

Foundation Drainage Guidelines

For general comments or suggestions, please contact:

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All application-specific inquiries should be directed to the City of Toronto, Development Review, Development Engineering (DE) case manager.

City of Toronto – Foundation
Drainage Guidelines

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Table of Contents

1.0 Introduction	1
2.0 Groundwater Monitoring Requirements.....	3
3.0 Discharge of Foundation Drainage containing Groundwater.....	6
4.0 Emergency Foundation Drainage Infrastructure	9

1.0 Introduction

1.1 Purpose

The purpose of the Foundation Drainage Guidelines (“Guidelines”) is to provide direction on the technical requirements to achieve compliance with the City of Toronto’s (“City’s”) Foundation Drainage Policy (“Policy”).

1.2 Applicability

The Guidelines are applicable to all development applications subject to the Policy and will aid applicants to determine how *Foundation Drainage* should be managed in accordance with the Policy, effective January 1, 2022 and as amended October 1, 2026.

The Guidelines are intended to support the completion of the Foundation Drainage Summary Form and its accompanying attachments that collectively constitute the Foundation Drainage Technical Brief. These documents are required as part of the complete [Application Support Materials](#) submitted for development applications.

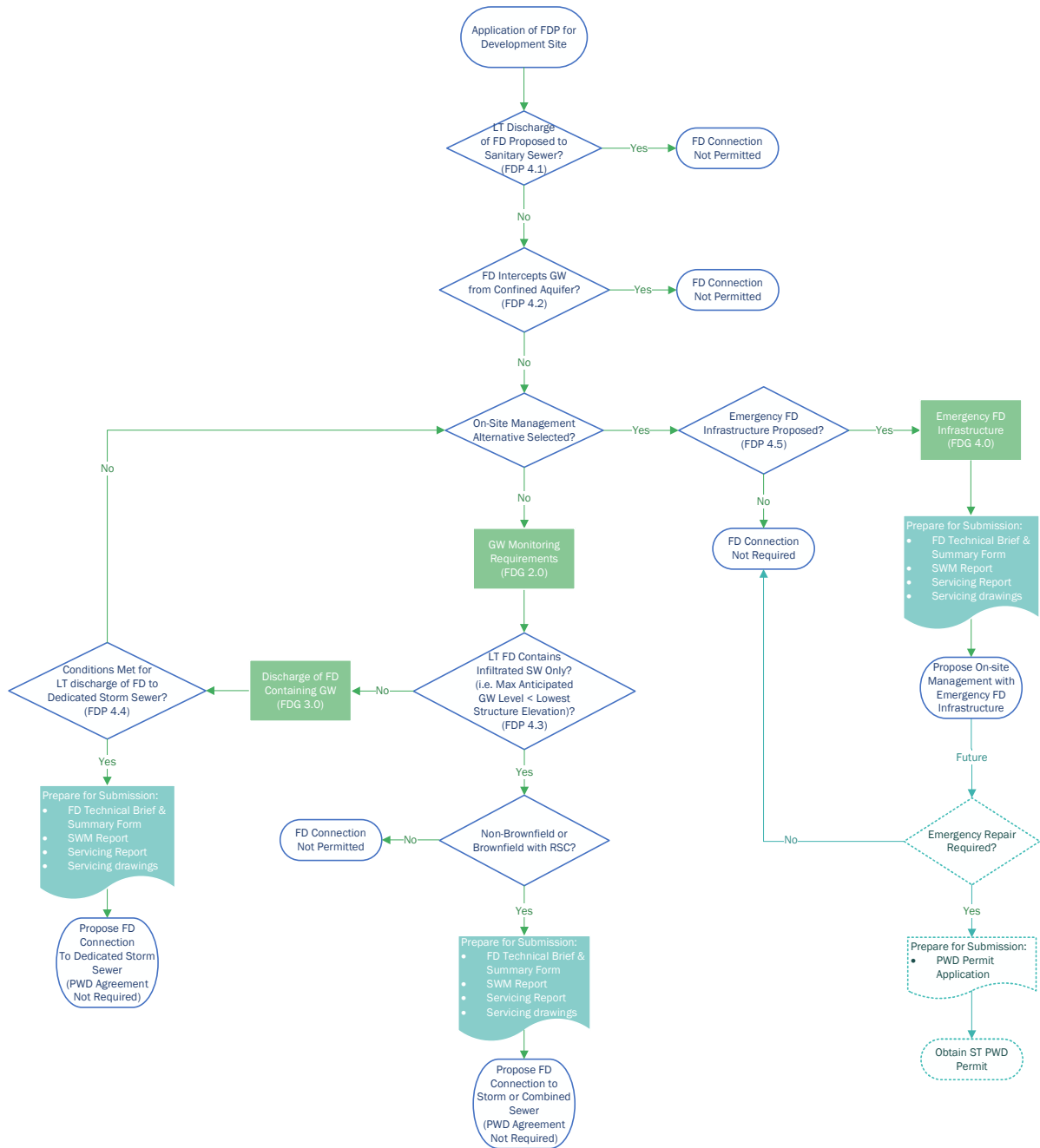
For definitions, refer to the Policy.

Figure 1 illustrates the process flow for how the Policy should be applied in identifying options for managing *Foundation Drainage* at development sites and subsequent submission and review requirements.

1.3 Limitations

These Guidelines do not supersede the requirements of the [Hydrological Review Terms of Reference](#) that may be required for obtaining [Discharge Permits & Agreements for Private Water](#) under, but not limited to, the following scenarios:

- a. Short-term Discharge of Foundation Drainage to allow for future emergency repair of *Emergency Foundation Drainage Infrastructure*.
- b. Short-term Discharge for construction dewatering.



2.0 Groundwater Monitoring Requirements

Groundwater monitoring is required to demonstrate the *Maximum Anticipated Groundwater Level* in relation to the lowest elevation of the proposed building structure. A *Qualified Professional* with a P.Eng. or P.Geo. licence shall undertake *Groundwater* monitoring to establish the potential interaction between *Infiltrated Stormwater* and *Groundwater* collected in *Foundation Drainage* systems.

Groundwater monitoring findings, analysis and interpretation will be reported in the Foundation Drainage Summary Form. The Foundation Drainage Technical Brief will include descriptions and supporting information.

2.1 Monitoring Wells

Monitoring wells shall be in accordance with the Hydrological Review Terms of Reference. As per the Terms of Reference:

- a. A minimum of five (5) groundwater monitoring wells shall be installed to measure static *Groundwater* levels.
- b. Monitoring well locations shall be identified by the *Qualified Professional* such that they sufficiently characterize the hydrogeology of the site.
- c. Monitoring wells shall be installed with a minimum of 3.8 cm diameter and 2 m below the lowest elevation of the proposed structure(s).
- d. At least one (1) monitoring well shall be drilled to a minimum 10 m depth below the lowest elevation of the proposed structure(s), or to bedrock, whichever is shallower.
- e. Where site-specific constraints are identified, or where the site area exceeds 30m x 30m, the number of monitoring wells, locations and depth shall be based on the *Qualified Professional's* judgment.

2.2 Monitoring Period

Static *Groundwater* levels ("GWL") in the monitoring wells shall be measured manually or by using pressure transducers and data loggers (or similar instrumentation). Based on site-specific conditions and circumstances, the *Qualified Professional* may choose the monitoring period from one of the following two options:

- a. **Option 1 (Flexible, Year-Round)** – Capture a minimum of three (3) static GWL measurements, taken every two (2) weeks, within any period of the calendar year.
- b. **Option 2 (Peak Season)** – Capture a minimum of six (6) static GWL measurements, taken every two (2) weeks, in April, May and June.

The first static GWL measurement must be taken at least 48 hours after the monitoring well installation.

2.3 Maximum Anticipated Groundwater Level Estimation

Based on the GWL measurements observed during the monitoring period, the *Qualified Professional* will estimate the *Maximum Anticipated Groundwater Level*. The *Maximum Anticipated Groundwater Level* will be compared to the lowest elevation of the building structure to determine the potential for *Infiltrated Stormwater* to interact or mix with *Groundwater* collected by foundation drains. The *Maximum Anticipated Groundwater Level* cannot exceed the ground surface.

The *Maximum Anticipated Groundwater Level* shall be calculated by adding a fluctuation allowance to the peak measured static GWL. The fluctuation allowance is intended to account for seasonal and multi-year fluctuations in *Groundwater* and shall be determined via one of the following methods:

- a. Where **Option 1 (Flexible, Year-Round)** monitoring approach is undertaken, the *Maximum Anticipated Groundwater Level* shall be determined by adding the respective fluctuation allowance to the peak measured static GWL based on the month of measurement, as tabulated in Table 1.

Table 1: Fluctuation Allowance for determining *Maximum Anticipated Groundwater Level* (*Maximum Anticipated Groundwater Level* = Observed Peak Static GWL + Fluctuation Allowance)

Month of Observed Peak Static GWL	Fluctuation Allowance [m]
January	1.9 m
February	2.1 m
March	1.9 m
April	1.6 m
May	1.3 m
June	1.9 m
July	3.1 m
August	2.4 m
September	2.6 m
October	2.8 m
November	2.3 m
December	2.4 m

- b. Where **Option 2 (Peak Season)** monitoring approach is undertaken, the *Maximum Anticipated Groundwater Level* shall be determined by adding a fluctuation allowance of 0.8 m to the peak measured static GWL.

The *Maximum Anticipated Groundwater Level* is not intended for use in structural engineering design or as a substitute for professional judgment of the *Qualified Professional* for any other *Foundation Drainage*-related engineering design decision.

3.0 Discharge of Foundation Drainage containing Groundwater

To demonstrate compliance with Policy Statement 4.4 (i.e., discharge of *Foundation Drainage* containing *Groundwater* to a *Dedicated Storm Sewer*), a *Qualified Professional* with a P.Eng. or P.Geo. licence shall undertake the necessary assessments. Specific guidance on demonstrating compliance with water quality and quantity requirements and the identification of a *Dedicated Storm Sewer* has been included below.

3.1 Water Quality Analysis

To demonstrate compliance with the storm discharge Water Quality requirements in accordance with Policy Statement 4.4.a., the following information must be integrated into the Stormwater Management Report or appended to the Foundation Drainage Brief:

- a. Sample(s) of *Foundation Drainage* proposed to be discharged from the premises must be collected by the applicant and submitted for analysis to a Canadian laboratory accredited and licensed by the Standards Council of Canada or the Canadian Association for Laboratory Accreditation. Field- or laboratory-filtered samples will not be accepted.
- b. The samples must have been collected within nine (9) months of the date of submission.
- c. A true copy of the complete analysis report, Certificate of Analysis and a Chain of Custody Record (COCR) for the sample must be included.
- d. Results for all parameters listed in Table 2 in Toronto Municipal Code – Chapter 681, Sewers, must be included in the analysis. The quality of water to be discharged must meet the quality limits in Table 2 of the Sewers By-law without the need for a pre-treatment system, with the exception of Total Suspended Solids (TSS).
- e. For TSS in *Foundation Drainage* containing *Groundwater*, compliance with Policy Statement 4.4.a. can be demonstrated by adhering to the Wet Weather Flow Management Guidelines in lieu of the TSS limit in Table 2 of the Sewers By-law. This consideration applies only to applications submitted under this Policy.

3.2 Discharge to a Dedicated Storm Sewer

To demonstrate compliance with Policy Statement 4.4.b., the applicant must demonstrate that an acceptable connection can be made from the site to a *Dedicated Storm Sewer*. To locate a *Dedicated Storm Sewer*, applicants should consult the Foundation Drainage Policy – Dedicated Storm Sewer Maps. For a connection to be

deemed acceptable, all City of Toronto requirements for service connections must be met. Proposed connections are subject to review and approval by Development Engineering.

Where a Dedicated Storm Sewer Map indicates that a development site lies along a non-compliant storm sewer (i.e., not a *Dedicated Storm Sewer*), but the applicant believes that the sewer functions as a *Dedicated Storm Sewer*, the applicant shall provide Development Engineering with sufficient technical justification to support this position, including but not limited to:

- a. A technical analysis, prepared by a Qualified Professional, demonstrating that the sewer functions as a *Dedicated Storm Sewer* in accordance with the Policy's definition of *Dedicated Storm Sewer*.
- b. At a minimum, the analysis shall document and assess the relevant physical, hydraulic, operational, and drainage characteristics of the sewer necessary to demonstrate that it meets the applicable definition.

Development Engineering, in consultation with Toronto Water when required, will review the submitted technical justification and determine whether the evidence is sufficient.

3.3 Water Quantity Analysis

To demonstrate compliance with Policy Statement 4.4.c., the following information must be included in the Stormwater Management Report, Servicing Drawings, or appended to the Foundation Drainage Brief, as applicable:

- a. Compliance with 4.4.c.i. (dry-weather requirements):
 - i. Pump schedule signed by a *Qualified Professional*, confirming the capacity of the selected pump under the associated design and demonstrating alignment with the dry-weather flow discharge rates in Policy Statement 4.4.c.i.
 - ii. Indication of selected pump size on the Servicing Drawings or associated mechanical drawing, as applicable.
 - iii. Description and associated design demonstrating how *Foundation Drainage* containing *Groundwater* is managed under dry weather conditions in a manner that is consistent with discharge assumptions and limits in Policy Statement 4.4.c.i.
- b. Compliance with 4.4.c.ii (wet weather requirements):
 - i. A stormwater management strategy demonstrating compliance with the City's Wet Weather Flow Management Guidelines, inclusive of both

Foundation Drainage and Stormwater.

- ii. *Foundation Drainage* containing *Groundwater* may be conveyed through the stormwater infrastructure or discharged as uncontrolled flow, provided that all applicable targets from the City's Wet Weather Flow Management Guidelines are met for the private site, including both water quantity and quality targets.

4.0 Emergency Foundation Drainage Infrastructure

To demonstrate compliance with Policy Statement 4.5, *Emergency Foundation Drainage Infrastructure* shall be designed and operated in accordance with these Guidelines and comply with the requirements of a future Private Water Discharge Permit. Applicants may follow one of the following design approaches: a pre-installed system or a system to be installed in the event of an emergency. Refer to Appendix A for Drawings 1 and 2 (T-709.050 and T-709.051), which establish the design requirements for both approaches.

Pre-installed Emergency Foundation Drainage Infrastructure

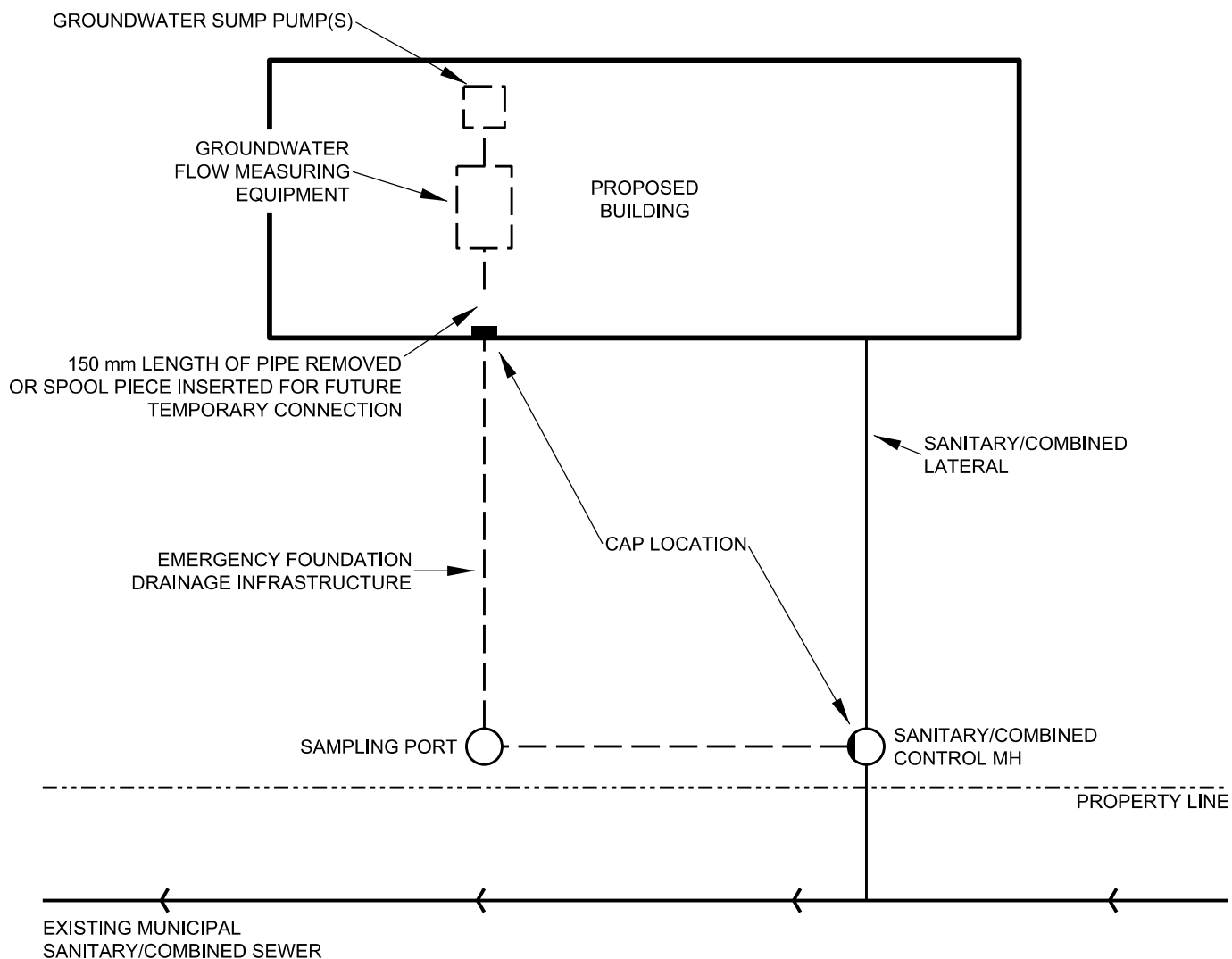
Pre-installed *Emergency Foundation Drainage Infrastructure* must be capped at the upstream building location and at the downstream control maintenance access hole. The system may only be uncapped and connected to City infrastructure via a *Temporary Connection* during emergency repairs and shall be disconnected and capped from City sewers after *Emergency Discharge* has taken place. All associated works and costs are to be undertaken by the development applicant or owner, except for the removal of the cap located at the control maintenance access hole.

The Servicing Report submission must include a Servicing Drawing, including cross-section detail, stamped by a P.Eng. licensed to practice in Ontario and qualified in the subject matter. The drawings must demonstrate that the *Emergency Foundation Drainage Infrastructure* has been designed in accordance with Drawings 1 and 2.

A pre-installed system may be connected at the time of a future emergency, subject to completion of the required activation steps. In the event of an emergency, the property owner shall contact Toronto Water Customer Care by calling 311 to initiate the activation of the *Emergency Foundation Drainage Infrastructure*. Within 30 days, or as agreed upon with the City, the property owner shall submit a completed Private Water Discharge Permit application.

System to be installed in the event of an emergency

For a system that is to be installed in the event of an emergency, infrastructure placeholders should be left for *Emergency Foundation Drainage Infrastructure*, using Drawings 1 and 2 as a base. At the time of an emergency, the property owner must engage a dewatering contractor to install the system in accordance with the *Emergency Foundation Drainage Infrastructure* design requirements. The property owner shall submit a completed Private Water Discharge Permit application. Regular Private Water Discharge Permit application processing times apply before a *Temporary Connection* can be made.



Notes:

1. Groundwater flow measuring equipment and sampling port according to T-709.020, T-709.030 and T-709.010.
2. Groundwater sump pumps(s) shall be in duty/standby configuration.
3. Emergency foundation drainage infrastructure components to be installed with construction of proposed building or at time of emergency. Temporary connection to be installed and caps removed at time of emergency discharge.
4. For details of emergency foundation drainage infrastructure profile, see T-709.051.



ENGINEERING & CONSTRUCTION SERVICES STANDARD DRAWING

**EMERGENCY FOUNDATION
DRAINAGE INFRASTRUCTURE
LAYOUT**

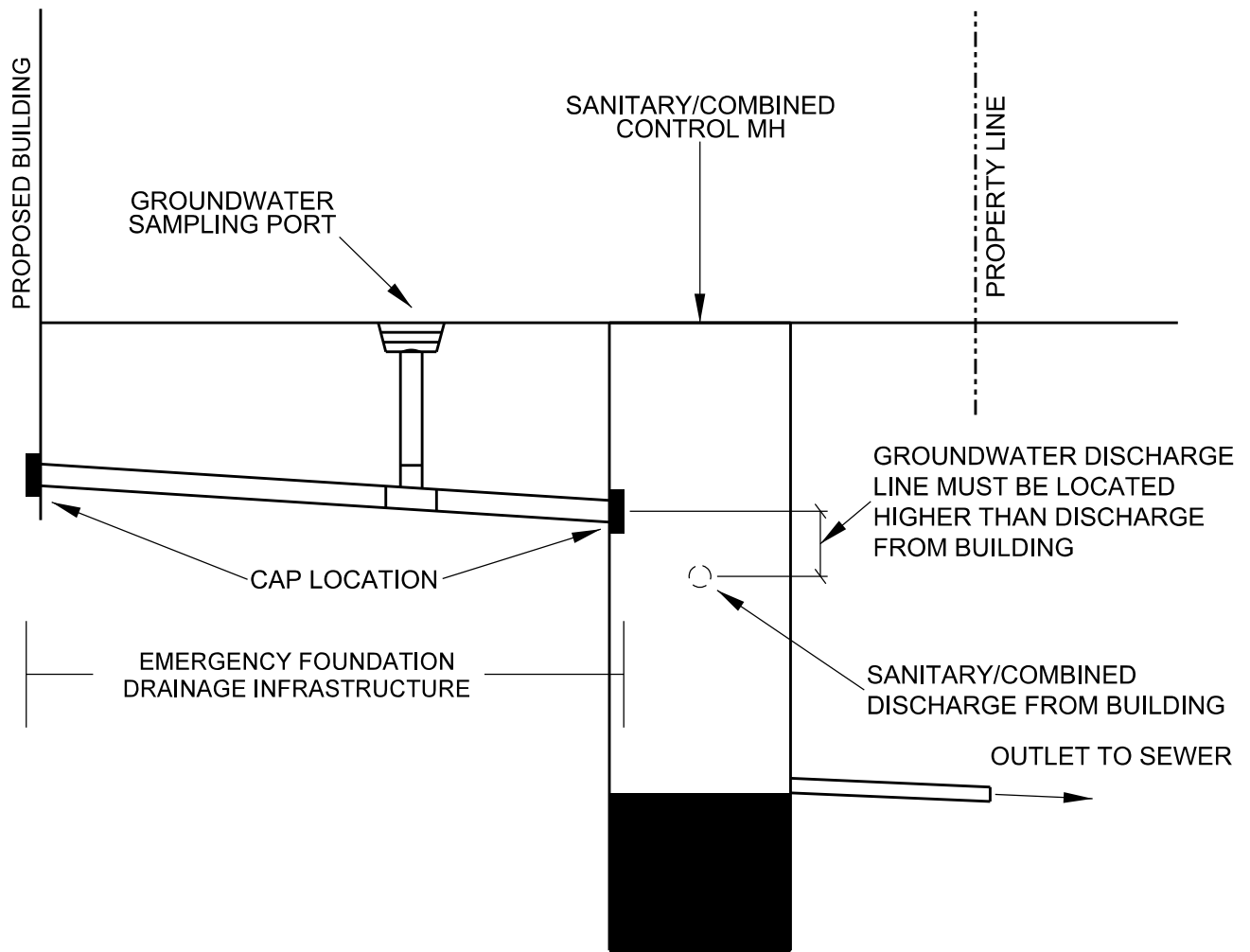
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Notes:

1. The emergency foundation drainage infrastructure shall have a minimum of 150 mm length of pipe removed (or spool piece in place) inside of the building and the line shall be capped/blank plate installed at both ends.
2. **TEMPORARY CONSTRUCTION CAP**
 - A) Cap or plug or plate to be used.
 - B) Cap shall be rated for full pipe diameter and expected hydrostatic pressure.
 - C) Attach safety chain to structure.
3. **IDENTIFICATION**
 - A) Mark pipe end with: "CAPPED - DO NOT CONNECT" using permanent paint or tag.
4. **GENERAL NOTES**
 - A) Cap to be plate or fitting screwed in.
 - B) Signage should be installed with the following wording: "This is emergency foundation drainage infrastructure - only to be connected at the time of an emergency and following contact with Toronto Water by dialing 311."
5. For layout of emergency foundation drainage infrastructure, see T-709.050.



ENGINEERING & CONSTRUCTION SERVICES STANDARD DRAWING

**EMERGENCY FOUNDATION
DRAINAGE INFRASTRUCTURE
PROFILE**

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