BID FORMS

PROJECT NAME:

Miscellaneous Site Repairs
22291 Charing Cross Road, Chatham-Kent
(Hydro One - Kent Operations Centre)

SUBMITTED BY:

_____
Contractor Name

_____
Contractor Address

Herein after called the Contractor

SUBMITTED TO:

BGIS
4175 14th Avenue
Markham, ON
L3R 0J2

Herein after called the Consultant

ON BEHALF OF:

Hydro One
c/o BGIS
4175 14th Avenue
Markham, ON
L3R 0J2

Hereinafter called the Owner

We the undersigned, have carefully examined the site, the conditions pertaining to the work, and the bid documents and specifications, including Addenda Nos. _____. We offer to enter into a contract to complete the work described plus or minus any work identified by the Consultant in accordance with the requirements of the bid documents and specifications for the price given in the bid breakdown below.

By submitting this bid, the Contractor confirms that:

1. This bid is made without any connection, comparison of figures or arrangements with, or knowledge of, any other corporation, firm or person making a bid for the same Work except for prices submitted for sub-contracts, and is in all respects fair and without collusion or fraud.

2. This bid will be left open for acceptance for a period of 60 days from the date of closing.

3. The drawings and specifications have been examined and there are no materials or methods indicated to which the Bidder objects or for which the Bidder would be unwilling or unable to

accept responsibility. The Bidder agrees that after signing the Contract, full responsibility for the performance of the Work will rest with the Bidder and the Owner is in no way to be held liable.

BID BREAKDOWN

Accurate quantities and allowances for parts of the Contract cannot be pre-determined and will only be established at the time of actual field work. The estimates shown below are approximate and shall serve as a guideline only to standardize quantities and allowances used when bidding. The prices submitted are for the completed work, excluding HST but including all other applicable taxes, overhead, profit and all other Contractor expenses.

All other items, whose quantities can be pre-determined, but not specifically itemized and described below, including items shown on drawings, discussed in the scope or other supporting documentation, or required to complete the work are to be quoted under “All Other Items”.

1. BASE BID ITEMS

Item No.	Item Description	Estimated Quantity	Unit Price	Price for Item
1	**General**			
1.1	Mobilization	-	Lump Sum	$
1.2	Access and Site Protection	-	Lump Sum	$
1.3	Phasing	-	Lump Sum	$
1.4	Handling and Disposal of Hazardous Building Material	-	Lump Sum	$
1.5	Demobilization	-	Lump Sum	$
2	**Masonry Repairs**			
2.1	Masonry Unit Replacement	700 units	$ / ea	$
2.2	Mortar Joint Repointing	40 m	$ / m	$
2.3	Retrofit Masonry Ties	15 ties	$ / ea	$
2.4	Underpin Masonry Veneer	8 m	$ / m	$
3	**Sealant Repairs**			

Item No.	Item Description	Estimated Quantity	Unit Price	Price for Item
3.1	Window Face-Sealing and Perimeter Sealing	-	Lump Sum	$
3.2	Masonry Control Joint Sealant Replacement	-	Lump Sum	$
3.3	Seal Wall Penetrations	10 locations	$ / location	$
4	**Miscellaneous Repairs**			
4.1	Clean and Coat Base of Existing Overhead Door Track			
a)	Overhead Door OH1	-	Lump Sum	$
b)	Overhead Door OH2	-	Lump Sum	$
c)	Overhead Door OH3	-	Lump Sum	$
4.2	Clean and Coat Existing Man Door Panels and Frames, and Perimeter Sealing			
a)	Man Door – D1	-	Lump Sum	$
b)	Man Door – D2	-	Lump Sum	$
c)	Man Door – D3	-	Lump Sum	$
d)	Man Door – D4	-	Lump Sum	$
e)	Man Door – D5	-	Lump Sum	$
f)	Man Door – D6	-	Lump Sum	$
g)	Man Door – D7	-	Lump Sum	$
4.3	Replace Man Door Frame D4	-	Lump Sum	$
4.4	Replace Weather Stripping and Door Sweep			
a)	Man Door – D5	-	Lump Sum	$
b)	Man Door – D7	-	Lump Sum	$
4.5	Replace Transom Glass at Door D3	-	Lump Sum	$

Item No.	Item Description	Estimated Quantity	Unit Price	Price for Item
4.6	Guard Rail Refinishing			
a)	Concrete Repairs	-	Lump Sum	$
b)	Guard Rail Refinishing	-	Lump Sum	$
5	**Allowance**			
5.1	Miscellaneous Repairs	-	Contingency Allowance	$ 25,000
5.2	Mechanical and Electrical	-	Cash Allowance	$ 10,000
5.3	Testing	-	Cash Allowance	$ 5,000
6	**Bonding** (may be deleted by Owner)	-	Lump Sum	$
7	**All Other Items**	-	Lump Sum	$
Estimated Total Contract Price (excluding taxes):				$

Construction Duration (weeks): **Allow for 20% Down Days due to Weather**	
Start Date (day/month/year):	
Minimum Number of Workers on Site:	

2. OPTIONAL ITEMS

Optional items shall be priced as stand-alone items, including allowances for increases in bonding, access, mobilization and demobilization, supervision and permits. Optional items may be included at the time of award or may be included after award, by Change Order, if required.

For all optional items, indicate if inclusion of the optional item results in a price increase/decrease and schedule increase/decrease.

Item No.	Optional Item Description	Estimated Quantity	Unit Price	Price for Item (+ or –)	Schedule (+ or –)
O1	Masonry Sealer	8 m^2	$ / m^2	$	wks

Item No.	Optional Item Description	Estimated Quantity	Unit Price	Price for Item (+ or –)	Schedule (+ or –)
O2	Door Replacement (in lieu of item 4.3 and 4.4)				
a)	Man Door – D3	-	Lump Sum	$	wks
b)	Man Door – D4	-	Lump Sum	$	wks
c)	Man Door – D6	-	Lump Sum	$	wks
d)	Man Door – D7	-	Lump Sum	$	wks
O3	Overhead Door Operator at OH2	-	Lump Sum	$	wks

3. HOURLY RATES

The following hourly rates (which are to include overhead and profit) may be applicable for changes and work completed with allowances:

Rate No.	Rate Description	Rate
1	Labourer	/ hr
2	Foreman	/ hr
3	Superintendent	/ hr
4	Project Manager	/ hr
5	Electrician	/ hr
6	Painter	/ hr
7	Mason	/ hr
8	Caulker	/ hr
9	Other: _____	/ hr

4. CONTRACTOR'S SITE REPRESENTATIVES

Provide the name and qualifications of the personnel who will be assigned to the project.

Project Personnel	Details
Site Foreman	Name: _____ Company: _____ Years Applicable Experience as Foreman: _____ Total Years' Experience: _____
Site Superintendent (if not the same as the foreman)	Name: _____ Company: _____ Years Applicable Experience as Superintendent: _____ Total Years' Experience: _____
Project Manager	Name: _____ Company: _____ Years Applicable Experience as Project Manager: _____ Total Years' Experience: _____

Backup information regarding personnel experience shall be provided upon request.

Substitute personnel will only be allowed upon approval by the Consultant.

5. PROPOSED SUB-CONTRACTORS

The name of each proposed sub-contractor must be given in the following list. If the Bidder proposes to sublet a part of the work, which is not listed below, the sub-trade and the proposed sub-contractor's name shall be added to the list. Failure by a Bidder to comply with the foregoing requirements may result in default of the Contract.

Failure to supply the name of proposed sub-contractor at the time of the bid shall indicate that work will be performed by the bidding Contractor's own forces. Sub-contractors not proposed at the time of bid shall not be permitted to perform work in this Contract without the Owner's/Consultant's approval.

Preference may be given to contractors relying more on their own forces than sub-contractors.

Sub-Trade	Proposed Sub-Contractor
Caulking	
Concrete	
Door Installer	
Painter	
Masonry	
Other: _____	

SIGNATURES

Signature

Print Name

Company

Witness

Print Name

Date

End of Section 00 41 00

PART 1 - GENERAL

1.1 Objective

Work under this Contract is to complete localized masonry repairs, face-sealing existing windows, replace and install building sealants and re-finishing overhead and man doors at the Hydro One Kent Operations Centre. The work in the Contract is to extend the service life of the structure, to maintain property standards, and to comply with Hydro One labour requirements.

The site is available immediately and the project is to be completed by December 31, 2019.

PART 2 - BASE SCOPE OF WORK

The work includes, but is not limited to, the following applied to areas indicated on the drawings included in this package:

2.1 General

.1 **Mobilization:** Mobilize all labour, equipment, and materials necessary to carry out the work and review of this Contract.

.2 **Access and Site Protection:** Provide and maintain all equipment necessary to maintain safe access and egress to and from the work area for the duration of the project. The operation centre is operational, and the site is occupied. Provide all protection, as required, to avoid damaging the existing building components, property and streets, and to prevent unauthorized access into the work areas. All work is to be completed in accordance with all Hydro One health and safety policies. As part of the work, include for cold weather protection, such as tarping and temporary heating.

.3 **Phasing:** The centre is to remain operational during the project. Provide and maintain access into the buildings and minimize disruption to building occupants. No more than one loading dock and one man-door can be closed off at any one time. Coordinate all emergency exit closures with the local authorities, such as the local fire department.

.4 **Handling and Disposal of Hazardous Building Material:** Take all necessary precautions to handle, disturb and dispose, as necessary, hazardous building materials as per all governing laws and regulations to complete the work herein. Hazardous materials include, but not limited to asbestos and lead, as outlined in the attached designated substance survey.

.5 **Demobilization:** At the conclusion of the work, remove all tools, equipment, temporary protection, unused construction material, waste, etc. from the site. Thoroughly clean the work area before the Consultant's final review.

2.2 Masonry Repairs

.1 **Masonry Unit Replacement:** Mark all deteriorated masonry units for Consultant's review. Where directed by the Consultant, remove and replace spalled, cracked or otherwise deteriorated masonry units.

.2 **Mortar Joint Repointing:** Mark all deteriorated mortar joints for Consultant's review. Where directed by the Consultant, rout out and repoint the joints.

.3 **Retrofit Masonry Ties:** Where directed by the consultant, install retrofit masonry lateral ties.

.4 **Underpin Masonry Veneer:** To the extent shown on SK-01, remove the existing masonry to expose the existing foundation wall, install epoxy coated dowels and install new concrete curb to support the existing masonry veneer as per PD-1. Work to include new through-wall flashing and sealant. Reinstate all adjacent finishes where disturbed to match existing. Include for engineered design outlining the sequence of removal and shoring requirements, if any.

2.3 Sealant Repairs

.1 **Window Face-Sealing and Perimeter Sealing:** Face-seal all existing windows (W1 thru W26). Work includes removing and installing new window perimeter sealant joints including the joint under the sill flashing, new cap beads between all metal to metal joints and installing a fillet bead at metal to glass joints. Work includes all surface preparation, removal of existing butyl that extends onto the exposed glass surface and removing existing sealant between glass to metal joints, where existing.

.2 **Masonry Control Joint Sealant Replacement:** Remove and replace all masonry control joints on the exterior walls, including the transition between masonry to metal siding. As part of the work, include routing out the existing mortar joint beneath the existing sealant, between the masonry units, full depth.

.3 **Seal Wall Penetrations:** Where directed by the consultant, remove the existing sealant if any, prepare the surface and install new sealant at wall penetrations.

2.4 Miscellaneous Site Repairs

.1 **Clean and Coat Base of Existing Overhead Door Track:** Remove all existing rust off the base of the overhead door tracks. Base of the door track is considered to be within 0.5m from finish grade. Prepare the surface and brush apply 3 coats of zinc rich paint with minimum 95% zinc content, 5 mils DFT per coat, to the base of the door tracks. Ensure coated surface is smooth and does not interfere with the overhead roller operation.

.2 **Clean and Coat Existing Man Door Panels and Frames, and Perimeter Sealing:** On both the interior and exterior surfaces, remove all existing rust and loose, flaking deteriorated or otherwise unsound paint from the door panels and frames to SSPC-SP3 surface prep profile. Apply primer to all exposed metal surfaces that were exposed by surface preparation. Apply base and finish coat in accordance to manufacturers written instructions to create a uniform appearance. In addition, remove existing door frame perimeter sealant, install low expansion polyurethane spray foam, and install new sealant. Acceptable paint products are as follow:

Manufacturer	Primer (65 microns DFT)	Base Coat (50 microns DFT)	Finish Coat (50 microns DFT)
ICI Devoe	Devguard 4360	Devguard 4308 (Gloss) or Devguard 4336 (Semi-Gloss)	Devguard 4308 (Gloss) or Devguard 4336 (Semi-Gloss)
Sherwin Williams	Kem Kromik Metal Primer B50 W1	Direct to Metal Enamel B55 Series	Direct to Metal Enamel B55 Series
PPG	Dimetcote 9 / Sigmazinc 9	Hi-Temp 1000 V	Hi-Temp 1000 V
PPG	Hi-Temp 1027	Hi-Temp 1000 VS	Hi-Temp 1000 VS

.3 Replace Man Door Frame D4: Remove and set aside the exiting door panel and all associated door hardware for reuse. Remove and dispose the existing door frame and install new door framing to match existing. Refinish the door panel as per paragraph 2.4.2 and reinstate with all associated hardware. Reconnection of security devices such as fob readers and sensors will be paid out of electrical and mechanical cash allowance.

.4 Replace Weather Stripping and Door Sweep: Remove the existing weather stripping and door sweeps and install new to match existing. New weather stripping shall be in full contact and compressed with the door panel when closed, and door sweep shall be in full contact with the door threshold or floor finish surface to prevent water and air intrusion into the building's interior.

.5 Replace Transom Glass at Door D3: Replace the transom glass at Door D3 with new. New glass panel shall match existing size and thickness. New glass shall be clear, Georgian wire glass. For pricing purpose, assume existing glass to be 6mm.

.6 Guard Rail Refinishing and Concrete Repairs: Complete the following work:

.1 **Concrete Repairs:** Where identified on SK-01, remove the existing guard rail adjacent to the concrete steps and store for reuse. Remove all delaminated concrete at the base of the guard rail. Remove sound concrete as required to achieve a square configuration and to reach corrosion-free steel. Clean and epoxy coat exposed reinforcing steel. Replace concrete and cure new concrete. For pricing purposes, assume 1m^2 at 100mm depth.

.2 **Guard Rail Refinishing:** Remove all existing rust and loose, flaking deteriorated or otherwise unsound paint from the guard rail to SSPC-SP3 surface prep profile. Apply primer to all exposed metal surfaces that were exposed by surface preparation. Apply base and finish coat in accordance to manufacturers written instructions to create a uniform appearance. Reinstate guard rail to original position with new stainless steel anchors. New anchors to be secured with Hilti RE500, minimum 100mm embedment. Acceptable paint products are as follow:

Manufacturer	Primer (65 microns DFT)	Base Coat (50 microns DFT)	Finish Coat (50 microns DFT)
ICI Devoe	Devguard 4360	Devguard 4308 (Gloss) or Devguard 4336 (Semi-Gloss)	Devguard 4308 (Gloss) or Devguard 4336 (Semi-Gloss)
Sherwin Williams	Kem Kromik Metal Primer B50 W1	Direct to Metal Enamel B55 Series	Direct to Metal Enamel B55 Series
PPG	Dimetcote 9 / Sigmazinc 9	Hi-Temp 1000 V	Hi-Temp 1000 V
PPG	Hi-Temp 1027	Hi-Temp 1000 VS	Hi-Temp 1000 VS

.7 **Concealed Repairs:** Complete minor repairs to address unanticipated conditions as found to be necessary and as directed by the Consultant in writing. Payment for this work shall be from the Miscellaneous Repairs allowance on the basis of time and materials or quoted fixed price, as agreed to prior to work proceeding.

PART 3 - OPTIONAL WORK

3.1 Masonry Sealer

Where directed by the Consultant, power wash the exterior masonry walls and apply two coats of penetrating silane/siloxane sealer (MasterProtect H177 by BASF or approved equivalent). Protect all adjacent surfaces as necessary from overspray, including all doors, windows and vegetation.

3.2 Door Replacement

Remove the existing man door, including all associated framing and hardware, including sidelites if present. Install new hollow metal door to fit existing opening. New doors shall match existing, including glass insert, where present, sidelites and all associated hardware such as heavy-duty hinges, door closure, door handle/panic device and glass transom. Reconnection of security devices such as fob readers and sensors will be paid out of electrical and mechanical cash allowance.

3.3 Overhead Door Operator at OH2

Install new hoist operator to operate the overhead door. New operator shall be as follows:

- Rated duty cycle of 12 cycles per hour, less than 50 cycles per day;
- Operator to be wall mounted;
- Operator to have an overload protection
- Include wall mounted 3-button station to allow door to open, close and stop. 3-button station to be located adjacent to the overhead door, approximately 1.5m above finish floor;
- Minimum ½ HP, 115V single phase;
- Photo eye connected to the door operator, mounted at the base of the overhead door; and
- Chain hoist with electric interlock for manual operation in an emergency;
- Two portable remote controls; and
- Secondary monitored entrapment protection device mounted continuously along the bottom of the door, such as the Optical Edge System by LiftMaster.

Work to include installation of the door operator and all necessary hardware to ensure smooth operation of the overhead door, including all necessary electrical feeds. For pricing purposes, allow for 5m to connect to the nearest electrical conduit. Work to meet all governing codes and regulations and pricing to include for ESA permits.

End of Section 01 10 00

PART 1 - GENERAL

1.1 Description

This section specifies the work required for removal of concrete from around corroded embedded reinforcing steel.

1.2 Submittals

.1 Submit engineered shoring drawings if required below.

.2 Submit Model Schedule S-B, Model Schedule S-C, and certificate of professional liability insurance for the shoring design engineer, if applicable.

1.3 Field Review and Testing

.1 Notify the Consultant for review of the following:

.1 Identification of all delaminated concrete;
.2 Completion of removals within the designated areas; and,
.3 Completion of surface preparation.

.2 Concrete removals need to be reviewed by the Consultant before concrete replacement proceeds to facilitate agreement between the Contractor and Consultant regarding to quantities to be invoiced. If there are disagreements regarding quantities of work because the Contractor did not notify the Consultant of review, invoicing amounts shall be based on the Consultant's quantities.

PART 2 - MATERIALS AND PRODUCTS

2.1 Pneumatic Hammers

.1 For removal of surface concrete to the depth of embedded steel, maximum 14kg total weight.

.2 For removal of concrete at and beyond embedded steel, maximum 7kg total weight.

.3 Rivet Busters or tractor mounted tools shall not be permitted.

PART 3 - EXECUTION

3.1 Extent

.1 The extent of unsound concrete on the top surface, edge and underside of suspended slabs shall be determined and clearly marked by the Contractor in a noticeable coloured lumber crayon for review by the Consultant. Unsound concrete includes spalling and/or delaminated concrete which produces a hollow sound when hit with a steel hammer. In areas where delamination has occurred, concrete shall be removed from around reinforcement 100mm beyond the extent of corrosion on the reinforcing steel.

.2 Obtain Consultant's approval prior to removing concrete.

.3 The Consultant may require that sound concrete also be removed in the vicinity of the approved repair areas. This may be required in order to minimize the number of small patches, to eliminate areas of unrepaired concrete protecting into patches, or to investigate the condition of the steel.

.4 Remove all efflorescence or mineral deposits from the soffit using wire brushes or light sandblast. Contain sandblast material. Where existing surfaces are painted, repaint concrete patches with paint approved by Consultant to match adjacent surfaces.

3.2 Removal

.1 Removal methods shall minimize damage to sound concrete which remains. Take measures to prevent damage to reinforcing, drains, or mechanical and electrical services.

.2 If exposed reinforcing steel has less than 12mm concrete cover, contact Consultant before proceeding in this area. Do not saw cut limit of repair areas, so that reinforcing is not cut.

.3 Where concrete is to be removed by pneumatic hammers, saw cut the limit of repair areas 12mm deep. Mechanically roughen and sandblast saw cut edge, prior to placement of patching material. If steel is encountered during saw-cutting, stop work immediately and notify the Consultant before proceeding in this area.

.4 Within the areas designated for repair, concrete shall be removed a minimum 25mm around all reinforcing steel.

.5 Clean chipped material and dust from surface of slab daily.

.6 Do not commence preparation of the repair surfaces until all delaminations and other material specifically located by the Consultant have been located and prepared. Be responsible for ensuring that all designated concrete has been removed.

3.3 Shoring

.1 Shoring shall be required and designed by a Professional Engineer to support the weight of the slab and construction loads when more than 10% of the total slab top or bottom bars running in one direction are exposed within a column strip (i.e., the strip over a column between the mid bay points of two adjacent column bays), or if otherwise directed by the Consultant. Shoring is to be installed prior to beginning removals.

.2 Shoring for columns or other vertical elements shall be provided as required for the extent of concrete removal necessary. Shoring drawings shall clearly show the allowable limits of concrete removal.

.3 Maintain shoring until repair concrete has attained 75% of the specified 28-day strength.

3.4 Vertical Surfaces

.1 When repairing vertical surfaces, do not remove concrete for more than 900mm in any direction at one time, unless engineered shoring is provided. Leave a minimum of 900mm of existing concrete between removal areas until repair material has attained 75% of the specified 28-day strength.

.2 Do not remove concrete deeper or in widths greater than the allowable limits indicated on the shoring drawings.

.3 Do not remove more than 20% of the cross-sectional area of columns and shear walls at one time, unless engineered shoring is provided.

3.5 Final Preparation

.1 Sound entire surface of each section of concrete where removal has been carried out to locate any fractures or loose concrete remaining. Remove all such material without creating new fractures by pneumatic hammers, or blast entire surface of chipped concrete with high pressure water. Repeat process until an entirely sound surface has been produced.

.2 Remove all contaminants or corrosion products from surface to expose clean, fresh concrete. Maintain in this state until new patch material is applied.

.3 Remove all loose dust or dirt from the surface of the concrete prior to placing patch. Use clean compressed air, with oil trap in line.

End of Section 03 01 30

PART 1 - GENERAL

1.1 Description

This section specifies the work required for preparation of reinforcing steel prior to coating, installation of new steel, and splicing of existing steel.

1.2 Environmental Conditions

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

.2 Surface temperatures must be at least 3°C above the dew point when coating reinforcing steel.

.3 For manufacturer-approved touch-up coatings, follow manufacturer recommendations for minimum temperatures.

1.3 Field Review and Testing

.1 Notify the Consultant for final review of steel preparation, prior to proceeding with coating.

.2 Notify the Consultant for final review of all epoxy coating for voids and other defects. The dry film thickness of the cured coating may also be randomly tested by non-destructive means.

PART 2 - MATERIALS AND PRODUCTS

2.1 Reinforcing Steel

.1 New material shall conform to ASTM A775/A775M. All bars shall be deformed and of 400MPa yield strength unless otherwise specified.

.2 New reinforcement shall have factory-applied fusion bonded epoxy coating unless noted otherwise, or unless the reinforcing is to be welded. The epoxy coating shall be of a colour which contrasts sharply with reinforcing steel and rust colours. Brown and grey are not acceptable.

.3 All epoxy coated reinforcing steel must be supplied cut and bent by facilities that are certified by the Concrete Reinforcing Steel Institute Voluntary Certification Program for Fusion-Bonded Epoxy Coating Applicator Plants. Certified epoxy applicators include:

.1 Harris Rebar
.2 LMS Reinforcing Steel Group

.4 Fabricate reinforcement to the requirements of CSA/CAN3-A23.1M.

.5 Reinforcing steel used for dowels shall be black steel for embedment into original concrete. Field epoxy coat steel reinforcing that will extend into new concrete.

2.2 Mechanical Couplers

.1 Approved mechanical couplers for connecting new reinforcing steel to existing bars are:

.1 BAR-LOCK S/CA series mechanical coupler by Dayton Superior; or,
.2 Lenton Lock S-Series by Erico International Corporation.

.2 For connecting new reinforcing steel bars between phases/concrete pours, use:

.1 DBR Coupler System or Taper – Lock Standard Coupler by Dayton Superior; or,
.2 Lenton Form Saver or Lenton Standard Couplers (Tapered Thread) mechanical couplers by Erico International Corporation.

.3 Alternate products may be considered to meet special project requirements.

.4 Thread reinforcing steel as required to fit threaded couplers. Threading shall be performed by the steel manufacturer.

2.3 Accessories

.1 In exposed concrete locations, supports shall be plastic, precast concrete or plastic protected steel, all the same colour as the concrete.

.2 Use plastic coated tie wire to tie overlapping/intersecting reinforcing steel together.

2.4 Field Coating

.1 The approved product for field coating existing reinforcement is Amerlock 400 High-Solids Epoxy by Amercoat Canada Inc. The epoxy coating shall be applied in two coats. The colour shall contrast sharply with steel, rust, and concrete colours.

.2 As the recoat/drying/cure time for Amerlock 400 exceeds 24 hours when temperatures drop below 10°C, Amerlock 2 is an acceptable fast cure alternate to Amerlock 400 for use in cold weather. Additives to Amerlock 2 to extend the pot life will not be permitted.

.3 If required, touch-ups to factory applied coatings shall be made with the patching material recommended/supplied by the coating applicator or reinforcing steel fabricator. Submit product information in writing for Consultant approval prior to use.

2.5 Adhesive

Adhesive for dowels shall be Hilti HIT-RE 500 V3 into holes drilled by Hilti Hollow Drill Bit (TE-CD or TE-YD) and vacuumed out using Hilti VC 20/40 Vacuum (VC 20-U OR VC 40-U), unless otherwise indicated on the drawings.

PART 3 - EXECUTION

3.1 General

.1 Do not remove any existing reinforcing steel without prior approval by the Consultant.

.2 Where corrosion has resulted in significant reduction of the cross-sectional area of the existing reinforcing, the Consultant may require repair or replacement of the reinforcing steel.

.3 As instructed by the Consultant, remove deteriorated reinforcing steel and replace with epoxy coated bars of equal or larger cross-sectional area. New reinforcing steel shall be lapped with original reinforcing to fully develop the reinforcing. Minimum lap lengths are as follows:

Bar Size	Lap Splice Length (mm) (f'c = 35 MPa)
10M	380
15M	570
20M	760
25M	1190
30M	1430

.4 Contain sandblast materials and debris within the work area. Do not allow dust to migrate from work area.

3.2 Preparation of Existing Steel

.1 Remove all existing exposed tie-wires and bar supports.

.2 Straighten all bent reinforcing bars to their original shape. Do not heat the steel. Where directed by the Consultant, bend bars or modify formwork to provide specified cover.

.3 Clean existing reinforcing to remove concrete, corrosion products, and dirt by sand blasting. Where repair areas are limited, and where approved by the Consultant, cleaning by mechanical methods in accordance with SSPC-SP3 (Power Tool Cleaning) are acceptable.

.4 Where existing steel extends into columns, walls, beams, portion of slabs, or other structures which are to remain, and new steel will need to be connected to the existing to maintain development, take care to ensure steel is cut to maintain sufficient lap lengths. Leave sufficient steel projecting to enable lap splicing of new steel to existing. Alternatively, and only if directed by the Consultant, cut steel to allow for weld splicing of the new steel.

3.3 Coupling of Reinforcement

.1 Where designated by the Consultant, couple new reinforcing steel to the existing steel as per manufacturer's recommendations.

.2 Mechanical couplers will be permitted, provided a minimum of 25mm concrete cover is maintained over the outside of mechanical coupler.

3.4 Dowels

.1 Drill and clean holes in parent concrete for dowels as per the adhesive manufacturer's recommendations.

.2 Embed black steel in parent concrete to a depth directed by the Consultant (minimum embedment 200mm), adhered with specified adhesive.

.3 Field epoxy coat exposed portion of dowel (portion not embedded in parent concrete).

3.5 Epoxy Coating Existing Reinforcing

.1 For exterior concrete near grade level, garage suspended slabs, garage roof slabs, or other concrete where there is likelihood of exposure to deicing salts, the existing reinforcing steel that is exposed within the repair areas shall be epoxy coated. Even where there is no exposure to deicing salts, all exposed reinforcing steel with concrete cover less than 12mm shall also be epoxy coated.

.2 The cleaned reinforcement shall be coated before oxidation of the surface discernible to the unaided eye occurs, or else the cleaning procedures shall be repeated.

.3 Apply epoxy in accordance with the manufacturer's written instruction to completely cover all steel which does not have a factory applied coating. After curing, the coating shall be free of holes, voids, cracks, damaged areas, contamination, and deficient areas that are discernible without magnification. The dry film thicknesses of the coating shall be between 0.20mm and 0.35mm (8 mils and 14 mils). A minimum of two coats will be required in order to achieve the specified DFT.

.4 Take care to apply epoxy to all steel surfaces, including "back" sides of bars.

.5 Take care not to apply epoxy coating onto adjacent concrete surfaces. Where epoxy is accidentally applied to concrete, the epoxy must be fully removed prior to concrete patching.

.6 Apply epoxy in advance of placing concrete, to achieve the manufacturer's written recommended curing time.

3.6 New Steel

.1 Handle epoxy coated reinforcing steel in accordance with ASTM A775.

.2 Store new reinforcement on timber racks or skids that are spaced to prevent sagging of steel. Bars shall be protected from dirt and maintained in their fabricated form.

.3 Coated bars or bundles shall not be dropped and dragged in any manner that may cause damage to the coating.

.4 Place and support new steel so as to not damage epoxy coating. Place new steel to provide the same concrete cover as the existing cover, to a minimum of 25mm cover.

.5 Securely tie reinforcing steel together with coated tie wire to prevent displacement during concrete placing and vibrating. Turn the ends of ties towards the interior of the concrete.

.6 Do not use Amerlock 400 to patch damaged areas of factory applied coatings. All cut ends of coated bars and touch-ups to damaged factory applied coating shall be coated with patching material recommended by the coating applicator or fabricator. Prepare surfaces and apply coating in strict accordance with the manufacturer's written recommendations.

.7 Coated bars shall not be stored unprotected for greater than 30 days. Total storage time of coated reinforcing shall not exceed 120 days from the date of coating as shown on the identification tags.

.8 A new factory coated bar will be rejected and shall be removed from site when the amount of damage to be repaired exceeds the following:

.1 For bars over 1m in length: 1% of the total bar surface area, not including cut ends.
.2 For bars under 1m in length: 5% of the total bar surface area, not including cut ends.

End of Section 03 01 40

PART 1 - GENERAL

1.1 Description

This section specifies materials and methods for placing new concrete in repair patches.

1.2 Environmental Conditions

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

.2 Do not place new concrete in the rain.

1.3 Submittal

.1 At least 5 business days prior to pouring concrete, submit concrete supplier mix information, including the following:

.1 Name of mix design,
.2 Minimum concrete strength,
.3 Air entrainment range,
.4 Admixtures and reinforcing, including quantities, to be introduced after concrete leaves the plant, and
.5 Slump range.

.2 Submit all concrete test reports for review by the Consultant.

1.4 Field Review and Testing

.1 Notify the Consultant 48 hours prior to concrete placement.

.2 Should concrete fail testing requirements, the Contractor shall be responsible for providing new concrete and additional testing as required by the Consultant.

.3 For site-mixed (pre-bagged) concrete, testing will be performed by an independent testing agency approved by the Consultant as follows:

.1 Minimum of one standard strength test for each day of concrete placement, or for each 7.5m^3 of concrete if more than 7.5m^3 is placed in a day. Testing shall be completed in accordance with CSA A23.2-3C.

.2 One standard slump and air entrainment test for each of the first 3 batches mixed per day. Testing procedures in accordance with relevant CSA A23.2 standards.

.4 Concrete will be considered under strength if:

.1 The average of any day's tests is below the specified strength.

.2 Any single test result is more than 3.5 MPa below the specified strength.

In the case of dispute, and at the discretion of the Consultant, the Contractor may have two 100mm diameter x 100mm long samples cored out of the concrete and tested, at their own expense, for each result below the required strength, in accordance with CSA A23.2-14C. The results will be evaluated in accordance with CSA A23.1.

PART 2 - MATERIALS AND PRODUCTS

2.1 Formwork Lumber

.1 Formwork lumber to be in accordance with CSA A.23.1

.2 Form Ties

.1 Buried / Covered Concrete: Removable or snap ties. Any holes left on concrete surfaces should not be larger than 25mm in diameter.

.2 Architectural Concrete: Galvanized ties with temporary plastic cones. Provide concrete plugs recessed in concrete surface 6mm, matching colour of concrete.

2.2 Concrete Proportions

.1 Comply with CSA A23.1, Table 2, Exposure Class C-1.

.2 Concrete to have minimum 35 MPa compressive strength at 28 days.

.3 Polypropylene fibre reinforcement to be added at a rate to control shrinkage cracking.

.4 Mixing water to be free of any deleterious materials.

.5 Re-tempering (adding water to restore loss of workability) is permitted only under direction of concrete supplier. Re-tempering must not be used to increase workability above design slump.

2.3 Site-Mixed (Pre-Bagged) Concrete

.1 Use one of the following pre-bagged concrete products:

Manufacturer	Product
BASF	MasterEmaco S 466CI
Sika	Sikacrete-08 SCC
Target	Flowcrete with 5% Silica Fume

.2 Use one of the following pre-bagged, high early strength concrete products:

Manufacturer	Product
BASF	MasterEmaco T 1060
BASF	MasterEmaco T 1061

.3 Mix and install pre-bagged concrete as per manufacturer’s requirements.

PART 3 - EXECUTION

3.1 Formwork Construction

.1 Design and construct formwork to accommodate construction loads and fluid pressures without deflection or overstressing.

.2 Formwork to be tight and flush to prevent panel outlines on the concrete surface.

.3 Formwork to be constructed to allow removal without damaging the concrete. Apply a form coating and release agent uniformly to formwork surfaces prior to reuse.

.4 Only remove formwork once concrete is able to support its own weight and any superimposed construction loads. Concrete must not become overstressed, distort, or deflect.

3.2 Preparation

.1 Complete concrete removals and reinforcing steel repairs as per the project specifications.

.2 Notify the Consultant for review of concrete placement, including application of slurry coat or bonding agent.

3.3 Concrete Placement

.1 Place concrete in accordance with CSA A23.1 and manufacturer's specifications.

.2 Provide a saturated surface dry substrate prior to applying slurry coats. Prepare and scrub slurry coat into concrete patch substrate prior to placing concrete.

.3 Place concrete in a continuous single pour for each patch.

.4 Ensure reinforcing steel remains in place during concrete placement. Maintain a minimum 25mm concrete cover over reinforcing steel. Vibrate concrete using plastic coated vibrators to avoid damaging epoxy coating on reinforcement.

3.4 Finishing

.1 **Horizontal surfaces:** Match finished surface flush with adjacent surfaces. Top surfaces to be sloped a minimum 2% away from walls and columns, and towards drains where achievable. Where protective coatings are to be installed over concrete, finish concrete surfaces as follows:

.1 Float finish: for concrete sealer or asphaltic traffic deck systems.

.2 Light trowel finish: for elastomeric traffic deck systems.

.2 **Vertical surfaces:** Match finished surface flush with adjacent surfaces.

.3 Wet cure new concrete immediately after surface finishing is completed. Cover concrete with wet burlap and maintain a continuous moist cure for at least 5 full days. Do not use curing sealing compounds.

3.5 Special Requirements for Cold Weather Concrete Repair

The following requirements apply when the air temperature is at or below 5°C, or when there is a chance of the ambient air temperature falling below 5°C within 24 hours of concrete placement:

.1 Provide temporary equipment for heating concrete materials and forms. Provide concrete protection and insulation, and maintain the required temperature and humidity of the concrete during curing, in accordance with CSA A23.1.

.2 Heat aggregate stockpiles to provide uniform conditions and temperature. Heating must not affect moisture content.

.3 Concrete temperature at time of placement to be in accordance with the following table.

Concrete Thickness (mm)	Concrete Temperature (°C)
< 300	10 - 35
300 - 1000	10 - 30
1000 - 2000	5 - 25

End of Section 03 01 50

PART 1 - GENERAL

1.1 Description

This section specifies the materials and methods for brick masonry work.

1.2 Environmental Conditions

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

.2 Cold Weather Requirements

Supplement Clause 6.7.2.1 of CSA-A371 with the following requirements:

.1 Temperature of mortar at the time of laying shall not be less than +20°C and not greater than +49°C.

.2 When ambient temperatures fall below +4°C, store all materials in a heated enclosure in which the temperature is maintained above +10°C.

.3 Provide the following measures:

Air Temperature	Requirements During Construction	Protection of Work (48 hours minimum)
0°C to +4°C	Mix mortar with hot water; mortar temperature to be a minimum of +20°C	Protect masonry from being wetted with rain/snow
-4°C to 0°C	Mix mortar with hot water; mortar temperature to be a minimum of +20°C	Immediately cover with weather-resisting membrane and seal the membrane's perimeter.

.4 Maintain maximum/minimum thermometers on site and maintain a daily log, with readings taken at the commencement and completions of daily operations and at midday.

.3 Hot Weather Requirements

.1 When wall surfaces or ambient temperatures reach 25°C, protect new work from rapid drying by providing burlap protection kept misted as necessary to control drying and shrinkage, or by protecting freshly laid masonry by means of waterproof, non-staining coverings, as approved by the Consultant.

.2 Temperatures of masonry at the time of installation and within 12 hours after shall not exceed 49°C. During warm sunny weather, avoid repointing areas that will be exposed to direct sunlight unless precautions are taking to avoid exceeding the specified maximum temperature.

.4 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind-driven rain, until masonry work is completed and protected by flashings or other permanent construction.

1.3 Design and Performance Requirements

The following Codes and Standards apply to the materials and methods herein:

.1 CAN/CSA-A82, Fired Brick Masonry Made From Clay or Shale

.2 CAN/CSA-A179, Mortar and Grout for Unit Masonry

.3 CAN/CSA-A371, Masonry Construction for Buildings

.4 ASTM C126, Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units

1.4 Quality Assurance

Installer Qualifications: Tradespeople are to be skilled and experienced in the type of work specified. Continuously supervise the work with a competent mason with 10 years' experience in brick masonry work.

1.5 Manufactured Clay Brick Units

Bricks shall conform to CAN/CSA-A82. All exterior bricks shall be grade EG, type S brick. Match existing bricks as closely as possible with respect to size, texture, and colour, as approved by the Owner and Consultant. Reuse existing bricks where possible.

PART 2 - EXECUTION

2.1 Installation

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

.2 Build masonry plumb, level, and true to line, with vertical joints in alignment. Install new masonry units to match existing lines and levels.

.3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum cutting. Bond, coursing height, and jointing to match existing.

.4 Mix brick units within each pallet and with other pallets to ensure uniform blend of colour and texture.

.5 Allow joints to set just enough to remove excess water, and then tool to match existing joint profile.

.6 Except in cold weather, wet bricks having an initial rate of absorption exceeding 1g/minute/1000mm2. Wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.

.7 Clean all dust, mortar droppings, or other stains on masonry or other surfaces as the work progresses. Perform further cleaning after the mortar has set and cured. Clean masonry with stiff natural bristle brush and clean water only. Vinegar or chemicals shall not be used without approval of the Consultant.

2.2 Sequence of Work

.1 Before starting work, the Contractor and Consultant shall together review the area to be restored and the amount of work will be defined.

.2 Perform removals from the upper most masonry unit and proceed down. At all times ensure that masonry adjacent to the work area is fully supported against vertical and lateral movement.

.3 Repair back-up wall as required, to provide a sound substrate for anchors and to provide a solid back up, free of voids.

.4 Replace or clean/coat steel shelf angles and other exposed steel components.

.5 Install through-wall flashing over original shelf angles and other exposed steel components.

.6 Reinstate masonry units.

End of Section 04 01 00

PART 1 - GENERAL

1.1 Description

This section specifies the materials and methods for masonry mortar.

1.2 Environmental Conditions

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

1.3 Testing

.1 The Consultant may require mortar testing by an independent agency in accordance with CAN/CSA-A179, including:

.1 Compressive strength testing before construction begins, at the time of mock-up preparation; and

.2 Random testing of job-mixed mortars.

.2 Three cubes shall be tested at 7 days. The remaining three shall be tested at 28 days.

1.4 Design and Performance Requirements

The following Codes and Standards apply to the materials and methods herein:

.1 CAN/CSA-A179, Mortar and Grout for Unit Masonry

PART 2 - MATERIALS AND PRODUCTS

2.1 General

Use same brands of materials for entire project.

2.2 Water

Water shall be potable and free from contaminants and deleterious materials such as acids, alkalis, and organic materials in accordance with CAN/CSA-A179.

2.3 Pre-Bagged Mortars

Pre-bagged Type N mortar, CAN/CSA-A179 low alkali content cement with white, type 10, non-staining Portland cement and pre-mixed aggregate (standard grey/beige aggregate, not white silica sand), or approved equivalent:

Manufacturer	Product
Baselite Concrete Products	Mortartek, 1:1:6 mortar mix, or approved alternate.

PART 3 - EXECUTION

3.1 General

Mix masonry mortar in accordance with CAN/CSA-A179 except where specified otherwise.

3.2 Pre-Bagged Mortars

.1 Obtain samples of existing mortar from below surface of existing joints. Do not include soiled mortar.

.2 Supply factory-coloured mortar to match existing “clean” mortar colour.

.3 Strictly follow manufacturer mixing procedures. Prepare and mix mortar under strict supervision and in small batches for immediate use only.

.4 Use mortar within 2.5 hours when air temperature is less than 25°C, and within 1.5 hours when air temperature is 25°C or higher, or as directed by manufacturer.

End of Section 04 05 13

PART 1 - GENERAL

1.1 Description

This Section describes the materials and methods for masonry repointing and installation of retrofit control joints.

1.2 Design and Performance Requirements

The following Codes and Standards apply to the materials and methods herein:

.1 CSA A23.1, Construction Materials and Methods of Concrete Construction

.2 CAN/CSA-A371, Masonry Construction for Buildings

1.3 Quality Assurance

Installer Qualifications: Tradespeople are to be skilled and experienced in the type of work specified. Continuously supervise the work with a competent mason with 10 years' experience in brick masonry work.

1.4 Inspection and Testing

Notify Consultant for review of the following:

.1 identification of joints to be repointed;

.2 review of raked joints, prior to repointing;

.3 identification of horizontal control joints requiring sawcutting;

.4 installation of vertical control joints; and

.5 repointing.

PART 2 - MATERIALS AND PRODUCTS

2.1 General

Mortar materials: refer to Section 04 05 13 Mortar and Masonry Grout.

PART 3 - EXECUTION.

3.1 General

Perform work in accordance with CAN/CSA3-A371.

3.2 Repointing

.1 Raking Joints

.1 Rake unsound joints free of deteriorated and loose mortar, dirt, and other undesirable material. The Contractor shall replace all masonry damaged as a result of the mortar removal process at no additional cost to the Owner.

.2 Clean joints to full depth of deteriorated mortar, but in no case to less than 20 mm. All loosened or disintegrated materials beyond this point shall also be removed. Clean out voids and cavities encountered. Notify Consultant if deterioration is deeper than 1/3 the depth of the masonry.

.3 Make precautions to avoid damage to masonry units when removing mortar for repointing.

.4 If using grinders or saws to remove mortar, saw-cut at the centre of the joint so as not to damage the masonry units. Do not overcut into adjacent cladding or structural components. Stop sawcut short of removal limits and remove remaining mortar by hand using hammer and chisel.

.5 Use hammer and chisels at ends and junctions of joints to cut the mortar removal square. Rounded or feather edged terminations shall not be permitted.

.6 Joints shall be washed clean of dust or debris prior to repointing.

.7 Leave no standing water.

.2 Repointing

.1 Dampen joints and completely fill with mortar. If surface of masonry units has worn rounded edges, keep pointing back from surface to keep same width of joint. Avoid feathered edges. Pack mortar solidly into voids and joints.

.2 Keep masonry damp but surface dry when new mortar is installed.

.3 Build-up pointing in layers not exceeding 12mm in depth. Allow bottom layers to set before applying subsequent layers. Maintain joint width.

.4 New joints shall be packed tightly in thin layers and tooled to match existing.

.5 Remove excess mortar from masonry face before it sets. Finish jointing neatly as specified.

3.3 New Vertical Control Joints

.1 Introduce vertical control joints starting from the top of the building.

.2 Stop all work if new cracks appear. Notify Consultant immediately.

.3 Coordinate brick removal with the control joint to minimize brick replacement. Do not remove brick where the control joint coincides with the crack.

.4 Saw cut minimum 115mm deep, 12mm wide with clean sharp edges. Do not cut into columns.

.5 Replace, at no extra cost to the Owner, any bricks adjacent to cuts, which spall or chip during this Work, so that sealant may be applied to thoroughly clean and sound surfaces.

.6 Install backer rod and sealant as specified in Section 07 92 13 – Caulking.

3.4 Retrofit Horizontal Soft Joints

.1 Start Work from the uppermost shelf angle in each panel.

.2 Stop all Work if new cracking starts spreading from Work. Notify Consultant immediately. Stop work if shelf angles are not encountered above the location of the joint being installed.

.3 Produce a totally clear joint beneath existing shelf angles for the full width and depth of the brick for a thickness of 10mm ± 3mm.

.4 Provide clear sharp edges. Replace bricks chipped by cutting operations at no extra cost to Owner. Do not cut into shelf angle.

.5 Sawcut beneath shelf angles starting from each end and working towards the middle of each panel of masonry.

.6 As alternate procedure, remove the course of brick immediately beneath the shelf angle. Re-install brick, cutting prior to installation as necessary to produce the specified joint.

.7 Clean exposed shelf angle and brick faces of all loose rust and mortar.

.8 Install backer rod and sealant in accordance with Section 07 92 13 – Caulking.

3.5 Drilled Weep Holes

.1 Drill 12mm diameter hole through mortar joint where instructed. Angle hole to drain to outside. Take care not to damage flashings.

.2 Mark drill bits to avoid drilling further than 10mm past the back of the brick.

3.6 Completion of Day's Work

.1 Ensure that all areas of mortar removal are adequately protected from penetration of rainwater.

.2 Protect adjacent finished work against damage, which may be caused by on-going work.

.3 Clean all dust, mortar droppings, or other stains on masonry or other surfaces as the work progresses. Perform further cleaning after the mortar has set and cured. Clean masonry with a stiff bristle brush and clean water only. Vinegar or chemicals should not be used with prior approval from the consultant.

End of Section 04 05 15

PART 1 - GENERAL

1.1 Description

This section specifies the materials and methods for connecting masonry to its structural backing, and providing internal reinforcement within the masonry.

1.2 Field Reviews

Notify the Consultant for review of the following:

.1 connector location layout;

.2 reinforcement location layout; and,

.3 connector and reinforcement installation.

1.3 Design and Performance Requirements

CAN/CSA-A370, Connectors for Masonry applies to the materials and methods herein.

PART 2 - MATERIALS AND PRODUCTS

2.1 General

.1 All masonry connectors shall meet the minimum requirements for strength and corrosion protection as defined in CAN/CSA A370.

.2 All connectors to be stainless steel as per ASTM A580 and ASTM A666.

.3 Unless otherwise specified, the minimum pullout connector strength shall be 1kN.

2.1 Retrofit Lateral Ties

8mm diameter stainless steel helical tie to be Spira-lok by Blok-Lok, DryFix by HeliFix or pre-approved alternate.

PART 3 - EXECUTION

3.1 General

.1 Install connectors and ties as per manufacturer’s written specifications and CAN/CSA A370.

.2 Adjust connector or tie locations and spacing as required to prevent penetrating through-wall flashings.

.3 Install connectors through mortar joints, unless otherwise approved by the Consultant.

3.2 Retrofit Connector Installation

.1 Connectors to be installed into solid concrete back-up walls only.

.2 Drill a 11mm pilot hole through the brick masonry mortar joint, then drill a 5mm pilot hole into the block backup.

.3 Screw anchor through mortar joint and block back-up.

.4 Torque the anchor as per manufacturer's written requirements.

.5 Replace mortar over anchor holes with colour matched mortar.

End of Section 04 05 19

PART 1 - GENERAL

1.1 Description

This Section specifies the materials and methods for work involving caulking.

1.2 Environmental Conditions

.1 Apply primers and caulking only to surfaces which are structurally sound and completely dry, at air and material temperatures within acceptable ranges established by manufacturer's specifications. Should it become necessary to apply caulking at temperatures below 5°C, inform the Consultant and consult the caulking manufacturer's representative. Proceed on their written instructions only.

.2 When working in cold temperatures, only clean/prime as much surfaces that can be sealed before frost and/or condensation re-occur.

1.3 Qualifications

Surface preparation and caulking installation shall be carried out by an applicator who is thoroughly trained and competent in all aspects of this work. Work shall be overseen by Contractor's personnel who have at least 5 years of experience installing caulking.

1.4 Field Review and Testing

.1 The Contractor shall arrange for the caulking manufacturer's representative to inspect the work and perform on-site adhesion testing at the mock-up and at regular intervals during the work. Repair adhesion tests at no additional cost to the Owner. Provide written project recommendations from the manufacturer's representative, including observations made during site visits and adhesion test results.

.2 The Consultant will perform on-site adhesion testing at mock-up locations and at sample locations throughout the work area. Repair adhesion tests at no additional cost to the Owner.

.3 Notify Consultant for review of surface preparation prior to caulking application and completed caulking application prior to demobilizing from each work area.

.4 Where silicone caulking applied to metal or glazing systems meets, and is to be sealed to, polyurethane caulking, materials shall be selected to assure proper adhesion. The manufacturer and site mock-up testing shall confirm that the selected materials adhere to each other by wet to wet and/or wet silicone to dry polyurethane application methods.

PART 2 - MATERIALS AND PRODUCTS

2.1 Exterior Caulking

.1 Polyurethane and Hybrid Polymer Caulking

.1 For metal to masonry, masonry control joints:

Manufacturer	Product
BASF	MasterSeal NP 1
BASF	MasterSeal NP 100
Sika	Sikaflex 15 LM
Tremco	Dymonic 100
Tremco	Dymonic FC

.2 Silicone Caulking

.1 For metal-to-metal, vinyl-to-glass, vinyl-vinyl and glass-to-metal joints:

Manufacturer	Product
Dow	Dowsil 795 Silicone Building Sealant
GE (Momentive Performance Materials)	SCS2000 SilPruf
Tremco	Spectrem 2

2.2 Solvents and Primers

.1 Solvents/cleaners for surfaces to receive caulking shall be compatible with the surfaces to receive the cleaner (i.e., solvent). The caulking manufacturer shall recommend and approve in writing the cleaner type(s) for each caulking in the project.

.2 Primers shall be recommended by the caulking manufacturer for surfaces to be adhered to and shall not be detrimental to the surface to which it comes in contact.

2.3 Accessories

.1 Joint backing shall be used to control depth of joint to recommended thickness of caulking and to prevent three-sided adhesion.

.1 Backer Rod: extruded polyolefin foam, non-gassing and have a diameter 25% larger than joint width.

Manufacturer	Product
Industrial Thermo Polymers	SOF-Type Rod
Tremco	SOF ROD

.2 Bond-breaker Tape:

Manufacturer	Product
3M	Bond Breaker Tape
Bron	Bondbreaker Tape
	Painters Tape

.3 Alternatively, apply a wax crayon to the substrate to prevent three-sided adhesion.

.2 Void Fillers

.1 Unless otherwise specified, insulation for packing into large voids and cavities shall be light weight resilient, inorganic fibrous batts, such as:

Manufacturer	Product
Owens Corning	Fiberglass Pink Friction Fit Batts
Roxul	Flexibatt Batt Insulation 07210

.2 Where specified, use a single component, non solvenated polyurethane foam, conforming to CAN/CGSB-51.23 (latest edition), “Spray-Applied Rigid Polyurethane Cellular Plastic Thermal Insulation” such as:

Manufacturer	Product
Adfast	Adfoam 1885-2
Dow Chemical	Enerfoam
Approved Alternate	

.3 Miscellaneous

.1 Cloths for solvent cleaning of surfaces prior to application of caulking shall be clean, white, solvent resistant cloths. Coloured cloths shall not be used. Change cloths frequently as they become soiled during cleaning.

PART 3 - EXECUTION

3.1 General

.1 Consult and follow caulking manufacturer’s recommendations.

3.2 Surface Preparation

.1 Remove all existing caulking to expose a sound substrate, without damaging adjacent finishes or causing damage to the substrate.

.2 For concrete and masonry surfaces, remove dust, paint, loose mortar and other foreign matter by brushing and vacuuming or blowing air.

.3 For ferrous and metal surfaces, remove dust, silt, scale, oxidation and coating by scraping, wire brushing or grinding.

.4 Clean all surfaces to receive caulking by wiping with a clean cloth saturated with recommended cleaning solvent and by following immediately with another clean cloth to wipe the surface dry. Clean only as much area as can be sealed in one hour. If cleaned areas are exposed to rain or contaminants (dirt, dust, etc.), the surface must be cleaned again.

3.3 Priming

.1 If recommended, prime surfaces to receive caulking as per the caulking manufacturer's specifications. Follow the caulking manufacturer's recommendations for application and cure time.

.2 Take sufficient precautions to prevent staining of adjacent surfaces. Do not apply primer to the backer rod/bond breaker. Where necessary to protect adjacent surfaces, mask surfaces with suitable tape prior to primer and/or caulking installation.

.3 If primed areas are exposed to rain or contaminants (dirt, dust, etc.), the surface must be cleaned and re-primed.

.4 Protect the surfaces that do not require primer. If primer is installed accidentally on surfaces other than the one specified, it should be removed immediately with a clean cloth dampened with the manufacturer's recommended cleaner.

3.4 Joint Backing

.1 At large open cavities, fill cavity with the approved void filler prior to the installation of the backer rod.

.2 Install backer rod or apply bond breaker tape prior to caulking installation.

.3 Tightly install backer rod without stretching, twisting, braiding or puncturing its outer skin.

.4 Use an approved installation tool that is blunt surfaced and developed to accurately set the backer rod at the required depth to achieve recommended caulking profile.

.5 Joint backing must be thoroughly dry. Do not install more joint backing/bond breaker tape than can be sealed in one working day.

3.5 Caulking Bead Profile

.1 Maintain the minimum and maximum caulking depths as recommended by the manufacturer. Provide caulking depth that is half the joint width where possible. Increase average caulking size as required to accommodate application tolerances.

.2 Unless otherwise approved by the Consultant, joint widths shall be greater than 10mm. Identify any joint widths less than this width to the Consultant for direction.

.3 Notify the Consultant of joints wider than 19mm. Application of caulking in several passes or incorporation of closure flashings may be required (depending on joint configuration, weather conditions, access and material type). Follow the caulking manufacturer's and Consultant's recommendations for maximum joint width and application methods.

.4 Provide a minimum bond surface of 6mm on each side of joint.

.5 Provide a minimum of 5mm caulking depth for cap beads.

3.6 Caulking Application

.1 Apply caulking using equipment approved by, and in accordance with the manufacturer's written instructions.

.2 Where required to achieve clean, neat lines, apply masking tape to adjacent surfaces prior to caulking.

.3 Immediately after application, tool the caulking to ensure firm, full contact with the faces of the joint. Neatly tool the surfaces to a slight concave profile. Avoid pulling the caulking out of the joint by frequent cleaning of the tooling instrument. Surface of caulking to be smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities.

.4 Ensure existing drainage paths are not blocked by the caulking material.

.5 Silicone and polyurethane caulking shall be placed in contact with each other by wet to wet (prior to skinning over) and/or wet silicone to dry polyurethane application methods, as recommended by the manufacturer and confirmed to be acceptable by an on-site mock-up. The caulking shall be detailed to provide a watertight seal, including lapping in order to provide proper shedding of water flowing with gravity. Where initial lengths of caulking are required to assure the appropriate lap, apply silicone first.

.6 Do not place caulking in contact with incompatible materials, including bituminous products, unless no adverse effects are confirmed by the caulking manufacturer in writing.

3.7 Cleaning

.1 Remove caulking smears and droppings on completion of caulking installation in affected areas.

.1 For non-porous surfaces (i.e., metal and glass), it is recommended to immediately remove all excess caulking adjacent to the joint as work progresses with a cleaning solvent recommended by the caulking manufacturer.

.2 For porous surfaces, it is recommended to allow caulking to develop initial cure, then remove by abrasion or other mechanical means. Caution should be exercised to maintain original surface integrity.

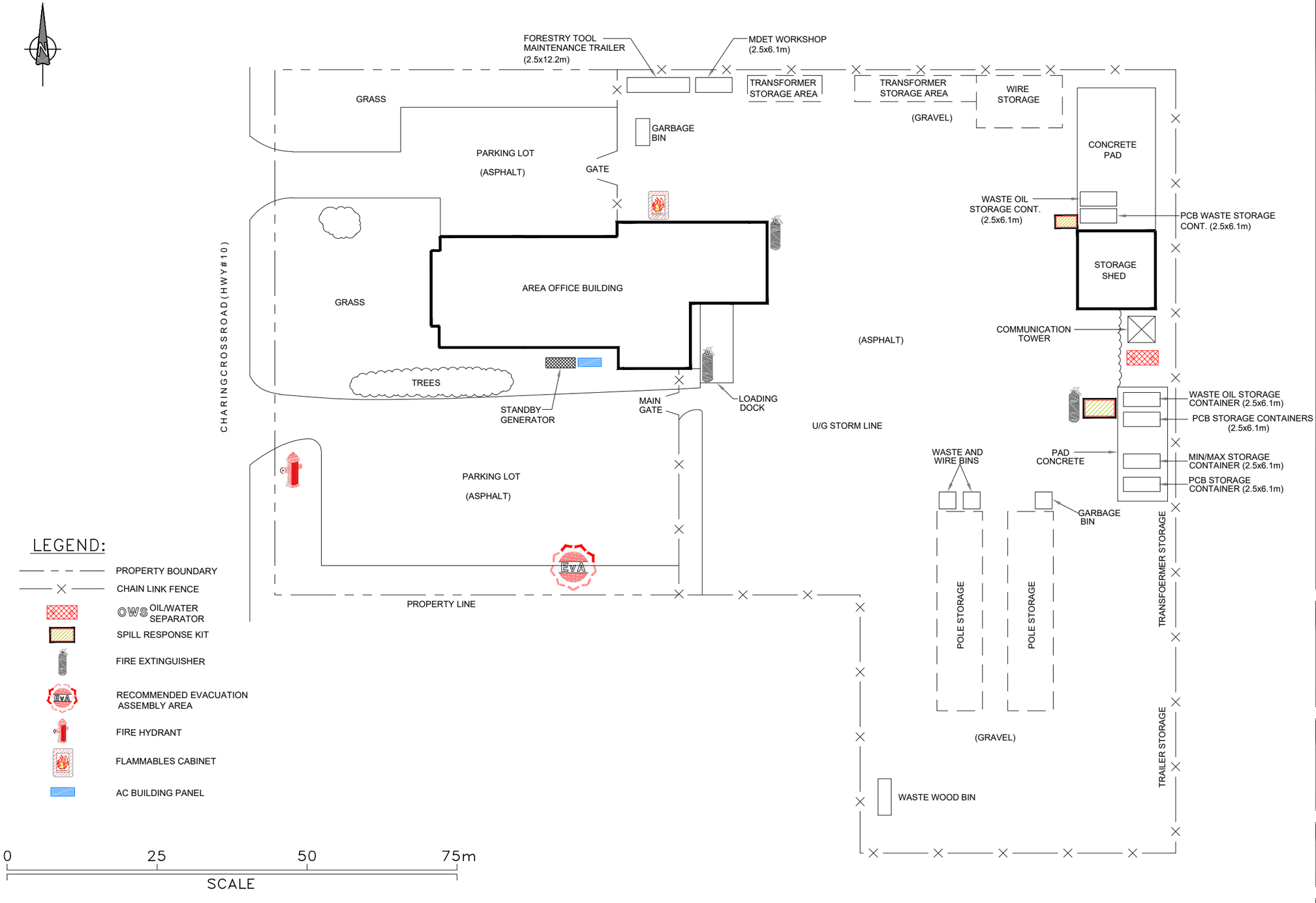
.2 Remove masking tape immediately after tooling of joints.

.3 Cleaning solutions and methods to be recommended in advance by the caulking manufacturer.

End of Section 07 92 13

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MISCELLANEOUS SITE REPAIRS

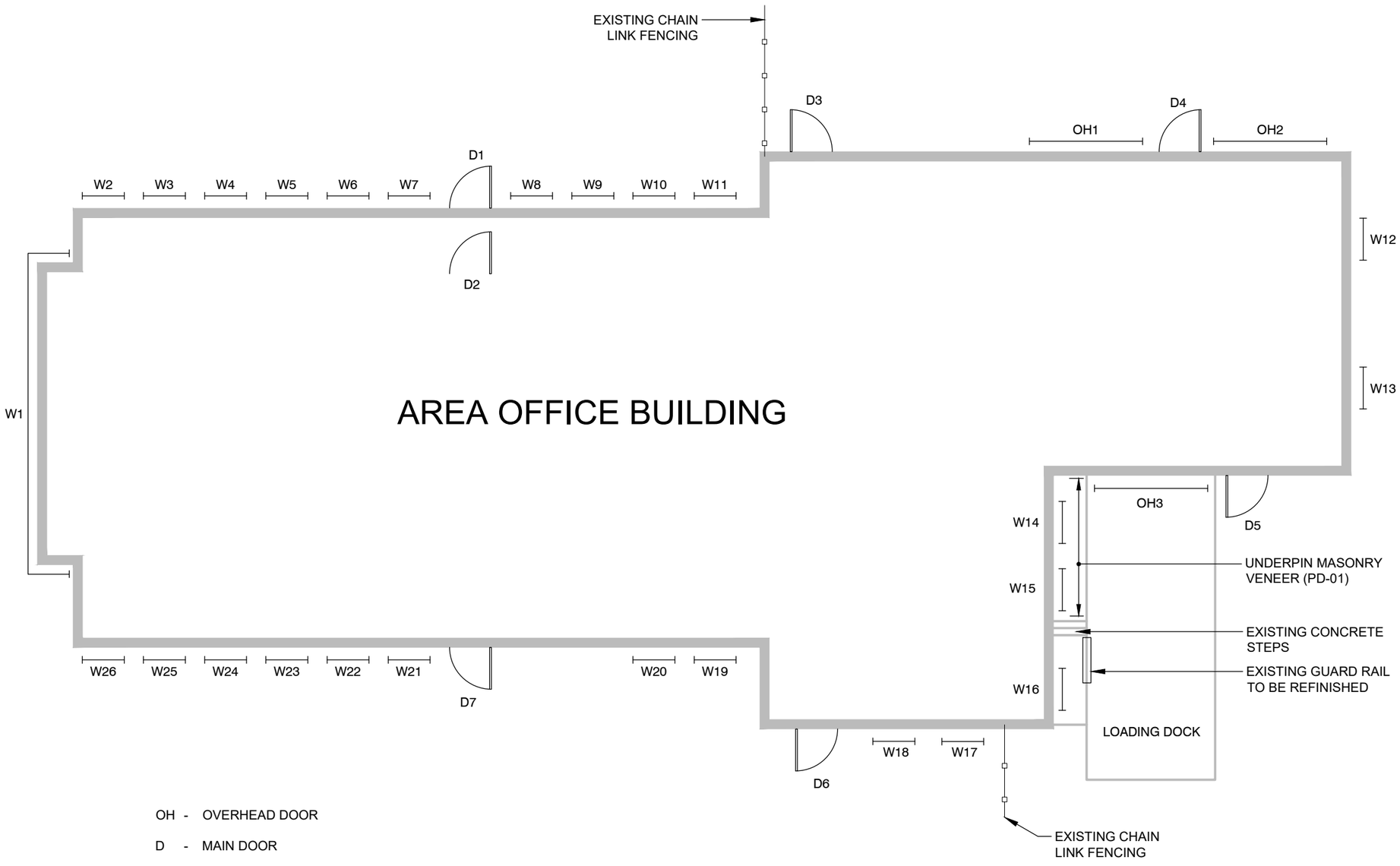
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DRAWING TITLE:
SITE PLAN

DRAWN BY:	SGU	PROJECT NUMBER:	19tR090A
CHECKED BY:	GKW		
SCALE:	NTS	DRAWING NUMBER:	SP-01
DATE:	2019-08-23		

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OH - OVERHEAD DOOR

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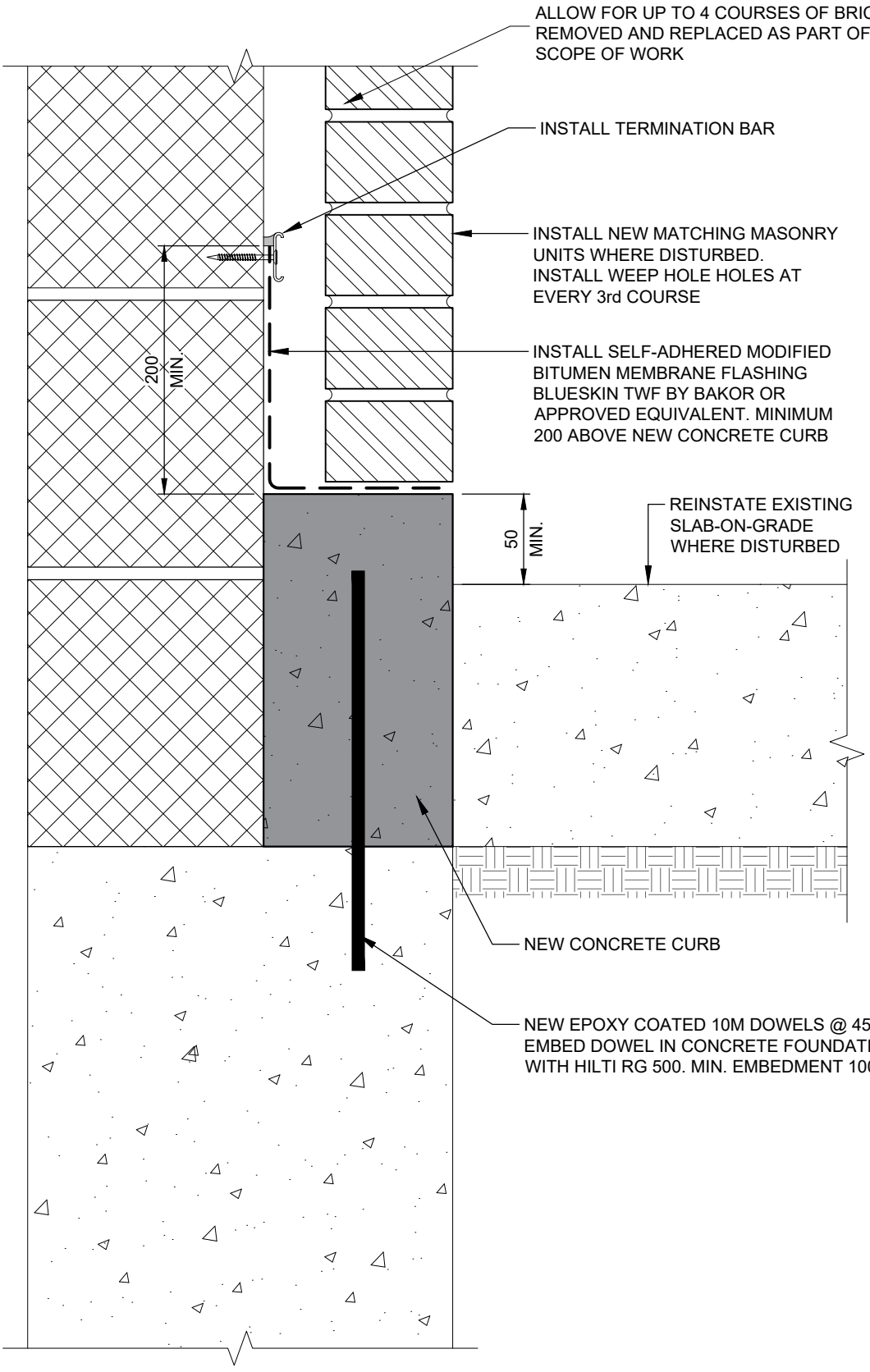
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CHECKED BY:	GKW		
SCALE:	NTS	DRAWING NUMBER:	SK-01
DATE:	2019-08-23		



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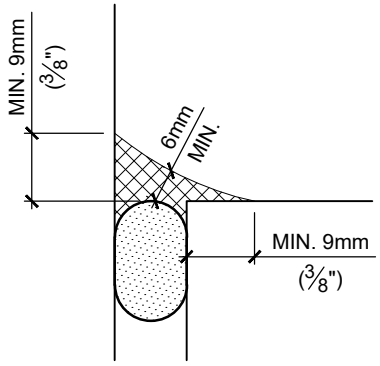
PROJECT NAME:
MISCELLANEOUS SITE REPAIRS

ADDRESS:
22291 CHARING CROSS ROAD, CHATHAM-KENT, ON

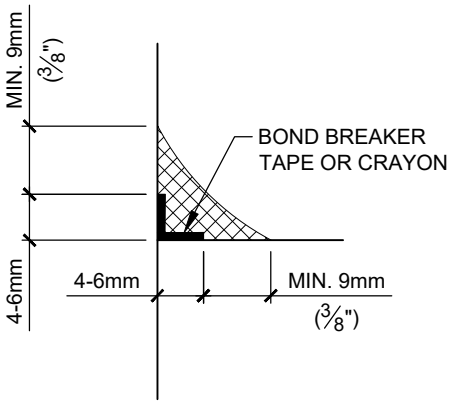
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UNDERPIN MASONRY VENEER

REVISION:

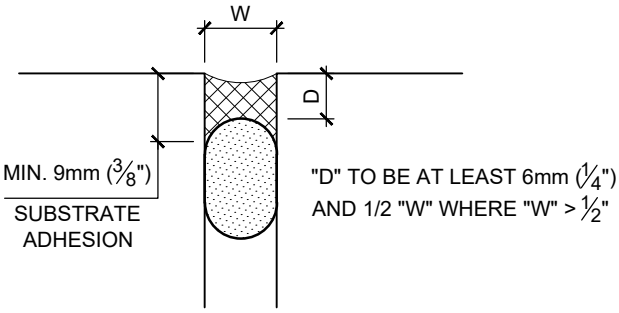
DRAWN BY: SGU
CHECKED BY: GKW
DATE: Aug. 2019
SCALE: NTS
PROJECT NO: 19tR090A
DRAWING NO: PD-1



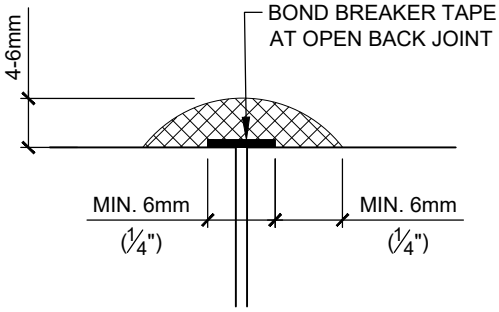
FILLET BEAD



TIGHT FILLET BEAD



BUTT JOINT



BAND-AID JOINT

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PROJECT NAME:	MISCELLANEOUS SITE REPAIRS
ADDRESS:	22291 CHARING CROSS ROAD, CHATHAM-KENT, ON
DRAWING TITLE:	TYPICAL SEALANT PROFILES
REVISION:	
DRAWN BY:	SGU
CHECKED BY:	GKW
DATE:	Aug. 2019
SCALE:	NTS
PROJECT NO:	19tR090A
DRAWING NO:	TD-C.01