Raida Chowdhury

From: noreply@esolutionsgroup.ca
Sent: Friday, April 28, 2023 3:31 PM
To: Great Places (SM)
Subject: New Response Completed for Great Places Awards - 2023
Attachments: 2023-04-28-117.pdf

Hello,

Please note the following response to Great Places Awards - 2023 has been submitted at Friday April 28th 2023 3:28 PM with reference number 2023-04-28-117.

- **Nomination type**
  Mike & Pat Wagner heritage award

- **Mike & Pat Wagner heritage award**
  Rehabilitation / adaptive reuse of cultural heritage resources

- **Has this project been nominated before?**
  No

- **Name of project being nominated**
  Kaufman Lofts Facade Repairs

- **Project address/location**
  404 King St. W., Kitchener

- **Why are you nominating this project?**
  Why are you nominating this project:
  - For its Historical Significance
  - Architectural Significance
  - Heritage Conservation Project Practices

  The Kaufman Lofts building should be nominated for its heritage designation due to its historical and architectural significance, as well as its contribution to the city's development. The restoration project completed by Edison also showed a commitment to preserving the building's heritage value.

- **Main contact name**
  John Hayes

- **Address (main contact)**
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- **Email (main contact)**
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- **Name (nominator)**
  Stefan Nicholas Nespoli

- **Street address (nominator)**
  25 Milling Rd., Suite 201

- **City (nominator)**
  Cambridge

- **Province (nominator)**
  Ontario

- **Postal code (nominator)**
  N3C 1C3

- **Phone (nominator)**
  12899255029

- **Email (nominator)**
  snespoli@edisonengineers.ca

- **Nominator confirmation**
  By checking this box, I as nominator confirm I have notified the nominee /property owner and have received their permission to make this nomination.

- **Enter answer below:**
  In addition to the summary below, please refer to the attached Conservation Plan.

  The Kaufman Lofts, previously known as the Kaufman Rubber Company/Footwear Building, was constructed in two phases in 1908 and 1925, and played a pivotal role in the industrial development of Kitchener. The company's presence had a significant impact on the local economy, providing employment opportunities for several generations of Kitchener's citizens. For nearly a century, the building has been a physical landmark in Kitchener, standing tall at the intersection of King St. W. and Francis St. N. and serving as a gateway to the downtown area. The primary facade also features prominently along the regional LRT system.

  The Kaufman family, who founded and managed the company, is a prominent family in Kitchener, renowned for their business acumen, innovative practices, public service, and philanthropy. Their legacy lives on in the Kaufman Lofts, which has become a symbol of the family's commitment to the city's growth and development.

  Today, the Kaufman Lofts is recognized for its historic and architectural value. The building retains its early industrial modernist architecture, representing the evolving construction methods of the era. The loft's conversion has brought new life to the building, providing contemporary living spaces while preserving the rich heritage of the site. The red brick used on the façade, particularly on the spandrels, serves to highlight the grid structure of the building.

  Edison was tasked with a project to renew the previously deteriorating exterior cladding. The main objectives of the project were as follows, to conserve the character defining elements, enhance public safety from deterioration, improve the building envelope’s ability to manage moisture, and repair the existing windows systems. This goal of the project was to extend the lifespan of the architectural components of the building while preserving the character-defining elements of this heritage asset’s fabric and its original

design via appropriate conservation treatments.

Edison completed the following repairs complete to the standards and guidelines for the conservation of historic places in Canada to the Kaufman building:

- Concrete repairs.
- Masonry repairs.
- Improved watershedding details and flashings.
- Resealed building cladding joints to prevent water infiltration.
- Exterior painting and coating to match the existing finish.

The building holds unique architectural significance and represents the history of industrial architecture in Canada. The combination of different construction phases adds to the building's distinctive character, while still maintaining a unified and cohesive appearance. Despite being constructed in four different phases, the building maintains a harmonious balance in both its style and scale. Its size and overall appearance make it a central and commanding feature in Kitchener's downtown area. Its prominent position in Kitchener's downtown area highlights its importance in the city's history and development.

In summary, the Kaufman Lofts are not only unique and beautiful living spaces but also a reminder of Kitchener's industrial past and the contribution of the Kaufman family to the city's growth and development. Edison has completed building envelope repairs to extend the longevity of the building’s heritage as the gateway to the downtown Kitchener area.

- **Firm name**
    1. Edison Engineers Inc.
    2. Megan Hobson
    3. The Restorer's Group
    4. Sanderson Management

- **Contact name**
    1. Stefan Nespoli
    2. Megan Hobson
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    4. abeauchesne@sandersonmanagement.com

- **Supporting information about the individual or property nominated (if known)**
  Refer to attached Conservation Plan.

- **Upload documents containing all project material**

1. FINAL CP_404 & 410 King W, Kitchener_Cladding Repairs_26 Aug 2020.pdf [11.8 MB]

- **Upload any additional supporting documentation here (not required)**
  1. 1 Before.JPG [212.2 KB]
  2. 2 After.JPG [254.8 KB]
  3. 3 Before.jpg [294.1 KB]
  4. 4 After.JPG [202.9 KB]
  5. 5 During.JPG [347.4 KB]

[This is an automated email notification -- please do not respond]

CONSERVATION PLAN

KAUFMAN LOFTS: CLADDING REPAIRS

404 & 410 KING STREET WEST

KITCHENER

FINAL_28 AUG 2020

MEGAN HOBSON CAHP
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Edison
ENGINEERS INC.

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1.0 INTRODUCTON

This *Conservation Plan* was prepared by Edison Engineers, an engineering firm that specializes in concrete and masonry repair, and built heritage consultant Megan Hobson who is a professional member of the *Canadian Association of Heritage Professionals (CAHP).* Edison Engineers provided detailed specifications for recommended cladding repairs to the Kaufman Building located at 401 & 410 King Street West. Megan Hobson provided a review of repairs to heritage attributes that are protected under the *Designation* to ensure that the repair strategy is consistent with Canadian conservation principles and guidelines. This report meets requirements provided by heritage staff at the City of Kitchener for a scoped *Conservation Plan*.

The Kaufman Lofts are located in the former Kaufman Rubber Company factory, a 4-storey reinforced concrete structure that was built in four phases between 1908 and 1925. The façade of the building is Designated under *Part IV* of the *Ontario Heritage Act* because it has historical and architectural significance.[1]

The Kaufman factory is an early and notable example in Canada of a reinforced concrete frame factory that was designed by Albert Kahn using the Kahn reinforcing system patented by his brother Julius Kahn. Albert Kahn is internationally recognized as an innovator in the design of reinforced concrete factory buildings. The Kaufman Rubber Company was a manufacturer of rubber footwear that played a significant role in making Kitchener an important industrial centre in South-Western Ontario in the early 20th century.

In 2006 the Kaufman factory was converted to residential lofts and is now under two separate ownerships known as 404 & 410 King Street West. As a result, the maintenance and repair of the *Designated* heritage façade is controlled by two independent condominium boards. This *Conservation Plan* addresses repairs to heritage attributes on both properties.

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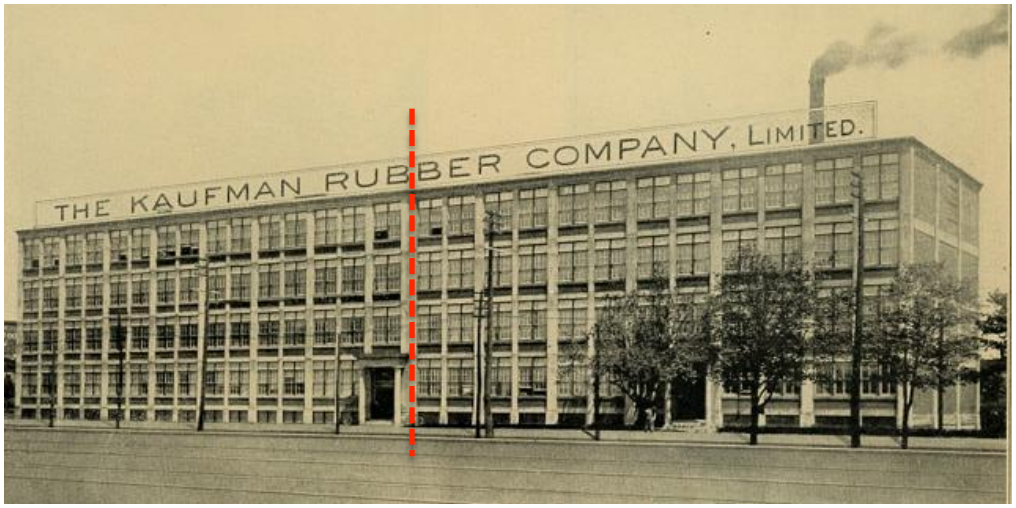
[1] *Designation By-law 1996-34.*

[2] The locations are identified in the *Condition Assessment* by Edison Engineers as Drops 7 & 8

KAUFMAN RUBBER CO. – BUILDING PHASES: 1908, 1911, 1920 & 1925

410 KING ST WEST 404 KING ST WEST

KAUFMAN BLDG, 1937 photo



KAUFMAN RUBBER CO. – c. 1912 photo

KAUFFMAN RUBBER CO. – c. 1940 illustration

2.0 HERITAGE ATTRIBUTES

The Kaufman Building is constructed with a reinforced concrete frame. The concrete is exposed on the exterior and has an opaque white coating on the surface. Because the factory was built in 4 phases there are some subtle variations in materials and details associated with each building phase. The 1908, 1911 and 1925 portions are 4-storeys in height, the 1920 portion is 5-storeys in height. Brick is used as an infill material between the concrete structural elements and on the later additions it is also used as a veneer on top of the concrete frame in some areas. A smooth red brick is used on the 1908 & 1911 portions and a random mix of red and brown textured bricks is used on the 1920 & 1925 additions. The brick choices reflect architectural fashions of the time. There are 2 entrances on King Street West on the 1908 & 1911 portions with concrete porticos. The porticos have carefully detailed classical entablatures with dentils that are supported by two Tuscan columns in the round. The roof cornice on the 1908 & 1911 sections has dentils with a distinctive overlapping pattern. The roof cornices on the later additions do not have dentils. The 1920 addition has an angled façade that dominates the street corner with a monumental portico constructed of limestone with engaged Tuscan columns and the words 'Kaufman Rubber Company Ltd' are carved in the entablature. There are electric light fixtures on the 5th floor of the 1920 addition that are not currently functioning. Although these are not included in the Designation, they have been identified by the consultant as an original feature with historic significance. Mechanization of industrial plants in the early 20th century is associated with the expansion of manufacturing and with the preference for reinforced concrete factory buildings that were fireproof and well suited to the significant weight and vibrations of this equipment. The Kaufman Rubber Company played an important role in securing the transmission of hydro-electric power to Kitchener in order to supply their factory.


SMOOTH RED BRICK


CONCRETE FRAME DETAIL


CONCRETE CORNICE DETAIL


TEXTURED RED/BROWN BRICK


CONCRETE CORNICE DETAIL


ELECTRIC LIGHT FIXTURES

In 2006, additional floors were added when the building was converted to lofts and new windows and balconies were installed. The rear elevations were altered and EIFS cladding was installed. Cladding repairs at the rear of the building are not subject to heritage review.

3.0 IMPACTS TO HERITAGE ATTRIBUTES

The table below provides a checklist of heritage elements included in the *Designation By-law* that require repair and a brief description of the repairs that are being proposed:

HERITAGE ATTRIBUTE	REPAIRS	REPAIR STRATEGY
1908 & 1911 BUILDING PHASES		
Exposed concrete frame	X	Surface repairs to cracked, spalling and delaminated concrete Application of protective coating & reapplication of paint
Window openings	-	-
Cornice and dentil mouldings	X	Cast-in-place patch repairs Application of protective coating & reapplication of paint
Roofline	-	-
Concrete entrance porticos with Tuscan columns	X	Surface repairs to column shaft Cast-in-place patch repairs to column base Application of protective coating & reapplication of paint
1920 BUILDING PHASE		
Exposed concrete frame	X	Surface repairs to cracked, spalling and delaminated concrete.
Brick infill panels	X	Selective replacement of deteriorated brick Selective re-pointing of brick
Concrete block infill panels		Surface repairs to cracked, spalling and delaminated concrete. Application of protective coating & reapplication of paint
Glass and metal enclosed entranceway	-	-
Limestone Tuscan portico	-	-
Window openings	-	-
Concrete cornice	X	Cast-in-place patch repairs to cracked, spalling and delaminated concrete Application of protective coating & reapplication of paint
Roof and roofline	-	-
Interior features of the entrance foyer	-	-
1925 BUILDING PHASE		
Exposed concrete frame	X	Surface repairs to cracked, spalling and delaminated concrete Application of protective coating & reapplication of paint
Brick and concrete block infill panels	X	Selective replacement of deteriorated brick Selective re-pointing of brick Surface repairs to cracked, spalling and delaminated concrete block

		Application of a protective coating on concrete block
Concrete lintels and sills	X	Surface repairs to cracked, spalling and delaminated concrete Application of protective coating & reapplication of paint
Window openings	-	-
Concrete cornice	X	Cast-in-place patch repairs to cracked, spalling and delaminated concrete Application of protective coating & reapplication of paint
Roof and roofline	-	-

4.0 AREAS OF DETERIORATION

Localized repairs are necessary to prevent further deterioration of the following heritage attributes:

- Exposed concrete frame
- Brick & concrete block infill panels
- Concrete lintels & sills
- Concrete cornice
- Concrete porticos

5.0 INVESTIGATION

In 2019 Edison Engineers undertook a condition assessment of the exterior cladding of 404 & 410 King Street West. The heritage facade was inspected using a bosun's chair. Investigation included a close visual inspection and sounding along 2 vertical drops on the 1920 portion of the building.[2] This was supplemented with high-resolution photography and investigation in several locations from grade level along the whole facade.

6.0 CAUSES OF DETERIORATION

Based on investigations carried out by Edison Engineers the deterioration appears to be superficial and is associated with the age of the building and normal weathering that occurs over time. The most significant deterioration has occurred at the base of the concrete columns at the 1908 & 1911 entrances on King Street West and along the edges of the concrete cornice on the 1920 addition.

Deterioration to column bases is due to water, snow and ice collecting at the base of the columns and the use of de-icing salts that are harmful to concrete surfaces. Deterioration to the concrete cornice is due to their exposed location and insufficient coverage of the embedded reinforcing steel. Weathering caused surface cracks and through freeze thaw action water has infiltrated the concrete and caused surface corrosion of the embedded reinforcing bars. Rust has formed on the steel that has exerted pressure causing further cracking and deterioration of the concrete. Architectural features such as cornices and window frames are particularly

[2] The locations are identified in the *Condition Assessment* by Edison Engineers as Drops 7 & 8

vulnerable to this type of weathering along the exposed edge due to insufficient coverage of the embedded steel in these locations.

7.0 REPAIR STRATEGY

Edison Engineers has prepared a detailed specification for carrying out surface repairs to the exterior cladding. Concrete mixes will be determined based on testing of concrete samples to ensure compatibility with the historic concrete. Testing will determine the compressive strength of the concrete so that a compatible repair material is used to carry out the repairs. The texture and colour of the concrete is not a concern because the original surface is painted. In areas where deterioration is associated with corrosion of embedded steel, additional chloride and carbonation testing will be done. This information will be used to determine if embedded steel can be cleaned of rust and coated or if it needs to be replaced with new steel. Due to the fact that the façade was built in four different phases (1908, 1911, 1920 & 1925) and the original concrete mixes may vary, testing will be done in each location. Brick and mortar samples from each area will also be taken to ensure that re-pointing mortars and replacement brick are matched to each area.

The general repair strategy proposed for repairs to heritage attributes is outlined in the table below:

HERITAGE ATTRIBUTE	TYPE OF REPAIR	REPAIR METHODOLOGY
Exposed concrete frame	crack repairs	• rout crack (12 mm wide and 12 mm deep) • apply silicone sealant and seal flush with wall surface
"	patch repairs (not related to corrosion or reinforcing steel)	• mark deteriorated areas for review • remove deteriorated concrete • replace concrete
"	patch repairs (related to corrosion of reinforcing steel)	• mark deteriorated areas for review • shore prior to removals where required • remove deteriorated concrete 25 mm beyond embedded reinforcing steel in approved areas • clean and coat steel • replace concrete
Concrete cornice & edge repairs	patch repairs (related to corrosion of reinforcing steel)	• mark deteriorated areas for review • shore prior to removals where required • remove deteriorated concrete 25mm beyond embedded reinforcing steel in approved areas • clean and coat steel • install new reinforcing steel where directed by Engineer • replace concrete
Concrete column repairs	patch repairs	• mark deteriorated areas for review • shore & unload column prior to removals in accordance with shoring drawings

		• remove deteriorated concrete in approved areas • clean and coat steel • replace concrete
All concrete repairs	protective coating	• apply a protective concrete coating to all concrete repairs
Brick infill panels & brick veneer	selective brick replacement	• mark deteriorated areas for review • carry out localized brick removal and replacement in approved areas
"	selective re-pointing	• mark deteriorated areas for review • remove deteriorated mortar • re-point with appropriate mortar

8.0 CONSERVATION PRINCIPLES & GUIDELINES

Repairing heritage attributes to prevent further deterioration is part of the regular maintenance of heritage buildings. The repair strategy specified by Edison Engineers is consistent with the Ontario Ministry of Culture's *Eight Guiding Principles in the Conservation of Built Heritage* and Parks Canada's *Standards & Guidelines for the Conservation of Historic Places in Canada*. An evaluation of the repair strategy is provided below:

8.1 Eight Guiding Principles:

- *Principle 1: Respect for documentary evidence*

  Not applicable.

- *Principle 2: Respect of the original location*

  Not applicable.

- Principle 3: *Respect of historic materials*

  All sound material will be repaired.

- *Principle 4: Respect for original fabric*

  Removal of original fabric will be limited to deteriorated masonry that cannot be repaired.

- *Principle 5: Respect for the building's history*

  The abandoned electrical light fixtures on the 5th floor of the 1920 addition are an original feature that has historical significance. The specification has been revised so that this feature will be preserved at the request of the heritage consultant.

- *Principle 6: Reversibility*

  Not applicable.

- *Principle 7: Legibility*

  Not applicable.

- *Principle 8: Maintenance*

  Repairs are required because of deferred maintenance that has contributed to deterioration of heritage attributes.

8.2 Standards & Guidelines:

- *Standard 1: Conserve the heritage value of an historic place. Do not remove, replace or substantially alter its intact or repairable character-defining elements.*

  Character-defining elements are being repaired. Removal and replacement is limited to deteriorated masonry that cannot be repaired.

- *Standard 2: Conserve changes to an historic place that, over time, have become character-defining elements in their own right.*

  The building was built in four phases in 1908, 1911, 1920 & 1925. The subtle differences in materials and design for each building phase have been identified and will be conserved.

- *Standard 3: Conserve heritage value by adopting an approach calling for minimal intervention.*

  Intervention is minimal and limited to localized repair of deteriorated concrete and brick. Removals will be marked and reviewed by the heritage consultant for approval. Existing concrete will not be removed more than required to expose the surface of sound concrete.

- *Standard 4: Recognize each historic place as a physical record of its time, place and use. Do not create a false sense of historical development by adding elements from other historic places or other properties, or by combining features of the same property that never coexisted.*

  Not applicable.

- *Standard 5: Find a use for an historic place that requires minimal or no change to its character-defining elements.*

  Not applicable.

- *Standard 6: Protect and, if necessary, stabilize an historic place until any subsequent intervention is undertaken. Protect and preserve archaeological resources in place. Where there is potential for disturbing archaeological resources, take mitigation measures to limit damage and loss of information.*

Not applicable.

- *Standard 7: Evaluate the existing condition of character-defining elements to determine the appropriate intervention needed. Use the gentlest means possible for any intervention. Respect heritage value when undertaking an intervention.*

  Preliminary inspections have identified areas of deterioration. Once scaffolding is erected, areas of deteriorated concrete will be marked for removal and reviewed by Edison Engineers so that only deteriorated concrete that cannot be repaired will be removed. Heritage review is included in the specifications to ensure that removal of original fabric is consistent with the Conservation Plan and the Heritage Permit, using a 'minimal intervention' approach.

- *Standard 8: Maintain character-defining elements on an ongoing basis.*

  Maintenance of concrete elements has been deferred for so long that bits of concrete have fallen from the building raising safety concerns for pedestrians. Deferred maintenance of the brick infill panels may be contributing to leaks in some of the residential units.

- *Standard 9: Make any intervention needed to preserve character-defining elements physically and visually compatible with the historic place and identifiable on close inspection. Document any intervention for future reference.*

  All repairs will be physically and visually compatible. The concrete repairs will be concealed by a protective coating and paint will be reapplied so that repairs will not be visually intrusive but will be identifiable on close inspection. Replacement brick and re-pointing will match the existing but will be identifiable on close inspection. Documentation of all interventions will be provided to the property owner, heritage staff, and the Municipal Heritage Committee.

Guidelines for Concrete (4.5.4)

- *1. Understanding the properties and characteristics of the historic place.*

  The dates of construction, construction methods and materials are documented. Areas of deterioration have been investigated using visual inspection and sounding.

- *2. Documenting the form, composition, strength, colour, texture, details and condition of the concrete before undertaking an intervention.*

  A condition assessment and photo documentation has been carried out by Edison Engineers. Further investigation and testing is specified as part of the repair strategy.

- *8. Protecting and maintaining concrete by preventing moisture penetration, maintaining property drainage, improving water shedding, and by preventing damage due to the overuse of ice-clearing chemicals.*

A protective coating will be applied to prevent moisture penetration. Installation of flashings to improve water shedding may be appropriate for the concrete cornice on the 5th floor of the 1920 addition. The use of de-icing salts should be avoided in the future.

- *9. Reapplying compatible paint or coating, if necessary that are physically and chemically compatible with the previous surface treatment and visually compatible with the surface to which they are applied.*

  New surface coating is specified that includes a protective coating and paint to match the existing paint. Test patches will be applied in inconspicuous areas to ensure compatibility of new coatings. Edison Engineers will review test patched to ensure that they are physically and chemically compatible. Megan Hobson Heritage Consultant will ensure that the patch repairs are visually compatible.

- *12. Repairing deteriorated concrete by patching or consolidating using appropriate conservation methods.*

  Localized patch repairs of deteriorated concrete and casting-in-place of missing elements is specified using appropriate conservation methods. All repairs will be 'in kind' repairs or replacement with an appropriate substitute material.

- *14. Cleaning concrete before repair to remove contaminants, dirt and soil, so that the new concrete patches match the cleaned surface.*

  Cleaning of repair surfaces is specified using pressure cleaning, wire brushing, grinding or chemical cleaners. Cleaning is limited to exposed concrete in the cut out areas. Pressure cleaning will be low-pressure, wire brushing will be done by hand, and grinding tools will be hand operated so that sound material is not removed. Cleaning is essential to ensuring a good bond between the existing concrete and the patching material. If chemical cleaning is needed in select areas it will be localized to the cut out area and the concrete surface will be protected.

- *15. Sealing of inactive cracks in concrete by pointing with a cementitous mortar, or injecting epoxies to prevent moisture from entering the concrete mass.*

  Sealing of cracks is specified with a silicone sealant that is physically, chemically and visually compatible. Test patches will be reviewed by the heritage consultant to ensure that the patch repairs are not highly visible, that they are flush with the surface and closely matched to the existing surface finish.

- *16. Replacing in kind extensively deteriorated or missing parts of concrete elements, based on documentary and physical evidence.*

  Selective 'in kind' replacement of extensively deteriorated and missing parts of the concrete cornice is specified. Replacement of extensively deteriorated steel reinforcing bars may be required in some sections of the concrete cornice.

Guidelines for Masonry (4.5.3)

- *1. Understanding the properties and characteristics of the masonry of the historic place.*

  The 1908 & 1911 portions of the historic façade have a smooth red brick, the mortar appears to be a lime mortar and the mortar joints are narrow with a concave profile. The 1920 & 1925 portions of the historic façade have a textured red/brown brick, the mortar appears to be a cement mortar and the mortar joints are wide with a heavily raked profile.

- *2. Documenting the form, composition, strength, colour, texture, details and condition of the masonry before undertaking an intervention.*

  A condition assessment and photo documentation has been carried out by Edison Engineers to document existing conditions including materials, forms and architectural details. The specifications include testing to determine the compressive strength of the concrete. The colour and texture of the concrete is not a primary concern because the concrete is painted and does not have a distinctive colour or texture that requires matching. Existing bricks will be matched in colour and texture. The specification includes provisions for brick tinting if necessary and products formulated for matching heritage brick are specified including Restauro-Lasur by Keim. An appropriate re-pointing mortar that is softer than the brick masonry units is specified. The colour and texture of the re-pointing mortar and the mortar joint profile will be visually matched to the existing brick. The specifications include approval of all replacement materials to be used on the heritage façade by Megan Hobson heritage consultant.

- *13. Repairing masonry by repointing the mortar joints where there is evidence of deterioration.*

  Re-pointing of deteriorated areas is specified. Edison Engineers has carried out a condition assessment and areas of deterioration have been identified. Areas for removal will be marked and inspected by the Edison Engineers and approved by the heritage consultant. Edison Engineer's has included re-pointing procedures in the Specifications (see Drawing D-12) with detailed instructions that are consistent with conservation practices.

- *15. Using mortars that are compatible in strength, porosity, absorption and vapor permeability with the existing masonry units. Pointing mortars should be weaker than the masonry units; and the joint profile should be visually compatible with the masonry in colour, texture and width.*

  The specification includes matching of existing mortars and mortar joint profiles based on existing conditions. For brick masonry the specified re-pointing mortars are lime-based mortars for heritage masonry and approved products are HLM 350 by King Masonry Products or NHL 4.6 by Daubois. Samples will be provided to the heritage consultant for approval to ensure that they are visually compatible.

- 16. Duplicating original mortar joints in colour, texture, width and joint profile.

Compatible mortars and joint profiles are specified. Mockups will be provided to the heritage consultant for review. Approved mock-ups will set the standard for other work.

- 17. Replacing in kind extensively deteriorated or missing parts of masonry elements based on documentary and physical evidence.

  Selective replacing of deteriorated brick masonry units is specified. Replacement brick will be matched to existing brick. Samples and mockups will be reviewed by the heritage consultant.

9.0 RECOMMENDATIONS

The following recommendations were made by the heritage consultant and have been incorporated into the repair strategy and are reflected in the attached specifications prepared by Edison Engineers.

9.1 MASONRY TESTING

Concrete Testing

Testing should be done on the 1908, 1911, 1920 & 1925 portions of the heritage façade, including the exposed concrete frame and the concrete architectural elements. A cash allowance is provided for testing samples of the existing concrete including compressive strength, chloride and carbonation. Testing will ensure that the patching compound is physically compatible and will confirm the causes and extent of deterioration in specific locations. This information will be used to inform recommendations for a long-term conservation strategy. Adhesion testing will be done to verify surface preparation procedures and ensure a strong bond between the existing concrete and the patch repairs.

9.2 ARCHIVAL RESEARCH

Archival Material

Archival research is not required to carry out the proposed surface repairs because all interventions will be guided by existing conditions. The heritage consultant will consult archival material at the University of Waterloo when access to that material is available. Access is currently limited due to restrictions associated with Covid19. The collection includes historic photos and original architectural drawings. The purpose of reviewing this material is to provide documentation that confirms that the existing light fixtures are original and to provide more information about their original appearance and significance. This information could be used to identify this feature as a heritage attribute and to restore it to its original condition in the future if desired.

9.3 HERITAGE REVIEW

The specifications include consultant review at each stage of the repairs including testing of existing conditions, mark-ups for removals, samples for replacement materials and mockups for new work. Approval by the heritage consultant is included in the review of all undertakings associated with the heritage façade. Heritage review will ensure that work is consistent with the Conservation Plan and the Heritage Permit so that a 'minimal intervention', 'replacement in kind' and 'gentlest means' approach is adhered to. Heritage verification original materials and finishes for the purposes of testing and approval of samples and mockups will ensure that replacement materials are consistent with the original design intent and that repairs are visually compatible.

Brick repairs

It is specified that samples of replacement brick and re-pointing mortar to be used on the heritage façade require approval by the heritage consultant.

Concrete repairs

It is specified that mock-ups for concrete repairs and coatings to be used on the heritage façade require approval by the heritage consultant.

Tracking Repairs

Edison Engineering will be the project manager and will track repairs. Information will be shared with the heritage consultant and site review will be arranged for the heritage consultant as needed. Elevation drawings by Edison Engineering showing the repair locations will be provided to heritage staff as part of the close out procedures.

Final Inspection

The heritage consultant will review the completed repairs on the heritage façade prior to final closeout to ensure that all work has been carried out in accordance with the *Conservation Plan* and *Heritage Permit*. The heritage consultant will provide photographs and a letter of completion to heritage staff as part of the close out procedures.

Long Term Strategy

Regular maintenance is recommended to fill and re-coat small surface cracks in the concrete and re-point mortar in the brick infill panels. Under the Condominium Act, cladding on Condominium Buildings must be inspected every 6 years. A review of the condition of the heritage facade by a heritage consultant should be included as part of this inspection. De-icing salts should not be used.

10. QUALIFICATIONS OF THE AUTHORS

Megan Hobson is a professional member of the Canadian Association of Heritage Professionals. Formal education includes a Master of Arts in Architectural History from the University of Toronto and a diploma in Heritage Conservation from the Willowbank School of Restoration Arts. Professional experience includes an internship at the Ontario Heritage Trust, three years as Architectural Historian and Conservation Specialist at Taylor Hazell Architects in Toronto, 1 year as a municipal heritage planner at the City of Oakville, and 8 years in private practice in Ontario as a heritage consultant. Other relevant experience includes teaching art history at the University of Toronto and McMaster University and teaching Research Methods and Conservation Planning at the Willowbank School for Restoration Arts in Queenston. In addition to numerous heritage reports, the author has published work in academic journals such as the *Journal of the Society for the Study of Architecture in Canada* and the *Canadian Historical Review*.

Edison Engineers Inc. is a professional engineering a project management firm that specializes in the repair and restoration of existing buildings. Contributing authors from Edison are **Alanna Wilson** and **Stefan Nespoli**. Alanna has a Bachelor of Arts in History and Theory of Architecture at Carleton University and a diploma in Architectural Technology at Mohawk College. During her time at Carleton, she was authored multiple "Hidden Heritage" articles published in Canada's History Magazine. Stefan is a Professional Engineer with a Bachelor of Applied Science in Civil Engineering from the University of Waterloo. He is a member of Professional Engineers Ontario and is a LEED Accredited Professional. Stefan has previously completed heritage work for clients in Ottawa, Toronto, London, and Windsor, and has published building repair articles for the Canadian Condominium Institute and the International Institute of Building Enclosure Consultants.

11. SOURCES

City of Kitchener, *Designation by-law 96-34: 410 King Street West (1996)*

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Edison ENGINEERS INC.

Specification Package

Cladding Repairs

404 King St. W., Kitchener

Board of Directors
Waterloo Standard Condominium Corporation No. 450
c/o Sanderson Management Inc.

September 15, 2020
WatSCC450.1796

SPECIFICATIONS

DRAWINGS

PART I - OBJECTIVE

The Kaufman Lofts buildings (formerly Kaufman Footwear) were constructed circa 1908-1925 and holds status as a Designated Part IV property under the Ontario Heritage Act with the City of Kitchener. The buildings were renovated and converted to condominiums in 2006.

The exterior cladding is deteriorating and requires localized repairs and preventative maintenance. There are localized areas of exposed spalled concrete and failing sealants and masonry. This project is undertaken to:

- Conserve the character-defining elements of this heritage asset's fabric and original design via appropriate conservation treatments.
- Enhance public safety by addressing potential fall hazard of spalled concrete.
- Improve building envelope's ability to manage moisture and prevent premature deterioration.
- Repair existing window systems that are allowing water penetration and frame deterioration.

The Owner intends to commence the work in 2021.

PART II - SCOPE OF WORK SUMMARY

The Scope of Work has been divided into four areas for access (refer to D-02):

1. Base Bid Access – south and east elevations of Building B
2. Optional Access 1 – south elevation of Building A along King St.
3. Optional Access 2 – north elevations
   (1) Locations with EIFS
   (2) Locations without EIFS

Base Bid repairs are focused on the south and east elevations of Building B and include concrete repairs and coating to address spalls and deterioration. Base bid also includes new drip flashings at Building B and a small area of column repairs at Building A.

Optional Items are included to address various deterioration at all areas and have been separated by work location in the Bid Form. Repairs include brick repairs and repointing, localized EIFS repairs, new drip flashings at window sills and other Watershedding areas, sealant replacement and face-sealing of windows.

PART III - SCOPE OF WORK

0. GENERAL REQUIREMENTS

a) Contractor shall provide all equipment, safety supervision, engineering, temporary support, etc., as required to facilitate the performance and inspection of the work described herein.

b) The Contractor is responsible for site safety. Overhead protection at building entrances and exits shall be installed as required. Construct and maintain a construction barrier with appropriate signage around the work area at all times. The minimum requirement is 6 ft high sectional metal fencing. Ensure that all air intakes are protected.

c) Full building access shall be maintained at all times. Provide overhead protection approved by a professional engineer registered with PEO.

d) Contractor to obtain required permits for closure or modified access to City sidewalk areas, including permits related to LRT Protection.

e) Refer to the requirements in section 01 02 00 for requirements related to hours of work, cleaning and other general items.

f) The Work shall include a mock-up of each concrete repair item, mortar joint repair, EIFS repair, and metal flashing installation. Brick replacement if work proceeds. The mock-ups will remain as part of the Work if approved. Allow 72 hrs for inspection of the mock-ups by the Engineering Consultant, Heritage Consultant and Owner prior to proceeding with work at other locations. The mock-up will become the accepted standard for the project.

1. ACCESS

Item 1.1 - Southeast Elevations: Provide access to the east and south elevations of Building B as required to complete the work and for consultant review. Means of access is to be Engineered scaffolding. The shop drawings must be submitted to the Consultant and stamped by a Professional Engineer registered in the Province of Ontario at least 2 weeks prior to starting any mobilization work. Drawings must clearly show the design criteria and procedural sequence to be followed for scaffolding installation. The scaffolding engineer must review the scaffolding installation and provide written acceptance of the scaffolding prior to commencing work. All scaffolded areas to be protected by construction mesh to control dust and debris. Payment for this item will be 50% on sign-off of installation and 50% upon removal. Refer to detail D-02 area denoted **Base Bid Access**.

2. CONCRETE REPAIRS

Item 2.1 - Rout and Seal Cracks: Mark all concrete wall cracks wider than the coating bridges per manufacturer's technical data sheet for consultant review. Where approved, rout the crack 12 mm wide and 12 mm deep. Apply bond break material (silicone sealant) inside the repair and seal flush with wall surface. Crayon is not an acceptable bond breaker. Refer to 07 92 10 and D-06.

Item 2.2 - Thin Surface Vertical Repair: Mark all scaled concrete surfaces or other thin deterioration that is not related to corrosion of reinforcing steel on all work area concrete elements for consultant review. Where approved, remove and replace concrete to a minimum depth of 12mm. Pay unit is per location. One location = 300mm x 300mm area max. Refer to sections 03 05 00, 03 20 00, and 03 30 00, and detail D-07.

Item 2.3 - Vertical Repairs: Mark all delaminated, spalled or cracked concrete caused by corrosion of the embedded reinforcing steel on all work area concrete elements. Shore prior to removals where required. Where repairs are approved, remove concrete, clean and coat steel, and replace concrete. Concrete shall be formed and vibrated. Unconsolidated concrete will not be accepted, and hand patching will not be permitted. Pay unit is per location. One location = 300mm x 300mm area max. Refer to sections 03 05 00, 03 20 00 and 03 30 00, and detail D-08.

Item 2.4 - Cornice/Edge Repair: Mark all delaminated, spalled or cracked concrete areas at cornices and at outside corners of window heads and sills. Where approved remove concrete 25mm beyond embedded reinforcing steel. Extend concrete removal to corrosion free steel. Clean and coat steel before replacing concrete. Unconsolidated concrete will not be accepted and hand patching will not be permitted. Pay unit is linear m. Refer to sections 03 05 00, 03 20 00, and 03 30 00, and details D-03-05, D-09.

Item 2.5 - Column Repair: Mark all delaminated, spalled or cracked concrete caused by corrosion of the embedded reinforcing steel at concrete columns on Building A King St. W. entrance. Where approved remove concrete, clean and coat steel, and replace concrete. Payment for this item is based on the number of "corners" (locations) that are repaired. For example, if ½ the column is repaired payment will be 2 locations. Install shoring and unload column prior to concrete removals in accordance with shoring drawing. Unconsolidated concrete will not be accepted and hand patching will not be permitted. Refer to sections 03 05 00, 03 20 00 and 03 30 00, and detail D-10.

Item 2.6 - Dowels: At repair patches where there is insufficient lap length available on existing reinforcing steel and where directed by the Consultant, dowel new reinforcing steel into the parent concrete. Use Hilti HIT-HY 200 system or approved alternate. Refer to section 03 20 00.

3. CONCRETE COATING

Item 3.1 - Southeast Concrete Coating: This includes all surface preparation and coating application for all exposed concrete elements in the Base Bid Access work area per D-02, the south, east and southeast elevations of Building B. Includes window sills. Surface preparation includes removal of loose areas of existing coating by means of pressure washing as per manufacturer's recommendations, and feathering patch edges by mechanical means to provide a smooth substrate profile. Surface preparation also includes window sill mortar joint repairs (rout and seal). Supply and install new exterior concrete coating to all work area concrete elements. Colour to be matched to existing to minimize aesthetic impact. Apply new coating as per manufacturer's written instructions. Refer to section 09 97 23 and drawings.

4. CASH ALLOWANCES

Do not proceed with or carry out any work under the cash allowance items unless specific written approval is provided by the Consultant. The scope of work and price shall be agreed to by the Consultant and Owner first.

Item 4.1 - **Cash Allowance for Testing:** Arranging and coordinating all specified testing. Payment shall be made based on the actual cost of testing, validated by receipt, and following submission of the testing report.

Item 4.2 - **Cash Allowance for Shoring Engineer:** Design and review of all required shoring systems. The drawings must be submitted to the Consultant by a Profession Engineer registered in the Province of Ontario at least 2 weeks prior to starting any repair work. Drawing must clearly show the design criteria, including limits of removals and procedural sequence to be followed for shoring installation. The shoring engineers must review the shoring installation and provide written acceptance of the shoring. The contractor shall apply for payment in the amount of the engineer's invoiced amount and shall submit invoices with each progress claim.

Item 4.3 - **Cash Allowance for Minor Repairs:** Carry out repairs outside the scope of work as approved by the Consultant.

Item 4.4 - **Cash Allowance for LRT Protection:** Arrange and coordinate the protection of LRT and power lines with Keolis and the City of Kitchener on the south Elevation. Payment is based on the actual cost of the protection validated by receipts.

5. GENERAL ITEMS

Item 5.1 - **Mobilization:** All costs associated with mobilizing all equipment, labour and products to carry out the work. Payment for this item shall be billed in full on the first invoice.

Item 5.2 - **Property Protection:** All costs associated with fabricating, installing and maintaining the required property protection systems, barriers and shoring during the work. This item will be released based on the percentage of work complete.

Item 5.3 - **Demobilization and Cleaning:** Demobilizing all equipment and products from the site and for cleaning all debris, dirt, laitance and staining caused by the work. Include cleaning of catch basins and drains as required. Payment will be released on the final invoice following complete demobilization and satisfactory cleaning of the site.

Item 5.4 - **All Other Items:** All items not included above but included in the General Requirements. Payment for this item will be billed based on the percentage of work complete.

Item 5.5 - **Bonding:** Arranging and obtaining specified bonding. Payment for this item will be released with the first invoice following submission of the bonds.

OPTIONAL ITEMS

6. ACCESS

Item 6.1 - **South Elevation:** Provide access to the south elevation of Building A as required to complete the work and for consultant review. Means of access is to be Engineered scaffolding. The shop drawings must be submitted to the Consultant and stamped by a Professional Engineer registered in the Province of Ontario at least 2 weeks prior to starting any mobilization work. Drawings must clearly show the design criteria and procedural sequence to be followed for scaffolding installation. The scaffolding engineers must review the scaffolding installation and provide written acceptance of the scaffolding prior to commencing work. All scaffolded areas to be protected by construction mesh to control dust and debris. Payment for this item will be 50% on sign-off of installation and 50% upon removal. Refer to detail D-02 area denoted **Optional Access 1**.

Item 6.2 - **North Elevations:** Provide access to the north elevations of Buildings A and B as required to complete the work and for consultant review. Prior to commencing work, lay out a mobilization plan (including note of how many "drops" the building will be divided into to facilitate the work). Payment to be made as a percent of drops accessed (50% at mobilization, 50% at demobilization from each drop). Provide 48 hours' notice prior to demobilizing from a drop. Refer to detail D-02 area denoted **Optional Access 2**.

7. CONCRETE COATING

Item 7.1 - **Concrete Coating:** Apply Scope of work Item 3.1 – Southeast Concrete Coating at remaining elevations. Refer to detail D-02 area denoted **Optional Access 1 & 2**.

Item 7.2 - **Coating Primer:** Premium to provide a single coat of manufacturer recommended primer to the work area for Items 3.1, 7.1, and 7.2. Surface preparation is included in coating items.

8. BRICK REPAIRS

Item 8.1 - Brick Replacement: Mark areas of brick deterioration for review by the Consultant. Where approved, carry out localized brick removal and replacement. Remove mortar by carefully raking the joints using hand tools to avoid damaging adjacent masonry that is in good condition. Replacement brick must closely match the original material in composition, size, colour and texture. Replacement mortar must closely match the original mortar in composition, colour and joint profile. Includes repointing around replaced bricks. Refer to section 04 03 31.

Item 8.2 - Mortar Joint Replacement: Mark out deteriorated masonry joints not adjacent to deteriorated bricks for review by the Consultant. Where approved, remove mortar or caulking by carefully raking the joints using hand tools to avoid damaging the adjacent masonry. Powered grinder cuts at centreline of mortar joints prior to hand tools is acceptable. Contractor is responsible to replace damaged masonry not marked for removal. Tool joints to match the existing profile. Refer to section 04 03 31 and D-12.

Item 8.3 - Brick Tinting: If matching replacement bricks are not available, tint new bricks to match the existing bricks. Refer to section 04 03 31.

Item 8.4 - Full Repointing at Base Bid Access Area: In lieu of Item 8.2 – Mortar Joint Replacement at Base Bid Access Area, remove mortar or caulking at entire work area by carefully raking the joints using hand tools to avoid damaging the adjacent masonry. Powered grinder cuts at centreline of mortar joints prior to hand tools is acceptable. Contractor is responsible to replace damaged masonry not marked for removal. Tool joints to match the existing profile. Refer to section 04 03 31 and D-12.

9. EIFS REPAIRS

Item 9.1 - Seal Inside Corners: At all vertical EIFS-to-EIFS joints provide new sealant. Colour to be selected from standard colour chart by Owner. Includes all surface preparation and primer. Refer to section 07 92 10 and detail D-11.

Item 9.2 - Replace Sealants: At all horizontal EIFS-to-EIFS joints, remove existing sealants to expose clean substrate. Complete surface preparation per manufacturer's recommendations. Contractor is responsible to replace EIFS or adjacent finishes damaged during removals. Mark areas for Consultant review where EIFS is not backwrapped. At EIFS, all sealants should be installed directly onto base coat. Supply and install new backer rod and sealants, colour to be selected from manufacturer's standard selection. Payment to be released based on percentage of work complete. Refer to sections 07 24 00, 07 92 10 and details D-11, D-13.

Item 9.3 - Localized Repairs: Mark locations of damaged EIFS for consultant review. Where approved, remove, dispose of, and replace localized areas of EIFS to match existing configuration as directed by the Consultant. Notify the Consultant immediately of any concealed deteriorated including delaminated insulation or lamina, non-backwrapped edges, impact damage, etc. This item does not include new finish coat. Refer to section 07 24 00 and detail D-14. Payment to be released based on actual area (m^2) replaced.

Item 9.4 - Localized Recoating: As directed by Consultant, provide new skim and finish coat over the existing and repaired EIFS sections to panel perimeter, including required surface preparation per manufacturer's recommendations. Refer to section 07 24 00.

Item 9.5 - EIFS Cornice Repair: As directed by Consultant, provide new skim and finish coat over the existing EIFS cornice face, top, and upturn to underside of existing metal roof parapet flashing, including required surface preparation per manufacturer's recommendations. Finish coat to be flexible elastomeric coating. Includes providing access from 6^{th} floor terraces at full perimeter of Buildings A and B. Refer to sections 07 24 00 and 09 97 23 and detail D-18.

10. WATERSHEDDING

Item 10.1 - Window Sill Flashings: Provide new prefinished sheet metal drip flashings at all window locations with precast concrete sills. Shim as needed to provide slope for positive drainage. Flashing colour to be selected from standard per substrate to minimize aesthetic impact. Refer to sections 07 62 00 and 07 92 10, and details D-11, D-15.

Item 10.2 - 5th Floor Transition Flashing: Provide new prefinished sheet metal drip flashings at all locations referenced on drawings. Repair EIFS as noted and provide new through-wall flashings and end dams to direct water to the exterior. Flashing colour to be selected from standard to minimize aesthetic impact. Refer to sections 07 24 00, 07 62 00 and 07 92 10, and details D-11, D-16-17.

11. WINDOW REPAIRS

Item 11.1 - Localized Frame Painting: Mark areas of bare alumimum and faded window frame finish for Consultant review. As directed by Consultant, clean and paint window frames sections and flashings. Remove all loose paint flakes and lightly sand to provide a smooth transition to well-adhered paint. Provide clean edges. Colour to be selected by owner to closely match existing. Refer to section 09 91 13.

Item 11.2 - Localized Sealant Replacement: Mark deteriorated, split, and debonded sealants for Consultant review. As directed by Consultant, remove and replace existing sealants. Includes all surface preparation and backer rod. Refer to section 07 92 10 and detail D-11.

Item 11.3 - Full Sealant Replacement: In lieu of item 11.2, remove and replace 100% of exterior sealants within the work area, including at window perimeters and brick control joints. Seal all envelope penetrations including but not limited to pipe penetrations, vents and anchors. Refer to section 07 92 10 and detail D-11.

Item 11.4 - Face Seal Windows: At area Optional Access 1 per D-02, complete surface preparation per manufacturer's recommendations and provide new needle bead at exterior glass to metal transitions – along all sills, upturning 150mm (6") onto jambs. Includes all fixed double-glazed panels. Provide clean lines. Sealant colour to be selected from manufacturer's standard selection. Refer to section 07 92 10 and detail D-11. Payment to be released based on percentage of work complete.

End of Section 01 01 00

1. General

(1) Work under this contract covers labour and materials required for the above noted project.

(2) The building shall remain in use in areas not immediately affected by the work.

(3) Work is allowed only from 8:00 am to 5:00 pm, Monday to Friday and in accordance with municipal bylaws. No work on weekends or evenings is permitted unless forty-eight (48) hours' notice is given and approved by the Owner.

(4) All shutdown work shall be coordinated with the Owner, and minimum 48 hours' notice must be given. Some shutdown works may have to be done in the evenings.

2. Contract Documents

(1) Work shall be performed under one Contract utilizing the Canadian Construction Document CCDC 4 (2011) – Unit Price Contract, as amended by Section 00 21 80 – Supplementary Conditions prepared by Edison Engineers Inc. The Contract and the Supplementary Conditions shall govern the performance of each Section of the Specifications.

(2) These General Requirements generally specify work and co-ordination that is the responsibility of the General Contractor but are not intended to define the responsibilities between the Contractor and Sub-contractors. Ensure that Sub-contractors fully understand the Contract, the Supplementary Conditions and these General Requirements.

(3) Sections of these specifications are not for the purpose of identifying limits of work between the General Contractor and Sub-contractors or between Sub-contractors.

3. Minimum Standards

(1) Work shall be executed to meet or exceed:

a) Ontario Building Code 2012 containing the Building Code Act, 1992, and O. Reg. 332/12

b) National Building Code of Canada 2015, National Fire Code of Canada 2015 and all other codes of local or provincial application. In cases of conflict between standards, or codes, the more stringent requirement shall apply.

c) Occupational Health and Safety Act Revised Statutes of Ontario 1990, c. 0.1, and Ontario Regulation for Construction Projects, 213/91 last amendment O. Reg. 252/14.

4. Temporary Facilities

(1) Temporary power and water for construction purposes is provided on site. power, light and water. Any extension or changes in existing facilities, required by the contract, shall be at the Contractor's expense. Obtain Owner approval prior to making any connection.

(2) Provide and maintain all fences, barricades, lights, and other protective structures or devices necessary for the safety of workers, equipment, the public, and property as required by Provincial or Municipal laws and regulations, and local ordinances, laws, and other requirements of the county, Province, and other authorities having jurisdiction with regard to safety precautions, operation, and fire hazards.

(3) For suspended access work comply with regulations O. Reg 213/91 and 242/16. For scaffolding over 15m high, the Contractor shall submit design drawings stamped by a Professional Engineer licensed to practice in the jurisdiction of the Work. The drawings shall clearly indicate all the materials which will be utilized and all fastening mechanisms to be employed. Upon completing installation and prior to use the design engineer shall carry out a review of the site and submit written confirmation that the installation was completed in accordance with the drawings.

Contractor to provide Ministry of Labour a minimum of 48hrs notice prior to setting up suspended work platforms and make available on site the inspection report and daily inspection logs throughout construction. Before the Work begins, the Contractor shall submit all documents required by the Ministry of Labour, including the following:

a) equipment design drawings;

b) P.Eng report confirming structural integrity of the work platform ;

c) written procedure for rescue;

d) risk assessment; and

e) a site specific work plan, including Roof plan.

(4) Coordinate requirements with LRT Operator (Keolis) and City of Kitchener.

5. Permits, Certificates and Fees

(1) The Contractor shall apply and pay for the Municipal Building Permit and shall make a submittal to the Owner. The Contractor shall be responsible for providing and paying for all other municipal permits, ESA, HVAC, plumbing permits, etc. The Contractor shall provide

authorities having jurisdiction with information requested and shall arrange for and co-operate with all authorities having jurisdiction for all requested inspections and reviews.

(2) The Contractor shall ensure that copies of all Inspection or Review Reports issued to the Contractor or Sub-trades are forwarded immediately to the Consultant.

6. Construction Schedule

(1) The Contractor shall supply the Consultant and the Owner with a construction schedule in MS2000 or gantt chart format, together with a Critical Materials Delivery Schedule within 5 days after notification of award of contract. The schedule shall indicate the various sub-trades, and shall include allowances for inclement weather and for increases in quantities of unit price items of up to 25%.

(2) The Construction Schedule shall be revised every two weeks until project completion. Notify the Consultant immediately of any changes to the schedule or to material delivery and or equipment delivery dates.

(3) The Contractor shall provide additional forces, at no additional cost to the Owner, in order to maintain the schedule. The contract will be considered breached should the Contractor not comply with a written request to provide additional crew, materials, or equipment to bring the work back on schedule.

(4) Any overtime (evening or weekend) work that might be required shall be done at no extra cost to the owner.

(5) The Construction Schedule forms an integral part of the Contract Documents, and as such, will be assigned a value of 5% of the project cost as a payment item. The Contractor will forfeit any claim to this amount if the Schedule information is not submitted as and when required.

(6) Include information relating to the dates for submission and return of shop drawings as part of the above requirements.

7. Construction Meetings

(1) All parties concerned must be informed of meetings, the time and location of such must be approved by the Owner.

(2) A Project Notification meeting must be held at the site no less than 48 hours prior to the commencement of the work to finalize all working constraints.

(3) The Contractor will attend biweekly meetings with the Owner and/or Consultant. Additional meetings will be scheduled by the Owner as required.

(4) The Consultant will record and prepare all minutes-of-meetings and distribute to the Contractor and Owner representative within 48 hours of the meeting. The Contractor is responsible for distributing the minutes to all sub-contractors within 24 hours of receiving the minutes-of-meeting. Any concern regarding the content of the minutes shall be directed in writing to the Consultant within 24 hours of receipt of the minutes failing which the contents of the minutes shall be deemed to be accurate and accepted by all recipients.

8. Examination

(1) It is assumed that the General Contractor and Sub-contractors will have examined the site and noted site conditions affecting the work. No additions to the contract amount will be allowed for work affected by visible site conditions.

(2) Prior to commencing work, verify layout dimensions and constraints in terms of the intent of the Drawings. Inform the Consultant immediately of any discrepancies.

9. Omissions, Errors and Discrepancies

(1) Report to the Consultant all discrepancies, omissions, errors, departures from building by-law or good practice, and points considered to be of dubious intent.

10. Site Records

(1) Maintain on site, one complete set of Contemplated Change Orders, Change Orders and Site Instructions.

(2) As work progresses, record deviations from the contract documents in red on a separate set of drawings. Record the location, size, and shape of repaired areas on drawings provided by the Consultant. The Contractor is responsible for requesting said drawings from the Consultant if not provided at the start of the project.

(3) Prior to issuance of Certificate of Substantial Performance, transfer all recorded deviations and/or repair locations to 2 clean sets of white prints, neatly printed to match original drawings. Annotate both sets of drawings as "AS-BUILT RECORD".

11. Maintenance and Warranty Data

(1) Prior to issuance of Certificate of Substantial Performance submit to the Consultant an electronic copy of the Maintenance Manual in pdf format. The Manual shall consist of, but not limited to, the following information:

a. Title Page and Table of Contents

b. Contractor and supplier's addresses and phone numbers

c. Material lists, colour codes and names, and technical data sheets for each material used

d. Maintenance instructions for materials

e. Shop Drawings and as-built drawings acquired during the project.

f. Other documents as indicated by the Consultant

(2) Maintenance and Warranty information form an integral part of the Contract Documents, and as such, will be assigned a value of 10% of the project cost as a payment item. The Contractor will forfeit any claim to this 10% amount if the Maintenance and Warranty information are not submitted as required.

12. Shop Drawings and Samples

(1) The Contractor shall arrange for the preparation of all shop drawings and samples by the sub-trades and suppliers immediately upon notification of award of contract.

(2) The Contractor shall check and certify as correct all shop drawings and product data sheets prior to issuing to the Consultant.

(3) Shop Drawings shall be submitted in three copies to the consultant. The shop drawing will clearly identify the Contractor, the Project, the Consultant, and the specification section pertaining to the shop drawing. Faxed and generic documents will not be acceptable.

(4) Submit 2 samples as requested in Specifications Sections, identifying the manufacturer, product, colour and specification section. Installed work shall match the reviewed sample.

13. Safety Regulations

(1) Conform with and strictly enforce compliance with the Occupational Health and Safety Act and other similar regulations in force at the place of work.

(2) Observe and enforce construction safety measures required by the NBCC 2015 Part 8, provincial government, WCB, and municipal statutes.

(3) Provide current MSDS sheets for applicable materials at the Project Notification Meeting.

(4) The Contractor is solely responsible for site safety and no action or lack of action by the Owner or Consultant shall be construed as an instruction related to safety of the workplace.

(5) No "hot work" is to be executed when the sprinkler system is inoperative.

(6) Contractor shall take all necessary precautions to ensure fire alarm systems are not accidently activated during the work.

14. Maintenance of Ongoing Operations of Affected and Adjoining Property(s)

(1) The General Contractor shall be aware and shall be responsible for making all Sub-trades and Suppliers aware of the necessity of maintaining the ongoing operation of the residents in the affected and adjoining sites. All work shall be coordinated and scheduled to prevent any disruption to those operations.

(2) The General Contractor will provide all necessary hoarding and dust barriers. The General Contractor shall co-ordinate any work within the adjoining properties or any general service disruptions with the Consultant 48 hours in advance of that Work. Permission may be withheld pending approval of those residents.

(3) Any and all works that may cause excessive noise or obstruction must be specially scheduled and noted to the Owner.

(4) Maintain full accessibility to the building, including emergency exits, during the repairs. Provide temporary measures for barrier free access.

15. Sub-Contractor Information

(1) The Contractor shall submit a complete list of sub-contractors in accordance with the Bid Form.

16. Existing Services

(1) Establish locations and protect all existing utilities and services.

(2) Cap off and remove unused utility services within the building as approved by the Consultant and the utilities involved.

17. Temporary Facilities and Services

(1) Contractor shall provide their own washroom facilities. Maintain clean and in an inconspicuous location as agreed to by the Owner.

(2) The Owner is responsible for general snow clearing of the site and grass cutting outside the areas immediately affected by the work. The Contractor shall be responsible for snow clearing and grass cutting within the work area and any additional snow or ice clearing required for safety or work reasons.

18. Site Review

(1) N/A

19. Cleaning

(1) Project area shall be kept free of accumulated waste and swept daily.

(2) Avoid structural overloading when piling waste.

(3) Maintain cleaning of all areas of the project until final completion.

(4) Prior to any inspection for Substantial Performance, provide full clean up, replace any damaged or broken materials, remove temporary protections and remove dust, stains, sealant and adhesives and any accumulations of construction materials, debris or rubbish.

20. Protection

(1) The Contractor shall protect existing work from damage and shall be responsible for complete replacement of damaged existing work to match.

(2) The Contractor shall provide and maintain all necessary fences, barricades, lights and other protective structures or devices for the safety of the public, workers, existing property and equipment as required by the Provincial or Municipal laws and regulations, local ordinances, laws and other requirements of the Region, County, Province or any other authorities having jurisdiction with regard to safety precautions, operation and fire hazards.

(3) The Contractor shall maintain all emergency and service access routes clear during the work.

(4) Access 'to and from' the building and mechanical rooms during construction must be kept closed for security & safety.

(5) The Contractor is responsible for identifying all locations which will allow any dust, fumes or odours generated by the work to travel to adjacent spaces, to the interior of affected building, or to mechanical and electrical systems. The Contractor shall report these concerns and take any necessary measures to prevent this from occurring.

(6) The Contractor shall complete a pre-construction review and submit a written list of any existing damage or systems not in working order.

(7) The Contractor shall take measures on a daily basis to mitigate the risk of water penetration to the interior of the building during building envelop repairs.

(8) The Contractor shall request permission from local authorities (Fire Marshall, etc.) to barricade balcony doors during the Work if required. If permission is granted, the Contractor shall install temporary guards at balcony or terrace doors to prevent access during the work. Make good any anchoring points or holes required to install guards.

(9) The Contractor shall keep access surfaces clean at all times.

21. Materials

(1) Material and equipment shall be delivered and stored to manufacturer's instructions with seals and product labels intact.

(2) New products and materials shall be utilized in all cases unless otherwise specified.

(3) The Contractor shall submit in writing any requests to use alternative materials or installation methods specified or stated in the bid documents at least 2 weeks prior to the intended application. The information submitted shall include the reason for the change, expected performance difference compared to those specified, all manufacturer data sheets and installation instructions, and the change in contract price, if any.

(4) The Contractor shall assume full responsibility for protection and safekeeping of products under this contract.

(5) Should unforeseen hazardous materials, such as asbestos, be detected or suspected within the work site, Contractor shall stop work immediately and report the findings to the Owner. Removal of hazardous materials will be by the Owner.

22. Independent Testing and Inspection

(1) A Cash Allowance is set out for Independent Testing and Inspection to include the following items:

i) Concrete cylinders (determination of 7-, 14-, and 28-day strength)

(2) The cost of Independent Testing & Inspection shall be paid for by the General Contractor, as authorized by the Consultant, from the Cash Allowance.

(3) The Contractor shall obtain a quote from the testing agency and submit to the Consultant for approval before retaining their services.

(4) The Independent Testing and Inspection Company shall have the authority to stop work should the quality of material or workmanship warrant. The General Contractor shall be responsible for conveying all Reports and Test Results from the Independent Testing and Inspection Company to the Consultant.

23. Project Correspondence

(1) The Contractor shall designate a Site Superintendent who will be on site full time and communicate daily with the Consultant. The Superintendent must be technically qualified and experienced for this type of project and shall be responsible for all coordination between the sub-trades on site.

24. Final Review and Project Closeout

(1) Ensure that cleaning is complete.

(2) Deficiencies are to be corrected on an on-going basis through the life of the project. Near the end of the project, the Consultant and Owner shall undertake a final inspection when the Contractor's work is deemed complete. The Contractor shall be given an itemized deficiency list at this time. These deficiencies are to be corrected within a time designated in a notice to the Contractor.

(3) The Contractor shall notify the Owner and Consultant prior to the scheduled completion of the deficiency repairs, so that a re-inspection can be scheduled. Should further inspections be found necessary due to uncorrected deficiencies, costs for these inspections by the Consultant and Owner shall be back-charged to the Contractor.

(4) Final review for completion will not take place until authorities having jurisdiction have inspected and provided certificates of approval, and all warranty information, guarantees, maintenance manuals and as-built drawings are received and reviewed.

End of Section 01 02 00

PART I - GENERAL

1.	Related Work	(1) Section 03 20 00 – Concrete Reinforcing
		(2) Section 03 30 00 – Cast-In-Place Concrete
2.	Reference Standards	(1) Guideline No. 310.1R-2008, Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion, from the International Concrete Repair Institute (ICRI).
3.	Submittals / Mock-Ups	(1) Shoring drawings stamped by a Professional Engineer registered in the Province of Ontario 2 weeks prior to beginning concrete removals. Inspection and approval letter from Engineer following installation.
		(2) The Contractor will be responsible for maintaining an accurate record of quantities for the various concrete repair categories. A copy of the quantity record shall be confirmed by the Consultant prior to and shall accompany progress invoices.
		(3) The Contractor shall submit plan drawings at the conclusion of each repair phase indicating all concrete repair locations.
4.	Job Conditions and Protection	(1) The Contractor is responsible for any damage to the building components caused by the work. Provide protection within the immediate work area and on the ground below.
		(2) Dispose of concrete debris and dust from slab and work area daily. Dispose of material in accordance with the governing waste control regulation.
5.	Quality Assurance	(1) Notify the Consultant for review of the following stages of concrete removals: a) Mark-outs of delaminated, spalled and or cracked concrete b) Mock-up of specified repairs. Coordinate review of mock-up with a) above if possible. c) Completion of bulk concrete removals prior to surface preparation
		(2) Do not proceed with bulk removals until the Consultant has approved mark-outs and mock-up.
6.	Warranty	(1) See related sections. Warranty period 2 years from date of substantial completion.

PART II - PRODUCTS

1. Hammers

(1) Chipping Hammers: maximum 7 kg – (D-shaped handle, held with one hand on handle and one on cylinder, approx. 300mm long cylinder, quick stroke) for removal of concrete at columns and walls, and beyond the level of the reinforcing steel in other areas.

(2) Jack Hammers: maximum 13 kg – Not permitted unless approved by the Consultant.

(3) Breaker Hammers: maximum 28 kg – Not permitted unless approved by the Consultant.

(4) The use of rivet busters is prohibited.

PART III - EXECUTION

1. Markouts

(1) The Contractor shall locate deteriorated and or unsound concrete on the walls by hammer-tap. The removal areas shall be marked-out for review by the Consultant prior to demolition.

(2) Do not commence removals without approval by Consultant.

(3) Soffit delaminations shall be repaired as through slab repair unless directed otherwise by the Consultant.

(4) After reviewing the mark-outs the Consultant, at their discretion, may extend removal areas to include sound concrete. This will be carried out to eliminate concrete projections into patches, to limit the quantity of small patches, or to check the condition of the steel beyond the removal.

2. Shoring

(1) Install shoring and obtain shoring engineer written approval prior to undertaking repairs.

(2) Shoring is required when more than 50% of the slab top steel on one side of a column or line between columns is marked for removals or as directed by the Consultant.

(3) Install shoring for vertical surfaces or columns as required.

(4) Shoring drawings submitted shall clearly demonstrate the limits of removals and required shoring.

(5) Maintain shoring in place until repair concrete has attained 75% of the specified 28-day strength.

3. Soffits

(1) Remove all existing protection or troughing installed to redirect leaking water on the underside of the slab within the area of work. Store or dispose of materials as directed by the Owner.

(2) The Contractor is responsible for repairing any damage to the soffits which extends beyond approved markouts unless damage can be attributed to poorly consolidated / cracked concrete or minimal concrete cover on the bottom reinforcing steel. All damaged areas shall be repaired as through slab repairs.

(3) Remove evidence of water leakage, efflorescence, corrosion, or mineral deposits from the underside of the slab using mechanical wire brush or sandblasting. Where the adjacent surfaces are painted, repaint to match with paint approved by the Consultant.

4. Vertical Surfaces

(1) Removals shall be undertaken in sections less than 900mm in any direction at one time where they cannot be shored. Where no shoring is employed leave a minimum of a 900mm wide section of full wall thickness between removal areas, uninterrupted from top to bottom of wall, until repair material has achieved 75% of specified 28-day strength.

5. Mechanical and Electrical Services

(1) Prior to commencement of concrete removals examine the concrete and note all mechanical and electrical services which may be affected by the work. Mark locations of services contained within the slab.

(2) Note location of main electrical rooms or service rooms, such as transformers and generators. Assess risk of water penetration once waterproofing and concrete are removed.

(3) Take measures to protect services from damage. Be responsible to maintain services to other parts of the building not affected by the work.

(4) Where the Owner has agreed to undertake repairs or temporary protection, communicate and coordinate with the Owner's contractor when embedded services are located during removals or will be affected by removals.

6. Bulk Removals

(1) All loose and delaminated concrete and concrete designated for removal shall be removed from areas as specified in the Contract and as approved by the Consultant. Do not remove any concrete beyond approved markouts. Once bulk removals are complete notify Consultant for review to extend patches as required.

(2) When patching is required, the perimeter of the area to be removed shall be sawn to a depth of 25 mm or to the depth of the reinforcing steel bar, whichever is less. Sawcutting shall not be employed for removal areas to be subsequently covered by the work of concrete overlays.

(3) Except when the Contract specifies a minimum depth of removal, when existing reinforcing steel is not exposed during concrete removal and sound concrete does not have to be removed in the area for other reasons, existing concrete shall not be removed more than that required to expose the surface of sound concrete.

(4) Concrete removal shall extend below the reinforcing steel within the boundaries approved by the Consultant in the following areas:

a) The entire area of spalls and delaminations.

b) The areas of concrete components where corrosion potential of the reinforcing steel is more negative than -0.35 volts, as determined by a half cell survey.

c) All areas of exposed reinforcing steel.

(5) Concrete shall be removed to a uniform depth of 25 mm or two times the maximum aggregate size of patch material behind the first layer of reinforcing steel whichever is greater. Concrete surrounding the second layer of reinforcing steel shall also be removed locally to provide a minimum clearance of 25 mm or two times the maximum aggregate size of patch material whichever is greater all around the reinforcing steel. All other concrete removal beyond the second layer of reinforcing steel shall be carried out only when directed by the Consultant.

(6) Remove concrete to provide a consistent depth and to enable application of cement slurry adjacent formwork and along the edge of patches. Depth of patches containing reinforcing steel shall be a minimum of 65 mm. Where approved by the Consultant patches may vary in thickness toward the edge of a patch while still maintaining minimum depth requirements described herein, and the slope of such transition must be a maximum of 45 degrees.

(7) Where reinforcing steel is exposed, concrete removal shall extend along the reinforcing steel to the point where it is free from heavy rust. Concrete covering the reinforcing steel at the edge of the repair area will be sounded by the Consultant for localized delaminations before removal operations are completed.

(8) Where the area of concrete removal with exposed reinforcing steel exceeds 2 m², the reinforcing steel shall be retied at every second intersection point and shall be supported to maintain the steel mat in its original location.

(9) Removals shall be carried out in a manner which minimizes damage to sound substrate, embedded reinforcing steel, electrical and mechanical services.

(10) All existing reinforcing steel shall remain in place unless otherwise directed by the Consultant in writing.

7. Concrete Substrate Preparation

(1) Preparation shall not begin until the Consultant has approved all bulk concrete removals. The Contractor is responsible for ensuring that all designated concrete has been removed.

(2) Prior to notifying Consultant for final review of concrete removal areas be responsible to check all substrate surfaces both within and around the perimeter of concrete removal areas to identify fractures, loose concrete and or unsound areas. Remove these defects and recheck the area until the entire substrate is sound.

(3) Mechanically roughen or sandblast saw-cut edges.

(4) Following sandblast cleaning, the surface will be checked by the Consultant for fractured concrete, or loose aggregate. This material shall be removed using hand tools.

(5) Remove all deteriorated concrete, dirt, oil, grease, other bond inhibiting materials from surface. Maintain in this state until new patch material is applied.

(6) Prior to placement of concrete remove all dust or dirt from surface of concrete using clean compressed air (with oil trap in line).

End of Section 03 05 00

PART I - GENERAL

1.	Related Work	(1) Section 03 05 00 – Concrete Removals
		(2) Section 03 03 00 – Cast-In-Place Concrete
2.	Reference Standards	(1) Welding Certification C.S.A. Standard W186-M1997
		(2) Manual of Standard practice of the Reinforcing Steel Institute of Ontario
		(3) CAN/CSA G30.18-M92(r2007) and CAN/CSA A23.1-04
		(4) ACI/ICRI Concrete Repair Manual
		(5) ACI Guideline No. 222 – Corrosion of Metals in Concrete
		(6) ICRI Guideline 310.1R-2008 Guide for Surface Preparation for the Repair of Deteriorated Concrete resulting from Reinforcing Steel Corrosion
		(7) ASTM A615/A615M Standard Specification for Deformed and Plain Billet-Steel Bar for Concrete Reinforcement
3.	Submittals / Mock-Ups	(1) Documentations verifying that all new reinforcing steel has been supplied by a plant certified by the Concrete Reinforcing Steel Institute.
		(2) Documents verifying that epoxy used to touch up existing reinforcing steel is approved by the reinforcing steel supplier.
4.	Job Conditions and Protection	(1) Take adequate measures to contain dust generated by the work. Protect all building components and mechanical equipment. Do not allow dust to leave work area during sandblast operations
		(2) During application and curing of epoxy the air and reinforcing steel surface temperatures shall be greater than +4°C.
		(3) Apply epoxy to dry surfaces only. Do not apply epoxy when the relative humidity is above 80% or when there is a risk of condensation (surface temperature of the steel must be greater than 3°C above the dew point).
		(4) Protect new reinforcing steel from damage and dirt by storing on racks or skids.

5. Quality Assurance

(1) Notify the Consultant for review of the following stages:

a) Final review of preparation of reinforcing steel
b) Final review of all epoxy coating.

(2) The coverage and thickness of the epoxy coating will be randomly checked non-destructively. Voids, pinholes and visibly thin areas of coating will not be accepted.

6. Warranty

(1) The workmanship and materials in this section shall be warranted to include corrosion of any new or field coated steel, or other defects as determined by the Consultant for a period of 2 years.

PART II - PRODUCTS

1. Reinforcing Steel Accessories

(1) Provide bar supports conforming to the requirements of Manual of Standard practice of the Reinforcing Steel Institute of Ontario. Supports shall be plastic, precast concrete or plastic protected steel, all of the same colour as the concrete. Use coated tie wire.

2. Field Applied Epoxy Coating

(1) Amerlock 400 High-Solids Epoxy by Amercoat Canada Inc. Apply in two coats to a dry film thickness of 0.2 to 0.4 mm (8-16 mils). The colour shall be unlike steel, concrete, or rust colours.

3. Reinforcing Steel

(1) Steel reinforcing bars or rods to be embedded in concrete shall be deformed bars of 400MPa strength. They shall be free from kinks or defects and from bends that cannot be readily and fully straightened in the field. Bars shall conform to CAN/CSA G30.18-M92(r2014) and CAN/CSA A23.1-04. Bars shall be epoxy coated. All bars shall be stored in a clean, dry place until incorporated in the work.

(2) Chairs, bolsters, bar supports, spacers shall be plastic, or epoxy coated. The use of pieces of broken stone or brick, pipe, or wooden blocks will not be permitted

(3) Where existing reinforcing steel is replaced, new factory coated reinforcing steel shall be 20% greater is length than existing. Alternatively, the existing steel can be replaced with 20% more steel as directed by the Consultant.

(4) All cut bar ends and other voids in new reinforcing steel coating shall be touched-up with epoxy supplied by the manufacture. Epoxy shall have original labels and written confirmation from the manufacturer shall be submitted to the Consultant.

PART III - EXECUTION

1. Removal and Replacement

(1) Do not remove any reinforcing steel without review and written consent by the Consultant. Prior to removing any steel prepare and submit a drawing detailing showing the size, layout and location of existing steel.

(2) When the existing reinforcing steel is to be replaced and where it extends into columns, walls, beams or other remaining structures, maintain a sufficient length of existing reinforcing steel to ensure sufficient lap lengths in accordance with CAN3-A23.3. Alternatively, only if directed by the Consultant, cut steel to allow for weld splicing of the new steel.

(3) Repair or replace reinforcing steel with heavy corrosion and or critical section loss as directed by the Consultant.

(4) Where directed by the Consultant, remove existing reinforcing steel and replace with new factory applied epoxy coated bars.

2. Reinforcing Steel Preparation

(1) Remove all existing exposed tie-wire and bar supports.

(2) Straighten all bent reinforcing bars to their original shape. Do not heat the steel. Bend bars or modify formwork to provide specified cover.

(3) Clean surface of existing reinforcing steel using mechanical methods in accordance with SSPC-SP3 (Power Tool Cleaning) or SSPC-SP7 (Brush-Off Blast Cleaning)

SSPC-SP7 - A Brush-Off Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint. Tightly adherent mill scale, rust, and paint may remain on the surface. Mill scale, rust, and coating are considered adherent if they cannot be removed by lifting with a dull putty knife. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods. For complete instructions, refer to Joint Surface Preparation Standard SSPC-SP7/NACE No. 4.

SSPC-SP3 - Power Tool Cleaning

Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1. For complete instructions, refer to Steel Structures Paint Council Surface Preparation Specification No. 3.

(4) Apply two coats of epoxy in accordance with the manufacturer's written instructions. Allow sufficient cure time before concrete placement.

3. New Steel

(1) Do not damage epoxy coating during placement of steel.

(2) Reinforcement shall be tied together sufficiently with coated tie wire to prevent displacement during concrete placement and vibration. The ties ends shall be bent toward the interior of the concrete.

4. Clear Cover

(1) For concrete placed against the earth (bottom of footings) provide 75mm clear concrete cover.

(2) Place new steel to match same concrete cover as existing steel to a minimum cover of 25mm.

5. Bar Lap Length

(1) Lap lengths with existing reinforcing bars are to be in accordance with CAN3-A23.3. See table below for common lap lengths:

Tension Lap for Grade 400MPa Epoxy Coated Bars	
Bar Size	**f'_c = 30Mpa or Greater**
10	530mm (21″)
15	780mm (31″)
20	1040mm (41″)
25	1610mm (64″)
30	1940mm (77″)
35	2250mm (89″)
-If clear cover is more than 3x the bar diameter and clear spacing between bars is less than 6x the bar diameter, divide values in table by 1.25 -Not Applicable for bundled bars -If more than 300mm of concrete is below and less than 300mm of concrete is above, and bars are horizontal, multiply values in table by 1.3	

End of Section 03 20 00

PART I - GENERAL

1. Related Work
   (1) Section 03 05 00 – Concrete Removals
   (2) Section 03 20 00 – Concrete Reinforcing
2. Reference Standards
   (1) CSA Standard A23.1-14
   (2) CSA Standard A23.2-14
   (3) CSA Standard S269.3-M92 (R2008) – Concrete Formwork
   (4) CAN/CSA S448.1 – Repair of Reinforced Concrete in Buildings and Parking Structures
   (5) SSPC – Surface Preparation Standards
3. Submittals / Mock-Ups
   (1) The Contractor shall provide evidence of satisfactory similar experience over the past 5 years and of a skilled workforce trained and competent in carrying out the repair work specified.
   (2) Submit a concrete mix design at least two weeks prior to concrete placement.
   (3) The Contractor will be responsible for maintaining an accurate record of quantities for the various concrete work completed, including the location, date, time and quantity of each pour and the ambient air temperatures during each pour.
   (4) The Contractor shall submit plan drawings at the conclusion of each repair phase indicating all concrete repair locations.
4. Job Conditions and Protection
   (1) Prior to placing concrete make any preparations necessary whenever the air temperature is expected to exceed 27˚C. Shelter formwork, reinforcing steel, and concreting equipment from direct sun and wind by erecting appropriate sun shades and by providing wind breaks.
   (2) Concrete shall be rejected when its temperature is less than 10˚C or greater than 30˚C.
   (3) Concrete shall not be placed when the area of placement is exposed during rain.
   (4) Cold weather concrete placement. If concrete is being placed when there is a probability of the air temperature falling below 5˚C within 24 hours of placement, all materials

and equipment needed for proper protection and curing shall be on site and ready for use prior to the start of concrete placement.

(5) During concrete placement and finishing take measures to protect all adjacent and nearby surfaces from overspill. Clean any cement or concrete slurry or spills from building surfaces immediately.

5. Quality Assurance

(1) Notify the Consultant for review of the following stages:

a) Formwork installation
b) Concrete placement

(2) Ready mix concrete shall be used unless otherwise directed or approved by the Consultant. The concrete shall be supplied by a member of the Ready-Mix Concrete Association of Ontario which has been issued a seal of Special Quality Concrete attesting that its coefficient of variation is less than 12%.

(3) Project specifications shall be reviewed in full by the contractor prior to ordering concrete materials.

(4) CONCRETE TESTING

a) Notify the Consultant when completed formwork and concrete reinforcement is ready for inspection.

b) Allow ample time for notification, inspection and corrective work, if required, before scheduling concrete placement.

c) Provide free access to all portions of the work and cooperate with the appointed testing agency and Consultant.

d) Following mobilization and prior to commencing work at each building location (Building A, Building B), extract concrete cores as required to establish the compressive strength of the existing concrete. Cores to be extracted near repair locations. Concrete repair material to be modified as required to closely match average compressive strength of existing concrete at each building. Additionally, complete chloride and carbonation testing near repair locations.

e) During the progress of the work a reasonable number of test cylinders shall be made as directed by the

Consultant. Each test consists of a minimum of three cylinders. The minimum number of tests shall be as follows:

(i) There shall be one test taken from each 15 m^3 of concrete placed or at least one test per day. Additional tests may be required at the discretion of the Consultant.

(ii) All cylinders shall be taken at the place of pour.

(iii) Slump and air content tests shall be taken on each load until satisfactory control of air content is established or as often as directed by the Consultant. Concrete used for air content tests shall not be used to produce test cylinders and will be disposed as waste by the contractor.

(iv) Slump tests shall conform to CSA A23.2-5C.

(v) Air Tests shall conform to CSA A23.2-4C or CSA A23.2.7C.

f) The test cylinders shall receive, insofar as practicable, the same protection during the first twenty-four (24) hours as that given to the work, and will be tested in accordance with CSA A23.2-3C. The test cylinders shall be placed in boxes provided by the inspection firm immediately following casting.

g) The inspection and testing of the concrete shall be done by a firm approved by the Consultant. The cost of cylinder tests shall be borne by the Owner.

h) In the case where the compressive strength of the test cylinder for any portion of the work falls below the requirements specified herein, the following shall apply:

(i) Where the twenty-eight (28) day strength of the test cylinder is under 100% of the specified strength but over 85%, in the Consultants own discretion, the concrete shall be completely removed and replaced, or covered by a five (5) year Maintenance Bond, either of which shall be at the Contractors' expense. The limits of the location covered by this Maintenance Bond shall be the measured area or length of concrete placed or as determined by the Consultant. The amount of the five (5) year Maintenance Bond shall be twenty-

five percent (25%) of the measured area or length of the work multiplied by the unit price or lump sum price submitted in the Tender Form.

(ii) Where the twenty-eight (28) day compressive strength of the test cylinder is under 85% of the specified strength complete replacement of the work will be required, the limits of the location of which shall be the measured area tested or as determined by the Consultant. The replaced work shall be subject to the terms and conditions of this Contract.

(5) CONCRETE PLACEMENT

The concrete may be rejected prior to placement for the following reasons:

a) Concrete does not conform to specified and approved mix design

b) Concrete placement does not start within 1.5 hours from the plant batch time

c) Concrete is older than 2 hours from plant batch time

d) The concrete has undergone less than 70 or more than 100 revolutions at mixing speed.

(6) Condemned or rejected material shall be immediately removed from the work and disposed of as directed by the Consultant.

(7) All defects or imperfections due to rain, frost, trespass, improper workmanship or materials appearing before final acceptance of the work shall be repaired to the satisfaction of the Consultant by the Contractor at his own expense during construction.

(8) COLD WEATHER CONCRETING

a) Special measures over and above those generally described in this Specification shall be taken by the Contractor during concreting in cold weather. Cold weather, for the purpose of this Specification, is when the air temperature is at or below the values in the table below, or when, in the opinion of the Consultant, the air temperature is likely to fall below these limits during the next twenty-four (24) hours. In these circumstances, concrete must be heated for placing and then

protected from the adverse effects of low temperatures as determined by the Consultant.

Thickness of Element	Min. Temp.	Max. Temp
300 mm	10°C	35°C
300 - 1000mm	10°C	30°C
1000-2000mm	5°C	25°C
> 2000mm	5°C	20°C

b) During cold weather the Contractor must have equipment for heating materials, for enclosing the freshly deposited concrete, for preheating the substrate, and for maintaining temperature and humidity during the curing period, on site.

c) Cold weather protection is to remain in place to ensure curing for a minimum of 3 days at ≥ 10 ºC or for a time necessary to attain 40% of the specified strength.

d) Special attention is required at corners and edges as these areas are most vulnerable.

e) The cost of all heating and protecting shall be borne by the Contractor. Concrete damaged by freezing shall be removed from the site and replaced at the Contractors expense, with new concrete in place subject to the terms of this contract.

f) If the temperature is or was, at any time during the previous twenty-four (24) hours, at 0 °C., or if the stockpiles of fine and coarse aggregate contain frozen material or are snow covered, then the aggregates shall be heated to a temperature of not less than 20 °C and not more than 65 °C. The aggregates shall be uniformly heated in the stockpiles and/or bins by steam, either injected, live or circulated in coils or by using heat before the aggregates are placed in the mixer. Whatever system is used, it shall be designed to give uniform heating which will avoid local overheating which may be injurious to the materials. That part of the stockpile in use shall be protected with tarpaulins, waterproof paper or plastic sheeting against the

formation of ice and the accumulation of snow.

g) The temperature of the reinforcement, forms and substrate shall be above 10°C prior to placing the concrete

h) The temperature of the concrete at the time of placing shall be between 20°C and 25°C unless the Consultant directs otherwise in relation to ambient conditions, the type of work and the protective system in use. The form work, existing concrete and reinforcing steel against which concrete is to be placed shall be free from ice, snow and within the stipulated temperature range before the Consultant will authorize placing to commence. The Contractor shall preheat the area in which the concrete is to be placed when the air temperature is 0°C or below, with live steam or moist hot air; this shall also remove the snow and ice and heat existing concrete to prevent the formation of a cold joint.

i) Concrete shall not be placed on frozen sub-grade or against frozen ground. The Contractor shall protect excavations with appropriate covering prior to placing concrete. The concrete shall be placed rapidly and evenly as near to its final position as possible to reduce the risk of segregation, flow lines and cold joints.

j) Wet curing is not required.

k) Strength gain is slowed during cold weather concreting. Additional strength cylinders shall be cast and left on site under similar protection to new concrete for testing. Each test sample shall include one additional cylinder to be stored as near to the placed concrete as possible, and shall receive the same protection from the elements as the concrete that it represents. This cylinder shall be stored in the field for the full 5-day cure period prior to being transported to the testing laboratory for a 7-day compressive strength test. Specimens shall not be removed from the moulds until after the 5-day cure period, unless the Contractor wishes to test this cylinder earlier for removal of formwork.

l) Consultant's written approval is required prior to removal of any formwork during cold weather concreting.

(9) Bond Tests: The Consultant may order tensile capacity tests in accordance with CSA A23.2-6B-Determination of Bond Strength of Bonded Toppings and Overlays and of Direct Tensile Strength of Mortar and Grout. The average bond strength shall be the greater of 1.5 MPa (220 psi) or the strength of the substrate. Any patch with a bond test result less than 1.0 MPa shall be rejected. If there is any dispute the Contractor can undertake additional tests at their expense.

6. Warranty

(1) The workmanship and materials in this section shall be warranted to include debonding of the patch material along the interface with the substrate concrete, excessive shrinkage cracking of the patch material, or other defects as determined by the Consultant for a period of 2 years.

PART II - PRODUCTS

1. Cement Slurry

(1) Conform to CSA Standard A23.1-09, Section 7.6.4.2.2(a)

(2) 1:1 Cement/Sand grout, mixed to a stiff, cream-like consistency, with maximum water to cement ratio of 0.45. The consistency of the mixture shall be such that it can be applied with a stiff brush to the existing concrete in a thin, even coating that will not run or puddle.

2. Packaged Concrete

(1) For column, vertical, top of cornice, or top edge repairs:

a) King MS-S10 – King Packaged Materials Company.

b) Approved alternate.

(2) For overhead cornice, edge, or soffit repairs:

a) King MS Self Consolidating Concrete – King Packaged Materials Company

b) SikaTop 123 Plus, extend with stone as required for depths greater than 38mm.

(3) All specified packaged concrete products are to be used in full accordance with manufacturer's directions.

3. Pressure Grouting

(1) Sikagrout 212 with equal parts Epocem810. Extend with pea gravel for patches deeper than 50mm.

(2) Sikagrout 212 HP for patches between 25 –150mm. Thicker applications are possible with the addition of suitable aggregate.

4. Self-Consolidating Concrete

(1) King MS-S6 Self Consolidating Concrete for shallow repairs (38mm to 50mm deep)

(2) King MS-S10 Self Consolidating Concrete for repairs deeper than 50mm

5. Formwork

(1) Plywood and wood formwork to be new or otherwise clean and free of any laitance materials conforming to CSA-23.1.

PART III - EXECUTION

1. Formwork

(1) The design, fabrication, erection, and use of concrete formwork shall conform to the requirements of CSA-S269.3.

(2) For Vertical and Column Repairs: Formwork shall be fabricated to allow for efficient removal and replacement for pre-saturation and slurry application processes prior to concreting.

(3) All forms shall be carefully inspected to ensure that they are properly placed, sufficiently rigid and tight and that all reinforcing steel is in the correct position and secured against movement during the placing operation.

(4) Install V-notch control joints at 6100mm maximum in all walls.

(5) For pressure grouting: Formwork shall be tight enough to prevent leakage of grout. Provide an inlet hole at lowest point of the formwork and an outlet hole at the top of the repair.

(6) For self-consolidating concrete: Provide inlet and outlet holes at high points in the underside repair.

(7) All mortar and dirt shall be removed from the forms that have been previously used.

(8) Install/Ensure formwork is constructed to match existing lines, levels, and profiles.

(9) Apply a form coating and release agent to the formwork surface before depositing any concrete against them. The amount of material should be kept to a minimum and any material that becomes adhered to reinforcing should be removed immediately. The forms shall be constructed to facilitate removal without damaging or shocking the concrete. Damaged concrete is not acceptable.

(10) Consultant to review formwork prior to concreting.

2. Concreting

(1) Saturate concrete surfaces for a minimum of 24 hours prior to placement of concrete. For vertical surfaces utilize absorbent material and soaker hoses to aid in wetting. Remove standing water and allow concrete surfaces to partially dry.

(2) For pressure grouting: fill formwork with water at least 12 hours before grouting to pre saturate the parent concrete.

(3) Apply slurry cement to the concrete surface and/or adjacent edge of concrete with a stiff bristle brush immediately prior to placement. Do not allow slurry to dry.

(4) Mix and substrate temperatures should be maintained between 5°- 30°C.

(5) Superplasticizer shall only be used when specified in the Contract or approved by the Consultant. The slump of the concrete shall be increased to 150 mm ±30 mm by the addition of the superplasticizer. The superplasticizer shall be added to the concrete on the job site and in strict conformance with the manufacturer's written instructions. The concrete shall be tested for air content before and after the addition of a superplasticizer.

(6) Ensure that all anchors seats, plates and other items to be cast into concrete are securely placed and will not interfere with concrete placement.

(7) Before placing concrete all equipment for mixing and transporting the concrete shall be cleaned of hardened concrete and foreign material. All forms shall be thoroughly cleaned and all debris, snow, ice or other foreign material removed. Chemicals will not be permitted to remove ice or hardened concrete from the forms. All forms shall be thoroughly soaked with water before placing concrete except in freezing weather.

(8) Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent the separation or loss of the ingredients. Concrete shall be poured in the forms as nearly as practicable in its final position to avoid re-handling or flowing. Vibrators shall not be used to move concrete.

(9) When concreting is started, it shall be carried on as a continuous operation until the placing of the section is completed. When shown on the drawings, concrete shall be placed in the sections indicated and according to the sequence given.

(10) When concrete is placed on an inclined surface, the placing operations shall begin at the lower end of the slope and progress upward; unless otherwise permitted by the Consultant.

(11) When concrete is placed by pumping, no grout or mortar used to lubricate pipelines shall be discharged into the forms.

(12) Pressure fill the repair area with pumpable, non-shrink cementitious grout to completely fill the void area with good bond to existing concrete.

(13) Concrete shall be thoroughly compacted by mechanical vibrators during placing operations. It shall be thoroughly worked around reinforcement, embedded fixtures and into the corners of the forms.

(14) Internal vibrators shall operate at a speed of not less than 7,000 vibrations per minute and shall be applied at the point of deposit and in the area of freshly placed concrete.

(15) Internal vibrators inserted on a plane as near vertical as possible and shall be allowed to sink of their own weight in the concrete until they penetrate to the previous layer of concrete. They shall be withdrawn immediately at the same speed at which they sank, moved approximately 0.3 meters to a new location and the process repeated.

(16) Where required, internal vibration shall be supplemented by external form vibrators or chipping hammers which shall be applied to wall forms directly opposite where the internal vibrators are operating. Chipping hammers shall be fitted with a 50mm by 50mm steel plate to bear against the walls. External vibration shall be continued for approximately the same period of time as internal vibration.

(17) Maintain accurate records of cast-in-place concrete items. Record date, location of pour, quantity, air temperature and test samples taken.

(18) Ensure reinforcement, inserts, embedded parts, formed expansion and control joints and water stops are not disturbed during concrete placement.

(19) Place concrete continuously between pre-set construction and control joints.

3. Finishing and Trowelling

(1) Ensure material has completely encapsulated any exposed rebar. Maintain a minimum 30mm covering to top level of reinforcing steel (60 mm where possible for concrete exposed to chlorides).

(2) Finish concrete to the lines and levels of adjacent concrete, with a tolerance of 3mm in 3m. Prevent cement paste from bridging joint of repair patch to existing concrete.

(3) Do not add extra water to the concrete.

(4) The concrete surfaces shall be protected from rain until the final set occurs.

(5) Take measures to protect concrete during rapid moisture loss conditions such as high temperatures, high winds and low humidity and from freezing during cold weather conditions.

(6) Begin curing immediately after material has reached initial set in accordance CSA A23.1 21.1.5. Two layers of wet burlap shall be placed on the surface of the concrete as soon as the surface will support it without deformation. Burlap shall be pre-soaked by immersion in water for a period of 24 hours prior to placing. A layer of moisture vapour barrier shall be placed immediately on the wet burlap. Ensure burlap and vapour barrier are sufficiently secured and weighted down to provide uniform coverage through the full curing period.

(7) The concrete shall be cured using the wet burlap covered with moisture vapour barrier for a minimum period of 72 hours. For Class C1 and Class C2 concretes extend curing to 7 days. For pre-packaged King LM curing time can be reduced to a total of 24 hrs.

(8) Curing for formed surfaces shall conform to the following:

a) If the formwork is left in place for 7 days or more, no additional curing will be required.

b) Where the formwork is removed in less than 7 days, the concrete shall be cured as specified for unformed surfaces for the remainder of the 7-day curing period.

(9) Curing compounds are not permitted where surface will be coated or painted.

(10) Obtain the Consultants approval prior to removing formwork. Provide strength test data. Forms and supporting shores must remain installed until members can support their own weight and superimposed construction loads without excessive stress, deflection or distortion.

(11) Remove all evidence of water penetration and paint surfaces to match existing.

(12) Cut 50% of the horizontal reinforcement at control joint locations in walls.

4. Thin Overlays – Concreting

(1) Be sure patch area is no less than 3 mm minimum depth.

(2) Dampen surface to be repaired with clean water. Substrate should be saturated surface dry (SSD) with no standing water during application.

(3) Mix concrete in accordance with manufacturer's written instructions.

(4) Scrub mortar bond coat into substrate to fill all pores and voids. Apply mortar before bond coat dries, then screed. Force product against edge of repair, working toward centre.

(5) Allow mortar to reach initial set (50-75 min after placing at 23°C), then finish with wood or sponge float for a smooth surface.

(6) Commence moist curing immediately after placing and finishing. At minimum use wet burlap and cover with polyethylene sheet. Maintain curing for 7 days. Protect freshly applied mortar from direct sunlight, wind rain and frost.

End of Section 03 30 00

PART I - GENERAL

1. Related Work
   (1) Section 07 92 10 – Joint Sealing

2. Reference Standards
   (1) Do historic masonry repairs in accordance with Canada's Historic Places, "The Standards and Guidelines for the Conservation of Historic Places in Canada".

   (2) CSA CAN 3-A370 – Connectors for Masonry

   (3) CSA CAN 3-A371 – Masonry Construction for Buildings

   (4) CSA-S304.1 – Masonry Design for Buildings

   (5) CSA A179 – Mortar and Grout for Unit Masonry

   (6) CSA A82.56M – Aggregates for Masonry Mortar

   (7) ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes

   (8) International Masonry Institute All-Weather Council - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction

3. Submittals / Mock-Ups
   (1) Submit manufacturer's printed technical data sheets and installation instruction for all proposed materials including anchors and adhesives prior to ordering materials. Alternates are not permitted without written approval.

   (2) Submit three samples of brick masonry to illustrate complete colour and pattern range, and finish texture of replacement masonry for Owners approval.

   (3) One (1) of each type of masonry reinforcement and tie proposed for use. As required for testing purposes.

   (4) Submit two 300 mm (12 in.) samples of coloured mortar.

   (5) Submit manufacturer's instructions for pre-bagged mortars.

   (6) Provide minimum three full size units for use in construction of sample wall for a mock-up.

   (7) The Work shall include a mock-up of a brick replacement, crack repair and mortar joint repointing. Repeat mock-ups as required to achieve Engineering and Heritage Consultant approval. The mock-ups will remain as part of the Work. Allow 72 hrs for

inspection of the mock-ups by the Consultant and Owner prior to proceeding with work at other locations. The approved mock-up shall become the standard for appearance and workmanship for the project.

4. Job Conditions and Protection

(1) Deliver mortar materials in original unbroken and undamaged packages with the maker's name and brand distinctly marked thereon, and upon delivery store in a shed until used on the Work.

(2) Store and pile sand on a plant platform and protect from dirt and rubbish. Store mortar materials and sand in such a manner as to prevent deterioration or contamination by foreign materials.

(3) Deliver and store masonry units in a manner designed to prevent damage and staining of units.

(4) Lift skids with proper and sufficiently long slings or forks with protection to prevent damage to units. Protect edges and corners.

(5) Stack units on timbers or platforms at least 75 mm above grade.

(6) Place polyethylene or other non-staining plastic film between wood and other finished surfaces of units when stored for extended periods of time.

(7) Cover stored units with non-staining, weather-proof protective enclosure.

(8) Ensure that substrate surface and mortar temperature are between 5°C and 38°C and maintained in this range for 72 hours after mortar application. Ensure that frost or frozen surfaces are thawed and dry.

(9) <u>Cold Weather Requirements</u>

a) When air temperature is below 5˚C, take following precautions in preparation and use of mortar:

i) Air temperature 0–4˚C: Heat sand or mixing water to a minimum of 20˚C and a maximum of 70˚C.

ii) Air temperature -4–0˚C: Heat sand and mixing water to a minimum of 20˚C and a maximum of 70˚C.

iii) Air temperature -7--4˚C: Heat sand and mixing water to a minimum of 20˚C and a maximum of 70˚C. Provide heat on both sides of walls under construction. Use windbreaks when wind exceeds 25 km/h. Cover new masonry with blanket for 24hrs.

iv) Air temperature -7˚C and below: Heat sand and mixing water to a minimum or 20˚C and a maximum of 70˚C. Provide enclosures and auxiliary heat to maintain an air temperature above 0˚C. The temperature of the unit when laid shall be not less than -7˚C.

(10) Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in cold weather.

(11) <u>Hot Weather Requirements:</u>

a) Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings. When air temperature is above

i) 38˚C or

ii) 32˚C with wind velocity greater than 13 km/h, spread of mortar beds shall be limited to 1.2 m (4 ft.), and the masonry units shall be set within 1 minute of spreading the mortar.

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

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

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

(15) Comply with section 5.16.3 of CSA A371-94 for protection requirements for completed masonry not being worked on.

5. Quality Assurance

(1) Carry out work by skilled tradesmen that specialized in the specified work. Full time supervision by mason with minimum 10 years of experience in historic masonry restoration.

(2) Obtain mortar ingredients, each type of stone accessory, sealants and other materials from a single manufacturer for each product.

(3) Submit laboratory test reports that certify compliance of masonry units and mortar ingredients with specification requirements.

(4) For clay units, in addition to requirements set out in referenced CSA and ASTM standards, include data indicating IRA for units proposed for use.

6. Warranty

(1) The Contractor warrants and shall correct at no cost to the Owner defects or deficiencies in material or workmanship, as determined by the Consultant. Warranty period is 2 years.

PART II - PRODUCTS

1. Brick Masonry

(1) Burned clay brick: shall conform to CSA A82.1-M87 (R92).

(2) Brick to match existing as closely as possible in size, texture and colour. Preference will be given to reclaimed bricks.

2. Water

(1) Potable and free of contaminants.

3. Pointing Mortar

(1) Hydraulic lime based mortar.

(2) Approved products:

a) HLM 350 by King Masonry Products.

b) NHL3.5 by Daubois.

4. Setting Mortar

(1) Hydraulic lime based mortar.

(2) Approved products:

a) HLM 500 by King Masonry Products.

b) NHL5 by Daubois.

5. Masonry Tinting

(1) Approved product: Restauro-Lasur by Keim.

(2) Approved applicator: Permatint.

2. Helical Ties

(1) For existing stone or beick wythe reinforcement use helical ties:

a) DryFix by Helifix Inc.

b) Spira-Lok by Block Lok.

3. Shims

(1) Low-durometer plastic, stainless steel, lead, oak or other non-staining wood (pre-soaked in water to allow for expansion), same thickness as mortar joints.

PART II - EXECUTION

1. Examination

(1) Mark out location of masonry deterioration for Consultant's review.

(1) Allow time in the Schedule for survey and inspection work carried out by the Consultant ahead of repairs. Provide sufficient safe access to enable review of all areas designated for repairs.

2. Brick Masonry Replacement

(1) Mark out deteriorated masonry for review by the Consultant. Where approved cut out deteriorated masonry to expose sound masonry.

(2) Remove full masonry units.

(3) Take sufficient care during removals so as not to damage remaining masonry units. Be responsible to replace damaged masonry units.

(4) Remove mortar adhering to the surface of the collar joint to expose backup wythe.

(5) Support masonry on concrete, steel or other approved material. Masonry is not permitted to be supported by wood.

(6) Wet clay bricks and back up masonry having IRA exceeding 30 g/min/194 cm2 (0.066 lb./min./03 in.2): wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.

(7) Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

(8) Clean units by washing with water and natural fibre brush before laying.

(9) Apply mortar to back-up wythe to form new collar joint as replacement brick courses are built in.

(10) Ensure that header joints are completely filled.

(11) Replacement header bricks shall be fully mortared into back up wythe.

(12) Build masonry plumb, level and true to line, with vertical joints in alignment.

(13) Lay out coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

(14) Tolerances in notes to Clause 5.3 and 5.13 of CSA A371-94 apply.

(15) Do not use cracked or damaged units in exposed or loadbearing masonry wall except as permitted by CAN/CSA A82.1-M82, "Burned Clay Bricks."

(16) For final pointing, rake joint back 25mm from front surface. Finish surface to match the existing texture and pointing profile.

(17) Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.

(18) Make cuts straight, clean and free from uneven edges.

3. Mortar

(1) Mix grout to semi-fluid consistency according to manufacturer's instructions.

(2) Incorporate colour into mixes in accordance with manufacturers' instructions.

(3) Use clean mixer for coloured mortar. Completely empty the mixer drum prior to mixing each batch.

(4) Use mortar within 1-1/2 hours after mixing.

(5) Re-tempering consisting of hand tamping shall be permitted. Re-tempering with water is not permitted.

4. Mortar Joint Repointing

(1) Procedure of testing: inspect joints visually for obvious signs of deteriorated masonry. As a general rule, mortar may be satisfactory if the pointing is firm, intact and not eroded more than 12mm from the face of the masonry. At locations designated for localized repointing, use the following criteria to determine which joints to repoint:

a) Open Joints: the mortar is deeply eroded (more than 12mm from the face of the masonry), or the mortar has fallen out, or,

b) Cracked Joints: cracks, hairline width or larger, have formed in the mortar, or,

c) Separated Joints: the mortar and masonry no longer adhere, resulting in a gap or crack between the two, or the mortar is sitting loosely in the joint, or,

d) Unsound Joints: joint is found to contain voids or weak areas as revealed by hammer-sounding, by raking with an appropriate tool or other approved method to determine score resistance, surface unsoundness or delamination.

(2) Raking joints:

a) Rake unsound joints free of deteriorated and loose mortar, dirt and other undesirable material. Joints should be raked to a minimum depth of 2 to 2.5 times the vertical joint height, but at no point less than 25mm (1").

b) Clean out voids and cavities encountered during raking. Remove mortar cleanly from masonry, leaving square corners and a flat surface at back of cut.

c) Clean by compressed air, surfaces of joints without damaging texture of exposed joints.

d) Flush open joints and voids; clean with low pressure water and if not free draining blow clean with compressed air.

e) Leave no standing water.

f) Before filling joints, any masonry that is loose should be reset. Any pieces that are chipped off while removing old mortar shall be repaired at the contractor's cost.

(3) Repointing:

a) Masonry to be repointed shall be damp but not wet. Do not allow free standing water.

b) Mortar joints are to be filled in successive layers. Deeper joints shall be filled first compacting new mortar in several layers until back of joint is flat. Several layers (maximum ½" each) will be needed to fill the joint flush with the surface of the masonry. Allow each layer to reach thumbprint hardness before the next is applied.

c) Keep masonry damp while pointing is being performed.

d) Do no pointing in freezing weather unless provisions are in place to protect mortar.

(4) Tooling:

a) Do not finish joint by using trowel to smooth out mortar.

b) Finish joint with slicker narrow enough to be placed inside the joint. Pull the slicker across surface of mortar to compress it.

c) Proper timing of the tooling operation is essential. If mortar is tooled when it is too soft, the colour will be too light and hairline cracks may occur; if mortar is too hard, dark streaks may result and good closure between mortar and stone may be difficult to achieve.

(5) Do not feather edge mortar. Joints shall be finished with a slight concave joint profile unless noted otherwise.

5. Face Pinning of Façade using Helical Ties

(1) Predrill a 5 mm pilot hole through the existing mortar joint into the back-up material at an angle of 45 degrees to a minimum depth of 50 mm. Use high speed electric hammer d (3-jaw chuck type).

(2) Insert the helical tie into the dry set installation tool (obtain from manufacturer) mounted on the rotary hammer S.D.S. drill.

(3) Drive the tie through mortar joint and into the back up wall until the nose of the dry set installation tool is hard against the veneer.

(4) The dry set installation tool automatically recesses helical tie into the face of the masonry.

(5) Patch the pilot hole using repair mortar to match the existing finish.

(6) Contractor to obtain all relevant drill bits and setting tools from manufacturer and install anchors in accordance with manufacturer's specification requirements.

(7) Install anchors to cross existing crack, minimum one from each side.

6. Clean Up

(1) Clean masonry to remove all indication of chemicals.

(2) Cleaning shall be done periodically throughout the work.

(3) Area of work shall be restored to its original condition.

End of Section 04 03 31

PART I - GENERAL

1. Related Work
   (1) Section 07 62 00 – Sheet Metal Flashing and Trim
   (2) Section 07 92 00 – Joint Sealing

2. Reference Standards
   (1) ASTM C1382 Test Method for Determining Tensile Adhesion Properties of Sealants When Used in EIFS Joints.
   (2) ASTM E2359 Test Method for Field Pull Testing of an In-Place Exterior Insulation and Finish System Clad Wall Assembly
   (3) EIFS QAP Manual Document # P200-01
   (4) CAN/ULC-S701-11 "Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering" / Annex A – forms a mandatory part of the standard for EPS thermal insulation boards destined for use within EIFS.
   (5) CAN/ULC-S702-09 "Standard for Mineral Fibre Thermal Insulation for Buildings
   (6) CAN/ULC-S710.1-11, "Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam", Part 1: Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials."
   (7) CAN/ULC-S710.2 -11, "Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 2: Installation."
   (8) CAN/ULC-S716.1 -12, "Standard for EIFS – Materials and Systems"
   (9) ULC-S716.2 -12, "Standard for EIFS – Installation."
   (10) ULC-S716.3 -12, "Standard for EIFS – Design Practices Guide."

3. Quality Assurance
   (1) Manufacturer Qualifications
      a) EQI licensed and accredited for the system and materials specified to meet the performance requirements of this specification.
      b) Manufacturing under a quality assurance program overseen by the Certification Body under whose certification mark the materials are produced.

(2) Contractor Qualifications:

a) Minimum 5 years' experience on projects of similar size, scope, and complexity.

(3) Regulatory Requirements:

a) Comply with the current National Building Code of Canada and the current Ontario Building Code.

b) System is to comply with Article 3.1.5.5. Combustible Components in Exterior Walls for use in non-combustible construction.

c) System is to comply with testing requirements of Article 3.2.3.8. where spatial separations require.

d) Comply with CCMC Evaluation Report or CAN/ULC-S716 series of standards.

4. Submittals

(1) Material Safety Data Sheets for all products/materials.

(2) Submit product data sheets for system materials, including product characteristics, performance criteria and limitations.

(3) Manufacturer's installation instructions.

(4) Certification Reports: Submit certification reports showing compliance with specified performance characteristics and physical properties to CAN/ULC-S716.1 or CCMC Evaluation Report.

(5) Written warranty as described below.

5. Samples

(1) Two (2) samples of finish, texture and colour to be used on the project. The same tools and techniques proposed for the actual installation shall be used.300 x 300 mm on backing of manufacturer's choice prior to construction of mockup.

6. Mock-ups

(1) Construct mock-up of each EIFS detail included in the scope of work, including patch repair, sealant installation and other critical details.

(2) The mock-up shall be prepared with the same products, tools, equipment and techniques required for the actual application. The finish used shall be from the same batch that is being used on the project.

(3) The mock-up or an adjacent surface will be used for testing.

(4) Allow 1 week for inspection of mock-up by Consultant and Manufacturer's technical representative.

(5) Start work only after receipt of written acceptance from Consultant.

(6) Mock-up will demonstrate minimum quality of work for this project.

(7) Mock-up may be included as part of work.

7. Delivery, Storage and Handling

(1) Deliver store and handle in accordance with Section 01 02 00 and to CAN/ULC-S716.2.-12

(2) Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

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

(4) Delivery:

a) Deliver materials in manufacturer's original packaging with identification labels intact and in quantities to suit project.

b) Upon arrival, inspect materials for physical damage, freezing or overheating. Questionable materials shall not be used.

c) EIFS material labelling to included Certification Mark (e.g. ULC or Warnock Hersey) and CCMC Evaluation Report Number. Products not so labelled will not be allowed on site.

d) Include batch numbers or production date, expiration date, mixing instructions and required WHMIS information.

(5) Storage and Protection:

a) Store materials at the jobsite in a cool, dry location, out of direct sunlight, protected from weather and other sources of damage. Minimum storage temperature shall be 4°C (40°F). Maximum storage temperature shall not exceed 38°C (100°F).

b) Store thermal insulation boards in original packaging until time of use, stacked flat, fully supported, off ground, dry, and under cover.

c) Avoid damage to edges, ends, or surfaces. Do not expose to direct sunlight before use.

d) Store reinforcing mesh cartons on side (not upright) in dry area protected from sunlight.

e) Protect dry cement-based materials (bag products) from moisture and humidity. Store off the ground, protected from sunlight, rain and ground moisture.

8. Job Conditions

(1) Do not application wet materials during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are completely dry.

(2) At the time of application, the minimum air and wall surface temperatures shall be as follows:

a) Primers: 7°C (45°F)

b) Finish Coats: 10°C (50°F)

c) Base Coats, Colour Prime & Adhesives: 4°C (40°F)

d) For other products, refer to specific product data sheets.

(3) Maintain specified temperatures with adequate air ventilation and circulation for a minimum of 24 hours (48 hours for some finishes) thereafter, or until the products are completely dry. Refer to published product data sheets for more specific information.

(4) The contractor shall have access to electric power, clean water and a clean work area at the location where the materials are to be applied.

9. Warranty

(1) The Contractor warrants that the Exterior Insulation and Finish System work of this section is guaranteed against water leakage, cracking, shrinkage, loss of adhesion, or other failure as determined by the Consultant. Warranty period is five (5) years from the date of Certificate of Substantial Performance.

PART II - PRODUCTS

1. Performance and Design Criteria

(1) Ensure all EIFS, LA-WRB. WRB, base coat, finish coat materials and accessories are from a single EIFS manufacturer and meeting the requirements of this specification.

(2) Ensure higher impact resistance of system to 1.8m minimum above grade and in locations indicated.

(3) Include 20 mm minimum expansion joints as indicated on drawings and at locations as follows:

a) At a maximal distance of 10m (30ft), to counter thermal expansion;

b) At substrate expansion joints;

c) At changes in building height;

d) At the floor line.

e) At changes in substrate material that result in differential substrate deflection and/or substrate behaviour;

f) At changes in roof, shape or structural system;

g) Where EIFS abuts dissimilar material

(4) Include 13 mm minimum perimeter expansion joint between EIFS and adjacent components such as doors and windows.

(5) Include sealant joints and air barrier connections at penetrations through EIFS as follows:

a) Ensure joint widths are 4 times minimum greater than anticipated range of movement;

b) Design joints with secondary moisture protection and drain joints to exterior;

c) Design joints to prevent air movement around building between sealant and air barrier.

d) Design joints using two stage seals, closed cell backer rod, bond breaker tape, primer and accessories in accordance with Section 07 92 00.

2. Membrane Flashing

(1) High density polyethylene film backed with a rubberized asphalt adhesive. Prime surfaces to receive membrane as required by product manufacturer.

a) Dryvit Flashing Tape

b) Durex Flex-Seal Wall Flashing

c) Sto Guard Tape

(2) Or an approved equivalent.

3. Air Barrier

(1) On Sheathing:

Vapour permeable, wet mix, water-based, non-cementitious, and applied by stainless steel trowel or spray equipment. Minimum dry thickness for both coats is 1.2mm (47 mils).

a) Backstop NT by Dryvit,

b) Durex Blue Shield by Durabond

c) Polar Bear by DuROCK,

d) Sto Gold Coat by Sto Canada

e) Or an approved equivalent.

(2) On Masonry:

Vapour permeable, wet mix, water-based acrylic dispersion, cementitious to be mixed with Type 10 cement 1:1 by weight, and applied by stainless steel trowel or spray equipment. Minimum dry thickness for both coats is 1.0mm (39 mils).

a) Dryflex by Dryvit,

b) Durex Flexcrete by Durabond

c) Cement Bear by DuROCK,

d) Sto Flexyl by Sto Canada

e) Or an approved equivalent.

4. Adhesive & Base Coat

(3) Dry mix, cementitious, polymer modified field mixed with clean water, applied by stainless steel trowel or spray equipment.

a) Primus DM by Dryvit,

b) Durex Monobase NC by Durabond

c) Prep Coat D by DuROCK,

d) Sto BTS Plus by Sto Canada

e) Or an approved equivalent.

5. Insulation Board

(1) Type 1 or 2 Expanded Polystyrene (EPS), flat, thickness is based on after rasping and indicated as per drawing details, minimum 25mm.

a) Outsulation Plus by Dryvit,

b) Insulite EW17 by Durabond,

c) Insulrock by DuROCK,

d) Sto Therm ci EPS by Sto Canada

e) Or an approved equivalent.

6. EPS Mouldings

(1) Expanded Polystyrene (EPS) precut foam mouldings, pre-reinforced with fiberglass mesh.

a) Exterior Pre-coated Profiles (EPP) – By Canamould

b) Pre-Approved equivalent

(2) Approved adhesive is Genesis DM by Dryvit, Sto BTS Plus by Sto, or a pre-approved equivalent.

7. Mechanical Fasteners

(1) High density plastic washers, minimum 51mm diameter used in combination with corrosion resistant screws suitable for the substrate. Embedment and spacing as specified by an Engineer licensed in Ontario clearly labelled on the shop drawings.

a) Wind-Devil 2 by Wind-Lock Corp,

b) Approved equivalent,

c) Or as specified on the approved shop drawings.

8. Reinforcing Mesh

(1) A balanced, open weave, alkaline resistant, glass fiber fabric mesh compatible with other system materials and as recommended by the manufacturer.

(2) Standard impact resistance mesh for back-wrapping - minimum 145 grams/m^2.

a) Standard or Standard Plus by Dryvit

b) Durex 040 Mesh by Durabond

c) Starter Mesh or DuROCK 5oz by DuROCK

d) Sto Mesh or Sto Detail Mesh by Sto

e) Or an approved equivalent

(3) High impact resistance mesh for double reinforcement at grade- minimum 450 grams/m^2.

a) Panzer 15 or Panzer 20 by Dryvit,

b) Durex 330 Mesh by Durabond

c) DuROCK 15oz or DuROCK 20oz by DuROCK

d) Armor Mat, Armor Mat (80921) or Armor Mat XX (80921) by Sto

e) Or an approved equivalent

9. Finish Coat

(1) Acrylic based textured wall coating 1 to 3 mm thick minimum with graded aggregate. Apply as per manufacturer's instructions.

a) Type of finish and colour to be selected by the Owner through samples and mock-up.

10. Woodpecker Protection

(2) An acrylic polymer-modified and fibre-reinforced point impact resistant compound. 2 coat application with colour to match surrounding finish. Minimum 3.2mm dry film application per coat.

a) Graphexcoat by Adex

b) ShieldIt by Dryvit

c) Sto IMPACT by Sto Canada

d) Or an approved equivalent

11. Direct Applied Textured Acyclic Finish

(1) Direct applied acyclic primer and finish applied to substrate.

a) Textured Acyclic Finish Option 1 by Dryvit

b) Sto Finish System for Concrete, Concrete Masonry and Stucco

c) Or an approved equivalent

PART III - EXECUTION

1. Manufacturer's Instructions

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

2. Repair Patches

(2) Mark-out areas for repair for review by Consultant. Repair areas should be squared off and will extend at minimum 75mm (3 in) beyond damaged areas. Do not remove any areas without the written approval of the Consultant.

(3) Cut through and remove lamina utilizing a sharp utility knife and/ or circular saw with a carborundum blade. Expose a neat uniform-sized area of insulation.

(4) Remove the finish coat using a disk grinder or belt sander to expose the reinforced base coat for approximately 75 mm (3 in) around cut out area. Use an aluminum oxide disk or belt, 20 grit. The edges of the finish should be sharp, clean and non-tapered from the finish down to the base coat layer. Do not cut through existing mesh reinforcing.

(5) Carefully cut out the insulation board within the repair area. Inspect the air/weather barrier and sheathing. Report any damage to the Consultant immediately and allow for inspection. Repair as necessary as directed.

3. Examination

(1) Site Verification of Conditions: Verify that substrate conditions which have been previously installed under other sections or contracts meet design tolerances to CAN/ULC-S716.2 and are acceptable for product installation in accordance with manufacturer's instructions prior to installation of EIFS.

(2) Inspect surfaces to determine conditions are free of the following:

a) Algae, chalkiness, dirt, dust, efflorescence, form release agents, fungus, grease, laitance, mildew or other foreign substances

b) Surface absorption and chalkiness.

c) Surface cracks: Measure and record location.

d) Damage and deterioration.

e) Moisture content and moisture damage: Use moisture meter to determine if moisture content is dry enough to receive EIFS.

(3) Inform Consultant of unacceptable conditions immediately upon discovery.

(4) Proceed with installation only after unacceptable conditions have been remedied by responsible party and conditions have been verified by the consultant.

4. Preparation

(1) Protect adjacent surfaces from damage or overspray resulting from EIFS work.

(2) Resurface, patch or level surfaces to required tolerance and smoothness as recommended in manufacturer's written instructions and to CAN/ULC- S716.2-12.

(3) Backwrap insulation board at terminations with base coat and mesh prior to installation where required by manufacturer’s termination requirements.

a) Rasp back of insulation board to maintain minimum drainage cavity according to manufacturer.

b) Allow adequate amount of mesh to wrap around board edge and cover according to manufacturer.

c) Allow adhesive to completely dry

5. Mixing

(1) Mix materials as recommended in manufacturer’s written instructions.

(2) Use, clean, rust-free high-speed mixer to stir finish to uniform consistency. Add small amounts of clean water to aid workability.

(3) Ensure drill rotational speed is 50 rpm maximum.

(4) Use of antifreeze agents, accelerators, rapid binders or other additives is not permitted.

(5) Mix only as much material as can readily be used.

6. Moisture Air Barrier and Membrane Flashings

(1) Trowel apply the air barrier membrane smooth to a uniform thickness on the entire prepared substrate area. Fill mortar joints completely or ensure air barrier is applied to all mortar and masonry unit surfaces.

(2) Prior to proceeding, check the wall to ensure that the air barrier is continuous and spot any visible voids with additional material.

(3) A second continuous, uniform coat shall be applied to the substrate and allowed to dry.

(4) Terminate air barrier at window jambs beyond the window frame and at other penetrations terminate membrane as shown on the drawings.

(5) Install membrane flashings over the upper edge of metal flashings as shown on the drawings. Moisture barrier and transition membrane shall be positively lapped for drainage.

7. Insulation Board

(1) The edge of all insulation board terminations (windows, HVAC penetrations, etc.) shall be wrapped with mesh and base coat. Install a minimum of 100 mm of detail mesh on the substrate and wrapped around the insulation board to provide a minimum of 50 mm of mesh on the outer surface of the insulation board.

(2) Install adhesive to the insulation board in the notched trowel method or as recommended by the manufacturer. Apply the adhesive so that the ribbons run vertically when the insulation is installed.

(3) Install the board with the notches in the vertical direction immediately following adhesive application. Apply firm pressure over the entire surface of the insulation board to ensure uniform contact and high initial grab. The new insulation board must be flush with the surrounding insulation board. No adhesive is to be used between board joints at any location.

(4) Apply the insulation board in a running bond pattern with offset vertical joints.

(5) Using a margin trowel, clean the insulation board edges of any adhesive mixture. Ensure that the insulation board joints are butted tightly and faces are level and flush. If for any reason the insulation board joints are not butted tightly, slivers of insulation board must be installed to fill any gaps. ALL GAPS GREATER THAN 1.6 mm (1/16 in) MUST BE SLIVERED OR FILLED WITH EXPANDING FOAM.

(6) With factory edges exposed, stagger vertical joints at inside and outside corners. Make sure the corners are straight and plumb.

(7) Cut insulation board in L-shaped pattern to fit around openings.

(8) At openings, align the insulation boards so that the edges (vertical and horizontal joints) do not coincide with the corners of the opening.

(9) Once the insulation board and Detail Mesh are in place, wait a minimum of 24 hours prior to working on the surface of the insulation board to prevent any movement which may weaken the bond of the adhesive mixture to the substrate.

(10) Rasp Insulation board to produce smooth even surface.

a) Ensure no planar difference at insulation board joints when rasping is completed,

b) Ensure surface variance is [3] mm in 1220 mm maximum in each direction across flat wall areas.

c) Thermal insulation board thickness after rasping shall be no less than 20 mm at any location.

(11) Check flatness with a 2.4m straight edge. Sand down high areas to produce a level and plumb surface.

(12) Install reveals. Embed detail mesh at reveals and edges of insulation to complete back-wrapping.

(13) Corners of all openings such as windows, doors, mechanical equipment and all penetrations shall be reinforced with Detail Mesh placed diagonally to the opening as shown in the drawings.

(14) Mechanical Fastening: Mechanically fasten insulation board panels to substrate system.

a) Ensure mechanical fasteners are sealed against moisture penetration.

b) Use mechanical fasteners only after receipt of written approval from [Consultant].

c) Pre-spot over mechanical fasteners with base coat and allow to dry completely before continuation of EIFS application.

8. EPS Mouldings

(1) Using a mitre saw, cut the prefabricated EPS mouldings to appropriate dimensions.

(2) Rasp newly cut exposed edges and sand adjoining pieces with 16 grit sanding paper to ensure a tight-fitting joint detail.

(3) Using a hot knife, create a groove in the EPS insulation at the cut end of the moulding along the underside of the pre-applied basecoat.

(4) Apply approved cement adhesive to the newly created groove using a stainless-steel trowel.

(5) Apply the approved cement adhesive to the rest of the cut end of the EPS mouldings to a uniform thickness of ≈1.6 mm (1/16 in). Take care to keep the base coat mixture off the surrounding original finish edge.

(6) Install the moulding with approved adhesive to the cured base coat on the previously installed EIFS. Apply firm pressure over the entire surface of the moulding to ensure uniform contact and high initial grab.

(7) Align adjoining moulding pieces and press together firmly to ensure proper adhesion. Remove excess adhesive from the joint and using a trowel, tool to a smooth finish.

(8) After the adhesive is dry. Sand the joint to a seamless finish.

(9) Once the EPS mouldings are in place, wait a minimum of 24 hours prior before working on the surface of the insulation board to prevent any movement which may weaken the bond.

9. Reinforcing Mesh and Base Coat

(1) Precisely mask the surrounding area with masking tape. Cut the reinforcing mesh so that it will cover the patch area, lapping onto the original reinforced base coat a minimum of 64 mm (2½ in).

(2) Using a stainless steel trowel, apply the base coat mixture to a uniform thickness of ≈1.6 mm (1/16 in) on the entire surface of the insulation board to an area slightly larger than the width and length of a piece of reinforcing mesh. Take care to keep the base coat mixture off the surrounding original finish edge.

(3) Allow the base coat mixture to take up until firm to the touch. Trowel a second tight coat of the base coat mixture over the first coat to fully cover the reinforcing mesh. The result should be such that the reinforcing mesh is approximately centred within the base coat thickness. Do not allow the first pass to dry completely prior to the second pass application or an excessive amount of base coat mixture will be necessary to fully coat the wall surface. Total dry rendering thickness shall be no less than 2.0 mm (1/12 in).

(4) When completed, the base coat should be recessed approximately 1.5 mm (1/16 in) from the existing finish coat. This will insure that when the finish is applied, the new finish will be level or on the same plane as the existing finish coat. Wait a minimum of 24 hours to allow the base coat to cure.

(5) High impact meshes shall be installed as specified at ground level, high traffic areas and other areas exposed to or susceptible to impact damage.

(6) Install high impact and pre-formed corner reinforcing mesh at locations indicated on project plans. Tightly butt high impact mesh with gaps no greater than 3 mm at seams. Do not overlap high impact mesh joints.

(7) Areas of high impact mesh are to be allowed to set, or fully dry in accordance with manufacturer's published instructions.

(8) Install standard mesh over high impact mesh and balance of exposed insulation.

(9) Standard mesh is to be overlapped at mesh joint locations minimum of 67mm or greater as required by the manufacturer's published instructions. Inside and outside corners are to have no vertical joints in the mesh within 200mm of either side of the corner and no less than two layer of mesh applied from opposing sides of the corner.

(10) Trowel smooth to ensure mesh colour is not visible while maintaining full encapsulation of the mesh in base coat.

(11) Reinforce first 1.8 m minimum above grade using 1 layer of standard reinforcing mesh and 1 layer of heavy duty reinforcing mesh.

(12) Reinforce corner of openings "butterfly" of detail reinforcing mesh 200 mm minimum, in accordance with manufacturer's written instructions.

(13) Trowel mesh from center to outside edges.

a) Feather out base coat on each side of mesh overlaps.

b) Avoid wrinkles in mesh.

(14) Ensure mesh is fully embedded and mesh color is not visible when base coat application is completed.

(15) Ensure base coat completely covers and seals mechanical fasteners where used.

(16) Apply base coat to weather exposed slope when trim, reveals, aesthetic bands, cornice profiles, sills or other architectural features projecting vertical wall plane.

(17) Allow base coat to dry 24 hours minimum prior to applying primer.

10. Woodpecker Protection

(1) Install woodpecker protection as per manufacturer's instructions. Allow final coat to cure 24 hours prior to rendering finish coat.

11. Sealant Joints

(1) Apply primer to the base coat surface that is to be in contact with sealants and extending to the joint edge.

(2) Allow the primer to dry a minimum of 48 hours prior to applying the sealant. Cool damp weather may require longer drying times.

(3) Refer to Joint Sealing section for the proper application of the sealant.

12. Skim Coat

(1) Review existing finish coat and ensure surfaces are free of dirt, algae, oils, and mildew.

(2) Where dirt and oils are present, remove with warm water and cleaner such as Trisodium phosphate detergent. Do NOT use the following:

a) solvent based cleaners such as acetone, gasoline, ketones, mineral oils, or turpentine,

b) steam or other high temperature cleaning methods,

c) wire brushes or excessive scrubbing such that it damages the existing finish coat, or

d) high pressure washing in excess of 500 psi or sandblasting.

(3) Allow surfaces to fully dry.

(4) Apply one tight coat of 100% acrylic finish coat or non-cementitious base coat 1.6mm to 3.2mm over existing finish and new repair areas. Allow to fully dry.

13. Sealant Repairs

(1) Cut sealant as close as possible to the EIFS surface without causing damage. Grasp the sealant and backer rod in one hand and with constant tension, slice the sealant away from the EIFS. Remove sealant as close as possible without damage. Contractor will be responsible to repair any damage.

(2) Remove any remaining sealant (wire brushing or grinding may be necessary) and inspect EIFS surface.

(3) Surfaces should be clean and sound with reinforcing mesh embedded in the base coat. Remove any existing textured finish from areas to receive sealant.

(4) Improperly embedded reinforcing mesh shall be skimmed with base coat to achieve proper coverage. Broken or damaged mesh can be repaired by addition of new mesh, properly embedded in base coat and lapped a minimum 64 mm (2½") over the existing adjacent base coat.

(5) Install closed cell backer rod, EIFS compatible primer, and sealant in accordance with Joint Sealing specification section.

14. Finish Coat

(1) Prior to applying the finish, the base coat shall have cured a minimum of 24 hours and shall be dry and hard. Cure time may be longer depending on environmental conditions.

(2) Inspect the base coat for any irregularities such as trowel marks, board lines, rough corners and edges, improper reinforcing mesh embedment as well as efflorescence.

(3) Prime reinforced, base coat covered boards prior to application of finish coat. Allow primer to completely dry prior to applying finish coat.

(4) Do not apply in direct sun. Shade work areas if required.

(5) Using a clean steel trowel, apply finish coat in a uniform thickness on the dry base coat. The texture is achieved by uniform hand motion and/or tool that produces the texture to match the approved sample. Each mechanic must use the same tool and hand motion to ensure that the texture achieved is uniform over the entire wall area.

(6) Small amount of mixing water may be added with finish coat materials to aid workability.

(7) Install finish coat continuously to a natural break. Maintain the leading edge wet at all times.

(8) Apply finish coat directly over primed base coat.

(9) Apply finish coat at thickness equal to size of largest texturing aggregate.

(10) Shade work to prevent application in direct sunlight and rapid setting of finish.

(11) Use tarpaulins to protect finish from scaffold shadow texture lines.

(12) Supply equipment, materials and work crew of sufficient size to ensure a continuous application within boundaries of wall area between natural break without cold joints.

(13) Ensure separate batches of finish coat are not installed side by side.

(14) Ensure finish coat is not installed into joints to receive sealants.

(15) Install the new finish over the patch area and texture to match the surrounding finish. If necessary, precisely mask the surrounding existing finish with masking tape.

(16) Allow the finish to dry for a short period of time depending on weather conditions prior to removing the masking tape.

(17) Feather the edges of the patch to blend inconspicuously with the surrounding texture.

(18) Do joint sealing in accordance with Section 07 92 00 – Joint Sealants.

15. Cleaning

(1) All excess system materials shall be removed from the job site in accordance with contract provisions and as required by applicable law.

(2) All surrounding areas shall be left free of debris and foreign substances.

(3) Leave work area clean and tidy at end of each work day.

(4) Final Cleaning: Upon completion, remove surplus and excess materials, rubbish, tools and equipment.

(5) Remove recycling containers and bins from site and dispose of materials at appropriate facility.

End of Section 07 24 00

PART I - GENERAL

1. Related Work
   (1) Section 04 03 31 – Historic Masonry Repairs
   (2) Section 07 24 00 – Exterior Insulation and Finish Systems
   (3) Section 07 92 10 – Joint Sealing
2. Reference Standards
   (1) ASTM A653/A653M-09 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   (2) ASTM A792/A792M-09 Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
   (3) Aluminum Association Aluminum Sheet Metal Work in Building Construction - 1980.
   (4) ASTM B221-14 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
   (5) ASTM B209-14 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
   (6) Canadian Roofing Contractors Association (CRCA).
   (7) CAN/CGSB 93.5 – 92 "Prefinished Aluminium Siding, Soffits, and Fascia for Residential Use"
3. Submittals / Mock-Ups
   (1) Build mock-ups for each type of flashing and counter flashing, complete with all fasteners as per drawings and specifications and obtain Consultant's approval prior to fabrication of any further metal flashings.
   (2) Samples 300mm square, of fabricated products as finished work.
4. Job Conditions and Protection
   (1) Deliver sheet-metal flashing materials to site and store in safe, protected storage area to prevent damage. Stack flashings to prevent twisting or bending out of shape.
   (2) Prevent contact of flashing materials with corrosive substances.
   (3) Handle and store metal flashings so that marring and scratching of the coatings do not occur. Damaged materials shall be replaced with new materials.
5. Quality Assurance
   (1) Notify Consultant for review of installation of sheet metal and caulking.

6. Warranty

(1) The Contractor warrants that the flashing assembly will be free of the following defects: splitting seams, lifting, loosening and undue expansion. Warranty period is two years from date of substantial performance.

PART II - PRODUCTS

1. Materials

(1) Extruded Aluminum: to ASTM B221-14, not less than 1.0mm (19ga.) core nominal thickness, alloy 6060 or 6063. Finish to match AAMA 2604. Colour to be selected by owner from manufacturer's standard range.

(2) Aluminum Sheet: to ASTM B209-14, minimum 24 gauge core nominal thickness, alloy 6061. Commercial grade, mill finish, shop pre-coated on both sides. Finish to be selected by owner from manufacturer's standard range.

2. Cleats and Fasteners

(1) Cleats and fasteners shall be of the same material as the metal they are designed to secure. Size shall be to suit components to be secured. Gauge shall be sufficient to retain the flashings in place, minimum 22 gauge. Match head finish to fastened material.

(2) Nails: Stainless steel, spiral thread, of sufficient length to provide a minimum 25 mm (1 in.) penetration into substrate.

(3) Nail Anchors: Expansion anchors shall be a pre-assembled nail drive anchor with a mushroom style head and a body formed from nylon. The carbon steel nail shall be plated according to ASTM Specification B633, SC1, Type II. Dimension to provide a minimum 25 mm (1 in.) penetration into substrate and in accordance with manufacturer's recommendations.

a) Powers Fasteners - Nylon Nailin
b) Hilti Canada - HPS-1 Impact Anchor

3. Accessories

(1) Plastic Cement: Plastic cement for caulking and bedding flashings shall conform to CAN/CGSB 37.5-M89.

(2) Bituminous Paint Bituminous paint shall conform to CGSB 1-GP-108, type II.

(3) Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, non-drying, nonmigrating sealant.

PART III - EXECUTION

1. Workmanship

(1) Metal flashing shall be as detailed, supplemented by recommendations of Canadian Roofing Contractors' Association Specifications.

(2) All free edges of metal flashing shall be strengthened by a fold at least 13 mm (0.5 in.) wide, set out slightly and presenting a straight line and a neat finish.

(3) Form flashings in 2400 mm (8 ft.) lengths whenever possible. Make allowance for expansion at joints.

(4) Install reglets to receive counter flashing

(5) End joints where adjacent lengths of metal flashing meet shall be made using an "S-lock" joint. This shall be executed by inserting the end of one coping length in a 25 mm (1 in.) deep S-lock formed in the end of the adjacent length in a full bed of caulking compound. Concealed portion of the S-lock shall extend 25 mm (1 in.) outward and be nailed to the substrate. Face nailing of the joints will not be permitted.

(6) The metal shall be formed on a bending brake. Shaping, trimming and hand seaming shall be done on the bench as far as is practicable with the proper sheet-metal working tools. The angle of the bends and the folds for interlocking the metal shall be made with full regard to expansion and contraction to avoid buckling or fullness in the metal after it is in service and to avoid damaging the surface of the metal.

(7) Install continuous starter strips where indicated or required to present a true, non-waving, leading edge. Anchor to back-up to provide rigid, secure installation.

(8) Apply isolation coating to metal surfaces to be embedded in or to be in contact with concrete or mortar.

(9) Mitre and seal corners with sealant.

2. Counter Flashing

(1) Install counter flashings as soon as possible after membrane flashings are in place.

(2) Counter flashings shall have a folded, bottom-edge, stiffening break where indicated, and shall extend up vertical face of wall or curb to height shown, then be turned into reglets or interlocked with cap flashings.

(3) Wedge flashings into reglets and caulk neatly using specified sealant.

3. Cap Flashing

(1) Tops of walls, parapets, counter flashings and the like shall be cap flashed as detailed, after membrane and metal counter flashings are in place.

(2) Parapet flashing shall fit tight to parapet and provide full support without significant deformation under typical access loads (bosun chairs, swing stages, etc.).

End of Section 07 62 00

PART I - GENERAL

1. Related Work
   (1) Section 07 24 00 - Exterior Insulation and Finish Systems
   (2) Section 07 62 00 – Sheet Metal Flashing and Trim
2. Reference Standards
   (1) CAN2-19.24-M90 – Multi-component, Chemical-Curing Sealing Compound
   (2) CGSB-19.13-M87 Sealing Compound, One Component, Elastomeric, Chemical Curing
   (3) ASTM C-920 – Standard Specification for Elastomeric Joint Sealants.
3. Submittals / Mock-Ups
   (1) Submit manufacturer's printed technical data sheets and application instructions for all proposed materials, including cleaners and primers.
   (2) Submit a letter from the manufacturer confirming:
      a) They have reviewed the site conditions
      b) The proposed sealants are acceptable for the application
      c) The installation methods, including cleaning and priming methods and environmental conditions are acceptable.
   (3) The Contractor shall provide a mock-up of each type of joint for review and approval by the Consultant and manufacturer at minimum of 7 days prior to beginning bulk sealant installation. The mock-up shall also determine the colour of sealant to be used.
      a) The mock-up shall be carried out by the same installers who will complete the general installation.
      b) Allow the sealants to cure according to the manufacturer's recommendation. Carry out adhesion testing as required by the manufacturer or Consultant to verify the surface preparation procedures.
      c) Provide written confirmation of the required surface preparation and installation methods from the manufacturer prior to general installation.

4. Job Conditions and Protection

(1) Do not apply sealants when substrate temperatures are less than 5°C without first obtaining manufacturer's written approval and instructions.

(2) Apply sealants only to completely dry surfaces.

(3) Deliver and store materials in original wrappings and containers with manufacturer's seals and labels intact. Protect from freezing, moisture and water.

(4) Comply with requirements of Workplace and Safety Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Human Resources Development Canada.

(5) Conform to manufacturer's recommended temperatures, relative humidity and substrate moisture content for application and curing of sealants including special conditions governing use.

5. Quality Assurance

(1) Notify Consultant for review of surface preparation and caulking installation.

(2) Provide access to a maximum of 20% of work area following full cure of sealant, typically 10-30 days, to allow for bond testing. Consultant shall select locations which will require access. Access shall include re-rigging drops.

6. Warranty

(1) The Contractor warrants that the caulking work of this section is guaranteed against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion, or other failure, staining adjacent surfaces. Warranty period is two years from the date of Certificate of Substantial Performance.

PART II - PRODUCTS

1. Materials

Sealants shall conform to CGSB specifications as listed below; colour to Consultant's selection.

(1) Exterior Sealants: Multi-component, epoxidized polyurethane terpolymer sealant. To meet specified requirements of CGSB Specification CAN2.19-24-M90. Use at all locations, except where another type is specified. Approved products include:

a) Sikaflex 2C by Sika Construction

b) Tremco Dymeric

c) Vulkem 227

d) THC 900/901 by Tremco

(2) Exterior Sealants: One part elastomeric sealants: to meet specified requirements of NSC/CGSB Specification CAN2-19.13 M87.

a) Classification MCG-2-25-A-L medium modulus silicone, to be used in glass-to-glass, glass-to-metal, and metal-to-metal joints. Approved products include:

i) DOWSIL 795 Silicone Sealant

ii) Tremco Spectrem 2

iii) Approved alternate

b) Classification MCG-2-25-A-L low modulus silicone, to be used in EIFS-to-EIFS, EIFS-to-metal, and EIFS-to-concrete or masonry joints. Metal-to-concrete, Metal-to-masonry. Approved products include:

i) Tremco Spectrem 1

ii) Tremco Spectrem 3

iii) DOWSIL 790

iv) DOWSIL 756 SMS

v) Approved alternate

(3) Glazing Sealants:

a) For filling in recesses in glazing tapes, toe beads, and heal beads. One component, neutral cure, low modulus silicone conforming to CAN/CGSB-19.13-M87. Approved products include:

i) Spectrum 2 by Tremco Ltd.

ii) 795 by DOWSIL

b) Classification MCG-2-25-A-L medium modulus silicone, to be used in as an optional bond breaker at crack repairs.

Approved products include:

i) Tremco Spectrem 2 (Optional Bond Breaker)

ii) DOWSIL 795

iii) Or approved alternate

2. Backer Rod

(1) Polyolefin, polyethylene, urethane, neoprene or vinyl foam

a) Extruded closed cell foam backer rod.

b) Size: oversize 30–50%.

c) Chemically compatible with primers and sealants.

d) Round solid rod, Shore A hardness 70.

e) Acceptable materials

i) SOF-Type Rod by Industrial Thermo Polymers

ii) Approved alternate

3. Bond breaker tape

(1) Polyethylene bond breaker tape which will not bond to sealant.

(2) Acceptable materials

a) #226 or #481 Tape by 3M Canada Inc
b) #40 Clear Bond Breaker Tape by Valley Industrial Products

(3) Thin layer of silicone sealants partially cured for urethane sealants as approved by Consultant.

(4) Low expansion spray foam insulation where approved by the Consultant.

4. Joint Cleaner for Non-Porous Surfaces

(1) Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

a) Methylethylketone (MEK) for urethane and silicone sealants
b) Isopropyl Alcohol for urethane sealants
c) Wire brush for concrete surfaces

(2) Cloths shall be clean, white, and solvent resistant. Coloured cloths are not permitted.

5. Primer
   (1) As recommended by manufacturer.
   (2) For EIFS joints: Porous Surface Primer by Tremco

PART III - EXECUTION

1. Extent of Work
   (1) Install sealants in all locations shown on drawings.
   (2) Install sealant at the perimeter of all exterior openings where doors, windows, grilles and other items abut or penetrate the exterior wall materials.
   (3) At all door saddles spread a bead of sealant compound over entire seat of saddles at least 3 mm (0.12 in.) thick before installing saddle.
   (4) Seal the junctions of differing exterior wall materials.
   (5) Provide a minimum of two continuous beads of sealant under all pre-finished galvanized steel wall flashings.
   (6) At window sill flashings install sealant at butt joints, expansion joint covers, and corner plates.
   (7) Ensure that drain holes for wall systems and windows remain clear and free draining after sealant installation.

2. Preparation of Joint Surfaces
   (1) Remove all existing sealant to expose a sound substrate, without damaging adjacent finishes. Ensure that new and old sealants are compatible.
   (2) For glass to metal sealant installation remove existing exuded butyl sealants from entire glass surface and metal frame.
   (3) Examine joint sizes and conditions to establish correct depth-to-width relationship for installation of back-up materials and sealants.
   (4) Clean bonding joint surfaces of harmful matter substances including dust, rust, oil, grease and other matter that may impair work, particularly where they have been sawcut or repaired.
   (5) For non-porous surfaces utilize the two-rag method for cleaning surfaces to receive sealant. Wipe with cloth saturated with solvent; follow immediately with another dry cloth to wipe surface dry. Clean only as much work as can be sealed in one hour. Cleaned surfaces that are exposed to rain or contaminants must be re-cleaned. Prevent application of solvents on adjacent porous surfaces with urethane sealant

residue. Solvents can lead to emulsification of urethane sealants which will act as a bond breaker.

(6) Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent or other coatings, unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

(7) Ensure joint surfaces are dry and frost-free.

(8) Prepare surfaces in accordance with manufacturer's directions.

3. Priming

(1) Where necessary to prevent staining, mask adjacent surfaces prior to priming and sealing.

(2) Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to sealing.

4. Backup Material

(1) Apply bond breaker tape where required to manufacturer's instructions and to meet Joint Profile requirements below.

(2) Where a fillet bead joint width is less than 9mm fill cavity with spray foam insulation and install bond breaker tape. At tensile bead profiles which cannot accommodate installation of backer rod install tape on bottom of joint across the entire width.

(3) Install joint filler to achieve correct joint depth and shape. Use blunt installation tool designed to set material at specified depth.

(4) To prevent bubbling of sealant from closed cell backer rod off-gassing, allow a minimum of 20 minutes to elapse following installation prior to applying sealants. Be responsible to repair any sealant with bubbling.

(5) Install bond break at joints between window sills and walls to provide specified sealant profile.

(6) Use spray foam insulation where backer rod or bond breaker tape cannot be applied. Ensure that the insulation is applied and cured according to manufacturer specifications, cure a minimum of 24 hours. Once cured, cut the insulation and apply the sealant immediately.

5. Mixing

(1) Mix materials in strict accordance with sealant manufacturer's instructions.

6. Joint Profile

(1) Sealant depth shall be ½ the joint width where possible.

(2) Joint widths shall be a min. 9mm (3/8″).

(3) Minimum sealant thickness shall be min. 6mm (1/4″).

(4) Substrate adhesion shall be a min. 9mm (3/8″) or equal to maximum depth of sealant.

(5) Fillet bead sealant joint width shall be min. 15mm (5/8″).

(6) All joints shall have an unbonded surface of min. 12mm (1/2″).

7. Application

(1) Apply sealant in accordance with manufacturer's instructions.

a) Apply sealant in continuous beads.

b) Apply sealant using gun with proper size nozzle.

c) Use sufficient pressure to fill voids and joints solidly.

d) Form surface of sealant with full bead, smooth, and free from ridges, wrinkles, sags, air pockets, embedded impurities.

e) Tool exposed surfaces to give slightly concave shape.

f) Remove excess compound promptly as work progresses and on completion.

(2) Cap beads at metal to metal joints shall be 6mm (1/4″) thick above the joint and shall have 6mm (1/4″) of adhesion to the metal surfaces on either side of the joint.

(3) Cap beads above glass to metal joints shall be 3mm (1/8″) thick above the metal and shall have 3mm (1/8″) adhesion to the glass surface and 5mm (3/16″) adhesion on the metal surface.

(4) Curing

a) Cure sealants in accordance with sealant manufacturer's instructions.

b) Do not cover up sealants until proper curing has taken place.

8. Clean-up

(1) Clean adjacent surfaces immediately and leave work neat and clean.

(2) Remove excess and droppings, using recommended cleaners as work progresses.

(3) Remove masking tape after initial set of sealant.

End of Section 07 92 10

PART I - GENERAL

1. Related Work
   (1) None.

2. Reference Standards
   (1) SSPC-SP 1 - Solvent Cleaning.
   (2) SSPC-SP 2 - Hand Tool Cleaning.
   (3) SSPC-SP 3 - Power Tool Cleaning.
   (4) SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete
   (5) ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test.

3. Submittals / Mock-Ups
   (1) Product Data: Manufacturer's data sheets on each paint and coating product should include:
      a) Product characteristics
      b) Surface preparation instructions and recommendations
      c) Primer requirements and finish specification
      d) Storage and handling requirements and recommendations
      e) Application methods
      f) Cautions
   (2) Submit a complete set of colour chips that represent the full range of manufacturer's colour samples available.
   (3) For each finish product specified, submit samples that represent actual product, colour, and sheen.
   (4) Apply a 300mm mock-up for up to three paint colours selected by the Owner at a window frame selected by owner.
   (5) Manufacturer representative to visit the site to review the surface preparation, application and to complete adhesion tests. Submit written confirmation from the Manufacturer of such visits including results of adhesion tests.

4. Job Conditions and Protection
   (1) Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

(2) No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F/10°C, unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50°F/10°C or higher to use low temperature products.

5. Quality Assurance

(1) Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:

a) Product name, type (description)
b) Application & use instructions
c) Surface preparation
d) VOC content
e) Environmental issues
f) Batch date
g) Colour number

(2) Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

(3) Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

6. Warranty

(1) The Contractor warrants that the paint or coating will be free of the following defects: blisters, peeling, flaking, splitting, lifting, and undue fading. Warranty period is two years from date of substantial performance.

PART II - PRODUCTS

1. Manufacturers

(1) Acceptable Manufacturer: The Sherwin-Williams Company

(2) Acceptable Manufacturer: Master Builders Solutions Canada Inc.

(3) Substitutions: Requests for substitutions will be considered. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2. Applications

(1) Paints and Coatings - General:
   a) Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

   b) For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base colour.

(2) Primers:
   a) Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

3. Exterior Aluminium (doors, frames, spandrel panels)

(1) Pro Industrial Pro-Cryl Universal Acrylic Primer, B66W00310 Series, (5.0 – 10.0 mils wet, 2.0 - 4.0 mils dry).

(2) Top Coat #1: Pro Industrial High Performance Acrylic, B66W00651, (6.0 – 12.0 mils wet, 2.5 - 4.0 mils dry).

(3) Top Coat #2: Sher-Cryl HPA High Performance Acrylic, B66W00351, (6.0 – 10.0 mils wet, 2.5 - 4.0 mils dry).

(4) Colour and gloss to matched as closely as possible to existing to minimize aesthetic impact.

4. Accessories

(1) Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufacturer's specifications.

PART III - EXECUTION

1. Examination

(1) Do not begin application of coatings until substrates have been properly prepared. Notify Consultant of unsatisfactory conditions before proceeding

(2) If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

(3) Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

2. Surface Preparation

(1) Ensure concrete substrates are free of bond-inhibiting contaminants.

(2) The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion. Some stains and surface contaminants may require chemical removal. When chemical cleaners are used, be sure to neutralize the compounds and fully rinse the surface with clean water. Allow surface to dry before proceeding.

(3) Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

(4) Glossy surfaces of old paint films must be clean and dull before repainting. Thorough washing with an abrasive cleanser will clean and dull in one operation, or, wash thoroughly and dull by sanding.

(5) Check for compatibility by applying a test patch of the recommended coating system, covering at least 2 to 3 square feet. Allow to dry one week before testing adhesion per ASTM D3359, measuring adhesion by Tape Method A. If the coating system is incompatible, complete removal is required.

(6) Solvent Cleaning, SSPC-SP1 - Remove all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process.

(7) Hand Tool Cleaning, SSPC-SP2 - Remove all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

3. Installation

(1) Apply all coatings and materials with manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendation.

(2) Do not apply to wet or damp surfaces.

(3) Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

(4) Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.

(5) Dark Colours and Deep Clear Colours: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

4. Protection

(1) Protect finished coatings from damage until completion of project.

(2) Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

(3) Ensure all repair surfaces and surrounding surfaces are clean.

(4) Remove all debris, packaging, and extra materials from site properly.

End of Section 09 91 13

PART I - GENERAL

1. Related Work

   (1) Section 07 92 10 – Joint Sealing

   (2) Section 07 24 00 – Exterior Insulation and Finish System

2. Reference Standards

   (1) ASTM D412 - Standard Test Method for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.

   (2) ASTM D4541 – Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

3. Submittals / Mock-Ups

   (1) Product data for elastomeric waterproofing, primer, and accessories. Include material safety data sheets (MSDSs) and certifications showing compliance with specified standards.

   (2) Manufacturer's colour and finish charts for selections by Owner. Provide up to five 300x300mm samples including colour-matched option for the Owner to finalize colour selection.

   (3) Manufacturer's instructions for installation and maintenance.

   (4) Manufacturer representative to visit the site to review the surface preparation, application and to complete adhesion tests. Submit written confirmation from the Manufacturer of such visits including results of adhesion tests.

   (5) Mock-Ups:

      a) Install at Project site or pre-selected area of building an area for field sample, minimum 1.2 m by 1.2 m, using specified material for each specified colour.

      b) Apply material in accordance with manufacturer's written application instructions.

      c) Have manufacturer's representative review technical aspects; surface preparation, repair, and workmanship.

      d) Mock-up will be standard for judging workmanship on remainder of Project.

      e) Obtain Consultant's written approval of mock-up before start of material application, including approval of aesthetics, color, texture, and appearance.

      f) Perform adhesion test in accordance with ASTM D3359, Method A. Minimum adhesion rating of 4A required on 0 to 5 scale.

4. Job Conditions and Protection

(1) Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

(2) Do not apply material when substrate or ambient temperature is less than 5°C or is expected to fall below 5°C within 24 hours after application.

(3) Do not apply material if rain is expected within 24 hours of application.

5. Quality Assurance

(1) Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:

a) Product name, type (description)
b) Application & use instructions
c) Surface preparation
d) VOC content
e) Environmental issues
f) Batch date
g) Colour number

(2) Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

(3) Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

(4) Qualifications

a) Manufacturer Qualifications: Company with minimum 15 years of experience in manufacturing of specified products.

b) Applicator Qualifications: Company with minimum of 5 years' experience in application of specified products on projects of similar size and scope and is acceptable to product manufacturer.

6. Warranty

(1) The Contractor warrants that the coating will be free of the following defects: blisters, peeling, flaking, splitting, lifting, and undue fading. Warranty period is two years from date of substantial performance.

PART II - PRODUCTS

1. Materials

(1) High-build, water-based, elastomeric, 100% acrylic, waterproof coating. VOC Content to be less than 50 g/L per ASTM D3960.

a) Acceptable Product: MasterProtect EL 750 by Master Builders Solutions Canada Inc. Construction Chemicals.

b) Or an approved equivalent.

(2) Performance Requirements: applied at 16 mils DFT:

a) Ultimate Elongation, ASTM D412: >150%.

b) Elongation Recovery, ASTM D412: After 24 hours >95%.

c) Ultimate Tensile Strength, ASTM D412: >1.4 MPa.

d) Crack Bridging, PR EN 1062-7:

a. At -60°C: 12 mils (0.3 mm).

b. At 0°C: 19.5 mils (0.5 mm).

c. At 23°C: 27.5 mils (0.7 mm).

e) Flexibility, ASTM D522, at -34° C: 3 mm mandrel.

f) Pull-Off Strength Adhesion, ASTM D4541: >1.4 MPa.

g) Water-Vapor Permeance, ASTM D1653: >10 perms.

h) Visual Color Change, ASTM D1729, pass after 5,000 hours.

i) Chalking, ASTM D4214, pass after 5,000 hours.

j) Dirt Pick-Up, ASTM D3719, after 6 months exposure: >94%.

k) Mildew Resistance, ASTM D3273 and 3274: No growth.

(3) Wet Film Thickness (WFT):

a) 16 to 32 mils (406 to 813 microns).

(4) Dry Film Thickness (DFT):

a) 8 to 19 mils (229 to 483 microns).

(5) Colour and Texture to be matched to existing to minimize aesthetic impact.

1. Primers

(1) Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

2. Accessories

(1) Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufactures specifications.

PART II - EXECUTION

1. Examination

(1) Do not begin application of coatings until substrates have been properly prepared. Notify Consultant of unsatisfactory conditions before proceeding.

(2) If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

(3) Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

2. Surface Preparation

(1) Protection: Protect adjacent Work areas and finish surfaces from damage during coating application.

(2) Remove all surface mounted plates and hardware prior to surface preparation. Replace upon completion of the work. Remove protruding concrete accessories and smooth out irregularities.

(3) Prepare surfaces in accordance with manufacturer's instructions.

(4) Inspect substrates to receive coating. Ensure surfaces are sound, clean, dry, and free of frost, dust, dirt, grease, oil, curing compounds, form release agents, laitance, efflorescence, mildew, fungus, biological residues, and other foreign material.

(5) Clean substrates as required to remove contaminates and foreign material by pressure cleaning (min. 2,500psi), wire brushing, grinding or other method recommended by manufacturer. Clean surface to achieve texture similar to medium-grit sandpaper.

(6) When chemical cleaners are used, neutralize compounds and fully rinse surface with clean water. Allow surface to dry before proceeding.

(7) Remove blisters or delaminated areas and sand edges to smooth rough areas and provide transition to existing areas. Repair deteriorated or damaged substrates and fill cracks, voids, honeycomb, and other defects using materials as recommended by manufacturer. Allow patching materials to cure.

(8) Protect adjacent surfaces not designated to receive coating to ensure clean termination lines.

(9) Provide protection for pedestrians, vehicles, landscaping, and surrounding areas to prevent contact with coating materials.

(10) Field adhesion test: Prior application of repellent, test each application condition to determine if primer is required to satisfactorily adhere repellent to substrate. Check adhesion of existing paint in accordance with ASTM D3359, measuring adhesion by Tape Method A.

(11) Primer: Apply primer to substrates determined by field adhesion test.

a) Use nap roller, nylon bristle brush, or airless sprayer.
b) Application rate: 300 square feet per gallon / 7.4 square meters per litre.
c) Allow to dry 30 to 120 minutes so surface is dry to touch.

(12) Where the existing paint or coating has peeled or flaked and is adequately bonded, feather the edges to eliminate sudden changes in surface elevations to improve aesthetics.

(13) Concrete Surfaces:

a) Cure concrete a minimum of 28 days before application.
b) Remove laitance, bond-inhibiting contaminants, form-release agents, and sealers.
c) Remove form tie wires and repair holes, small voids, and spalls using appropriate repair product approved by coating manufacturer.
d) Abrasive-blast slick, dense concrete surfaces or use primer approved by coating manufacturer. Test surface for proper adhesion.

(14) Exterior Insulation and Finish Systems (EIFS) Surfaces:

a) Refasten or re-adhere delaminated or loose expanded polystyrene (EPS) insulation in accordance with manufacturer's approved methods.
b) Replace or patch missing or damaged EPS to original condition.
c) Finish with trowel acrylic finish to match and blend with existing texture.
d) Allow repaired areas to fully cure.
e) Refer to EIFS manufacturer's instructions for appropriate repair and procedures.

(15) Existing Acrylic Coating Surfaces:

a) Sand or grind edges of existing coating to ensure adhesion and smooth transition of new material. Sand edges of area to featheredge.

b) Wash down and allow to completely dry.

c) Prime chalky surfaces with primer approved by coating manufacturer.

(16) Crack Preparation and Treatment:

a) Treat cracks larger than 1/32 inch (0.8 mm) and up to 1/16 inch (1.6 mm) with brush-grade acrylic crack filler approved by coating manufacturer.

b) Treat cracks larger than 1/16 by 1/16 inch (1.6 by 1.6 mm) but less than 1/4 by 1/4 inch (6 by 6 mm) with knife-grade acrylic crack filler approved by coating manufacturer.

c) Treat moving cracks larger than 1/4 by 1/4 inch (6 by 6 mm) with internally plasticized polyurethane sealant approved by coating manufacturer.

d) Apply test application of crack repair materials in inconspicuous location to ensure compatibility and aesthetic approval.

3. Installation

(1) Apply all coatings and materials with manufacture specifications in mind. Mix and thin coatings according to manufacturer recommendation.

(2) Do not apply to wet or damp surfaces.

(3) Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

(4) Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.

(5) Dark Colours and Deep Clear Colours: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

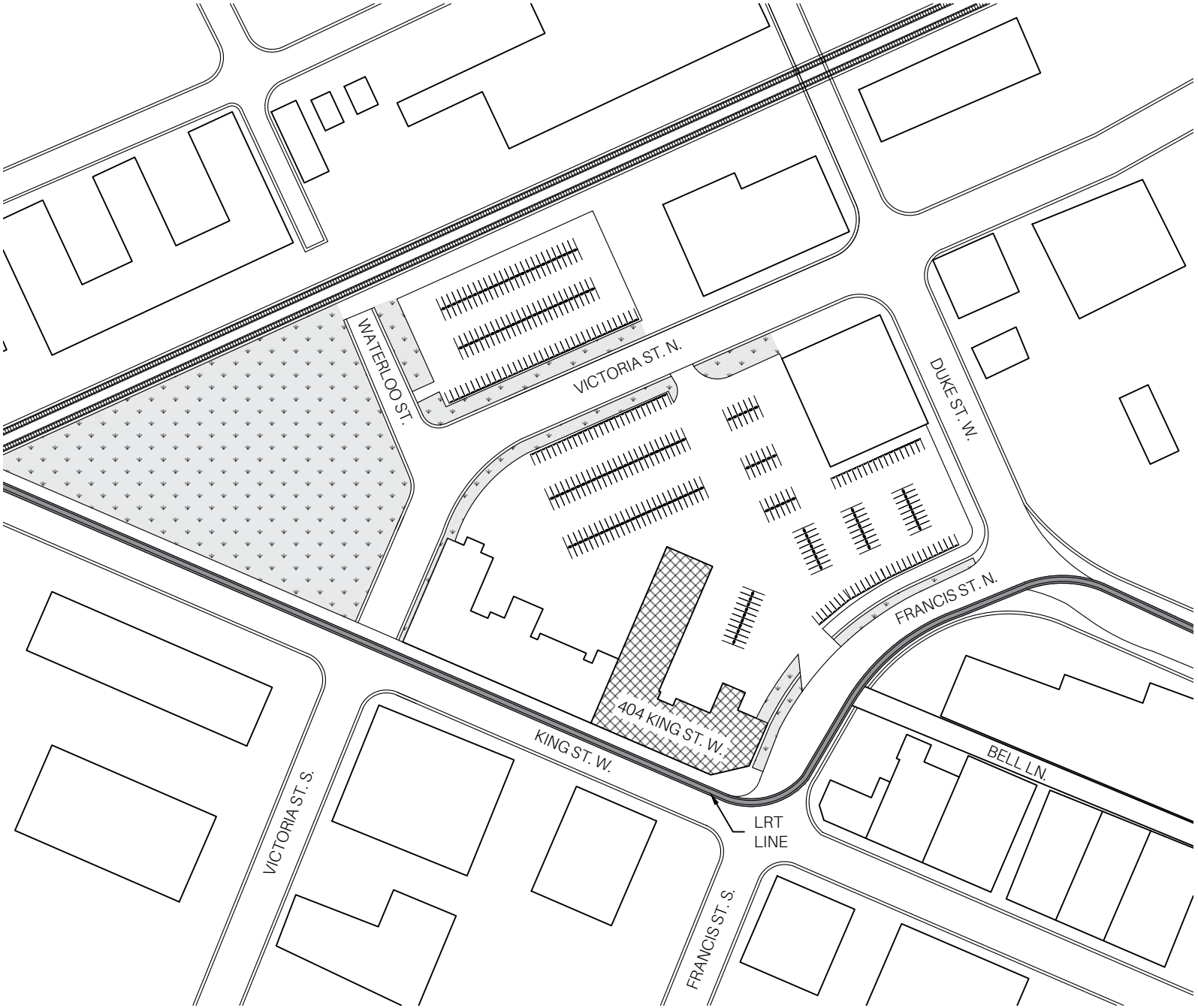
(6) Apply coating as a 2-coat system.

(7) Maintain proper uniform wet-film thickness during application to ensure performance characteristics desired.

(8) Apply coating to achieve pinhole-free, consistent film build on coated surfaces.

4.	Protection and clean up	(1) Protect finished coatings from damage until completion of project. (2) Touch-up damaged coatings after substantial completion, following manufacturers recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings. (3) Ensure all repair surfaces and surrounding surfaces are clean. (4) Remove all debris, packaging, and extra materials from site properly.

End of Section 09 97 23



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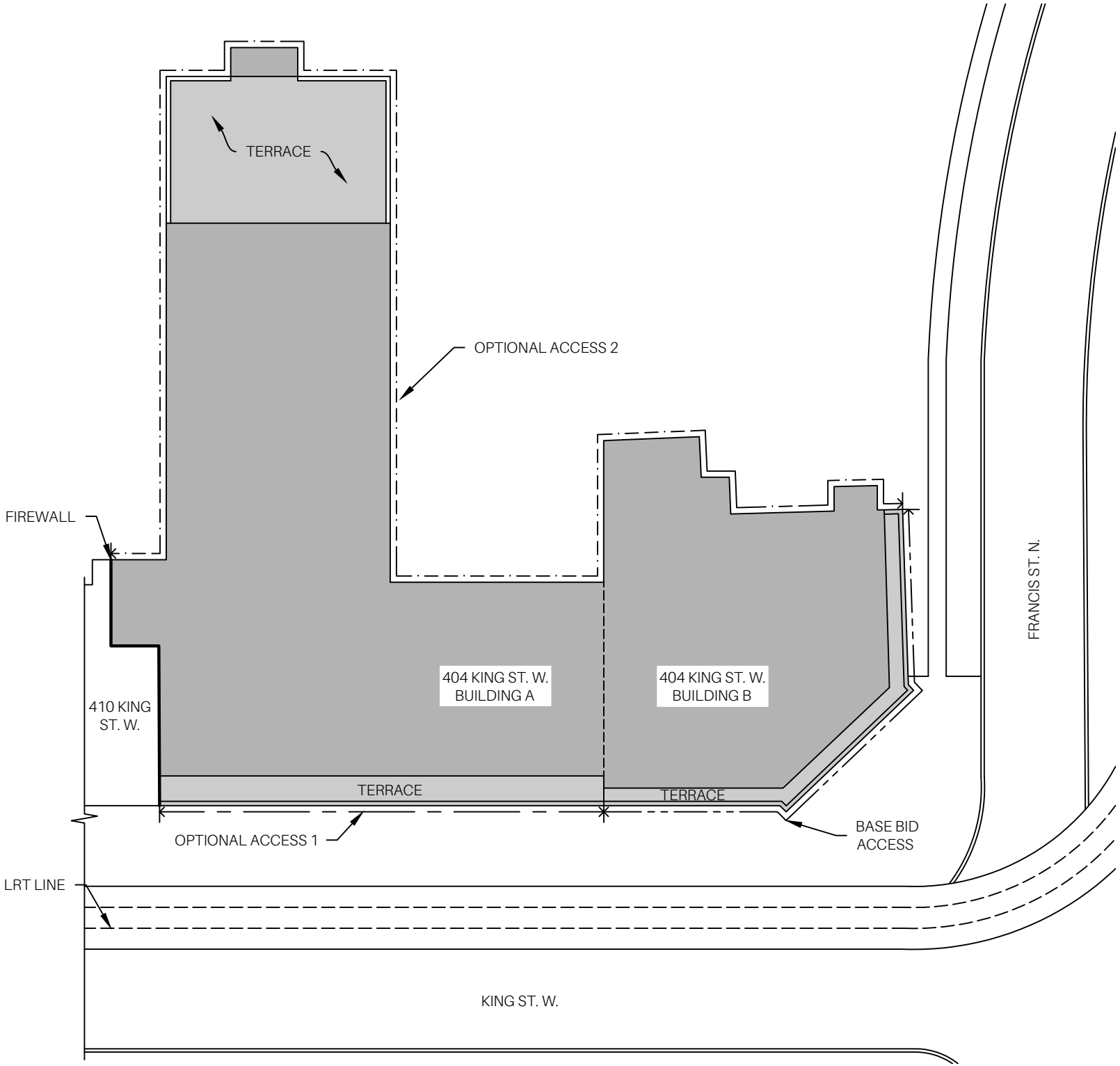
404 KING ST. W., KITCHENER

CLADDING REPAIRS

SITE PLAN

PROJECT No.		DRAWING No.
WatSCC450.1796		D-01
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



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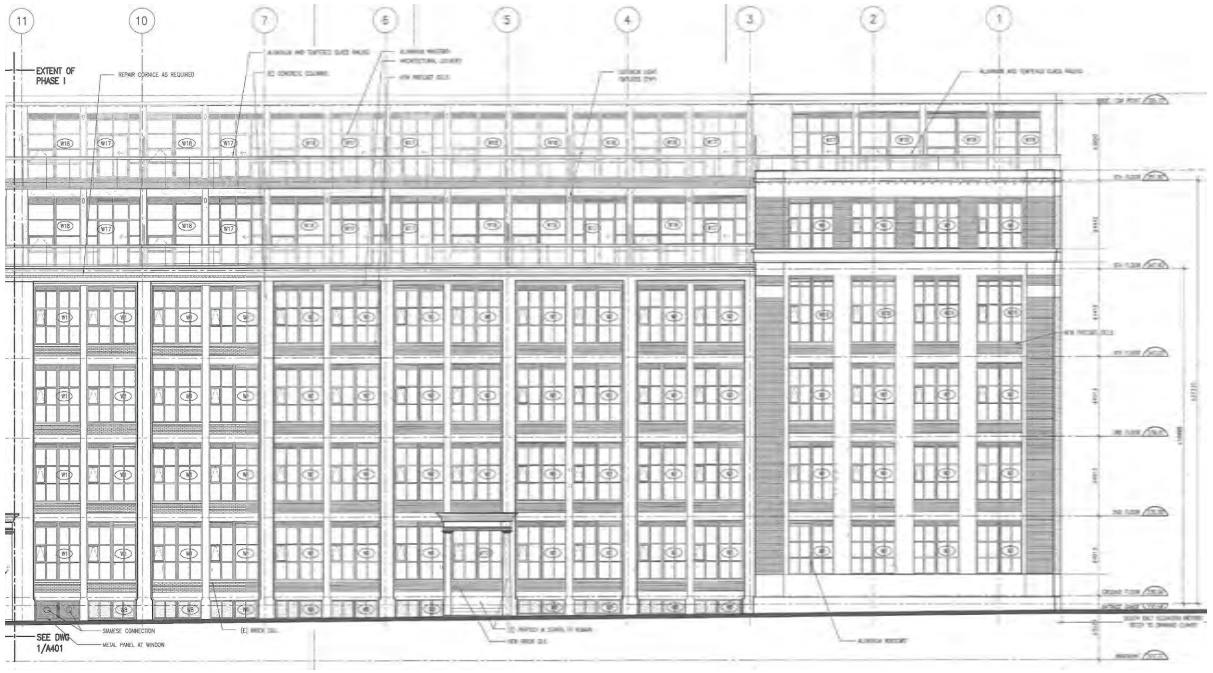
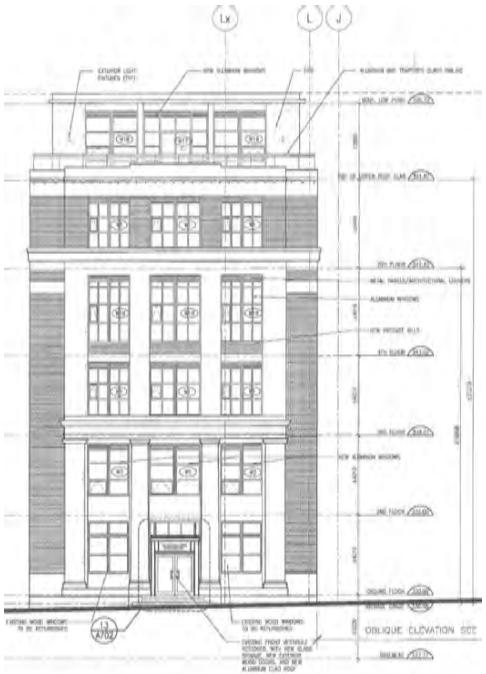
CLADDING REPAIRS

BUILDING PLAN

PROJECT No.		DRAWING No.
WatSCC450.1796		D-02
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



1 D-03 SOUTH ELEVATION
SCALE : NTS



2 D-03 SOUTH EAST ELEVATION
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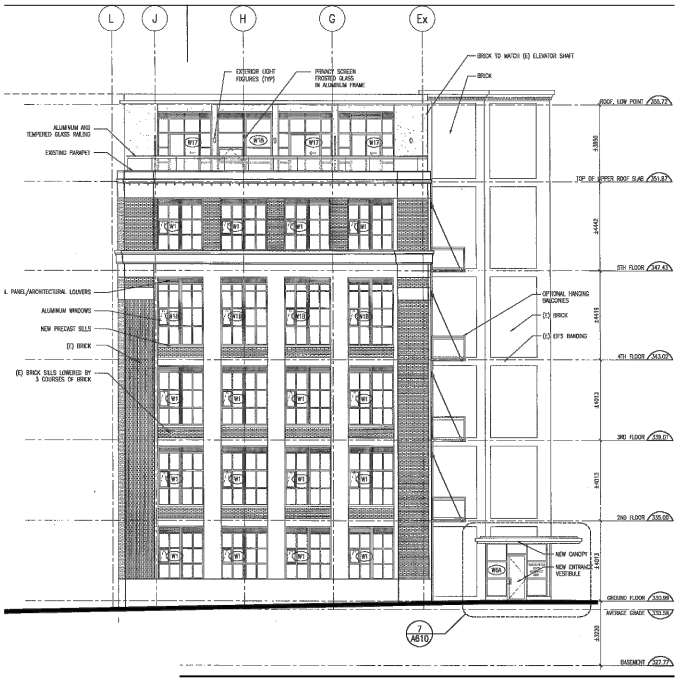

3 D-03 EAST ELEVATION
SCALE : NTS

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ELEVATIONS

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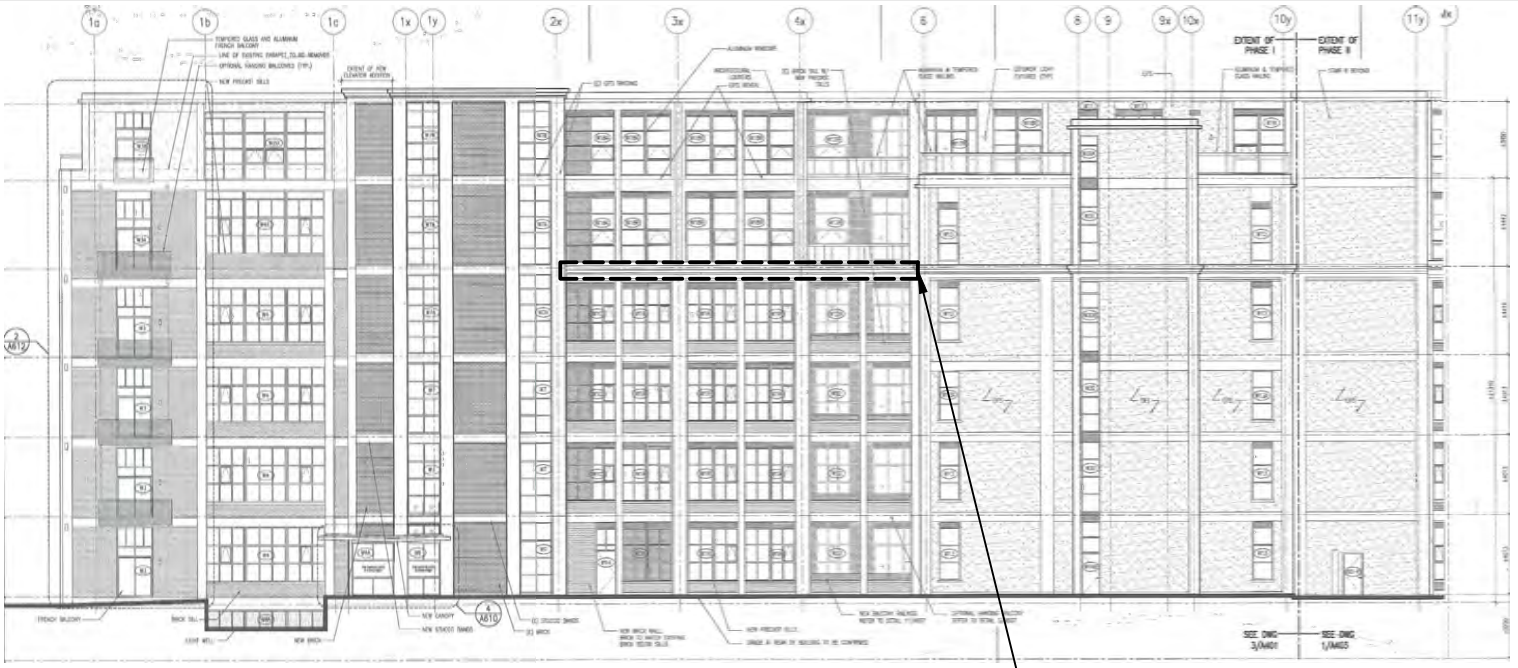
DATE: 20/06/19	SCALE: NTS	



1 / D-04 NORTH ELEVATION
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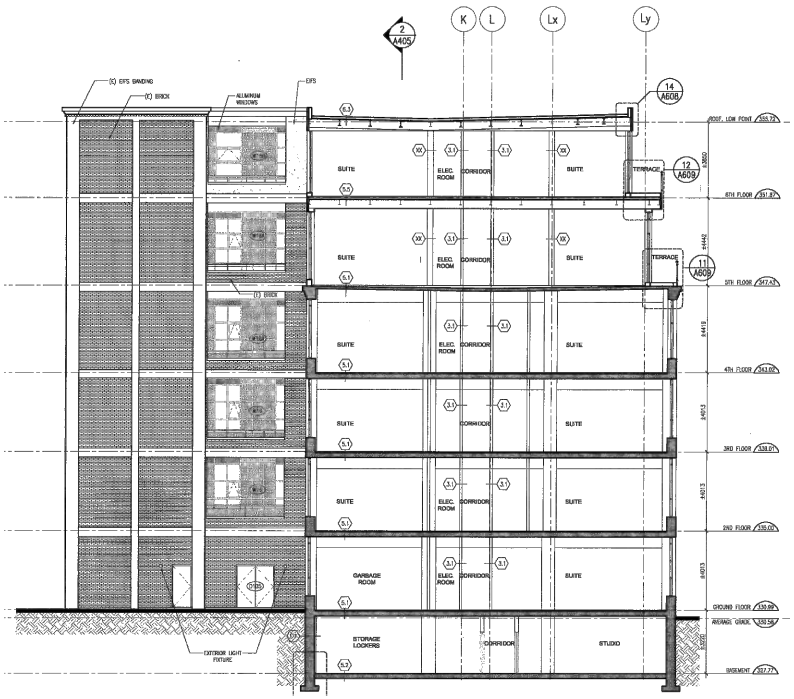

2 / D-04 PARTIAL REAR WEST ELEVATION
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ELEVATIONS

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DATE: 20/06/19	SCALE: NTS

ITEM 10.2: 5TH FLOOR TRANSITION FLASHING

1
D-05

REAR WEST ELEVATION
SCALE : NTS

ITEM 10.2: 5TH FLOOR TRANSITION FLASHING

2
D-05

REAR EAST ELEVATION
SCALE : NTS

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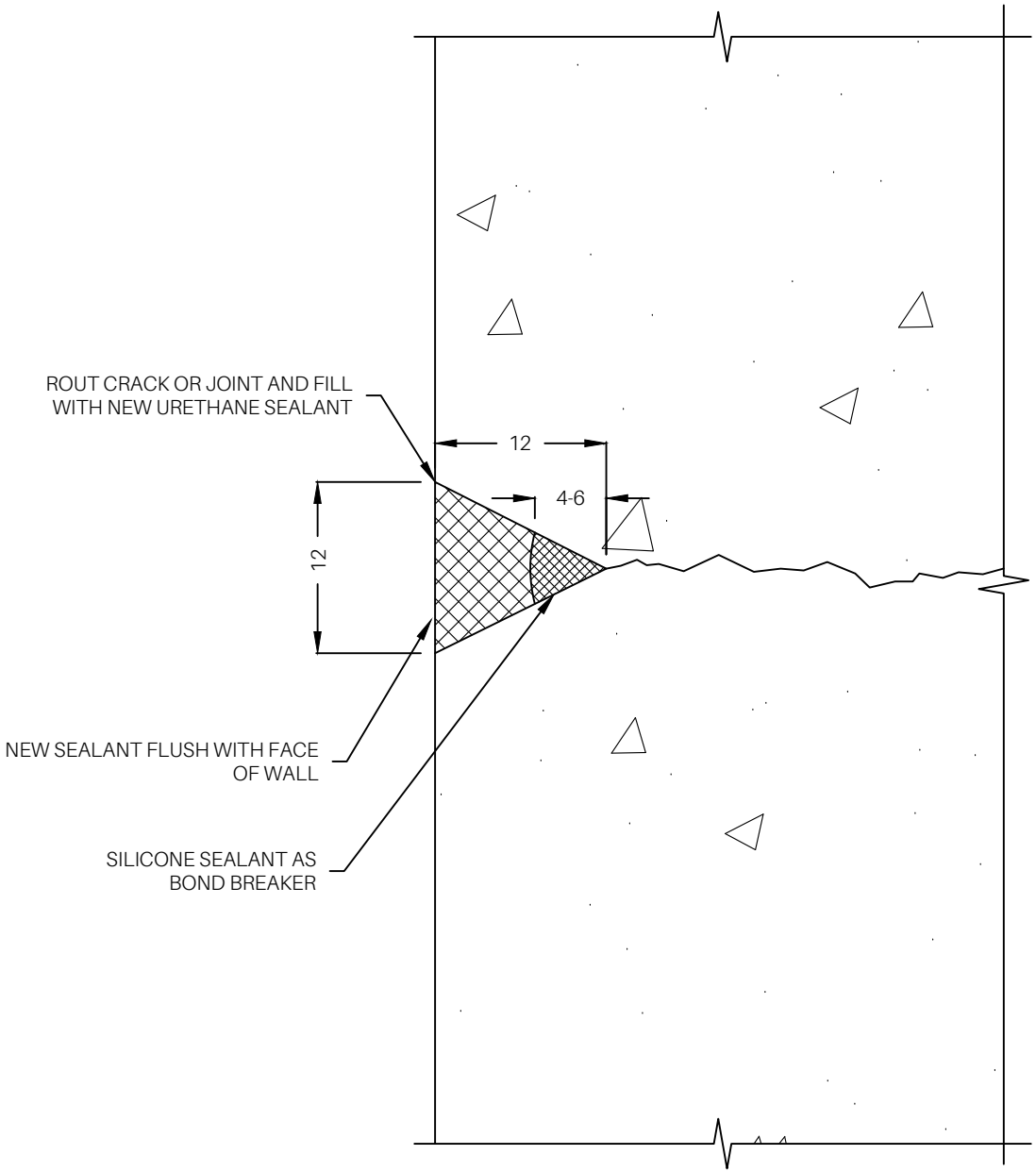
DATE: 20/06/19	SCALE: NTS	



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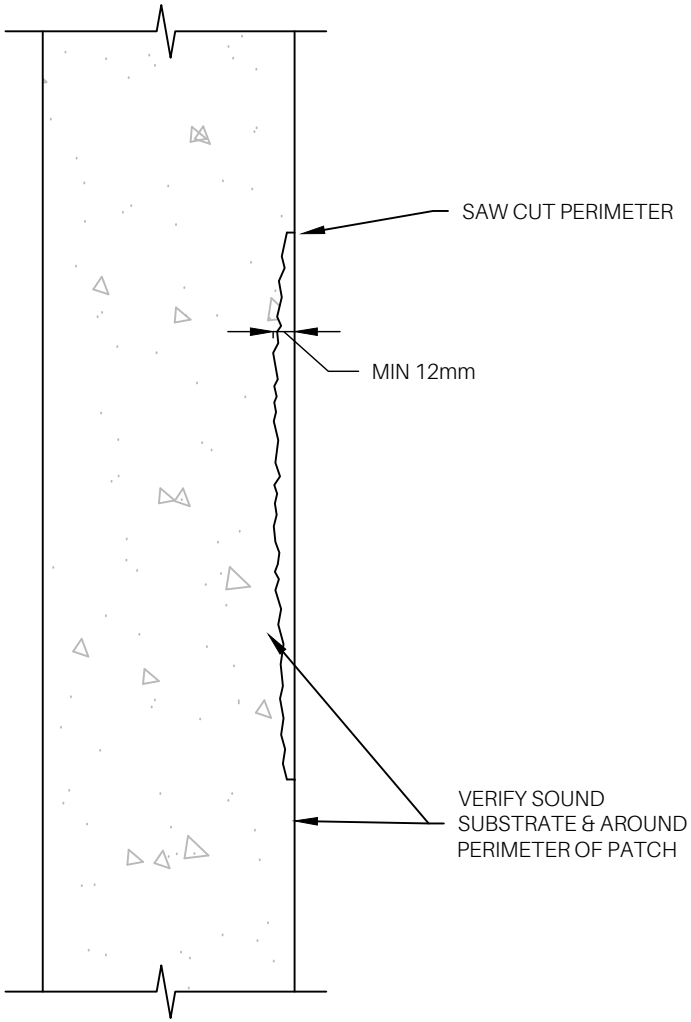
CLADDING REPAIRS

ROUT AND SEAL CRACK REPAIR DETAIL

PROJECT No.		DRAWING No.
WatSCC450.1796		D-06
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	

NOTES:

1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. ROUTE AND SEAL ALL CRACKS GREATER THAN OR EQUAL TO 1mm IN WIDTH.



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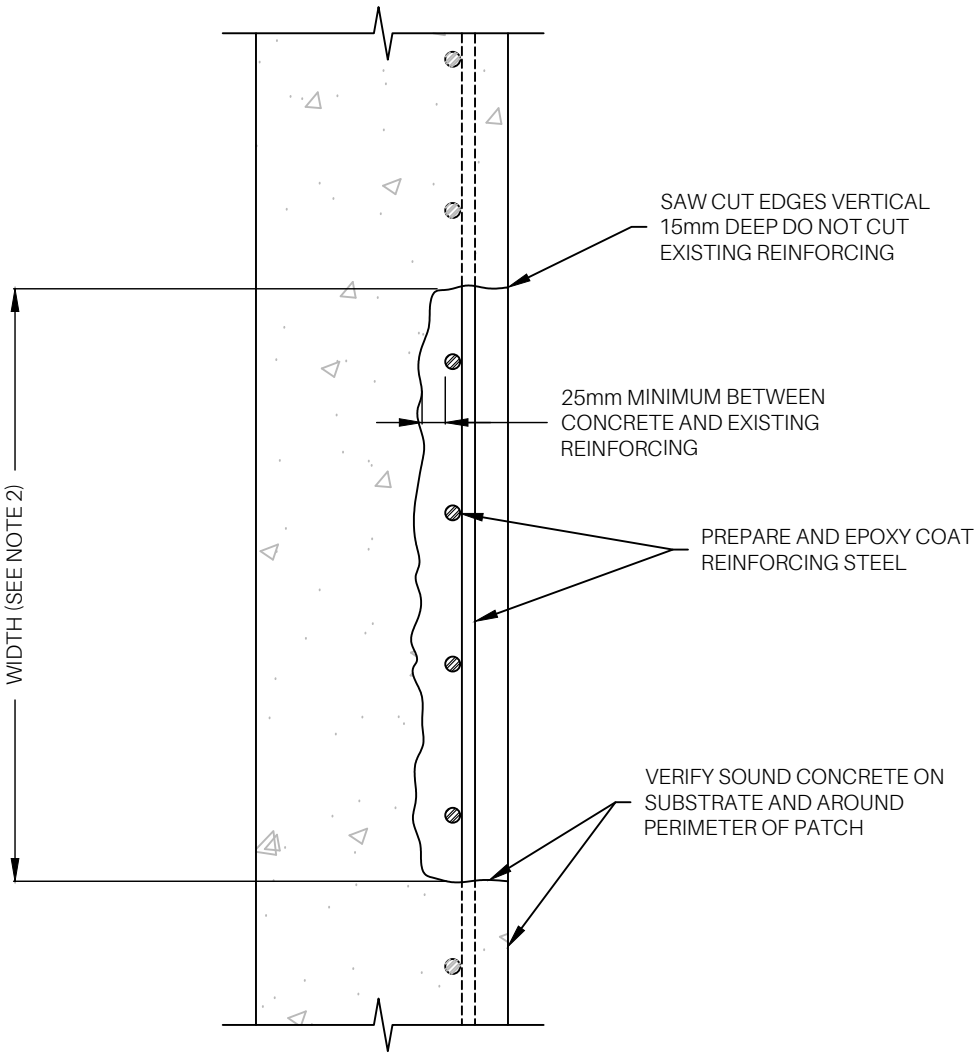
CLADDING REPAIRS

VERTICAL THIN SURFACE CONCRETE REPAIR DETAIL

NOTES:

1. REPORT AND DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. VERIFY SOUND CONCRETE ON SUBSTRATE, AROUND THE PERIMETER OF THE PATCH AND BENEATH THE PATCH PRIOR TO CASTING NEW CONCRETE.
3. INSTALL PROFESSIONALLY ENGINEERED SHORING AS REQUIRED BY SHORING ENGINEER PRIOR TO REMOVAL.
4. CONCRETE PATCHES SHALL BE SQUARED OFF AND SAWCUT PRIOR TO STARTING REMOVALS.

PROJECT No.		DRAWING No.
WatSCC450.1796		D-07
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



NOTES:

1. REPORT AND DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. INSTALL PROFESSIONALLY ENGINEERED SHORING AS REQUIRED PRIOR TO REMOVALS. ENGINEER TO REVIEW EACH INSTALLATION AND ISSUE APPROVAL SITE REPORT.
3. FIELD CONDITIONS MAY DIFFER FROM THE INFORMATION SHOWN ON THIS DETAIL FOR NUMBER, QUANTITY AND LOCATION OF REINFORCING BARS.
4. HEAVILY CORRODED STEEL BARS SHALL BE REINFORCED AS DIRECTED BY THE CONSULTANT. DO NOT REMOVE ANY BARS WITHOUT FORMAL APPROVAL.
5. PROVIDE 25mm CLEARANCE AROUND ALL EXPOSED REINFORCING BARS.
6. CONCRETE PATCHES SHALL BE SQUARED OFF AND SAWCUT PRIOR TO STARTING REMOVALS.

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CLADDING REPAIRS

VERTICAL CONCRETE REPAIR DETAIL

PROJECT No.	DRAWING No.
WatSCC450.1796	D-08
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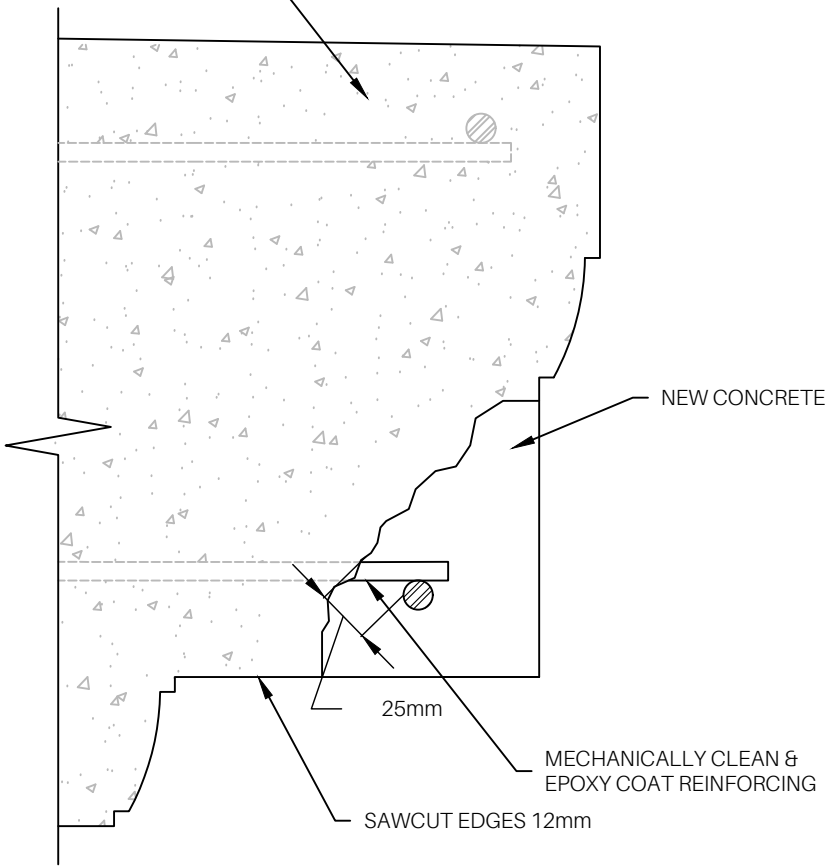
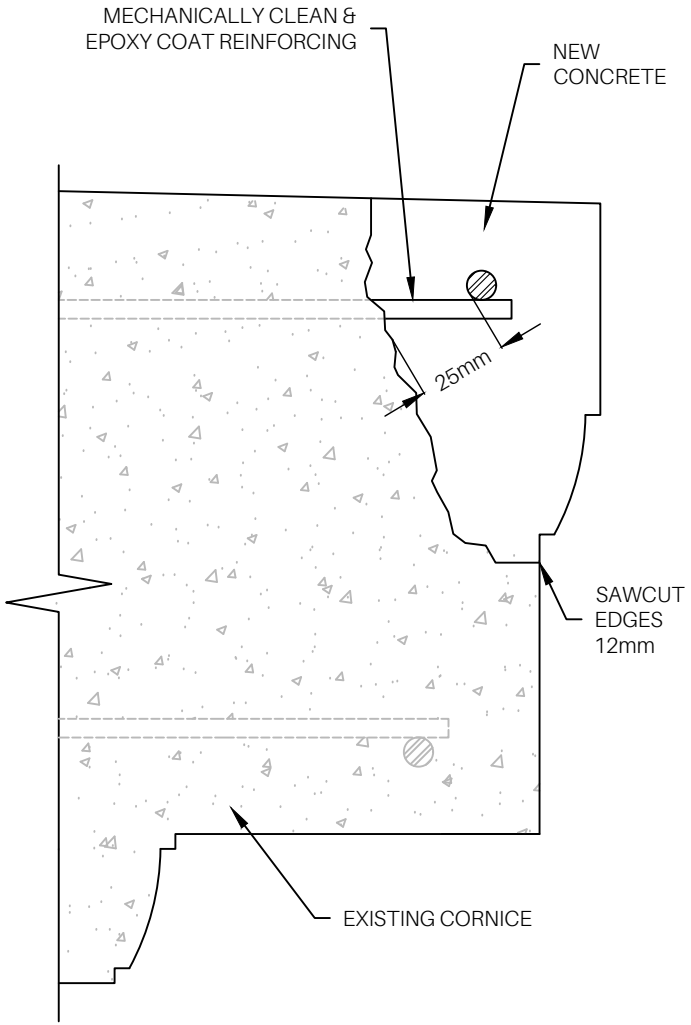
DATE: 20/06/19 / SCALE: NTS	



1 / D-09 BOTTOM EDGE REPAIR
SCALE : NTS



2 / D-09 TOP EDGE REPAIR
SCALE : NTS

NOTES:

1. CONCRETE PROFILES VARY THROUGHOUT.
2. REINFORCING QUANTITY AND LOCATION VARIES THROUGHOUT.
3. REPORT ANY DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
4. VERIFY SOUND CONCRETE ON SUBSTRATE, AROUND THE PERIMETER OF THE PATCH AND BENEATH THE PATCH PRIOR TO CASTING NEW CONCRETE.
5. ALL STEEL SHALL BE MECHANICALLY CLEANED AND EPOXY COATED.
6. INSTALL PROFESSIONALLY ENGINEERED SHORING AS REQUIRED PRIOR TO REMOVAL.

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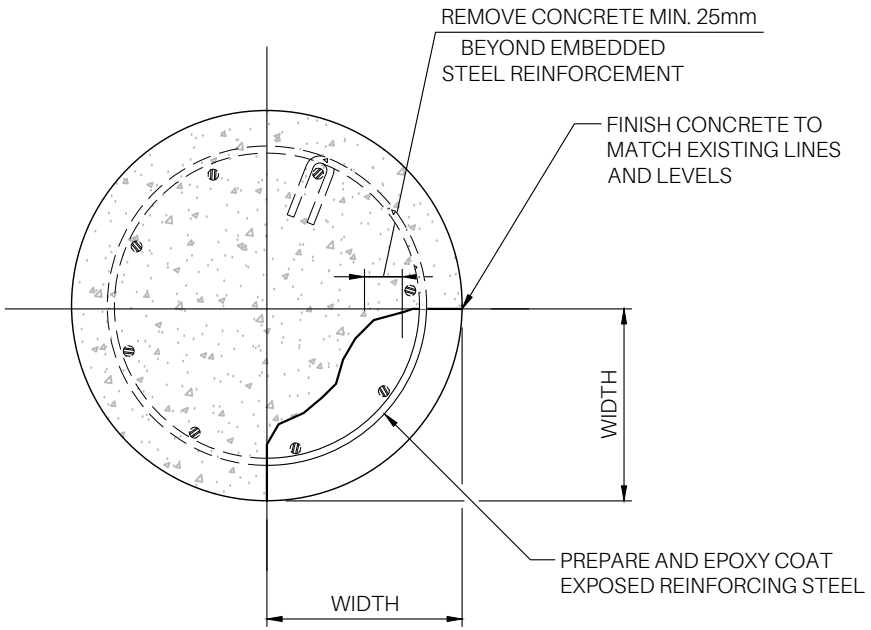
CLADDING REPAIRS

CORNICE REPAIR DETAIL

PROJECT No.		DRAWING No.
WatSCC450.1796		D-09
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



NOTES:

1. REPORT ANY DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. INSTALL PROFESSIONALLY ENGINEERED SHORING AS REQUIRED TO UNLOAD THE COLUMN PRIOR TO REMOVALS. ENGINEER TO REVIEW EACH INSTALLATION AND ISSUE APPROVAL SITE REPORT.
3. FIELD CONDITIONS MAY DIFFER FROM THE INFORMATION SHOWN ON THIS DETAIL FOR NUMBER, QUANTITY AND LOCATION OF REINFORCING BARS.
4. HEAVILY CORRODED STEEL BARS AND COLUMN TIES SHALL BE REINFORCED AS DIRECTED BY THE CONSULTANT. DO NOT REMOVE ANY BARS WITHOUT WRITTEN APPROVAL.
5. PROVIDE 25mm CLEARANCE AROUND ALL EXPOSED REINFORCING BARS.
6. CONCRETE PATCHES SHALL BE SQUARED OFF AND SAWCUT PRIOR TO STARTING REMOVALS. DO NOT CUT EXISTING REINFORCING.
7. UNCONSOLIDATED CONCRETE WILL NOT BE ACCEPTED. FORM AND CAST COLUMN REPAIRS AS REQUIRED. NO HAND PATCHING IS PERMITTED.
8. PAYMENT BASED ON 1/4 OF COLUMN FOR EACH LOCATION.

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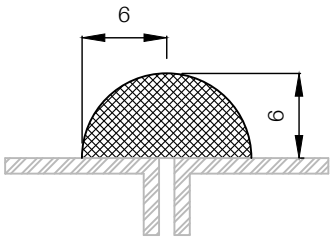
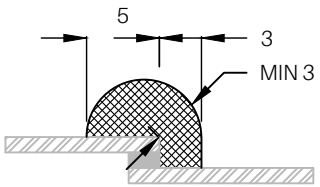
CLADDING REPAIRS

COLUMN REPAIR DETAIL

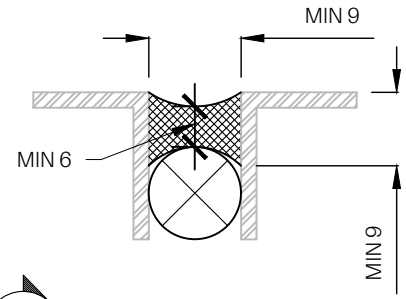
PROJECT No.		DRAWING No.
WatSCC450.1796		D-10
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



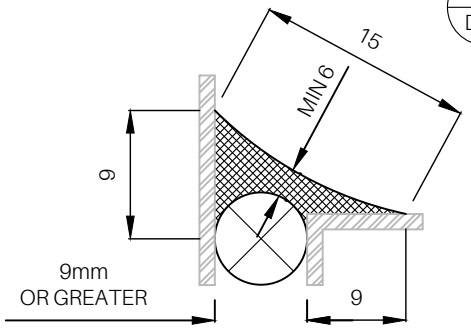
A D-11 CAP BEAD: METAL TO METAL
SCALE: NTS



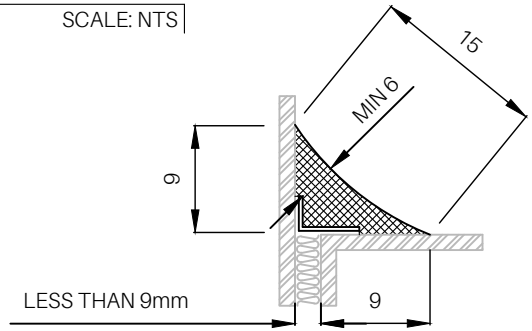
B D-11 CAP BEAD: GLASS TO METAL
SCALE: NTS



C D-11 BUTT BEAD
SCALE: NTS



D D-11 FILLET BEAD: >9mm JOINT
SCALE: NTS



E D-11 FILLET BEAD: <9mm JOINT
SCALE: NTS

NOTES:

1. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. BE RESPONSIBLE FOR GOOD BOND BETWEEN SEALANT AND SUBSTRATES.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

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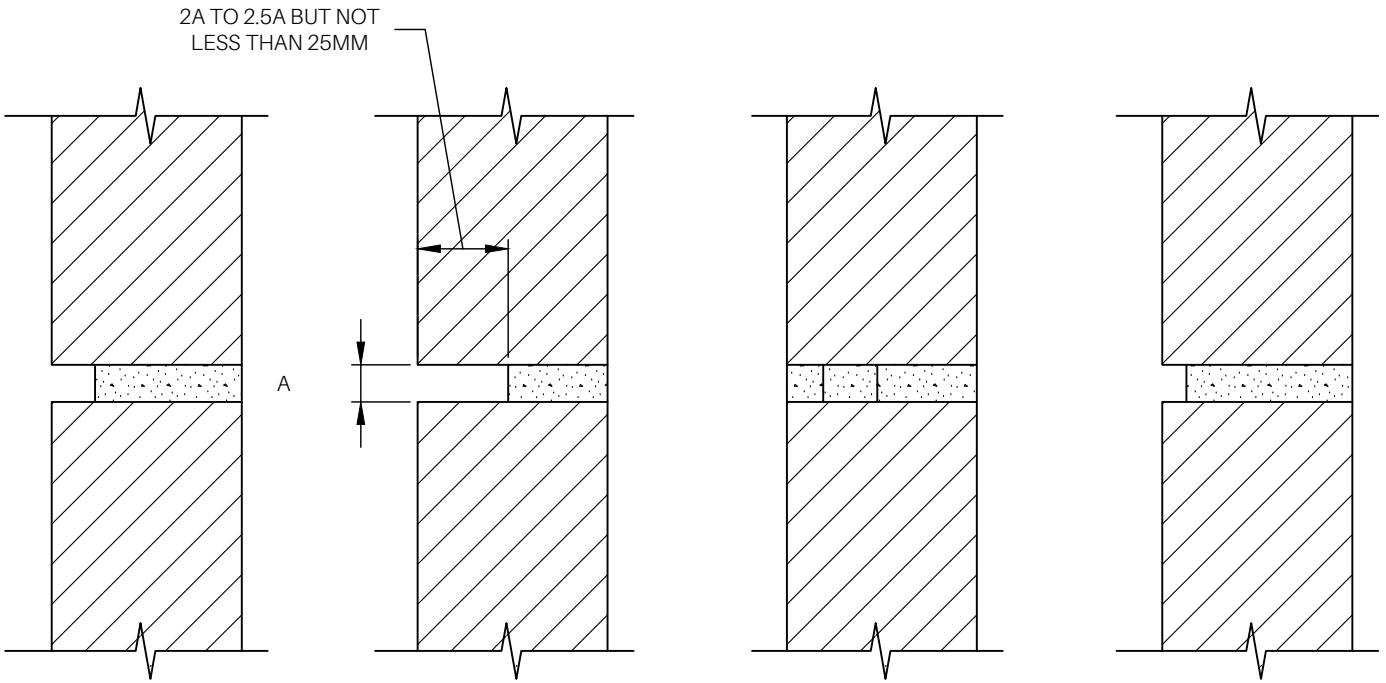
CLADDING REPAIRS

SEALANT DETAILS

PROJECT No.		DRAWING No.
WatSCC450.1796		D-11
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	

MORTAR JOINT REPOINTING PROCEDURE:

1. REMOVE EXISTING CAULKING (IF REQUIRED) AND RAKE UNSOUND JOINTS FREE OF DETERIORATED AND LOOSE MORTAR, DIRT AND OTHER UNDESIRABLE MATERIAL. JOINTS SHOULD BE RAKED TO A DEPTH OF 2-2.5 TIMES THE VERTICAL JOINT WIDTH BUT NO LESS THAN 25MM. FLUSH OPEN JOINTS AND VOIDS CLEAN WITH WATER AND/OR AIR, AND IF NOT FREE DRAINING, BLOW CLEAN WITH COMPRESSED AIR.
2. MORTAR JOINTS ARE TO BE FILLED IN SUCCESSIVE LAYERS. DEEPER JOINTS SHALL BE FILLED FIRST COMPACTING NEW MORTAR IN SEVERAL LAYERS UNTIL BACK OF JOINT IS FLAT. MULTIPLE 12MM LAYERS WILL BE NEEDED TO FILL THE JOINT FLUSH WITH THE SURFACE OF THE MASONRY. ALLOW EACH LAYER TO REACH THUMBPRINT HARDNESS BEFORE THE NEXT IS APPLIED.
3. FINISH MASONRY JOINTS TO MATCH EXISTING MORTAR JOINTS. LEAVE EXISTING MASONRY WORK CLEAN AND FREE OF MORTAR DROPPINGS.



1. DETERORATED MORTAR JOINTS

2. MORTAR CUT BACK TO SOUND SURFACE

3. NEW MORTAR LAYERED INTO MORTAR JOINT

4. JOINT TOOLED TO ORIGINAL PROFILE

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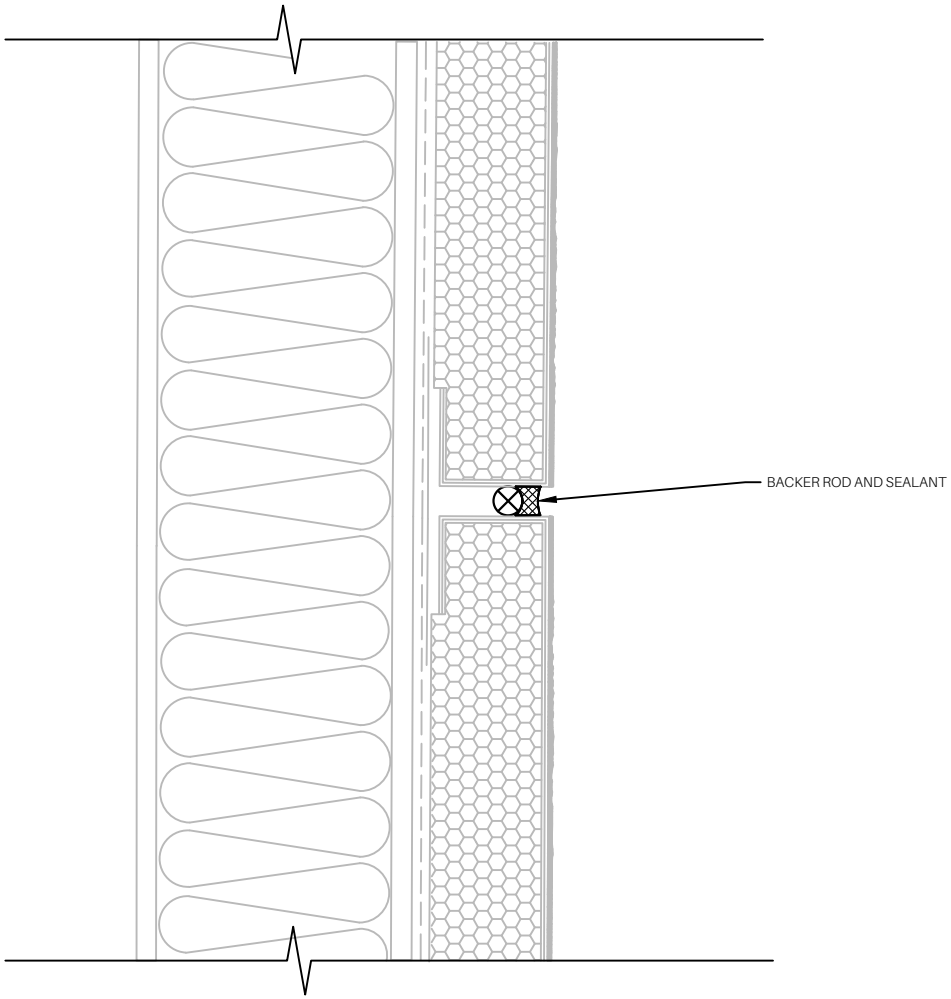
CLADDING REPAIRS

MORTAR JOINT REPLACEMENT DETAIL

PROJECT No.		DRAWING No.
WatSCC450.1796		D-12
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



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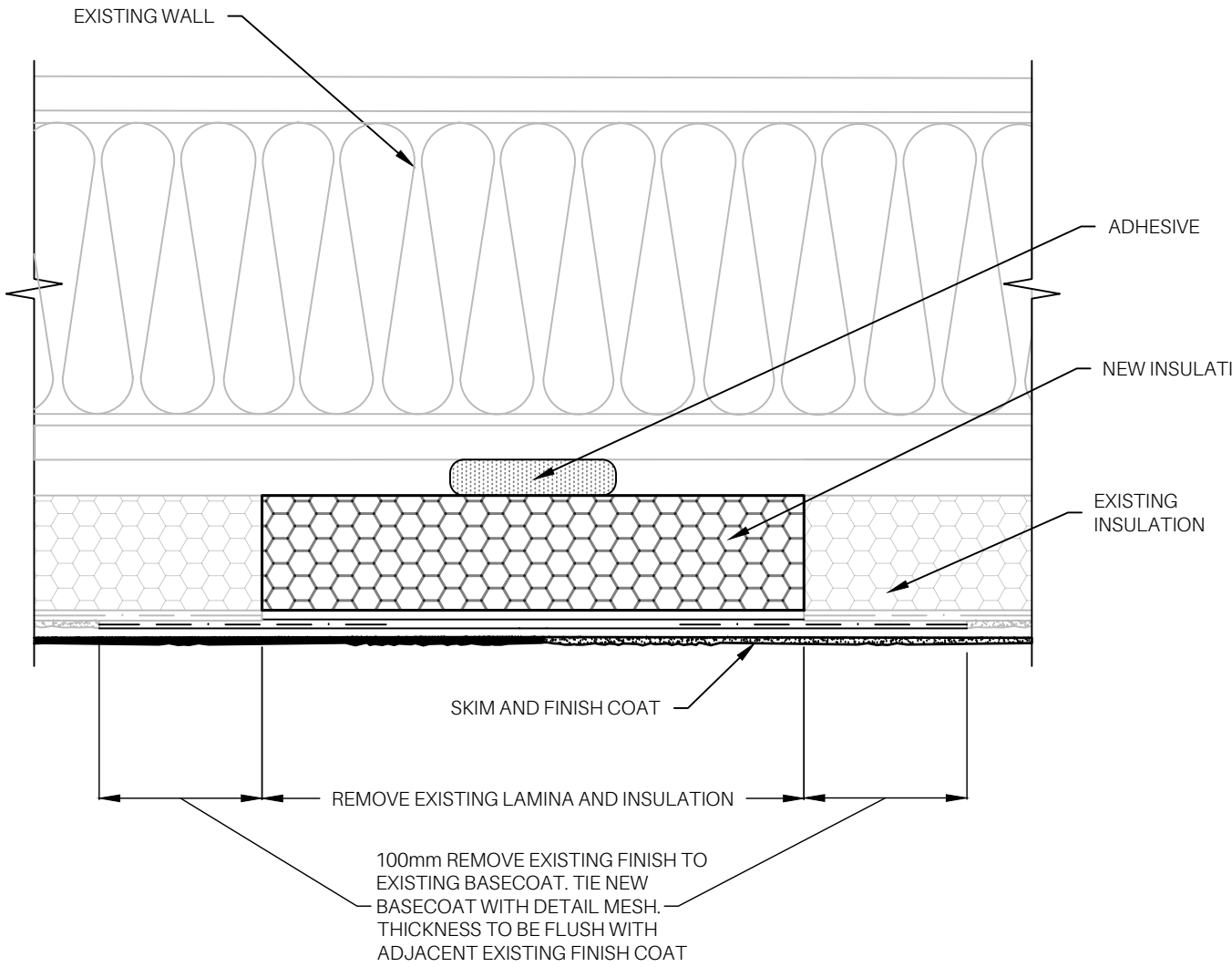
CLADDING REPAIRS

EIFS EXPANSION JOINT DETAIL

NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. SPRAY FOAM GAPS BETWEEN EPS GREATER THAN 1.5 mm.
3. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

PROJECT No.		DRAWING No.
WatSCC450.1796		D-13
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. MARK OUT LAMINA REPLACEMENT LOCATIONS FOR CONSULTANT REVIEW BEFORE COMPLETING REPAIRS.
3. REVIEW CONDITION OF EXISTING INSULATION BENEATH BASECOAT. REPORT ANY DAMAGES OR IRREGULARITIES TO CONSULTANT BEFORE PROCEEDING.
4. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

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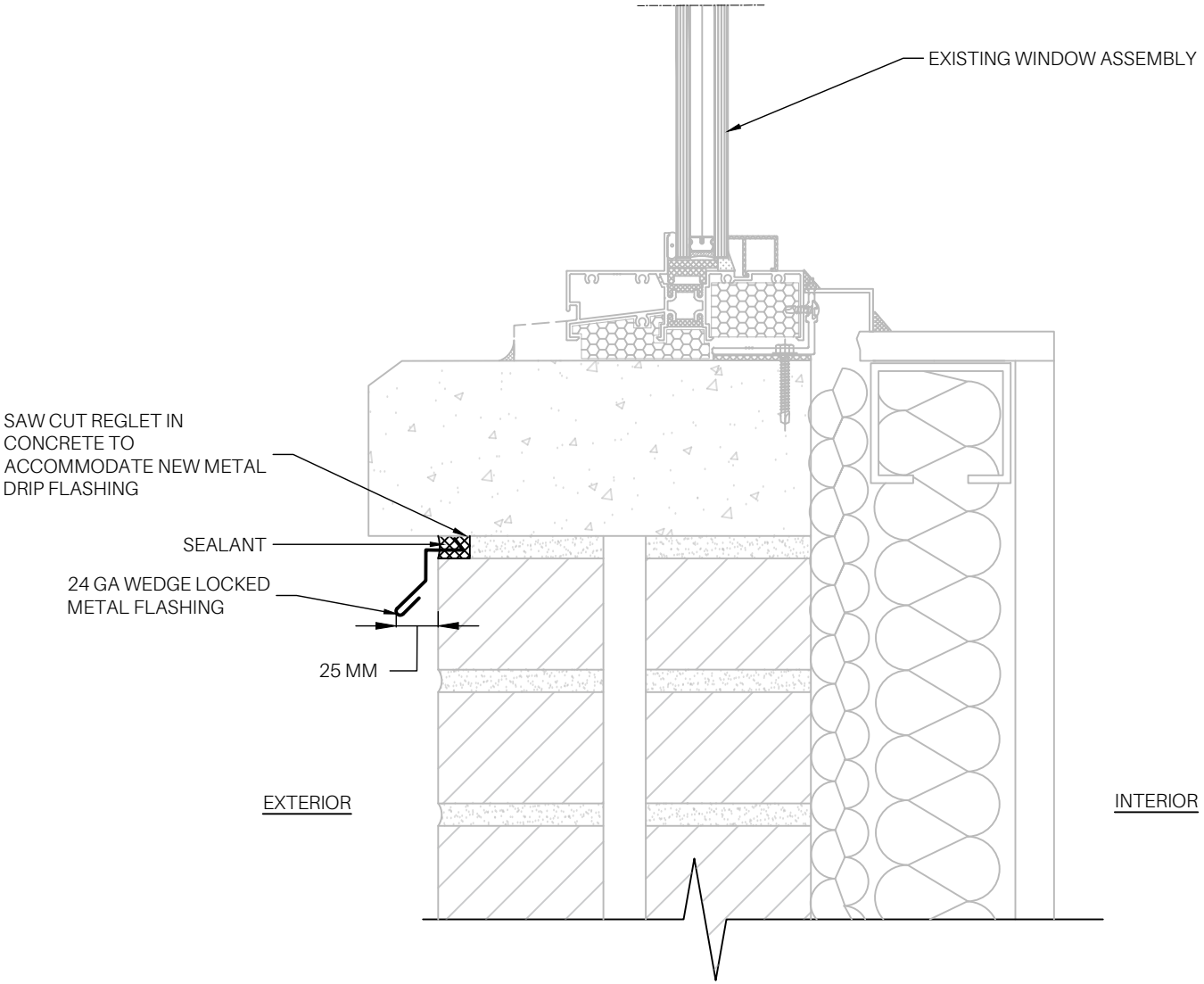
EIFS LAMINA AND INSULATION REPAIR DETAIL

PROJECT No.		DRAWING No.
WatSCC450.1796		D-14
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



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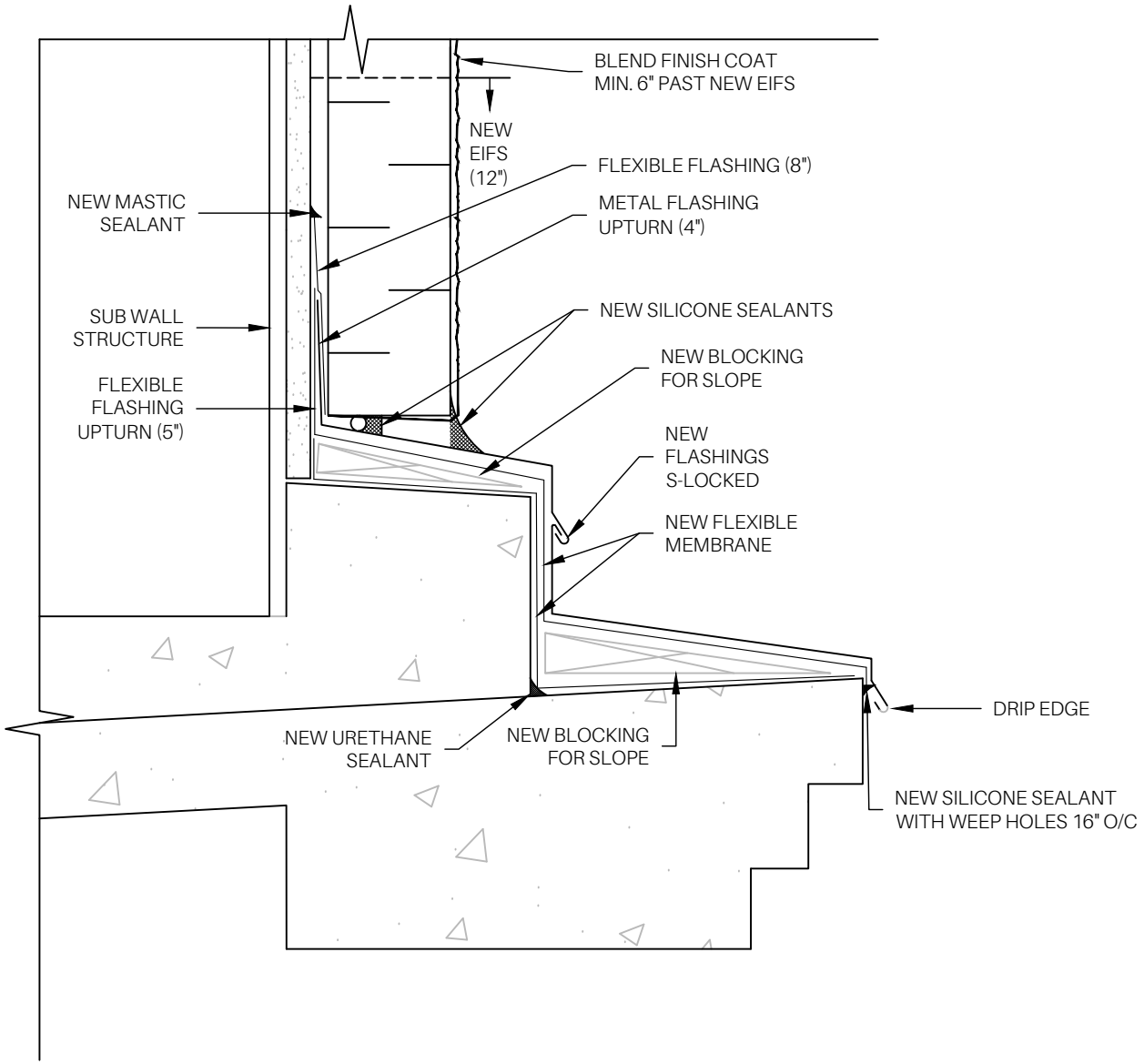
CLADDING REPAIRS

WINDOW SILL FLASHING DETAIL

PROJECT No.	DRAWING No.
WatSCC450.1796	D-15
CHECKED BY: SNN / DRAWN BY: AJW	
DATE: 20/06/19 / SCALE: NTS	

NOTES:

1. REPORT AND DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.



NOTES:
1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. SPRAY FOAM GAPS BETWEEN EPS GREATER THAN 1.5mm.
3. ALL METAL FLASHING TO BE 26 GAUGE MILL-FINISHED EXTRUDED ALUMINUM.
4. FLEXIBLE MEMBRANE: HENRY BAKOR BLUESKIN SA-LT.
5. SILICONE SEALANT: TREMCO SPECTRUM 1.
6. POLYURETHANE SEALANT: TREMCO DYMONIC 100.
7. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED.

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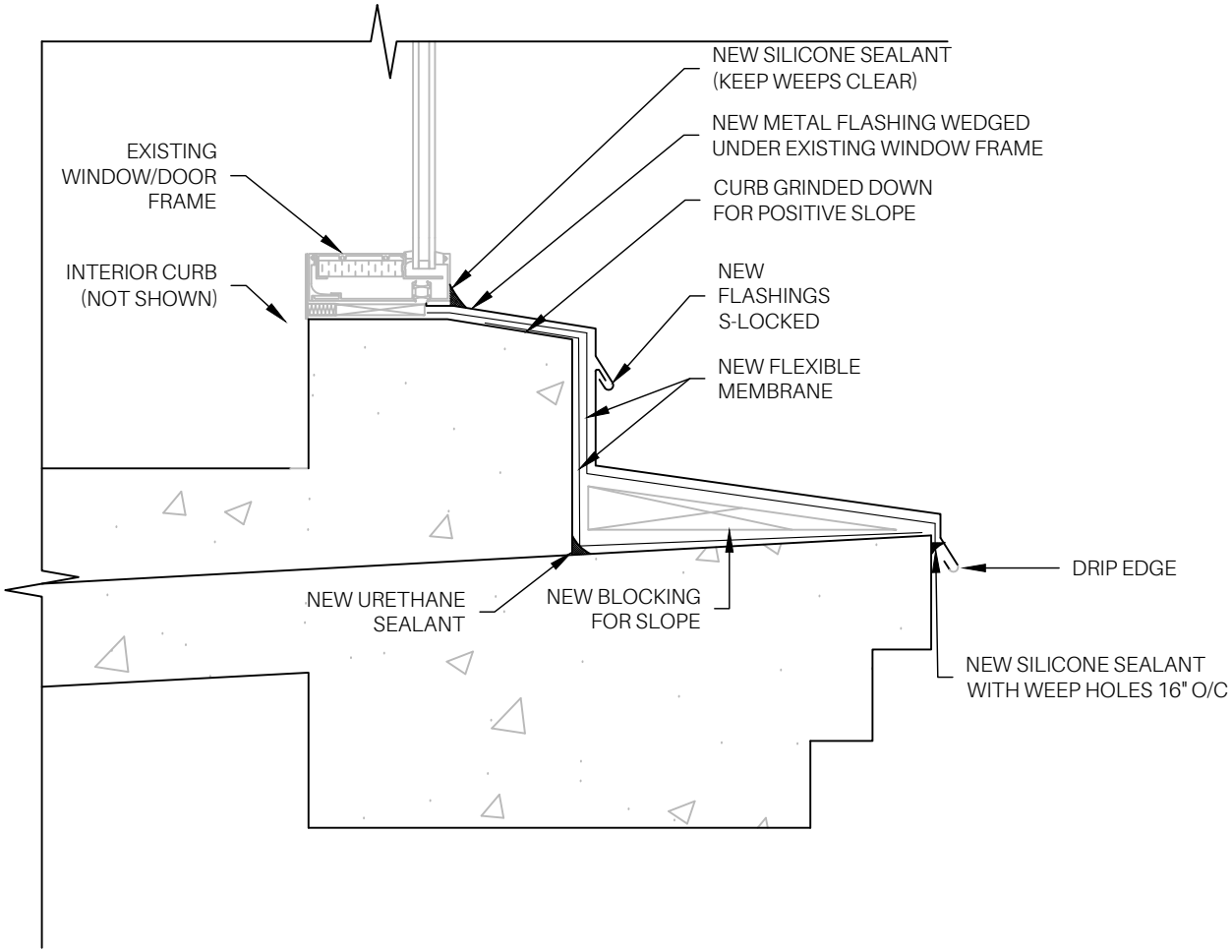
CLADDING REPAIRS

5TH FLOOR TRANSITION FLASHING DETAIL AT EIFS

PROJECT No.		DRAWING No.
WatSCC450.1796		D-16
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/19	SCALE: NTS	



NOTES:
1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. ALL METAL FLASHING TO BE 26 GAUGE MILL-FINISHED EXTRUDED ALUMINUM.
3. FLEXIBLE MEMBRANE: HENRY BAKOR BLUESKIN SA-LT.
4. SILICONE SEALANT: TREMCO SPECTRUM 1.
5. POLYURETHANE SEALANT: TREMCO DYMONIC 100.
6. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED.

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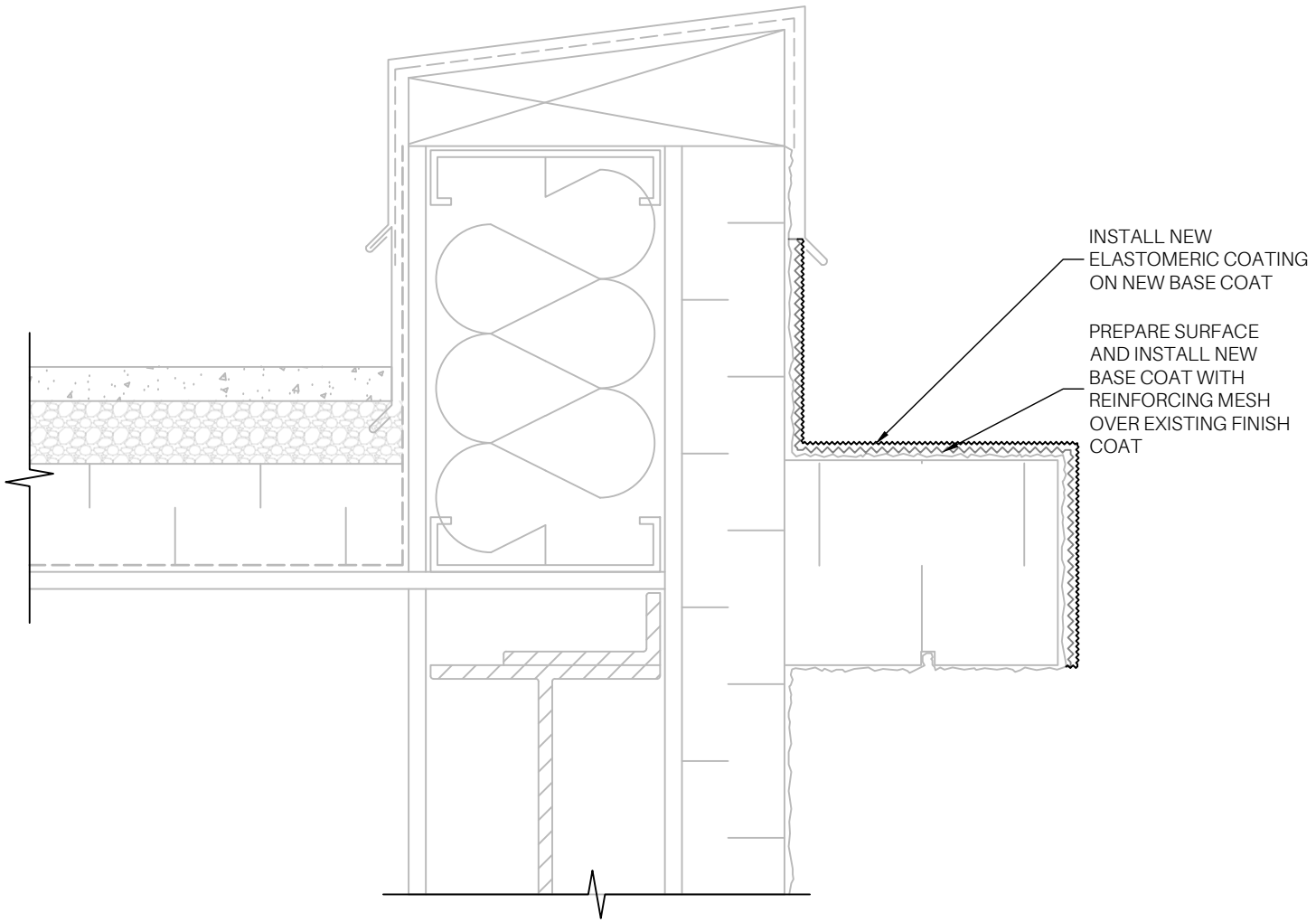
CLADDING REPAIRS

5TH FLOOR TRANSITION FLASHING DETAIL AT WIDOWS

PROJECT No.	DRAWING No.
WatSCC450.1796	D-17
CHECKED BY: SNN / DRAWN BY: AJW	
DATE: 20/06/19 / SCALE: NTS	



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CLADDING REPAIRS

EIFS CORNICE REPAIR DETAIL

PROJECT No.	DRAWING No.
WatSCC450.1796	D-18
CHECKED BY: SNN / DRAWN BY: AJW	
DATE: 20/06/19 / SCALE: NTS	

NOTES:

1. REPORT AND DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

Edison
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BUILDING RESTORATION

Construction Review
Project Management
Building Envelope
Structural Repairs
Prestressed Structures
Mechanical and
Electrical Design
Roofing and Waterproofing

STRUCTURAL ADDITIONS AND RENOVATIONS

Interior Fit-Outs
Building Additions
Structural Capacity Check
Structural Strengthening
PV Feasibility Review

BUILDING AUDITS

Property Assessments
Pre-Purchase Inspections
Refinance Inspections
Reserve Fund Studies
Performance Audits
Energy Audits

MECHANICAL AND ELECTRICAL ENGINEERING

Heating
Ventilation
Cooling
Domestic Hot and Cold Water Plumbing
Boilers, Chillers, and Pumps
Roof Top Units, Heat Recovery Units and Solar Systems
Storm and Sanitary Sewer Systems
Lighting
Emergency generators
Energy Audits

HAMILTON

17 Ogilvie Street Dundas Ontario L9H 2S1

LONDON

202-553 Southdale Road East London Ontario N6E 1A2

TORONTO

215-7300 Warden Avenue Markham Ontario L3R 9Z6

WINDSOR

694 Scofield Avenue Windsor Ontario N9G 1L3

1 866 397 2506
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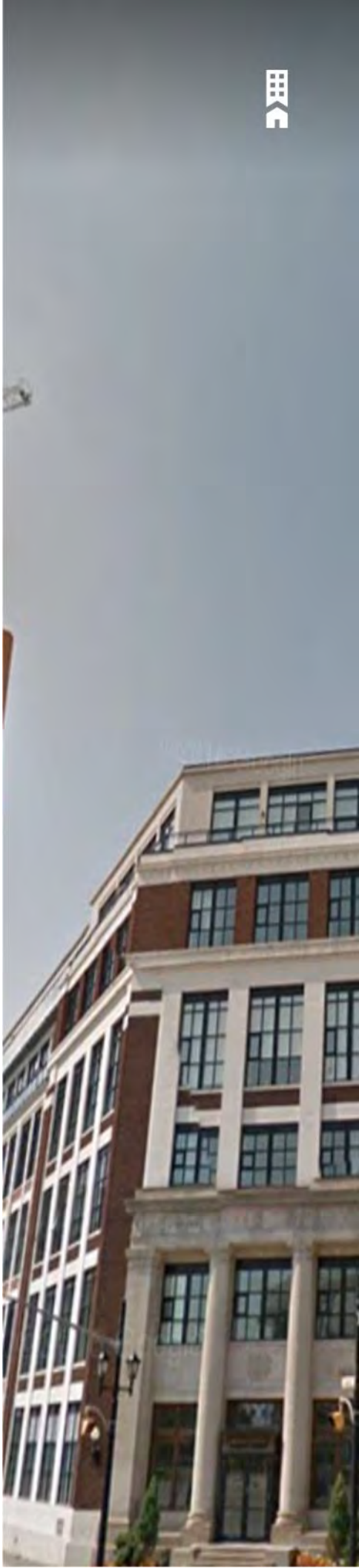


APPENDIX B

Edison ENGINEERS INC.

Specification Package

Cladding Repairs

410 King St. W., Kitchener

Board of Directors
Waterloo Standard Condominium Corporation No. 460
c/o Sanderson Management Inc.

September 15, 2020
WatSCC460.1814

SPECIFICATIONS

DRAWINGS

PART I - OBJECTIVE

The Kaufman Lofts buildings (formerly Kaufman Footwear) were constructed circa 1908-1925 and holds status as a Designated Part IV property under the Ontario Heritage Act with the City of Kitchener. The buildings were renovated and converted to condominiums in 2006.

The exterior cladding is deteriorating and requires localized repairs and preventative maintenance. There are localized areas of exposed spalled concrete and failing sealants and masonry. This project is undertaken to:

- Conserve the character-defining elements of this heritage asset's fabric and original design via appropriate conservation treatments.
- Enhance public safety by addressing potential fall hazard of spalled concrete.
- Improve building envelope's ability to manage moisture and prevent premature deterioration.
- Repair existing window systems that are allowing water penetration and frame deterioration.

The Owner intends to commence the work in 2021.

PART II - SCOPE OF WORK SUMMARY

Base Bid repairs are focused on the south and west elevations of Building B and include concrete repairs and localized re-coating near grade to address spalls and deterioration. Base bid also includes column repairs at Building A.

Optional Items are included to address various deterioration at all areas and have been separated by work location in the Bid Form. Repairs include brick repairs and repointing, localized EIFS repairs, new drip flashings at window sills and other watershedding areas, and sealant replacement and face-sealing of windows.

The Optional Items Scope of Work has been divided into four areas for access (refer to D-02):

1. Optional Access 1 – south elevations of Buildings A & B along King
2. Optional Access 2 – west elevation of Building B
3. Optional Access 3 – north elevations of Buildings A & B
   (1) Locations with EIFS
   (2) Locations without EIFS

PART III - SCOPE OF WORK

0. GENERAL REQUIREMENTS

a) Contractor shall provide all equipment, safety supervision, engineering, temporary support, etc., as required to facilitate the performance and inspection of the work described herein.

b) The Contractor is responsible for site safety. Overhead protection at building entrances and exits shall be installed as required. Construct and maintain a construction barrier with appropriate signage around the work area at all times. The minimum requirement is 6 ft high sectional metal fencing. Ensure that all air intakes are protected.

c) Full building access shall be maintained at all times. Provide overhead protection approved by a professional engineer registered with PEO.

d) Contractor to obtain required permits for closure or modified access to City sidewalk areas, including permits related to LRT Protection.

e) Refer to the requirements in section 01 02 00 for requirements related to hours of work, cleaning and other general items.

f) The Work shall include a mock-up of each concrete repair item, mortar joint repair, EIFS repair, and metal flashing installation. Brick replacement if work proceeds. The mock-ups will remain as part of the Work if approved. Allow 72 hrs for inspection of the mock-ups by the Engineering Consultant, Heritage Consultant and Owner prior to proceeding with work at other locations. The mock-up will become the accepted standard for the project.

1. CONCRETE REPAIRS

Item 1.1 - Rout and Seal Cracks: Mark all concrete wall cracks for consultant review. Where approved, rout the crack 12 mm wide and 12 mm deep. Apply bond break material (silicone sealant) inside the repair and seal flush with wall surface. Crayon is not an acceptable bond breaker. Refer to 07 92 10 and D-05.

Item 1.2 - Thin Surface Vertical Repair: Mark all scaled concrete surfaces or other thin deterioration that is not related to corrosion of reinforcing steel on all work area concrete elements for consultant review. Where approved, remove and replace concrete to a minimum depth of 12mm. Pay unit is per location. One location = 300mm x 300mm area max. Refer to sections 03 05 00, 03 20 00, and 03 30 00, and detail D-06.

Item 1.3 - **Vertical Repairs:** Mark all delaminated, spalled or cracked concrete caused by corrosion of the embedded reinforcing steel on all work area concrete elements. Shore prior to removals where required. Where repairs are approved, remove concrete, clean and coat steel, and replace concrete. Concrete shall be formed and vibrated. Unconsolidated concrete will not be accepted, and hand patching will not be permitted. Pay unit is per location. One location = 300mm x 300mm area max. Refer to sections 03 05 00, 03 20 00 and 03 30 00, and detail D-07.

Item 1.4 - **Cornice/Edge Repair:** Mark all delaminated, spalled or cracked concrete areas at cornices and at outside corners of window heads and sills. Where approved remove concrete 25mm beyond embedded reinforcing steel. Extend concrete removal to corrosion free steel. Clean and coat steel before replacing concrete. Unconsolidated concrete will not be accepted and hand patching will not be permitted. Pay unit is linear m. Refer to sections 03 05 00, 03 20 00, and 03 30 00, and details D-03-05.

Item 1.5 - **Column Repair – Local:** Mark all delaminated, spalled or cracked concrete caused by corrosion of the embedded reinforcing steel at concrete columns on Building A King St. W. entrance. Where approved remove concrete, clean and coat steel, and replace concrete. Payment for this item is based on the number of "corners" (locations) that are repaired. For example, if ½ the column is repaired payment will be 2 locations. Install shoring and unload column prior to concrete removals in accordance with shoring drawing. Unconsolidated concrete will not be accepted and hand patching will not be permitted. Refer to sections 03 05 00, 03 20 00 and 03 30 00, and detail D-08.

Item 1.6 - **Column Repair – Full:** At the west concrete column on Building A King St. W. entrance, remove concrete, clean and coat steel, and replace deteriorated concrete at the bottom 1.0m of the column. Finish to existing lines and levels. Install shoring and unload column prior to concrete removals in accordance with shoring drawing. Unconsolidated concrete will not be accepted and hand patching will not be permitted. Refer to sections 03 05 00, 03 20 00 and 03 30 00, and detail D-08.

Item 1.7 - **Dowels:** At repair patches where there is insufficient lap length available on existing reinforcing steel and where directed by the Consultant, dowel new reinforcing steel into the parent concrete. Use Hilti HIT-HY 200 system or approved alternate. Refer to section 03 20 00.

2. CONCRETE COATING

Item 2.1 - Localized Concrete Coating: This includes all surface preparation and coating application for all concrete repair areas. Surface preparation includes removal of loose areas of existing coating by means of pressure washing as per manufacturer's recommendations, and feathering patch edges by mechanical means to provide a smooth substrate profile. Supply and install new exterior concrete coating to all work area concrete elements. Colour to be matched to existing to minimize aesthetic impact. Apply new coating as per manufacturer's written instructions. Refer to section 09 97 23 and drawings.

3. CASH ALLOWANCES

Do not proceed with or carry out any work under the cash allowance items unless specific written approval is provided by the Consultant. The scope of work and price shall be agreed to by the Consultant and Owner first.

Item 3.1 - Cash Allowance for Testing: Arranging and coordinating all specified testing. Payment shall be made based on the actual cost of testing, validated by receipt, and following submission of the testing report.

Item 3.2 - Cash Allowance for Shoring Engineer: Design and review of all required shoring systems. The drawings must be submitted to the Consultant by a Profession Engineer registered in the Province of Ontario at least 2 weeks prior to starting any repair work. Drawing must clearly show the design criteria, including limits of removals and procedural sequence to be followed for shoring installation. The shoring engineers must review the shoring installation and provide written acceptance of the shoring. The contractor shall apply for payment in the amount of the engineer's invoiced amount and shall submit invoices with each progress claim.

Item 3.3 - Cash Allowance for Minor Repairs: Carry out repairs outside the scope of work as approved by the Consultant.

4. GENERAL ITEMS

Item 4.1 - Mobilization: All costs associated with mobilizing all equipment, labour and products to carry out the work. Payment for this item shall be billed in full on the first invoice.

Item 4.2 - Property Protection: All costs associated with fabricating, installing and maintaining the required property protection systems, barriers and shoring during the work. This item will be released based on the percentage of work complete.

Item 4.3 - Demobilization and Cleaning: Demobilizing all equipment and products from the site and for cleaning all debris, dirt, laitance and staining caused by the work. Include cleaning of catch basins and drains as required. Payment will be released on the final invoice following complete demobilization and satisfactory cleaning of the site.

Item 4.4 - All Other Items: All items not included above but included in the General Requirements. Payment for this item will be billed based on the percentage of work complete.

Item 4.5 - Bonding: Arranging and obtaining specified bonding. Payment for this item will be released with the first invoice following submission of the bonds.

OPTIONAL ITEMS

5. ACCESS

Item 5.1 - Optional Access 1: Provide access to the south elevations of Buildings A & B as required to complete the work and for consultant review. Means of access is to be Engineered scaffolding. Scaffolding shall extend 2m beyond the southwest building corner. The shop drawings must be submitted to the Consultant and stamped by a Professional Engineer registered in the Province of Ontario at least 2 weeks prior to starting any mobilization work. Drawings must clearly show the design criteria and procedural sequence to be followed for scaffolding installation. The scaffolding engineer must review the scaffolding installation and provide written acceptance of the scaffolding prior to commencing work. All scaffolded areas to be protected by construction mesh to control dust and debris. Payment for this item will be 50% on sign-off of installation and 50% upon removal. Refer to detail D-02 area denoted **Optional Access 1.**

Item 5.2 - Optional Access 2: Provide access to the west elevation of Building B as required to complete the work and for consultant review. Prior to commencing work, lay out a mobilization plan (including note of how many "drops" the building will be divided into to facilitate the work). Payment to be made as a percent of drops accessed (50% at mobilization, 50% at demobilization from each drop). Provide 48 hours' notice prior to demobilizing from a drop. Refer to detail D-02 area denoted **Optional Access 2.**

Item 5.3 - **Optional Access 3:** Provide access to the north elevations of Buildings A and B and the mechanical penthouse walls as required to complete the work and for consultant review. Prior to commencing work, lay out a mobilization plan (including note of how many "drops" the building will be divided into to facilitate the work). Payment to be made as a percent of drops accessed (50% at mobilization, 50% at demobilization from each drop). Provide 48 hours' notice prior to demobilizing from a drop. Refer to detail D-02 area denoted **Optional Access 3**.

6. CONCRETE COATING

Item 6.1 - **Concrete Coating:** This includes all surface preparation and coating application for all exposed concrete elements. Includes window sills. Surface preparation includes removal of loose areas of existing coating by means of pressure washing as per manufacturer's recommendations, and feathering patch edges by mechanical means to provide a smooth substrate profile. Surface preparation also includes window sill mortar joint repairs (rout and seal). Supply and install new exterior concrete coating to all work area concrete elements. Colour to be matched to existing to minimize aesthetic impact. Apply new coating as per manufacturer's written instructions. Refer to section 09 97 23 and drawings.

Item 6.2 - **Coating Primer:** Premium to provide a single coat of manufacturer recommended primer to the work area for Item 6.1. Surface preparation is included in coating items.

7. BRICK REPAIRS

Item 7.1 - **Brick Replacement:** Mark areas of brick deterioration for review by the Consultant. Where approved, carry out localized brick removal and replacement. Remove mortar by carefully raking the joints using hand tools to avoid damaging adjacent masonry that is in good condition. Replacement brick must closely match the original material in composition, size, colour and texture. Replacement mortar must closely match the original mortar in composition, colour and joint profile. Includes repointing around replaced bricks. Refer to section 04 03 31.

Item 7.2 - **Mortar Joint Replacement:** Mark out deteriorated masonry joints not adjacent to deteriorated bricks for review by the Consultant. Where approved, remove mortar or caulking by carefully raking the joints using hand tools to avoid damaging the adjacent masonry. Powered grinder cuts at centreline of mortar joints prior to hand tools is acceptable. Contractor is responsible to replace damaged masonry not marked for removal. Tool joints to match the existing profile. Refer to section 04 03 31 and D-10.

Item 7.3 - **Brick Tinting:** If matching replacement bricks are not available, tint new bricks to match the existing bricks. Refer to section 04 03 31.

Item 7.4 - **Full Repointing at Optional Access Area 1 – Building B:** In lieu of Item 7.2 – Mortar Joint Replacement at Optional Access Area 1 for Building B, remove mortar or caulking at entire work area by carefully raking the joints using hand tools to avoid damaging the adjacent masonry. Powered grinder cuts at centreline of mortar joints prior to hand tools is acceptable. Contractor is responsible to replace damaged masonry not marked for removal. Tool joints to match the existing profile. Refer to section 04 03 31 and D-10.

8. EIFS REPAIRS

Item 8.1 - **Seal Inside Corners:** At all vertical EIFS-to-EIFS joints provide new sealant. Colour to be selected from standard colour chart by Owner. Includes all surface preparation and primer. Refer to section 07 92 10 and detail D-09.

Item 8.2 - **Replace Sealants:** At all horizontal EIFS-to-EIFS joints, remove existing sealants to expose clean substrate. Complete surface preparation per manufacturer's recommendations. Contractor is responsible to replace EIFS or adjacent finishes damaged during removals. Mark areas for Consultant review where EIFS is not backwrapped. At EIFS, all sealants should be installed directly onto base coat. Supply and install new backer rod and sealants, colour to be selected from manufacturer's standard selection. Payment to be released based on percentage of work complete. Refer to sections 07 24 00, 07 92 10 and details D-09, D-11.

Item 8.3 - **Localized Repairs:** Mark locations of damaged EIFS for consultant review. Where approved, remove, dispose of, and replace localized areas of EIFS to match existing configuration as directed by the Consultant. Notify the Consultant immediately of any concealed deteriorated including delaminated insulation or lamina, non-backwrapped edges, impact damage, etc. This item does not include new finish coat. Refer to section 07 24 00 and detail D-12. Payment to be released based on actual area (m^2) replaced.

Item 8.4 - **Localized Recoating:** As directed by Consultant, provide new skim and finish coat over the existing and repaired EIFS sections to panel perimeter, including required surface preparation per manufacturer's recommendations. Refer to section 07 24 00.

Item 8.5 - **EIFS Cornice Repair:** As directed by Consultant, provide new skim and finish coat over the existing EIFS cornice face, top, and upturn to underside of existing metal roof parapet flashing, including required surface preparation per manufacturer's recommendations. Finish coat to be flexible elastomeric coating. Includes providing access from 6th floor terraces at full perimeter of Buildings A and B. Refer to sections 07 24 00 and 09 97 23 and detail D-16.

Item 8.6 - **EIFS At Grade Repair:** Mark locations of damaged EIFS at grade for consultant review. Where approved, remove, dispose of, and replace localized areas of EIFS to provide min. 200mm clearance above grade. Notify the Consultant immediately of any concealed deteriorated including delaminated insulation or lamina, non-backwrapped edges, impact damage, etc. This item includes new finish coat. Refer to section 07 24 00 and detail D-17.

9. WATERSHEDDING

Item 9.1 - **Window Sill Flashings:** Provide new prefinished sheet metal drip flashings at all window locations with precast concrete sills. Shim as needed to provide slope for positive drainage. Flashing colour to be selected from standard per substrate to minimize aesthetic impact. Refer to sections 07 62 00 and 07 92 10, and details D-09, D-13.

Item 9.2 - **5th Floor Transition Flashing:** Provide new prefinished sheet metal drip flashings at all locations referenced on drawings. Repair EIFS as noted and provide new through-wall flashings and end dams to direct water to the exterior. Flashing colour to be selected from standard to minimize aesthetic impact. Refer to sections 07 24 00, 07 62 00 and 07 92 10, and details D-09, D-14-15.

10. WINDOW REPAIRS

Item 10.1 - **Localized Frame Painting:** Mark areas of bare aluminum and faded window frame finish for Consultant review. As directed by Consultant, clean and paint window frames sections and flashings. Remove all loose paint flakes and lightly sand to provide a smooth transition to well-adhered paint. Provide clean edges. Colour to be selected by owner to closely match existing. Refer to section 09 91 13.

Item 10.2 - Localized Sealant Replacement: Mark deteriorated, split, and debonded sealants for Consultant review. As directed by Consultant, remove and replace existing sealants. Includes all surface preparation and backer rod. Refer to section 07 92 10 and detail D-09.

Item 10.3 - Full Sealant Replacement: In lieu of item 10.2 at Optional Access Area 1, remove and replace 100% of exterior sealants within the work area, including at window perimeters and brick control joints. Seal all envelope penetrations including but not limited to pipe penetrations, vents and anchors. Refer to section 07 92 10 and detail D-09.

Item 10.4 - Face Seal Windows: At Optional Access Area 1 per D-02, complete surface preparation per manufacturer's recommendations and provide new needle bead at exterior glass to metal transitions – along all sills, upturning 150mm (6") onto jambs. Includes all fixed double-glazed panels. Provide clean lines. Sealant colour to be selected from manufacturer's standard selection. Refer to section 07 92 10 and detail D-09. Payment to be released based on percentage of work complete.

End of Section 01 01 00

1. General

(1) Work under this contract covers labour and materials required for the above noted project.

(2) The building shall remain in use in areas not immediately affected by the work.

(3) Work is allowed only from 8:00 am to 5:00 pm, Monday to Friday and in accordance with municipal bylaws. No work on weekends or evenings is permitted unless forty-eight (48) hours' notice is given and approved by the Owner.

(4) All shutdown work shall be coordinated with the Owner, and minimum 48 hours' notice must be given. Some shutdown works may have to be done in the evenings.

2. Contract Documents

(1) Work shall be performed under one Contract utilizing the Canadian Construction Document CCDC 4 (2011) – Unit Price Contract, as amended by Section 00 21 80 – Supplementary Conditions prepared by Edison Engineers Inc. The Contract and the Supplementary Conditions shall govern the performance of each Section of the Specifications.

(2) These General Requirements generally specify work and co-ordination that is the responsibility of the General Contractor but are not intended to define the responsibilities between the Contractor and Sub-contractors. Ensure that Sub-contractors fully understand the Contract, the Supplementary Conditions and these General Requirements.

(3) Sections of these specifications are not for the purpose of identifying limits of work between the General Contractor and Sub-contractors or between Sub-contractors.

3. Minimum Standards

(1) Work shall be executed to meet or exceed:

a) Ontario Building Code 2012 containing the Building Code Act, 1992, and O. Reg. 332/12

b) National Building Code of Canada 2015, National Fire Code of Canada 2015 and all other codes of local or provincial application. In cases of conflict between standards, or codes, the more stringent requirement shall apply.

c) Occupational Health and Safety Act Revised Statutes of Ontario 1990, c. 0.1, and Ontario Regulation for Construction Projects, 213/91 last amendment O. Reg. 252/14.

4. Temporary Facilities

(1) Temporary power and water for construction purposes is provided on site. power, light and water. Any extension or changes in existing facilities, required by the contract, shall be at the Contractor's expense. Obtain Owner approval prior to making any connection.

(2) Provide and maintain all fences, barricades, lights, and other protective structures or devices necessary for the safety of workers, equipment, the public, and property as required by Provincial or Municipal laws and regulations, and local ordinances, laws, and other requirements of the county, Province, and other authorities having jurisdiction with regard to safety precautions, operation, and fire hazards.

(3) For suspended access work comply with regulations O. Reg 213/91 and 242/16. For scaffolding over 15m high, the Contractor shall submit design drawings stamped by a Professional Engineer licensed to practice in the jurisdiction of the Work. The drawings shall clearly indicate all the materials which will be utilized and all fastening mechanisms to be employed. Upon completing installation and prior to use the design engineer shall carry out a review of the site and submit written confirmation that the installation was completed in accordance with the drawings.

Contractor to provide Ministry of Labour a minimum of 48hrs notice prior to setting up suspended work platforms and make available on site the inspection report and daily inspection logs throughout construction. Before the Work begins, the Contractor shall submit all documents required by the Ministry of Labour, including the following:

a) equipment design drawings;

b) P.Eng report confirming structural integrity of the work platform ;

c) written procedure for rescue;

d) risk assessment; and

e) a site specific work plan, including Roof plan.

(4) Coordinate requirements with LRT Operator (Keolis) and City of Kitchener.

5. Permits, Certificates and Fees

(1) The Contractor shall apply and pay for the Municipal Building Permit and shall make a submittal to the Owner. The Contractor shall be responsible for providing and paying for all other municipal permits, ESA, HVAC, plumbing permits, etc. The Contractor shall provide authorities having jurisdiction with information requested and shall arrange for and co-operate with all authorities having jurisdiction for all requested inspections and reviews.

(2) The Contractor shall ensure that copies of all Inspection or Review Reports issued to the Contractor or Sub-trades are forwarded immediately to the Consultant.

6. Construction Schedule

(1) The Contractor shall supply the Consultant and the Owner with a construction schedule in MS2000 or gantt chart format, together with a Critical Materials Delivery Schedule within 5 days after notification of award of contract. The schedule shall indicate the various sub-trades, and shall include allowances for inclement weather and for increases in quantities of unit price items of up to 25%.

(2) The Construction Schedule shall be revised every two weeks until project completion. Notify the Consultant immediately of any changes to the schedule or to material delivery and or equipment delivery dates.

(3) The Contractor shall provide additional forces, at no additional cost to the Owner, in order to maintain the schedule. The contract will be considered breached should the Contractor not comply with a written request to provide additional crew, materials, or equipment to bring the work back on schedule.

(4) Any overtime (evening or weekend) work that might be required shall be done at no extra cost to the owner.

(5) The Construction Schedule forms an integral part of the Contract Documents, and as such, will be assigned a value of 5% of the project cost as a payment item. The Contractor will forfeit any claim to this amount if the Schedule information is not submitted as and when required.

(6) Include information relating to the dates for submission and return of shop drawings as part of the above requirements.

7. Construction Meetings

(1) All parties concerned must be informed of meetings, the time and location of such must be approved by the Owner.

(2) A Project Notification meeting must be held at the site no less than 48 hours prior to the commencement of the work to finalize all working constraints.

(3) The Contractor will attend biweekly meetings with the Owner and/or Consultant. Additional meetings will be scheduled by the Owner as required.

(4) The Consultant will record and prepare all minutes-of-meetings and distribute to the Contractor and Owner representative within 48 hours of the meeting. The Contractor is responsible for distributing the minutes to all sub-contractors within 24 hours of receiving the minutes-of-meeting. Any concern regarding the content of the minutes shall be directed in writing to the Consultant within 24 hours of receipt of the minutes failing which the contents of the minutes shall be deemed to be accurate and accepted by all recipients.

8. Examination

(1) It is assumed that the General Contractor and Sub-contractors will have examined the site and noted site conditions affecting the work. No additions to the contract amount will be allowed for work affected by visible site conditions.

(2) Prior to commencing work, verify layout dimensions and constraints in terms of the intent of the Drawings. Inform the Consultant immediately of any discrepancies.

9. Omissions, Errors and Discrepancies

(1) Report to the Consultant all discrepancies, omissions, errors, departures from building by-law or good practice, and points considered to be of dubious intent.

10. Site Records

(1) Maintain on site, one complete set of Contemplated Change Orders, Change Orders and Site Instructions.

(2) As work progresses, record deviations from the contract documents in red on a separate set of drawings. Record the location, size, and shape of repaired areas on drawings provided by the Consultant. The Contractor is responsible for requesting said drawings from the Consultant if not provided at the start of the project.

(3) Prior to issuance of Certificate of Substantial Performance, transfer all recorded deviations and/or repair locations to 2 clean sets of white prints, neatly printed to match original drawings. Annotate both sets of drawings as "AS-BUILT RECORD".

11. Maintenance and Warranty Data

(1) Prior to issuance of Certificate of Substantial Performance submit to the Consultant an electronic copy of the Maintenance Manual in pdf format. The Manual shall consist of, but not limited to, the following information:

a. Title Page and Table of Contents

b. Contractor and supplier's addresses and phone numbers

c. Material lists, colour codes and names, and technical data sheets for each material used

d. Maintenance instructions for materials

e. Shop Drawings and as-built drawings acquired during the project.

f. Other documents as indicated by the Consultant

(2) Maintenance and Warranty information form an integral part of the Contract Documents, and as such, will be assigned a value of 10% of the project cost as a payment item. The Contractor will forfeit any claim to this 10% amount if the Maintenance and Warranty information are not submitted as required.

12. Shop Drawings and Samples

(1) The Contractor shall arrange for the preparation of all shop drawings and samples by the sub-trades and suppliers immediately upon notification of award of contract.

(2) The Contractor shall check and certify as correct all shop drawings and product data sheets prior to issuing to the Consultant.

(3) Shop Drawings shall be submitted in three copies to the consultant. The shop drawing will clearly identify the Contractor, the Project, the Consultant, and the specification section pertaining to the shop drawing. Faxed and generic documents will not be acceptable.

(4) Submit 2 samples as requested in Specifications Sections, identifying the manufacturer, product, colour and specification section. Installed work shall match the reviewed sample.

13. Safety Regulations

(1) Conform with and strictly enforce compliance with the Occupational Health and Safety Act and other similar regulations in force at the place of work.

(2) Observe and enforce construction safety measures required by the NBCC 2015 Part 8, provincial government, WCB, and municipal statutes.

(3) Provide current MSDS sheets for applicable materials at the Project Notification Meeting.

(4) The Contractor is solely responsible for site safety and no action or lack of action by the Owner or Consultant shall be construed as an instruction related to safety of the workplace.

(5) No "hot work" is to be executed when the sprinkler system is inoperative.

(6) Contractor shall take all necessary precautions to ensure fire alarm systems are not accidently activated during the work.

14. Maintenance of Ongoing Operations of Affected and Adjoining Property(s)

(1) The General Contractor shall be aware and shall be responsible for making all Sub-trades and Suppliers aware of the necessity of maintaining the ongoing operation of the residents in the affected and adjoining sites. All work shall be coordinated and scheduled to prevent any disruption to those operations.

(2) The General Contractor will provide all necessary hoarding and dust barriers. The General Contractor shall co-ordinate any work within the adjoining properties or any general service disruptions with the Consultant 48 hours in advance of that Work. Permission may be withheld pending approval of those residents.

(3) Any and all works that may cause excessive noise or obstruction must be specially scheduled and noted to the Owner.

(4) Maintain full accessibility to the building, including emergency exits, during the repairs. Provide temporary measures for barrier free access.

15. Sub-Contractor Information

(1) The Contractor shall submit a complete list of sub-contractors in accordance with the Bid Form.

16. Existing Services

(1) Establish locations and protect all existing utilities and services.

(2) Cap off and remove unused utility services within the building as approved by the Consultant and the utilities involved.

17. Temporary Facilities and Services

(1) Contractor shall provide their own washroom facilities. Maintain clean and in an inconspicuous location as agreed to by the Owner.

(2) The Owner is responsible for general snow clearing of the site and grass cutting outside the areas immediately affected by the work. The Contractor shall be responsible for snow clearing and grass cutting within the work area and any additional snow or ice clearing required for safety or work reasons.

18. Site Review

(1) N/A

19. Cleaning

(1) Project area shall be kept free of accumulated waste and swept daily.

(2) Avoid structural overloading when piling waste.

(3) Maintain cleaning of all areas of the project until final completion.

(4) Prior to any inspection for Substantial Performance, provide full clean up, replace any damaged or broken materials, remove temporary protections and remove dust, stains, sealant and adhesives and any accumulations of construction materials, debris or rubbish.

20. Protection

(1) The Contractor shall protect existing work from damage and shall be responsible for complete replacement of damaged existing work to match.

(2) The Contractor shall provide and maintain all necessary fences, barricades, lights and other protective structures or devices for the safety of the public, workers, existing property and equipment as required by the Provincial or Municipal laws and regulations, local ordinances, laws and other requirements of the Region, County, Province or any other authorities having jurisdiction with regard to safety precautions, operation and fire hazards.

(3) The Contractor shall maintain all emergency and service access routes clear during the work.

(4) Access 'to and from' the building and mechanical rooms during construction must be kept closed for security & safety.

(5) The Contractor is responsible for identifying all locations which will allow any dust, fumes or odours generated by the work to travel to adjacent spaces, to the interior of affected building, or to mechanical and electrical systems. The Contractor shall report these concerns and take any necessary measures to prevent this from occurring.

(6) The Contractor shall complete a pre-construction review and submit a written list of any existing damage or systems not in working order.

(7) The Contractor shall take measures on a daily basis to mitigate the risk of water penetration to the interior of the building during building envelop repairs.

(8) The Contractor shall request permission from local authorities (Fire Marshall, etc.) to barricade balcony doors during the Work if required. If permission is granted, the Contractor shall install temporary guards at balcony or terrace doors to prevent access during the work. Make good any anchoring points or holes required to install guards.

(9) The Contractor shall keep access surfaces clean at all times.

21. Materials

(1) Material and equipment shall be delivered and stored to manufacturer's instructions with seals and product labels intact.

(2) New products and materials shall be utilized in all cases unless otherwise specified.

(3) The Contractor shall submit in writing any requests to use alternative materials or installation methods specified or stated in the bid documents at least 2 weeks prior to the intended application. The information submitted shall include the reason for the change, expected performance difference compared to those specified, all manufacturer data sheets and installation instructions, and the change in contract price, if any.

(4) The Contractor shall assume full responsibility for protection and safekeeping of products under this contract.

(5) Should unforeseen hazardous materials, such as asbestos, be detected or suspected within the work site, Contractor shall stop work immediately and report the findings to the Owner. Removal of hazardous materials will be by the Owner.

22. Independent Testing and Inspection

(1) A Cash Allowance is set out for Independent Testing and Inspection to include the following items:

i) Concrete cylinders (determination of 7-, 14-, and 28-day strength)

(2) The cost of Independent Testing & Inspection shall be paid for by the General Contractor, as authorized by the Consultant, from the Cash Allowance.

(3) The Contractor shall obtain a quote from the testing agency and submit to the Consultant for approval before retaining their services.

(4) The Independent Testing and Inspection Company shall have the authority to stop work should the quality of material or workmanship warrant. The General Contractor shall be responsible for conveying all Reports and Test Results from the Independent Testing and Inspection Company to the Consultant.

23. Project Correspondence

(1) The Contractor shall designate a Site Superintendent who will be on site full time and communicate daily with the Consultant. The Superintendent must be technically qualified and experienced for this type of project and shall be responsible for all coordination between the sub-trades on site.

24. Final Review and Project Closeout

(1) Ensure that cleaning is complete.

(2) Deficiencies are to be corrected on an on-going basis through the life of the project. Near the end of the project, the Consultant and Owner shall undertake a final inspection when the Contractor's work is deemed complete. The Contractor shall be given an itemized deficiency list at this time. These deficiencies are to be corrected within a time designated in a notice to the Contractor.

(3) The Contractor shall notify the Owner and Consultant prior to the scheduled completion of the deficiency repairs, so that a re-inspection can be scheduled. Should further inspections be found necessary due to uncorrected deficiencies, costs for these inspections by the Consultant and Owner shall be back-charged to the Contractor.

(4) Final review for completion will not take place until authorities having jurisdiction have inspected and provided certificates of approval, and all warranty information, guarantees, maintenance manuals and as-built drawings are received and reviewed.

End of Section 01 02 00

PART I - GENERAL

1.	Related Work	(1) Section 03 20 00 – Concrete Reinforcing
		(2) Section 03 30 00 – Cast-In-Place Concrete
2.	Reference Standards	(1) Guideline No. 310.1R-2008, Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion, from the International Concrete Repair Institute (ICRI).
3.	Submittals / Mock-Ups	(1) Shoring drawings stamped by a Professional Engineer registered in the Province of Ontario 2 weeks prior to beginning concrete removals. Inspection and approval letter from Engineer following installation.
		(2) The Contractor will be responsible for maintaining an accurate record of quantities for the various concrete repair categories. A copy of the quantity record shall be confirmed by the Consultant prior to and shall accompany progress invoices.
		(3) The Contractor shall submit plan drawings at the conclusion of each repair phase indicating all concrete repair locations.
4.	Job Conditions and Protection	(1) The Contractor is responsible for any damage to the building components caused by the work. Provide protection within the immediate work area and on the ground below.
		(2) Dispose of concrete debris and dust from slab and work area daily. Dispose of material in accordance with the governing waste control regulation.
5.	Quality Assurance	(1) Notify the Consultant for review of the following stages of concrete removals: a) Mark-outs of delaminated, spalled and or cracked concrete b) Mock-up of specified repairs. Coordinate review of mock-up with a) above if possible. c) Completion of bulk concrete removals prior to surface preparation
		(2) Do not proceed with bulk removals until the Consultant has approved mark-outs and mock-up.
6.	Warranty	(1) See related sections. Warranty period 2 years from date of substantial completion.

PART II - PRODUCTS

1. Hammers

(1) Chipping Hammers: maximum 7 kg – (D-shaped handle, held with one hand on handle and one on cylinder, approx. 300mm long cylinder, quick stroke) for removal of concrete at columns and walls, and beyond the level of the reinforcing steel in other areas.

(2) Jack Hammers: maximum 13 kg – Not permitted unless approved by the Consultant.

(3) Breaker Hammers: maximum 28 kg – Not permitted unless approved by the Consultant.

(4) The use of rivet busters is prohibited.

PART III - EXECUTION

1. Markouts

(1) The Contractor shall locate deteriorated and or unsound concrete on the walls by hammer-tap. The removal areas shall be marked-out for review by the Consultant prior to demolition.

(2) Do not commence removals without approval by Consultant.

(3) Soffit delaminations shall be repaired as through slab repair unless directed otherwise by the Consultant.

(4) After reviewing the mark-outs the Consultant, at their discretion, may extend removal areas to include sound concrete. This will be carried out to eliminate concrete projections into patches, to limit the quantity of small patches, or to check the condition of the steel beyond the removal.

2. Shoring

(1) Install shoring and obtain shoring engineer written approval prior to undertaking repairs.

(2) Shoring is required when more than 50% of the slab top steel on one side of a column or line between columns is marked for removals or as directed by the Consultant.

(3) Install shoring for vertical surfaces or columns as required.

(4) Shoring drawings submitted shall clearly demonstrate the limits of removals and required shoring.

(5) Maintain shoring in place until repair concrete has attained 75% of the specified 28-day strength.

3. Soffits

(1) Remove all existing protection or troughing installed to redirect leaking water on the underside of the slab within the area of work. Store or dispose of materials as directed by the Owner.

(2) The Contractor is responsible for repairing any damage to the soffits which extends beyond approved markouts unless damage can be attributed to poorly consolidated / cracked concrete or minimal concrete cover on the bottom reinforcing steel. All damaged areas shall be repaired as through slab repairs.

(3) Remove evidence of water leakage, efflorescence, corrosion, or mineral deposits from the underside of the slab using mechanical wire brush or sandblasting. Where the adjacent surfaces are painted, repaint to match with paint approved by the Consultant.

4. Vertical Surfaces

(1) Removals shall be undertaken in sections less than 900mm in any direction at one time where they cannot be shored. Where no shoring is employed leave a minimum of a 900mm wide section of full wall thickness between removal areas, uninterrupted from top to bottom of wall, until repair material has achieved 75% of specified 28-day strength.

5. Mechanical and Electrical Services

(1) Prior to commencement of concrete removals examine the concrete and note all mechanical and electrical services which may be affected by the work. Mark locations of services contained within the slab.

(2) Note location of main electrical rooms or service rooms, such as transformers and generators. Assess risk of water penetration once waterproofing and concrete are removed.

(3) Take measures to protect services from damage. Be responsible to maintain services to other parts of the building not affected by the work.

(4) Where the Owner has agreed to undertake repairs or temporary protection, communicate and coordinate with the Owner's contractor when embedded services are located during removals or will be affected by removals.

6. Bulk Removals

(1) All loose and delaminated concrete and concrete designated for removal shall be removed from areas as specified in the Contract and as approved by the Consultant. Do not remove any concrete beyond approved markouts. Once bulk removals are complete notify Consultant for review to extend patches as required.

(2) When patching is required, the perimeter of the area to be removed shall be sawn to a depth of 25 mm or to the depth of the reinforcing steel bar, whichever is less. Sawcutting shall not be employed for removal areas to be subsequently covered by the work of concrete overlays.

(3) Except when the Contract specifies a minimum depth of removal, when existing reinforcing steel is not exposed during concrete removal and sound concrete does not have to be removed in the area for other reasons, existing concrete shall not be removed more than that required to expose the surface of sound concrete.

(4) Concrete removal shall extend below the reinforcing steel within the boundaries approved by the Consultant in the following areas:

a) The entire area of spalls and delaminations.

b) The areas of concrete components where corrosion potential of the reinforcing steel is more negative than -0.35 volts, as determined by a half cell survey.

c) All areas of exposed reinforcing steel.

(5) Concrete shall be removed to a uniform depth of 25 mm or two times the maximum aggregate size of patch material behind the first layer of reinforcing steel whichever is greater. Concrete surrounding the second layer of reinforcing steel shall also be removed locally to provide a minimum clearance of 25 mm or two times the maximum aggregate size of patch material whichever is greater all around the reinforcing steel. All other concrete removal beyond the second layer of reinforcing steel shall be carried out only when directed by the Consultant.

(6) Remove concrete to provide a consistent depth and to enable application of cement slurry adjacent formwork and along the edge of patches. Depth of patches containing reinforcing steel shall be a minimum of 65 mm. Where approved by the Consultant patches may vary in thickness toward the edge of a patch while still maintaining minimum depth requirements described herein, and the slope of such transition must be a maximum of 45 degrees.

(7) Where reinforcing steel is exposed, concrete removal shall extend along the reinforcing steel to the point where it is free from heavy rust. Concrete covering the reinforcing steel at the edge of the repair area will be sounded by the Consultant for localized delaminations before removal operations are completed.

(8) Where the area of concrete removal with exposed reinforcing steel exceeds 2 m², the reinforcing steel shall be retied at every second intersection point and shall be supported to maintain the steel mat in its original location.

(9) Removals shall be carried out in a manner which minimizes damage to sound substrate, embedded reinforcing steel, electrical and mechanical services.

(10) All existing reinforcing steel shall remain in place unless otherwise directed by the Consultant in writing.

7. Concrete Substrate Preparation

(1) Preparation shall not begin until the Consultant has approved all bulk concrete removals. The Contractor is responsible for ensuring that all designated concrete has been removed.

(2) Prior to notifying Consultant for final review of concrete removal areas be responsible to check all substrate surfaces both within and around the perimeter of concrete removal areas to identify fractures, loose concrete and or unsound areas. Remove these defects and recheck the area until the entire substrate is sound.

(3) Mechanically roughen or sandblast saw-cut edges.

(4) Following sandblast cleaning, the surface will be checked by the Consultant for fractured concrete, or loose aggregate. This material shall be removed using hand tools.

(5) Remove all deteriorated concrete, dirt, oil, grease, other bond inhibiting materials from surface. Maintain in this state until new patch material is applied.

(6) Prior to placement of concrete remove all dust or dirt from surface of concrete using clean compressed air (with oil trap in line).

End of Section 03 05 00

PART I - GENERAL

1. Related Work	(1) Section 03 05 00 – Concrete Removals
	(2) Section 03 03 00 – Cast-In-Place Concrete
2. Reference Standards	(1) Welding Certification C.S.A. Standard W186-M1997
	(2) Manual of Standard practice of the Reinforcing Steel Institute of Ontario
	(3) CAN/CSA G30.18-M92(r2007) and CAN/CSA A23.1-04
	(4) ACI/ICRI Concrete Repair Manual
	(5) ACI Guideline No. 222 – Corrosion of Metals in Concrete
	(6) ICRI Guideline 310.1R-2008 Guide for Surface Preparation for the Repair of Deteriorated Concrete resulting from Reinforcing Steel Corrosion
	(7) ASTM A615/A615M Standard Specification for Deformed and Plain Billet-Steel Bar for Concrete Reinforcement
3. Submittals / Mock-Ups	(1) Documentations verifying that all new reinforcing steel has been supplied by a plant certified by the Concrete Reinforcing Steel Institute.
	(2) Documents verifying that epoxy used to touch up existing reinforcing steel is approved by the reinforcing steel supplier.
4. Job Conditions and Protection	(1) Take adequate measures to contain dust generated by the work. Protect all building components and mechanical equipment. Do not allow dust to leave work area during sandblast operations
	(2) During application and curing of epoxy the air and reinforcing steel surface temperatures shall be greater than +4°C.
	(3) Apply epoxy to dry surfaces only. Do not apply epoxy when the relative humidity is above 80% or when there is a risk of condensation (surface temperature of the steel must be greater than 3°C above the dew point).
	(4) Protect new reinforcing steel from damage and dirt by storing on racks or skids.

5. Quality Assurance

(1) Notify the Consultant for review of the following stages:

a) Final review of preparation of reinforcing steel
b) Final review of all epoxy coating.

(2) The coverage and thickness of the epoxy coating will be randomly checked non-destructively. Voids, pinholes and visibly thin areas of coating will not be accepted.

6. Warranty

(1) The workmanship and materials in this section shall be warranted to include corrosion of any new or field coated steel, or other defects as determined by the Consultant for a period of 2 years.

PART II - PRODUCTS

1. Reinforcing Steel Accessories

(1) Provide bar supports conforming to the requirements of Manual of Standard practice of the Reinforcing Steel Institute of Ontario. Supports shall be plastic, precast concrete or plastic protected steel, all of the same colour as the concrete. Use coated tie wire.

2. Field Applied Epoxy Coating

(1) Amerlock 400 High-Solids Epoxy by Amercoat Canada Inc. Apply in two coats to a dry film thickness of 0.2 to 0.4 mm (8-16 mils). The colour shall be unlike steel, concrete, or rust colours.

3. Reinforcing Steel

(1) Steel reinforcing bars or rods to be embedded in concrete shall be deformed bars of 400MPa strength. They shall be free from kinks or defects and from bends that cannot be readily and fully straightened in the field. Bars shall conform to CAN/CSA G30.18-M92(r2014) and CAN/CSA A23.1-04. Bars shall be epoxy coated. All bars shall be stored in a clean, dry place until incorporated in the work.

(2) Chairs, bolsters, bar supports, spacers shall be plastic, or epoxy coated. The use of pieces of broken stone or brick, pipe, or wooden blocks will not be permitted

(3) Where existing reinforcing steel is replaced, new factory coated reinforcing steel shall be 20% greater is length than existing. Alternatively, the existing steel can be replaced with 20% more steel as directed by the Consultant.

(4) All cut bar ends and other voids in new reinforcing steel coating shall be touched-up with epoxy supplied by the manufacture. Epoxy shall have original labels and written confirmation from the manufacturer shall be submitted to the Consultant.

PART III - EXECUTION

1. Removal and Replacement

(1) Do not remove any reinforcing steel without review and written consent by the Consultant. Prior to removing any steel prepare and submit a drawing detailing showing the size, layout and location of existing steel.

(2) When the existing reinforcing steel is to be replaced and where it extends into columns, walls, beams or other remaining structures, maintain a sufficient length of existing reinforcing steel to ensure sufficient lap lengths in accordance with CAN3-A23.3. Alternatively, only if directed by the Consultant, cut steel to allow for weld splicing of the new steel.

(3) Repair or replace reinforcing steel with heavy corrosion and or critical section loss as directed by the Consultant.

(4) Where directed by the Consultant, remove existing reinforcing steel and replace with new factory applied epoxy coated bars.

2. Reinforcing Steel Preparation

(1) Remove all existing exposed tie-wire and bar supports.

(2) Straighten all bent reinforcing bars to their original shape. Do not heat the steel. Bend bars or modify formwork to provide specified cover.

(3) Clean surface of existing reinforcing steel using mechanical methods in accordance with SSPC-SP3 (Power Tool Cleaning) or SSPC-SP7 (Brush-Off Blast Cleaning)

SSPC-SP7 - A Brush-Off Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint. Tightly adherent mill scale, rust, and paint may remain on the surface. Mill scale, rust, and coating are considered adherent if they cannot be removed by lifting with a dull putty knife. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods. For complete instructions, refer to Joint Surface Preparation Standard SSPC-SP7/NACE No. 4.

SSPC-SP3 - Power Tool Cleaning

Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1. For complete instructions, refer to Steel Structures Paint Council Surface Preparation Specification No. 3.

(4) Apply two coats of epoxy in accordance with the manufacturer's written instructions. Allow sufficient cure time before concrete placement.

3. New Steel

(1) Do not damage epoxy coating during placement of steel.

(2) Reinforcement shall be tied together sufficiently with coated tie wire to prevent displacement during concrete placement and vibration. The ties ends shall be bent toward the interior of the concrete.

4. Clear Cover

(1) For concrete placed against the earth (bottom of footings) provide 75mm clear concrete cover.

(2) Place new steel to match same concrete cover as existing steel to a minimum cover of 25mm.

5. Bar Lap Length

(1) Lap lengths with existing reinforcing bars are to be in accordance with CAN3-A23.3. See table below for common lap lengths:

Tension Lap for Grade 400MPa Epoxy Coated Bars	
Bar Size	**f'_c = 30Mpa or Greater**
10	530mm (21″)
15	780mm (31″)
20	1040mm (41″)
25	1610mm (64″)
30	1940mm (77″)
35	2250mm (89″)
-If clear cover is more than 3x the bar diameter and clear spacing between bars is less than 6x the bar diameter, divide values in table by 1.25 -Not Applicable for bundled bars -If more than 300mm of concrete is below and less than 300mm of concrete is above, and bars are horizontal, multiply values in table by 1.3	

End of Section 03 20 00

PART I - GENERAL

1. Related Work
   (1) Section 03 05 00 – Concrete Removals
   (2) Section 03 20 00 – Concrete Reinforcing
2. Reference Standards
   (1) CSA Standard A23.1-14
   (2) CSA Standard A23.2-14
   (3) CSA Standard S269.3-M92 (R2008) – Concrete Formwork
   (4) CAN/CSA S448.1 – Repair of Reinforced Concrete in Buildings and Parking Structures
   (5) SSPC – Surface Preparation Standards
3. Submittals / Mock-Ups
   (1) The Contractor shall provide evidence of satisfactory similar experience over the past 5 years and of a skilled workforce trained and competent in carrying out the repair work specified.
   (2) Submit a concrete mix design at least two weeks prior to concrete placement.
   (3) The Contractor will be responsible for maintaining an accurate record of quantities for the various concrete work completed, including the location, date, time and quantity of each pour and the ambient air temperatures during each pour.
   (4) The Contractor shall submit plan drawings at the conclusion of each repair phase indicating all concrete repair locations.
4. Job Conditions and Protection
   (1) Prior to placing concrete make any preparations necessary whenever the air temperature is expected to exceed 27˚C. Shelter formwork, reinforcing steel, and concreting equipment from direct sun and wind by erecting appropriate sun shades and by providing wind breaks.
   (2) Concrete shall be rejected when its temperature is less than 10˚C or greater than 30˚C.
   (3) Concrete shall not be placed when the area of placement is exposed during rain.

(4) Cold weather concrete placement. If concrete is being placed when there is a probability of the air temperature falling below 5˚C within 24 hours of placement, all materials and equipment needed for proper protection and curing shall be on site and ready for use prior to the start of concrete placement.

(5) During concrete placement and finishing take measures to protect all adjacent and nearby surfaces from overspill. Clean any cement or concrete slurry or spills from building surfaces immediately.

5. Quality Assurance

(1) Notify the Consultant for review of the following stages:

a) Formwork installation
b) Concrete placement

(2) Ready mix concrete shall be used unless otherwise directed or approved by the Consultant. The concrete shall be supplied by a member of the Ready-Mix Concrete Association of Ontario which has been issued a seal of Special Quality Concrete attesting that its coefficient of variation is less than 12%.

(3) Project specifications shall be reviewed in full by the contractor prior to ordering concrete materials.

(4) CONCRETE TESTING

a) Notify the Consultant when completed formwork and concrete reinforcement is ready for inspection.

b) Allow ample time for notification, inspection and corrective work, if required, before scheduling concrete placement.

c) Provide free access to all portions of the work and cooperate with the appointed testing agency and Consultant.

d) Following mobilization and prior to commencing work at each building location (Building A, Building B), extract concrete cores as required to establish the compressive strength of the existing concrete. Cores to be extracted near repair locations. Concrete repair material to be modified as required to closely match average compressive strength of existing concrete at each building. Additionally, complete chloride and carbonation testing near repair locations.

e) During the progress of the work a reasonable number of test cylinders shall be made as directed by the Consultant. Each test consists of a minimum of three cylinders. The minimum number of tests shall be as follows:

   (i) There shall be one test taken from each 15 m^3 of concrete placed or at least one test per day. Additional tests may be required at the discretion of the Consultant.

   (ii) All cylinders shall be taken at the place of pour.

   (iii) Slump and air content tests shall be taken on each load until satisfactory control of air content is established or as often as directed by the Consultant. Concrete used for air content tests shall not be used to produce test cylinders and will be disposed as waste by the contractor.

   (iv) Slump tests shall conform to CSA A23.2-5C.

   (v) Air Tests shall conform to CSA A23.2-4C or CSA A23.2.7C.

f) The test cylinders shall receive, insofar as practicable, the same protection during the first twenty-four (24) hours as that given to the work, and will be tested in accordance with CSA A23.2-3C. The test cylinders shall be placed in boxes provided by the inspection firm immediately following casting.

g) The inspection and testing of the concrete shall be done by a firm approved by the Consultant. The cost of cylinder tests shall be borne by the Owner.

h) In the case where the compressive strength of the test cylinder for any portion of the work falls below the requirements specified herein, the following shall apply:

   (i) Where the twenty-eight (28) day strength of the test cylinder is under 100% of the specified strength but over 85%, in the Consultants own discretion, the concrete shall be completely removed and replaced, or covered by a five (5) year Maintenance Bond, either of which shall be at the Contractors' expense. The limits of the location

covered by this Maintenance Bond shall be the measured area or length of concrete placed or as determined by the Consultant. The amount of the five (5) year Maintenance Bond shall be twenty-five percent (25%) of the measured area or length of the work multiplied by the unit price or lump sum price submitted in the Tender Form.

(ii) Where the twenty-eight (28) day compressive strength of the test cylinder is under 85% of the specified strength complete replacement of the work will be required, the limits of the location of which shall be the measured area tested or as determined by the Consultant. The replaced work shall be subject to the terms and conditions of this Contract.

(5) CONCRETE PLACEMENT

The concrete may be rejected prior to placement for the following reasons:

a) Concrete does not conform to specified and approved mix design

b) Concrete placement does not start within 1.5 hours from the plant batch time

c) Concrete is older than 2 hours from plant batch time

d) The concrete has undergone less than 70 or more than 100 revolutions at mixing speed.

(6) Condemned or rejected material shall be immediately removed from the work and disposed of as directed by the Consultant.

(7) All defects or imperfections due to rain, frost, trespass, improper workmanship or materials appearing before final acceptance of the work shall be repaired to the satisfaction of the Consultant by the Contractor at his own expense during construction.

(8) COLD WEATHER CONCRETING

a) Special measures over and above those generally described in this Specification shall be taken by the Contractor during concreting in cold weather. Cold weather, for the purpose of this Specification, is when the air temperature is at or below the values in the table

below, or when, in the opinion of the Consultant, the air temperature is likely to fall below these limits during the next twenty-four (24) hours. In these circumstances, concrete must be heated for placing and then protected from the adverse effects of low temperatures as determined by the Consultant.

Thickness of Element	Min. Temp.	Max. Temp
300 mm	10°C	35°C
300 - 1000mm	10°C	30°C
1000-2000mm	5°C	25°C
> 2000mm	5°C	20°C

b) During cold weather the Contractor must have equipment for heating materials, for enclosing the freshly deposited concrete, for preheating the substrate, and for maintaining temperature and humidity during the curing period, on site.

c) Cold weather protection is to remain in place to ensure curing for a minimum of 3 days at ≥ 10 ºC or for a time necessary to attain 40% of the specified strength.

d) Special attention is required at corners and edges as these areas are most vulnerable.

e) The cost of all heating and protecting shall be borne by the Contractor. Concrete damaged by freezing shall be removed from the site and replaced at the Contractors expense, with new concrete in place subject to the terms of this contract.

f) If the temperature is or was, at any time during the previous twenty-four (24) hours, at 0 °C., or if the stockpiles of fine and coarse aggregate contain frozen material or are snow covered, then the aggregates shall be heated to a temperature of not less than 20 °C and not more than 65 °C. The aggregates shall be uniformly heated in the stockpiles and/or bins by steam, either injected, live or circulated in coils or by using heat before the aggregates are placed in the mixer.

Whatever system is used, it shall be designed to give uniform heating which will avoid local overheating which may be injurious to the materials. That part of the stockpile in use shall be protected with tarpaulins, waterproof paper or plastic sheeting against the formation of ice and the accumulation of snow.

g) The temperature of the reinforcement, forms and substrate shall be above 10°C prior to placing the concrete

h) The temperature of the concrete at the time of placing shall be between 20°C and 25°C unless the Consultant directs otherwise in relation to ambient conditions, the type of work and the protective system in use. The form work, existing concrete and reinforcing steel against which concrete is to be placed shall be free from ice, snow and within the stipulated temperature range before the Consultant will authorize placing to commence. The Contractor shall preheat the area in which the concrete is to be placed when the air temperature is 0°C or below, with live steam or moist hot air; this shall also remove the snow and ice and heat existing concrete to prevent the formation of a cold joint.

i) Concrete shall not be placed on frozen sub-grade or against frozen ground. The Contractor shall protect excavations with appropriate covering prior to placing concrete. The concrete shall be placed rapidly and evenly as near to its final position as possible to reduce the risk of segregation, flow lines and cold joints.

j) Wet curing is not required.

k) Strength gain is slowed during cold weather concreting. Additional strength cylinders shall be cast and left on site under similar protection to new concrete for testing. Each test sample shall include one additional cylinder to be stored as near to the placed concrete as possible, and shall receive the same protection from the elements as the concrete that it represents. This cylinder shall be stored in the field for the full 5-day cure period prior to being transported to the testing laboratory for a 7-day compressive strength test. Specimens shall not be removed from the moulds until after the 5-day cure period, unless the Contractor wishes to test this cylinder earlier for removal of formwork.

l) Consultant's written approval is required prior to removal of any formwork during cold weather concreting.

(9) Bond Tests: The Consultant may order tensile capacity tests in accordance with CSA A23.2-6B-Determination of Bond Strength of Bonded Toppings and Overlays and of Direct Tensile Strength of Mortar and Grout. The average bond strength shall be the greater of 1.5 MPa (220 psi) or the strength of the substrate. Any patch with a bond test result less than 1.0 MPa shall be rejected. If there is any dispute the Contractor can undertake additional tests at their expense.

6. Warranty

(1) The workmanship and materials in this section shall be warranted to include debonding of the patch material along the interface with the substrate concrete, excessive shrinkage cracking of the patch material, or other defects as determined by the Consultant for a period of 2 years.

PART II - PRODUCTS

1. Cement Slurry

(1) Conform to CSA Standard A23.1-09, Section 7.6.4.2.2(a)

(2) 1:1 Cement/Sand grout, mixed to a stiff, cream-like consistency, with maximum water to cement ratio of 0.45. The consistency of the mixture shall be such that it can be applied with a stiff brush to the existing concrete in a thin, even coating that will not run or puddle.

2. Packaged Concrete

(1) For column, vertical, top of cornice, or top edge repairs:

a) King MS-S10 – King Packaged Materials Company.

b) Approved alternate.

(2) For overhead cornice, edge, or soffit repairs:

a) King MS Self Consolidating Concrete – King Packaged Materials Company

b) SikaTop 123 Plus, extend with stone as required for depths greater than 38mm.

(3) All specified packaged concrete products are to be used in full accordance with manufacturer's directions.

3. Pressure Grouting
   (1) Sikagrout 212 with equal parts Epocem810. Extend with pea gravel for patches deeper than 50mm.
   (2) Sikagrout 212 HP for patches between 25 –150mm. Thicker applications are possible with the addition of suitable aggregate.
4. Self-Consolidating Concrete
   (1) King MS-S6 Self Consolidating Concrete for shallow repairs (38mm to 50mm deep)
   (2) King MS-S10 Self Consolidating Concrete for repairs deeper than 50mm
5. Formwork
   (1) Plywood and wood formwork to be new or otherwise clean and free of any laitance materials conforming to CSA-23.1.

PART III - EXECUTION

1. Formwork
   (1) The design, fabrication, erection, and use of concrete formwork shall conform to the requirements of CSA-S269.3.
   (2) For Vertical and Column Repairs: Formwork shall be fabricated to allow for efficient removal and replacement for pre-saturation and slurry application processes prior to concreting.
   (3) All forms shall be carefully inspected to ensure that they are properly placed, sufficiently rigid and tight and that all reinforcing steel is in the correct position and secured against movement during the placing operation.
   (4) Install V-notch control joints at 6100mm maximum in all walls.
   (5) For pressure grouting: Formwork shall be tight enough to prevent leakage of grout. Provide an inlet hole at lowest point of the formwork and an outlet hole at the top of the repair.
   (6) For self-consolidating concrete: Provide inlet and outlet holes at high points in the underside repair.
   (7) All mortar and dirt shall be removed from the forms that have been previously used.
   (8) Install/Ensure formwork is constructed to match existing lines, levels, and profiles.

(9) Apply a form coating and release agent to the formwork surface before depositing any concrete against them. The amount of material should be kept to a minimum and any material that becomes adhered to reinforcing should be removed immediately. The forms shall be constructed to facilitate removal without damaging or shocking the concrete. Damaged concrete is not acceptable.

(10) Consultant to review formwork prior to concreting.

2. Concreting

(1) Saturate concrete surfaces for a minimum of 24 hours prior to placement of concrete. For vertical surfaces utilize absorbent material and soaker hoses to aid in wetting. Remove standing water and allow concrete surfaces to partially dry.

(2) For pressure grouting: fill formwork with water at least 12 hours before grouting to pre saturate the parent concrete.

(3) Apply slurry cement to the concrete surface and/or adjacent edge of concrete with a stiff bristle brush immediately prior to placement. Do not allow slurry to dry.

(4) Mix and substrate temperatures should be maintained between 5°- 30°C.

(5) Superplasticizer shall only be used when specified in the Contract or approved by the Consultant. The slump of the concrete shall be increased to 150 mm ±30 mm by the addition of the superplasticizer. The superplasticizer shall be added to the concrete on the job site and in strict conformance with the manufacturer's written instructions. The concrete shall be tested for air content before and after the addition of a superplasticizer.

(6) Ensure that all anchors seats, plates and other items to be cast into concrete are securely placed and will not interfere with concrete placement.

(7) Before placing concrete all equipment for mixing and transporting the concrete shall be cleaned of hardened concrete and foreign material. All forms shall be thoroughly cleaned and all debris, snow, ice or other foreign material removed. Chemicals will not be permitted to remove ice or hardened concrete from the forms. All forms shall be thoroughly soaked with water before placing concrete except in freezing weather.

(8) Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent the separation or loss of the ingredients. Concrete shall be poured in the forms as nearly as practicable in its final position to avoid re-handling or flowing. Vibrators shall not be used to move concrete.

(9) When concreting is started, it shall be carried on as a continuous operation until the placing of the section is completed. When shown on the drawings, concrete shall be placed in the sections indicated and according to the sequence given.

(10) When concrete is placed on an inclined surface, the placing operations shall begin at the lower end of the slope and progress upward; unless otherwise permitted by the Consultant.

(11) When concrete is placed by pumping, no grout or mortar used to lubricate pipelines shall be discharged into the forms.

(12) Pressure fill the repair area with pumpable, non-shrink cementitious grout to completely fill the void area with good bond to existing concrete.

(13) Concrete shall be thoroughly compacted by mechanical vibrators during placing operations. It shall be thoroughly worked around reinforcement, embedded fixtures and into the corners of the forms.

(14) Internal vibrators shall operate at a speed of not less than 7,000 vibrations per minute and shall be applied at the point of deposit and in the area of freshly placed concrete.

(15) Internal vibrators inserted on a plane as near vertical as possible and shall be allowed to sink of their own weight in the concrete until they penetrate to the previous layer of concrete. They shall be withdrawn immediately at the same speed at which they sank, moved approximately 0.3 meters to a new location and the process repeated.

(16) Where required, internal vibration shall be supplemented by external form vibrators or chipping hammers which shall be applied to wall forms directly opposite where the internal vibrators are operating. Chipping hammers shall be fitted with a 50mm by 50mm steel plate to bear against the walls. External vibration shall be continued for approximately the same period of time as internal vibration.

(17) Maintain accurate records of cast-in-place concrete items. Record date, location of pour, quantity, air temperature and test samples taken.

(18) Ensure reinforcement, inserts, embedded parts, formed expansion and control joints and water stops are not disturbed during concrete placement.

(19) Place concrete continuously between pre-set construction and control joints.

3. Finishing and Trowelling

(1) Ensure material has completely encapsulated any exposed rebar. Maintain a minimum 30mm covering to top level of reinforcing steel (60 mm where possible for concrete exposed to chlorides).

(2) Finish concrete to the lines and levels of adjacent concrete, with a tolerance of 3mm in 3m. Prevent cement paste from bridging joint of repair patch to existing concrete.

(3) Do not add extra water to the concrete.

(4) The concrete surfaces shall be protected from rain until the final set occurs.

(5) Take measures to protect concrete during rapid moisture loss conditions such as high temperatures, high winds and low humidity and from freezing during cold weather conditions.

(6) Begin curing immediately after material has reached initial set in accordance CSA A23.1 21.1.5. Two layers of wet burlap shall be placed on the surface of the concrete as soon as the surface will support it without deformation. Burlap shall be pre-soaked by immersion in water for a period of 24 hours prior to placing. A layer of moisture vapour barrier shall be placed immediately on the wet burlap. Ensure burlap and vapour barrier are sufficiently secured and weighted down to provide uniform coverage through the full curing period.

(7) The concrete shall be cured using the wet burlap covered with moisture vapour barrier for a minimum period of 72 hours. For Class C1 and Class C2 concretes extend curing to 7 days. For pre-packaged King LM curing time can be reduced to a total of 24 hrs.

(8) Curing for formed surfaces shall conform to the following:

a) If the formwork is left in place for 7 days or more, no additional curing will be required.

b) Where the formwork is removed in less than 7 days, the concrete shall be cured as specified for unformed surfaces for the remainder of the 7-day curing period.

(9) Curing compounds are not permitted where surface will be coated or painted.

(10) Obtain the Consultants approval prior to removing formwork. Provide strength test data. Forms and supporting shores must remain installed until members can support their own weight and superimposed construction loads without excessive stress, deflection or distortion.

(11) Remove all evidence of water penetration and paint surfaces to match existing.

(12) Cut 50% of the horizontal reinforcement at control joint locations in walls.

4. Thin Overlays – Concreting

(1) Be sure patch area is no less than 3 mm minimum depth.

(2) Dampen surface to be repaired with clean water. Substrate should be saturated surface dry (SSD) with no standing water during application.

(3) Mix concrete in accordance with manufacturer's written instructions.

(4) Scrub mortar bond coat into substrate to fill all pores and voids. Apply mortar before bond coat dries, then screed. Force product against edge of repair, working toward centre.

(5) Allow mortar to reach initial set (50-75 min after placing at 23°C), then finish with wood or sponge float for a smooth surface.

(6) Commence moist curing immediately after placing and finishing. At minimum use wet burlap and cover with polyethylene sheet. Maintain curing for 7 days. Protect freshly applied mortar from direct sunlight, wind rain and frost.

End of Section 03 30 00

PART I - GENERAL

1.	Related Work	(1) Section 07 92 10 – Joint Sealing
2.	Reference Standards	(1) Do historic masonry repairs in accordance with Canada's Historic Places, "The Standards and Guidelines for the Conservation of Historic Places in Canada".
		(2) CSA CAN 3-A370 – Connectors for Masonry
		(3) CSA CAN 3-A371 – Masonry Construction for Buildings
		(4) CSA-S304.1 – Masonry Design for Buildings
		(5) CSA A179 – Mortar and Grout for Unit Masonry
		(6) CSA A82.56M – Aggregates for Masonry Mortar
		(7) ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes
		(8) International Masonry Institute All-Weather Council - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction
3.	Submittals / Mock-Ups	(1) Submit manufacturer's printed technical data sheets and installation instruction for all proposed materials including anchors and adhesives prior to ordering materials. Alternates are not permitted without written approval.
		(2) Submit three samples of brick masonry to illustrate complete colour and pattern range, and finish texture of replacement masonry for Owners approval.
		(3) One (1) of each type of masonry reinforcement and tie proposed for use. As required for testing purposes.
		(4) Submit two 300 mm (12 in.) samples of coloured mortar.
		(5) Submit manufacturer's instructions for pre-bagged mortars.
		(6) Provide minimum three full size units for use in construction of sample wall for a mock-up.

(7) The Work shall include a mock-up of a brick replacement, crack repair and mortar joint repointing. Repeat mock-ups as required to achieve Engineering and Heritage Consultant approval. The mock-ups will remain as part of the Work. Allow 72 hrs for inspection of the mock-ups by the Consultant and Owner prior to proceeding with work at other locations. The approved mock-up shall become the standard for appearance and workmanship for the project.

4. Job Conditions and Protection

(1) Deliver mortar materials in original unbroken and undamaged packages with the maker's name and brand distinctly marked thereon, and upon delivery store in a shed until used on the Work.

(2) Store and pile sand on a plant platform and protect from dirt and rubbish. Store mortar materials and sand in such a manner as to prevent deterioration or contamination by foreign materials.

(3) Deliver and store masonry units in a manner designed to prevent damage and staining of units.

(4) Lift skids with proper and sufficiently long slings or forks with protection to prevent damage to units. Protect edges and corners.

(5) Stack units on timbers or platforms at least 75 mm above grade.

(6) Place polyethylene or other non-staining plastic film between wood and other finished surfaces of units when stored for extended periods of time.

(7) Cover stored units with non-staining, weather-proof protective enclosure.

(8) Ensure that substrate surface and mortar temperature are between 5°C and 38°C and maintained in this range for 72 hours after mortar application. Ensure that frost or frozen surfaces are thawed and dry.

(9) <u>Cold Weather Requirements</u>

a) When air temperature is below 5˚C, take following precautions in preparation and use of mortar:

i) Air temperature 0–4˚C: Heat sand or mixing water to a minimum of 20˚C and a maximum of 70˚C.

ii) Air temperature -4–0˚C: Heat sand and mixing water to a minimum of 20˚C and a maximum of 70˚C.

iii) Air temperature -7–-4˚C: Heat sand and mixing water to a minimum of 20˚C and a maximum of 70˚C. Provide heat on both sides of walls under construction. Use windbreaks when wind exceeds 25 km/h. Cover new masonry with blanket for 24hrs.

iv) Air temperature -7˚C and below: Heat sand and mixing water to a minimum or 20˚C and a maximum of 70˚C. Provide enclosures and auxiliary heat to maintain an air temperature above 0˚C. The temperature of the unit when laid shall be not less than -7˚C.

(10) Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in cold weather.

(11) <u>Hot Weather Requirements:</u>

a) Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings. When air temperature is above

i) 38˚C or

ii) 32˚C with wind velocity greater than 13 km/h, spread of mortar beds shall be limited to 1.2 m (4 ft.), and the masonry units shall be set within 1 minute of spreading the mortar.

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

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

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

(15) Comply with section 5.16.3 of CSA A371-94 for protection requirements for completed masonry not being worked on.

5. Quality Assurance

(1) Carry out work by skilled tradesmen that specialized in the specified work. Full time supervision by mason with minimum 10 years of experience in historic masonry restoration.

(2) Obtain mortar ingredients, each type of stone accessory, sealants and other materials from a single manufacturer for each product.

(3) Submit laboratory test reports that certify compliance of masonry units and mortar ingredients with specification requirements.

(4) For clay units, in addition to requirements set out in referenced CSA and ASTM standards, include data indicating IRA for units proposed for use.

6. Warranty

(1) The Contractor warrants and shall correct at no cost to the Owner defects or deficiencies in material or workmanship, as determined by the Consultant. Warranty period is 2 years.

PART II - PRODUCTS

1. Brick Masonry

(1) Burned clay brick: shall conform to CSA A82.1-M87 (R92).

(2) Brick to match existing as closely as possible in size, texture and colour. Preference will be given to reclaimed bricks.

2. Water

(1) Potable and free of contaminants.

3. Pointing Mortar

(1) Hydraulic lime based mortar.

(2) Approved products:

a) HLM 350 by King Masonry Products.

b) NHL3.5 by Daubois.

4. Setting Mortar

(1) Hydraulic lime based mortar.

(2) Approved products:

a) HLM 500 by King Masonry Products.

b) NHL5 by Daubois.

5. Masonry Tinting

(1) Approved product: Restauro-Lasur by Keim.

(2) Approved applicator: Permatint.

2. Helical Ties

(1) For existing stone or beick wythe reinforcement use helical ties:

a) DryFix by Helifix Inc.

b) Spira-Lok by Block Lok.

3. Shims

(1) Low-durometer plastic, stainless steel, lead, oak or other non-staining wood (pre-soaked in water to allow for expansion), same thickness as mortar joints.

PART II - EXECUTION

1. Examination

(1) Mark out location of masonry deterioration for Consultant's review.

(1) Allow time in the Schedule for survey and inspection work carried out by the Consultant ahead of repairs. Provide sufficient safe access to enable review of all areas designated for repairs.

2. Brick Masonry Replacement

(1) Mark out deteriorated masonry for review by the Consultant. Where approved cut out deteriorated masonry to expose sound masonry.

(2) Remove full masonry units.

(3) Take sufficient care during removals so as not to damage remaining masonry units. Be responsible to replace damaged masonry units.

(4) Remove mortar adhering to the surface of the collar joint to expose backup wythe.

(5) Support masonry on concrete, steel or other approved material. Masonry is not permitted to be supported by wood.

(6) Wet clay bricks and back up masonry having IRA exceeding 30 g/min/194 cm2 (0.066 lb./min./03 in.2): wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.

(7) Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

(8) Clean units by washing with water and natural fibre brush before laying.

(9) Apply mortar to back-up wythe to form new collar joint as replacement brick courses are built in.

(10) Ensure that header joints are completely filled.

(11) Replacement header bricks shall be fully mortared into back up wythe.

(12) Build masonry plumb, level and true to line, with vertical joints in alignment.

(13) Lay out coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

(14) Tolerances in notes to Clause 5.3 and 5.13 of CSA A371-94 apply.

(15) Do not use cracked or damaged units in exposed or loadbearing masonry wall except as permitted by CAN/CSA A82.1-M82, "Burned Clay Bricks."

(16) For final pointing, rake joint back 25mm from front surface. Finish surface to match the existing texture and pointing profile.

(17) Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.

(18) Make cuts straight, clean and free from uneven edges.

3. Mortar

(1) Mix grout to semi-fluid consistency according to manufacturer's instructions.

(2) Incorporate colour into mixes in accordance with manufacturers' instructions.

(3) Use clean mixer for coloured mortar. Completely empty the mixer drum prior to mixing each batch.

(4) Use mortar within 1-1/2 hours after mixing.

(5) Re-tempering consisting of hand tamping shall be permitted. Re-tempering with water is not permitted.

4. Mortar Joint Repointing

(1) Procedure of testing: inspect joints visually for obvious signs of deteriorated masonry. As a general rule, mortar may be satisfactory if the pointing is firm, intact and not eroded more than 12mm from the face of the masonry. At locations designated for localized repointing, use the following criteria to determine which joints to repoint:

a) Open Joints: the mortar is deeply eroded (more than 12mm from the face of the masonry), or the mortar has fallen out, or,

b) Cracked Joints: cracks, hairline width or larger, have formed in the mortar, or,

c) Separated Joints: the mortar and masonry no longer adhere, resulting in a gap or crack between the two, or the mortar is sitting loosely in the joint, or,

d) Unsound Joints: joint is found to contain voids or weak areas as revealed by hammer-sounding, by raking with an appropriate tool or other approved method to determine score resistance, surface unsoundness or delamination.

(2) Raking joints:

a) Rake unsound joints free of deteriorated and loose mortar, dirt and other undesirable material. Joints should be raked to a minimum depth of 2 to 2.5 times the vertical joint height, but at no point less than 25mm (1").

b) Clean out voids and cavities encountered during raking. Remove mortar cleanly from masonry, leaving square corners and a flat surface at back of cut.

c) Clean by compressed air, surfaces of joints without damaging texture of exposed joints.

d) Flush open joints and voids; clean with low pressure water and if not free draining blow clean with compressed air.

e) Leave no standing water.

f) Before filling joints, any masonry that is loose should be reset. Any pieces that are chipped off while removing old mortar shall be repaired at the contractor's cost.

(3) Repointing:

a) Masonry to be repointed shall be damp but not wet. Do not allow free standing water.

b) Mortar joints are to be filled in successive layers. Deeper joints shall be filled first compacting new mortar in several layers until back of joint is flat. Several layers (maximum ½" each) will be needed to fill the joint flush with the surface of the masonry. Allow each layer to reach thumbprint hardness before the next is applied.

c) Keep masonry damp while pointing is being performed.

d) Do no pointing in freezing weather unless provisions are in place to protect mortar.

(4) Tooling:

a) Do not finish joint by using trowel to smooth out mortar.

b) Finish joint with slicker narrow enough to be placed inside the joint. Pull the slicker across surface of mortar to compress it.

c) Proper timing of the tooling operation is essential. If mortar is tooled when it is too soft, the colour will be too light and hairline cracks may occur; if mortar is too hard, dark streaks may result and good closure between mortar and stone may be difficult to achieve.

(5) Do not feather edge mortar. Joints shall be finished with a slight concave joint profile unless noted otherwise.

5. Face Pinning of Façade using Helical Ties

(1) Predrill a 5 mm pilot hole through the existing mortar joint into the back-up material at an angle of 45 degrees to a minimum depth of 50 mm. Use high speed electric hammer d (3-jaw chuck type).

(2) Insert the helical tie into the dry set installation tool (obtain from manufacturer) mounted on the rotary hammer S.D.S. drill.

(3) Drive the tie through mortar joint and into the back up wall until the nose of the dry set installation tool is hard against the veneer.

(4) The dry set installation tool automatically recesses helical tie into the face of the masonry.

(5) Patch the pilot hole using repair mortar to match the existing finish.

(6) Contractor to obtain all relevant drill bits and setting tools from manufacturer and install anchors in accordance with manufacturer's specification requirements.

(7) Install anchors to cross existing crack, minimum one from each side.

6. Clean Up

(1) Clean masonry to remove all indication of chemicals.

(2) Cleaning shall be done periodically throughout the work.

(3) Area of work shall be restored to its original condition.

End of Section 04 03 31

PART I - GENERAL

1. Related Work
   (1) Section 07 62 00 – Sheet Metal Flashing and Trim
   (2) Section 07 92 00 – Joint Sealing

2. Reference Standards
   (1) ASTM C1382 Test Method for Determining Tensile Adhesion Properties of Sealants When Used in EIFS Joints.
   (2) ASTM E2359 Test Method for Field Pull Testing of an In-Place Exterior Insulation and Finish System Clad Wall Assembly
   (3) EIFS QAP Manual Document # P200-01
   (4) CAN/ULC-S701-11 "Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering" / Annex A – forms a mandatory part of the standard for EPS thermal insulation boards destined for use within EIFS.
   (5) CAN/ULC-S702-09 "Standard for Mineral Fibre Thermal Insulation for Buildings
   (6) CAN/ULC-S710.1-11, "Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam", Part 1: Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials."
   (7) CAN/ULC-S710.2 -11, "Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 2: Installation."
   (8) CAN/ULC-S716.1 -12, "Standard for EIFS – Materials and Systems"
   (9) ULC-S716.2 -12, "Standard for EIFS – Installation."
   (10) ULC-S716.3 -12, "Standard for EIFS – Design Practices Guide."

3. Quality Assurance
   (1) Manufacturer Qualifications
      a) EQI licensed and accredited for the system and materials specified to meet the performance requirements of this specification.
      b) Manufacturing under a quality assurance program overseen by the Certification Body under whose certification mark the materials are produced.

(2) Contractor Qualifications:

a) Minimum 5 years' experience on projects of similar size, scope, and complexity.

(3) Regulatory Requirements:

a) Comply with the current National Building Code of Canada and the current Ontario Building Code.

b) System is to comply with Article 3.1.5.5. Combustible Components in Exterior Walls for use in non-combustible construction.

c) System is to comply with testing requirements of Article 3.2.3.8. where spatial separations require.

d) Comply with CCMC Evaluation Report or CAN/ULC-S716 series of standards.

4. Submittals

(1) Material Safety Data Sheets for all products/materials.

(2) Submit product data sheets for system materials, including product characteristics, performance criteria and limitations.

(3) Manufacturer's installation instructions.

(4) Certification Reports: Submit certification reports showing compliance with specified performance characteristics and physical properties to CAN/ULC-S716.1 or CCMC Evaluation Report.

(5) Written warranty as described below.

5. Samples

(1) Two (2) samples of finish, texture and colour to be used on the project. The same tools and techniques proposed for the actual installation shall be used.300 x 300 mm on backing of manufacturer's choice prior to construction of mockup.

6. Mock-ups

(1) Construct mock-up of each EIFS detail included in the scope of work, including patch repair, sealant installation and other critical details.

(2) The mock-up shall be prepared with the same products, tools, equipment and techniques required for the actual application. The finish used shall be from the same batch that is being used on the project.

(3) The mock-up or an adjacent surface will be used for testing.

(4) Allow 1 week for inspection of mock-up by Consultant and Manufacturer's technical representative.

(5) Start work only after receipt of written acceptance from Consultant.

(6) Mock-up will demonstrate minimum quality of work for this project.

(7) Mock-up may be included as part of work.

7. Delivery, Storage and Handling

(1) Deliver store and handle in accordance with Section 01 02 00 and to CAN/ULC-S716.2.-12

(2) Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

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

(4) Delivery:

a) Deliver materials in manufacturer's original packaging with identification labels intact and in quantities to suit project.

b) Upon arrival, inspect materials for physical damage, freezing or overheating. Questionable materials shall not be used.

c) EIFS material labelling to included Certification Mark (e.g. ULC or Warnock Hersey) and CCMC Evaluation Report Number. Products not so labelled will not be allowed on site.

d) Include batch numbers or production date, expiration date, mixing instructions and required WHMIS information.

(5) Storage and Protection:

a) Store materials at the jobsite in a cool, dry location, out of direct sunlight, protected from weather and other sources of damage. Minimum storage temperature shall be 4°C (40°F). Maximum storage temperature shall not exceed 38°C (100°F).

b) Store thermal insulation boards in original packaging until time of use, stacked flat, fully supported, off ground, dry, and under cover.

c) Avoid damage to edges, ends, or surfaces. Do not expose to direct sunlight before use.

d) Store reinforcing mesh cartons on side (not upright) in dry area protected from sunlight.

e) Protect dry cement-based materials (bag products) from moisture and humidity. Store off the ground, protected from sunlight, rain and ground moisture.

8. Job Conditions

(1) Do not application wet materials during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are completely dry.

(2) At the time of application, the minimum air and wall surface temperatures shall be as follows:

a) Primers: 7°C (45°F)

b) Finish Coats: 10°C (50°F)

c) Base Coats, Colour Prime & Adhesives: 4°C (40°F)

d) For other products, refer to specific product data sheets.

(3) Maintain specified temperatures with adequate air ventilation and circulation for a minimum of 24 hours (48 hours for some finishes) thereafter, or until the products are completely dry. Refer to published product data sheets for more specific information.

(4) The contractor shall have access to electric power, clean water and a clean work area at the location where the materials are to be applied.

9. Warranty

(1) The Contractor warrants that the Exterior Insulation and Finish System work of this section is guaranteed against water leakage, cracking, shrinkage, loss of adhesion, or other failure as determined by the Consultant. Warranty period is five (5) years from the date of Certificate of Substantial Performance.

PART II - PRODUCTS

1. Performance and Design Criteria

(1) Ensure all EIFS, LA-WRB. WRB, base coat, finish coat materials and accessories are from a single EIFS manufacturer and meeting the requirements of this specification.

(2) Ensure higher impact resistance of system to 1.8m minimum above grade and in locations indicated.

(3) Include 20 mm minimum expansion joints as indicated on drawings and at locations as follows:

a) At a maximal distance of 10m (30ft), to counter thermal expansion;

b) At substrate expansion joints;

c) At changes in building height;

d) At the floor line.

e) At changes in substrate material that result in differential substrate deflection and/or substrate behaviour;

f) At changes in roof, shape or structural system;

g) Where EIFS abuts dissimilar material

(4) Include 13 mm minimum perimeter expansion joint between EIFS and adjacent components such as doors and windows.

(5) Include sealant joints and air barrier connections at penetrations through EIFS as follows:

a) Ensure joint widths are 4 times minimum greater than anticipated range of movement;

b) Design joints with secondary moisture protection and drain joints to exterior;

c) Design joints to prevent air movement around building between sealant and air barrier.

d) Design joints using two stage seals, closed cell backer rod, bond breaker tape, primer and accessories in accordance with Section 07 92 00.

2. Membrane Flashing

(1) High density polyethylene film backed with a rubberized asphalt adhesive. Prime surfaces to receive membrane as required by product manufacturer.

a) Dryvit Flashing Tape

b) Durex Flex-Seal Wall Flashing

c) Sto Guard Tape

(2) Or an approved equivalent.

3. Air Barrier

(1) On Sheathing:

Vapour permeable, wet mix, water-based, non-cementitious, and applied by stainless steel trowel or spray equipment. Minimum dry thickness for both coats is 1.2mm (47 mils).

a) Backstop NT by Dryvit,

b) Durex Blue Shield by Durabond

c) Polar Bear by DuROCK,

d) Sto Gold Coat by Sto Canada

e) Or an approved equivalent.

(2) On Masonry:

Vapour permeable, wet mix, water-based acrylic dispersion, cementitious to be mixed with Type 10 cement 1:1 by weight, and applied by stainless steel trowel or spray equipment. Minimum dry thickness for both coats is 1.0mm (39 mils).

a) Dryflex by Dryvit,

b) Durex Flexcrete by Durabond

c) Cement Bear by DuROCK,

d) Sto Flexyl by Sto Canada

e) Or an approved equivalent.

4. Adhesive & Base Coat

(3) Dry mix, cementitious, polymer modified field mixed with clean water, applied by stainless steel trowel or spray equipment.

a) Primus DM by Dryvit,

b) Durex Monobase NC by Durabond

c) Prep Coat D by DuROCK,

d) Sto BTS Plus by Sto Canada

e) Or an approved equivalent.

5. Insulation Board

(1) Type 1 or 2 Expanded Polystyrene (EPS), flat, thickness is based on after rasping and indicated as per drawing details, minimum 25mm.

a) Outsulation Plus by Dryvit,

b) Insulite EW17 by Durabond,

c) Insulrock by DuROCK,

d) Sto Therm ci EPS by Sto Canada

e) Or an approved equivalent.

6. EPS Mouldings

(1) Expanded Polystyrene (EPS) precut foam mouldings, pre-reinforced with fiberglass mesh.

a) Exterior Pre-coated Profiles (EPP) – By Canamould

b) Pre-Approved equivalent

(2) Approved adhesive is Genesis DM by Dryvit, Sto BTS Plus by Sto, or a pre-approved equivalent.

7. Mechanical Fasteners

(1) High density plastic washers, minimum 51mm diameter used in combination with corrosion resistant screws suitable for the substrate. Embedment and spacing as specified by an Engineer licensed in Ontario clearly labelled on the shop drawings.

a) Wind-Devil 2 by Wind-Lock Corp,

b) Approved equivalent,

c) Or as specified on the approved shop drawings.

8. Reinforcing Mesh

(1) A balanced, open weave, alkaline resistant, glass fiber fabric mesh compatible with other system materials and as recommended by the manufacturer.

(2) Standard impact resistance mesh for back-wrapping - minimum 145 grams/m^2.

a) Standard or Standard Plus by Dryvit

b) Durex 040 Mesh by Durabond

c) Starter Mesh or DuROCK 5oz by DuROCK

d) Sto Mesh or Sto Detail Mesh by Sto

e) Or an approved equivalent

(3) High impact resistance mesh for double reinforcement at grade- minimum 450 grams/m^2.

a) Panzer 15 or Panzer 20 by Dryvit,

b) Durex 330 Mesh by Durabond

c) DuROCK 15oz or DuROCK 20oz by DuROCK

d) Armor Mat, Armor Mat (80921) or Armor Mat XX (80921) by Sto

e) Or an approved equivalent

9. Finish Coat

(1) Acrylic based textured wall coating 1 to 3 mm thick minimum with graded aggregate. Apply as per manufacturer's instructions.

a) Type of finish and colour to be selected by the Owner through samples and mock-up.

10. Woodpecker Protection

(2) An acrylic polymer-modified and fibre-reinforced point impact resistant compound. 2 coat application with colour to match surrounding finish. Minimum 3.2mm dry film application per coat.

a) Graphexcoat by Adex

b) ShieldIt by Dryvit

c) Sto IMPACT by Sto Canada

d) Or an approved equivalent

11. Direct Applied Textured Acyclic Finish

(1) Direct applied acyclic primer and finish applied to substrate.

a) Textured Acyclic Finish Option 1 by Dryvit

b) Sto Finish System for Concrete, Concrete Masonry and Stucco

c) Or an approved equivalent

PART III - EXECUTION

1. Manufacturer's Instructions

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

2. Repair Patches

(2) Mark-out areas for repair for review by Consultant. Repair areas should be squared off and will extend at minimum 75mm (3 in) beyond damaged areas. Do not remove any areas without the written approval of the Consultant.

(3) Cut through and remove lamina utilizing a sharp utility knife and/ or circular saw with a carborundum blade. Expose a neat uniform-sized area of insulation.

(4) Remove the finish coat using a disk grinder or belt sander to expose the reinforced base coat for approximately 75 mm (3 in) around cut out area. Use an aluminum oxide disk or belt, 20 grit. The edges of the finish should be sharp, clean and non-tapered from the finish down to the base coat layer. Do not cut through existing mesh reinforcing.

(5) Carefully cut out the insulation board within the repair area. Inspect the air/weather barrier and sheathing. Report any damage to the Consultant immediately and allow for inspection. Repair as necessary as directed.

3. Examination

(1) Site Verification of Conditions: Verify that substrate conditions which have been previously installed under other sections or contracts meet design tolerances to CAN/ULC-S716.2 and are acceptable for product installation in accordance with manufacturer's instructions prior to installation of EIFS.

(2) Inspect surfaces to determine conditions are free of the following:

a) Algae, chalkiness, dirt, dust, efflorescence, form release agents, fungus, grease, laitance, mildew or other foreign substances

b) Surface absorption and chalkiness.

c) Surface cracks: Measure and record location.

d) Damage and deterioration.

e) Moisture content and moisture damage: Use moisture meter to determine if moisture content is dry enough to receive EIFS.

(3) Inform Consultant of unacceptable conditions immediately upon discovery.

(4) Proceed with installation only after unacceptable conditions have been remedied by responsible party and conditions have been verified by the consultant.

4. Preparation

(1) Protect adjacent surfaces from damage or overspray resulting from EIFS work.

(2) Resurface, patch or level surfaces to required tolerance and smoothness as recommended in manufacturer's written instructions and to CAN/ULC- S716.2-12.

(3) Backwrap insulation board at terminations with base coat and mesh prior to installation where required by manufacturer’s termination requirements.

a) Rasp back of insulation board to maintain minimum drainage cavity according to manufacturer.

b) Allow adequate amount of mesh to wrap around board edge and cover according to manufacturer.

c) Allow adhesive to completely dry

5. Mixing

(1) Mix materials as recommended in manufacturer’s written instructions.

(2) Use, clean, rust-free high-speed mixer to stir finish to uniform consistency. Add small amounts of clean water to aid workability.

(3) Ensure drill rotational speed is 50 rpm maximum.

(4) Use of antifreeze agents, accelerators, rapid binders or other additives is not permitted.

(5) Mix only as much material as can readily be used.

6. Moisture Air Barrier and Membrane Flashings

(1) Trowel apply the air barrier membrane smooth to a uniform thickness on the entire prepared substrate area. Fill mortar joints completely or ensure air barrier is applied to all mortar and masonry unit surfaces.

(2) Prior to proceeding, check the wall to ensure that the air barrier is continuous and spot any visible voids with additional material.

(3) A second continuous, uniform coat shall be applied to the substrate and allowed to dry.

(4) Terminate air barrier at window jambs beyond the window frame and at other penetrations terminate membrane as shown on the drawings.

(5) Install membrane flashings over the upper edge of metal flashings as shown on the drawings. Moisture barrier and transition membrane shall be positively lapped for drainage.

7. Insulation Board

(1) The edge of all insulation board terminations (windows, HVAC penetrations, etc.) shall be wrapped with mesh and base coat. Install a minimum of 100 mm of detail mesh on the substrate and wrapped around the insulation board to provide a minimum of 50 mm of mesh on the outer surface of the insulation board.

(2) Install adhesive to the insulation board in the notched trowel method or as recommended by the manufacturer. Apply the adhesive so that the ribbons run vertically when the insulation is installed.

(3) Install the board with the notches in the vertical direction immediately following adhesive application. Apply firm pressure over the entire surface of the insulation board to ensure uniform contact and high initial grab. The new insulation board must be flush with the surrounding insulation board. No adhesive is to be used between board joints at any location.

(4) Apply the insulation board in a running bond pattern with offset vertical joints.

(5) Using a margin trowel, clean the insulation board edges of any adhesive mixture. Ensure that the insulation board joints are butted tightly and faces are level and flush. If for any reason the insulation board joints are not butted tightly, slivers of insulation board must be installed to fill any gaps. ALL GAPS GREATER THAN 1.6 mm (1/16 in) MUST BE SLIVERED OR FILLED WITH EXPANDING FOAM.

(6) With factory edges exposed, stagger vertical joints at inside and outside corners. Make sure the corners are straight and plumb.

(7) Cut insulation board in L-shaped pattern to fit around openings.

(8) At openings, align the insulation boards so that the edges (vertical and horizontal joints) do not coincide with the corners of the opening.

(9) Once the insulation board and Detail Mesh are in place, wait a minimum of 24 hours prior to working on the surface of the insulation board to prevent any movement which may weaken the bond of the adhesive mixture to the substrate.

(10) Rasp Insulation board to produce smooth even surface.

a) Ensure no planar difference at insulation board joints when rasping is completed,

b) Ensure surface variance is [3] mm in 1220 mm maximum in each direction across flat wall areas.

c) Thermal insulation board thickness after rasping shall be no less than 20 mm at any location.

(11) Check flatness with a 2.4m straight edge. Sand down high areas to produce a level and plumb surface.

(12) Install reveals. Embed detail mesh at reveals and edges of insulation to complete back-wrapping.

(13) Corners of all openings such as windows, doors, mechanical equipment and all penetrations shall be reinforced with Detail Mesh placed diagonally to the opening as shown in the drawings.

(14) Mechanical Fastening: Mechanically fasten insulation board panels to substrate system.

a) Ensure mechanical fasteners are sealed against moisture penetration.

b) Use mechanical fasteners only after receipt of written approval from [Consultant].

c) Pre-spot over mechanical fasteners with base coat and allow to dry completely before continuation of EIFS application.

8. EPS Mouldings

(1) Using a mitre saw, cut the prefabricated EPS mouldings to appropriate dimensions.

(2) Rasp newly cut exposed edges and sand adjoining pieces with 16 grit sanding paper to ensure a tight-fitting joint detail.

(3) Using a hot knife, create a groove in the EPS insulation at the cut end of the moulding along the underside of the pre-applied basecoat.

(4) Apply approved cement adhesive to the newly created groove using a stainless-steel trowel.

(5) Apply the approved cement adhesive to the rest of the cut end of the EPS mouldings to a uniform thickness of ≈1.6 mm (1/16 in). Take care to keep the base coat mixture off the surrounding original finish edge.

(6) Install the moulding with approved adhesive to the cured base coat on the previously installed EIFS. Apply firm pressure over the entire surface of the moulding to ensure uniform contact and high initial grab.

(7) Align adjoining moulding pieces and press together firmly to ensure proper adhesion. Remove excess adhesive from the joint and using a trowel, tool to a smooth finish.

(8) After the adhesive is dry. Sand the joint to a seamless finish.

(9) Once the EPS mouldings are in place, wait a minimum of 24 hours prior before working on the surface of the insulation board to prevent any movement which may weaken the bond.

9. Reinforcing Mesh and Base Coat

(1) Precisely mask the surrounding area with masking tape. Cut the reinforcing mesh so that it will cover the patch area, lapping onto the original reinforced base coat a minimum of 64 mm (2½ in).

(2) Using a stainless steel trowel, apply the base coat mixture to a uniform thickness of ≈1.6 mm (1/16 in) on the entire surface of the insulation board to an area slightly larger than the width and length of a piece of reinforcing mesh. Take care to keep the base coat mixture off the surrounding original finish edge.

(3) Allow the base coat mixture to take up until firm to the touch. Trowel a second tight coat of the base coat mixture over the first coat to fully cover the reinforcing mesh. The result should be such that the reinforcing mesh is approximately centred within the base coat thickness. Do not allow the first pass to dry completely prior to the second pass application or an excessive amount of base coat mixture will be necessary to fully coat the wall surface. Total dry rendering thickness shall be no less than 2.0 mm (1/12 in).

(4) When completed, the base coat should be recessed approximately 1.5 mm (1/16 in) from the existing finish coat. This will insure that when the finish is applied, the new finish will be level or on the same plane as the existing finish coat. Wait a minimum of 24 hours to allow the base coat to cure.

(5) High impact meshes shall be installed as specified at ground level, high traffic areas and other areas exposed to or susceptible to impact damage.

(6) Install high impact and pre-formed corner reinforcing mesh at locations indicated on project plans. Tightly butt high impact mesh with gaps no greater than 3 mm at seams. Do not overlap high impact mesh joints.

(7) Areas of high impact mesh are to be allowed to set, or fully dry in accordance with manufacturer's published instructions.

(8) Install standard mesh over high impact mesh and balance of exposed insulation.

(9) Standard mesh is to be overlapped at mesh joint locations minimum of 67mm or greater as required by the manufacturer's published instructions. Inside and outside corners are to have no vertical joints in the mesh within 200mm of either side of the corner and no less than two layer of mesh applied from opposing sides of the corner.

(10) Trowel smooth to ensure mesh colour is not visible while maintaining full encapsulation of the mesh in base coat.

(11) Reinforce first 1.8 m minimum above grade using 1 layer of standard reinforcing mesh and 1 layer of heavy duty reinforcing mesh.

(12) Reinforce corner of openings "butterfly" of detail reinforcing mesh 200 mm minimum, in accordance with manufacturer's written instructions.

(13) Trowel mesh from center to outside edges.

a) Feather out base coat on each side of mesh overlaps.

b) Avoid wrinkles in mesh.

(14) Ensure mesh is fully embedded and mesh color is not visible when base coat application is completed.

(15) Ensure base coat completely covers and seals mechanical fasteners where used.

(16) Apply base coat to weather exposed slope when trim, reveals, aesthetic bands, cornice profiles, sills or other architectural features projecting vertical wall plane.

(17) Allow base coat to dry 24 hours minimum prior to applying primer.

10. Woodpecker Protection

(1) Install woodpecker protection as per manufacturer's instructions. Allow final coat to cure 24 hours prior to rendering finish coat.

11. Sealant Joints

(1) Apply primer to the base coat surface that is to be in contact with sealants and extending to the joint edge.

(2) Allow the primer to dry a minimum of 48 hours prior to applying the sealant. Cool damp weather may require longer drying times.

(3) Refer to Joint Sealing section for the proper application of the sealant.

12. Skim Coat

(1) Review existing finish coat and ensure surfaces are free of dirt, algae, oils, and mildew.

(2) Where dirt and oils are present, remove with warm water and cleaner such as Trisodium phosphate detergent. Do NOT use the following:

a) solvent based cleaners such as acetone, gasoline, ketones, mineral oils, or turpentine,

b) steam or other high temperature cleaning methods,

c) wire brushes or excessive scrubbing such that it damages the existing finish coat, or

d) high pressure washing in excess of 500 psi or sandblasting.

(3) Allow surfaces to fully dry.

(4) Apply one tight coat of 100% acrylic finish coat or non-cementitious base coat 1.6mm to 3.2mm over existing finish and new repair areas. Allow to fully dry.

13. Sealant Repairs

(1) Cut sealant as close as possible to the EIFS surface without causing damage. Grasp the sealant and backer rod in one hand and with constant tension, slice the sealant away from the EIFS. Remove sealant as close as possible without damage. Contractor will be responsible to repair any damage.

(2) Remove any remaining sealant (wire brushing or grinding may be necessary) and inspect EIFS surface.

(3) Surfaces should be clean and sound with reinforcing mesh embedded in the base coat. Remove any existing textured finish from areas to receive sealant.

(4) Improperly embedded reinforcing mesh shall be skimmed with base coat to achieve proper coverage. Broken or damaged mesh can be repaired by addition of new mesh, properly embedded in base coat and lapped a minimum 64 mm (2½") over the existing adjacent base coat.

(5) Install closed cell backer rod, EIFS compatible primer, and sealant in accordance with Joint Sealing specification section.

14. Finish Coat

(1) Prior to applying the finish, the base coat shall have cured a minimum of 24 hours and shall be dry and hard. Cure time may be longer depending on environmental conditions.

(2) Inspect the base coat for any irregularities such as trowel marks, board lines, rough corners and edges, improper reinforcing mesh embedment as well as efflorescence.

(3) Prime reinforced, base coat covered boards prior to application of finish coat. Allow primer to completely dry prior to applying finish coat.

(4) Do not apply in direct sun. Shade work areas if required.

(5) Using a clean steel trowel, apply finish coat in a uniform thickness on the dry base coat. The texture is achieved by uniform hand motion and/or tool that produces the texture to match the approved sample. Each mechanic must use the same tool and hand motion to ensure that the texture achieved is uniform over the entire wall area.

(6) Small amount of mixing water may be added with finish coat materials to aid workability.

(7) Install finish coat continuously to a natural break. Maintain the leading edge wet at all times.

(8) Apply finish coat directly over primed base coat.

(9) Apply finish coat at thickness equal to size of largest texturing aggregate.

(10) Shade work to prevent application in direct sunlight and rapid setting of finish.

(11) Use tarpaulins to protect finish from scaffold shadow texture lines.

(12) Supply equipment, materials and work crew of sufficient size to ensure a continuous application within boundaries of wall area between natural break without cold joints.

(13) Ensure separate batches of finish coat are not installed side by side.

(14) Ensure finish coat is not installed into joints to receive sealants.

(15) Install the new finish over the patch area and texture to match the surrounding finish. If necessary, precisely mask the surrounding existing finish with masking tape.

(16) Allow the finish to dry for a short period of time depending on weather conditions prior to removing the masking tape.

(17) Feather the edges of the patch to blend inconspicuously with the surrounding texture.

(18) Do joint sealing in accordance with Section 07 92 00 – Joint Sealants.

15. Cleaning

(1) All excess system materials shall be removed from the job site in accordance with contract provisions and as required by applicable law.

(2) All surrounding areas shall be left free of debris and foreign substances.

(3) Leave work area clean and tidy at end of each work day.

(4) Final Cleaning: Upon completion, remove surplus and excess materials, rubbish, tools and equipment.

(5) Remove recycling containers and bins from site and dispose of materials at appropriate facility.

End of Section 07 24 00

PART I - GENERAL

1. Related Work
   (1) Section 04 03 31 – Historic Masonry Repairs
   (2) Section 07 24 00 – Exterior Insulation and Finish Systems
   (3) Section 07 92 10 – Joint Sealing
2. Reference Standards
   (1) ASTM A653/A653M-09 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   (2) ASTM A792/A792M-09 Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
   (3) Aluminum Association Aluminum Sheet Metal Work in Building Construction - 1980.
   (4) ASTM B221-14 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
   (5) ASTM B209-14 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
   (6) Canadian Roofing Contractors Association (CRCA).
   (7) CAN/CGSB 93.5 – 92 "Prefinished Aluminium Siding, Soffits, and Fascia for Residential Use"
3. Submittals / Mock-Ups
   (1) Build mock-ups for each type of flashing and counter flashing, complete with all fasteners as per drawings and specifications and obtain Consultant's approval prior to fabrication of any further metal flashings.
   (2) Samples 300mm square, of fabricated products as finished work.
4. Job Conditions and Protection
   (1) Deliver sheet-metal flashing materials to site and store in safe, protected storage area to prevent damage. Stack flashings to prevent twisting or bending out of shape.
   (2) Prevent contact of flashing materials with corrosive substances.
   (3) Handle and store metal flashings so that marring and scratching of the coatings do not occur. Damaged materials shall be replaced with new materials.
5. Quality Assurance
   (1) Notify Consultant for review of installation of sheet metal and caulking.

6. Warranty

(1) The Contractor warrants that the flashing assembly will be free of the following defects: splitting seams, lifting, loosening and undue expansion. Warranty period is two years from date of substantial performance.

PART II - PRODUCTS

1. Materials

(1) Extruded Aluminum: to ASTM B221-14, not less than 1.0mm (19ga.) core nominal thickness, alloy 6060 or 6063. Finish to match AAMA 2604. Colour to be selected by owner from manufacturer's standard range.

(2) Aluminum Sheet: to ASTM B209-14, minimum 24 gauge core nominal thickness, alloy 6061. Commercial grade, mill finish, shop pre-coated on both sides. Finish to be selected by owner from manufacturer's standard range.

2. Cleats and Fasteners

(1) Cleats and fasteners shall be of the same material as the metal they are designed to secure. Size shall be to suit components to be secured. Gauge shall be sufficient to retain the flashings in place, minimum 22 gauge. Match head finish to fastened material.

(2) Nails: Stainless steel, spiral thread, of sufficient length to provide a minimum 25 mm (1 in.) penetration into substrate.

(3) Nail Anchors: Expansion anchors shall be a pre-assembled nail drive anchor with a mushroom style head and a body formed from nylon. The carbon steel nail shall be plated according to ASTM Specification B633, SC1, Type II. Dimension to provide a minimum 25 mm (1 in.) penetration into substrate and in accordance with manufacturer's recommendations.

a) Powers Fasteners - Nylon Nailin
b) Hilti Canada - HPS-1 Impact Anchor

3. Accessories

(1) Plastic Cement: Plastic cement for caulking and bedding flashings shall conform to CAN/CGSB 37.5-M89.

(2) Bituminous Paint Bituminous paint shall conform to CGSB 1-GP-108, type II.

(3) Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, non-drying, nonmigrating sealant.

PART III - EXECUTION

1. Workmanship

(1) Metal flashing shall be as detailed, supplemented by recommendations of Canadian Roofing Contractors' Association Specifications.

(2) All free edges of metal flashing shall be strengthened by a fold at least 13 mm (0.5 in.) wide, set out slightly and presenting a straight line and a neat finish.

(3) Form flashings in 2400 mm (8 ft.) lengths whenever possible. Make allowance for expansion at joints.

(4) Install reglets to receive counter flashing

(5) End joints where adjacent lengths of metal flashing meet shall be made using an "S-lock" joint. This shall be executed by inserting the end of one coping length in a 25 mm (1 in.) deep S-lock formed in the end of the adjacent length in a full bed of caulking compound. Concealed portion of the S-lock shall extend 25 mm (1 in.) outward and be nailed to the substrate. Face nailing of the joints will not be permitted.

(6) The metal shall be formed on a bending brake. Shaping, trimming and hand seaming shall be done on the bench as far as is practicable with the proper sheet-metal working tools. The angle of the bends and the folds for interlocking the metal shall be made with full regard to expansion and contraction to avoid buckling or fullness in the metal after it is in service and to avoid damaging the surface of the metal.

(7) Install continuous starter strips where indicated or required to present a true, non-waving, leading edge. Anchor to back-up to provide rigid, secure installation.

(8) Apply isolation coating to metal surfaces to be embedded in or to be in contact with concrete or mortar.

(9) Mitre and seal corners with sealant.

2. Counter Flashing

(1) Install counter flashings as soon as possible after membrane flashings are in place.

(2) Counter flashings shall have a folded, bottom-edge, stiffening break where indicated, and shall extend up vertical face of wall or curb to height shown, then be turned into reglets or interlocked with cap flashings.

(3) Wedge flashings into reglets and caulk neatly using specified sealant.

3. Cap Flashing

(1) Tops of walls, parapets, counter flashings and the like shall be cap flashed as detailed, after membrane and metal counter flashings are in place.

(2) Parapet flashing shall fit tight to parapet and provide full support without significant deformation under typical access loads (bosun chairs, swing stages, etc.).

End of Section 07 62 00

PART I - GENERAL

1. Related Work
   (1) Section 07 24 00 - Exterior Insulation and Finish Systems
   (2) Section 07 62 00 – Sheet Metal Flashing and Trim
2. Reference Standards
   (1) CAN2-19.24-M90 – Multi-component, Chemical-Curing Sealing Compound
   (2) CGSB-19.13-M87 Sealing Compound, One Component, Elastomeric, Chemical Curing
   (3) ASTM C-920 – Standard Specification for Elastomeric Joint Sealants.
3. Submittals / Mock-Ups
   (1) Submit manufacturer's printed technical data sheets and application instructions for all proposed materials, including cleaners and primers.
   (2) Submit a letter from the manufacturer confirming:
      a) They have reviewed the site conditions
      b) The proposed sealants are acceptable for the application
      c) The installation methods, including cleaning and priming methods and environmental conditions are acceptable.
   (3) The Contractor shall provide a mock-up of each type of joint for review and approval by the Consultant and manufacturer at minimum of 7 days prior to beginning bulk sealant installation. The mock-up shall also determine the colour of sealant to be used.
      a) The mock-up shall be carried out by the same installers who will complete the general installation.
      b) Allow the sealants to cure according to the manufacturer's recommendation. Carry out adhesion testing as required by the manufacturer or Consultant to verify the surface preparation procedures.
      c) Provide written confirmation of the required surface preparation and installation methods from the manufacturer prior to general installation.

4. Job Conditions and Protection

(1) Do not apply sealants when substrate temperatures are less than 5°C without first obtaining manufacturer's written approval and instructions.

(2) Apply sealants only to completely dry surfaces.

(3) Deliver and store materials in original wrappings and containers with manufacturer's seals and labels intact. Protect from freezing, moisture and water.

(4) Comply with requirements of Workplace and Safety Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Human Resources Development Canada.

(5) Conform to manufacturer's recommended temperatures, relative humidity and substrate moisture content for application and curing of sealants including special conditions governing use.

5. Quality Assurance

(1) Notify Consultant for review of surface preparation and caulking installation.

(2) Provide access to a maximum of 20% of work area following full cure of sealant, typically 10-30 days, to allow for bond testing. Consultant shall select locations which will require access. Access shall include re-rigging drops.

6. Warranty

(1) The Contractor warrants that the caulking work of this section is guaranteed against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion, or other failure, staining adjacent surfaces. Warranty period is two years from the date of Certificate of Substantial Performance.

PART II - PRODUCTS

1. Materials

Sealants shall conform to CGSB specifications as listed below; colour to Consultant's selection.

(1) Exterior Sealants: Multi-component, epoxidized polyurethane terpolymer sealant. To meet specified requirements of CGSB Specification CAN2.19-24-M90. Use at all locations, except where another type is specified. Approved products include:

a) Sikaflex 2C by Sika Construction

b) Tremco Dymeric

c) Vulkem 227

d) THC 900/901 by Tremco

(2) Exterior Sealants: One part elastomeric sealants: to meet specified requirements of NSC/CGSB Specification CAN2-19.13 M87.

a) Classification MCG-2-25-A-L medium modulus silicone, to be used in glass-to-glass, glass-to-metal, and metal-to-metal joints. Approved products include:

i) DOWSIL 795 Silicone Sealant

ii) Tremco Spectrem 2

iii) Approved alternate

b) Classification MCG-2-25-A-L low modulus silicone, to be used in EIFS-to-EIFS, EIFS-to-metal, and EIFS-to-concrete or masonry joints. Metal-to-concrete, Metal-to-masonry. Approved products include:

i) Tremco Spectrem 1

ii) Tremco Spectrem 3

iii) DOWSIL 790

iv) DOWSIL 756 SMS

v) Approved alternate

(3) Glazing Sealants:

a) For filling in recesses in glazing tapes, toe beads, and heal beads. One component, neutral cure, low modulus silicone conforming to CAN/CGSB-19.13-M87. Approved products include:

i) Spectrum 2 by Tremco Ltd.

ii) 795 by DOWSIL

b) Classification MCG-2-25-A-L medium modulus silicone, to be used in as an optional bond breaker at crack repairs.

Approved products include:

i) Tremco Spectrem 2 (Optional Bond Breaker)

ii) DOWSIL 795

iii) Or approved alternate

2. Backer Rod

(1) Polyolefin, polyethylene, urethane, neoprene or vinyl foam

a) Extruded closed cell foam backer rod.

b) Size: oversize 30–50%.

c) Chemically compatible with primers and sealants.

d) Round solid rod, Shore A hardness 70.

e) Acceptable materials

i) SOF-Type Rod by Industrial Thermo Polymers

ii) Approved alternate

3. Bond breaker tape

(1) Polyethylene bond breaker tape which will not bond to sealant.

(2) Acceptable materials

a) #226 or #481 Tape by 3M Canada Inc
b) #40 Clear Bond Breaker Tape by Valley Industrial Products

(3) Thin layer of silicone sealants partially cured for urethane sealants as approved by Consultant.

(4) Low expansion spray foam insulation where approved by the Consultant.

4. Joint Cleaner for Non-Porous Surfaces

(1) Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

a) Methylethylketone (MEK) for urethane and silicone sealants
b) Isopropyl Alcohol for urethane sealants
c) Wire brush for concrete surfaces

(2) Cloths shall be clean, white, and solvent resistant. Coloured cloths are not permitted.

5. Primer
   (1) As recommended by manufacturer.
   (2) For EIFS joints: Porous Surface Primer by Tremco

PART III - EXECUTION

1. Extent of Work
   (1) Install sealants in all locations shown on drawings.
   (2) Install sealant at the perimeter of all exterior openings where doors, windows, grilles and other items abut or penetrate the exterior wall materials.
   (3) At all door saddles spread a bead of sealant compound over entire seat of saddles at least 3 mm (0.12 in.) thick before installing saddle.
   (4) Seal the junctions of differing exterior wall materials.
   (5) Provide a minimum of two continuous beads of sealant under all pre-finished galvanized steel wall flashings.
   (6) At window sill flashings install sealant at butt joints, expansion joint covers, and corner plates.
   (7) Ensure that drain holes for wall systems and windows remain clear and free draining after sealant installation.

2. Preparation of Joint Surfaces
   (1) Remove all existing sealant to expose a sound substrate, without damaging adjacent finishes. Ensure that new and old sealants are compatible.
   (2) For glass to metal sealant installation remove existing exuded butyl sealants from entire glass surface and metal frame.
   (3) Examine joint sizes and conditions to establish correct depth-to-width relationship for installation of back-up materials and sealants.
   (4) Clean bonding joint surfaces of harmful matter substances including dust, rust, oil, grease and other matter that may impair work, particularly where they have been sawcut or repaired.

(5) For non-porous surfaces utilize the two-rag method for cleaning surfaces to receive sealant. Wipe with cloth saturated with solvent; follow immediately with another dry cloth to wipe surface dry. Clean only as much work as can be sealed in one hour. Cleaned surfaces that are exposed to rain or contaminants must be re-cleaned. Prevent application of solvents on adjacent porous surfaces with urethane sealant residue. Solvents can lead to emulsification of urethane sealants which will act as a bond breaker.

(6) Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent or other coatings, unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

(7) Ensure joint surfaces are dry and frost-free.

(8) Prepare surfaces in accordance with manufacturer's directions.

3. Priming

(1) Where necessary to prevent staining, mask adjacent surfaces prior to priming and sealing.

(2) Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to sealing.

4. Backup Material

(1) Apply bond breaker tape where required to manufacturer's instructions and to meet Joint Profile requirements below.

(2) Where a fillet bead joint width is less than 9mm fill cavity with spray foam insulation and install bond breaker tape. At tensile bead profiles which cannot accommodate installation of backer rod install tape on bottom of joint across the entire width.

(3) Install joint filler to achieve correct joint depth and shape. Use blunt installation tool designed to set material at specified depth.

(4) To prevent bubbling of sealant from closed cell backer rod off-gassing, allow a minimum of 20 minutes to elapse following installation prior to applying sealants. Be responsible to repair any sealant with bubbling.

(5) Install bond break at joints between window sills and walls to provide specified sealant profile.

(6) Use spray foam insulation where backer rod or bond breaker tape cannot be applied. Ensure that the insulation is applied and cured according to manufacturer specifications, cure a minimum of 24 hours. Once cured, cut the insulation and apply the sealant immediately.

5. Mixing

(1) Mix materials in strict accordance with sealant manufacturer's instructions.

6. Joint Profile

(1) Sealant depth shall be ½ the joint width where possible.

(2) Joint widths shall be a min. 9mm (3/8″).

(3) Minimum sealant thickness shall be min. 6mm (1/4″).

(4) Substrate adhesion shall be a min. 9mm (3/8″) or equal to maximum depth of sealant.

(5) Fillet bead sealant joint width shall be min. 15mm (5/8″).

(6) All joints shall have an unbonded surface of min. 12mm (1/2″).

7. Application

(1) Apply sealant in accordance with manufacturer's instructions.

a) Apply sealant in continuous beads.

b) Apply sealant using gun with proper size nozzle.

c) Use sufficient pressure to fill voids and joints solidly.

d) Form surface of sealant with full bead, smooth, and free from ridges, wrinkles, sags, air pockets, embedded impurities.

e) Tool exposed surfaces to give slightly concave shape.

f) Remove excess compound promptly as work progresses and on completion.

(2) Cap beads at metal to metal joints shall be 6mm (1/4″) thick above the joint and shall have 6mm (1/4″) of adhesion to the metal surfaces on either side of the joint.

(3) Cap beads above glass to metal joints shall be 3mm (1/8″) thick above the metal and shall have 3mm (1/8″) adhesion to the glass surface and 5mm (3/16″) adhesion on the metal surface.

(4) Curing

a) Cure sealants in accordance with sealant manufacturer's instructions.

b) Do not cover up sealants until proper curing has taken place.

8. Clean-up

(1) Clean adjacent surfaces immediately and leave work neat and clean.

(2) Remove excess and droppings, using recommended cleaners as work progresses.

(3) Remove masking tape after initial set of sealant.

End of Section 07 92 10

PART I - GENERAL

1. Related Work
   (1) None.

2. Reference Standards
   (1) SSPC-SP 1 - Solvent Cleaning.
   (2) SSPC-SP 2 - Hand Tool Cleaning.
   (3) SSPC-SP 3 - Power Tool Cleaning.
   (4) SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete
   (5) ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test.

3. Submittals / Mock-Ups
   (1) Product Data: Manufacturer's data sheets on each paint and coating product should include:
      a) Product characteristics
      b) Surface preparation instructions and recommendations
      c) Primer requirements and finish specification
      d) Storage and handling requirements and recommendations
      e) Application methods
      f) Cautions
   (2) Submit a complete set of colour chips that represent the full range of manufacturer's colour samples available.
   (3) For each finish product specified, submit samples that represent actual product, colour, and sheen.
   (4) Apply a 300mm mock-up for up to three paint colours selected by the Owner at a window frame selected by owner.
   (5) Manufacturer representative to visit the site to review the surface preparation, application and to complete adhesion tests. Submit written confirmation from the Manufacturer of such visits including results of adhesion tests.

4. Job Conditions and Protection
   (1) Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

(2) No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F/10°C, unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50°F/10°C or higher to use low temperature products.

5. Quality Assurance

(1) Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:

a) Product name, type (description)
b) Application & use instructions
c) Surface preparation
d) VOC content
e) Environmental issues
f) Batch date
g) Colour number

(2) Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

(3) Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

6. Warranty

(1) The Contractor warrants that the paint or coating will be free of the following defects: blisters, peeling, flaking, splitting, lifting, and undue fading. Warranty period is two years from date of substantial performance.

PART II - PRODUCTS

1. Manufacturers

(1) Acceptable Manufacturer: The Sherwin-Williams Company

(2) Acceptable Manufacturer: Master Builders Solutions Canada Inc.

(3) Substitutions: Requests for substitutions will be considered. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2. Applications

(1) Paints and Coatings - General:
   a) Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

   b) For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base colour.

(2) Primers:
   a) Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

3. Exterior Aluminium (doors, frames, spandrel panels)

(1) Pro Industrial Pro-Cryl Universal Acrylic Primer, B66W00310 Series, (5.0 – 10.0 mils wet, 2.0 - 4.0 mils dry).

(2) Top Coat #1: Pro Industrial High Performance Acrylic, B66W00651, (6.0 – 12.0 mils wet, 2.5 - 4.0 mils dry).

(3) Top Coat #2: Sher-Cryl HPA High Performance Acrylic, B66W00351, (6.0 – 10.0 mils wet, 2.5 - 4.0 mils dry).

(4) Colour and gloss to matched as closely as possible to existing to minimize aesthetic impact.

4. Accessories

(1) Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufacturer's specifications.

PART III - EXECUTION

1. Examination

(1) Do not begin application of coatings until substrates have been properly prepared. Notify Consultant of unsatisfactory conditions before proceeding

(2) If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

(3) Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

2. Surface Preparation

(1) Ensure concrete substrates are free of bond-inhibiting contaminants.

(2) The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion. Some stains and surface contaminants may require chemical removal. When chemical cleaners are used, be sure to neutralize the compounds and fully rinse the surface with clean water. Allow surface to dry before proceeding.

(3) Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

(4) Glossy surfaces of old paint films must be clean and dull before repainting. Thorough washing with an abrasive cleanser will clean and dull in one operation, or, wash thoroughly and dull by sanding.

(5) Check for compatibility by applying a test patch of the recommended coating system, covering at least 2 to 3 square feet. Allow to dry one week before testing adhesion per ASTM D3359, measuring adhesion by Tape Method A. If the coating system is incompatible, complete removal is required.

(6) Solvent Cleaning, SSPC-SP1 - Remove all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process.

(7) Hand Tool Cleaning, SSPC-SP2 - Remove all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

3. Installation

(1) Apply all coatings and materials with manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendation.

(2) Do not apply to wet or damp surfaces.

(3) Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

(4) Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.

(5) Dark Colours and Deep Clear Colours: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

4. Protection

(1) Protect finished coatings from damage until completion of project.

(2) Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

(3) Ensure all repair surfaces and surrounding surfaces are clean.

(4) Remove all debris, packaging, and extra materials from site properly.

End of Section 09 91 13

PART I - GENERAL

1. Related Work

(1) Section 07 92 10 – Joint Sealing

(2) Section 07 24 00 – Exterior Insulation and Finish System

2. Reference Standards

(1) ASTM D412 - Standard Test Method for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.

(2) ASTM D4541 – Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

3. Submittals / Mock-Ups

(1) Product data for elastomeric waterproofing, primer, and accessories. Include material safety data sheets (MSDSs) and certifications showing compliance with specified standards.

(2) Manufacturer's colour and finish charts for selections by Owner. Provide up to five 300x300mm samples including colour-matched option for the Owner to finalize colour selection.

(3) Manufacturer's instructions for installation and maintenance.

(4) Manufacturer representative to visit the site to review the surface preparation, application and to complete adhesion tests. Submit written confirmation from the Manufacturer of such visits including results of adhesion tests.

(5) Mock-Ups:

a) Install at Project site or pre-selected area of building an area for field sample, minimum 1.2 m by 1.2 m, using specified material for each specified colour.

b) Apply material in accordance with manufacturer's written application instructions.

c) Have manufacturer's representative review technical aspects; surface preparation, repair, and workmanship.

d) Mock-up will be standard for judging workmanship on remainder of Project.

e) Obtain Consultant's written approval of mock-up before start of material application, including approval of aesthetics, color, texture, and appearance.

f) Perform adhesion test in accordance with ASTM D3359, Method A. Minimum adhesion rating of 4A required on 0 to 5 scale.

4. Job Conditions and Protection

(1) Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

(2) Do not apply material when substrate or ambient temperature is less than 5°C or is expected to fall below 5°C within 24 hours after application.

(3) Do not apply material if rain is expected within 24 hours of application.

5. Quality Assurance

(1) Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:

a) Product name, type (description)
b) Application & use instructions
c) Surface preparation
d) VOC content
e) Environmental issues
f) Batch date
g) Colour number

(2) Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

(3) Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

(4) Qualifications

a) Manufacturer Qualifications: Company with minimum 15 years of experience in manufacturing of specified products.

b) Applicator Qualifications: Company with minimum of 5 years' experience in application of specified products on projects of similar size and scope and is acceptable to product manufacturer.

6. Warranty

(1) The Contractor warrants that the coating will be free of the following defects: blisters, peeling, flaking, splitting, lifting, and undue fading. Warranty period is two years from date of substantial performance.

PART II - PRODUCTS

1. Materials

(1) High-build, water-based, elastomeric, 100% acrylic, waterproof coating. VOC Content to be less than 50 g/L per ASTM D3960.

a) Acceptable Product: MasterProtect EL 750 by Master Builders Solutions Canada Inc. Construction Chemicals.

b) Or an approved equivalent.

(2) Performance Requirements: applied at 16 mils DFT:

a) Ultimate Elongation, ASTM D412: >150%.

b) Elongation Recovery, ASTM D412: After 24 hours >95%.

c) Ultimate Tensile Strength, ASTM D412: >1.4 MPa.

d) Crack Bridging, PR EN 1062-7:

a. At -60°C: 12 mils (0.3 mm).

b. At 0°C: 19.5 mils (0.5 mm).

c. At 23°C: 27.5 mils (0.7 mm).

e) Flexibility, ASTM D522, at -34° C: 3 mm mandrel.

f) Pull-Off Strength Adhesion, ASTM D4541: >1.4 MPa.

g) Water-Vapor Permeance, ASTM D1653: >10 perms.

h) Visual Color Change, ASTM D1729, pass after 5,000 hours.

i) Chalking, ASTM D4214, pass after 5,000 hours.

j) Dirt Pick-Up, ASTM D3719, after 6 months exposure: >94%.

k) Mildew Resistance, ASTM D3273 and 3274: No growth.

(3) Wet Film Thickness (WFT):

a) 16 to 32 mils (406 to 813 microns).

(4) Dry Film Thickness (DFT):

a) 8 to 19 mils (229 to 483 microns).

(5) Colour and Texture to be matched to existing to minimize aesthetic impact.

1. Primers

(1) Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

2. Accessories

(1) Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufactures specifications.

PART II - EXECUTION

1. Examination

(1) Do not begin application of coatings until substrates have been properly prepared. Notify Consultant of unsatisfactory conditions before proceeding.

(2) If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

(3) Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

2. Surface Preparation

(1) Protection: Protect adjacent Work areas and finish surfaces from damage during coating application.

(2) Remove all surface mounted plates and hardware prior to surface preparation. Replace upon completion of the work. Remove protruding concrete accessories and smooth out irregularities.

(3) Prepare surfaces in accordance with manufacturer's instructions.

(4) Inspect substrates to receive coating. Ensure surfaces are sound, clean, dry, and free of frost, dust, dirt, grease, oil, curing compounds, form release agents, laitance, efflorescence, mildew, fungus, biological residues, and other foreign material.

(5) Clean substrates as required to remove contaminates and foreign material by pressure cleaning (min. 2,500psi), wire brushing, grinding or other method recommended by manufacturer. Clean surface to achieve texture similar to medium-grit sandpaper.

(6) When chemical cleaners are used, neutralize compounds and fully rinse surface with clean water. Allow surface to dry before proceeding.

(7) Remove blisters or delaminated areas and sand edges to smooth rough areas and provide transition to existing areas. Repair deteriorated or damaged substrates and fill cracks, voids, honeycomb, and other defects using materials as recommended by manufacturer. Allow patching materials to cure.

(8) Protect adjacent surfaces not designated to receive coating to ensure clean termination lines.

(9) Provide protection for pedestrians, vehicles, landscaping, and surrounding areas to prevent contact with coating materials.

(10) Field adhesion test: Prior application of repellent, test each application condition to determine if primer is required to satisfactorily adhere repellent to substrate. Check adhesion of existing paint in accordance with ASTM D3359, measuring adhesion by Tape Method A.

(11) Primer: Apply primer to substrates determined by field adhesion test.

a) Use nap roller, nylon bristle brush, or airless sprayer.
b) Application rate: 300 square feet per gallon / 7.4 square meters per litre.
c) Allow to dry 30 to 120 minutes so surface is dry to touch.

(12) Where the existing paint or coating has peeled or flaked and is adequately bonded, feather the edges to eliminate sudden changes in surface elevations to improve aesthetics.

(13) Concrete Surfaces:

a) Cure concrete a minimum of 28 days before application.
b) Remove laitance, bond-inhibiting contaminants, form-release agents, and sealers.
c) Remove form tie wires and repair holes, small voids, and spalls using appropriate repair product approved by coating manufacturer.
d) Abrasive-blast slick, dense concrete surfaces or use primer approved by coating manufacturer. Test surface for proper adhesion.

(14) Exterior Insulation and Finish Systems (EIFS) Surfaces:

a) Refasten or re-adhere delaminated or loose expanded polystyrene (EPS) insulation in accordance with manufacturer's approved methods.
b) Replace or patch missing or damaged EPS to original condition.
c) Finish with trowel acrylic finish to match and blend with existing texture.
d) Allow repaired areas to fully cure.
e) Refer to EIFS manufacturer's instructions for appropriate repair and procedures.

(15) Existing Acrylic Coating Surfaces:

a) Sand or grind edges of existing coating to ensure adhesion and smooth transition of new material. Sand edges of area to featheredge.

b) Wash down and allow to completely dry.

c) Prime chalky surfaces with primer approved by coating manufacturer.

(16) Crack Preparation and Treatment:

a) Treat cracks larger than 1/32 inch (0.8 mm) and up to 1/16 inch (1.6 mm) with brush-grade acrylic crack filler approved by coating manufacturer.

b) Treat cracks larger than 1/16 by 1/16 inch (1.6 by 1.6 mm) but less than 1/4 by 1/4 inch (6 by 6 mm) with knife-grade acrylic crack filler approved by coating manufacturer.

c) Treat moving cracks larger than 1/4 by 1/4 inch (6 by 6 mm) with internally plasticized polyurethane sealant approved by coating manufacturer.

d) Apply test application of crack repair materials in inconspicuous location to ensure compatibility and aesthetic approval.

3. Installation

(1) Apply all coatings and materials with manufacture specifications in mind. Mix and thin coatings according to manufacturer recommendation.

(2) Do not apply to wet or damp surfaces.

(3) Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

(4) Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.

(5) Dark Colours and Deep Clear Colours: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

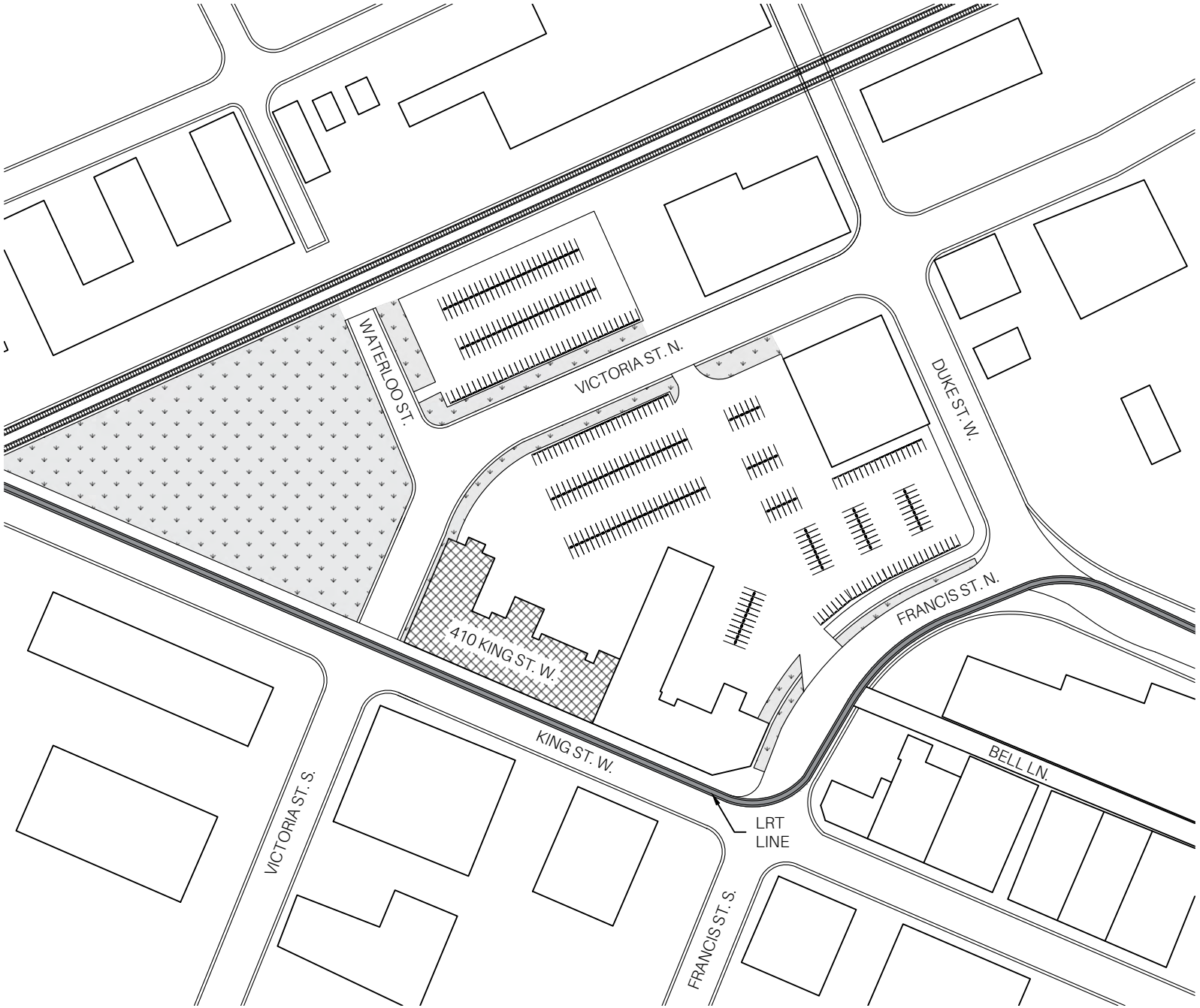
(6) Apply coating as a 2-coat system.

(7) Maintain proper uniform wet-film thickness during application to ensure performance characteristics desired.

(8) Apply coating to achieve pinhole-free, consistent film build on coated surfaces.

4.	Protection and clean up	(1) Protect finished coatings from damage until completion of project.
		(2) Touch-up damaged coatings after substantial completion, following manufacturers recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.
		(3) Ensure all repair surfaces and surrounding surfaces are clean.
		(4) Remove all debris, packaging, and extra materials from site properly.

End of Section 09 97 23



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Edison ENGINEERS INC.
866-397-2506
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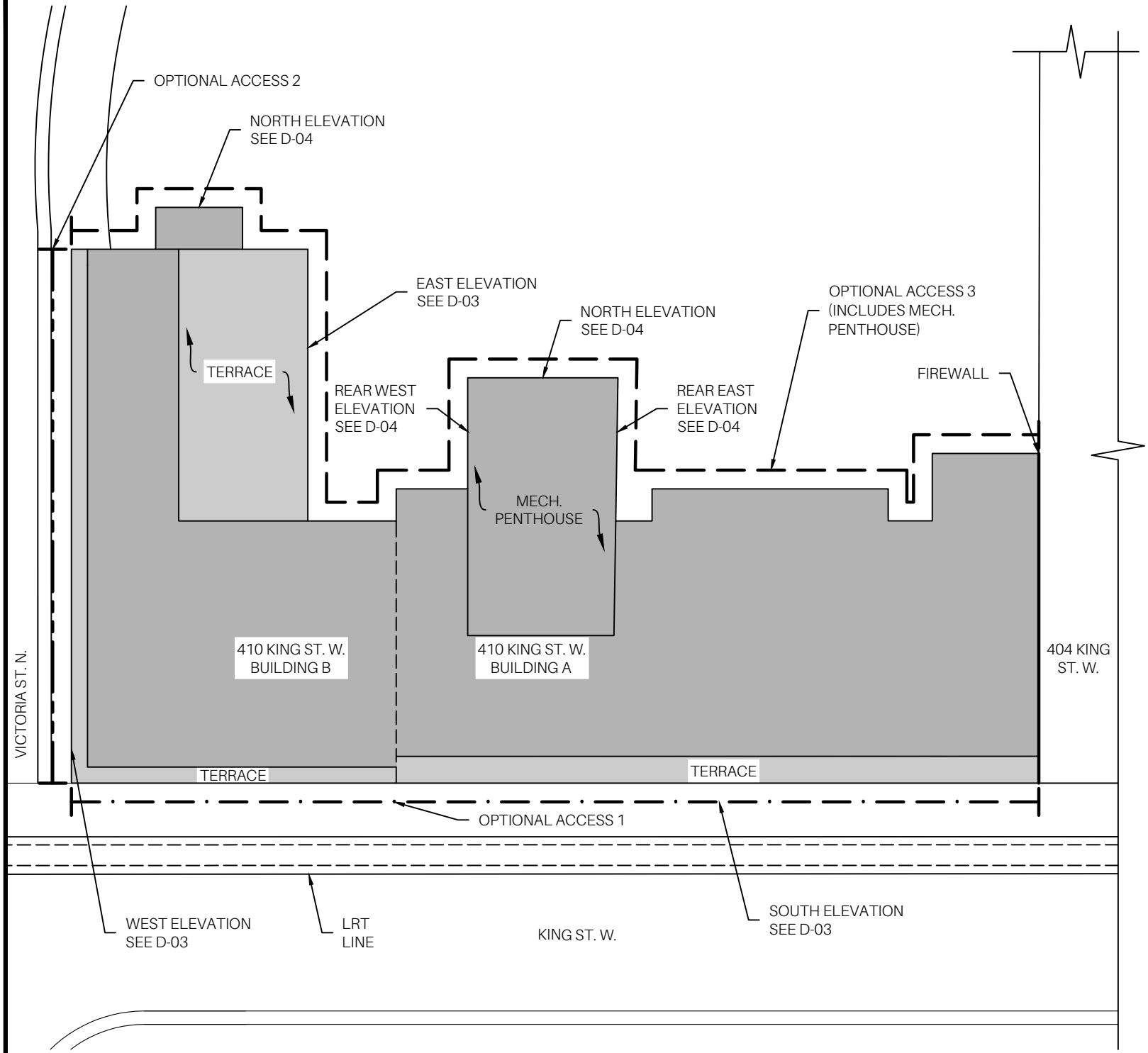
410 KING ST. W., KITCHENER

CLADDING REPAIRS

SITE PLAN

PROJECT No.		DRAWING No.
WatSCC460.1814		D-01
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	



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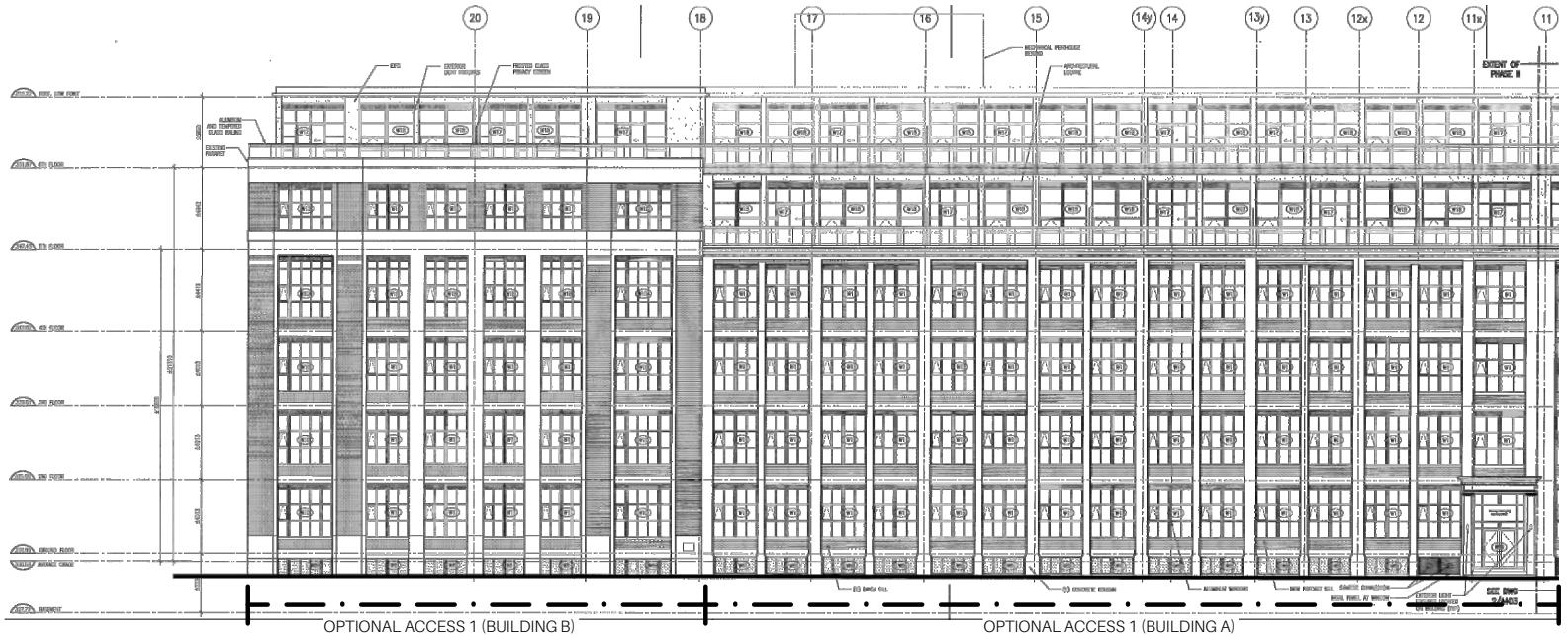
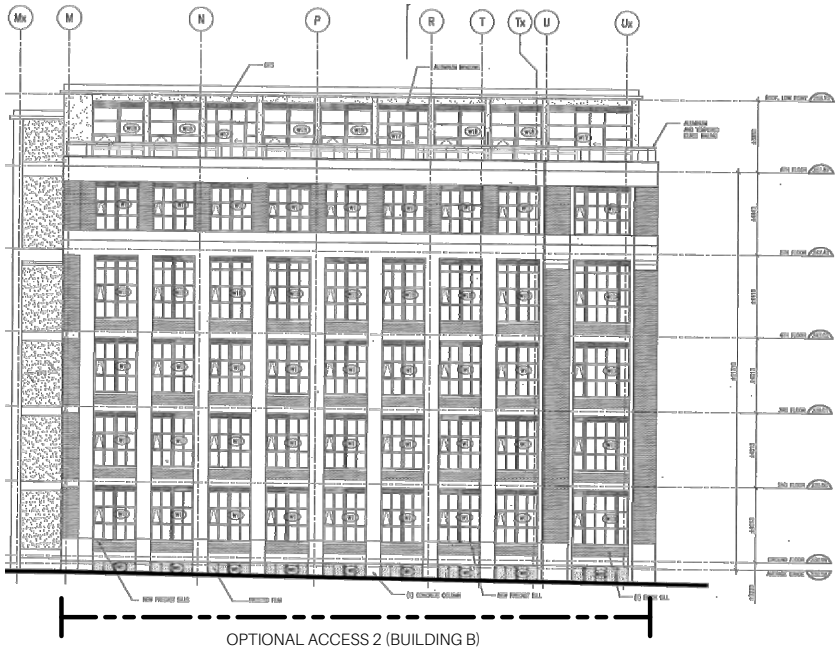
CLADDING REPAIRS

BUILDING PLAN

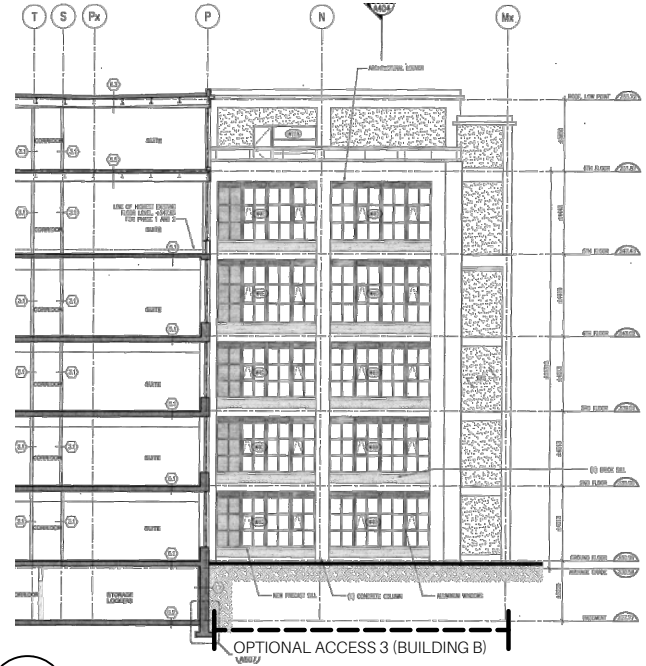
PROJECT No.	DRAWING No.
WatSCC460.1814	D-02
CHECKED BY: SNN / DRAWN BY: AJW	
DATE: 20/06/23 / SCALE: NTS	



1 / D-03 SOUTH ELEVATION
SCALE : NTS



2 / D-03 WEST ELEVATION
SCALE : NTS



3 / D-03 EAST ELEVATION
SCALE : NTS

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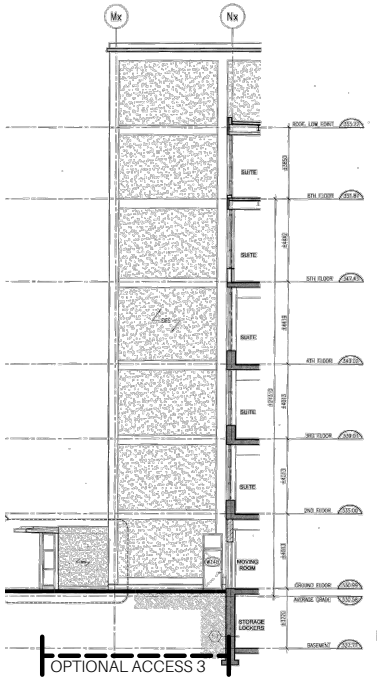
CLADDING REPAIRS

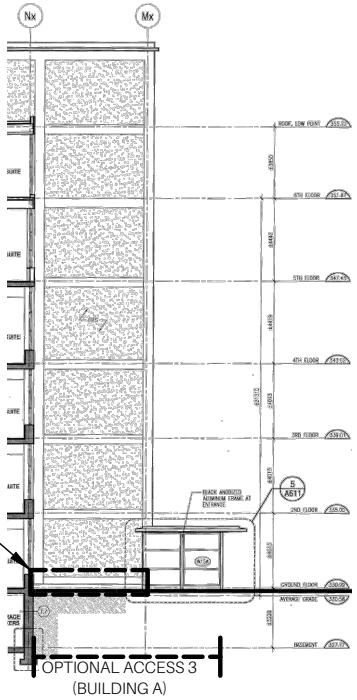
ELEVATIONS

PROJECT No.		DRAWING No.
WatSCC460.1814		D-03
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	

1 / D-04 NORTH ELEVATION
SCALE : NTS



2 / D-04 REAR WEST ELEVATION
SCALE : NTS



3 / D-04 REAR EAST ELEVATION
SCALE : NTS

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ELEVATIONS

PROJECT No.		DRAWING No.
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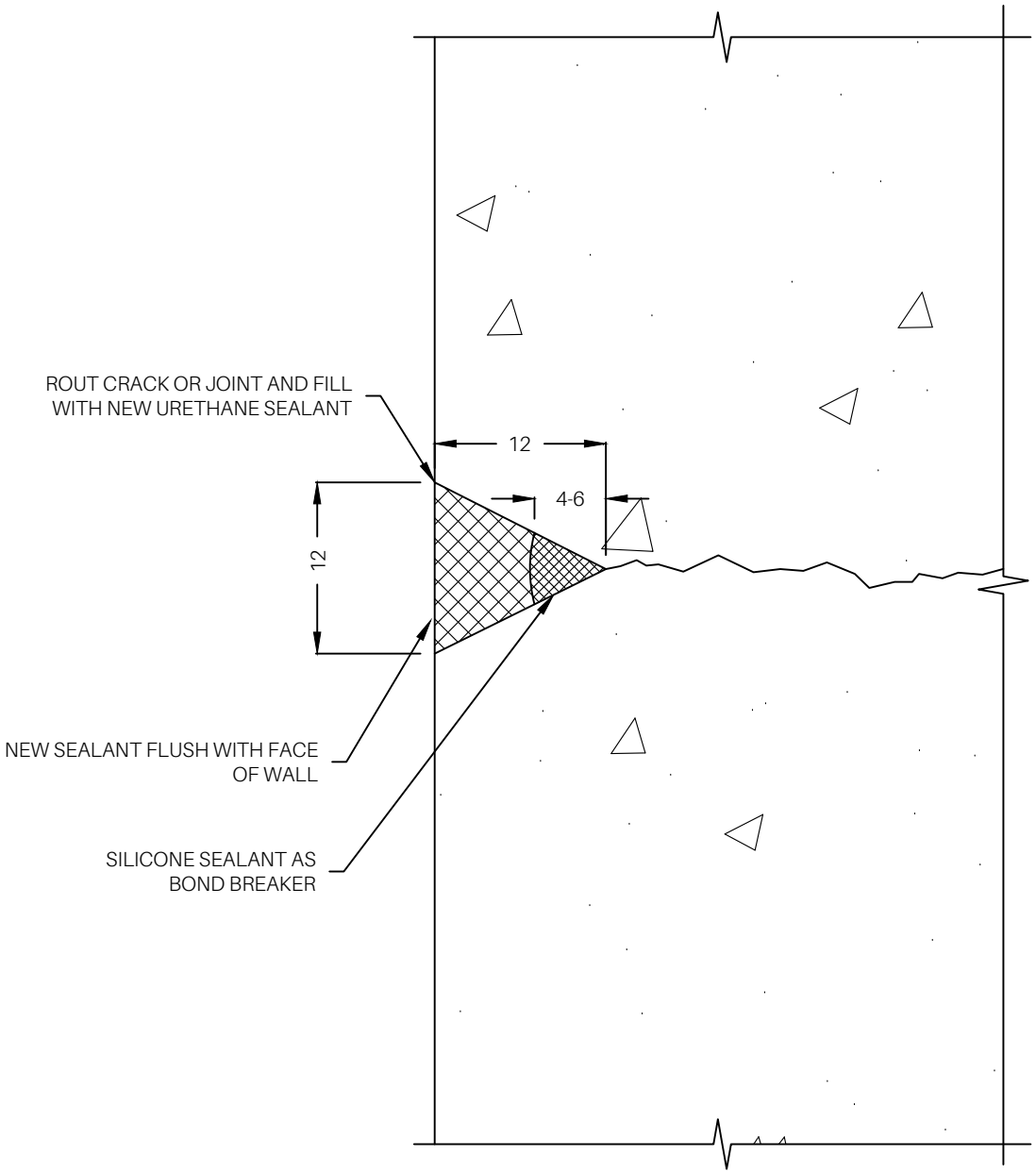
DATE: 20/06/23	SCALE: NTS	



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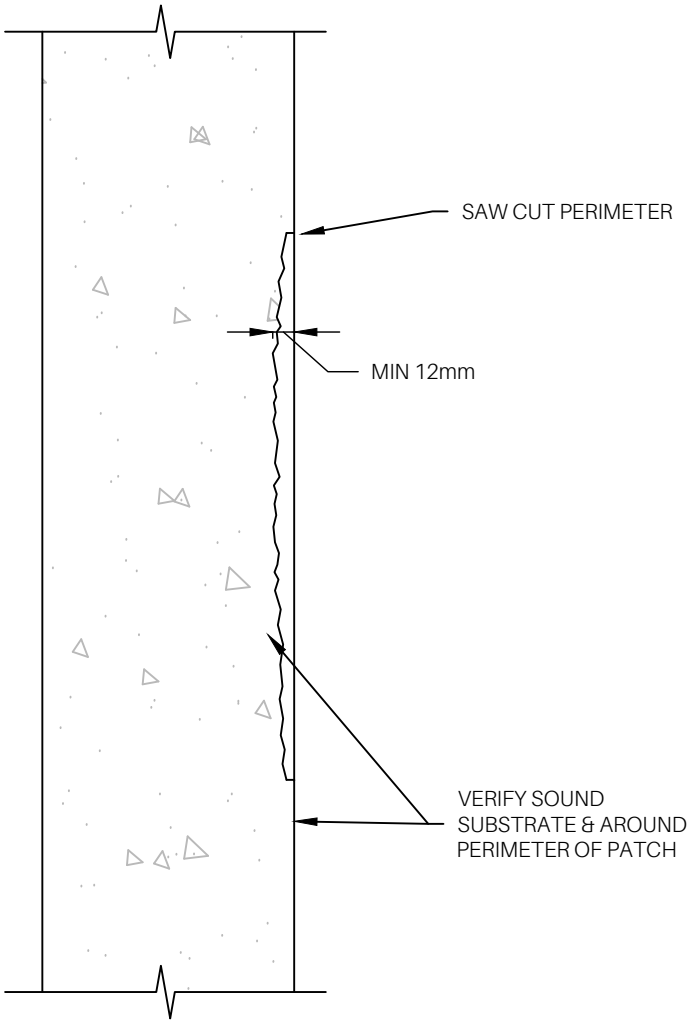
CLADDING REPAIRS

ROUT AND SEAL CRACK REPAIR DETAIL

PROJECT No.		DRAWING No.
WatSCC460.1814		D-05
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	

NOTES:

1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. ROUTE AND SEAL ALL CRACKS GREATER THAN OR EQUAL TO 1mm IN WIDTH.



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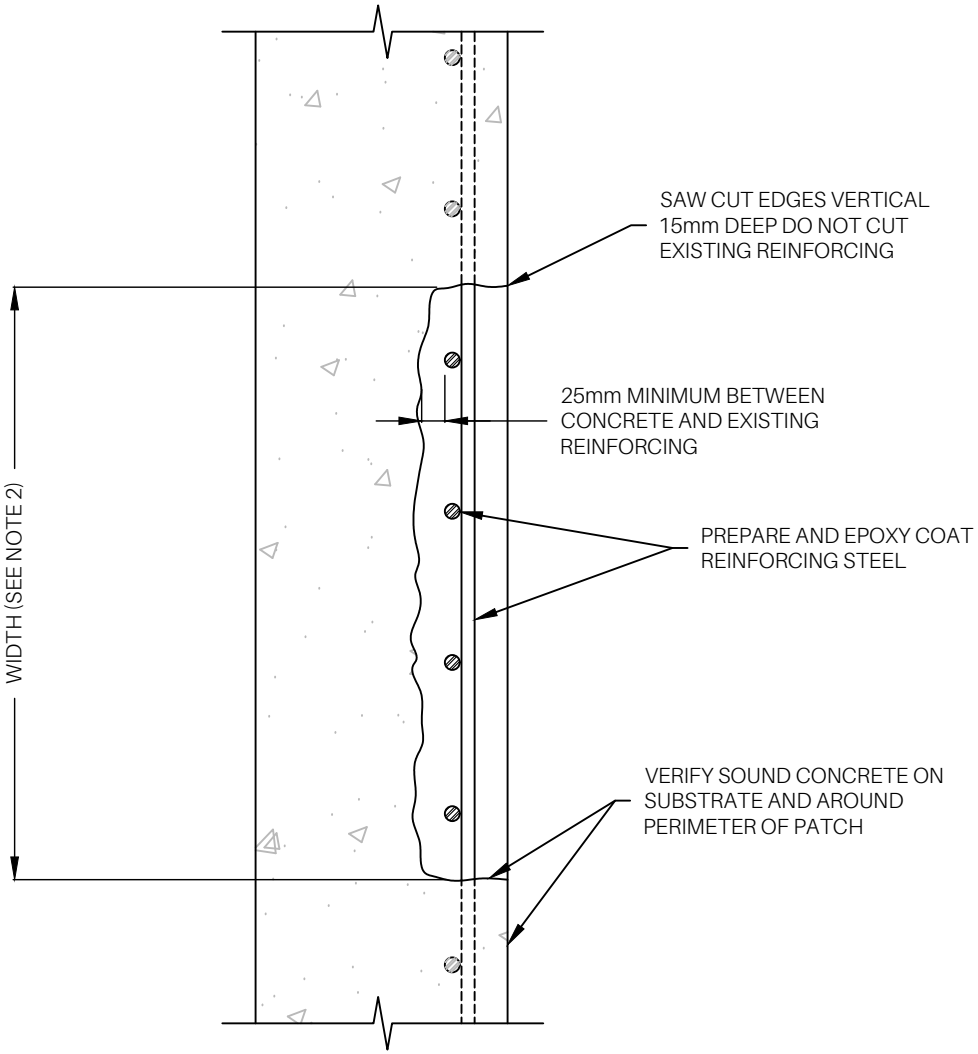
CLADDING REPAIRS

VERTICAL THIN SURFACE CONCRETE REPAIR DETAIL

NOTES:

1. REPORT AND DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. VERIFY SOUND CONCRETE ON SUBSTRATE, AROUND THE PERIMETER OF THE PATCH AND BENEATH THE PATCH PRIOR TO CASTING NEW CONCRETE.
3. INSTALL PROFESSIONALLY ENGINEERED SHORING AS REQUIRED BY SHORING ENGINEER PRIOR TO REMOVAL.
4. CONCRETE PATCHES SHALL BE SQUARED OFF AND SAWCUT PRIOR TO STARTING REMOVALS.

PROJECT No.		DRAWING No.
WatSCC460.1814		D-06
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	



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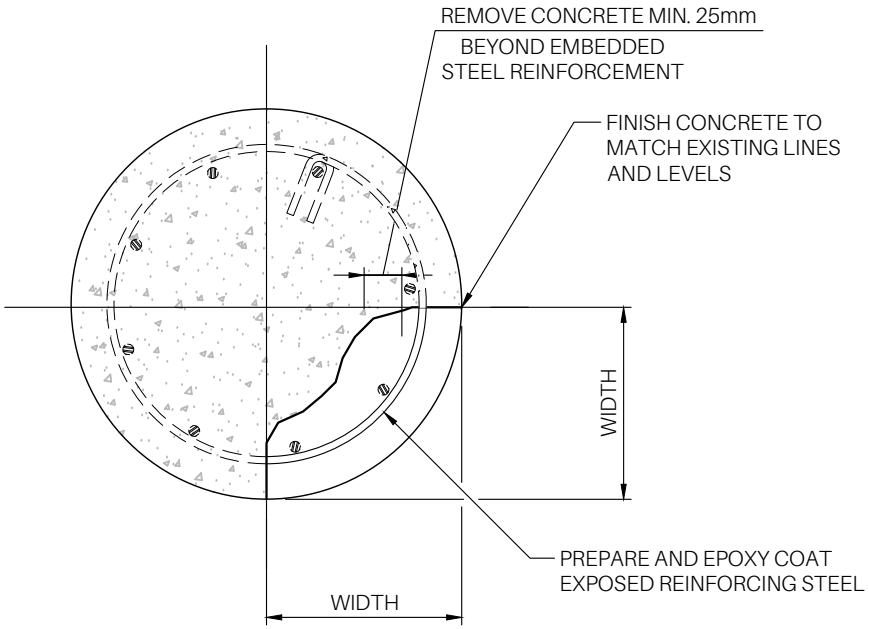
CLADDING REPAIRS

VERTICAL CONCRETE REPAIR DETAIL

NOTES:

1. REPORT AND DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. INSTALL PROFESSIONALLY ENGINEERED SHORING AS REQUIRED PRIOR TO REMOVALS. ENGINEER TO REVIEW EACH INSTALLATION AND ISSUE APPROVAL SITE REPORT.
3. FIELD CONDITIONS MAY DIFFER FROM THE INFORMATION SHOWN ON THIS DETAIL FOR NUMBER, QUANTITY AND LOCATION OF REINFORCING BARS.
4. HEAVILY CORRODED STEEL BARS SHALL BE REINFORCED AS DIRECTED BY THE CONSULTANT. DO NOT REMOVE ANY BARS WITHOUT FORMAL APPROVAL.
5. PROVIDE 25mm CLEARANCE AROUND ALL EXPOSED REINFORCING BARS.
6. CONCRETE PATCHES SHALL BE SQUARED OFF AND SAWCUT PRIOR TO STARTING REMOVALS.

PROJECT No.		DRAWING No.
WatSCC460.1814		D-07
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	



NOTES:

1. REPORT ANY DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. INSTALL PROFESSIONALLY ENGINEERED SHORING AS REQUIRED TO UNLOAD THE COLUMN PRIOR TO REMOVALS. ENGINEER TO REVIEW EACH INSTALLATION AND ISSUE APPROVAL SITE REPORT.
3. FIELD CONDITIONS MAY DIFFER FROM THE INFORMATION SHOWN ON THIS DETAIL FOR NUMBER, QUANTITY AND LOCATION OF REINFORCING BARS.
4. HEAVILY CORRODED STEEL BARS AND COLUMN TIES SHALL BE REINFORCED AS DIRECTED BY THE CONSULTANT. DO NOT REMOVE ANY BARS WITHOUT WRITTEN APPROVAL.
5. PROVIDE 25mm CLEARANCE AROUND ALL EXPOSED REINFORCING BARS.
6. CONCRETE PATCHES SHALL BE SQUARED OFF AND SAWCUT PRIOR TO STARTING REMOVALS. DO NOT CUT EXISTING REINFORCING.
7. UNCONSOLIDATED CONCRETE WILL NOT BE ACCEPTED. FORM AND CAST COLUMN REPAIRS AS REQUIRED. NO HAND PATCHING IS PERMITTED.
8. PAYMENT BASED ON 1/4 OF COLUMN FOR EACH LOCATION.

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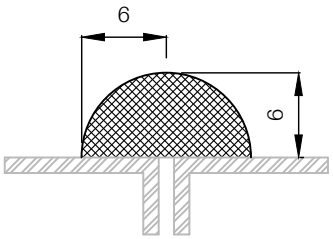
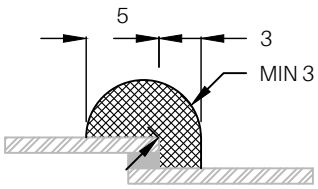
COLUMN REPAIR DETAIL

PROJECT No.		DRAWING No.
WatSCC460.1814		D-08
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	



A D-09 CAP BEAD: METAL TO METAL
SCALE: NTS



B D-09 CAP BEAD: GLASS TO METAL
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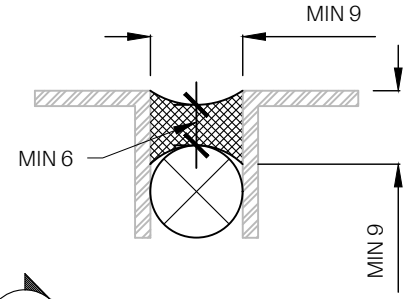
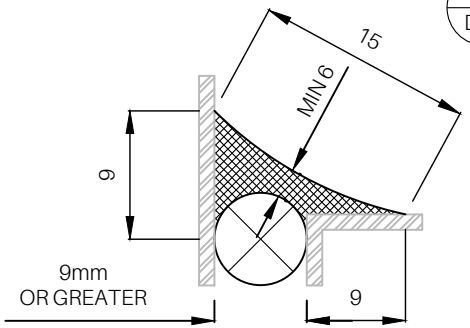
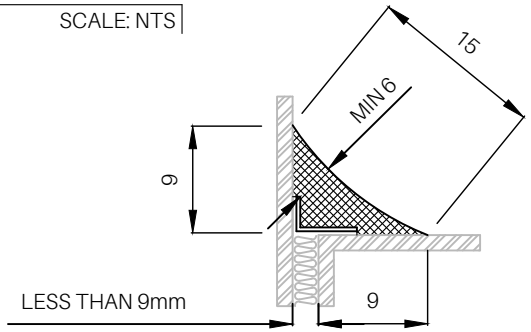


C D-09 BUTT BEAD
SCALE: NTS



D D-09 FILLET BEAD: >9mm JOINT
SCALE: NTS



E D-09 FILLET BEAD: <9mm JOINT
SCALE: NTS

NOTES:

1. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. BE RESPONSIBLE FOR GOOD BOND BETWEEN SEALANT AND SUBSTRATES.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

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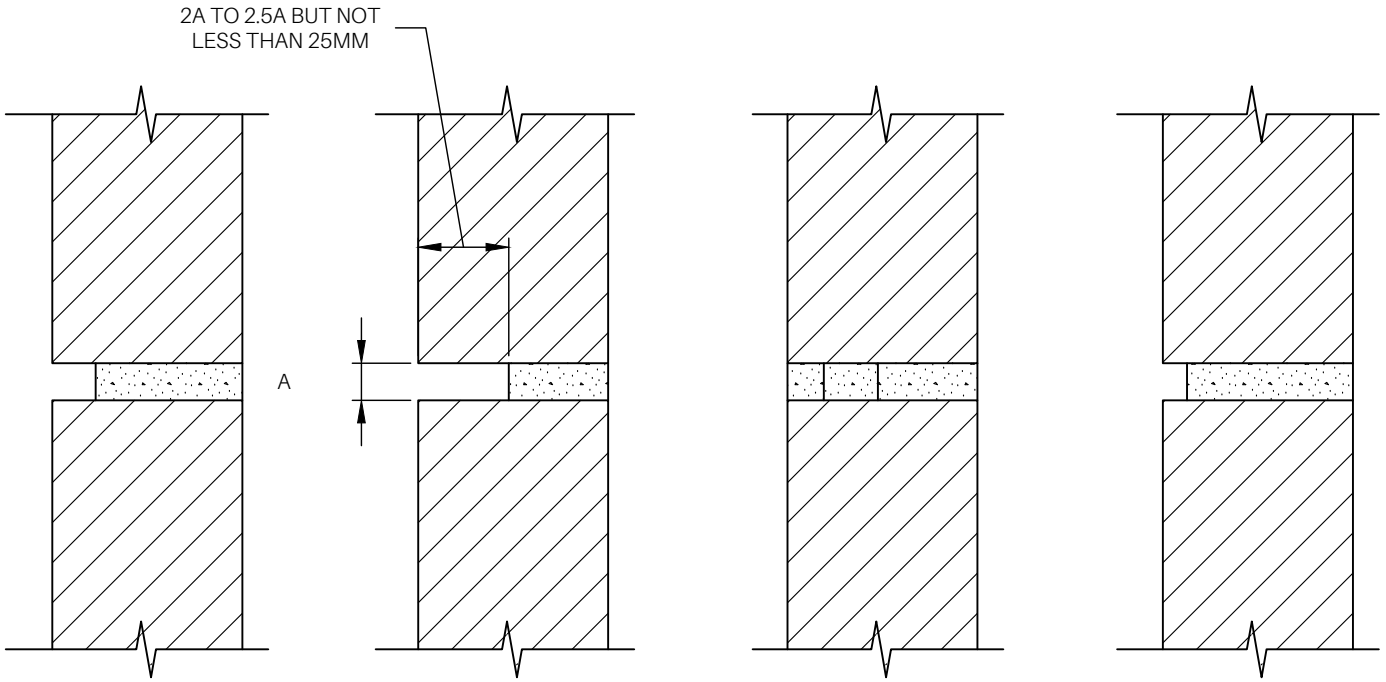
CLADDING REPAIRS

SEALANT DETAILS

PROJECT No.		DRAWING No.
WatSCC460.1814		D-09
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	

MORTAR JOINT REPOINTING PROCEDURE:

1. REMOVE EXISTING CAULKING (IF REQUIRED) AND RAKE UNSOUND JOINTS FREE OF DETERIORATED AND LOOSE MORTAR, DIRT AND OTHER UNDESIRABLE MATERIAL. JOINTS SHOULD BE RAKED TO A DEPTH OF 2-2.5 TIMES THE VERTICAL JOINT WIDTH BUT NO LESS THAN 25MM. FLUSH OPEN JOINTS AND VOIDS CLEAN WITH WATER AND/OR AIR, AND IF NOT FREE DRAINING, BLOW CLEAN WITH COMPRESSED AIR.
2. MORTAR JOINTS ARE TO BE FILLED IN SUCCESSIVE LAYERS. DEEPER JOINTS SHALL BE FILLED FIRST COMPACTING NEW MORTAR IN SEVERAL LAYERS UNTIL BACK OF JOINT IS FLAT. MULTIPLE 12MM LAYERS WILL BE NEEDED TO FILL THE JOINT FLUSH WITH THE SURFACE OF THE MASONRY. ALLOW EACH LAYER TO REACH THUMBPRINT HARDNESS BEFORE THE NEXT IS APPLIED.
3. FINISH MASONRY JOINTS TO MATCH EXISTING MORTAR JOINTS. LEAVE EXISTING MASONRY WORK CLEAN AND FREE OF MORTAR DROPPINGS.



1. DETERORATED MORTAR JOINTS

2. MORTAR CUT BACK TO SOUND SURFACE

3. NEW MORTAR LAYERED INTO MORTAR JOINT

4. JOINT TOOLED TO ORIGINAL PROFILE

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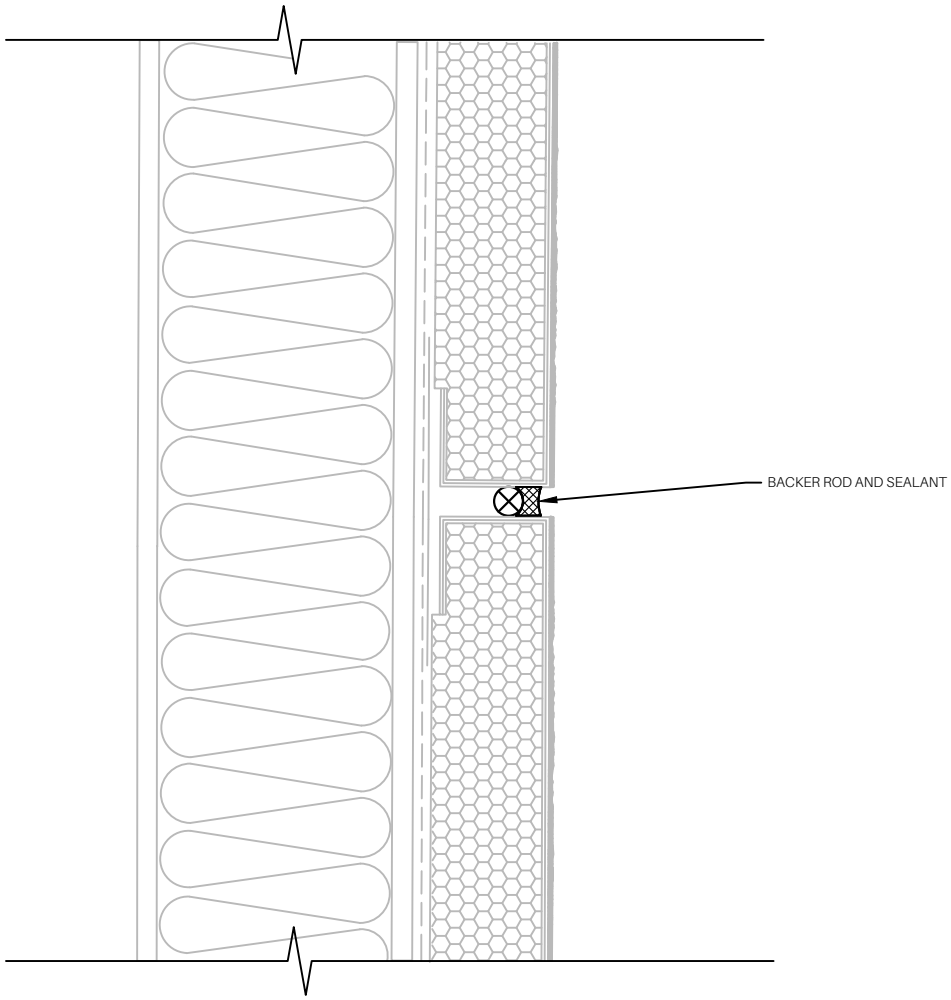
CLADDING REPAIRS

MORTAR JOINT REPLACEMENT DETAIL

PROJECT No.	DRAWING No.
WatSCC460.1814	D-10
CHECKED BY: SNN / DRAWN BY: AJW	
DATE: 20/06/23 / SCALE: NTS	



NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. SPRAY FOAM GAPS BETWEEN EPS GREATER THAN 1.5 mm.
3. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

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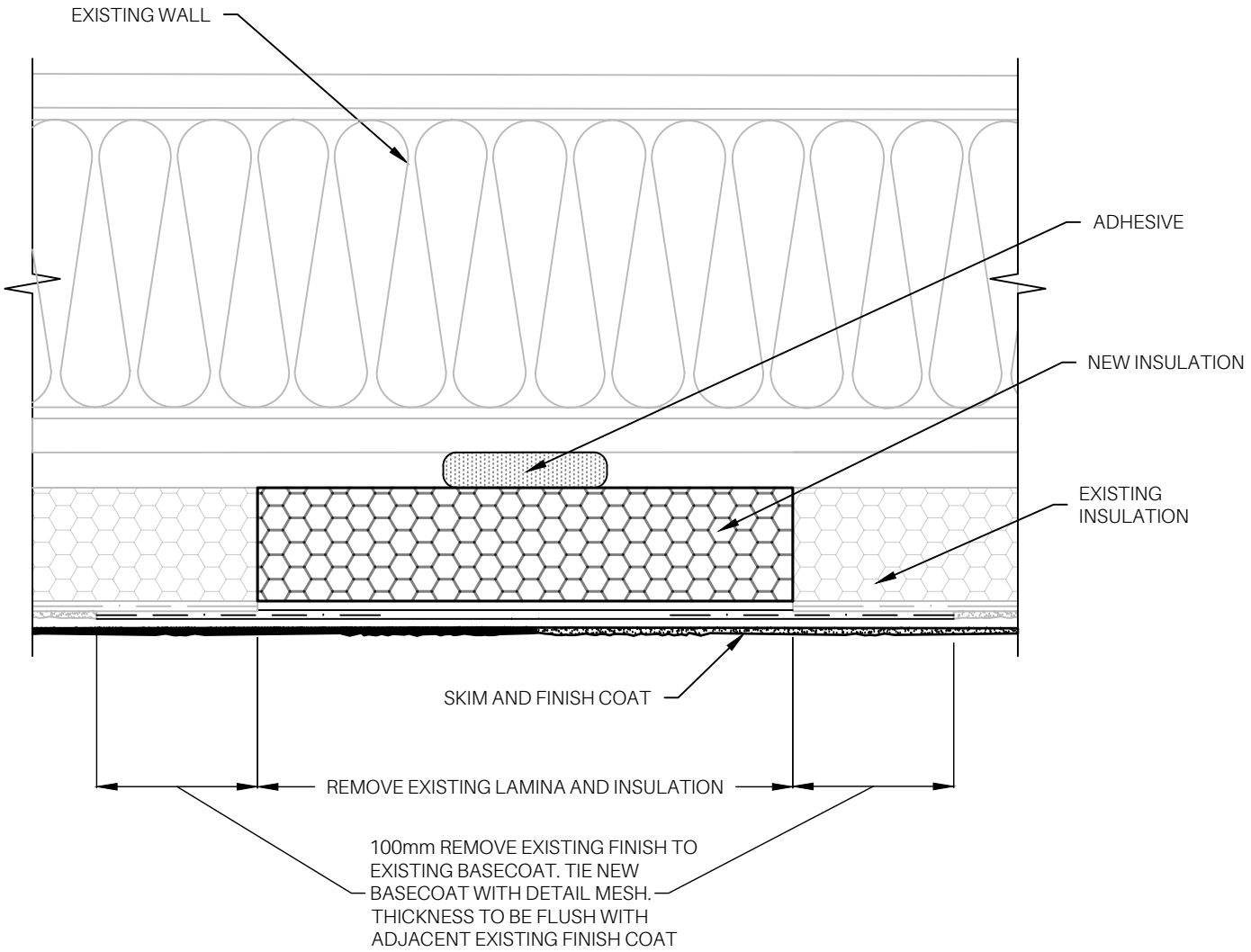
410 KING ST. W., KITCHENER

CLADDING REPAIRS

EIFS EXPANSION JOINT DETAIL

PROJECT No.		DRAWING No.
WatSCC460.1814		D-11
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	



NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. MARK OUT LAMINA REPLACEMENT LOCATIONS FOR CONSULTANT REVIEW BEFORE COMPLETING REPAIRS.
3. REVIEW CONDITION OF EXISTING INSULATION BENEATH BASECOAT. REPORT ANY DAMAGES OR IRREGULARITIES TO CONSULTANT BEFORE PROCEEDING.
4. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

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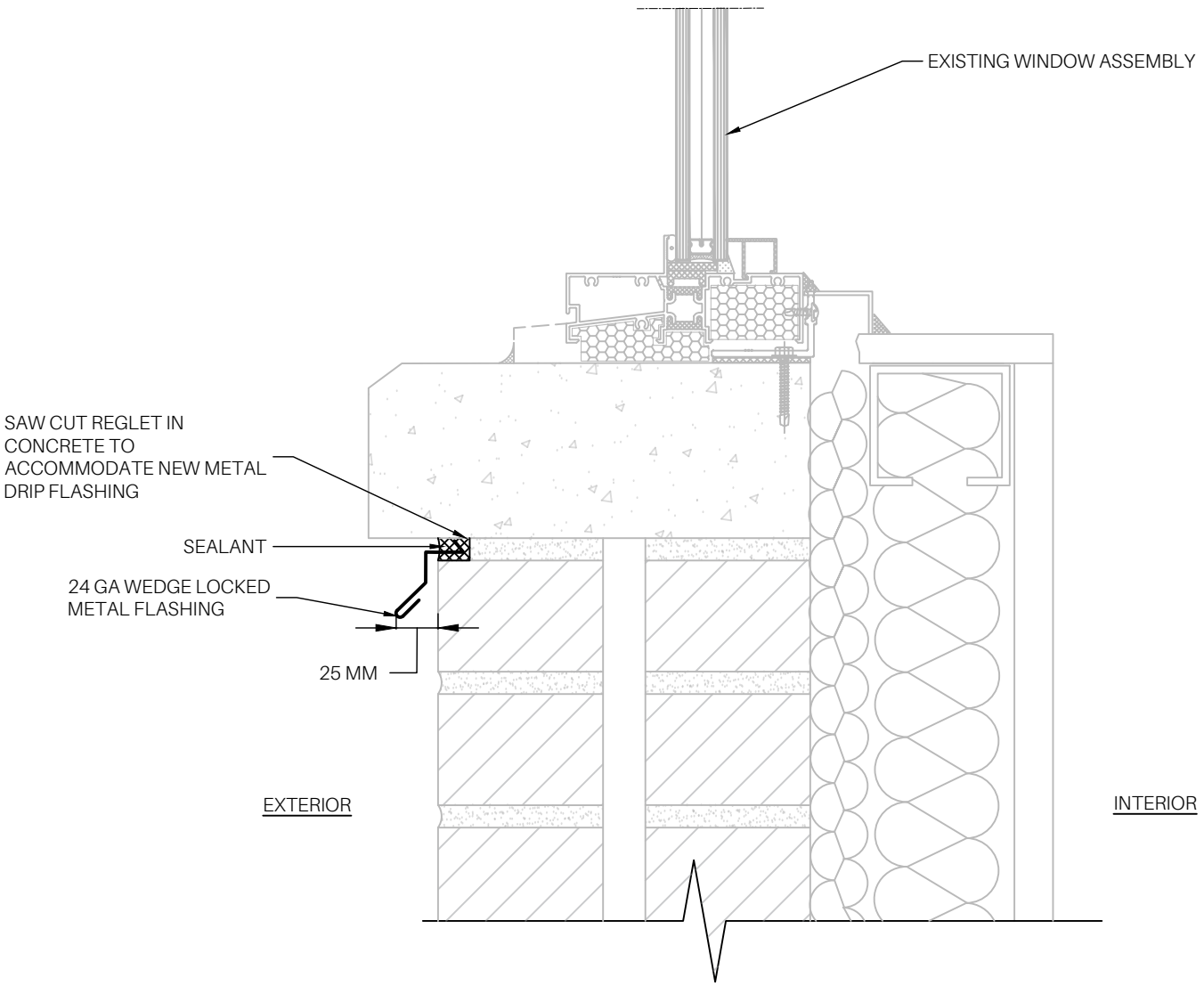
410 KING ST. W., KITCHENER

CLADDING REPAIRS

EIFS LAMINA AND INSULATION REPAIR DETAIL

PROJECT No.		DRAWING No.
WatSCC460.1814		D-12
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	



NOTES:

1. REPORT AND DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

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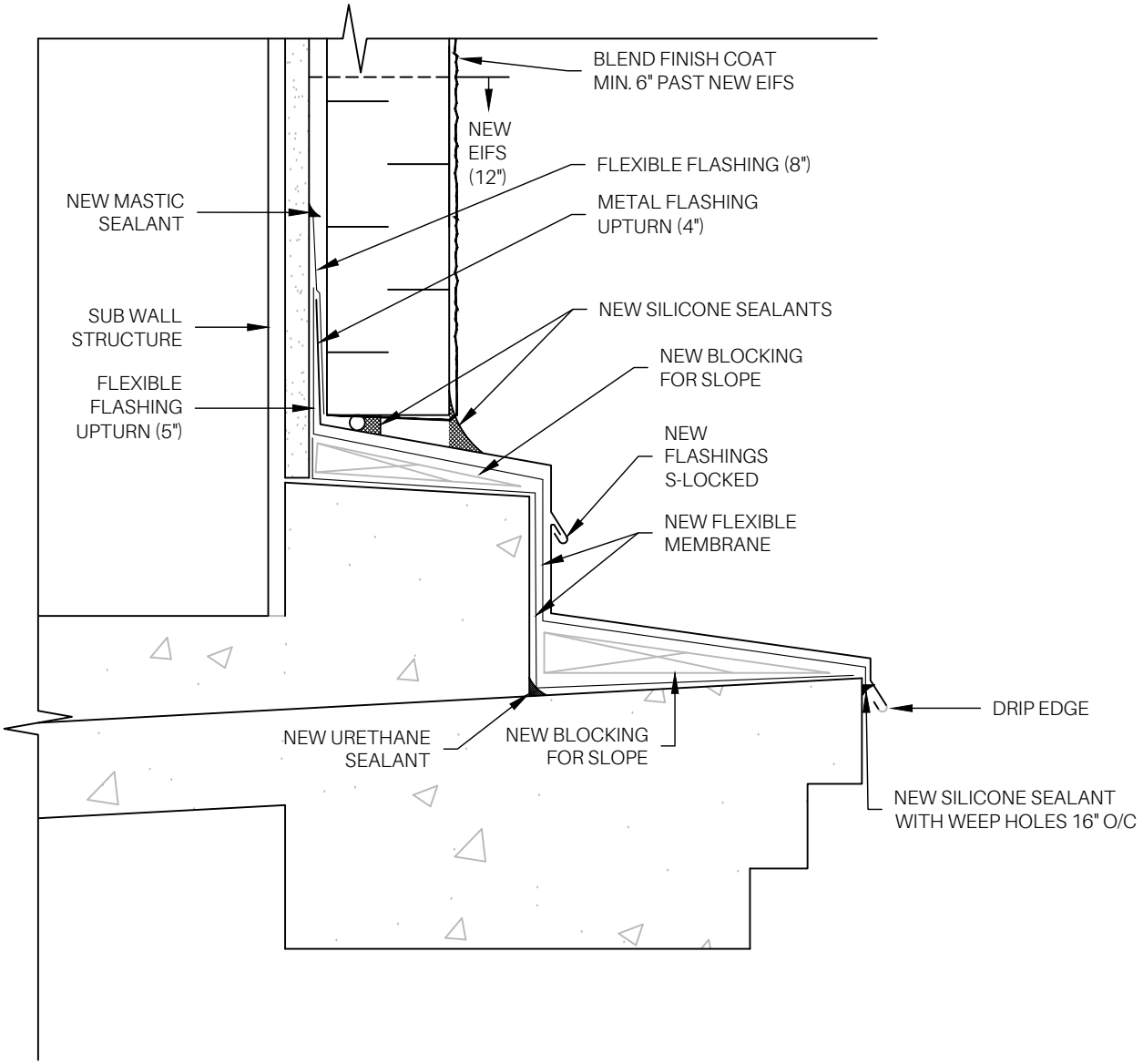
410 KING ST. W., KITCHENER

CLADDING REPAIRS

WINDOW SILL FLASHING DETAIL

PROJECT No.		DRAWING No.
WatSCC460.1814		D-13
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	



NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. SPRAY FOAM GAPS BETWEEN EPS GREATER THAN 1.5mm.
3. ALL METAL FLASHING TO BE 26 GAUGE MILL-FINISHED EXTRUDED ALUMINUM.
4. FLEXIBLE MEMBRANE: HENRY BAKOR BLUESKIN SA-LT.
5. SILICONE SEALANT: TREMCO SPECTRUM 1.
6. POLYURETHANE SEALANT: TREMCO DYMONIC 100.
7. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED.

NO.	DATE YY/MM/DD	REVISION	APPR.

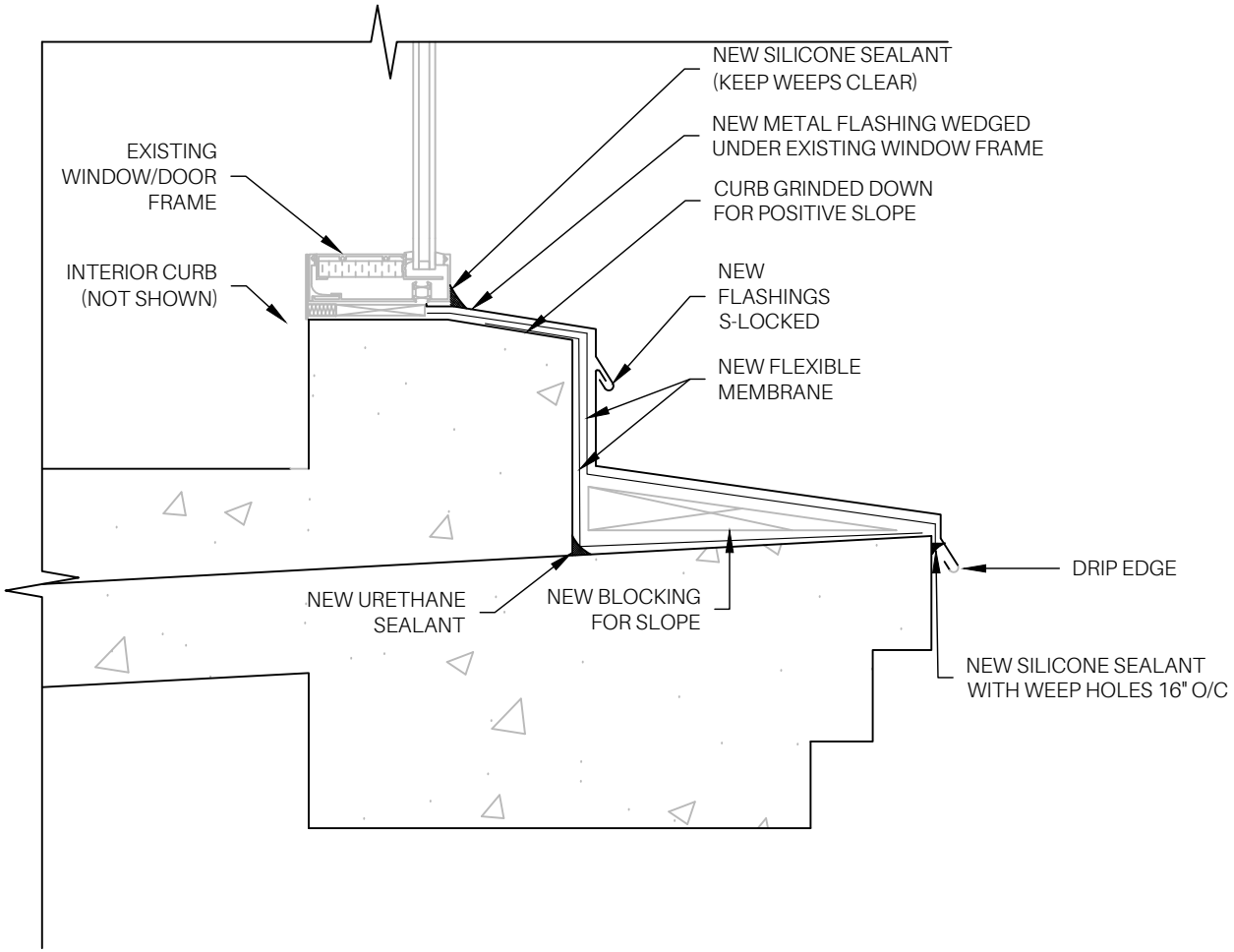
Edison ENGINEERS INC.
866-397-2506
INFO@EDISON ENGINEERS.CA

410 KING ST. W., KITCHENER

CLADDING REPAIRS

5TH FLOOR TRANSITION FLASHING DETAIL AT EIFS

PROJECT No.		DRAWING No.
WatSCC460.1814		D-14
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	



NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. ALL METAL FLASHING TO BE 26 GAUGE MILL-FINISHED EXTRUDED ALUMINUM.
3. FLEXIBLE MEMBRANE: HENRY BAKOR BLUESKIN SA-LT.
4. SILICONE SEALANT: TREMCO SPECTRUM 1.
5. POLYURETHANE SEALANT: TREMCO DYMONIC 100.
6. ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED.

NO.	DATE YY/MM/DD	REVISION	APPR.

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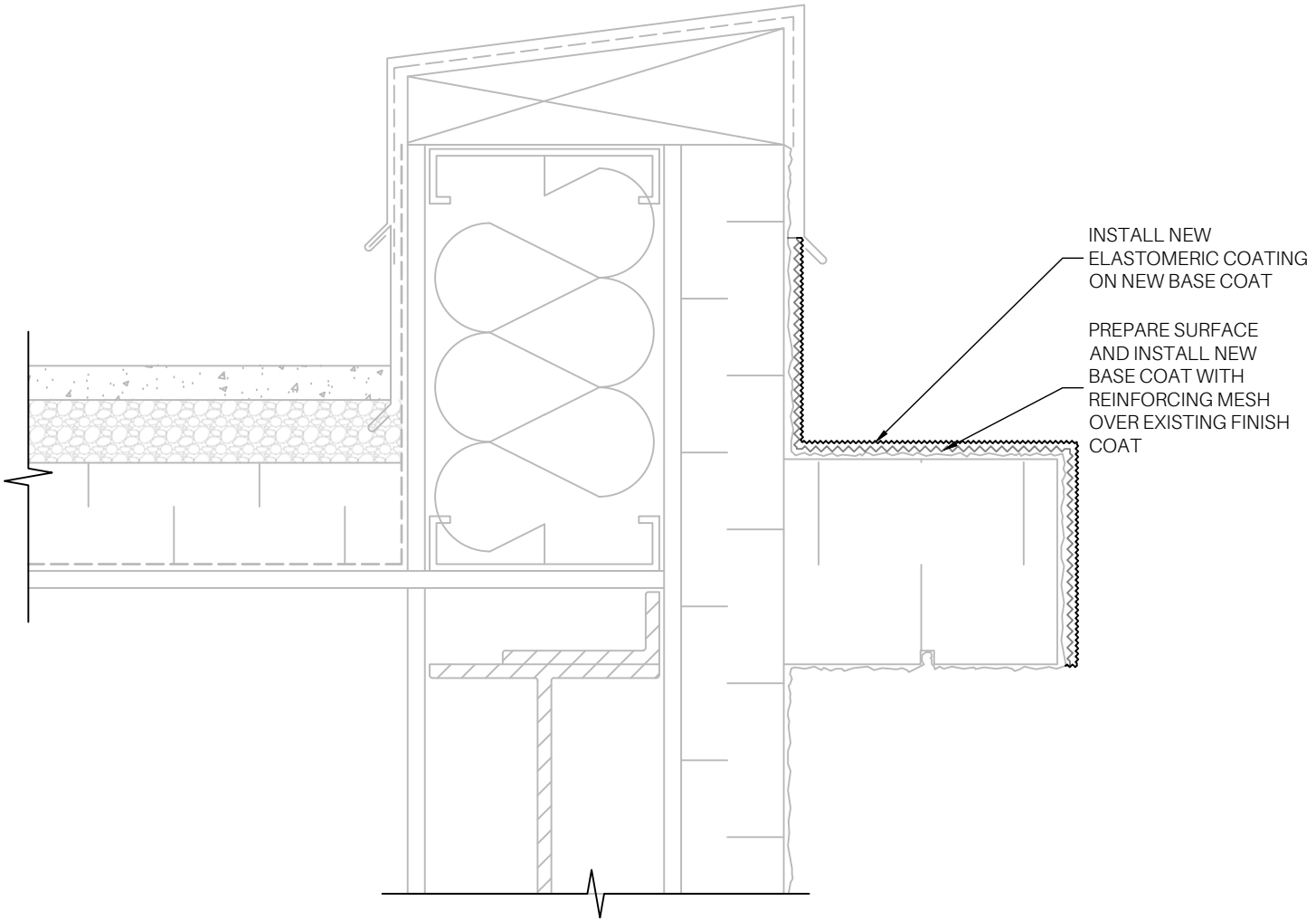
CLADDING REPAIRS

5TH FLOOR TRANSITION FLASHING DETAIL AT WINDOWS

PROJECT No.	DRAWING No.
WatSCC460.1814	D-15
CHECKED BY: SNN / DRAWN BY: AJW	
DATE: 20/06/23 / SCALE: NTS	



NO.	DATE YY/MM/DD	REVISION	APPR.

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410 KING ST. W., KITCHENER

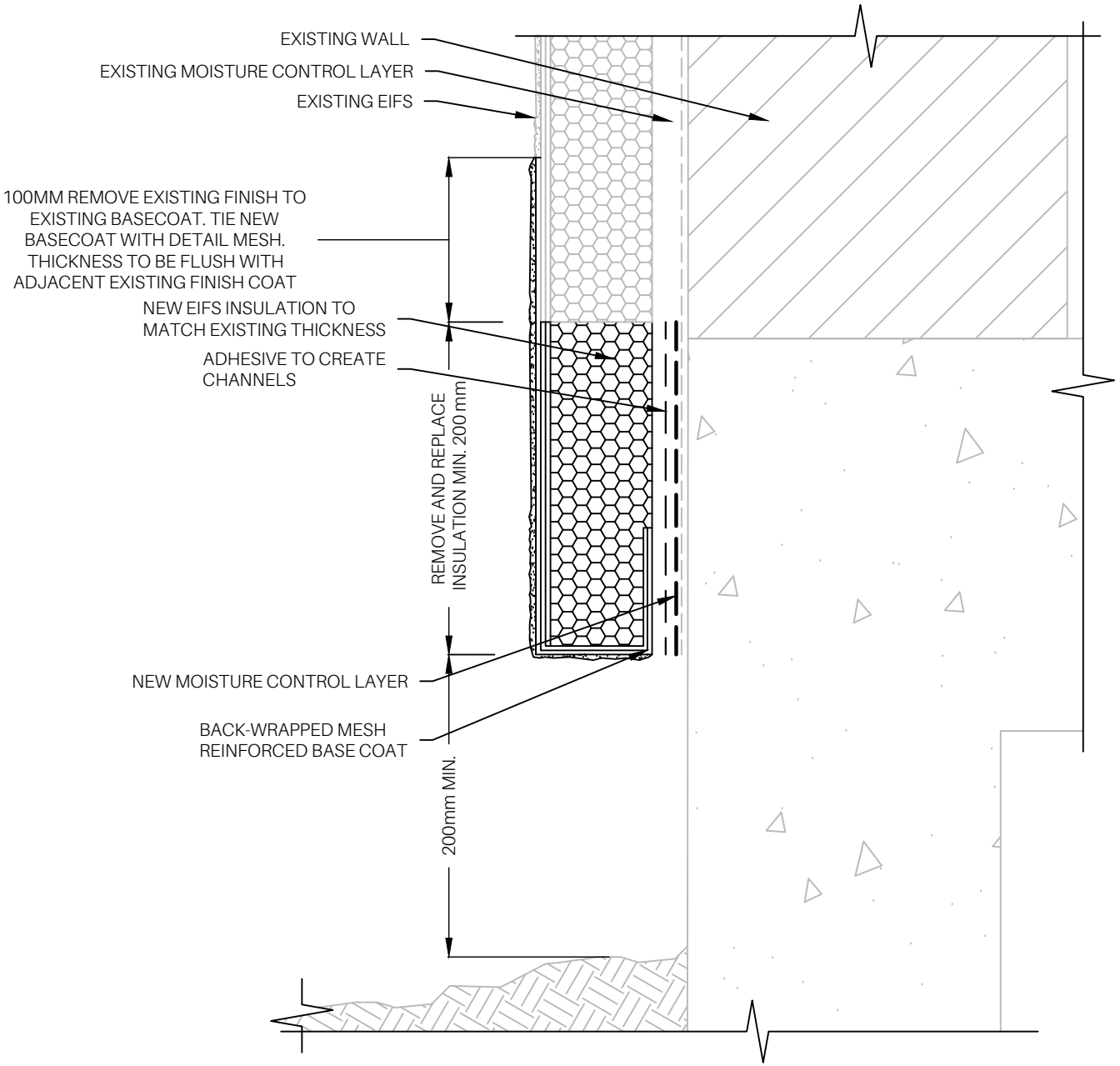
CLADDING REPAIRS

EIFS PARAPET FLASHING DETAIL

PROJECT No.		DRAWING No.
WatSCC460.1814		D-16
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	

NOTES:

1. REPORT AND DISCREPANCY BETWEEN DETAILS AND SITE CONDITIONS TO THE CONSULTANT IMMEDIATELY.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.



NOTES:

1. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
2. SPRAY FOAM GAPS BETWEEN EPS GREATER THAN 1.5mm
3. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED

NO.	DATE YY/MM/DD	REVISION	APPR.

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CLADDING REPAIRS

EIFS AT GRADE DETAIL

PROJECT No.		DRAWING No.
WatSCC460.1814		D-17
CHECKED BY: SNN	DRAWN BY: AJW	
DATE: 20/06/23	SCALE: NTS	

BUILDING ENVELOPE
Flat Roofs, Sloped Roofs & Attics
Precast Concrete Panels, Vinyl Siding & Metal Cladding
Masonry, Stucco, Exterior Insulation
& Finish Systems (EIFS)
Windows, Window-Wall, Curtain Walls
Air & Water Leaks
Thermal Modelling, IR Thermography,
& Building Energy Modelling
Construction Monitoring

STRUCTURAL RESTORATION
Balconies, Parking Garages
Foundation Walls
Waterproofing
Post-Tensioned Concrete Structures
Pretensioned Precast Concrete Structures
Asphalt Pavement
Structural Design
Building Alterations & Additions
Structural Capacity Check & Strengthening

CAPITAL PLANNING
Property & Building Condition Assessments
Pre-Purchase & Vendor Reports
Refinance Inspections
Reserve Fund Studies & Capital Plans
Performance Audits & Resolution

MECHANICAL & ELECTRICAL
Heating, Ventilation, Cooling
Domestic Hot and Cold-Water Plumbing
Boilers, Chillers and Pumps
Roof Top Units, Heat Recovery Units and Solar Systems
Storm and Sanitary Sewer Systems
Lighting
Emergency Generators

GREATER TORONTO

GOLDEN HORSESHOE

GRAND RIVER

SOUTHWESTERN ONTARIO


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