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Part 1 General

1.1 SECTION INCLUDES

.1 Measurement schedule.

.2 Quantity calculations.

1.2 GENERAL REQUIREMENTS

.1 The conditions contained in this document are supplemental to, and should be read in conjunction with, the Standard General Conditions (the “SGCs”). Where any condition herein deletes, modifies, or adds to a special general condition set forth in the SGCs or part thereof, the unaltered portion shall remain in effect.

.2 Where in these special conditions, the letters “SGC.” followed by a number appears, the reference is to a clause by that number in the Standard General Condition.

1.3 UNIT PRICES

.1 Refer to Schedule 3, Part E Project Specific Requirements.

.2 If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum/prices contracted.

.3 All unit price Work performed without notifying The Consultant to establish measurement and payment shall not be considered for payment.

.4 The prices bid for various items of work, unless specifically noted otherwise, shall include the supply of all labour, material, and product equipment necessary to construct the work in accordance with the specifications.

.5 The prices bid for supply and installation shall be full compensation for supplying, hauling, installing, cleaning, testing, and placing in service together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.

.6 Measurement - unit prices

.1 Measurement units are delineated in the Schedule of Quantities for conditions specified in the Contract.

.2 Measurement methods and unit prices are determined by The Municipality of Drumheller for conditions that have been changed since the creation of this Contract.

.3 Take measurements and compute quantities. The Municipality of Drumheller will verify measurements and quantities.

.7 Includes full compensation for required labour, Products, tools, equipment, plant and facilities, transportation, storage, services, and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.4 MEASUREMENT SCHEDULE

.1 Schedule: See following pages.

.2 Quantity Calculations – Scheduled Lump Sum items.

.1 When an interim payment is to be a specified percentage of a lump sum item and is calculated based on the ratio of the value of Work completed to the interim date, and the Project Price, that specified percentage will be included in the calculation of the value of the Work completed to that interim date.

.3 Breakdown of Lump Sum items

.1 Submit a breakdown of each lump sum item included in the Schedule of Prices, within 15 days after the commencement date of the Agreement.

.2 Provide sufficient details as required to identify the principal components of the work and to permit ready valuation of the work performed.

.4 Lump Sum items paid in accordance with the following schedule. The total amount of such payments shall not exceed the amount bid for this item.

.1 Payment of 25% of the Lump Sum amount after completion of Work for 5% of the bid amount.

.2 Payment of another 25% of the Lump Sum amount after completion of Work for 25% of the bid amount.

.3 Payment of another 25% of the Lump Sum amount after completion of Work for 50% of the bid amount.

.4 Payment of the remaining 25% of the Lump Sum amount after completion of all Work of the Agreement.

ITEM No.	ITEM NAME	SCOPE, MEASUREMENT, AND PAYMENT
1	Mobilization and Demobilization	.1 Scope: Mobilization includes: Supplying and transporting to the Site, labour, equipment, products and incidentals; providing and maintaining temporary facilities and controls, including site offices and related utilities; providing, maintaining, and restoring roads, pathways, laydown areas, and parking areas including video survey; temporary relocation and reinstatement of existing facilities; supplying, installing, maintaining and removing construction materials necessary for the Contractor's methods carried out during performance of the Agreement and which does not remain as part of the Permanent Work; and all related work and materials for which payment is not included elsewhere. Demobilization includes: Removing and transporting from the Site, labour, equipment, products, and other items not required to remain upon Completion; cleaning of the Site; and all related work and materials for which payment is not included elsewhere. Mobilization and Demobilization includes: Interim and partial mobilization and demobilization activities required to perform the Work of the Agreement. .2 Payment: Lump Sum and shall be paid for as 80% once mobilization to the Project Site is complete and the subject work has been initiated and the remainder shall be paid upon completion of all work to the satisfaction of The Municipality of Drumheller.
2	Existing and Temporary Roads, Pathways and Signs	.1 Scope: Includes designing; providing earthwork materials; constructing, and removing when required, existing and temporary roads and pathways, and detours; providing materials including signs, barricades, signals, flashers, and other safety measures; removing snow, dirt and debris from existing and temporary roads and detours; dust control; preparing submittals and obtaining approvals, including paying all levies, from the City of Calgary Transportation Department and Traffic Operations Division and Calgary Parks Department; includes video surveys; and all related work and materials for which payment is not included elsewhere. Materials

		incorporated in these works will not be paid for under any other item. .2 Payment: Lump Sum paid in accordance with the schedule outlines in Article 1.4.4 above.
3	Temporary Construction Panel Fencing	.1 Scope: Includes supplying, storing, handling, installing, maintaining, and removing temporary construction panel fencing; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be the installed length of temporary construction panel fencing measured along the fence at the ground surface. .3 Payment: Unit Price per metre in accordance with the following schedule: .1 Payment of 75% of the extended amount after installing the fence. .2 Payment of the balance of the extended amount after removing the fence.
4	Surveying	.1 Scope: Layout, grading, and as-built purposes .2 Payment: Lump Sum paid in accordance with the schedule outlines in Article 1.4.4 above.
5	Paving Preparation	.1 Scope: Clearing and Grubbing: Includes cutting, removing, grubbing, mulching, loading, hauling, and disposing of logs, trees, brush, stumps, roots, and other deleterious material at an off Site waste disposal facility; salvaging and protecting roots of cleared plants designated by the Consultant to be replanted; protecting and treating trees and shrubs that are to remain; levelling, grading, and finishing of cleared areas; and all related work and materials for which payment is not included elsewhere. Topsoil Stripping: Includes stripping, sorting, loading, hauling, dumping, and stockpiling of Topsoil in specified areas; and all related work and materials for which payment is not included elsewhere. Excavation: Includes excavating designated areas; shaping and trimming to finished excavation surfaces; temporary stockpiling and rehandling, if required; loading, hauling, and dumping excess in an appropriate off-Site waste disposal facility following approval by The City; and all related work and

		materials for which payment is not included elsewhere. .2 Measurement: Shall be the area of Paving Preparation measured by survey. .3 Payment: Unit Price per square metre
6	Sidewalk Removal	.1 Scope: Includes saw cutting, demolishing, excavating, removing, temporary stockpiling, if required, rehandling, loading, hauling, and disposal of asphalt and gravel pavements and gravel subgrade materials off-site; and all related work for which payment is not included elsewhere. .2 Measurement: The area to be demolished shall be paint-marked prior to demolition and measured with the Consultant prior to starting the work. Shall be the surface area in square metres of the asphalt or gravel pathway removed as agreed with the Consultant. .3 Payment: Unit Price per square metre.
7	Tree Removal	.1 Scope: Includes cutting, removing, grubbed, mulching, loading, hauling and disposal at an off-site waste disposal facility; levelling, grading and finishing of area; and all related work and materials for which payment is not included elsewhere. .2 Payment: Unit Price per Each
8	Soil Type A	.1 Scope: Includes preparing submittals and obtaining approvals, quality control testing, supplying, paying royalties, excavating, sorting, loading, hauling, temporary stockpiling, if required, mixing native Topsoil and supplied compost to the satisfaction of The City; preparing receiving surfaces; dumping, spreading, grading, rolling, cultivating, and raking Soil Type A; removing and disposing of rocks and deleterious materials; and all related work for which payment is not included elsewhere. .2 Measurement: Shall be the in-place volume of Soil Type A as determined from the top surface area of the Soil Type A measured by survey multiplied by the thickness specified in the contract documents or as adjusted by the Consultant. .3 Payment: Unit Price per cubic metre
9	Asphalt Repair	.1 Scope: Includes all labour, equipment, and material necessary to complete the construction of the Municipal Standard asphalt, including excavating,

		preparing the subgrade and base, side forms as required, supplying, storing, placing, spreading, trimming, joining, anchoring, installing root barrier, if required; protecting, paying royalties, any quality control testing as required by the approving authority, and any other work or material necessary to complete the structure that is not provided elsewhere. .2 Measurement: Shall be the installed area of asphalt pathway as determined by survey. .3 Payment: Unit Price per square metre
10	Surface Crush Paving	.1 Scope: Includes all labour, equipment, and material necessary to complete the construction of the Limestone Screenings, including excavating, preparing the subgrade and base, supplying, storing, placing, spreading, trimming, joining, protecting, paying royalties, any quality control testing as required by the approving authority, and any other work or material necessary to complete the structure that is not provided elsewhere. .2 Measurement: Shall be the installed area of Limestone Screenings as determined by survey. .3 Payment: Unit Price per square metre
11	Concrete Paving	.1 Scope: Includes all labour, equipment, and material necessary to complete the construction of the Cast in Place Concrete Paving, including excavating, preparing the subgrade and base, supplying, storing, placing, spreading, trimming, joining, protecting, paying royalties, any quality control testing as required by the approving authority, and any other work or material necessary to complete the structure that is not provided elsewhere. .2 Measurement: Shall be the installed area of Cast in Place Concrete as determined by survey. .3 Payment: Unit Price per square metre
12	Concrete Curb	.1 Scope: Includes all labour, equipment, and material necessary to complete the construction of the Concrete Curb, including excavating, preparing the subgrade and base, supplying, storing, placing, spreading, trimming, joining, protecting, paying royalties, any quality control testing as required by the approving authority, and any other work or material necessary to complete the structure that is not provided elsewhere.

		.2 Measurement: Shall be the installed area of Concrete Curb as determined by survey. .3 Payment: Unit Price per metre
13	Waste Bin Enclosure	.1 Scope: Includes supplying, storing, loading, hauling, handling, and installing Waste Bin Enclosure; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be the installed length of Waste Bin Enclosure measured along the fence at the ground surface. .2 Payment: Unit Price per metre
14	Barrier Gate	.1 Scope: Includes preparing submittals and obtaining approvals; fabricating, supplying, storing, loading, hauling, handling, and installing the Barrier Gate; and all related work and materials for which payment is not included elsewhere. .2 Payment: Lump Sum
15	Public Washroom	.1 Scope: Includes designing, engineering, obtaining approvals; fabricating, loading, hauling, handling and temporary stockpiling, if required; assembling and installing frame, plumbing, gate, support structure, foundations, coordination of electrical connection with ATCO, installing toilet, and all related work and materials for which payment is not listed elsewhere. .2 Payment: Lump Sum
16	Custom Rammed Earth Seat – Large, Medium, Small Custom Rammed Earth Elements	.1 Scope: Includes designing, obtaining approvals, fabricating, rammed earth fabricating, coating, supplying, loading, hauling, handling, preparing receiving surface and foundations; and all related work and materials for which payment is not listed elsewhere. .2 Measurement: Shall be the in placein-place number of seats.elements. .3 Payment: Unit Price per seat.
17	Waste Receptacle	.1 Scope: Includes supplying, loading, hauling, handling, preparing receiving surface and installing foundations; and all related work and materials for which payment is not listed elsewhere. .2 Measurement: Shall be the in-place number of waste receptacles.

		.3 Payment: Unit Price per benchreceptacle.
18	Custom Rammed Earth Planter	.1 Scope: Includes designing, obtaining approvals, fabricating, loading, hauling, protecting, temporary storing, and rehandling, if required, and installing the planter frame and liner; supplying, excavating, sorting, quality control testing, placing and spreading of washed gravel drainage layer, geotextile and planting soil; and all related work and materials for which payment is not listed elsewhere. .2 Measurement: Shall be the in placein-place number of planters. .3 Payment: Unit Price per planter.
19	Edge Restraint	.1 Scope: Includes designing, obtaining approvals, fabricating, metal fabricating, coating, supplying, welding, loading, hauling, handling, and installing frames, signs, posts, and foundations; and all related work and materials for which payment is not listed elsewhere. .2 Measurement: Shall be the installed length of Edge Restraint measured along the planting beds .3 Payment: Unit Price per planterlinear metre.
20	Trees	.1 Scope: Includes supplying nursery-grown container trees, protecting, hauling, offloading, and temporarily storing, if required; preparing receiving surfaces; excavation of pits and planting beds, placing planting soil; temporary stockpiling and rehandling, if required; planting, protecting, and watering; removing and disposing of deleterious materials; supplying, loading, hauling, and placing Hemp Squares; supplying and installing tree protection; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be the in placein-place number of trees. .3 Price: Unit Price per tree.
21	Site Lighting	1 Scope: Includes supplying, storing, loading, hauling, handling, and installing site pole lighting; and all related work and materials for which payment is not included elsewhere. ATCO to perform all servicing and connection work. .2 Measurement: Shall be the in-place number of pole lights.

		.3 Payment: Unit Price per pole light.
22	Perennials	.1 Scope: Includes supplying nursery-grown container perennials, protecting, hauling, offloading, and temporarily storing, if required; preparing receiving surfaces; excavation of pits and planting beds, placing planting soil; temporary stockpiling and rehandling, if required; planting, protecting, and watering; removing and disposing of deleterious materials; supplying, loading, hauling, and placing additional mulch if required; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be the in placein-place number of perennials. .3 Price: Unit Price per perennial..1 Scope: Includes supplying nursery-grown container perennials, protecting, hauling, offloading, and temporarily storing, if required; preparing receiving surfaces; excavation of pits and planting beds, placing planting soil; temporary stockpiling and rehandling, if required; planting, protecting, and watering; removing and disposing of deleterious materials; supplying, loading, hauling and; supplying and installing plant protection; and all related work and materials for which payment is not included elsewhere. .2 Measurement: Shall be the in place number of shrubs. .3 Price: Unit Price per perennial.
23	Vegetation Establishment – Watering Perennials	.1 Scope: Includes preparing and obtaining permits, if required, and obtaining approvals; soil moisture testing and recording; loading, hauling, and watering planted trees, shrubs, perennials; installing temporary irrigation systems if determined by the Contractor and approved by The City; and all related work and materials for which payment is not included elsewhere. .2 Payment: Lump Sum per Year..1 Scope: Includes supplying nursery-grown container perennials, protecting, hauling, offloading, and temporarily storing, if required; preparing receiving surfaces; excavation of pits and planting beds, placing planting soil; temporary stockpiling and rehandling, if required; planting, protecting, and watering; removing and disposing of deleterious materials; supplying, loading, hauling, and placing additional mulch if required; and all related work and materials for which payment is

		not included elsewhere. .2 Measurement: Shall be the in place number of perennials. .3 Price: Unit Price per perennial
24	Vegetation Establishment - Establishment logs Vegetation Establishment - Watering	.1 Scope: Includes preparing and submitting Establishment logs; pruning trees, shrubs; protecting plants, replanting trees, shrubs, perennials; and all related work and materials for which payment is not included elsewhere. .2 Measurement: to be filled out whenever activities are performed and submitted monthly with the progress claims. .3 Payment: Lump Sum per Month.1 Scope: Includes preparing and obtaining permits, if required, and obtaining approvals; soil moisture testing and recording; loading, hauling, and watering planted trees, shrubs, perennials; installing temporary irrigation systems if determined by the Contractor and approved by The City; and all related work and materials for which payment is not included elsewhere. .2 Payment: Lump Sum per Year
25	Vegetation Establishment - Establishment logs	.1 Scope: Includes preparing and submitting Establishment logs; pruning trees and perennials; protecting plants, replanting trees, perennials; and all related work and materials for which payment is not included elsewhere. .2 Measurement: to be filled out whenever activities are performed and submitted monthly with the progress claims. .3 Payment: Lump Sum per Month
26	Vegetation Establishment - Weed control Vegetation Establishment - Establishment logs	.1 Scope: Includes preparing submittals and obtaining approvals; supplying, loading, hauling and applying chemical herbicides; eradicating or preventing weed growth through labour and mechanical methods as described in the Contract Documents or directed by The City; and all related work and materials for which payment is not included elsewhere. 2: Payment: Lump Sum per Month. 1 Scope: Includes preparing and submitting Establishment logs; pruning trees, perennials; protecting plants, replanting trees, and perennials; and all related work and materials for

		which payment is not included elsewhere. .2 Measurement: to be filled out whenever activities are performed and submitted monthly with the progress claims. .3 Payment: Lump Sum per Month
27	Stage	.1 Scope: Includes supplying, loading, hauling, handling, preparing receiving surface and installing foundations; and all related work and materials for which payment is not listed elsewhere. .2 Payment: Lump Sum

Part 2 Products - NOT USED

Part 3 Execution - NOT USED

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Coordination Work with other contractors under administration of Consultant.

.2 Pre-installation, inspection and scheduled progress meetings.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Municipality of Drumheller Standard General Conditions.

1.3 ADMINISTRATIVE RESPONSIBIILITIES

.1 The Consultant will be responsible for the administrative requirement for the following meetings:

.1 Pre-construction.

.2 Construction progress.

.3 Post-construction.

.2 The Contractor shall be responsibility for the administrative requirement for the following meetings:

.1 Workplace orientation.

.2 Safety.

.3 The Consultant or Contractor may request additional meetings related to installation of equipment, co-ordination of assigned contracts, co-ordination of subcontracts, warranty, dispute resolution, and environmental issues. Unless otherwise specifically requested by the Contractor, the Consultant will be responsible for administrative duties related to these meetings. The agenda for these meetings may be combined with that of the construction progress meetings.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 The administrative requirements for Contract meetings include the following:

.1 Scheduling and administering the Contract meetings throughout the progress of the Work.

.2 Preparing the agenda for the meetings.

.3 Distributing to the relevant attendees written notice of each meeting and the proposed agenda at least 3 days in advance of the meeting date.

.4 Presiding at the meetings.

.5 Recording the minutes including attendance, significant proceedings and decisions, and action required by the parties.

.6 Consultant will record minutes of meetings and circulate to attending parties and affected parties not in attendance within seven (7) days after meeting.

.1 The meeting minutes will serve as the agenda for the subsequent construction meeting.

.2 Representatives of the Contractor, Subcontractors, and Suppliers shall attend meetings as necessary and be authorized to act on behalf of the party each represents.

1.5 CONSTRUCTION ORGANIZATION AND START-UP

.1 Within fifteen (15) days after award of Contract and prior to commencement of activities on site, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities. Include time and location of meeting in the request.

.2 Attendees

.1 Contractor's representatives: senior management, site superintendent, major Subcontractors, and others as necessary

.2 Consultant: as determined by the Consultant.

.3 The Municipality of Drumheller: Project Manager, Site inspector and others as necessary.

.3 Agenda to include the following:

.1 Appointment of official representative of participants in Work and communication ladder.

.2 Schedules: of the Work, submittals, equipment delivery, etc. Coordinate inspections and layout work with Consultant and The Municipality of Drumheller.

.3 Mobilization to Site, including requirements and locations for temporary facilities, site signage, offices, storage sheds, utilities, fences.

.4 Site safety and security.

.5 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.

.6 Owner-furnished Products.

.7 Record documents.

.8 Maintenance manuals, takeover procedures, acceptance, and warranties.

.9 Monthly progress claims, administrative procedures, photographs, and holdbacks.

.10 Inspection and testing.

.11 Insurances and transcript of policies.

1.6 CONSTRUCTION PROGRESS MEETINGS

.1 Schedule and administer bi-weekly project meetings throughout progress of Work or as determined by the Consultant.

.2 Purpose is to monitor construction progress, to identify problems and actions required for their solution, and to expedite the Work.

.3 Attendees: Contractor, major subcontractors involved in Work, Consultant, The Municipality of Drumheller and others as necessary that are involved in the Work.

.4 Agenda may 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 and revisions to the construction schedule. Corrective measures and procedures to regain projected schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Progress and schedule for the succeeding work period.

.7 Review submittal schedules: expedite as required.

.8 Adherence to quality standards.

.9 Review proposed changes that affect the construction schedule and/or completion date.

.10 Review site safety, environmental and security issues, or other contentious items of the Work.

.11 Other business.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Shop Drawings and product data.

.2 Samples.

.3 Establishment Log Submissions.

1.2 RELATED SECTIONS

.1 Other sections requesting submittals.

1.3 ADMINISTRATIVE

.1 Submit to Consultant submittals listed for review. Submit with reasonable promptness and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Work affected by submittal shall not proceed until review is complete.

.3 Present Shop Drawings, product data, samples, and mock-ups in metric units.

.4 Where items or information is not manufactured or produced in SI metric units, converted values within the metric measurement tolerances are acceptable.

.5 Review submittals prior to submission to Consultant. This review represents those 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.

.6 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.

.7 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent Work are coordinated.

.9 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.

.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.

.11 Keep one (1) reviewed copy of each submission on site.

1.4 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 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 coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow a minimum of ten (10) days for Consultant's review of each submission.

.4 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.

.5 Make changes in Shop Drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of any revisions other than those requested.

.6 Accompany submissions with transmittal letter, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.7 Submissions shall 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 other parts of the Work.

.8 After Consultant's review, distribute copies.

.9 Submit electronic copy of Shop Drawings for each requirement requested in specification Sections and as consultant may reasonably request.

.10 Submit electronic copy 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.

.11 Delete information not applicable to project.

.12 Supplement standard information to provide details applicable to project.

.13 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. If Shop Drawings are rejected, noted copy will be returned and re-submission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.14 Shop Drawings must be submitted for the following features:

.1 Public Washroom

.2 Waste Bin Enclosure

.3 Edge Restraint

.4 Custom Rammed Earth Planter

.5 Custom Rammed Earth Seat – Large, Medium, Small

.15 Foundation type and sizing, where needed, shall be sized appropriately for each feature and follow the recommendations from the Geotechnical Report.

.16 Shop Drawings prepared under supervision of and stamped by a Professional Structural Engineer experienced in design of this Work and licensed in Alberta must be submitted for the following features (including all required components for construction):

.1 Public Washroom unit and rammed earth facade

.2 Waste Bin Enclosure, including foundation

.17 Contractor is responsible for all Engineering costs.

1.5 SAMPLES

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

.2 Deliver samples prepaid to Consultant's business address.

.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.

1.6 ESTABLISHMENT LOGS

.1 Provide establishment logs during the warranty period.

.2 Contractor to submit revisions to the Establishment Log prior to the warranty period for approval.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Laws, notices, permits and approvals.

1.2 RELATED SECTIONS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 REGULATORY RESPONSIBILITY

.1 Conform to Regulatory Requirements and pay all fees and give all notices required by them.

.2 Obtain approvals necessary for the Work and the Agreement from the regulatory agencies having jurisdiction, except those approvals obtained by The Municipal's Design Professional as identified in this section.

.3 The Municipal's Design Professional will obtain the approvals necessary for the Project that involve agreement between The Municipal's Design Professional and the regulatory agency having jurisdiction.

1.4 CITY OBTAINED APPROVALS

.1 The Municipality of Drumheller will obtain the approvals listed below prior to construction. Do not commence work until approvals are obtained by The Municipal. Comply with conditions of approvals.

1.5 REGULATORY DOCUMENTS

.1 The following regulatory documents are required prior to commencing Work on site:

.1 Tree Protection Plan and Soil Management Plan.

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.

.4 Written and electronic reports.

.5 Equipment and system adjust and balance.

1.2 RELATED SECTIONS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 32.

1.3 REFERENCES

.1 ISO/IEC 17025-2005 - General Requirements for the Competence of Testing and Calibration Laboratories.

.2 SCC (Standards Council of Canada).

.3 Calgary Development Guidelines and Standard Specifications: Landscape Construction (current edition).

1.4 INSPECTION BY AUTHORITY

.1 Allow Authorities Having Jurisdiction 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 whenever portions of the Work are designated for special tests, inspections, or approvals, either when described in the Agreement or when required by law in the Place of the 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.

1.5 REVIEW BY DESIGN PROFESSIONAL

.1 Consultant may order any part of the Work to be reviewed or inspected if Work is suspected to be not in accordance with the Agreement.

.2 If, upon review such work is found not in accordance with the Agreement, correct such Work and pay cost of additional review and correction.

1.6 TESTING

.1 The Contractor shall be responsible for securing qualified testing agencies to perform any required testing.

.2 The Municipality of Drumheller may employ an independent testing agency or employ their own forces to conduct test on the work for verification. The Municipality of Drumheller will pay for this extra testing if the Municipality of Drumheller choses to have the testing done. The contractor shall make work or materials available for testing.

.3 Testing Organizations: As determined by the Municipality of Drumheller.

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

.5 Employment of inspection and testing agencies does not relax responsibility to perform Work in accordance with The Agreement.

.6 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and testing to ascertain full degree of defect. Correct defect and irregularities as advised by Design Professional at no cost to Municipality of Drumheller. Pay costs for retesting and re-inspection.

1.7 ACCESS TO WORK

.1 Allow inspection and testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Cooperate to provide reasonable access and facilities for such access.

1.8 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 materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay 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.

1.9 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 The Agreement. Replace or re-execute in accordance with The Agreement.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of the Consultant it is not expedient to correct defective Work or Work not performed in accordance with the Agreement, Municipality of Drumheller may deduct from Project Price the difference in value between Work performed and that called for the Agreement, amount of which shall be determined by the Consultant.

1.10 REPORTS

.1 Submit one (1) electronic copy of signed inspection and test reports to Consultant.

.2 Provide signed paper copies to manufacturer or fabricator of material being inspected or tested.

1.11 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

.2 The cost of tests and mix designs beyond those called for in the Agreement or beyond those required by law of Place of Work shall be appraised by the Design Professional and may be authorized as recoverable.

1.12 MOCK-UP

.1 Prepare mock-up for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

.2 Construct in all locations acceptable to the Consultant.

.3 Prepare mock-ups for the Consultant’s review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of the agreement and no claim for extension by reason of such default will be allowed.

.5 If requested, the Consultant will assist in preparing a schedule fixing dates for preparation.

.6 Approved mock-up may remain as part of Work if directed by the Consultant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Site enclosure.

.2 Guardrails and barriers.

.3 Weather enclosures.

.4 Dust tight barriers.

.5 Protection for off-site and public property.

.6 Protection of applied finishes.

.7 Protection of surrounding Work.

1.2 RELATED SECTIONS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.4 SITE ENCLOSURE

.1 Erect temporary site enclosure hoarding using 38 x 89 mm construction grade lumber framing at 600 mm on centre, and 1200 x 2400 mm size, thick exterior grade particleboard.

.2 Provide one (1) lockable truck entrance gate and at least one (1) pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys with restricted availability, in the project office.

.3 Maintain pedestrian walkways routes complete with signs and electrical lighting as required by law.

.4 Erect temporary site enclosure using new 1.2 m snow fence wired to rolled steel "T" bar fence, posts spaced at 2.4 m on centre.

.1 Provide [one (1)] lockable truck gate.

.2 Maintain site protection fencing in good repair.

1.5 GUARD RAILS AND BARRIERS

.1 Provide secure, rigid guard rails and barricades around excavations and open edges of site demolition areas.

1.6 WEATHER ENCLOSURES

.1 Design enclosures to withstand wind pressure and snow loading.

1.7 DUST TIGHT BARRIERS

.1 Provide dust tight barriers and 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.

1.8 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 APPLIED FINISHES

.1 Provide protection for finished and partially finished surfaces and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Consultant locations and installation schedule three (3) days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

1.10 PROTECTION OF SURROUNDING WORK

.1 Provide protection for finished and partially finished Work from damage.

.2 Provide necessary cover and protection.

.3 Be responsible for damage incurred due to lack of or improper or inappropriate protection.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Product substitution procedures.

.3 Manufacturer's instructions.

.4 Quality of Work, coordination, and fastenings.

.5 Existing facilities.

1.2 RELATED SECTIONS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 TERMINOLOGY

.1 New: Produced from new materials.

.2 Re-newed: Produced or rejuvenated from an existing material to like-new condition to serve a new or existing service.

.3 Defective: A condition determined exclusively by the Consultant.

1.4 PRODUCT QUALITY

.1 Products, materials, equipment, parts, or assemblies (referred to as Products) incorporated in Work: either new or renewed, not damaged or defective, of best quality (compatible with specification requirements) for purpose intended. If requested, provide evidence as to type, source and quality of Products provided.

.2 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.

.3 Should any dispute arise as to quality or fitness of Products, decision rests strictly with Consultant.

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

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

1.5 AVAILABILITY

.1 Immediately upon signing Contract, review Product delivery requirements and anticipate foreseeable supply delays for any items.

.2 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.

.3 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.

1.6 STORAGE AND PROTECTION

.1 Store and protect Products in accordance with manufacturers' written instructions.

.2 Store with seals and labels intact and legible.

.3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.

.4 For exterior storage of fabricated Products, place on sloped supports above ground.

.5 Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.

.6 Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

.7 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

.8 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.7 TRANSPORTATION AND HANDLING

.1 Transport and handle Products in accordance with manufacturer's written instructions.

.2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

.3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.8 PRODUCT CHANGES

.1 Change in Product/Products: Submit request for substitution or alternative to Consultant within 5 business days.

1.9 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 project schedule, pedestrians, and surrounding traffic flow.

.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.

1.10 MANUFACTURER'S WRITTEN INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect Products to manufacturer's written 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 may 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.

1.11 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 any 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.

1.12 COORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.13 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.

1.14 REMEDIAL WORK

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

1.15 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.

1.16 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.

1.17 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 Type 304 or 316 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.

1.18 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of the Project.

.2 Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated, without written approval of Consultant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Submittal requirements associated with connecting to new and existing facilities.

.2 Execution requirements for all Work.

1.2 RELATED SECTIONS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 SUBMITTALS - ATTACHING TO EXISTING WORK

.1 Submit written request in advance of cutting or alteration which affects:

- .1 Structural integrity of any element of Project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of any operational element.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

.2 Include in request:

- .1 Identification of Project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.4 TOLERANCES

.1 Monitor fabrication and installation tolerance control of Products to produce acceptable Work.

.2 Do not permit tolerances to accumulate beyond effective or practical limits.

.3 Comply with manufacturers' tolerances. In case of conflict between manufacturers' tolerances and Contract Documents, request clarification from Consultant before proceeding.

.4 Adjust Products to appropriate dimensions; position and confirm tolerance acceptability, before permanently securing Products in place.

1.5 EXECUTION

.1 Execute cutting, fitting, and patching to complete the Work.

.2 Perform all required excavation and fill to complete the Work.

.3 Fit several parts together, to integrate with other Work.

.4 Uncover Work to install ill-timed Work.

.5 Remove and replace defective or non-conforming Work.

.6 Remove samples of installed Work for testing, if not designated in the respective Section as remaining as part of the Work.

.7 Provide openings in non-structural elements of Work for penetrations of electrical and mechanical work. Limit opening dimensions to minimal sizes required and performed in a neat and clean fashion.

.8 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.9 Employ qualified workers to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.10 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry or concrete work without prior approval.

.11 Restore work with new products in accordance with requirements of Contract Documents.

.12 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.13 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, for full thickness of the constructed element.

.14 Re-finish surfaces to match adjacent finishes: For continuous surfaces re-finish to nearest intersection; for an assembly, re-finish entire unit.

.15 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Alteration project procedures.

.2 Removal of designated construction.

.3 Disposal of materials.

.4 Identification of utilities.

.5 Refer to items as indicated.

1.2 PRICE AND PAYMENT PROCEDURES

.1 Unit Prices: Section 01 22 10 - Measurement Schedule.

1.3 ALTERATION PROJECT PROCEDURES

.1 Materials: As specified in Product sections; match existing Products and work for patching and extending work.

.2 Employ skilled and experienced installer to perform alteration work.

.3 Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

.4 Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring Products and finishes to specified condition.

.5 Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

.6 When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to the Consultant for review.

.7 Where a change of plane of 6 mm or more occurs, request instructions from the Consultant.

.8 Patch or replace portions of existing surfaces which are damaged, lifted, discoloured, or showing other imperfections.

.9 Finish surfaces as specified in individual Product sections.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:

.1 Schedule Work to precede site excavation work and coincide with new construction.

.2 Describe demolition removal procedures and schedule.

.2 Perform noisy work:

.1 Between the hours of 9:00 am and 5:00 pm.

1.5 SUBMITTALS FOR INFORMATION

.1 Record Documentation: Accurately record actual locations of capped utilities and subsurface obstructions.

1.6 REGULATORY REQUIREMENTS

.1 Conform to applicable code for demolition work, dust control, products requiring electrical disconnection or reconnection.

.2 Obtain required permits from authorities.

.3 Do not close or obstruct egress width to any building or site exit.

.4 Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

1.7 SITE CONDITIONS

.1 Conduct demolition to minimize interference with adjacent building areas and properties.

.2 Cease operations immediately if structure appears to be in danger and notify the Consultant. Do not resume operations until directed.

Part 2 Products

2.1 MATERIALS

.1 Not Used.

Part 3 Execution

3.1 PREPARATION

.1 Provide, erect, and maintain temporary barriers at locations indicated.

.2 Erect and maintain weatherproof closures for exterior openings.

.3 Erect and maintain temporary partitions to prevent spread of dust, odours, and noise to permit continued the Municipality of Drumheller occupancy.

.4 Protect existing materials which are not to be demolished.

.5 Prevent movement of structure; provide bracing and shoring.

.6 Notify affected utility companies before starting work and comply with their requirements.

.7 Mark location and termination of utilities.

.8 Provide appropriate temporary signage including signage for exit or building egress.

3.2 DEMOLITION

.1 Disconnect, remove, cap, and identify designated utilities within demolition areas.

.2 Demolish in an orderly and careful manner. Protect existing supporting structural members.

.3 Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

.4 Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.

.5 Cease operations immediately if adjacent structures appear to be in danger. Notify the Consultant. Do not resume operations until directed.

.6 Conduct operations with minimum interference to public or private accesses.

.7 Remove temporary Work.

3.3 SELECTIVE DEMOLITION

.1 Remove the following equipment and store for re-use on-site for re-use.

- .1 Grease Bin
- .2 Recycle Bin
- .3 Garbage Bin

.2 Remove the following equipment and materials for disposal as noted on the drawings. Dispose of at an approved off -site facility.

- .1 0-01 – Asphalt surface and/or excavate to 600mm ± depth
- .2 0-02 – Existing concrete planter curb
- .3 0-03 – Existing concrete curb and gutter along roadway
- .4 0-04 – Asphalt surface and/or excavate to 480mm ± depth
- .5 0-05 – Existing concrete paving and/or excavate to 450mm ± depth
- .6 0-06 – Asphalt surface and/or excavate to 150mm ± depth
- .7 0-07 – Planting and planting soil to 600mm ± depth
- .8 0-08 – Planting and planting soil to 300mm ± depth
- .9 0-09 – Existing trees to be removed
- .10 0-12 – Asphalt surface and/or excavate to extent required for repair.

.3 Protect the following materials and equipment:

- .1 Existing Utility to remain.
- .2 Existing Street signs to remain.
- .3 Existing sidewalks and pathways to remain.
- .4 Existing curbs to remain.
- .5 All other site elements not designated for removal.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Wood slats for Waste Bin Enclosure

.2 Wood slats for Stage Surface

.3 Hardware and attachment brackets

1.2 RELATED SECTIONS

.1 Section 06 10 00 - Site Furnishings

1.3 REFERENCES

1.4 References:

.1 Conform to the requirements of the local building code identified on the structural Drawings as amended by all subsequent regulations issued to the date of this Specification and applicable acts of authorities having jurisdiction.

.2 All references to the standards and publications noted in this Specification shall be to the edition referenced in the local building code identified on the structural Drawings, or to the edition referenced in the latest published editions or revisions of all standards published by the Canadian Standards Association issued to the date of this Specification, whichever is the later edition or revision.

.3 All references to the standards and publications noted in this Specification which are not referenced by the local building code or by the standards published by the Canadian Standards Association shall be to the latest edition and revision published to the date of this Specification.

.4 Standards referenced by the publications noted in this Specification apply even if they are not included in the list. Where such reference is made, it shall be to the latest edition and revision published.

.5 Where there are differences between the Agreement and the standards, codes, or acts, the most stringent provisions govern.

.6 ASME B18.2.1 Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Bolts.

.7 ASME B18.6.1 57.15mm GRK Fasteners #10 Coated SILVER Countersinking-Head Star R4 Multipurpose Wood Screws

.8 ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.9 ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.

.10 ASTM A563 Standard Specification for Carbon and Alloy Steel Nuts.

.11 ASTM A653/A653M Standard Specification for Steel Plate, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.12 ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

.13 ASTM D2898 Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing.

.14 ASTM D3201/D3201M Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Based Products.

.15 ASTM D5664 Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant- Treated Lumber.

.16 ASTM D6841 Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber.

.17 ASTM E84 Standard Test Method for Surface Burning Characteristics of Building

.18 ASTM F1667 Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

.19 AWPA M2 Standard for the Inspection of Preservative-Treated Products for Industrial Use.

.20 AWPA M4 Standard for the Care of Preservative-Treated Wood Products.

.21 CAN/ULC S101 Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.22 CSA B111 Wire Nails, Spikes and Staples.

.23 CSA G40.20-13/G40.21 General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel.

.24 CSA O80 Series-15 Wood Preservation.

.25 CSA O86 Engineering Design in Wood.

.26 CSA O141 Softwood Lumber.

.27 NLGA (National Lumber Grades Authority) Standard Grading Rules for Canadian ULC Fire Resistance Directory.

1.5 PERFORMANCE REQUIREMENTS

.1 Fire-Resistance Ratings: As tested in accordance with CAN/ULC S101; testing by a qualified agency.

.1 Identify products with appropriate markings of applicable testing agency.

.2 Indicate design designations from ULC's "Fire Resistance Directory" or from the listings of another qualified testing agency.

1.6 SUBMITTALS FOR REVIEW

.1 Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

.1 Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

.2 Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials.

.3 For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.

.4 For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

.5 For connectors, include installation instructions.

.2 Samples: One of each different type of wood member exposed to view, minimum 300mm in size, illustrating wood grain, stain, and finish.

.3 Provide letter outlining steps to be taken during construction to ensure adequate weather protection of wood structures.

1.7 SUBMITTALS FOR INFORMATION

.1 Material Certificates: Issued by an approved grading agency.

.1 For dimension lumber specified to comply with minimum allowable unit stresses, indicate species, grade, and design values for each use.

.2 For exposed items, omit grade stamp and provide certificates as to species, grade, stress grade, seasoning, moisture content, and other evidence as required to show compliance with the Specifications.

.2 Evaluation Reports: For the following, from CCMC or ICC-ES:

.1 Wood-preservative-treated lumber.

.2 Fire-retardant-treated lumber

.3 Power-driven Fasteners

.4 Post-installed anchors

.5 Metal framing anchors

.3 Qualification Data: For installer and testing agency.

1.8 QUALITY ASSURANCE

.1 Grading Agencies: Certified by NLGA

Installer Qualifications: Company specializing in performing the Work of this Section with minimum three years of experience.

Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.9 DELIVERY, STORAGE, AND PROTECTION

.1 Protect wood products from weather during transit to Project site.

.2 Stack wood products flat with spacers beneath and between each bundle to provide air

.3 circulation.

.4 Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

.5 Store plywood panels flat and level.

.6 Keep finish faces inward and cover stacks to protect from bumping and abrasion.

.7 Protect tongue and groove plywood panel edges and corners.

.8 Protect panels from sunlight, water, or excessive humidity.

.9 Store materials off the ground.

Part 2 Products

2.1 DIMENSION LUMBER FRAMING

.1 Grading Rules: NLGA. All softwood lumber shall conform to CSA 0141 and CSA 086.

- .1 Factor mark each piece of lumber with grade stamp of grading agency unless noted otherwise
- .2 Do not grade stamp lumber exposed to view. Deliver to site with certificates as to species, grades, stress grades, seasoning, moisture content, and other evidence as required to show compliance with the Specifications.

.2 Dress lumber, S4S, unless noted otherwise.

.3 Maximum Moisture Content: 19% unless noted otherwise.

.4 Joists, Built-Up Beams, and Blocking: SPF #2, or any species and grade with minimum design values as follows:

- .1 Modulus of elasticity, E: 9,500 MPa.
- .2 Bending, Fb: 11.8 MPa.

2.2 MATERIALS

.1 No. 2 Structural Grade, Western Red Cedar, square edge, face surface smooth.

2.3 WOOD-PRESERVATIVE-TREATED LUMBER

.1 Preservative Treatment by Pressure Process: CSA O80; Use Category UC3.2 for exterior construction not in contact with ground, and Use Category UC4.1 for items in contact with ground.

.1 Preservative chemicals must be acceptable to authorities having jurisdiction and contain no arsenic or chromium.

.2 For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

.3 For exposed items indicated to receive an applied finish, use process that does not include water repellents or other substances that might interfere with application of indicated finishes.

.4 For items that will remain unfinished, use process that includes water-repellent treatment.

.2 After treatment, redry materials to a maximum moisture content of 19%. Do not use material that is warped or that does not comply with requirements for untreated material.

.3 Mark treated materials with treatment quality mark of an inspection agency acceptable to authorities having jurisdiction. For exposed items indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

.4 Treat items only as indicated on the Drawings.

.5 Any fasteners in contact with treated wood must be hot-dip galvanized or stainless steel.

2.4 WOOD TREATMENT

.1 Cedar treatment: Clear, transparent oil-based finish containing no water, to be approved by the Design Professional.

2.5 FASTERNERS AND ACCESSORIES

.1 Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture. Where rough carpentry is exposed to weather (during or after construction), in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153 or of Type 304 stainless steel.

.2 Nails, Spikes, and Staples: ASTM F1667.

.3 Power-Driven Fasteners: Fasteners with a CCMC or ICC-ES evaluation report acceptable to authorities having jurisdiction.

.4 Through Bolts and Anchor Bolts: ASTM A307, Grade A; with ASTM A563 hex nuts and, where indicated, flat washers, hot dip galvanized to ASTM A153.

.5 Wood Screws: ASME B18.6.1 or as specified on the Drawings.

.6 Lag Screws: ASME B18.2.1.

.1 All lag screws to be machined threaded, not cast threaded.

.2 Pre-drilled hole sizes in wood members for lag screws to be in accordance with CSA O86.

.3 Lag screws are acceptable only where specifically indicated on the Drawings. Do not substitute lag screws for self-tapping wood screws.

.7 Post-Installed Anchors: Fastener systems with a CCMC or ICC-ES evaluation report acceptable to authorities having jurisdiction.

.8 Self Drilling Dowels:

.1 See section 2.5.2

.9 Steel brackets, supports and other miscellaneous items as specified in Section 05 50 00 – Metal Fabrications

.10 Steel Connections and Brackets: ASTM A36/A36M ASTM A167, galvanized steel.

.11 Hardware: ASTM A325M ASTM A325, structural quality, galvanized steel.

.12 Galvanized Coating for Untreated Wood: Hot dip galvanized to ASTM A653/A653M, Z275 zinc coating designation.

.13 Galvanized Coating for Treated Wood: Hot dip galvanized to ASTM A653/A653M, Z275zinc coating designation.

.14 Nails, Spikes, and Staples: ASTM F1667.

.15 Laminating Adhesive: CSA-O112, ASTM D2559.

.16 Metal Primer: Zinc-rich.

2.6 METAL FRAMING ANCHORS

.1 Provide products with design loads, as published by manufacturer, that meet or exceed those indicated.

.1 Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

.2 Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

.3 Provide framing anchors with minimum metal thickness of 1.3mm unless noted otherwise.

2.7 MISCELLANEOUS MATERIALS:

.1 Moisture Barrier: Any of the following:

.1 Light gauge metal.

.2 Asphalt-impregnated building paper.

.3 Closed-cell foam gasket material, 6mm thick

.4 Saturated felt roll roofing.

.5 Polyethylene, 6 mil thick.

.2 Proprietary Products:

.1 Proprietary products shown on the Drawings have been selected and specified based on the manufacturer's representation.

.2 The Design Professional shall not become guarantor of the product.

.3 Install proprietary products in strict conformance with the manufacturer's recommendations.

.4 Contractor is responsible for proper workmanship during installation.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that site conditions are ready to receive work and opening dimensions are as indicated on Shop Drawings and instructed by the manufacturer.

.2 Examine supporting construction in areas to receive wood framing, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of the Work.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

.1 Comply with Part 9 of the National Building Code of Canada unless noted otherwise.

.2 Provide temporary shores, guys, braces, and other supports during erection to keep wood framing secure, plumb, and in alignment against wind loads, seismic loads, temporary construction loads, and loads equal in intensity to design loads.

.1 Any failure to make proper and adequate provisions for stresses during erection shall be solely the responsibility of the Installer.

.2 Fasteners required for erection purposes are the responsibility of the Contractor and are to be included in the bid.

.3 Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

.4 Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

.5 Comply with AWPA M4 and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2 for applying field treatment to cut surfaces of preservative treated lumber.

.1 Use inorganic boron for items that are continuously protected from liquid water.

.2 Use copper naphthenate for items not continuously protected from liquid water.

3.3 SITE APPLIED WOOD TREATMENT

.1 Apply preservative treatment to manufacturer's written instructions.

.2 Brush apply two (2) coats on wood requiring cutting or drilling after treatment.

.3 Allow preservative to dry prior to erecting members.

3.4 ERECTION TOLERANCES

.1 For rectangular floor areas, the corner-to-corner diagonal measurements should not deviate from each other by more than 13mm or 0.25% of the length of the shortest side of the rectangle, whichever is greater.

.2 Posts:

.1 Plumbness: 0.25% of wall height (1:400) maximum deviation from plumb measured at any point along the wall.

.2 Position: plus or minus 10mm from theoretical at base.

.3 Length: plus or minus 10mm from theoretical.

.4 Stud Spacing: plus or minus 16mm from specified.

.3 Walls:

.1 Plumbness: 0.25% of wall height (1:400) maximum deviation from plumb measured at any point along the wall.

.2 Position: plus of minus 10mm from theoretical at base.

.3 Length: plus or minus 10mm from theoretical

.4 Stud spacing: Plus or minus 16mm from specified.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Soil materials.

.2 Soil Amendments.

.3 Placement of soil materials.

.4 Finish grading.

.5 Stockpile Cleanup.

1.2 RELATED SECTIONS

.1 Section 01 22 00 Measurement Schedule.

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 32 93 10 - Trees, Shrubs and Ground Cover Planting.

1.3 REFERENCES

.1 Government of Alberta

.1 Design Guidelines for Erosion and Sediment Control, Appendix C – Erosion and Sedimentation Control, Best Management Practices (BMP) - #34 (a-c)
www.transportation.alberta.ca

.2 AASHTO T 180-15 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 inch) Drop.

.3 American Society for Testing and Materials (ASTM)

.1 ASTM D2487 – 17 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

.2 ASTM D698-12e2 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3)).

.3 ASTM D1557-12e1 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

.4 ASTM D2167-15 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

.5 ASTM D6938-15 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS FOR REVIEW

.1 Analysis of Planter Topsoil Material:

.1 Provide intended use, type of mulches to be applied, type of topsoil, and the quality of drainage list to Consultant for approval, including all below listed features:

.1 Nitrate-nitrogen (total nitrogen maximum 0.33%)

.2 Available phosphorus (ranging from 20 to 60 mg/kg)

.3 Available potassium (ranging from 300 to 1000 mg/kg)

.4 pH (ranging from 6.0 to 7.5)

.5 Salinity (EC) (Salinity reading not exceeding 1.5 dS/m)

.6 Micronutrients (boron, chlorine, copper, iron, manganese and zinc)

.7 Organic matter (not less than 4% for clay loams and not less than 2% for sandy loams, to a maximum of 10%)

.8 Texture (Loam, Sandy loam, silt loam, sand clay loam are acceptable)

.9 Free of subsoil contamination, roots, and weeds.

.10 Free of rocks greater than 75 mm in diameter. Volume of rock (75mm dia. And under) not to exceed 20%..

.2 Planting topsoil shall not be delivered to site until Consultant has approved soil type selection.

.2 Soil Amendments

.1 Supply labels from all specified Soil Amendments and those recommended from testing of Soil Material.

.2 Soil Amendment Type A:

.1 Prior to placement, prepare one (1) five-gallon bucket of Soil Amendment Type A onsite with the Consultant for inspection and approval. A scale is required for measurement of materials.

.2 Supply labels from all specified components of Soil Amendment Type A.

.3 Compost

.1 Submit to the Consultant the source and type of compost.

.3 The Municipality of Drumheller will provide testing on soil materials to be disposed off site. The Contractor shall not dispose of soil materials off-site until approval from The Municipality of Drumheller has been obtained.

1.5 QUALITY CONTROL

.1 Provide materials of each type from same approved source throughout the Work.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Place planting soil and mulch in dry weather.

.2 Do not spread soil when ground is frozen, excessively wet, or otherwise in a condition detrimental to the Work, as determined by the Consultant.

Part 2 Products

2.1 SOIL MATERIALS

.1 Planting Soil: Top Dress mixture.

.1 50mm thick of 50% topsoil and 30% compost amendments.

.2 Topsoil to meet identified values from the soil testing submittals.

.1 Soil amendments shall be added as determined by the results of the soil tests and as directed by the Consultant.

.2 30% Class A Compost that shall:

.1 Be approved by the Consultant prior to use.

.2 Commercially prepared compost shall meet the CCME Guidelines for Compost Quality.

.3 Be substantially free from coliform, pathogens, and chemical or organic contaminates that may be detrimental to plant or animal health.

.4 Contain less than 0.5% by volume of contaminants such as rocks, plastic, metal or glass.

.5 Not exceed a 25:1 to 30:1 total carbon to nitrogen ratio.

.6 Well rotted wood residuals are acceptable provided the total carbon to total nitrogen ratio above is not exceeded.

.3 5% Perlite

.4 120 g of Mycorrhizae fungi per cubic meter of mix (endo types, multiple species)

2.2 SOIL AMENDMENTS

.1 Soil amendments shall be used only if recommended by the Consultant. The Consultant will recommend specific soil amendments based on soil testing results if soil does not meet specified requirements.

.2 Supply and apply soil amendments at rate determined from topsoil analysis for all native topsoil as directed by the Consultant.

.3 Soil Amendment Types:

.1 Soil Amendment Type A: Soil Amendment to be placed at the base of all potted plants per Section 32 93 10 Trees, Shrubs and Ground Cover Planting.

.1 Imported from off-site sources and mixed with the following materials (this mix will fill 11 – 5-gallon buckets, each bucket should cover 2.5 m2 and will cover approximately 28 m2 at approximately 10 mm depth):

.1 6.00 kg of organic fertilizer, 4-4-4 with: alfalfa meal, bone meal, blood meal, glacial rock dust, sulphate of potash, humate, rock phosphate, greensand, kelp meal, gypsum, (Gaia Green Products Ltd. All Purpose 4-4-4) or approved equivalent.

.2 0.12 kg of Mycorrhizae fungi (endo types, multiple species).

.3 0.80 kg of granular humate complexes (Gaia Green Products Ltd, Fossilized Carbon Complex) or approved equivalent.

.4 7 Litres of quality worm castings.

.4 Water:

.1 Clean, fresh, and free of substances or matter which could inhibit vigorous growth of plants.

Part 3 Execution

3.1 TOPSOIL PLACEMENT

.1 Verify the following prior to starting work:

.1 Existing conditions.

.2 Substrate base has been contoured and compacted, uneven area and low spots are eliminated, and debris, root, branches, stones in excess of 500mm in size are removed.

.2 Scarify substrate surface to depth of 200 mm where topsoil is scheduled to be placed. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

.3 Place topsoil after Consultant has accepted subgrade.

.4 Wherever practical, Topsoil shall be transferred directly to placement.

.5 Place topsoil in areas where planting, sodding, and seeding is required as shown on the drawings to thickness as scheduled. Place topsoil during dry weather.

.6 Place topsoil and grade no more than 48 hours prior to seeding or sodding.

.7 Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.

.8 For Topsoil depths greater than 300mm, place Topsoil at no greater than 150 mm lifts and lightly compact.

.9 Placed Topsoil shall be allowed to settle or shall be lightly compacted such that it is firm against deep footprints prior to planting, seeding or sodding. Compaction shall not be more than necessary to meet this requirement. Mechanical compactors are not permitted.

.10 Topsoil shall be placed and spread manually to prevent damage to existing infrastructure.

.11 Remove roots, weeds, rocks, and foreign material while spreading.

.12 Consultant to inspect and approve placed Topsoil and finish grades prior to planting.

.13 Install Plant Material immediately after placing Topsoil.

.14 Protect Topsoil from disturbance and compaction during remainder of construction and maintenance period.

.15 Lightly compact placed topsoil.

.16 Stockpile as specified in Section 31 12 13 Site Clearing.

3.2 STOCKPILE CLEANUP

.1 Remove stockpile, leave area completely free of excess material upon completion of the project.

.2 Leave area in a clean and neat condition. Dispose of roots, debris and other deleterious materials at an off-site waste disposal facility.

.3 Vegetate stockpile area per the Contract Documents. If needed, scarify compacted areas prior to planting.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Aggregate materials for base course.

.2 Aggregate surface materials.

1.2 RELATED SECTIONS

.1 Section 01 22 00 Measurement Schedule.

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 31 05 13 - Soil Materials.

.4 Section 32 12 16 – Asphalt Paving.

1.3 REFERENCES

.1 ASHTO M 147-65(2012) - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses.

.2 AASHTO T 180-15 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 inch) Drop.

.3 ASTM C-117 for gravel gradation.

.4 ASTM C136/A136M-14 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.5 ASTM D698-12e2 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3)).

.6 ASTM D1557-12e1 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

.7 ASTM D2167-15 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

.8 ASTM D2487-11 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

.9 ASTM D4318-10e1 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 SUBMITTALS

.1 Refer to Section 01 33 00 - Submittal Procedures.

.2 Provide sample of colour of decorative aggregate screenings

.3 The following submittals are for information only; do not request these submittals if the information submitted will be assessed for acceptability.

.4 Materials Source: Submit name of local material suppliers.

.5 Aggregate size, gradation, and quality documentation for all product materials.

1.5 QUALITY ASSURANCE

.1 Document that the gravel aggregate size, gradation and quality are met.

.2 The Municipality of Drumheller may request the documentation at any time, require additional documentation or measurements or quality testing.

.3 The Municipality of Drumheller, at its cost, may undertake independent measurements and quality testing.

.4 If tests indicate materials do not meet specified requirements, change material or material source and retest.

.5 Provide materials of each type from same source throughout the Work.

Part 2 Products

2.1 GRAVEL BASE COURSE MATERIALS

.1 Light Duty Concrete Paving base course: 25mm crushed gravel, compacted to 98% SPD.

.2 Heavy Duty Concrete Paving base course: 80mm crushed gravel sub-base, compacted to 98% SPD.

2.2 FINE AGGREGATE MATERIALS

.1 Surface Crusher Fines Paving

.1 10 mm aggregate custom ground for fines; golden/tan; free of silt, loam, friable or soluble materials, and organic matter; graded to ASTM C136/A136M; within the following limits:

Sieve Size Particle Size	Percent % of Passing
10mm	100%
#4	90% – 100%
#8	55% – 80%
#16	40% – 70%
#30	25% – 50%
#200	6% – 15%

.2 If the gradation of crusher fines does not meet the 6% passing the #200, clay fines may be added and mixed with the aggregate to do the job.

.3 Contractor to provide samples of all crusher fines and clay additives for approval.

Part 3 Execution

3.1 PREPARATION

.1 Stake alignment of plaza prior to excavation. Layout to be approved by the Consultant prior to excavation.

.2 Proof roll subgrade with the Consultant prior to start of any gravelling. Provide Consultant with 48 hours notice for sub-grade proof roll. If the sub-grade is deemed unsuitable for placement of the gravel layers, perform remedial measure to achieve 98% SPMDD.

.1 Decision for remedial measures will be made at the time of construction if required once the proof roll has been conducted but could include placing a geogrid on the subgrade or additional sub cut and placement of geogrid.

.3 Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

.4 Do not place fill on soft, muddy, or frozen surfaces.

3.2 AGGREGATE PLACEMENT

.1 Process, handle and transport aggregates to avoid segregation, contamination and degradation.

.2 Place gravels to the lines and grades provided.

.3 Do not place granular materials on snow, ice or frozen surfaces. Place base granular material on prepared subgrade, geotextile fabric, and/or sub-base granular materials.

.4 Do not place the base material until the subgrade or sub-base materials have been inspected, surveyed, proof rolled, tested and approved by the Consultant.

.5 Place the base material uniformly on the approved sub-base material to compacted depths specified. Do not place the base materials in layers exceeding 150 mm compacted depth. Shape each layer to a smooth contour and compact to the specified density before placing the next layer. Areas that become segregated during spreading will be removed and replaced at the Contractor’s expense. Compact the final layer of the base material to proper grade and cross-section.

.6 Maintain the base material to the specified section, grade and condition required for the placement of other materials or as required by the Consultant. Provide interim drainage to prevent damages to the Work or the causing of unstable conditions due to high moisture contents.

.7 Place gravels to the depths a noted on the drawings. Supply and compact gravels to 98% Standard Proctor Maximum Dry Density (SPMDD).

.8 Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

.9 Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

.10 Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.3 TOLERANCES

.1 Flatness: Maximum variation of 6 mm measured with 3 m straight edge.

.2 Scheduled Compacted Thickness: Within 6 mm.

.3 Variation from Design Elevation: Within 10 mm.

3.4 FIELD QUALITY CONTROL

.1 Compaction testing will be performed to AASHTO T 180.

.2 If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

.3 Frequency of Tests: every 150mm lift.

3.5 STOCKPILING

.1 Stockpile materials on site at locations designated by Consultant.

.2 Stockpile in sufficient quantities to meet Project schedule and requirements.

.3 Separate differing materials with dividers or stockpile apart to prevent mixing.

.4 Prevent intermixing of soil types or contamination.

.5 Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

.6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Consultant within 48 hours of rejection.

3.6 STOCKPILE CLEANUP

.1 Refer to Section 31 05 13 Soil Materials.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Cutting, grading, filling, rough contouring, compacting the site for earthwork, site structures, pathways and planting beds.

1.2 RELATED SECTIONS

.1 Section 02 41 19 - Selective Demolition.

.2 Section 31 05 13 - Soil Materials.

.3 Section 31 05 16- Aggregate Materials.

1.3 PRICE AND PAYMENT PROCEDURES

.1 Unit Prices: Section 01 22 10 - Measurement Schedule.

1.4 REFERENCES

.1 The City of Calgary Parks Development Guidelines and Standard Specifications: Roads Construction. (Current edition).

.2 AASHTO T 180-15 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 inch) Drop.

.3 ASTM C136/A136M-14 - 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 (12 400 ft-lbf/ft^3 (600 kN-m/m^3)).

.5 ASTM D1556/D1556M-15 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

.6 ASTM D1557-12e1 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

.7 ASTM D2167-15 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

.8 ASTM D2419-14 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

.9 ASTM D2434-68(2006) - Standard Test Method for Permeability of Granular Soils (Constant Head).

1.5 Submittals

.1 Submit minimum of 0.5 kg samples of each type of excavated or imported fill materials to be used. Forward samples to the appointed testing firm. Pack tightly in containers to prevent contamination.

.2 Ensure such test results clearly indicate type of materials and composition, hardness, compatibility and suitability for proposed usage.

1.6 QUALITY ASSURANCE

.1 Perform Work in accordance with the following documents:

.1 Calgary Parks Development Guidelines and Standard Specifications: Landscape Construction. (Current edition) or approved equivalent.

.2 Calgary Parks Development Guidelines and Standard Specifications: Roads Construction. (Current edition) or approved equivalent.

.2 If conditions are discovered by the Contractor that vary from those indicated in the documents, notify the Consultant.

.3 Examine the site for amounts of fill or excavation required, and also the amount of topsoil to be removed; be fully aware of all existing conditions on the site and make allowance for the same.

.4 If conditions are discovered by the Contractor that vary from those indicated in the documents, notify the Consultant.

.5 Existing underground service on the site must remain in use during construction. Excavate with extreme care in areas of these services to avoid disruption.

.6 Verify all existing utilities by contacting the appropriate authorities on ALBERTA 1st call 1-800-242-3447, toll free. Do not start excavation until after this has been done.

Part 2 Products

2.1 MATERIALS

.1 All imported fill and base materials are to be reviewed at the source and accepted by the Consultant prior to hauling operations

.2 Site-excavated soil: approved site-excavated material free of vegetation, organics, or other deleterious matter; includes only site-excavated material removed by required or authorized excavation. Do not use frozen soil for fill or backfill.

.3 Imported fill material: suitable soil free from organic or other deleterious matter to the approval of the Consultant; required only if there is not sufficient site excavated soil for backfilling and grading operations.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that survey bench mark and intended elevations for the Work are as indicated.

3.2 PREPARATION

.1 Identify required lines, levels, contours, and datum.

.2 Stake and flag locations of known utilities.

.3 Locate, identify, and protect utilities that remain, from damage.

.4 Notify utility company to remove and relocate utilities as required.

.5 Protect above and below grade utilities that remain.

.6 Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 PROTECTION

.1 Schedule and execute all the work in a careful manner with due consideration for the public and to prevent injury to any persons and damage to any property. Avoid interference with the use of, or passage to and from, adjoining buildings and facilities.

.2 Stake and flag locations of known utilities. Before commencing excavation or backfill, determine the exact location of all underground utility installations such as electrical services, storm sewer, sanitary sewer, water pipes, gas lines and power cables. Contact all utility companies and give notice of the extent of excavation and other site work involved.

.3 Repair all damage to any utilities, at the Contractor's expense, to the satisfaction and in accordance with all rules, regulations and specifications of municipal and provincial authorities and any other authority having jurisdiction.

.4 Follow the requirements of the ATCO Crossing Agreement for work within the ATCO Utility Right of Way.

3.4 SUBSOIL EXCAVATION

.1 Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded.

.2 Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.

.3 Remove subsoil not being reused from site.

.4 When excavating through roots, perform work by hand and cut roots with sharp axe.

.5 Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key placed fill material to slope to provide firm bearing.

.6 Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

.7 Minimize disturbance to the subgrade soil.

.8 Stockpile as specified in Section 31 05 13 Soil Materials.

3.5 FILLING

.1 Install Work in accordance with the following documents:

.1 Calgary Parks Development Guidelines and Standard Specifications: Landscape Construction. (Current edition) or approved equivalent.

.2 Calgary Parks Development Guidelines and Standard Specifications: Roads Construction. (Current edition) or approved equivalent.

.2 Use site-excavated material for backfill and fill where not specified otherwise. Use imported fill material only if there is not sufficient site excavated soil. The material is to be accepted by the Consultant before use.

.3 Fill areas to contours and elevations with unfrozen materials.

.4 Place fill material on continuous layers and compact in maximum 200 mm lifts.

.5 Maintain optimum moisture content of fill materials to attain required compaction density.

.6 Slope grade away from building minimum 2%, unless noted otherwise.

.7 Make grade changes gradual. Blend slope into level areas.

.8 Remove surplus fill materials from site.

.9 Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent fill material.

.10 Scarify and proof roll subgrade surface to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

.11 Place fill material on continuous layers and compact.

.12 Employ a placement method that does not disturb or damage other work.

.13 Maintain optimum moisture content of fill materials to attain required compaction density.

.14 Make grade changes gradual. Blend slope into level areas.

3.6 TOLERANCES

.1 Top Surface of Subgrade: Plus or minus 30 mm from required elevation.

3.7 FIELD QUALITY CONTROL

.1 If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

.2 Frequency of Tests: per lift of subgrade, and upon inspection of final subgrade preparation.

END OF SECTION

1. General

1.1 SCOPE

.1 The Contractor shall provide maintenance and warranty of all plant material. The maintenance work of this section shall include watering, weeding, pruning and other incidental maintenance deemed necessary to ensure healthy plant material for a period of two growing seasons upon completion of planting. The warranty shall cover any defects in materials and workmanship.

1.2 RELATED SECTIONS

.1 Section 31 05 13 Seeding

.2 Section 32 93 10 Trees, Shrubs and Groundcover

1.3 REFERENCE STANDARDS

.1 “Pruning in Alberta” published by Alberta Agriculture, Food and Rural Development Agdex 270/24-1.

.2 “Backyard Pest Management” published by Alberta Agriculture, Food and Rural Development, Agdex 605-2.

.3 “Manual for Maintenance of Grounds” published by Alberta Infrastructure.

.4 Calgary Parks Development Guidelines and Standard Specifications: Landscape Construction (Current Edition).

1.4 HOURS OF WORK

.1 Perform maintenance work during regular working hours of 07:00 to 18:00, Monday to Friday.

.2 Obtain The Municipality of Drumheller's approval to perform maintenance outside of regular working hours.

1.5 SUBMITTALS

.1 Landscape Maintenance Log

- .1 Keep daily maintenance log throughout the agreement. Complete log during each day of maintenance activity.
  - .1 Submit legible and signed copy of maintenance log data to Municipality of Drumheller and the Consultant each week for verification.
- .2 Failure to maintain and submit log as required may:
  - .1 Delay payment of invoices to Contractor,
  - .2 Extend Maintenance Period at no additional cost to The Municipality of Drumheller,
  - .3 Result in payment reductions or back charges for maintenance.
- .3 Record and update all maintenance activities daily including:
  - .1 Date and time of activities,

.2 Location where activities were carried out,

.3 Name of each employee and supervisor on site.

.4 Applications of all chemical pesticides including:

.1 Target weed, insect or other pest,

.2 Mode, type, and rates of application, and;

.3 Weather conditions

.4 Results.

.2 Arborist Qualifications.

.1 Submit certification demonstrating arborist responsible for all tree pruning is certified with the International Society of Arborists.

.3 Herbivore Repellent Schedule:

.1 Provide schedule for application of herbivore repellent for approval. Schedule should include assumptions for additional applications due to adverse weather and/or additional need for control. Winter application is required per manufacturer's recommendations.

1.6 DAMAGE TO PROPERTY

.1 Any damage to existing turf vegetation, hard surfaces, structures or services cause as a result of the Contractor work methods and practices for plant material maintenance shall be reinstated or repaired to the satisfaction of the Consultant. The cost of such reinstatement or repair shall be solely at the Contractor's expense.

.2 Repair and pay for damages caused by contractor's personnel and equipment during the term of the Agreement.

.3 Immediately report damages to The Municipality of Drumheller.

.4 Obtain The City's approval for repairs and replacements. Return grass areas, plants, equipment, paved surfaces and buildings to their original condition before damage.

.5 Mechanical damage to trees and shrubs including tearing of bark, improper pruning of plants, and damages resulting from improper use of chemical pesticides and fertilizers will be considered damage.

.6 Complete repairs and replacements within seven days from date of approval given for repair or replacement.

1.7 QUALITY ASSURANCE

.1 Throughout the maintenance and warranty period, units of plant material that are found to be unacceptable will be replaced by the Contractor at the earliest opportunity. At the discretion of the Consultant, plant material that is identified as dead or in a poor or diseased condition shall be immediately removed from the site. All replacement plant material shall be as per the size indicated on the drawings. Note all plant replacements in the maintenance logs.

.2 When maintenance and replacement of plant material is required during the warranty period, all such costs will be the responsibility of the contractor. No additional costs will be borne by The Municipality of Drumheller.

.3 Where, in the opinion of the Consultant, the Contractor has failed to complete obligations as detail in this Specification; and further, fails to rectify said deficiency within two days of written notification from the Consultant, The Municipality of Drumheller reserves the right to complete the work and deduct incurred expenses from monies owing to the Contractor.

.4 Replacement for plants supplied by The Municipality of Drumheller will not be covered under warranty, but maintenance of this plant material is required.

1.8 DURATION OF MAINTENANCE PERIOD

.1 Maintain exterior landscape work as from the time of planting until two (2) growing seasons after issuance of the Certificate of Construction Completion (CCC).

.1 Prior to issuance of the Certificate of Construction Completion (CCC) the Contractor shall maintain, at no additional expense to the City, all soft landscaping constructed by the Contractor.

.2 Following Issuance of the Certificate of Construction Completion (CCC), the Contractor shall maintain all soft landscaping for a period of two (2) growing seasons, beginning the day following issuance of the CCC for planted areas by the City to the Contractor.

.2 Plants that are replaced under warranty shall be maintained and warranted for an additional period of one year, or for the remaining duration of the Maintenance Period, whichever is greater. Ball and burlap trees that are replaced shall be warrantied for the full warranty period, regardless of when it was replanted.

.3 The Maintenance Period may be extended at the discretion of The Municipality of Drumheller and / or the Consultant, at no additional charge, as a result of the following:

.1 Failure to submit proper documentation for the Landscape Maintenance Log;

.2 When inadequate site maintenance occurs;

.3 When the maintenance schedule is not followed;

.4 When unsatisfactory work is performed.

.4 The Municipality of Drumheller, at its discretion, may negotiate with the Contractor an additional two (2) years of maintenance upon the termination of this Agreement.

1.9 WARRANTY

.1 The Contractor hereby warrants that the plant material will remain free of defects for a period of two (2) years after planting. The Contractor shall make all corrections, adjustments and replacements required as a result of failure of all plant material.

.2 The Municipality of Drumheller and the Consultant will perform Warranty inspections in the Spring and Fall of every year throughout the Warranty Period. Any plant material identified for replacement by The Municipality of Drumheller during any Warranty Inspection shall be replaced with new plant material within thirty (30) days unless otherwise directed by The Municipality of Drumheller.

.3 Replacement plant materials shall meet the requirements of the initial planting. All plants must be in healthy and vigorous growing condition at the end of the Maintenance Period.

.4 Plants that are replaced under warranty shall be maintained and warranted for an additional period of one year, or for the remaining duration of the Maintenance Period, whichever is greater. Ball and burlap trees that are replaced shall be warrantied for the full warranty period, regardless of when they were replanted.

.5 Contractor shall remove from the site any plant material which has been determined by the Consultant to have died or failed to grow in a satisfactory manner during the Warranty or Maintenance Period. Dead or diseased plant material will not be stored on site.

.6 The Contractor shall replace dead plant material immediately after removal from the site.

.7 The The Municipality of Drumheller and the Consultant, accompanied by the Contractor, will undertake an End-of-Warranty inspection to identify plant material that will be replaced before the issuance of Final Acceptance Certificate (FAC).

.8 The Warranty does not apply to damage or failure due to vandalism or theft that occurs after planting.

1.10 ACCEPTANCE

.1 Refer to Current Municipality of Drumheller Standards for Landscape Construction or approved equivalent.

2. Products

2.1 WATER

.1 Water shall be free from any contaminants that could adversely affect plant growth.

2.2 FERTILIZER

.1 Organic foliar spray may be used to help plants establish as approved by the Consultant.

2.3 TOPSOIL

.1 Any additional topsoil shall original from the same source as the initial approved material.

2.4 PLANT PROTECTION MATERIALS

.1 Herbivore Repellent:

.1 Organic herbivore repellent such as Plantskydd, Bobbex or approved equivalent: repellent treatment sprayed on trunks and limbs and leaves.

.2 Rodent Guards

.1 Rodent guards shall originate from the same source as the initial approved product.

2.5 MULCH

.1 Mulch shall originate from the same source as the initial approved product.

3. Execution

3.1 GENERAL WORKMANSHIP

.1 The Municipality of Drumheller and / or The Consultant will be the “Sole Judge” for assessing the Contractor’s maintenance and workmanship performance.

.2 Schedule timing of operations to growth, weather conditions and use of site. Do each operation continuously and complete within reasonable time period.

.3 Do not perform work in any location or manner that may endanger the health and safety of the public.

.4 No maintenance equipment, materials or other miscellaneous items may be store on site unless approved the Consultant.

.5 Supply sufficient experienced manpower to complete all required maintenance services as scheduled to good horticultural practice and in accordance with specifications.

.6 Perform all landscape maintenance services in the Agreement under the site direction and supervision of an experienced and certified Landscape Journeyman Gardener or a qualified experienced person knowledgeable in horticulture meeting The Municipality of Drumheller’s approval.

.7 Provide appropriate well-maintained equipment, tools and other materials necessary to complete all maintenance services to acceptable horticultural standards.

.8 Collect and dispose of excess material, debris, and other extraneous material resulting from the maintenance operation shall be removed from the site daily to approved municipal disposal site immediately following collection.

.9 Coordinate maintenance practices with The Municipality of Drumheller. Alter maintenance schedules, when necessary, to accommodate The Municipality of Drumheller 's site activities.

.10 Contact City immediately when specified maintenance requirements cannot be met for any reason.

.11 Ensure that all workers use appropriate personal protective equipment where there is a danger of injury and as required by Alberta’s Occupational Health and Safety Act. Essential protective equipment must meet CSA approval.

3.2 ESTABLISHMENT AND MAINTENANCE SCHEDULE

Growing Season	Phase	Timeline	Summary of Work
Growing Season 1	Initial Establishment	1- 30 days following planting completion	• Water daily as required • Control weeds as specified • Perform diagnostic inspection weekly • Re-seed / re-plant bare spots as required
	Routine Maintenance	30 days to end of growing season 1	• Water daily as required • Control weeds as specified, more as required to prevent seed ripening • Re-seed / re-plant bare spots as required
	Fall Cleanup	End of growing season 1	• Autumn preparation • Warranty inspection
Growing Season 2	Spring Startup	Start of growing season 2	• Spring clean-up • Warranty Inspection
	Routine Maintenance	Start of Growing Season 2 to end of season 2	• Water daily as required • Control weeds as specified, more as required to prevent seed ripening • Re-seed / re-plant bare spots as required
	Fall Cleanup	End of growing season 2	• Autumn preparation • Warranty inspection
Growing Season 3	Spring Startup (if autumn CCC)	Start of growing season 3	• Spring clean-up • Warranty inspection
	Total Completion	Two years after construction completion	• End-of-Warranty inspection

3.3 MULCHING

.1 In the autumn and spring of the maintenance prior, the Contractor shall replace wood mulch to meet the specifications.

3.4 WEEDING

.1 All weeds and grasses within saucers, beds, and mulched areas around plant material shall be removed by hand. Weed whackers or whipper-snippers shall not be used to remove weeks in the vicinity of plant materials.

.2 The application of herbicides shall not be permitted unless otherwise approved the Consultant. Removed weeds and grasses shall be disposed of the project site.

.3 At a minimum, weeding shall occur bi-weekly intervals, with the first operation occurring at the beginning of May and the final operation occurring in early October. All areas shall be weeded immediately prior to the final warranty inspection.

3.5 INTEGRATED PEST MANAGEMENT (IPM) AND INFESTATIONS

.1 Monitor plant material throughout the maintenance period for any sign of disease or insect problems. Ensure immediate treatment to control and repair damage.

.2 Manage and control pests using IPM principles that utilizes regular monitoring to identify pests, considers various control options (biological, physical, cultural, mechanical and chemical) before implementing an effective, economical and environmentally acceptable solution to prevent and suppress pests.

.3 Contractor to work with the Consultant to identify appropriate weed treatment approaches.

.4 General Considerations:

.1 Cultural or non-toxic methods of control shall be given first priority.

.2 Prior to chemical pesticide applications, obtain written approval from The Municipality of Drumheller.

.3 Do not use D.D.T or other chemicals prohibited by Agriculture Canada. All chemicals must be approved by the Design Professional prior to use.

.4 Determine susceptibility of plant species to pesticide damage before any chemical application.

.5 Use equipment and containers free of harmful residues not related to specific control measures applicable to situation.

.6 Perform disease, weed and insect control, in accordance with Municipal, Federal and Provincial chemical application legislation. Provide The Municipality of Drumheller with three days advance notification of intent to apply chemical pesticides on site.

.7 Prepare and apply chemical according to manufacturer's specification. Minimize drift at all times. Erect signs to notify building occupants and the public regarding pesticide use on site.

.8 Carry out treatment with regard to climatic effect on surroundings and occupants of buildings.

.9 Provide ongoing and knowledgeable communications with The Municipality of Drumheller regarding identified pests on site, controls implemented to manage pest and outcome of treatment actions. Record all information in maintenance log.

.5 Insect and Disease Control:

.1 Make weekly inspection of lawns and plants for insect and disease infestations. Apply chemicals based on development stage of insects' life cycles.

.2 Repair and pay for damages caused by application of chemicals.

.3 Effectiveness of treatment program to be determined by inspection by The Municipality of Drumheller. Repeat as required.

3.6 TREE, PERENNIAL AND SHRUB MAINTENANCE

.1 Plant Establishment

.1 Plugs and perennials:

.1 Contractor shall warrant that 90% of installed plants shall remain free from any defect or failure and withstand climatic, maintenance and normal operational conditions after the first growing season.

.2 Contractor shall warrant that 80% of installed plants shall remain free from any defect or failure and withstand climatic, maintenance and normal operational conditions at the end of the Maintenance Period.

.2 Trees:

.1 Contractor shall warrant that 100% of installed trees shall remain free of any defect or failure and withstand climatic, maintenance and normal operational conditions at the end of the Maintenance Period.

.2 Maintenance of Plant Beds and Tree Wells:

.1 Remove and dispose of debris, rubbish, animal waste, dead and unhealthy plants on a regular weekly basis.

.2 Maintain a weed free appearance in plant beds and tree wells.

.3 Re-spread disturbed mulch or replace to maintain original mulch depth of 50mm min.

.4 Install planting media where settlement occurs to maintain original grades.

.5 Respread disturbed mulch or replace to maintain original mulch depth of 50mm min.

.3 Soil Conditioning:

.1 Maintain correct soil conditions in plant beds to promote optimum growth and health for each plant.

.2 Supply and add soil amendments and organic matter according to soil analysis.

.4 Staking and Tree Protection:

.1 Keep stakes and guy wires taut and plants plumb for duration of Maintenance Period

.2 Remove support stakes and staking accessories when plants become self-supporting or when directed by the Consultant.

.3 Install and keep plant protection materials in proper repair and adjustment when required or directed by The Municipality of Drumheller.

.5 Pruning:

.1 Obtain and prune in accordance with proper practices and standards described in “Pruning in Alberta” and as directed by The Municipality of Drumheller. The Municipality of Drumheller will be the "Sole Judge" for assessing all pruning operations.

.2 Only qualified arborists shall conduct pruning activities.

.3 Prune to provide natural branching structure and to encourage healthy natural growth pattern for each plant.

.4 Prune plants with sharp pruning tools and equipment using qualified, experienced and trained personnel. Sterilize pruning tools after completion of each plant cutting operation and especially after pruning any diseased plant.

.5 All improperly pruned plants or plants pruned by Contractor without City’s authorization will be subject to rejection. Contractor will replace rejected plants or rectify improper pruning as determined and directed by City.

.6 Prune plants to remove all dead, diseased, damaged and injured branches, crossing or rubbing branches, stubs, double leaders, suckers, watersprout and multiple shoots.

.7 Do not strip lower branches, raise up crown of trees, shear or top any plant. All such improper pruning will result in rejection of work unless authorized by City. Promptly replace all rejected plants at no cost to the City.

.6 Plant Replacement:

.1 Promptly replace plants that die or become unhealthy during the maintenance and warranty periods. All replacement plants shall be noted in maintenance log.

.2 All plants must be in healthy and vigorous growing condition at end of Maintenance Period.

.7 Fertilization Requirements in Early Spring:

.1 Adjust fertilizer requirements according to soil test analysis or when directed by The City. Use a slow release non-soluble fertilizer.

.2 Apply 10-6-4 or similar fertilizer at rate of 18 g/25 mm of caliper per tree from trunk to dripline of tree.

.3 Apply 16-10-9 or similar fertilizer spikes at rate of one spike per 25 mm of caliper per tree at dripline of tree.

.4 Apply 10-6-4 or similar fertilizer at rate of 5 kg/100 m2 into upper surface of plant beds.

.5 Apply adequate water after fertilizing to ensure penetration of fertilizer into soil and roots.

.8 Watering of Plants:

.1 It is the Contractor's responsibility to water the planted areas as required to supplement precipitation in order to maintain optimal growing conditions.

.2 Watering amount guidelines:

.1 Typical shrub/perennial watering amount: 5 gallons per #1 or #2 container shrub.

.2 Typical tree watering amount: 5 gallons per inch of trunk diameter per tree.

.3 Watering amounts may vary based on soil moisture testing.

.3 Soil moisture testing will be conducted by the Contractor using a soil moisture probe with a range from 0-100%.

.1 Acceptable soil moisture before watering would be 60%.

.2 If testing is above 60%, do not water to prevent waterlogged roots.

.3 Plants require watering if reading is below 60% and watering for that session should continue until a 100% reading is achieved with the probe.

.4 Test soil for each plant at 3 random locations to 12"depth. Tests are to be done immediately before and after every watering.

.5 Fill out maintenance logs with test results, including duration and frequency of watering. These logs will be submitted a minimum of once a month to City Project Manager, Park Inspector and Project Team.

.6 Random moisture inspections will be conducted by the Project Team to verify compliance.

.4 Supply clean water and water truck including all accessories to adequately water and maintain plants where water is not available or inadequate.

.5 Deep water trees and shrubs thoroughly on a regular basis using a deep root feeder to maintain adequate moisture level within root systems and ensure healthy vigorous growing conditions.

.6 Supply clean water and water truck including all accessories to adequately water and maintain plants where water is not available or inadequate.

3.7 SPRING CLEAN-UP

.1 Maintenance Period will commence in early May on such date as mutually agreed upon by the Municipality of Drumheller and the Contractor.

.1 Complete spring clean-up by May 15 or as soon as working conditions are favourable.

.2 Remove and dispose of protective coverings and mulch, if used, in winter protection.

.3 Clean, collect and remove sand, gravel, salt and debris accumulated during winter months from maintained turf, seeded areas and planting beds. Dispose in approved municipal disposal site.

.4 Remove and store off site: snow fence, stakes and sand containers.

.5 Rake, clean and remove all dead vegetation, leaves, debris, and snow mould from turf areas.

.6 Cut back previous year's growth of ornamental grasses close to root mass to allow for regeneration of new growth.

.7 Roll turf areas lightly where grass has lifted due to frost action.

.8 Clean planting beds and planters of debris and dead plant material and remove from site.

.1 If no mulch is used, loosen and lightly cultivate soil without disturbing roots of permanent plantings.

3.8 AUTUMN PREPARATION

.1 Deep water trees and shrubs between October 1 to 15. Continue deep watering plants where unseasonal warm dry temperatures are experienced.

.2 Protect plants from rodent, animal and sun damages by use of appropriate materials. Use chemical repellent, rodent wire mesh, plastic perforated spiral strip, burlap, or other approved material.

.3 Erect snow fencing where directed by The Municipality of Drumheller.

.4 Remove and dispose, at the Contractor's expense, fallen leaves and debris from planting beds, seeded areas and turf areas, unless directed otherwise by the Design Professional or The Municipality of Drumheller.

.1 If The Municipality of Drumheller has an organics compost collection program, the Design Professional may dispose of organic matter at the City's collection facility with The Municipality of Drumheller written consent.

3.9 CLEANLINESS OF SOFT LANDSCAPING

.1 Keep grounds in clean and tidy condition on a routine basis or as a need for clean up occurs and when directed by The Municipality of Drumheller.

.2 Collect and dispose of excess material and debris to municipal disposal site weekly.

.3 Make weekly inspections for vandalism and damage. Immediately report vandalism and damage to The Municipality of Drumheller.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Asphalt Paving

1.2 RELATED SECTIONS

.1 Section 01 22 00 – Measurement Schedule.

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 31 12 13 – Site Clearing.

.4 Section 31 05 16 – Aggregate Materials.

1.3 REFERENCES

.1 ASTM D946/D946M-09a - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.

.2 AI (Asphalt Institute) MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot Mixes (6th Edition).

.3 AI (Asphalt Institute) MS-4 - The Asphalt Handbook (2007 Edition).

.4 AI (Asphalt Institute) MS-19 - Basic Asphalt Emulsion Manual (4th Edition).

.5 AI (Asphalt Institute) MS-22 - Construction of Hot Mix Asphalt Pavements (2nd Edition).

1.4 QUALITY ASSURANCE

.1 In event of discrepancy between Drawings and The Municipality of Drumheller Standard Specifications, seek clarification from Consultant to determine which is to govern.

.2 Obtain materials from same source throughout.

1.5 SITE CONDITIONS

.1 Ambient Conditions:

.1 Do not place asphalt when ambient air or base surface temperature is less than 4 degrees C, or surface is wet or frozen.

.2 Place bitumen mixture when temperature is not more than 8 degrees C below bitumen suppliers bill of lading and not more than maximum specified temperature.

Part 2 Products

2.1 MATERIALS

.1 Aggregate for Sub-Base Course: As specified in Section 31 05 16 – Aggregate Materials.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that compacted substrate is dry and ready to support paving and imposed loads.

.2 Verify gradients and elevations of base are correct.

.3 Inform Consultant of unacceptable conditions immediately upon discovery.

.4 Proceed with installation only after unacceptable conditions have been remediated.

3.2 PREPARATION

.1 Stake alignment of trails prior to excavation. Layout to be approved by the Consultant prior to excavation.

.2 Proof roll subgrade with the Consultant and Geotechnical Representative prior to start of any gravelling. Provide Consultant with 48 hours notice for sub-grade proof roll. If the sub-grade is deemed unsuitable for placement of the gravel layers, perform remedial measure to achieve 98% SPMDD as directed by the Geotechnical Engineer.

.1 Decision for remedial measures will be made at the time of construction if required once the proof roll has been conducted but could include placing a geogrid on the subgrade or additional sub cut and placement of geogrid.

.3 Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

.4 Do not place fill on soft, muddy, or frozen surfaces.

3.3 SUB-BASE

.1 Install per section 31 05 16 Aggregate Materials.

3.4 ASPHALT PAVEMENT

.1 Place topsoil along edge of pathway to create smooth transition between path surface and surrounding grades.

3.5 TOLERANCES

.1 Flatness: Maximum variation of 6 mm measured with 3 m straight edge.

.2 Scheduled Compacted Thickness: Within 6 mm.

.3 Variation from True Elevation: Within 13 mm.

3.6 PROTECTION OF FINISHED WORK

.1 Immediately after placement, protect pavement from mechanical injury for 3 days or until surface temperature is less than 60 degrees C.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Concrete sidewalks, pathways, plazas, integral curbs, gutters.

1.2 RELATED SECTIONS

.1 Section 31 05 16 - Aggregate Materials.

.2 Section 31 22 13 - Rough Grading: Preparation of site for paving and base.

.3 Section 31 22 19 - Finish Grading: Preparation of subsoil at pavement perimeter.

1.3 PRICE AND PAYMENT PROCEDURES

.1 Unit Prices: Section 01 22 10 - Measurement of quantities affecting this section.

1.4 REFERENCES

.1 ACI 301-10 - Specifications for Structural Concrete for Buildings.

.2 ASTM C94/C94M-15a - Standard Specification for Ready-Mixed Concrete.

.3 ACI 306R-10 - Guide to Cold Weather Concreting.

.4 ASTM C260/C260M-10a - Standard Specification for Air-Entraining Admixtures for Concrete.

.5 ASTM D1751-04(2013)e1 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (No extruding and Resilient Bituminous Types).

.6 ASTM D1752-04a(2013) - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.7 CSA-A23.1-09/A23.2-14 - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.8 CSA-A3000-13 - Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.9 CSA-G30.18-09 (R2014) - Carbon Steel Bars for Concrete Reinforcement.

.10 CAN/CSA-S269.3-M92 (R2013) - Concrete Formwork.

.11 CSA-W186-M1990 (R2012) - Welding of Reinforcing Bars in Reinforced Concrete Construction.

.12 City of Calgary Guidelines and Standard Specifications Landscape Construction, Roads Construction (current edition).

1.5 PERFORMANCE REQUIREMENTS

.1 Pedestrian paving: Designed for sidewalk at 35 MPA.

1.6 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submittal procedures.

.2 Provide mix design for concrete for each class of concrete.

.3 Submit proposed mix design to Consultant for review prior to commencement of work.

.4 Product Data: Provide data on joint devices, attachment accessories, admixtures.

.5 Samples: Submit two (2) sample panels each for Concrete Paving A and Concrete Paving B, 500 mm x 500 mm in size, illustrating colour, broom finish, saw cuts.

1.7 MOCK-UP

.1 Section 01 45 00: Requirements for mock-up.

.2 Concrete: Prepare two (2) 3m x 3m sample panels of each concrete type illustrating colour, broom finish, sandblast finish, and sawcuts.

.3 Locate where directed by Consultant.

.4 Approved mock-up may remain as part of the Work.

.5 Performance testing shall follow review of mock-up. Testing procedures to be directed by Consultant and may include tests designed to review response to pressure, weight, abrasion, adhesion, and impact.

1.8 QUALITY ASSURANCE

.1 Perform work in accordance with requirements of City of Calgary Guidelines and Standard Specifications Landscape Construction, Roads Construction (current edition).

.2 Perform Work in accordance with CSA-A23.1/A23.2.

.3 Acquire cement and aggregate from same source for all work.

.4 Conform to CSA-A23.1/A23.2 when concreting during hot weather.

.5 Conform to CSA-A23.1/A23.2 when concreting during cold weather.

1.9 REGULATORY REQUIREMENTS

.1 Conform to the Municipality of Drumheller or the City of Calgary Guidelines where applicable and Standard Specifications Landscape Construction, Roads Construction (current edition).

1.10 SITE CONDITIONS

.1 Ambient Conditions:

.1 Do not place concrete when base surface temperature is less than 4 degrees C, or surface is wet or frozen unless proper heating and hording measures are in place.

Part 2 Products

2.1 FORM MATERIALS

.1 Joint Filler: per specifications or approved equivalent.

2.2 REINFORCEMENT

.1 Reinforcing Wire: per specifications or approved equivalent. CONCRETE MATERIALS

.2 Concrete Materials: per specifications or approved equivalent.

.3 Concrete Paving - Standard Grey (Ref. 1-03, 1-02):

.1 Concrete Materials: per specifications or approved equivalent.

.2 Cement: CSA-A3000, standard grey

.3 Fine and Coarse Mix Aggregates: Refer to CSA-A3000.

.4 Water: Potable, not detrimental to concrete.

2.3 CONCRETE MIX - BY PERFORMANCE CRITERIA

.1 Mix and deliver concrete to ASTM C94/C94M.

.2 Provide concrete to the following criteria:

.1 Compressive Strength: 20.7 MPa at 7 days.

.2 Compressive Strength: 32 MPa at 28 days.

.3 Slump: 30-100 mm.

.4 Minimum Water/Cement Ratio: 0.50.

.5 Air Entrained: 4-8%.

.3 Use accelerating admixtures in cold weather only when approved by Consultant. Use of admixtures will not relax cold weather placement requirements.

.4 Use calcium chloride only when approved by Consultant.

.5 Use set retarding admixtures during hot weather only when approved by Consultant.

2.4 SOURCE QUALITY CONTROL

.1 Tests on cement and aggregates will be performed to ensure conformance with specified requirements.

.2 Test samples to CSA-A23.1/A23.2.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify base conditions before starting work.

.2 Verify compacted subgrade and granular base is acceptable and ready to support paving and imposed loads.

.3 Verify gradients and elevations of base are correct.

3.2 SUBBASE

.1 Subbase: Prepare subbase in accordance with the the Municipality of Drumheller's Guidelines and Standard Specifications, Roads Construction (current edition) or approved equivalent.

3.3 PREPARATION

.1 Moisten base to minimize absorption of water from fresh concrete.

.2 Coat surfaces of manhole or catch basin frames with oil to prevent bond with concrete pavement.

.3 Notify Consultant minimum twenty-four (24) hours prior to commencement of concreting operations.

3.4 FORMING

.1 Place and secure forms to correct location, dimension, profile, and gradient.

.2 Assemble formwork to permit easy stripping and dismantling without damaging concrete.

.3 Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.5 REINFORCEMENT

.1 Place reinforcement as indicated.

.2 Interrupt reinforcement at expansion joints.

3.6 PLACING CONCRETE

.1 Place concrete as specified.

3.7 JOINTS

.1 Place expansion joints as indicated. Align curb, gutter, and sidewalk joints.

.2 Provide sawn joints as required.

.3 Saw cut contraction joints 5 mm wide at an optimum time after finishing. Cut one third (1/3) into depth of slab.

3.8 EXPOSED AGGREGATE

.1 Wash exposed aggregate surface with clean water and scrub with stiff bristle brush exposing aggregate to match sample panel.

3.9 FINISHING

.1 Concrete Paving Light and Heavy Duty: Sandblast to smooth.

.2 Curbs and Gutters: Light broom.

.3 Direction of Texturing: Parallel to pavement direction unless otherwise indicated.

.4 General:

.1 Provide a surface finish on all exterior horizontal concrete slabs that has a coefficient of friction when measured in accordance with ASTM C1028 not less than 0.60 for level surfaces and 0.80 for surfaces sloped 1:20 or more.

.2 Finish slabs so they do not deviate more than 6.3 mm in 3.0 metres from a straight edge. Finish elevations to within 3.2 mm elevations shown or required to match adjacent existing conditions.

.3 Finish edges and surfaces smooth, true and clean.

.4 Apply finish to slabs as soon as the concrete can support the weight of the workmen.

.5 Increase the humidity of the air directly above the concrete surface, prior to and during finishing operations by adding a fine fog mist of water to the air with mist nozzles when atmospheric conditions (temperature, humidity, and wind) are such that rapid evaporation of mixing water from the concrete is likely to occur.

.5 Medium Sandblast Finish:

.1 Applies to all slabs and indicated to receive a Sandblast Finish.

.2 Complete the work required under “Preliminary Steps for Other Finishes.”

.3 Blasting should occur within seven days of placing the concrete.

.4 Apply a medium abrasive sandblast to the entire surface with No. 60 to 30 grit sand as selected to evenly texture the surface and expose the coarse aggregate by approximately 5mm from the surface.

.6 Detail Work: Applies to all concrete flatwork and to exposed top edges of all formed concrete. 5mm radius on all exposed edges of slabs, curbs, and other exposed horizontal edges unless a formed chamfered edge is called for. Repeat tooling with each floating or troweling operation.

.1 Apply a Trowel finish to the top of the formed walls, curbs and machine bases.

3.10 JOINT SEALING

.1 Separate pavement from vertical surfaces with joint filler per Contract Documents.

.2 Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

3.11 TOLERANCES

.1 Section 01 73 00: Tolerances.

.2 Maximum Variation of Surface Flatness: 6 mm in 3 m.

.3 Maximum Variation From True Position: 6 mm.

3.12 FIELD QUALITY CONTROL

.1 Section 01 45 00: Field review.

.2 Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.

.3 Three concrete test cylinders will be taken of each class for every 50 or less cu m of concrete placed each day.

.4 One (1) additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.

.5 One slump test will be taken for each set of test cylinders taken.

.6 Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.13 PROTECTION OF FINISHED WORK

.1 Protect installed work.

.2 Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

.3 Do not permit vehicular, pedestrian or cyclist traffic over pavement for seven (7) days minimum after finishing.

.4 Do not permit vehicular, pedestrian or cyclist traffic over pavement until 75% design strength of concrete has been achieved.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Custom site furnishings.

.2 Site furnishings.

1.2 RELATED SECTIONS

.1 Section 01 22 00 Measurement Schedule.

.2 Section 01 33 00 – Submittal Procedures.

.3 Refer to 06 10 00 – Rough Carpentry.

1.3 SUBMITTALS FOR REVIEW

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for furniture and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Shop Drawings:

.1 Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

.2 Installation procedures to be reviewed and approved by Consultant prior to installation, including timing and sequence of foundations and finishing.

.1 Stage footings and installation procedure.

1.4 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect furnishings from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 WASTE RECEPTACLE

.1 Maglin 200 Trash Container Heavy Duty Steel Flat Bar 32 Gallon Liner Capacity (Gallons), no side ash receptacle, no side opening / side opening, bronze 14 matte finish or approved equivalent.

2.2 CUSTOM RAMMED EARTH PLANTER

.1 Planter to be provided by Innovative Earth per contract drawings,or approved equivalent supplier.

.2 Contractor to provide color options for review and approval by Consultant.

.3 Final placement of planter to be determined on site by Consultant.

2.3 CUSTOM RAMMED EARTH SEAT – LARGE, MEDIUM, SMALL

.1 Planter to be provided by Innovative Earth per contract drawings, or approved equivalent supplier.

.2 Contractor to provide color options for review and approval by Consultant.

.3 Final placement of seating to be determined on site by Consultant.

2.4 CUSTOM RAMMED EARTH FAÇADE FOR PUBLIC WASHROOM

.1 Facade to be provided by Innovative Earth per contract drawings, or approved equivalent supplier.

.2 Contractor to provide color options for review and approval by Consultant.

.3 Contractor to provide shop drawings indicating connection of façade to the public washroom for review and approval.

2.5 EDGE RESTRAINT

.1 A606-4 11 Gauge, 203.2mm x 3048" weathering steel landscape edging or approved equivalent.

.2 11 Gauge 304.8mm weathering steel landscape edging stakes and corners.

.3 All weathering steel to arrive untreated, natural rusting will occur via weather exposure.

2.6 BARRIER GATE

.1 3.35m Round Barrier Gate from Gate Depot including post, lock, and hot dip galvanized fittings, or approved equivalent.

2.7 PEDESTRAIN LIGHT

.1 Luminus SC655 Series SCOPO-LED outdoor light and supporting HD 235.0-273.0 B.C.D (mm) pole base. QPPCDBZ – Dark Bronze (RAL-8019) finish. TT400 Mounting System and applicable fasteners.

.2 Contractor to coordinate installation with electrical contractor.

2.8 STAGE

.1 Consultant will inform contractor of stage location.

.2 Stage to be provided by Contractor per contract drawings, or approved equivalent supplier.

.3 Contractor to provide engineer stamped shop drawings for stage surface, cladding, footings and all accompanying support structures.

2.9 WASTE BIN ENCLOSURE FENCE

.1 Waste bin enclosure fence to be provided by Contractor per contract drawings, or approved equivalent supplier.

.2 Contractor to provide 2 x 300mm wood slat samples for review and approval by Consultant.

2.10 GREY RUBBER WHEEL STOP

.1 Product SKU # 06FY1770-GY 1828.8mm x 152.4mm x 101.6mm Grey Rubber Wheel Stop and accompanying HRDWR-3WS/WK 355.6mm rebar spikes.

2.11 PREFABRICATED WASHROOM FACILITY

.1 CXT Standard Cortez Washroom Prefabricated unit including stainless steel fixtures, electronic flush, 2 Baby change tables, engineer stamped drawings and shipping, or approved equivalent supplier.

.2 Contractor responsible for washroom site prep, lifting building in place, electrical and plumbing permits, hook up utilities, site clean-up during and post installation.

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 exterior site furnishing installation in accordance with Shop Drawings and/or manufacturer's written instructions.

.1 Visually inspect substrate in presence of the Consultant.

.2 Inform the Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from the Consultant.

3.2 PREPARATION

.1 Locate and protect utility lines.

.2 Notify and acquire written acknowledgment from utility authorities before beginning installation Work.

3.3 INSTALLATION

.1 Assemble furnishings in accordance with Shop Drawings and/or manufacturer's written recommendations.

.2 Fabricator is responsible for ensuring structural integrity of wood, metal, footings, and hardware connections for all site furniture.

.3 Touch-up damaged finishes to approval of The Municipality of Drumheller and/or Consultant.

3.4 CLEANING

.1 Progress Cleaning:

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion, remove surplus materials, rubbish, tools and equipment.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by site furnishings installation.

END OF SECTION

GENERAL

1.1 Scope of Work

.1 Supply and installation of irrigation point of connection, controller, sleeves, sprinklers, electrical control valves, copper and plastic piping, wire control system, sprinklers and all related items necessary to provide a properly operating automatic irrigation system to cover the applicable landscape.

.2 Prepare and submit As-Built Irrigation Plans and Operation Manual.

.3 Provide a one (1) year Maintenance & Warranty period following award of Substantial Completion.

1.2 Related Work Specified Elsewhere

.1	General Requirements	Section 01 00 06
.2	Piping, Valves, & Fittings (except plumbing)	Section 23 21 13.23
.3	Electrical Hangers Supports and Inserts	Section 26 05 29
.4	Electrical Conduits	Section 26 05 33.13
.5	Operation and Maintenance of Planting	Section 32 01 90
.6	Plant Material and Soils Mixes (Exterior)	Section 32 93 00
.7	Spreading and Grading Topsoil	Section 31 22 19.13

1.3 Quality Assurance

.1 The Contractor performing this work shall be a Certified Irrigation Contractor (CIC) certified by **The Irrigation Association** (IA), and have experienced, trained and insured personnel qualified to carry out the 'Work' of this project. "Qualified" implies certified, formally trained, or licensed.

.2 A written guarantee of the installed irrigation system shall be provided to the Owner, which will cover workmanship and materials for a minimum of one (1) year from the date of Substantial Completion. The Contractor shall warranty maintenance on the system for a minimum of one (1) year.

1.4 Submittals

.1 The Contractor shall submit evidence of project personnel having certification in High-Density Polyethylene (HDPE) Butt-Fusion prior to commencing the work.

.2 The Contractor shall submit shop drawings, product literature, and specifications for approval by the Consultant prior to construction.

.3 The Contractor shall submit a suitably scaled As-Built drawing of the irrigation system, prepared in AutoCAD 2013 (or newer version). All components of the irrigation system shall be shown as installed; with clear measurements from an identifiable reference point (datum) to the location of all the various components that make up the irrigation system.

.4 The Contractor shall submit the As-Built drawing prior to issue of Substantial (or Construction) Completion. The Contractor shall maintain the As-Built drawing throughout the Maintenance & Warranty Period and issue a revised As-Built Irrigation Plan at Final Acceptance.

.5 The Contractor is to prepare and deliver to the Consultant within ten (10) calendar days prior to completion of construction the following information on two (2) hard copies bound in 3-ring cover binders and one (1) digital copy saved to a USB drive.

.1 Index sheet stating Contractor's address and telephone number, list of equipment with name and addresses of local manufacturer's representatives.
.2 Catalogue and parts sheets for all materials and equipment installed under this Contract.
.3 The Contractor warranty document.
.4 Complete operating and maintenance instructions on all major equipment.
.5 Construction details.
.6 Complete trouble-shooting guides to common irrigation problems.
.7 Fall shut-down (Winterization) and spring start-up procedures.
.8 Chart of approximate watering times for spring, summer, and fall showing the proposed run times for each zone relative to differing weather conditions and plant water requirements.
.9 Maintenance materials to be furnished:

.1 Two (2) sets of tools required for removing, disassembling, and adjusting each type of sprinklers installed on this project.

.10 The above-mentioned equipment shall be turned over to the Owner at the conclusion of the project. Before Final Inspection can occur, evidence that the Owner has received material must be shown to the

1.5 Test Reports and Permits

.1 The Contractor shall submit to the Consultant at Substantial (or Construction) Completion all applicable Permits required for the work.

1.6 Site Conditions

.1 Verify the existence and location of all utilities and services prior to commencement of the work.

.2 Consult with the Consultant to adjust the design, if necessary, to suit existing site conditions and grades prior to commencement of the work.

.3 Protect from damage, existing landscape features, plant material, structures, irrigation work in progress, and the work of other trades.

.4 Ensure that sequencing of the irrigation work is in coordination with the works of other trades and that sleeves are installed where appropriate.

.5 Ensure all piping sleeves are installed where appropriate.

1.7 Supervisor

.1 At the time of Tender, submit to the Consultant the name of the proposed Superintendent, together with information regarding their qualifications and previous Superintendent experience on projects of similar size and scope. The chosen Superintendent must be acceptable to the Owner and Consultant.

.2 The Superintendent shall devote their time exclusively to the Work of this Contract and shall remain on the job during normal working hours. Additionally, the Superintendent shall attend all site coordination and progress meetings.

.3 Superintendents will not be changed during the progress of the Work, without prior written permission of the Owner.

.4 At the discretion of the Consultant and/or the Owner, any employee of the Contractor (or Sub-contractor) who is deemed unfit or unsuitable to carry out the Work, shall be dismissed from the Work for the remainder of the project.

1.8 Regulations

.1 The Contractor shall be responsible for obtaining all permits and licenses applicable to the irrigation system and shall include costs for such permits and licenses in the bid prices.

.2 The Contractor shall ensure that there is compliance with all applicable codes and regulations for all Work performed during the project.

1.9 Notification to the Consultant

.1 Report to the Consultant, through the Construction Manager, any conditions or defects encountered on the site during or prior to construction, upon which the Work of this section depends, and/or which may adversely affect its performance.

.2 Notify the Consultant, through the Construction Manager, for inspection, testing and approval of the irrigation system as specified in this section. Provide the Consultant and Construction Manager minimum 48 Business hours' notice prior to required inspections or meetings.

1.10 Measurement and Payment

.1 Payments will be on a unit basis. Payment shall include the supply and installation of all materials shown on the drawings, and all materials incidental to the completion of the Work. Payment shall also include all costs for the Maintenance & Warranty of the system.

.2 Progress claims submitted by the Contractor shall be based on the unit prices submitted or the percentage of work completed in the Tender Form at the date of the claim and require approval by the Consultant and Construction Manager prior to payment.

.3 No payment shall be made for materials delivered and stored onsite that have not been properly installed and tested

PRODUCTS

2.1 High Density Polyethylene (HDPE) Pipe

.1 The pipe shall be PE4710 PR160 Standard Dimension Ratio and shall be listed by the Plastic Pipe Institute as a PE4710 or PE3608 resin with a hydrostatic basis (HDB) of 160psi for water at 23º C. The material shall comply with ASTM D1248 as a Type III Class C, Category %, Grade P34 material and with ASTM D3350-14 as a 445474C cell material for PE4710 and 345464C cell material for PE3608. The material shall have a design factor of 0.63 for water service at 23º C.

.2 Pipe pressure rating, sizing, and jointing methods shall be as per drawings and spec.

2.2 Polyvinylchloride (PVC) Pipe

.1 Polyvinylchloride pipe shall conform to CSA B137.3. All pipe shall be in new condition extruded from virgin materials and continuously and permanently marked with the manufacturers name, material, size, pressure rating and CSA approval.

.2 Series 200 shall be used in 25mm size pipe and Series 160 in 38mm and larger irrigation pipe.

.3 Jointing methods: solvent weld for 50mm diameter and smaller size pipe.

.4 Fittings for PVC pipe shall be schedule 40 PVC suitable for solvent welding or threaded connections.

.5 Threaded connections of PVC to metal shall have male threads on the PVC and female threads on the metal.

.6 PVC pipe cement and primer combination shall be as recommended by the manufacturer to be suitable for the materials and application, when used as directed, and meet local codes.

2.3 Copper Pipe

.1 The copper pipe shall be as specified on the drawings. All copper piping within the building and into the soft landscape is to be designed and installed by the mechanical contractor.

.2 The material and type shall be in accordance with Local, Provincial and Canadian plumbing/building Codes and Standards.

.3 Copper fitting(s) shall be in accordance with Local, Provincial and Canadian plumbing/building Codes and Standards.

.4 Copper pipe shall be used for irrigation mainline & lateral piping within the building

2.4 Electric Control Valves

.1 The control zone valve shall be a Normally Closed 24 VAC 50/60 cycle Hz solenoid globe pattern design. The valve pressure rating shall not be less than 175 psi. The valve shall have a flow rate of 0.1 - 40 gpm and pressure loss should not exceed: 5 psi.

.2 Diaphragm shall be of nylon reinforced nitrile rubber. The valve shall have both internal and external manual open/close control (internal and external bleed) to manually open and close the valve without electrically energizing the solenoid. The valve's internal bleed shall prevent flooding of the valve box. The valve shall have a flow control handle.

.3 The valves shall house a fully-encapsulated, one piece solenoid. The solenoid shall have a captured plunger with a removable retainer for easy servicing and a leverage handle for easy turning. These 24 VACS 50/60 Hz solenoid

2.5 Sprinklers

.1 The Hunter Pro-Spray Nozzle shall be used or approved equivalent.

.2 The Nozzle shall be installed on a Hunter Pro-Spray PRS30 Spray Body

2.6 Valve Boxes

.1 Valve boxes shall be made of heavy-duty UV resistant plastic.

.2 Valve boxes shall be sized and installed as shown on the drawings or details. Provide valve box extensions where required

.3 Valve boxes shall have a locking lid.

.4 Valve boxes shall be installed with minimum 350mm depth, 25 mm diameter washed gravel at bottom of box.

.5 Valve boxes shall be Tan in color.

2.7 Irrigation Controller

.1 The irrigation controller shall be a Hunter ACC2 (Part #A2C-1200-M) controller.

.2 Irrigation controller shall include flow sensing.

.3 Hunter Wireless Rain-Clik Sensor shall be installed as per drawings and manufacturers recommendations.

2.8 Control Wire

.1 Wires shall conform to the Canadian Electric Code and any other regulatory conditions, which may govern this type of installation.

.2 Control wire from the controller to valves shall be minimum 14-gauge direct burial type, CSA approved type PE direct burial wire, Paige Electric P7079D or equivalent, and conforming to Canadian Electrical Code. Control wires shall be any colour other than white (reserved for common) and green (reserved for ground).

.3 Common wire shall be CSA approved 12-gauge direct burial type PE wire, Paige Electric P7079D, or equivalent white-colour wire is reserved exclusively.

.4 All wire splices shall be made with 3M DBR-Y Splice kits.

2.9 Flow Sensor

.1 The Flow Sensor shall be as shown on the drawing.

2.10 Electrical Products

.1 All electrical products shall be CSA approved and bear the CSA label. Alternatively, where a product does not bear the required CSA label, it shall be approved in writing, by the authority having jurisdiction.

.2 Wire conduit shall be Grey PVC non-metallic electric conduit. All electrical conduit inside the building is to be installed by the electrical contractor.

.3 Pull and Junction Boxes: installed according to CSA C22.2 No.40-1973 (R1981), sheet steel, screw-on or hinged covers.

2.11 Backfill Material

.1 Native Excavated Material: Clean native excavated soil, free from organic matter, stones larger than 25 mm, building debris, and other foreign substances.

.2 Sand: Natural coarse sand.

.3 Gravel: 19 mm diameter crushed gravel.

2.12 Miscellaneous Components

.1 Miscellaneous Components such as air relief valves, pressure regulators, etc., shall be indicated by type, size and location on the drawings or details. Install according to the manufacturer's specification.

EXECUTION

3.1 Recycling and Protection of Existing Work

.1 Protect existing and proposed landscape features and building elements from damage or contamination. Coordinate with the work of other trades to reduce waste, mixing of waste, soil compaction or erosion, overspray, or run-off from cleaning operations.

3.2 Layout

.1 All staking and measurements shall be taken from permanent objects, buildings, or survey bench markers and not from objects such as turf boundaries, which are subject to change.

.2 As staking progresses, all additions, changes, or equipment locations, shall be noted on the copy of the "working drawings" from which the "As-Built" drawings will be prepared.

.3 System layout changes necessitated by unforeseen conflicts or changes to the site conditions shall be approved in writing by the Consultant.

3.3 Excavation

.1 Notify the Construction Manager immediately if the waterproofing gets damaged in all instances.

.2 Keep excavations free of water.

.3 Excavate the pipe trench to minimum of 350 mm of cover over pipe for laterals.

.4 Excavate the pipe trench to minimum of 450 mm of cover over pipe for Mainlines.

.5 Trenching, laying of pipe and backfilling shall be continuous so that the amount of open trench at the end of each work day is minimized. Any open trench or other excavations shall be barricaded and marked with high visibility flagging tape.

3.4 Pipe Laying

.1 Lay the pipe in a straight line between fittings, placing it on firm soil at all points in the trench.

.2 Prevent dirt from entering exposed ends of pipe.

.3 Install piping inside of sleeves where shown on drawings or details.

3.5 Backfilling

.1 Backfill excavated subgrade material in 150 mm lifts, placing and compacting to minimum 85% S.P.D. until 150 mm below finish grade.

3.6 Water Line Flushing

.1 Flush all irrigation water lines prior to connection with drip irrigation header pipe to remove any accumulated dirt and other foreign materials.

3.7 Controller

.1 Install the Hunter controller in a location acceptable to the Consultant and Client.

.2 A copy of the As-Built Irrigation Plan reduced by 50% size shall be laminated and permanently fastened inside the controller cabinet next to the controller.

.3 The Contractor shall program the controller with start and run times as per the irrigation schedule. The Contractor shall seasonally adjust the irrigation controller to meet, but not exceed, the plant water requirements.

.4 The Contractor shall inform the Consultant of any deviations to the irrigation schedule from that shown on the drawings.

3.8 Wire

.1 All wiring shall be installed in accordance with Local, Provincial and National Electrical Codes

.2 All 24Vac wire cable and spare wire that is to be installed inside the building shall be installed in conduit.

.3 Irrigation control wiring shall be installed in grey, non-metallic electrical conduit and installed adjacent to the water pipe. The irrigation control wiring cannot be placed directly in the sleeves with the water pipe when routing the irrigation control wiring between the planters.

3.9 Clean Up

.1 The job site shall be kept in a neat, clean and orderly condition at all times during the irrigation installation.

.2 All scrap and excess materials shall be regularly removed from the site and not buried in trenches.

3.10 Inspections and Testing

.1 The Contractor shall provide the Consultant and Construction Manager with minimum 48 hours' notice prior to scheduled inspections.

.2 Test irrigation main line for leaks prior to connection of any laterals.

3.11 Winterization

.1 When the system is to be shutdown for the winter season, the Contractor shall completely drain and winterize the system.

.2 The Contractor shall not leave drain valves and test cocks open for the winter.

3.12 Spring Startup

.1 In the following spring after Substantial Completion, the Contractor shall set the system in operation by May 1 or as weather permits.

.2 Once the irrigation system has been put in operation for the season, the Contractor is required to submit and implement a proposed watering schedule for the irrigation season. This schedule shall be adjusted as required throughout the season to ensure that plant water requirements are met but not exceeded.

.3 The Contractor shall perform all maintenance and repair procedures necessary to ensure system is completely functional and operating to original design intent.

3.13 Maintenance

.1 Protect & maintain the entire irrigation system throughout the Maintenance & Warranty Period. Include replacement of any defective materials and complete all repairs necessary due to faulty workmanship.

.2 The Maintenance & Warranty Period shall be one (1) year following Substantial Completion.

.3 The Contractor shall be responsible for conducting the winterization and spring start-up of system until the irrigation system is awarded the Final Acceptance Certificate.

3.14 Final Acceptance

.1 The complete irrigation system will be inspected by the Consultant and the Construction Manager (or Owner) at the completion of the Maintenance Period.

.2 During the Maintenance & Warranty Period, if it is found that irrigation system has been poorly maintained, or there has been a failure to rectify deficiencies within a reasonable timeframe, issuance of Final Acceptance and payment of the maintenance portion of the Contract Price may be withheld at the discretion of the Owner and the Consultant.

End of Section

Part 1 General

1.1 SECTION INCLUDES

.1 Trees, Shrubs and Groundcover Planting.

.2 Placement of soil materials.

.3 Mulch materials.

1.2 RELATED SECTIONS

.1 Section 01 22 00 Measurement Schedule.

.2 Section 01 33 00 Submittal Procedures.

.3 Section 31 05 13 - Soil Materials.

1.3 REFERENCES

.1 Canadian Standards for Nursery Stock (Current Edition).

.2 NAA (National Arborist Association) - Pruning Standards for Shade Trees.

.3 Nomenclature: to “International Code of Nomenclature for Cultivated Plants (Current Edition)

.4 Size and Development of Trees: to “Metric Guide Contract Documents for Nursery Stock (Current Edition).

.5 Alberta Horticultural Guide: Alberta Horticultural Agdex 220/01 (Current Edition).

1.4 QUALITY ASSURANCE

.1 Nursery Qualifications: Company specializing in growing and cultivating the plants with minimum three (3) years documented experience.

.2 Installer Qualifications: Company specializing in installing and planting the plants with minimum three (3) years documented experience.

.3 Tree Pruner Qualifications: Company specializing in pruning trees with proof of Arborist Certification.

.4 Tree Pruning: NAA – Pruning Standards for Shade Trees.

.5 Establishment Services: Performed by installer.

1.5 REGULATORY REQUIREMENTS

.1 Plant Materials: Certified by Federal Department of Agriculture. Described by the Canadian Nursery Landscape Association Canadian Standards for Nursery Stock; free of disease or hazardous insects.

.1 Plants that show evidence of disease or hazardous impacts at the time of planting, or within 30 days of the time of planting, must be immediately removed and replaced at Contractor’s cost. Municipality of Drumheller

Representative shall be the sole judge of the infestation condition of the root, tree or perennial.

.2 The Municipality of Drumheller reserves the right to reject any and all plant material that does not meet specified requirements.

1.6 SUBMITTALS

.1 Provide Consultant with written documentation indicating the commercial nursery and installer at least 60 days prior to commencement of the planting.

.1 Provide Consultant with written confirmation of plant material availability.

.2 Pre-order plant materials by no later than December 31st, 2021.

.3 The Contractor shall provide the source of the supplied stock to the Consultant prior to planting. All trees and shrubs shall be winter hardened and from Alberta grown seed or mother plant stock grown in Zones 2 or 3 in accordance with Agriculture Canada Plant Hardiness Map.

.2 If required, the Contractor will provide a list of substitutions for approval

.3 Provide Consultant with receipt of purchased plant material from the Nursery.

1.7 SUBSTITUTIONS

.1 Contractor to confirm in writing unavailable plant material and request substitution for approval by the Consultant.

.2 Substitution requests must contain the following information:

.1 Scientific name

.2 Pot size and plant size in the nursery

.3 Supplier

.4 Source of plant material

.3 Plant substitutions must be of similar genus and species and of equal or greater size as those originally specified.

1.8 SOURCE QUALITY CONTROL

.1 Plant Material Review:

.1 All plant material supplied by the Contractor to be reviewed at the project site by the Consultant prior to planting.

.2 Plant material that is rejected by the Consultant to be replaced at the Contractor’s expense.

.3 Consultant may review the plant material at the source should the Contractor choose and provide the Consultant with seven (7) days notification prior to requested review. The Contractor shall accompany the Consultant during the review.

1.9 DELIVERY, STORAGE, AND PROTECTION

.1 Protect trees from damage and drying out from the time of digging until planting. Trees with broken or abraded trunks or branches will be rejected.

.2 Protect root balls with burlap and, if required, wire baskets. Maintain moisture levels in root zones.

.3 When delivery distance is less than 30 km and vehicle speeds are under 80 km/h, tie tarpaulins around plants or over truck boxes.

.4 When delivery distance exceeds 30 km and/or vehicle speeds exceed 80 km/h, use enclosed vehicle to transport trees.

.5 Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

.6 Protect and maintain plant life until planted.

.7 Deliver plant life materials immediately prior to placement. Keep plants moist.

.8 Fully support root ball of trees during all lifting operations.

.9 Do not lift trees by the trunk or branches. Trees to be moved by lifting the root ball.

.10 Remove broken and damaged roots with clean cuts using sharp pruning shears.

.11 All live plant materials will be properly acclimatized prior to planting to ensure late season planting does not cause an increased risk of mortality. Acclimatization includes the plants being kept at the climatic conditions on site for at least two (2) weeks prior to planting.

.12 Deliver Soil Amendments in waterproof containers.

1.10 ENVIRONMENTAL REQUIREMENTS

.1 Do not install plant life when ambient temperatures may drop below 2 degrees C or rise above 32 degrees C.

.2 Do not install plant life when wind velocity exceeds 48 k/hr.

.3 Do not plant into frozen ground.

Part 2 Products

2.1 TREES, SHRUBS AND GROUNDCOVERS

.1 Trees, Shrubs and Groundcover: Species and size identifiable in plant schedule, grown in climatic conditions similar to those in locality of the Work. Plants shall be measured in their normal positions.

.2 Type of root preparation, sizing, grading and quality: Comply with CNLA Canadian Standards for Nursery Stock (Current Edition).

.3 Source: Grown in Zone 2 or 3 in accordance with Agriculture Canada Plant Hardiness Map within 200 km of project site.

.4 Plant Material: Plants shall be true to type and structurally sound, well-branched, healthy and vigorous and free of disease, insect infestations, rodent damage, sun scale, frost cracks and other abrasions or scars to the bark. They shall be densely foliated when in leaf and have a healthy well developed root system.

Pruning wounds shall show vigorous bark growth on all edges and all parts shall be moist and show live, green cambium tissue when cut.

.5 Plant Material: Root pruned regularly, but not later than one growing season prior to arrival on site.

.6 Trees: With straight trunks, well and characteristically branched for species.

.7 Container Grown Plant Material:

.1 Container Grown Plant Material refers to all perennials and trees not applied by seed or sod.

.2 Root ball to container relationship to be of sufficient ratio to ensure room for healthy, vigorous root development.

.3 Plant material shall have been container grown for a minimum of one growing season but not longer than two growing seasons.

.4 The plant material root systems must have the ability to "hold" growing medium when removed from the container.

.5 Root bound plant material is not acceptable.

2.2 SOIL MATERIALS

.1 Topsoil: As specified in Section 31 05 13 - Soil Materials.

.2 Soil Amendments: As specified in Section 31 05 13 - Soil Materials.

2.3 MULCH MATERIALS

.1 Parkland Premium Mulch or approved equivalent, to be approved by Consultant prior to purchase and delivery.

2.4 PLANT PROTECTION MATERIALS

.1 Herbivore Repellent:

.1 Organic herbivore repellent such as Plantskydd, Bobbex or approved equivalent: repellent treatment sprayed on trunks, limbs and leaves.

Part 3 Execution

3.1 PRE-PLANTING OPERATIONS

.1 Verify that prepared soil is ready to receive work.

.2 Saturate soil with water to test drainage.

.3 Place flags on site to identify location of trees and shrubs as per Contract Documents. The Consultant will review all tree and shrub locations prior to start of planting.

.4 Trees and shrubs:

.1 Excavate the depth of the pit to be equal to the height of the root ball.

.2 Excavate the width of the tree pit to be a minimum of 100 mm to 150 mm greater than the diameter of the root ball.

.3 Increase tree pit widths in heavy or compacted soils to three to five times the width of the root ball as directed by the Consultant.

.4 Scarify the sides of tree pits to eliminate glazed surface.

.5 Ensure planting pits in heavy or compacted soils exhibit the ability to drain freely. Notify the Consultant if planting beds in any soil condition do not drain freely or if planting pit fills with groundwater.

.6 Protect bottom of planting pit(s) from freezing.

.7 Ensure planting pits are kept well drained and free of contaminants and construction debris.

.8 Remove water collected in bottom of planting pit prior to planting.

3.2 PLACING SOIL AMENDMENTS

.1 Immediately prior to placing each plant in planting pit, evenly spread Soil Amendment Type A to a depth of 10mm at the bottom of the planting pit.

3.3 PLANTING

.1 In event of discrepancy between Drawings and Municipality of Drumheller Standard Specifications, seek clarification from Consultant to determine which is to govern.

.2 Place plants for best appearance for review and final orientation by Consultant prior to planting.

.3 Set plants vertical.

.4 Container grown plant material: Remove entire container (including biodegradable containers) without disturbing root ball. Score root ball vertically at six (6) locations evenly spaced around entire root ball to minimize girdling of roots.

.5 Do not remove plants from containers until ready to be planted. Plant immediately upon removal from container.

.6 Protect all plant materials from drying out while planting.

.7 Place 10mm of Soil Amendment Type A under each container plant.

.8 Set plants in pits or beds.

.9 Measure minimum depth of plant pit from downward side of slope when planting on an incline.

.10 Backfill planting pits with approved topsoil in 150 mm lifts to 2/3 of the depth of the planting bed, tamping each lift of soil around the root system to eliminate air voids.

.11 Do not use frozen or saturated growing medium for backfill operation.

.12 Prior to placing remaining 1/3 soil, fill planting bed with water. Complete backfill operation only after water has completely penetrated into soil.

.13 Build 100 mm high by 150 mm wide saucer around outer edge of tree and shrub dripline to assist with establishment watering.

.14 Install hemp square per supplier's instructions.

.15 After plant installation remove all labels attached by wire or cord.

.16 Dispose of container material at an off-site waste disposal facility.

.17 Spray planting beds with approved herbivore deterrent immediately after planting per manufacturers specifications.

.18 Prune trees and shrubs after planting operations if required for health. Notify Consultant prior to pruning.

3.4 PLANT PROTECTION MATERIALS

.1 Herbivore Repellent:

.1 Refer to Section 32 01 31 Vegetation Establishment.

3.5 PLANT SUPPORT

.1 Install tree support as per nursery recommendations.

3.6 SCHEDULE - PLANT LIST

.1 Refer to Drawings.

END OF SECTION