FLOROS CONCEPT

BID DOCUMENT

UXBRIDGE SECONDARY SCHOOL

127 Planks Lane, Uxbridge, Ontario

1956 SOUTH ENTRANCE
FOUNDATION WALL WATERPROOFING
& STORM WATER PIPE REPLACEMENT

ISSUED FOR TENDER
February 24, 2026

25-011

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DIVISION 01 – GENERAL REQUIREMENTS

Section 01 11 13 – Work Covered by Contract Documents

1.1 GENERAL

.1 Bids shall be based on the materials and methods as outlined in the bid documents. If the contractor cannot meet the requirements, no bid shall be entered.

.2 Refer to the technical specifications and drawings sections for products, and technical requirements.

.3 All qualifications (years of experience, approved installer/applicator, etc.) noted in the bid documents are required at the time of bidding.

1.2 SCOPE OF WORK

.1 The Work outlined herein is a general description and must be read in conjunction with all bid documents.

1.3 PURPOSE OF WORK

.1 The purpose of this project is to address water penetration issues to the interior areas of the 1956 addition building foundation and address site drainage causing back up and flooding into the entrance stairwell.

1.4 HAZARDOUS MATERIALS

.1 A hazardous material survey has been completed by DDSB and is available for information. All bidders are encouraged to review the report.

.2 Removal techniques included in the scope of work are to account for the presence of the hazardous materials and included in the Contract Value.

1.5 BASE BID

.1 Mobilization

.1 Mobilize on site all plant, tools, equipment and labour required to carry out this Work.

.2 Bonds and Permits

.1 Provide specified bonds to the Owner following the contract award. Work must not commence without the submission of the Performance Bond, and the Material and Labour Bond.

.2 Obtain and pay for all Federal, Provincial and Municipal permits necessary for this work.

.3 General Requirements

.1 Provide all the necessary labour, plant, equipment, and materials necessary to conform to all requirements as specified in the Contract Documents. This includes, but is not limited to access (interior and exterior as required to facilitate work), shoring, etc. Install all necessary fencing, hoarding, barriers and signage to protect staff, building elements, vehicular and pedestrian traffic in accordance with the Occupational Health and Safety Act. Include all necessary construction signage and coordination. Signage is to be properly lettered and visible. In addition to preventing injury, all work areas must be protected from damage due to equipment.

.2 Provide temporary support to existing structural loads, where required, to ensure the building and any excavated areas are maintained in a safe condition and damage is not caused to building elements; this includes bracing of existing walls, shoring of exterior wall elements, and shoring of soil. Any damage as a result of inadequate shoring or support shall be rectified at no additional cost to the Owner.

.3 Include the manufacture and installation of all necessary material and system site mock-ups that will be required to the satisfaction of the Owner and Consultant. This may include specific supply of materials in advance of material selection to perform said mock-ups. Multiple mock-ups of the same material/system may be required to confirm performance and installation, and material selection.

.4 Maintain all building egress points as fire exits during construction unless otherwise confirmed by a fire safety plan or fire department approval. Post all necessary signage to indicate construction and erect all barricades/hoarding protection necessary to direct pedestrians through the construction area.

.5 If the Contractor deems it necessary to temporarily remove any permanent exterior furnishings such as fencing, benches, bollards, etc. in order to facilitate access, the cost to remove and reinstate or replace such elements shall be included in the pricing of these general requirements.

.6 Remove and reinstate exterior wall mounted accessories (i.e. light fixtures, conduit, drainage downspouts, etc.) as required to complete the work.

.7 Make allowances during construction for down time made necessary for access to and review of the Work by Consultant.

.8 Protect all excavated areas from persons falling into area and from water entry/accumulation. Ensure excavated area has a means of drainage. Provide signage to warn all persons of open and excavated area. Ensure a means for safe entry and exit to facilitate review.

.9 Working Around Existing Trees and Tree Protection:

.1 Determine construction access path, staging and stockpiling areas and prepare soft ground for mini-excavator passage as follows:

.1 Mini-excavator access to the building, stockpiling areas, and staging are to be located outside the drip line of trees wherever possible.

.2 Where the mini-excavator must be driven, turned, or parked below the drip line of any trees on site, two layers of ¾" plywood must be laid on the surface of the soil to minimize compaction and rutting of mini-excavator. Plywood sheets must be overlapping and secured together so that they do not move with the passage of the excavator.

.3 To restrict the movement of any construction equipment and stockpiling within the drip lines of trees, the path of the excavator is to be delineated using orange-web snow fencing on T-Bars spaced every 6' and tied with #10 gauge galvanized wire, or portable steel construction fencing secured in place.

.4 All stockpiling of soil, materials, bins must be located on existing hard surfaces wherever possible. No construction materials may be stored or parked below the drip lines of trees. Any stockpiling of soil or materials that occurs on existing soft surfaces (sod, soil, bare screenings) must protect the ground below using the two-layer plywood treatment described above.

.2 All trees within 12m of the work area must be protected using orange-web snow fencing on T-Bars spaced every 6' and tied with #10 gauge galvanized wire.

.3 Along the perimeter of the excavation the top 3 feet of soil is to be removed using root-sensitive excavation methods (by hand, air spade or hydrovac).

.4 Demobilization and Site Clean-up

.1 Demobilize all plant, tools, equipment and labour for this Work from site. Upon completion of Work, and immediately before the Consultant's final review for Total Performance of the work, all areas of the building affected by this Contract shall be thoroughly cleaned. Include the dismantling and removal of the scaffolding at the completion of the project. Remove all temporary protection, equipment, waste and surplus materials from site and leave in neat, tidy condition to the satisfaction of the Owner.

.2 Make good any building elements incidentally affected by the Work including access equipment, furnishings, etc.

.3 Make good any landscaping and landscaping elements (asphalt, concrete sidewalk, sod, bushes, fencing, fence posts, etc) damaged or removed during repairs. Replace damaged asphalt with hot-mix asphalt, and replace damaged grass with new sod.

.5 Building Foundation Wall Excavation and Backfill

.1 Remove the existing landscaping (asphalt pavement, concrete pavement, concrete stairs, handrails, grass, etc.), base and sub-base, and weeping tile (if present) in the area shown on the drawings. Handrails are to be stored for reinstallation.

.2 At the foundation wall, excavate and dispose of the existing fill to accommodate the new sub-base, and to the depth of the footing to accommodate the new backfill. The footing is assumed to be located 6 feet below grade.

.3 Remove the frost slab and concrete block masonry wall as shown.

.4 Uniformly compact the existing fill to 98% proctor density.

.5 At foundation wall areas, install new 20 mm (3/4") clear stone to the minimum depths shown on the drawings. Uniformly compact to 98% proctor density. Install new filter cloth to separate clear stone from adjacent soil materials (clear stone, granular A, native, etc.).

.6 Building Foundation Wall Repairs

.1 The construction of the foundation wall is rubble masonry and concrete block masonry.

.2 Note that the exterior foundation wall will be exposed down to the footing following completion of the excavation work as described in item 1.4.5.1.

.3 Carry out 100% repointing of the foundation wall masonry joints. Fill any gaps or holes.

.4 Remove the existing parging and install new cementitious parging throughout the foundation wall.

.5 The finish surface of the new concrete foundation wall must be a suitable substrate for waterproofing system installation.

.7 Building Foundation Wall Waterproofing

.1 Supply and install new waterproofing membrane system for the full height of the foundation wall and upturned on the building face side of the new below grade concrete block masonry wall in accordance with the manufacturer's recommendations; note that the intention is to bathtub the area with the weeping tile with a continuous membrane installation. The waterproofing system installation is to terminate within the sub-base or topsoil or extend to the underside of the windowsill where present.

.2 The membrane system must be continuous thus must be sealed at all penetrations.

.3 Terminate the membrane with a sealed termination bar at the top of the wall and into a reglet at the footing in accordance with the manufacturer's requirements.

.4 Supply and install a new drainage board complete with a filter cloth in accordance with the manufacturer's recommendations.

.5 Supply and install new rigid insulation board in accordance with the manufacturer's recommendations.

.6 Supply and install a new weeping tile along the full length of the exposed building foundation wall. If present, remove the existing. Connect the weeping tile to the existing catch basin.

.8 New Below Grade Concrete Block Masonry Foundation Wall

.1 Supply and install a new concrete block masonry foundation wall supported by the existing footing for the removed concrete block masonry wall. Note that the new wall is to be installed to the right extent of the footing to allow for a weeping tile installation at the building foundation wall.

.2 Provide ladder ties and doweled reinforcement as noted on the drawings.

.3 The top of the concrete block masonry is to be the elevation of the underside of the frost slab.

.9 New Frost Slab Installation

.1 Where removed, install a new frost slab complete with granular A and filter cloth. Provide dowels to the adjacent frost slab as noted.

.10 Masonry At Grade

.1 The exterior wall consists of brick masonry in a solid masonry construction.

.2 Localized Brick Masonry Replacement

.1 Survey the brick masonry within 4 feet of grade and locally replace deteriorated brick units. Estimated Quantity: 100 each.

.3 Brick Masonry Repointing

.1 Carry out localized repointing of the mortar joints on all elevations within 4 feet of grade. Include for surveying the wall and marking out joints to be repointed. Do not commence with repointing work until the identified joints have been reviewed and accepted by the Consultant. The estimated quantity is 2,500 feet.

.11 Landscaping and Compression Seal

.1 Install new concrete pavement, concrete stairs, concrete sidewalk, concrete curbs, asphalt paving, and grass and any other elements, where removed to facilitate the work and to make good following site operations.

.2 Reinstate the handrails at the stairs.

.3 Along the building face, install a new compression seal between the building and the concrete. Ensure the compression seal makes a water tight joint.

.12 Sealant Replacement

.1 Remove and replace the existing sealant throughout the work area including, foundation wall to grade, exterior wall to grade, control or movement joints within 6 feet of grade, all penetrations within 6 feet of grade, around window and doors and windowsills, etc.

.13 Storm Water Pipe Replacement

.1 Refer to the drawings for scope of work.

.14 Allowances

.1 Testing Allowance

.1 Arrange and pay for a third-party testing company/consultant, acceptable to the Owner and Consultant, to perform testing specified herein and as directed by the Consultant. Examples of testing that may be requested include:

.1 compaction testing (sub-base, fill and asphalt).

.2 concrete testing.

.3 CCTV camera scope

.2 Administer this allowance and do not arrange for testing beyond the stipulated amount without approval. No payment shall be made for costs incurred as a result of re-testing necessitated by work that has failed a previous test. Unexpended portions of the testing allowance will be deducted from the Contract Price. Increase in allowance beyond the stipulated amount shall be authorized by a Change Order.

.2 General Contingency

.1 This includes a general project contingency for unforeseen conditions not specified in the Contract Documents that are made necessary by the Work, due to conditions that were not visible upon, or reasonably inferable from an examination of the site during the bidding period as determined by the Consultant. Use of the allowance will be by Site Instruction. Unexpended portions of this allowance will be deducted from the Contract Price. Increase in allowance beyond the stipulated amount shall be authorized by a Change Order. The Contractor is to include $10,000 in their bid amount.

1.6 UNIT PRICES (Appendix A)

.1 Submit a unit rate for the following items:

.1 Brick Unit Replacement (Each).

.2 Mortar Joint Repointing.

1.7 ALTERNATIVE PRICES (Appendix B

.1 There are no alternative prices.

1.8 SEPARATE PRICES (Appendix C)

.1 There are no separate prices.

END OF SECTION 01 11 13

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 35 23 – Health and Safety

1.1 SECTION INCLUDES

.1 Safety requirements and adherence.

1.2 RELATED SECTIONS

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

1.3 SAFETY PLAN

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

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

1.4 RESPONSIBILITY

.1 The Prime Contractor according the Act, is responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 For purposes of the installation, the restoration contractor shall act as the Constructor (as that role is defined in the health and safety legislation of Ontario, and as such is fully responsible for directing and controlling all installation work and the safety of the work on the jobsite.

.3 As Constructor/Prime Contractor, the restoration contractor shall be fully and solely responsible for ensuring that all applicable occupational health and safety laws, regulations, rules and orders are complied with in the course of the installation. Entry of manufacturer personnel to ensure quality installation in accordance with the manufacturer’s specifications and to perform warranty inspections shall not be for purposes of monitoring the safety of the work at the job site.

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

.5 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province of Ontario. Advise Consultant verbally and in writing.

1.5 SUBMITTALS

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

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation.

.2 Submit copies of reports or directions issued by Federal or Provincial health and safety inspectors.

.3 Submit copies of incident and accident reports.

.4 Submit Material Safety Data Sheets (MSDS) to Consultant.

.5 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within ten (10) days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within seven (7) days after receipt of comments from Consultant.

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

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

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

1.6 SAFETY ACTIVITIES

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

.2 Schedule and administer Health and Safety meeting with Consultant prior to commencement of Work.

1.7 POSTING OF DOCUMENTS

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

1.8 CORRECTION OF NON-COMPLIANCE

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

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

.3 The Owner may stop the Work if non-compliance of health and safety regulations is not corrected.

1.9 WORK STOPPAGE

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

1.10 FIRE PROTECTION

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

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

1.11 VEHICLE MOVEMENTS

.1 A flagperson must always be present to direct vehicular and pedestrian traffic when a construction vehicle is operating both within and beyond the limits of the Contractor's compound whilst on DDSB property.

1.12 EXCAVATED AREAS

.1 Protect all excavated areas from persons falling into area and from water entry/accumulation. Ensure excavated area has a means of drainage. Provide signage to warn all persons of open and excavated area.

END OF SECTION 01 35 23

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 35 26 – Environment Protection

1.1 SECTION INCLUDES

.1 Site fires.

.2 Disposal of wastes.

.3 Drainage.

.4 Site cleaning and plant protection.

.5 Work adjacent to waterways.

.6 Pollution control.

1.2 RELATED SECTIONS

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

1.3 FIRES

.1 Fires and burning of rubbish on site not permitted.

.2 Provide supervision, attendance and fire protection measures as directed.

1.4 DRAINAGE

.1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 ASBESTOS CONTENT

.1 Refer to General Condition Section, Asbestos Management Plan and Owner's instructions.

1.6 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authority's emission requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

END OF SECTION 01 35 26

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 52 00 – Construction Facilities

1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Project identification.

1.2 RELATED SECTIONS

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

1.3 REFERENCES

.1 CAN/CSA-Z321- 96 (R2006): Signs and Symbols for the Occupational Environment.

.2 Ontario Regulation 213/91 – Construction Projects.

1.4 INSTALLATION AND REMOVAL

.1 Provide construction facilities in accordance with O. Reg. 213/91 – Construction Projects.

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

.3 Remove from site all such work after use.

1.5 SCAFFOLDING

.1 Provide and maintain scaffolding and pedestrian protection as required to complete the project in a safe manner.

1.6 HOISTING

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

.2 Hoists or cranes shall be operated by qualified operator.

.3 Provide protective coverings for finish surfaces of cars and entrances.

1.7 USE OF THE WORK

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

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

1.8 CONSTRUCTION PARKING

.1 Limited parking will be permitted on site per owner instructions.

.2 Provide and maintain adequate access to project site.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

.4 Clean runways where used by Contractor's equipment.

1.9 SECURITY

.1 Provide and pay for responsible security personnel as required to guard site and contents of site after working hours and during holidays.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

1.11 SANITARY FACILITIES

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

.2 Post notices and take such precautions as required by local health authorities.

.3 Always keep sanitary facilities clean and fully stocked with the necessary supplies.

END OF SECTION 01 52 00

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 61 00 – Product Requirements

1.1 SECTION INCLUDES

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

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

.4 Existing facilities.

1.2 RELATED SECTIONS

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

1.3 TERMINOLOGY

.1 New: Produced from new materials.

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

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

1.4 PRODUCT QUALITY

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

.2 Defective Products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.

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

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

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

1.5 AVAILABILITY

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

.2 If delays in supply of Products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

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

1.6 STORAGE AND PROTECTION

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

.2 Store with seals and labels intact and legible.

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

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

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

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

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

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

1.7 TRANSPORTATION AND HANDLING

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

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

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

1.8 MANUFACTURER'S WRITTEN INSTRUCTIONS

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

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

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

1.9 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

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

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

.4 All workers on site must have the required qualifications, including those from manufacturers where in place, prior to commencing with the work.

1.10 COORDINATION

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

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

1.11 CONCEALMENT

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

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

1.12 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.

1.13 FASTENERS

.1 Provide metal fasteners 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 stainless steel fasteners and anchors for securing exterior work unless otherwise indicated.

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

1.14 FASTENERS - EQUIPMENT

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

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use Type 304 or 316 stainless steel for exterior areas.

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

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

1.15 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of the Project.

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

END OF SECTION 01 61 00

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 62 00 – Product Exchange Procedures

1.1 SECTION INCLUDES

.1 Substitutions.

.2 Alternatives.

.3 Separate prices.

1.2 RELATED SECTIONS

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

1.3 SUBSTITUTIONS

.1 Instructions to Bidders specify time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this section.

.2 Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor. Substitutions must be for Canadian made products where available.

.3 Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

.4 A request constitutes a representation that the Bidder:

.1 Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.

.2 Will provide the same warranty for the Substitution as for the specified Product.

.3 Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

.4 Waives claims for additional costs or time extension which may subsequently become apparent.

.5 Will reimburse Owner for review or redesign services associated with re-approval by authorities.

.5 Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

.6 Substitution Submittal Procedure:

.1 Submit request for Substitution for consideration electronically complete with accompanying technical data and manufacturer information; provided submission but clearly indicate that the substitution is an equivalent material/product/system. Note that if insufficient information is provided, the substitution will be rejected.

.2 Limit each request to one (1) proposed Substitution.

.3 Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.

.4 Submit the above-mentioned information a minimum of ten days prior to the tender closing time.

.5 The Consultant and/or Owner will notify Contractor in writing of decision to accept or reject request.

1.4 ALTERNATIVES

.1 Accepted Alternatives will be identified in Owner-Contractor Agreement.

.2 Submit alternatives identifying the effect on adjacent or related components.

.3 Alternatives quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted alternatives will be identified in the Owner-Contractor Agreement.

.4 Coordinate related work and modify surrounding work to integrate the Work of each alternative.

1.5 SEPARATE PRICES

.1 Separate Price items do NOT replace or substitute items already in the Bid Documents. Accepted Separate Prices will be:

.1 Identified in the Construction Agreement as an increase to the Bid Price; or

.2 In a subsequent Change Order.

.2 Submit Separate Prices to identify items that may be added to the Contract, at the Owner's option. Include in the quoted Separate Price, overhead and profit, the effect on adjacent or related components already in the Work described in the Bid Documents.

.3 Coordinate related Work and modify surrounding Work to integrate the work of each Separate Price.

.4 Schedule of Separate Prices: Refer to Bid Form or Supplementary Bid Information Form.

END OF SECTION 01 62 00

DIVISION 03 – CONCRETE

Section 03 20 00 – Concrete Reinforcing

1.0 GENERAL

1.1 DESCRIPTION

.1 Provide all labour, materials, plant and equipment to complete the reinforcing steel work indicated on the drawings and specified herein including accessories such as hanger bars, spirals, wire ties, support bars, chairs, spacers supports or other devices required to position reinforcing properly.

1.2 TOLERANCES

.1 Perform fabrication and setting so that completed work will be within the tolerances set out in A23.1.

.2 These tolerances are acceptable with regard to structural requirements. Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

1.3 QUALIFICATIONS

.1 Welding Reinforcement: Be qualified by the Canadian Welding Bureau under the requirements of W186-M1990.

1.4 SUBMITTALS

.1 Shop Drawings for Reinforcement

.1 The structural drawings shall not be reproduced, in whole or in part, for use as shop drawings.

.2 Prepare reinforcement shop drawings and bar lists taking into account all openings and recesses shown on the architectural, structural, mechanical and electrical drawings, and on the sleeving shop drawings.

.3 Complete dimension openings, recesses and sleeves, and relate to suitable grid lines and elevation datum.

.4 Prepare shop drawings to a minimum scale of [1:50] or ¼ " = 1' – 0" in a clear complete manner that will permit placing of reinforcement to be performed without reference to Contract Drawings.

.5 Detail reinforcement in accordance with the contract documents, CAN/CSA-A23.1, CSA-S413 and detailing standards in RSIC Manual of Standard Practice.

.6 Where 10M top bars and welded wire fabric are shown, provide adequate chairs, bolsters or supports to ensure that these bars are not bent or displaced prior to or during the concreting operation.

.7 As a minimum, show the following:

.1 Bar sizes, spacing, location and quantities of reinforcement, welded wire fabric.

.2 Identification of each bar with code mark corresponding to the bar lists.

.3 Detail sections to fully illustrate placement of concrete reinforcement at areas such as openings, change of levels, stairs, and where else required.

.4 Large scale detail concrete sections at areas of steel concentrations.

.5 Place sequence for reinforcement such as intersections of beams, joists, slabs and within plate, flat, and two way slabs.

.6 Minimum clearances between reinforcement and minimum concrete protection to reinforcement.

.7 Location and embedment of dowels.

.8 Location, number and type of support accessories, including support bars suitably sized and spaced to rigidly support the weight of reinforcement and construction load.

.9 Submit code marks or symbols used on reinforcement of each manufacturer so that Consultant may identify grades and sizes of reinforcement.

.2 As-Built Drawings

.1 Mark on a complete set of final reproducible drawings any changes, additions or deletions that occur during construction as a result of the Contractor's work, change orders, or for any other reasons.

.2 For all shop drawings marked "Reviewed as Noted" or "Revise and Resubmit", update and submit a record set of these drawings at the completion of the structural work. Ensure that these drawings reflect the changes and are coordinated with the final reproducible drawings noted above.

2.0 PRODUCTS

2.1 MATERIALS

.1 Reinforcing Steel: Only Canadian manufactured deformed steel to CSA Standards of G30 Series and to the material specification shown on the drawings. Reinforcement to be welded shall conform to the material recommendations contained in W186. For deformed steel manufactured outside Canada, provide test data from a Canadian Testing Laboratory proving that each size and grade of reinforcement proposed meets specification requirements.

.2 Polypropylene Fiber Reinforcement: Fiberstrand 100 by Euclid Chemical or approved equal.

.3 Chairs, bolsters, bar supports, spacers: to A23.1. In the case of concrete exposed to view or weather the accessories shall be such that no metal is permitted to come closer than 40 mm (15/8") from a formed face and 50 mm (2") from a troweled surface. Use precast concrete supports for exposed concrete beams and soffits and concrete cast against soil/rock.

.4 Support accessories for suspended parking garage slabs: An approved plastic or non-corroding type of chair, bolster or spacer of sufficient strengths to rigidly support the weight of reinforcement and construction loads. Do not use plastic coated or plastic tipped steel chairs.

.5 Hot dip galvanizing: To CSA G164, minimum zinc coating of 600g/m^2.

.6 Threaded Rods: Grade 300W conforming to CSA G40.21-M

.7 Epoxy coating: to ASTM A775/A775M, D3963/D3963M. Acceptable field touch-up product: Amerlock 400.

3.0 EXECUTION

3.1 FABRICATION

.1 Fabricate reinforcement in accordance with A23.1 and the RSIC Manual of Standard Practice.

.2 Identify with a tag each bundle of bars with a code mark corresponding to that appearing on the bar list.

.3 Bend reinforcement once only and at room temperature. Do not straighten or rebend reinforcement. Do not use bars with kinks or bends not shown on the drawings.

.4 Replace bars which develop cracks or splits.

.5 The continuity of the coating shall be visually inspected prior to installation. The coating shall be free of holes, voids, blemishes, cracks, contaminations, and any

damaged areas discernible to a person with normal vision. If more than 4 issues were noted per metre, the bar must be removed and not used.

3.2 PLACING

.1 Prior to concreting, accurately place reinforcement, support and secure against displacement, as indicated on reviewed drawings and in accordance with A23.1. Tack welding of reinforcement to secure in place will not be permitted.

.2 Do not drive or force reinforcement into fresh concrete.

.3 Where toppings are placed on waterproof membranes, vapour retarders and the like, prevent reinforcement or tie wire contacting these items.

.4 Maintain all metal including reinforcement, tie wires, conduit, etc. at least the specified cover dimension from form faces (min. 40 mm (15/8") from a formed face).

.5 All bars must be recoated in their entirety following sandblasting.

.6 The continuity of the coating shall be visually inspected after installation and prior to concrete placement. The coating shall be free of holes, voids, blemishes, cracks, contaminations, and any damaged areas discernible to a person with normal vision. Any such issues must be touched up with a touch up epoxy coating.

3.3 POLYPROPYLENE FIBER REINFORCEMENT

.1 Where no reinforcement is shown, provide Polypropylene Fiber Reinforcement into the concrete mix, unless noted otherwise on drawings.

3.4 QUALITY CONTROL

.1 Provide a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of Consultant any defects in the work or departures from the Contract Documents which may occur during Construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Contractor are both undertaken to inform the Owner of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility.

3.5 NOTIFICATION

.1 Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification to afford

them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.6 INSPECTION AND TESTING

.1 Appointment of Independent Inspection and Testing Companies.

.1 The Contractor will retain the Independent Inspection and Testing Company to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Company shall be responsible only to the Owner and shall make only such inspections or tests as the Consultant may direct.

.2 When defects are revealed, the Consultant may request, at the Contractor's expense, additional inspection or testing to ascertain the full extent of the defect.

3.7 DEFECTIVE MATERIALS AND WORK

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength made, and the like, in order to help determine whether the work must be replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of the Ontario Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fails to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 03 20 00

DIVISION 3 – CONCRETE

Section 03 51 00 – CAST-IN-PLACE CONCRETE

1. GENERAL

1.1 DESCRIPTION

.1 This section specifies the materials and methods for the placement of new concrete.

1.2 REFERENCES

.1 All concrete work to conform to the requirements detailed in the current editions of the Ontario Building Code as amended and regulations and by-laws of other authorities having jurisdiction including current amendments.

.2 CAN3/CSA-A23.1 Concrete Materials and Methods of Concrete Construction

.3 CAN3/CSA-A23.2 Methods of Test and Standard Practices for Concrete.

.4 CAN3/CSA-A23.3 Design of Concrete Structures.

.5 CAN3/CSA-S413 Parking Structures

.6 Where there are differences between the specifications and drawings and the codes, standards or acts, the most stringent shall govern.

.7 Standards referenced by the Standards noted above are to apply even if they are not included in the list.

1.3 TOLERANCES

.1 Perform placing operations so that completed work will be within the tolerances set out in A23.1 and as listed below:

.1 Variations in building lines which result in extension of the building over lot lines or restriction lines will not be permitted.

.2 These tolerances are acceptable with regard to structural requirements. Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

.2 Floor finishing tolerances are to satisfy the following:

.1 Slab or floor finish tolerances shall meet the requirements of A23.1.

.2 Slab or floor tolerance measurements shall be made a maximum of 72 hours after completion of each floor placement.

.3 Floor finish is to meet the standards of a Class A.

.4 Floor finish is to be checked using the straight edge method describe in A23.1.

1.4 QUALIFICATIONS

.1 The installer shall be a company specializing in concrete work with a minimum of five (5) years proven experience for projects of similar size and complexity.

.2 Use single Contractor for all concrete work.

.3 The 'foreperson' or 'lead hand' supervising the placement, consolidation, finishing and curing of the concrete shall be certified under an industry recognized concrete finishing program, such as the ACI Concrete Flatwork Finisher/Technician Certification Program.

.4 Where concrete toppings are specified, the concrete flooring contractor shall assume responsibility for all aspects of the topping construction. This will include, but is not limited to the base course or substrate preparation, review of concrete mix design, concrete supply, bonding agents, placing, finishing and curing etc.

1.5 CONCRETE MIX DESIGN

.1 Design the mix in accordance with A23.1-04 so that concrete will be homogeneous, uniformly workable, readily placeable into corners and angles of forms and around reinforcement by methods of placing and consolidation employed on the work, but without permitting materials to segregate or excessive free water to collect on the surface. The concrete, when hardened, shall have the qualities specified.

.2 Do not use fly ash in concrete that will be exposed to view.

.3 Use of calcium chloride is not permitted.

1.6 EXISTING CONDITIONS

.1 Make good any damage occurring during the execution of the Work at no expense to the Owner.

1.7 SHORING

.1 Provide temporary shoring and bracing to maintain the structural integrity of the existing building affected by the Work.

.2 The Contractor is to provide shop drawings reflecting all shoring, bracing, etc. required for the Work stamped by a Professional Engineer license in the Province of Ontario. All installed shoring and bracing must be signed off by shoring engineer prior to the start of the Work.

.3 Any shoring/bracing installed on the interior must not damage or otherwise adversely affected the interior finishes. This may require ballasted support/restraint.

1.8 SAMPLES AND ASSISTANCE

.1 Supply samples of all materials and the following, the cost of which shall be paid for by this trade.

.2 Concrete Test Cylinders

.1 Cooperate in the execution of the concrete cylinder testing program. Furnish concrete required, protect specimens against injury and loss, assist in the sampling and storage of specimens.

.2 Sample concrete, cast cylinders and store in accordance with A23.1 where directed by the Consultant.

.3 For all Portland cement concrete compressive strength tests, 100 x 200mm (4 x 8 inch) or 150 x 300mm (6 x 12 inch) cylinders shall be used.

.4 In accordance with requirements of A23.1, provide storage facilities for site storage of all cylinders.

1.9 SUBMITTALS

.1 Concrete Mix Design

.1 Provide confirmation of the concrete mix design for the Consultant's review a minimum of one (1) week prior to the first scheduled concrete placement using the standard RMCAO form for Concrete Mix Design Submission. The mix design shall include as a minimum:

.1 Concrete strength;

.2 Exposure class;

.3 Water/cement ratio;

.4 Maximum aggregate size;

.5 Maximum supplementary cementing materials (SCM) replacement;

.6 Additional durability and architectural requirements;

.7 Slump range;

.8 Plastic air range;

.9 Synthetic fibre reinforcement content;

.10 Method of placement; and,

.11 Other specific information regarding the source and type of all material being proposed including the source of all SCM.

.2 Describe in detail on the mix design summary, the location(s) where each mix is to be placed.

.2 Provide shoring drawings showing posts/jacks to be used including their support rating, and layout, stamped by a Profession Engineer licensed to practice in the Province of Ontario.

.3 Provide reinforcing steel shop drawings confirming connections, layout, size of bars, quality of steel, etc. stamped by a Profession Engineer licensed to practice in the Province of Ontario.

.4 Certificates

.1 Prior to beginning work and when any change in materials or source of supply is proposed, provide the following certificates prepared by an approved inspection company. The cost of this work shall be borne by the Contractor.

.2 The Concrete Supplier must submit a valid "Certificate of Concrete Production Facilities" as issued by the Ready Mixed Concrete Association of Ontario (RMCAO), including certification that all raw materials used in the production of concrete proposed for the work comply with the requirements of the specifications and A23.1-04.

.3 The concrete supplier shall submit their most current "Concrete Mix Design Statistical Analysis" records for the proposed concrete plant. These records shall indicate the concrete supplier's average strength, standard deviation, coefficient of variation, and target strength, as per A23.1 requirements.

.4 Certification that compressive strength, water-cement ratio, slump, entrained air content and other specified properties will be met, using the proposed mixes.

.5 Give proportions by dry weight of cement, coarse and fine aggregate, type and amount of admixture or air entraining agents, and water-cement ratio, for the mix proposed for each class of concrete. Provide separate mix designs when pump mixes and mixes containing pea gravel are proposed. Describe in detail on the mix design summary the location(s) where each class of concrete is to be placed in the structure.

.6 State for each mix if and how much fly ash or slag is used in lieu of cement.

.5 Wet Curing Procedures

.1 At least four weeks prior to implementation in the field, submit a detailed description of the procedures which will be employed to wet cure the concrete.

.2 As a minimum, the procedures shall indicate:

.1 the method of curing which will be used;

.2 the type of materials which will be used;

.3 the duration of curing;

.4 location and number of hoses, sprinklers etc., to ensure 100% continuous coverage of the pour;

.3 If requested by the Consultant, submit a 300mm x 300mm (12" x 12") sample of each type of material (absorptive mat, fabric, plastic film, waterproof paper etc.) which will be used to wet cure the concrete.

.6 At least four weeks prior to the first supply of concrete to the project, submit a complete "Concrete Quality Plan", in the format provided by the Ready Mixed Concrete Association of Ontario (RMCAO).

1.10 INSPECTION AND TESTING

.1 Appointment of Independent Inspection and Testing Companies

.1 The Consultant will appoint the Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct.

.2 When defects are revealed, the Owner may request, at the Contractor's expense, additional inspection or testing to ascertain the full extent of the defect.

.2 Tests on Concrete Materials

.1 Cement and Aggregates: The Consultant may make tests on these materials as deemed necessary during the work.

.2 Concrete Strength: Cylinder testing will be carried out in accordance with A23.1 and as follows: Three companion laboratory cured concrete standard compression test cylinders; two tested at 28 days and one tested at 7 days, constitute a strength test. For C-XL concrete, 1 cylinder will be tested at 7 days, 1 at 28 days, and 2 at 56 days. During the placing of concrete in cold weather one additional field cured test cylinder will be made and tested at 7 days. The results of the 7 day tests related to curing procedure shall be the basis to strip soffit forms from horizontal or inclined members.

.3 Payment for Testing shall be made under Testing Allowance as contained within the Articles of Agreement and is subject to the conditions associated with such payment.

1.11 ENVIRONMENTAL CONDITIONS

.1 Make preparations in advance of placing concrete to protect the concrete before, during and after placement, if there is a probability that the ambient temperature will fall below 5°C or will not exceed 27°C.

.2 Do not place concrete during rain.

.3 Protect newly placed concrete surfaces from direct sun and wind with sun shades and wind breaks.

2. PRODUCTS

2.1 CEMENT

.1 Normal (Type 10, GU) Portland Cement conforming to the current version of CAN/CSA-A5.

2.2 WATER

.1 Potable water from municipal supply, clear and free from deleterious substances.

2.3 AGGREGATE

.1 Fine aggregate: Natural sand conforming to CAN/CSA A23.1 (current version).

.2 Coarse aggregate: Crushed stone or gravel confirming to CAN/CSA A23.1 (current version), nominal size 20 mm. Pea gravel (10 mm) to be used for shallow depth repair, concrete topping, and concrete pavement.

2.4 ADMIXTURES

.1 Polypropylene fibre reinforcement conforming to CSA A23.1, Appendix H, added at a rate to control shrinkage cracking.

.2 All air-entraining agents and chemical admixtures used in the same mix shall be from the same manufacturer. Comply with the manufacturer's instructions.

.3 Air-entraining agents shall conform to ASTM C260.

2.5 BONDING AGENT

.1 Materials and methods of construction shall be in accordance with CSA Standard 23.1.

.1 Portland cement shall meet the requirements of CSA Standard CAN3-A5, Type 10.

.2 Cement slurry shall consist of one part Portland cement and one part fine aggregate by weight with sufficient water to form a heavy cream consistency.

2.6 CONCRETE

.1 Normal density concrete with an air dry density between 2350 and 2450 kg/m^3.

.2 Concrete for structural slabs, columns and walls conforming to CSA A23.1, Table 2, Class C-XL, exposure subject to de-icing chemicals, and having the following properties.

.1 Minimum 56-day Compressive Strength: 50 MPa

.2 Range in Air Content: 5-8%

.3 Concrete for structural slabs, columns and walls conforming to CSA A23.1, Table 2, Class C-1, exposure subject to de-icing chemicals, and having the following properties.

.1 Minimum 28-day Compressive Strength: 35 MPa

.2 Range in Air Content: 5-8%

Concrete for curbs and sidewalks conforming to CSA A23.1, Table 2, Class C-2, and having the following properties

.1 Minimum 28-day Compressive Strength: 32 MPa

.2 Range in Air Content: 5-8%

PARGING

.1 SIKA 123 by Sika Canada.

3. EXECUTION

3.1 CONCRETE PLACEMENT

.1 Conform to the requirements of A23.1.

.2 Immediately before placing concrete, clean forms and reinforcement of foreign matter.

.3 Maintain exposed surfaces to which new concrete will be bonded in a damp condition for a minimum of 12 hours before scheduled pour. Prior to placing concrete remove all standing water. Using a stiff brush, work cement-latex slurry into surface of existing back-up wall. Slurry should be of "creamy" consistency.

.4 Do not puddle slurry in patches, do not allow slurry to skim or dry before concrete is placed. Consult latex supplier for recommended mix proportions for slurry.

.5 Do not add water to the mix.

.6 Do not over agitate the concrete in the concrete mixer.

.7 Do not use concrete that is older than 2 hours from batch time and concrete that has not begun to be placed within 1½ hours from batch time where set retarding admixtures are not employed.

.8 Allow 24 hours minimum to elapse after placing concrete in columns, piers or walls before placing concrete in beams or slabs supported thereon.

.9 Place new concrete such that the concrete is not dropped from a height into the formwork.

.10 Remove concrete spilled onto forms around hoisting equipment before depositing concrete in these areas.

.11 Completely fill the formwork ensuring no voids or air pockets. Tamp, vibrate or otherwise suitably consolidate fresh concrete to achieve a dense and homogeneous repair free from voids or honeycombed concrete. Do not excessively vibrate the concrete so as to result in segregation.

.12 Finish surface to give equivalent of a smooth steel float finish. The slab-on-grade tolerances must be in compliance with the substrate preparation for resilient flooring.

.13 Treat any superficial surface cracking with slurry consisting of 1-part Portland cement, 2 parts fine sand and 1-part latex modifier, all by volume.

.14 Place concrete in sections to comply with the requirements of the standard.

3.2 CURING CONCRETE

.1 Cure all concrete in accordance with A23.1, except as specified herein.

.2 Wet cure concrete by covering with damp burlap in accordance with Curing Type 2 as per A23.1: cure the concrete at a minimum temperature of 10°C for a minimum of 7 days or the time necessary to attain 75% of the 28-day strength, which ever is longer.

.3 The use of curing compounds will not be permitted in these areas.

3.3 GRANITE PAVER INSTALLATION

.1 Install granite pavers in the layout, jointing, etc. to match the existing.

.2 Install the granite pavers in wet concrete to ensure secure bonding.

.3 Ensure pavers are installed flush with the surrounding concrete.

.4 Ensure that sufficient concrete cover is maintained and that the operation of the heating cables is not adversely affected.

3.4 PROTECTION

.1 Conform to the requirements of A23.1 and the following to protect freshly deposited concrete from freezing, abnormally high temperatures or temperature differentials, premature drying, and moisture loss for a period of time necessary to develop the specified properties of the concrete.

3.5 HOT WEATHER CONCRETING

.1 When rate of moisture evaporation exceeds 1 kg/m² per hour, employ the following measures in addition to the requirements of CSA A23.1:

.1 Use ice as mixing water to lower the concrete temperature.

.2 Dispatch ready-mix trucks and organize work to keep mixing time to a minimum. Minimize exposure of mixing trucks to the hot sun while waiting.

.3 Place concrete in layers thin enough and areas small enough so that the time interval for placing is reduced and compaction will ensure complete union of adjacent portions.

.4 With formed concrete, reliance shall not be placed on the forms alone to provide curing. Spray formwork with water to keep it tight and free from cracking.

3.6 COLD WEATHER CONCRETING

.1 When the ambient temperature is at or below 5˚C, or when there is a probability of the ambient temperature falling below 5°C within 24 hour of concrete placement, provide all equipment necessary, have in-place and employ the following measures to protect the concrete before concrete placement starts:

.1 Provide temporary equipment for heating concrete materials and forms. Protect, insulate and maintain the proper temperature and humidity of the concrete during curing in accordance with A23.1.

.2 When fresh concrete is to be cast against existing concrete, prevent the loss of heat by extending the protection for the fresh concrete at least 600mm over the existing.

.3 Insulate, or enclose within the protective housing, tie rods, reinforcement or metal which projects from the concrete being protected.

.4 Maintain housing, enclosures and supplementary heat in place for entire period of protection, except that sections may be temporarily removed as required to permit placing additional forms or concrete provided the uncovered concrete is not permitted to freeze.

.5 Locate heating units to avoid heating concrete locally or drying it excessively. Avoid high temperature and dry heating within enclosures.

.6 Take particular care to maintain edges and corners of concrete at the required temperature because of their greater vulnerability to freezing.

.7 Provide sufficient insulation, and heat as necessary, to prevent freezing of soil which is against structural elements.

.8 The application of deicing salts on completed work is not permitted.

3.7 PROTECTION OF COMPLETED WORK

.1 At all times during the work, protect exposed concrete, exposed masonry and other exposed members from staining or becoming coated with concrete leakage due to continuing concreting operations. Members which become coated may be classed as defective by the Consultant.

.2 Protect exposed members from staining due to rusting of reinforcement projecting beyond construction joints.

.3 Take suitable measures to prevent spalling and cracking damage occurring to the structure due to water freezing in expansion joints, small holes, slots, depressions and take suitable measures to prevent damage occurring to foundations and the like due to frost action in the soil or backfill.

.4 The application of deicing salts on completed work is not permitted.

3.8 FINISHING

.1 Initial and final finishing of horizontal surfaces in accordance with A23.1.

3.9 MAKING GOOD

.1 Make good temporary openings left in concrete construction around pipes, ducts and the like using a mortar of the same proportions as the surrounding work. Reinforce mortar with welded wire fabric where openings exceed 75 mm (3"). Roughen existing surfaces to receive mortar or apply suitable bonding agent such that mortar will be securely bonded to existing concrete.

3.10 QUALITY CONTROL

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Adhere to the requirements of the project “Concrete Quality Plan” prepared and submitted as required under the Submittals section of this specification.

.3 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during Construction. The Consultant will decide upon corrective action and give his recommendations in writing.

.4 The Consultant's general review during construction and inspection and testing by independent inspection and testing agencies reporting to the Consultant are both undertaken to inform the Owner of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility.

3.11 NOTIFICATION

.1 Prior to commencing significant segments of the work, give the Consultant and independent inspection and testing agencies appropriate notification to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.12 DEFECTIVE MATERIALS AND WORK

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, concrete coring, inspections or surveys performed, analytical calculations of structural strength made and the like in order to help determine whether the work must be repaired or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant’s opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of the Ontario Building Code, except where this would in the Consultant's opinion cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fails to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 03 51 00

DIVISION 4 – MASONRY

Section 04 90 00 – Masonry

1. GENERAL

1.1 SECTION INCLUDES

.1 Clay Face Brick Masonry

.2 Concrete Block Masonry

.3 Concrete Brick Masonry

.4 Mortar

.5 Reinforcing and Connectors

.6 Accessories

1.2 DEFINITIONS

.1 As defined in CSA A371-94 “Masonry Construction for Buildings”:

.1 Repointing: Removing deteriorated mortar from the joints of a masonry wall and filling and finishing with new mortar.

.2 Tooling: Compressing and shaping the face of a masonry joint with a special tool to provide final contour.

1.3 REFERENCES

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

.2 CAN/CSA-A23.2: Methods of Testing for Concrete

.3 CAN/CSA-A23.3: Design of Concrete Structures

.4 CAN/CSA-A82.1-M87(R1992): Burned Clay Brick

.5 CSA A179-94: Mortar and Grout for Unit Masonry

.6 CAN3-A165 Series M-94: Concrete Masonry Units

.7 CAN3-S304-M84: Masonry Design for Buildings

.8 CSA A371-94: Masonry Construction for Buildings

.9 CSA A370-94: Connectors for Masonry

1.4 SUBMITTALS

.1 Two (2) weeks prior to the commencement of work, submit two (2) samples of each of the masonry units and mortar to be used on the project to illustrate the finish colour and the texture, for approval by the Owner.

.2 All samples must be delivered on site directly to the Consultant.

1.5 QUALIFICATIONS

.1 The installer shall be a company specializing in masonry work with a minimum of five (5) years proven experience for projects of similar size and complexity.

.2 Use single masonry Contractor for all masonry work.

1.6 QUALITY ASSURANCE

.1 Perform the work in accordance with the current versions of CAN 3-A370 and CAN3-A371.

1.7 MOCK-UP

.1 General

.1 The mock-up shall be carried out in one area for each system to show installation etc. of all components of the repair as described by the Contract Documents.

.2 The mock-up area shall include all applicable installation within at least 10 square feet area.

.3 Construct mock-ups a minimum of two (2) weeks prior to commencing with the Work.

.4 Mock-up materials shall have full cure prior to review by the Owner and the Consultant.

.5 The Consultant will be present for the duration of the mock-up installation. A minimum of 48 hours notice is to be provided.

.2 The mock-up shall demonstrate all aspects (removal, surface preparation, installation, tooling, aesthetic finish, etc.) required to complete the Work. Each aspect must be carried out in the presence of the Consultant. Completed mock-ups will not be considered compliant.

.3 The mock-up shall demonstrate the standard to which all work is completed. Rejected mock-ups must be removed and new mock-ups installed.

.4 The mock-up shall be prepared with the same products, tools equipment and techniques required for the actual applications.

.5 The finish achieved will be considered the aesthetic finish to which all areas will be reviewed. Staining to achieve a colour match to the surrounding brick masonry must also form part of the mock-up.

.6 The mock-up installation shall also incorporate the protective methods the Contractor will employ to ensure that adjacent areas and surfaces are not adversely affected by the work.

.7 The mock-up shall also demonstrate demolition techniques.

.8 May be kept in place if deemed to meet or exceed the requirements of the Contract Documents.

.9 Must be removed if deemed to **not** meet or exceed the requirements of the Contract Documents.

.10 Shall illustrate the finished performance, aesthetic, colour and the texture, for approval by the Owner.

1.8 HELICAL TIE TESTING

.1 Provide pull tests by helical tie manufacturer to demonstrate the ultimate pull out strength of the tie.

.2 A total of 5% of the ties are to be tested. Locations to be chosen by the Consultant.

1.9 DELIVERY, STORAGE AND PROTECTION

.1 Provide weather protection and construction protection in accordance with CAN3-S304.

.2 Store cementitious materials and aggregates in accordance with CSA Standard A23.1

.3 Store mortar in a cool dry place so as not to be in contact with earth and to be protected from elements.

.4 Keep the materials dry and protected from the weather, freezing and contamination.

.5 Ensure that the labels and seals on all materials are intact upon delivery.

.6 Remove rejected or contaminated materials from the site.

1.10 WARRANTY

.1 The Contractor shall submit a warranty of the work of this section covering a period of not less than two (2) years from the date of Substantial Performance of the Contract. Substantial completion shall be determined by the Consultant and the Owner.

.2 Defective work shall include, but is not limited to, cracking, crumbling, loss of adhesion, loss of cohesion, discolouration, premature deterioration and out of plane movement.

1.11 ENVIRONMENTAL REQUIREMENTS

.1 General:

.1 All work shall be performed in strict accordance with manufacturer's written requirements for all products specified in the specification.

.2 Should a conflict arise between the requirements of this section and the manufacturer's requirements, the more stringent requirements shall govern.

.2 Masonry Construction:

.1 Execute the work when the ambient temperature is above four (4) degrees Celsius. When the ambient temperature is below four (4) degrees Celsius, use care and heat as directed by the Consultant. All work must comply with the CSA standards.

.2 Brace the masonry walls as necessary to resist wind pressure and other lateral forces during construction.

1.12 EXISTING CONDITIONS

.1 The Contractor shall provide all required support to safely support all the loads.

.2 The decision to replace and repoint the existing masonry is based on cracked mortar joints, loose and spalled faces. Should any other masonry deterioration be detected during the

execution of the work that is unrelated to the noted visual defects, immediately inform the Consultant.

.3 Report, in writing to the Consultant, any areas of deteriorated masonry revealed that are not part of this work. Obtain the Consultant's approval and instruction for the repair and replacement of the masonry units before proceeding with the repair work.

.4 Assist in the investigation of possible structural problems and report prior to commencing with the masonry work.

.5 Study pointing styles and methods and reproducing them and submit a sample for approval before starting the work.

.6 Examine horizontal and vertical joints to determine which were struck first and whether they are the same style, as well as the other aspects of workmanship, which establish the authenticity of the original work.

1.13 ALTERNATIVES

.1 Alternatives to manufacturer's brands or supply sources of materials will not be accepted.

2. PRODUCTS

2.1 CLAY FACE BRICK MASONRY

.1 New brick masonry to match the existing. New brick masonry to conform to CAN/CSA-A82.1, current revision. Acceptable manufacturer: Brampton Brick, Mason's Masonry or approved alternate.

.2 All materials shall be neatly stored on pallets in a location designated by the Owner.

2.2 CONCRETE BLOCK MASONRY

.1 New concrete block masonry to match size of existing. Acceptable manufacturer: Rinker or approved alternate.

.2 All materials shall be neatly stored on pallets in a location designated by the Owner.

2.3 CONCRETE BRICK MASONRY

.1 New concrete brick masonry to match the existing clay brick masonry in size, texture and dimension, and is to be solid (no cores).

.2 The face of the units is to be stained to match the existing clay brick masonry colour.

2.4 BRICK MASONRY MORTAR

.1 Betomix Plus pre-bagged mortar as manufactured by Daubois or King 1-1-6 as manufactured by King Packaging, mixed in strict accordance with the manufacturer's instructions.

.2 Mortar Type N above grade.

.3 The colour of the mortar shall match the existing. Mortar to be tinted by the manufacturer for the entire project; custom tint may be required.

.4 Admixtures shall not be added to the mortar.

.5 Use same brand of materials for the entire project.

2.5 CONCRETE BLOCK MORTAR

.1 Pre-bagged mortar mixed in strict accordance with the manufacturer's instructions.

.2 Acceptable products:

.1 King Block Mortar, as manufactured by King Packaged Materials Company.

.2 Bloc Mix, as manufactured by Daubois Inc.

.3 Type S for loadbearing walls unless noted.

.4 Conform to CAN/CSA-A179, 15 MPa minimum compressive strength at 28 days, 250mm (10") slump, maximum aggregate size 10mm (3/8").

2.6 BRICK STAINING

.1 Stain the face of the replacement brick to match the colour and sheen of the existing. Stain material to be mineral based, UV resistant, penetrating, mold, fungus, mildew and weather resistant.

.2 Acceptable Manufacturers:

.1 PermaTint Limited

.2 Nawkaw Corporation

2.7 REINFORCING AND CONNECTORS

.1 All reinforcing and connectors shall be in conformance with the current version of CSA A370.

.2 Reinforcing connectors shall be installed in accordance with the manufacturer's instructions.

.3 All reinforcing and connectors shall have a corrosion protection level of II as specified in CSA Standard A370.

.4 Masonry Ties:

.1 Helical ties: 6 mm Stainless Steel Spira Lok manufactured by Blok-Lok. Assumed tie length (to be confirmed prior to order): 150 mm.

.2 Veneer wall ties: BL-407 as manufactured by Blok-Lok. Stainless Steel. To suit existing exterior wall dimensions.

.3 Ladder ties (concrete block masonry): BL-10 as manufactured by Blok-Lok. Stainless Steel.

2.8 Shelf Angle

.1 Angle to conform to CAN/CSA-G40.20/G40.21 grade 300W.

.2 Shop Primer: to CISC/CPMA Standard 2-75.

.3 Zinc-Rich Primer: Catha-Coat 302 as supplied by Devoe Coating Company (3 mils dry film thickness) or Carbozinc 11 as supplied by Carboline Company (2 to 3 mils dry film thickness) or approved alternative.

.4 Hot Dip Galvanizing: to CSA G164, minimum zinc coating of 600 g/m2.

2.9 Anchors (secure shelf angle)

.1 19mm diameter (3/4") Hilti Kwik Bolt. Anchors are to be hot dipped galvanized. PARGING

.1 SIKA 123 by Sika Canada.

2.11 SEALANT

.1 Refer to section 07 90 00 Sealant.

2.12 ACCESSORIES

.1 Steel Corrosion Inhibiting Coating: Refer to 07 98 00 Exterior Coatings

.2 Weeps and Vents: CellVent as manufactured by Mortar Net Solutions.

.3 Mortar Net: MortarNet with Insect Barrier as manufactured by Mortar Net Solutions.

3. EXECUTION

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the work of this section.

.2 Commencing with the installation means acceptance of the existing substrates by the Contractor.

.3 The Contractor shall sound and identify all masonry wall areas to remain covered under contract for deteriorated mortar and brick. The Contractor shall commence with the repairs upon receipt of approval by the Consultant in writing.

3.2 PREPARATION

.1 Protect adjacent finished materials from marking or damage due to the work.

.2 Seal and protect all openings, doors, windows and adjacent areas to minimize the potential for damage and the spread of dust, water or other materials into the building or adjacent sidewalks and properties.

.3 Brace all openings to remain plumb.

.4 All projections should be covered with rigid protection, secured into the joints for the duration of the work.

.5 Any part of the scaffolding/swing stage shall not directly bear against the masonry. The Contractor to provide any isolating materials required to prevent damage to the existing masonry.

.6 Provide and install the safety devices and signs near the work area.

.7 Install temporary shoring, bracing or other supports as necessary to support loading in the area of work.

.8 The top surface of uncompleted masonry and openings in the building during the work shall be completely covered and protected with non-staining waterproofing covers when the construction is not in process.

3.3 GENERAL

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

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

.3 Tolerances shall conform to CAN3-A371.

3.4 COLD WEATHER PROTECTION

.1 When laying masonry in ambient temperature below 4 deg C (40 deg F), use heat and maintain temperature of masonry materials. Protect completed work from freezing to satisfaction of the Consultant. Heat and maintain temperature of masonry materials to at least 4 deg C (40 deg F), but not more than 48 deg C (120 deg F), and maintain air temperature above 4 deg C (40 deg F) on both sides of masonry for period of at least 72 hours.

.2 Do not use scorched sand. Do not use salts or anti-freezes. Use approved smokeless heaters.

.3 Heat water to a minimum temperature of twenty (20) degrees Celsius and a maximum of thirty (30) degrees Celsius.

.4 Use warm water and use less mix water in winter; cover sand to keep dry; heat sand and ensure no frozen lumps; use small batches; provide temporary heat and weather protection enclosure at area of masonry work; cover top of all unfinished work to prevent water or ice getting into masonry work.

.5 When the temperature is ten (10) degrees Celsius or less, store cements and sands for immediate use within a heated enclosure. Allow these materials to reach a minimum temperature of ten (10) degrees Celsius or a temperature that is in equilibrium with the air in the enclosure.

.6 At the time of the use, the temperature of the mortar is to be a minimum of fifteen (15) degrees Celsius and a maximum of thirty (30) degrees Celsius.

3.5 HOT WEATHER REQUIREMENTS

.1 Do plan for hot weather construction. Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

.2 Avoid using dry masonry in hot weather conditions. Use predampened brick nominally saturated, but surface dry at time of lying. Do not dip brick in a bucket of water.

.3 Do spread only enough mortar to permit soft setting of masonry units; do not over mix mortar materials; do not re-tamper mortar after 2 hours of use; do not re-tamper pigment coloured mortar; do not spread more than 900 mm (3') of mortar for placement of brick.

.4 Do not mix cement with water or with aggregate or with water-aggregate mixtures having a temperature higher than thirty (30) degrees Celsius.

.5 When the air temperature is above thirty-eight (38) degrees Celsius or thirty-two (32) degrees Celsius with a wind velocity greater than 13 km/h, the spread of the mortar beds shall be less than 1.2 m and the masonry units shall be set within one (1) minute of spreading the mortar.

3.6 PROTECTION

.1 Protect laid masonry from damage by weather. At end of each day or shutdown period, cover exposed tops of masonry with canvas or strong waterproof membrane securely clamped down and overhanging on each side of wall at least 600 mm (2'). Use wire spring clamps which extend 200 mm (8") down each side of wall, spaced 2400 mm (8') maximum or other approved method.

.2 Provide temporary bracing to masonry work during erection to prevent damage due to winds or other lateral loads until permanent structure provides adequate bracing.

.3 Contractor must maintain the exterior walls watertight at all times to prevent moisture penetration into the wall fabric. The Contractor shall be responsible for all costs associated with damage associated with moisture penetration resulting from inadequate protection as determined by the Consultant.

.4 Contractor must ensure that no damage occurs to the interior finishes from the exterior. This includes removal of the paper backing, holes, punctures, knife cuts, etc. The Contractor shall be responsible for all costs associated with damage associated to the interior finishes resulting from inadequate protection and inadequate precautions as determined by the Consultant.

3.7 REMOVAL OF AREAS OF BRICKWORK

.1 Carry out demolition, removal and disposal in strict accordance with municipal and provincial regulations as applicable, the Ontario Building Code and the Occupational Health and Safety Act. Prevent movement, settlement or damage to adjacent building structures, services and parts of building to remain. Provide bracing and shoring as required. Be responsible for safety and support of such elements; be liable for any such movement or settlement, any damage or injury caused thereby or resulting therefrom. If at any time safety of any portion of the building appears to be endangered, cease operations, notify Consultant, take precautions to support structure; do not resume operations until permission has been granted. If such movement or settlement of building is caused by negligence or default of Contractor, restore the structural integrity of the structure to the Consultant's design at no extra cost to Owner. When Consultant considers additional bracing or shoring necessary to safeguard or prevent such movement or settlement, install bracing and shoring upon order. Provide all required dust control to prevent migration into building.

3.8 REPLACEMENT OF DETERIORATED BRICK

.1 The Contractor shall mark the locations of masonry to be removed for verification by the Consultant prior to commencing with the removal process.

.2 In any area, should the amount of deteriorated brick rise above 5% of the quantity approved by the Consultant, the Contractor must stop all work and notify the Consultant immediately. The Contractor must obtain written approval from the Consultant prior to replacing amounts of brick totaling above 5% of the approved quantity. If the Contractor proceeds above 5% without written approval from the Consultant, payment will not be received for all brick quantities above 5% of the approved quantity.

.3 The brick is damaged or deteriorated when it is cracked, chipped, spalled or the outer face is hollow, detached or missing.

.4 The Contractor shall maintain the stability of the structure/masonry wall at all times.

.5 The Contractor shall cut out all damaged backup brick and prepare for the replacement of the new brick. Clean and remove all dust and brick fragments from the masonry. All loose material shall be removed from the adjacent substrates.

.6 Localized Brick Replacement (less than 4 bricks per location)

.1 Bond, coursing and jointing to match the existing.

.2 Immediately prior to placing the masonry, thoroughly wet the adjacent substrates in order to control absorption.

.3 Allow water to soak into the masonry, leaving no standing water but remaining wet. Should the surfaces dry prior to pointing, the substrates should be wet again.

.4 Set the brick in a full bed of mortar, true to line, and level with the adjacent units.

.5 Ensure the cavity to the rear of the brick is filled solidly with mortar.

.6 Tool the mortar joints flush to match the existing.

3.9 REBUILDING AREAS OF BRICKWORK

.1 Where replacing in excess of four bricks in one area, install masonry ties to bond the facing with backup wythes of masonry.

.2 The ties shall not be installed in advance of the masonry coursing.

.3 The ties shall be installed in accordance with CSA A370 unless where indicated tie spacing is more stringent than the standard.

.4 The Contractor is to ensure that the tie sits in a full bed of mortar and is not twisted or bent.

.5 The ties should be randomly installed in rebuilt areas, except where areas are sufficiently large for the tie to be set every twelve (12) inches horizontally and every twelve (12) inches vertically with staggered centres.

.6 Drill entry hole into the block backup in accordance with the Manufacturer's recommended embedment length and hole diameter

.7 Drive the tie into position.

.8 Ensure that the ties are solidly set in the back-up wythe.

.9 Bend the excess of the tie 90 deg with the Manufacturer's specified bending equipment prior to being wet set into the mortar joint.

.10 General Procedures

.1 Slushing of the joints after the bricks are placed is not permitted.

.2 In the summer, if the initial rate of absorption of the brick is greater than 30 g/min/194 cm^2, the bricks shall be thoroughly wetted for a period of three (3) to twenty-four (24) hours prior to use.

.3 Full head joints shall be obtained by double buttering of the ends of each brick being installed.

.4 Mortar joint thickness and brick coursing shall match the existing. Variation in the brick size shall be evenly distributed in the wall so that the size is consistent.

.11 Feathered edges and mortar smears onto adjacent masonry surfaces are not acceptable.

3.10 REMOVAL AND REBUILDING AREAS OF CONCRETE BLOCK MASONRY

.1 Remove the existing concrete block masonry wall where noted and dispose off site including all reinforcement, ties, etc.

.2 Prepare the existing footing to ensure a solid substrate to accept the new concrete block masonry wall. Allow for the installation of a solid grout base to level the top of the footing.

.3 Install new concrete block masonry with ladder ties every second course, grout cells for the bottom 3 courses and install dowels (10M bar) every 2nd cell.

.4 Prepare the top of the concrete block masonry wall in preparation for the frost slab installation.

3.11 SOLID MASONRY WALL STABILIZATION

.1 Installation of Helical Ties

.1 Install ties at locations indicated on the drawings.

.2 Drill entry hole into the block backup in accordance with the Manufacturer's recommended embedment length and hole diameter.

.3 Drive the tie into position.

.4 Ensure that the ties are solidly set in the back-up wythe.

.5 Ensure that the tie is set 10 mm behind the face of the mortar/brick.

.6 Set ties 12" horizontally and 12" vertically with staggered centers at all locations indicated in the drawings.

3.12 INSTALLATION OF HELICAL TIES

.1 Install ties at locations indicated on the drawings.

.2 Drill entry hole into the block backup in accordance with the Manufacturer's recommended embedment length and hole diameter.

.3 Drive the tie into position.

.4 Ensure that the ties are solidly set in the back-up wythe.

.5 Ensure that the tie is set 10 mm behind the face of the mortar/brick.

3.13 MORTAR REMOVAL

.1 Mortar is defective when it is cracked, spalled, chalked or otherwise crumbling.

.2 Consultant Review

.1 The Contractor shall provide access, permit inspection, correct any defects and obtain written approval of all raked joints prior to commencing with the pointing.

.3 Where mortar is found to be defective beyond the specified raking depth, the Contractor shall continue raking until solid mortar is encountered. Remove all loose mortar, dirt and other undesirable material.

.4 Be aware that additional raking beyond specified depths will be necessary and that voiding can be expected. Back pointing will be required at these locations prior to repointing.

.5 If masonry unseats or the bond is broken, remove the unit and reset in accordance with the work outlined in this section.

.6 Tools and Techniques

.1 Tools used for cutting out of the mortar joints shall be narrower than the joint.

.2 Cutting out of the joint shall be performed using the following techniques:

.1 Hand held rotary saws or any type of grinder or wheel are permitted. All grinders and saws to incorporate dust control vacuums (and HEPA filters).

.3 The joints shall be cleaned back for the full specified depth. All mortar should be removed on the masonry surfaces to a square surface of existing mortar at the back of the joint.

.4 All loose particles in the mortar joints shall be removed with compressed air and left open for review by the Consultant.

.7 Damage

.1 The Contractor shall take all reasonable precautions in order to prevent damage to the masonry units resulting from the removal process.

.2 Such damage to the masonry includes but is not limited to the widening of the joints, nicks, gouges, and chipped or scratched surfaces from the cutting out tools due to improper workmanship.

.3 The Contractor shall replace or repair all damaged units to the satisfaction of the Consultant with no change in the contract price or schedule.

.8 Depth of Raking

.1 The depth of the raking shall be carried out to at least twice the width of the joint to a minimum depth of one inch (1”) measured from the face of the masonry unit and beyond the existing depth of repointing.

3.14 BACK POINTING OF JOINTS

.1 Obtain written acceptance from the Consultant of the raked out work prior to commencing with pointing operations.

.2 Where the cut out joints are deeper than raking out depths specified, back point joints to bring the mortar face to the specified depth for raked out joints in preparation of finish pointing. Fill with mortar voids that cannot be filled with conventional back pointing.

.3 Immediately prior to pointing, thoroughly wet the joints in order to control absorption.

.4 Allow water to soak into masonry and mortar, leaving no standing water but remaining wet. Should the surfaces dry prior to pointing, the joints should be wet.

.5 For back pointing, fill all joints full with pointing mortar. Compact the mortar firmly into the joints to ensure positive adhesion to all inner surfaces. Place mortar in layers, with a maximum thickness of one and one quarter (1-1/4) inches and a minimum of one half (1/2) inch. Each layer should be set to thumb print hard before placing the next layer. Bring the face of the mortar in back pointed joints to the specified depth for raked out joints, measured from the face of the masonry unit. Leave the joint ready for the final pointing.

.6 Prevent the mortar from being placed or smeared onto the face of the masonry to minimize the potential for staining during back pointing.

.7 Keep the work area clean; remove all droppings as the work proceeds, and again at the end of each day.

3.15 POINTING OF JOINTS

.1 Obtain the Consultant's written acceptance of raked out and back pointed work prior to commencing with the pointing operation.

.2 Prevent the mortar from being placed or smeared on to the face of the stone or masonry to minimize the potential for staining on the faces during the pointing.

.3 Immediately prior to pointing, thoroughly wet the joints in order to control absorption.

.4 Allow water to soak into masonry and mortar, leaving no standing water but remaining wet. Prior to pointing, the joints should be wet.

.5 Fill all bed and head joints full with pointing mortar, compact joints firmly to ensure positive adhesion to all inner surfaces.

.6 Thoroughly compact the mortar into the joints.

.7 At initial set, finish neatly the joints to match the existing pointing style.

.8 Keep the work area clean; remove all droppings as the work proceeds, and again at the end of each day.

.9 Protection at Completion

.1 Protect newly laid mortar from frost, rainfall or rapid drying conditions for a minimum period of three (3) weeks.

.2 Cut out and replace all joints that dry prematurely and are lighter than the surrounding joints and have shrinkage cracks.

3.16 EXPANSION ANCHOR INSTALLATION

.1 Drill hole in concrete substrate to the required depth. The minimum hole depth must exceed the anchor embedment prior to torquing by at least one hole diameter.

.2 Clean holes with a nylon brush and compressed air.

.3 Drive the anchor into the hole using a hammer. A minimum of 6 threads must be below the surface.

.4 Tighten the nut to the installation torque.

3.17 ADHESIVE ANCHOR INSTALLATION

.1 Angle and substrate to be drilled with a rotary drill to an appropriate depth or specify depth.

.2 Clean holes with a nylon brush and compressed air.

.3 Insert stainless steel screen tube into the hole. Ensure that the screen is not deformed during installation. Nylon screens are not acceptable.

.4 Inject epoxy adhesive into the hole/screen.

.5 Insert the anchor into the adhesive in a rotating manner to force the adhesive mortar into the hole.

.6 Remove any excess material and allow the anchor to set.

.7 Install the washer and nut and tighten to manufacturer's recommendations with a torque wrench.

3.18 FIELD QUALITY CONTROL

.1 All shop and field materials and workmanship shall be subject to review by the Owner or the Owner's Representative at all times. These reviews shall not relieve the Contractor from the obligations to provide materials conforming to all requirements of the contract documents.

.2 Promptly remove any defective, damaged, or otherwise rejected material from the site. Installed materials which are damaged, or which in the opinion of the Owner do not conform to the contract documents, shall be removed and replaced with acceptable material at no additional cost to the Owner.

3.19 CLEANING

.1 Clean masonry as work progresses using soft, clean cloths within few minutes after being placed. Upon completion, when mortar has set, so that it will not be damaged by cleaning, clean with soft sponge or brush and clean water. Polish with soft, clean cloths.

.2 Clean masonry as work progresses. Allow mortar droppings on masonry to partially dry then remove by means of a trowel, followed by rubbing lightly with a masonry unit and brushing.

.3 All holes in the mortar joints shall be filled with mortar and tooled.

.4 Dry brush the masonry surfaces at the end of each day's work and after the final pointing.

.5 Remove mortar smears and droppings from the surfaces after they have dried.

.6 Clean the finished brickwork. Remove all mortar stains on any exposed brickwork and clean the masonry with low pressure clean water and a soft bristle brush. Do not excessively wet the masonry. Should efflorescence result, the Contractor is to clean to the satisfaction of the Owner and the Consultant.

.7 Remove all equipment and materials from the site upon completion of the work. Surfaces damaged during the course of the work shall be replaced by the Contractor at no cost to the Owner.

END OF SECTION 04 90 00

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

Section 07 14 16 – Cold Fluid Applied Elastomeric Waterproofing Membrane

1. GENERAL

1.1 SECTION INCLUDES

.1 Cold Fluid Applied Elastomeric Waterproofing Membrane

1.2 REFERENCES

.1 Specification American Society for Testing and Materials (ASTM):

1. ASTM C836, Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
2. ASTM D412, Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers - Tension
3. ASTM D624, Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
4. ASTM D4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and heat in a Xenon Arc Type Apparatus
5. ASTM D4833, Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
6. ASTM D5893, Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements
7. ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials

.2 Canadian General Standards Board (CGSB):

1. CGSB 37.58-M86, Membrane, Elastomeric, Cold-Applied, for Non-Exposed Use in Roofing and Waterproofing

1.3 SUBMITTALS

.1 Four (4) weeks prior to starting the work, the contractor shall submit the following:

1. List of the materials to be provided under this section.
2. Manufacturer's product data and specifications for each material.
3. Cold fluid applied elastomeric waterproofing membrane manufacturer's written project recommendations.

1.4 QUALITY ASSURANCE

.1 Perform the work in accordance with the manufacturer's written project recommendations.

.2 Obtain cold fluid applied elastomeric waterproofing membrane through one source from a single manufacturer.

1.5 QUALIFICATIONS

.1 The applicator shall be familiar with and fully equipped to apply cold fluid applied elastomeric waterproofing membrane and shall be familiar with good waterproofing practices.

.2 The applicator shall be acceptable to Consultant for installation of cold fluid applied elastomeric waterproofing membrane.

.3 Use single Contractor for all waterproofing work.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery: At the time of delivery, visually inspect all materials for damage. Note any damaged to materials on the receiving ticket and immediately report to the shipping company and the manufacturer.

1. Remove damaged materials from the site immediately.

.2 Storage:

1. Store materials in accordance with manufacturer's written instructions, raised off the ground and cover with a weather proof flame resistant sheeting or tarpaulin.
2. Store role materials on end in original packaging.
3. Store cold fluid applied waterproofing in closed containers outdoors.
4. Store adhesives and primers at temperatures of 5 deg C (41 deg F) and above to facilitate handling.
5. Keep solvent away from open flame or excessive heat.
6. Protect products from direct sunlight until ready for use.

.3 Handling: Material shall be handled in accordance with sound material handling practices and in accordance with manufacturer's written instructions.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 No installation work shall be performed during rainy or inclement weather and on frost or wet covered surfaces.

.2 Temporary protection of the membrane shall be provided to prevent mechanical damage or damage from spillage of oil or solvents until such time as permanent protection is provided.

.3 Do not permit traffic of any kind over unprotected membrane. Apply protection course as soon as possible in accordance with published literature after waterproofing membrane installation.

1.8 WARRANTY

.1 General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents, and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

.2 Provide written warranty signed by waterproofing manufacturer and installer agreeing to repair or replace waterproofing that does not meet requirements or that does not remain watertight within the specified warranty period.

.3 Warranty Period: 5 years after date of Substantial Completion.

1.9 ALTERNATIVES

.1 Alternatives to manufacturer's brands or supply sources of materials will not be accepted.

2. PRODUCTS

2.1 COLD FLUID APPLIED ELASTOMERIC WATERPROOFING MEMBRANE

.1 Fast curing, one component elastomeric, solvent free, moisture cure waterproofing compound designed to provide a seamless waterproofing membrane

.2 Acceptable product: Henry CM100 manufactured by Henry or Colphene LM Barr by Soprema.

2.2 FABRIC REINFORCEMENT:

.1 Polyester Fabric Reinforcement Sheet as supplied by Henry or Soprema, as compatible with the system.

2.3 PROTECTION/DRAINAGE BOARD

.1 Composite two-part prefabricated geo-composite drain board consisting of a formed polystyrene core covered on one side with a woven or non-woven polypropylene filter fabric. Designed for vertical and horizontal installations requiring a high compressive strength and moderate flow capacity.

.1 Acceptable products: DB 6000 by Henry Company or Sopradrain 15-G by Soprema as compatible with the system.

2.4 RIGID INSULATION

.1 Extruded Polystyrene board insulation to CAN/ULC S701 TYPE IV:

.1 Minimum density of 26kg/cu.m.,
.2 ship lap edged, with integral high density skin.
.3 Aged thermal resistance: RSI 0.87 per 25mm
.4 Compressive strength: 210 kPa
.5 Thickness: 100mm

.2 Acceptable product: Sytrofoam SM Perimate by Dupont Canada or Sopra-XPS 30 by Soprema.

2.5 ROOT BARRIER SYSTEM

.1 Where a root barrier is needed, use: 260GC and TRA sheeting as manufactured by Tremco.

2.6 ACCESSORIES

.1 Termination Sealant: HE925 BES Sealant manufactured by Henry or Sopraseal Sealant by Soprema as compatible with the system.

.2 Termination Bars: Securement bars shall be continuous aluminum, stainless steel or galvanized metal, 3mm x 25mm x 25mm (1/8" x 1" x 1") in size and shall be pre-drilled for non-corrosive screw attachment on a maximum of 200mm (8") centers.

.3 Fasteners: Galvanized, hot dipped or non-ferrous type, appropriate for purpose intended and approved by system manufacturer; length required for thickness of material, with metal washers.

.4 Primers: as recommended by the manufacturer.

3. EXECUTION

3.2 GENERAL

.1 Ensure continuity of the waterproofing membrane throughout the scope of this section.

.2 Work shall be scheduled to provide a watertight seal at the end of each working day on the areas worked upon during the day.

.3 Cold fluid applied elastomeric waterproofing membrane to be applied no sooner than 24 hours following wet cure of new concrete and formwork removal.

.4 Remove any existing waterproofing membrane from surfaces to receive new waterproofing using mechanical means. Chemical solvents are not permitted. Burning the membrane is not permitted but the application of heat is allowed to soften the membrane to facilitate its removal, provided that no smoke and fumes are produced.

.5 Before membrane application, the substrate shall be clean and dry, free from surface water, ice, snow, frost, dust, dirt oil, grease, curing compounds and any other foreign matter detrimental to the adhesion of the membrane.

3.3 EXAMINATION

.1 Examine substrates to receive work and surrounding adjacent surfaces for conditions affecting installation.

.2 Notify Consultant in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.

.3 Notify Contractor in writing of any conditions that are not acceptable.

.4 Proceed with installation after verification and correction of surface conditions acceptable to manufacturer.

3.4 SURFACE PREPARATION

.1 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Concrete surfaces shall be free of large voids and spalled areas. Fill areas in substrate to provide an even plane.

.2 Provide and install prefabricated expansion joint assemblies prior to application of the waterproofing assembly.

.3 Acceptable Substrates:

1. Concrete:
   - .1 Form Release Agents: Contact the manufacturer
   - .2 Cast-in-Place Concrete/Composite Deck/Precast Concrete:
     - Strength/Density: Minimum 20MPa (2,500 psi) compressive strength and minimum 1842 kg/m3 (115 pcf) density.
     - Finish: Broom, wood-float, or wood-troweled equivalent finish.
   - .3 Concrete Hydration (Cure):
     - Method of Cure: Water cure, wet coverings, paper sheets, plastic sheets or approved liquid curing compound (sodium silicate preferred).
     - Duration of Cure/Dry: Recommend 24 hours minimum after concrete forms have been removed.
2. Concrete Block Masonry

3.5 APPLICATION OF COLD FLUID APPLIED ELASTOMERIC WATERPROOFING MEMBRANE

.1 Ensure substrate is ready to receive cold fluid applied waterproofing membrane in accordance with published literature.

.2 Apply first layer of cold fluid applied waterproofing membrane evenly to a minimum thickness of 1.5mm (60 mils) to form a continuous monolithic coating over horizontal and vertical surfaces including previously reinforced areas.

.3 Apply polyester fabric reinforcing sheet and firmly press into first layer of cold fluid applied waterproofing. Overlap polyester fabric reinforcing sheet approximately 25mm - 50mm (1" - 2") ensuring that a layer of cold fluid applied waterproofing membrane is present between each sheet.

.4 Apply second layer of cold fluid applied waterproofing membrane over the polyester fabric reinforcing sheet to a minimum thickness of 1.5mm (60 mils) providing a total thickness of 3mm (120 mils). Ensure the reinforcing sheet is fully embedded in the waterproofing.

3.6 INSTALLATION OF RIGID INSULATION

.1 Install insulation as indicated on the drawings and in accordance with manufacturers written instructions.

.2 Insulation joints to be tightly fit.

3.7 INSTALLATION OF DRAINAGE BOARD (VERTICAL)

.1 Install drainage board as indicated on the drawings and in accordance with manufacturers written instructions.

.2 Overlap core flange with core flange of adjacent sheet a minimum of 25mm (1") and top layer of filter fabric a minimum of 63.5mm (2-1/2").

.3 Cut core and fabric to fit tightly around penetrations.

3.8 FIELD QUALITY CONTROL

.1 The manufacturer shall regularly visit the site during each phase (substrate preparation, priming, membrane installation, detailing, etc.) of the installation and provide written acceptance of the work.

3.9 CLEAN-UP

.1 Promptly as the work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.

.2 Clean to the Consultant's approval, soiled surfaces, spatters, and damage caused by work of this Section.

END OF SECTION 07 14 16

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

Section 07 90 00 – Sealant

1.0 GENERAL

1.1 SECTION INCLUDES:

.1 Sealant

1.2 GENERAL REQUIREMENTS

.1 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, swing-stages, permits, authorization from utilities, etc. The cost associated with these items will not be paid for separately, but will be considered incidental to work of this section.

1.3 REFERENCES

.1 ASTM C 510 Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.

.2 ASTM C 661 Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer

.3 ASTM C 719 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).

.4 ASTM C 794 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.

.5 ASTM C 920 Standard Specification for Elastomeric Joint Sealants.

.6 ASTM C 1193 Standard Guide for Use of Joint Sealants.

.7 ASTM C 1248 Standard Test Method for Staining of Porous Substrate by Joint Sealants.

.8 ASTM C 1311 Standard Specification for Solvent Release Sealants.

.9 ASTM D 2203 Standard Test Method for Staining from Sealants.

.10 ASTM D 2240 Standard Test Method for Rubber Property—Durometer Hardness

.11 ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Materials

1.4 SUBMITTALS

.1 Two (2) weeks prior to starting the work, the contractor shall submit the following:

.1 List of the materials to be provided under this section.

.2 Manufacturer's product data and specifications for each material.

.3 Sealant manufacturer's written project recommendations.

.2 At the Consultant's request, submit samples, including available colours, of the materials to be used on the project.

1.5 QUALITY ASSURANCE

.1 Perform the work in accordance with the manufacturer's written project recommendations.

.2 Obtain each type of joint sealant through one source from a single manufacturer.

1.6 QUALIFICATIONS

.1 The installation of the sealant work shall be performed by a recognized specialized applicator, having at least five (5) years of experience, with skilled mechanics, thoroughly trained and competent in all phases of the work.

1.7 MOCK-UP

.1 Construct mock-ups two (2) weeks prior to commencement of the work to demonstrate all of the joints encountered in this project.

.2 The mock-ups shall be 1 m in length for each type of sealant and substrate.

.3 The mock-ups shall demonstrate the surface preparation prior to the sealant installation and the location, size, shape, colour, depth of joints, and adhesion and cohesion, complete with back-up material, primer, and new sealant.

.4 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part of the finished work.

.5 The approved mock-up shall be the standard to which all work shall be performed.

.6 The mock-up shall be performed prior to the pre-installation conference.

1.8 DELIVERY, STORAGE AND PROTECTION

.1 Deliver all materials to the job-site in their original unopened containers with labels indicating manufacturer, product name and designation, colour, expiration date, pot life, curing time, and mixing instructions for multi-component materials.

.2 Store all materials in strict accordance with the manufacturer’s recommendations.

.3 Keep the materials dry and protected from the weather, freezing and contamination.

.4 Ensure that the labels and seals on all materials are intact upon delivery.

.5 Remove rejected or contaminated materials from the site.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials. Labelling and provision of MSDS sheets shall be acceptable to Labour Canada.

.2 Ensure that all materials, containers, rags, etc. are disposed of in accordance with the local Waste Management Plan and hazardous material disposal regulations and requirements.

1.10 ALTERNATIVES

.1 Alternatives to manufacturer’s brands or supply sources of materials will not be accepted.

1.11 WARRANTY

.1 The Contractor shall submit a full labour and material warranty against defective workmanship or materials that result in water penetration, material incompatibility, material failure, system failure, etc. for a period of two (2) years from the date of Substantial Performance of the Contract.

.2 Warranty coverage to include the repair of any premise/content property damaged as a result of failure of the assembly system.

.3 The warranty is to be supplied on official company letter head and shall bear the corporate seal.

1.12 ANTICIPATED FIELD TESTING PROGRAM

.1 Material and adhesion tests shall be conducted at the discretion of the Consultant on a random basis to show that properties are appropriate to the particular sealant and proper bond is achieved.

.2 Extent of testing shall be as follows:

.1 Ten (10) tests for the first 1 000 feet (300 m) of joint length for each type of elastomeric sealant and joint substrate.

.2 One (1) test for each 1 000 feet (300 m) of joint length therefore or one test per each floor per elevation.

.3 The Contractor shall repair all test areas as part of the work in accordance with this section.

.4 All sealant installation failing material and adhesion tests shall be rectified in accordance with manufacturer and Consultant approved methods. Rectified areas will be retested until results confirm compliance with the manufacturer's written requirements.

2.0 PRODUCTS

2.1 SEALANT

.1 Substrates not in contact with bituminous materials:

.1 Dowsil 790 Building Sealant.

.2 Substrates in contact with bituminous membranes:

.1 925 BES Sealant by Henry Company.

.3 Substrates in contact with roofing membranes and asphalt materials:

.1 M1 by Chemlink.

2.2 PRIMERS

.1 Primer shall be as specified by the sealant manufacturer.

2.3 CLEANING AGENT

.1 The cleaning material for the surfaces to receive the sealant shall be as recommended by the manufacturer of the sealant.

2.4 MASKING TAPE

.1 Non-staining, non-absorbent material compatible with joint sealant and surface adjacent to joints.

3.0 EXECUTION

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the work of this section.

.2 Commencing with the installation means acceptance of the existing substrates by the Contractor.

.3 Examine the areas and conditions under which the work will be performed. Review the planned operating procedures with the Consultant. Do not proceed with work until any unsatisfactory conditions are corrected in a manner acceptable to both the Owner and the Consultant.

.4 Verify that the specified environmental conditions exist before commencing with the work.

.5 The Contractor shall arrange for the sealant Manufacturer's representative to visit the site and review the surface preparation and installation procedures at the start of the work.

3.2 PROTECTION

.1 The Contractor is responsible for maintaining the work weather tight during the course of the project. At the end of each work day or when stoppage occurs, provide necessary protection to prevent water penetration through the exterior walls.

.2 Seal and protect all openings, doors, windows and adjacent areas to minimize the potential for damage and the spread of dust, water or other materials into the building or adjacent sidewalks and properties.

.3 Protect adjacent finished materials from marking or damage during the work.

.4 Protect completed sealant installation during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes such that sealant is without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, such sealant shall be rectified immediately.

3.3 SURFACE PREPARATION

.1 Consult and follow the sealant manufacturer's project recommendations.

.2 Remove the existing sealant around the penetrations without causing damage to the substrates.

.3 Remove dust, paint, loose mortar and other foreign matter, and dry joint surfaces.

.4 Where necessary to protect the adjacent surfaces, mask by suitable means prior to priming and sealant installation.

.5 Report in writing to the Consultant, any conditions which may be detrimental to the proper performance of the work. Proceeding with the work shall be taken as acceptance of the existing surfaces and conditions.

.6 The joints shall be clean, dry and free of frost and foreign matter prior to surface application.

.7 Butt and Bridge Joint Applications

.1 Examine the joint sizes and correct as required to allow for the anticipated movement and to achieve proper width / depth ratio in accordance with the manufacturer's recommendations for the specified sealant unless indicated differently on the drawings, or by the Consultant.

.2 Should joint width correction be required, ensure that the correction is distributed appropriately to each side of joint.

.8 Fillet Joint Applications

.1 Remove oil, grease and other coatings from non-ferrous metals with an approved cleaning solvent or abrasive technique. Obtain approval from the Consultant prior to commencing.

3.4 PRIMING

.1 Prime all substrates as directed by the sealant manufacturer's recommendations.

.2 Prime sides of the joint using the two-cloth method in accordance with the manufacturer's directions, immediately prior to sealant installation.

.3 Primers that require application by the wipe of a clean soft cloth, shall be poured onto the cloth. Do not dip the cloth into the primer container.

.4 Prime only as much area as can be sealed in the same working day.

3.5 APPLICATION

.1 The Contractor shall have a trained representative on site at all times who is responsible for all sealant applications.

.2 Perform all work in strict accordance with the manufacturer's printed instructions. The Contractor shall provide the Consultant a copy of these instructions prior to commencing with the injection and sealing operations.

.3 Mix multi-component sealant such that air pocket formation is minimized in accordance with the manufacturer's recommendation.

.4 The sealant must be applied continuously to ensure that all voids and joints are completely filled.

.5 Tool the sealant with light pressure immediately after application to ensure positive and complete contact of the sealant to the interface. Only tooling agents that are approved in writing by the sealant manufacturer and that do not discolour sealants or adjacent surfaces shall be used.

.6 Neatly tool the surface to form a slight concave profile. The surface of the sealant shall be smooth, free from ridges, wrinkles, air pockets and embedded impurities.

3.6 CLEAN UP

.1 Clean the adjacent surfaces immediately and leave the work area neat and clean. All excess (sealant and primer) and droppings shall be removed using the recommended cleaners as the work progresses.

.2 All masking shall be removed immediately after tooling the joints. Sealant affected by the masking removal shall be retooled to achieve proper joint configuration.

END OF SECTION 07 90 00

DIVISION 9 - FINISHES

Section 09 91 13 – Exterior Coatings

1.0 GENERAL

1.1 DESCRIPTION

.1 Work includes both shop and field coated metal. Note that in all applications, the topcoat will be field installed. For all new materials and retained materials removed from site, the system will be shop prepared and the primer and base coat are to be shop applied.

1.2 ENVIRONMENTAL CONDITIONS

.1 Store, handle and install materials in accordance with manufacturer's written recommendations.

1.3 FIELD REVIEW AND TESTING

.1 Notify the Consultant for review of preparation of metal surfaces and application of coating.

.2 Do not commence topcoat application until you receive written authorization from the Consultant.

.3 All coating applications shall be inspected in accordance with SSPC-PA2, Measurement of Dry Film Thickness with Magnetic Gauges, as well as ASTM D 3359, Standard Test Methods for Measuring Adhesion by Tape Test.

.4 Deficiencies shall be repaired in accordance with manufacturer's written instructions.

.5 Inspection and testing of work done to repair deficiencies shall be paid for by the Contractor.

1.4 QUALITY ASSURANCE

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

.2 Conform to latest MPI requirements for exterior repainting work including cleaning, preparation and priming.

.3 The contractor shall arrange for the coating manufacturer's representative to inspect the work, perform on-site adhesion testing at the mock-up and at regular intervals during the work. Provide written project recommendations including observations made during shop/site visits and on-site test results in accordance with the project specifications.

.4 Notify Consultant for review of surface preparation prior to coating application, and completed coating application prior to demobilizing from each work area.

1.5 WARRANTY

.1 The Contractor shall submit a full labour and material warranty against defective workmanship or materials that result in material incompatibility, material failure, system failure, etc. for a period of two (2) years from the date of Substantial Performance of the Contract.

.2 Warranty coverage to include the repair of any premise/content property damaged as a result of failure.

.3 The warranty is to be supplied on official company letter head and shall bear the corporate seal.

2.0 MATERIALS AND PRODUCTS

2.1 GENERAL

.1 All paint materials, including primers, paints, coatings, thinners and solvents, to be products of a single manufacturer and designated by that manufacturer to be compatible with the existing conditions and to each other.

.2 The coating system is to be applied in three coats, with a multi-pass technique, to the film thickness required for the intended service and condition of the substrate.

.3 All materials to be in accordance with the latest edition of the MPI Approved Product List and be the highest quality product of an approved manufacturer listed in the MPI Maintenance Repainting Manual.

.4 The paint used on this project shall be for exterior application.

.5 All primers and base coats shall be tinted to a colour contrasting with the coats that follow.

.6 All materials delivered to the site must be in the original containers with unbroken seals and intact labels clearly identifying the product.

.7 Use materials in strict accordance with the manufacturer's specifications and requirements.

.8 Colours will be selected by the Owner on site.

2.2 EXISTING COATING SYSTEM REMOVAL

.1 Peel Away 1, Heavy Duty Paint Remover

.2 Super Remover, multi layer stripper

2.3 COATING SYSTEMS

.1 New copper, lead coated existing copper and existing galvanized steel:

.1 Decontaminate surfaces as per SSPC SP-1 "Solvent Cleaning"

.2 Surface preparation: Brush Blast as per SSPC SP-7, OR, Manual/Power Tool Cleaning as per SSPC SP 2/3.

.3 Primer: Rustbond PS, Epoxy primer/tie-coat applied in one coat at 1 to 3 mils DFT manufactured by Carboline

.4 Mid-Coat: Carboguard 890, Epoxy coating applied in one coat at 4 to 6 mils DFT manufactured by Carboline

.5 Topcoat: Carbothane 134UV Ultra applied in one coat at 2 to 3 mils DFT, manufactured by Carboline colour to be selected by Owner.

.2 New and existing wood surfaces:

.1 Decontaminate surfaces as per SSPC SP-1 "Solvent Cleaning"

.2 Surface preparation: Manually sand surfaces to remove existing coatings, paints and varnishes.

.3 Primer: Sanitile 120, Acrylic primer/tie-coat applied in one coat at 1 to 2 mils DFT manufactured by Carboline

.4 Mid-Coat: Carbocrylic 3359DTM, Acrylic coating applied in one coat at 2 to 3 mils DFT, manufactured by Carboline use a colour different to the topcoat to provide contrast during application.

.5 Topcoat: Carbocrylic 3359DTM, Acrylic coating applied in one coat at 2 to 3 mils DFT, manufactured by Carboline colour to be selected by Owner.

.3 Existing Steel:

.1 Decontaminate surfaces as per SSPC SP-1 "Solvent Cleaning".

.2 Surface preparation: Brush Blast as per SSPC SP-7, OR, Manual/Power Tool Cleaning as per SSPC SP 2/3.

.3 Primer: Rustbond PS, Epoxy primer/tie-coat applied in one coat at 1 to 3 mils DFT manufactured by Carboline.

.4 Mid-Coat: Carbomastic 15, Aluminum Flake Filled Epoxy coating applied in one coat at 5 to 7 mils DFT manufactured by Carboline.

.5 Topcoat: Carbothane 134UV Ultra applied in one coat at 2 to 3 mils DFT, colour to be selected by Owner manufactured by Carboline.

2.4 ACCESSORIES

.1 Wood Filler: PC-Woody Epoxy Paste

3.0 EXECUTION

3.1 QUALITY CONTROL

.1 All work shall meet or exceed the more stringent of the manufacturer's requirements or the requirements of this Specification, or the standards quoted.

.2 Single Source Responsibility: All coating materials shall be those of a single manufacturer. The specified coating materials manufactured by the Carboline Company have been chosen to set a standard of quality as is required to provide the intended performance.

.3 Inspector Qualifications: A NACE Certified Coatings inspector is to verify and report that all the provisions in this specification and the product data sheets are adhered to during the decontamination, surface preparation and installation of the coating system. All inspection records are to be shared with the owner, contractor and the coatings manufacturer.

.4 Coating Application: Compliance to this specification is necessary to ensure that the best available performance is attained from the particular coating system selected. Refer to SSPC PA-1 “Shop, Field and Maintenance Painting of Steel” for generic, industry standard, good painting practices.

.5 All coated steel shall have the dry film thicknesses verified by inspection with either a metallic or non-metallic Positector or similar dry film thickness testing device. Dry film thickness readings to be taken in accordance with SSPC PA-2 – 2012, level 3.

3.2 STORAGE OF MATERIALS

.1 Store materials in a single location designated by the Consultant. Maintain neat and clean. Remove soiled and/or used rags at end of each workday to avoid risk of fire.

3.3 SURFACE PREPARATION – COPPER, LEAD COATED COPPER, STEEL AND GALVANIZED STEEL

.1 All oil, grease and contaminants must be removed prior to surface preparation.

.2 Removal of oil and grease to be done in accordance with SSPC SP-1 “Solvent Cleaning”.

.3 Before surface preparation commences, measure the chloride concentration on the surfaces and verify that it is lower than 15 µg/cm2. Should the chloride concentration on the surface of the steel be above 15 µg/cm2, use a Chlor-Rid wash until the measured levels are below the specified limit.

.4 Surfaces should be brush blasted by dry abrasive blasting in accordance with SSPC-SP7

.5 The anchor pattern or "tooth" on all galvanized steel and copper surfaces to be coated shall be sharp, angular and dense with a minimum depth of 1 mil (25.4 microns), as measured by ASTM D 4417.

.6 All prepared surfaces should be vacuum cleaned to remove all blast media and dust after blasting is completed. Ensure that any vacuum attachment that touches the surface is clean and does not contaminate the surface.

.7 Non-visible oxidation of the surfaces to be coated shall not be permitted between the time of blasting and application of the primer on the blasted surface. Ensure that the primer is applied to the clean surfaces as soon as practical and within the same shift that completed the surface preparation steps.

.8 Care should be taken to avoid contamination of the prepared surface and previous coats by perspiration, fingerprinting, or by the introduction of other contaminants from the workers' clothes or their equipment.

3.4 SURFACE PREPARATION – WOOD

.1 All oil, grease and contaminants must be removed prior to surface preparation.

.2 Removal of oil and grease to be done in accordance with SSPC SP-1 “Solvent Cleaning”.

.3 Surfaces should be sanded using coarse, medium and fine sandpaper.

.4 All prepared surfaces should be vacuum cleaned to remove all blast media and dust after blasting is completed. Ensure that any vacuum attachment that touches the surface is clean and does not contaminate the surface.

.5 Non-visible oxidation of the surfaces to be coated shall not be permitted between the time of blasting and application of the primer on the blasted surface. Ensure that the primer is applied to the clean surfaces as soon as practical and within the same shift that completed the surface preparation steps.

.6 Care should be taken to avoid contamination of the prepared surface and previous coats by perspiration, fingerprinting, or by the introduction of other contaminants from the workers' clothes or their equipment.

3.5 SITE PREPARATION PRIOR TO COATING INSTALLATION

.1 Mask over adjacent surfaces as required, producing neat and true paint lines at discontinuous edges.

.2 Protect adjacent surfaces and surfaces below from dripping, overspray etc.

.3 Install "WET PAINT" signs.

.4 Enclose areas below the work to prevent access to pedestrians. Be responsible for any paint spilled on vehicles or other objects below the work area.

3.6 MATERIAL PREPARATION

.1 Mix well before using.

.2 Withdraw from original container only as much material as can be used in one day. Do not return unused material to original container.

.3 Maintain containers closed if not extracting paint.

.4 For thinning, use only those materials permitted by the Consultant and approved by the manufacturer.

3.7 APPLICATION OF PRIMER COAT

.1 Mix thoroughly to manufacturer's instructions.

.2 Apply primer coat to all metal surfaces that were exposed by surface preparation.

.3 Apply primer to exceed the minimum dry film thickness (DFT).

3.8 APPLICATION OF BASE/FINISH COATS

.1 Apply in strict accordance with manufacturer's requirements. Do not use any other paint application methods unless prior written approval is obtained from the Consultant.

.2 Apply base coat and finish coats to all surfaces to exceed the minimum DFT specified by the manufacturer.

.3 The dried finish coat shall be uniform in appearance, colour, and gloss. The "lap-in" areas shall exhibit uniformity with the adjacent painted areas. The finish shall be free of dirt, coarse particles, or any other foreign matter.

.4 The final finish coat shall completely cover in one application. The Contractor shall touch-up areas which were not properly coated the first time.

END OF SECTION 09 91 13

DIVISION 31 – EARTHWORKS

Section 31 23 10 – Excavating, Backfilling and Grading

1.0 GENERAL

1.1 SECTION INCLUDES:

.1 Excavation, backfilling and grading materials.

1.2 ENVIRONMENTAL CONDITIONS

.1 Do not backfill or compact when the ambient temperature is below 5°C.

1.3 SUBMITTALS / MOCK-UPS

.1 Submit evidence of compliance of proposed backfill material with required standards from supplier at least 2 weeks prior to use on site.

.2 Submit a site plan and topographic survey showing all existing grades and elevations prior to removals. Once removals are completed, submit a further site plan showing the existing elevations of the suspended slab and proposed elevation of new finishes. This submission should include proposed drain locations and finished grade elevations.

.3 Submit a site plan showing planned travel paths of construction equipment and stockpile areas of any equipment and materials. Work cannot commence until the plan is reviewed and accepted by the Consultant and the Owner.

1.4 SHOP DRAWINGS

.1 For areas where soil retention shoring is required (i.e. 1:1 excavation is not feasible), provide shoring shop drawings stamped by an Ontario P.Eng.

1.5 INSPECTION AND TESTING

.1 Notify Consultant for review of subgrade and all backfilling operations at least 48 hours prior to commencement. Obtain written approval of materials to be used and testing required. Arrange for presence of an independent testing agency, selected by Consultant, at any activity required by the Consultant to be tested, including compaction.

.2 Testing to conform with the Ontario Provincial Standard Specifications (O.P.S.S.) 501, 902, and 1010 and the Ministry of Transportation - Ontario (M.T.O) Laboratory Standards (LS).

.3 Amount of granular fill or sub-base required to be inspected and tested shall be verified prior to notifying testing agency, and shall include:

.1 One standard sieve analysis for gradation as determined by M.T.O. LS-602 for each type of granular material placed. Each test sample will consist of proper identification and field data.

.4 Perform in-place compaction testing with a nuclear density test gauge in randomly selected locations, in accordance with O.P.S.S. 501(Method A). Percent compaction shall be evaluated based on the maximum dry density as determined by M.T.O. LS-706.

.5 The Consultant may require additional testing as deemed necessary.

1.6 WARRANTY

.1 The Contractor shall submit a full labour and material warranty against defective workmanship or materials that result in settlement, heaving, material incompatibility, material failure, system failure, etc. for a period of two (2) years from the date of Substantial Performance of the Contract.

.2 Warranty coverage to include the repair of any premise/content property damaged as a result of failure.

.3 The warranty is to be supplied on official company letter head and shall bear the corporate seal.

2.0 PRODUCTS

2.1 SOIL FILL

.1 Clean, natural soil material, free from organic matter, rocks larger than 50mm, foreign or building debris and other deleterious material. Excavated soils may be used for fill, subject to the approval of the Consultant. Otherwise, disposal of existing fill off site, and supply and placement of new soil fill, shall be paid for at the Unit Price quoted.

.2 Backfill material must consist of existing parent soil or clean, sandy-loam topsoil (50-60% sand; 20-40% silt; 6-10% clay; 2-5% organic; pH 7.5 or less).

2.2 GRANULAR FILL

.1 Granular materials shall conform to the requirements of Ontario: O.P.S.S. 314 and 1010:

	Gradation	Material
Sub-base	Granular 'B', Type II	Quarried Bedrock; or
		50mm Crushed Limestone
Base Course	Granular 'A'	Quarried Bedrock; or
		20mm Crushed Limestone; or
		Reclaimed Concrete Material; or
		Reclaimed Asphalt Pavement, up to 30% by mass

2.3 DRAINAGE COURSE

.1 20mm clear stone, washed and free of fines.

2.4 FILTER FABRIC

.1 Filter fabric as supplied by Terrafix Geosynthetics Inc:

.2 For tensile strength in combination with Geogrid: Terrafix 200R

.3 For encasing subsurface drain systems and over drainage course: Terrafix 270R

2.5 GEOGRID

.1 Geogrid as supplied by Terrafix Geosynthetics Inc.: Terrafix BX1100

3.0 EXECUTION

3.1 USE OF SITE

.1 Determine construction access path, staging and stockpiling areas and prepare soft ground for mini-excavator passage as follows:

.1 Mini-excavator access to the building, stockpiling areas, and staging are to be located outside the drip line of trees wherever possible.

.2 Where the mini-excavator must be driven, turned, or parked below the drip line of any trees on site, two layers of ¾" plywood must be laid on the surface of the soil to minimize compaction and rutting of mini-excavator. Plywood sheets must be overlapping and secured together so that they do not move with the passage of the excavator.

.3 To restrict the movement of any construction equipment and stockpiling within the drip lines of trees, the path of the excavator is to be delineated using orange-web snow fencing on T-Bars spaced every 6' and tied with #10 gauge galvanized wire, or portable steel construction fencing secured in place.

.4 All stockpiling of soil, materials, bins must be located on existing hard surfaces wherever possible. No construction materials may be stored or parked below the drip lines of trees. Any stockpiling of soil or materials that occurs on existing soft surfaces (sod, soil, bare screenings) must protect the ground below using the two-layer plywood treatment described above.

.2 All trees located within 12m of the work area must be protected at the dripline using orange-web snow fencing on T-Bars spaced every 6' and tied with #10 gauge galvanized wire.

.3 Works on hard landscaping is not restricted. Any damaged areas must be repaired to equal or better standard at the Contractor's sole expense.

3.2 DEMOLITION, SITE CLEARING AND REMOVALS

.1 It is the Contractor's sole responsibility to contact the necessary local and regional authorities and agencies to determine the exact locations of utilities prior to any excavation or demolition.

.2 Remove all existing materials as necessary to expose areas for repair. In areas that have an underlying waterproofing membrane, remove overburden material by methods which will not damage areas of existing membrane, where it is required to remain. Ensure that sufficient undamaged existing membrane remains at the edges of areas being repaired to allow for the lapping and proper bonding of the new membrane with the existing membrane.

.3 All re-usable materials, such as railings, fences, concrete and unit pavers, catch basins, lamp posts, signage, etc. are to be either disposed of or carefully removed and stored for re-use, as directed by the Owner.

.4 Sawcut around areas of concrete, curbs, asphalt or paving which require removal. Leave a straight, vertical edge where paving is removed for placing new material against it. For sidewalk removals, extend removals to nearest tooled or control joint.

.5 Where existing paving is directly on waterproofing, sawcut to within approximately 10mm of the bottom of the paving. Investigate the thickness of the paving before sawcutting and ensure that sawcuts do not go completely through the paving and damage the existing membrane.

.6 Clean site of all rubbish and debris, including materials which are not to be stored or re-used.

3.3 GENERAL EXCAVATION

.1 Excavate to the levels required for the execution of the Work of all divisions. Do not over excavate, otherwise the overbreak shall be made up with compacted granular fill, at the Contractors own expense.

.2 Make every effort to protect nearby and buried structures during the excavation process. Properly designed shoring systems must be designed by others prior to excavation/demolition operation commence. Safety to all personnel and any nearby structures is the sole responsibility of the Contractor.

.3 Immediately following the excavation and until backfill, the tree closest to the excavation must be thoroughly watered below the entire drip line of the tree. Watering must be applied with sufficient quantity to penetrate the existing sod and top 50 mm of the underlying topsoil. Watering must be applied at such a rate as to ensure there is no runoff. Frequency of watering will be in accordance climate conditions and conditions of the soil.

.4 Where excavation is required through the roots of trees which are to remain, excavation is to be performed as follows:

.1 Along the perimeter of the excavation, the top 3 feet of soil is to be removed using root-sensitive excavation methods (by hand, air spade or hydrovac). Exposed tree roots must be cleanly pruned using a sharp hand-saw.

.2 Soil requiring excavation deeper than 3 feet may be removed using a mini-excavator bucket. If any tree roots are encountered, the excavation must stop to allow the roots to be cleanly pruned by hand. Tearing roots using the mini-excavator bucket is not permitted.

.5 No extra compensation will be allowed for removing rock or other materials encountered during excavation work or site work, unless reviewed and approved by Consultant.

.6 Where excavation is required adjacent to curbs, which are to remain in place, it shall be to 1m from curb to maintain soil bearing for curbs.

.7 No blasting or other use of explosives will be permitted.

.8 Bottoms of excavations shall be adequately protected from frost and water accumulation.

3.4 DEWATERING

.1 Bail, pump out or divert water from excavations, from whatever cause, as it accumulates, and until the time proposed works are placed and set.

.2 Provide and operate pumps of sufficient number and capacity, including standby units, and all necessary accessories, to keep excavations free of water at all times.

.3 Take care to protect all adjacent structures that would be affected by changes in hydrostatic or earth pressures.

.4 The Contractor shall not hold the Owner liable for leakage encountered during his work from existing sewers, watermains, drains, or from other sewers or drains under construction.

.5 Settling tanks of adequate size shall be provided for removal of sand and mud, if and when deemed necessary by the Municipality or Consultant.

3.5 ROUGH GRADING AND SUBGRADE PREPARATION

.1 Rough grade work area to suit required backfill depths. Proof role the exposed subgrade to identify areas of unsuitable material.

.2 Subgrade below proposed new structures shall be undisturbed and/or stable material, having a minimum 98% of the maximum dry density, as determined by M.T.O. LS-706, at optimum moisture content. Compact and adjust the moisture content to the top 300mm of the exposed subgrade where required to achieve these limits. Do not compact frozen material.

.3 If any unsatisfactory material is encountered in the subgrade, this material should be completely removed at a 45 degree slope (1:1) beneath and away from the base elevation of the proposed structure. Unsatisfactory material includes any man-made fill that was not controlled during placement or contains unacceptable constituents. Once unsatisfactory fill material is completely removed, it should be replaced with existing on-site material if approved by the Consultant, or a with an approved import fill material, disposing of unsuitable material off-site. Place in maximum 200mm lifts. Each lift shall be compacted to obtain 98% of the maximum dry density, as determined by M.T.O. LS-706, at optimum moisture content, before proceeding to apply a subsequent layer. Do not compact frozen material. Backfill to accommodate the depth of the specified overlying materials.

.4 Where bridging of soft areas is required prior to backfilling, and as directed by consultant, place geofilter and geogrid on subgrade, as per manufacturer’s installation guidelines.

.5 The moisture content of the backfilling material should be adjusted to optimum moisture content by pre-mixing stockpiles prior to installation or “working” moisture into the subgrade soil by discing or other suitable agitation

3.6 BACKFILLING

.1 The excavated trench must be back filled as soon as possible following completion of the work.

.2 For backfilling below landscaped areas without trees, place approved material in maximum 300mm layers, loose thickness. Compact each layer to 95% of the maximum dry density, as determined by M.T.O. LS-706, using manually operated vibratory tampers. Minimum weight of vibratory equipment to be 25 kg and maximum face area to be .065 m2. Backfill to accommodate the depth of the specified overlying materials.

.3 For backfilling roof slab downturns or excavations adjacent to foundation walls, place material in maximum 300mm layers, loose thickness. Compact each layer to 98% of the maximum dry density, as determined by M.T.O. LS-706, using manually operated vibratory tampers. Minimum weight of vibratory equipment to be 25 kg and maximum face area to be .065 m2. Backfill to accommodate the depth of the specified overlying materials.

.4 For backfilling below landscaped areas with trees:

.1 To prevent the soil and tree roots adjacent to the trench from drying out while the trench is open, the Contractor is to water the soil 2 feet away from the face of the trench on a daily basis until the trench is backfilled. Watering is to be applied slowly, at a rate so as to avoid runoff. Sufficient water is to be applied to penetrate the top 3 inches of soil.

.2 Backfill must gently tamped and applied such that the grade will be level with surrounding existing grades, taking into account soil settling. Finished topsoil surface must be smooth and firm against footprints, with a fine loose texture. Finished topsoil surface is to be free of rocks or other deleterious material.

3.7 GRADING

.1 Do grading required for paved, sodded and landscaped areas.

.2 Cut and fill as required. Make allowance for depth of surface finishes and base courses. Rough grade areas to within ±75 mm of required subgrade.

.3 Establish and maintain line and grade stakes for duration of grading operations.

.4 Uniformly slope grade between elevations shown and at slope top and toe of slopes.

.5 Unless otherwise shown, match the existing slopes and elevations and with following parameters. Final elevations and slopes to be confirmed on site:

.1 Driveways: min. 2.0%, max 4.0%

.2 Playground areas: min. 2.0%, max 6.0%

.3 Parking areas: min. 2.0%, max. 3.0% perpendicular to parking bay, max. 4.0% parallel to parking bay

.4 Sidewalks: min. 2.0% crossfall, max 3.5% crossfall

.5 Soft landscaped areas: min. 2.5%, max 25%

.6 Drainage swales: min. 0.5% (preferably 1.0%)

.6 Proofroll existing subgrade below paved areas with a heavy static roller to consolidate existing soil to minimum 98% SPMDD. Sub-excavate soft and excessively wet spots and backfill with suitable granular material compacted to 98% SPMDD.

.7 Establish subgrade parallel to finish grades and shape in manner to permit drainage of water in the event of heavy rain.

.8 Finish grading must not require the installation of handrails.

3.8 DRAINAGE LAYER ON ROOF DECKS

.1 Provide continuous, minimum 150mm thick clear limestone drainage course, compacted on concrete roof slab, if grades permit.

.2 Place filter cloth over all areas of drainage course. Clamp to drain inlets.

END OF SECTION 31 23 10