149-151 Ontario Street, Kitchener

Temporary Protection Plan including Demolition and Stabilization Plan, Structural Assessment Report and Risk Management Plan

Project Location:
149-151 Ontario Street, Kitchener, ON

Prepared for:
LMC Limited Partnership
66 Bond Street
Kitchener, ON N2H 4S5

Prepared by:
MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, ON N2B 3X9

November 23, 2023

MTE File No.: 50855-100

Engineers, Scientists, Surveyors.

Contents

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Executive Summary

MTE Consultants Inc. has been retained by LMC Limited Partnership to prepare a Temporary Protection Plan for the existing building at 149-151 Ontario Street, Kitchener. This plan also includes a Demolition and Stabilization Plan along with a Structural Assessment Report and Risk Mitigation Plan. The subject property is a two-storey residence that was built c. 1876. The property owner desires to redevelop the site and proposes a new 27 storey mixed use residential tower. The Heritage Impact Assessment, prepared by LHC Heritage, outlines the plan to preserve two portions of the façade of the existing building by incorporating them into the design of the new development. This Temporary Protection Plan is intended to show the means by which the heritage resources of the building will be preserved and maintained through the construction of the new development.

This plan outlines the means and methods by which these heritage resources, in the form of the existing front and right side facades, shall be preserved through the process of the demolition of the remaining building and protected and stabilized during the construction of the new development. Protecting and shoring the structure in place during the construction of the new development is the method that has been chosen. This report elaborates on how this method shall be carried out while preserving the heritage resources of the existing building.

Owner Contact Information

Melissa Carter
melissac@lmcproperties.ca
LMC Limited Partnership
66 Bond Street
Kitchener, ON N2H 4S5

Existing Conditions

The subject property is a two-storey residence located at 149-151 Ontario Street in Kitchener, Ontario. The original building was built in c. 1876 and has later additions at the rear. The structure is a combination of load bearing brick masonry and wood framing. Existing foundations consist of both clay brick and rubble stone walls. It is the intent of the proposed development to preserve the front (west) brick façade and part of the right-side (south) brick façade of the building and incorporate them into the new structure. These two walls that are being preserved were found to be of double wythe masonry construction. The walls were found to be in mostly serviceable condition; however, local damage was noted in several localized areas. The bricks at the base of the front porch showed significant damage, most likely to long exposure to de-icing salts. In addition, several bricks had holes drilled in them over the years for the installation of various appendages. In 2022, there was a fire in the structure which damaged some of the wood framing. This damage has been repaired to make the structure sound. Other than staining with soot, the bricks do not appear to be significantly impacted by the fire. It is concluded that the existing façades (west and south) are adequate to sustain the construction and renovation work required for this development.

Temporary Protection Plan

It is the intent of the conservation plan to protect and shore the front and partial right façade of the building in place during the demolition of the remaining structure and the construction of the new structure. The existing facades will be incorporated into the new development and stabilized by the new structure.

- The new development requires new foundations that will be below the elevation of the existing building foundations. Shoring the façade in place will necessitate the need for underpinning of the entire existing façade to remain. This underpinning will consist installation of new concrete footings below the existing rubble foundation that extend down to the elevation of the new building foundations. This underpinning conflicts with and complicates the construction of the new development's foundations, and therefore will need to be removed for the construction of the new foundations. Once the partial demolition of the house is completed, the façade will need to be re-supported on helical piles which will allow for the construction of the new foundations while still in place. It should be noted that the helical piles cannot be installed until the partial demolition is complete and therefore both underpinning and helical piles are required in a two stage process of supporting the façade. Once the new foundations are in place the wall can be supported on a new cast in place concrete wall and the helical piles can be removed.
- Shoring the building facades in place also will require the use of temporary shoring towers installed to laterally brace the facades while the remainder of the existing house is removed and until the new support structure is completed. These shoring towers will interfere with the new construction that would occur below them, and therefore the new foundation needs to be partially installed prior to the shoring towers being erected.
- As the existing façade will be present on an active construction site, there is risk damage from collision with construction equipment. It is therefore recommended that the entire shored façade be wrapped in hoarding to protect it from impact. This hoarding shall consist of a layer of extruded polystyrene insulation encased in waterproofed plywood sheathing.
- The design of the shoring and design of the new structure have taken into consideration the need to minimize vibration on the site. Helical piles have been chosen to support the façade as they can be installed with minimal vibration. The new structure's foundation is designed as a raft slab which can be installed via standard excavation techniques and pouring of concrete without any significant vibratory methods.

Figures 1-3 have been prepared illustrating the elements of this plan and are included as an appendix to this report. In addition, the following items highlight the requirements of this plan.

1. Shoring and demolition shall be performed per the requirements of the contract documents to be prepared by the design team and submitted for building permit.
2. Shoring and demolition shall be performed under the direction of both a professional engineer and the Heritage Professional.
3. The existing facade shall be protected from impact from the new construction and from weather by encasing it in waterproofed 19mm plywood over 50mm of Styrofoam insulation.
4. At the joint between the façade to remain and the brick to be demolished, saw-cutting the brick shall not be permitted. An experience heritage mason shall be retained to perform the removal at this joint. Toothed bricks shall be removed by hand and replaced with either appropriately sized brick salvaged from the demolished portion, or individually cut bricks.
5. At the joint between the existing wood framing and the remaining façade, the wood shall be cut locally and removed from the brick by hand. Any voids created in the removal of wood framing shall be filled with appropriate grout.
6. All removal of existing wood moldings, wood roof brackets and exterior doors shall be conducted with hand tools and kept intact.

7. All brick from the demolished portion of the building shall be salvaged and retained in a secure manner. Brick shall be covered and protected from weather. Brick shall be segregated between sound and unsound brick. Bricks from additions shall be kept separate from the brick from the original construction. Brick that is not reused or incorporated into the new development, per OP Policy 12.C.1.32, shall be offered to the City of Kitchener for reuse, archival, display, or commemorative purposes. Specific details of the brick storage shall be included in the Salvage and Documentation Plan.

Demolition and Stabilization Plan

Based on the direction provided above, the demolition and stabilization shall be conducted according to the plan outlined below. This plan consists of many steps, which are also illustrated in Figure 2.

A. Concrete underpinning shall be installed under the existing rubble foundation down to the elevation of the new structure's underside of footings. Underpinning shall be installed in stages such that not more than one metre of the existing foundation wall shall be undermined at one time. The underpinning shall be the responsibility of the General Contractor.

B. Perimeter earth retention shoring shall be installed on the north and west property lines of the site to allow for excavation. Driving of piles or sheet piles shall not be permitted in the installation of this shoring, and as such, shoring shall be installed using augured and grouted soldier piles (soldier piles and lagging) or drilled caissons (caisson wall). This shall be the responsibility of the earth retention shoring contractor.

C. Excavation shall occur between the underpinning and the earth retention shoring down to the elevation of the bottom of the proposed new footings with temporary bracing installed to brace underpinned foundations. This shall be the responsibility of the General Contractor.

D. New building foundations shall be installed along a two metre strip running parallel to the existing façade foundations. These foundations shall be designed to support both the temporary façade supports and the final building loads. These footings shall be the responsibility of the General Contractor.

E. Shoring towers shall be erected on top of the new building foundations. These shoring towers shall be designed by a Professional Engineer and submitted for Building Permit. Design and installation of the shoring towers is the responsibility of the building shoring contractor.

F. The existing brick façade shall be tied back to the shoring towers and temporary bracing noted in Item C can be removed. This is the responsibility of the building shoring contractor. See Detail 1 on Figure 3.

G. Partial demolition of the existing house shall occur with the removal of all of the superstructure leaving the remaining façade and the existing foundations. Demolition of all elements attached to the remaining façade shall be conducted by hand with small tools. See Details 2 and 3 on Figure 3. This is the responsibility of the demolition contractor.

H. A temporary protection system consisting of 19mm plywood over 50mm of Styrofoam insulation shall be installed over the brick façade. See Detail 4 on Figure 3. This is the responsibility of the General Contractor.

I. A helical pile support system shall be installed supporting the façade at the level of the bottom of the existing brick. Piles are to be drilled into soil and not driven. Support system to be designed to support full weight of brick façade and shall be braced to the shoring tower. See Detail 5 on Figure 3. This is the responsibility of the building shoring contractor.

J. The remainder of the site shall be excavated down to the elevation of the bottom of new footings. This is the responsibility of the General Contractor.

K. The existing rubble foundation and underpinning shall be removed. This is the responsibility of the General Contractor.

L. The remainder of the new building's foundations shall be constructed. This is the responsibility of the General Contractor.

M. A new concrete support wall shall be constructed on top of the new foundation to the underside of the brick façade. This is the responsibility of the General Contractor.

N. The helical pile support system shall be cut and removed. See Detail 5 on Figure 3. This is the responsibility of the building shoring contractor.

O. Construction of the new structure shall commence up to the level of the third floor. This is the responsibility of the General Contractor.

P. The façade shall be tied back to the new building structure. This shall consist of a steel back-up frame behind the brick façade that is anchored to the new concrete structure. This shall be designed by the Engineer of Record and shown on the building permit drawings. See Detail 7 on Figure 3. This is the responsibility of the General Contractor.

Q. The shoring towers shall be removed. This is the responsibility of the building shoring contractor.

R. Construction of the remainder of the new building shall continue. This is the responsibility of the General Contractor.

S. The brick protection shall remain in place for the duration of construction. This is the responsibility of the General Contractor.

Structural Assessment Report

The structural assessment of façade is intimately tied to the demolition and stabilization of the facade. The plan outlined above shows the means and methods to be used to safely remove portion of the existing building in order to avoid causing structural damage to the historical portions to remain. The brick assessment report, previously submitted as part of the Heritage Conservation Plan, provides evidence that the existing condition of the brick is such that the work proposed can be carried out with causing any further deterioration to the brick façade. When the proposed plans and assessments are reviewed together, it is concluded that the overall plan is structurally adequate to maintain the heritage resources of the property.

Risk Management Plan

The Demolition and Stabilization Plan has been developed with the intent to minimize vibration to the property during construction. In addition, the design of new structure has been restricted so that the means and methods of construction employed on the construction on the new development should minimize vibration. Some of these mitigation means are noted below.

- Earth retention shoring shall be design using drilled or augured piles such that pile driving is not required.
- Temporary building shoring shall utilize helical screw piles such that pile driving is not required.
- New foundations consist of a raft footing on native soil to minimize the need for vibratory compaction of soil.
- The majority of the tower is constructed using precast concrete where fabrication takes place off site.

Report Preparer

This report has been authored by Kurt Ruhland, P.Eng., CAHP. Kurt has been a professional structural consulting engineer in the building industry for over 30 years and a member of the Canadian Association of Heritage Professionals (CAHP) since 2016. Kurt has been involved in the structural restoration of dozens of designated and non-designated heritage building across Southern Onterio. Notable projects include the Elora Mill restoration in Elora, the restoration of Devereaux House in Halton Hills and the renovation of Creelman Hall at the University of Guelph.

Conclusion

It is understood that it is intended to redevelop that property at 149-151 Ontario Street in Kitchener, Ontario with a new 27 storey mixed use residential tower. The property presently contains a two-storey residential building that was built c. 1876 that contains heritage value. It is proposed to preserve this heritage by inclusion of the portions of the building façade into the new development. It is proposed that this be accomplished by the shoring the structure in place during construction of the new development. This report provides the plans outlining the means and methods by which this is to occur.

All of which is respectfully submitted,

MTE Consultants Inc.

Kurt Ruhland, P.Eng., CAHP
Vice President
519-743-6500 ext. 1236
kruhland@mte85.com

KUR:smk
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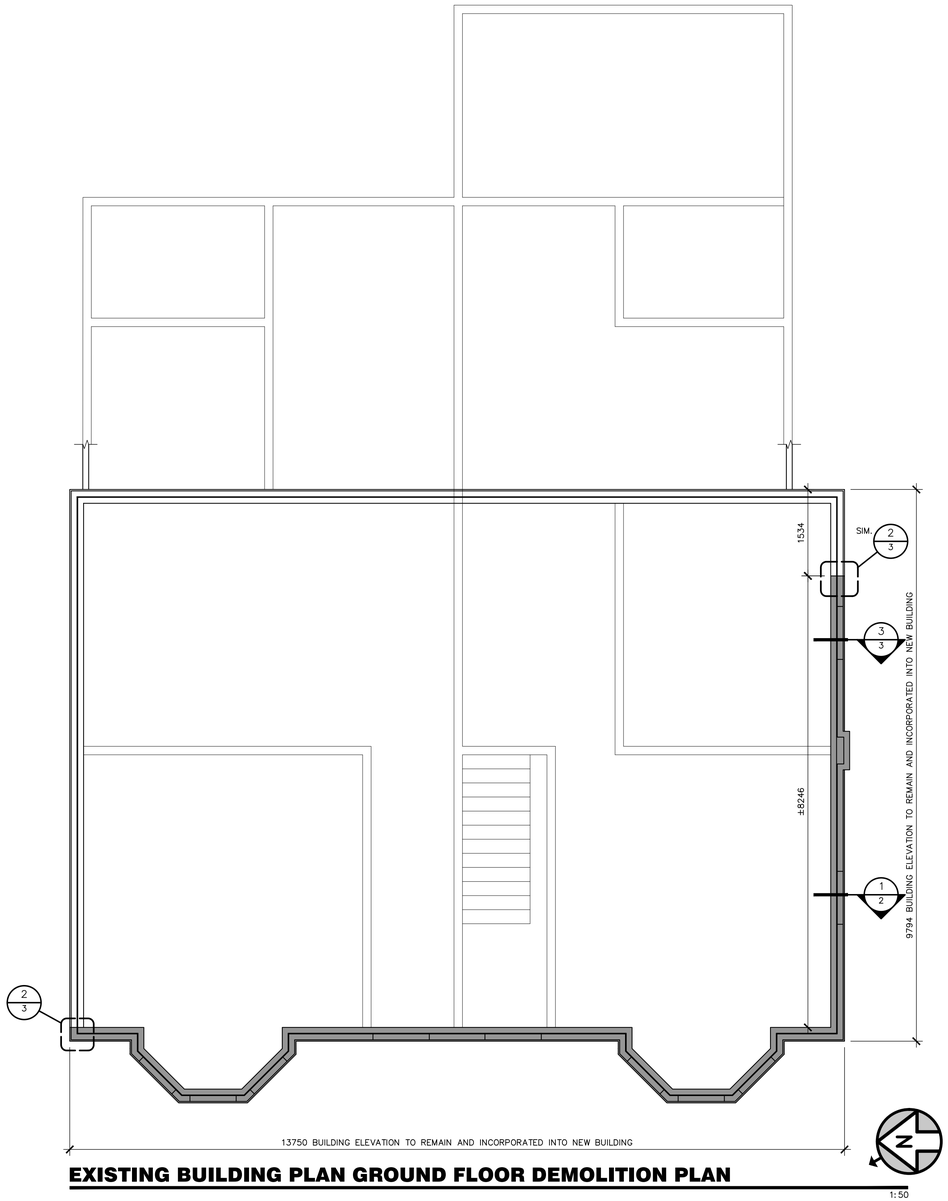
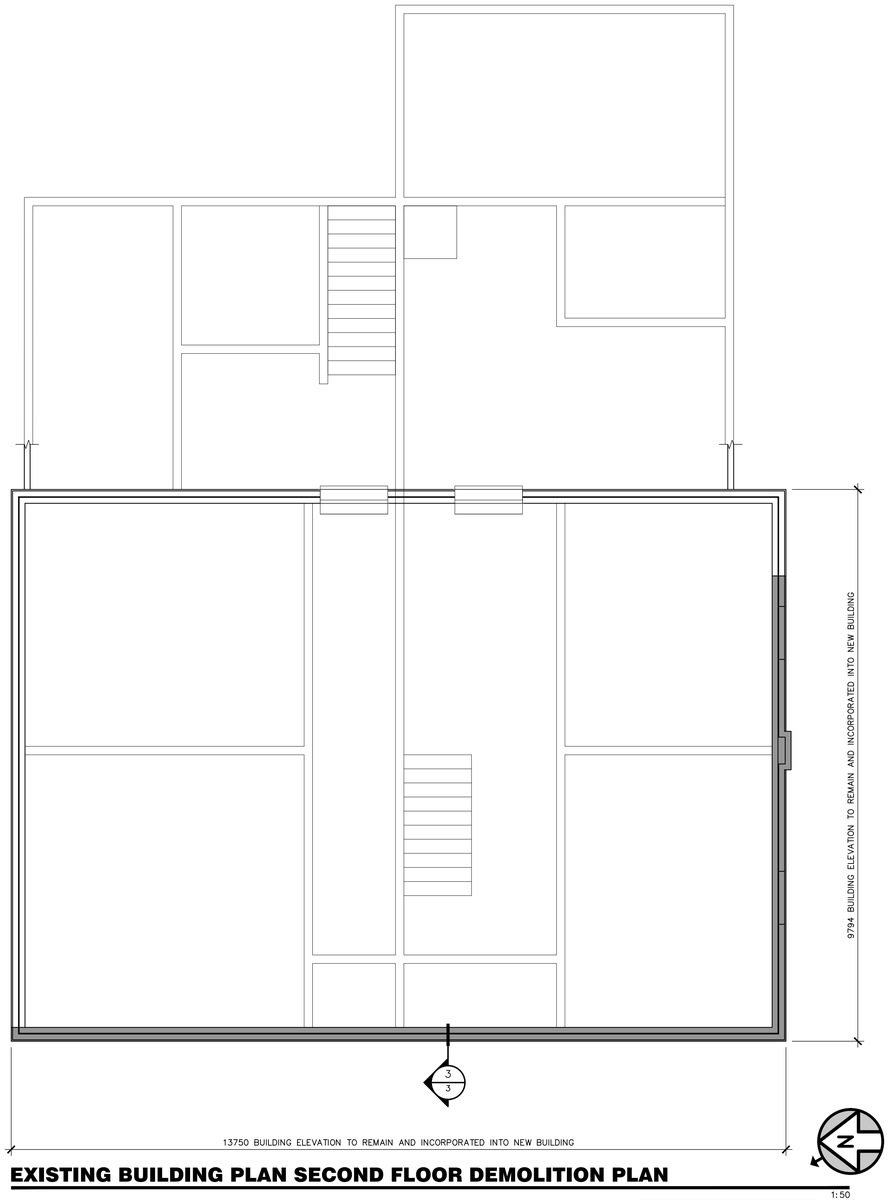
Figures

MTE FILE No. 50855-100-Figure 1
DEMOLITION STABILIZATION AND TEMPORARY PROTECTION PLAN ---- ----
P:\P\50855\100\Existing House\50855-100-S.dwg



EXISTING BUILDING PLAN GROUND FLOOR DEMOLITION PLAN

1:50



EXISTING BUILDING PLAN SECOND FLOOR DEMOLITION PLAN

1:50

NOTE:

- HIGHLIGHTED WALLS SHALL REMAIN
- REMAINDER OF STRUCTURE TO BE DEMOLISHED
- CARE TO BE TAKEN SO THAT DAMAGE TO REMAINING WALLS DOES NOT OCCUR DURING DEMOLITION

NOTE: CONSERVATION PLANS ARE FOR CONCEPT AND APPROVAL ONLY, NOT FOR CONTRACTOR USE. CONTRACTOR TO PROCEED ONLY PER CONTRACT DOCUMENTS

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519-743-6500

OWNER
LMC LIMITED PARTNERSHIP

PROJECT
MIXED USE DEVELOPMENT
151 ONTARIO STREET KITCHENER, ON

DRAWING
DEMOLITION STABILIZATION AND TEMPORARY PROTECTION PLAN

Project Manager KUR	Date APR. 2023
Design By KUR	Project No. 50855-100
Drawn By MWK	Figure No. 1
Scale 1:25	

November 23, 2023 - 4:01 PM - Printed By:Tim Steffler - ARCH Full Bleed D (36.00 X 24.00 Inches)

MTE FILE No. 50855-100-Figure 2
---- ---- WALL SECTION ---- ----
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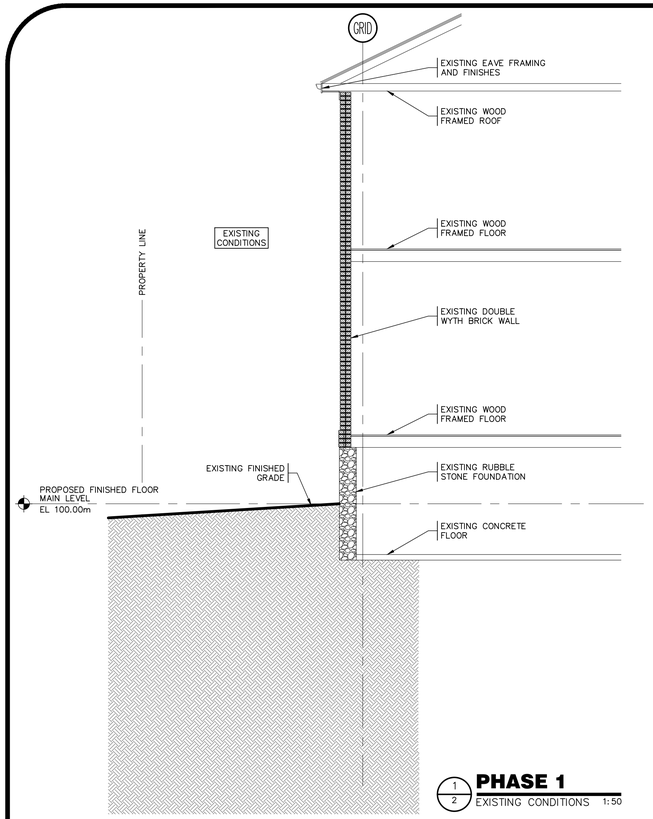
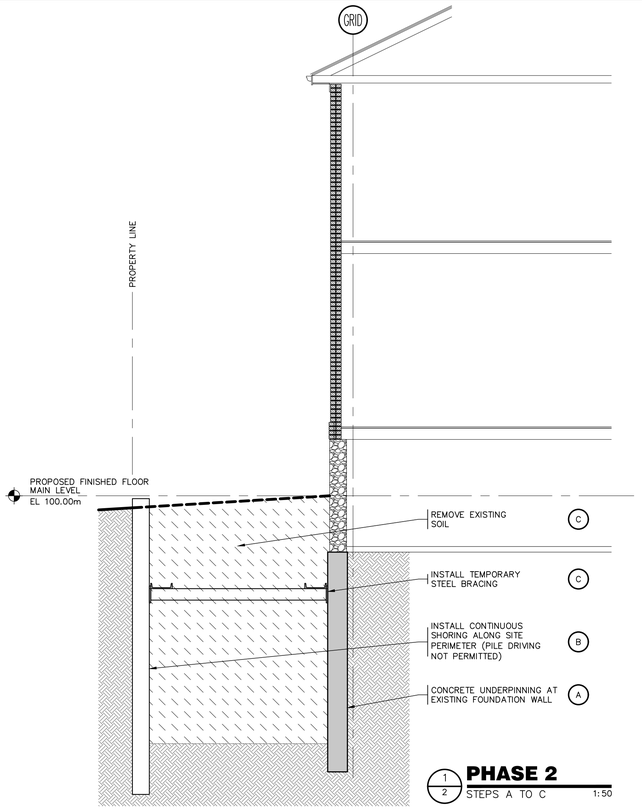
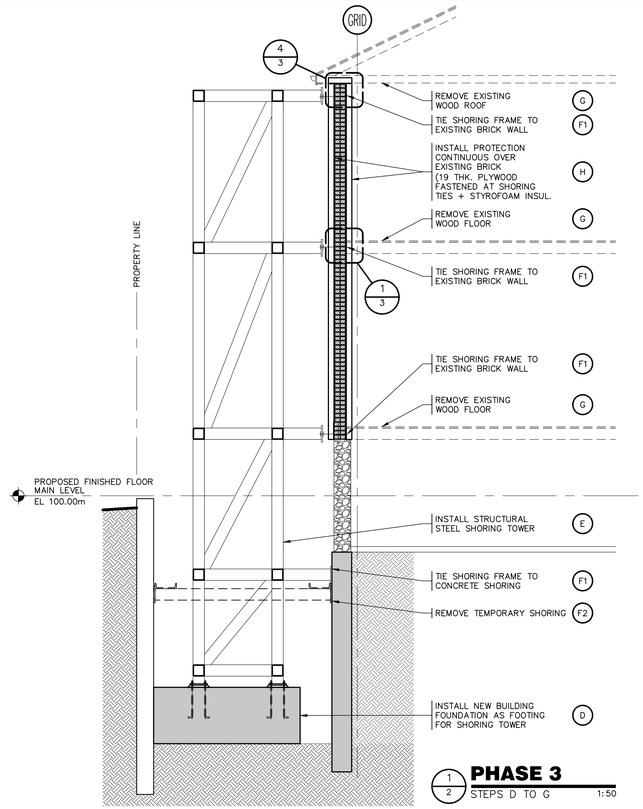


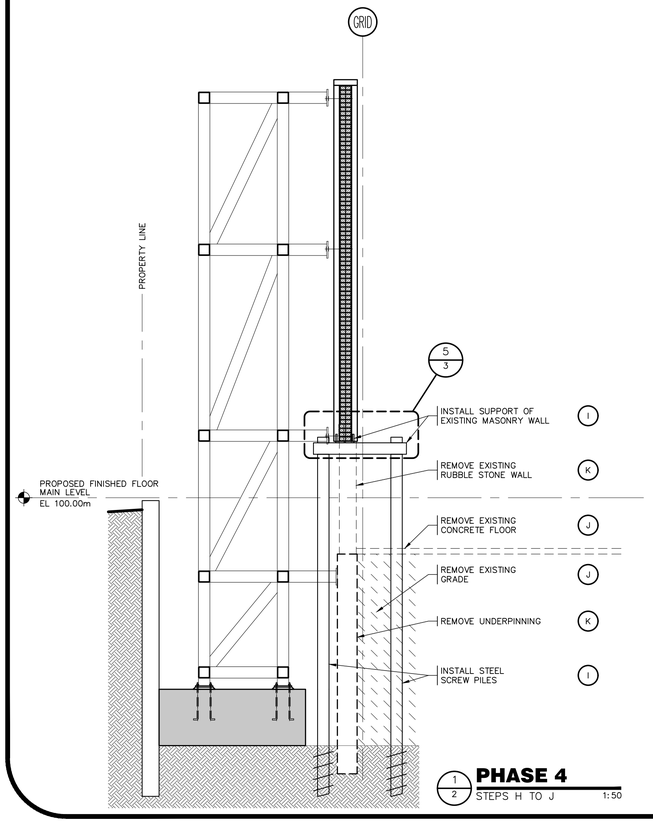
1/2 **PHASE 1**
EXISTING CONDITIONS 1:50



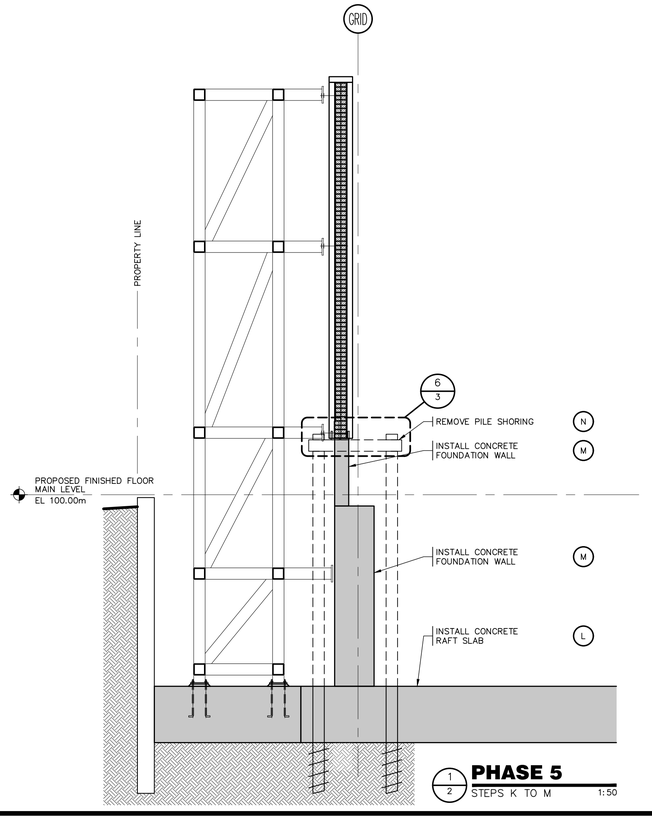
1/2 **PHASE 2**
STEPS A TO C 1:50



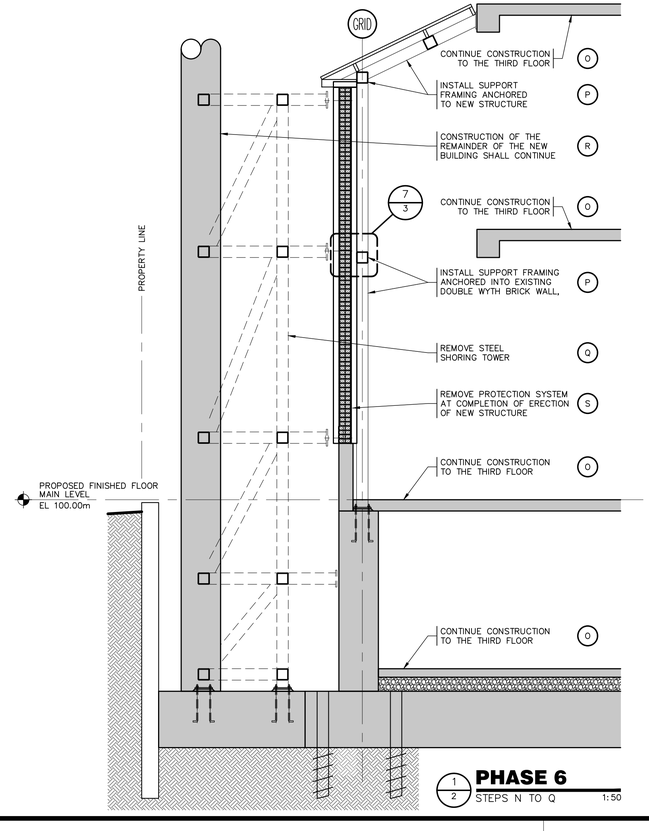
1/2 **PHASE 3**
STEPS D TO G 1:50



1/2 **PHASE 4**
STEPS H TO J 1:50



1/2 **PHASE 5**
STEPS K TO M 1:50



1/2 **PHASE 6**
STEPS N TO Q 1:50

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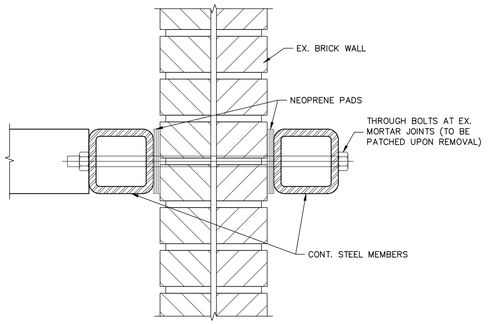
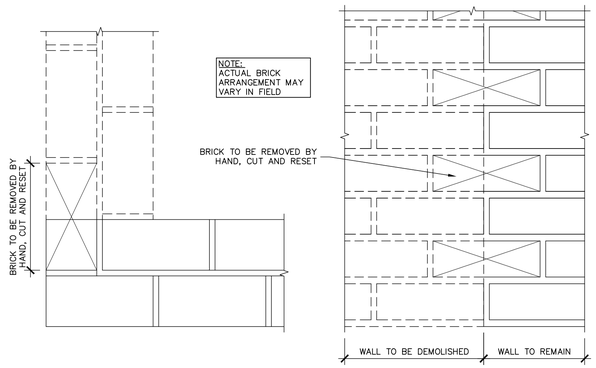
MIXED USE DEVELOPMENT
151 ONTARIO STREET KITCHENER, ON

DRAWING
WALL SECTION

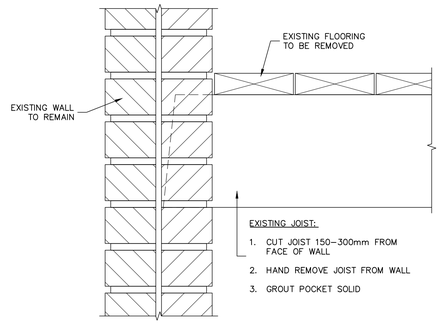
Project Manager KUR	Date APR. 2023
Design By KUR	Project No. 50855-100
Drawn By MWK	Figure No. 2
Scale 1:25	



1/S3 **DETAIL**
STRUCTURE TIES TO SHORING TOWERS 1:5



2/S3 **DETAIL**
BRICK REMOVAL 1:5



3/S3 **DETAIL**
JOIST REMOVAL 1:5

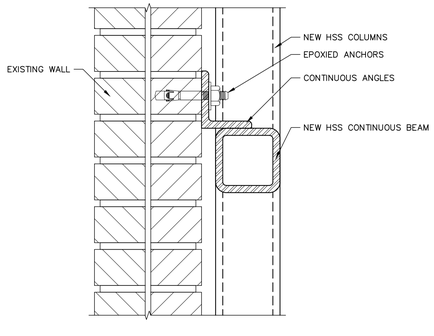
4/S3 **DETAIL**
PARAPET PROTECTION 1:5

PROCEDURE:
1. HAND CUT GROOVES AND INSTALL SUPPORT ANGLES IN PIECES
2. CUT POCKETS AND INSTALL SUPPORT BEAMS
3. ANCHOR SUPPORT BEAMS TO PILES
4. BRACES SUPPORTS TO SHORING TOWERS
5. REMOVE WALL BELOW

5/S3 **DETAIL**
WALL SUPPORT 1:5

PROCEDURE:
1. POUR NEW CONCRETE WALL TO UNDERSIDE OF ANGLES LEAVING POCKETS AT SUPPORT BEAMS
2. REMOVE ANGLES IN PIECES, WHILE DRY PACKING VOIDS
3. REMOVE SUPPORT BEAMS
4. GROUT POCKETS SOLID

6/S3 **DETAIL**
NEW CONCRETE WALL 1:5



7/S3 **DETAIL**
EXISTING WALL TIE INTO NEW STRUCTURE 1:5

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Scale: 1:25	