

UNITED PROPERT RESOURCE CORPORATION

**360 KENNEDY LANE EAST, RESIDENTIAL
DEVELOPMENT, OTTAWA, ON
SERVICING REPORT**

SEPTEMBER 20, 2022
2ND SUBMISSION





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RESIDENTIAL DEVELOPMENT,
OTTAWA, ON
SERVICING REPORT**

UNITED PROPERTY RESOURCE CORPORATION

SITE PLAN AND ZONING BY-LAW AMENDMENT APPLICATION
2ND SUBMISSION

PROJECT NO.: 211-12127-00
DATE: SEPTEMBER 2022

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1 GENERAL

1.1 EXECUTIVE SUMMARY

WSP was retained by United Property Resource Corporation to provide servicing and grading design services for the proposed new residential development located at 360 Kennedy Lane East, approximately 400m south of St Joseph Boulevard and 400m west of Tenth Line Road. This report outlines findings and calculations pertaining to the servicing of the proposed development with a gross lot area of 12,208m².

Currently the land proposed for the residential development is natural landscaping covered mainly by grass and trees, as well as a single storey church building and a single storey storage building with an asphalt surfaced parking area and laneway. The total study area for the site is considered to be 1.22 ha in size. The site is bounded by residential development to the north, east and west, and park land to the south. Based on the topographic survey, the site is being divided into two drainage portions, the developed areas to the west and the landscape areas to the east. The flow from the eastern portion of the site will drain toward Kennedy Lane East via parking lot and grass area; the flow from the western portion of the site will be collected by the existing on-site ditches and discharge to the park land to the south.

The City of Ottawa required that the design of a drainage and stormwater management system in this development must be prepared in accordance with the following documents:

- Sewer Design Guidelines, City of Ottawa, October 2012;
- Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003; and
- Stormwater Management Facility Design Guidelines, City of Ottawa, April 2012

This report was prepared utilizing servicing design criteria obtained from available sources, and outlines the design for water, sanitary wastewater, and stormwater facilities.

The format of this report matches that of the servicing study checklist found in Section 4 of the City of Ottawa's Servicing Study Guidelines for Development Applications, November 2009.

The following municipal services are available within Kennedy Lane East to the development as recorded from as-built drawings from City of Ottawa:

Kennedy Lane East:

- 900mm storm sewer, 250mm sanitary sewer and 200mm watermain.

It is proposed that:

- On-site stormwater management systems, employing surface storage and underground storm chambers will be provided to attenuate flow rates. Existing drainage patterns, previously established controlled flow rates and storm sewers will be maintained. Refer to the stormwater management report for details.

1.2 DATE AND REVISION NUMBER

This version of the report is the second revision, dated September 20, 2022.

1.3 LOCATION MAP AND PLAN

The proposed residential development is located at 360 Kennedy Lane East, in the City of Ottawa at the location shown in Figure 1-1 below.



Figure 1-1 Site Location

1.4 ADHERENCE TO ZONING AND RELATED REQUIREMENTS

The proposed property use will be submitted for ZBLA in conformance with zoning and related requirements prior to approval and construction and is understood to be in conformance with any zoning requirements.

1.5 PRE-CONSULTATION MEETINGS

A pre-consultation meeting was held with the City of Ottawa on May 19, 2021. Notes from this meeting are provided in Appendix A.

1.6 HIGHER LEVEL STUDIES

The review for servicing has been undertaken in conformance with, and utilizing information from, the following documents:

- Ottawa Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa including:
 - Technical Bulletin ISDTB-2012-4 (20 June 2012)
 - Technical Bulletin ISDTB-2014-01 (05 February 2014)
 - Technical Bulletin PIEDTB-2016-01 (September 6, 2018)
 - Technical Bulletin ISDTB-2018-01 (21 March 2018)
 - Technical Bulletin ISDTB-2018-04 (27 June 2018)
- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
 - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
 - Technical Bulletin ISTB-2018-02 (21 March 2018)
- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).
- Design Guidelines for Drinking-Water Systems, Ontario Ministry of the Environment and Climate Change, 2008 (GDWS).
- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 1999.

1.7 STATEMENT OF OBJECTIVES AND SERVICING CRITERIA

The objective of the site servicing is to meet the requirements for the proposed modification of the site while adhering to the stipulations of the applicable higher-level studies and City of Ottawa servicing design guidelines.

1.8 AVAILABLE EXISTING AND PROPOSED INFRASTRUCTURE

A municipal sanitary sewer, a municipal storm sewer and a watermain are located within the Kennedy Lane East right of way. A new sanitary sewer, a new storm sewer and a new water service will be connected to the existing sewers along Kennedy Lane East from the proposed development. Quantity control is required to restrict the discharge leaving the development areas, as noted in the Stormwater Management Report. The existing boundary roads at the site will remain open.

1.9 ENVIRONMENTALLY SIGNIFICANT AREAS, WATERCOURSES AND MUNICIPAL DRAINS

As per the existing condition, the eastern portion of the site drains to various ditches which discharge into a catchbasin where flow is directed to an existing 450mm storm sewer on Mountainside Crescent. Flow is ultimately directed to the Ottawa River.

The western portion of the site is drained predominantly through existing catchbasins which discharge to the sewer on Kennedy Lane East through a 300mm storm sewer. Flow is ultimately directed to the Ottawa River.

On going flooding issue occur for the residential units east of the site. City councillor and public have highly concern to stop the runoff draining over due to the misleading design from the past. As directed by the city staff, the pre-development drainage areas should be considered as one and it goes to Kennedy Lane west of the site, and post-development to follow. Correspondence is attached on Appendix A.

1.10 CONCEPT LEVEL MASTER GRADING PLAN

A detailed grading plan has been developed, matching the existing overland flow pattern in the west of directing overflow drainage to Kennedy Lane East. In the eastern portion of the site the grading has been adjusted to direct flow towards Kennedy Lane East as opposed to allowing flow to drain south into the parkland and the residential development to the east as in existing conditions. The site topographic survey, included in Appendix A, provides evidence of direction of overland flow.

Approximately 0.069 ha of the south and east of the site and 0.020 ha of the west of the site will remain uncontrolled in terms of drainage and will maintain the existing grading.

Grading will employ smooth transitions from the new work areas to existing grades. In some grassed areas 3:1 terracing are proposed between proposed and existing grades. No changes will be made to grades at the development perimeter.

1.11 GEOTECHNICAL SUTDY

A geotechnical investigation report has been prepared by Pinchin Ltd. (Geotechnical Investigation – Proposed Residential Development, November 30, 2021), and its recommendations have been taken into account in developing the engineering specifications.

2 WATER DISTRIBUTION

2.1 CONSISTENCY WITH MASTER SERVICING STUDY AND AVAILABILITY OF PUBLIC INFRASTRUCTURE

There is an existing 200mm diameter public watermain along Kennedy Lane East which will provide water to the development. A 200mm diameter private watermain will loop around the site to provide water to the development and will tie into the existing 200mm watermain on Kennedy Lane East.

Five new private fire hydrants will be required to service and provide adequate coverage to the proposed units. No changes are required to the existing City water distribution system to allow servicing for this property.

2.2 SYSTEM CONSTRAINTS AND BOUNDARY CONDITIONS

Boundary conditions have been obtained from the City of Ottawa at the 200 mm diameter watermain on Kennedy Lane East for the development, and if obtained, will be added to Appendix B. A maximum fire flow demand of 200 l/s (12,000 l/min) has been calculated for the proposed development as indicated in Section 2.4.

Table 2-1: Boundary Conditions (City of Ottawa)

BOUNDARY CONDITIONS		
SCENARIO	Head (m)	Pressure (psi)
Maximum HGL	130.2	61.1
Minimum HGL (Peak Hour)	125.8	54.9
Max Day + Fire Flow	102.5	21.7

2.3 CONFIRMATION OF ADEQUATE DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution. As previously noted, the development is considered as a residential development, consisting of 60 stacked town units and 21 average towns. A water demand calculation sheet is included in Appendix B, and the total water demands are summarized as follows:

WATER DEMANDS	
SCENARIO	DEMAND
Average Day	0.54 l/s
Maximum Day	1.34 l/s
Peak Hour	2.95 l/s

The 2010 City of Ottawa Water Distribution Guidelines stated that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

A water model software, WaterGEMS was used to perform the water distribution analyze for the proposed development including existing church. The minimum water pressure inside the building at the connection is determined with the minimum HGL condition, resulting in a pressure of 373 kPa for Building which exceeds the minimum requirement of 276 kPa per the guidelines. Refer to Appendix B for detail water distribution analyze output.

Table 2-2: Summary of the minimum water pressure under peak hour scenario

Peak Hour - Junction	
ID	Pressure (kPa)
J-01	376
J-02	374
J-03	375
J-04	374
J-05	374
J-06	375
J-07	373
J-08	376

2.4 CONFIRMATION OF ADEQUATE FIRE FLOW PROTECTION

The fire flow rate has been calculated using the Fire Underwriters Survey (FUS) method. The method takes into account the type of building construction, the building occupancy, the use of sprinklers and the exposures to adjacent structures. A fire flow demand of 200 l/s for the development has been calculated. Calculations are included in Appendix B.

The proposed development can be serviced through the combination of existing and proposed hydrants. There is one existing fire hydrant on Kennedy Lane East just north of the site, and five new private hydrants are proposed throughout the site. All residential units are within 35m of a private hydrant. All of the proposed and existing hydrants are rated at 5700 l/min.

The proposed residential units on site will be serviced by a single 100 mm service off the 300 and 250 mm private watermain.

The boundary condition for Maximum Day and Fire Flow results the available fire flows of 184.67 l/s, 174.79 l/s and 168.00 l/s at J-02, J-03 and J-04. In the guidelines, a minimum residual pressure of 140 kPa must be maintained in the distribution system for a fire flow and maximum day event. As the available demand fire flow is achieved, the fire flow requirement is exceeded.

Table 2-3: Summary of the available fire flow under Max Day + Fire scenario

Max Day + Fire @ XXX l/s (TO BE COMPLETED LATER)	
ID	Allowable Fire Flow (l/s)
J-01	262.67
J-02	216.30
J-03	198.83
J-04	196.16
J-05	198.48
J-06	2111.61
J-07	171.11
J-08	257.43

2.5 CHECK OF HIGH PRESSURE

High pressure is not a concern. The maximum water pressure inside the building at the connection is determined with the maximum HGL condition, resulting in a pressure of 415 kPa which is less than the 552 kPa threshold in the guideline in which pressure control is required. Based on this result, pressure control is not required for the proposed townhomes.

2.6 RELIABILITY REQUIREMENTS

DMA chamber as per city of Ottawa standard W3 and shot off valve will be provided at the study boundary from Kennedy Lane East. Water can be supplied to the private watermain from Kennedy Lane East and can be isolated. A redundancy looping is provided for the subjected site, water can be supplied from either side Kennedy Lane East. Refer to servicing plan C05 for details.

2.7 CAPABILITY OF MAJOR INFRASTRUCTURE TO SUPPLY SUFFICIENT WATER

The current infrastructure is capable of meeting the domestic demand based on City requirements and fire demand as determined by FUS requirements for the proposed residential units.

2.8 DESCRIPTION OF PROPOSED WATER DISTRIBUTION NETWORK

A combination of 250mm and 300mm private watermain are proposed to loop around the site and will distribute water to all residential units. Five private hydrants are proposed throughout the site.

2.9 OFF-SITE REQUIREMENTS

No off-site improvements to watermains, feeder mains, pumping stations, or other water infrastructure are required to maintain existing conditions and service the adjacent buildings, other than the connection of the new private watermain to the City watermain in the south frontage of the site.

2.10 CALCULATION OF WATER DEMANDS

Water demands were calculated as described in Sections 2.3 and 2.4 above and is also attached in Appendix B.

2.11 MODEL SCHEMATIC

The water works consist of a private watermain looping with 250mm and 300mm watermain, five proposed private fire hydrants, and service connections to each residential unit. Additionally, the existing water service which leads to the existing one storey church building will be capped and integrated into the proposed network. A model schematic is provided with WaterGEM for this development, the results are attached in Appendix B.

3 WASTEWATER DISPOSAL

3.1 DESIGN CRITERIA

In accordance with the City of Ottawa's Sewer Design Guidelines, the following design criteria have been utilized in order to predict wastewater flows generated by the subject site and complete the sewer design;

• Minimum Velocity	0.6 m/s
• Maximum Velocity	3.0 m/s
• Manning Roughness Coefficient	0.013
• Average sanitary flow for residential use	280 L/cap/day
• Average sanitary flow for commercial use	28,000 L/Ha/day
• Commercial/Institutional Peaking Factor	1.5
• Infiltration Allowance (Total)	0.33 L/s/Ha
• Minimum Sewer Slopes – 200 mm diameter	0.32%

3.2 CONSISTENCY WITH MASTER SERVICING STUDY

The outlet for the private sanitary sewer network is the 250 mm diameter municipal sewer on Kennedy Lane East. The Ottawa Sewer Design Guidelines provide estimates of sewage flows based on residential development. The anticipated total flow based on a development area of 1.22ha is 2.30 L/s. A sanitary drainage area plan and the sanitary design sheet have been attached to Appendix C for reference.

3.3 DESCRIPTION OF EXISTING SANITARY SEWER

The outlet sanitary sewer is the existing 250 mm diameter sewer on Kennedy Lane East. This local sewer outlets to a sanitary trunk sewer, then discharges to a municipal wastewater treatment facility.

3.4 VERIFICATION OF AVAILABLE CAPACITY IN DOWNSTREAM SEWER

The capacity of the downstream 250 mm diameter sanitary sewer on Kennedy Lane East at 0.60% slope is 25.41 L/s, which is adequate for the flow assumptions from the proposed development. And the flow from the existing sanitary sewer upstream of 360 Kennedy Lane East has a total flow of 8.95 L/s. The downstream sanitary sewer will carry over the discharge from the subjected site and the upstream areas, a total flow of 11.04 L/s is anticipated.

A sanitary sewer design sheet is provided for both the subjected site and the upstream areas. See Appendix C for details.

3.5 DESCRIPTION OF PROPOSED SEWER NETWORK

The proposed sanitary sewer network on site will consist of 200 mm diameter private sanitary sewers with typical sanitary services for the residential units.

4 SITE STORM SERVICING

4.1 EXISTING CONDITION

The runoff from the west portion of the existing site is directed to a 900 mm diameter sewer on Kennedy Lane East. And the runoff from the east portion of the existing site is directed to the adjacent ditches next to the residential lots and park land. The overall flow from the site ultimately outlets to the Ottawa River. Drainage in excess of the minor system capacity currently flows overland to a the low section within the eastern and western part of the site and overflow to the adjacent property.

4.2 ANALYSIS OF AVAILABLE CAPACITY IN PUBLIC INFRASTRUCTURE

The total controlled area of the site draining toward Kennedy Lane East is 1.131 ha. There is 0.069 ha of uncontrolled area draining toward the existing ditches along the southeast property line as per the existing condition. And 0.020 ha of uncontrolled area draining toward the Kennedy Lane ROW. The runoff from the controlled areas will discharge to a 900mm storm pipe at Kennedy Lane East which ultimately drains to the Ottawa River via the 1800mm trunk sewer.

On-site attenuation to predevelopment flow is required for the purpose of advancing use of this storm outlet. Using the Rational Method, with coefficient of 0.20 for pervious areas and 0.90 for impervious areas, and a 10 minute time of concentration, results in an estimated 2 year flow of 103.69 L/s from this area. Using utility records from the City, the slope of the existing storm sewer 900 mm diameter running north to south on Kennedy Lane East is 0.60%, which equates to a capacity in excess of 1403.68 L/s. As the proposed stormwater management works for the site will reduced the runoff rate to a peak discharge at outlet equal to 120.0 L/s, capacity in the minor system is not a concern.

As the proposed stormwater management works for the site will restricted the 100 year flow to the pre-development 5 year runoff rate, capacity in the minor system is not a concern.

The allowable release rate for the site is 120.0 L/s as calculated in the Stormwater Management Report.

4.3 DRAINAGE DRAWING

Drawing C05 shows the receiving storm sewer and site storm sewer network for the site. Drawing C04 provides proposed grading and drainage and includes existing grading information. Drawing C06 provides a post-construction drainage sub-area plan. F02 provides a pre-development drainage sub-area. Post site sub-area information is also provided on the storm sewer design sheet attached in Appendix D.

4.4 WATER QUANTITY CONTROL OBJECTIVE

Refer to the Stormwater Management Report for the water quantity objective for the site.

4.5 WATER QUALITY CONTROL OBJECTIVE

The designated water quality control objective is 80% TSS removal. This objective will be achieved through the use of an oil/grit separator for the runoff generated from the developed site. Refer to the Stormwater Management Report for further details.

4.6 DESIGN CRITERIA

The stormwater system was designed following the principles of dual drainage, making accommodation for both major and minor flow.

Some of the key criteria include the following:

- | | |
|---------------------------------|--|
| • Design Storm (minor system) | 1:2 year return (Ottawa) |
| • Rational Method Sewer Sizing | |
| • Initial Time of Concentration | 10 minutes |
| • Runoff Coefficients | |
| Landscaped Areas | C = 0.20 |
| Asphalt/Concrete | C = 0.90 |
| Traditional Roof | C = 0.90 |
| • Pipe Velocities | 0.80 m/s to 6.0 m/s |
| • Minimum Pipe Size | 250 mm diameter
(200 mm CB Leads and service pipes) |

4.7 PROPOSED MINOR SYSTEM

The detail design for this site provides a storm sewer outlet to Kennedy Lane East, and small areas of uncontrolled surface drainage entering the adjacent park towards the south east side of the site (consistent with existing conditions). Storage in underground tanks will be included on site to reduce surface ponding and will include flow control. Refer to the Storm Management Report for details.

The existing catchbasins and their leads, as well as the sewer connection to Kennedy Lane East will be removed. Please refer to the removals drawing C03 for details.

Weeping tile is proposed and will be connected to the main sewer without restrictions.

Using the above noted criteria, the proposed on-site storm sewers were sized accordingly. A detailed storm sewer design sheet and the associated storm sewer drainage area plan is included in Appendix D.

4.8 WATERCOURSES

The minor flow will be ultimately directed to the Ottawa River.

4.9 PRE AND POST DEVELOPMENT PEAK FLOW RATES

Pre and post development peak flow rates for the site have been noted in storm sewer design sheet as well as the Stormwater Management report.

4.10 DIVERSION OF DRAINAGE CATCHMENT AREAS

With the exception of a small uncontrolled area to the south east of the site, the development will be regraded such that all overland flow is directed west towards Kennedy Lane East as directed by City of Ottawa.

4.11 MUNICIPAL DRAINS AND RELATED APPROVALS

There are no municipal drains on the site or associated with the drainage from the site.

5 SEDIMENT AND EROSION CONTROL

5.1 GENERAL

During construction, existing storm sewer system can be exposed to sediment loadings. A number of construction techniques designed to reduce unnecessary construction sediment loadings will be used including:

- The installation of straw bales within existing drainage features surrounding the site.
- Filter cloths will remain on open surface structures such as manholes and catchbasins until these structures are commissioned and put into use.
- Installation of silt fence, where applicable, around the perimeter of the proposed work area.

During construction of the services, any trench dewatering using pumps will be fitted with a “filter sock.” Thus, any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filter sock as needed including sediment removal and disposal.

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Consequently, until the surrounding surface has been completed, these structures will be covered to prevent sediment from entering the minor storm sewer system. These measures will stay in place and be maintained during construction and build-out until it is appropriate to remove them.

During construction of any development both imported and native soils are placed in stockpiles. Mitigative measures and proper management to prevent these materials entering the sewer system are needed.

During construction of the deeper watermains and sewers, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally placed before any catchbasins are installed.

Refer to the Erosion and Sedimentation Control Plan C08 provided in Appendix E.

6 APPROVAL AND PERMIT REQUIREMENTS

6.1 GENERAL

The proposed development is subject to site plan approval, zoning by-law amendment and building permit approval.

No approvals related to municipal drains are required.

No permits or approvals are anticipated to be required from the Ontario Ministry of Transportation, National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or federal regulatory agency.

7 CONCLUSION CHECKLIST

7.1 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the proposed development can meet all provided servicing constraints and associated requirements. It is recommended that this report be submitted to the City of Ottawa in support of the application for site plan approval.

7.2 COMMENTS RECEIVED FROM REVIEW AGENCIES

This is the second submission, response letter to city comments has been attached.

APPENDIX

A

- PRE-CONSULTATION MEETING NOTES
- TOPOGRAPHIC SURVEY PLAN
- EMAILS FROM RVCA
- CORESPONDENCE EMAIL FROM CITY

Site Plan Pre- Application Consultation Notes

Date: Wednesday, May 19, 2021

Site Location: 360 Kennedy Lane E

Type of Development: Residential (townhomes, stacked, singles, apartments), Office Space, Commercial, Retail, Institutional, Industrial, Other: N/A

Infrastructure

Water

Existing public services:

- Kennedy Lane E – 203mm DI



Watermain Frontage Fees to be paid (\$190.00 per metre) on Woodroffe Avenue Yes No

Boundary conditions:

Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission.

- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
 - Location of service(s)
 - Type of development and the amount of fire flow required (as per FUS, 1999)
 - Average daily demand: ___ L/s
 - Maximum daily demand: ___ L/s
 - Maximum hourly daily demand: ___ L/s
- Fire protection (Fire demand, Hydrant Locations)
- Please submit sanitary demands with the water boundary conditions

General comments

- Service areas with a basic demand greater than 50 m³/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid creation of vulnerable service area.
- A District Metering Area Chamber (DMA) is required for new services 150mm or greater in diameter.

Sanitary Sewer

Existing public services:

- Kennedy Lane E – 250mm PVC



Is a monitoring manhole required on private property? Yes No

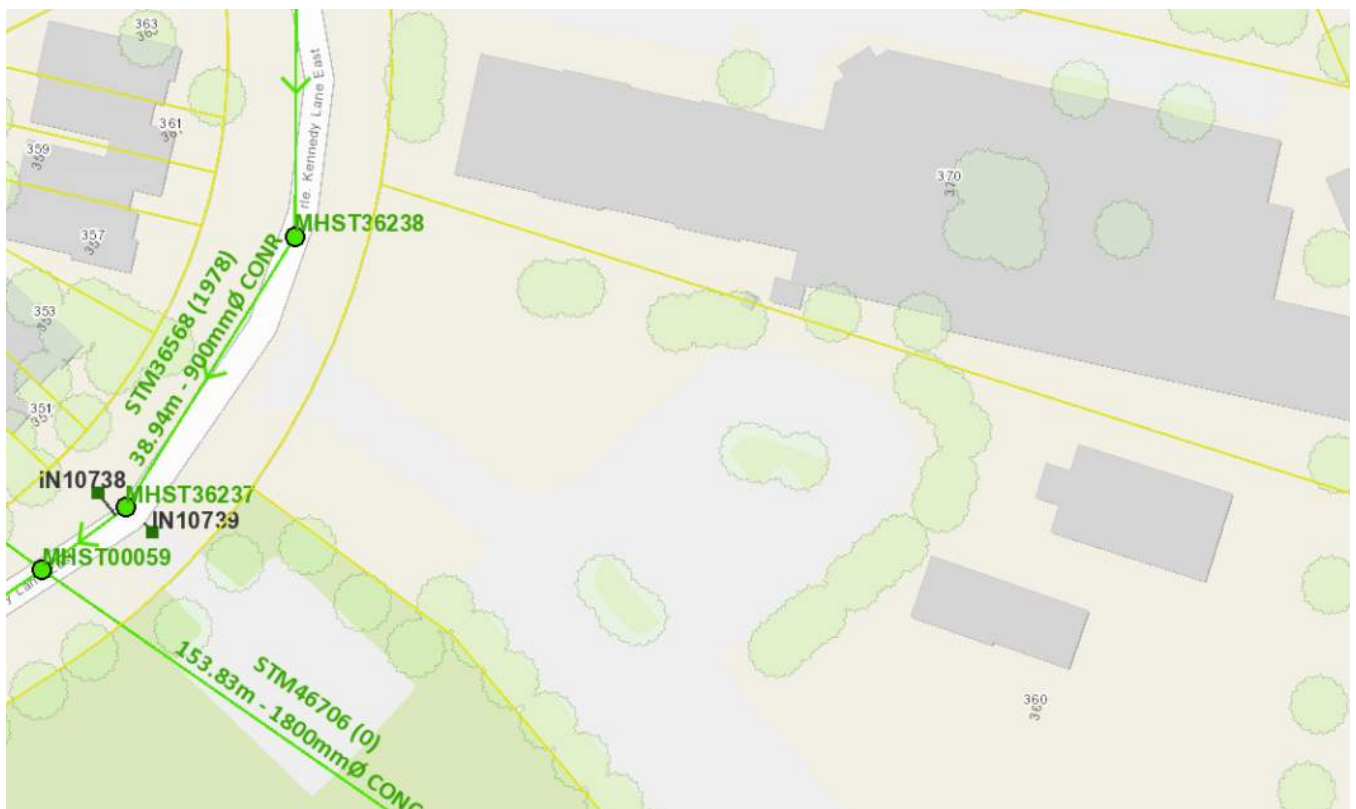
General comments

- Please submit sanitary demands with the water boundary conditions
- For infill developments within older neighbourhoods there is not an allotment for the sanitary capacity. As part of the rezoning application the consultant is required to demonstrate that there is sufficient capacity in the pipe network and system for the proposed sanitary demands.

Storm Sewer

Existing public services:

- Kennedy Lane E – 900mm Conc R



Stormwater Management

Quality Control:

- Rideau Valley Conservation Authority to confirm quality control requirements.

Quantity Control:

- LID features are strongly encouraged as the development is going from mostly pervious to impervious.
- Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min
- Allowable run-off coefficient: 0.5
- Allowable flowrate: Allowable flowrate: Control the 100-year storm events to the 5-year storm event.

Ministry of Environment, Conservation and Parks (MECEP)

All development applications should be considered for an Environmental Compliance Approval, under MECP regulations.

- a. Consultants are required to determine if an approval for sewage works under Section 53 of OWRA is required.
- b. ECA applications are required to be submitted online through the MECP portal. A business account required to submit ECA application. For more information visit <https://www.ontario.ca/page/environmental-compliance-approval>
- c. If the consultant determines the site does not meet the definition of industrial site the consultant may request the MECP to exempt the works. The following information must be provided to the City Project Manager:
 - (i) is designed to service one lot or parcel of land;
 - (ii) discharges into a storm sewer that is not a combined sewer;
 - (iii) does not service industrial land or a structure located on industrial land; and
 - (iv) is not located on industrial land.

NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent

General Service Design Comments

- Existing sewers or watermains that are not reused must be decommissioned as per City Standards.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.

Other

Capital Works Projects within proximity to application? Yes No

References and Resources

- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
- All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)
- Please find relevant City of Ottawa Links to Preparing Studies and Plans below:
<https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines>
- To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre:
InformationCentre@ottawa.ca <<mailto:InformationCentre@ottawa.ca>>
(613) 580-2424 ext. 44455
- geoOttawa
<http://maps.ottawa.ca/geoOttawa/>

SITE PLAN APPLICATION – Municipal servicing

For information on preparing required studies and plans refer to:

<http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans>

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S		1. Site Servicing Plan	2. Site Servicing Report	S	
S		3. Grade Control and Drainage Plan	4. Geotechnical Study Alternatively, existing report with memo providing recommendations for works based on current geotechnical guidelines.	S	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	S	
S		11. Storm water Management Report	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise / Vibration Study	S	
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, City Planning will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the City.

Notes:

4. Geotechnical Study / Slope Stability Study – required as per Official Plan section 4.8.3. All site plan applications need to demonstrate the soils are suitable for development. A Slope Stability Study may be required with unique circumstances (Schedule K or topography may define slope stability concerns).

10. Erosion and Sediment Control Plan – required with all site plan applications as per Official Plan section 4.7.3.

11. Stormwater Management Report/Brief - required with all site plan applications as per Official Plan section 4.7.6.

REZONING APPLICATION – Municipal servicing

For information on preparing required studies and plans refer to:

<http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans>

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Notes:

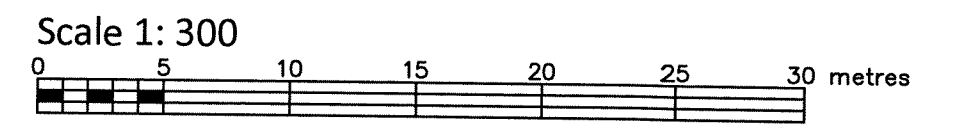
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PART OF BLOCK 8 REGISTERED PLAN 50M-77 CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2021



Metric Note
Distances and coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note
Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99997.

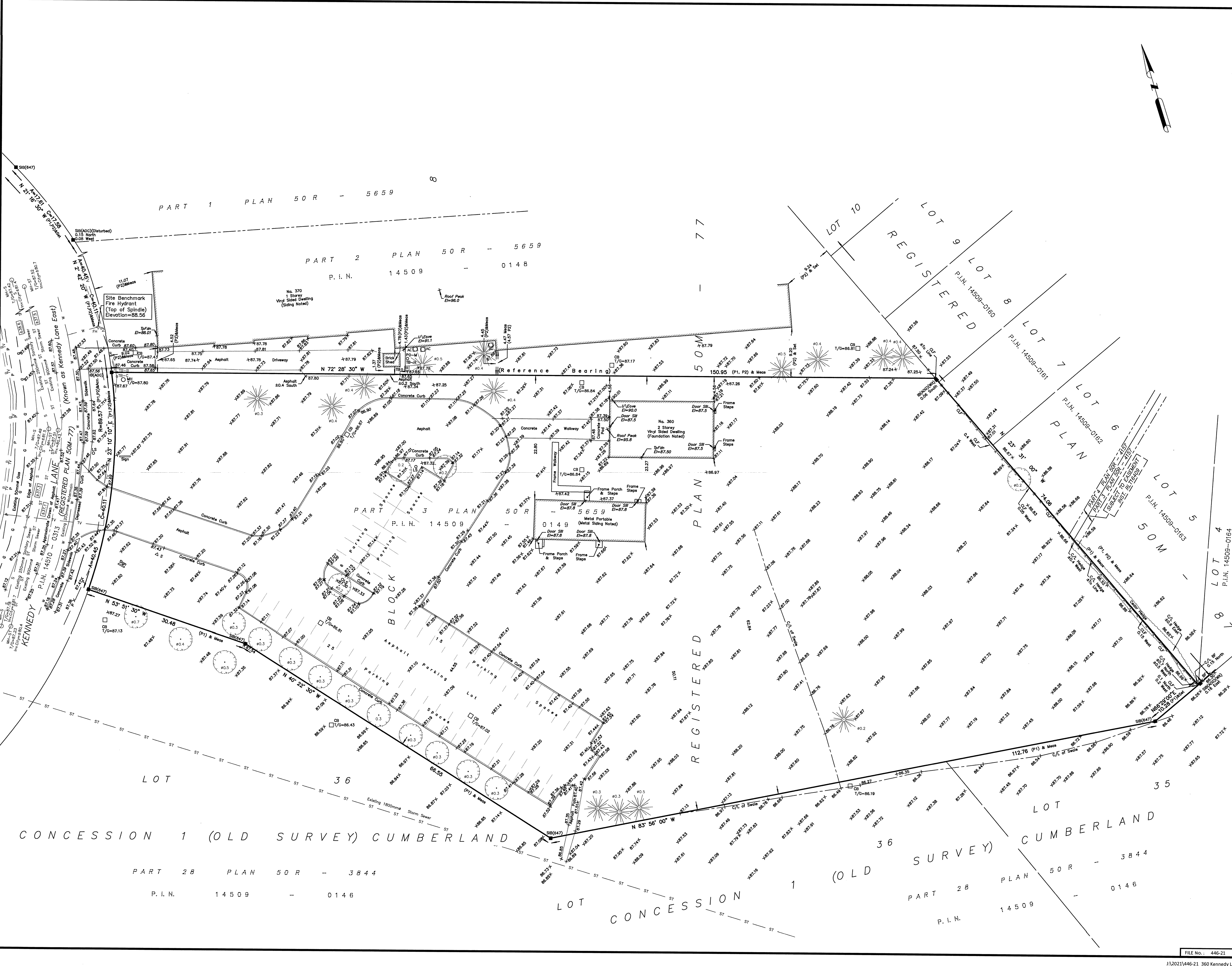
Bearing Note
Bearings hereon are grid bearings derived from the Can-Net Real Time Network and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).
For bearing comparisons, a rotation of 0°02'00" clockwise was applied to bearings on P1, P2.

Elevation Notes
1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that its relative elevation and description agrees with the information shown on this drawing.

Utility Notes
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference: 4. C-33-20, C-33-26, 13441.
4. Sanitary and storm sewer grades and inverts were compiled from: Field measurement and City of Ottawa Utility Sheets.
5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Notes & Legend

Denotes	
—	Survey Monument Planted
—	Survey Monument Found
SIB	Standard Iron Bar
IB	Iron Bar
(Wit)	Witness
Meas	Measured
(P1)	Plan by (AOG) dated July 22, 1998 (Job No. C-063-98)
(P2)	Plan by (AOG) dated July 22, 1998 (Job No. C-063-98)
Acc.	Accepted
○ MH-ST	Maintenance Hole (Storm)
○ MH-S	Maintenance Hole (Sanitary)
○ MH	Maintenance Hole (Unidentified)
— ST	Underground Storm Sewer
— S	Underground Sanitary Sewer
— W	Underground Water
— P	Underground Hydro
— G	Underground Gas
— B	Underground Bell
— R	Underground Rogers
— TV	Underground Television
○ LS	Light Standard
○ CB	Catch Basin
○ FH	Fire Hydrant
○ TB-B	Bell Terminal Box
○ TB-C	Cable Terminal Box
○ TB-B	Bell Terminal Box
○ TB-C	Cable Terminal Box
○ TB-H	Hydro Terminal Box
○ TB	Unidentified Terminal Box
△ S	Sign
○ PO-M	Metal Pole
○ AC	Air Conditioner
○	Diameter
CLF	Chain Link Fence
BF	Board Fence
Inv.	Invert
T/G	Top of Grate
EI	Elevation
U/Eave	Underside of Eave
Trdn	Top of Foundation
C/L	Centreline
+65.00	Location of Elevations
+65.00	Top of Concrete Curb Elevation
○	Deciduous Tree - The Symbol shown denotes location and trunk diameter only. Size of its' root system/overhead canopy may be smaller/larger than the symbol size depicted on this plan.
○	Coniferous Tree - The Symbol shown denotes location and trunk diameter only. Size of its' root system/overhead canopy may be smaller/larger than the symbol size depicted on this plan.



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LAND SURVEYORS
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Surveyor's Certificate
I certify that:
1. This survey and plan are correct and in accordance with the Surveyors Act, the Surveyors Act and the Regulations made under them.
2. The survey was completed on the 19th day of August, 2021.

Date: Aug 25/21
Daniel Robinson
Ontario Land Surveyor

FARLEY, SMITH & DENIS SURVEYING LTD.
ONTARIO LAND SURVEYORS
CANADA LAND SURVEYORS
Unit 275, 30 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
TEL. (613) 727-8226 E-mail: fdsurveyors@bellnet.ca

FILE No.: 446-21

Yang, Winston

From: Jadallah, Ayham
Sent: November 17, 2021 8:02 AM
To: O'Neill, Meaghan; Yang, Winston
Cc: Hughes, Michelle
Subject: FW: Water Quality Requirements - Site Development- 360 Kennedy Lane E

Hi,

Please find below the response from CA and note that CLI approach might be applicable.

Thanks,
Ayham

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: Tuesday, November 16, 2021 9:07 PM
To: Jadallah, Ayham <Ayham.Jadallah@wsp.com>
Cc: Emma Bennett <emma.bennett@rvca.ca>
Subject: Water Quality Requirements - Site Development- 360 Kennedy Lane E

Good Evening Ayham,

Based on the distance to the downstream outlet to the Ottawa River, the water quality target would be 80% TSS removal. Any stormwater management plan must conform to the 2003 MOE Stormwater Management Planning and Design Manual and any other relevant guiding documents that may be in place at the time of the official submission. The opportunity for LID measures should be explored for any proposed stormwater management plan. Specific attention will need to be placed on water budget/balance and the items mentioned above. It should be noted that these requirements are already within the existing 2003 MOE Design Manual.

The new consolidated linear infrastructure ECA approach from the Ministry of Environment, Conservation and Parks has an implementation scheduled for summer 2021. Therefore, based on the projected timeframe for this project, it may form part of the City's ECA for which the following criteria is noted:

- Water balance or runoff volume control to the 90th percentile
- OGS units will only address 50% treatment
- Other items identified in the new consolidated linear infrastructure ECA

Therefore, the applicant is strongly encouraged to design accordingly within their stormwater management approach.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca



3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

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and any copy of the e-mail and any printout thereof, immediately. Your cooperation is appreciated.

Yang, Winston

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: November 8, 2021 11:12 AM
To: Yang, Winston
Subject: RE: Boundary Condition Request - Queenswood United Church PAR - 360 Kennedy Lane East

As part of the development application the site would be required to connect to Kennedy Lane E and the overland flows would also need to be directed towards the street.

Rubina

Rubina Rasool, E.I.T.

Project Manager

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review – East Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1 rubina.rasool@ottawa.ca

From: Yang, Winston <Winston.Yang@wsp.com>

Sent: November 08, 2021 10:46 AM

To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>

Subject: RE: Boundary Condition Request - Queenswood United Church PAR - 360 Kennedy Lane East

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Hi Rubina,

Please see attached pdfs for the FUS. I have also attached architectural site plan for your reference.

And I have a question for Stormwater Management. Currently the grass area of the site is draining toward the existing ditch and picked up by the existing CB located at the park south of the site.

Can I use the entire site to calculate the pre-development allowable release rate to Kennedy Lane east or only use half of the site for our consideration since half of the site is draining toward Kennedy Lane East and half of the site is draining toward the park?



Ding Bang (Winston) Yang, P.Eng.

Project Engineer
Municipal Engineering - Ottawa

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2611 Queensview Drive, Suite 300
Ottawa, Ontario,
K2B 8K2 Canada

wsp.com

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>

Sent: November 8, 2021 9:24 AM

To: Yang, Winston <Winston.Yang@wsp.com>

Subject: RE: Boundary Condition Request - Queenswood United Church PAR - 360 Kennedy Lane East

Hi Winston,

I will circulate the water boundary conditions; however, I will have to take a closer look at the FUS calculations. The development is similar to a subdivision and Technical Bulletin 2018-02 (attached) allows for 10,000 L/min if minimum separation distances are provided.

Rubina

Rubina Rasool, E.I.T.

Project Manager

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review – East Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1 rubina.rasool@ottawa.ca

From: Yang, Winston <Winston.Yang@wsp.com>

Sent: November 04, 2021 10:37 AM

To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>

Subject: Boundary Condition Request - Queenswood United Church PAR - 360 Kennedy Lane East

Importance: High

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Hi Rubina,

As per the pre-consultation meeting direction, here is the water supply boundary condition request for the proposed residential development by Queenswood United Church at 360 Kennedy Lane East at Orlean.

The proposed development will be serviced from the existing 203mm diameter watermain from Kennedy Lane that as per pre-consult meeting minute where the water service from the development will be connected to the existing 203mm diameter watermain along Kennedy Lane East.

The proposed residential development consists of 21 two storey and 60 three storey Townhouse units . There are two existing public fire hydrants at Kennedy Lane East next to the subjected site. Multiple private fire hydrants will be proposed on site.

The domestic water demands were calculated using the City of Ottawa's Water Design Guidelines and fire demand were calculated using FUS 1999.

The results are summarized as follow:

Proposed development	Average Daily Demand (l/s)	Maximum Daily Demand (l/s)	Maximum Hourly Demand (l/s)	Fire Demand (l/min)
Queenswood UC PAR	0.65	1.62	3.56	16000

I have also attached the FUS calculation spreadsheet for the most fire flow required for your review. The proposed onsite water service is to be designed to connect to the existing 203mm water service pipe on the Kennedy Lane East as shown on the attached sketch for your reference. Two connections to the existing 203 W/M are required as the basic demand exceed 50 m³/day

The sanitary total flow from the site is 2.68 L/s. The spreadsheet is attached for your reference.

If you have the report and drawings please send them to me.

Thank you,



Ding Bang (Winston) Yang, P.Eng.

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APPENDIX

APPENDIX

B

- WATERMAIN BOUNDARY CONDITIONS FROM CITY OF OTTAWA
- EMAILS FROM CITY OF OTTAWA
- FIRE UNDERWRITERS SURVEY – FIRE FLOW CALCULATION
- WATER DEMAND CALCULATION
- F03 – EXPOSED DISTANCE
- WATER MODEL OUTPUT – WATERGEM

Boundary Conditions 360 Kennedy Lane East

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	39	0.65
Maximum Daily Demand	97	1.62
Peak Hour	214	3.56
Fire Flow Demand #1	15,000	250.00
Fire Flow Demand #2	16,000	266.67

Location



Results

Connection 1 – Kennedy Lane E.

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	130.2	61.1
Peak Hour	125.8	54.9
Max Day plus Fire 1	102.5	21.7
Max Day plus Fire 2	99.3	17.1

Ground Elevation = 87.2 m

Connection 2 – Kennedy Lane E.

Demand Scenario	Head (m)	Pressure¹ (psi)
Maximum HGL	130.2	61.1
Peak Hour	125.8	54.9
Max Day plus Fire 1	102.1	21.1
Max Day plus Fire 2	98.8	16.4

Ground Elevation = 87.2 m

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Yang, Winston

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: November 24, 2021 2:30 PM
To: Yang, Winston
Subject: RE: Boundary Condition Request - Queenswood United Church PAR - 360 Kennedy Lane East
Attachments: 360 Kennedy Lane East_22Nov2021.docx

Please find attached the water boundary conditions. Please note the 16,000 L/min does not meet the 20 psi fire requirement. We have added the 15,000 L/min which does meet the fire requirement.

Rubina

Rubina Rasool, E.I.T.

Project Manager

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review – East Branch

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Block 1
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A = 2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 392 m²

C = 1.5

F = 6529.5 L/min

rounded off to 7,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 7,000 = 5,950 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 5,950 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	25	10% north side
Side 2	8.5	20% east side
Side 3	100	0% south side
Side 4	40	0% west side

30% (Total shall not exceed 75%)

Increase due to separation 30% x 5,950 = 1,785 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

- The fire flow requirement is 8,000 L/min (Rounded to nearest 1000 L/min)
- or **133 L/sec**
- or 2,113 gpm (us)
- or 1,760 gpm (uk)



Block 2
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A = 2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 692 m²
 C = 1.5
 F = 8677.8 L/min

rounded off to 9,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 9,000 = 7,650 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 7,650 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	17	15% north side
Side 2	6	20% east side
Side 3	100	0% south side
Side 4	8.5	20% west side

55% (Total shall not exceed 75%)

Increase due to separation 55% x 7,650 = 4,208 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 12,000 L/min (Rounded to nearest 1000 L/min)
 or 200 L/sec
 or 3,170 gpm (us)
 or 2,640 gpm (uk)



Block 3
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A = 2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 656 m²
 C = 1.5
 F = 8448.9 L/min

rounded off to 8,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 8,000 = 6,800 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 6,800 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	17	15% north side
Side 2	4	20% east side
Side 3	100	0% south side
Side 4	6	20% west side

55% (Total shall not exceed 75%)

Increase due to separation 55% x 6,800 = 3,740 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

- The fire flow requirement is 11,000 L/min (Rounded to nearest 1000 L/min)
- or **183 L/sec**
- or 2,906 gpm (us)
- or 2,420 gpm (uk)



Block 4
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A = 2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 495 m²
 C = 1.5
 F = 7342.0 L/min

rounded off to 7,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 7,000 = 5,950 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 5,950 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	13	15% north side
Side 2	31	5% east side
Side 3	100	0% south side
Side 4	4	20% west side

40% (Total shall not exceed 75%)

Increase due to separation 40% x 5,950 = 2,380 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 8,000 L/min (Rounded to nearest 1000 L/min)
 or **133 L/sec**
 or 2,113 gpm (us)
 or 1,760 gpm (uk)



Block 5
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A = 2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 282 m²

C = 1.5

F = 5541.6 L/min

rounded off to 6,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 6,000 = 5,100 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 5,100 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	18	15% north side
Side 2	16	15% east side
Side 3	13	15% south side
Side 4	15	15% west side

60% (Total shall not exceed 75%)

Increase due to separation 60% x 5,100 = 3,060 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 8,000 L/min (Rounded to nearest 1000 L/min)

- or 133 L/sec
- or 2,113 gpm (us)
- or 1,760 gpm (uk)



Block 6
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A = 2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 618 m²

C = 1.5

F = 8203.7 L/min

rounded off to 8,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 8,000 = 6,800 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 6,800 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	14.5	15% north side
Side 2	15	15% east side
Side 3	14.5	15% south side
Side 4	6	20% west side

65% (Total shall not exceed 75%)

Increase due to separation 65% x 6,800 = 4,420 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

- The fire flow requirement is 11,000 L/min (Rounded to nearest 1000 L/min)
- or **183 L/sec**
- or 2,906 gpm (us)
- or 2,420 gpm (uk)



Block 7
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A = 2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 495 m²
 C = 1.5
 F = 7342.0 L/min

rounded off to 7,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard $-15\% \times 7,000 = 5,950$ L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System $0\% \times 5,950 = 0$ L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	14	15% north side
Side 2	6	20% east side
Side 3	14.5	15% south side
Side 4	21.5	10% west side

60% (Total shall not exceed 75%)

Increase due to separation $60\% \times 5,950 = 3,570$ L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 10,000 L/min (Rounded to nearest 1000 L/min)
 or **167 L/sec**
 or 2,642 gpm (us)
 or 2,200 gpm (uk)



Block 8
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A = 2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 413 m²
 C = 1.5
 F = 6702.3 L/min

rounded off to 7,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 7,000 = 5,950 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 5,950 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	10.5	15% north side
Side 2	20.5	10% east side
Side 3	13.5	15% south side
Side 4	20.5	10% west side

50% (Total shall not exceed 75%)

Increase due to separation 50% x 5,950 = 2,975 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 9,000 L/min (Rounded to nearest 1000 L/min)
 or **150 L/sec**
 or 2,378 gpm (us)
 or 1,980 gpm (uk)



Existing Church
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220 C \sqrt{A}$

- F = required fire flow in litres per minute
- C = coefficient related to the type of construction
 - 1.5 for **Type V** Wood Frame Construction
 - 0.8 for **Type IV-A** Mass Timber Construction
 - 0.9 for **Type IV-B** Mass Timber Construction
 - 1.0 for **Type IV-C** Mass Timber Construction
 - 1.5 for **Type IV-D** Mass Timber Construction
 - 1.0 for **Type III** Ordinary Construction
 - 0.8 for **Type II** Noncombustible Construction
 - 0.6 for **Type I** Fire resistive Construction

A =2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 198 m²
 C = 1.5
 F = 4643.5 L/min

rounded off to 5,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -15% x 5,000 = 4,250 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System 0% x 4,250 = 0 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	11.5	15% north side
Side 2	42.5	5% east side
Side 3	14	15% south side
Side 4	20.5	10% west side
	45%	(Total shall not exceed 75%)

Increase due to separation 45% x 4,250 = 1,913 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 6,000 L/min (Rounded to nearest 1000 L/min)
 or 100 L/sec
 or 1,585 gpm (us)
 or 1,320 gpm (uk)

Water Demand Calculation Sheet

Project: Queenswood United Church
Location: City of Ottawa
WSP Project No. 211-12127-00

Date: 2022-09-20
Design: WY
Page: 1 of 1



Proposed Buildings	Residential				Non-Residential			Average Daily			Maximum Daily			Maximum Hourly			Fire
	Units			Pop.	Industrial (ha)	Institutional (ha)	Commercial (ha)	Demand (l/s)			Demand (l/s)			Demand (l/s)			Demand (l/s)
	SF	APT	TH					Res.	Non-Res.	Total	Res.	Non-Res.	Total	Res.	Non-Res.	Total	
Proposed Residential																	
Block 1		6	2	16				0.05		0.05	0.13	0.13	0.29	0.29			133
Block 2		9	4	27				0.09		0.09	0.22	0.22	0.48	0.48			200
Block 3		6	5	24				0.08		0.08	0.20	0.20	0.43	0.43			183
Block 4		12		22				0.07		0.07	0.18	0.18	0.39	0.39			133
Block 5			4	11				0.04		0.04	0.09	0.09	0.19	0.19			133
Block 6		15		27				0.09		0.09	0.22	0.22	0.48	0.48			183
Block 7		12		22				0.07		0.07	0.18	0.18	0.39	0.39			167
Block 8			6	16				0.05		0.05	0.13	0.13	0.29	0.29			150
Ex. Church						0.02			0.01	0.01	0.01	0.01	0.02	0.02			100
Total		60	21	165						0.54		1.34					2.95

Population Densities

Single Family	3.4 person/unit
Semi-Detached	2.7 person/unit
Duplex	2.3 person/unit
Townhome (Row)	2.7 person/unit
Bachelor Apartment	1.4 person/unit
1 Bedroom Apartment	1.4 person/unit
2 Bedroom Apartment	2.1 person/unit
3 Bedroom Apartment	3.1 person/unit
4 Bedroom Apartment	4.1 person/unit
Avg. Apartment	1.8 person/unit

Average Daily Demand

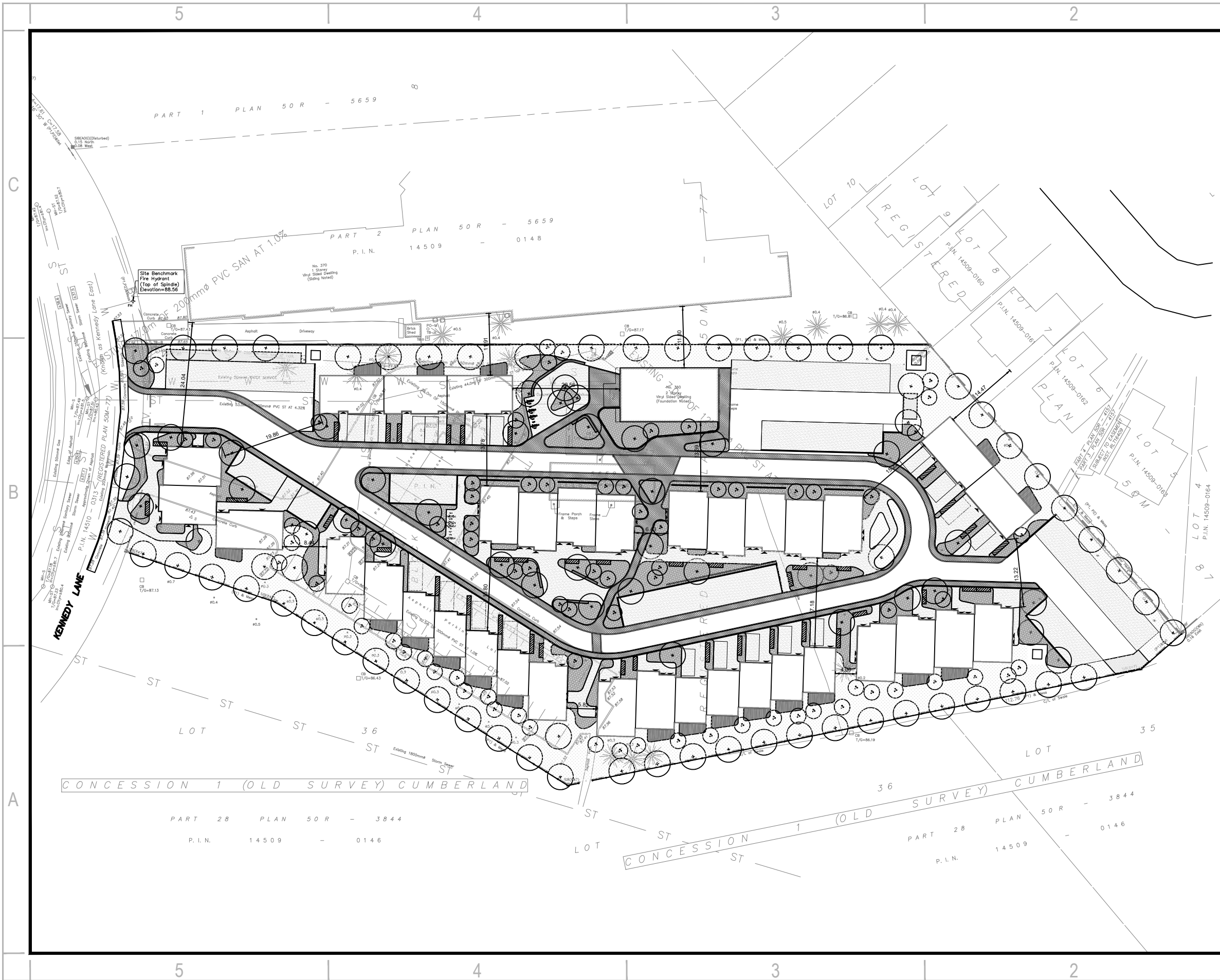
Residential	280 l/cap/day
Industrial	35000 l/ha/day
Institutional	28000 l/ha/day
Commercial	28000 l/ha/day

Maximum Daily Demand

Residential	2.5 x avg. day
Industrial	1.5 x avg. day
Institutional	1.5 x avg. day
Commercial	1.5 x avg. day

Maximum Hourly Demand

Residential	2.2 x max. day
Industrial	1.8 x max. day
Institutional	1.8 x max. day
Commercial	1.8 x max. day



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**UNITED PROPERTY RESOURCE CORPORATION
QUEENSWOOD UNITED CHURCH**

CLIENT REF. #:
PROJECT:
QUEENSWOOD UNITED CHURCH

LEGEND

PROJECT NO:
211-12127-00

ORIGINAL SCALE:
1:750

DESIGNED BY:
E.B.

DRAWN BY:
J.T.

CHECKED BY:
D.Y.

TITLE:

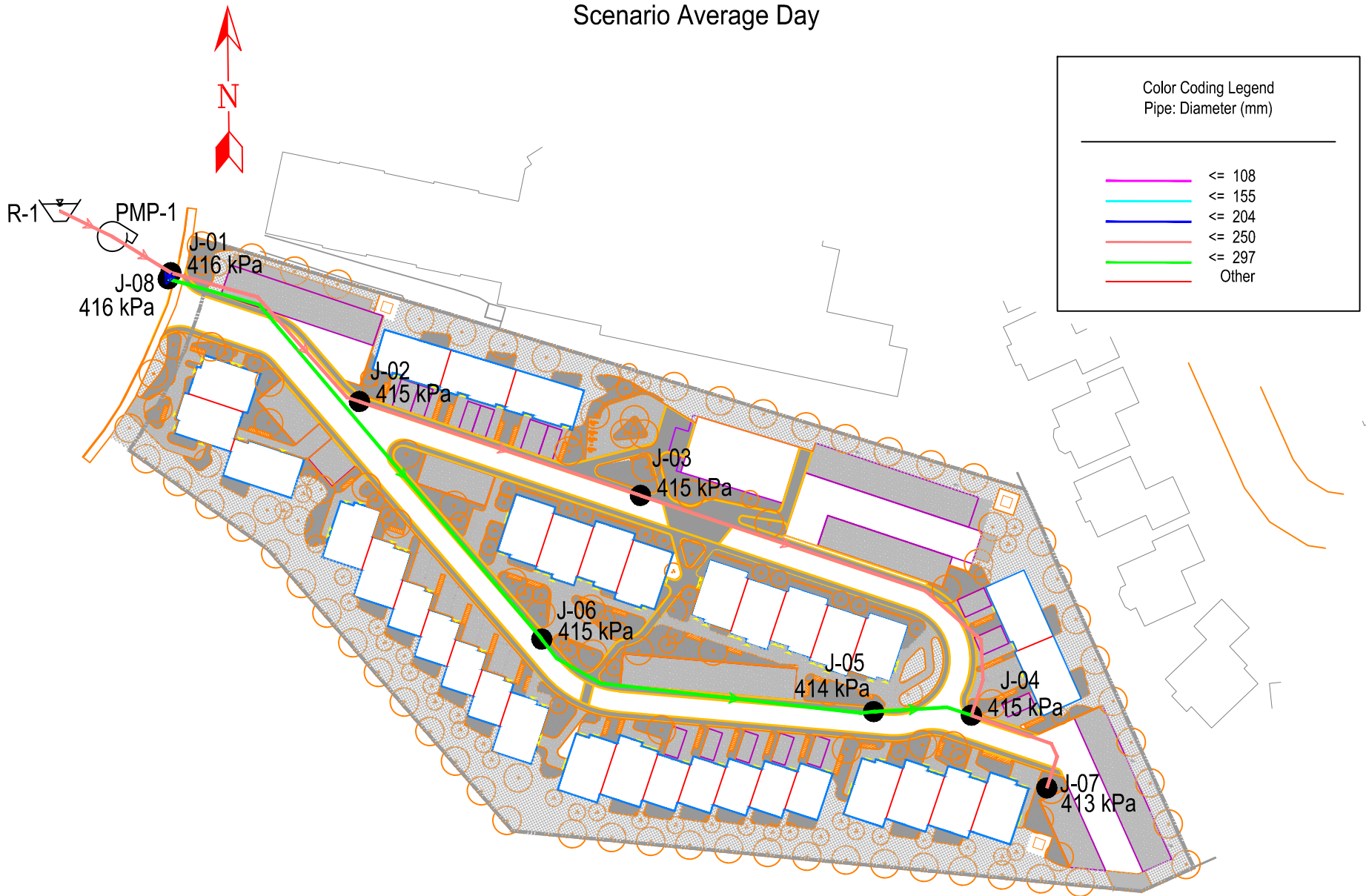
DATE:
SEPTEMBER 2022

IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.

EXPOSURE DISTANCE

SHEET NUMBER:
F3

360 Kennedy Lane East
WaterCAD Hydraulic Model
Scenario Average Day



360 Kennedy Lane East WaterCAD Hydraulic Model Junction



Color Coding Legend
Pipe: Diameter (mm)

- <= 108
- <= 155
- <= 204
- <= 250
- <= 297
- Other

360 Kennedy Lane East
WaterCAD Hydraulic Model
Scenario Max Day + Fire

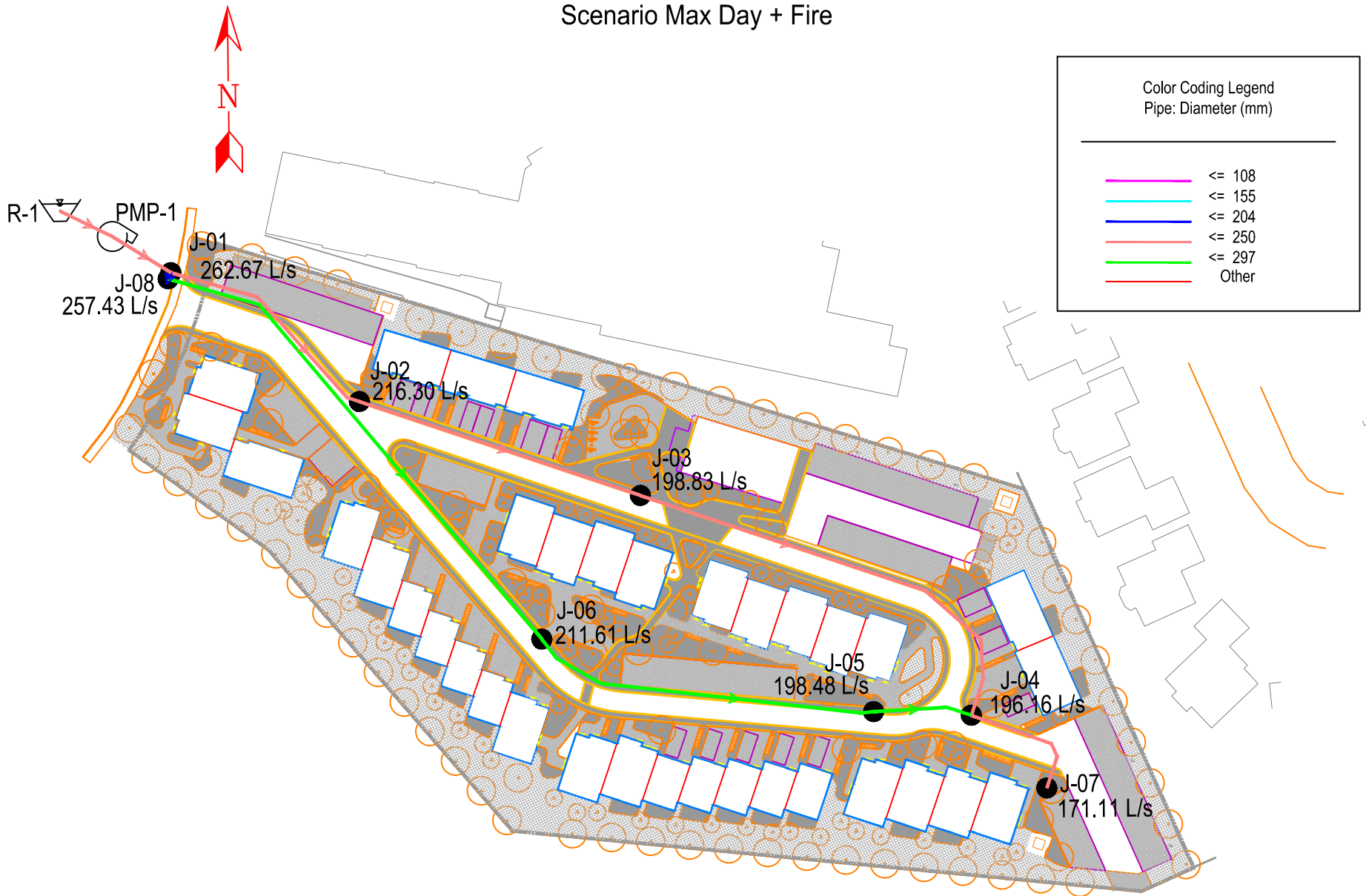


Color Coding Legend
Pipe: Diameter (mm)

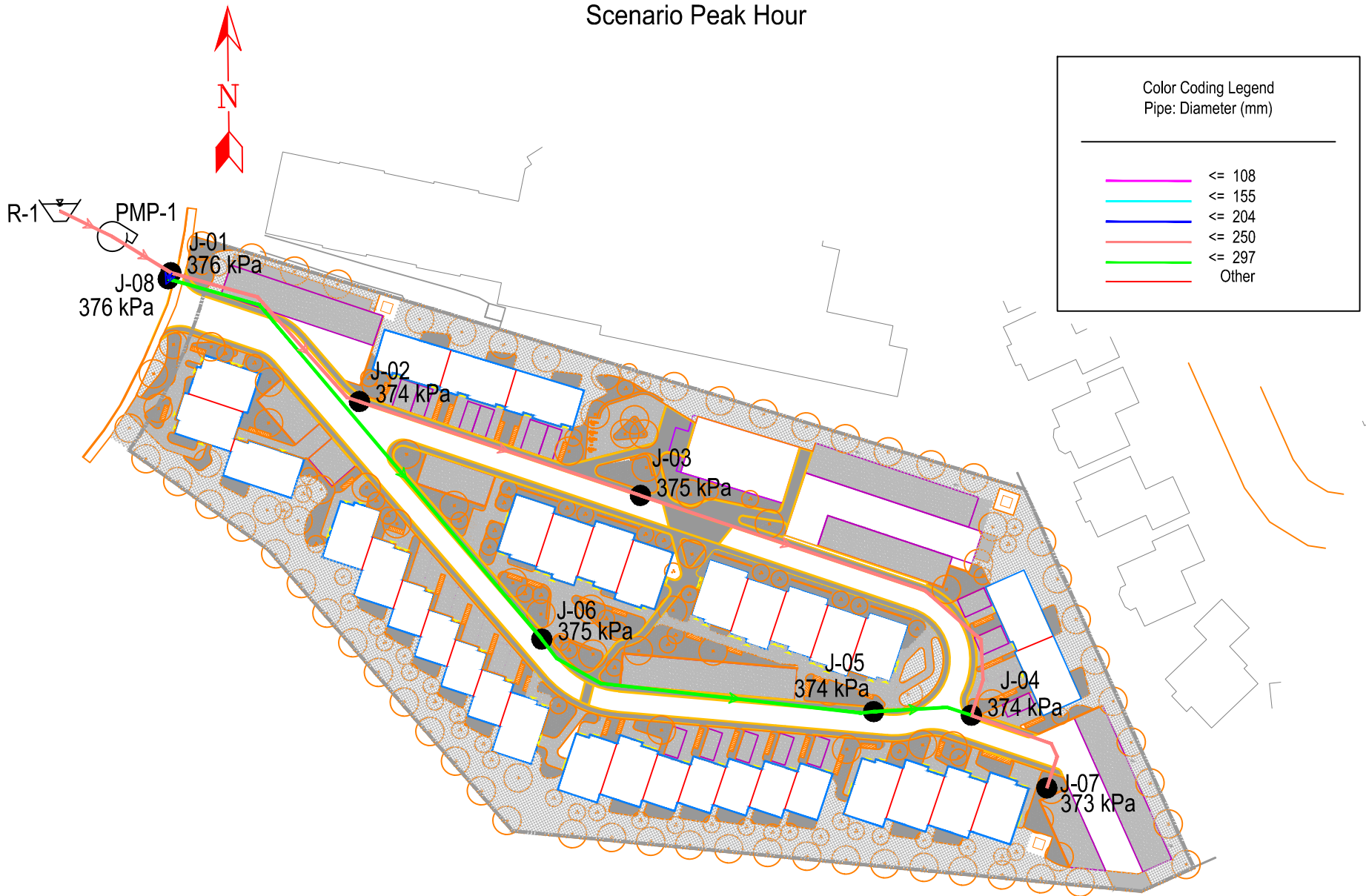
	<= 108
	<= 155
	<= 204
	<= 250
	<= 297
	Other



360 Kennedy Lane East
WaterCAD Hydraulic Model
Scenario Max Day + Fire



360 Kennedy Lane East
WaterCAD Hydraulic Model
Scenario Peak Hour

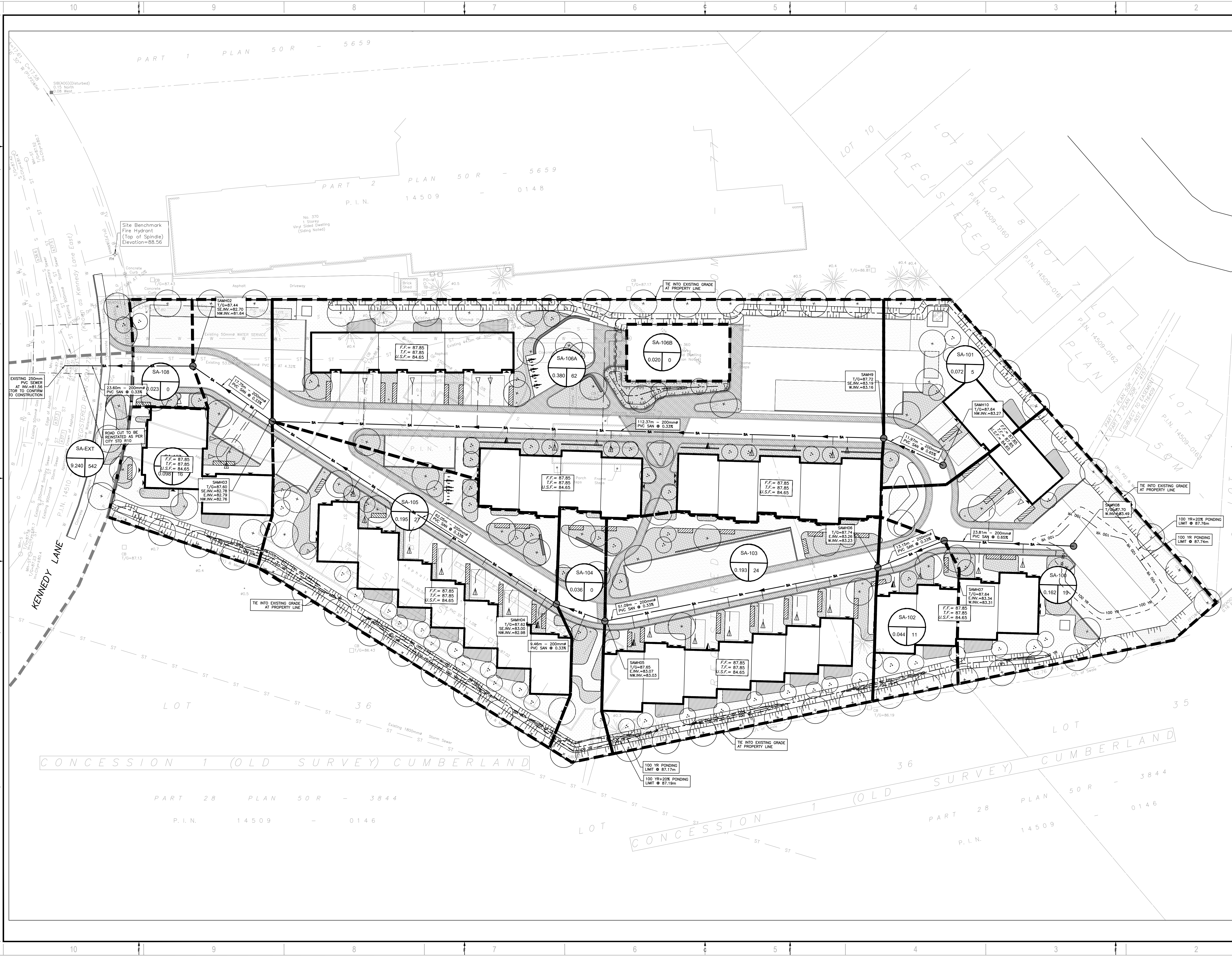


APPENDIX

APPENDIX

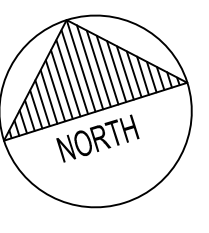
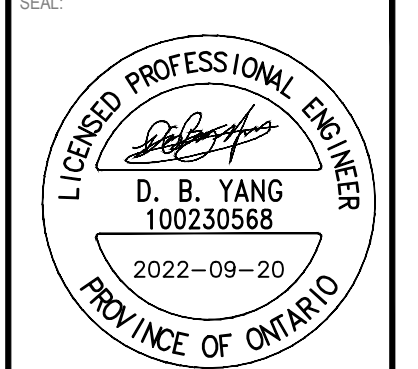
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- C07 -SANITARY DRAINAGE AREA PLAN
- F01 - OVERALL SANITARY DRAINAGE AREA PLAN
- SANITARY SEWER DESIGN SHEET



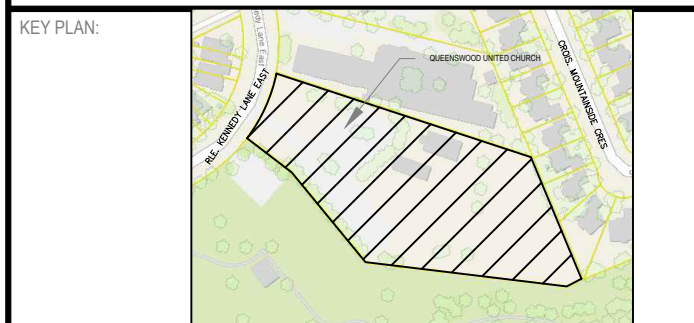
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ARCHITECT:
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PROJECT:
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	2	2022-09-20	RE-ISSUED FOR SPA AND ZBLA
	1	2021-11-30	ISSUED FOR SPA AND ZBLA

PROJECT NO: 211-12127-00	DATE: SEPTEMBER 2022
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DESIGNED BY: EB/DY	
DRAWN BY: JTEB	
CHECKED BY: DY	

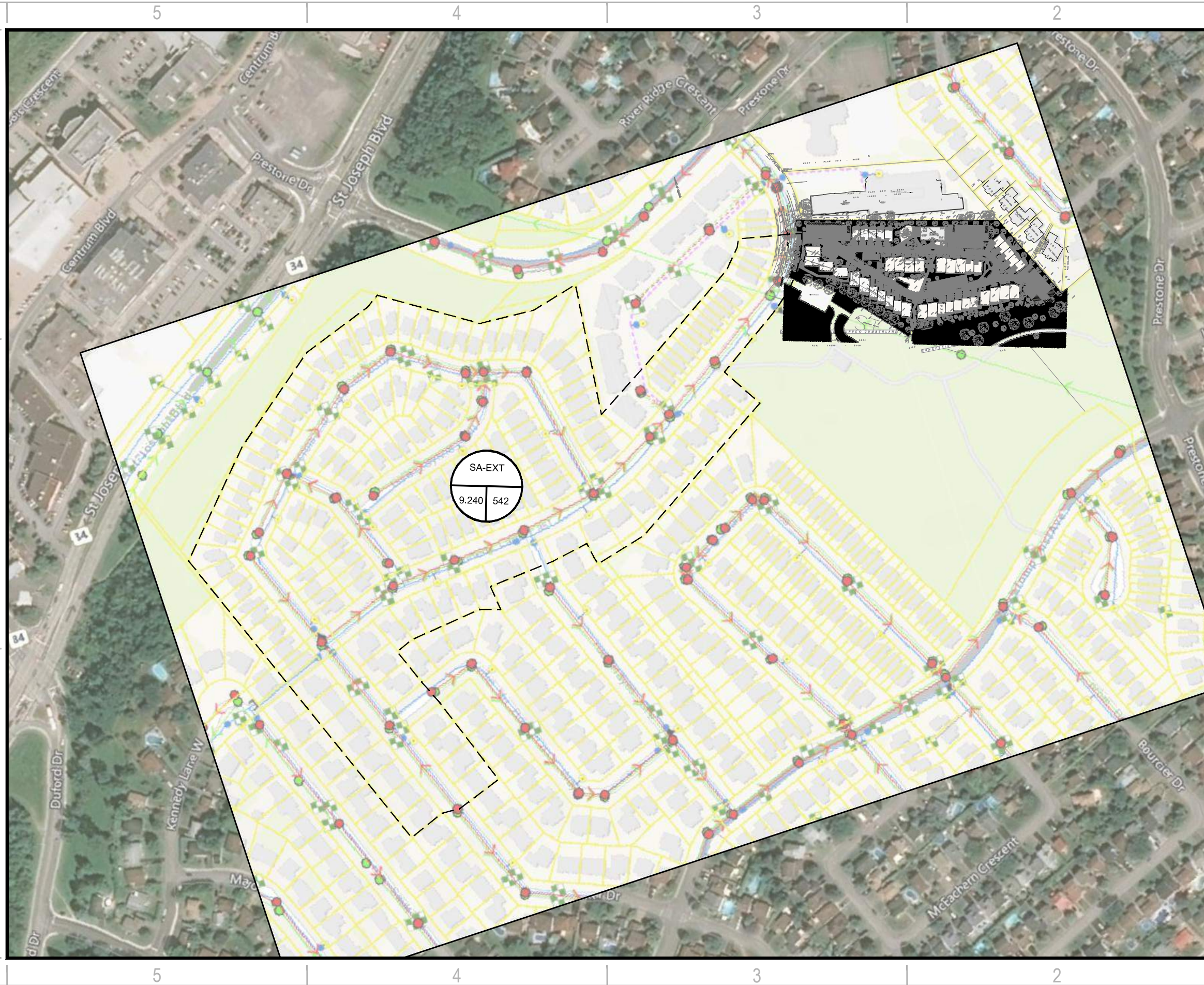
DISCIPLINE: **CIVIL**

TITLE:
SANITARY DRAINAGE AREA PLAN

SHEET NUMBER: C07	REV # 0
ISSUE: RE-ISSUE FOR SPA AND ZBLA	
DATE OF: 2022-09-20	

V:\10-13-NE 2021\Project\211-12127-00 Queenwood United Church\3. Drawing\Working drawings\211-12127-00_C07.dwg, Sep 20, 2022, 12:05pm BY:camy092741

#18692 D07-12-22-0002



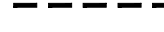


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QUEENSWOOD UNITED CHURCH**

CLIENT REF. #:
PROJECT:
QUEENSWOOD UNITED CHURCH

LEGEND

-  I.D. DENOTES SANITARY DRAINAGE AREA ID
-  AREA DENOTES SANITARY DRAINAGE AREA
POP DENOTES POPULATION
-  SANITARY DRAINAGE BOUNDARY

PROJECT NO:
211-12127-00

DATE:
NOVEMBER 2021

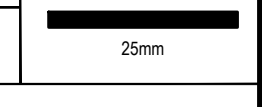
ORIGINAL SCALE:
1:3000

IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.

DESIGNED BY:
E.B.

DRAWN BY:
J.T.

CHECKED BY:
D.Y.



TITLE:
EXTERNAL SANITARY DRAINAGE AREA

SHEET NUMBER:
F1

SANITARY SEWER DESIGN SHEET
Queenswood United Church
360 Kennedy Lane East - Residential Development
Ottawa, ON
Project: 211-12127-00
Date: September 2022



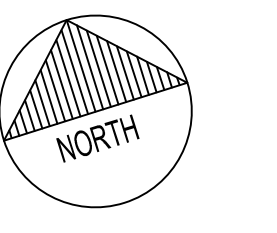
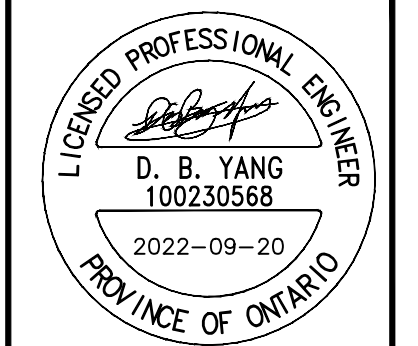
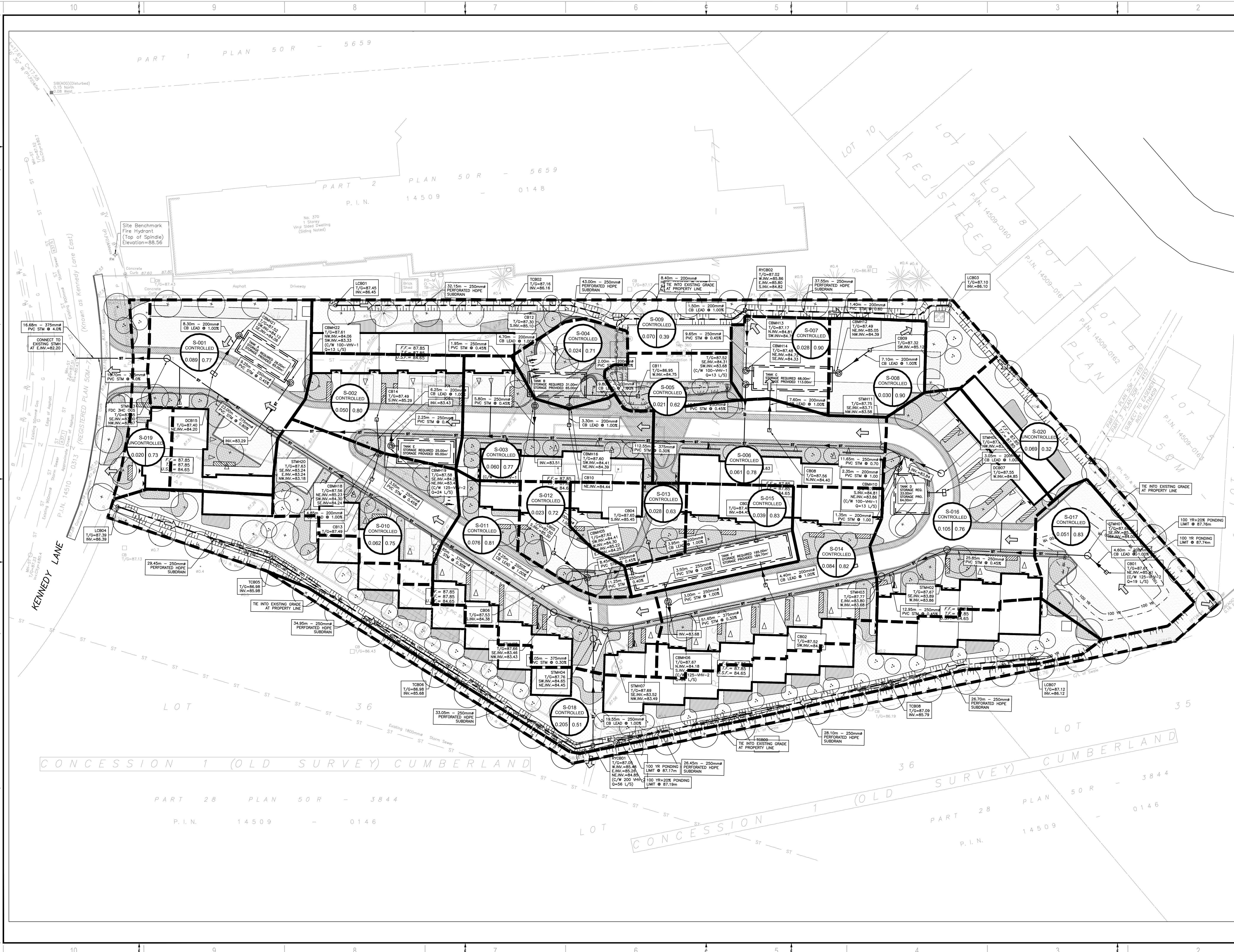
LOCATION				RESIDENTIAL AREA AND POPULATION										INDUSTRIAL				COMMERCIAL		INSTITUTIONAL		I+C+I	INFILTRATION			TOTAL FLOW (l/s)	PIPE										
LOCATION	FROM M.H.	TO M.H.	SANITARY DRAINAGE AREA ID	INDV AREA (ha)	ACCU AREA (ha)	NUMBER OF UNITS					POPULATION		PEAK FACT.	PEAK FLOW (l/s)	GROSS AREA (ha)	DEVEL. AREA (ha)	ACCU. AREA (ha)	PEAK FACTOR	INDV AREA (ha)	ACCU. AREA (ha)	INDV AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	INDV AREA (ha)	ACCU. AREA (ha)		INFILT. FLOW (l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	AVAIL. CAP. (%)				
TO KEENEY LANE EAST																																					
BLOCK 4 & 5	SANMH08	SANMH07	SA-100	0.162	0.162			3.00	6.00			19	19	3.71	0.23											0.162	0.16	0.05	0.28	23.81	200	0.65	26.44	0.84	98.94%		
BLOCK 4	SANMH07	SANMH06	SA-102	0.044	0.206				6.00			11	30	3.68	0.35											0.044	0.21	0.07	0.42	13.15	200	0.33	18.84	0.60	97.76%		
BLOCK 3	SANMH06	SANMH05	SA-103	0.193	0.399			5.00	6.00			24	54	3.65	0.64											0.193	0.40	0.13	0.77	51.09	200	0.33	18.84	0.60	95.91%		
	SANMH05	SANMH04	SA-104	0.036	0.435							0	54	3.65	0.64											0.036	0.44	0.14	0.78	9.46	200	0.33	18.84	0.60	95.85%		
BLOCK 2	SANMH04	SANMH03		0.195	0.630			4.00	9.00			27	81	3.61	0.95											0.195	0.63	0.21	1.16	62.05	200	0.33	18.84	0.60	93.86%		
BLOCK 5	SANMH10	SANMH09	SA-101	0.072	0.072			2.00				5	5	3.75	0.07											0.072	0.07	0.02	0.09	11.97	200	0.65	26.44	0.84	99.66%		
BLOCK 6 TO 8, EX. CHURCH	SANMH09	SANMH03	SA-106A, SA-106B	0.380	0.452			5.00	27.00			62	68	3.63	0.79										0.02	0.02	0.01	0.96	112.37	200	0.33	18.84	0.60	94.93%			
BLOCK 1	SANMH03	SANMH02	SA-107	0.098	1.180			2.00	6.00			16	165	3.54	1.89										0.02	0.01	0.098	1.20	0.40	2.29	17.75	200	0.33	18.84	0.60	87.83%	
ENTRANCE	SANMH02	EX. SAN	SA-108	0.023	1.203							0	165	3.54	1.89										0.02	0.01	0.023	1.22	0.40	2.30	23.60	200	0.33	18.84	0.60	87.79%	
UPSTREAM OF 360 KEENEY LANE EAST																																					
SA-EXT	EX. SANMH	EX. SANMH		9.240	9.240	141	2	21.00				542	542	3.36	5.90											9.240	9.24	3.05	8.95	38.00	250	0.60	25.41	0.81	64.76%		
DOWNSTREAM OF 360 KEENEY LANE EAST																																					
	EX. SANMH	EX. SANMH		10.443								0	706	3.31	7.58											0.02	0.01	0.000	10.46	3.45	11.04	36.90	250	0.60	25.41	0.81	56.54%
DESIGN PARAMETERS																																					
RESIDENTIAL AVG. DAILY FLOW =	280	l/cap/day	COMMERCIAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)	PEAK POPULATION FLOW, (l/s) =	$P^*q^*M/86400$	UNIT TYPE	PERSONS/UNIT	DESIGNED:	NO.	REVISION	DATE																								
COMMERCIAL AVG. DAILY FLOW =	28,000	l/ha/day		1.0	(WHEN AREA < 20%)	PEAK EXTRANEOUS FLOW, (l/s) =	I^*Ac	SINGLES	3.4	E.E./D.B.Y	1.	City Submission No.1	2021-11-30																								
INSTITUTIONAL AVG. DAILY FLOW =	0.324	l/ha/s	INSTITUTIONAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)	RESIDENTIAL PEAKING FACTOR, M =	$1+(14/(4+P^*0.5))^*K$	SEMI-DETACHED	2.7	CHECKED:	2.	City Submission No.2	2022-09-13																								
	28,000	l/ha/day		1.0	(WHEN AREA < 20%)	Ac = CUMULATIVE AREA (ha)		TOWNHOMES	2.7	D.B.Y																											
	0.324	l/ha/s	RESIDENTIAL CORRECTION FACTOR, K =	0.80		P = POPULATION (THOUSANDS)		WALK UP TOWNS	1.8	PROJECT:																											
LIGHT INDUSTRIAL FLOW =	35,000	l/ha/day	MANNING N =	0.013		SEWER CAPACITY, Q _{cap} (l/s) =	$1/N S^*(1/2) R^*(2/3) Ac$	2-BED APT. UNIT	2.1	Queenswood United Church																											
	0.405	l/ha/s	PEAK EXTRANEOUS FLOW, I (l/s/ha) =	0.33		(MANNING'S EQUATION)		3-BED APT. UNIT	3.1	Residential Development																											
HEAVY INDUSTRIAL FLOW =	55,000	l/ha/day								LOCATION:																											
	0.637	l/ha/s								Ottawa, Ontario																											
										PAGE NO:	FILE & DWG. REFERENCE:																										
										1 of 1	C07																										

APPENDIX

APPENDIX

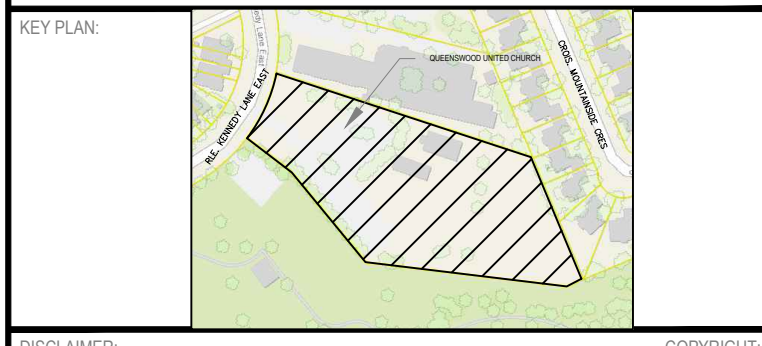
D

- STORM SEWER DESIGN SHEET
- POST-DEVELOPMENT STORM DRAINAGE AREA PLAN C06
- GRADING PLAN C04
- SERVICING PLAN C05
- STORMTECH CHAMBERS DESIGN
- STORMCEPTOR



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QUEENSWOOD UNITED CHURCH

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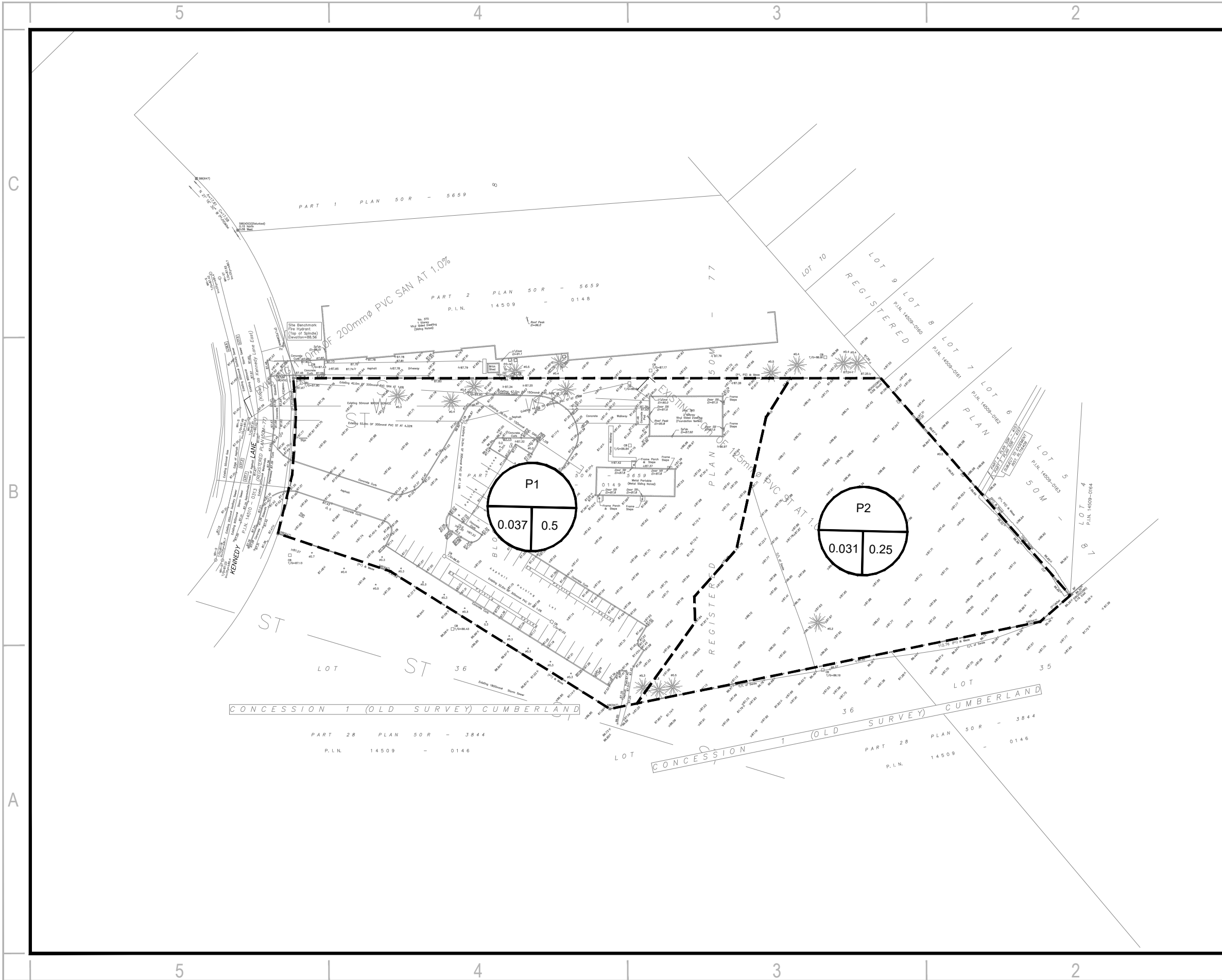
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	2	2022-09-20	RE-ISSUED FOR SPA AND ZBLA
	1	2021-11-30	ISSUED FOR SPA AND ZBLA

PROJECT NO:	211-12127-00	DATE:	SEPTEMBER 2022
ORIGINAL SCALE:	1:300	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.	
DESIGNED BY:	EB/DY		
DRAWN BY:	JT/EB		
CHECKED BY:	DY		
DISCIPLINE:	CIVIL		
TITLE:	DRAINAGE AREA PLAN		
SHEET NUMBER:	C06		
SHEET #:	6	OF	8
ISSUE:	RE-ISSUE FOR SPA AND ZBLA		
DATE OF:	2022-09-20	REV #:	0

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D07-12-22-0002

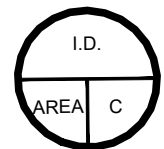




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CLIENT:
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QUEENSWOOD UNITED CHURCH**

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PROJECT:
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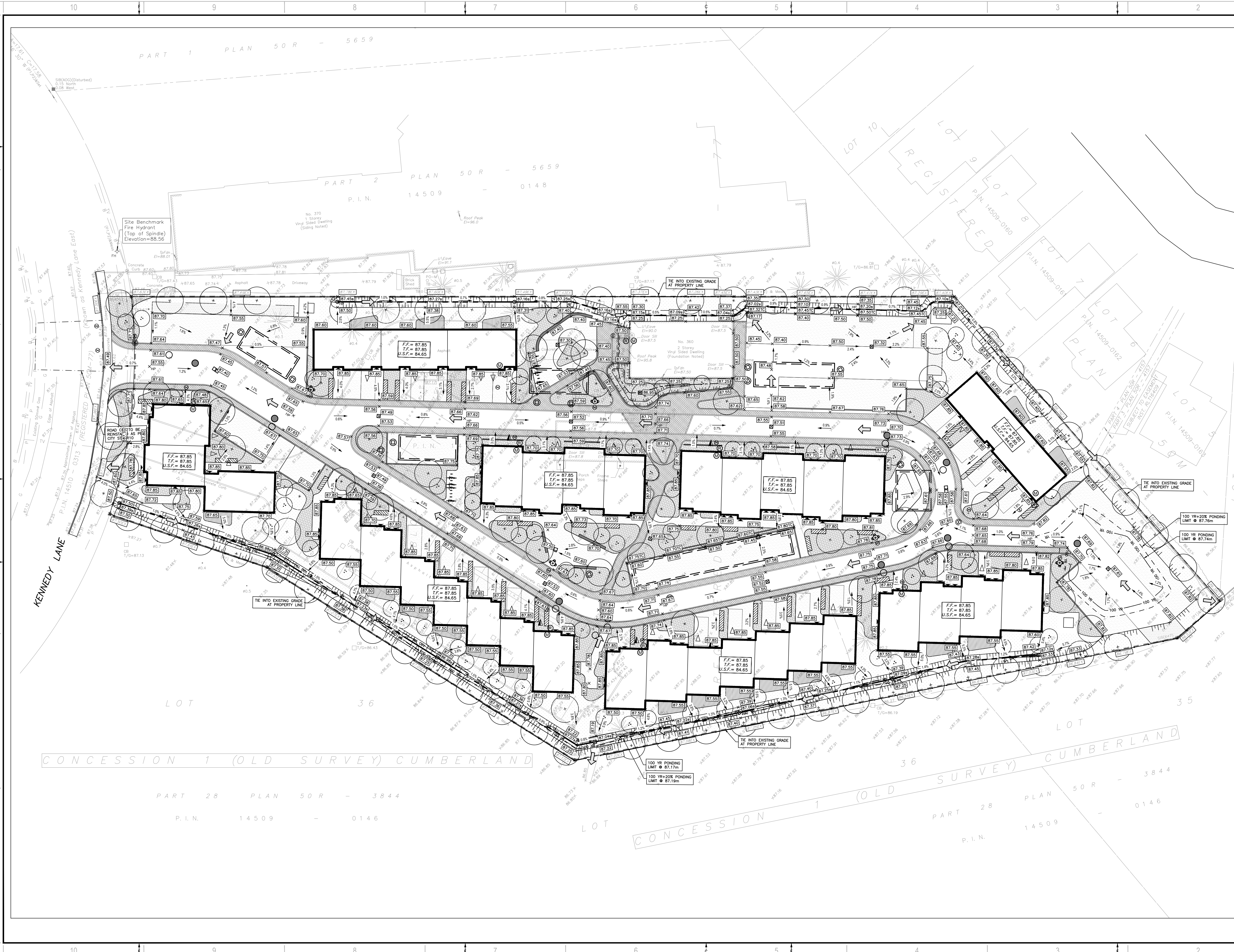
LEGEND

-  I.D. DENOTES SANITARY DRAINAGE AREA ID
- AREA C DENOTES SANITARY DRAINAGE AREA
- C DENOTES RUN OF COEFFICIENT
-  SANITARY DRAINAGE BOUNDARY

PROJECT NO: 211-12127-00	DATE: NOVEMBER 2021
ORIGINAL SCALE: 1:1000	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: E.B.	
DRAWN BY: J.T.	
CHECKED BY: D.Y.	

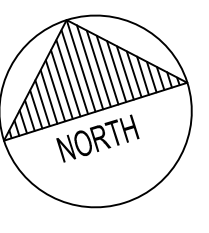
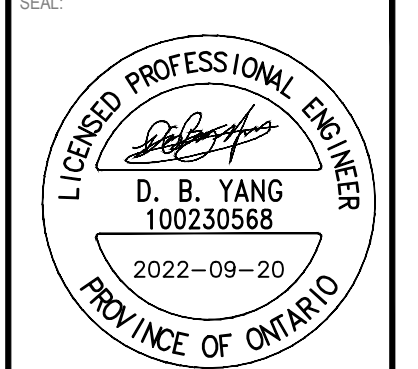
**PRE-DEVELOPMENT
DRAINAGE AREA PLAN**

SHEET NUMBER: **F2**



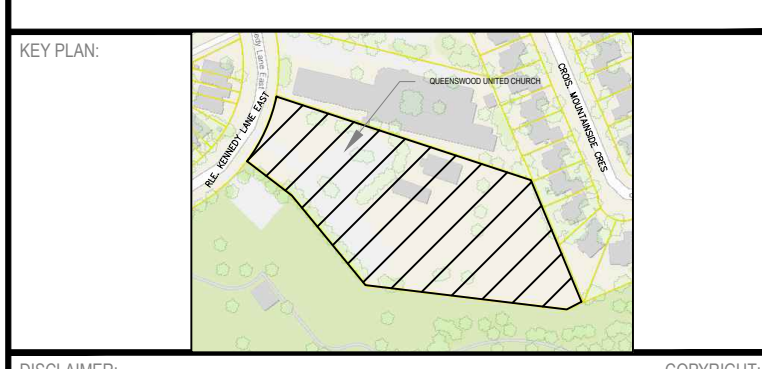
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ARCHITECT:
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CANADA M5A 9L8
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PROJECT:
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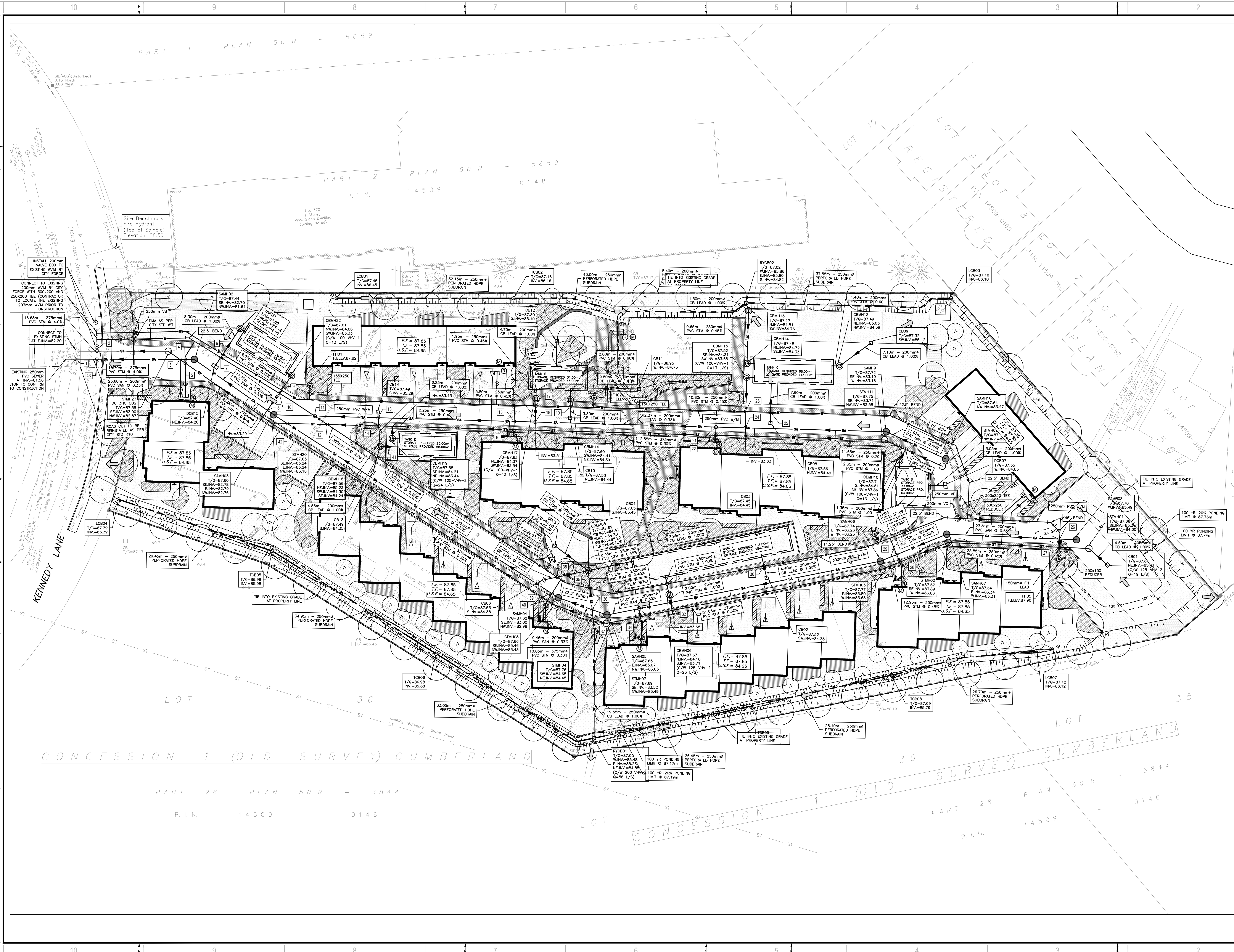
ISSUED FOR - REVISION	NO.	DATE	DESCRIPTION
	2	2022-09-20	RE-ISSUED FOR SPA AND ZBLA
	1	2021-11-30	ISSUED FOR SPA AND ZBLA

PROJECT NO: 211-12127-00	DATE: SEPTEMBER 2022
ORIGINAL SCALE: 1:300	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: EB/DY	
DRAWN BY: JT/EB	
CHECKED BY: DY	

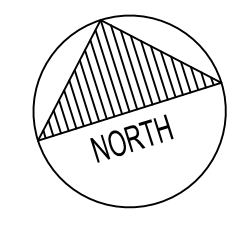
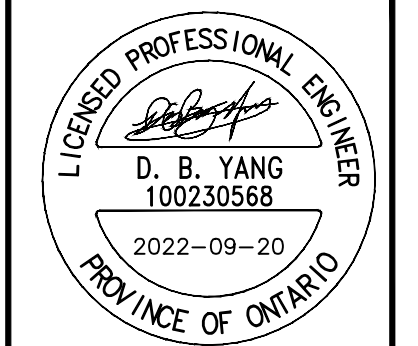
DISCIPLINE: CIVIL	TITLE: GRADING PLAN
SHEET NUMBER: C04	REV #: 0
ISSUE: RE-ISSUE FOR SPA AND ZBLA	DATE: 2022-09-20

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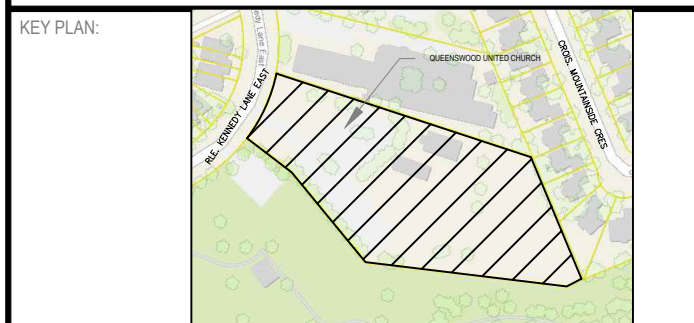


KPMB ARCHITECTS
 351 KING STREET EAST, SUITE 1200
 TORONTO, ONTARIO
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	2	2022-09-20	RE-ISSUED FOR SPA AND ZBLA
	1	2021-11-30	ISSUED FOR SPA AND ZBLA

PROJECT NO:	211-12127-00	DATE:	SEPTEMBER 2022
ORIGINAL SCALE:	1:300	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.	
DESIGNED BY:	EB/DY		
DRAWN BY:	JT/EB		
CHECKED BY:	DY		
DISCIPLINE:	CIVIL		
TITLE:	SERVICING PLAN		
SHEET NUMBER:	C05		
SHEET #:	5 OF 8		
ISSUE:	RE-ISSUE FOR SPA AND ZBLA	REV #:	0
DATE:	2022-09-20		

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D07-12-22-0002

Hydro First Defense® - HC

Net Annual Water Quality Worksheet

Rev. 9.1



Project Name: **360 Kennedy Lane** Report Date: **2022-09-09** Paste
 Street: City: **Ottawa**
 Province: **Ontario** Country: **Canada**
 Designer: **WSP** email:

Net Annual Removal Model: FD-3HC			
Intensity ⁽¹⁾	Fraction of Rainfall ⁽¹⁾	FD-3HC Removal Efficiency ⁽²⁾	Weighted Net Annual Efficiency
(mm/hr)	(%)	(%)	(%)
0.50	0.1%	97.3%	0.1%
1.00	14.1%	91.2%	12.9%
1.50	14.2%	87.8%	12.5%
2.00	14.1%	85.5%	12.1%
2.50	4.2%	83.8%	3.5%
3.00	1.5%	82.3%	1.2%
3.50	8.5%	81.2%	6.9%
4.00	5.4%	80.2%	4.4%
4.50	1.2%	79.3%	0.9%
5.00	5.5%	78.5%	4.3%
6.00	4.3%	77.2%	3.3%
7.00	4.5%	76.1%	3.4%
8.00	3.1%	75.2%	2.3%
9.00	2.3%	74.3%	1.7%
10.00	2.6%	73.6%	1.9%
20.00	9.2%	69.0%	6.4%
30.00	2.6%	66.5%	1.7%
40.00	1.2%	0.0%	0.0%
50.00	0.5%	0.0%	0.0%
100.00	0.7%	0.0%	0.0%
150.00	0.1%	0.0%	0.0%
200.00	0.0%	0.0%	0.0%

Treatment Parameters:

Structure ID: OGS
 TSS Goal: 80 % Removal
 TSS Particle Size: Fine
 Area: 1.22 ha
 Percent Impervious: 71%
 Rational C value: 0.68
 Rainfall Station: Ottawa, ONT
 Peak Storm Flow: L/s

RESULTS SUMMARY

Model	TSS	Volume
FD-3HC	79.6%	99.3%
FD-4HC	85.1%	99.9%
FD-5HC	89.2%	99.9%
FD-6HC	91.8%	99.9%
FD-8HC	94.9%	99.9%

Model Specification:

Model: **FD-3HC**
 Diameter: 900 mm
 No Bypass Flow: 8.00 L/s
 Peak Flow Capacity: 425.00 L/s
 Sediment Storage: 0.31 m³
 Oil Storage: 473.00 L

Installation Configuration:

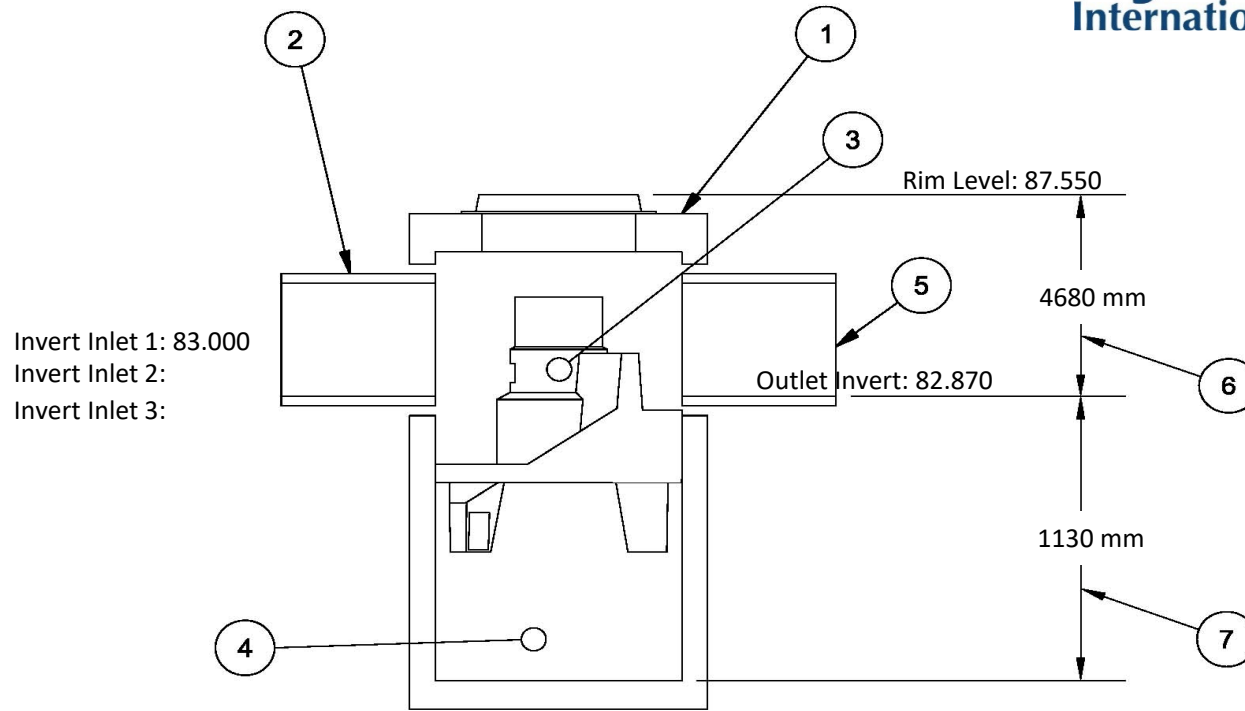
Placement: Online
 Outlet Pipe Size: 375 mm OK
 Inlet Pipe 1 Size: 375 mm OK
 Inlet Pipe 2 Size: mm OK
 Inlet Pipe 3 Size: mm OK
 Rim Level: 87.550 m
 Outlet Pipe Invert: 82.870 m OK
 Invert Pipe 1: 83.000 m OK
 Invert Pipe 2: m
 Invert Pipe 3: m

Total Net Annual Removal Efficiency: 79.6%
Total Annual Runoff Volume Treated: 99.3%

- Rainfall Data: 1960:2007, HLY03, Ottawa, ONT, 6105976 & 6105978.
- Based on third party verified data and approximating the removal of a PSD similar to the STC Fine distribution
- Rainfall adjusted to 5 min peak intensity based on hourly average.

Designer Notes:

Hydro First Defense® - HC



All drawing elevations are metres.

FD-3HC Specification

1	Vortex Chamber Diameter	900 mm
2	Inlet Pipe Diameter	375 mm
3	Oil Storage Capacity	473.00 L
4	Min. Provided Sediment Storage Capacity	0.31 m ³
5	Outlet Pipe Diameter	375 mm
6	Height(Final Grade to Outlet Invert)	4680 mm
7	Sump Depth(Outlet Invert to Sump)	1130 mm
Total Depth		5810 mm

Notes:

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



360 KENNEDY LANE EAST COPY

OTTAWA, CANADA

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-3500.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 75 mm (3").
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

- STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOOTER LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE WELL GRADED BETWEEN ¾" AND 2" (20-50 mm).
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

- STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
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 - NO RUBBER Tired LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



360 KENNEDY LANE EAST COPY

OTTAWA, CANADA

MC-4500 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-4500.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
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 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 75 mm (3").
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
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 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-4500 CHAMBER SYSTEM

- STORMTECH MC-4500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOOTER LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 230 mm (9") SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE WELL GRADED BETWEEN ¾" AND 2" (20-50 mm).
- STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 300 mm (12") BETWEEN ADJACENT CHAMBER ROWS.
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

- STORMTECH MC-4500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- THE USE OF EQUIPMENT OVER MC-4500 CHAMBERS IS LIMITED:
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER TIRE LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
- FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	



360 KENNEDY LANE EAST COPY

OTTAWA, CANADA

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-7200.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
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- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 75 mm (3").
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
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 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

- STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOOTER LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 230 mm (9") SPACING BETWEEN THE CHAMBER ROWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE WELL GRADED BETWEEN ¾" AND 2" (20-50 mm).
- STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 300 mm (12") BETWEEN ADJACENT CHAMBER ROWS.
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

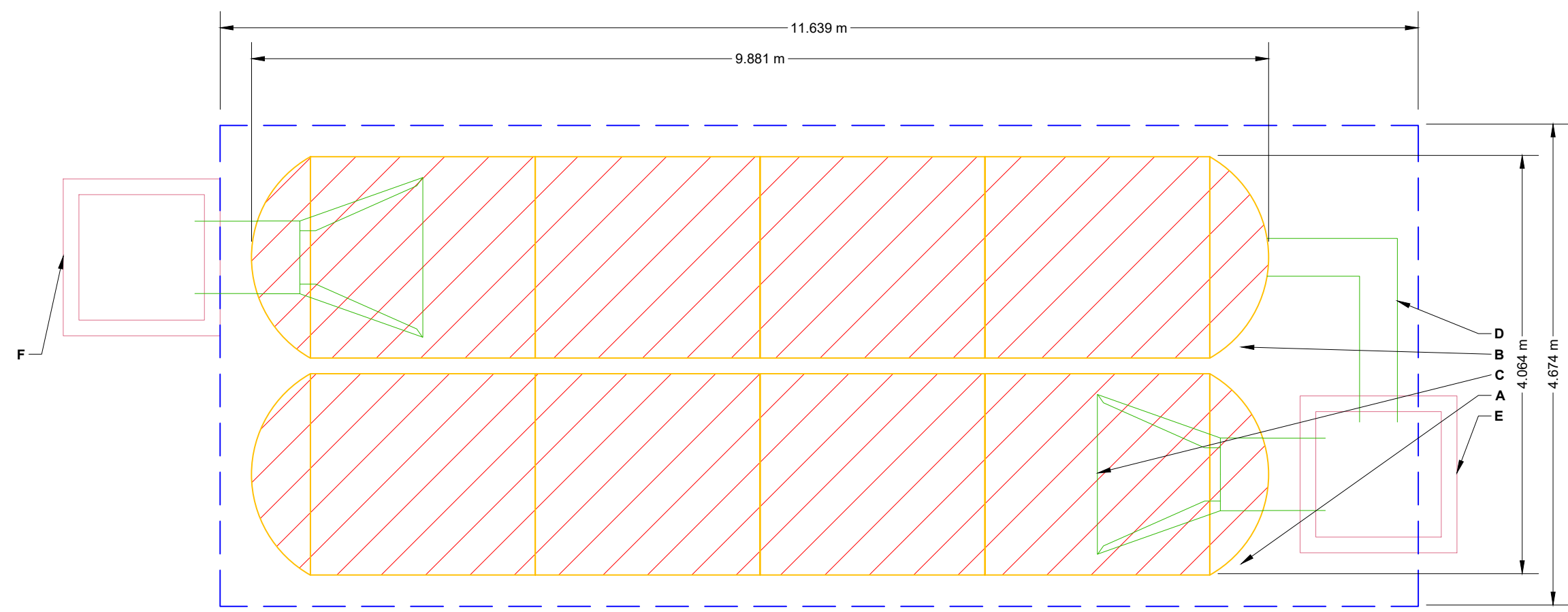
- STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
- THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER TIRE LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
- FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT: BED A		PROPOSED ELEVATIONS: BED A	
8	STORMTECH MC-3500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	87.583
4	STORMTECH MC-3500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	85.754
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	85.602
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	85.602
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	85.602
52.4	INSTALLED SYSTEM VOLUME (m ³) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	85.449
		TOP OF MC-3500 CHAMBER:	85.145
		300 mm x 300 mm TOP MANIFOLD INVERT:	84.671
		600 mm ISOLATOR ROW PLUS INVERT:	84.054
54.4	SYSTEM AREA (m ²)	600 mm ISOLATOR ROW PLUS INVERT:	84.054
32.6	SYSTEM PERIMETER (m)	BOTTOM OF MC-3500 CHAMBER:	84.002
		BOTTOM OF STONE:	83.773

*INVERT ABOVE BASE OF CHAMBER					
PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW	
PREFABRICATED END CAP	A	600 mm BOTTOM CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	52 mm		
PREFABRICATED END CAP	B	300 mm TOP CORED END CAP, PART#: MC3500IEPP12T / TYP OF ALL 300 mm TOP CONNECTIONS	670 mm		
FLAMP	C	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MC350024RAMP (TYP 2 PLACES)			
MANIFOLD	D	300 mm x 300 mm TOP MANIFOLD, ADS N-12	670 mm		
CONCRETE STRUCTURE	E	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)			70 L/s IN
CONCRETE STRUCTURE	F	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)			



- ISOLATOR ROW PLUS
(SEE DETAIL/TYP 2 PLACES)
- NO WOVEN GEOTEXTILE
- BED LIMITS

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
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SHEET

4 OF 20

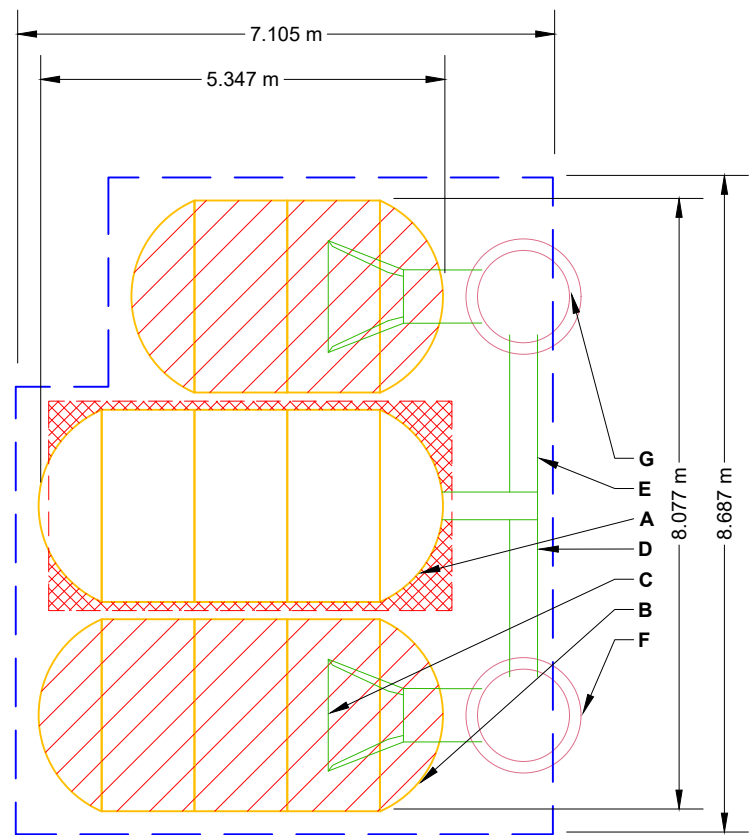
DESCRIPTION

DATE

DRW

CHK

PROPOSED LAYOUT: BED B		PROPOSED ELEVATIONS: BED B		*INVERT ABOVE BASE OF CHAMBER				
				PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
8	STORMTECH MC-4500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	87.989					
6	STORMTECH MC-4500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	86.617					
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	86.465	PREFABRICATED END CAP	A	300 mm TOP PARTIAL CUT END CAP, PART#: MC4500IEPP12T / TYP OF ALL 300 mm TOP CONNECTIONS	907 mm	
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	86.465					
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	86.465	PREFABRICATED END CAP	B	600 mm BOTTOM PARTIAL CUT END CAP, PART#: MC4500IEPP24B / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	57 mm	
66.5	INSTALLED SYSTEM VOLUME (m ³) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	86.160	FLAMP	C	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MC450024RAMP (TYP 2 PLACES)		
		TOP OF MC-4500 CHAMBER:	85.855	MANIFOLD	D	300 mm x 300 mm TOP MANIFOLD, ADS N-12	907 mm	
		300 mm x 300 mm TOP MANIFOLD INVERT:	85.238	MANIFOLD	E	300 mm x 300 mm TOP MANIFOLD, ADS N-12	907 mm	
		300 mm x 300 mm TOP MANIFOLD INVERT:	85.238	CONCRETE STRUCTURE	F	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		70 L/s IN
58.3	SYSTEM AREA (m ²)	600 mm ISOLATOR ROW PLUS INVERT:	84.389	CONCRETE STRUCTURE	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		70 L/s IN
31.6	SYSTEM PERIMETER (m)	600 mm ISOLATOR ROW PLUS INVERT:	84.389					
		BOTTOM OF MC-4500 CHAMBER:	84.331					
		BOTTOM OF STONE:	84.103					



- ISOLATOR ROW PLUS
(SEE DETAIL/TYP 2 PLACES)
- PLACE MINIMUM 5.334 m OF ADSPLUS175 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS
- BED LIMITS

NOTES

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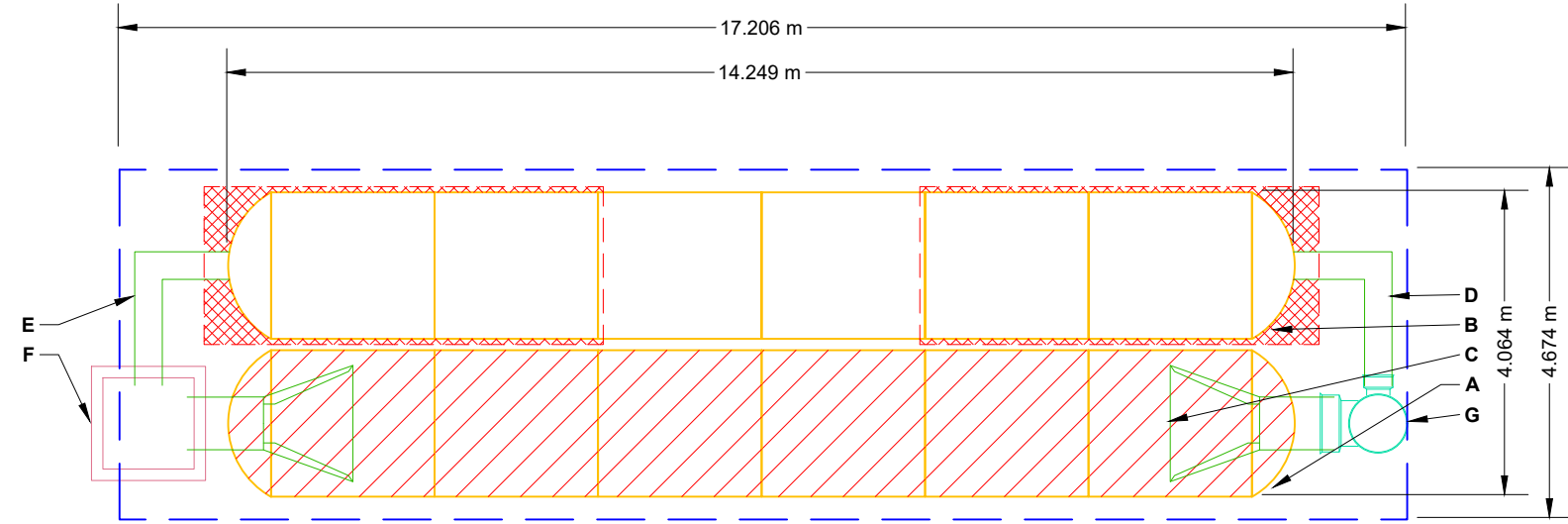
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SHEET

5 OF 20

PROPOSED LAYOUT: BED C		PROPOSED ELEVATIONS: BED C	
12	STORMTECH MC-3500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	87.913
4	STORMTECH MC-3500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	86.084
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	85.932
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	85.932
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	85.932
77.4	INSTALLED SYSTEM VOLUME (m ³) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	85.779
		TOP OF MC-3500 CHAMBER:	85.474
		300 mm x 300 mm TOP MANIFOLD INVERT:	85.001
		300 mm x 300 mm TOP MANIFOLD INVERT:	85.001
80.4	SYSTEM AREA (m ²)	600 mm ISOLATOR ROW PLUS INVERT:	84.384
43.8	SYSTEM PERIMETER (m)	600 mm ISOLATOR ROW PLUS INVERT:	84.384
		BOTTOM OF MC-3500 CHAMBER:	84.331
		BOTTOM OF STONE:	84.103

				*INVERT ABOVE BASE OF CHAMBER	
PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW	
PREFABRICATED END CAP	A	600 mm BOTTOM CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	52 mm		
PREFABRICATED END CAP	B	300 mm TOP CORED END CAP, PART#: MC3500IEPP12T / TYP OF ALL 300 mm TOP CONNECTIONS	670 mm		
FLAMP	C	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MC350024RAMP (TYP 2 PLACES)			
MANIFOLD	D	300 mm x 300 mm TOP MANIFOLD, ADS N-12	670 mm		
MANIFOLD	E	300 mm x 300 mm TOP MANIFOLD, ADS N-12	670 mm		
CONCRETE STRUCTURE	F	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)			70 L/s IN
NYLOPLAST (INLET W/ ISO PLUS ROW)	G	750 mm DIAMETER (610 mm SUMP MIN)			70 L/s IN



- ISOLATOR ROW PLUS (SEE DETAIL)
- PLACE MINIMUM 5.334 m OF ADSPLUS175 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS
- BED LIMITS

NOTES

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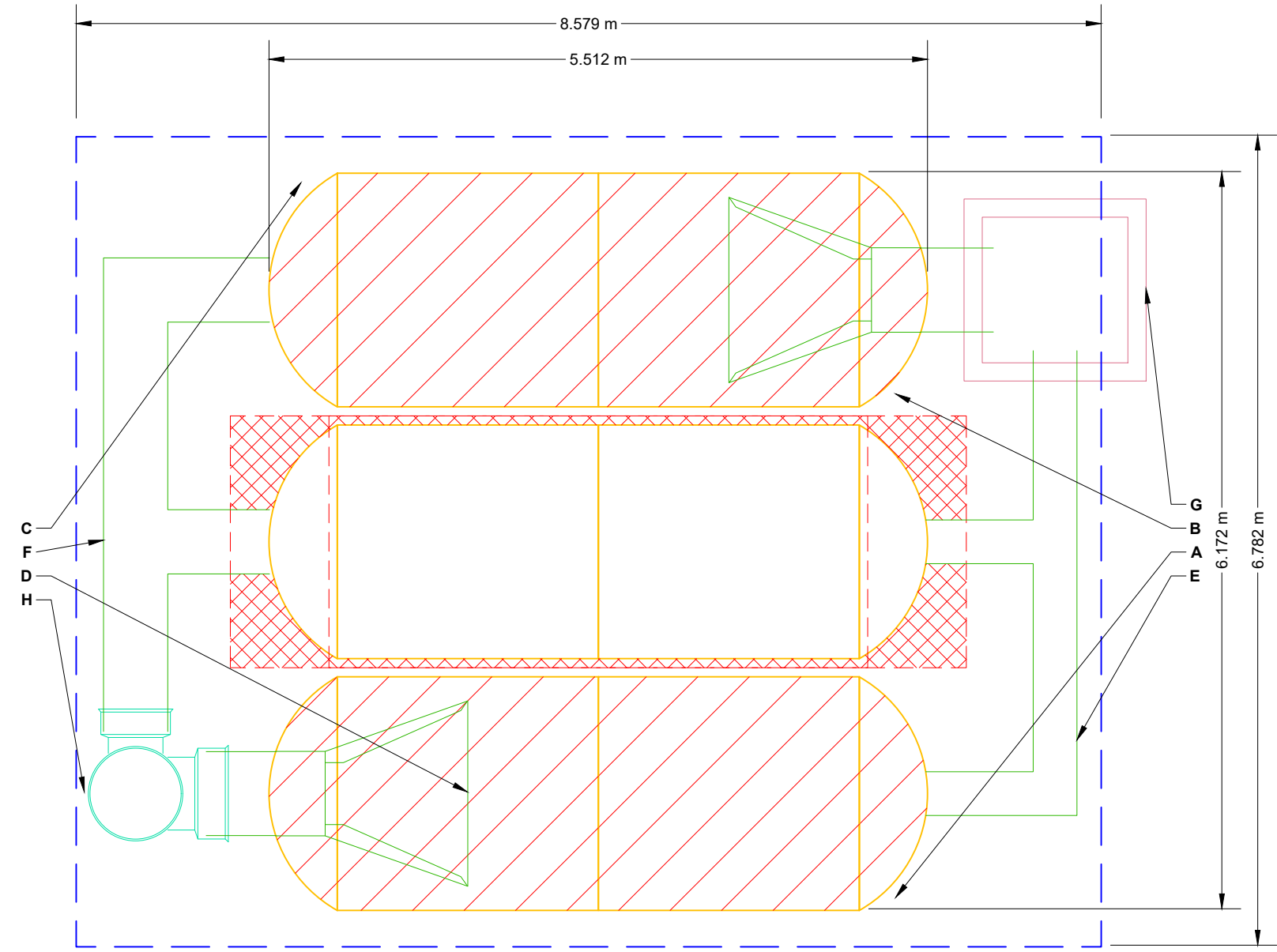
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SHEET
6 OF 20

PROPOSED LAYOUT: BED D		PROPOSED ELEVATIONS: BED D		*INVERT ABOVE BASE OF CHAMBER				
				PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
6	STORMTECH MC-3500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	87.383					
6	STORMTECH MC-3500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	85.554	PREFABRICATED END CAP	A	300 mm TOP CORED END CAP, PART#: MC3500IEPP12T / TYP OF ALL 300 mm TOP CONNECTIONS	670 mm	
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	85.402	PREFABRICATED END CAP	B	600 mm BOTTOM CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	52 mm	
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	85.402	PREFABRICATED END CAP	C	450 mm TOP CORED END CAP, PART#: MC3500IEPP18TC / TYP OF ALL 450 mm TOP CONNECTIONS	509 mm	
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	85.402	PREFABRICATED END CAP	D	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MC350024RAMP (TYP 2 PLACES)		
51.7	INSTALLED SYSTEM VOLUME (m ³) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	85.250	FLAMP				
		TOP OF MC-3500 CHAMBER:	84.945	MANIFOLD	E	300 mm x 300 mm TOP MANIFOLD, ADS N-12	670 mm	
		300 mm x 300 mm TOP MANIFOLD INVERT:	84.471	MANIFOLD	F	450 mm x 450 mm TOP MANIFOLD, ADS N-12	509 mm	
58.2	SYSTEM AREA (m ²)	450 mm x 450 mm TOP MANIFOLD INVERT:	84.310	CONCRETE STRUCTURE	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		140 L/s IN
30.7	SYSTEM PERIMETER (m)	600 mm ISOLATOR ROW PLUS INVERT:	83.854	NYLOPLAST (INLET W/ ISO PLUS ROW)	H	750 mm DIAMETER (610 mm SUMP MIN)		311 L/s IN
		600 mm ISOLATOR ROW PLUS INVERT:	83.854					
		BOTTOM OF MC-3500 CHAMBER:	83.802					
		BOTTOM OF STONE:	83.573					



- ISOLATOR ROW PLUS (SEE DETAIL/TYP 2 PLACES)
- PLACE MINIMUM 5.334 m OF ADSPLUS175 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS
- BED LIMITS

NOTES

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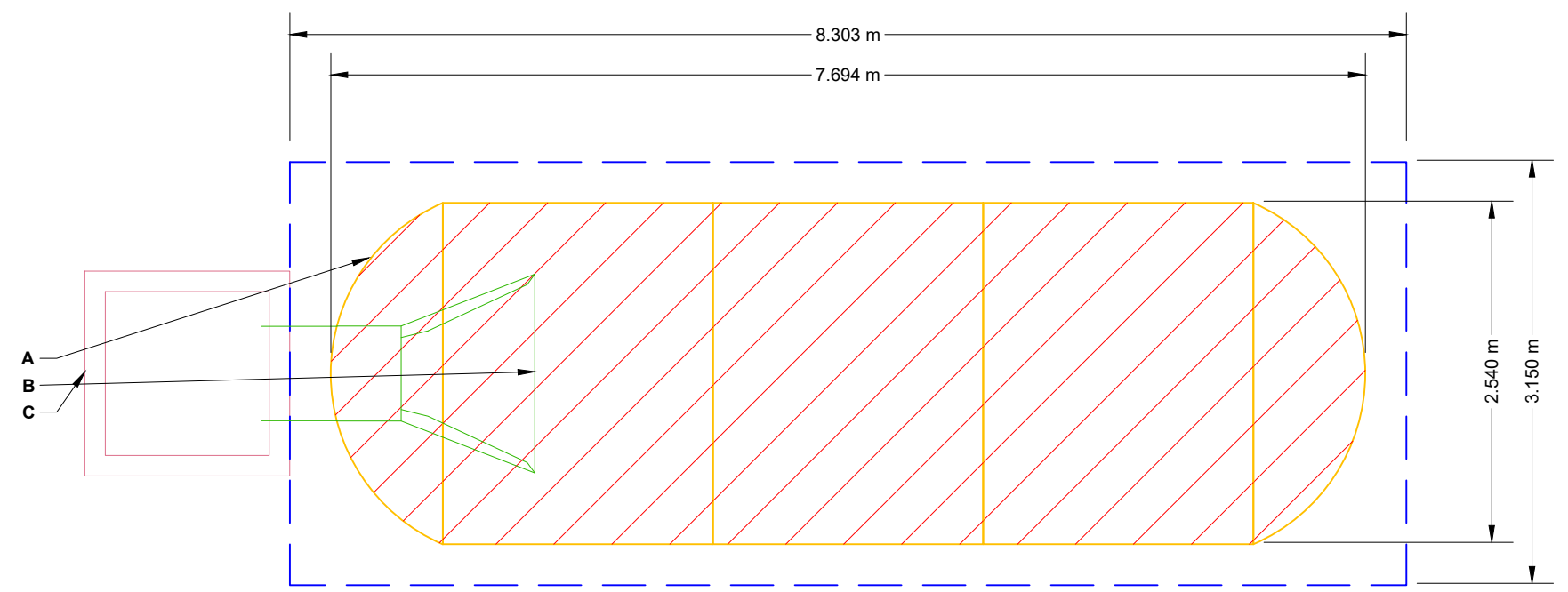
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7 OF 20

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PROPOSED LAYOUT: BED E		PROPOSED ELEVATIONS: BED E	
3	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	87.039
2	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	85.668
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	85.515
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	85.515
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	85.515
31.8	INSTALLED SYSTEM VOLUME (m ³) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	85.210
		TOP OF MC-7200 CHAMBER:	84.906
		600 mm ISOLATOR ROW PLUS INVERT:	83.439
		BOTTOM OF MC-7200 CHAMBER:	83.382
26.2	SYSTEM AREA (m ²)	BOTTOM OF STONE:	83.153
22.9	SYSTEM PERIMETER (m)		

				*INVERT ABOVE BASE OF CHAMBER	
PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW	
PREFABRICATED END CAP	A	600 mm BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	57 mm		
FLAMP	B	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MC720024RAMP			
CONCRETE STRUCTURE	C	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)			



- ISOLATOR ROW PLUS (SEE DETAIL)
- NO WOVEN GEOTEXTILE
- BED LIMITS

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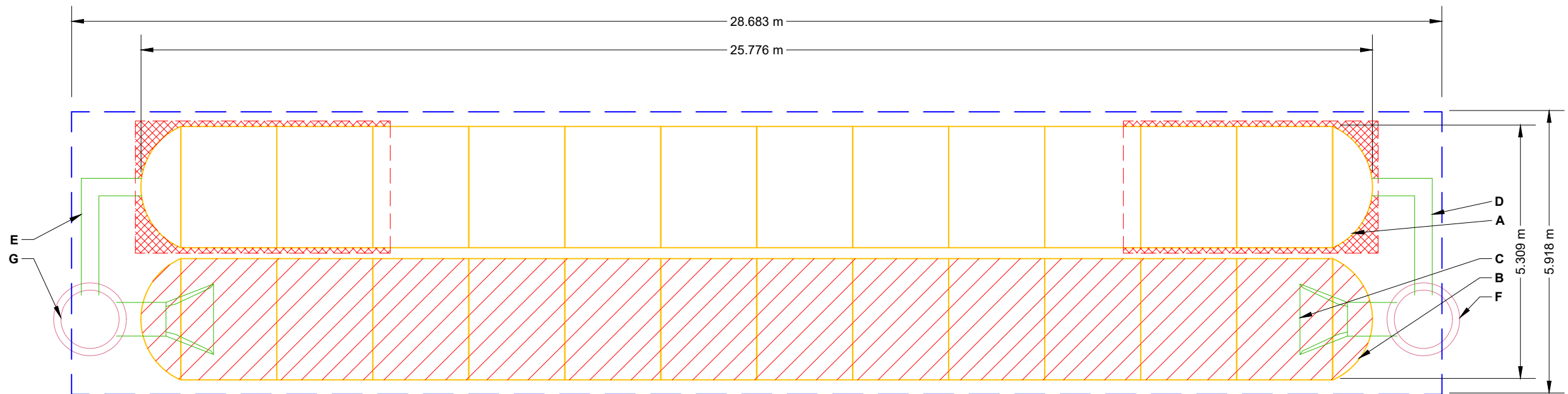
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SHEET
8 OF 20

PROPOSED LAYOUT: BED F		PROPOSED ELEVATIONS: BED F		*INVERT ABOVE BASE OF CHAMBER				
				PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
24	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	87.849					
4	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	86.478	PREFABRICATED END CAP	A	300 mm TOP PARTIAL CUT END CAP, PART#: MC7200IEPP12T / TYP OF ALL 300 mm TOP CONNECTIONS	907 mm	
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	86.325					
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	86.325	PREFABRICATED END CAP	B	600 mm BOTTOM PARTIAL CUT END CAP, PART#: MC7200IEPP24B / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	57 mm	
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	86.325	FLAMP	C	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MC720024RAMP (TYP 2 PLACES)		
214.1	INSTALLED SYSTEM VOLUME (m ³) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	86.020	MANIFOLD	D	300 mm x 300 mm TOP MANIFOLD, ADS N-12	907 mm	
		TOP OF MC-7200 CHAMBER:	85.716	MANIFOLD	E	300 mm x 300 mm TOP MANIFOLD, ADS N-12	907 mm	
		300 mm x 300 mm TOP MANIFOLD INVERT:	85.098	CONCRETE STRUCTURE	F	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		70 L/s IN
169.8	SYSTEM AREA (m ²)	600 mm ISOLATOR ROW PLUS INVERT:	84.249	CONCRETE STRUCTURE	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		70 L/s IN
69.2	SYSTEM PERIMETER (m)	600 mm ISOLATOR ROW PLUS INVERT:	84.249					
		BOTTOM OF MC-7200 CHAMBER:	84.192					
		BOTTOM OF STONE:	83.963					



- ISOLATOR ROW PLUS (SEE DETAIL)
- PLACE MINIMUM 5.334 m OF ADSPLUS175 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS
- BED LIMITS

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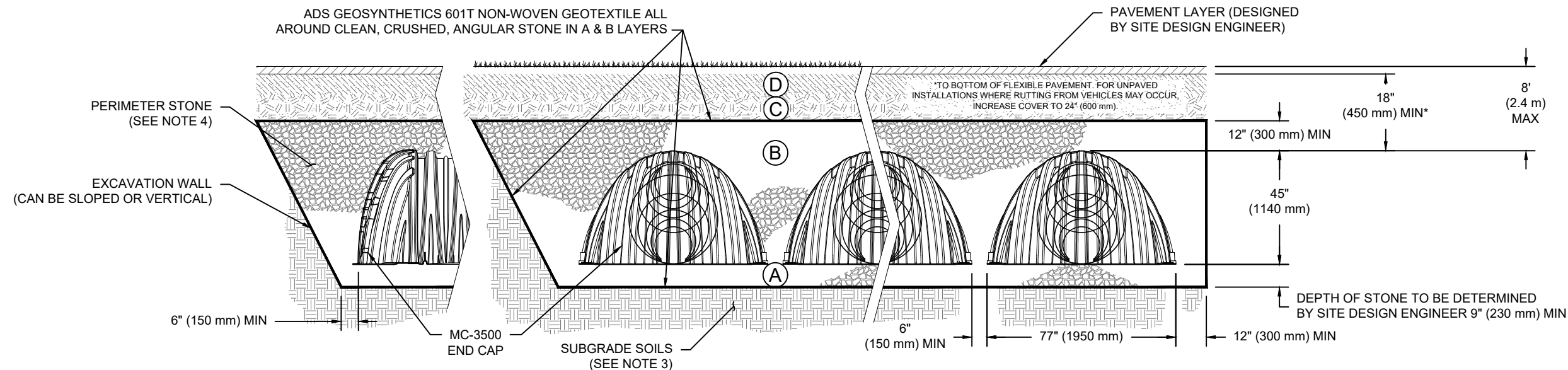
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9 OF 20

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145' A-1, A-2-4, A-3 OR AASHTO M43' 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43' 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43' 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

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- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
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NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
- MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
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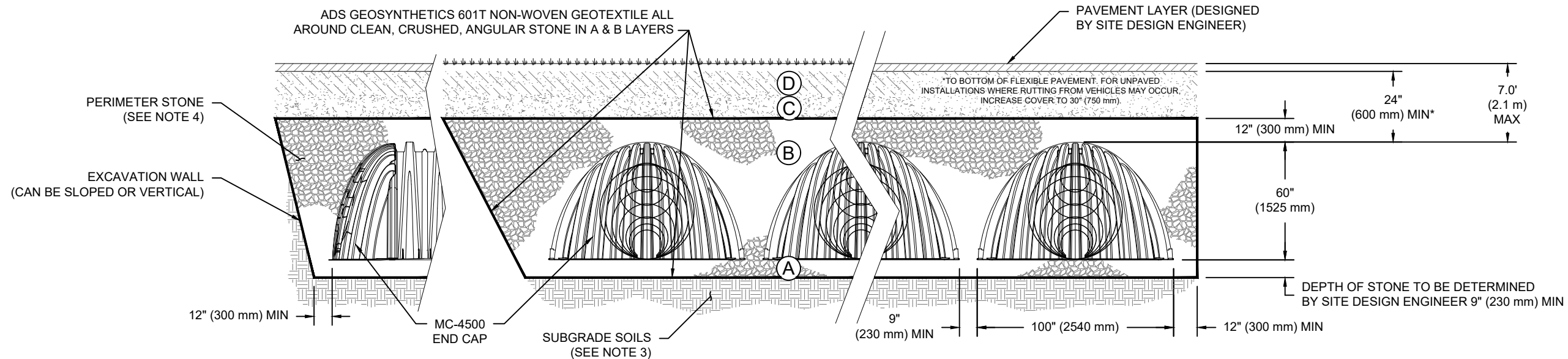
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 SHEET
10 OF 20

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
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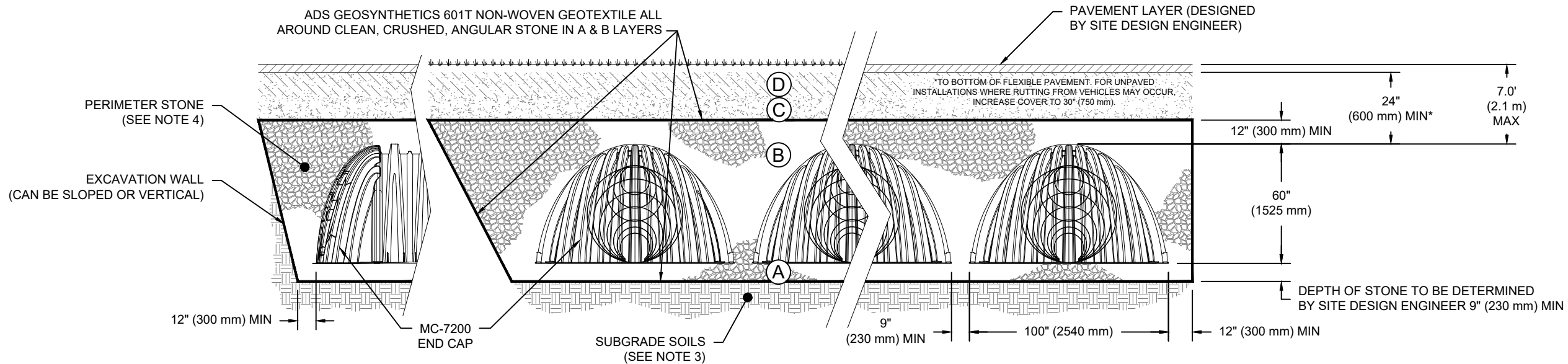
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ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

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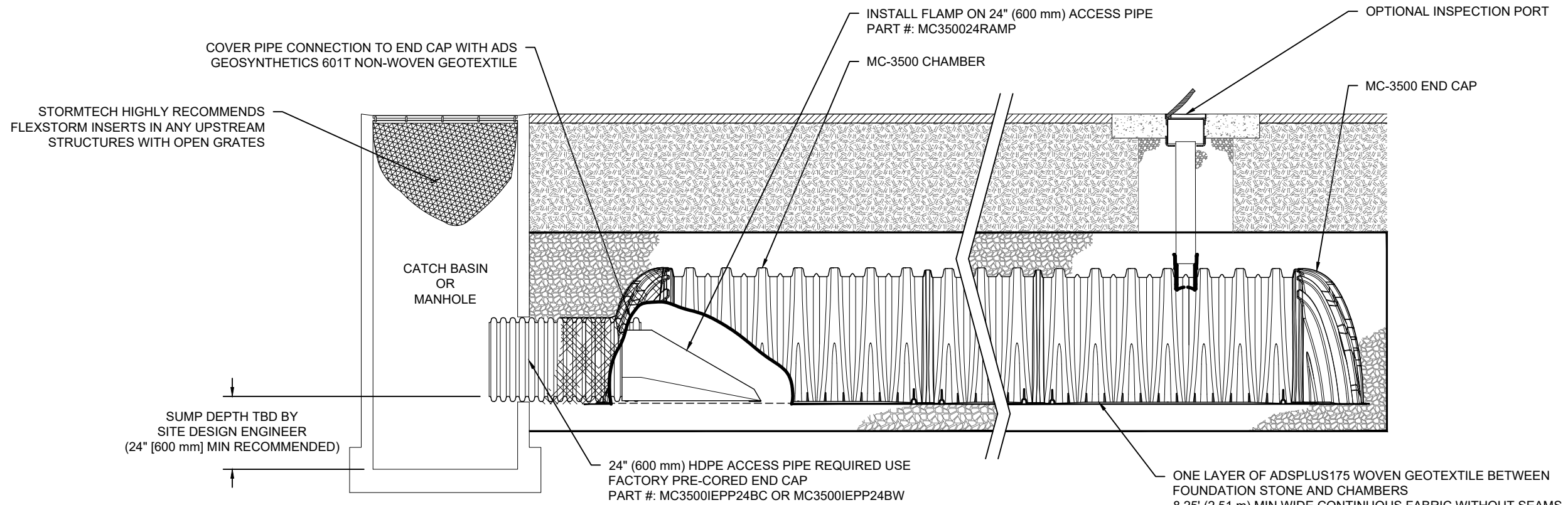
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MC-3500 ISOLATOR ROW PLUS DETAIL

NTS

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
 - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
 - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - B. ALL ISOLATOR PLUS ROWS
 - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
 - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
 - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
 - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
 - C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

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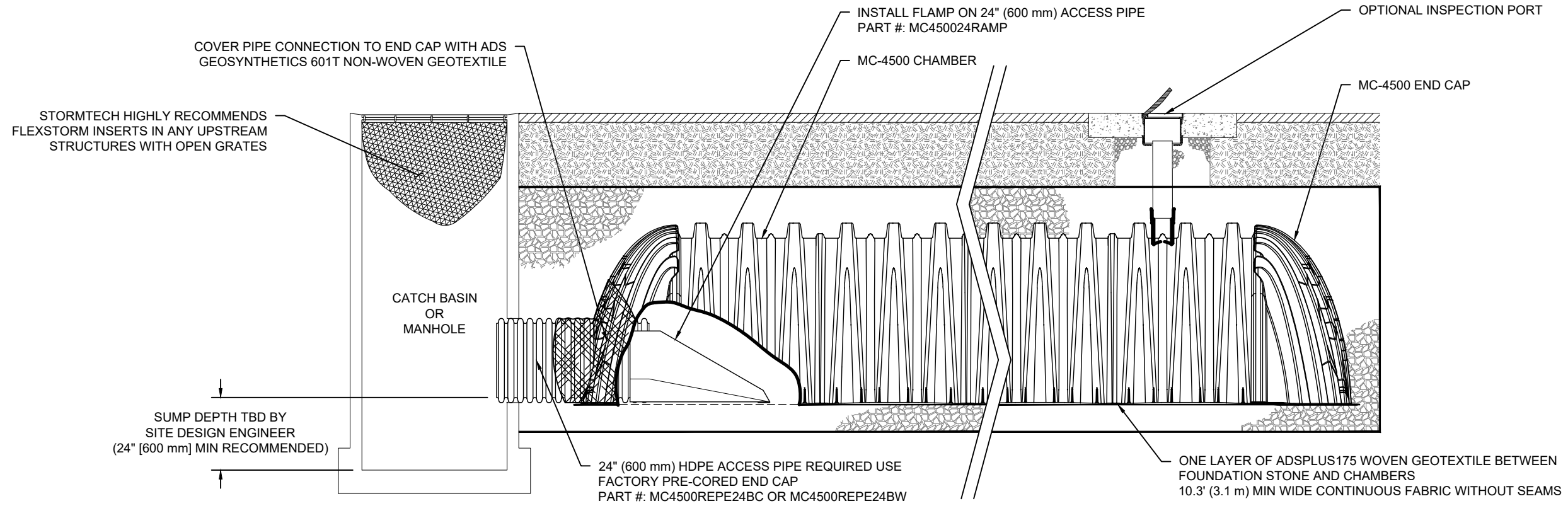
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MC-4500 ISOLATOR ROW PLUS DETAIL
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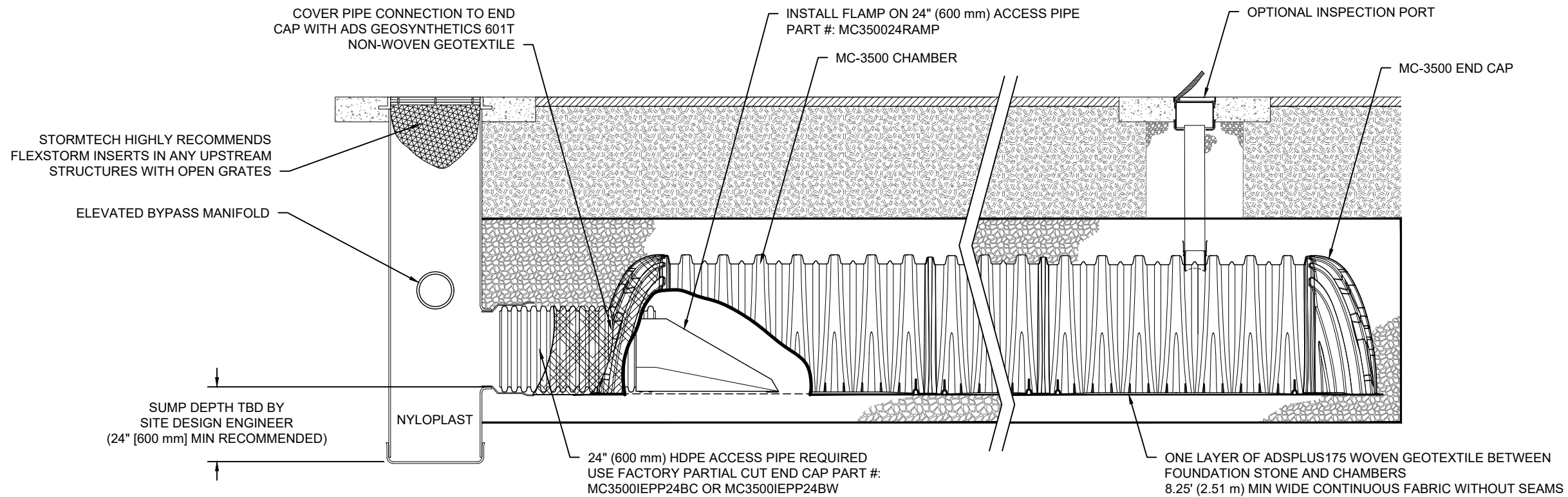
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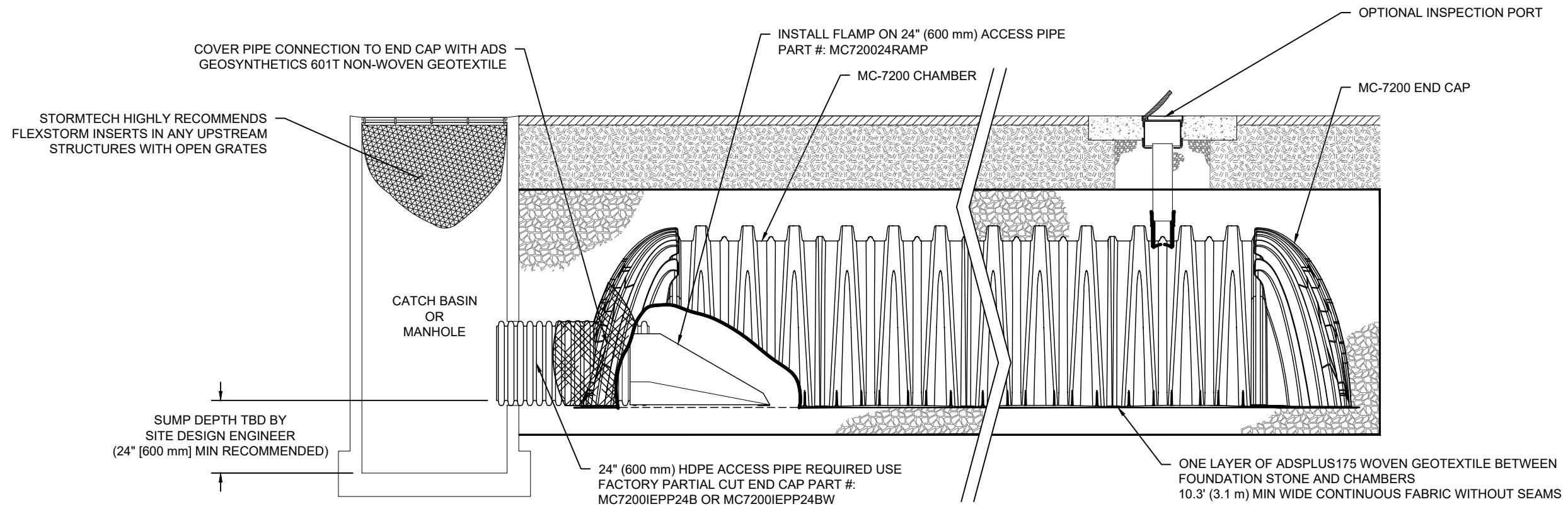
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MC-3500 ISOLATOR ROW PLUS DETAIL

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MC-7200 ISOLATOR ROW PLUS DETAIL

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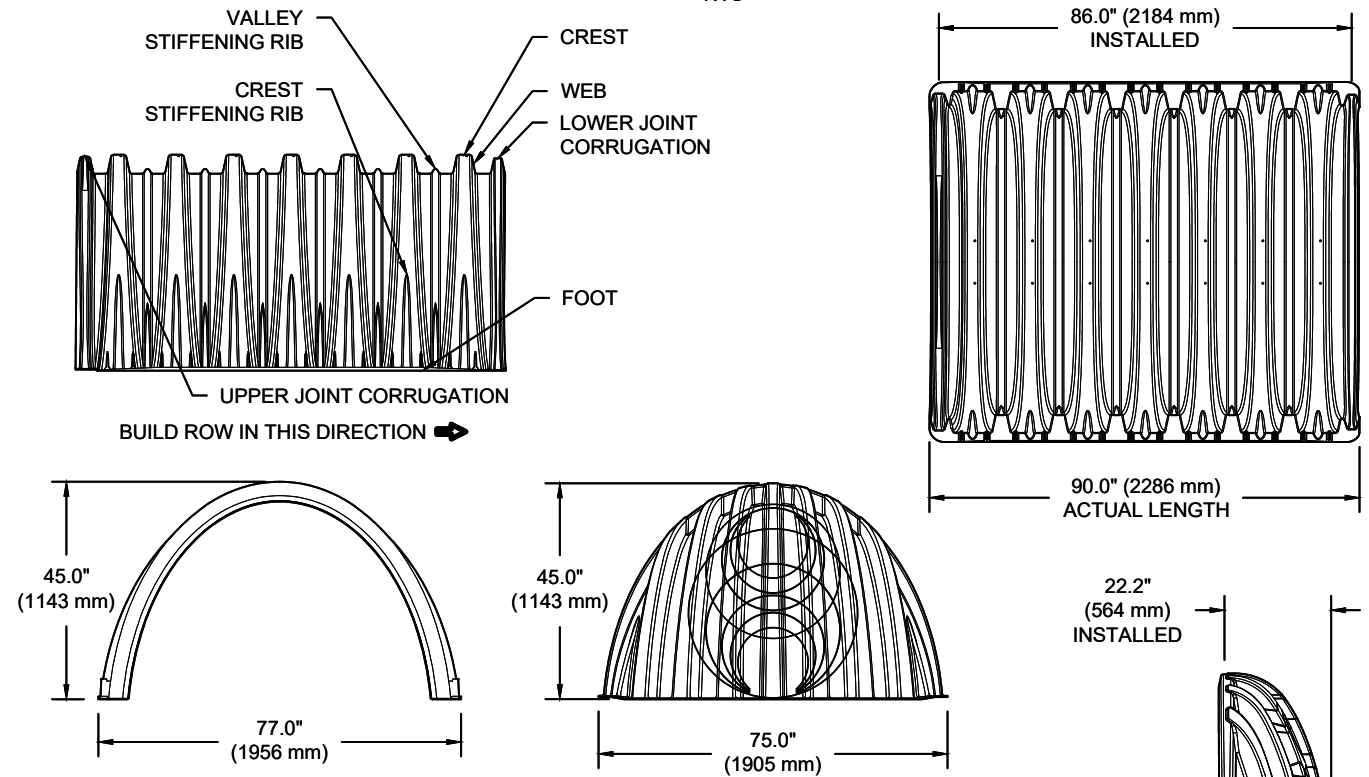
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MC-3500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)		
77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)	
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m ³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m ³)
WEIGHT	134 lbs.	(60.8 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)		
75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)	
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m ³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m ³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" SPACING BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

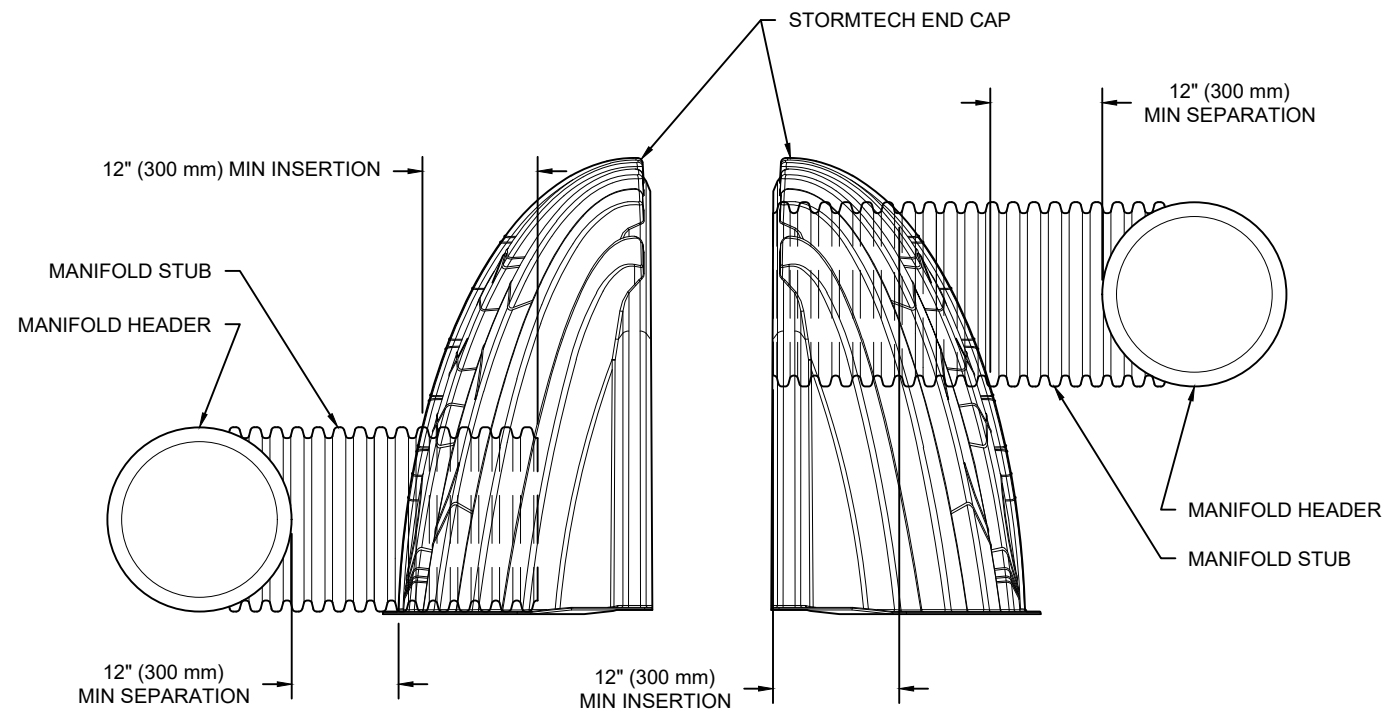
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
 STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
 END CAPS WITH A WELDED CROWN PLATE END WITH "C"
 END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			---
MC3500IEPP18BC			1.77" (45 mm)
MC3500IEPP18BW			---
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			---
MC3500IEPP24BC			2.06" (52 mm)
MC3500IEPP24BW			---
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-SERIES END CAP INSERTION DETAIL

NTS



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

NOTE: ALL DIMENSIONS ARE NOMINAL

NO.	DESCRIPTION	DATE	DRW	CHK

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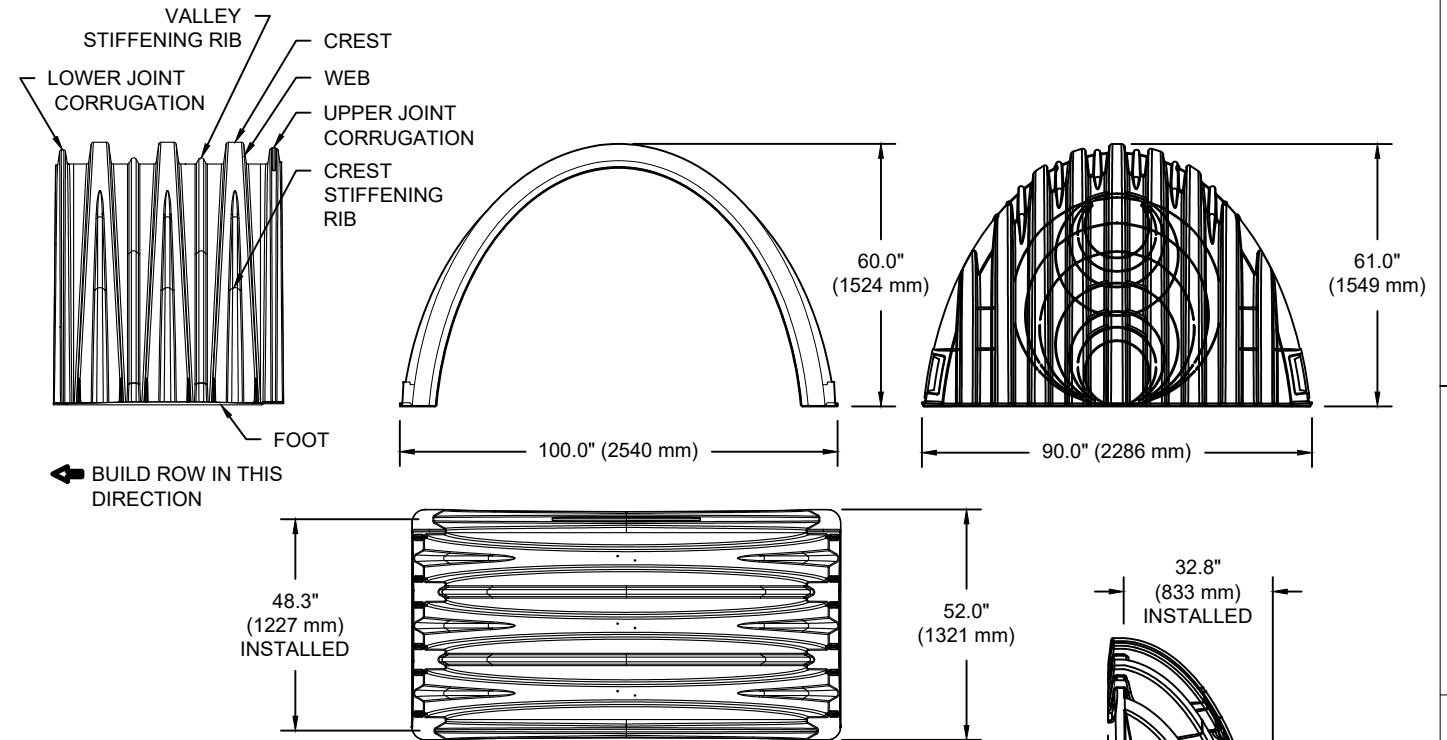
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MC-4500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 48.3"	(2540 mm X 1524 mm X 1227 mm)
CHAMBER STORAGE	106.5 CUBIC FEET	(3.01 m ³)
MINIMUM INSTALLED STORAGE*	162.6 CUBIC FEET	(4.60 m ³)
WEIGHT (NOMINAL)	125.0 lbs.	(56.7 kg)

NOMINAL END CAP SPECIFICATIONS

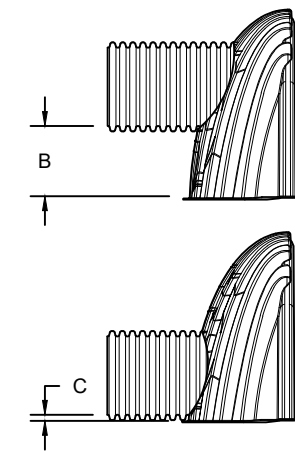
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m ³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m ³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
 PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
 END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC4500IEPP06T		42.54" (1081 mm)	---
MC4500IEPP06B	6" (150 mm)	---	0.86" (22 mm)
MC4500IEPP08T		40.50" (1029 mm)	---
MC4500IEPP08B	8" (200 mm)	---	1.01" (26 mm)
MC4500IEPP10T		38.37" (975 mm)	---
MC4500IEPP10B	10" (250 mm)	---	1.33" (34 mm)
MC4500IEPP12T		35.69" (907 mm)	---
MC4500IEPP12B	12" (300 mm)	---	1.55" (39 mm)
MC4500IEPP15T		32.72" (831 mm)	---
MC4500IEPP15B	15" (375 mm)	---	1.70" (43 mm)
MC4500IEPP18T		29.36" (746 mm)	---
MC4500IEPP18TW	18" (450 mm)	---	1.97" (50 mm)
MC4500IEPP18B			
MC4500IEPP18BW			
MC4500IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC4500IEPP24TW			
MC4500IEPP24B			
MC4500IEPP24BW		---	2.26" (57 mm)
MC4500IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC4500IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC4500IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

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 PROJECT #: _____ CHECKED: N/A

DATE	DRW	CHK	DESCRIPTION

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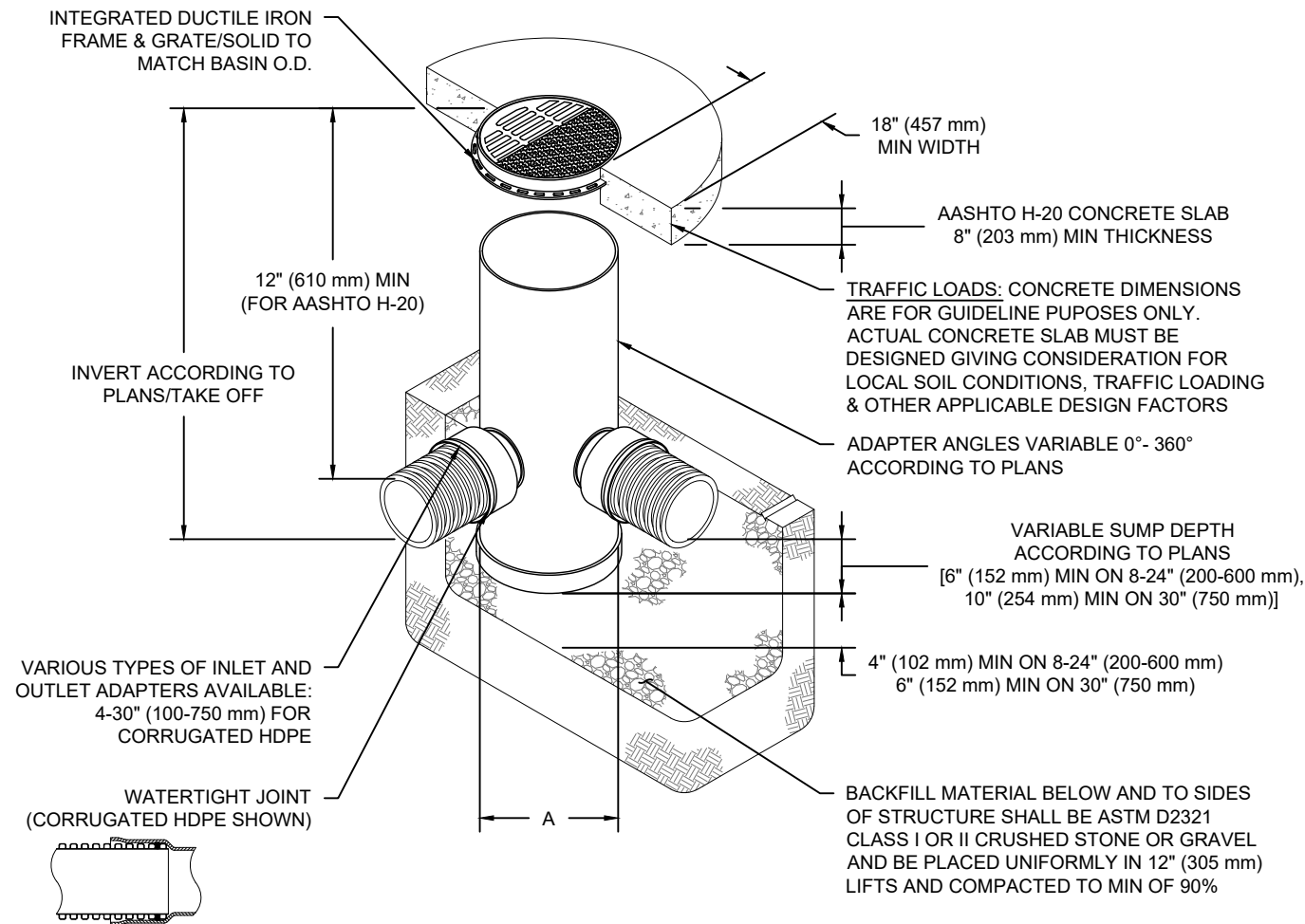
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NYLOPLAST DRAIN BASIN

NTS



NOTES

- 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
- 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
- DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
- DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION: WWW.NYLOPLAST-US.COM
- TO ORDER CALL: 800-821-6710

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

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OTTAWA, CANADA

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DRAWN: HN

PROJECT #: CHECKED: N/A

DESCRIPTION	DATE	DRW	CHK

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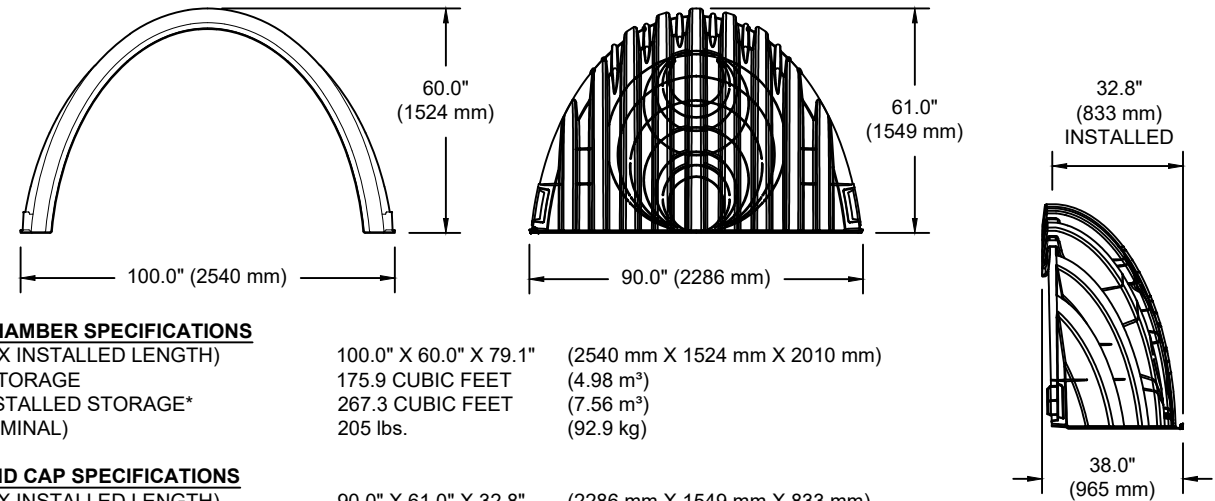
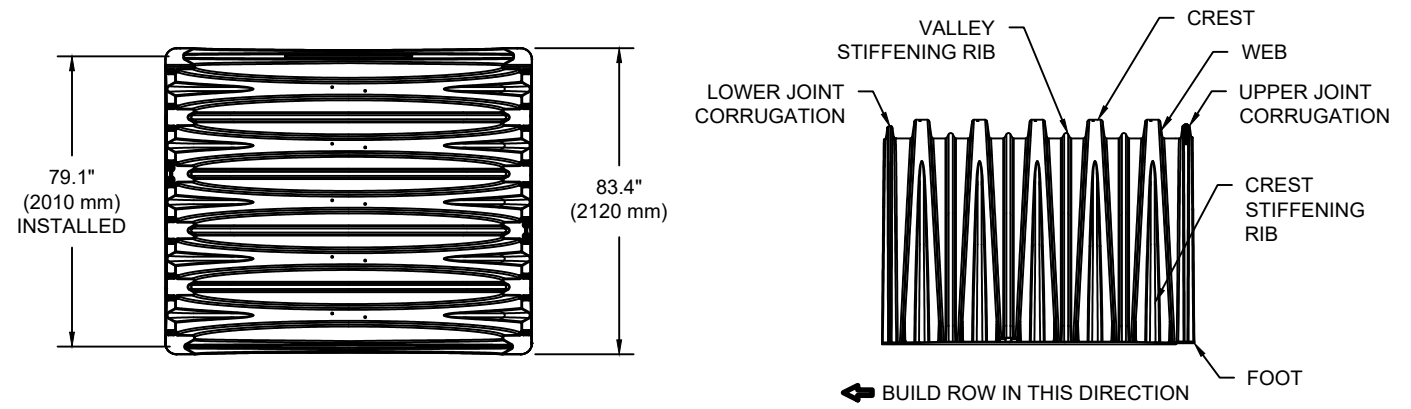
SHEET

19 OF 20

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MC-7200 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m ³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m ³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

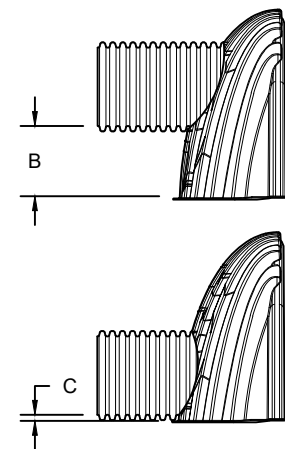
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m ³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m ³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
 PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
 END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW		---	1.97" (50 mm)
MC7200IEPP18B		---	---
MC7200IEPP18BW		---	---
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24TW		---	2.26" (57 mm)
MC7200IEPP24B		---	---
MC7200IEPP24BW		---	---
MC7200IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PREFABRICATED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-7200 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

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 DATE: _____ DRAWN: HN
 PROJECT #: _____ CHECKED: N/A

DATE	DRW	CHK	DESCRIPTION

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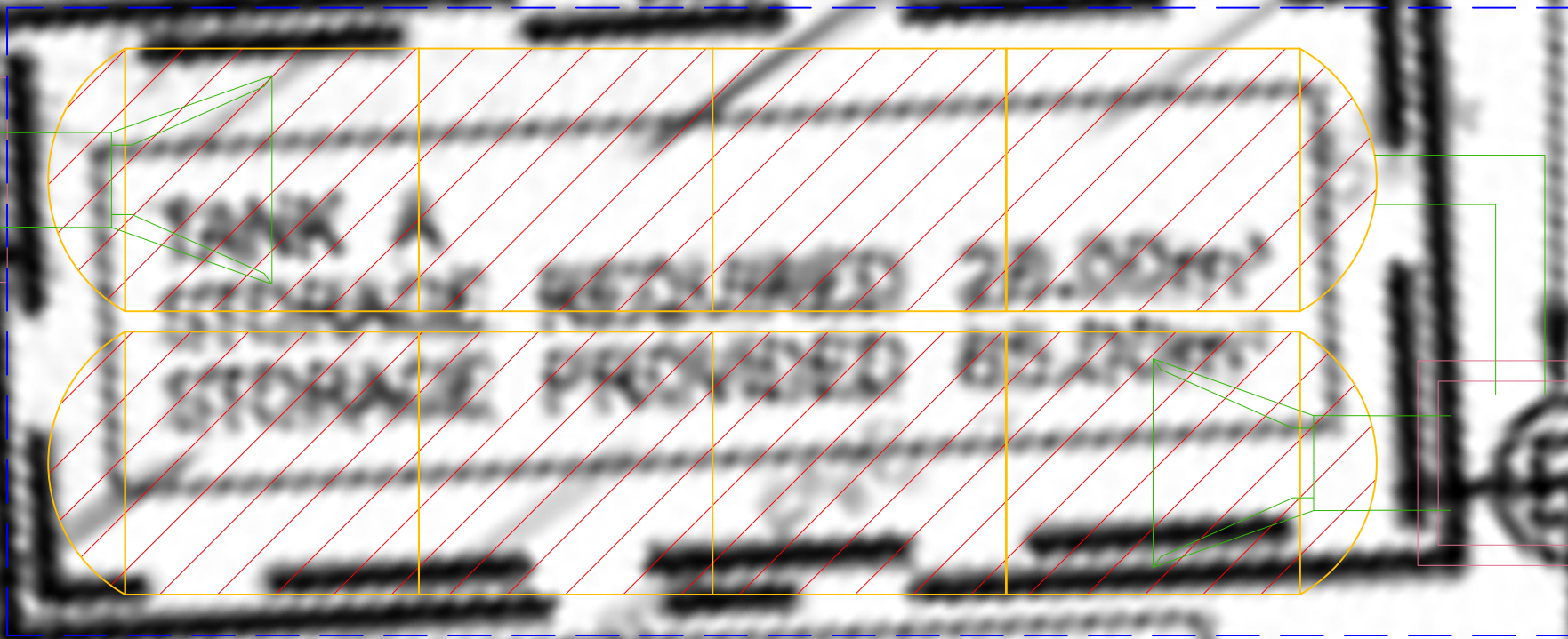
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CBMH21
T/G=57.52
SW.INV.=84.12
SE.INV.=84.08



Ø.25m -- 250mm^ø
PVC STM @ 0.45%

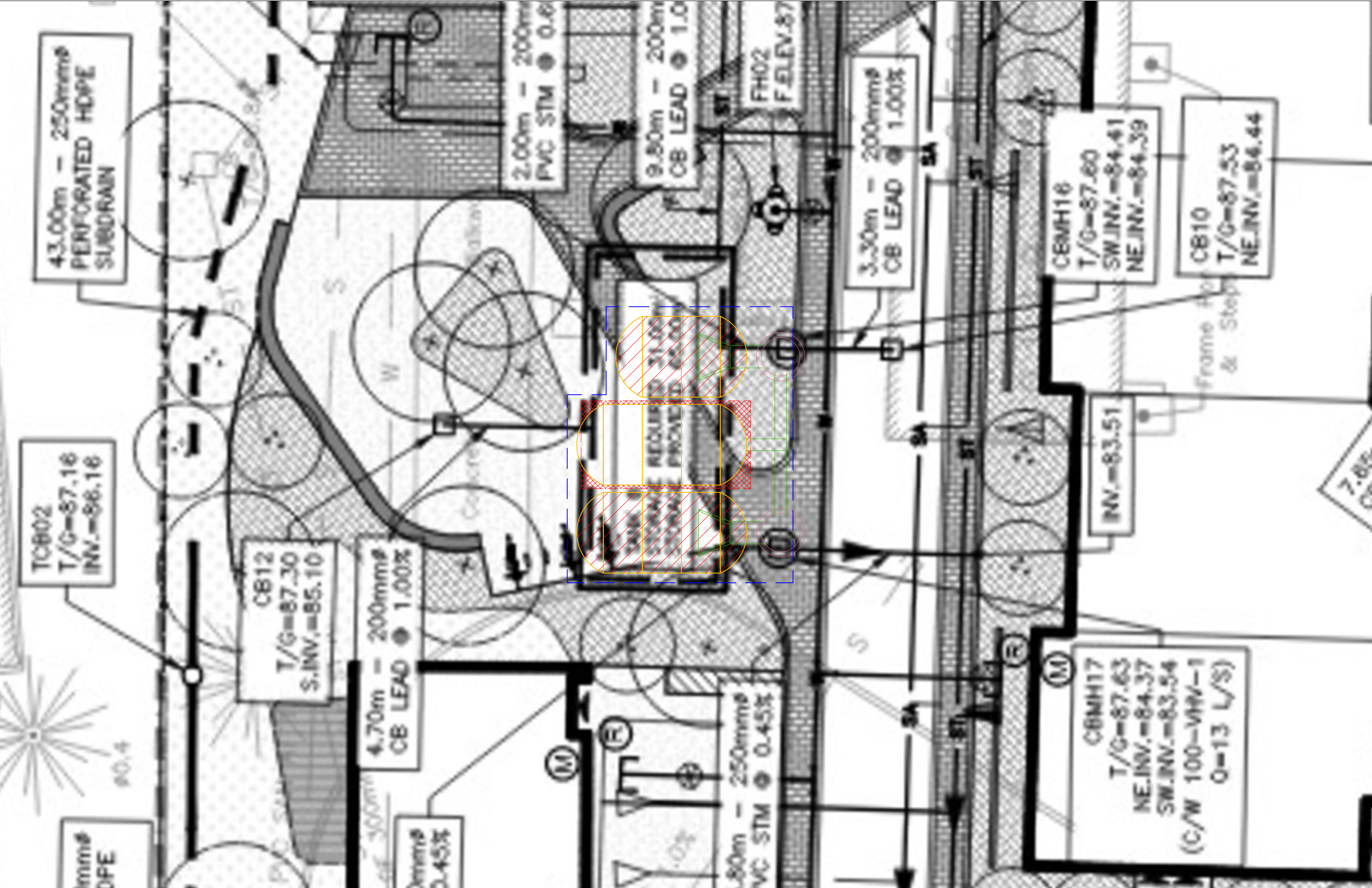
17.75m -- 200mm^ø

7.14
82.70
91.64

BEND

ST

ST



43.00m - 250mm \varnothing
PERFORATED HDPE
SUBDRAIN

TCB02
T/G=87.16
INV.=86.16

CB12
T/G=87.30
S.INV.=85.10

4.70m - 200mm \varnothing
CB LEAD @ 1.00%

2.00m - 200mm \varnothing
PVC STM @ 0.6

9.80m - 200mm \varnothing
CB LEAD @ 1.0

1.80m - 250mm \varnothing
PVC STM @ 0.45%

3.30m - 200mm \varnothing
CB LEAD @ 1.00%

CBMH17
T/G=87.63
NE.INV.=84.37
SW.INV.=83.54
(C/W 100-VHV-1
Q=13 L/S)

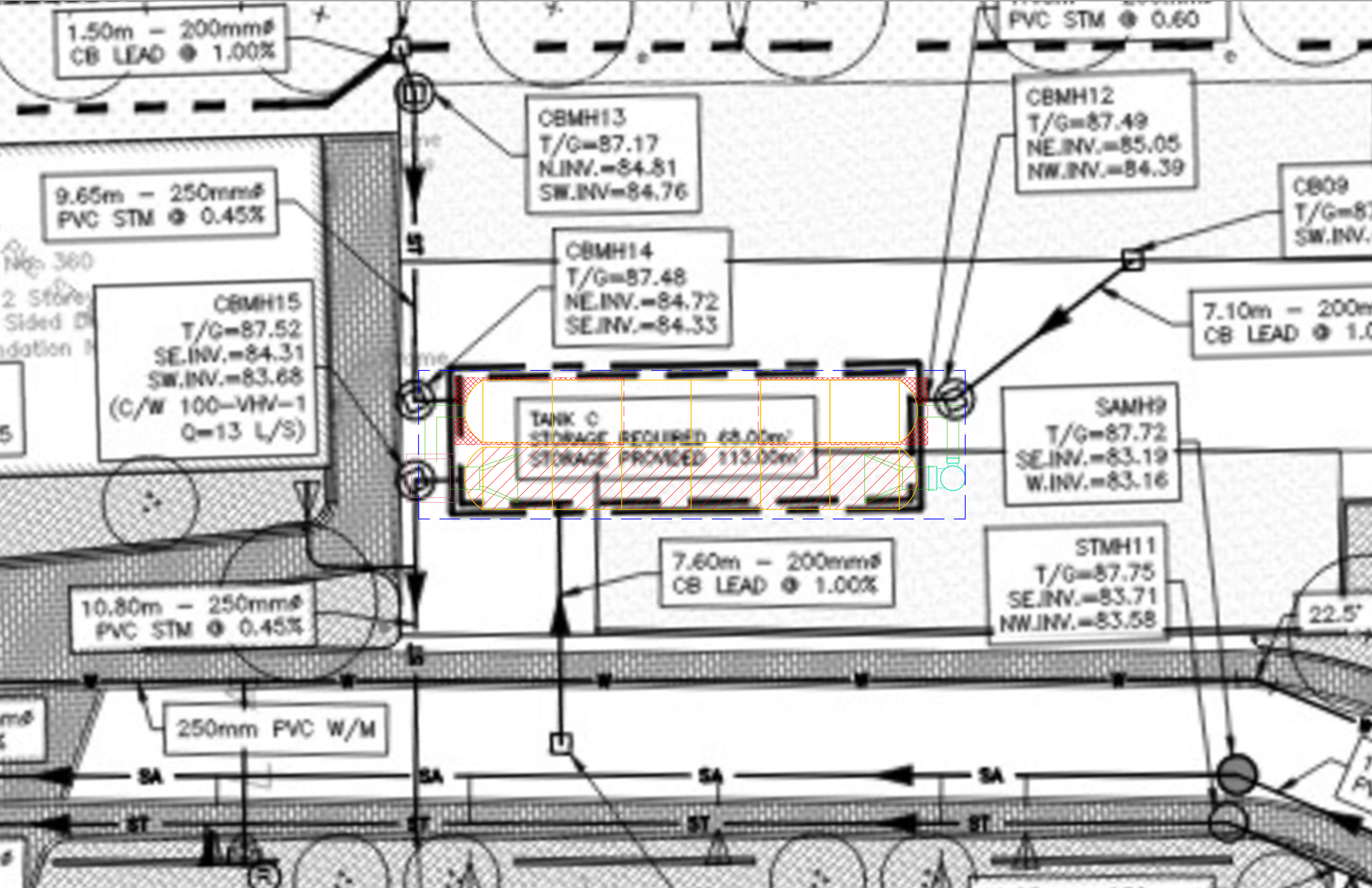
CBMH16
T/G=87.60
SW.INV.=84.41
NE.INV.=84.39

CB10
T/G=87.53
NE.INV.=86.44

Frame Ho
& Step

INV.=83.51

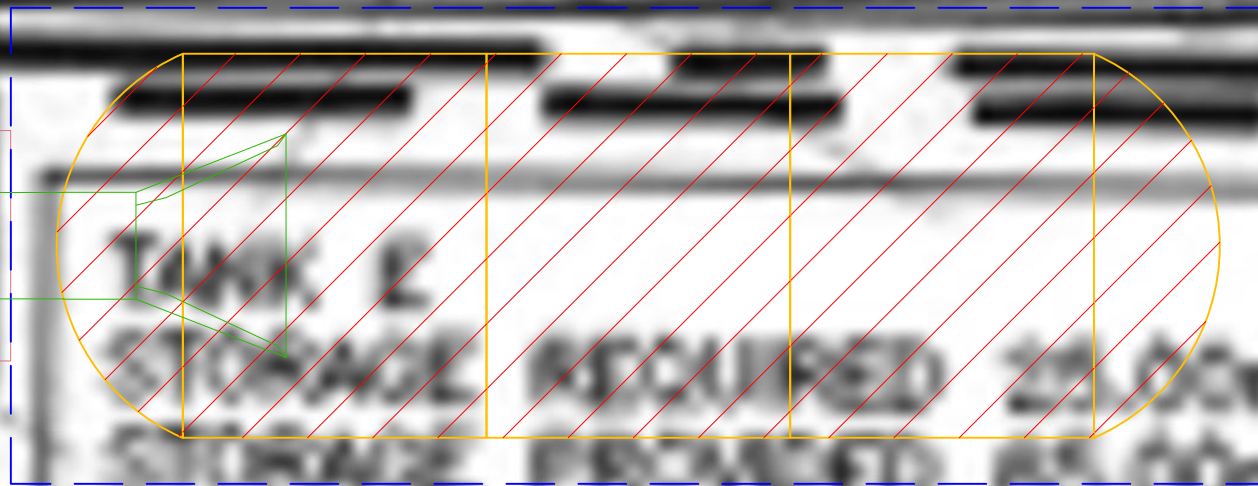
7.85
C/W





W/M
SA

2.25m = 250mm ϕ
PVC STM ϕ 0.45%



TANK E
STORAGE REQUIRED 25.00m³
STORAGE PROVIDED 65.00m³

CBMH19
T/G=87.58
SE.INV.=84.21
NE.INV.=83.44

CB04
T/G=87.65
S.INV.=85.45

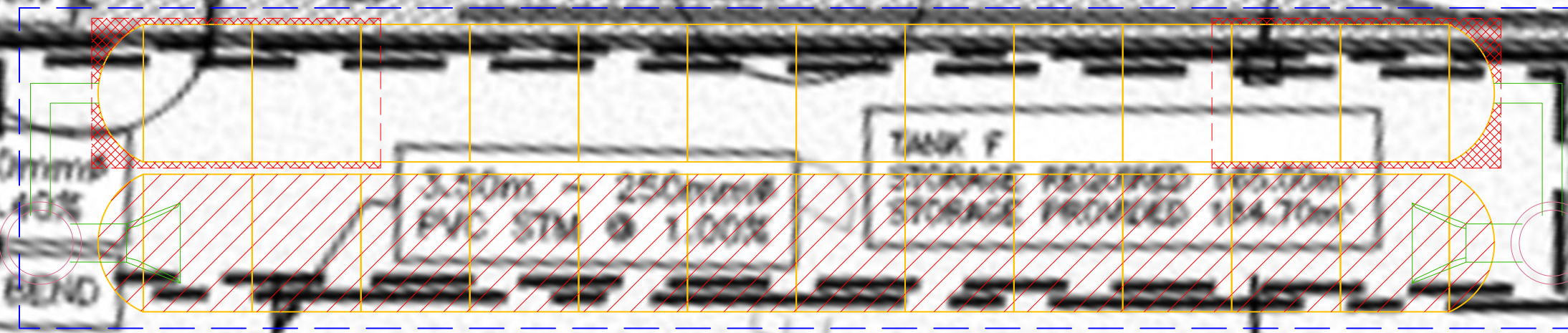
CBMH05
T/G=87.62
SW.INV.=84.41
W.INV.=84.30
NW.INV.=85.22
E.N.INV.=84.25

CB03
T/G=87.45
INV.=84.45

CB02
T/G=87.45
N.INV.=84.45

8.45m - 250mm \varnothing
PVC STM @ 0.45%

3.95m - 200mm \varnothing
CB LEAD @ 1.00%



11.25m - 250mm \varnothing
PVC STM @ 0.45%

TANK F
STORAGE TANK FOR
3000L (750GAL) 154.70m \varnothing

3.00m - 250mm \varnothing
PVC STM @ 1.00%

22.5' BEND

51.09m - 200mm \varnothing
PVC SAN @ 0.33%

3.00m - 250mm \varnothing
PVC STM @ 1.00%

4.40m - 200mm \varnothing
CB LEAD @ 1.00%



51.65m - 375mm \varnothing
PVC STM @ 0.30%

INV.=83.68



PART 2
P.I.N. 14509
PLAN 50 R

No. 370
1 Storey
Vial Slab Drawing
(Slab Noted)

CBMH21
T/G=87.52
SW.IV.=84.12
SE.IV.=84.08

CBMH22
T/G=87.61
SW.IV.=84.08
SE.IV.=83.33
(C/W 100-WV-1
Q=13 L/S)

CBMH17
T/G=87.63
NE.IV.=84.37
SW.IV.=83.54
(C/W 100-WV-1
Q=13 L/S)

CBMH16
T/G=87.60
SW.IV.=84.41
NE.IV.=84.39

CBMH15
T/G=87.52
SE.IV.=84.31
SW.IV.=83.68
(C/W 100-WV-1
Q=13 L/S)

CBMH14
T/G=87.48
NE.IV.=84.72
SE.IV.=84.33

CBMH13
T/G=87.17
N.IV.=84.11
SW.IV.=84.76

CBMH12
T/G=87.49
NE.IV.=85.05
SW.IV.=84.39

CBMH11
T/G=87.75
SE.IV.=83.71
SW.IV.=83.58

STMH20
T/G=87.63
SE.IV.=83.24
SW.IV.=83.18

CBMH19
T/G=87.68
SE.IV.=84.21
NE.IV.=83.44
(C/W 125-WV-2
Q=24 L/S)

CBMH18
T/G=87.56
NE.IV.=85.23
SW.IV.=84.24

CBMH17
T/G=87.63
NE.IV.=84.37
SW.IV.=83.54
(C/W 100-WV-1
Q=13 L/S)

CBMH16
T/G=87.60
SW.IV.=84.41
NE.IV.=84.39

CBMH15
T/G=87.52
SE.IV.=84.31
SW.IV.=83.68
(C/W 100-WV-1
Q=13 L/S)

CBMH14
T/G=87.48
NE.IV.=84.72
SE.IV.=84.33

CBMH13
T/G=87.17
N.IV.=84.11
SW.IV.=84.76

CBMH12
T/G=87.49
NE.IV.=85.05
SW.IV.=84.39

STMH20
T/G=87.63
SE.IV.=83.24
SW.IV.=83.18

CBMH19
T/G=87.68
SE.IV.=84.21
NE.IV.=83.44
(C/W 125-WV-2
Q=24 L/S)

CBMH18
T/G=87.56
NE.IV.=85.23
SW.IV.=84.24

CBMH17
T/G=87.63
NE.IV.=84.37
SW.IV.=83.54
(C/W 100-WV-1
Q=13 L/S)

CBMH16
T/G=87.60
SW.IV.=84.41
NE.IV.=84.39

CBMH15
T/G=87.52
SE.IV.=84.31
SW.IV.=83.68
(C/W 100-WV-1
Q=13 L/S)

CBMH14
T/G=87.48
NE.IV.=84.72
SE.IV.=84.33

CBMH13
T/G=87.17
N.IV.=84.11
SW.IV.=84.76

CBMH12
T/G=87.49
NE.IV.=85.05
SW.IV.=84.39

STMH20
T/G=87.63
SE.IV.=83.24
SW.IV.=83.18

CBMH19
T/G=87.68
SE.IV.=84.21
NE.IV.=83.44
(C/W 125-WV-2
Q=24 L/S)

CBMH18
T/G=87.56
NE.IV.=85.23
SW.IV.=84.24

CBMH17
T/G=87.63
NE.IV.=84.37
SW.IV.=83.54
(C/W 100-WV-1
Q=13 L/S)

CBMH16
T/G=87.60
SW.IV.=84.41
NE.IV.=84.39

CBMH15
T/G=87.52
SE.IV.=84.31
SW.IV.=83.68
(C/W 100-WV-1
Q=13 L/S)

CBMH14
T/G=87.48
NE.IV.=84.72
SE.IV.=84.33

CBMH13
T/G=87.17
N.IV.=84.11
SW.IV.=84.76

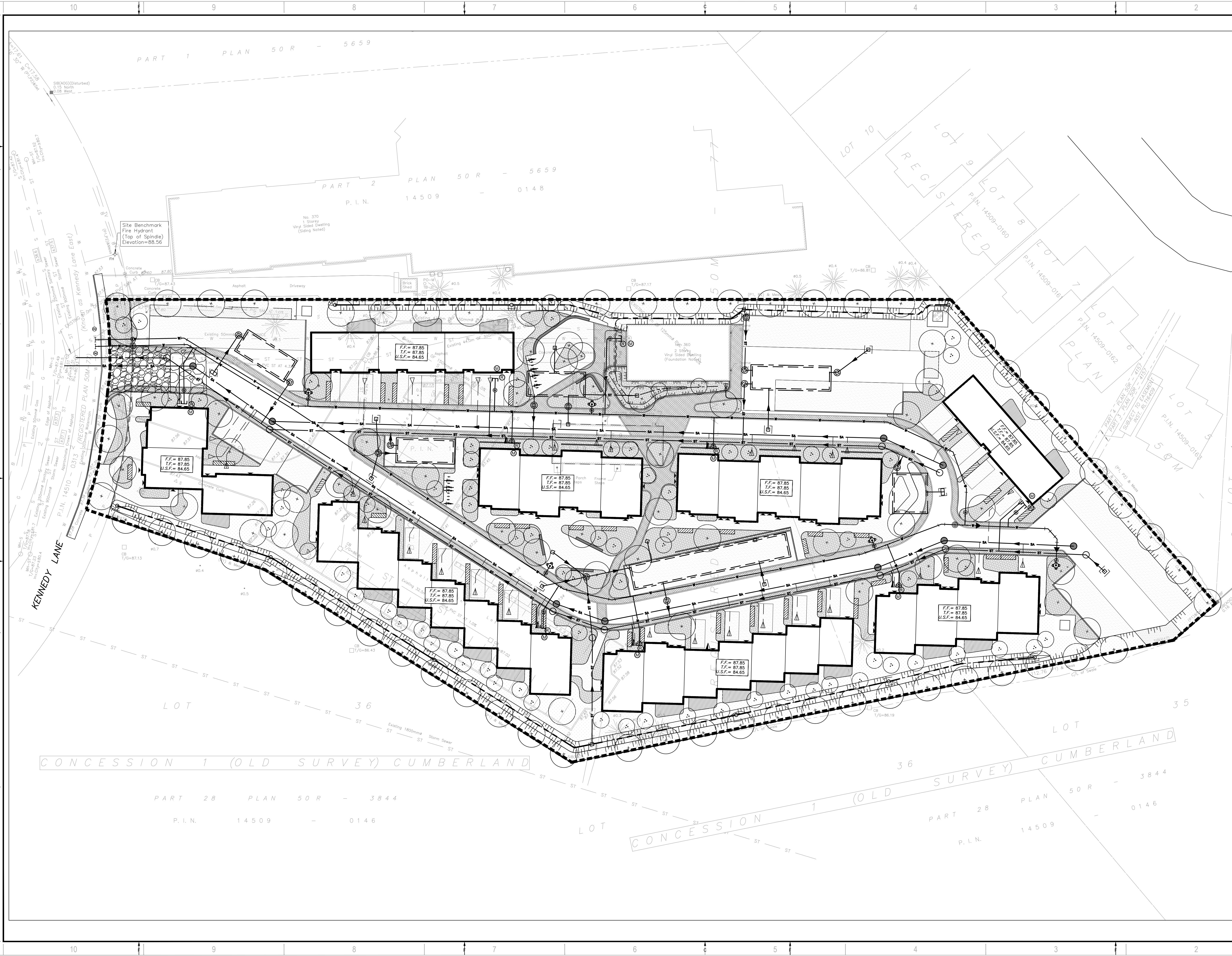
CBMH12
T/G=87.49
NE.IV.=85.05
SW.IV.=84.39

APPENDIX

APPENDIX

E

- EROSION AND SEDIMENTATION CONTROL PLAN C08



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KPMB ARCHITECTS
351 KING STREET EAST, SUITE 1200
TORONTO, ONTARIO
CANADA M5A 9L6
T: 416-977-5104

SEAL:

LICENSED PROFESSIONAL ENGINEER
D. B. YANG
100230568
2022-09-20
PROVINCE OF ONTARIO

NORTH

CLIENT:
UNITED PROPERTY RESOURCE CORPORATION
QUEENSWOOD UNITED CHURCH

CLIENT REF. #
PROJECT:
QUEENSWOOD UNITED CHURCH



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ISSUED FOR - REVISION	DATE	DESCRIPTION
2	2022-09-20	RE-ISSUED FOR SPA AND ZBLA
1	2021-11-30	ISSUED FOR SPA AND ZBLA

PROJECT NO: 211-12127-00	DATE: SEPTEMBER 2022
ORIGINAL SCALE: 1:300	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: EB/DY	
DRAWN BY: JT/EB	
CHECKED BY: DY	

DISCIPLINE: **CIVIL**

TITLE:
EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER:
C08

SHEET #:
8 OF 8

ISSUE:
RE-ISSUE FOR SPA AND ZBLA

DATE OF: 2022-09-20

REV #:
0

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APPENDIX

APPENDIX

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- SUBMISSION CHECK LIST