Project Manual

City of Winnipeg

Flagpole Addition

510 Main Street

Winnipeg, Manitoba

Bid Opportunity No. 364-2021

Project:

Flagpole Addition
510 Main Street
Winnipeg, Manitoba

Architectural Consultants:

Northern Sky Architecture Inc.
100 – 128 James Avenue
Winnipeg, Manitoba R3B 0N8
Telephone: (204) 943-6767
Fax: (204) 956-7979
E-mail: kent@nsai.ca

Structural Consultants:

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100 – 128 James Avenue
Winnipeg, Manitoba R3B 0N8
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E-mail: agies@knhsawatzky.com

The following list of drawings form part of this bid:

Architectural and Structural

A1.1	Site Plan and Details

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the construction of three new flagpoles and associated landscape work, located at 510 Main Street, Winnipeg; and further identified as Flagpole Addition Project. Work shall include the installation of three new flagpoles on piled concrete foundations with associated site work as per contract drawings.

.2 All work is to be completed in conformance with City of Winnipeg Standard Construction Specifications and Details. The Standard Construction Specifications and Details can be viewed at https://www.winnipeg.ca/matmgt/Spec/Default.stm.

1.2 CONTRACT METHOD

.1 Construct Work under City of Winnipeg construction contract.

1.3 INTERPRETATION OF DOCUMENTS

.1 In interpreting the plans (drawings) and specifications, in the event of discrepancies or conflicts between:
.1 Specifications and drawings bound with specifications, the specifications shall govern.
.2 Specifications and City of Winnipeg Specifications, the specifications shall govern.

1.4 CONTRACTOR USE OF PREMISES

.1 Unrestricted use of immediate site until Substantial Performance.

.2 Co-ordinate use of site under direction of Project Manager.

1.5 CITY OF WINNIPEG FURNISHED ITEMS

.1 Owner Responsibilities:
.1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
.2 Deliver supplier's bill of materials to Contractor.
.3 Arrange and pay for delivery to site in accordance with Progress Schedule.
.4 Inspect deliveries jointly with Contractor.
.5 Submit claims for transportation damage.
.6 Arrange for replacement of damaged, defective or missing items.

.2 Contractor Responsibilities:
.1 Designate submittals and delivery date for each product in progress schedule.
.2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
.3 Receive and unload products at site.
.4 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
.5 Handle products at site, including uncrating and storage.
.6 Protect products from damage, and from exposure to elements.
.7 Assemble, install, connect, adjust, and finish products.
.8 Provide installation inspections required by public authorities.
.9 Repair or replace items damaged by Contractor or subcontractor on site (under his control).

.3 Schedule of Owner furnished items:
.1 Aluminum flagpoles and accessories.
.2 Flagpole anchors to be set in concrete base.

1.6 EXISTING SERVICES

.1 Notify, Project Manager 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 and vehicular traffic.

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

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

.5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.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.

1.7 DOCUMENTS REQUIRED

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

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 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

.1 Closures: protect work temporarily until permanent enclosures are completed.

1.3 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 of notice for necessary interruption of mechanical or electrical service that may interfere with Tenant occupants after Interim Occupancy. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

.3 Provide for personnel and vehicular traffic.

.4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.4 SPECIAL REQUIREMENTS

.1 Carry out noise generating Work Monday to Friday and weekends & statutory holidays within provisions of applicable municipal by-laws.

.2 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.3 Keep within limits of work and avenues of ingress and egress.

.4 Ingress and egress of Contractor vehicles at site is limited to existing curb cuts.

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

1.01 REFERENCE STANDARDS

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 City of Winnipeg Construction Contract
.2 Project Supplementary Conditions

1.02 CASH ALLOWANCES

.1 To be included in contract price, identified as cash allowances.
.2 Cash allowances, unless otherwise specified, cover costs to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage and other authorized expenses incurred in performing Work.
.3 Cash allowances are not to include the contractor’s overhead and profit.
.4 Contract Price will be adjusted by change order to provide for excess or deficit to each cash allowance.
.5 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated as set out in Contract Documents.
.6 Include progress payments on accounts of work authorized under cash allowances in Consultant's monthly certificate for payment.
.7 Prepare schedule jointly with Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.
.8 Amount of each allowance, for Work specified in respective specification Sections is as follows:
  .1 Section 03 30 00 include allowance of $2,500.00 for purchase of concrete testing services.

PART 2 – PRODUCTS

2.01 NOT USED

.1 Not used.

PART 3 – EXECUTION

3.01 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

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

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

.3 Present shop drawings, product data, samples and mock-ups in units to match construction documents.

.4 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 coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

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

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

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

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

.9 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 10 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 revisions other than those requested.

.6 Accompany submissions with transmittal letter, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.7 Submissions 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 one electronic copy 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.

.10 Submit one electronic copy of test reports for requirements requested in specification Sections and as requested by Contract Administrator.
.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
.2 Testing must have been within 3 years of date of contract award for project.

.11 Submit one electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Contract Administrator.
.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.12 Delete information not applicable to project.

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

.14 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.

1.3 SAMPLES

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

.2 Deliver samples prepaid to Contract Administrator's business address.

.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 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

1.6 PROGRESS PHOTOGRAPHS

.1 Progress photographs taken weekly shall be provided by the General Contractor and submitted to the Project Administrator. Photos are to be submitted in high resolution digital format.

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 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 for such services will be borne by the City.

.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 City. Pay costs for re-testing and re-inspection.

1.2 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.

1.3 PROCEDURES

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

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.4 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, 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.

1.5 REPORTS

.1 Submit 3 copies of inspection and test reports to Contract Administrator.

.2 Provide copies to subcontractor of work being inspected or tested.

1.6 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

1.7 MOCK-UPS

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

.2 Construct in locations acceptable to Contract Administrator.

.3 Prepare mock-ups for Contract Administrator's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

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

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

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

1.8 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical and electrical systems.

.2 Refer to relevant specification sections for definitive requirements.

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 utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.2 DEWATERING

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

1.3 WATER SUPPLY

.1 Contractor will provide continuous supply of potable water for construction use.

.2 Water for construction contracts or work may be taken from the City's water system provided a permit is obtained for hydrant use. A separate permit will be required for each hydrant used.

.3 Obtain permits for hydrant use from the Permits Branch of Customer Services Division of the Public Works Department, at 1155 Pacific Avenue. Ensure Tender Number is noted on each permit for City contract work. Permit is only valid for use for the construction contract or work it was taken out for.

.4 Water Services Division of Water and Waste Department will provide and install metering equipment and identification "donut" on hydrants once permits have been obtained.

.5 Provide approved backflow device with current test tag attached and an enclosure in accordance with SD-019 before using water from a hydrant.

.6 Cost of permits for hydrant use and for water used from the City's water system will be at own expense.

.7 Repair of existing services, utilities and structures within and adjacent to the Site that are damaged due to carelessness during construction will be at own expense.

1.4 TEMPORARY POWER AND LIGHT

.1 Contractor to provide and pay for temporary power during construction for temporary lighting and operating of power tools and required equipment.

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

.3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.5 TEMPORARY COMMUNICATION FACILITIES

.1 Contractor to provide and pay for temporary telephone and fax equipment and hook up necessary for own use and use of Contract Administrator.

1.6 FIRE PROTECTION

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

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

End of Section

PART 1 - GENERAL

1.1 INSTALLATION AND REMOVAL

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.2 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA- S269.2.

.2 Provide and maintain scaffolding, ramps, ladders and platforms as required to perform work.

1.3 HOISTING

.1 Provide, operate and maintain hoists required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists to be operated by qualified operator.

1.4 SITE STORAGE/LOADING

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

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

1.5 CONSTRUCTION PARKING

.1 Parking will not be permitted on site.

.2 Provide and maintain adequate access to project site.

1.6 OFFICES

.1 A site office will not be required.

.2 Provide clearly marked and fully stocked first-aid case in a readily available location.

1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

1.8 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.9 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three weeks of signing Contract, of a design and in a location acceptable to City

.2 Install sign supplied by Contract Administrator on framing for project sign.

.3 No other signs or advertisements, other than warning signs, are permitted on site.

.4 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Contract Administrator.

1.10 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and

flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

1.11 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

End of Section

PART 1 - GENERAL

1.1 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.2 HOARDING

.1 Erect temporary site enclosure using 2.4 m high metal mesh fence. Provide one lockable truck gate. Maintain fence in good repair.

.2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.3 GUARD RAILS AND BARRICADES

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

.2 Provide as required by governing authorities.

1.4 ACCESS TO SITE

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

1.5 FIRE ROUTES

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

1.6 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.7 PROTECTION OF BUILDING FINISHES

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

.2 Provide necessary screens, covers, and hoardings.

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

End of Section

PART 1 - GENERAL

1.1 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 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.

1.2 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify 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.

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

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

1.4 TRANSPORTATION

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

1.5 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 Contract Administrator will 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.

1.6 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.

1.7 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.8 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.

1.9 FASTENINGS

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

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

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

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

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

1.10 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.

1.11 PROTECTION OF WORK IN PROGRESS

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

1.12 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.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

End of Section

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Recording of subsurface conditions found.

1.2 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Contract Administrator of findings.

.2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Contract Administrator.

1.3 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Contract Administrator of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Contract Administrator.

1.4 RECORDS

.1 Prior to engaging in any demolition or excavation, conduct a condition survey including an annotated photographic record of existing structures adjacent to project extents. Investigate foundations to determine underpinning, and related works required.

.2 Prior to engaging in any demolition or excavation, record elevations, in relation to project geodetic, for existing structures adjacent to project extents.

.3 Maintain a complete, accurate log of control and survey work as it progresses.

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

1.5 SUBSURFACE CONDITIONS

.1 Promptly notify Contract Administrator in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Contract Administrator determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders and Change Directives.

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 SUBMITTALS

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

.2 Submit written request in advance of cutting or alteration which affects:
- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of City or separate contractor.

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

1.2 MATERIALS

.1 Required for original installation.

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

1.3 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 are to be exposed by uncovering work; maintain excavations free of water.

1.4 EXECUTION

.1 Execute cutting, fitting, and patching, including excavation and fill, 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 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

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

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

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

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

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

.11 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

.12 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, other than that caused by City or other Contractors.

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

.3 Clear snow and ice from access to building.

.4 Make arrangements with and obtain permits from Authorities Having Jurisdiction for disposal of waste and debris.

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

.6 Provide and use marked separate bins for recycling.

.7 Dispose of waste materials and debris off site.

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

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

.10 Provide adequate ventilation during use of volatile or noxious substances.

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

.12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not 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, and leave Work clean and suitable for occupancy.

.3 Clean and polish wall stone, stainless steel, aluminum and chrome.

.4 Remove stains, spots, marks and dirt from decorative work, stonework, retaining walls, and slabs.

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

.6 Broom clean and wash exterior walks and surfaces; rake clean other surfaces of grounds.

.7 Remove dirt and other disfiguration from exterior surfaces.

.8 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 Subcontractors: conduct 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 to 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 Certificates required by Utility companies have been submitted.
- .5 Operation of systems have been demonstrated to City's personnel.
- .6 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 re-inspection.

.5 Declaration of Substantial Performance: when Contract Administrator considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to City Agreement for specifics to application.

.6 Commencement of Lien and Warranty Periods: date of City's acceptance of submitted declaration of Substantial 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 considers 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 re-inspection.

.8 Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with City agreement.

1.2 CLEANING

.1 In accordance with Section 01 74 11 - Cleaning.

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 SUBMITTALS

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

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

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

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

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

.6 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.

.7 Furnish evidence, if requested, for type, source and quality of products provided.

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

.9 Pay costs of transportation.

1.2 FORMAT

.1 Organize data as instructional manual.

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

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

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

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

.6 Text: manufacturer's printed data, or typewritten data.

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

.8 All information within binders shall also be submitted in electronic ‘PDF’ format.

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 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.

.6 Training: refer to Section 01 79 00 - Demonstration and Training.

1.4 AS-BUILTS AND SAMPLES

.1 Maintain, at site for Contract Administrator, one record copy of:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.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.

.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: mark each item to record actual construction, including:
- .1 Measured depths of elements of foundation in relation to finish first floor datum.
- .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
- .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .4 Field changes of dimension and detail.
- .5 Changes made by change orders.
- .6 Details not on original Contract Drawings.
- .7 References to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:
- .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
- .2 Changes made by Addenda and change orders.

1.6 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.

1.7 SPECIAL TOOLS

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to location as directed; place and store.

.4 Receive and catalogue items. Submit inventory listing to Contract Administrator. Include approved listings in Maintenance Manual.

1.8 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Contract Administrator for approval.

.3 Warranty management plan to include required actions and documents to assure that City receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Contract Administrator for approval prior to each monthly pay estimate.

.6 Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- .4 Verify that documents are in proper form, contain full information, and are notarized.
- .5 Co-execute submittals when required.
- .6 Retain warranties and bonds until time specified for submittal.

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

.8 Include information contained in warranty management plan as follows:

- .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractor, subcontractors, manufacturers or suppliers involved.
- .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, pumps, motors, transformers, and commissioned systems such as fire protection systems.
- .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
  - .1 Name of item.
  - .2 Model and serial numbers.
  - .3 Location where installed.
  - .4 Name and phone numbers of manufacturers or suppliers.
  - .5 Names, addresses and telephone numbers of sources of spare parts.
  - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
  - .7 Cross-reference to warranty certificates as applicable.
  - .8 Starting point and duration of warranty period.
  - .9 Summary of maintenance procedures required to continue warranty in force.
  - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
  - .11 Organization, names and phone numbers of persons to call for warranty service.
  - .12 Typical response time and repair time expected for various warranted equipment.
- .4 Procedure and status of tagging of equipment covered by extended warranties.

.5 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.9 Respond in a timely manner to oral or written notification of required construction warranty repair 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 DESCRIPTION

.1 Demonstrate scheduled operation and maintenance of equipment to City's personnel one week prior to date of final inspection.

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

1.2 PREPARATION

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

.2 Verify that designated personnel are present.

1.3 DEMONSTRATION AND INSTRUCTIONS

.1 Demonstrate operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times, at the designated location.

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

.3 Prepare and insert additional data in operations and maintenance manuals when 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 SUMMARY

.1 Section Includes.

.1 Methods and procedures for demolishing, salvaging, recycling and removing sitework items designated to be removed in whole or in part, and for backfilling resulting trenches and excavations.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 Canadian Council of Ministers of the Environment (CCME).

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

.1 Material Safety Data Sheets (MSDS).

1.3 DEFINITIONS

.1 Demolition: rapid destruction of building following removal of hazardous materials.

.2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

1.4 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA, and] applicable Provincial/Territorial regulations.

.2 Site Meetings.

.1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations in accordance with Section 01 32 18 - Construction Progress Schedules - Bar (GANTT) Chart to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review manufacturer's installation instructions and warranty requirements.

.2 Arrange for site visit with Contract Administrator to examine existing site conditions adjacent to demolition work, prior to start of Work.

.3 Hold project meetings every 2 weeks.

.4 Ensure key personnel attend.

.5 Contract Administrator will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

.3 Health and Safety.

.1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Storage and Protection.

.1 Protect in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

.2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Contract Administrator and at no cost to Contract Administrator

.3 Remove and store materials to be salvaged, in manner to prevent damage.

.4 Store and protect in accordance with requirements for maximum preservation of material.

.5 Handle salvaged materials as new materials.

1.6 SITE CONDITIONS

.1 Site Environmental Requirements.
- .1 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .2 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
  - .1 Ensure proper disposal procedures are maintained throughout the project.
- .3 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
- .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.
- .5 Protect trees, plants and foliage on site and adjacent properties where indicated.

.2 Existing Conditions.
- .1 Remove contaminated or hazardous materials listed as hazardous as defined by authorities having jurisdiction as directed by Contract Administrator from site, prior to start of demolition Work, and dispose of at designated disposal facilities in safe manner in accordance with TDGA and other applicable regulatory requirements.

1.7 SCHEDULING

.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
- .1 Notify Contract Administrator in writing when unforeseen delays occur.

PART 2 – PRODUCTS

2.1 EQUIPMENT

.1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Inspect site with Contract Administrator and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

3.2 REMOVAL OF HAZARDOUS WASTES

.1 Remove contaminated or dangerous materials defined by Authorities Having Jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

3.3 REMOVAL OPERATIONS

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place.

.3 Removal of Pavements, Curbs and Gutters:
- .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Contract Administrator.
- .2 Protect adjacent joints and load transfer devices.
- .3 Protect underlying and adjacent granular materials.

3.4 REMOVAL FROM SITE

.1 Remove stockpiled material, when it interferes with operations of project.

.2 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.

3.5 RESTORATION

.1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work.

.2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.6 CLEANING

.1 Remove debris, trim surfaces and leave work site clean, upon completion of Work

.2 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 Canadian Standards Association (CSA)
- .1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
- .2 CAN/CSA-O86.1, Engineering Design in Wood (Limit States Design).
- .3 CSA O121, Douglas Fir Plywood.
- .4 CSA O151, Canadian Softwood Plywood.
- .5 CSA O437, Standards for OSB and Waferboard.
- .6 CSA S269.1, Falsework for Construction Purposes.
- .7 CAN/CSA-S269.3, Concrete Formwork.

.2 Council of Forest Industries of British Columbia (COFI)
- .1 COFI Exterior Plywood for 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 CAN/CSA-O86.1.
- .2 For concrete with special architectural features, use formwork materials to CAN/CSA-A23.1.

.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.
- .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.3 Form release agent: non-toxic, low VOC.

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

.5 Sealant: to Section 07 92 10 - Joint Sealing.

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 Obtain Contract Administrator's approval for use of earth forms framing openings not indicated on drawings.

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

.4 Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.

.5 Refer to architectural drawings for concrete members requiring architectural exposed finishes.

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

.7 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.8 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.

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

.10 Locate horizontal form joints for exposed columns 2400 mm above finished floor elevation.

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

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

.13 Construct forms for architectural concrete, and place ties as indicated and/or as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.14 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.

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

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.
- .1 3 days for walls and sides of beams.
- .2 3 days for footings and abutments.

.2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

.3 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.4 Space reshoring in each principal direction at not more than 3000 mm apart.

.5 Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Concrete Institute (ACI)
- .1 ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.2 American National Standards Institute/American Concrete Institute (ANSI/ACI)
- .1 ANSI/ACI 315, Details and Detailing of Concrete Reinforcement.

.3 Canadian Standards Association (CSA)
- .1 CAN3-A23.3, Design of Concrete Structures for Buildings.
- .2 CAN/CSA-G30.18, Billet-Steel Bars for Concrete Reinforcement.
- .3 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.

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, spacing's, 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, spacing's 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.

.3 Detail lap lengths and bar development lengths to CAN3-A23.3.

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 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-30.18.

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

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

.6 Plain round bars: to CAN/CSA-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.

.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.

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 reviewed 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 material and placement.

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

.5 Protect epoxy and paint coated portions of bars with covering during transportation and handling.

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 SECTIONS

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

.2 Section 03 20 00 - Concrete Reinforcing.

.3 Section 03 35 00 - Concrete Finishing.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM C 109/C109M, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50-mm Cube Specimens).
- .2 ASTM C 260, Specification for Air-Entraining Admixtures for Concrete.
- .3 ASTM C 332, Specification for Lightweight Aggregates for Insulating Concrete.
- .4 ASTM C 494, Specification for Chemical Admixtures for Concrete.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-37.2, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
- .2 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 Canadian Standards Association (CSA)
- .1 CAN/CSA-A5, Portland Cement.
- .2 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
- .3 CAN/CSA-A23.2, Methods of Test for Concrete.
- .4 CAN/CSA-A23.5, Supplementary Cementing Materials.
- .5 CAN/CSA A363, Cementitious Hydraulic Slag.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Use trigger operated spray nozzles for water hoses.

.2 Designate a cleaning area for tools to limit water use and runoff.

.3 Carefully coordinate the specified concrete work with weather conditions.

.4 Ensure emptied containers are sealed and stored safely for disposal away from children.

.5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

.6 Choose least harmful, appropriate cleaning method, which will perform adequately.

PART 2 - PRODUCTS

2.1 MATERIALS

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

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

.3 Cementitious hydraulic slag: to CAN/CSA-A363.

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

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

.6 Air entraining admixture: to ASTM C 260.

.7 Chemical admixtures: to ASTM C 494. Contract Administrator to approve accelerating or set

retarding admixtures during cold and hot weather placing.

.8 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents.
- .1 Compressive strength: 35 MPa at 28 days.
- .2 Consistency:
  - .1 Fluid: to ASTM C 827. Time of efflux through flow cone (ASTM C 939), under 30s.
  - .2 Flowable: to ASTM C 827. Flow table, 5 drops in 3s, (ASTM C 109, applicable portion) 125 to 145%.
  - .3 Plastic: to ASTM C 827. Flow table, 5 drops in 3 s, (ASTM C 109, applicable portions) 100 to 125 %.
  - .4 Dry pack to manufacturer's requirements.
- .3 Net shrinkage at 28 days: maximum 0 %.

.9 Non premixed dry pack grout: composition of non metallic aggregate Portland cement with sufficient water for the mixture to retain its shape when made into a ball by hand and capable of developing compressive strength of 35 MPa at 28 days.

.10 Curing compound: to CAN/CSA-A23.1 white and to ASTM C 309, Type 1-chlorinated rubber.

.11 Premoulded joint fillers:
- .1 Bituminous impregnated fiber board: to ASTM D 1751.
- .2 Sponge rubber: to ASTM D 1752, Type I, flexible grade.

.12 Polyethylene film: 0.254 mm thickness to CAN/CGSB-51.34.

2.2 MIXES
.1 Proportion normal density concrete in accordance with CAN/CSA-A23.1, as indicated on the drawings.

PART 3 - EXECUTION

3.1 PREPARATION
.1 Obtain Contract Administrator's approval before placing concrete. Provide 24 hours 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.

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

.6 In locations where new concrete is dowelled to existing work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.

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

3.2 CONSTRUCTION
.1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1 and City of Winnipeg specifications.

.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 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.

.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 diameter. Drilled holes to be to manufacturer's recommendations.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with epoxy 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 using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

.5 Finishing.

.1 Finish concrete in accordance with CAN/CSA-A23.1.

.2 Use procedures acceptable to Contract Administrator to remove excess bleed water. Ensure surface is not damaged.

.3 Provide smooth trowel finish on interior slabs unless otherwise indicated.

.4 Provide broom finish on exterior slabs unless otherwise indicated.

.5 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.

.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 joints as indicated. Install joint filler.

.3 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.

3.3 SITE TOLERANCE

.1 Concrete tolerance in accordance with CAN/CSA-A23.1.

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

End of Section

PART 1 – GENERAL

1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-25.20, Surface Sealer for Floors.

1.3 PERFORMANCE REQUIREMENTS

.1 Product quality and quality of work in accordance with Section 01 61 00 - Common Product Requirements.

.2 Submit written declaration that components used are compatible and will not adversely affect finished flooring products and their installation adhesives.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Place materials defined as hazardous or toxic waste in designated containers.

.2 Dispose of surplus chemical and finishing materials in accordance with federal, provincial and municipal regulations.

.3 Dispose of waste from stripping of floors in a manner that will not have unfavourable effects on the environment.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Temporary lighting: Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 sq m of floor being treated.

.2 Electrical power: Provide sufficient electrical power to operate equipment normally used during construction.

.3 Work area: Make the work area water tight protected against rain and detrimental weather conditions.

.4 Temperature: Maintain ambient temperature of not less than 10 °C from 7 days before installation to at least 48 hours after completion of work and maintain relative humidity not higher than 40% during same period.

.5 Moisture: Ensure concrete substrate is within moisture limits prescribed by manufacturer.

.6 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

.7 Ventilation:

.1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.2 Provide continuous ventilation during and after coating application.

PART 2 - PRODUCTS

2.1 SEALING COMPOUNDS

.1 Surface sealer: to CAN/CGSB-25.20.

2.2 CURING COMPOUNDS

.1 Select water-based curing compounds.

2.3 MIXES

.1 Mixing, ratios and application in accordance with manufacturer's instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verify that slab surfaces are ready to receive work and elevations are as instructed by manufacturer.

3.2 PREPARATION OF SLAB

.1 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radiused edges unless otherwise indicated.

.2 Saw cut control joints to CSA-A23.1, 24 hours maximum after placing of concrete as indicated on drawings.

.3 Remove chlorinated rubber or existing surface coatings.

.4 Use protective clothing, eye protection and respiratory equipment during stripping of chlorinated rubber or existing surface coatings.

3.3 APPLICATION

.1 Prepare and mix materials in accordance with manufacturer’s directions to produce a uniform monolithic surface.

3.4 PROTECTION

.1 Protect finished installation in accordance with manufacturer's instructions.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

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

- .1 ASTM A-53/A53M, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- .3 ASTM A-307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 Canadian Standards Association (CSA International)

- .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 SUBMITTALS

.1 Product Data:

- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

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 Storage and Protection:

- .1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
- .2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W.

.2 Welding materials: to CSA W59.

.3 Bolts and anchor bolts: to ASTM A 307.

.4 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 Shop coat primer: to CAN/CGSB-1.40.

.3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.4 ISOLATION COATING

.1 Isolate aluminum from following components, by means of bituminous paint:
- .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
- .2 Concrete, mortar and masonry.
- .3 Wood.

2.5 SHOP PAINTING

.1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.

.2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.

.3 Clean surfaces to be field welded; do not paint.

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.

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 ANCHOR BOLTS

.1 Anchor bolts are to be provided by the City of Winnipeg as per flag pole manufacturer's requirements.

.2 Install anchor bolts as indicated by manufacturer's requirements.

3.3 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

End of Section

PART 1 - GENERAL

1.1 REFERENCES

(All standards listed below and within this specification shall be the most recent and up-to-date versions available at the time this project was tendered)

.1 ASTM International Inc.
- .1 ASTM D 41, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- .2 ASTM D 449, Standard Specification for Asphalt Used in Dampproofing and Waterproofing.
- .3 ASTM D 6163, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fibre Reinforcements.
- .4 ASTM D 6164, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

.2 Canadian General Standards Board (CGSB)
- .1 CGSB 37-GP-9Ma, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .2 CGSB 37-GP-56M, Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Provide copies of most recent technical waterproofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Provide and maintain dry, off-ground weatherproof storage.

.2 Store rolls of felt and membrane in upright position.
- .1 Store membrane rolls with salvage edge up.

.3 Remove only in quantities required for same day use.

.4 Store sealants at +5 degrees C minimum.

.5 Handle waterproofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.

1.4 SITE CONDITIONS

.1 Ambient Conditions
- .1 Do not install waterproofing when temperature remains below -12 degrees C.
- .2 Minimum temperature for solvent-based adhesive is -5 degrees C.

.2 Install waterproofing on dry surface, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into waterproofing system.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Sheet Applied Waterproofing Membrane:
- .1 Self-adhering waterproofing membrane consisting of SBS modified bitumen and a cross-laminated polyethylene film, having the following properties:
  - .1 Thickness: 1.5mm (60 mils)
  - .2 Water Vapour Transmission (ASTM E96): 1.14 ng/Pa.m^2.s., (0.02 perms)

.3 Peel Strength (ASTM D903): 1576N/m
.4 Minimum Puncture Resistance – Membrane (ASTM E154): 222 N/m
.5 Hydrostatic Head (ASTM D1876): 70m of Water
.6 Moisture Absorption (ASTM D570): 0.1% Maximum
.7 Tensile Strength (ASTM D412-modified): 2.24 MPa
.8 Elongation (ASTM D412-modified): 300%

2.2 ADHESIVES AND PRIMERS

.1 Adhesive for Self-Adhering Membranes (at temperatures above -12 deg C): Synthetic rubber based adhesive type, quick setting, having the following physical properties:
.1 Weight: 0.8 kg/l.
.2 Solids by weight: 35%.
.3 Drying time (initial set): 30 minutes.
.4 Application Temperature: between -12 deg C and 40 deg C.

.2 Warm Weather Application Adhesive for Self-Adhering Waterproofing Membranes (at temperatures above –4 deg C): Polymer emulsion based adhesive type, quick setting, low VOC content, having the following physical properties:
.1 Weight: 1.0 kg/l
.2 Solids (by weight): 58% (approx.)
.3 Water based, no solvent odours.
.4 Drying time (initial set): 30 minutes at 50% RH and 20 deg C.
.5 Application Temperature: between -4 deg C and 40 deg C.

.3 Cold Weather Application Adhesive for Self-Adhering Waterproofing Membranes (at temperatures above -12 deg C): Rubber-based adhesive, quick setting, having the following physical properties:
.1 Weight: 0.8 kg/l.
.2 Solids by weight: 35%.
.3 Drying time (initial set): 30 minutes
.4 Application Temperature: between -12 deg C and 25 deg C.
.5 Adhesive Application over Insulated Concrete Forms (ICF): Pass.

2.3 MASTICS AND TERMINATION SEALANTS

.1 Insulation and Protection Board Adhesive: Synthetic rubber base compound having the following characteristics:
.1 Compatible with sheet applied waterproofing membrane, substrate and insulation materials.
.2 Long term flexibility: Pass CGSB 71-GP-24M.
.3 Chemical resistance: Alkalis, mild acid and salt solutions.
.4 Application Temperature: between -12 deg C and 40 deg C.

.2 Termination and Joint Sealant: Polymer modified sealing compound having the following characteristics:
.1 Compatible with sheet applied waterproofing membrane and substrate.
.2 Solids by volume: 70%.
.3 Vapour permeance: 2.9 ng/Pa.m².s, ASTM E96.
.4 Complies with CGSB 37.29.
.5 Remains flexible with aging.
.6 Adheres to wet surfaces.
.7 Chemical resistance: Alkalis, calcium chloride, mild acid and salt solutions.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions:
.1 Examine substrates to receive work and surrounding adjacent surfaces for conditions affecting installation.
.2 Surfaces shall be smooth and without large voids, spalled areas or sharp protrusions.

.3 The installing contractor shall examine and determine that surfaces and conditions are ready to accept the Work of this section in accordance with published literature. Commencement of Work or any parts thereof shall mean installers acceptance of the substrate.

3.2 PREPARATION

.1 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants.

.2 Use appropriate waterproofing membrane adhesive as recommended by manufacturer based on air and surface temperature at time of application.

.3 Protect adjacent surfaces and Work of other trades from damage resulting from Work of this section. Make good such damage at no additional cost to the Owner.
- .1 Provide sound handling and installation procedures to prevent and protect against spillage and overspray of materials specified in this Section.

.4 Use appropriate waterproofing membrane adhesive as recommended by manufacturer based on air and surface temperature at time of application.

3.3 INSTALLATION

.1 Non-Moving Substrate Crack Treatment and Corner Treatment:
- .1 Gaps up to 3mm (1/8") wide:
  - .1 Sealant Method: Apply 1.5mm (60 mil) coating of termination and crack sealant, 50mm (2") wide, centered on the gap and strike smooth. Allow to dry prior to application of sheet applied waterproofing membrane.
  - .2 Sheet Applied Method: Apply adhesive and allow to dry. Apply 150mm (6") wide strip of sheet applied waterproofing membrane, centered over gap and roll in place. Provide 75mm (3") end laps.

.2 Adhesive or Primer for Sheet Applied Waterproofing Membrane:
- .1 Apply adhesive or primer for sheet applied waterproofing membrane at rate recommended by manufacturer.
- .2 Apply adhesive or primer to all areas to receive sheet applied waterproofing membrane, as indicated on drawings by roller or spray and allow minimum thirty (30) minute open time. Surfaces not covered by sheet applied waterproofing membrane during the same working day must be re-applied.

.3 Sheet Applied Waterproofing Membrane – Vertical Application:
- .1 Align and position sheet applied waterproofing membrane, to prepared and primed substrate in lengths of 2400mm (8') or less.
- .2 Provide 65mm (2-1/2") laps at both sides and ends. Position for alignment and remove protective film.
- .3 Press firmly into place and promptly roll all laps to affect seal.
- .4 Overlap additional sheets in shingle fashion, staggering all vertical joints, and in accordance with manufacturer's recommendations.
- .5 Terminate sheet applied waterproofing membrane using termination sealant. Refer to manufacturers standard details.
- .6 Seal all laps within 305mm (12") of a 90 degrees change in plane with termination sealant. Trowel apply a feathered edge to all horizontal termination sealant applications to allow shedding of water.

3.4 FIELD QUALITY CONTROL

.1 Final Observation and Verification:
- .1 Final inspection of sheet applied waterproofing membrane shall be carried out by the Owner's representative, and the contractor.
- .2 Contact Manufacturer for warranty issuance requirements.

.2 Sheet applied waterproofing membrane is not designed for permanent UV exposure. Install grading as soon as possible after installation of sheet applied waterproofing membrane. Refer to manufacturer published literature for product limitations.

3.5 CLEANING AND PROTECTION

.1 Progress Cleaning: Leave work area clean at the end of each work day, ensuring safe movement of passing pedestrians.

3.6 WARRANTY

.1 Contractor Warranty: Warrant that the sheet applied waterproofing membrane and membrane flashings will stay in place and remain leak proof for two (2) years.

.2 Manufacturer's Warranty: Sheet applied waterproofing membrane manufacturer must warranty the membrane and membrane flashings for leak coverage as a result of faulty materials for a period of five (5) years from the date of substantial completion.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Society for Testing and Materials International, (ASTM)
- .1 ASTM C 919, Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)
- .1 CGSB 19-GP-5M, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
- .2 CAN/CGSB-19.13, Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .3 CGSB 19-GP-14M, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
- .4 CAN/CGSB-19.17, One-Component Acrylic Emulsion Base Sealing Compound.
- .5 CAN/CGSB-19.24, Multi-component, Chemical Curing Sealing Compound.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

1.2 DELIVERY, STORAGE, AND HANDLING

.1 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.

1.3 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.

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.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Urethanes Two Part.
- .1 Non-Sag to CAN/CGSB-19.24, Type 2, Class B, colour as selected
- .2 Acceptable material: Tremco Dymeric 240, Vulkem 227

.2 Urethanes One Part.
- .1 Non-Sag to CAN/CGSB-19.13, Type 2, colour as selected
- .2 Acceptable material: Tremco Dymonic, Vulkem 116, Vulkem 431

.3 Silicones One Part.
- .1 To CAN/CGSB-19.13.

.1 Acceptable material: Tremco Spectrum 2 or 3, GE Silpruf 2000

.2 To CAN/CGSB-19.22 (Mildew resistant).

.1 Acceptable material: Tremco Tremsil 200, GE SCS 1700 Sanitary

.4 Acrylics One Part.

.1 To CGSB 19-GP-5M.

.2 Acceptable material: Tremco 555

.5 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/m 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.

2.3 SEALANT SELECTION

.1 Perimeters of exterior openings where frames meet exterior facade of building (ie. brick, block, precast masonry): Sealant type: 2.2.2

.2 Cornice and wash (or horizontal surface joints): Sealant type: 2.2.2

.3 Exterior joints in horizontal wearing surfaces: Sealant type: 2.2.2

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.

3.6 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

1.01 REFERENCE STANDARDS

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 The Aluminum Association (AA)
  .1 AA DAF-45, Designation System for Aluminum Finishes - 9th Edition.

.2 ASTM International
  .1 A ASTM A 53/A 53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  .2 ASTM A 123/A 123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  .3 ASTM B 241/B 241M, Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for flag poles and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
  .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
  .2 Indicate dimensions, finishes, base jointing, anchoring and support systems, cleats, halyard boxes, trucks, finials and base collar for flagpoles.

.4 Manufacturer's Instructions: submit manufacturer's installation instructions for each type of flagpole.

1.03 QUALITY ASSURANCE

.1 Provide each flagpole as complete unit produced by single manufacturer, including fittings, accessories, bases and anchorage devices.

1.04 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
  .1 Spiral wrap each flagpole with heavy kraft paper, wood strip and steel band, or polyethylene wrap and pack in tubing for shipment.
  .2 Ship flagpole to installation site in one piece.

.3 Storage and Handling Requirements:
  .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  .2 Store and protect flagpoles from nicks, scratches, and blemishes.
  .3 Replace defective or damaged materials with new.

PART 2 – PRODUCTS

2.01 MATERIALS

.1 Aluminum:
  .1 Aluminum Association alloy AA 6063-T5 seamless extruded aluminum tubing.
  .2 Fabricated from seamless extruded tubing in accordance with ASTM B 241, alloy 6063 T6, having minimum tensile strength not less than 20 MPa and a yield point of 17 MPa. Heat treated and age hardened after fabrication.

.2 Isolation coating: alkali-resistant bituminous paint or epoxy resin solution.

2.02 DESIGN CRITERIA

.1 Flagpole, bases and anchorage devices to resist minimum wind velocity of 145 km/h unflagged, 100 km/h flagged.

.2 Description: all flagpole specifications to match the existing flagpoles. Contact Contract Administrator should there be any discrepancies between the sjpecifications and site conditions.
.1 Exposed Height: 10.668m (35'-0") – contractor to site confirm.
.2 Butt Diameter: 152.4mm (6").
.3 Top Diameter: 76.2mm (3").
.4 Wall Thickness: 4.78mm (.188").
.5 Options and Accessories: aluminum revolving cap, stainless steel internal halyard, steel flag snaps (2), weighted nylon loop, lockable aluminum access door, aluminum base cover, steel fixed base, steel anchor bolts, steel lightning cable.
.6 Flag Size: to match existing.
.7 Finish: satin brushed, to match existing.

2.03 FABRICATION
.1 Fabricate 10.668 mm long flagpole as complete unit including base, mounting brackets, anchorage and fittings.
.2 Cone tapered flagpole:
.1 Seamless, uniform, straight line tapered section above cylindrical butt section.
.2 Taper: full height of run.
.3 Provide internal splicing, self-aligning sleeve of same material as flagpole for snug fitting, watertight field joints.

2.04 FINISHES
.1 Finish to be aluminum.
.2 Finish exposed surfaces of aluminum components in accordance with AA DAF-45:

2.05 FIELD FABRICATION
.1 Fabricate ground-set foundation assembly for fixed base installation of flagpole as indicated.
.2 Fabricate mountings of same metal as flagpoles where exposed and of galvanized steel where encased in concrete.

PART 3 – EXECUTION

3.01 EXAMINATION
.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable.
.1 Visually inspect substrate.
.2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied.

3.02 INSTALLATION
.1 Shop apply isolation coating to metal surfaces of flagpole and base that will be encased in concrete.
.2 Install flagpoles, base assemblies and fittings to shop drawings and manufacturer's instructions.
.3 Provide ground stakes for positive lightning ground for each flagpole installation.
.4 Check and adjust installed fittings for smooth operation of halyards.

3.03 CLEANING
.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.
.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.04 PROTECTION
.1 Protect installed products and components from damage during construction.
.2 Repair damage to adjacent materials caused by flagpole installation.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

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

.2 Section 32 11 19 – Granular Sub-base.

.3 Section 32 11 23 – Granular Base.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D 4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

1.3 SAMPLES

.1 If requested, submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide Contract Administrator with access to source and processed material for sampling.

.3 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused granular materials from landfill to local facility as approved by Contract Administrator.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.

.2 Flat and elongated particles of coarse aggregate: to ASTM D 4791.

.1 Greatest dimension to exceed five times least dimension.

.3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:

.1 Natural sand.

.2 Manufactured sand.

.3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.

.4 Coarse aggregates satisfying requirements of applicable section to be one of, or blend of, following:

.1 Crushed rock.

.2 Gravel composed of naturally formed particles of stone.

.3 Light weight aggregate, including slag and expanded shale.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Topsoil stripping

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.

.2 Begin topsoil stripping of areas as indicated after area has been cleared of brush, weeds and grasses and removed from site.

.3 Strip topsoil to depths as directed by Contract Administrator. Avoid mixing topsoil with subsoil.

.4 Stockpile in locations as Contract Administrator. Stockpile height not to exceed 3.0m.

.2 Aggregate source preparation

.1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as approved by authority having jurisdiction.
.2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
.3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
.4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
.5 Trim off and dress slopes of waste material piles and leave site in neat condition.

.3 Processing
.1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
.2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Contract Administrator.
.3 Wash aggregates, if required to meet specifications. Use only equipment approved by Contract Administrator.
.4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.

.4 Handling
.1 Handle and transport aggregates to avoid segregation, contamination and degradation.

.5 Stockpiling
.1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Contract Administrator. Do not stockpile on completed pavement surfaces.
.2 Stockpile aggregates in sufficient quantities to meet Project schedules.
.3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
.4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 100 mm of pile into Work.
.5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
.6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Contract Administrator within 48 h of rejection.
.7 Stockpile materials in uniform layers of thickness as follows:
.1 Max 1.5 m for coarse aggregate and base course materials.
.2 Max 1.5 m for fine aggregate and sub-base materials.
.3 Max 1.5 m for other materials.
.8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
.9 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

.1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.2 Leave any unused aggregates in neat compact stockpiles as directed by Contract Administrator.

.3 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

End of Section

PART 1 - GENERAL

1.1 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 Canadian Standard Association (CSA)

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

1.2 REGULATIONS

.1 Shore and brace excavations, protect slopes and banks and perform all work in accordance with Provincial and Municipal regulations whichever is more stringent.

1.3 TESTS AND INSPECTIONS

.1 Testing of materials and compaction of backfill and fill will be carried out by testing laboratory designated by Contract Administrator.

.2 Do not begin backfilling or filling operations until material has been approved for use by Contract Administrator.

.3 Not later than 48 hours before backfilling or filling with approved material, notify Contract Administrator so that compaction tests can be carried out by designated testing agency.

.4 Before commencing work, conduct, with Contract Administrator, condition survey of existing structures, trees and other plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.

1.4 BURIED SERVICES

.1 Before commencing work establish the location of all buried services on and adjacent to the site.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.

.3 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.

1.5 PROTECTION

.1 Protect excavations from freezing.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Contract Administrator's approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular A.

PART 3 - EXECUTION

3.1 EXCAVATION

.1 Excavate as required to carry out work, in all materials met. Do not disturb soil or rock below bearing surfaces. Notify Contract Administrator when excavations are complete.

.2 Excavate for slabs and retaining walls to subgrade levels. In addition, remove all topsoil, organic matter, debris and other loose and harmful matter encountered at subgrade level.

3.2 BACKFILLING

.1 Inspection: do not commence backfilling until fill material and spaces to be filled have been inspected and approved by Contract Administrator.

.2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.

.3 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.

.4 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as specified for fill. Fill excavated areas with gravel and sand compacted as specified for fill.

.5 Placing:
- .1 Place backfill, fill and basecourse material in 150 mm lifts. Add water as required to achieve specified density.

.6 Compaction: compact each layer of material to following densities for material to ASTM D 698:
- .1 To underside of basecourses: 95%.
- .2 Basecourses: 100%.
- .3 Elsewhere: 90%.

.7 Under slabs and paving:
- .1 Use 150 mm up to bottom of granular base courses.
- .2 Use 150 mm for base courses.

.8 In trenches:
- .1 Up to 300 mm above pipe or conduit: sand placed by hand.
- .2 Over 300 mm above pipe or conduit: native material approved by Contract Administrator.

.9 Under seeded and sodded areas: use site excavated material to bottom of topsoil except in trenches and within 600 mm of foundations.

.10 Against foundations (except as applicable to trenches and under slabs and paving): excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.

3.3 GRADING

.1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by the Contract Administrator. Grade to be gradual between finished spot elevations shown on drawings.

3.4 SHORTAGE AND SURPLUS

.1 Supply all necessary fill to meet backfilling and grading requirements and with minimum and maximum rough grade variance.

.2 Dispose of surplus material off site.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 05 17 - Aggregate Materials.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Society for Testing and Materials International (ASTM)
- .1 ASTM C 117, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D 422-63, Standard Test Method for Particle-Size Analysis of Soils.
- .4 ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

1.3 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
- .1 Rock: any solid material in excess of 0.25m and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.
- .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Topsoil:
- .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25mm in any dimension.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.6 Unsuitable materials:
- .1 Weak, chemically unstable, and compressible materials.
- .2 Frost susceptible materials:
  - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D 4318, and gradation within limits specified when tested to ASTM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB-8.2.
  - .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45

  - .3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

1.4 SUBMITTALS

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

.2 Preconstruction Submittals:

.1 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field, clearance record from utility authority, location plan of relocated and abandoned services, as required.

1.5 QUALITY ASSURANCE

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Storage and Protection:

.1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.2 Existing buried utilities and structures:

.1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.2 Prior to beginning excavation Work, notify City and applicable authorities having jurisdiction, establish location and state of use of buried utilities and structures. City and authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.3 Confirm locations of buried utilities by careful test excavations.

.4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.5 Where utility lines or structures exist in area of excavation, obtain direction of utility before removing or re-routing.

.6 Record location of maintained, re-routed and abandoned underground lines.

.3 Existing buildings and surface features:

.1 Conduct, with Contract Administrator, condition survey of existing service poles, wires and survey bench marks which may be affected by Work.

.2 Protect existing buildings and surface features on adjacent properties from damage while Work is in progress. In event of damage, inform Contract Administrator immediately.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Type 1 and Type 2 fill: properties to Section 31 05 17 - Aggregate Materials and the following requirements:

.1 Crushed, pit run or screened stone, gravel or sand.

.2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1.

.3 Table:

Sieve Designation	% Passing		Sieve Designation	% Passing	
	Type 1	Type 2		Type 1	Type 2
75mm	-	100	9.5mm	50-100	-
50mm	-	-	4.75mm	30-70	22-85
37.5mm	-	-	2.00mm	20-45	-
25mm	100	-	0.425mm	10-25	5-30
19mm	75-100	-	0.180mm	-	-
12.5mm	-	-	0.075mm	3-8	0-10

.2 Type 3 fill: selected material from excavation or other sources, approved by Contract Administrator for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

.3 Shearmat: honeycomb type bio-degradable cardboard 150mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.

.4 Polyethylene: 0.254mm thick

.5 Pea Gravel: clean, round stone of uniform 9.5mm size.

PART 3 - EXECUTION

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

3.3 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions as indicated.

.2 Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation.

.3 Keep excavated and stockpiled materials safe distance away from edge of trench.

.4 Restrict vehicle operations directly adjacent to open trenches.

.5 Dispose of surplus and unsuitable excavated material off site.

.6 Do not obstruct flow of surface drainage or natural watercourses.

.7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.8 Notify Contract Administrator when bottom of excavation is reached.

.9 Obtain Contract Administrator approval of completed excavation.

.10 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Contract Administrator.

.11 Correct unauthorized over-excavation as follows:
- .1 Fill under bearing surfaces and footings with concrete specified for footings.
- .2 Fill under other areas with Type 2 fill compacted to not less than 95 % of corrected Standard Proctor maximum dry density.

.12 Hand trim, make firm and remove loose material and debris from excavations.
- .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

3.4 FILL TYPES AND COMPACTION

.1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698.
- .1 Exterior side of perimeter walls: use Type 3 fill to subgrade level. Compact to 95% of corrected maximum dry density.
- .2 Under concrete slabs: provide 150mm compacted thickness base course of Type 1 fill to underside of slab. Compact base course to 100%.
- .3 Retaining walls: use Type 3 fill to subgrade level on high side for minimum 500mm from wall and compact to 85%.

3.5 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as indicated.

.2 Place bedding and surround material in unfrozen condition.

3.6 BACKFILLING

.1 No machine tracks or vehicular tires are allowed within 1.8m of foundation walls. All backfill

within 1.8m of foundation wall shall be placed in maximum 300mm lifts and compacted to maximum 95% Standard Proctor density with light duty, hand-operated plate compactors.

.2 Do not proceed with backfilling operations until completion of following:
- .1 Contract Administrator has inspected and approved installations.
- .2 Contract Administrator has inspected and approved of construction below finish grade.
- .3 Inspection, testing, approval, and recording location of underground utilities.

.3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.4 Do not use backfill material which is frozen or contains ice, snow or debris.

.5 Place backfill material in uniform layers not exceeding 150mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.6 Backfilling around installations.
- .1 Place bedding and surround material as specified elsewhere.
- .2 Do not backfill around or over cast-in-place concrete within 72 hours after placing of concrete.
- .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 0.6 m.
- .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
  - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Contract Administrator or:
  - .2 If approved by Contract Administrator, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Contract Administrator.

.7 Install drainage filter system in backfill as indicated.

3.7 RESTORATION

.1 Replace topsoil as indicated.

.2 Reinstate planting beds to elevation which existed before excavation.

.3 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.4 Clean and reinstate areas affected by Work as directed by Contract Administrator.

.5 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 11 00 - Clearing and Grubbing.

.2 Section 31 23 10 - Excavation, Trenching and Backfill.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).

1.3 EXISTING CONDITIONS

.1 Examine subsurface investigation report which is bound into this specification document.

.2 Known underground and surface utility lines and buried objects are as indicated on site plan.

.3 Refer to dewatering in Section 31 23 10 – Excavating, Trenching and Backfill.

1.4 PROTECTION

.1 Protect and/or transplant existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as directed by Contract Administrator. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

PART 2 - PRODUCTS

2.1 NOT USED

.1 not used.

PART 3 - EXECUTION

3.1 GRADING

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to following depths below finish grades:

.1 250 mm for concrete walks.

.3 Slope rough grade away from building 1:50 minimum.

.4 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.5 Compact filled and disturbed areas to maximum dry density to ASTM D 698, as per recommendations in soils report attached to this specification document.

3.2 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading or landscaping off site.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 05 17 - Aggregate Materials.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM C 117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .2 ASTM C 131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .3 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .4 ASTM D 422-63, Standard Test Method for Particle-Size Analysis of Soils.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

.3 City of Winnipeg Standard Construction Specifications
- .1 CW – 3110 Sub-Grade, Sub-Base and Base Course Construction, all works to adhere to the most recent City of Winnipeg Standard Construction Specifications.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused granular material from landfill to local quarry as approved by Contract Administrator.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular sub-base material: in accordance with Section 31 05 17 - Aggregate Materials and following requirements:
- .1 Crushed, pit run or screened stone, gravel or sand.
- .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.2.
- .3 Table

Sieve Designation	% Passing			
100mm	-	-	-	-
75mm	100	100	100	-
50mm	-	-	-	100
37.5mm	-	-	-	-
25mm	55-100	-	-	60-100
19mm	-	-	-	-
12.5mm	-	-	-	38-70
9.5mm	-	-	-	-
4.75mm	25-100	25-85	-	22-55
2.00mm	15-80	-	-	13-42
0.425mm	4-50	5-30	0-30	5-28
0.180mm	-	-	-	-
0.075mm	0-8	0-10	0-8	2-10

- .4 Other Properties as follows:
  - .1 Liquid Limit: to ASTM D 4318, Maximum 25.
  - .2 Plasticity Index: to ASTM D 4318, Maximum 6.
  - .3 Los Angeles degradation: to ASTM C 131. Max% Loss by mass: 40.

PART 3 - EXECUTION

3.1 PLACING

.1 Place granular sub-base after subgrade is inspected and approved by Contract Administrator.

.2 Construct granular sub-base to depth and grade in areas indicated.

.3 Ensure no frozen material is placed.

.4 Place material only on clean unfrozen surface, free from snow or ice.

.5 Place granular sub-base materials using methods which do not lead to segregation or degradation.

.6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Contract Administrator may authorize thicker lifts (layers) if specified compaction can be achieved.

.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.8 Remove and replace portion of layer in which material has become segregated during spreading.

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compact to density of not less than 98% corrected maximum dry density.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.4 Apply water as necessary during compaction to obtain specified density.

.5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Contract Administrator.

.6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.3 SITE TOLERANCES

.1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.4 PROTECTION

.1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Contract Administrator.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 31 05 17 - Aggregate Materials.

.2 Section 32 11 19 - Granular Sub-base.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM C 117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .2 ASTM C 131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .3 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .4 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).
- .5 ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 City of Winnipeg Standard Construction Specifications.

- .1 CW 3110 – Sub-Grade Sub-Base and Base course construction, all works to adhere to the most recent City of Winnipeg Standard Construction Specifications.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and stockpile aggregates in accordance with Section 31 05 17 - Aggregate Materials. Stockpile minimum 50% of total aggregate required prior to beginning operation.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused granular material from landfill to local quarry as approved by Contract Administrator.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular base: material in accordance with Section 31 05 17 - Aggregate Materials and following requirements:

- .1 Crushed stone or gravel.
- .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.2.
  - .1 Gradation Method # 1 to:

Sieve Designation	% Passing (1)	(2)	(3)
100mm	–	–	–
75mm	-	-	-
50mm	100	-	-
37.5mm	70-100	-	-
25.0mm	-	100	-
19.0mm	50-75	-	100
12.5mm	-	65-100	70-100
9.5mm	40-65	-	-
4.75mm	30-50	35-60	40-70
2.00mm	-	22-45	23-50
0.425mm	10-30	10-25	7-25
0.180mm	-	-	-
0.075mm	3-8	3-8	3-8

PART 3 - EXECUTION

3.1 SEQUENCE OF OPERATION

.1 Place granular base after sub-base surface is inspected and approved by Contract Administrator.

.2 Placing
- .1 Construct granular base to depth and grade in areas indicated.
- .2 Ensure no frozen material is placed.
- .3 Place material only on clean unfrozen surface, free from snow and ice.
- .4 Place material using methods which do not lead to segregation or degradation of aggregate.
- .5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Contract Administrator may authorize thicker lifts (layers) if specified compaction can be achieved.
- .6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .7 Remove and replace that portion of layer in which material becomes segregated during spreading.

.3 Compaction Equipment
- .1 Compaction equipment to be capable of obtaining required material densities.

.4 Compacting
- .1 Compact to density not less than 100% maximum dry density.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .3 Apply water as necessary during compacting to obtain specified density.
- .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Contract Administrator.
- .5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.2 SITE TOLERANCES

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

3.3 PROTECTION

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

End of Section

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

.1 Section32 11 12 Aggregate Base Courses.

1.02 REFERENCE STANDARDS

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 ASTM International
- .1 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .2 ASTM C 979/C 979M, Standard Specification for Pigments for Integrally Colored Concrete.

.2 CSA Group
- .1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .2 CSA A283, Qualification Code for Concrete Testing Laboratories.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for precast concrete unit paving and include product characteristics, performance criteria, physical size, finish and limitations.

1.04 QUALITY ASSURANCE

.1 Qualifications:
- .1 Installer: company or person specializing in precast concrete paver installations with 5 years documented experience.

1.05 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
- .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect precast concrete units from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

PART 2 – PRODUCTS

2.01 CONCRETE PAVERS

.1 Concrete pavers: to CSA A23.1/A23.2 and as follows:
- .1 Size: 210 mm x 105 mm x 60 mm height.
- .2 Shape: rectangular to match existing.
- .3 Colour: to match existing.
- .4 Finish: to match existing.

.2 Retaining wall units: to CSA A23.1/A23.2 and as follows:
- .1 Size: 102 mm x 203/152 mm x 203 mm height.
- .2 Shape: trapezoid to match existing retaining wall.
- .3 Colour: to match existing retaining wall.
- .4 Standard and coping units as required.

.3 Pigment in concrete pavers: to ASTM C 979/C 979M.

2.02 BEDDING AND JOINT MATERIAL

.1 Bedding and joint sand: clean, non-plastic, free from deleterious or foreign matter, natural or manufactured from crushed rock or gravel. Do not use limestone screenings or stone dust.

.2 Gradation: to CSA A23.1/A23.2, Table 4 - Grading Limits for Fine Aggregate, and CAN/CSA-A179 as follows.

Sieve Designation	% Passing for Joint Sand	Bedding Sand
10 mm	100	
5 mm	95-100	100
2.5 mm	80-100	95-100
1.25 mm	50-90	60-100
630 microns	25-65	
600 microns		35-80
315 microns	10-35	
300 microns		15-20
160 microns	2-10	
150 microns		2-15

2.03 EDGE RESTRAINTS

.1 PVC or medium density polyethylene, industrial and flexible type edging, manufactured for use in paver installation, complete with connectors and pre-manufactured anchoring locations for spikes:
  .1 Anchoring: Galvanized, spiral, steel anchor spikes 9.5 mm diameter x 254 mm length, 1 per 300 mm of edging and at 100 mm each side of joints.

2.04 CLEANING COMPOUND

.1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of contamination encountered.
.2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on pavers.

2.05 ADHESIVES

.1 Adhesive as per manufacturer’s recommendations.

2.06 SEALING COMPOUND

.2 Sealant as per manufacturer’s recommendations.

PART 3 – EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for precast concrete unit paving installation in accordance with manufacturer's written instructions.
  .1 Visually inspect substrate.
  .2 Proceed with installation only after unacceptable conditions have been remedied.

3.02 STRUCTURAL SURFACE

.1 Verify that structural surfaces conform to levels and compaction required for installation of unit pavers. If discrepancies occur, notify Contract Administrator and do not commence work until instructed by Contract Administrator.
.2 Verify that top of structural surface (top of base) does not exceed plus or minus 10 mm of grade over 3 m straightedge.
.3 Ensure that structural surface is not frozen or standing water is present during installation.

3.03 INSTALLATION OF EDGE RESTRAINTS

.1 Install restraints true to grade, in accordance with manufacturer's recommendations.

3.04 PLACING OF BEDDING MATERIAL

.1 Ensure bedding material is not saturated or frozen at all times until installation is complete.
.2 Do not disturb screeded material. Do not use bedding material to fill depressions in structural surface.

3.05 INSTALLATION OF RETAINING WALL

.1 Lay units to pattern of existing installation.
.2 Use appropriate coping, edge and corner stones. Saw cut pavers to fit around obstructions and at abutting structures.

.3 Inspect, remove, and replace chipped, broken and damaged pavers
.4 Secure all units with adhesive.
.5 Final surface elevations not to exceed plus or minus 10mm under 3 m long straightedge
.6 Ensure conformance of final elevations.

3.06 INSTALLATION OF CONCRETE PAVERS

.1 Lay pavers to pattern of existing installation.
.2 Use appropriate end, edge and corner stones. Saw cut pavers to fit around obstructions and at abutting structures.
.3 Use a low amplitude, high frequency plate compactor capable of at least 22 kN centrifugal compaction force to vibrate pavers into bedding sand.
.4 Inspect, remove, and replace chipped, broken and damaged pavers.
.5 Sweep dry joint sand material into joints.
.6 Settle sand by vibrating pavers with plate compactor.
.7 Continue application of joint material and vibrating of pavers until joints are full. Do not vibrate within 1 m of unrestrained edges of pavers.
.8 Complete installation to within 1 m of laying face, with sand-filled joints, at completion of each work day.
.9 Sweep off excess joint material when installation is complete.
.10 Final surface elevations not to exceed plus or minus 10mm under 3 m long straightedge.
.11 Ensure conformance of final elevations.

3.07 PRECAST CONCRETE UNIT CLEANING

.1 Carry out cleaning at times and conditions recommended by manufacturer of cleaning compound.
.2 Remove and dispose of loose, extraneous materials from surfaces to be cleaned.
.3 Apply cleaning compounds appropriate for removal of various contaminants encountered in accordance with manufacturer's recommendations.
.4 Final surface to be free of contamination.

3.08 SEALING

.1 Ensure paver surfaces to be sealed are clean, free of extraneous materials and efflorescence, dry and appropriately cured.
.2 Apply 1 coat of sealer in accordance with manufacturer's recommendations.
.3 Protect sealed surfaces from trespass until sealer has dried and hardened.

3.09 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.
.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

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

.2 Section 03 20 00 - Concrete Reinforcing.

.3 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

All reference standards shall be current issue or latest revision at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).

.2 Canadian Standards Association (CSA)

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

.3 City of Winnipeg Standard Construction Specifications.

.1 CW 3310 Portland Cement Concrete Pavement Works, all works to adhere to the most recent City of Winnipeg Standard Construction Specifications.

.2 CW 3325 Portland Cement Concrete Sidewalk, all works to adhere to the most recent City of Winnipeg Standard Construction Specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Concrete mixes and materials: to Section 03 30 00 - Cast-in-Place Concrete.

.2 Reinforcing steel: to Section 03 20 00 - Concrete Reinforcing.

.3 Curing Compound: to Section 03 30 00 - Cast-in-Place Concrete.

.4 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap.

.5 Fill material: to Section 31 23 10 - Excavating, Trenching and Backfill.

.6 Boiled linseed oil: to CAN/CGSB-1.2.

.7 Kerosene: to CAN/CGSB-3.3.

PART 3 - EXECUTION

3.1 GRANULAR BASE

.1 Obtain Contract Administrator's approval of subgrade before placing granular base.

.2 Place granular base material to lines, widths, and depths as indicated.

.3 Compact granular base to at least 95% of maximum density to ASTM D 698.

3.2 CONCRETE

.1 Obtain Contract Administrator's approval of granular base and reinforcing steel prior to placing concrete.

.2 Do concrete work in accordance with Section 03 30 00 - Cast-in-Place Concrete.

.3 Immediately after floating, give sidewalk surface uniform broom finish to produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line.

.4 Provide edging as indicated with 10 mm radius edging tool.

.5 Slip-form pavers equipped with string line system for line and grade control may be used if quality of work acceptable to Contract Administrator can be demonstrated. Hand finish surfaces when directed by Contract Administrator.

3.3 TOLERANCES

.1 Finish surfaces to within 3 mm in 3 m as measured with 3 m straightedge placed on surface.

3.4 EXPANSION AND CONTRACTION JOINTS

.1 Install tooled transverse contraction joints after floating, when concrete is stiff, but still plastic, at intervals of 1 m.

.2 Install expansion joints at intervals of 6 m.

.3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide.

3.5 ISOLATION JOINTS

.1 Install isolation joints around manholes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure.

.2 Install joint filler in isolation joints in accordance with Section 03 30 00 - Cast-in-Place Concrete.

.3 Seal isolation joints with sealant approved by Contract Administrator.

3.6 CURING

.1 Cure concrete by adding moisture continuously in accordance with CAN/CSA-A23.1 to exposed finished surfaces for at least 1 day after placing, or sealing moisture in by curing compound approved by Contract Administrator.

.2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.

.3 Apply curing compound evenly to form continuous film in accordance with manufacturer's requirements.

3.7 BACKFILL

.1 Allow concrete to cure for 7 days prior to backfilling.

.2 Backfill to designated elevations with material approved by Contract Administrator. Compact and shape to required contours as indicated or as directed by Contract Administrator.

End of Section