END OF SECTION

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises general construction of a shade structure, workshop building, and exterior improvements at the Living Prairie Museum at 2795 Ness Avenue.

.2 The work of this contract generally includes, but is not necessarily limited to:

- .1 Demolition of a portion of the existing parking lot, curb, and concrete retaining wall.
- .2 Construction and installation of a new concrete curb, planting beds, fire pit, concrete retaining wall, edging, and crushed stone surface.
- .3 Construction and installation of new site furnishings.
- .4 Construction of new reclaimed wood and steel shade structure.
- .5 Construction of new workshop building and green roof.

1.2 EXISTING SERVICES

.1 Notify Contract Administrator and utility companies of intended interruption of services and obtain required permission.

.2 Where work involves breaking into or connecting to existing services, give Contract Administrator 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian, vehicular traffic, and tenant operations.

.3 Establish location and extent of service lines in area of work before starting Work. Notify Contract Administrator of findings.

.4 Submit schedule to and obtain approval from Contract Administrator for any shutdown or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.5 Provide temporary services when directed by Contract Administrator to maintain critical building and tenant systems.

.6 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.

.7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.8 Record locations of maintained, re-routed and abandoned service lines.

.9 Construct barriers in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

1.3 CONTRACTOR USE OF PREMISES

.1 Contractor has use of site with the following restrictions:

.1 Use site for Work, for storage, and for access, limited to the areas indicated on the drawings or as directed by Contract Administrator.

.2 Co-ordinate use of premises under direction of Contract Administrator.

.3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.4 Assume full responsibility for protection and safekeeping of products under this Contract.

1.4 DOCUMENTS REQUIRED

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Contract Administrator are specified under various sections.

1.2 APPOINTMENT AND PAYMENT

.1 Contract Administrator will appoint and pay for services of testing laboratory except follows:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.

.4 Mill tests and certificates of compliance.

.5 Tests specified to be carried out by Contractor under the supervision of Contract Administrator.

.6 Additional tests specified in the following paragraph.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Contract Administrator to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

.1 Provide access to Work to be inspected and tested.

.2 Facilitate inspections and tests.

.3 Make good Work disturbed by inspection and test.

.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Contract Administrator sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Contract Administrator.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Activity: An element of Work performed during course of Project. An activity normally has an expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart). A graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: Original approved plan (for Project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: Number of work periods (not including holidays or other nonworking periods) required to complete an activity or other Project element. Usually expressed as workdays or workweeks.

.6 Master Plan: A summary-level schedule that identifies major activities and key milestones.

.7 Milestone: A significant event in Project, usually completion of major deliverable.

.8 Project Schedule: The planned dates for performing activities and the planned dates for meeting milestones. A dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: Overall system operated by Contract Administrator to

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 SUBMITTALS

.1 Submit to Contract Administrator within 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.2 Submit Project Schedule to Contract Administrator within 5 working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Contract Administrator will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.

.2 Shop Drawings, Samples.

.3 Permits.

.4 Mobilization.

.5 Demolitions

.6 Exterior Architecture (Curbs, Walls, Surfacing, Structures).

1.6 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETINGS

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

current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Contract Administrator submittals listed for review. Submit with reasonable promptness and in orderly sequence so as 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 SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

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

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

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator’s review of submittals.

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

.10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 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 5 working days for Contract Administrator's review of each submission.

.4 Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in

writing to Contract Administrator prior to proceeding with Work.

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

.6 Accompany submissions with transmittal letter, in duplicate, 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 adjacent work.

.8 After Contract Administrator's review, distribute copies.

.9 Submit 4 prints of shop drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.

.10 Submit 4 copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Contract Administrator 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 Contract Administrator, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.14 The review of shop drawings by the Contract Administrator is for sole purpose of ascertaining conformance with general concept. This review shall not mean that Contract Administrator approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.3 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 Contract Administrator's site office.

.3 Notify Contract Administrator 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 Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

.6 Make changes in samples which Contract Administrator 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.

1.4 MOCK-UPS

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

1.5 PRE-CONSTRUCTION PHOTOGRAPHS

.1 Submit progress photographs of existing buildings, in accordance with Section 01 33 00 - Submittal Procedures.

.2 Sizes: 100 mm x 150 mm

.3 Finish: glossy colour with binding margin at one end.

.4 Paper: single weight, un-mounted.

.5 Number of Prints required: 3 sets

.1 Submit one set to the Contract Administrator and maintain one set on site and the other set in Contractor's office prior to the request of the first progress claim.

.2 Each set shall be placed in a 3-ring binder and photo sleeves.

.3 Upon completion of the project and prior to requesting substantial Performance Review, submit all three (3) sets along with the contract Operation and Maintenance Manuals, as indicated in Section 01 78 00 – Closeout Submittals.

.4 All photographs to be done in digital format.

.6 Identification: typewritten name and number of project and date of exposure on reverse side of each photograph.

.7 Number of viewpoints: Sufficient views and proximity to clearly indicate condition of existing building, surrounding site, entire project area.

.8 Frequency: before demolition proceeds.

.9 Existing area to be photographed:

.1 Contractor to take photographs of existing parking lot, walls, planting beds, and adjacent prairie preserve.

.2 Contractor to take photographs of elevations of existing building, utility room and existing electrical connections.

1.6 PHOTO DOCUMENTATION

.1 The Contractor shall photograph and submit bi-monthly colour pictures in digital format demonstrating the progress of the Work and at all concealed areas prior to being covered.

.2 Submit two sets to the Contract Administrator.

.3 Submit 100 mm x 150 mm copies of each, labelled and in protective covers in three-ring binders to the Contract Administrator with the Contract Operation and Maintenance Manuals upon completion of the project.

PART 2 Products

2.1 CONTRACTORS OPTIONS FOR SELECTION OF MATERIALS FOR

BIDDING

.1 Materials specified by referenced standard, select any material that meets or exceeds the specified standard.

.2 Where materials are required to be listed on the "Canadian General Standards Board, Qualified Products List" select any manufacturer so listed.

.3 Materials specified by "Prescriptive" or "Performance" specification, select any material meeting or exceeding specification.

.4 Materials specified by naming one or more materials, select any material named. For the purpose of these specifications, the term "Acceptable Material" is deemed to be a complete and working commodity as described by a manufacturer's name, catalogue number, trade name or any combination thereof.

.5 When materials are specified by a Standard, Prescriptive or Performance specification, upon request of the Contract Administrator, obtain from manufacturer an independent testing laboratory reporting, showing that the material or equipment meets or exceeds the specified requirements.

.6 The design and drawings are based upon the acceptable materials, or products. The acceptable materials, or products may not be identical in all aspects. A later claim by the Contractor for an addition to the contract price because of changes in work necessitated by use of acceptable materials, or products shall not be considered.

2.2 SUBSTITUTION / AVAILABILITY OF MATERIALS

.1 The design and drawings are based upon the acceptable material or product identified. Approved Substitutions shall meet the requirements as listed I paragraphs 2.1.1,2,3,4,5,6.

.2 Where Bid Documents stipulate a particular product, Approved Substitutions will be considered as B6.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.3 Province of Manitoba

.1 Workplace Safety and Health Act, R.S.M. 1987.

1.2 SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Contract Administrator and authority having jurisdiction, weekly.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets.

.7 Contract Administrator will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Contract Administrator within 5 days after receipt of comments from Contract Administrator.

.8 Contract Administrators review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Contract Administrator.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.4 SAFETY ASSESSMENT

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

1.5 MEETINGS

.1 Schedule and administer Health and Safety meeting with Contract Administrator prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 – Regulatory Requirements.

1.7 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Contract Administrator may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

.1 Comply with Workplace Safety and Health Act, Workplace Safety Regulation, Manitoba Reg. R.S.M 1987.

1.10 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having

jurisdiction and advise Contract Administrator verbally and in writing.

1.11 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have minimum 2 years' site-related working experience specific to activities associated with health and safety.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

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

.5 Be on site during execution of Work.

1.12 POSTING OF DOCUMENTS

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

1.13 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Contract Administrator.

.2 Provide Contract Administrator with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Contract Administrator may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Contract Administrator.

1.15 WORK STOPPAGE

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

PART 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) including all amendments up to Bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

1.2 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions.

PART 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 INSPECTION

.1 Allow Contract Administrator access to Work.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Contract Administrator instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Contract Administrator may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Contract Administrator shall pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Contract Administrator for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Contractor.

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

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

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

1.3 ACCESS TO WORK

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

.2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

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

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in 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.

1.5 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 Contract Administrator as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

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

.3 If in opinion of Contract Administrator it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, The City may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Contract Administrator.

1.6 REPORTS

.1 Submit 4 copies of inspection and test reports to Contract Administrator.

.2 Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

1.7 MOCK-UPS

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

.2 Construct in all locations acceptable to Contract Administrator as specified in specific Section.

.3 Prepare mock-ups for Contract Administrator'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 Contract Time and no claim for extension by reason of such default will be allowed.

.5 If requested, Contract Administrator will assist in preparing a schedule fixing dates for preparation.

.6 Remove mock-up at conclusion of Work or when acceptable to Contract Administrator.

.7 Mock-ups may remain as part of Work.

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

END OF SECTION

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.2 WATER SUPPLY

.1 Provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.

1.3 TEMPORARY POWER AND LIGHT

.1 Contractor will provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230volts 30amps.

.2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

.3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.

1.4 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax., data hook up, lines, equipment necessary for own use.

1.5 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction, and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

END OF SECTION

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.2 SCAFFOLDING

.1 Provide and maintain scaffolding, ramps, ladders, and platforms.

1.3 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.4 CONSTRUCTION PARKING

.1 Parking will be permitted on site.

.2 Contract Administrator to assign parking area.

1.5 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously and remove from site all such work after use.

1.2 TEMPORARY CONSTRUCTION FENCING

.1 Provide temporary construction fencing surrounding all Work areas. Confirm with Contract Administrator locations, installation schedule, and fencing type 3 days prior to installation.

.2 Maintain clear and safe access to Interpretive Centre during performance of Work.

1.3 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles. Ensure that all existing fire exits in the existing building remain open for staff and the public.

1.4 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 At no time shall the Contractor use any part of the prairie preserve for construction layout, site access, or in any way that may incur damage.

.3 Be responsible for damage incurred.

1.5 PROTECTION OF FINISHES

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

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Contract Administrator locations and installation schedule 3 days prior to installation.

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

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.

.2 If there is question as to whether any product or system is in conformance with applicable standards, Contractor reserves right to have such products or systems tested to prove or disprove conformance.

.3 Cost for such testing will be born by Contractor in event of conformance with Contract Documents or by Contractor in event of non-conformance.

.4 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.2 QUALITY

.1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish 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 Contract Administrator based upon requirements of Contract Documents.

.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.

1.3 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Contract Administrator of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Contract Administrator at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Contract Administrator reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in ventilated area. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Contract Administrator.

.9 Touch-up damaged factory finished surfaces to Contract Administrator’s satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

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

1.6 MANUFACTURER’S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Contract Administrator in writing, of conflicts between specifications and manufacturer's instructions, so that Contractor may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Contract Administrator to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced

and skilled in respective duties for which they are employed. Immediately notify Contract Administrator if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Contract Administrator reserves right to require dismissal from site, workers deemed incompetent or careless.

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

1.8 CO-ORDINATION

.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.

1.9 CONCEALMENT

.1 In finished areas, conceal pipes, and wiring in walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Contract Administrator if there is interference. Install as directed by Contract Administrator.

1.10 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.

1.11 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Contract Administrator of conflicting installation. Install as directed.

1.12 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing

exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spilling or cracking of material to which anchorage is made are not acceptable.

1.13 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Contract Administrator.

1.15 EXISTING UTILITIES

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Individual product Sections: cutting and patching incidental to work of Section. Advance notification to other Sections required.

1.2 SUBMITTALS

.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 The City 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 The City or separate Contractor.
- .7 Written permission of affected separate Contractor.
- .8 Date and time work will be executed.

1.3 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

1.4 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which may be exposed by uncovering work.

1.5 EXECUTION

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

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

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Remove samples of installed Work for testing.

.6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

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

.8 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

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

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

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

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

.13 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including other than that caused by The City or other Contractors.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site containers for collection of waste materials and debris.

.5 Remove waste material and debris from site at end of each working day.

.6 Dispose of waste materials and debris off site.

.7 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.

.8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris other than that caused by The City or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Contract Administrator. Do not burn waste materials on site.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Clean and polish glass, acrylic, hardware, stainless steel, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass or acrylic

panels.

.8 Remove stains, spots, marks and dirt from finished work, electrical and mechanical fixtures, site furnishings, concrete, and wood.

.9 Clean lighting reflectors, lenses, and other lighting surfaces.

.10 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.11 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.12 Remove dirt and other disfiguration from exterior surfaces.

.13 Sweep and wash clean paved areas.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Contract Administrator in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request Contract Administrator's Inspection.

.2 Contract Administrator's Inspection: Contract Administrator and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.4 Operation of systems have been demonstrated to The City personnel.

.5 Work is complete and ready for Final Inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Contract Administrator, and Contractor. If Work is deemed incomplete by Contract Administrator, complete outstanding items and request reinspection.

.5 Declaration of Substantial Performance: when Contract Administrator consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of The City's acceptance of submitted declaration of Total Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment: When Contract Administrator consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. If Work is deemed incomplete by Contract Administrator, complete outstanding items and request reinspection.

END OF SECTION

Part 1 General

1.1 SUBMISSION

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection, with Contract Administrator's comments.

.3 Revise content of documents as required prior to final submittal.

.4 Two weeks prior to Substantial Performance of the Work, submit to the Contract Administrator four final copies of operating and maintenance manuals in English.

.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.6 If requested, furnish evidence as to type, source and quality of products provided.

.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.8 Pay costs of transportation.

1.2 FORMAT

.1 Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in .dwg format on CD.

1.3 CONTENTS – EACH VOLUME

.1 Table of Contents: provide title of project;

.1 date of submission; names,

.2 addresses, and telephone numbers of Contract Administrator and Contractor with name of responsible parties;

.3 schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.4 AS-BUILT AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the site for Contract Administrator one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Contract Administrator.

1.5 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Contract Administrator.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.2 Field changes of dimension and detail.

.3 Changes made by change orders.

.4 Details not on original Contract Drawings.

.5 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.6 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions.

.2 Include manufacturer's printed operation and maintenance instructions.

.3 Additional requirements: As specified in individual specification sections.

1.7 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.8 FORMAT

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

.4 Except for items put into use with The City's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 Demonstrate scheduled operation and maintenance of equipment and systems to Operations personnel two weeks prior to date of substantial performance.

.2 The City will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

1.2 QUALITY CONTROL

.1 When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Operations personnel, and provide written report that demonstration and instructions have been completed.

1.3 SUBMITTALS

.1 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Contract Administrator's approval.

.2 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.3 Give time and date of each demonstration, with list of persons present.

1.4 CONDITIONS FOR DEMONSTRATIONS

.1 Equipment has been inspected and put into operation in accordance with specification Section.

.2 Testing, adjusting, and balancing has been performed and equipment and systems are fully operational.

.3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.5 PREPARATION

.1 Verify that conditions for demonstration and instructions comply with requirements.

.2 Verify that designated personnel are present.

1.6 DEMONSTRATION AND INSTRUCTIONS

.1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at scheduled times, at the equipment location.

.2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.

.3 Review contents of manual in detail to explain all aspects of operation and maintenance.

.4 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Not used.

1.2 SUBMITTAL

.1 Not used.

1.3 EXISTING CONDITIONS

.1 Underground utilities and elements: locate all underground utilities and elements prior to digging and/or driving stakes. Take care, to neither disturb nor damage any existing above ground or underground utilities or elements. Keep streets, sidewalks and site clean, free from debris and affected drains open and free flowing at all times.

.2 Contact appropriate utility to request shut-off of pressurized or powered utilities. Verify that all appropriate services have been disconnected. The Contractor shall pay for all fees and costs associated with utility disconnect, capping of lines and meter removals required within the Public Right of Way.

.3 Notify Contract Administrator before disrupting building access or services

.4 Objectionable Noises: Limit use of air hammers and other noisy equipment as much as possible. Conform to local governing requirements.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 PROTECTION

.1 Prevent movement, settlement, or damage to adjacent structures, utilities, and elements to remain in place. Provide bracing and shoring required.

.2 Protect Prairie Preserve at all times during course of Work.

3.2 DEMOLITION

.1 Demolition and construction activities shall be in accordance with NBC 1995, Part 8.

.2 Demolish Asphalt Paving:

.1 Saw cut and remove asphalt paving as indicated on Drawings. Use care to protect edge to remain as finished edge against new concrete curb or pathway.

.2 Completely remove asphalt paving, leaving aggregate base where indicated on Drawings only if base conforms to CW 3110.

.3 Demolish Concrete Paving and Concrete Curbs:

.1 Remove existing pavement and curbs as indicated on Drawings. Use care to protect edge to remain as finished edge against new concrete or asphalt.

.2 Completely remove concrete paving, leaving aggregate base where indicated on Drawings only if base conforms to CW 3110.

.4 Demolish Lawn:

.1 Remove existing lawn as indicated on Drawings.

.2 Completely remove all organic material in new non-planted areas as indicated on drawings.

.5 Demolish Portion of Concrete Retaining Wall:

.1 Remove existing concrete retaining wall as indicated on Drawings.

.6 Demolish and remove any other existing elements as necessary for completion of Work as approved by Contract Administror.

3.3 DEMOLTION SALVAGE AND DISPOSAL

.1 Remove parts of pavements and lawn area to permit new construction. Sort selected materials into appropriate piles for reuse and recycling if possible.

.2 Refer to drawings for items to be salvaged for reuse.

.3 Dispose of removed materials, except where specified otherwise, in accordance with authority having jurisdiction.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA)

- .1 CAN/CSA-A23.1-04 Concrete Materials and Methods of Concrete Construction.
- .2 CAN/CSA-O86.1-94, Engineering Design in Wood (Limit State Design).
- .3 CSA O121M1978, Douglas Fir Plywood.
- .4 CSA O151-M1978, Canadian Softwood Plywood.
- .5 CSA O153-M1980, Poplar Plywood.
- .6 CSA S269.11975, Falsework for Construction Purposes.
- .7 CAN/CSA-S269.3-M92, Concrete Formwork.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

- .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121, CAN/CSA-O86.1, CSA-O153.

.2 Form ties:

- .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.

.3 Form liner:

- .1 Plywood: Douglas Fir to CSA O121, Canadian Softwood Plywood t CSA O151., square edge, 19mm thick.

.4 Form release agent: chemically active, non-toxic release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing concrete from sticking to forms.

.5 Form stripping agent: colourless mineral oil, non-toxic free of kerosene, with viscosity 15 to 24 mm2/s at 40ЈЬC, flashpoint minimum 150ЈЬC, open cup.

.6 Falsework materials: to CSA-S269.1.

.7 Sealant: to Section 07 92 00 - Joint Sealers.

Part 3 Execution

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.3 Do not place shores and mud sills on frozen ground.

.4 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.

.5 Align form joints and make watertight. Keep form joints to minimum.

.6 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners , joints, unless specified otherwise.

.7 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.8 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.9 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

.10 All form lumber, studding, etc. becomes the property of the Contractor when the work is finished, and it shall be removed from the concrete and the site by the Contractor after the concrete is set, free of extra charge, and the entire site left in a neat and clean condition.

.11 It shall be permissible to use the forms over again where possible, provided they are thoroughly cleaned and in good condition after being removed from the former portions of the Work. The Consultant shall be the sole judge of their condition and his decision shall be final regarding the use of them again.

3.2 REMOVAL AND RESHORING

.1 The Contract Administrator must be notified at least 24 hours prior to form removal and give approval prior to beginning work.

3.3 PATCHING OF FORMED SURFACES

.1 Immediately after forms have been removed, but before any repairing or surface finish is started, the concrete surface shall be inspected by the Contract Administrator. Any repair or surface finishing started before this inspection may be rejected and required to be removed.

.2 All formed concrete surfaces shall have bolts, ties, struts and all other timber or metal parts not specifically required for construction purposes cut back twenty-five (25) mm from the surface before patching.

.3 Minor surface defects caused by honeycomb, air pockets greater than 5 mm in diameter and voids left by strutting and tie holes shall be repaired by removing the defective concrete to sound concrete, dampening the area to be patched and then applying patching mortar. A slurry grout consisting of water and cement, shall be well brushed onto the area to the patched. When the slurry grout begins to lose the water sheen, the patching mortar shall be applied. It shall be struck off slightly higher than the surface and left for one hour before final finishing to permit initial shrinkage of the patching mortar, it shall be touched up until it is satisfactory to the Contract Administrator.

.4 All objectionable fins, projections, offsets, streaks or other surface imperfections shall be removed by approved means to the Contract Administrator's satisfaction. Cement washes of any kind shall not be used.

.5 Wherever "Concrete Surface Coating" is to be applied, patching of minor surface defects shall be done by the Thoroseal applicator using Thorite. Payment for same is considered incidental to the works of this Specification. Patching of snap tie holes to defects larger than 15 mm in diameter shall be done under this Specification.

3.4 FINISHING OF FORMED SURFACES

.1 Concrete shall be cast against forms which will produce plane surfaces with no bulges, indentation or swelling other than those shown on the Drawing. The arrangement of panel joints shall be kept to a minimum. Panels containing worn edges, patches or other defects which will impair the texture of concrete surfaces shall not be used. All fins on the concrete surfaces shall be removed.

Part 4 Quality Control

4.1 INSPECTION

.1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the specified work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or works which are not in accordance with the requirements of this Special Provision.

4.2 ACCESS

.1 The Contract Administrator shall be afforded full access for the inspection of form work and constituent materials.

END OF SECTION

Part 1 General

1.1 RELATED SECTION

.1 Section 03 10 00 – Concrete Formwork.

.2 Section 03 30 00 – Cast-in-Place Concrete.

1.2 REFERENCES

.1 American Concrete Institute (ACI)

.1 ACI 315R-80, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.2 American National Standards Institute/American Concrete Institute (ANSI/ACI)

.1 ANSI/ACI 315-80, Details and Detailing of Concrete Reinforcement.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.

.2 CAN3-A23.3-00, Design of Concrete Structures for Buildings.

.3 CSA G30.12

1.3 SHOP DRAWINGS

.1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00- Submittal Procedures.

.2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices if approved by Contract Administrator, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacings and locations of chairs, spacers and hangers. Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada. ANSI/ACI 315 and ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.3 Detail lap lengths and bar development lengths to CAN3-A23.3, unless otherwise indicated.

Part 2 Products

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Contract Administrator.

.2 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.

.3 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1.

.4 Mechanical splices: subject to approval of Contract Administrator.

.5 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.

.6 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.

.7 Welded steel wire fabric: to ASTM A185/A185M.

.1 Provide in flat sheets only.

.8 Welded deformed steel wire fabric: to [ASTM A82/A82M].

.1 Provide in flat sheets only.

.9 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/m5.

.1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.

.2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.

.1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.

.3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.

.1 In this case, no restriction applies to temperature of solution.

.4 Chromate solution sold for this purpose may replace solution described above, provided it is of equivalent effectiveness.

.10 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1, ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.

.2 Obtain Contract Administrator's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Contract Administrator, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Contract Administrator with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.

.2 Upon request inform Contract Administrator of proposed source of material to be supplied.

Part 3 Execution

3.1 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Contract Administrator.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on approved placing drawings and in accordance with CAN/CSA-A23.1.

.2 Use plain round bars as slip dowels in concrete. Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint. When paint is dry, apply a thick even film of mineral lubricating grease.

.3 Prior to placing concrete, obtain Contract Administrator's approval of reinforcing materials and placement.

.4 Ensure cover to reinforcement is maintained during concrete pour.

3.3 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

END OF SECTION

Part 1 General

1.1 RELATED SECTION

.1 Section 03 10 00 – Concrete Forming and Accessories.

.2 Section 03 20 00– Concrete Reinforcing.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C260-94, Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-94, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494-92, Specification for Chemical Admixtures for Concrete.

.4 ASTM D1751-83(1991), Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.2 Canadian Standards Association (CSA)

.1 CAN/CSA-A5-93, Portland Cement.

.2 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.

.3 CAN/CSA-A23.2-04, Methods of Test for Concrete.

1.3 STANDARD

.1 Concrete materials and methods of construction to CAN/CSA-A23.1 unless otherwise specified.

1.4 TESTING AND INSPECTION

.1 Concrete testing to CAN/CSA-A23.1 by testing laboratory designated by Contract Administrator.

.2 Give Contract Administrator minimum of seven days notice prior to each concrete pour.

1.5 SAMPLES

.1 Concrete testing to CAN/CSA-A23.1 by testing laboratory designated by Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 At least 4 weeks prior to commencing work, inform Contract Administrator of proposed source of aggregates and provide access for sampling.

1.6 CERTIFICATES

.1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.

.3 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.

Part 2 Products

2.1 MATERIALS

.1 Portland cement: to CAN/CSA-A5.

.2 Supplementary cementing materials: to CAN/CSA-A23.5.

.3 Water: to CAN/CSA-A23.1.

.4 Aggregates: to CAN/CSA-A23.1.

.5 Air entraining admixture: to ASTM C260.

.6 Chemical admixtures: to ASTM C494. Contract Administrator to approve accelerating or set retarding admixtures during cold and hot weather placing.

.7 Concrete retarders: to ASTM C494. Do not allow moisture of any kind to come in contact with the retarder film.

.8 Non-shrink grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents.

.1 Compressive strength: 50 MPa at 28 days

.9 Polyethylene film: 6 mil thickness to CAN/CGSB-51.34.

.10 Curing compound: to CAN/CSA-A23.1 and to ASTM C309.

.11 Premoulded joint fillers:

.1 Bituminous impregnated fiber board: to ASTM D1751.

2.2 MIXES

.1 Proportion concrete in accordance with CAN/CSA-A23.1, to give quality and yield for concrete as indicated. Refer to Drawings, General Notes for mix proportions and strengths.

2.3 DELIVERY AND STORAGE

.1 Concrete hauling time: deliver to site of Work and discharge within 120 minutes maximum after batching.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Contract Administrator's approval before placing concrete. Provide seven days notice prior to placing of concrete.

.2 Pumping of concrete is permitted only after approval of equipment and mix.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Prior to placing of concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.6 Do not place load upon new concrete until authorized by Contract Administrator.

3.2 COLD WEATHER REQUIREMENTS

.1 In the event “Possutec 20” as manufactured by Master Builders is used, relaxation of the following bill be considered.

.2 When the air temperature is at or below 5°C or when there is a probability of it falling to that limit during the placing or curing period, cold weather requirements shall be applicable.

.3 Provide heating equipment or heating plant on the job ready for use when concrete is being placed during cold weather. Such equipment shall be adequate for the purpose of maintaining the required temperature during the placing and curing of the concrete. The methods used for heating shall be acceptable to the Contract Administrator. Equipment inducing carbon monoxide gas free to come into contact with concrete work shall not be acceptable.

.4 Concrete shall not be placed on or against reinforcing, formwork, ground or any surface that is at a temperature less than 5°C.

.5 When being placed the concrete shall have a temperature of not less than 10°C nor more than 30°C.

.6 The temperature of the concrete at all surfaces shall be maintained at not less than 20°C for three days, or at not less than 10°C for five days after placing.

.7 Means shall be provided to humidify the air within enclosures and to keep the concrete and formwork continuously moist if dry heat is used.

.8 The concrete shall be kept above freezing temperature for a period of seven days and shall be kept from alternate freezing and thawing for at least fourteen days after placement.

.9 At the end of the specified protection period, the temperature of the concrete shall be reduced gradually at a rate not exceeding that shown in Table 17 of CSA CAN3-A23.1-M77.

.10 Accelerator or so-called antifreeze compounds shall not be permitted unless otherwise approved by Contract Administrator.

.11 All protective coverings shall be kept clear of the concrete and dorm surfaces to permit free circulation of air and shall be maintained intact for at least twenty-four hours after the artificial heat is disconnected.

.12 On slip formed work, newly poured surfaces exposed of exterior weather conditions shall be protected to avoid exposure to adverse effects of wind, rain and low temperatures.

3.3 CONSTRUCTION

.1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1.

.2 Sleeves and inserts.

.1 No sleeves, ducts, pipes or other openings shall pass through joists, beams, column capitals or columns, except where indicated or approved by Contract Administrator.

.2 Where approved by Contract Administrator, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100 mm (4” x 4”) not indicated must be approved by Contract Administrator.

.3 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Contract Administrator before placing of concrete.

.4 Check locations and sizes of sleeves and openings shown on drawings.

.5 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.3 Anchor bolts.

.1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.

.2 With approval of Contract Administrator, grout anchor bolts in preformed holes or holes drilled after concrete has set. Formed holes to be minimum 100 mm (4”) diameter. Drilled holes to be [minimum 25 mm (1”) larger in diameter than bolts used to manufacturers's recommendations.

.3 Protect anchor bolt holes from water accumulations, snow and ice buildups.

.4 Set bolts and fill holes with grout.

.5 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

.4 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

.5 Finishing.

.1 Finish concrete to CSA A23.1/A23.2. Refer to Drawings for finishes.

.2 Use procedures acceptable to Contract Administrator or those noted in CAN/CSA-A23.1 to remove excess bleed water. Ensure surface is not damaged.

.3 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.

.4 Rub exposed sharp edges of concrete with carborundum to produce 3 mm (1/8") radius edges unless otherwise indicated.

.5 Provide light broom finish with no frames for exterior slabs unless noted otherwise.

.6 Joint fillers.

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Contract Administrator. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.2 Locate and form construction, expansion joints as indicated. Install joint filler.

3.4 CURING

.1 Cure and protect concrete in accordance with CAN/CSA A23.1.

3.5 WATERSTOPS

.1 Install waterstops to provide continuous water seal. Do not distort or pierce waterstop in such a way as to hamper performance. Do not displace reinforcement when installing waterstops. Use equipment to manufacturer's requirements to field splice waterstops. Tie waterstops rigidly in place.

.2 Use only straight heat sealed butt joints in field. Use factory welded corners and intersections unless otherwise approved by Contract Administrator.

3.6 SITE TOLERANCE

.1 Concrete tolerance in accordance with CAN/CSA-A23.1 and to tolerance schedule as indicated.

3.7 FIELD QUALITY CONTROL

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Contract Administrator in accordance with CAN/CSA-A23.1 and Section 01 45 00 - Quality Control.

.2 Contract Administrator will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.3 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.2.

.4 Inspection or testing by Contract Administrator will not augment or replace Contractor quality control nor relieve him/her of his/her contractual responsibility.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 ASTM International Inc.

.1 ASTM A36/A36M [08], Standard Specification for Carbon Structural Steel.

.2 ASTM A193/A193M [08], Standard Specification for Alloy Steel and Stainless Steel Bolting Materials for High Temperature or High-Pressure Service and Other Special Purpose Applications.

.3 ASTM A307 [07b], Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.4 ASTM A325 [07a], Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.5 ASTM A325M [08], Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength[Metric].

.6 ASTM A490M [04ae], Standard Specification for High Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints [Metric].

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 85.10 [99], Protective Coatings for Metals.

.3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).

.1 Handbook of the Canadian Institute of Steel Construction.

.2 CISC/CPMA Standard 2 75, Quick Drying Primer for use on Structural Steel.

.4 Canadian Standards Association (CSA International)

.1 CSA G40.20/G40.21 [04], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA G164 [M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA S16 [01(R2007)], Limit States Design of Steel Structures.

.4 CAN/CSA S136 [07], North American Specifications for the Design of Cold Formed Steel Structural Members.

.5 CSA W47.1 [03], Certification of Companies for Fusion Welding of Steel.

.6 CSA W48 [06], Filler Metals and Allied Materials for Metal Arc Welding.

.7 CSA W55.3 [1965(R2003)], Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.8 CSA W59 [03], Welded Steel Construction (Metal Arc Welding).

.5 Master Painters Institute

.1 MPI INT 5.1 [08], Structural Steel and Metal Fabrications.

.2 MPI EXT 5.1 [08], Structural Steel and Metal Fabrications.

.6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International

.1 NACE No. 3/SSPC SP 6 [06], Commercial Blast Cleaning.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Shop Drawings:

.1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.

.3 Erection drawings:

.1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:

.1 Description of methods.

.2 Sequence of erection.

.3 Type of equipment used in erection.

.4 Temporary bracings.

.4 Fabrication drawings:

.1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the Province of Manitoba, Canada.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.

Part 2 Products

2.1 DESIGN REQUIREMENTS

.1 Design details and connections in accordance with requirements of CAN/CSA S16 and CAN/CSA S136 with CSA S136.1 to resist forces, moments, shears and allow for movements indicated.

.2 Shear connections:

.1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.

.2 Select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam, when shears are not indicated.

2.2 MATERIALS

.1 Structural steel: the following salvaged steel beams have been purchased and shall be used for all structural steel components of the shade structure. It is the responsibility of the Contractor to familiarize themselves and be prepared to work with the material below:

Eight (8) - 12 ½ x 6 ½ x 16 ft. 6 in x 3/8 flange and ¼ web

Two (2) - 8 x 6 ½ x 13 ft. 7/16 flange x 5 1/5 web

One (1) - 8 x 6 ½ x 27 ft x 7/16 flange x 5 1/5 web

.2 The Contractor shall verify dimensions of structural steel provided and notify Contract Administrator of any discrepancies from dimensions provided in Section 05 12 23 2.2.1.

.2 Anchor bolts: to CSA G40.20/G40.21, Grade 300W.

.3 High strength anchor bolts: to ASTM A193/A193M.

.4 Bolts, nuts and washers: to ASTM A325M.

.5 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.

.6 Shop paint primer: to CISC/CPMA2-75 solvent reducible alkyd, grey.

.7 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA G164, minimum zinc coating of 600 g/m2.

.8 Shear studs: to CSA W59, Appendix H.

2.3 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA S136 and in accordance with approved shop drawings.

.2 Continuously seal members by continuous welds. Grind smooth.

.3 Sandblast all salvaged steel beams to consistent finish after all welding is complete.

2.4 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA S16except where members to be encased in concrete.

.2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to NACE No.3/SSPC SP 6.

.3 Apply one coat of primer in shop to steel surfaces to achieve minimum dry film thickness of 2to 5 mils, except:

.1 Surfaces to be encased in concrete.

.2 Surfaces to receive field installed stud shear connections.

.3 Surfaces and edges to be field welded.

.4 Faying surfaces of slip-critical connections.

.5 Below grade surfaces in contact with soil.

.4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.

.5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.

.6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

Part 3 Execution

3.1 APPLICATION

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

3.2 GENERAL

.1 Structural steel work: in accordance with CAN/CSA S136.

.2 Welding: in accordance with CSA W59.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.3 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Contract Administrator for direction before commencing fabrication.

3.4 MARKING

.1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.

.2 Match marking: shop mark for fit and match.

3.5 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA S136 and in accordance with approved erection drawings.

.2 Field cutting or altering structural members: to approval of Consultant and material supplier

.3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

.4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.6 FIELD QUALITY CONTROL

.1 Provide safe access and working areas for testing on site, as required consultant.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Steamless.

.2 ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSITensile Strength.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.

.2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.

.4 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.1 CSA W59-1989(R2001), Welded Steel Construction (Metal Arc Welding)

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with City of Winnipeg Standard Construction Specification Submittal Procedures.

.2 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

1.3 QUALITY ASSURANCE

.1 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading: Deliver, store, handle and protect materials in accordance with Section 01 61 00 Common Product Requirements.

Part 2 Products

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade as indicated.

.2 Steel pipe: to ASTM A53/A53M standard weight, black finish.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307.

.6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m2 to CAN/CSA G164.

.2 Raw steel: sandblast to remove all rust and to achieve consistent finish.

2.4 DOWN PIPE

.1 Steel pipe to size, type, diameter and height as indicated on Drawings.

.2 Sandblasted raw steel or galvanized as indicated on Drawings.

2.5 METAL PLATES

.1 Metal plates, tabs and bars as indicated on Drawings.

.2 Sandblasted raw steel or galvanized as indicated on Drawings.

Part 3 Execution

3.1 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA-S16.1, or weld.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer. Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA B111-1974(R1998), Wire Nails, Spikes and Staples.

.2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA O121-M1978(R1998), Douglas Fir Plywood.

.4 CAN/CSA-O141-91(R1999), Softwood Lumber.

.2 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2000.

1.2 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

.2 Indicate details of construction, profiles, jointing, fastening and other related details.

.3 Indicate materials, thicknesses, finishes and hardware.

.4 Indicate locations of service outlets, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit sample of all exposed wood types with representative sample of fasteners and with finish applied.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials of this section in accordance with Section 01 61 00 - Common Product Requirements.

.2 Protect lumber against dampness and damage during and after delivery.

Part 2 Products

2.1 MATERIALS

.1 Salvaged/Reclaimed lumber to be supplied by Wood Anchor: (204) 261-1913 or approved equal in accordance with B6.

.2 Non-salvaged/reclaimed softwood lumber: unless specified otherwise, S4S, moisture content 7 % or less in accordance with following standards:

.1 AWMAC custom grade, moisture content as specified.

.3 Non-salvaged/reclaimedhardwood lumber: S4S, moisture content 7 % or less in accordance with following standards:

.1 AWMAC custom grade, moisture content as specified.

.4 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

.1 S2S is acceptable for all concealed uses.

.2 Board sizes: "Standard" or better grade.

.3 Dimension sizes: "Standard" light framing or better grade.

.4 Post and timbers sizes: "Standard" or better grade.

.5 Plywood: to AWMAC custom grade.

.6 Interior mat-formed wood particleboard: to AWMAC custom grade.

.7 Nails and staples: to CSA B111.

.8 Bolts: 12.5mm diameter unless indicated otherwise, complete with nuts and washers.

.9 Wood screws steel plated, type and size to suit application.

.10 All exposed hardware shall be stainless steel unless indicated otherwise.

.11 Sealant: in accordance with Section 07 92 00 – Joint Sealers.

.12 Wood Preservative: surface applied water repellent wood preservative. Colour: clear.

Part 3 Execution

3.1 PREPARATION

.1 Treat surfaces of material with wood preservative, before installation.

.2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.

.3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

.4 Treat material as follows :

.1 Wood cants, fascia backing, curbs, nailers, sleepers on roof deck.

.2 Wood furring for on an outside surface of exterior masonry and concrete walls.

.3 Wood sleepers supporting wood subflooring over concrete slabs in contact with ground or fill.

.4 Exposed ends of any pre-treated wood.

3.2 INSTALLATION

.1 Comply with requirements of NBC, supplemented by the following paragraphs.

.2 Install furring and blocking as required to space-out and support casework, wall and ceiling finishes, facings, fascia, soffit, siding and other work as required.

.3 Align and plumb faces of furring and blocking to tolerance of 1:600.

.4 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

.5 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.

.6 Install sleepers as indicated.

3.3 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other work or as indicated on Drawings.

3.4 SCHEDULES

.1 Provide electrical equipment backboards for mounting electrical equipment as indicated.

END OF SECTION

Part 1 General

1.1 RELATED SECTION

.1 Section 06 10 00 – Rough Carpentry.

1.2 SUBMITTALS

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

.2 Twelve inch long piece of shade structure joist, showing representative sample of pre-drilled bolt hole and cut edge condition with finish applied.

.3 Twelve inch long piece of workshop cladding material, showing example of screw hole fastener with finish applied.

.4 Twelve inch long piece of bench board, showing example of pre-drilled hole and fastener with finish applied.

1.3 SHOP DRAWINGS

.1 Submit shop drawings including layout, fastener placement and all connections for site furnishings, shade structure, and workshop in accordance with Section 01 33 00- Submittal Procedures.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Time delivery and installation of timber materials to avoid extended on-site storage.

.2 Keep timber and associated material protected during fabrication, delivery, storage, handling and installation.

.3 Store materials under cover, protected from weather, out of direct sunlight and away from contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings. Allow a minimum of 3 days for acclimation in local temperature and humidity conditions.

Part 2 Products

2.1 LUMBER

.1 Shade structure joists: reclaimed fir as indicated on Drawings. Supplied by Wood Anchor (204) 261-1913 or approved equal.

.2 Bench and table boards: reclaimed oak as indicated on Drawings. Supplied by Wood Anchor (204) 261-1913 or approved equal.

.3 Workshop exterior cladding: reclaimed fir as indicated on Drawings. Supplied by Wood Anchor (204) 261-1913 or approved equal.

.1 SUBSTITUTION 1: If directed by Contract Administrator, reclaimed fir may be substituted with non reclaimed/non-salvaged Fir with edge radius removed on visible sides.

2.2 FASTENERS

.1 Shade structure joists: All bolts, nuts, washers and/or other metal components shall be hot dipped galvanized.

.2 Site Furnishings benches and table: All nails, rods, screws, bolts and/or other metal components shall be hot dipped galvanized.

.3 Workshop exterior cladding: All components including, but not limited to, screws shall be stainless steel.

.4 Nut and Bolt Locker: Loctite Blue and Loctite Red or similar approved.

2.3 WOOD PRESERVATIVE

.1 All fir and oak lumber shall receive finish treatment of OSMO Clear Oil Wood Finish or approved equal.

.2 Fresh cuts shall be sealed within 24 hours with latex based endgrain sealant. Colour: clear.

Part 3 Execution

3.1 GENERAL

.1 Examine the areas and conditions where exterior woodwork is to be installed and notify the Contract Administrator of any conditions that may in any way impact on the correct installation, layout or design intent of the work. Do not proceed with work until unsatisfactorily conditions are corrected to allow for proper installation of the work.

3.2 LUMBER

.1 Design of members: Member sizes and shapes as shown on Drawings.

.2 Layout and construction: As shown on Drawings.

3.3 FASTENERS

.1 Layout and number of holes: As shown on Drawings.

.2 Apply Loctite Blue to all site furnishings threaded fasteners. After a period of one year, remove and replace with Loctite Red after fasteners have been tightened.

3.4 WOOD PRESERVATIVES

.1 Fresh cuts shall be sealed within 24 hours with latex based endgrain sealant. Apply clear finish with a paint brush.

.2 Apply approved finish product after completion of installation.

.3 Test selected finish product on several sample boards to confirm ability to adhere and dry. Advise Contract Administrator of any problems in adherence or drying capacity. Do not proceed with work until the determination has been made on the appropriateness or inappropriateness of the selected finish product.

3.5 PROTECTION

.1 Protect completed work from damage resulting from adjacent work.

3.6 ADJUSTING AND MAINTENANCE

.1 Repair damaged surfaces and finishes after installation and completion of adjacent work. Replace damaged, disfigured or stained boards if repairs are unacceptable to Contract Administrator.

.2 Tighten any boards that have loosened as a result of shrinkage after a period of one year after installation. Apply Loctite Red to all site furnishings threaded fasteners.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

1.2 SUBMITTALS

.1 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.

1.3 PRODUCT DATA

.1 Submit product data in accordance with Section 01330 - Submittal Procedures.

.2 Submit WHMIS MSDS - Material Safety Data Sheets.

.3 Submit product data sheets for sheet vapour retarders. Include:

.1 Product characteristics.

.2 Performance criteria.

.3 Limitations.

Part 2 Products

2.1 SHEET VAPOUR BARRIER – ROOF MEMBRANE

.1 60-mil minimum thickness reinforced EPDM membrane with stripped-in lap seams.

2.2 SHEATHING PAPER

.1 Asphalt saturated paper, with no visible markings on paper surface.

.2 Acceptable material:

.1 Davis Wire Asphalt Saturated Paper

.2 Super Jumbo Tex 60 Minute

.3 Similar Approved

2.3 ACCESSORIES

.1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 63 mm wide, black

.2 Sealant: non-skinning, non-drying coumpound.

.3 Staples and nails: galvanized steel staples minimum 12 mm long to CSA B111.

.4 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

Part 3 Execution

3.1 INSTALLATION VAPOUR BARRIER

.1 Ensure services are installed and inspected prior to installation of retarder.

.2 Use sheets of largest practical size to minimize joints.

.3 Install continuous vapour barrier at inside face of exterior wood framed building elements unless otherwise indicated.

.4 Installed vapour barrier to form a complete and continuous envelope, properly sealed at all joints, fastenings and penetrations, effectively resisting moisture migration.

.5 All penetrations through vapour barrier, unless clearly detailed on drawings, must be approved by Contract Administrator.

.6 To ensure continuity of vapour barrier at all locations, install strips of vapour barrier of sufficient width at intersecting walls, on top of walls at joists bearings and at other locations where subsequent work would prevent installation of continuous vapour barrier.

.7 Place vapour barrier joints over solid backing, lapped one full stud or joist space and sealed with sealant between sheets. Where vapour barrier is applied to top of roof deck or floor sheathing, lap joints minimum 150 mm and seal with sealant between sheets.

.8 At door and window openings cut `X` at , carry material onto sill, head and jamb framing members, staple in place and seal framing.

.9 At electrical outlets and boxes located in exterior building elements, provide preformed polyethelene box. Seal vapour barrier to box and seal between electrical wires and boxes with sealant to maintain continuity of barrier.

.10 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

.11 Do not cover up any area until Contract Administrator has inspected and accepted installation of vapour barrier.

3.2 SHEATHING PAPER

.1 Install at exterior walls and where indicated on drawings.

.2 Installed barrier to be continuous and complete, lapped and taped at joints, to form an effective barrier against air infiltration and exfiltration.

.3 At exterior walls, install over plywood sheathing. Staple or nail air barrier 300 mm o.c.; do not place seams at corners. Cut `X` at window at door openings and fasten material to sill, head and jambs and seal.

3.3 PERIMETER SEALS

.1 Seal perimeter of sheet vapour barrier as follows:

.1 Apply continuous bead of sealant to substrate at perimeter of sheets.

.2 Lap sheet over sealant and press into sealant bead.

.3 Install staples through lapped sheets at sealant bead into wood substrate.

.4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.4 LAP JOINT SEALS

.1 Seal lap joints of sheet vapour barrier as follows:

.1 Attach first sheet to substrate.

.2 Apply continuous bead of sealant over solid backing at joint.

.3 Lap adjoining sheet minimum 150 mm and press into sealant bead.

.4 Install staples through lapped sheets at sealant bead into wood substrate.

.5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.4 ELECTRICAL BOXES

.1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:

.1 Install moulded box vapour barrier. Wrap boxes with film sheet providing minimum 300 mm perimeter lap flange.

.2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 16 00 Sheet Vapour Retarders

1.2 REFERENCES

.1 FLL-standards (Guideline for Planning, Execution and Upkeep of Green-Roof Sites, Release 2002)

.2 ASTM E2396-05: Standard Test Method for Saturated Water Permeability of Granular Drainage Media for Green Roof Systems.

.3 ASTM E2397-05: Standard Practice for Determination of Dead Loads and Live Loads associated with Green Roof Systems.

.4 ASTM E2398-05: Standard Test Method for Water Capture and Media Retention of Geo composite Drain Layers for Green Roof Systems.

.5 ASTM E2399-05: Standard Test Method for Maximum Media Density for Dead Load Analysis of Green Roof Systems.

1.3 SUBMITTALS

.1 Submit signed shop drawings showing that the roofing system, green roof assembly, materials, perimeter and penetration details are accepted by the green roof manufacturer to ensure that the green roof system meets the necessary performance requirements.

.2 Submit a certification showing that all the components of the green roof assembly are supplied and warranted by the green roof manufacturer.

.3 Submit an inspection report, signed by the roof Subcontractor and the green roof Subcontractor, resulting from the quality control of the roofing system installation prior to the installation of the green roof assembly indicating that the roofing system is installed correctly.

.4 Submit references which indicate that the green roof manufacturer as well as the green roof Subcontractor has recently successfully completed projects of similar scope and nature.

1.4 QUALITY ASSURANCE

.1 Installers Qualifications: Work of this section shall be installed by a recognized green roof or landscape Subcontractor, approved by the green roof manufacturer. The Subcontractor shall have adequate equipment, skilled workers with extensive practical experience, skills and knowledge of plants horticulture techniques and overall landscape design requirements.

.2 Prior to the installation of the green roof system, test the water tightness of the roofing system by flood testing for at least a 48 hour period or an electronic leak detection process performed by a qualified testing agency.

.3 Submit documentation certifying that the load bearing capacity of the roof and building construction is tested and approved by a structual engineer, with regard to the extra weight of the Green Roof system.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Store the materials in a dry area, out of direct sunlight, protected from freezing, staining or damage. If storing on the roof make sure that the load of the materials does not exceed the load bearing capacity of the roof and building construction

1.6 WARRANTY

.1 Submit a 2-year product manufacturing warranty and a 5 years system performance warranty according to the specifications of the green roof manufacturer which warrants all the components of the green roof and the performance of the total system, expect planting.

.2 Submit a 2-year workmanship warranty which warrants the installation of the green roof system, except planting, according to the specifications.

Part 2 Products

2.1 SPECIFIED PRODUCT

.1 ZinCo Floradrain ® FD25-E: Sedum Carpet

Supplier**:** **ZinCo Canada Inc.**
P.O. Box 29
Carlisle, ON Canada, L0R 1H0
Phone: 905-690-1661
E-mail: greenroof@zinco.ca
Website: www.zinco.ca

2.2 ROOT BARRIER

.1 **ZinCo root barrier WSF 40** made of special-polyethylene – Bitumen and Polystyrol resistant - Without plasticizer - UV-stabilized. Thickness: 0,40 mm. Weight: 380 g/m^2.

2.3 MOISTURE RETENTION AND PROTECTION MAT

.1 **ZinCo moisture retention and protection mat SSM45** made of recycled non-rotting fibers for water- and nutrient retention as well as a protection layer. Thickness: 5 mm. Weight approx. 470 g/m^2. Water retention capacity: 5 l/m^2. Bitumen resistant – Biologically and Chemically neutral. Penetration resistance: > 2400N. Tensile strength length wise: >8.5 KN/m.

2.4 DRAINAGE AND WATER STORAGE ELEMENT

.1 **ZinCo Drainage and water storage element Floradrain® FD25-E** made of 100% thermoformed recycled polyethylene, with water storage cells, openings for aeration and diffusion as well as a multidirectional drainage channel system on the underside. Bitumen resistant – Compressive strength: 270 kN/m^2. Water retention capacity: 3 l/m^2. Weight: approx. 1,7 kg/m^2. Dimensions: 1.00 x 2.00 x 0.025 m.

2.5 FILTER FABRIC

.1 **ZinCo filter sheet SF** made of non-rotting thermal consolidated Polypropylene. Water flow rate: 155 l/(m^{2}s) if there is a water column of 100 mm. Apparent Opening size: d90%= 110 µm. Weight: 100 g/m^2.

2.6 GROWING MEDIUM

.1 **Growing medium for extensive Green Roofs - ZinCo Blend-E**, produced using light weight recycled or re-used materials and minerals, enriched with high quality compost elements, resistant to flying sparks, frost-resistant, stable structure. Specially engineered by ZinCo Canada and meets the FLL-Standards for Planning, Execution and Upkeep of Green Roof sites. Depth: 80 mm – 100 mm.

Particle Size Distribution		
Proportion of silting components (d < 0.063 mm)	Mass %	≤ 15
Density Measurements		
Bulk Density (at max. water-holding capacity)	kg/m^3	1100 – 1500
Compression Factor	Vol. %	<20%
Water/Air Measurements		
Total Pore Volume	Vol. %	≥ 65
Maximum water-holding capacity	Vol. %	*≥ 35%*
Air-filled porosity at max water-holding capacity	Vol. %	≥ 10
Water permeability (saturated hydraulic conductivity)	cm/sec	*≥0.001*
pH		
pH		6.5 - 8.0

Organic Measurements		
Organic matter content	Mass %	*≤ 8% mass%*
Nutrients		
Phosphorus, P205 (CAL)	mg/L	≤ 200
Potassium, K2O (CAL)	mg/L	≤ 700
Magnesium, Mg (CaCl2)	mg/L	≥ 200
Nitrate + Ammonium (CaCl2)	mg/L	≤ 80

2.7 PLANT MATERIAL

.1 Not in contract. Supplied and installed by others.

(Plug plants: Plant material potted in 50 or 72 tray plugs in a mix of Sedums, Grasses and Herbs. Quantity: at least 16 plants/m^2;)

2.8 WIND PROTECTION

.1 Bio-degradable jute mesh, satisfying the following specifications:

Aperture ≥ 0.375 in and ≤ 1.0 in
Weight ≤ 20 oz/ft2
Tensile strength (ASTM D4632) ≥ 20 lb
Elongation at failure (ASTM D-4595) ≥ 25%

2.9 RELATED PRODUCTS

.1 **ZinCo inspection chamber KS8** made of plastic coated galvanized steel with thermally insulated cover, resistant to compression. Height: 80 mm. To ensure accessibility of the roof drains at any time. Dimensions: 0.25 x 0.25 x 0.08 m. Weight: 3 kg.

.2 **ZinCo gravel retainer KL 85** made of aluminum L-bracket with square slots for drainage. Designed as gravel retainer for gravel strips. Length: approx. 3 m. Height: 85 mm. Including joint connectors.

.3 **Gravel strip** to protect roofing details, using a 1”-2” round aggregate. Width: at least 15 cm. Depth: 80 mm.

Part 3 Execution

3.1 INSPECTION

.1 Clean up the waterproofing membrane carefully (well-swept)

.2 Careful inspection of the waterproofing membrane including seams, penetrations and details after flood testing or electronic leak detection. If the waterproofing system and the Green Roof system are not carried out by the same company, the acceptance of the method used for waterproofing quality should be agreed by all the parties. Identified defects are to be reported in written form. Do not proceed until corrected.

3.2 ROOT BARRIER

.1 Deliver and install the **ZinCo root barrier WSF40** on top of the non root-resistant waterproofing with a minimum overlap of 500 mm according to the manufacturers instructions. The root barrier must be installed above the growing medium along the edges and roof penetrations.

3.3 MOISTURE RETENTION AND PROTECTION MAT

.1 Deliver and install the **ZinCo protection mat SSM45** directly on the top of the root barrier with a minimum overlap of 100 mm, according to the manufacturers instructions. The protection mat has to be taken above the growing medium along the edges and roof penetrations. Cut the protection mat in place at the roof penetrations.

3.4 DRAINAGE AND WATER STORAGE ELEMENT

.1 Deliver and install the **ZinCo drainage and water storage element Floradrain ® FD25-E** directly on the protection mat or diffusion membrane according to the manufacturers instructions. Install the Floradrain elements side by side with the ventilation and evaporation holes facing up and fix the elements together with connection clips or overlap them. Cut the drain elements in place along the edges and roof penetrations. Fill the water retention cups of the drain layer once with water.

3.5 FILTER FABRIC

.1 Deliver and install the **ZinCo filter sheet SF** on the drainage layer with a minimum overlap of 200 mm according to the manufacturers instructions. The filter must be installed above the growing medium along the edges and roof penetrations. Cut the filter sheet in place along the edges and at roof penetrations.

3.6 GROWING MEDIUM

.1 Deliver and install the **growing medium for extensive Green Roofs ZinCo Blend-E** on the filter sheet. Spread out the growing medium equally to a depth of 4” minimum. Check the depth on several places to ensure the right thickness. A tolerance of 1 cm is acceptable.

3.7 WIND PROTECTION

.1 Deliver and install the jute matting on top of the growing medium. Tether jute matting to filter fabric.

3.8 RELATED PRODUCTS

.1 **ZinCo inspection chamber KS8**

Deliver and install the ZinCo Inspection Chamber on top of the drainage layer above the roof outlets. Install the ZinCo filter sheet SF on the flange of the inspection chamber.

.2 **ZinCo gravel retainer KL 85**

Deliver and install the ZinCo gravel retainer on top of the filter fabric between the gravel strip and the growing medium.

.3 **Gravel strip**

Deliver and install a gravel strip along roof edges, flashing details and roof penetrations on top of the filter sheet using a 1”-2” round aggregate. Depth: 80 mm.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.2 ASTM C90-05, Standard Specification for Elastomeric Joint Sealants.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168, June 2006.

1.2 SUBMITTALS

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

.2 Manufacturer's product to describe:

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.4 Submit duplicate samples of each type of material and colour.

.5 Cured samples of exposed sealants for each color where required to match adjacent material.

.6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.

.1 Instructions to include installation instructions for each product used.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.4 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.3 Ventilate area of work as directed by Contract Administrator by use of approved portable supply and exhaust fans.

1.6 QUALITY ASSURANCE

.1 Perform the work by experienced and skilled mechanics thoroughly trained and competent in the use of caulking and sealing equipment and the specified materials with at least five years experience.

.2 Arrange with the caulking and sealant manufacturers for a visit at the job site by one of their technical representatives before beginning the caulking and sealing installation to discuss with the Contractor and the Contract Administrator the procedures to be adopted, to analyse site conditions and inspect the surfaces and joints to be sealed, in order that type of sealant recommendations may be made for typical joint configuration.

.3 Discuss the following items and provide a written report indicating:

.1 Sealants and caulking materials selected for use from those specified.

.2 Surface preparation requirements;

.3 Priming and application procedures;

.4 Verification that sealants and caulking are suitable for purposes intended and joint design;

.5 Sealants and caulkings are compatible with other materials and products with which they come in contact including but not limited to sealants provided under other Sections, insulation adhesives, bitumens, block, concrete, metals and metal finishes.

.6 Verification that sealant and caulking are suitable for temperature and humidity conditions at time of application and will not stain adjacent surfaces;

.7 Recommended sealant for each type of joint configuration;

.8 Joint design;

.9 Anticipated frequency and extent of joint movement;

.10 Number of beads to be used in the sealing operation;

.11 Suitability of durometer hardness and other properties of material to be used;

.12 Weather conditions under which work will be done.

Part 2 Products

2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which offgas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.

.3 Where sealants are qualified with primers use only these primers.

.4 The VOC content of adhesives, sealants and sealant primers used must be less than the VOC content limits of the State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168, June 2006.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Silicones One Part '3':

.1 To ASTM C919-02 and ASTM C920-05, primerless, Type S, Grade NS, Class 50, 100, Non-Sag, SWRI validated. Polysulfide Two Part '1B'.

.2 Acoustical Sealant '6': One part silicone to ASTM C919-02 and ASTM C920-05, primerless, Type S, Grade NS, Class 25, SWRI validated Ecologo certified maximum VOC 60 g/L.

.3 Exterior glazing sealant '10': one part silicone to ASTM C920-05, Type S, Grade NS, Class 50.

.4 Interior glazing sealant '10': one part silicone to ASTM C920-05, Type S, Grade NS, Class 25.

.5 Silicones One Part '11': to ASTM C919 and C920, primerless, Type S, Grade NS, Class 25, SWRI validated, Ecologo certified maximum VOC 60 g/l.

.6 Preformed Compressible and Non-Compressible back-up materials:

.1 Polyethylene, Urethane, Neoprene or Vinyl Foam:

.1 Extruded closed cell foam backer rod.

.2 Size: oversize 30 to 50 %.

.2 Neoprene or Butyl Rubber:

.1 Round solid rod, Shore A hardness 70.

.3 High Density Foam:

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m3 density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond Breaker Tape:

.1 Polyethylene bond breaker tape which will not bond to sealant.

.7 Sealant for fireproofing; where cables, conduits, pipes and ducts pass through floors and fire-rated walls, pack space between wiring and sleeve full with penetrating foam sealing system, ULC listed meeting CAN4-S115-M85 and ASTM E814.

.8 Colours: Colours shall be selected from manufacturer's standard colour range. Colours to match material/background colour upon which they occur. Final colour selection by Contract Administrator.

.9 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.10 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.11 Where sealants are qualified with primers use only these primers.

2.3 SEALANT SELECTION

.1 Perimeters of exterior openings where frames meet exterior facade of building: Designations, 3.

.2 Expansion and control joints in exterior surfaces of walls: Designations 3.

.3 Coping joints and coping-to facade joints: Designations 3.

.4 Exterior joints in horizontal wearing surfaces (as itemized): Designations 3.

.5 Seal interior perimeters of exterior openings as detailed on drawings: Designations 3.

.6 Control and expansion joints on the interior of exterior surfaces walls: Designations 3.

.7 Interior control and expansion joints in floor surfaces: Designations 3.

.8 Perimeters of interior frames, as detailed and itemized: Designations 3.

.9 Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, waterclosets, basins, vanities): Designations 11.

.10 Joints in washrooms, janitors room etc Designations 11.

.11 Exposed interior control joints in drywall: Designations 3.

.12 Joints in polyethylene and where acoustical sealant is specified: Designations 6.

.13 Exposed interior control joints in drywall: Designations 3.

.14 Joints in polyethylene and where acoustical sealant is specified: Designations 6.

.15 Sealants for glazing: Designations 10.

2.4 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

Part 3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.5 APPLICATION

.1 Sealant:

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions

.2 Do not cover up sealants until proper curing has taken place.

.3 Cleanup:

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Non-rated, fire rated and thermally insulated steel frames.

.2 Non-rated, fire rated and thermally insulated steel doors.

1.2 REFERENCES

.1 ANSI A1 17.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

.2 ASTM A653JA653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 CSDFMA (Canadian Steel Door and Frame Manufacturers Association).

.4 DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

.5 SDI-100 - Standard Steel Doors and Frames.

1.3 SUBMITTALS

.1 Product Data: Indicate frame configuration and finishes. Indicate door configurations, location of cut-outs for hardware reinforcement.

.2 Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacings, location of cut-outs for hardware, and finish. Indicate door elevations, internal reinforcement, closure method, and cut-outs for finishes.

1.4 QUALITY ASSURANCE

.1 Conform to requirements of CSDFMA SDI-100 and ANSI A117.1.

1.5 PROJECT CONDITIONS

.1 Coordinate the work with frame opening construction, door, and hardware installation.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS

.1 Shanahans or approved equal in accordance with B6 by Contract Administrator.

2.2 FRAMES

.1 Frames: 1.5 mm thick material, base metal thickness with ZF75 Colourbond coating.

.2 Removable Stops: Rolled steel shape, mitered corners; prepared for countersink style tamper proof screws.

.3 Anchors: purpose made to rigidly secure frames, 3 per jamb.

.4 Mortar Guard Boxes: 0.76 mm welded in place.

.5 Bituminous Coating: Fibered asphalt emulsion.

.6 Primer: Zinc chromate type.

.7 Silencers: Resilient rubber set in steel fitted into drilled hole.

.8 Insulation: Fibreglass.

2.3 DOORS

.1 Insulated Core Doors: minimum, 1.2 mm surface sheets, and top and bottom end channels; cores filled with insulation.

.2 Honeycomb Core Doors: minimum, 1.2 mm surface sheets and, top and bottom end channels; cores filled with honeycomb material laminated under pressure to surface sheets.

.3 Reinforcement for hardware:

.1 Locks: minimum 1.5 mm.stee1.

.2 Butts: minimum 3.42 mm steel.

.3 Flush Bolts: minimum 3.42 mm steel.

.4 Door Closures: minimum 1.9 mm steel.

2.4 FABRICATION FRAMES

.1 Fabricate frames as welded unit.

.2 Fabricate frames with hardware reinforcement plates welded in place. Provide mortar guard boxes.

.3 Reinforce frames wider than 1200 mm inches with roll formed steel channels fitted tightly into frame head, flush with top.

2.5 FABRICATION - DOORS

.1 Fabricate hollow metal doors and panels in accordance with requirements of "Canadian Manufacturing Standards for Steel Doors and Frames" produced by the Canadian Steel Door and Frame Manufacturer's Association and as indicated on Drawings. Fabricate doors with hardware reinforcement welded in place.

.2 Mechanically interlock longitudinal seams of honeycomb core type doors weld seams and sand flush. Top and bottom of doors closed with end channels recessed and spot-welded in place.

.3 Reinforce and prepare doors to receive hardware.

.4 Each exterior hollow metal door to be supplied complete with a full minimum 3.42 mm anti-intrusion plate welded to latch side of door.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that opening sizes and tolerances are acceptable.

3.2 INSTALLATION

.1 Install frames in accordance with CSDFMA.

.2 Coordinate with masonry, gypsum board, concrete wall construction for anchor placement.

.3 Coordinate installation of doors and frames.

.4 Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

.5 After installation touch up all scratched or damaged surface and prime.

3.3 ERECTION TOLERANCES

.1 Maximum Diagonal Distortion: 1.5 nun inch measured with straight edges, crossed corner to corner.

.2 Clearance on steel doors at head and jambs shall be 3mm maximum, and 3mm maximum between pairs of doors.

3.4 ADJUSTING

.1 Adjust door for smooth and balanced door movement.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).

.1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-69.17-M86(R1993), Bored and Preassembled Locks and Latches.

.2 CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-1981, Butts and Hinges.

.3 CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-1986, Door Controls (Closers).

.4 CAN/CGSB-69.21-M90/ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products.

.5 CAN/CGSB-69.28-M90/ANSI/BHMA A156.12-1986, Interconnected Locks and Latches.

.6 CAN/CGSB-69.29-93/ANSI/BHMA A156.13-1987, Mortise Locks and Latches.

.7 CAN/CGSB-69.30-93/ANSI/BHMA A156.14-1991, Sliding and Folding DoorNHardware.

.8 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, AuxiliarY Hardware.

.9 CAN/CGSB-69.36-M90/ANSI/BHMA A156.20-1984, Strap and Tee Hinges and Hasps.

1.2 SUBMITTALS

.1 Product Data: Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.3 After approval samples will be returned for incorporation in the Work.

.3 Hardware List:

.1 Submit contract hardware list in accordance with Section 01 33 00 – Submittal Procedures.

.2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.5 Closeout Submittals

.1 Provide operation and maintenance data for door closers, and locksets, for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.2 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 – Common Product Requirements.

.2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.2 Storage and Protection:

.1 Store finishing hardware in locked, clean and dry area.

1.5 MAINTENANCE

.1 Extra Materials:

.1 Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.

.2 Supply two sets of wrenches for door closers, and locksets.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS

.1 Shanahan's or approved equal in accordance with B6 by Contract Administrator.

2.2 DOOR HARDWARE

.1 As indicated on Schedule.

2.3 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.4 KEYING

.1 Doors to be keyed as directed by Contract Administrator. Prepare detailed keying schedule in conjunction with City.

.2 Provide keys in duplicate for every lock in this Contract.

.3 Stamp keying code numbers on keys and cylinders.

.4 Provide construction cores.

.5 Provide all permanent cores and keys to Contract Administrator.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

.1 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

.2 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.3 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.4 Remove construction cores, locks when directed by Contract Administrator; install permanent cores and check operation of locks.

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer’s instructions.

. .3 Remove protective material from hardware items where present.

.4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 SCHEDULE

.1 As indicated on Drawings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section CW 3110 – Sub grade

1.2 SUBMITTALS

.1 Product Data: Including stone type and quantity.

.2 The following shall be submitted 10 days, minimum, prior to beginning work under this Section.

.1 List of materials and sources for products to be installed under this section. Include a description of the components of the material.

.2 A half cubic foot of gravel

.3 A 1'x1' sample of compacted gravel

1.3 QUALITY ASSURANCE

.1 Sources: The crushed stone surfacing shall be obtained from a single source and be of the same type material to assure uniformity of quality and appearance. Deliver all project stone materials to an approved holding area prior to commencement of work for review by the Contract Administrator.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials to the site only when the work area is ready and surfacing can begin.

.2 Store and handle gravel and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, or other causes.

.3 Store cementitious materials off the ground, under cover, and in a dry location.

.4 Store aggregates, covered and in a dry location, where grading and other required characteristics can be maintained and contamination avoided.

.5 Handling:

1. Handle materials in a safe and professional manner. Use tools, equipment and methods designed and suitable for the task being performed.

2. Comply with all applicable safety standards, requirements, and practices, including those for using safety glasses or goggles.

1.5 SUBSTITUTIONS

.1 Make no materials substitutions without the written approval of the Contract Administrator.

1.6 LAYOUT

.1 Verify the location of all elements prior to installation with Contract Administrator.

Part 2 Products

2.1 CRUSHED STONE SURFACING BASE AGGREGATE

.1 3/4”Down Crushed Limestone per CW3110

2.2 CRUSHED STONE SURFACING TOP COURSE

.1 1/4" Down Black Granite, as supplied by Ron Paul Garden Centre (204) 257-2893 or approved equal in accordance with B6 by Contract Administrator.

2.3 STEEL EDGER

.1 6” – 7ga. Commercial Steel Edging. Product Number: 1007-6 by Col-met (800) 829-8225 or approved equal in accordance with B6 by Contract Administrator. Galvanized finish.

.2 Galvanized end stakes and corner stakes by Col-met (800) 829-8225 or approved equal in accordance with B6 by Contract Administrator.

2.4 NON WOVEN GEOTEXTILE FABRIC

.1 Refer to CW 3130 latest revision.

Part 3 Execution

3.1 EXAMINATION

.1 Verify the following:

.1 Support work and site conditions are ready to receive Work of this Section.

.2 Items in other Sections are properly located and sized.

3.2 PREPARATION

.1 Do not work frozen soils.

.2 Protect soils from excessive moisture.

.3 Apply supplemental moisture to overly dry soils.

3.3 GRADING

.1 Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Contract Administrator is not authorized. Unauthorized excavation, as well as remedial work directed by the Contract Administrator shall be at the Contractor's expense.

.2 Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified areas. Compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades. Finish surfaces free from irregular surface changes.

.3 Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.

.4 Locate and retain soil materials away from edge of excavations and drip lines of trees to remain.

.5 Dispose of excess soil material and waste materials as herein specified.

3.4 COMPACTION

.1 General: Control soil compaction during construction providing minimum percentage of density specified for area classification. Do not allow equipment traffic to overly compact areas beyond specified percentages. Remediate over compaction as directed by the Contract Administrator including ripping, regrading and re-compaction or over-excavation and in-kind replacement per plan.

.2 Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages for maximum density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D1557; and not less than the following percentages of relative density; determined in accordance with ASTM 2049, for soils which will not exhibit a well defined moisture density relationship (cohesionless soils).

.1 Import aggregate base material for Crushed Stone Surface- 95%.

.2 Crushed Stone Surface Top Course - 95%

.3 Moisture Control:

.1 Where sub-grade or lift of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.

.2 Before compaction, moisten or aerate each layer as necessary to provide optimum content. Compact each layer to required percentages of maximum dry density or relative dry density for each area classification.

.3 Do not perform compaction operations on excessively wetted soils.

3.5 CRUSHED STONE SURFACING BASE BACKFILL

.1 Provide a minimum 6" compacted lift of specified Crushed Stone Surfacing Base Aggregate true to the elevations either described or implied in the Contract Drawings or as required to match adjacent existing pavements, and a minimum of 6" beyond the horizontal layout lines of pavement as indicated on the Contract Drawings.

3.6 STEEL EDGER

.1 Install as per manufacturer's specifications.

3.7 CRUSHED STONE SURFACING TOP COURSE

.1 Provide a 2" compacted lift of specified Crushed Stone Surfacing Top Course Crushed Rock true to the elevations either described or implied by the Contract Drawings or as required by the Contract Administrator.

.2 Shape the crushed stone area to the desired grades and shape surfaces so as to provide natural runoff and drainage.

Part 4 Quality Control

4.1 INSPECTION

.1 All workmanship and all materials furnished and supplied under this Specification are subject to close and systematic inspection and testing by the Contract Administrator including all operations from the selection and production of materials through to final acceptance of the specified work. The Contractor shall be wholly responsible for the control of all operations incidental thereto notwithstanding any inspection or approval that may have been previously given. The Contract Administrator reserves the right to reject any materials or works which are not in accordance with the requirements of this Special Provision.

4.2 ACCESS

.1 The Contract Administrator shall be afforded full access for the inspection of materials.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section CW3170 – Earthwork and Grading

.2 Section CW3510 – Sodding

.3 Section CW 3540 – Topsoil for Turf

1.2 SUBMITTALS

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

.2 One cubic foot of topsoil.

.3 One cubic foot of mulch

Part 2 Products

2.1 MATERIALS

.1 Planting Soil: black top soil, a fertile friable natural loam containing by volume not less than 4% and no more than 25% of organic matter for clay loams, and not less than 2% and no more than 25% for sandy loams, with an acidity value ranging from pH 6.0 to 8.0 and capable of sustaining vigorous plant growth. Topsoil is to be free of any mixture of subsoil, clay lumps and free of stones and other extraneous matter. It is not to contain couch or crab grass rhizomes.

.2 Mulch: locally available mulch, free of soil, stones or other deleterious material, smallest chips to be no less than 1" in any one dimension. Colour: dark brown or black. Red, gold, or orange mulch shall not be accepted.

.3 Water: potable and free of minerals which may be detrimental to plant growth.

.4 Fertilizer: complete synthetic slow release fertilizer with maximum 35% water-soluble nitrogen.

Part 3 Execution

3.1 PLANTING BED PREPARATION

.1 All areas to be excavated shall be to the shape shown on the drawings. Beds shall be excavated to the finished depth (including bark mulch) shown on drawings.

.2 Excavation shall be filled with soil mixture. After filling, excavation of top of bed shall be level with surrounding grade. Soil should be lightly compacted and indicated soil depths shall be depths after light compaction.

.3 All areas and locations provided for planting shall be staked according to layout shown on the drawings. Excavation shall not proceed until the layout has been inspected and approved by the Contract Administrator. Excavation shall not be undertaken until all underground utilities have been located and protected.

.4 The Contractor shall provide a planting bed with a crisp spade edge (where appropriate), complete with topsoil and bark mulch as indicated on the Drawings.

3.2 INSTALLATION OF MULCH

.1 Bark mulch shall be spread to a consistent depth over entire planting bed area, taking care not to damage the plants.

3.3 COORDINATION OF INSTALLATION

.1 Topsoil and mulch installation shall be coordinated with the Contract Adminstrator to allow sufficient time for planting of tree, shrubs and green roof plants by the City.

END OF SECTION