Project Manual

City of Winnipeg

Churchill Park Maintenance Building Renovation

Winnipeg, Manitoba

Bid Opportunity No. 578-2021

Set No.:

Project:

Churchill Park Maintenance Building Renovation
Winnipeg, Manitoba

Client:

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Structural Consultants:

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The following list of drawings form part of this bid:

Architectural	
A0.1	Building Code Review, List of Drawings and Notes.
A1.1	Location, Key and Site Plan
A2.1	Main Floor Plans
A3.1	Exterior Elevations
A4.1	Sections and Details
A5.1	Reflected Ceiling Plan, Interior Elevations, Schedules
Structural	
S1	Notes & Schedules
S2	Foundation, Main Flr. & Roof Demo. Plans
S3	Foundation, Main Flr. & Roof Framing Plans
Mechanical	
M0.0	Mechanical - Mechanical Schedules
M1.0	Mechanical - Main Floor Plan - Sanitary
M1.1	Mechanical - Main Floor Plan - Plumbing
M2.0	Mechanical - Main Floor Plan - HVAC
M3.0	Mechanical - Specification
M3.1	Mechanical - Specification
Electrical	
E1.0	Electrical Specification
E2.0	Electrical Renovation Layout and Schedules

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the renovation of public washrooms and maintenance building, located at 430 Churchill Drive, Winnipeg, Manitoba; and further identified as Churchill Park Maintenance Building Renovation. Work shall include renovations to the existing building, replacement of the holding tank and minor site renovations.

1.2 CONTRACT METHOD

.1 Construct Work under single stipulated price contract.

1.3 WORK BY OTHERS

.1 Not Applicable.

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 Not Applicable.

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 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 Contract Administrator's monthly certificate for payment.
.7 Prepare schedule jointly with Contract Administrator and Contractor to show when items called for under cash allowances must be authorized by Contract Administrator 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 Contract 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 the contractor after approval by the Contract Administrator for purpose of inspecting and/or testing portions of Work.

.2 Cost for such services will be borne by the City as allocated in Section 01 21 00 - Allowances.

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

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

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

.3 Contractor is to pay for utility charges at prevailing rates.

1.4 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:
- .1 Facilitate progress of Work.
- .2 Protect Work and products against dampness and cold.
- .3 Prevent moisture condensation on surfaces.
- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Maintain temperatures of minimum 10° C in areas where construction is in progress.

.5 Ventilating:
- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 Permanent heating system of building, not to be used when available. Contractor is responsible for damage to heating system if use is permitted.

.7 Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Contract Administrator.

.8 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
- .1 Conform with applicable codes and standards.
- .2 Enforce safe practices.
- .3 Prevent abuse of services.
- .4 Prevent damage to finishes.
- .5 Vent direct-fired combustion units to outside.

.9 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.5 TEMPORARY POWER AND LIGHT

.1 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.

1.6 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.

1.7 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, swing staging, platforms, temporary stairs 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 There is no on site parking for this project.

.2 Provide and maintain adequate access to project site.

1.6 OFFICES

.1 A dedicated construction office is not required for this project.

.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 WEATHER ENCLOSURES

.1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

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

1.5 ACCESS TO SITE

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

1.6 FIRE ROUTES

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

1.7 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.

1.8 PROTECTION OF BUILDING FINISHES

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

.2 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 Unless otherwise indicated in specifications, maintain uniformity of manufacturer for any particular or like item throughout project.

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

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

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

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

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

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

1.4 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 CONCEALMENT

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

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

1.9 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.

1.10 LOCATION OF FIXTURES

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

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

1.11 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.

1.12 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.

1.13 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.

1.14 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 REFERENCES

.1 City's identification of existing survey control points and property limits.

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 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

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

1.5 SUBMITTALS

.1 Submit name and address of Surveyor to Contract Administrator.

.2 On request of Contract Administrator, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform with Contract Documents. The signed certificate will also note any elevations and locations that do not conform to Contract Documents.

.4 Provide the City with a Building Location Certificate prepared by a legal surveyor to document the location of the building and major features on the site.

1.6 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 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00 - Firestopping, full thickness of the construction element.

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

.13 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. Use of building ventilation systems is not permitted for this purpose.

.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 fall on wet, newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

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

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

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

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

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

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

.7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.

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

.10 Vacuum clean and dust building interiors, behind grilles, louvers and screens.

.11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

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

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

.14 Remove dirt and other disfiguration from exterior surfaces.

.15 Clean and sweep roofs, gutters, areaways, and sunken wells.

.16 Sweep and wash clean paved areas.

.17 Clean equipment and fixtures to sanitary condition.

.18 Clean or replace filters of mechanical equipment.

.19 Clean roofs, downspouts, and drainage systems.

.20 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.21 Remove snow and ice from access to building.

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

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

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

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

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

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

.9 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 FINAL SURVEY

.1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.7 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

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

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.

.15 Additional requirements: as specified in individual specification sections.

1.8 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.

1.9 SPARE PARTS

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site; place and store.

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

.5 Obtain receipt for delivered products and submit prior to final payment.

1.10 MAINTENANCE MATERIALS

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 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.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.11 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.

1.12 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

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

.4 Store paints and freezable materials in a heated and ventilated room.

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

1.13 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 and systems to City's personnel two weeks 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 SUBMITTALS

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

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

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

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

1.3 CONDITIONS FOR DEMONSTRATIONS

.1 Equipment has been inspected and put into operation.

.2 Testing, adjusting, and balancing has been performed.

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

1.4 PREPARATION

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

.2 Verify that designated personnel are present.

1.5 DEMONSTRATION AND INSTRUCTIONS

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

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

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

.4 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 RELATED SECTIONS

.1 Common Work Results – Mechanical.

.2 Common Work Results - Electrical.

1.2 QUALITY ASSURANCE

.1 Provide testing organization services under provisions specified in Section 01 45 00 – Quality Control.

.2 Testing organization: current member in good standing certified to perform specified services.

.3 Comply with applicable procedures and standards of the certification sponsoring association.

.4 Perform services under discretion of supervisor qualified under certification requirements of sponsoring association.

1.3 REFERENCES

.1 Associated Air Balance Council (AABC): National Standards for Field Measurements and Instrumentation, Total Systems Balance, Air Distribution-Hydronics Systems.

1.4 SUBMITTALS

.1 Prior to the start of Work, submit name of organization proposed to perform services. Designate who has managerial responsibilities for coordination of entire testing, adjusting and balancing.

.2 Submit documentation to confirm organization compliance with quality assurance provision.

.3 Submit three (3) preliminary specimen copies of each report form proposed for use.

.4 Fifteen (15) days prior to Substantial Performance, submit three (3) copies of final reports on applicable forms.

.5 Submit reports of testing, adjusting and balancing postponed due to seasonal, climatic, occupancy, or other reasons beyond Contractor’s control, promptly after execution of those services.

1.5 PROCEDURES - GENERAL

.1 Comply with procedural standards of certifying association under whose standard services will be performed.

.2 Notify Contract Administrator three (3) days prior to beginning of operations.

.3 Accurately record data for each step.

.4 Report to Contract Administrator any deficiencies or defects noted during performance of services.

1.6 FINAL REPORTS

.1 Testing organization having managerial responsibility shall make reports.

.2 Ensure each form bears signature of recorder, and that of supervisor of reporting organization.

.3 Identify each instrument used and latest date of calibration of each.

1.7 CONTRACTOR RESPONSIBILITIES

.1 Prepare each system for testing and balancing.

.2 Cooperate with testing organization and provide access to equipment and systems.

.3 Provide personnel and operate systems at designated times, and under conditions required for proper testing, adjusting and balancing.

.4 Perform services under discretion of supervisor qualified under certification requirements of sponsoring association.

1.8 PREPARATION

.1 Provide instruments required for testing, adjusting and balancing operations.

.2 Make instruments available to Contract Administrator to facilitate spot checks during testing.

.3 Retain possession of instruments and remove at completion of services.

.4 Verify systems installation is complete and in continuous operation.

.5 Verify lighting is turned on when lighting is included in cooling load.

.6 Verify equipment such as computers, laboratory and electronic equipment are in full operation.

1.9 EXECUTION

.1 Test equipment, balance distribution systems, and adjust devices for HVAC systems.

.2 Test hydronic systems, adjust and record liquid flow at each piece of equipment.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

End of Section

PART 1 - GENERAL

1.1 REFERENCES

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).

1.2 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.

1.3 SUBMITTALS

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

.2 Product Data: submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.

.3 Shop drawings.

.1 Submit for approval drawings, diagrams or details showing sequence of demolition work and temporary shoring for supporting structures, where required by authorities having jurisdiction.

.2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Manitoba, Canada.

.4 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.

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.

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 and Section 02 61 33 - Hazardous Materials.

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.

.4 Prevent contamination with base course aggregates, when removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving,

.5 Remove designated trees during demolition.
.1 Obtain written approval of Contract Administrator prior to removal of trees not designated.

3.4 REMOVAL FROM SITE

.1 Remove stockpiled material as directed by Contract Administrator, 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 DEFINITIONS

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

1.2 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with applicable Provincial/Territorial and Municipal regulations.

1.3 ENVIRONMENTAL PROTECTION

.1 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.

1.4 EXISTING CONDITIONS

.1 Should material resembling spray or trowel applied asbestos or other substance be encountered in course of demolition, stop work, take preventative measures, and notify Contract Administrator immediately. Do not proceed until written instructions have been received.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Do not disrupt active or energized utilities designated to remain undisturbed.

3.2 REMOVAL OF HAZARDOUS WASTES

.1 Remove contaminated or dangerous materials as 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 DEMOLITION

.1 Demolish building components as specified.

.2 Wipe down areas of selective demolition to minimize dusting.

.3 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.

.4 At end of each day's work, leave Work in safe and stable condition.

.5 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.

.6 Contain fibrous materials (e.g. Insulation) to minimize release of airborne fibres while being transported within facility.

.7 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

.8 Use natural lighting to do Work where possible.

.1 Shut off lighting except those required for security purposes at end of each day.

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.

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 494, Specification for Chemical Admixtures for Concrete.
- .4 ASTM C 827, Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.

.2 Canadian General Standards Board (CGSB)
- .1 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 48 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 provide to Contract Administrator hot and cold weather concrete procedures for review and comment.

.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, refer to construction documents.

.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.

.2 Anchor bolts.
- .1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.
- .2 Obtain approval from Contract Administrator prior to using any post-installed anchors. All anchors prepared to be reviewed and approved by Contract Administrator.
- .3 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

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

.4 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.

.5 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 PAINTED CONCRETE

.1 INT 3.2D, polyurethane pigmented coating over epoxy as per MPI installation recommendations and instructions. Colour: grey.

2.4 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.

.5 Prepare existing and new areas of slab to receive new INT 3.2D polyurethane pigmented over epoxy coating as per manufacturer’s installation instructions.

3.3 APPLICATION

.1 Prepare and mix materials and apply each component of coating system in accordance with manufacturer’s directions to produce a uniform monolithic surface. Minimum of 2 coats required. Total dry film thickness to be 32 mils.

- .1 Prime Coat: Apply sealer as recommended by polyurethane coating manufacturer.
- .2 Finish Coat: Apply INT 3.2D, polyurethane pigmented coating as per manufacturer’s instructions. Allow coating to cure.
- .3 Finished colour and texture to meet approval of Contract Administrator.

3.4 PROTECTION

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

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 109/C 109M, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm Cube Specimens).
- .2 ASTM C 260, Standard Specification for Air-Entraining Admixtures for Concrete.

.2 Canadian Standards Association (CSA)/CSA International
- .1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .2 CSA A23.4, Precast Concrete-Materials and Construction.
- .3 CSA A3000, Cementitious Materials Compendium.
- .4 CSA G30.18, Carbon and Steel Bars for Concrete Reinforcement.

1.2 ACTION AND INFORMATION 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 and include product characteristics, performance criteria, physical size, mix design, finish and limitations.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE SPLASHPADS

.1 Precast Concrete Splashpad.
- .1 915 x 305 x 63 for downspouts, Natural Pebblestone finish as manufactured by Barkman or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install curbs and splashpads as indicated.

.2 Replace damaged and defective units as directed by Contract Administrator.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

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

.2 Section 04 05 12 – Masonry Mortar and Grout.

.3 Section 04 05 19 - Masonry Anchorage and Reinforcing.

.4 Section 04 05 23 - Masonry Accessories.

.5 Section 04 22 00 - Concrete Unit Masonry.

.6 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 International).
- .1 CSA-A165, Standards on Concrete Masonry Units.
- .2 CSA A179, Mortar and Grout for Unit Masonry.
- .3 CSA-A371, Masonry Construction for Buildings.

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 Samples.
- .1 If requested, submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit samples.
  - .1 Two of each type of masonry unit specified.
  - .2 One of each type of masonry accessory specified.
  - .3 One of each type of masonry reinforcement, tie and connector proposed for use.

.3 Manufacturer's Instructions.
- .1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Mock-ups.
- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up panel of exterior masonry wall construction 1200 x 1800 mm showing masonry colours and textures, use of reinforcement, flashing, jointing, coursing, mortar and workmanship.
- .3 Mock-up will be used:
  - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .4 Construct mock-up where approved.
- .5 Allow 24 hours for inspection of mock-up by Contract Administrator before proceeding with work.
- .6 When accepted by Contract Administrator, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

.2 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

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

.2 Deliver materials to job site in dry condition.

.3 Storage and Protection.

.1 Keep materials dry until use.
.2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 SITE CONDITIONS

.1 Site Environmental Requirements.
.1 Cold weather requirements.
.1 Supplement Clause 5.15.2 of CSA-A371 with following requirements.
.1 Maintain temperature of mortar between 5 degrees C and 50 degrees C until batch is used or becomes stable.
.2 Maintain ambient temperature between 5 degrees C and 50 degrees C and protect site from wind chill.
.2 Hot weather requirements.
.1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
.2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Masonry materials are specified in Related Sections.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 PREPARATION

.1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

3.3 INSTALLATION

.1 Do masonry work in accordance with CSA-A371 except where specified otherwise.

.2 Build masonry plumb, level, and true to line, with vertical joints in alignment.

.3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3.4 CONSTRUCTION

.1 Exposed masonry.
.1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, Clause 82.1, in exposed masonry and replace with undamaged units.

.2 Jointing.
.1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated.
.2 Provide clean, fully flush joints where flush joints are indicated.

.3 Cutting.
.1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
.2 Make cuts straight, clean, and free from uneven edges.

.4 Building-In.
- .1 Build in items required to be built into masonry.
- .2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.
- .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.

.5 Wetting of bricks.
- .1 Except in cold weather, wet bricks having an initial rate of absorption exceeding 1 g/minute/1000 mm^2: wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.
- .2 Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

.6 Support of loads.
- .1 Use 35 MPa concrete to Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.
- .2 Use grout to CSA A179 where grout is used in lieu of solid units.
- .3 Install building paper below voids to be filled with concrete or grout; keep paper 25 mm back from faces of units.

.7 Provision for movement.
- .1 Leave 3 mm space below shelf angles.
- .2 Leave 6 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.
- .3 Built masonry to tie in with stabilizers, with provision for vertical movement.

.8 Control joints.
- .1 Construct continuous control joints as indicated.

.9 Expansion joints.
- .1 Build-in continuous expansion joints as indicated.

.10 Interface with other work.
- .1 Cut openings in existing work as indicated.
- .2 Openings in walls: approved by Contract Administrator.
- .3 Make good existing work. Use materials to match existing.

11 Sealant.
- .1 Seal masonry and joints as per Section 09 91 23 – Interior Painting.

3.5 SITE TOLERANCES

.1 Tolerances in notes to Clause 5.3 of CSA-A371 apply.

3.6 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.

3.7 PROTECTION

.1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 10 - Common Work Results for Masonry.

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 International).

.1 CSA A179, Mortar and Grout for Unit Masonry.

1.3 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Use same brands of materials and source of aggregate for entire project.

.2 Mortar: CSA A179.

.3 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.

.4 Colour: ground coloured natural aggregates or metallic oxide pigments.

.5 Mortar for exterior masonry above grade:

.1 Loadbearing: type N based on Proportion specifications.

.2 Non-Loadbearing: type N based on Proportion specifications.

.6 Following applies regardless of mortar types and uses specified above:

.1 Mortar for calcium silicate brick and concrete brick: type O based on Proportion specifications.

.2 Mortar for grouted reinforced masonry: type S based on Proportion specifications.

.7 Non-Staining mortar: use non-staining masonry cement for cementitious portion of specified mortar type.

.8 Grout: to CSA A179, Table 3.

2.2 MIXES

.1 Consistency: mix grout to semi-fluid consistency.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 CONSTRUCTION

.1 Do masonry mortar and grout work in accordance with CSA A179 except where specified otherwise.

3.3 CLEANING

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

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 10 - Common Work Results for Masonry.

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 International).
- .1 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .2 CSA-A370, Connectors for Masonry.
- .3 CSA-A371, Masonry Construction for Buildings.
- .4 CSA-S304.1, Masonry Design for Buildings.
- .5 CSA A179, Mortar and Grout For Unit Masonry.

1.3 SUBMITTALS

.1 Shop Drawings:
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop drawings consist of bar bending details, lists and placing drawings.
- .3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.

.2 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Bar reinforcement: to CSA-A371 and CAN/CSA G30.18, Grade 300 for bars 10M or smaller, and Grade 400 for bars larger than 10M.

.2 Connectors: to CSA-A370 and CSA-S304.

.3 Corrosion protection: to CSA-S304, galvanized to CSA-S304 and CSA-A370.

2.2 FABRICATION

.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1.

.2 Fabricate connectors in accordance with CSA-A370.

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

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

.5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 GENERAL

.1 Supply and install masonry connectors and reinforcement in accordance with CSA-A370, CSA-A371, CAN/CSA-A23.1 and CSA-S304.1 unless indicated otherwise.

3.3 BONDING AND TYING

.1 Bond walls of two or more wythes using metal connectors in accordance with CSA-S304, CSA-A371 and as indicated.

.2 Tie masonry veneer to backing in accordance with NBC, CSA-S304.1, CSA-A371.

3.4 REINFORCED LINTELS AND BOND BEAMS

.1 Reinforce masonry lintels and bond beams as indicated.

.2 Place and grout reinforcement in accordance with CSA-S304.1, CSA-A371, and CSA-A179.

3.5 GROUTING

.1 Grout masonry in accordance with CSA-S304.1, CSA-A371 and CSA-A179 and as indicated.

3.6 ANCHORS

.1 Supply and install metal anchors as indicated.

3.7 LATERAL SUPPORT AND ANCHORAGE

.1 Supply and install lateral support and anchorage in accordance with CSA-S304.1 and as indicated.

3.8 MOVEMENT JOINTS

.1 Reinforcement will not be continuous across movement joints unless otherwise indicated.

3.9 FIELD BENDING

.1 Do not field bend reinforcement and connectors 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 and connectors which develop cracks or splits.

3.10 FIELD TOUCH-UP

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

3.11 CLEANING

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

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 10 - Common Work Results for Masonry.

.2 Section 04 05 19 - Masonry Anchorage and Reinforcing.

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 International).

.1 CSA-A371, Masonry Construction for Buildings.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Control joint filler: purpose-made elastomer 80 durometer hardness to ASTM D 2240 of size and shape indicated.

.2 Lap adhesive: recommended by masonry flashing manufacturer.

.3 Aluminum flashings.

.1 Aluminum foil, .004 mm thick, asphalt laminated between two sheets of creped kraft paper with one exposed paper surface coated with asphalt-wax treatment.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 Install continuous control joint fillers in control joints at locations indicated on drawings.

.2 Install weep hole vents in vertical joints immediately over flashings, in exterior wythes of cavity wall and masonry veneer wall construction, at maximum horizontal spacing of 600 mm on centre.

3.3 CONSTRUCTION

.1 Build in flashings in masonry in accordance with CSA-A371.

.1 Install flashings under exterior masonry bearing on foundation walls, slabs, shelf angles, and steel angles over openings. Install flashings under weep hole courses and as indicated.

.2 In cavity walls and veneered walls, carry flashings from front edge of masonry, under outer wythe, then up backing not less than 150 mm, and as follows:

.1 For wood frame backing, staple flashing to walls behind sheathing paper.

.2 For gypsum board backing, bond to wall using manufacturer's recommended adhesive.

.3 Lap joints 150 mm and seal with adhesive.

3.4 CLEANING

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

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 10 - Common Work Results for Masonry.

.2 Section 04 05 12 - Masonry Mortar and Grout.

.3 Section 04 05 19 - Masonry Anchorage and Reinforcements.

.4 Section 04 05 23 - Masonry Accessories.

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 International)

.1 CAN/CSA A165 Series, Standards on Concrete Masonry Units

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Standard concrete block units: to CAN3-A165 Series (CAN3-A165.1), 1 Hour Fire Resistance Rating.

.1 Classification: H / 15 / A / O.

.2 Size: Depth 190mm x Height 190mm x Width 390mm.

.3 Special shapes: Provide purpose-made shapes for lintels and bond beams.

.4 Colour: grey.

.5 Finish: Smooth Face.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Concrete block units.

.1 Bond: running.

.2 Coursing height: 200 mm for one block and one joint unless noted otherwise.

.3 Jointing: concave where exposed or where paint or other finish coating is specified.

.2 Concrete block lintels.

.1 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.

.2 End bearing: not less than 200 mm.

3.2 CLEANING

.1 Standard block: Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing.

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 A 36/A36M, Specification for Structural Steel.
- .2 ASTM A 307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- .3 ASTM A 325, Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- .4 ASTM A 325M, Specification for High-Strength Bolts for Structural Steel Joints.
- .5 ASTM A 490M, Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric).

.2 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA).
- .1 CISC/CPMA 1-73b, Quick-Drying, One-Coat Paint for Use on Structural Steel.
- .2 CISC/CPMA 2-75, Quick-Drying, Primer for use on Structural Steel.

.3 Canadian Standards Association (CSA International)
- .1 CAN/CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN/CSA-S16, Limit States Design of Steel Structures.
- .4 CAN/CSA-S136, Cold Formed Steel Structural Members.
- .5 CSA-S136.1, Commentary on CSA Standard S136.
- .6 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.
- .7 CSA W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- .8 CSA W59, Welded Steel Construction (Metal Arc Welding).

1.2 DESIGN REQUIREMENTS

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

.2 Shear connections:
- .1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.
- .2 Select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam, when shears are not indicated.

.3 Upon request, submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Provinces of Manitoba, Canada for non standard connections.

1.3 SHOP DRAWINGS

.1 Submit shop drawings including fabrication and erection documents and materials list in accordance with Section 01 33 00 - Submittal Procedures.

.2 Erection drawings: indicate details and information necessary for assembly and erection purposes including:
- .1 Description of methods.
- .2 Sequence of erection.
- .3 Type of equipment used in erection.
- .4 Temporary bracings.

.3 Ensure Fabricator drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the province of Manitoba.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Structural steel: to CAN/CSA-G40.20/G40.21 Grade as indicated or CAN/CSA-S136.

.2 Anchor bolts: to ASTM A 36/A36M.

.3 High strength anchor bolts: to ASTM A 193/A 93M.

.4 Bolts, nuts and washers: to ASTM A 325 or ASTM A 325M.

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

.6 Shop paint primer: to CISC/CPMA 2.

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

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

2.2 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with reviewed shop drawings.

.2 Install shear studs in accordance with CSA W59.

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

.4 Provide holes in flanges for attachment of wood nailers.

2.3 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16 except where members to be encased in concrete.

.2 Clean members, remove loose mill scale, rust, oil, dirt and other foreign matter. Prepare surface according to SSPC-SP-6.

.3 Apply one coat of primer in shop to steel surfaces to achieve minimum dry film thickness of 1.5 to 2.0 mils, except:
- .1 Surfaces to be encased in concrete.
- .2 Surfaces to receive field installed stud shear connections.
- .3 Surfaces and edges to be field welded.
- .4 Faying surfaces of friction-type connections.
- .5 Below grade surfaces in contact with soil.

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

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

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

PART 3 - EXECUTION

3.1 GENERAL

.1 Structural steel work: in accordance with CAN/CSA-S16.

.2 Welding: in accordance with CSA W59.

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

3.2 MARKING

.1 Mark materials in accordance with CAN/CSA G40.20/G40.21. Do not use die stamping. If steel is

to be left in unpainted condition, place marking at locations not visible from exterior after erection.

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

3.3 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with reviewed erection drawings.

.2 Field cutting or altering structural members: to approval of Contract Administrator.

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

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

3.4 FIELD PAINTING

.1 Paint in accordance with Section 09 91 23 – Interior Painting.

.1 Touch up damaged surfaces and surfaces without shop coat with primer to SSPC-SP-6 except as specified otherwise. Apply in accordance with CAN/CGSB 85.10.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

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

.2 Section 05 12 23 - Structural Steel for Buildings.

.3 Section 09 91 13 - Exterior Painting.

.4 Section 09 91 23 - Interior Painting.

.5 Section 10 91 00 – Miscellaneous Specialties.

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.
- .2 ASTM A-269, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .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.
- .3 CAN/CSA-W59, Welded Steel Construction (Metal Arc Welding) (Imperial Version).

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 Steel pipe: to ASTM A 53/A53M standard weight, galvanized finish.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

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

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

2.2 FABRICATION

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

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

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

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

2.3 FINISHES

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

.2 Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper, 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.

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

.4 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.

2.6 DOWNSPOUTS

.1 HSS pipe: nominal dimensions as indicated on drawings, formed to shape and sizes as indicated.

.2 Apply one shop coat of primer to metal items, with exception of galvanized items.

2.7 BOLLARDS

.1 HSS pipe: nominal dimensions as indicated on drawings, formed to shape and sizes as indicated.

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

.3 Refer to Section 10 91 00 Miscellaneous Specialties for bollard covers.

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 DOWNSPOUTS

.1 Install downspouts in locations as indicated.

3.3 BOLLARDS

.1 Install bollards in locations as indicated.

.2 Install bollard covers.

3.4 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 RELATED SECTIONS

.1 Section 07 42 46 – Fibre Reinforced Cementitious Wall Panels.

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 A 653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.

.2 Canadian Standards Association (CSA)

- .1 CSA B111, Wire Nails, Spikes and Staples.
- .2 CSA O121, Douglas Fir Plywood.
- .3 CAN/CSA-O141, Softwood Lumber.
- .4 CSA O151, Canadian Softwood Plywood.

.3 National Lumber Grades Authority (NLGA)

- .1 Standard Grading Rules for Canadian Lumber.

1.3 QUALITY ASSURANCE

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Set aside damaged wood and dimensional lumber off-cuts for approved alternative uses (e.g. bracing, blocking, cripples, bridging). Store this separated reusable wood waste convenient to cutting station and area of work.

.2 Do not burn scrap at the project site.

PART 2 - PRODUCTS

2.1 PANEL MATERIALS

.1 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.0.

.2 Douglas fir plywood (DFP): to CSA O121, standard construction.

2.2 ACCESSORIES

.1 Exterior wall sheathing paper: to CAN/CGSB-51.32 spunbonded olefin type as indicated. Standard of Acceptance: Tyvek® CommercialWrap®

.2 Sealants: as per Section 07 92 10 - Joint Sealing

.3 General purpose adhesive: to CSA O112 Series.

.4 Nails, spikes and staples: to CSA B111.

.5 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

2.3 FASTENER FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for interior highly humid areas.

.2 Stainless steel: use stainless steel fasteners for pressure treated lumber and exterior work.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Store wood products such that they are not exposed to rainfall and ground moisture.

3.2 INSTALLATION

.1 Comply with requirements of Manitoba Building Code supplemented by following paragraphs.

.2 Install members true to line, levels and elevations, square and plumb.

.3 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding, electrical equipment mounting boards, and other work as required.

.4 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

3.3 ERECTION

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

.2 Countersink bolts where necessary to provide clearance for other work.

3.4 SCHEDULES

.1 Electrical equipment mounting boards:
  .1 Plywood, DFP or CSP, G1S grade, square edge 19 mm thick, painted grey.

.2 Roof sheathing, vertical truss sheathing:
  .1 Plywood, DFP or CSP sheathing grade, square edge, 13mm thick.

End of Section

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)
- .1 CSA O80, Wood Preservation.
- .2 CAN/CSA-O86, Engineering Design in Wood.
- .3 CAN/CSA-O141, Softwood Lumber.
- .4 CSA S307, Load Test Procedure for Wood Roof Trusses for Houses and Small Buildings.
- .5 CSA S347, Method of Test for Evaluation of Truss Plates Used in Lumber Joints.

.2 National Lumber Grades Authority (NLGA)
- .1 NLGA-03, Standard Grading Rules for Canadian Lumber.

.3 Truss Plate Institute of Canada (TPIC)
- .1 TPIC, Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses (Limit States Design).

1.2 DESIGN REQUIREMENTS

.1 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for wood truss chords and webs in accordance with engineering properties in CAN/CSA-O86.

.2 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for truss joint designs to test engineering properties in accordance with CSA S347 and listed in CCMC Registry of Product Evaluations.

.3 Design trusses, bracing and bridging in accordance with CAN/CSA-O86.1 for building locality as ascertained by NBC, Climatic Information for Building Design in Canada and minimum uniform and minimum concentrated loadings stipulated in NBC commentary.

.4 Limit live load deflection to 1/360th of span where gypsum board ceilings are hung directly from trusses.

.5 Limit total load deflections to 1/240th of span unless otherwise specified or indicated.

1.3 SUBMITTALS

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

.2 Shop Drawings:

.3 Each shop drawing submission showing connection details to be signed and stamped by professional engineer registered or licensed in province of Manitoba, Canada.

.4 Indicate species, sizes, and stress grades of lumber used as truss members. Show pitch, span, camber, configuration and spacing of trusses. Indicate connector types, thicknesses, sizes, locations and design value. Specify bearing details, and all required fasteners and pre-fabricated connectors to affix trusses to structure.. Indicate design load for members.

.5 Submit stress diagram or print-out of computer design indicating design load for truss members. Indicate allowable load and stress increase.

.6 Indicate arrangement of webs or other members to accommodate ducts and other specialties.

.7 Show location of lateral bracing for compression members.

1.4 DELIVERY, STORAGE AND HANDLING

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

.2 Storage and Protection:
- .1 Store trusses on job site in accordance with manufacturer's instructions. Provide bearing supports and bracings. Prevent bending, warping and overturning of trusses.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Lumber: SPF species, No. 2 or better grade, softwood, S4S, with maximum moisture content of 19% at time of fabrication and to following standards:
- .1 CAN/CSA-O141.
- .2 NLGA, Standard Grading Rules for Canadian Lumber.

.2 Fastenings: to CAN/CSA-O86.

2.2 FABRICATION

.1 Fabricate wood trusses in accordance with reviewed shop drawings.

.2 Provide for design camber and roof slopes when positioning truss members.

.3 Connect members using metal connector plates.

2.3 SOURCE QUALITY CONTROL

.1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 ERECTION

.1 Erect wood trusses in accordance with reviewed shop drawings.

.2 Handling, installation, erection, bracing and lifting in accordance with manufacturers instructions.

.3 Make adequate provisions for handling and erection stresses.

.4 Exercise care to prevent out-of-plane bending of trusses.

.5 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing and decking are installed.

.6 Install permanent bracing in accordance with reviewed shop drawings, prior to application of loads to trusses.

.7 Do not cut or remove any truss material without approval of Contract Administrator.

.8 Remove chemical and other surface deposits on treated wood, in preparation for applied finishes.

3.3 CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment on completion of installation.

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 ASTM International
  .1 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  .2 ASTM C 1186 Standard Specification for Flat Fiber-Cement Sheets
.2 National Research Council Canada (NRC)
  .1 National Building Code of Canada (NBC).
  .2 Manitoba Building Code (MBC).
.3 Underwriters Laboratories' of Canada (ULC)
  .1 CAN/ULC-S102 Test for Surface Burning Characteristics of Building Materials and Assemblies.
  .2 CAN/ULC-S114 Standard Method of Test for determination of Non-Combustibility in Building Materials.

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 cementitious materials, support system, fasteners, adhesives and accessories. Include product characteristics, performance criteria, physical size, finish and limitations.

1.03 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.
.3 Storage and Handling Requirements:
  .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  .2 Replace defective or damaged materials with new.

PART 2 – PRODUCTS

2.01 DESIGN REQUIREMENTS

.1 Design cementitious panel wall cladding and support system to allow for thermal movement of component materials caused by ambient temperature range of 80 degrees C without causing buckling, undue stress on fasteners or other detrimental effects.
.2 Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to panels, supports or anchors, or racking of joints.
.3 Design members to withstand dead load and wind loads as calculated in accordance with National Building Code of Canada (NBC) and applicable Municipal/Territorial regulations, to maximum allowable deflection of 1/180 of span.
.4 Design wall system to accommodate specified erection tolerances of structure.

2.02 CLADDING SYSTEM COMPONENTS

.1 Vertical siding requirement for Materials:
  .1 Fiber-cement Siding - complies with ASTM C 1186 Type A Grade II.
  .2 Fiber-cement Siding - complies with ASTM E 136 as a noncombustible material.
  .3 Fiber-cement Siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
  .4 National Evaluation Report No. NER 405 (BOCA, ICBO, SBCCI, IBC, IRC).
  .5 Texture:. Smooth finish.

2.03 ACCESSORY COMPONENTS

.1 Pre-finished Manufactured Component System.

.1 Outside Corner Trim
Characteristics:
.1 Description: a rigid, straight and true, abuse resistant outside corner with exposed 44mm tabs that create a right angle where they meet and cover the vertical ends of the two inset 5/16" lapped fiber cement plank siding boards.
.2 Materials: Extruded Aluminum (Alloy 6063-T5). Colour to match adjacent panel finish.
.2 Inside Corner Trim
Characteristics:
.1 Description: a rigid, straight and true, inside corner with exposed 19mm tabs that fully cover and protect the vertical ends of the inset lapped plank siding.
.2 Materials: Extruded Aluminum (Alloy 6063-T5). Colour to match adjacent panel finish.
.3 J Panel Trim (top and bottom of panels)
Characteristics:
.1 Description: Caps the top of the horizontal fiber cement panel at the base and top of the panels. Trim to use 13mm tab that covers the edge of the fiber cement panel, completing a uniform 13mm tab perimeter framed panel design.
.2 Materials: Extruded Aluminum (Alloy 6063-T5). Colour to match adjacent panel finish.

.2 Fasteners: colour matched heads, self-tapping, type and material as recommended by manufacturer for service and substrate.
.3 Gaskets: EPDM rubber sheet.
.4 Adhesive: purpose made, waterproof, type as recommended by panel manufacturer for exposure and service conditions.
.5 Isolation coating: bituminous paint.

2.04 FINISHES
.1 Factory Finish:
.1 Factory applied finish by fiber cement manufacturer in a controlled environment within the fiber cement manufacturer's own facility utilizing a multi-coat, heat cured finish within one manufacturing process.
.2 Accessories: Complete finishing system includes pre-packaged touch-up kit provided by fiber cement manufacturer. Provide quantities as recommended by manufacturer.
.3 Colour: Colour to be selected from full range of manufacturer's panel colours. Trim board colour to match adjacent siding colour, unless noted otherwise.

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 composite metal building panel 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 PREPARATION
.1 Clean surfaces thoroughly prior to installation.
.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION
.1 Install materials in strict accordance with manufacturer's installation instructions.
.2 Block framing between studs where panel siding horizontal joints occur.
.3 Trim Reveals.
.1 Inside and Outside Corner Trims: Install at designated corners.
.2 J Trim: Begin at the base of the wall to set your perimeter plum line. Install around perimeter of designated wall areas as starter trim and to finish panel at top of wall.
.3 Install wall panel vertically. No horizontal joints are to be installed between panels.
.4 Install the General J trim around the sides and bottoms of windows, doors and other wall

penetrations and as a mid-wall terminating point as detailed.

.4 Place fasteners no closer than 3/8 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.

.5 Factory Finish Touch Up: Apply touch up paint to cut edges in accordance with manufacturer's printed instructions:

.1 Touch-up nicks, scrapes, and nail heads in pre-finished siding using the manufacturer's touch-up kit pen.

.2 Touch-up of nails shall be performed after application, but before plastic protection wrap is removed to prevent spotting of touch-up finish.

.3 Use touch-up paint sparingly. If large areas require touch-up, replace the damaged area with new pre-finished siding. Match touch up color to siding color through use of manufacturer's branded touch-up kits.

3.04 CLEANING AND WASTE MANAGEMENT

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Wash down exposed exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths.

.2 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.

3.05 PROTECTION

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

.2 Repair damage to adjacent materials caused by mineral fibre reinforced panel installation.

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 American National Standards Institute (ANSI).
- .1 ANSI B18.6.4, Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws.

.2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-93.2, Prefinished Aluminum Siding, Soffits and Fascia, for Residential Use.
- .2 CAN/CGSB-93.3, Prefinished Galvanized and Aluminum-Zinc Alloy Steel Sheet for Residential Use.
- .3 CAN/CGSB-93.4, Galvanized and Aluminum-Zinc Alloy Coated Steel Siding Soffits and Fascia, Prefinished, Residential.
- .4 CGSB 93.5, Installation of Metal Residential Siding, Soffits and Fascia.

.3 Canadian Standards Association (CSA International).
- .1 CSA B111, Wire Nails, Spikes and Staples.

1.3 SUBMITTALS

.1 Shop Drawings:
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, soffits, fascia, metal furring, and related work.

.2 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

PART 2 - PRODUCTS

2.1 STEEL CLADDING AND COMPONENTS

.1 Wall Cladding: to CAN/CGSB-93.2,
- .1 Colour: Silicone Modified Polyester Paint System (From full range of colours).
- .2 Gloss: medium.
- .3 Profile: 14mm corrugated.
- .4 Pattern: plain surface.
- .5 Thickness: .635mm.

.2 Fascia: to CAN/CGSB-93.2,
- .1 Colour: Galvalume Plus AZ180 finish.
- .2 Gloss: medium.
- .3 Profile: to match roof profile.
- .4 Pattern: to match roof profile.
- .5 Thickness: .635mm.

2.2 ACCESSORIES

.1 Exposed trim: inside corners, outside corners, cap strip, drip cap, undersill trim, starter strip and window/door trim of same material, colour and gloss as cladding, with fastener holes pre-punched.

2.3 FASTENERS

.1 Screws: ANSI B18.6.4. Self tapping, nylon coated head screws with neoprene washer. Colour to match metal colour.

.2 Screws: as recommended by cladding manufacturer.

2.4 CAULKING

.1 Sealants: See Section 07 92 10 - Joint Sealing.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 Install cladding in accordance with CGSB 93.5, and manufacturer's written instructions

.2 Install wall cladding where indicated.

.3 Install fascia cladding as indicated. Use concealed fastenings for fascia except where approved by Contract Administrator before installation.

.4 Install one layer exterior wall sheathing paper horizontally over wood sheathing areas by stapling and lapping edges 150mm.

.5 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated.

.6 Install outside corners, fillers and closure strips with carefully formed and profiled work.

.7 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.

.8 Attach components in manner not restricting thermal movement.

.9 Caulk junctions with adjoining work in accordance with Section 07 92 10 – Joint Sealing.

3.3 CLEANING

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

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

- .1 ASTM A 167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM A 653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB).

- .1 CAN/CGSB-37.5, Cutback Asphalt Plastic Cement.
- .2 CAN/CGSB-37.29, Rubber-Asphalt Sealing Compound.
- .3 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.

1.3 SUBMITTALS

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

.2 Indicate arrangements of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural frame.

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

.4 Submit 300 x 300 mm samples of each sheet metal material.

PART 2 – PRODUCTS

2.1 PREFINISHED STEEL SHEET

.1 Prefinished steel roof panels.
Standing seam, 0.635mm (24ga) thickness, ±400mm panel width. Finish to be Galvalume Plus AZ180 finish. Acceptable systems:

- .1 Prestige-R 16” system as manufactured by Vicwest.
- .2 SL-38 system c/w intermediate flutes as manufactured by Agway Metals.
- .3 1” Snap Lock by Metalworks Canada Ltd..

.2 Flashing, Trim and Closures: Same material, gauge and finish as adjacent wall and roof panels. Fastenings shall be as specified for wall and roof panels. Form or mold closure strips to match configuration of the roofing or siding. Install closures wherever necessary to insure weather tight construction.

2.2 ACCESSORIES

.1 Except as indicated as work of another specification section, provide components required for a complete roof system, including trim, copings, fascias, ridge closures, clips, seam covers, battens, flashings, gutters, sealants, gaskets and closure strips. Match materials and finishes of roof.

.2 Isolation coating: alkali resistant bituminous paint.

.3 Plastic cement: to CAN/CGSB-37.5.

.4 Underlay: self adhered modified bituminous membrane.
Standard of Acceptance: Blueskin® RF200.

.5 Sealant: asbestos-free sealant, compatible with systems materials, recommended by system manufacturer.

.6 Rubber-asphalt sealing compound: to CAN/CGSB-37.29.

.7 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Use concealed fastenings except where approved by Contract Administrator before installation.

.2 Provide underlay under sheet metal roofing. Secure in place and lap joints 100 mm minimum.

.3 Install sheet metal roof panels as per manufacturers requirements.

.4 Flash roof penetrations, and adjacent walls with material matching roof panels, and make watertight.

.5 Form seams in direction of water-flow and make watertight.

End of Section

PART 1 - GENERAL

1.1 RELATED WORK

.1 Fire stopping and smoke seals within mechanical assemblies (ie. inside ducts, dampers) and electrical assemblies (ie. inside cable trays) are specified in those sections respectively.

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 Underwriter's Laboratories of Canada (ULC)

.1 ULC-S115, Fire Tests of Firestop Systems.

1.3 SHOP DRAWINGS

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

.2 Submit shop drawings (commonly called ULC Design Sheets) of each penetration type to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details must accurately reflect actual job conditions.

1.4 PRODUCT DATA

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

.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with ULC-S115.

.1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended [and conforming to special requirements specified in 3.5.

.2 Firestop system rating: to match wall for floor assembly requirements.

.2 Service penetration assemblies: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40 U19.

.3 Service penetration firestop components: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No.40 U19.13 and ULC Guide No.40 U19.15 under the Label Service of ULC.

.4 Fire-resistance rating of installed firestopping assembly in accordance with NBC.

.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.10 Sealants for vertical joints: non-sagging.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.2 INSTALLATION

.1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

.2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.4 Tool or trowel exposed surfaces to a neat finish.

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

3.3 INSPECTION

.1 Notify Contract Administrator when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.4 SCHEDULE

.1 Firestop and smoke seal at:

- .1 Penetrations through fire-resistance rated masonry and concrete partitions and walls.
- .2 Top of fire-resistance rated masonry partitions.
- .3 Intersection of fire-resistance rated masonry partitions.
- .4 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
- .5 Openings and sleeves installed for future use through fire separations.
- .6 Around mechanical and electrical assemblies penetrating fire separations.

3.5 CLEAN UP

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

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

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

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

.2 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 or approved equal

.3 Acrylic Latex One Part.
.1 To CAN/CGSB-19.17.
.2 Acceptable material: Tremflex 834 or approved equal

.4 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: 2.2.1

.2 Exterior joints in horizontal wearing surfaces: Sealant type: 2.2.1

.3 Seal interior perimeters of exterior openings as detailed on drawings: Sealant type: 2.2.3

.4 Perimeters of interior frames, as detailed and itemized: Sealant type: 2.2.1

.5 Interior masonry vertical control joints (block-to-block, block-to-concrete, and intersecting masonry walls): Sealant type: 2.2.1

.6 Perimeter of bath fixtures (e.g. sinks, tubs, urinals, stools, waterclosets, basins, vanities): Sealant type: 2.2.2.2

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

1.1 RELATED SECTIONS

.1 Section 07 92 10 - Joint Sealing

.2 Section 08 71 10 - Door Hardware

.3 Section 09 91 13 - Exterior Painting.

.4 Section 09 91 23 - Interior Painting.

.5 Section 16 Wiring for electronic hardware.

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 International)
- .1 ASTM A 653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM B 29, Specification for Refined Lead.
- .3 ASTM B 749, Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
- .2 CGSB 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors.

.3 Canadian Standards Association (CSA International)
- .1 G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CSA W59, Welded Steel Construction (Metal Arc Welding) (Metric Version).

.4 Canadian Steel Door Manufacturers' Association, (CSDMA).
- .1 CSDMA, Specifications for Commercial Steel Doors and Frames.
- .2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors.

1.3 DESIGN REQUIREMENTS

.1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35° C to 35° C.

.2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.4 SHOP DRAWINGS

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

.2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, arrangement of hardware and fire rating and finishes.

.3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings fire rating finishes.

.4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.5 REQUIREMENTS

.1 Steel fire rated doors and frames: labeled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M NFPA 252 for ratings specified or indicated.

.2 Provide fire labeled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.6 SAMPLES

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

.2 If requested, submit one 300 x 300 mm top butt corner sample of each type door.

.3 If requested, submit one 300 x 300 mm corner sample of each type of frame.
.1 Show butt cutout glazing stops 300 mm long removable mullion connection snap-on trim with clips.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused paint and sealant materials from landfill to official hazardous material collections site.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.

.2 Reinforcement: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A 653M, ZF75.

.3 Composites: balance of core materials used in conjunction with lead: in accordance with manufacturers' proprietary design.

2.2 DOOR CORE MATERIALS

.1 Honeycomb construction:
.1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness.

.2 Stiffened: face sheets, honeycomb or insulated core as indicated.
.1 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m³.

.3 Thermal insulation material must:
.1 not require being labeled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act;
.2 be manufactured using a process that uses chemical compounds with the minimum ozone depletion potential (ODP) available.

2.3 ADHESIVES

.1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

.2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

.3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.

2.5 PAINT

.1 Field paint steel doors and frames in accordance with Sections 09 91 23 - Interior Painting and 09 91 13 - Exterior Painting. Protect weatherstripping from paint. Provide final finish shall be free of scratches or other blemishes.

2.6 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type.

.2 Exterior and interior top and bottom caps: rigid polyvinylchloride extrusion conforming to CGSB

41-GP-19Ma.

.3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

.4 Metallic paste filler: to manufacturer's standard.

.5 Fire labels.

.6 Sealant: as per Section 07 92 10 - Joint Sealing.

2.7 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDMA specifications.

.2 Fabricate frames to profiles and maximum face sizes as indicated.

.3 Interior frames: 1.6 mm (16 gauge), construction as indicated.

.4 Blank, reinforce, drill and tap frames for mortised, templated hardware, using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.

.5 Protect mortised cutouts with steel guard boxes.

.6 Prepare frame for door silencers, 3 for single door.

.7 Manufacturer's nameplates on frames and screens are not permitted.

.8 Conceal fastenings except where exposed fastenings are indicated.

.9 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

2.8 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

2.9 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.

.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.

.5 Securely attach floor anchors to inside of each jamb profile.

.6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

.7 Fabricate frame products for openings in sections, splice joints for field assembly.

.8 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

2.10 DOOR FABRICATION GENERAL

.1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.

.2 Exterior doors: insulated construction. Interior doors: hollow steel construction.

.3 Fabricate doors with longitudinal edges locked seam. Seams: visible.

.4 Blank, reinforce, drill doors and tap for mortised or templated hardware.

.5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.6 Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.

.7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

.8 Provide fire labeled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.9 Manufacturer's nameplates on visible faces of doors are not permitted.

2.11 DOORS: HONEYCOMB CORE CONSTRUCTION

.1 Form each face sheet for interior doors from 1.6 mm sheet steel with honeycomb core laminated under pressure to face sheets.

2.12 HOLLOW STEEL CONSTRUCTION

.1 Form each face sheet for interior doors from 1.6 mm sheet steel.

.2 Reinforce doors with vertical stiffeners, securely fastened to each face sheet at 150 mm on centre maximum.

.3 Fill voids between stiffeners of interior doors with fiberglass core.

.4 Fill voids between stiffeners of interior doors with fiberglass honeycomb temperature rise rated core.

PART 3 - EXECUTION

3.1 INSTALLATION GENERAL

.1 Install labeled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.2 Install doors and frames to CSDMA Installation Guide.

3.2 FRAME INSTALLATION

.1 Set frames plumb, square, level and at correct elevation.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.

.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Caulk perimeter of frames between frame and adjacent material.

.6 Maintain continuity of vapour retarder.

3.3 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 - Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor as follows.

.1 Hinge side: 1.0 mm.
.2 Latchside and head: 1.5 mm.
.3 Finished floor, top of carpet and thresholds: 13 mm.

.3 Adjust operable parts for correct function.

3.4 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

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 revisions at the date of building permit issue. This specification refers to the following standards, specifications or publications:

.1 National Building Code of Canada (NBC)

.2 North American Fenestration Standard (NAFS)

.1 AAMA/WDMA/SCA 101/I.S.2/A440-8, NAFS – North American Fenestration Standard, Specification for Windows, Doors and Skylights.

.3 Canadian Standards Associations (CSA) International

.1 CSA-A440.2, Energy Performance of Windows and Other Fenestration Systems

.2 CSA-A440.4, Window and Door Installation.

.3 CSA-A440SI, Canadian supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS- North American Fenestration Standard, Specification for Windows, Doors and Skylights.

.4 CSA-440.7, Window and Door Installation.

1.3 SHOP DRAWINGS

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

.2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, elevations of unit, anchorage details, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.

.3 Provide manufacturers fabrication dimensions for all window components (cut sheets) for all window types and configurations.

.4 Indicate on shop drawings, dimensions, relation to construction of adjacent work, air and vapour seal with adjacent construction materials, component anchorage and locations, anchor methods, shim methods and material, and hardware installation details. Include also opening dimensions, frames opening tolerances and affected related work and installation requirements. Provide shop drawings for anchor and shim methods and materials, sealed by an engineer registered in the Province of Manitoba.

1.4 PERFORMANCE REQUIREMENTS

.1 Design frames in exterior walls to accommodate expansion and contraction within services temperature range of -40°C to 75°C.

.2 Accommodate, without damage to components or deterioration of seals:

.1 Expansion and contraction within system caused by a cycling temperature changes without causing detrimental affect to system components including buckling, failure of joint seals, or undue stress on fasteners.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.3 System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within the system, to the exterior by a weep drainage network.

.4 Thermal Movement: Design sections to permit movement caused by thermal expansion and contraction of fibreglass to suite glass, infill, and perimeter opening construction.

.5 Design glazing system, mullions and frames to support a live load of 1.46 kN/m acting vertically, 1.61kN/m acting horizontally at any point up to 1070mm above the floor or, 0.73kN/m at 1070mm above the floor or 0.73kN/m at 1070mm above the floor, whichever produces the greatest effect.

.6 Mullions to have L/175 deflection limit rating as per NAFS using Mullion Assembly (MA) designation.

1.5 MAINTENANCE DATA

.1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 WARRANTY

.1 Provide written warranty for window sashes and frames against material or manufacturing defects occurring within 20 years from date of substantial performance.

.2 Provide written warranty for glazing seal failure against material or manufacturing defects occurring within 10 years from the date of substantial performance.

1.7 CLOSEOUT SUBMITTALS

.1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Materials: to CSA-A440/A440.1 supplemented as follows:

.2 All windows of similar material to be by same manufacturer.

.3 Main frame: fiberglass.

.4 Glass: Polycarbonate security glazing:
- .1 Single 19 mm thick polycarbonate sheet, clear colour.
- .2 Flexural strength: to ASTM D 790.
- .3 Surface burning characteristics for flame and smoke spread: to ASTM E 84.
- .4 Self ignition characteristics: to ASTM D 1929.

.5 Isolation coating: alkali resistant bituminous paint.

2.2 WINDOW TYPE AND CLASSIFICATION

.1 Type:
- .1 Fixed fiberglass: Polycarbonate security glazing.
  - .1 Acceptable materials: Duxton 325 Series, Silex 2100 Series, Accurate Dorwin 325 Series or approved equal.

2.3 FABRICATION

.1 Fabricate in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 supplemented as follows:
.2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less, and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
.3 Face dimensions detailed maximum permissible sizes.
.4 Brace frames to maintain squareness and rigidity during shipment and installation.
.5 Finish steel clips and reinforcement with 380 g/m^2 zinc coating to ASTM A 123/A 123M.

2.4 FIBERGLASS FINISHES

.1 The finished interior and exterior surfaces of fiberglass components are to be selected from the manufacturer's full range of colours.

2.5 ISOLATION COATING

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

2.6 GLAZING

.1 Glaze windows in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 with polycarbonate security glazing.
.2 Glazing as per section 08 80 50.

PART 3 - EXECUTION

3.1 WINDOW INSTALLATION

.1 Install in accordance with CSA-A440/A440.1.

.2 Arrange components to prevent abrupt variation in colour.

3.2 SILL INSTALLATION

.1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece lengths at each location.

.2 Secure sills in place with anchoring devices located at ends and evenly spaced 600 mm on centre in between.

.3 Fasten expansion joint cover plates and drip deflectors with self tapping stainless steel screws.

3.3 CAULKING

.1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.

.2 Apply sealant in accordance with Section 07 92 10 - Joint Sealing. Conceal sealant within window units except where exposed use is permitted by Contract Administrator.

3.4 SCHEDULE

.1 Window series and colour.

Window	Type	Series	Int. Colour	Ext. Colour
W1	Fibreglass		TBC (Stock Color)	TBC (Stock Color)

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 08 11 14 – Metal Doors and Frames

.2 Section 26 – Wiring Device

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 Steel Door and Frame Manufacturers' Association (CSDFMA).
- .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.

.2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-69.17, Bored and Preassembled Locks and Latches.
- .2 CAN/CGSB-69.18/ANSI/BHMA A156.1, Butts and Hinges.
- .3 CAN/CGSB-69.19/ANSI/BHMA A156.3, Exit Devices.
- .4 CAN/CGSB-69.20/ANSI/BHMA A156.4, Door Controls (Closers).
- .5 CAN/CGSB-69.21/ANSI/BHMA A156.5, Auxiliary Locks and Associated Products.
- .6 CAN/CGSB-69.22/ANSI/BHMA A156.6, Architectural Door Trim.
- .7 CAN/CGSB-69.26/ANSI/BHMA A156.10, Power-operated Pedestrian Doors.
- .8 CAN/CGSB-69.28/ANSI/BHMA A156.12, Interconnected Locks and Latches.
- .9 CAN/CGSB-69.29/ANSI/BHMA A156.13, Mortise Locks and Latches.
- .10 CAN/CGSB-69.31/ANSI/BHMA A156.15, Closer/Holder Release Device.
- .11 CAN/CGSB-69.32/ANSI/BHMA A156.16, Auxiliary Hardware.
- .12 CAN/CGSB-69.34/ANSI/BHMA A156.18, Materials and Finishes.
- .13 CAN/CGSB-69.35/ANSI/BHMA A156.19, Power Assist and Low Energy Power Operated Doors.

1.3 SUBMITTALS

.1 Hardware List:
- .1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.2 Manufacturer's Instructions:
- .1 Submit manufacturer's installation instructions.

.3 Closeout Submittals
- .1 Provide operation and maintenance data for door closers, locksets, door holders and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:
- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.2 Storage and Protection:
- .1 Store finishing hardware in locked, clean and dry area.

1.5 MAINTENANCE

.1 Provide maintenance data and materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Data:
- .1 Provide maintenance data, parts lists and manufacturer’s instructions for each type of door closer, lockset, door holder and fire exit hardware.
- .2 Brief maintenance staff regarding proper care, cleaning and general maintenance.

.3 Extra Materials:
- .1 Provide two (2) sets of special wrenches for door closers, locksets and fire exit hardware and other tools applicable to each different or special hardware component.
- .2 Provide two (2) sets of maintenance tools and accessories supplied by hardware component manufacturer.
- .3 Provide two (2) copies of all installation instructions, operating manuals, programming guides and product warranties.

PART 2 - PRODUCTS

2.1 HARDWARE ITEMS
.1 Use one manufacturer's products only for similar items.

2.2 DOOR SIGNAGE
.1 Washroom signs: Rockwood BF689, 200 x 200, metal sign, US10BL/626 finish (Satin Chrome Plated Brass), Grade 2 Braille translation, mechanically fastened to wall with tamper proof fasteners or approved equal.

2.3 FASTENINGS
.1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.2 Exposed fastening devices to match finish of hardware.

.3 Use fasteners compatible with material through which they pass.

2.4 KEYING
.1 Provide construction cores.

.2 City shall provide all permanent cores to be installed by Contractor.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS
.1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their Work to receive hardware.

.3 Furnish manufacturers' instructions for proper installation of each hardware component.

.4 Install closers and stops to allow maximum door swing permitted by the hardware and adjacent construction.

.5 Where special placement is required, consult the City.

3.2 INSTALLATION
.1 Install hardware to meet the new Manitoba Amendments Article 3.8.3.3(3).

.2 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.3 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.4 Remove construction cores when directed by Contract Administrator; install permanent cores and check operation of locks.

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

.4 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.4 CLEANING

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

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

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

3.5 SCHEDULE

Hardware Set#: 1

Single: D101

4	Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1	Classroom Deadbolt	70 8203	US32D	SA
1	Deadlock	LB V21 70 8221	US32D	SA
2	Core	Supplied by Owner		BE
2	Back to Back Pull	RM4200-18" Mtg-Type 5HD	US32D	RO
1	Conc Overhead Stop	6-X36	630	RF
1	Automatic Opener	6021	689	NO
1	Kick Plate	K1050 12"	US32D	RO
1	Threshold	272A		PE
1	Gasketing	290AS		PE
2	Sweep	18100CNB		PE
1	Monitor	LML-1		SU
2	Full Height Actuator	639		NO
1	Guide Rail	Curran CE-805-MB x Size to Suit	AL	OT

Notes: Provide 2 deadbolts - one at standard deadbolt height (standard deadbolt) and other lower on door (classroom deadbolt). Wire actuators through the LML monitor switch used on the standard deadbolt strike. When that deadbolt is thrown the actuators will be disabled. Provide standard deadbolt at standard height and classroom deadbolt lower on door.
Provide door sign.

Hardware Set#: 2

Single: D102

3	Hinge, Full Mortise	TA2714 4-1/2" x 4"	US26D	MK
1	Privacy Lock	28 7U65 LL	US26D	SA
1	Surface Closer	1431 PS	EN	SA
1	Kick Plate	K1050 12"	US32D	RO

Hardware Set#: 3

Single: D103A

3	Hinge, Full Mortise	TA2314 NRP 4-1/2" x 4"	US32D	MK
1	Dormitory Lock	70 8225 LNL	US32D	SA
1	Core	Supplied by Owner		BE
1	Door Closer	1431 CPS	EN	SA
1	Kick Plate	K1050 12"	US32D	RO
1	Threshold	272A		PE
1	Gasketing	2891AS		PE
1	Sweep	18100CNB		PE
1	Astragal	3572SP		PE

Hardware Set#: 4
Single: D103B
All operating hardware is existing
Notes: Weatherstrip to be replaced by overhead door division.
External heavy duty stainless steel slide bolt locks c/w padlocks to be replaced by overhead door division (2 required). Padlocks to be keyed to master lock system.

Hardware Set#: 5
Single: D104

3	Hinge, Full Mortise	TA2714 4-1/2" x 4"	US26D	MK
1	Entry/Office Lock	28 70 7G05 LL	US26D	SA
1	Core	Supplied by Owner		BE
1	Floor Stop	441/443	US26D	RO

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 National Standards Institute (ANSI).
- .1 ANSI/ASTM E330-02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 American Society for Testing and Materials International, (ASTM).
- .1 ASTM C 542-94, Specification for Lock-Strip Gaskets.
- .2 ASTM D 790-02, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- .3 ASTM D 2240-02b, Test Method for Rubber Property - Durometer Hardness.
- .4 ASTM F 1233-98, Test Method for Security Glazing Materials and Systems.

.3 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
- .2 CAN/CGSB-12.8-97, Insulating Glass Units.

.4 Canadian Standards Association (CSA International).
- .1 CSA A440.2, Energy Performance Evaluation of Windows and Sliding Glass Doors.
- .2 CSA Certification Program for Windows and Doors.

.5 Flat Glass Manufacturers Association (FGMA).
- .1 FGMA Glazing Manual.

1.2 SYSTEM DESCRIPTION

.1 Performance Requirements:
- .1 Size glass to withstand wind loads, dead loads and positive and negative live loads.
- .2 Limit glass deflection to 1/200 with full recovery of glazing materials.

1.3 SUBMITTALS

.1 Shop Drawings:
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Closeout Submittals:
- .1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

PART 2 - PRODUCTS

2.1 MATERIALS: FLAT GLAZING

.1 Polycarbonate security glazing:
Single 19 mm thick polycarbonate sheet, clear colour.
Flexural strength: to ASTM D 790.
Surface burning characteristics for flame and smoke spread: to ASTM E 84.
Self ignition characteristics: to ASTM D 1929.

2.3 ACCESSORIES

.1 Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D 2240, to suit glazing method, glass light weight and area.

.2 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

.3 Glazing tape:
- .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240; coiled on release paper, black colour.
- .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25 %.

.4 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.

.5 Glazing clips: manufacturer's standard type.

.6 Lock-strip gaskets: to ASTM C 542.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 EXAMINATION

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.4 INSTALLATION: EXTERIOR - DRY METHOD (PREFORMED GLAZING)

.1 Perform work in accordance with FGMA Glazing Manual.

.2 Cut glazing tape to length; install on glazing light. Seal corners by butting tape and sealing junctions with sealant.

.3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

.5 Install removable stops without displacing glazing tape. Exert pressure for full continuous contact.

.6 Trim protruding tape edge.

3.5 CLEANING

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

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacture's instructions.

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

3.6 SCHEDULE

.1 Fibreglass Exterior Window: 19mm polycarbonate sheet, clear colour. Flexural strength: to ASTM D 790.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 09 91 23 - Painting of Interior Surfaces.

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 Architectural Painting Specifications Manual, Master Painters Institute (MPI).

1.3 QUALITY ASSURANCE

.1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeymen who have a "Tradesman Qualification Certificate of Proficiency" shall be engaged in painting work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.

.3 Conform to latest MPI requirements for exterior painting work including preparation and priming.

.4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) shall be in accordance with MPI Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used.

.5 Other paint materials such as linseed oil, shellac, turpentine, etc. shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other coating materials as required.

.6 Standard of Acceptance:

- .1 Walls: No defects visible from a distance of 1000 mm at 90° to surface.
- .2 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.4 SCHEDULING OF WORK

.1 Submit work schedule for various stages of painting to Contract Administrator for approval. Submit schedule minimum of 48 hours in advance of proposed operations.

.2 Schedule painting operations to prevent disruption of occupants in and about the building.

1.5 SUBMITTALS

.1 Submit product data and manufacturer's installation/application instructions for paints and coating products to be used in accordance with Section 01 33 00 - Submittal Procedures.

.2 Upon completion, submit records of products used. List products in relation to finish system and include the following:

- .1 Product name, type and use.
- .2 Manufacturer's product number.
- .3 Colour numbers.

1.6 SAMPLES

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

.2 Submit 200 x 300 mm sample panels of each paint, stain, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:

- .1 3 mm plate steel for finishes over metal surfaces.
- .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
- .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.

.3 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

.4 Submit full range of available colours where colour availability is restricted.

1.7 EXTRA MATERIALS

.1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit one - four litre can of each type and colour of primer, stain and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

.3 Deliver to Contractor and store where directed.

1.8 DELIVERY, HANDLING AND STORAGE

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

.2 Deliver and store materials in original containers, sealed, with labels intact.

.3 Labels shall clearly indicate:
- .1 Manufacturer's name and address.
- .2 Type of paint or coating.
- .3 Compliance with applicable standard.
- .4 Colour number in accordance with established colour schedule.

.4 Remove damaged, opened and rejected materials from site.

.5 Provide and maintain dry, temperature controlled, secure storage.

.6 Observe manufacturer's recommendations for storage and handling.

.7 Store materials and supplies away from heat generating devices.

.8 Store materials and equipment in a ventilated area with temperature range 7° C to 30° C.

.9 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.10 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Contract Administrator. After completion of operations, return areas to clean condition to approval of Contract Administrator.

.11 Remove paint materials from storage only in quantities required for same day use.

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

.13 Fire Safety Requirements:
- .1 Provide one 4.5 kg Type ABC fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.9 SITE REQUIREMENTS

.1 Heating, Ventilation and Lighting:
- .1 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10° C for 24 hours before, during and after paint application until paint has cured sufficiently.
- .2 Where required, provide continuous ventilation for seven days after completion of application of paint.
- .3 Coordinate use of existing ventilation system with City and ensure its operation during and after application of paint as required.
- .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- .5 Perform no painting work unless a minimum lighting level of 323 Lux is provided on

surfaces to be painted. Adequate lighting facilities shall be provided by General Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:
  - .1 ambient air and substrate temperatures are below 10° C.
  - .2 substrate temperature is over 32° C unless paint is specifically formulated for application at high temperatures.
  - .3 substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
  - .4 the relative humidity is above 85% or when dew point is less than 3° C variance between air/surface temperature.
  - .5 rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
- .2 Perform no painting work when maximum moisture content of substrate exceeds:
  - .1 12% for concrete and masonry (clay and concrete brick/block).
  - .2 15% for wood.
  - .3 12% for plaster and gypsum board.
- .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:
- .1 Apply paint finish only in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
- .2 Apply paint only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
- .3 Apply paint only when previous coat of paint is dry or adequately cured.
- .4 Apply paint finishes only when conditions forecast for entire period of application fall within manufacturer's recommendations.
- .5 Do not apply paint when:
  - .1 Temperature is expected to drop below 10° C before paint has thoroughly cured.
  - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
  - .3 Surface to be painted is wet, damp or frosted.
- .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
- .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of the City such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

.2 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.3 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
- .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
.4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.4 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint materials listed in the latest edition of the MPI Approved Products List (APL) are acceptable for use on this project.

.2 Paint materials for paint systems shall be products of a single manufacturer.

.3 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.4 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.
.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.2 COLOURS

.1 Contract Administrator will provide Colour Schedule after Contract award.

.2 Colour schedule will be based upon selection of three base colours and two accent colours. No more than five colours will be selected for the entire project.

.3 Selection of colours will be from manufacturers full range of colours.

.4 Where specific products are available in a restricted range of colours, selection will be based on the limited range.

.5 Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.

.3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.

.4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Contract Administrator.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 GLOSS/SHEEN RATINGS

.1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level Category	Units @ 60°	Units @ 60°
G1 – matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	min. 35
G5 - semi gloss	35 to 70	
G6 - gloss finish	70 to 85	
G7 – high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces as noted on Finish Schedule.

2.5 EXTERIOR PAINTING SYSTEMS

.1 Concrete Vertical Surfaces:
  .1 EXT 3.1K – Latex, Gloss Level 4 finish.

.2 Concrete Masonry Units:
  .1 EXT 4.2G – Polyurethane, Pigmented, Gloss Level 6 finish.

.3 Galvanized Metal: not chromate passivated
  .1 EXT 5.3A – Latex, Gloss Level 5 finish.

.4 Dimensional Lumber:
  .1 EXT 6.2M – Latex, Gloss Level 5 finish.

PART 3 - EXECUTION

3.1 GENERAL

.1 Perform preparation and operations for exterior painting in accordance with MPI Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.2 EXISTING CONDITIONS

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Contract Administrator damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Contract Administrator. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:
  .1 Wood: 15%.

3.3 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Contract Administrator.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect passing pedestrians, building occupants and general public in and about the building.

.5 Removal of light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings shall be done prior to undertaking painting operations by General Contractor. Items shall be securely stored and re-installed after painting is completed by General Contractor.

.6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of Contract Administrator.

3.4 CLEANING AND PREPARATION

.1 Clean and prepare exterior surfaces in accordance with MPI Painting Specification Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
- .1 Remove dust, dirt, and other surface debris by brushing, wiping with dry, clean cloths or compressed air.
- .2 Wash surfaces with a biodegradable detergent (and bleach where applicable) and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
- .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
- .4 Allow surfaces to drain completely and allow to dry thoroughly.
- .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
- .6 Use trigger operated spray nozzles for water hoses.
- .7 Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.

.2 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.3 Where possible, prime surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
- .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
- .2 Apply wood filler to nail holes and cracks.
- .3 Tint filler to match stains for stained woodwork.

.4 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.5 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes.

.6 Touch up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.

3.5 APPLICATION

.1 Method of application to be as approved by Contract Administrator. Apply paint by brush, roller, or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:
- .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
- .2 Work paint into cracks, crevices and corners.
- .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
- .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Contract Administrator.
- .5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray Application:
- .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
- .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
.4 Brush out immediately runs and sags.
.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Contract Administrator.

.5 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.3 Do not paint over nameplates.

.4 Paint fire protection piping red.

.5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.7 RESTORATION

.1 Clean and re-install all hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashing's on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Contract Administrator. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Contract Administrator.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 09 91 13 – Exterior Painting

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 Architectural Painting Specifications Manual, Master Painters Institute (MPI).

1.3 QUALITY ASSURANCE

.1 Qualifications:

- .1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
- .3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.

1.4 SCHEDULING

.1 Submit work schedule for various stages of painting to Contract Administrator for review. Submit schedule minimum of 48 hours in advance of proposed operations.

.2 Schedule painting operations to prevent disruption of occupants.

1.5 SUBMITTALS

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

.2 Product Data:

- .1 Submit product data and instructions for each paint and coating product to be used.
- .2 Submit product data for the use and application of paint thinner.

.3 Samples:

- .1 Submit full range colour sample chips to indicate where colour availability is restricted.
- .2 Submit 200 x 300mm sample panels of each paint, stain, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
  - .1 3 mm plate steel for finishes over metal surfaces.
  - .2 13 mm birch plywood for finishes over wood surfaces.
  - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
  - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
- .3 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour numbers.

1.6 MAINTENANCE

.1 Extra Materials:

- .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
- .2 Quantity: provide one - four litre can of each type and colour of primer, stain, finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

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

.2 Acceptance at Site:
.1 Identify products and materials with labels indicating:
.1 Manufacturer's name and address.
.2 Type of paint or coating.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Storage and Protection:
.1 Provide and maintain dry, temperature controlled, secure storage.
.2 Store materials and supplies away from heat generating devices.
.3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.

.5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.

.7 Remove paint materials from storage only in quantities required for same day use.

.8 Fire Safety Requirements:
.1 Provide one 4.5 kg Type ABC fire extinguisher adjacent to storage area.
.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
.3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

.9 Waste Management and Disposal:
.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
.2 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
.3 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
.4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
.5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
.4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

1.8 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:
.1 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
.2 Provide continuous ventilation for seven days after completion of application of paint.
.3 Provide temporary ventilating and heating equipment where permanent facilities are not

available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.4 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless pre-approved written approval by product manufacturer, perform no painting when:

.1 Ambient air and substrate temperatures are below 10 degrees C.

.2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.

.4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.

.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

.6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.

.2 Perform painting work when maximum moisture content of the substrate is below:

.1 Allow new concrete and masonry to cure minimum of 28 days.

.2 15% for wood.

.3 12% for plaster and gypsum board.

.3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.

.3 Apply paint when previous coat of paint is dry or adequately cured.

.4 Additional interior application requirements:

.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

.2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of City such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.9 EXTRA MATERIALS

.1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit one - four litre can of each type and colour of primer, stain and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

.3 Deliver to Contractor and store where directed.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.2 Provide paint materials for paint systems from single manufacturer.

.3 Conform to latest MPI requirements for interior painting work including preparation and priming.

.4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.

.5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.

2.2 COLOURS

.1 Contract Administrator will provide Colour Schedule after Contract award.

.2 Colour schedule will be based upon selection of two base colours and three accent colours. No more than six colours will be selected for entire project.

.3 Selection of colours from manufacturers full range of colours.

.4 Where specific products are available in restricted range of colours, selection based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.

.4 Thin paint for spraying in accordance with paint manufacturer's instructions.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 GLOSS/SHEEN RATINGS

.1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category	Units @ 60°	Units @ 60°
G1 – matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	min. 35
G5 - semi gloss	35 to 70	
G6 - gloss finish	70 to 85	
G7 – high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces as indicated and as noted on Finish Schedule.

2.5 INTERIOR PAINTING SYSTEMS

.1 Concrete Floor: smooth
  .1 INT 3.2D –Polyurethane pigmented finish over epoxy. Premium Grade.

.2 Concrete Masonry Units: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
  .1 INT 4.2A - Latex Gloss Level 4 finish. Premium Grade.

.3 Structural Steel: beams, columns, teleposts.
  .1 INT 5.1Q - Latex Gloss Level 5 finish. Premium Grade.

.4 Galvanized Metal: doors, frames, railings, misc. steel, pipes, and ducts.
  .1 INT 5.3A - Latex Gloss Level 5 finish. Premium Grade.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Contract Administrator damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:
- .1 Clay and Concrete Block/Brick: 12%.
- .2 Wood: 15%.

3.4 PREPARATION

.1 Protection:
- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Contract Administrator.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect passing pedestrians, building occupants and general public in and about the building.

.2 Surface Preparation:
- .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
- .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of City.

.3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
- .1 Remove dust, dirt, and other surface debris by vacuuming, or wiping with dry, clean cloths.
- .2 Wash surfaces with a biodegradable detergent and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
- .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
- .4 Allow surfaces to drain completely and allow to dry thoroughly.
- .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
- .6 Use trigger operated spray nozzles for water hoses.
- .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration

occurs.

.5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
- .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
- .2 Apply wood filler to nail holes and cracks.
- .3 Tint filler to match stains for stained woodwork.

.6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.7 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes.

.8 Touch up of shop primers with primer as specified.

3.5 APPLICATION

.1 Method of application to be as approved by Contract Administrator. Apply paint by brush, roller or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:
- .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
- .2 Work paint into cracks, crevices and corners.
- .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
- .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
- .5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application:
- .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
- .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
- .4 Brush out immediately all runs and sags.
- .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

.5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.9 Finish inside of cupboards and cabinets as specified for outside surfaces.

.10 Finish closets and alcoves as specified for adjoining rooms.

.11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.

.2 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.3 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.4 Do not paint over nameplates.

.5 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

.6 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.7 Do not paint interior transformers and substation equipment.

3.7 SITE TOLERANCES

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.8 RESTORATION

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashing’s on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Contract Administrator. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Contract Administrator.

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 (ASTM)
- .1 ASTM A 167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM B 456, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- .3 ASTM A 653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 ASTM A 924/A924M, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.81, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
- .2 CAN/CGSB-1.88, Gloss Alkyd Enamel, Air Drying and Baking.
- .4 CGSB 31-GP-107Ma, Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.

.3 Canadian Standards Association (CSA)
- .1 CAN/CSA-B651, Barrier-Free Design.
- .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.2 SHOP DRAWINGS

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

.2 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, and building-in details of anchors for grab bars.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 EXTRA MATERIALS

.1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.

.2 Deliver special tools to City.

PART 2 - PRODUCTS

2.1 COMPONENTS

.1 Toilet tissue dispenser: surface mounted, dual coreless jumbo roll, 22 gauge stainless steel.
- .1 Acceptable material: Bradley 5426-11 or approved equal in accordance with B7.

.2 Security towel hook: 14 gauge stainless steel backplate with satin finish and tamper resistant mounting screws. Stainless steel safety hook with pivoting ball joint that releases when more than 20 lbs of force is applied.
- .1 Acceptable materials: Bradley SA36, Bobrick B-983, ASI B-123 or approved equal in accordance with B7.

.3 Hand Dryer: 22 gauge satin finish stainless steel cover, automatic operation.
- .1 Acceptable materials: Bradley 2902-287400, Bobrick B-7128, ASI 0185 or approved equal in accordance with B7.

.4 Sanitary Napkin Disposal: surface mounted, satin finish stainless steel
- .1 Acceptable material: Bradley 4781-15, Bobrick B-270, ASI 20852 or approved equal in accordance with B7.

.5 Mirrors: 20 gauge bright annealed stainless steel c/w tamper resistant mounting screws
.1 Acceptable material: Bradley, 7481 series 610mm x 915mm, ASI8026 or approved equal in accordance with B7.

.6 Soap Dispenser: surface mounted vertical type, 20 gauge stainless steel construction
.1 Acceptable material: Bradley 6562, Bobrick B-2111, ASI 0347 or approved equal in accordance with B7.

.7 Grab Bars: 32mm x 915mm and 32mm x 610mm concealed mounted grab bar: wall tubing stainless steel, 76 mm diameter wall flanges, concealed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Grab bar material and anchorage to withstand downward pull of 2.2 kN. Check drawings for length, degree of slope, bends and locations.
.1 Acceptable material: Bradley 832 series, Bobrick B-5806 series, ASI 3700 Series or approved equal in accordance with B7.

.8 Mop and Broom Holder: Type 304 stainless steel, 915mm wide, satin finish with spring loaded, rubber cam, anti slip mop holders.
.1 Acceptable material: Bradley 9953, Bobrick B-223 x 36, ASI 8215 or approved equal in accordance with B7.

.9 Waste Receptacle: 22 gauge stainless steel, 356mm wide x 457mm high x 152mm deep, 6.5 gallon capacity. Fasten to wall with tamper resistant mounting screws. Provide vinyl liner.
.1 Acceptable material: Bradley 357, Bobrick B-279, ASI 0828 or approved equal in accordance with B7.

2.2 FABRICATION

.1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.

.2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.

.3 Brake form sheet metal work with 1.5 mm radius bends.

.4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

.5 Back paint components where contact is made with building finishes to prevent electrolysis.

.6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.

.7 Shop assemble components and package complete with anchors and fittings.

.8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.

.9 Provide steel anchor plates and components for installation on studding and building framing.

2.3 FINISHES

.1 Chrome and nickel plating: to ASTM B 456, satin finish.

.2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Contract Administrator.

.3 Manufacturer's or brand names on face of units not acceptable.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install and secure accessories rigidly in place as follows:
.1 Masonry walls: install as per manufacturer’s recommendation.

.2 Use tamper proof screws/bolts for fasteners.

.3 Fill units with necessary supplies shortly before final acceptance of building.

3.2 SCHEDULE

.1 Toilet tissue dispenser: one per toilet fixture.

.2 Security towel hook: one per washroom.

.3 Hand Dryer: one per washroom.

.4 Napkin Receptacle: one per washroom.

.5 Mirror: one per washroom.

.6 Soap Dispenser: one per washroom.

.7 Grab bars: one 610mm and two 915mm per toilet fixture.

.8 Mop and Broom Holder: one per Building Services room.

.9 Waste Receptacle: one per washroom.

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 National Standards Institute (ANSI)

.1 ANSI/NFPA 10, Portable Fire Extinguishers.

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S508, Rating and Fire Testing of Fire Extinguishers and Class "D" Extinguishing Media.

1.2 SHOP DRAWINGS AND PRODUCT DATA

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

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

PART 2 - PRODUCTS

2.1 MULTI-PURPOSE DRY CHEMICAL EXTINGUISHERS

.1 Stored pressure rechargeable type with hose and shut-off nozzle, ULC labeled for A, B and C class protection. Size 4.5 kg.

2.2 EXTINGUISHER BRACKETS

.1 Type recommended by extinguisher manufacturer.

2.3 IDENTIFICATION

.1 Identify extinguishers in accordance with recommendations of ANSI/NFPA 10.

.2 Attach tag or label to extinguishers, indicating month and year of installation. Provide space for service dates.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install or mount extinguishers in cabinets or on brackets as indicated on drawings.

End of Section

PART 1 - GENERAL

1.1 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 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-44.40-01, Steel Clothing Locker.

1.2 ACTION AND INFORMATION SUBMITTALS

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

1.3 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.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

.1 Lockers: to CAN/CGSB-44.40, Type 1-Single full-height locker.
- .1 Size: 457mm wide x 381mm deep x 1 828mm high, steel thickness No.20 MSG.
- .2 Rivet assembly for extra strength and tamper-proof fastening.
- .3 Full length continuous piano hinges.
- .4 Doors: rigid, double pan welded box with 1” thick honeycomb interior.
- .5 Door handle: recessed handle steel with nickel-plated finish.
- .6 Standard friction catch to accept standard padlock.
- .7 Colour: Powder coated finish to be selected by Contract Administrator from full colour range.

2.2 ACCESSORIES

.1 Locking system: padlocks, supplied by locker manufacturer.
.2 Galvanneal box bases.
.3 Heavy-duty 16 gauge Sloped Tops.
.4 Colour coordinated Expansion Trims, where necessary.
.5 Colour coordinated Dress Ends where necessary.
.6 Plastic number plates.
.7 Three double prong, chrome plated ball point head hooks per locker.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Assemble and install lockers in accordance with manufacturer's written instructions.
.2 Securely fasten lockers to grounds and nailing strips.
.3 Install finished end panels to exposed ends of locker banks.
.4 Install locker numbers and locks.

3.2 ADJUSTING

.1 Adjust metal lockers for correct function and operation in accordance with manufacturer's written instructions.
.2 Lubricate moving parts to operate smoothly and fit accurately.

3.3 CLEANING

.1 Progress and Final Cleaning: clean in accordance with Section 01 74 11 – Cleaning.

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.
.2 Repair damage to adjacent materials caused by metal locker installation.

End of Section

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 05 50 00 – Metal Fabrications

1.2 SHOP DRAWINGS

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

PART 2 - PRODUCTS

2.1 BOLLARD COVERS

.1 Polyethylene Thermoplastic (LDPE) bollard cover having ultra-violet resistance and anti-static properties, nominal thickness 6 mm. Standard of Acceptance: Metro Decorative cover by Ideal Shield or approved equal.

.1 Colour: colour to be selected from full range of manufacturer's options

.2 Secure with manufacturer's neoprene adhesive tape as per manufacturer's installation guidelines; no screws, glue or clamping will be acceptable.

.3 Size covers for pipe diameters; site confirm.

PART 3 - EXECUTION

3.1 BOLLARD COVERS

.1 Install bollard covers on all bollards.

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 CLEARING AND GRUBBING

.1 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.

.2 Remove stumps and tree roots below slabs, and paving, and to 600 mm below finished grade elsewhere.

.3 Dispose of cleared and grubbed material off site daily to disposal areas acceptable to authority having jurisdiction.

3.2 EXCAVATION

.1 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil. Stockpile topsoil on site for later use.

.2 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.

.3 Excavate trenches to provide uniform continuous bearing and support for 150mm thickness of pipe bedding material on solid and undisturbed ground. Trench widths below point 150mm above pipe not to exceed diameter of pipe plus 600 mm.

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

3.3 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.

3.4 GRADING

.1 Grade so that water will drain away from buildings and walls to maintain existing run off areas approved by the Contract Administrator. Grade to be gradual between finished spot elevations shown on drawings.

3.5 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.

.3 Samples:
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures if requested.
- .2 Submit ten (10) kg samples of type of fill specified including representative samples of excavated material upon request of Contract Administrator.
- .3 Ship samples prepaid to Contract Administrator, in tightly closed containers to prevent contamination and exposure to elements.

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 Void form: Aerofoam Type I insulation.

.6 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 STRIPPING OF TOPSOIL

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

.2 Strip topsoil to depths as indicated as indicated. Do not mix topsoil with subsoil.

.3 Stockpile in locations as directed by Contract Administrator. Stockpile height not to exceed 3.0 m and should be protected from erosion.

.4 Dispose of unused topsoil off site.

3.3 STOCKPILING

.1 Stockpile fill materials in areas designated by Contract Administrator. Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.4 DEWATERING AND HEAVE PREVENTION

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

3.5 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 For trench excavation, unless otherwise authorized by Contract Administrator in writing, do not excavate more than 30m of trench in advance of installation operations and do not leave open more than 15m at end of day's operation.

.4 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Contract Administrator.

.5 Restrict vehicle operations directly adjacent to open trenches.

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

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

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

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

.10 Obtain Contract Administrator approval of completed excavation.

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

.12 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.

.13 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.

3.6 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 Within building area: use Type 2 to underside of base course for floor slabs. Compact to 100% of corrected maximum dry density.
- .3 Under concrete slabs: provide 150mm compacted thickness base course of Type 1 fill to underside of slab. Compact base course to 100%.
- .4 Retaining walls: use Type 3 fill to subgrade level on high side for minimum 500mm from wall and compact to 85%.

3.7 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.

3.8 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.
- .4 Removal of concrete formwork.
- .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.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.

3.9 RESTORATION

.1 Replace topsoil as indicated.

.2 Reinstate lawns to elevation which existed before excavation.

.3 Reinstate granular walkways 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 EXISTING CONDITIONS

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

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

1.3 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 STRIPPING OF TOPSOIL

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

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

.3 Rototill weeds and grasses in stripped topsoil and retain as topsoil on site. Avoid mixing topsoil with subsoil.

.4 Dispose of unused topsoil off site.

3.2 GRADING

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

.2 Rough grade to following depths below finish grades:
- .1 150 mm for grassed areas.
- .2 375 mm for asphalt paving.
- .3 250 mm for concrete walks.

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

.4 Grade ditches to depth as indicated.

.5 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.

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

3.3 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.

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.

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

1.1 SOURCE QUALITY CONTROL

.1 Advise Project Administrator of sources of topsoil to be utilized seven days in advance of starting work.

.2 Contractor is responsible for soil analysis and related costs, and requirements for amendments to supply topsoil as specified.

.3 Test topsoil for clay, sand and silt, NPK, Mg, soluble salt content, PH, growth inhibitors, soil sterilants and organic matter.

.1 Submit 0.5 kg sample of topsoil to testing laboratory and indicate present use, intended use, type of subsoil and quality of drainage. Prepare and ship sample in accordance with provincial regulations and testing laboratory requirements.

.2 Submit 2 (two) copies of soil analysis and recommendations for corrections to the Project Administrator.

1.2 SCHEDULE OF WORK

.1 Schedule finish grading to permit sodding and/or seeding operations under optimum conditions.

1.3 PROTECTION OF EXISTING FACILITIES

.1 Protect elements surrounding the work of this section from damage or disfiguration.

.2 Protect landscaping and other features remaining as final Work.

.3 Protect existing structures, fences, roads, sidewalks, paving and curbs.

.4 In the event of damage immediately replace such items or make repairs to the same, at no additional cost to the City.

1.4 DELIVERY AND STORAGE

.1 Coordinate locations for storage of all materials with Project Administrator.

.2 Deliver and store fertilizer in waterproof bags accompanied in writing by weight, analysis and name of manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Topsoil

.1 Shall consist of a screened clay-textured or loam-textured dark topsoil, a fertile, friable material neither of heavy clay nor of very light sandy nature containing by volume, a minimum of 4% to a maximum of 25% organic matter (peat, rotted manure or composted material) and capable of sustaining vigorous plant growth.

.2 Ph value: 7.5 to 8.2

.3 Contain no toxic elements or growth inhibiting materials.

.4 Free from:

.1 Debris, roots, stones and clay lumps over 40 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.3 Subsoil contamination.

.4 Quackgrass rhizomes, Canada Thistle roots or other noxious weeds.

.5 Consistence: friable when moist.

.6 Salinity rating less than 1.5mmhos/cm.

.5 Planting mix: 4 parts topsoil with 1 part peatmoss.

.2 Soil Amendments

.1 Peatmoss:

.1 Derived from partially decomposed species of Sphagnum Mosses.
.2 Elastic and homogeneous, brown in colour.
.3 Free of wood and deleterious material which could prohibit growth.
.4 Shredded particle minimum size: 5 mm.

.2 Sand: washed course silica sand, medium to course textured.

.3 Limestone, if required as a result of soil analysis:
.1 Ground agricultural limestone containing minimum calcium carbonate equivalent of 85%.
.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.4 Fertilizer: Synthetic slow release fertilizer with and NPK analysis of 1-2-1 ratio at a rate to provide 48 kg actual Nitrogen, 96 kg actual Phosphate and 48 kg actual Potassium per hectare.

PART 3 - EXECUTION

3.1 PREPARATION OF EXISTING GRADE

.1 Subsoil shall be fine graded and shaped so that by spreading a uniform depth of topsoil, the final elevations and contours may be achieved. Uneven areas and low spots shall be eliminated to ensure positive grade.

.2 Verify that grades are correct. If discrepancies occur, notify Project Administrator and do not commence work until instructed by Project Administrator.

.3 Areas which are to receive topsoil shall be cultivated to a depth of 100 mm. This cultivation shall be repeated and cross cultivated in locations where machinery or equipment has compacted the soil.

.4 Remove surface debris, roots, vegetation, branches and stones in excess of 40 mm in diameter. Remove any soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off site.

3.2 SPREADING OF TOPSOIL

.1 Subgrade shall be inspected and approved by the City prior to spreading topsoil.

.2 Topsoil shall be evenly spread with adequate moisture, in uniform layers not exceeding 150 mm, over approved, unfrozen subgrade free of standing water, in locations where sodding or planting is indicated.

.3 Keep topsoil 25 mm below finished grade in areas to be sodded.

.4 Apply topsoil to the following minimum depths after settlement and 80% compaction:

.1 Refer to drawing details.

.2 150 mm for seeded and sodded areas.
.3 300 mm for flower beds.
.4 500 mm for shrub beds.

.5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.3 SOIL AMENDMENTS

.1 Any soil amendments required shall be applied to the topsoil at a rate as specified and as determined by the soil sampling. Mix any soil amendments in to the full depth of the topsoil prior to application of fertilizer.

3.4 APPLICATION OF FERTILIZER

.1 Spread fertilizer over entire area to receive topsoil at a rate as recommended by the manufacturer or as determined by the soil testing.

.2 Mix fertilizer thoroughly to a minimum depth of 150 mm of the topsoil

3.5 FINISH GRADING

.1 Areas shall be leveled and graded to provide positive drainage. Leveling shall be in accordance with the contour lines, elevations, drainage direction arrows and other descriptions as shown on the drawings or specified herein.

.2 Positive surface drainage shall be provided on all areas to be sodded by creating grade not less than 2% unless otherwise shown on the drawings.

.3 Prepare loose friable bed by means of cultivation and subsequent raking. Roll lightly and rake wherever topsoil is too loose.

.4 Roll topsoil with a 100 kg, 1000 mm minimum wide roller, to consolidate topsoil in areas to be sodded. Leave a smooth, uniform surface, firm against deep foot printing. Surface shall be even textured.

.5 The site shall be kept tidy during operations and all excess material shall be disposed of off-site, to a legal dump site at no cost to the City.

3.6 ACCEPTANCE

.1 Contract Administrator will inspect topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

End of Section