END OF SECTION**