



316 KING STREET NORTH

Functional Servicing Report

Project Location:

316 King Street North
Waterloo, Ontario

Prepared for:

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1.0 INTRODUCTION

MTE Consultants Inc. was retained by Masri O Inc. Architects, on behalf of the property owner, to complete a Functional Servicing Report for the redevelopment of 316 King Street North (herein referred to as 'the Site') in the City of Waterloo in support of the Zoning By-Law Amendment Application.

The Site is located approximately 100 metres north of the intersection of King Street North and Hickory Street East. The property is bounded to the north, south and east by existing residential dwellings and to the west by King Street North. For the exact location of the Site refer to Figure 1.0.

The proposed development for the Site is the renovation of the existing 10 storey residential building, construction of a commercial building and parking structure south of the existing building, and construction of a 15 storey mixed use building north of the existing building. One level of underground parking will span the majority of the site area.

The purpose of this report is to document the opportunities and constraints for the subject property with respect to servicing, grading and stormwater management in support of the Zoning By-Law Amendment Application. Pending approval of the Zoning By-Law Amendment application, detailed design of the Site will commence and be submitted to the City in support of Site Plan Approval.

2.0 EXISTING CONDITIONS

2.1 Existing Topography

The Site encompasses an area of 0.275 ha and currently comprises of a 10 storey residential building with one level of underground parking. There are two existing driveway accesses onto King Street North and a drive aisle with surface parking around the building. In the existing condition, the Site falls from north to south, with a two metre elevation difference between the north and south property lines. The majority of surface runoff from the Site is captured by the storm structures in the existing parking lot.

2.2 Existing Servicing

2.2.1 Water

The existing residential building is serviced by a 150 mm water service connecting to the 150 mm diameter municipal watermain on the west side of King Street North. There is also a 400 mm Regional watermain that runs along the west side of King Street North. The closest municipal fire hydrant is located in the King Street North right-of-way, across from the northwest corner of the Site.



FIGURE 1.0 Date: APR.12/18
Scale: N.T.S.

**316 KING STREET
NORTH
LOCATION
PLAN**



Engineers | Scientists | Surveyors

2.2.2 Sanitary

The existing residential building is serviced by a 150 mm diameter sanitary service that connects to the 225 mm diameter sanitary sewer on King Street North which drains towards the south. There are two existing sanitary manholes fronting the Site, both approximately 2.3 m deep. The existing residential building connects into the manhole further downstream. There is an existing sanitary service stub of unknown size in front of the proposed residential building on the north side of the Site.

2.2.3 Storm

There is an existing 450 mm diameter municipal storm sewer on King Street North that upsizes to a 525 mm storm sewer at the storm manhole across from the Site's north driveway access. The storm sewer drains to the south. The existing residential building has a storm service of unknown size that connects to a catchbasin on King Street North in front of the Site's north driveway access. This catchbasin is approximately 1.6 m deep and is connected to the previously mentioned municipal manhole by a 250 mm storm sewer. A second municipal storm manhole, located further downstream, was installed as part of a previous redevelopment of the Site. This manhole is approximately 1.7 m deep. The storm sewer system for the existing parking lot and drive aisles connects into this manhole with a 250 mm storm sewer at the southwest corner of the Site.

3.0 PROPOSED GRADING AND SERVICING STRATEGY

Preliminary grading and servicing strategies for the proposed development have been developed based on plan and profile information as well as the Conceptual Site Plan prepared by Masri O Inc. Architects, dated February 2, 2018.

3.1 Proposed Grading

The proposed development will include the construction of a second residential building with one level of underground parking north of the existing residential building and a two-level parking structure with commercial units facing King Street to the south of the existing building. The majority of the Site will be covered with underground parking. The proposed grading strategy will respect the existing grades along all property lines and provide barrier free access from King Street North to the principal entrances to all buildings.

3.2 Proposed Servicing

3.2.1 Water

The proposed building will be serviced by the existing 150 mm diameter watermain. The 150 mm diameter service enters the existing parking garage in the location of the existing mechanical room and will be connected to the two proposed buildings internally. Refer to Figure 2.0 for a sketch of the conceptual servicing design. It is anticipated that the existing municipal hydrant will be able to service the development. Water modeling results for the available flow and pressure within the 150mm diameter municipal watermain on King Street North has been requested from the Region of Waterloo to ensure the proposed development can be supported by the existing infrastructure. If required, a water distribution report and fire flow analysis will be completed at the detailed design stage to ensure that adequate flow and pressure is available.

3.2.2 Sanitary

It is proposed that the existing residential building and the new commercial building use the existing 150 mm diameter connection to the municipal sanitary sewer. Due to the location of the existing hydro transformer in front of the existing building, it is proposed that the new residential building be serviced by a 200mm diameter sanitary sewer connected to the upstream municipal manhole. The existing service stub in front of the proposed building is to be used if it is of adequate size, depth and condition. The private sanitary sewers are to be installed at a slope that provides depth for the servicing of the buildings while maintaining adequate capacity. The service sizes and inverts will be confirmed at detailed design.

3.2.3 Storm

A private storm sewer system will be installed on-site to collect rooftop runoff and runoff from the exposed driveway and parking areas. The runoff collected in the storm sewers will outlet through the existing 250 mm storm service at the south end of the Site. Runoff from the frontage of the property will flow towards the King Street North right-of-way.

4.0 CONCEPTUAL STORM WATER MANAGEMENT DESIGN

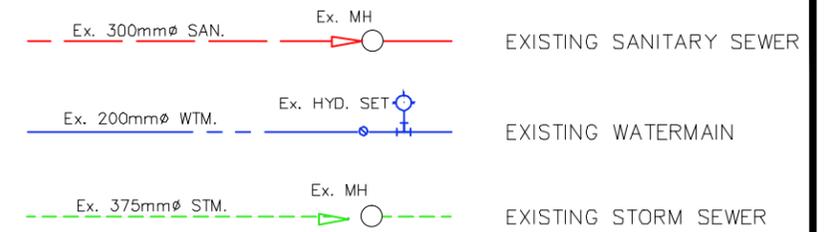
4.1 SWM Criteria

The stormwater management design criteria for the subject site, as established by the City of Waterloo, are as follows:

- i) Attenuation of the post-development peak flows for the 2,5 and 100 year storm event to the pre-development peak flow; and
- ii) Implementation of Normal (level 2) water quality controls.



LEGEND OF EXISTING FEATURES



LEGEND OF PROPOSED FEATURES

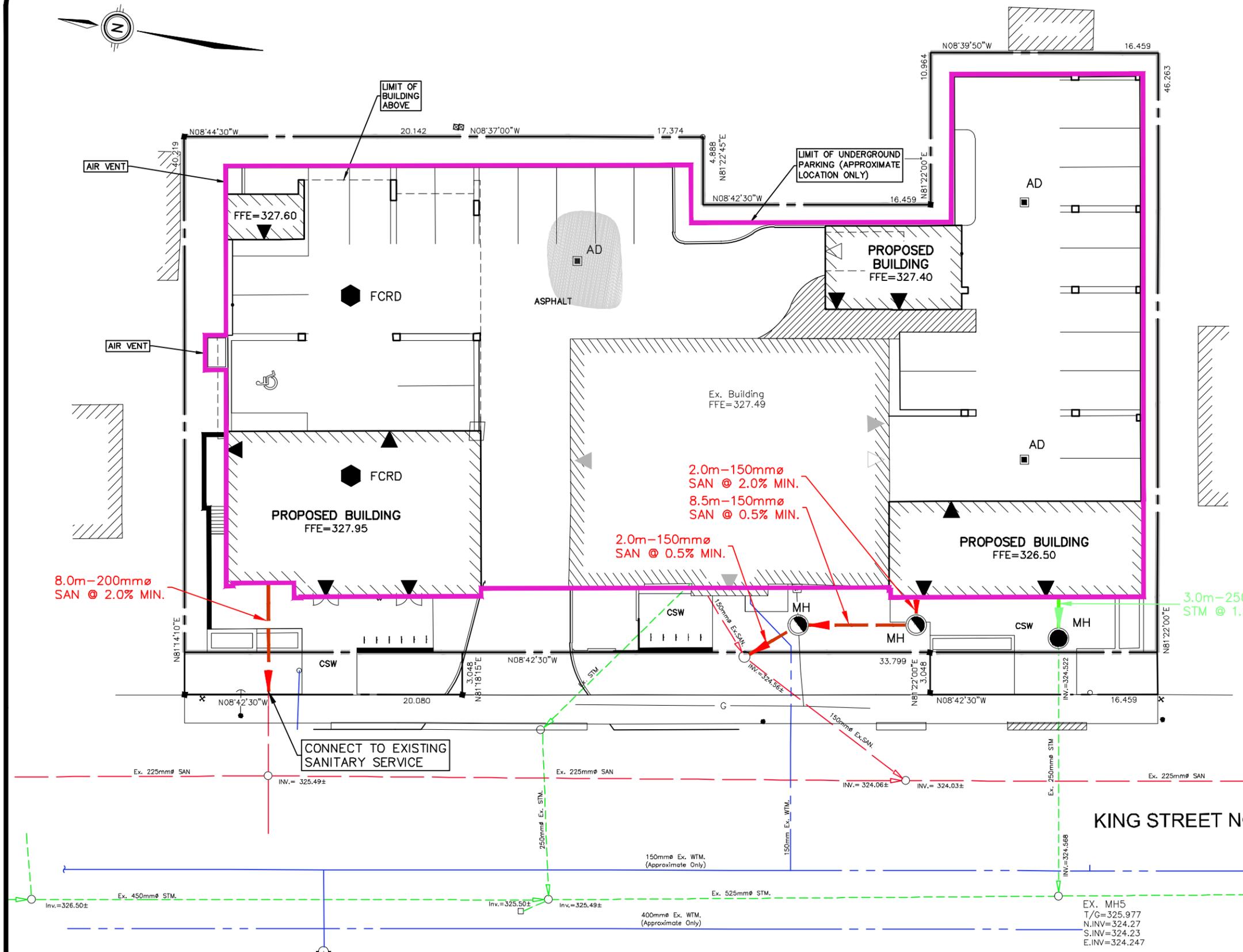
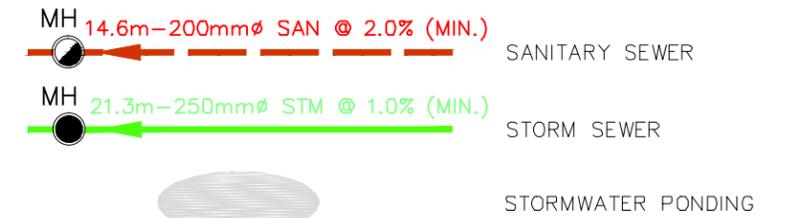


FIGURE 2.0 Date: APR.12/18
Scale: 1:300

**CONCEPTUAL SITE
SERVICING PLAN**

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4.2 Water Quantity Control

The existing conditions for modelling the pre-development peak flow were taken from the MTE Stormwater Management Report approved by the City of Waterloo May 23, 2012. The pre-development peak flows for the 2, 5 and 100 year storm are 0.046 m³/s, 0.065 m³/s, and 0.124 m³/s, respectively. The proposed development presents an increase in the overall imperviousness of the Site. Runoff from the increased impervious area will need to be attenuated to reduce post development peak flows to pre-development rates. Water quantity requirements for the Site can be achieved by utilizing flow control roof drains on the new residential building. Area drains will be installed on exposed paved surfaces and ponding will be available in the surface level parking area. Runoff generated from the rooftops, parking deck and exposed surface level parking will be conveyed to a manhole in front of the commercial building entrance. The flow will then be conveyed to the King Street North municipal storm sewer by the existing 250 mm diameter service. The pipe will restrict the post development flow to 0.038 m³/s, 0.054 m³/s and 0.103 m³/s for the 2, 5 and 100 year storms.

4.3 Water Quality Control

In the existing condition, the residential building is surrounded by an asphalt drive aisle and parking spaces located along the north, east and south property lines. The existing area of exposed asphalt is 1525 m². In the proposed condition, part of the parking will be covered by the building with approximately 500 m² of exposed asphalt at grade and 450 m² of exposed asphalt in the upper parking level that will produce "dirty" stormwater. In order to control the water quality to Normal (level 2), it is proposed the storm manhole in front of the commercial building entrance be fitted with a snout to prevent debris from entering the storm system. A minimum sump of 500 mm will be required on the manhole to reduce the amount of sediment entering the storm system.

4.4 Erosion & Sediment Control

In order to minimize the effects of erosion during the grading of the site, sediment control fencing will be installed around the perimeter of the Site and around any stockpiles and catchbasins during construction. Any sediment that is tracked onto the road way during the course of construction will be cleaned by the contractor. These measures will be shown on the detailed design drawings.

5.0 CONCLUSIONS

Based on the foregoing analysis, it is concluded that:

- i) Existing municipal infrastructure for water, sanitary and storm is available along King Street North.
- ii) The existing 150 mm diameter water service connection off of King Street North will service the proposed development. The existing municipal hydrant will likely provide fire flow coverage to all of the proposed and existing buildings. If required, a detailed water distribution analysis will be completed at the detailed design stage.
- iii) A 200 mm diameter sanitary service connection off of King Street North will service the proposed new residential building. The existing building and commercial building will be serviced by the existing 150 mm diameter service off of King Street North.
- iv) The stormwater quantity criteria can be achieved by installed FCRD's on the proposed residential building and providing ponding in the exposed surface parking.
- v) The amount of exposed asphalt is reduced in the post development condition and a snout is proposed to improve the quality of runoff from the Site.
- vi) Additional grading, servicing and storm water management details will be provided during detailed design.

All of which is respectfully submitted,

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