TENDER DOCUMENTS

For
Parking Garage Repairs

At
Guelph Parkades
Guelph

Owner:  City of Guelph
         1 Carden Street
         Guelph, Ontario

Engineer: Brown & Beattie Ltd.
          556 Edward Avenue
          Unit 71
          Richmond Hill, Ontario
          L4C 9Y5

Ref.:    .gar/s

Date:    March, 2010
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PART 1: GENERAL

1.1 DESCRIPTION OF THE WORK

.1 The intent of the work is to local repair and waterproofing of the ‘East’ and ‘West’ Parkades in downtown Guelph (off Macdonnell Street)

.2 The proposed work includes the following:

**West Parkade:**

i. Supply and install heavy duty elastomeric waterproofing system on the cast-in-place concrete ramp assembly at the P2 level, including fully encapsulating all related curb assemblies and onto surrounding slab surfaces by a minimum of 400mm. (It may be assumed that all traffic will be diverted around this ramp for the duration, provided the installation is completed without undue delay in the sole discretion of the Engineer).

Re-apply affected traffic markings to match existing.

ii. Supply and install 2 drains and 30’ above-grade drainpipes.

iii. Remove and replace the gland style expansion joint waterproofing system on the ‘P6’ level as authorized, including ‘welding’ to existing, upturns, nosing replacements, etc. Take care to recess the top of the joint sealant to below the adjacent slab/nosings.
iv. Supply and install heavy duty elastomeric waterproofing system on all exposed suspended floor slabs (P5 to P2) from the existing expansion joint nosings to at least 750mm either side of the nosing, as necessary to waterproof the construction joints resulting from prior through-slab repairs alongside these expansion joints. (It may be assumed that traffic will be diverted around essentially ‘half’ of the length of all of the expansion joints at a time for the duration of each phase of waterproofing provided in the sole discretion of the Engineer there is no undue application delays.)

v. Work with the Engineer to CAREFULLY expose at selected locations existing post tensioning cables to facilitate related inspection and repair as directed on site under authorized Labour and Material Unit Rates.

**Elevated Walkway:**

vi. Identify all delaminated concrete on the elevated walkway and repair as specified where authorized by the Engineer.

vii. Supply and install drains as directed by the Engineer, including related above-grade drainpipes.

viii. Supply and install new elastomeric waterproofing system and gland type expansion joint sealant system on all horizontal topside walkway surfaces as well as ‘downturns’ to soffit drips. Include area over the loading dock, but not step assembly closest to the street. Incorporate ‘gland’ type expansion joint seal into top of the slab at the construction joint where these sections meet.
ix. Identify deteriorated or damaged steel railing components and weld repair as directed on site by the Engineer under Labour and Material Unit Rates as authorized.

x. Prepare by mechanical means and FULL prime and paint with MINIMUM 2 coats all railing components, including fully encapsulating baseplate assemblies with waterproof sealant coverings.

xi. **East Parkade:**

xii. Remove all concrete and mastic/asphalt from around drains to facilitate waterproofing as site conditions dictate by the Engineer around existing drains. Replace surrounding with approved mastic or HL3A asphalt (hot-applied) as required.

If authorized, remove and replace existing drain assemblies in conjunction with surrounding waterproofing replacements. Relocate or supply and install new drains as directed. Carry concrete repairs not associated with drain replacements in Unit Rates.
xiii. Identify all leaks and delaminated concrete within designated work areas and repair as specified where authorized by the Engineer and in accordance with suitable Unit Rates.

.3 The Owner reserves the right to enter into a contract for all or part of the Work.

1.2 SCHEDULE

.1 Time is of the essence for this project.

.2 All work shall be completed by August 30, 2010. Traffic disrupting work must be done between July 1<sup>st</sup> and August 25<sup>th</sup> 2010.

1.3 EXAMINATION OF SITE AND DOCUMENTS

.1 Make a careful examination of the site with respect to all matters relating to the Work including but not limited to the means of access and egress, any obstacles and the rights and interests of others that may be interfered with during the course of the Work.

.2 Make a careful examination of all requirements referred to in the Tender Documents, Specifications and Drawings.

.3 No allowance will be made after tender submission for any conditions which are known or apparent during the tendering period.

.4 Any available original construction drawings and / or condition surveys will be available from the Engineer for viewing if requested. These documents are for guidance only. All information must be verified by the Bidder.

.5 Drawings are in part diagrammatic are intended to convey the scope of the work and indicate general and approximate locations and arrangement of work. Obtain more accurate information about locations, arrangement and sizes from study and co-ordination of drawings and site conditions.

End of Section 00100
SUPPLEMENTARY CONDITIONS

GENERAL


DEFINITIONS

1. Definition 2; Contract Documents shall also include the Instructions to Bidders and the completed Tender Proposal Form as submitted by the successful bidder.

2. Definition 2; add the words “in writing” after “agreed upon”.

REVISIONS TO THE CONTRACT ARTICLES

Article A-4 Payment, clause (b), paragraph (2); replace the words “Substantial Performance of the Work” with the following: “45 days after publication of Substantial Performance of the Work and the expiry of all liens under applicable legislation”.

REVISIONS TO THE GENERAL CONDITIONS

GC 1 DOCUMENTS

Add the following paragraph to GC 1:

“If the Contractor believes that there is some discrepancy, omission, error or departure from the applicable By-Laws in the Contract Documents or Engineer’s instructions, he shall immediately cease work on the portion affected until resolved with the Engineer and instructed to proceed.”

Replace the last sentence of paragraph 1.6 with the following:

“Notwithstanding the foregoing, documents of later date shall always govern only when they are of the same type.”

Replace paragraph 1.7 with the following:

“The Contractor will be provided with up to two (2) sets of Contract Documents. Additional sets will be provided at the General Contractor’s expense.”

GC 7 DISPUTES

Add the following paragraph to GC 7:
“The Arbitrator shall in no way be financially connected with the Work or the business affairs of either party.”

**GC 12 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK**

Add the following to paragraph 12.2:

“The Contractor shall observe the following procedures when submitting a claim for a change in the Contract price and, if applicable, a change in the Contract Time:

(a) The claim must set out the value of the changes (referred to in the notice of contemplated change) in sufficient detail for a proper assessment to be made including breakdowns of labour and materials for the Contractor and each Subcontractor. The valuations must indicate that additional sums for overhead and profit are included as set out herein.

(b) The claim must indicate that the total value of the changes (referred to in the notice of contemplated change) is the product of the quantity of work involved and of the applicable unit price as set out in the Schedule of Contract Unit Prices or such other unit price as may be agreed upon. Unit prices include all additional sums for overhead and profit. No additional mark-ups are permitted for valuations submitted under this method.

(c) The claim must set out the value of the changes (referred to in the notice of contemplated change) and be accompanied by signed time sheets, invoices and vouchers to enable a proper assessment to be made. The valuation must indicate that additional sums for overhead and profit are included as set out herein.

The valuation for each and every change under methods (a) and (c) is to include additional sums for overhead and profit based of the actual cost of work as follows:

Extras and Credits - Up to $10,000

For Subcontractors: 10 % for overhead and 5 % for profit on the actual cost of their work.

For Contractor: 10 % total for overhead and profit on the valuation of Subcontractor’s work.

For Contractor: 10 % for overhead and 5 % for profit on the actual cost of his work.
Extras and Credits - Over $10,000

For Subcontractors: 10% total for overhead and profit on the actual cost of their work.

For Contractor: 10% total for overhead and profit on the actual cost of his work, or on the valuation of Subcontractor’s work.”

In paragraphs 12.7 and 12.8 change all references from 15% to 30%.

GC 13 APPLICATIONS FOR PAYMENT

Add the following paragraph to GC 13:

“The Contractor shall submit an application for each payment of an acceptable form, complete with a breakdown of the unit rates and quantities showing work performed to date, GST, holdback and if requested, receipts or other vouchers showing his payments for labour and materials, and payments to Subcontractors. No payment will be approved for materials delivered to the site but not yet incorporated into the Work.

The Contractor shall submit with each application a current Certificate of Clearance from the Workplace Safety & Insurance Board.

The Contractor shall submit with each application, after the first, a Statutory Declaration in a form satisfactory to the Engineer that all accounts for labour, subcontracts, products, construction, machinery and equipment and other indebtedness incurred by the Contractor to the last day of the agreed monthly payment period have been paid in full, excepting only holdbacks.

After site review for Substantial Performance and when applying for release of the holdback, the Contractor shall submit to the Engineer all specified warranties, records, maintenance manuals, a Certificate of Clearance from the Workplace Safety & Insurance Board, Statutory Declaration and proof of publication of Substantial Performance.

The Contractor shall submit with each application, after the first, an updated work schedule.”

GC 14 CERTIFICATES AND PAYMENTS

Amend paragraph 14.2 as follows:
Substitute “thirty (30)” for “fifteen (15)” in the second line and revise thus, “The Owner shall make payment.....no later than thirty (30) days after receipt of the certificate for payment issued by the Engineer.”

**GC 16 LAWS, NOTICES, PERMITS AND FEES**

Add the following to paragraph 16.2:

“The Contractor will apply and pay for the Building Permit, if required. The Owner will reimburse the Contractor for the Building Permit fee from the contingency allowance of the Contract.”

**GC 19 INDEMNIFICATION**

Amend paragraph 19.2 as follows:

Substitute “one million dollars” with “two million dollars”.

**GC 20 INSURANCE**

Amend paragraph 20.1 as follows:

Substitute all references to “one million dollars” with “two million dollars”.

Delete paragraphs 20.1 (c) and (d).

Add the following paragraphs to GC 20:

“The Contractor is required to insure against damage to the Owner’s property caused by the Work in the amount of two million dollars per occurrence.

The Contractor is required to submit a Certificate of Insurance which states that all requirements of the Contract are included in his policy coverage.

The Contractor shall name the Owner, Property Manager and the Engineer as additional insured.”

**GC 21 PROTECTION OF WORK AND PROPERTY**

Add the following paragraph to GC 21:

“Should construction be closed down for any cause, the Contractor shall assume all responsibility for protecting the Work during such period.”
GC 23 BONDS

Add the following to GC 23.1:

“.1 Submit a Bid Bond and an Agreement to Bond, issued by a Surety Company licensed to do business in Canada, with the tender.

.2 The Bid Bond shall be in an amount equal to 10 % of the tender price and shall be valid for a period of 60 days from the date of the tender. If the bidder fails to enter into a contract, the surety company shall make up the difference between their bid and the next lowest bid, up to the value of the bond.

.3 The Agreement to Bond shall bind the Surety Company to provide a 50 % Performance Bond and a 50 % Labour and Materials Payment Bond upon award of the contract.

.4 Bids not accompanied by a Bid Bond and an Agreement to Bond, duly signed and sealed by all required parties, may be declared informal.”

Add the following paragraph to GC 23.2:

“The Performance Bond shall be maintained beyond the date of final completion of the work for the full duration of the warranty period. Should the warranty period be extended for any reason the Performance Bond shall be maintained accordingly.”

GC 24 WARRANTY

Amend paragraph 24.2 as follows:

Substitute “one year from the date of Substantial Performance of the Work” with “two years from the date of Substantial Performance of the Work unless otherwise specified in Section 01000 of the Contract”.

Add the following paragraph to GC 24:

“.1 The Contractor shall obtain and submit all manufacturer product warranties in excess of two years to the Owner.

.2 Warranty all work including that related to Change Orders, regardless of the extent, for the period specified, from the date of substantial performance. The warranty period shall be for two (2) years unless otherwise noted.
.3 Submit each warranty in the Contractor's and Owner's names and identifying the Contractor as the warrantor/guarantor.

.4 The warranty shall include all labour and materials for the replacement or repair of the defective work and associated work as the result of faulty materials and/or workmanship.

.5 Promptly correct, at no expense to the Owner, any defects or deficiencies which become apparent within the warranty period.”

GC 25 CONTRACTOR’S RESPONSIBILITIES AND CONTROL OF THE WORK

Amend paragraph 25.6 with the following:

Substitute “to the Owner and Consultant for their information within a reasonable time from the date of Contract award” with “to the Owner and Consultant for their approval prior to the start of construction and within a reasonable time from the date of Contract award”.

GC 34 SHOP DRAWINGS

Add the following paragraph to GC 24:

“The Contractor shall make all requested submissions of shop drawings to the Consultant in sets of three.”

End of Section 00800
PART 1: GENERAL

1.1 SCOPE OF WORK

.1 The work consists of the repair of the parking garages at the Guelph Parkades.

.2 The Scope of Work is summarized in Section 00100, Instructions to Bidders, and detailed in each respective section, the typical details and drawings.

1.2 MOBILIZATION / DEMOBILIZATION / SITE SAFETY / ADMINISTRATION

.1 Mobilize and demobilize all forces including labour, materials, equipment, site office and safety hoarding / fencing necessary to carry out all of the work.

.2 Mobilization also includes all insurance, permits and schedules.

.3 This item includes all site safety and project administration.

.4 Payment for this item will be 50% upon full mobilization and the remaining in increments equivalent to the portion of the work completed, except the final 20% that will not be released until Substantial Performance has been achieved and final clean-up is completed.

.5 Should this item exceed 10% of the total contract price, a detailed breakdown may be required prior to reviewing further the Bidder’s tender.

1.3 SUBMITTALS

.1 Provide an emergency phone number and contact for use by the Engineer or Owner outside of normal business hours.

.2 Submit to the Engineer, if requested, all submittals listed for review. Follow-up fax submissions with originals. Make submissions two weeks prior to requiring a response unless notified otherwise and in an orderly sequence so as not to cause any delay in the Work.

.3 Prior to the start of the Work, submit the following documents for review.

.1 Insurance Certificates.

.2 Bonds.
.3 Clearance Certificate from the Workplace Safety and Insurance Board.

.4 Construction Schedule.

.4 During the course of the Work, submit the following documents for review.

.1 Shop drawings.

.2 Product literature and samples.

.3 Material Safety Data Sheets (MSDS).

.4 Colour samples.

.5 Upon completion of the Work, submit the following documents for review.

.1 Statutory Declaration.

.2 Clearance Certificate from the Workplace Safety and Insurance Board.

.3 Warranty Documentation.

.4 Equipment Manuals.

.6 The issuing of a Statutory Declaration declares that all Subcontractors and Suppliers have been paid what is rightfully owed to them, such that no liens can be legally registered against the property, regardless of the wording of the Statutory Declaration.

1.4 LAYOUT

.1 Verify existing conditions on the site and dimensions shown on the drawings and report any errors or inconsistencies to Engineer before commencing work. Note all irregularities affecting the Work.

.2 Lay out work in accordance with lines and levels, as shown on the drawings. When dimensions and levels are not shown on the drawings, determine site dimensions and levels so that all new work is installed to correct sizes.

.3 Arrange for utility locate services prior to any excavation or digging.
1.5 SITE CONDITIONS

.1 Report in writing to the Engineer, prior to commencing work, any conditions or defects encountered on the site upon which the work depends, and which may adversely affect the performance of the work. Do not commence work until such conditions or defects have been investigated and corrected.

.2 Have the manufacturers and suppliers of any materials and products to be used on this project review the tender documents at the time of tendering and report any discrepancies or concerns to the Engineer before tender closing.

.3 Before commencing the Work, inspect all building components and property within the area of the Work. Report in writing, any damage or items not functioning. Pay to rectify all damage not reported in writing prior to the start of the work.

.4 Commencement of work implies acceptance of surfaces and conditions. No claim for damages or resulting extra work will be accepted except where such conditions cannot be determined prior to construction and brought to the Engineer’s attention prior to disturbance of conditions.

.5 Be responsible for making good, repair and restoration of existing conditions on public or private properties as part of the tendered prices. In all cases blend with existing conditions.

.6 Any item not specifically mentioned in the description of the Work or shown on the drawings but implied or required to complete the work, will be considered to be included in the total and/or unit price.

1.6 BUILDING ACCESS

.1 Workers are not permitted access to the building interior without prior authorization from the Owner.

1.7 PARKING

.1 Limited parking is available. Obtain the Owner’s approval for parking of the Contractor’s vehicles.

.2 Provide a minimum of 72 hours notice to the Owner for the temporary removal of vehicles from parking areas affected by the Work.
GENERAL REQUIREMENTS

1.8 SAFETY


.2 Register the project with The Ministry of Labour by providing them with Form 1000 as required under the Occupational Health & Safety Act. Ensure all sub-trades register with The Minstry of Labour. If requested, provide the Engineer with a copy of the Registration Forms including those from the sub-contractors.

.3 Notify the The Ministry of Labour of the project by providing them with a Notice of Project as required under the Occupational Health & Safety Act. If requested, provide the Engineer with a copy of the Notice of Project.

.4 Work in conjunction with the proper safety associations operating under the authority of the Ontario Workers’ Compensation Act. Do not, in any manner, endanger the safety or unlawfully interfere with the convenience of the public. Be solely responsible for all safety related to the work at the site.

.5 Maintain on Site, readily accessible to those who may be exposed to hazardous materials, a list of all hazardous materials proposed for use together with current MSDS.

.6 Safety precautions are part of the construction techniques and processes for which the Contractor is solely responsible.

.7 Erect and maintain fencing, hoarding, barricades and signage in accordance with governing regulations and as required to ensure public safety or as requested by the Engineer.

.8 Maintain all public, fire and maintenance access to and from the building and parking garage. Where fire routes or fire exits to a building will be disrupted as a result of the work, notify the local Fire Department and implement any recommendations made by them.

.9 Burning of rubbish on site is not permitted.
1.10 Conform to Construction Safety Association of Ontario’s manual on Propane in construction. Watch work area until all chance of danger has passed. Provide Site fire security when required by local building department and/or municipal fire department.

1.11 The Engineer and the Owner have the right to stop the Work for reasons of safety. This in no way shall limit the Contractor’s sole responsibility for safety.

1.12 The Contractor is solely responsible for site safety and protection of property. No instructions from the Owner or the Engineer are to be taken as replacing the Contractor’s total responsibility for safety.

1.9 SCHEDULE

1. The Contractor is solely responsible for the project schedule. Provide a suitable work schedule with sufficient detail, in the opinion of the Engineer, to facilitate tracking critical aspects of the Work towards a satisfactory completion date. Submit updated schedule with each application for payment.

2. When progress of the Work falls behind the schedule submitted by the Contractor, and upon the request of the Engineer, increase the forces on the site as well as hours worked each week in order to catch up to the schedule. This work shall be done without extra cost to the Owner.

3. Do not unduly disrupt normal building and site operations during the Work.

1.10 WORKING TIMES

1. Hours of work on the site shall be approved by the Owner. Weekend work will not be permitted without approval by the Owner.

2. Work may only be carried out between 8:00 a.m. and 5:00 p.m., Monday to Friday inclusive, except for statutory holidays.

3. Seventy-two (72) hours notice is required for work to be performed outside the designated times, if permitted.

1.11 ADDITIONAL WORK
GENERAL REQUIREMENTS

.1 Do not engage in any other work at the site without prior consent of the Engineer and Owner. The consent may be withdrawn at any time should the additional work, in the opinion of the Engineer, jeopardize the Work.

1.12 QUALIFICATIONS OF WORKERS

.1 Provide a site superintendent who will oversee all work carried out at the site. The site superintendent shall be present during all times that work is being carried out.

.2 For operating equipment, use only thoroughly trained and experienced operators.

.3 For installation of various items of work, or for finishing work of any trade, use only personnel thoroughly trained and experienced.

1.13 WORKMANSHIP

.1 Materials are to be applied or installed in accordance with the manufacturer’s written instructions.

.2 Should the manufacturer’s instructions differ from the specifications or drawings, the more stringent, in the opinion of the Engineer, shall apply.

1.14 QUALITY ASSURANCE

.1 As requested by the Engineer, have material and component manufacturers review the installation or application methods and procedures and comment in writing on their acceptability with respect to their requirements.

1.15 SUBCONTRACTORS

.1 Obtain current WSIB Clearance Certificates and Liability Insurance Certificates (minimum $1,000,000 coverage) from sub-contractors. Provide copies to the Engineer if requested.

.2 Ensure that Subcontractors examine the Drawings and Specifications covering their work and the work of all other Subcontractors which may affect their work.

.3 Ensure that all work is carried out in compliance with the Contract Documents and to accept responsibility for delays or costs arising from his failure to inspect or adequately co-ordinate a Subcontractor’s work.
.4 Ensure that Subcontractors and other trades cooperate with other Subcontractors whose work attaches to, or is affected by their own work, and ensure that all required adjustments are made to allow proper attachment of adjoining work.

.5 Ensure that subcontractors do not engage in any other work at the site without prior consent of the Engineer and Owner. The consent may be withdrawn at any time should the additional work, in the opinion of the Engineer, jeopardize the Work.

.6 Communications between the Contractor and the Owner shall be through the Engineer and vise versa. The Contractor shall be responsible for communications with the subcontractors.

1.16 MATERIALS STORAGE & HANDLING

.1 Do not order or store products and materials on site unless specified and samples have been approved by the Engineer.

.2 Deliver products and materials to the job site in good condition and properly protect against damage of any kind, including vandalism.

.3 Store products and materials in a clean, dry location and in a manner to avoid damage. Where products or materials should be kept dry, cover with a waterproof tarpaulin or polyethylene sheeting in a manner that permits air circulation inside the covering.

.4 Store packaged materials in original, undamaged containers with manufacturer’s labels and seals intact. Handle and store materials in accordance with manufacturer’s and supplier’s recommendations. Prevent damage to materials during storage and handling, and replace any damaged materials.

.5 Follow precautionary statements on product labels and Material Safety Data Sheets for storage and handling before use.

.6 Store materials away from open flame or ignition sources.

.7 Remove and replace any damaged materials.

.8 Obtain the Owner's approval of the location and extent of all on-site storage areas. Do not transport materials through the buildings.
1.17 SITE OFFICE AND STORAGE SHEDS

.1 Provide a site office and storage sheds, if required, in approved locations, and maintain as necessary. Remove them when directed or when no longer required.

.2 The site office must be kept in a clean, presentable condition and remain that way until completion of the Work.

1.18 PERMITS

.1 The Contractor will secure and pay for all permits (including the Building Permit if required), fees and inspections required by all authorities having jurisdiction.

.2 The Owner will reimburse the Contractor for the cost of the Building Permit only. Attach a copy of the receipt for the Building Permit fee to the invoice.

.3 Forward a copy of the Building Permit to the Engineer.

.4 Keep a copy of all permits on site.

.5 Keep a copy of the specifications and drawings on site whether a permit has been issued or not. Ensure site supervisors are familiar with the specification and drawing requirements.

.6 If a Building Permit has been issued and significant changes in the scope of work have occurred during the Work, notify and file appropriate details with the local Building Department where the Permit was issued.

1.19 STANDARDS AND CODES

.1 Work shall conform to the 2006 Ontario Building Code and all referenced standards and codes therein.

.2 All Standards, Codes, Regulations, Contract Forms, Manuals, Installation, Application and Maintenance Instructions, referred to in this specification, shall be understood to be the latest published edition including all amendments.

1.20 ALTERNATES
GENERAL REQUIREMENTS

.1 Items specified by trade name shall be used unless an approved equal is stipulated.

.2 Requests for substitution must be submitted with sufficient notice and accompanied by sufficient technical data and testing information to substantiate the claim that the item is equal to that specified.

.3 Approval for the use of an alternate must be received in writing from the Engineer. Such approval may be refused without reason.

.4 The costs incurred by the Engineer to review proposed alternates in subcontractors, materials, procedures, methods, etc. after contract award shall be at the Contractor’s expense. Reimburse the Owner for the Engineer’s costs at the rate of 1.5 times billing. Notice of the invoking of this clause by the Engineer is not required.

.5 Any cost savings resulting from the use of an approved equal shall be passed on to the Owner.

.6 If no trade name is specified, the materials used shall conform to the specified standards and substantiation that the standards have been met must be provided if requested by the Engineer.

1.21 PROTECTION

.1 The building and parking areas not immediately affected by the Work, will remain occupied during the Work.

.2 Take all necessary precautions to adequately protect the building and property from damage. Protect all trees and planting areas that are to remain. Make good all damage at no extra cost.

.3 Protect, relocate and maintain existing utilities and services wherever they are encountered.

.4 Erect suitable safety barriers and warning signs as required for security and to make the site safe for pedestrians.

.5 Construct and maintain hoardings, covered ways and protective canopies as required to maintain access to buildings and public safety. Erect hoarding around all work and storage areas.
GENERAL REQUIREMENTS

.6 Take precautions to protect openings made in existing building from entry of elements and of persons during construction and to protect existing structure and finishes from damage.

.7 Provide suitable protection to prevent rain, ground water, frost, snow or wind damage to exposed sections of the building.

.8 Adequately protect the Work at all stages, and maintain the protection until the Work is completed. Remove and replace any work and materials damaged that can not be satisfactorily repaired at no extra cost.

.9 Damaged work shall be made good by the original trade, but at the expense of those causing damage.

.10 Protect floor and roof surfaces during the Work from all construction activities by using plywood sheathing panels.

.11 Do not load any part of the structure during the Work with loads greater than the design loads. Make all temporary supports as strong as permanent supports.

1.22 EMBEDDED SERVICES

.1 Consult with the Owner regarding the location of embedded conduit and other services prior chipping, drilling, coring, cutting and hydrodemolition into concrete or masonry. Use a metal detector to identify embedded services prior to chipping, drilling, coring, cutting and hydrodemolition.

.2 Examine electrical drawings (if available from the Owner) to determine the potential for embedded conduit prior to chipping, drilling, coring, cutting and hydrodemolition.

.3 X-ray the area of the building prior to work if requested by the Owner. Owner to pay for the cost of such service from the contract contingency allowance.

.4 Do not chip, drill, core, cut or hydrodemolish within 1 metre of any known embedded conduits or services without the approval of the Owner.

.5 The Owner shall repair or replace embedded services damaged by corrosion.

.6 The Owner shall repair or replace embedded services and other related damaged components provided the Contractor follows the above
requirements of this section otherwise the Contractor shall be responsible for such damage.

1.23 TEMPORARY ELECTRICAL SERVICE

.1 The existing electrical service may be used as a temporary service for lighting and the operation of electrical tools and motors during construction to the extent that there is sufficient capacity. Where capacity is insufficient, provide a temporary electrical service. Arrange with the Owner for use of existing services and avoid overloading of circuits.

.2 The Owner will pay for the cost of the power supply for the existing service only.

.3 Where existing lighting fixtures and conduits require removal to complete the Work, provide temporary lighting service. Reinstall original lighting upon completion of the Work.

1.24 TEMPORARY WATER SUPPLY

.1 The existing water service may be used as a temporary water supply for construction purposes.

.2 The Owner will pay for the cost of the water supply for the existing service only. Where existing service is not sufficient, provide for additional service.

.3 Hoses and water containers shall be supplied by the trade performing the work.

.4 All temporary connections must provide a proper shut-off valve and backflow preventer between each existing and temporary service.

.5 Use of hydrants or fire hoses is not permitted without written consent from the Owner.

1.25 TEMPORARY TOILETS

.1 Provide and maintain sanitary temporary toilets and washbasins for the use of workers, in compliance with local by-laws and regulations. Toilets in the buildings shall not be used by anyone engaged in the work without the Owner’s written approval.

1.26 COLD WEATHER CONSTRUCTION
.1 It is the intention of this Contract to work on a continuous basis to complete the Work before cold weather conditions are encountered. Should work be required beyond the date that ambient air temperatures are prohibitive then it may be necessary to postpone the remaining work. If it is decided by the Owner or Contractor to continue, the Work must be carried out under strict cold weather construction criteria, to be established by the Engineer, which will include but not necessarily be restricted to, the provision of temporary heat and protection. Pay for all procedures necessary to either postpone or continue the Work.

.2 Comply with cold weather construction requirements and guidelines in related Codes and Standards.

.3 Some materials must be applied and cured at a minimum temperature. Provide temporary protection by means of enclosures, heat and ventilation as required to maintain proper temperatures for applying and curing materials.

.4 Protect all areas of the Work from cold, wind and rain by enclosing the area with tarps and heating the enclosure.

.5 Pay all costs relating to the provision of temporary heat and ventilation used during the Work, including the cost of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters (propane heaters, etc.), discharging waste products into work area are not permitted.

.6 Furnish and install temporary heat and ventilation in enclosed areas as required to:

   .1 Facilitate progress of the Work.

   .2 Protect the Work and products against dampness and cold.

   .3 Prevent moisture condensation on surfaces.

   .4 Provide ambient temperatures and humidity levels for storage, installations and curing of materials.

   .5 Provide adequate ventilation to meet health regulations for safe working environment and prevent construction fumes from entering the building.
.7 Remove snow and ice affecting any part of the work as soon as possible so that progress is not disrupted. Calcium chloride is not permitted on new concrete surfaces.

1.27 INSPECTION

.1 Provide free access to the Engineer and other authorized personnel to all areas of the Work at all times. Facilitate swing stage access as necessary for the Engineer to inspect the Work and administer the Contract.

.2 Give minimum notice of 36 hours when any phase of the work is ready for inspection.

.3 As and where requested by the Engineer, dismantle portions of the Work completed in his absence should subsequent inspections identify issues of non-conformance.

.4 All materials are subject to inspection by the Engineer on arrival to the site. Any materials not meeting the specifications will be rejected and must be removed from the site immediately.

.5 Allow for the costs associated with providing facilities and access for inspection of the work, excluding the cost of the Engineer’s time which will be paid for by the Owner.

.6 The cost of re-inspection due to deficient work may be the Contractor’s responsibility, including the cost of the Engineer if deemed appropriate by the Engineer. The Engineer’s costs related to disputes may be the Contractor’s responsibility if deemed appropriate by the Engineer.

.7 Inspection of the work by the Engineer does not relieve the Contractor of their responsibility to carry out the work in accordance with the Contract Documents.

.8 Immediately notify the Engineer of a quantity of work which is appreciably greater than that foreseen, as generally defined by the Contract.

.9 Where required, provide notice to the local municipal Building Department of the readiness of the Work for inspection in accordance with Part 2 of the Ontario Building Code.

1.28 MATERIALS TESTING
.1 Arrange and pay for all material testing services as required by the Engineer. The Testing Firm, and all Field Technicians of the firm, shall be CSA certified and must be acceptable to the Engineer.

.2 All testing shall be in accordance with CSA standards.

.3 The Materials Testing Allowance will be used to pay for the testing services only. Submit invoices from the Testing Firm as back-up with corresponding progress claims. No additional charges other than the Testing Firm’s charges will be approved. Pay for costs related to re-testing of failed materials or faulty workmanship.

.4 Provide the Engineer with at least 48 hours notice of intended backfilling, asphalt paving and concrete placement or any other operation requiring testing. The Engineer will stipulate the number and types of tests required.

.5 Provide the Testing Firm with at least 24 hours notice of the required tests. Be responsible for delays associated with the Testing Firm.

1.29 ALLOWANCES

.1 Allowances shall be used to pay for those services as specified under the allowance description. Submit invoices as back-up with corresponding progress claims. No additional charges or mark-up will be approved.

1.30 MAKE GOOD

.1 Make good all damage resulting from work carried out under this Contract. Restore and blend to match surrounding existing conditions.

.2 Unless otherwise specified or required by codes or by-laws to meet a certain requirement or both, make good new work to match existing work.

.3 Where existing work is to be made good, the new work shall match the old work in material, construction and finish, unless otherwise noted or specified.

1.31 MEASUREMENT FOR PAYMENT

.1 Measurements for payment shall be carried out by the Engineer in the presence of the Contractor. Work carried out by swing stages shall be measured by the Contractor and recorded on forms provided by the
Engineer if requested. Provide access to allow the Engineer to verify the Contractor’s measurements.

.2 There are no minimum measurements of work.

.3 The applicable Unit Price shall be applied to the measurements of each part of the Work.

.4 Exceedence of the estimated tender quantities without prior written approval from the Engineer is done so at the Contractor’s risk.

.5 Final measurements for payment of all concrete repairs to be carried out shall be measured and agreed upon by the Engineer and the Contractor prior to commencing patching.

.6 Costs for containing dust within work areas and providing temporary heat will be considered to be included in the Work.

.7 Measurements for localized waterproofing repair shall be taken at the area of waterproofing (including minimum overlaps) only and not the excavation or overburden replaced.

.8 Balcony slab edge repair will be considered slab edge up until the depth repaired equals the slab thickness, unless otherwise noted.

1.32 CLEAN-UP

.1 Leave work areas in a tidy, safe and secure condition at the end of each work day.

.2 Supply a disposal bin for temporary storage of debris at locations authorized by the Owner. Do not locate bins on a structural slab. Remove disposal bins promptly when full and upon completion of the work.

.3 As work proceeds and at the completion of the work each day collect all debris and garbage and store in the disposal bin.

.4 Storage of debris outside of the disposal bin will not be allowed overnight.

.5 Cleaning of the area of the work shall include, but not be limited to:

.1 The removal of rubbish and other unsightly material and/or debris from the building interior, face of the building, adjacent ground areas and from the roof and balcony surfaces.
.2 The removal of dust and other debris from pipes, window frames, sills and other areas by brushing and/or other suitable methods.

.6 As work proceeds remove surplus materials and equipment from the site.

.7 Upon completion of the work, leave areas affected in a condition as close to, or better than the original.

.8 Clean out all drains, catch basins and manholes within the construction area to maintain proper drainage and immediately before final acceptance. Remove all debris, surplus material, temporary facilities, temporary connections, etc.

.9 Clean-up shall be to the complete satisfaction of the Owner and Engineer.

1.33 WARRANTY

.1 Warranty all work including that related to Change Orders, regardless of the extent, for the period specified, from the date of substantial performance. The warranty period shall be for two (2) years unless otherwise noted.

.2 Submit each warranty in the Contractor's and Owner's names and identifying the Contractor as the warrantor/guarantor.

.3 The warranty shall include all labour and materials for the replacement or repair of the defective work and associated work as the result of faulty materials and/or workmanship.

.4 Promptly correct, at no expense to the Owner, any defects or deficiencies which become apparent within the warranty period.

End of Section 01000
PART 1: GENERAL

1.1 GENERAL

.1 The General Instructions, Section 01000, is part of this section and shall apply as if repeated here.

1.2 DESCRIPTION

.1 This section specifies the repair of reinforced concrete.

1.3 SUBMITTALS

.1 Submit concrete and shotcrete mix designs for approval prior to placement.

1.4 TESTING

.1 Concrete

.1 Arrange for testing of concrete by the Testing Firm as directed by the Engineer.

.2 Testing shall be for each day of concrete placement unless otherwise directed by the Engineer.

.3 Tests shall include slump and air content of the plastic concrete.

.4 Test cylinders shall be cast for evaluating the compressive strength potential of the concrete. Additional cylinders may be cast to evaluate the insitu compressive strength.

.2 Polymer Modified Mortar

.1 Arrange for compressive strength testing of mortar by the Testing Firm as directed by the Engineer.

1.5 QUALITY ASSURANCE

.1 Take necessary measures to control cracking in new concrete and patching materials.
### CONCRETE REPAIRS

.2 Should, in the opinion of the Engineer, excessive cracking occur, repair such cracks as required by the Engineer at no additional cost to the Owner.
PART 2: PRODUCTS

2.1 EQUIPMENT

.1 Pneumatic Hammers:

.1 For removal of concrete at and beyond the first level of reinforcing steel: Maximum 7 kg. (15 lb.).

2.2 MATERIALS

.1 The concrete may be repaired using ready mix concrete, site mixed concrete, polymer modified mortar or shotcrete. Concrete pours of 3 m$^3$ or more shall be from ready mixed concrete. Specified compressive strength for each repair material is 35 MPa. Admixtures containing chlorides are not permitted.

.2 Ready Mixed Concrete: Class C-1 conforming to CSA A23.1, supplied by a RMCAO company, with the following properties:

- Course Aggregate: 10 mm maximum
- Air Content: 6-9%
- Slump: 80 mm without superplasticizer
- Water/Cement Ratio: 0.40 maximum

.1 Maximum 25% cementitious hydraulic slag is permitted by weight of total cementing materials. Fly ash is not permitted. Parking garage concrete pours of 3 m$^3$ or more shall include a silica fume in the mix.

.2 Water reducing agent conforming to ASTM C494 Type A.

.3 Air entraining agent conforming to ASTM 260.

.4 Superplasticizer conforming to ASTM C494, Type F. Superplasticizer shall be added to the ready mix truck at the site.

.5 All admixtures shall be from the same manufacturer.

.3 Site Mixed Concrete: Conforming to the requirements of ready mixed concrete above or 10-60 Rapid Mortar (with aggregate extension) and
CONCRETE REPAIRS

Masterpatch 240 CR by BASF or FA-S10 by King Packaged Materials Company.

.4 Site Mix Concrete (for Vertical Surface Repair and Pumping Overhead): LA40 PMAC Repair Mortar and Masterpatch 240 CR by BASF or MS Self-Consolidating Concrete by King Packaged Materials Company.

.5 Polymer Modified Mortar: SikaTop 122 and 123 Plus by Sika Canada Inc., HBA Repair Mortar by Thoroc or Gel Patch by BASF or approved equal.

.6 Mixing Water: From municipal supply; clean, potable and free from deleterious amounts of acids, alkalis and organic matter.

.7 Reinforcing Steel: Epoxy coated deformed bars with 400 MPa yield strength conforming to CSA G30.12-M1977. Minimum size 10M.

.8 Reinforcing Steel Coating: Amerlock 400 High-Solids Epoxy by Amercoat Canada Inc. Colour to sharply contrast with steel and rust.

.9 Touch-up Coating for Epoxy Coated Reinforcing Steel: Epoxy compatible with the existing, Tammsbar by Euclid Chemical or as acceptable to the manufacturer of the reinforcing steel.

.10 Reinforcing Steel Supports: Plastic, precast concrete or plastic coated steel conforming to the requirements of the Reinforcing Steel Institute of Ontario.

.11 Reinforcing Steel Tie Wire: Plastic coated wire conforming to the requirements of the Reinforcing Steel Institute of Ontario.

.12 Bonding Agent: Cement/sand slurry conforming to CSA A23.1. Minimum bond strength 1.0 MPa.

.13 Formwork: Plywood and timber conforming to CSA A23.1.


PART 3: EXECUTION

3.1 GENERAL

.1 Carry out the work in accordance with CSA A23.1.

3.2 IDENTIFICATION OF REPAIR AREAS
.1 Determine the extent of delaminated concrete by hammer tap and/or chain drag. Repair areas shall also include spalled concrete. Mark all areas with spray paint and allow for verification by the Engineer.

.2 Include in the repair those areas of sound concrete adjacent to delaminated concrete as directed by the Engineer.

3.3 PREPARATION

.1 Remove and store surface mounted electrical conduit, light fixtures, signs, drain pipes and other items as required to carry out the work.

.2 Take precautions to determine the location of embedded services and avoid such damage in accordance with Section 01000.

.3 Erect hoarding and dust barriers at the perimeter of the work area to protect the areas of the building not being repaired.

.4 Erect shoring to support the weight of the slab and construction loads. Shoring shall be designed in accordance with Section 01000.

3.4 REMOVAL OF CONCRETE

.1 Remove concrete from the repair areas and continue removal to 20 mm around both layers of bars in the top mat of reinforcing. Should unsound concrete continue beyond this point continue removal until all defective concrete is removed. Avoid damage to embedded services.

.2 Do not damage reinforcing steel that is to remain and avoid damage to sound concrete. Do not remove reinforcing steel without the approval of the Engineer.

.3 Where top and soffit delaminations coincide, repair the area as a through-slab repair.

.4 Remove obsolete chairs, ties and services.

.5 Should unsound concrete continue beyond the limits marked, obtain the Engineer’s approval prior to proceeding with the removal in these areas.

.6 Provide a 12 mm vertical edge at the perimeter of the repair areas. Do not cut reinforcing steel.
.7 Do not stockpile concrete rubble on suspended slabs. Remove rubble from the work area on a daily basis.

3.5 SURFACE PREPARATION

.1 Sound all areas to ensure all defective concrete has been removed. Obtain Engineer’s approval and remove any defective concrete identified as above.

.2 Obtain Engineer’s approval before proceeding with surface preparation.

.3 Abrasive blast clean the concrete surface, exposed reinforcing steel and embedded hardware within the repair areas to remove all materials that may impair the bond of the new concrete including defective concrete, rust, dirt, scale, etc. to the satisfaction of the Engineer and to the reinforcing steel coating manufacturer’s specifications. Wire brushing is not permitted.

.4 Allow for inspection by the Engineer. Repair defective concrete and provide additional abrasive blast cleaning as directed by the Engineer.

.5 For steel joist balconies, abrasive blast clean or grind off excessive rust from joists as directed by the Engineer. Abrasive blast concrete surfaces within the repair area.

3.6 REINFORCING STEEL

.1 Replace severely corroded reinforcing steel as directed by the Engineer. Leave sufficient lap splice length when cutting existing reinforcing in accordance with CSA A23.3-94.

.2 Install additional reinforcing steel to compensate for corroded reinforcing as directed by the Engineer. Replace existing wire mesh where directed by the Engineer.

.3 Apply reinforcing steel coating to the exposed original bars and embedded hardware. Locally apply coating to new reinforcing where epoxy coating is damaged or bars cut. The coating shall be free of voids, holes and cracks after curing so as to completely encapsulate the exposed portion of the bars. Coating of joists, reinforcing steel or wire mesh in steel joist balconies is not required.

.4 Provide necessary support to reinforcing steel as required to ensure correct location of bars.
.5 Secure reinforcing steel to ensure no movement of the bars prior to and during placement of concrete or other repair material.

3.7 FORMWORK

.1 Design falsework in accordance with Section 01000.

.2 Design and erect formwork in accordance with CSA S269.3.

.3 Make forms tight and flush to prevent the leakage of concrete materials.

.4 Apply a form release agent to ensure the forms can be removed readily and without damage to the concrete.

.5 Form expansion joints at location and size as directed by the Engineer or indicated on the drawings.

.6 Install bearing pad above ledge beams. Pads shall cover the entire exposed surface of the ledge and extend 25 mm beyond the face.

.7 Locate construction joints as directed by the Engineer.

.8 Do not remove shoring, falsework or formwork unless directed by the Engineer.

3.8 CONCRETE PLACEMENT

.1 Maintain concrete substrate continuously moist for 24 hours prior to placement of concrete.

.2 Immediately prior to placing concrete remove ponding water and scrub bonding agent into concrete surfaces.

.3 Place concrete while bonding agent is still damp.

.4 Consolidate concrete thoroughly around all reinforcing and embedded hardware using vibrators and other means as necessary.

.5 Slope slabs towards drains and away from columns and walls.

3.9 POLYMER MODIFIED MORTAR PLACEMENT
.1 Apply a slurry coat to the concrete surface as required by the manufacturer.

.2 Mix and apply mortar in accordance with the manufacturer’s instructions.

3.10 FINISHING AND CURING

.1 Finish surfaces to the lines and levels of adjacent concrete.

.2 Provide a suitable finish for surfaces to be coated with protective membrane or sealer. Provide a wood float finish for shotcrete.

.3 Cure concrete and shotcrete with wet burlap or other suitable means and keep continuously moist 7 days or as required by the manufacturer for polymer modified mortar. Commence curing immediately after finishing. Do not use curing agents on surfaces to receive a protective membrane or sealer.

3.11 MAKE GOOD

.1 Upon removal of formwork remove concrete surface irregularities, particularly at the perimeter of through-slab repair areas. Make good by patching with polymer modified mortar at no additional cost.

.2 Paint wall, soffit and through-slab repair areas to match existing.

.3 Reinstall surface mounted conduit, light fixtures, signs, drain pipes and other items removed to facilitate the work.

End of Section 03500
PART 1: GENERAL

1.1 GENERAL

.1 The General Instructions, Section 01000, is part of this section and shall apply as if repeated here.

1.2 DESCRIPTION

.1 This section specifies the application of multi-ply, fully reinforced and mechanically fastened, hot-applied rubberized asphalt waterproofing systems.

1.3 SUBMITTALS

.1 Submit a letter from the Manufacturer certifying that the surface preparation and installations are satisfactory.

1.4 TESTING

.1 Repair all test cuts made by the Engineer.

.2 Establish that the surfaces are waterproof by water testing prior to replacement of the overburden materials.

1.5 QUALITY ASSURANCE

.1 Waterproofing materials shall be applied by a Contractor approved by the Manufacturer and the Engineer. Provide written evidence of approval from the Manufacturer as requested.

PART 2: PRODUCTS

2.1 MATERIALS

.1 Membrane: Hot-applied fabric reinforced rubberized asphalt membrane system conforming to CGSB 37-GP-50M and OPSS 1213. One of the following double application, fully reinforced systems.

- Monolithic Membrane 6125 by Hydrotech Membrane Corporation
- Hot Applied Rubberized Asphalt Waterproofing 790-11 by Bakor Inc.
- Tremproof 6100 by Tremco Limited
.2 Primer: Asphalt based, conforming to CGSB 37-GP-9M as recommended by the membrane manufacturer.

.3 Fabric Reinforcement: Polyester spun-bonded sheet as recommended by the membrane manufacturer.

.4 Elastomeric Reinforcing Sheet: Heavy duty, butyl sheet as recommended by the membrane manufacturer. Thickness; 63 mils.

.5 Modified Bitumen Reinforcing Sheet: Non-woven polyester reinforcing mat coated with SBS modified bitumen conforming to CGSB 37-GP-56M, NP180 S/S or P/P Base Sheet by Bakor Inc. or approved equal by Soprema Waterproofing Inc. or Tremco Limited.

.6 Mastic Asphalt Traffic Topping: Duromastic Traffic Topping by Duron Ontario Ltd. or Florastic Hot Applied Mastic by Vulcan Asphalt & Supply Ltd.

.7 Separation Sheet: Asphalt impregnated glass fibre sheet by CanRoof Corporation Inc. or approved equal.

2.2 EQUIPMENT

.1 Heat the membrane material in a double-jacketed oil bath kettle with agitator. The kettle shall have calibrated thermometers for the oil and membrane.

PART 3: EXECUTION

3.1 PREPARATION

.1 Remove existing waterproofing materials from surfaces to receive new waterproofing. Avoid damage to concrete.

.2 Repair the concrete substrate as directed elsewhere.

.3 Prepare terminations at existing waterproofing that is to remain to ensure a minimum 150 mm overlap. Remove the protection board from the existing waterproofing for a distance of 150 mm, exposing the underlying existing membrane. Ensure the underlying membrane is clean and dry. Saw cut reglets into the concrete, 3 mm wide, at the edge of the new waterproofing.
Where the existing waterproofing is not bonded, prepare both the waterproofing and the concrete below as necessary to “sandwich” the existing between two layers of new waterproofing.

.4 At up-turns provide a saw cut reglet on the vertical surface for termination of the top of the waterproofing. Ensure the reglet is free of dust and debris.

.5 Abrasive blast clean surfaces to receive new waterproofing as necessary to remove all materials that may hinder the adhesion of the new membrane.

.6 Provide protection to adjacent surfaces.

3.2 EXAMINATION

.1 Examine all surfaces for suitability of the application of the waterproofing. Report any defects to the Engineer. Commencement of work implies acceptance of conditions by the Contractor.

.2 Have the membrane manufacturer’s representative examine the preparation and verify the acceptability of the existing conditions and installations, specifically with respect to the substrate.

.3 Have the manufacturer comment on the compatibility of the membrane with the existing waterproofing that is to remain.

.4 Have the manufacturer confirm that the joints in the protection board will not result in cracking of the asphalt pavement when paving directly over top.

3.3 APPLICATION

.1 Apply primer to the concrete surfaces to receive membrane and both sides of the elastomeric sheets and fastening bars at a rate recommended by the membrane manufacturer and allow to thoroughly dry.

.2 Pre-treat construction joints and cracks where directed by the Engineer by the application of 2 mm layer of membrane and embedding a 300 mm wide modified bitumen base sheet, torched in place.

.3 Apply one layer of membrane to a minimum thickness of 3 mm. Place fabric reinforcing in hot membrane. Lap adjacent sheets 50 mm. Apply a
second layer of membrane to a minimum thickness of 3 mm over the fabric reinforcing. Apply additional layers of membrane over rough areas of concrete prior to the general waterproofing to ensure a minimum thickness of 6 mm.

.4 At junctions between the new membrane and the existing waterproofing, overlap the waterproofing 150 mm. Prior to application of the new membrane, heat the edge of the existing waterproofing to soften it. Allow material to cool and lay a polyethylene separation sheet over the membrane prior to installation of protection boards.

.5 Reinforce the membrane at drains with an elastomeric sheet. The sheet shall be minimum 450 mm square with holes for the clamping ring bolts. Embed the sheet immediately following the application of the first layer of hot membrane to ensure complete adhesion of the sheet. Place the sheet directly over the drain such that the clamping ring bolts pass through the holes in the sheet. Cut a 100 mm diameter hole in the elastomeric sheet upon application of the second layer of hot membrane. Secure clamping ring to drain body.

3.4 MASTIC ASPHALT WATERPROOFING

.1 Apply one layer of membrane to a minimum thickness of 3 mm. Place a separation sheet installed over top and lap adjacent sheets 50 mm. Extend waterproofing 150 mm at up-turns and down-turns.

.2 Reinforce the membrane at expansion joints with an 300 mm wide elastomeric sheet fully adhered to the membrane. Embed the sheet immediately following the application of the first layer of hot membrane to ensure complete adhesion of the sheet. Loop the sheet into the expansion joint to a minimum depth of 25 mm. Lap ends of adjacent sheets 300 mm.

Mechanically fasten the elastomeric sheet to adjacent walls and columns with a metal fastening bar. Apply a second layer of membrane to form a double reinforced layer of waterproofing. Fill the expansion joint loop with membrane material and completely cover the metal fastening bar.

.3 Prior to general application of the mastic asphalt traffic topping form mastic asphalt cants at columns and walls. Build cants as necessary to slope the surface away and ensure the membrane on the columns and walls is completely covered after a general traffic topping installation.
4. Apply mastic asphalt traffic topping over top of waterproofing to a thickness of 20 mm. Dimple mastic surface on interior ramps for traction purposes. Form joints in the mastic asphalt at expansion joints and other locations as directed by the Engineer. Fill joints with hot pour sealant.

3.5 WATER TESTS

1. Perform water tests as and where directed by the Engineer.

2. Pond water to a 50 mm depth for a minimum period of 24 hours.

3. Notify the Engineer of the start of the test and arrange for a review of the test in progress. Inspect the walls and soffit immediately below the test areas.

4. Repair defects in the waterproofing to the satisfaction of the Engineer. Repeat water test until the area is determined to be in a watertight condition.

5. Remove water at the end of the test.

End of Section 07100
PART 1: GENERAL

1.1 GENERAL

.1 The General Instructions, Section 01000, is part of this section and shall apply as if repeated here.

1.2 DESCRIPTION

.1 This section specifies the application of elastomeric waterproofing.

1.3 SUBMITTALS

.1 Submit a letter from the manufacturer certifying that the surface preparation is satisfactory.

1.4 TESTING

.1 Repair all test cuts made by the Engineer.

.2 As directed by the engineer, establish that the surfaces are waterproof by water testing.

1.5 QUALITY ASSURANCE

.1 Waterproofing materials shall be applied by a Contractor approved by the manufacturer. Provide written evidence of approval from the manufacturer as requested.

PART 2: PRODUCTS

2.1 MATERIALS

.1 Garage Waterproofing: Polyurethane membrane and wear course system conforming to ASTM C-957. Auto-Gard II by Neogard, Duodeck by Duochem Inc. or Vulkem 350(or 360)/950 by Tremco. Colour to be selected by the Owner from the manufacturer's standard range.

Auto-Gard II shall consist of base coat (20 mils dry), wear course (20 mils dry in two applications with aggregate broadcast between) and top course in drive aisle (12 mils dry).
Duodeck shall consist of 390 membrane (20 mils dry), 391 wear course with aggregate broadcast (25 mils dry, 36 mils at turns and ramps) and for exterior applications 394 top coat (5 mils dry).

Vulkem shall consist of 350 (or 360) membrane (25 mils dry), 950 wear course (12 mils dry with aggregate broadcast, 18 mils at drive aisles and ramps) and 950 top coat (12 mils dry). Use 951 in lieu of 950 for exposed locations.

.2 Cant Bead Sealant: Urethane sealant, Neogard 70991 by Neogard, Sonolastic NP 1 or NP 2 by BASF, Vulkem 116 by Tremco or as approved by the membrane manufacturer.

.3 Crack Repair Sealant: Urethane sealant, THC 901 by Tremco Ltd., Sikaflex 1CSL by Sika Canada Inc. and Sonolastic NP 2 and SL 2 by BASF.

PART 3: EXECUTION

3.1 PREPARATION

.1 Repair the concrete substrate as directed elsewhere.

.2 Abrasive blast clean concrete surface to receive waterproofing including the bottom 150 mm of columns and walls.

.3 Sound the slab surface by chain dragging or other suitable means. Mark and repair any unsound concrete as directed elsewhere.

.4 Seal openings around pipes, conduits, etc. with non-shrink grout or polymer modified mortar.

.5 Where specified construct concrete curbs around mechanical equipment and services.

.6 Install expansion joint seals as specified elsewhere.

.7 Apply a bead of sealant at all up-turns as required by the manufacturer.

.8 Repair cracks (greater 1.5 mm wide) by routing out to 6 mm wide x 6 mm deep as directed by the waterproofing manufacturer. Install suitable bond breaker and fill with sealant.
ELASTOMERIC WATERPROOFING

.9 Allow concrete repair materials to sufficiently cure prior to application of the waterproofing materials. Do not apply waterproofing unless ambient and substrate temperature is at least 4°C.

.10 Mask walls, columns and other surfaces to ensure clean finished edge to the waterproofing.

3.2 EXAMINATION

.1 Examine all surfaces for suitability of the application of the waterproofing. Report any defects to the Engineer. Commencement of work implies acceptance of conditions.

.2 Have the manufacturer examine the preparation and verify the acceptability of the existing conditions, specifically with respect to the substrate.

.3 Have the manufacturer comment on the compatibility of the membrane with any existing waterproofing that is to remain.

3.3 APPLICATION

.1 Blow surfaces clean with oil-free compressed air immediately prior to waterproofing.

.2 Apply primer to the concrete surfaces to receive membrane as required by the manufacturer.

.3 When tying into existing waterproofing that is to remain, prepare surface and apply primer as required by the manufacturer to provide a minimum overlap of 100 mm.

.4 Pre-treat construction joints and cracks (up to 1.5 mm wide) with the application of a stretch coat of membrane (30 mils dry thickness) along the line of the crack or joint 100 mm wide.

.5 Apply one coat of membrane base coat over the entire surface. Extend waterproofing 150 mm up walls, columns and penetrations. Tie in the membrane at drains.

.6 On balconies, extend the waterproofing down the outside vertical face and into the drip slot on the underside.
.7 Extend waterproofing minimum 25 mm onto elastomeric expansion joint block-outs.

.8 Allow the membrane to dry and apply wear course coat while broadcasting in the aggregate and backroll as specified by the manufacturer. Remove excess aggregate.

.9 Apply an additional wear course layer in high traffic areas as specified.

.10 Apply top coat as specified.

3.4 PROTECTION

.1 Protect the waterproofing during each stage of the application until suitable for vehicular and pedestrian traffic.

3.5 TRAFFIC MARKINGS

.1 Reinstate traffic markings to match original layout unless otherwise specified.

3.6 MAKE GOOD

.1 Remove masking.

End of Section 07570
PART 1: GENERAL

1.1 GENERAL

.1 The General Instructions, Section 01000, is part of this section and shall apply as if repeated here.

1.2 DESCRIPTION

.1 This section specifies the installation of expansion joint seals for parking garage floor slabs.

1.3 SUBMITTALS

.1 Submit a letter from the manufacturer certifying that the gland size is suitable for the joint width and that the surface preparation is satisfactory.

1.4 TESTING

.1 Water test the repaired expansion joints prior to leaving the site. Repair areas not watertight as directed by the Engineer and the manufacturer.

1.5 QUALITY ASSURANCE

.1 Expansion joint materials shall be applied by a Contractor approved by the manufacturer. Provide written evidence of approval from the manufacturer as requested.

PART 2: PRODUCTS

2.1 MATERIALS

.1 Expansion Joint Seal: Neoprene gland with elastomeric concrete nosing. Permacrete WF Expansion Joint System by Permaquik Corporation, WaboCrete Membrane by Watson Bowman Acme (BASF) or Polycrête/WM-Series System by Erie Metal Specialties. Gland size to suit site conditions.

.2 Fastening Bar: 3 mm x 38 mm aluminum with pre-drilled holes complete with compatible fasteners.

PART 3: EXECUTION
3.1  FABRICATION

.1 Site measure expansion joint. Joint sealant to extend 150 mm up walls.

.2 Fabricate gland to suit site measurements and provide one continuous piece where practical. Factory weld all joints.

.3 Upon delivery to the job site allow the gland to relax. Clean gland surfaces as required by the manufacturer.

3.2  PREPARATION

.1 Create a block-out (100 mm wide x 25 mm deep) on either side of the expansion joint by saw cutting and concrete removal. At joint terminations at columns or walls continue the block-out 150 mm up the vertical surface.

.2 Cut out slab edges as necessary to facilitate gland installation.

.3 Remove existing expansion sealant.

.4 Abrasive blast clean the concrete surfaces forming the block-out to ensure proper adhesion of the elastomeric concrete. Blow surfaces clean.

.5 Mask the edges of the block-out to ensure a clean finished product.

3.3  INSTALLATION

.1 Position the gland in joint block-out. Apply primer or tack coat as required by the manufacturer.

.2 Mix and apply elastomeric concrete in accordance with the manufacturer's instructions. Adhere the gland in position and fill the block-out.

.3 Build up the slab level with the elastomeric concrete to provide a slope away from either side of the joint.

.4 Where expansion joints are parallel to walls or columns mechanically fasten the adjacent gland flap to the wall using a continuous fastening bar secured at 450 mm spacing. Seal the fasteners and the top of the flap using a bituminous sealant.

.5 Protect the installation until suitable for vehicular traffic.
End of Section 07950
PART 1: GENERAL

1.1 GENERAL

.1 The General Instructions, Section 01000, is part of this section and shall apply as if repeated here.

1.2 DESCRIPTION

.1 This section specifies the supply and installation of garage floor drains and related drain pipe.

1.3 SUBMITTALS

.1 Submit to the Engineer for review, shop drawings of each type of drain proposed. Do not commence installation until shop drawings have been accepted.

1.4 QUALITY ASSURANCE

.1 Work shall comply with applicable plumbing codes and standards.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Protect products during handling and storage to prevent rusting, staining, abrasion of finish coatings and other damage.

.2 Replace products deemed unacceptable by the Engineer.

PART 2: PRODUCTS

2.1 MATERIALS

.1 Drains: Medium duty, epoxy-coated cast iron drain with waterproofing clamp ring by Ancon, Watts Drainage or Zurn Industries Limited, complete with sediment bucket and hinged grate. Minimum 200 x 200 mm.

.2 Above-Grade Drain Pipe: Cast iron, minimum 100 mm diameter, complete with a clean-out for each drain.

.3 Below Grade Drain Pipe: Poly-vinyl chloride (PVC), minimum 100 mm diameter.

.4 Non-shrink Grout: SikaGrout 212 by Sika Canada Inc. or approved equal.
PART 3: EXECUTION

3.1 PREPARATION

.1 Consult with the Engineer to determine locations for new drains.

.2 Determine the interior building and/or garage conditions below each drain location.

.3 Remove existing drains and drain pipe as directed by the Engineer. Repair existing drain openings not to be reused as specified elsewhere.

3.2 DRAIN INSTALLATION

.1 Install new floor drains at locations designated by the Engineer.

.2 Do not install drains through beams or drop panels without prior approval of the Engineer.

.3 Use a core drill to cut drain openings. Cut holes no larger than required to install drain. Avoid damage to existing reinforcing by using a metal detector. Take precautions to determine the location of embedded services and avoid such damage in accordance with Section 01000.

.4 Set drain at the appropriate level to prevent water from ponding on the slab.

.5 Provide a clean-out with each drain installed.

.6 Completely repair the space between the drain and core hole with non-shrink grout.

3.3 ABOVE-GRADE DRAIN PIPE

.1 Install drain pipe and connect to existing sanitary sewer system. Ensure drain pipe has a minimum 2% slope.

.2 Supply and install all necessary elbows, T's, Y's, clamps and hangers, etc.

.3 Install pipe hangers at appropriate spacing using suitable expansion anchors.
4 If necessary, extend the drain pipe to the lower parking levels by core drilling through the garage floor slabs. Repair the slabs with non-shrink grout.

3.4 BELOW-GRADE DRAIN PIPE

1 Install drain pipe below slab on grade only where suitable connection cannot be made to the existing sanitary sewer system with above-grade drain pipe and where approved by the Engineer.

2 Determine the location of new below-grade drain pipe, saw cut the slab on grade and remove the concrete to the full depth of the slab.

3 Excavate subgrade material as necessary to install pipe.

4 Lay pipe to ensure positive drainage and connect to sanitary sewer system.

5 Backfill with existing material and lightly compact.

6 Reconstruct slab on grade using Class C-2 ready mixed concrete.

3.5 PROTECTION

1 Protect drains and drain pipes until acceptance by the Engineer and Owner.

3.6 MAKE GOOD

1 Repair any garage floor slab waterproofing damaged during the installation as specified elsewhere.

End of Section 15430