FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT STUDY REPORT

FOR

PROPOSED PLACE OF WORSHIP-MOSQUE DEVELOPMENT AT

12662 TENTH LINE, WHITCHURCH, STOUFFVILLE, ON

September 04, 2026

(Project n2271)

Prepared by:

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REFERENCE:

1. SITE PLAN CONCEPT of Proposed Development at 12662 Tenth Line, Whitchurch, Stouffville, Ontario, prepared by n Architecture Inc.
2. Design Guidelines and Standard Drawings –Town of Whitchurch-Stouffville, January 2023
3. MOECC Stormwater Management Planning and Design Manual (SWMPD Manual)
4. MTO Drainage Management Manual
5. As built information of underground utilities obtain from the Town's website

1.0 INTRODUCTION

n Engineering Inc. was retained by owner to study functional servicing and stormwater management for the proposed place of worship –mosque development. Based on available information obtained for the architect the development project proposed to develop a 2 storey mosque building with a parking lot. Functional servicing and stormwater management to be studied for the proposed development will be estimated based on Town of Witchurch- Stouffville Design Guideline and standard drawings, MOECP guidelines and all other authorities of Jurisdiction guidelines and presented.

2.0 STUDY AREA

The nearest major intersection to the site is Tenth Line and Bethesda Side Rd. The municipal address of the site is 12662 Tenth Line, Whitchurch, Stouffville, Ontario.

Figure 1 – Rendered Concept Plan

3.0 EXISTING SITE

Existing site consists of vacant land covered with grass.

4.0 PROPOSED DEVELOPMENT

The proponent of the site proposed to develop a place of worship- mosque building with a capacity of occupant load of 586 people and parking spaces.

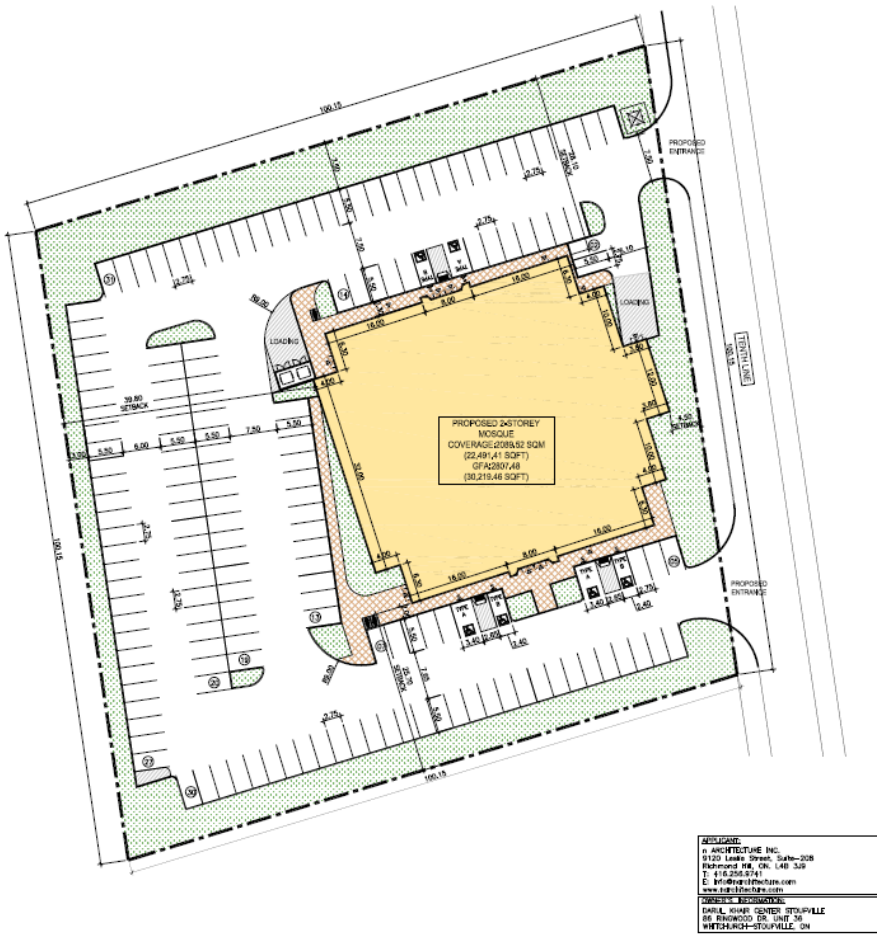

Figure 2 – Proposed Concept Plan

5.0 STORM WATER MANAGEMENT

Stormwater quantity control to be designed in accordance with the Town of Whitchurch-Stouffville Stormwater Management Guidelines. The post-development peak flow from the site to be controlled to the 2-year pre-development peak flow rate, with the stormwater management system designed to accommodate the 100-year storm event.

Stormwater quality control to be provided in accordance with the MOECC Stormwater Management Planning and Design Manual (SWMPD Manual). The proposed stormwater management measures to be designed to achieve a minimum of 80% Total Suspended Solids (TSS) removal, equivalent to an Enhanced (Level 1) protection level.

In addition, erosion and sediment control (ESC) measures for the proposed development to be assessed and designed in accordance with the methods outlined in the MTO Drainage Management Manual. Appropriate temporary erosion and sediment control measures to be implemented during construction to minimize sediment migration and protect downstream receiving systems.

6.0 SANITARY SEWAGE FLOW

As per site plan provided by n Architecture Inc. the proposed development consists of following:

1) Area of the Lot: 8392.58 m^2 = 0.84 ha
2) Building Coverage : 2089.52 m^2
3) Occupant Load : 586 persons

As per Town of Whitchurch-Stouffville Guideline, the sanitary sewage flow calculated as below:

Average Design Flow	= 28.0 m^3/ha/day
Area of Development:	=0.84 ha.
Average Demand:	=28 x 0.84 m^3/day = 23.52 m^3/day = 0.27 L/sec

Peaking factor Calculation:

Population = 586 people

Harmon's Equation

$$M = 1 + \frac{14}{4 + P^{1/2}}$$

$= 1 + (14/(4+ (586/1000)^{0.5}))$

$= 3.94 \sim 4$

Peak Demand	= 0.27 L/sec x 4= **1.08 L/sec**
Extraneous Flow	= 0.23 L/s.ha
Total Extraneous Flow	=0.23 x 0.84 m^3/day = 0.19 L/sec
Total Sanitary Demand	= Peak Demand + Extraneous Flow
	= 1.08 + 0.19
Total Sanitary Demand	**= 1.27 L/sec = 0.0013 m^3/sec**

7.0 WATER DEMAND

As per Town's design criteria – all water supply system to be designed to satisfy the following conditions:

a) Average Day Demand
b) Maximum Day Demand
c) Peak Hour Demand

Domestic Water Demand

Domestic water demand calculated as per Town of Whitchurch-Stouffville Guideline;

Average demand:	= 28 m^3/ha/day
Area of Development:	=0.84 ha.
Average Demand:	=28 x 0.84 m^3/day = 23.52 m^3/day = 0.27 L/sec
Max Day Factor	= 2.0
Maximum Hour Factor	= 3.0
Maximum Day Demand	= 0.27 L/sec x 2 = **0.54 L/sec**
Peak Hour Demand	= 0.27 L/sec x 3 = **0.81 L/sec**

Fire Water Demand

As per the Town of Whitchurch-Stouffville Guideline section E2.02, minimum fire flow required for the institutional development is **175 L/s.**

8.0 TOTAL WATER DEMAND

The Maximum Fire Flow Demand plus Peak Day Demand: 175 + 0.54 = **175.54 L/sec**
Peak Hour Demand = 0.81 L/sec

9.0 AVAILABLE SERVICES IN MUNICIPAL RIGHT-OF-WAY

According to record drawings obtained from the Town website – following servicing are available on the right of way:

1. 200mm (8 inch) diameter Sanitary Sewer on Noah's Farm Trail
2. 300mm (12 inch) diameter Water Main on Noah's Farm Trail

Above services are available to provide service connection for the proposed development.

10.0 SERVICE CONNECTION

- The storm sewer connection from the proposed development to be designed to discharge the controlled flow to the existing ditch located in front of the site along Tenth Line with the appropriate outfall protection and erosion and sediment control measures will be provided at the discharge location.

- Sanitary sewage flows from the proposed development to be conveyed under gravity. A 150 mm diameter PVC sanitary sewer service, installed at a minimum slope of 2.0%, to be be routed through the proposed easement from the development to Noah's Farm Trail. The proposed service capable of conveying a flow of up to 10.76 L/s under half-full pipe flow conditions.

- Water supply service connection proposed as below:

  1.0 **Fire Water Service:** 150mm diameter PVC connected to the existing 300mm Watermain on Noah's Farm Trail through Proposed easement.
  2.0 **Domestic Water Service:** 100mm diameter PVC connected to the existing 300mm Watermain on Noah's Farm Trail through Proposed easement.

11.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations herein are based on the information available at the time of preparation and may be subject to revision as additional detailed design information, servicing requirements, and agency comments become available.

Based on available information – Stormwater mangement, water demand and wastewater flow generation from the proposed site analysis following the design criteria of Town of Witchurch-Stouffville Design Guideline and standard drawings, MOECP guidelines and all other authorities of Jurisdiction guidelines summarized as follows:

1. 100 years Post-development flow to be controlled to 2 year pre-development flow with enhanced level 1 quality control;
2. Sanitary Sewage Flow to be approximately 1.27 L/sec;
3. Maximum water demand including fire water demand to be approximately 175.54 L/sec.
4. Fire Hydrant Flow test recommended to confirm available supply and pressure of existing 300mm water main on Noah's Farm Trail;
5. Sanitary service connection proposed to be a 150mm diameter PVC pipe at 2.0% via. easement from site to the Noah's Farm Trail
6. Fire Water Service connection proposed to be a 150mm diameter PVC SDR17 via. easement from the site to the Noah's Farm Trail;
7. Domestic Water Service connection proposed to be a 100mm diameter PVC SDR17 via. easement from the site to the Noah's Farm Trail;

Respectfully Submitted,

n Engineering Inc.

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Head of Engineering

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