Ashbury College - Synthetic Turf Field

Site Stormwater Management Report

Stantec

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Prepared by:
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1 Introduction

Stantec Consulting Ltd. (Stantec) has been commissioned by Ashbury College to prepare the following Site Stormwater Management study in support of a Site Plan Control (SPC) Application for the proposed synthetic turf field to be situated at 362 Mariposa Avenue, in the City of Ottawa, as indicated in **Figure 1-1.** The property is located on the north side of Maple Lane directly north of Ashbury Place. The impacted drainage areas include portions of the property encompassed between Springfield Road to the west, Glenwood Avenue to the east, and a paved pathway to the north.

The 2.3 ha site includes existing buildings, gravel parking areas, walkways, and an existing grass sports field (football/soccer). The site development plan, as indicated on the Site Plan drawing **SP01** developed by Stantec's Landscape Architecture Team, includes converting the existing field from a grass surface to a synthetic turf field. The new synthetic turf significantly increases the site's impervious surface area and impacts the existing underground infiltration system, prompting this study. The purpose of this site stormwater management report is to develop a new stormwater management plan for the quality and quantity control requirements for the impacted portion of the site.

Figure 1-1: Overall Development Location Plan

1.1 Objectives

This stormwater management (SWM) report presents a SWM plan that is free of conflicts, provides on-site SWM in accordance with City of Ottawa Design Guidelines, the pre-consultation meeting feedback (PC2024-0226, dated July 12, 2024), and uses the existing municipal infrastructure in accordance with

any limitations communicated during consultation with the City of Ottawa staff. Details of the existing infrastructure located within the Maple Lane right of way (ROW) were obtained from available as-built drawings and site topographic survey by Annis, O'Sullivan, Vollebekk Ltd. (December 18, 2018).

Criteria and constraints provided by the City of Ottawa have been used as a basis for the detailed stormwater management plan for the proposed redevelopment. Specific and potential development constraints to be addressed are as follows:

Stormwater Management and Storm Servicing:

- Determine the pre-development (existing) runoff coefficient for the site.
- Define major and minor conveyance systems in conjunction with the proposed grading plan.
- Delineate and characterize stormwater drainage catchments that are impacted by the re-development.
- Determine the stormwater management quantity control storage requirements to meet the 5-year pre-development allowable release rate for the re-developed portions of the site.
- Utilize Low Impact Development (LID) designs for SWM quality and quantity control where feasible.
- Determine the quality control design requirements to meet the enhanced level of treatment requiring 80% Total Suspended Solids (TSS) removal, due to the absence of existing downstream controls.
- Design the proposed onsite private storm sewers which will be connected to the existing 750mm municipal storm sewer located in the Maple Lane ROW.

Grading, Erosion and Sediment Control, and Geotechnical Considerations:

- Prepare a grading plan in accordance with the proposed Site Plan and tie into existing grades at the property lines.
    - Identify key drainage patterns and grading features.
    - Identify the major (emergency) overland flow paths.
    - Identify static ponding areas.
- Provide an Erosion and Sediment Control (ESC) Concept Plan and Best Management Practices
- Incorporate the relevant geotechnical information, constraints, and recommendations.
- Identify utility site constraints (existing infrastructure removals/accommodations, easements, etc.)

1.2 References

Documents referenced in preparation of the design for the Ashbury College Field includes:

- *City of Ottawa Sewer Design Guidelines* (SDG 004) 4th Edition, City of Ottawa, December 2025.
- *Low Impact Development Technical Guidance Report (Draft) – City of Ottawa*, prepared by Dillon Consulting and Aquafor Beech Ltd., November 2019.
- *Low Impact Development Stormwater Management Guidance Manual – Draft for Consultation,* Ministry of the Environment, Conservation and Parks (MECP), January 2022.
- *Stormwater Management Planning and Design Manual*, Ministry of the Environment, Conservation, and Parks (MECP), March 2003.
- *Geotechnical Investigation Report – Ashbury College – 362 Mariposa Avenue, Ottawa, Ontario,* Stantec Consulting Ltd. May 2024.
- *Pre-consultation: Meeting Feedback – Proposed Site Plan Control Application – 362 Mariposa Avenue (File No.: PC2024-0226),* City of Ottawa, July 12, 2024.
- *362 Mariposa Avenue, Ottawa, ON - Stormwater Management and Site Servicing Report,* prepared by R.V. Anderson Associated Ltd., June 2013.

2 Stormwater Management and Servicing

2.1 Objectives

The objective of this stormwater management plan is to determine the measures necessary to control the quantity and quality of stormwater released from the proposed re-development to criteria established within the pre-consultation meeting feedback, and to provide sufficient detail for SPC approval and construction.

2.2 SWM Criteria and Constraints

Criteria were established by combining current design practices outlined by the City of Ottawa Design Guidelines (2025), the Low Impact Development Technical Guidance Report (Draft - 2019), and through consultation with City of Ottawa staff. The following summarizes the criteria, with the source of each criterion indicated in brackets:

2.2.1 General

- Use of the dual drainage principle (City of Ottawa).
- Wherever it is feasible and practical, LID site-level measures should be used to reduce and control the volume and rate of runoff. (City of Ottawa).
- Assess impact of 100-year event outlined in the City of Ottawa Sewer Design Guidelines on major and minor drainage system (City of Ottawa).
- Provide enhanced 80% TSS quality control onsite (City of Ottawa)

2.2.2 Storm Sewer & Inlet Controls

- Size the internal private storm sewers to convey the 2-year storm event under free-flow conditions using City of Ottawa I-D-F parameters (City of Ottawa).
- Determine the pre-development runoff coefficient for the site. Utilize the lesser of this value or 0.5 (City of Ottawa) to determine the 5-year storm event pre-development discharge rate (City of Ottawa).
- Site stormwater discharge rates for each storm event up to and including the 100-year event are to be restricted to 5-year storm event pre-development rate (City of Ottawa).
- Existing stormwater outlet options for the site re-development include:
  - the existing municipal 750mm diameter concrete storm sewer which transitions to 675mm diameter concrete storm sewer in the Maple Lane ROW, to the south of the site,
  - the existing municipal 375mm diameter PVC storm sewer in the Springfield Road ROW, to the west of the site, and
  - the existing municipal 300mm diameter PVC storm sewer located in the Glenwood Avenue ROW, to the east of the site.

2.2.3 Surface Storage & Overland Flow

- Building openings are to be a minimum of 0.15m above the 100-year water level (City of Ottawa).
- Maximum depth of flow under either static or dynamic conditions shall be less than 0.35m (City of Ottawa)
- Balance of flows exceeding the allowable release rate up to and including the 100-year storm event to be detained on-site (City of Ottawa).
- Provide adequate emergency overflow conveyance off-site for events beyond the 100-year storm (City of Ottawa)
- Where possible, major flow from the site is to be safely conveyed by surface routing towards the municipal ROWs.

2.3 Background

The existing internal stormwater management and servicing system is established in the Stormwater Management and Site Servicing Report, prepared by R.V. Anderson Associated Ltd. (June 2013). The existing system includes several components.

1. For the north portion of the site, internal storm sewers direct roof and yard drainage to an existing underground infiltration system located beneath the existing sports field. This existing system does not have an outlet (all runoff is infiltrated).

2. On the west side of the site, an existing gravel parking area drains to the west to a catch basin and are directed to the existing 375mm diameter storm sewer in the Springfield Road ROW.

3. The existing grass sports field drains from east to west, with the north portion draining to the Springfield Road ROW, and the south portion draining to a catch basin connected to the existing 750 mm diameter storm sewer in the Maple Lane ROW.

4. The existing western buildings have building storm services to Springfield Road while the eastern buildings have building storm services to Glenwood Avenue.

Some of the existing buildings have peaked roofs and rear yard areas that drain internally into the site. A portion of the existing east building expansion roof drainage is serviced internally within the site to the existing infiltration system. The internally draining areas and existing storm service will need to be accommodated in the new site stormwater system. The existing conditions are shown on **Drawing C101.**

2.4 Analysis

The impacted areas of the site were identified by considering the existing drainage areas affected by the sports field resurfacing, new storm sewers, and new stormwater management system. The impacted areas were delineated utilizing the information from the R.V. Anderson 2013 report and the current topographic survey. The impacted areas delineated the existing drainage area (subcatchment EX-1) as shown in the existing storm drainage plan on **Drawing C101.** The existing (pre-development) runoff coefficient for the site was determined to be C=0.39. Since this value is less than 0.5, the analysis proceeded based on the 5-year pre-development runoff coefficient of 0.39.

The impacted area was subdivided into drainage areas (subcatchments) tributary to the new stormwater management system and outlet, as shown on **Drawing C130**. Runoff coefficient values were calculated assigned to each drainage area based on the relative proportion the proposed finished surfaces and imperviousness. A summary of subareas and runoff coefficients is provided in **Appendix A.1.** The storm drainage areas were subdivided utilizing the information from the R.V. Anderson 2013 report, the current topographic survey, and the proposed site grading plan, **Drawing C120.**

The Modified Rational Method (MRM) was employed to assess the rate and volume of runoff generated during pre-development and post-development conditions. Runoff coefficient values have been increased by 25% for the post-development 100-year storm event based on the City of Ottawa SDG. Modified Rational Method storm sewer design sheets have been provided in **Appendix A.1.**

2.4.1 Allowable Release Rate

The peak post-development discharge from the subject site is to be limited to that of the 5-year event discharge under pre-development conditions, to a maximum discharge coefficient C of 0.39. Due to the numerous existing stormwater outlets and short pipe runs, the pre-development time of concentration for the site was determined to be less than 10 minutes; hence a time of concentration of 10 minutes has been used for the site, as per the City of Ottawa SDG. Peak stormwater flow rates have been calculated using the rational method as follows:

Q = 2.78 CiA
Where: Q = peak flow rate, L/s
A = drainage area, ha
I = rainfall intensity, mm/hr (per Ottawa IDF curves)
C = site runoff coefficient

The 5-year pre-development rainfall event with a C-value of 0.39, and a time of concentration of 10 minutes was determined by the rational method to be **258.9 L/s.** Consequently, this is the target release rate for the site, under all rainfall events up to and including the 100-year event.

2.4.2 Uncontrolled Catchments

The impacted areas assessed in this study are all tributary to the proposed internal storm sewer system, infiltration gallery, and restricted storm sewer outlet. Consequently, there are no uncontrolled catchments considered.

2.4.3 Storage Requirements

The site requires quantity control measures and quality control measures to meet the restrictive stormwater criteria. It is proposed that an infiltration gallery, located under the south side of the synthetic turf field, is utilized to reduce site peak outflow to the target rate and to provide quality control through storage in the granular materials and exfiltration into the subsoil.

2.4.3.1 Quantity Control

The modified rational method was used to evaluate the volume of onsite storage required to meet the site's restricted outflow rate. An inlet control device (ICD) is proposed at the downstream (south) invert of manhole STM 102 to restrict the outflow rate. The modified rational method calculation sheet included in **Appendix A.1** demonstrates that the peak 100-year event outflow rate can be restricted to the target release rate using a 344 mm diameter circular orifice with an invert set to match the invert elevation of the infiltration gallery (the top of stone beneath the storage chambers). The high water level of the infiltration gallery (the top of stone elevation above the storage chambers) and the consequent hydraulic head results in a storage requirement of 471.6m^3. A summary of the discharge and storage requirements are provided in **Table 2.1**.

Table 2.1: Release Rate and Quantity Control Summary

Contributing Area IDs	Design Storm	Tributary Area (ha)	Design Head (m)	HWL Elevation (m)	Discharge (L/s)	$V_{required}$ (m^3)
L106A, L107A, L108A, L4A, L4B, & L4C	100-Year	2.29	1.06	69.22	258.5	471.6

2.4.3.2 Quality Control

Quality control is required on this site due to the potential contaminants associated with the west gravel surface parking areas and the particulates associated with the proposed synthetic turf field. On this site, quality control is achieved by creating sufficient storage within a layer of granular materials (clear stone) beneath the infiltration gallery to retain the first flush of stormwater for a duration sufficient to allow for the removal of suspended solids and sediments through the exfiltration of stormwater into the subsoil. Table 3.2 of the MECP SWM Planning Design Manual (2003) establishes the ratio of the required quality control infiltration volume to the overall site drainage area. The ratio is a function of the site's post-development imperviousness and the required level of protection for long-term TSS removal. The required infiltration volume will be a factor for determining the depth of the quality control storage layer.

The overall site runoff coefficient was determined to be 0.68 in the area summary sheet included in **Appendix A.1.** The corresponding imperviousness of the site was estimated to be 0.85 (or 85%). Per the pre-consultation feedback, the City requires enhanced (80%) TSS removal for this site due to the proximity of the Ottawa River. The infiltration volume calculation details are provided in **Appendix A.1** on the infiltration calculations sheet and summarized in **Table 2.2**. For this site, the volume of storage required for quality control was found to be **91.7m^3**.

Table 2.2: Quality Control Storage Volume Requirements

Level of Protection for Long-Term Suspended Solids Removal	Imperviousness	Tributary Area (ha)	Table 3.2 Storage Requirement Ratio (m^3/ha)	Volume Required (m^3)
Enhanced (80% TSS removal)	0.85	2.29	40	91.7

2.4.3.3 Drawdown Time

To ensure the drawdown time of the water stored for quality control does not exceed 48 hours, the bottom area of the infiltration bed needs to be appropriately sized to suit the percolation rate of the native subsoils as determined in the field. Equation 4.3 of the MECP SWM Planning Design Manual (2003) was utilized to determine the minimum bottom area of the infiltration bed for this site. This formula assumes that all infiltration occurs vertically through the bottom of the infiltration bed. Equation 4.3 is as follows:

$$A = \frac{1000V}{\mathrm{Pn}\Delta\mathrm{t}}$$

Where:
A = minimum required bottom area of infiltration bed (m^2)
V = runoff volume to be infiltrated (m^3)
P = percolation rate of the surrounding native soil (mm/h)
n = porosity of the storage media (0.4 for clear stone)
Δt = retention time (hours)

The runoff volume to be infiltrated was determined to be 91.7m^3 as per Table 3.2 of the MECP SWM Planning Design Manual (2003). The percolation rate of the surrounding native soil was determined in the field by Stantec, as described in the Geotechnical Investigation Report (2024). Infiltration testing was carried out in several test pit locations. The testing location identified in the geotechnical report as IT-No.3 is within the boundaries of the proposed infiltration gallery. The second test “IT-No.3 (Test 2)” provided satisfactory in-situ infiltration data for analysis, as summarized in **Table 2.3** and included in **Appendix A.1** on the infiltration calculations sheet.

Table 2.3: Results of Infiltration Testing at Location IT-No.3 (Test 2)

Testing Location ID (test number)	Test Depth (mBGS)	Soil Substrate Description During Permeameter Testing (Nearby Borehole Log Description)	Vertical Hydraulic Conductivity (m/s)	Infiltration Rate (mm/hr)
IT-No.3(2)	0.45	Silty Sand (Fill)	$2.0x10^{-5}$	103

For Equation 4.3, it was assumed that the percolation rate of the native soils is equal to the infiltration rate determined at testing location IT-No.3(2). The proposed granular storage media is to be 19mm (Type II) clear stone, and so a porosity of 0.4 is applicable. The recommended retention time of 24 hours was applied, as per the MECP SWM Planning Design Manual (2003). Utilizing equation 4.3, the resulting minimum required bottom area of the infiltration bed was found to be **92.7m^2**.

2.4.4 LID Design Requirements

The MECP SWM Planning Design Manual (2003) and the City of Ottawa Draft Low Impact Development Technical Guidance Report (2019) provide design guidance for LIDs and physical constraints for SWMP types. For an infiltration basin/gallery, these considerations include:

- Drainage Area: <5ha
- Minimum soil percolation rate: loam (infiltration rate ≥60 mm/hr)
- Bedrock: situated ≥1.0m below the bottom of the infiltration bed
- Groundwater: situated ≥1.0m below the bottom of the infiltration bed

The Ashbury College synthetic turf field site has previously been shown to meet both the drainage area and minimum soil percolation rate criteria for an infiltration gallery. Bedrock and groundwater levels have been established in the Geotechnical Investigation Report (Stantec, 2024) and the proceeding groundwater monitoring program, which began in 2025 and will continue through the 2026 season.

2.4.4.1 Bedrock

A 2024 field investigation carried out by Stantec included nine (9) boreholes located in the existing sports field. 2025 field investigations added four (4) boreholes, three (3) with monitoring wells to facilitate the long-term groundwater monitoring program. Borehole locations are shown on the civil **Drawing C130**. In the Geotechnical Investigation Report (Stantec, 2024) The bedrock elevation in each borehole was inferred from the depth of auger refusal (AR) compared to the elevation at the surface of the borehole. The invert elevations of the proposed storm pipes were compared to the bedrock elevation at the nearest adjacent borehole location to determine feasible locations for the infiltration gallery. It was found that at the south side of the sports field, the storm sewer invert elevations could be established at a minimum of 1.0m above the bedrock elevation.

The bedrock elevations are summarized in **Table 2.4** and included in **Appendix A.1** on the infiltration calculations sheet. The soil strata information from the geotechnical report was sufficient to inform the storm sewer design and select a location for the infiltration gallery where the bottom (invert) of the infiltration bed is more than one meter above the native bedrock.

Table 2.4: Bedrock Considerations

Borehole Location ID	Surface Elevation at Borehole (mASL)	Depth of Auger Refusal (mBGS)	Inferred Elevation of Bedrock (mASL)	Invert of Inf. Gallery Inlet (mASL)	Clearance Between Invert and Bedrock (m)
BH25-1	70.3	3.7	66.60	67.71	1.1
BH25-2	70.6	5.6	65.00		2.7

2.4.4.2 Groundwater

The 2024 and 2025 field work carried out by Stantec for the geotechnical investigation included measurements of the groundwater levels in each borehole and in the monitoring wells established in 2025. Upon completion of the auger drilling operations in 2024, all open boreholes were found to be dry (no observed groundwater seepage). However, monitoring data from the wells established in 2025 have showed fluctuating groundwater levels due to seasonal changes, snowmelt and precipitation events. The groundwater monitoring data available to date is included in **Appendix A.3.**

Groundwater levels measured in BH25-1 and BH25-2 were found to be well below the design invert of the infiltration gallery in the months of July and August (2025) and satisfy the LID design considerations. However, groundwater levels measured in March 2026 were found to be considerably higher than the summer measurements, with levels at BH25-1 (elevation 68.16m) situated above the design invert of the infiltration bed (67.71m), and levels at BH25-1A situated only 1.07m below the ground surface. Groundwater levels from BH25-2 were not available from the March 2026 observations, when the monitoring well was inaccessible due to ice. The next monitoring event will take place in late April 2026.

The March 2026 monitoring data suggests that the seasonally high groundwater table in the sports field does not satisfy the LID design considerations. Given the physical constraints of the proposed storm sewer system for onsite conveyance (cover requirements, minimum slopes, etc.), the invert of the infiltration bed could not be raised above the seasonally high groundwater table. Particulate loads from the synthetic turf field are anticipated to be minimal compared to the particulates from the parking areas. Considering the period of high groundwater levels correlates to the periods of low field usage (and low particulate loadings from the parking areas), the capacity of the infiltration gallery to provide enhanced quality control for the site will likely not be significantly impacted.

Groundwater levels measured during the 2025 summer months suggest it is likely that the invert of the infiltration gallery will have sufficient clearance (>1.0m) above the seasonal (summer and fall) low groundwater tables to meet the 1.0m clearance design criteria. The high-use operational season of the sports field and parking areas is typically from June to November, when the particulate loads are expected to be highest. Correspondingly, these months are also when the groundwater table is expected

to be much lower. Hence, we are confident that the proposed quality control component of the infiltration gallery will perform adequately during the field's high-use periods when the particulate loads are also high. Continuous monitoring throughout 2026 will provide additional groundwater information and verify these assumptions.

2.5 Stormwater Management Facility (SWMF) Design

It is proposed to use a Cultec stormwater management product, which combines an infiltration bed and detention storage within open-bottom tunnel structures to achieve the stormwater quantity and quality targets. The online Cultec StormGenie design tool was utilized to provide preliminary product selection and design. The chamber model Recharger 360HD was selected for the site design. Documentation of the tool's user inputs, product specifications, and stage-storage curve are provided in **Appendix A.2** for discussion and approval purposes. Construction-level detailed design of the Cultec system is to be provided by the manufacturer prior to Building Permit.

A summary of the preliminary Cultec infiltration gallery design is provided in **Table 2.5** and included in **Appendix A.1** on the infiltration calculations sheet. The location and key features of the infiltration gallery area also shown on **Drawing C130.** The proposed infiltration gallery achieves the design requirements for:

- quantity control storage, 100-year event (>471.8m^3)
- quality control storage (>91.7 m^3)
- minimum bed area (>92.7m^2)

This preliminary design results in a 100-year high water level (HWL) in the infiltration gallery of 69.22, which aligns with the top of stone above the units (chambers). Upon review of this HWL compared to the hydraulic grades throughout the site, there is sufficient clearance below catch basin grate elevations and building storm service elevations to offer flood protection in the 100-year event.

Table 2.5: Preliminary Design for Cultec Recharger 360HD

Invert of Stone Below Unit (m)	Depth of Stone Below Unit (mm)	Depth of Stone Above Unit (mm)	Length of Chamber Field (m)	Width of Chamber Field (m)	Height of Chamber (mm)	Bed Area (m^2)	Storage Volume in Stone Below Unit (m^3)	Total Available Storage (m^3)
67.71	440	152	48.31	10.90	915	524.5	92.3	473.8

2.6 Stormwater Servicing

As shown in **Drawings C130 and C110** and detailed in the storm sewer design sheet in **Appendix A.4**, the proposed site will be serviced by a network of gravity storm sewers which will convey the 2-year stormwater flows from the impacted site drainage areas to the infiltration gallery under the south side of the sports field. Several new catch basins, leads, and one new catch basin manhole are proposed to collect drainage from the site's overland flow areas and convey the stormwater to the main storm sewers and infiltration gallery. The stormwater management design does not include ICDs on the catchbasins. The storm system includes a stub for the field outlet, allowing for connection of the subsurface drainage system of the proposed synthetic turf field. The subsurface drainage for the field is to be designed by Stantec's Landscape Architects at a later stage of the design. The 600mm storm sewer at the infiltration gallery outlets to a new (1200mm diameter) storm monitoring manhole, then connects to a new (1800mm diameter) manhole on the 750mm diameter municipal storm sewer in the Maple Lane ROW.

3 Grading and Drainage

The impacted site drainage area measures approximately 2.29ha. The topography across the site is a gradual slope draining principally from east to west, with a difference in elevation approaching 1.4m. A detailed grading plan (see **Drawing C120**) has been provided to satisfy the stormwater management requirements, adhere to the geotechnical recommendations (see **Section 4**) for the site, and provide for minimum cover requirements for storm sewers and infiltration gallery chambers, where possible. Site grading has been established to provide emergency overland flow routes required for stormwater management in accordance with City of Ottawa requirements.

The subject site maintains emergency overland flow routes for flows deriving from storm events exceeding the 100-year rainfall. The emergency overland flow routes drain toward the west, and spill through the gravel parking areas into the Springfield Road municipal ROW. Static ponding areas, volumes, depths, and spill elevations are delineated in **Drawing C130.**

Terracing and a 600mm high rock retaining wall is proposed along the north side of the field to facilitate the approximately 2.0m grade change from the sports field and pathways to the higher elevations north of the field. See the landscape plans for retaining wall details. Stairs and an accessible ramp structure are proposed at the northwest corner of the field to accommodate pedestrian connections to the existing residence building to the northwest. Proposed grading within the proposed synthetic turf field cuts into the exiting subsurface infiltration system hence, it has been identified for removal, and a new SWM facility is proposed.

4 Geotechnical Considerations

A Geotechnical Investigation Report was prepared by Stantec and dated May 2024. The report summarizes the existing soil conditions within the re-development areas and provides construction recommendations. For details which are not summarized below, please see the original report.

Subsurface soil conditions within the subject area were determined from 16 boreholes and six (6) test pits (for infiltration testing) distributed across the development for the 2024 investigation, and four (4) additional boreholes in 2025 for the installation of groundwater monitoring wells. In general, soil stratigraphy consisted of topsoil underlain by fill varying from silty sand to sandy silt, followed by glacial till consisting of silty sandy gravel to sandy silt with gravel over bedrock. Bedrock/inferred bedrock elevations range from depths of 1.0 to 5.6m below ground surface. Groundwater levels were measured as described in this report in **Section 2.4.4.2.**

The geotechnical report recommends a grade raise restriction of 1.0m for this site. In the case that greater grade raises are contemplated, additional geotechnical input should be provided.

The report provides direction for the proposed rock retaining wall, pipe bedding and backfill requirements for underground services and recommendations for rock removal were also identified for the subject site.

The asphalt pavement structure for site access roads, parking areas, paved pathways, light traffic and occasional garbage or service trucks is outlined in the Geotechnical Investigation Report and in **Drawing C110**.

5 Utilities

As the subject site is bound to the north, east, and west by existing institutional buildings, and by a municipal right-of-way to the south, Hydro, Bell, Gas and Cable servicing for the proposed development should be readily available, if needed. Pole mounted infrastructure may exist along the southern property line and may need to be relocated during construction. It is anticipated that existing infrastructure will be sufficient to provide a means of distribution for the proposed field re-development. Exact size, location and routing of utilities will be finalized after design circulation. Utilities will be coordinated between disciplines to resolve potential conflicts. The Site Utility Plan is included on **Drawing C110.**

6 Erosion and Sediment Control During Construction

To protect downstream water quality and prevent sediment build-up in catch basins and storm sewers, erosion and sediment control (ESC) measures must be implemented by the Contractor prior to commencing construction. The Contractor will need to monitor, repair, maintain or replace the ESC measures as needed during construction. The following recommendations will be included in the contract documents and communicated to the Contractor.

1. Implement best management practices to provide appropriate protection of the existing and proposed drainage system and the receiving water course(s).
2. Limit the extent of the exposed soils at any given time.
3. Re-vegetate exposed areas as soon as possible.
4. Minimize the area to be cleared and grubbed.
5. Protect exposed slopes with geotextiles, geogrid, or synthetic mulches.
6. Install silt barriers/fencing around the perimeter of the site as indicated in **Drawing C102** to prevent the migration of sediment offsite.
7. Install trackout control mats (mud mats) at the entrance/egress to prevent migration of sediment into the public ROW.
8. Provide sediment traps and basins during dewatering works.
9. Install sediment traps (such as SiltSack® by Terrafix) between catch basins and frames.
10. Schedule the construction works at times which avoid flooding due to seasonal rains.

The Contractor will also be required to complete inspections and guarantee the proper performance of their erosion and sediment control measures at least after every rainfall. The inspections are to include:

- Verification that water is not flowing under silt barriers.
- Cleaning and changing the sediment traps placed on catch basins.

Refer to **Drawing C102** for the proposed Erosion and Sediment Control Concept Plan for the location of silt fences, sediment traps, and other erosion control measures for the onsite works.

7 Approvals

Environmental Compliance Approvals (ECAs, formerly Certificates of Approval (CofA)) under the Ontario Water Resources Act are not expected to be a requirement for this development as there are no proposed industrial site uses, and site stormwater discharges are routed from the privately owned site and SWM facility to a municipal storm sewer that is legal outlet registered under the City of Ottawa's CLI ECA. Existing downstream sewers have demonstrated adequate capacity to receive the 5-year pre-development peak release rate from the site.

For ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). Given the variable groundwater monitoring data, it is possible that groundwater may be encountered in excavations on this site. A minimum of two to four weeks should be allotted for completion of the EASR registration and the preparation of the Water Taking and Discharge Plan by a Qualified Person as stipulated under O.Reg. 63/16. An MECP Permit to Take Water (PTTW), which is required for dewatering volumes exceeding 400,000L/day, is not anticipated for the site.

8 Conclusions

The report assessed servicing conditions within and immediately adjacent to the project site and evaluated the feasibility of a new infiltration gallery for quantity and quality management of stormwater. Other SPC design requirements appeared in this report including:

- grading and drainage,
- geotechnical considerations,
- utilities,
- erosion and sediment control during construction, and
- approvals.

We trust that the information and the proposed stormwater management and servicing strategies presented in this report are adequate to support the Site Plan Control application for this re-development. Please contact the author or engineer of record of this report if you have any questions or concerns.

Appendix A Stormwater Management

A.1 Modified Rational Method Calculations

Stormwater Management Calculations

File No: **116501019**
Project: **Ashbury College - Synthetic Turf Field**
Date: **14-Apr-26**

SWM Approach:
Post-development to Pre-development flows

Post-Development Site Conditions:

Overall Runoff Coefficient for Site and Sub-Catchment Areas

Runoff Coefficient Table

Catchment Type	Sub-catchment Area ID / Description		Area (ha) "A"		Runoff Coefficient "C"	"A x C"		Overall Runoff Coefficient
Controlled - Tributary	INFILTRATION GALLERY (L106A, L107A, L108A, L4A, L4B, & L4C)	Hard	1.578		0.9	1.420		
		Soft	0.714		0.2	0.143		
		Subtotal		2.29			1.563	0.68
Controlled - Tributary	L106A	Hard	0.849		0.9	0.764		
		Soft	0.212		0.2	0.042		
		Subtotal		1.06			0.806	0.76
Controlled - Tributary	L107A	Hard	0.507		0.9	0.457		
		Soft	0.138		0.2	0.028		
		Subtotal		0.65			0.484	0.75
Controlled - Tributary	L108A	Hard	0.034		0.9	0.031		
		Soft	0.038		0.2	0.008		
		Subtotal		0.07			0.038	0.53
Controlled - Tributary	L4C	Hard	0.069		0.9	0.062		
		Soft	-0.005		0.2	-0.001		
		Subtotal		0.06			0.061	0.95
Controlled - Tributary	L4B	Hard	0.070		0.9	0.063		
		Soft	0.257		0.2	0.051		
		Subtotal		0.33			0.114	0.35
Controlled - Tributary	L4A	Hard	0.049		0.9	0.044		
		Soft	0.073		0.2	0.015		
		Subtotal		0.12			0.058	0.48
Total				**2.29**			**1.56**	
Overall Runoff Coefficient= C:								**0.68**

Total Roof Areas	**0.0 ha**
Total Tributary Surface Areas (Controlled and Uncontrolled)	**2.3 ha**
Total Tributary Area to Outlet	**2.3 ha**
Total Uncontrolled Areas (Non-Tributary)	**0.0 ha**
Total Site	**2.3 ha**

Stormwater Management Calculations

Project #116501019, Ashbury College - Synthetic Turf Field
Modified Rational Method Calculations for Storage

5 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	998.071
b =	6.053
c =	0.814

t (min)	I (mm/hr)
5	141.18
10	104.19
15	83.56
20	70.25
25	60.90
30	53.93
35	48.52
40	44.18
45	40.63
50	37.65
55	35.12
60	32.94

5 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 2.29
C: 0.39

Typical Time of Concentration

tc (min)	I (5 yr) (mm/hr)	Qtarget (L/s)
10	104.19	**258.9**

5 YEAR Modified Rational Method for Entire Site

Subdrainage Area: INFILTRATION GALLERY
(L106A, L107A, L108A, L4A, L4B, & L4C) Controlled - Tributary
Area (ha): 2.29
C: 0.68

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	452.77	130.5	322.3	193.4
20	70.25	305.27	130.5	174.8	**209.7**
30	53.93	234.34	130.5	103.9	186.9
40	44.18	192.00	130.5	61.5	147.6
50	37.65	163.62	130.5	33.1	99.4
60	32.94	143.15	130.5	12.7	45.6
70	29.37	127.64	130.5	0.0	0.0
80	26.56	115.42	130.5	0.0	0.0
90	24.29	105.54	130.5	0.0	0.0
100	22.41	97.37	130.5	0.0	0.0
110	20.82	90.48	130.5	0.0	0.0
120	19.47	84.60	130.5	0.0	0.0

Storage: Subsurface Storage - Cultec Recharger 360HD

Orifice Equation: $Q = CdA(2gh)^{0.5}$ Where C = 0.61
Orifice Diameter: 344.00 mm
Invert Elevation 68.16 m (top of stone below chamber)
HWL Elevation 68.43 m (from stage-storage curve)
Max Ponding Depth 0.00 m (no surface ponding is proposed)
Downstream W/L 66.56 m

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
5-year Water Level	68.43	0.27	130.5	209.7	473.8	OK
					264.03	

Subdrainage Area: L106A Controlled - Tributary
Area (ha): 1.06
C: 0.76

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	104.19	233.59	233.6
20	70.25	157.50	157.5
30	53.93	120.90	120.9
40	44.18	99.06	99.1
50	37.65	84.42	84.4
60	32.94	73.86	73.9
70	29.37	65.85	65.9
80	26.56	59.55	59.6
90	24.29	54.45	54.5
100	22.41	50.24	50.2
110	20.82	46.68	46.7
120	19.47	43.64	43.6

Subdrainage Area: L107A Controlled - Tributary
Area (ha): 0.65
C: 0.75

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	104.19	140.28	140.3
20	70.25	94.58	94.6
30	53.93	72.60	72.6
40	44.18	59.49	59.5
50	37.65	50.69	50.7
60	32.94	44.35	44.4
70	29.37	39.54	39.5
80	26.56	35.76	35.8
90	24.29	32.70	32.7
100	22.41	30.17	30.2
110	20.82	28.03	28.0
120	19.47	26.21	26.2

Project #116501019, Ashbury College - Synthetic Turf Field
Modified Rational Method Calculations for Storage

100 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	1735.688
b =	6.014
c =	0.820

t (min)	I (mm/hr)
5	242.70
10	178.56
15	142.89
20	119.95
25	103.85
30	91.87
35	82.58
40	75.15
45	69.05
50	63.95
55	59.62
60	55.89

100 YEAR Modified Rational Method for Entire Site

Subdrainage Area: INFILTRATION GALLERY
(L106A, L107A, L108A, L4A, L4B, & L4C) Controlled - Tributary
Area (ha): 2.29
C: 0.85

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	969.90	258.5	711.4	426.8
20	119.95	651.55	258.5	393.0	**471.6**
30	91.87	499.01	258.5	240.5	432.8
40	75.15	408.18	258.5	149.6	359.1
50	63.95	347.39	258.5	88.8	266.5
60	55.89	303.61	258.5	45.1	162.2
70	49.79	270.45	258.5	11.9	50.0
80	44.99	244.38	258.5	0.0	0.0
90	41.11	223.31	258.5	0.0	0.0
100	37.90	205.88	258.5	0.0	0.0
110	35.20	191.21	258.5	0.0	0.0
120	32.89	178.68	258.5	0.0	0.0

Storage: Subsurface Storage - Cultec Recharger 360HD

Orifice Equation: $Q = CdA(2gh)^{0.5}$ Where C = 0.61
Orifice Diameter: 344.00 mm
Invert Elevation 68.16 m (top of stone below chamber)
HWL Elevation 69.22 m (top of stone above chamber)
Max Ponding Depth 0.00 m (no surface ponding is proposed)
Downstream W/L 66.56 m

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	69.22	1.06	258.5	471.6	473.8	OK
					2.16	

Subdrainage Area: L106A Controlled - Tributary
Area (ha): 1.06
C: 0.95

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	178.56	500.40	500.4
20	119.95	336.15	336.2
30	91.87	257.45	257.5
40	75.15	210.59	210.6
50	63.95	179.23	179.2
60	55.89	156.64	156.6
70	49.79	139.53	139.5
80	44.99	126.08	126.1
90	41.11	115.21	115.2
100	37.90	106.22	106.2
110	35.20	98.65	98.7
120	32.89	92.19	92.2

Subdrainage Area: L107A Controlled - Tributary
Area (ha): 0.65
C: 0.94

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	178.56	300.50	300.5
20	119.95	201.86	201.9
30	91.87	154.61	154.6
40	75.15	126.46	126.5
50	63.95	107.63	107.6
60	55.89	94.07	94.1
70	49.79	83.79	83.8
80	44.99	75.72	75.7
90	41.11	69.19	69.2
100	37.90	63.79	63.8
110	35.20	59.24	59.2
120	32.89	55.36	55.4

Stormwater Management Calculations

Project #116501019, Ashbury College - Synthetic Turf Field
Modified Rational Method Calculations for Storage

Subdrainage Area: L108A — Controlled - Tributary
Area (ha): 0.07
C: 0.53

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	104.19	11.13	11.1
20	70.25	7.51	7.5
30	53.93	5.76	5.8
40	44.18	4.72	4.7
50	37.65	4.02	4.0
60	32.94	3.52	3.5
70	29.37	3.14	3.1
80	26.56	2.84	2.8
90	24.29	2.59	2.6
100	22.41	2.39	2.4
110	20.82	2.22	2.2
120	19.47	2.08	2.1

Subdrainage Area: L4C — Controlled - Tributary
Area (ha): 0.06
C: 0.95

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	104.19	17.75	17.7
20	70.25	11.97	12.0
30	53.93	9.19	9.2
40	44.18	7.53	7.5
50	37.65	6.41	6.4
60	32.94	5.61	5.6
70	29.37	5.00	5.0
80	26.56	4.52	4.5
90	24.29	4.14	4.1
100	22.41	3.82	3.8
110	20.82	3.55	3.5
120	19.47	3.32	3.3

Subdrainage Area: L4B — Controlled - Tributary
Area (ha): 0.33
C: 0.35

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	104.19	33.14	33.1
20	70.25	22.34	22.3
30	53.93	17.15	17.2
40	44.18	14.05	14.1
50	37.65	11.97	12.0
60	32.94	10.48	10.5
70	29.37	9.34	9.3
80	26.56	8.45	8.4
90	24.29	7.72	7.7
100	22.41	7.13	7.1
110	20.82	6.62	6.6
120	19.47	6.19	6.2

Subdrainage Area: L4A — Controlled - Tributary
Area (ha): 0.12
C: 0.48

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	104.19	16.88	16.9
20	70.25	11.38	11.4
30	53.93	8.74	8.7
40	44.18	7.16	7.2
50	37.65	6.10	6.1
60	32.94	5.34	5.3
70	29.37	4.76	4.8
80	26.56	4.30	4.3
90	24.29	3.93	3.9
100	22.41	3.63	3.6
110	20.82	3.37	3.4
120	19.47	3.15	3.2

SUMMARY TO OUTLET

			Vrequired	Vavailable*	
Tributary Area	2.29	ha			
Total 5yr Flow to Sewer	258.5	L/s	0	0 m^3	Ok
Total Area	2.29	ha			
Total 5yr Flow	258.5	L/s			
Target	258.9	L/s			

Project #116501019, Ashbury College - Synthetic Turf Field
Modified Rational Method Calculations for Storage

Subdrainage Area: L108A — Controlled - Tributary
Area (ha): 0.07
C: 0.66

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	178.56	23.85	23.8
20	119.95	16.02	16.0
30	91.87	12.27	12.3
40	75.15	10.04	10.0
50	63.95	8.54	8.5
60	55.89	7.46	7.5
70	49.79	6.65	6.6
80	44.99	6.01	6.0
90	41.11	5.49	5.5
100	37.90	5.06	5.1
110	35.20	4.70	4.7
120	32.89	4.39	4.4

Subdrainage Area: L4C — Controlled - Tributary
Area (ha): 0.06
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	178.56	32.02	32.0
20	119.95	21.51	21.5
30	91.87	16.47	16.5
40	75.15	13.47	13.5
50	63.95	11.47	11.5
60	55.89	10.02	10.0
70	49.79	8.93	8.9
80	44.99	8.07	8.1
90	41.11	7.37	7.4
100	37.90	6.80	6.8
110	35.20	6.31	6.3
120	32.89	5.90	5.9

Subdrainage Area: L4B — Controlled - Tributary
Area (ha): 0.33
C: 0.44

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	178.56	70.98	71.0
20	119.95	47.68	47.7
30	91.87	36.52	36.5
40	75.15	29.87	29.9
50	63.95	25.42	25.4
60	55.89	22.22	22.2
70	49.79	19.79	19.8
80	44.99	17.89	17.9
90	41.11	16.34	16.3
100	37.90	15.07	15.1
110	35.20	13.99	14.0
120	32.89	13.08	13.1

Subdrainage Area: L4A — Controlled - Tributary
Area (ha): 0.12
C: 0.60

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)
10	178.56	36.16	36.2
20	119.95	24.29	24.3
30	91.87	18.60	18.6
40	75.15	15.22	15.2
50	63.95	12.95	13.0
60	55.89	11.32	11.3
70	49.79	10.08	10.1
80	44.99	9.11	9.1
90	41.11	8.33	8.3
100	37.90	7.68	7.7
110	35.20	7.13	7.1
120	32.89	6.66	6.7

SUMMARY TO OUTLET

			Vrequired	Vavailable*	
Tributary Area	2.29	ha			
Total 100yr Flow to Sewer	258.5	L/s	0	0 m^3	Ok
Total Area	2.29	ha			
Total 100yr Flow	258.5	L/s			
Target	258.9	L/s			

Stantec	Project:	Ashbury College - Synthetic Turf Field	116501019
	INFILTRATION CALCULATIONS		
	Prepared By: AG	Revision No: 1	Checked By: DT
	Date Prepared: 15-Apr-2026	Date Revised: 17-Apr-2026	Date Checked: 17-Apr-2026

Summary of Geotechnical Information for Bedrock and Groundwater

			AUGER REFUSAL		SEASONAL HIGH GW LEVELS			
Slope	FG W	FG E	AR W BH25-1	AR E BH25-2	W BH 25-1		E BH25-2[5]	
%	(m)	(m)	(m)	(m)	(m)	DATE	(m)	DATE
0.20	70.45	70.74	66.60	65.00	68.16	12-Mar-26	66.83	11-Jul-25

Summary of Cultec Unit Design

	CULTEC UNIT PARAMETERS[4]									
Design Clearance from AR to INV Stone (m)	INV Stone Below Unit (m)	Depth Stone Below Unit (mm)	Depth Stone Above Unit[6] (mm)	Length (m)	Width (m)	Bed Area (m^2)	Available Storage Volume (m^3)	Cultec Unit	Height Cultec Unit (mm)	100-YEAR HWL (m)
1.1	67.71	440	152	48.31	10.90	524.5	473.8	Recharger 360 HD	915	69.22

Summary of Quality Control Infiltration Requirements

INFILTRATION DETAILS (Per Equation 4.3 MECP SWM Planning Design Manual)

Required Infiltration Volume[1] (m^3)	Vertical Hydraulic Conductivity[2] (m/s)	Percolation Rate of Soils[2] (mm/h)	Porosity of the Storage Media (Clearstone)	Retention Time (hours)	Minimum Required Bed Area[3] (m^2)	Available Void Volume Below Cultec Unit (m^3)
91.7	2.00E-05	103	0.4	24	92.7	92.3

Notes:

1. Required infiltration volume determined from Table 3.2 of the MECP SWM Planning Design Manual, Enhanced (80%) Protection Level for Long-Term Suspended Solids Removal
   a) Overall site runoff coefficient = 0.68
   b) Imperviousness ≈ 0.85
   c) Storage Required = 40m^3/ha
   d) Storage = 2.29ha x 40m^3/ha= 91.7 m^3
2. Infiltration testing information obtained from location ID: IT-No.3 (Test 2), as per the Geotechnical Investigation Report by Stantec Consulting Ltd., May 2024
3. Calculation of required bottom area of trench/bed as per Equation 4.3 of the MECP SWM Planning Design Manual.
4. For details, refer to Cultec StormGenie preliminary design package for model no. Recharger 360 HD.
5. Monitoring well in BH25-2 was inaccessible in March, 2026. Spring levels are anticipated to be recorded in late April 2026.
6. Minimum stone depth provided.

A.2 CULTEC StormGenie Design Summary

CULTEC
StormGenie

USER INPUTS

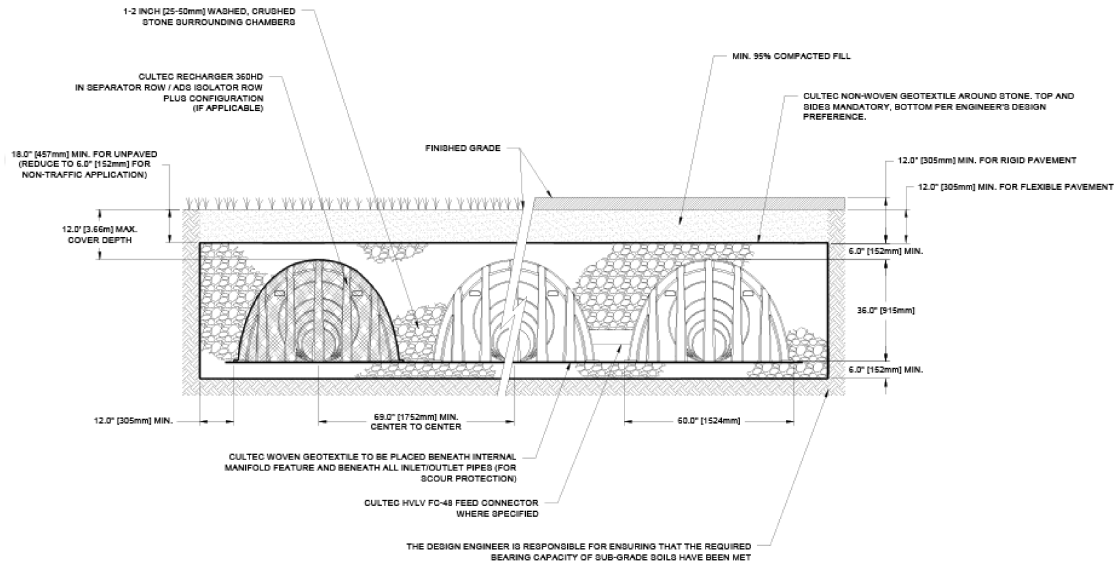
Project Name:	Ashbury College - Synthetic Turf Field - Recharger 360HD
Engineer:	Alyssa Gladish
Project Location:	Ontario
Measurement Type:	Metric
Chamber Model:	Recharger 360HD
Required Storage Volume:	473.01 m³
Available Length:	50.00 m
Available Width:	13.00 m
Stone Above Chambers:	153 mm
Stone Below Chambers:	440 mm
Base Stone Elevation:	67.72 m
Stone Porosity:	40%
Maximum Allowable Finished Grade	NaN m
Minimum Allowable Finished Grade	67.72 m
Outlet Control Structure:	Yes

RESULTS

Installed Storage Volume:	473.77 m³
Storage Volume Per Chamber:	1.04 m³
Chamber Rows:	6
Maximum Length:	48.32 m
Maximum Width:	10.90 m
Approx. Bed Area Required:	524.47 m²

SYSTEM COMPONENTS - NOT FOR CONSTRUCTION

Number of Chambers Required:	251
Number of End Caps Required:	12
Number of Feed Connectors Required:	8
Amount of Stone Required:	528 m³
Volume of Excavation (Not Including Fill):	791 m³
Non-woven Geotextile Required:	1821 m²
Woven Geotextile Required (Beneath Internal Manifold):	24 m
Woven Geotextile Required (Cultec Separator Row / ADS Isolator Row Plus):	54 m
Total Woven Geotextile Required:	78 m



ASHBURY COLLEGE - SYNTHETIC TURF FIELD - RECHARGER 360HD

OTTAWA, ON, CANADA

DRAWING INDEX	
TITLE	SHEET NO.
COVER SHEET	1 OF 4
SYSTEM LAYOUT SHEET	2 OF 4
SYSTEM OVERLAY SHEET	3 OF 4
R-360HD DETAIL SHEET	4 OF 4

PROJECT INFORMATION						
PROJECT NO.						
CULTEC SALES REP						
CULTEC PROJECT SUPERVISOR						
ENGINEER OF RECORD						
REVISIONS	ITERATION	DATE	BY	COMMENTS	EOR SHEET REFERENCE	DATE
	00					

CULTEC

Subsurface Stormwater Management Systems

P.O. Box 280
878 Federal Road
Brookfield, CT 06804
www.cultec.com

PH: 1(203) 775-4416
PH: 1(800) 4-CULTEC
stormgenie@cultec.com

NOTE: THESE SHOP DRAWINGS MAY CONTAIN COMPONENTS INCLUDING BUT NOT LIMITED TO MANHOLES, CATCH BASINS, STORM PIPES AND FITTINGS, MANIFOLDS, CASTINGS AND OTHER NECESSARY APPURTENANCES THAT MAY NOT BE SUPPLIED BY CULTEC, INC. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND/OR SUPPLIER TO CONFIRM WITH CULTEC THE MATERIALS PROVIDED.

BEFORE YOU BEGIN - REQUIRED MATERIALS AND EQUIPMENT

1. PROPER GEOTECHNICAL SOIL EVALUATION BY A QUALIFIED ENGINEER OR SOIL SCIENTIST TO DETERMINE SUITABILITY OF STRUCTURAL INSTALLATION
2. OSHA COMPLIANCE
3. CULTEC WARNING TAPE, OR EQUIVALENT
4. ASSURANCES FROM LOCAL UTILITIES THAT NO UNDERGROUND GAS, ELECTRICAL OR OTHER POTENTIALLY DANGEROUS PIPELINES OR CONDUITS ARE ALREADY BURIED AT THE SITE
5. ACCEPTABLE 1- 2 INCH (25 - 51 mm) WASHED, CRUSHED STONE AS DETAILED IN CULTEC'S INSTALLATION INSTRUCTIONS. CLEANLINESS OF STONE TO BE VERIFIED BY ENGINEER.
6. ACCEPTABLE FILL MATERIAL AS SHOWN IN CULTEC'S INSTALLATION INSTRUCTIONS.
7. ALL CULTEC CHAMBERS AND ACCESSORIES AS SPECIFIED IN THE ENGINEER'S PLANS INCLUDING NON-WOVEN GEOTEXTILE, CULTEC STORMFILTER AND CULTEC AFAB-HPF WOVEN GEOTEXTILE, WHERE APPLICABLE.
8. RECIPROCATING SAW OR ROUTER
9. STONE BUCKET
10. STONE CONVEYOR AND/OR TRACKED EXCAVATOR
11. TRANSIT OR LASER LEVEL MEASURING DEVICE
12. COMPACTION EQUIPMENT WITH MAXIMUM GROSS VEHICLE WEIGHT OF 12,000 LBS (5,440 KGS). VIBRATORY ROLLERS MAY ONLY BE USED ON THE STONE BASE PRIOR TO THE INSTALLATION OF CHAMBERS.
13. CHECK CULTEC CHAMBERS FOR DAMAGE PRIOR TO INSTALLATION. DO NOT USE DAMAGED CULTEC CHAMBERS, CONTACT YOUR SUPPLIER IMMEDIATELY TO REPORT DAMAGE OR PACKING-LIST DISCREPANCIES.

REQUIREMENTS FOR CULTEC CHAMBER SYSTEM INSTALLATIONS

1. INSTALLING CONTRACTORS ARE EXPECTED TO COMPREHEND AND USE THE MOST CURRENT INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING A SYSTEM INSTALLATION. IF THERE IS ANY QUESTION AS TO WHETHER YOU POSSESS THE MOST CURRENT INSTRUCTIONS, CONTACT CULTEC AT (203) 775-4416 OR VISIT WWW.CULTEC.COM.
2. CONTACT CULTEC AT LEAST THIRTY DAYS PRIOR TO SYSTEM INSTALLATION TO ARRANGE FOR A PRE-CONSTRUCTION MEETING.
3. ALL CULTEC SYSTEM DESIGNS MUST BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.
4. USE CULTEC INSTALLATION INSTRUCTIONS AS A GUIDELINE ONLY FOR MINIMUM/MAXIMUM REQUIREMENTS. ACTUAL DESIGN MAY VARY. REFER TO APPROVED CONSTRUCTION DRAWINGS FOR JOB-SPECIFIC DETAILS. BE SURE TO FOLLOW THE ENGINEER'S DRAWINGS AS YOUR PRIMARY GUIDE.
5. THE FOUNDATION STONE SHALL BE LEVEL AND COMPACTED PRIOR TO CHAMBER INSTALLATION.
6. OVERLAPPING RIB CONNECTIONS OF CHAMBERS SHALL BE FULLY SHOULDERED PRIOR TO STONE PLACEMENT.
7. CENTER-TO-CENTER SPACING SHALL BE CHECKED AND MAINTAINED THROUGHOUT INSTALLATION PROCESS.
8. ANY DISCREPANCIES WITH THE SYSTEM SUB-GRADE SOIL'S BEARING CAPACITY MUST BE REPORTED TO THE DESIGN ENGINEER.
9. NON-WOVEN GEOTEXTILE MUST BE USED AS SPECIFIED IN THE ENGINEER'S DRAWINGS.
10. CULTEC REQUIRES THE CONTRACTOR TO REFER TO CULTEC'S INSTALLATION INSTRUCTIONS CONCERNING VEHICULAR TRAFFIC. RESPONSIBILITY FOR PREVENTING VEHICLES THAT EXCEED CULTEC'S REQUIREMENTS FROM TRAVELING ACROSS OR PARKING OVER THE CHAMBER SYSTEM LIES SOLELY WITH THE CONTRACTOR THROUGHOUT THE ENTIRE SITE CONSTRUCTION PROCESS. THE PLACEMENT OF WARNING TAPE, TEMPORARY FENCING, AND/OR APPROPRIATELY LOCATED SIGNS IS HIGHLY RECOMMENDED. IMPRINTED WARNING TAPE IS AVAILABLE FROM CULTEC. FOR ACCEPTABLE VEHICLE LOAD INFORMATION, REFER TO CULTEC INSTALLATION INSTRUCTIONS.
11. TRAFFIC OF INSTALLATION EQUIPMENT OR OTHER VEHICULAR TRAFFIC OVER TOP OF THE CULTEC STORMWATER SYSTEM IS STRICTLY RESTRICTED AND PROHIBITED UNTIL SATISFACTORY COVER AND COMPACTION IS ACHIEVED ACCORDING TO CULTEC'S MANUFACTURER INSTALLATION INSTRUCTIONS.
12. EROSION AND SEDIMENT-CONTROL MEASURES MUST MEET LOCAL CODES AND THE DESIGN ENGINEER'S SPECIFICATIONS THROUGHOUT THE ENTIRE SITE CONSTRUCTION PROCESS.
13. CULTEC SYSTEMS MUST BE DESIGNED AND INSTALLED IN ACCORDANCE WITH CULTEC'S MINIMUM REQUIREMENTS. FAILURE TO DO SO WILL VOID THE LIMITED WARRANTY.
14. CONTACT CULTEC, INC. AT 203-775-4416 WITH ANY QUESTIONS OR FURTHER CLARIFICATION OF REQUIREMENTS.
15. PLACEMENT OF EMBEDMENT STONE MUST BE IN ACCORDANCE WITH CULTEC'S INSTALLATION INSTRUCTIONS. STONE COLUMN HEIGHT DEFERENTIAL MUST NEVER EXCEED 12" (305 mm) BETWEEN CHAMBER ROWS, ADJACENT CHAMBERS OR STONE PERIMETER. STONE MUST BE PLACED OVER THE CROWN OF THE CHAMBERS TO ANCHOR THE CHAMBERS IN PLACE AND MAINTAIN ROW SPACING.
16. EMBEDMENT STONE MUST ONLY BE PLACED BY EXCAVATOR OR TELESCOPING CONVEYOR BOOM. PLACEMENT OF EMBEDMENT STONE WITH BULLDOZER IS NOT AN ACCEPTABLE METHOD OF INSTALLATION AND MAY CAUSE DAMAGE TO THE CHAMBERS. ANY CHAMBERS DAMAGED USING AN UNACCEPTABLE METHOD OF BACKFILL ARE NOT COVERED UNDER THE CULTEC LIMITED WARRANTY.

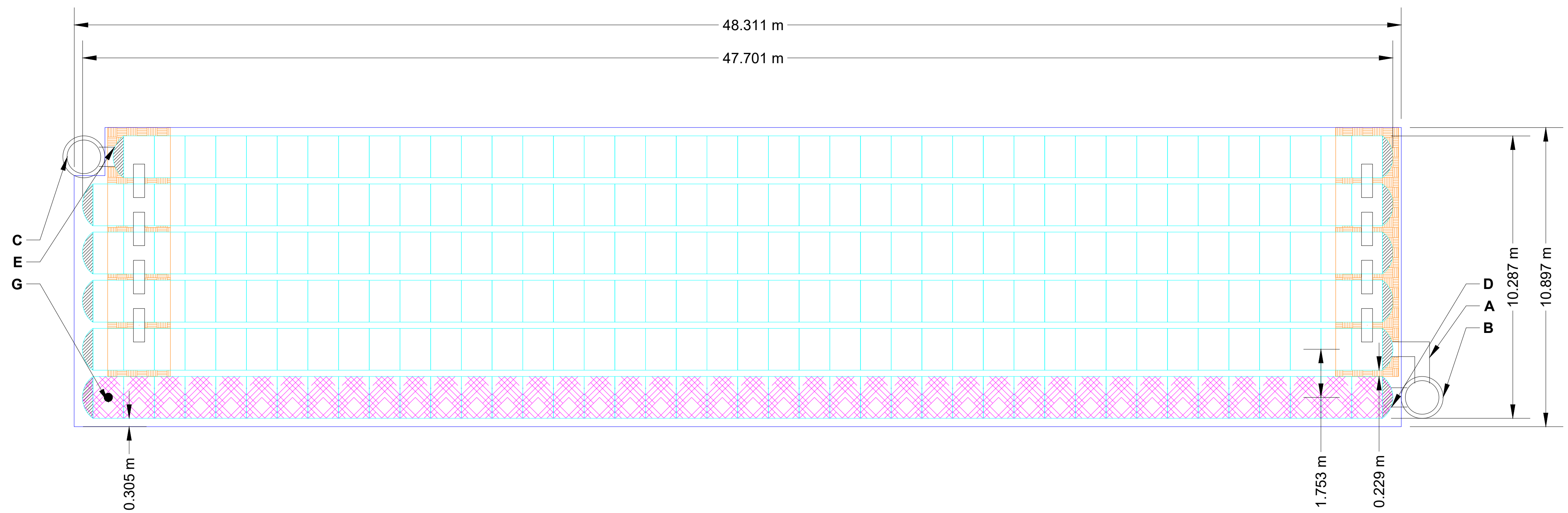
THIS DRAWING HAS BEEN PREPARED TO SUPPORT THE PROJECT ENGINEER OF RECORD FOR THE PROPOSED SYSTEM. THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO CULTEC UNDER THE DIRECTION OF THE PROJECT ENGINEER OF RECORD OR OTHER PROJECT REPRESENTATIVE. IT IS ULTIMATE RESPONSIBILITY OF THE PROJECT ENGINEER OF RECORD TO ENSURE THAT THE CULTEC SYSTEM'S DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS, REGULATIONS AND MANUFACTURER REQUIREMENTS.

PROPOSED STORMWATER MANAGEMENT SYSTEM ELEVATIONS (M)	
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT OR UNPAVED)	72.722
MINIMUM ALLOWABLE GRADE (UNPAVED TRAFFIC)	69.674
MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)	69.522
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)	69.522
TOP OF STONE ELEVATION	69.217
TOP OF CHAMBER ELEVATION	69.064
450 mm x 450 mm TOP MANIFOLD INVERT	68.480
600 mm BOTTOM CONNECTION INVERT	68.201
600 mm BOTTOM CONNECTION INVERT	68.201
BOTTOM OF CHAMBER ELEVATION	68.150
BOTTOM OF STONE ELEVATION	67.710

CULTEC STORMWATER MANAGEMENT SYSTEM SUMMARY	
TOTAL STORAGE REQUIRED (CU. METERS)	473.0
TOTAL STORAGE PROVIDED (CU. METERS)	473.8
% STONE POROSITY	40
SYSTEM AREA (SQ. METERS)	524.5
DEPTH OF EMBEDMENT STONE (MM)	152
DEPTH OF BEDDING STONE (MM)	440
SYSTEM PERIMETER (M)	118.4
SPACING BETWEEN CHAMBER ROWS (MM)	228.6

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*
ELEVATED BYPASS PIPE	A	450 mm HIGH-FLOW BYPASS PIPE (PROVIDED BY OTHERS)	330 mm
CONCRETE STRUCTURE	B	INLET STRUCTURE (DESIGN BY ENGINEER / PROVIDED BY OTHERS)	
CONCRETE STRUCTURE	C	OUTLET STRUCTURE (DESIGN BY ENGINEER / PROVIDED BY OTHERS)	
INLET PIPE	D	600 mm INLET/CULTEC SEPARATOR ROW / ADS ISOLATOR ROW PLUS ACCESS PIPE (PROVIDED BY OTHERS)	51 mm
OUTLET PIPE	E	600 mm OUTLET PIPE (PROVIDED BY OTHERS)	51 mm
INSPECTION PORT	G	6"-10" UNIVERSAL (SEE DETAIL)	



1 SYSTEM LAYOUT SHEET
1 / 200

NOTES: ALL EXTERNAL SYSTEM STRUCTURES, INLET/OUTLET PIPES, AND PROPOSED ELEVATIONS MUST BE DESIGNED AND APPROVED BY THE ENGINEER OF RECORD. ALL PROPOSED SYSTEM ELEVATIONS PROVIDED MUST BE VERIFIED BY THE ENGINEER OF RECORD ENGINEER AND THE ENGINEER OF RECORD MUST ENSURE CHAMBER BURIAL REQUIREMENTS ARE MET.

MATERIALS LIST SUPPLIED BY CULTEC		
CULTEC RECHARGER® 360HD CHAMBER	251	PIECES
CULTEC RECHARGER® 360HD END CAP	12	PIECES
CULTEC HVLV FC-48 FEED CONNECTOR	8	PIECES
CULTEC No.410 NON-WOVEN GEOTEXTILE (40% OVERAGE)	1821	SQ. METERS
CULTEC AFAB-HPF WOVEN GEOTEXTILE (10% OVERAGE)	78	METERS
CULTEC INSPECTION PORT KIT	1	PIECES

MATERIALS LIST NOT SUPPLIED BY CULTEC		
1-2 INCH WASHED, CRUSHED STONE	528	CU. METERS

CULTEC RECHARGER® 360HD LEGEND

- CULTEC RECHARGER 360HD CHAMBER
- CULTEC RECHARGER 360HD END CAP
- CULTEC HVLV FC-48 FEED CONNECTORS
- CULTEC SEPARATOR ROW / ADS ISOLATOR ROW PLUS
- CULTEC WOVEN GEOTEXTILE
- STONE BORDER

CULTEC STORMWATER CHAMBER

PROJECT #:		DATE:	04/17/2026
DESIGNED BY:	StormGenie	CHECKED:	N/A
SCALE:	1 / 200	SHEET	2 OF 4

ASHBURY COLLEGE - SYNTHETIC TURF FIELD - RECHARGER 360HD

OTTAWA, ON, CANADA

SYSTEM LAYOUT SHEET

CULTEC
Subsurface Stormwater Management Systems
P.O. Box 280
878 Federal Road
Brookfield, CT 06804
www.cultec.com
PH: 1(203) 775-4416
PH: 1(800) 4-CULTEC
stormgenie@cultec.com

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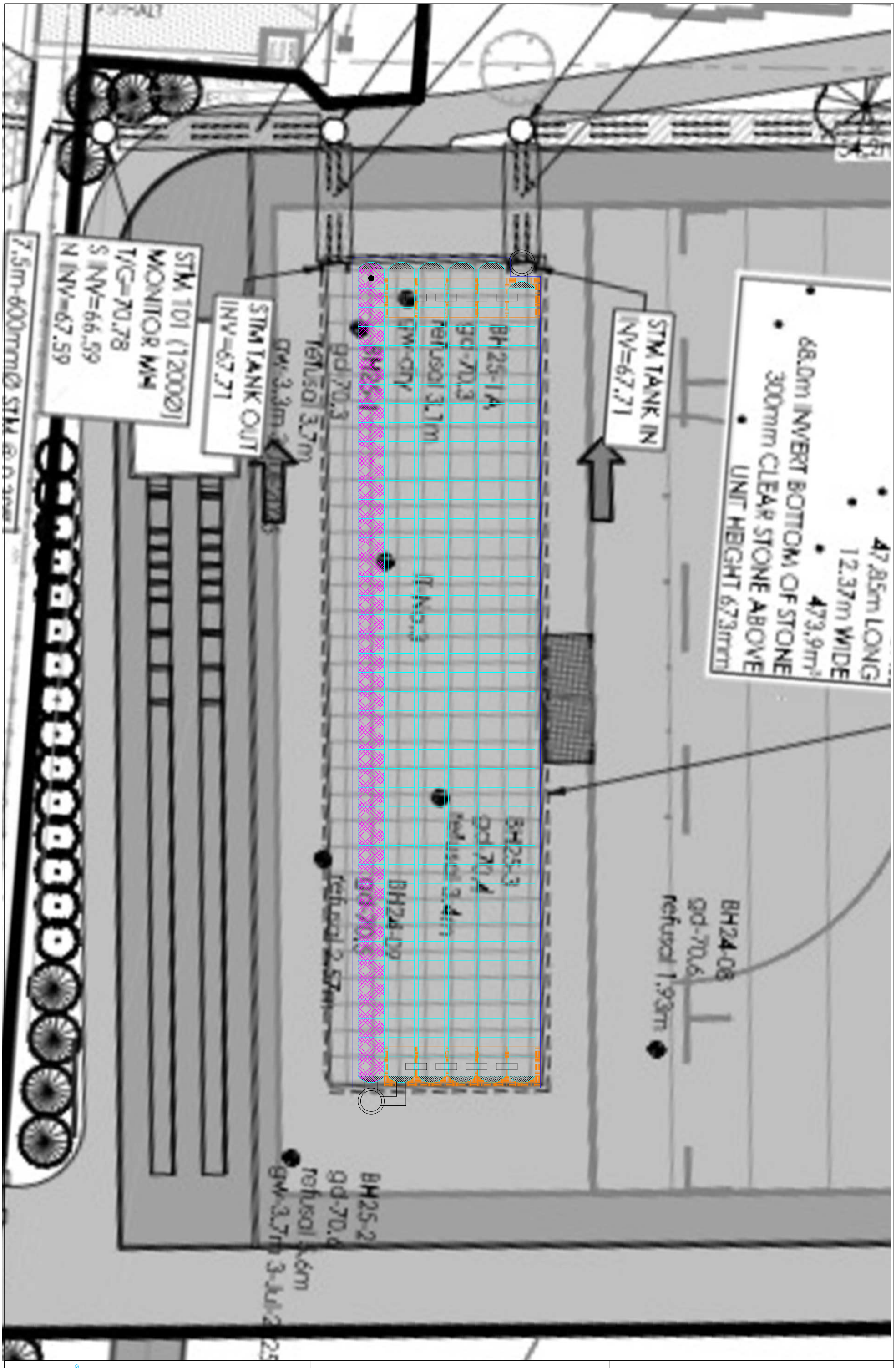

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1.02

ASHBURY COLLEGE - SYNTHETIC TURF FIELD - RECHARGER 360HD

OTTAWA, ON, CANADA

SYSTEM OVERLAY SHEET

CULTEC STORMWATER CHAMBER

PROJECT #:		DATE:	04/17/2026
DESIGNED BY:	StormGenie	CHECKED:	N/A
SCALE:	1 / 200	SHEET	3 OF 4

CULTEC RECHARGER® 360HD PRODUCT SPECIFICATIONS

GENERAL
CULTEC RECHARGER® 360HD CHAMBERS ARE DESIGNED FOR UNDERGROUND STORMWATER MANAGEMENT. THE CHAMBERS MAY BE USED FOR RETENTION, RECHARGING, DETENTION OR CONTROLLING THE FLOW OF ON-SITE STORMWATER RUNOFF.

CHAMBER PARAMETERS
1. THE CHAMBERS SHALL BE MANUFACTURED IN THE U.S.A. OR CANADA BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS.
3. THE CHAMBER SHALL BE DESIGNED TO WITHSTAND THE AASHTO DESIGN TRUCK LOAD AND LIVE AND DEAD LOAD FACTORS AS DEFINED BY AASHTO LRFD SECTION 12.12 WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
4. THE CHAMBER SHALL BE STRUCTURAL FOAM INJECTION MOLDED OF BLUE VIRGIN HIGH MOLECULAR WEIGHT IMPACT-MODIFIED POLYPROPYLENE.
5. THE CHAMBER SHALL BE ARCHED IN SHAPE.
6. THE CHAMBER SHALL BE OPEN-BOTTOMED.
7. THE CHAMBER SHALL BE JOINED USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS.
8. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC RECHARGER® 360HD SHALL BE 36 INCHES (915 mm) TALL, 60 INCHES (1525 mm) WIDE AND 50 INCHES (1275 mm) LONG. THE INSTALLED LENGTH OF A JOINED RECHARGER® 360HD SHALL BE 3.67 FEET (1.12 m).
9. MULTIPLE CHAMBERS MAY BE CONNECTED TO FORM DIFFERENT LENGTH ROWS. EACH ROW SHALL BEGIN AND END WITH A SEPARATELY FORMED CULTEC RECHARGER® 360HD END CAP. MAXIMUM INLET OPENING ON THE END CAP IS 24 INCH (600 mm) HDPE OR 30 INCH (750mm) PVC.
10. THE CHAMBER SHALL HAVE TWO SIDE PORTALS TO ACCEPT CULTEC HVLV™ FC-48 FEED CONNECTORS TO CREATE AN INTERNAL MANIFOLD. MAXIMUM ALLOWABLE PIPE SIZE IN THE SIDE PORTAL IS 10 INCH (250mm) HDPE OR 12 INCH (300mm) PVC.
11. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV™ FC-48 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 49 INCHES (1245 mm) LONG.
12. THE NOMINAL STORAGE VOLUME OF THE RECHARGER® 360HD CHAMBER SHALL BE 10.0 FT³ / FT (.928 m³ / m) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF A JOINED RECHARGER® 360HD SHALL BE 36.66 FT³ / UNIT (1.038 m³ / UNIT) - WITHOUT STONE.
13. THE NOMINAL STORAGE VOLUME OF THE HVLV™ FC-48 FEED CONNECTOR SHALL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE.
14. THE RECHARGER® 360HD CHAMBER SHALL HAVE 7 CORRUGATIONS.
15. THE CHAMBER SHALL BE MANUFACTURED IN A FACILITY EMPLOYING CULTEC'S QUALITY CONTROL AND ASSURANCE PROCEDURES.
16. MAXIMUM ALLOWABLE COVER OVER THE TOP OF THE CHAMBER SHALL BE 12.0 FEET (3.66 m).

END CAP PARAMETERS
1. THE CULTEC RECHARGER® 360HD END CAP (REFERRED TO AS 'END CAP') SHALL BE MANUFACTURED IN THE U.S.A. OR CANADA BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
4. THE END CAP SHALL BE STRUCTURAL FOAM INJECTION MOLDED OF BLUE VIRGIN HIGH MOLECULAR WEIGHT IMPACT-MODIFIED POLYPROPYLENE.
5. THE END CAP SHALL BE ARCHED IN SHAPE.
6. THE END CAP SHALL BE OPEN-BOTTOMED.
7. THE END CAP SHALL BE JOINED AT THE BEGINNING AND END OF EACH ROW OF CHAMBERS USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS.
8. THE END CAP SHALL HAVE 5 CORRUGATIONS.
9. THE NOMINAL DIMENSIONS OF THE END CAP SHALL BE 36.5 INCHES (927 mm) TALL, 60 INCHES (1525 mm) WIDE AND 18 INCHES (458 mm) LONG. WHEN JOINED WITH A RECHARGER 360HD CHAMBER, THE INSTALLED LENGTH OF THE END CAP SHALL BE 15 INCHES (381 mm).
10. THE NOMINAL STORAGE VOLUME OF THE END CAP SHALL BE 5.17 FT³ / FT (0.48 m³ / m) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF AN INTERLOCKED END CAP SHALL BE 6.46 FT³ / UNIT (0.183 m³ / UNIT) - WITHOUT STONE.
11. MAXIMUM INLET OPENING ON THE END CAP IS 24 INCH (600 mm) HDPE OR 30 INCH (750 mm) SMOOTH-WALL PVC.
12. THE CHAMBER SHALL BE MANUFACTURED IN A FACILITY EMPLOYING CULTEC'S QUALITY CONTROL AND ASSURANCE PROCEDURES
13. THE END CAP SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12.

CULTEC HVLV FC-48 FEED CONNECTOR PRODUCT SPECIFICATIONS

GENERAL
CULTEC HVLV FC-48 FEED CONNECTORS ARE DESIGNED TO CREATE AN INTERNAL MANIFOLD FOR CULTEC RECHARGER MODEL 360HD STORMWATER CHAMBERS.

FEED CONNECTOR PARAMETERS
1. THE FEED CONNECTOR SHALL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE FEED CONNECTOR SHALL BE VACUUM THERMOFORMED OF BLACK HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE).
3. THE FEED CONNECTOR SHALL BE ARCHED IN SHAPE.
4. THE FEED CONNECTOR SHALL BE OPEN-BOTTOMED.
5. THE NOMINAL DIMENSIONS OF THE CULTEC HVLV FC-48 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 49 INCHES (1245 mm) LONG.
6. THE NOMINAL STORAGE VOLUME OF THE HVLV FC-48 FEED CONNECTOR SHALL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE.
7. THE HVLV FC-48 FEED CONNECTOR SHALL HAVE 4 CORRUGATIONS.
8. THE HVLV FC-48 FEED CONNECTOR MUST BE FORMED AS A WHOLE UNIT HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT SHALL FIT INTO THE SIDE PORTALS OF THE CULTEC RECHARGER STORMWATER CHAMBER AND ACT AS CROSS FEED CONNECTIONS CREATING AN INTERNAL MANIFOLD.
9. THE FEED CONNECTOR SHALL BE DESIGNED TO WITHSTAND AASHTO HS-25 DEFINED LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
10. THE FEED CONNECTOR SHALL BE MANUFACTURED IN AN ISO 9001:2008 CERTIFIED FACILITY.

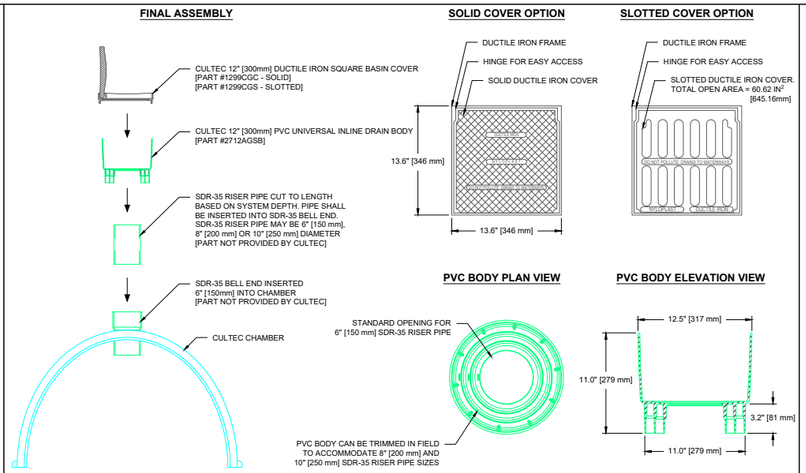
CULTEC NO. 410™ NON-WOVEN GEOTEXTILE
CULTEC NO. 410™ NON-WOVEN GEOTEXTILE MAY BE USED WITH CULTEC CONTACTOR® AND RECHARGER® STORMWATER INSTALLATIONS TO PROVIDE A BARRIER THAT PREVENTS SOIL INTRUSION INTO THE STONE.

GEOTEXTILE PARAMETERS
1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TYPICAL WEIGHT OF 4.5 OZ/SY (142 G/M).
4. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH VALUE OF 120 LBS (533 N) PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE AN ELONGATION @ BREAK VALUE OF 50% PER ASTM D4632 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A MULLEN BURST VALUE OF 225 PSI (1551 KPA) PER ASTM D3786 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A PUNCTURE STRENGTH VALUE OF 65 LBS (289 N) PER ASTM D4833 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE VALUE OF 340 LBS (1513 N) PER ASTM D6241 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A TRAPEZOID TEAR VALUE OF 50 LBS (222 N) PER ASTM D4533 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A AOS VALUE OF 70 U.S. SIEVE (0.212 MM) PER ASTM D4751 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY VALUE OF 1.7 SEC-1 PER ASTM D4491 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATE VALUE OF 135 GAL/MIN/SF (5500 L/MIN/SM) PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A UV STABILITY @ 500 HOURS VALUE OF 70% PER ASTM D4355 TESTING METHOD.

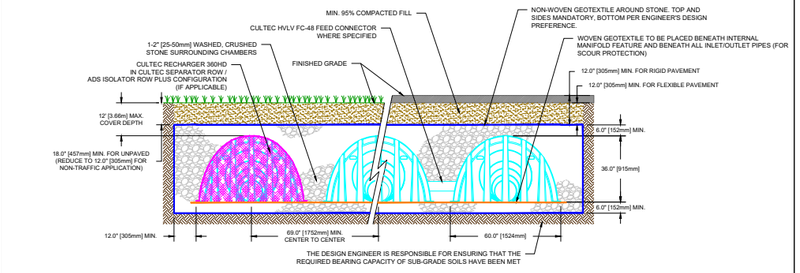
CULTEC AFAB-HPF™ WOVEN GEOTEXTILE
CULTEC AFAB-HPF WOVEN GEOTEXTILE IS DESIGNED AS A UNDERLAYMENT TO PREVENT SCOURING CAUSED BY WATER MOVEMENT WITHIN THE CULTEC CHAMBERS AND FEED CONNECTORS UTILIZING THE CULTEC MANIFOLD FEATURE. IT MAY ALSO BE USED AS A COMPONENT OF THE CULTEC SEPARATOR ROW / ADS ISOLATOR ROW PLUS TO ACT AS A BARRIER TO PREVENT SOIL/CONTAMINANT INTRUSION INTO THE STONE WHILE ALLOWING FOR MAINTENANCE.

GEOTEXTILE PARAMETERS
1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
3. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH OF 320 X 320 LBS (1,420 X 1,420 N) PER ASTM D4632 TESTING METHOD.
4. THE GEOTEXTILE SHALL HAVE A ELONGATION @ BREAK RESISTANCE OF 15 X 15% PER ASTM D4632 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE OF 3,563 X 3,563 LBS/FT (52 X 52 KN/M) PER ASTM D4595 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE RESISTANCE OF 1,500 LBS (6,670 N) PER ASTM D6241 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A TRAPEZOIDAL TEAR RESISTANCE OF 120 X 120 LBS (540 X 540 N) PER ASTM D4533 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE AN APPARENT OPENING SIZE OF 30 US STD. SIEVE (0.60 MM) PER ASTM D4751 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY RATING OF 0.2 SEC-1 PER ASTM D4491 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATING OF 22 GPM/FT2 (900 LPM/M2) PER ASTM D4491 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE A UV RESISTANCE OF 70% @ 500 HRS. PER ASTM D4355 TESTING METHOD.

GENERAL NOTES

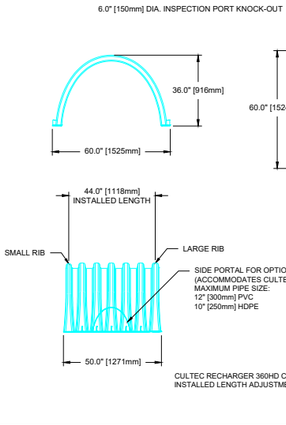


CULTEC UNIVERSAL INSPECTION PORT KIT DETAIL

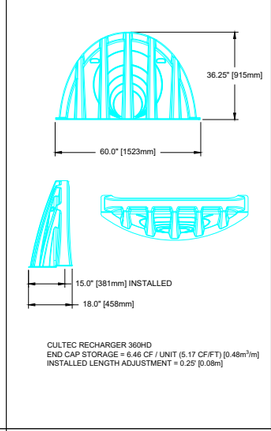


NOTES:
1. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THE LOAD CONFIGURATION SHALL INCLUDE:
   1.a. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   1.b. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   1.c. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
2. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   3.a. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   3.b. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   3.c. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95

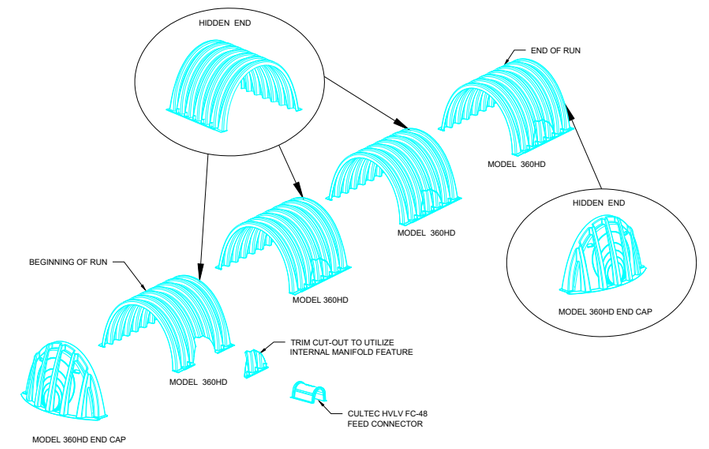
CULTEC RECHARGER 360HD CROSS SECTION



CULTEC RECHARGER 360HD HEAVY DUTY THREE VIEW



CULTEC RECHARGER 360HD HEAVY DUTY END CAP THREE VIEW

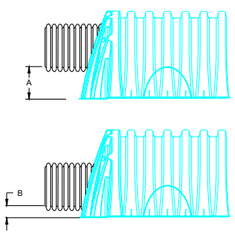


CULTEC RECHARGER 360HD HEAVY DUTY TYPICAL INTERLOCK

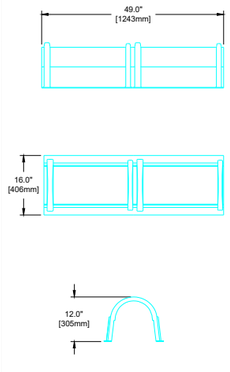
NOTES:
1. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THE LOAD CONFIGURATION SHALL INCLUDE:
   1.a. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   1.b. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   1.c. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
2. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   3.a. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   3.b. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   3.c. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95

PIPE	A	B
6" [150 mm]	26.50" [673 mm]	1.00" [25 mm]
8" [200 mm]	24.50" [622 mm]	1.00" [25 mm]
10" [250 mm]	22.25" [565 mm]	1.25" [32 mm]
12" [300 mm]	19.75" [502 mm]	1.75" [45 mm]
15" [375 mm]	16.50" [419 mm]	2.00" [50 mm]
18" [450 mm]	13.00" [330 mm]	2.50" [64 mm]
21" [525 mm]	10.00" [254 mm]	2.50" [64 mm]
24" [600 mm]	7.00" [178 mm]	2.50" [64 mm]
30" [750 mm]	N/A	3.50" [89 mm]

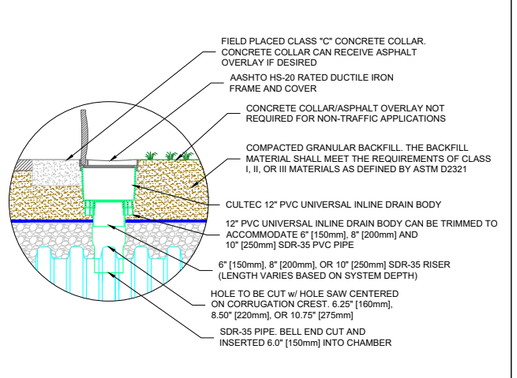
*THE TYPICAL INVERT TABLE ABOVE IS BASED ON THE INSIDE DIAMETER OF STANDARD CORRUGATED PLASTIC PIPE. THE HEAVY DUTY END CAP HAS PRE-MARKED TRIM LINES FOR PIPE DIAMETERS 12" (300mm), 15" (375mm), 18" (450mm) AND 24" (600mm). PIPES OF ANY SIZE AND MATERIAL UP TO 24" (600mm) MAY BE PLACED AT CUSTOM LOCATIONS AND CUSTOM INVERTS. 30" (750 mm) SMOOTH-WALL SDR-35 PVC PIPE MAY BE USED AT THE BOTTOM OF THE END CAP. THE CROWN OF THE PIPE MUST REMAIN A MINIMUM OF 3" (75mm) FROM THE EDGE OF THE HEAVY DUTY END CAP.



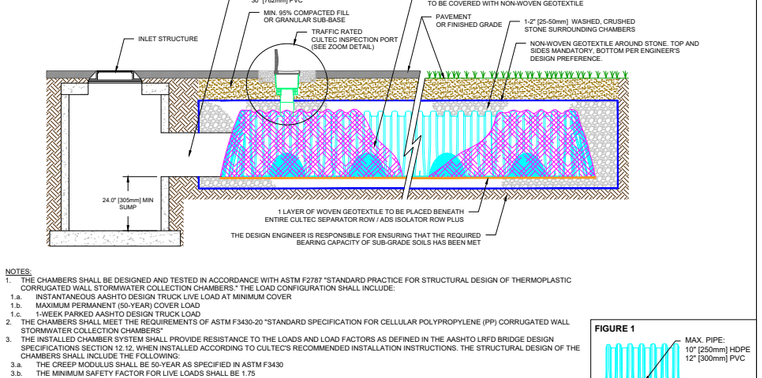
CULTEC RECHARGER 360HD TYPICAL PIPE INVERTS



CULTEC HVLV FC-48 FEED CONNECTOR THREE VIEW

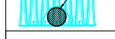


OPTIONAL CULTEC INSPECTION PORT - ZOOM DETAIL



NOTES:
1. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THE LOAD CONFIGURATION SHALL INCLUDE:
   1.a. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   1.b. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   1.c. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
2. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   3.a. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   3.b. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   3.c. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95

FIGURE 1



ZOOM OF SIDE PORTAL SHOWING MAX. PIPE O.D.

CULTEC SEPARATOR ROW / ADS ISOLATOR ROW PLUS - CULTEC INSPECTION PORT DETAIL (IF APPLICABLE)

CULTEC STORMWATER CHAMBER

DATE: 04/17/2026
CHECKED: N/A
DESIGNED BY: StormGenie
SCALE:
SHEET 4 OF 4
PROJECT #:

ASHBURY COLLEGE - SYNTHETIC TURF FIELD - RECHARGER 360HD

OTTAWA, ON, CANADA

CULTEC
Subsurface Stormwater Management Systems
P.O. Box 280
878 Federal Road
Brookfield, CT 06804
PH: 1(203) 775-4416
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www.cultec.com

1.02

CULTEC
P.O. Box 280, 878 Federal Rd.
Brookfield, CT 06804 USA

Phone: 203-775-4416
www.cultec.com
StormGenie@cultec.com

CULTEC StormGenie DESIGN TOOL

Date: 04/17/2026

Click for Imperial

PROJECT INFORMATION

Project Name: Ashbury College - Synthetic Turf Field - Recharger 360HD
City: Ottawa
State / Province: ON
Country: Canada

	Recharger 360HD	
Chamber Model:		
Number of Rows:	6	units
Total Number of Chambers :	251	units
Stone Void :	40	%
Stone Base :	440	mm
Stone Above Units :	152	mm
Area :	524.46	m^2
Base of Stone Elevation:	67.71	m

524.39	Min. Area Required

Note: Min. Area required is based on 305 mm around the system and typ. spacing

Ashbury College - Synthetic Turf Field - Recharger 360HD
Recharger 360HD Incremental Storage Volumes

Height of System	Chamber Volume	Stone Volume	Cumulative Storage Volume	Total Cumulative Storage Volume	Elevation
mm	m^3	m^3	m^3	m^3	m
1499	0.000	5.33	5.33	471.99	69.21
1473	0.000	5.33	5.33	466.66	69.18
1448	0.000	5.33	5.33	461.33	69.16
1422	0.000	5.33	5.33	456.00	69.13
1397	0.000	5.33	5.33	450.67	69.11
1372	0.000	5.33	5.33	445.35	69.08
1346	0.573	5.10	5.67	440.02	69.06
1321	1.216	4.84	6.06	434.35	69.03
1295	1.808	4.60	6.41	428.29	69.01
1270	3.058	4.10	7.16	421.88	68.98
1245	3.862	3.78	7.65	414.71	68.95
1219	4.465	3.54	8.01	407.07	68.93
1194	4.967	3.34	8.31	399.06	68.90
1168	5.401	3.17	8.57	390.75	68.88
1143	5.786	3.01	8.80	382.19	68.85
1118	6.131	2.88	9.01	373.39	68.83
1092	6.445	2.75	9.19	364.38	68.80
1067	6.731	2.64	9.37	355.19	68.78
1041	6.998	2.53	9.53	345.82	68.75
1016	7.242	2.43	9.67	336.29	68.73
991	7.467	2.34	9.81	326.62	68.70
965	7.677	2.26	9.93	316.81	68.68
940	7.874	2.18	10.05	306.88	68.65
914	8.058	2.10	10.16	296.83	68.62
889	8.232	2.04	10.27	286.66	68.60
864	8.392	1.97	10.36	276.40	68.57
838	8.546	1.91	10.46	266.03	68.55
813	8.693	1.85	10.54	255.58	68.52
787	8.830	1.80	10.63	245.03	68.50
762	8.960	1.74	10.70	234.41	68.47
737	9.080	1.70	10.78	223.70	68.45
711	9.196	1.65	10.85	212.93	68.42
686	9.306	1.61	10.91	202.08	68.40
660	9.407	1.57	10.97	191.17	68.37
635	9.505	1.53	11.03	180.20	68.35
610	9.598	1.49	11.09	169.17	68.32
584	9.685	1.45	11.14	158.08	68.29
559	9.765	1.42	11.19	146.94	68.27
533	9.842	1.39	11.23	135.76	68.24
508	9.912	1.36	11.27	124.52	68.22
483	9.981	1.34	11.32	113.25	68.19
457	10.050	1.31	11.36	101.93	68.17
432	0.000	5.33	5.33	90.57	68.14
406	0.000	5.33	5.33	85.25	68.12
381	0.000	5.33	5.33	79.92	68.09
356	0.000	5.33	5.33	74.59	68.07
330	0.000	5.33	5.33	69.26	68.04
305	0.000	5.33	5.33	63.93	68.01
279	0.000	5.33	5.33	58.61	67.99
254	0.000	5.33	5.33	53.28	67.96
229	0.000	5.33	5.33	47.95	67.94
203	0.000	5.33	5.33	42.62	67.91
178	0.000	5.33	5.33	37.29	67.89

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Ashbury College - Synthetic Turf Field - Recharger 360HD

Recharger 360HD Incremental Storage Volumes

Height of System	Chamber Volume	Stone Volume	Cumulative Storage Volume	Total Cumulative Storage Volume	Elevation
mm	m^3	m^3	m^3	m^3	m
152	0.000	5.33	5.33	31.97	67.86
127	0.000	5.33	5.33	26.64	67.84
102	0.000	5.33	5.33	21.31	67.81
76	0.000	5.33	5.33	15.98	67.79
51	0.000	5.33	5.33	10.66	67.76
25	0.000	5.33	5.33	5.33	67.74
0	0.000				67.71

A.3 Table E.2 Groundwater Level Data – Monitoring Wells

TABLE E.2
GROUNDWATER LEVEL DATA - MONITORING WELLS

Well ID	UTM Coordinates		Date	Time	Well Depth			Screen Separation[1]	Top of Casing Elevation (m AMSL)	Ground Surface Elevation (m AMSL)	Pipe Stick-up (m)	Groundwater Level			Vertical Hydraulic Gradient[2]
	Northing	Easting			(m BTOC)	(m BGS)	(m AMSL)	(m)				(m BGS)	(m BTOC)	(m AMSL)	(+) = Upward (-) = Downward
BH25-1	5032793	447061	11-Jul-25 5-Aug-25 18-Aug-25 12-Mar-26	8:18 AM 1:15 PM 10:41 AM 10:45 AM	6.30	6.40	63.90	3.3	70.20	70.30	-0.10	3.31 3.56 3.56 2.14	3.21 3.46 3.46 2.04	66.99 66.75 66.74 68.16	-
BH25-1A	5032795	447058	11-Jul-25 5-Aug-25 18-Aug-25 12-Mar-26	8:05 AM 12:00 AM 10:08 AM 10:55 AM	3.10	3.15	67.16		70.26	70.30	-0.05	- - - 1.07	DRY DRY DRY 1.02	- - - 69.24	
BH25-2	5032798	447109	11-Jul-25 5-Aug-25 18-Aug-25 12-Mar-26	9:32 AM 1:34 PM 11:23 AM -	9.20	9.28	61.32	-	70.52	70.60	-0.08	3.77 3.96 3.95 -	3.69 3.88 3.87 -	66.83 66.65 66.65 -	

Notes:

(1) Vertical distance between the mid-point of the shallow and deep monitoring well screens.
(2) Vertical hydraulic gradient calculated based on the distance between the mid-point of the shallow and deep monitoring well screens.

m BGS = meters below ground surface
m BTOC = meters below top of casing
DRY = no groundwater or surface water was observed in the piezometer or watercourse, respectively
- = measurement not available

A.4 Storm Sewer Design Sheet

Stantec

Ashbury College Synthetic Turf

DATE: 2026-04-20
REVISION: 1
DESIGNED BY: MJS
CHECKED BY: AG

FILE NUMBER: **116501019**

STORM SEWER DESIGN SHEET
(City of Ottawa)

DESIGN PARAMETERS

$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2012)

	1:2 yr	1:5 yr	1:10 yr	1:100 yr
a =	732.951	998.071	1174.184	1735.688
b =	6.199	6.053	6.014	6.014
c =	0.810	0.814	0.816	0.820

MANNING'S n = 0.013
MINIMUM COVER: 2.00 m
TIME OF ENTRY 10 min
BEDDING CLASS = B

LOCATION			DRAINAGE AREA																						PIPE SELECTION											
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (2-YEAR) (ha)	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (100-YEAR) (ha)	AREA (ROOF) (ha)	C (2-YEAR) (-)	C (5-YEAR) (-)	C (10-YEAR) (-)	C (100-YEAR) (-)	A x C (2-YEAR) (ha)	ACCUM AxC (2YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	A x C (10-YEAR) (ha)	ACCUM. AxC (10YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	$I_{2\text{-YEAR}}$ (mm/h)	$I_{5\text{-YEAR}}$ (mm/h)	$I_{10\text{-YEAR}}$ (mm/h)	$I_{100\text{-YEAR}}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)	LENGTH (m)	PIPE WIDTH OR DIAMETEI (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)	VEL. (ACT) (m/s)	TIME OF FLOW (min)
L108A	108	105	0.65	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.484	0.484	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	103.3	16.6	375	375	CIRCULAR	PVC	-	1.00	164.8	**62.68%**	1.56	1.43	0.19
																				10.19																			
L4A, L4B, L4C, L4D	EX 4	106	0.59	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.272	0.272	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	58.1	66.4	375	375	CIRCULAR	PVC	-	0.50	116.6	**49.86%**	1.11	0.95	1.17
	106	105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.272	0.000	0.000	0.000	0.000	0.000	0.000	11.17	72.58	98.39	115.31	168.52	0.0	0.0	54.9	43.0	375	375	CIRCULAR	CONCRETE	-	0.50	116.6	**47.12%**	1.11	0.93	0.77
																				11.94																			
	105	104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.757	0.000	0.000	0.000	0.000	0.000	0.000	11.94	70.07	94.94	111.24	162.55	0.0	0.0	147.3	28.3	525	525	CIRCULAR	CONCRETE	-	0.30	245.7	**59.93%**	1.10	0.99	0.48
																				12.42																			
	FIELD OUTLET	104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	0.0	4.4	300	300	CIRCULAR	PVC	-	1.00	96.2	**0.00%**	1.37	0.00	0.00
																				10.00																			
L107A	107	104	1.06	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.806	0.806	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	172.0	17.2	375	375	CIRCULAR	PVC	-	2.00	233.1	**73.79%**	2.21	2.13	0.13
																				10.13																			
	104	103	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.563	0.000	0.000	0.000	0.000	0.000	0.000	12.42	68.62	92.94	108.90	159.11	0.0	0.0	297.9	54.2	600	600	CIRCULAR	CONCRETE	-	0.30	350.8	**84.91%**	1.20	1.20	0.75
	103	TANK IN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	1.563	0.000	0.000	0.000	0.000	0.000	0.000	13.17	66.46	89.98	105.41	153.98	0.0	0.0	288.5	7.7	600	600	CIRCULAR	CONCRETE	-	0.30	350.8	**82.23%**	1.20	1.19	0.11
																				13.28									600	600									
	TANK OUT	102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	288.5	9.5	600	600	CIRCULAR	CONCRETE	-	0.30	350.8	**82.23%**	1.20	1.19	0.13
	102	101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.13	76.30	103.50	121.32	177.35	258.5	258.5	258.5	14.4	600	600	CIRCULAR	CONCRETE	-	0.30	350.8	**73.68%**	1.20	1.16	0.21
	101	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.34	75.52	102.43	120.06	175.50	0.0	258.5	258.5	7.1	600	600	CIRCULAR	CONCRETE	-	0.30	350.8	**73.68%**	1.20	1.16	0.10
																				10.44									600	600									

Appendix B Correspondence

B.1 Pre-Consultation: Meeting Feedback (City of Ottawa)

File No.: PC2024-0226

July 12, 2024

Gord Dol
Sports Turf International Ltd.
Via email: gdol@sportsturfintl.com

Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 362 Mariposa Avenue

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on June 28, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☒	**4** ☐	**5** ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. As per the provincial Bill 185, *Cutting Red Tape to Build More Homes Act*, applicants are no longer required to partake in pre-consultation, but they may choose to participate. Should your team wish to continue with the pre-consultation process, pre-consultation fees still apply. Staff encourage further pre-consultation steps to take place.

2. Alternatively, should your team wish to skip any further pre-consultation steps, and proceed directly to applying for the required applications, please be advised that upon application, the City will assess whether the submission is "complete" or "incomplete". Staff will review the submission to ensure all the material outlined on the Study Plan and Identification List (SPIL) is provided and that this material meets the City's Terms of Reference. Should it be deemed "incomplete" the submission will be put on hold.

3. In your next pre-consultation submission or application submission, please ensure that all comments detailed herein are addressed. A detailed cover letter stating how each comment has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

1. Our preference is natural grass as it will better align with existing policy framework (Official Plan, Rockcliffe Park Secondary Plan and Rockcliffe Park Heritage Conservation District Plan).

2. Artificial turf has a heat generating effect. City's Official Plan has specific environmental policies with regards to heat island effect.

3. Additional features to reduce heat island effect can be considered as well, such as new tree plantings.

4. Please, consider permeability in the design of sports fields.

5. Have you explored options of integrating artificial turf with soft landscaping to reduce negative impacts associated with artificial turf?

6. There are trees proposed for removal near the running/sprint track) from Maple Lane side). Please, see Forestry and Environmental Planning comments below. Preservation of tree canopy both on private and public properties is crucial. Preservation of trees is also supported by Rockcliffe Park Secondary Plan and Rockcliffe Park Heritage Conservation District Plan. Please, design around trees.

7. The site is within the Rockcliffe Park Secondary Plan

    - Designated Special Use on Schedule A

- There is specific language about preservation of unifying landscape in the Secondary Plan and dominance of soft landscaping in the Heritage area (Section 2.4). Please, elaborate how the proposal responds to this.

  Protecting the continuity of the unifying landscape by ensuring that soft landscaping continues to dominate individual properties and the public realm…

- Please, note that if the lighting is replaces, it should respond to Secondary Plan policy 8 (Section 2.2), i.e. *Lighting in Rockcliffe Park should be configured to be sensitive to the context of the street?*

8. Zoning: Minor Institutional Zone, Subzone A (I1A)

   - No measurements for the setbacks are indicated on the site plan, and therefore, it's not possible to review compliance with Zoning By-law at this time.

   - Section 3 of the Zoning by-law speaks to non-conforming uses and non-complying buildings. The proposal is for a structure. Therefore, legal non-complying rights are not applicable in this case.

   - The subject lot has four frontages abutting City's ROW. The setbacks along Maple Lane and Glenwood Avenue should comply with Section 170, Table 170A of the Zoning By-law. Please, refer to Column IV of the Table.

   - Any setbacks that are non-compliant with Section 170, Table 170A of the Zoning By-law will need a zoning relief, whereas through Minor Variance application to the Committee of Adjustment or Zoning By-law Amendment.

Urban Design

N/A

Engineering

Comments:

9. The Stormwater Management Criteria, for the subject site, is to be based on the following:

   a. Application of the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

   b. In separated areas, the pre-development runoff shall be the lower of the existing coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).

c. A calculated time of concentration (cannot be less than 10 minutes).

d. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.

e. Storm sewer outlets should not be submerged.

f. The quantity control criteria (100-year post-development to 5-year pre-development).

g. Quality control criteria. Enhanced treatment of 80% TSS removal, due to proximity of the Ottawa River.

10. Deep Services (Storm, Sanitary and/or Water Supply)

a. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.

b. Review provision of a high-level sewer.

c. CCTV sewer inspection of city infrastructure is required to record pre and post construction conditions and ensure there is no damage to City infrastructure.

d. Sewer connections to be made above springline of the sewermain as per:

i. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.

ii. Std Dwg S11 (For rigid main sewers) – lateral must be less that 50% the diameter of the sewermain,

iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less than 50% diameter of the sewermain,

iv. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

11. Stormwater

a. Modifying the existing field to the proposed artificial turf will require storm water management of the fields as per the above mentioned criteria.

b. Underground Storage: Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally

intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.

In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 2- and 100-year event storage requirements.

In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

c. Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.

12. Grading

a. Low Impact Development (LID) measures are to be implemented and infiltration, erosion and water quality targets achieved. The site needs be designed in conformity with high-level studies and allow for available area(s) to implement suitable LID practices onsite to meet the infiltration targets. Provide detailed infiltration calculations and supporting documentation.

b. Post-development site grading shall match existing property line grades to minimize disruption to the adjacent residential properties. A topographical plan of survey shall be provided as part of the submission and a note provided on the plans.

c. Please provide an updated survey plan or Pre-Development Drainage Area Plan to define the pre-development drainage areas/patterns. Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution considering no overland flow path.

d. The consultant should demonstrate that any surface water directed towards the the street or laneway can flow unrestricted and will not adversly affect the adjacent properties.

e. The proposed sprint track is to be sloped away from the field and the drainage is to be directed towards the ROW and the laneway properly without impacting the neighboring properties.

13. Geotechnical Memo

A geotechnical memo is required to demonstrate that the soil conditions are suitable for the proposed sprint track and artificial turf field. The memo should also discuss the required pipe bedding for the artificial turf drain system, and foundation design for a proposed underground stormwater holding tank if applicable. In addition, if an underground holding tank is required the normal high ground water table level (NHGWTL) should be assessed to ensure that the holding tank under side of footing is above the NHGWTL or designed accordingly if below the NHGWTL.

14. Environmental Site Assessment

A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 in support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required.

The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.

Official Plan Section 4.8.4:

https://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan/volume-1-official-plan/section-4-review-development-applications#4-8-protection-health-and-safety

Please refer to the City of Ottawa Guide to Preparing Studies and Plans [Engineering]: Planning application submission information and materials. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

Feel free to contact Amy Whelan, Project Manager, Farbod Azimi, Engineering Intern for follow-up questions.

Transportation

TIA Screening Form, Received June 13, 2024
Concept Plans, Dated May 24, 2024

General Comments:

15. Mariposa Avenue is classified as a Local Road. There are no additional protected ROW limits identified in the OP.

16. Springfield Road is classified as Collector Road adjacent to Ashbury College. There are no additional protected ROW limits identified in the OP.

17. Maple Lane is classified as a Local Road. There are no additional protected ROW limits identified in the OP.

18. Glenwood Avenue is classified as a Local Road. There are no additional protected ROW limits identified in the OP.

19. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16.

20. The Screening Form has indicated that no TIA Triggers have been met. This development would not generate sufficient traffic to warrant a TIA report.

21. Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be in safe, secure places near main entrances and preferably protected from the weather.

Feel free to contact Wally Dubyk, Transportation Project Manager, for follow-up questions.

Environment

Comments:

22. There are no natural features on or adjacent to this site, accordingly there is no trigger for an environmental impact study.

23. Urban Heat Island - Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building with low heat absorbing materials.

24. Bird Safe Design - Please review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf

Feel free to contact Matthew Hayley, Environmental Planner, for follow-up questions.

Forestry

Comments:

25. A Tree Conservation Report and Landscape Plan are Site Plan Control submission requirements. The two reports can be combined into one if all required information is provided.

26. The TCR must address how the proposal will influence existing trees. All trees 10 cm in diameter or greater on private property (including property boundaries), and City trees of any size, are protected under the by-law (No. 2020-340). The development shall seek to avoid all tree conflicts where feasible. Replacement planting should be incorporated on the site if there are any unavoidable tree conflicts resulting in removal.

27. Tree protection fencing must be installed and maintained for the extent of construction. Materials and equipment cannot be stored in the critical root zone of protected trees.

28. Review section 4.10.3 of the Official Plan which speaks to protecting and incorporating trees on school sites.

29. Tree Conservation Report requirements. The following Tree Conservation Report (TCR) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines – for more information on these requirements please contact hayley.murray@ottawa.ca

    a. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City

    b. Any tree 10 cm in diameter or greater and City-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw

(Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

c. The TCR must contain 2 separate plans/maps:

   i. Plan/Map 1 - show existing conditions with tree cover information.

   ii. Plan/Map 2 - show proposed development with tree cover information.

d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition. Please note that averages can be used if there are forested areas.

e. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)

f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.

g. The removal of trees on a property line will require the permission of both property owners.

h. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca

i. The city encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

j. Removal of a City tree is not permitted unless justified. If justified, monetary compensation for the value of the tree must be paid before a tree removal permit is issued.

30. Landscape Plan (LP) requirements.

a. Landscape Plan Terms of Reference must be adhered to for all tree planting: Landscape Plan Terms of Reference. For more information on these requirements please contact hayley.murray@ottawa.ca

31. Additional Elements for Tree Planting in the Right of Way:

a. Please ensure any retained trees are shown on the LP

b. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.

c. Soil Volume - Please demonstrate as per the Landscape Plan Terms of Reference that the available soil volumes for new plantings will meet or exceed the minimum soil volumes requested.

d. The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.

e. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years

f. Minimum Setbacks

    i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.

    ii. Maintain 2.5m from curb

    iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.

    iv. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.

    v. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

g. Tree specifications

    i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

    ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.

    iii. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.

    iv. No root barriers, dead-man anchor systems, or planters are permitted.

    v. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

h. Hard surface planting

i. If there are hard surface plantings, a planting detail must be provided.

ii. Curb style planters are highly recommended.

iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

iv. Trees are to be planted at grade.

Feel free to contact Hayley Murray, Planning Forester, for follow-up questions.

Parkland

N/A

Heritage

Comments:

32. General Heritage Conservation District Policies

- The property is designated under Part V of the Ontario Heritage Act as part of the Rockcliffe Park Heritage Conservation District (HCD). Alterations to the landscape on this property shall comply with the policies and guidelines for landscapes in the Rockcliffe Park HCD plan.

- Heritage staff support the retention of the natural grass fields and the existing trees. The dominance of soft landscaping in Rockcliffe, including trees and green spaces, are essential cultural heritage attributes of both the HCD and the property. The existing policy framework of the HCD plan requires the conservation, maintenance, and enhancement of soft landscaping.

- The applicant is strongly encouraged to consult with the Heritage Committee of the Rockcliffe Park Residents' Association. The Heritage Committee provides comments on proposals for new construction and alterations in the HCD.

33. Heritage Permit Requirements

- A heritage permit may be required. Depending on the scale of the project, approval may be delegated to staff (staff-level heritage permit). If the project does not meet the requirement for approval through delegated authority, the property owner will require the approval of City Council prior to the issuance of a heritage permit (council-level heritage permit). Council-level heritage

permit applications require the applicant to undertake consultation with the Heritage Committee of the Rockcliffe Park Residents' Association.

- An updated site plan with the requested information, a landscape plan, material specifications, and plans/elevations for the proposed new buildings are required for heritage staff to determine whether a heritage permit is necessary and the type of heritage permit that would be required.

- If a heritage permit is required, it must be obtained prior to other permits and clearances.

34. Landscape Guidelines

- The removal of mature trees is strongly discouraged. Where a tree must be removed to allow for new construction, it will be replaced with a new tree of an appropriate size and species (7.3.3).

- The tradition of using native plant material is encouraged (7.3.3).

- The selection of trees and shrubs to be planted on private property adjacent to the road should reflect the range of species historically found in gardens in the area and favour native species (7.5).

35. New Construction

- Please provide elevations and material specifications for the proposed facility building. Include existing trees and confirm whether trees will be removed in the construction of these facilities.

- Modern equipment shall be located in a manner that is discreet and not visible from the street. Screening with strategically located plant material is encouraged (7.3.3).

- The use of natural materials, such as stone, real stucco, brick and wood is an important attribute of the HCD. The use of materials such as vinyl siding, aluminum soffits, synthetic stucco, and manufactured stone will not be permitted (7.4.1).

Feel free to contact Sara Wehbi, Heritage Planner, for follow-up questions.

Conservation Authority

N/A

Community issues

N/A

Submission Requirements and Fees

1. Outlines the application type/subtype required and the associated fees
    a. Additional information regarding fees related to planning applications can be found here.
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Masha Wakula

c.c. Jean Charles Renaud
Sara Wehbi
Hayley Murray
Matthew Hayley
Amy Whelan
Farbod Azimi

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