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West Capital Airpark Phase 1B-2 Residential (Novatech Phase 2B)

Servicing Report

Prepared for: West Capital Developments

West Capital Airpark – Phase 1B-2 Residential

1500 Thomas Argue Road

Ottawa, Ontario

Servicing Report

Prepared By:

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Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
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July 28, 2023
Revised: February 26, 2024
Revised: June 28, 2024

Novatech File: 102085-22
Ref: R-2024-075

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Engineers, Planners & Landscape Architects

June 28, 2024

City of Ottawa
Planning & Growth Management Department
10 Laurier Avenue West
4th Floor Infrastructure Approvals Division
Ottawa, ON K1P 1J1

Attention: **Kevin Hall, C.E.T. Project Manager**

Reference: **West Capital Airpark – Phase 1B-2 Residential**
Site Servicing Report
Our File No: 102085
City File No.: D07-16-22-0017

Please find enclosed the Servicing Report, revised June 28, 2024, prepared for the Phase 1B-2 residential area of the West Capital Airpark, to address servicing related conditions of Final Approval. The report has been revised in response to City Ottawa comments received June 12 and June 13, 2024. Updated drawings in response to comments have been included. No changes have been made to the conclusions of this report.

If you have any questions or require any additional information, please contact the undersigned.

Yours truly,

NOVATECH


(Aden Rongve signing for Alex McAuley)

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Cc: West Capital Developments

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1.0 INTRODUCTION

1.1 Background

Novatech has been retained to provide design services for the proposed West Capital Airpark (residential development and business park) located at Carp Airport. The Carp Airport property is described as Part of Lots 12, 13, 14 and 15 Concession 3, Part of Lots 13 and 14 Concession 4 and part of the Road Allowance between Concession 3 & 4 in the former Township of West Carleton (Huntley Ward)—now the City of Ottawa. Refer to **Figure 1** (Key Plan) for the site location.

1.2 Purpose

This Servicing Report has been prepared to address conditions of Final Approval for the revised Draft Plan of Subdivision for the proposed Phase 1B-2 Residential subdivision, which was originally part of the registered Phase 1 Residential subdivision. The conditions of Final Approval are included in **Appendix A**.

This report outlines the detailed servicing design for the proposed Phase 1B-2 Residential development with respect to water distribution, sanitary servicing, and storm drainage. Stormwater management is addressed in the separate Stormwater Management Report.

This report has been revised to address comments from the City of Ottawa as indicated in the cover letter. The City review comments and response to comments are included in **Appendix A** for reference.

The City of Ottawa Development Servicing Study Checklist has been included in **Appendix E.**

1.3 Proposed Development

The proposed Phase 1B-2 consists of 77 single family homes and 30 townhouse units. The development will include one new private street with extensions to existing Chandelle Private and Albert Boyd Private.

A total of 329 residential units have been draft approved for Phase 1 and Phase 2. The Phase 1B-2 development will bring the total unit count to 342. The draft approved 329 residential units, that included 270 single family homes and 59 townhomes, with a corresponding population of 1,077. With the current unit breakdown of single-family homes and townhouses, the total development population will be 1,109. A summary of the residential unit counts, and population is summarized in **Table 1** below.

Table 1: Residential Units and Population

Phase	Single Family Homes	Townhouses	Population	Status
1A	77	-	262	Registered
1B-1	28	-	96	Registered
2A	82	48	409	Registered
1B-2	77	30	340	Revised Draft Plan Approval Pending
Subtotal	264	78	1,109	
1 & 2	270	59	1,077	Draft Approved

Refer to the **Draft 4M Plan** and **Figure 2** (Residential Phasing Plan) for the proposed development concept for Phase 1B-2 Residential. Design drawings are listed in the Table of Contents.

1.4 Reference Documents

The following references documents are to be read in conjunction with this report.

- Village of Carp Class Environmental Assessment for Water and Wastewater Infrastructure Upgrade/Expansion (1634-00693) dated May 2008, by Stantec.
- Hydraulic Network Analysis and Water Storage Facility Design Report (R-2015-118) dated July 2015, by Novatech.
- Phase 1B-2 Residential Serviceability and Conceptual Stormwater Management Report (R-2023-106) dated June 2023, by Novatech.
- Geotechnical Investigation Carp Airport Servicing and Residential Development – Phase 1 (PG2450-2), dated January 2023, by Paterson Group.
- Phase 1B-2 Residential – SBS Sanitary Collection Design Brief dated February 2024, by Clearford
- Phase 1B-2 Residential Stormwater Management Report (R-2023-010) revised June 28, 2024, by Novatech

1.5 Ownership, Operation and Maintenance of Proposed Servicing

The sanitary and water servicing—including the sanitary collection system, the sewage treatment facility, water distribution system, and water storage facility—will be private communal systems owned, operated, and maintained by a condominium corporation as common elements. The sewage treatment facility and water storage facility have been constructed and are currently being maintained by Clearford Water Systems Inc.

The right of ways within the West Capital Airpark development will be owned by the condominium corporation as common elements. However, in accordance with the Municipal Capital Facility Development Agreement (MCFDA) that is in place for the project, the City of Ottawa would be responsible for maintenance, repair, and replacement of the surface works that include roadways, curbs, sidewalks, boulevards, streetlights, and the storm drainage system which includes the stormwater management facilities.

Details are included in Schedule I of the Subdivision Agreement for Phase 1 Residential (refer to **Appendix A**). The same approach is proposed for Phase 1B-2.

2.0 ROAD DESIGN

The proposed roadways for Phase 1B-2 will consist of the following right-of-way and asphalt widths:

- Chandelle Pvt. extension - 20m right-of-way, 8.5m asphalt width with barrier curbs
- Albert Boyd Pvt. extension - 20m right-of-way, 8.5m asphalt width with barrier curbs
- Street Three - 18m right-of-way, 8.5m asphalt width with barrier curbs.

The proposed right-of-way cross sections are shown on the Notes and Details Plan (**102085-ND1B2**).

An updated Geotechnical Investigation report (Paterson, January 2023) was prepared for the development of Phase 1B-2 and provides recommendations for pavement structure, servicing,

and foundations. For the residential roadways within Phase 1B-2 the recommended pavement structure is outlined in **Table 2** below.

Table 2: Recommended Pavement Structure (from Geotechnical Investigation Report)

Pavement Material Description	Layer Thickness (mm)
Asphalt Wear Course (Superpave 12.5)	40
Asphalt Base Course (Superpave 19.0)	50
Granular A Base	150
Granular B -Type II Subbase	450

3.0 SITE SERVICING OVERVIEW

The objective of the servicing design is to provide a suitable domestic water supply and adequate sanitary and storm servicing system for the proposed Phase 1B-2 development.

The following works would be constructed as part of Phase 1B-2:

- Phase 1B-2 right of ways, including roads, watermain, sanitary sewers, and storm sewers,
- Phase 1B-2 rear yard drainage systems, including permanent infiltration trenches,
- Inlet to the East Stormwater Management Facility for 1B-2 and Future Development Lands, including stone cooling trench, and
- Interim infiltration measures within the Future Development Lands.

The following works were constructed as part of Phase 1A and Phase 1B-1 and will service Phase 1B-2:

- Watermain feed from Carp Village (Phase 1A)
- Water Storage Facility (Phase 1A)
- Wastewater Treatment Facility (Phase 1A, with second module installed with Phase 1B-1)
- East Stormwater Management Facility (Phase 1B-1)

Refer to **Figure 1** (Key Plan) for an approximate location of the Water Storage Facility and Wastewater Treatment Facility.

Ministry of the Environment Conservation and Parks (MECP) approvals have been received for the Wastewater Treatment Facility and the East Stormwater Management Facility. Refer to **Appendix F** for copies of the MECP Environmental Compliance Approvals (ECAs).

In support of the Draft Plan of Subdivision revision application for Phase 1B-2, the capacity of the existing Carp Airport infrastructure was reviewed as part of the Serviceability and Conceptual Stormwater Management Report (Novatech, June 2023). The Serviceability Report found that the existing infrastructure has capacity to service Phase 1B-2 and that the design details would be confirmed as part of this Servicing Report.

4.0 WATER SUPPLY AND DISTRIBUTION

The watermain system for the West Capital Airpark development is connected to the existing Village of Carp municipal watermain which supplies maximum day demand to the private watermain system. The existing water storage facility and the water distribution system are private communal systems owned, operated, and maintained by a condominium corporation as common elements.

A 200mm watermain was constructed along the shoulder of Carp Road, from Rivington Street in the Village of Carp to the east end of future Street 15. The 200mm watermain connects to a 300mm watermain within the development which connects to the water storage facility. The water storage facility is used to accommodate peak flows and provide fire protection in accordance with the approved Hydraulic Network Analysis (Novatech, July 2015).

Domestic water is distributed from the water storage facility through the private water distribution network. Refer to **Figure 3** (Watermain Servicing) for an overview of the water distribution system.

4.1 Water Demands

The Village of Carp EA (Stantec 2008) accounts for an allocation of 1.46ML/day to the Draft Plan Approved Carp Airport development, after long term upgrades to the City's infrastructure. These planned upgrades have not yet been completed. The City of Ottawa has confirmed that a total of 0.5ML/day of water is currently available to the Carp Airport. The City of Ottawa has also indicated that short term upgrades are underway which would provide an additional 0.2ML/day for a total of 0.7ML/day. Refer to **Appendix B** for the City of Ottawa email which provides a Carp Village servicing update.

The individual house meters for the existing Carp Airport Residential (Phases 1A, 1B-1 & 2A) have been monitored. Based on this metered data, the existing average daily demand was determined to be 200L/capita/day. A combination of monitored and theoretical (per City of Ottawa Water Distribution Guidelines) average day water demands were used to assess the impact of Phase 1B-2 on the allocated water demand available to the Carp Airport. The combined demands are summarized below in **Table 3** under two scenarios.

Table 3: Combined Water Demands

Use	Number of Units	ppu	Population	Scenario #1 [1] Combined Theoretical[3] and Monitored [4] Average Day Rates (ML/day)		Scenario #2 [2] Monitored Average Day Rates (ML/day)	
RESIDENTIAL				Avg Day	Max Day 2.0xAvg Day[5]	Avg Day	Max Day 2.0xAvg Day[5]
Registered Phases 1A, 2A, 1B-1				200L/c/day		200L/c/day	
Single Family	187	3.4	636	0.13		0.13	
Townhomes	48	2.7	130	0.03		0.03	
Total Phases 1A, 2A, 1B-1	235		766	0.15	0.31	0.15	0.30
Proposed Phase 1B-2				280L/c/day		200L/c/day	
Single Family	77	3.4	262	0.07		0.05	
Townhomes	30	2.7	81	0.02		0.02	
Total Phase 1B-2	107		343	0.10	0.19	0.07	0.14
Total Residential Phases 1 & 2	342		1109		**0.50 ML/day**		**0.44 ML/day**

[1] Scenario 1 combines the Monitored Average Day Rate for Registered Phases (1A, 2A, and 1B-1) and the Theoretical Average Day Rate for the Proposed Phase (1B-2).
[2] Scenario 2 uses the Monitored Average Day Rate for all phases.
[3] Theoretical Average Day Rate of 280L/capita/day based on City of Ottawa Water Distribution Guidelines.
[4] Monitored Average Day Rate of 200L/capita/day based on private water meter readings from current occupied Carp Airport units (103 homes to date with flow data from November 2020 to October 2022).
[5] Average Day to Maximum Day Peaking Factor of 2.0 from Village of Carp EA (2008).

Based on the demand calculations, there is sufficient water allocation available from the Village of Carp (within the current 0.5ML/day) to service Phase 1B-2 under both Scenario 1 and 2.

4.2 Fire Flows

Fire protection for the West Capital Airpark was developed with Ottawa Fire Services on the basis of providing 63.08L/s for 30 minutes. The system for providing fire protection, including the pumps and storage of water has been constructed on the above basis.

Fire flow calculations for Phase 1B-2, per the Ontario Building Code (OBC), are provided in **Appendix B** and are within the available fire flow at the West Capital Airpark, as summarized below.

- Fire flow per OBC calculations: 45 L/s
- Fire flow available: 63.08L/s

The water system at West Capital Airpark is able to provide the fire flows required by the Ontario Building Code.

Fire Underwriters Survey (FUS) calculations have been provided for reference only. Calculations for fire flows using the FUS method result in higher flow rates than required by OBC. Supporting information is included in **Appendix B**.

4.3 Water Distribution

The proposed watermain for the Phase 1B-2 Residential subdivision would connect to the existing 150mm and 200mm diameter Phase 1B-1 watermains on Chandelle Private and Albert Boyd Private. Watermains within the Phase 1B-2 subdivision are proposed to be 200mm in diameter.

EPA NET modeling was completed to confirm that the fire flows and peak hour flows could be adequately delivered with the watermain sizes proposed. A theoretical average day domestic demand of 280L/capita/day (per City of Ottawa Guidelines) was used in the model. The model results satisfy the following pressure conditions at all locations within the development.

- Pressures less than 56m (80psi) during the high pressure (average day) condition.
- Pressures greater than 28m (40psi) during the low pressure (peak hour) condition.
- Pressures greater than 14m (20psi) during the maximum day plus fire flow condition.

The hydraulic model and watermain design are consistent with the recommendations outlined in the Hydraulic Network Analysis and Water Storage Facility Design Report (Novatech, July 2015). The Phase 1B-2 Hydraulic Network Analysis Design Brief summarizes the Phase 1B-2 modelling results and is included in **Appendix B**.

4.4 Water Storage Facility

The Water Storage Facility constructed with the Phase 1A Residential subdivision uses onsite water storage tanks to accommodate peak hour flows and provide fire protection in accordance with the approved Water Storage Facility Design Report (Novatech, July 2015). The Water Storage Facility currently has one operational water storage tank that was constructed as part of the Phase 1A works with a capacity of 352,000L.

The capacity of the system was reviewed to confirm that there is sufficient storage to accommodate Phase 1B-2. The results are summarized is **Table 4** below under the same two scenarios presented in **Table 3**.

Table 4: Water Storage Review

		Scenario #1	Scenario #2
		Combined Theoretical and Monitored Average Day Rates	**Monitored Average Day Rates**
[1]	**Maximum Day Demand[1] (L/day)**	498,480	437,200
[2]	**Peak Hour Demand[2] (L/s)**	12.7	11.1
[3]	**Required Fire Flow[3] (L/s)**	63.08	63.08
[4]	**Required Fire Duration[3] (hrs)**	0.5	0.5
[5]	**Fire Storage (L) ([3] x [4])**	113,544	113,544
[6]	**Max Day Storage (L)**	498,480	437,200
[7]	**Equalization Storage[4] (L) ([6] x 25%)**	124,620	109,300
[8]	**Emergency Storage[5] (L) (25% x {[5] + [7]})**	59,541	55,711
[9]	**Total Storage Required[6] (L) ([5] + [7] + [8])**	**297,705**	**278,555**
[10]	**Tank Storage Provided**	352,000	352,000

[1] Maximum Day Demands for Scenario 1 and 2 (from Table 3)
[2] Peak Hour Demand = 2.2 x Max Day Demand per City of Ottawa Water Distribution Guidelines (July 2010)
[3] Required Fire Flow and Duration indicated in Section 4 of Novatech Hydraulic Network Analysis and Water Storage Facility Design Report (July 2015)
[4] Equalization Storage = 25% Max Day Storage
[5] Emergency Storage = 25% (Fire Storage + Equalization Storage)
[6] Total Storage Required = Fire Storage + Equalization Storage + Emergency Storage

As demonstrated in **Table 4**, in both scenarios the existing water storage tank provides sufficient storage to accommodate the addition of Phase 1B-2.

5.0 SANITARY SEWAGE COLLECTION AND TREATMENT

Sanitary servicing will be done by means of small-bore sewers and has been designed by Clearford Water Systems Inc. The sanitary sewers will connect to the existing small-bore sewer system constructed as part of Phase 1B-1, which outlets to the existing wastewater treatment facility. The entire collection system, including clarifier tanks, will be owned, operated, and maintained by the condominium corporation.

5.1 Sanitary Collection

The small-bore sewer collection system consists of a clarifier tank installed on each lot. The clarifier tank is a septic tank fitted with Clearford proprietary components. The outlet from the clarifier tank will connect to a small-bore sewer collection system located within the right-of-way. System access point cleanout structures will be installed at approximately 90m spacing.

The design of the small-bore sewer system is discussed in the Phase 1B-2 Residential – SBS Sanitary Collection Design Brief (prepared by Clearford, February 2024).

The proposed servicing layout for the sanitary system is shown on **Figure 4** (Sanitary Servicing).

5.2 Sanitary Treatment

The wastewater treatment facility (WWTF) is being constructed in phases. Two modules are currently operational; One module was constructed with Phase 1A Residential, and one with Phase 1B-1 Residential. Each module has a capacity of 186m^3/day (total of 372m^3/day). MECP ECA approval is currently in place to allow this 372m^3/day of capacity. **Table 5** below summarizes treatment capacity requirements for combined theoretical/monitored average day flows (Scenario #1) and monitored average days flow (Scenario #2).

Table 5: Average Day Wastewater Flows

				Scenario #1		Scenario #2	
Type of Unit	**Number of Units**	**ppu**	**Population**	**Combined Theoretical[1]/ Monitored[2] Avg Day Flow (L/cap/day)**	**Combined Theoretical/ Monitored Avg Day Flow (L/day)**	**Monitored Average Day Flow [2] (L/cap/day)**	**Avg Day Monitored Flow (L/day)**
RESIDENTIAL							
Phase 1A, 2A, 1B-1							
Single Family	187	3.4	636	184	117,024	184	117,024
Townhomes	48	2.7	130	184	23,920	184	23,920
Phase 1B-2							
Single Family	77	3.4	262	290	75,980	184	48,208
Townhomes	30	2.7	81	290	23,490	184	14,904
Total Residential	342		1,109		240,414		204,056
NON-RESIDENTIAL							
Park [3]					2,000		2,000
Total Non-Residential					2,000		2,000
TOTAL	342		1,109		242,414		206,056
					242m^3/day		206m^3/day

[1] Average day theoretical flow of 290L/cap/day from Phase 1B-2 Residential – SBS Sanitary Collection Design Brief, dated February 2024, by Clearford.
[2] Average day monitored flow of 184L/cap/day based on monitored flow data provided by Clearford for the wastewater treatment facility (January 2021 to November 2022).
[3] Park Flows from Phase 1B-2 Residential – SBS Sanitary Collection Design Brief, dated February 2024, by Clearford.

The MECP has indicated that the wastewater treatment facility may operate at no more than 80% of its rated capacity (80% of 372m^3/day which is 297.6m^3/day) when using monitored flows. Refer to **Appendix C** for email correspondence with the MECP. The preliminary review of the capacity of the two constructed modules indicates that both scenarios do not exceed 80% of the design treatment capacity. Therefore, the two modules provide sufficient capacity to service the proposed Phase 1B-2 development, as summarized in **Table 5.**

A copy of the MOECC ECA for the wastewater treatment facility is included in **Appendix F**.

6.0 STORM DRAINAGE

The proposed right of ways within Phase 1B-2 will be serviced by a new storm sewer system, separate from the existing Phase 1B-1 storm sewer system. The Phase 1B-2 storm sewer system will outlet to the existing East Stormwater Management Facility (East SWM Facility), constructed as part of Phase 1B-1, which outlets directly to the Carp Creek.

In accordance with the Municipal Capital Facility Development Agreement (MCFDA) that is in place for this project, the City of Ottawa would be responsible for maintenance, repairs, and replacement of the storm drainage system—including the stormwater management facilities.

The storm sewers are sized for the 1:2 year storm event. Flows into the sewers are controlled with ICDs in the roadway and rear yard catchbasins. Major flows would be conveyed overland within the rights-of-way to the East SWM Facility. The proposed servicing concept for the storm drainage system is shown on **Figure 5 (**Storm Servicing) and outlets to the East SWM Facility constructed as part of the Phase 1B-1 residential subdivision. A storm sewer design sheet can be found in **Appendix D**.

The Phase 1B-2 stormwater management design is outlined in the Stormwater Management Report (Novatech, June 2024).

7.0 WATER BALANCE (INFILTRATION)

The Stormwater Site Management Report (Novatech, 2015) included water balance calculations to estimate the impacts of development on the hydrologic cycle and to estimate performance of the proposed infiltration Best Management Practices (BMPS). The water balance calculations were completed for both the East and West Residential Communities based on pre- and post-development conditions with the post-development condition being full build-out of the Draft Approved residential lands.

Details of the water balance calculations for Phase 1B-2 can be found in the Stormwater Management Report (Novatech, February 2024).

8.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures will be implemented during construction in accordance with the “Guidelines on Erosion and Sediment Control for Urban Construction Sites” (Government of Ontario, May 1987). Proposed erosion and sediment control measures are shown in the Erosion and Sediment Control Plan (**102085-ESC3**) and include:

- Placement of filter bags under catch basins and maintenance holes;
- Silt fences around the area under construction;
- Light duty straw bale or rock check dams;
- An interim infiltration swale to capture runoff from the undeveloped lands to the east;
- Vegetating disturbed areas; and
- Rip rap at the storm sewer inlet to the Stormwater Management Facility.

Inspections of erosion and sediment control measures will be required daily during active construction, and immediately after every rainfall event (a minimum of 25 mm of rain in any 24-hour period), significant snowmelt event (melting of snow at a rate which adversely affects the performance and function of the system), and any extreme weather event. It will be required to repair any damaged or nonfunctioning measures immediately. Inspections and maintenance of erosion and sediment control measures would continue until they are no longer required.

The contractor will be required to:

- Identify and rectify any deficiencies and undertake necessary maintenance measures as soon as possible.
- Ensure that records of inspection, including at a minimum, the inspector's name, date of inspection, visual observations, and any necessary remedial measures to maintain the interim erosion and sediment control measures.

9.0 CONCLUSIONS

This report has been prepared to address servicing related conditions of Final Approval for the proposed West Capital Airpark Phase 1B-2 Residential Subdivision.

The conclusions are as follows:

- The sanitary and water servicing—including the sanitary collection system, sewage treatment and disposal, the water storage facility, and the water distribution system—will be private communal systems owned, operated, and maintained by a condominium corporation as common elements.
- The City of Ottawa would be responsible for maintenance, repairs, and replacement of the surface works, including roadways, curbs, sidewalks, boulevards and streetlights, and the storm drainage system which includes the stormwater management facility.
- The proposed watermains would connect to the existing Phase 1B-1 watermains on Chandelle Pvt and Albert Boyd Pvt.
- The water storage facility has capacity to service Phase 1B-2.
- Sanitary servicing will be by means of small bore sewer system consisting of a clarifier tank installed on each lot connected to a small bore sewer collection system. The proposed small bore sewers will connect to the existing small bore sewer.
- The Wastewater Treatment Facility (WWTF) is currently operational with two modules. The two modules have capacity to service Phase 1B-2.
- The proposed storm sewer system is sized for a 1:2 year storm event and would be controlled with Inlet Control Devices (ICDs) in the roadway and rear yard catchbasins. Major flows would be conveyed overland within the right-of-way to the East Stormwater Management Facility.
- Erosion and sediment control measures would be implemented during construction.

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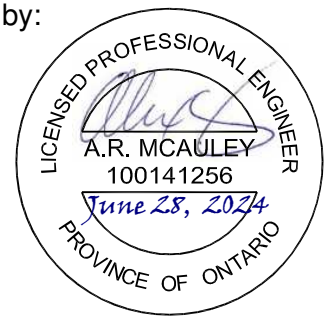
Mitch Parker, B.Eng

Reviewed by:



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Director | Land Development

LOT/BLOCK	PART OF PIN(S)	PART OF LOT /BLOCK ON 4M1593	SUBJECT TO EASEMENT(s)	PART(s) on Plan 4R30566	PART(s) on Plan 4R35312
1	04538–0811	120	OC1983198, OC1983279, OC1983318	29	
2	04538–0811, 04538–0851	120, 160	OC1983198, OC1983279, OC1983318, OC1983234	29	
3,4	04538–0811, 04538–0851, 04538–0812	120, 160, 121	OC1983234		
5	04538–0812	121	NO EASEMENTS		
6,7	04538–0812, 04538–0820	121, 177			
8	04538–0820	177			
9,10	04538–0820, 04538–0814	177, 123			
11	04538–0820, 04538–0813, 04538–1093	121, 122	OC1983198, OC1983279, OC1983318	31, 32	
		176	OC1983223,OC1983279,OC1983333,OC2481626,OC2520813,OC2588447		2
12	04538–0813, 04538–1093	122	OC1983198, OC1983279, OC1983318	32	
		176	OC1983223,OC1983279,OC1983333,OC2481626,OC2520813,OC2588447		2
13	04538–0801, 04538–0813, 04538–0852, 04538–1093	110, 122, 161	OC1983198, OC1983279, OC1983318, OC1983223	32, 33, 34	
		176	OC1983223,OC1983279,OC1983333,OC2481626,OC2520813,OC2588447		2
14	04538–0801, 04538–0852, 04538–1093	110, 161	OC1983198, OC1983279, OC1983318, OC1983223	34	
		176	OC1983223,OC1983279,OC1983333,OC2481626,OC2520813,OC2588447		2
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18	04538–0799	108		36	
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32	04538–0791, 04538–0792	100, 101		43, 44	
33	04538–0791	100		44	
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41	04538–0791, 04538–0792, 04538–0868	100, 101, 177			
42	04538–0792, 04538–0868	101, 177			
43	04538–0792, 04538–0793, 04538–0868	101, 102, 177			
44	04538–0793, 04538–0868	102, 177			
45	04538–0793, 04538–0794, 04538–0868	102, 103, 177			
46	04538–0794, 04538–0868	103, 177			
47	04538–0794, 04538–0795, 04538–0868	103, 104, 177			
48,49	04538–0796, 04538–0797, 04538–0868	105, 106, 177			
50	04538–0797, 04538, 0798, 04538–0868	106, 107,177			
51	04538, 0798, 04538–0868	107, 177			
52	04538–0798, 04538–0799, 04538–0868	107, 108, 177			
53	04538–0799, 04538–0868	108, 177			
54	04538–0799, 04538–0800, 04538–0868	108, 109, 177			
55	04538–0800, 04538–0868	109, 177			
56	04538–0800, 04538–0801, 04538–0868	109, 110, 177			
57	04538–0801, 04538–0852, 04538–0868	110, 161, 177	OC1983223		
58	04538–0801, 04538–0813, 04538–0852, 04538–0868	110,122,161,177	OC1983223		
59,60	04538–0813, 04538–0868	122, 177	NO EASEMENTS		
61	04538–0812, 04538–0813, 04538–0815, 04538–0868	121,122,124,177			
62	04538–0814, 04538–0815, 04538–0869	123, 124	OC1983198, OC1983279, OC1983318	63, 64	
		178	OC1983223, OC198327, OC1983333		
63	04538–0815, 04538–0816, 04538–0869	124, 125	OC1983198, OC1983279, OC1983318	63	
		178	OC1983223, OC198327, OC1983333		
64	04538–0815, 04538–0816	124, 125	NO EASEMENTS		
65	04538–0816	125			
66	04538–0816, 04538–0817, 04538–0853	125, 126, 162	OC1983223		
67	04538–0817	126	NO EASEMENTS		
68	04538–0817, 04538–0818	126, 127			
69	04538–0818	127			
70	04538–0818, 04538–0819	127, 128			
71	04538–0819	128			
72	04538–0819, 04538–0820	128, 129			
73,74	04538–0820, 04538–0821	129, 130			
75	04538–0821, 04538–0822	130, 131			
76	04538–0822	131			
77	04538–0822, 04538–0823	131, 132			
78	04538–0823, 04538–0824	132, 133			
79,80,81	04538–0824	133			
82,83	04538–0824, 04538–0825	133, 134			
84,85,86	04538–0825	134			
87	04538–0825, 04538–0826	134, 135			
88,89,90	04538–0826	135			
91	04538–0826, 04538–0827	135, 136			
92	04538–0827	136			
93,94,95,96	04538–0827, 04538–0868	136, 177			
97	04538–0788, 04538–0868	97, 177			
98,99	04538–0787, 04538–0788, 04538–0868	96, 97, 177			
100–106	04538–0787, 04538–0788	96, 97			
107	04538–0787, 04538–0788	96, 97	OC1983198, OC1983279, OC1983318	47, 48	
108	04538–0841	150	NO EASEMENT		
109	04538–0854	163	OC1983234		
110	04538–0814	123	NO EASEMENT		
111	04538–0814, 04538–0841, 04538–0854, 04538–0869	123, 150	OC1983198, OC1983279, OC1983318	66	13, 14
		163	OC1983198, OC1983279, OC1983234	65	
		178	OC1983223, OC1983279, OC1983333		15
112	04538–0811, 04538–0812, 04538–0813, 004538–814, 04538–0815, 04538–0851, 04538–1093, 04538–0868	120, 121	OC1983198, OC1983279, OC1983318		3, 4, 7, 8
		122,123,124,177			10, 11, 12, 13
		160	OC1983198 OC1983279 OC1983318		5
			OC2588448, OC1983234		5, 6
		176	OC2588448, OC1983223, OC1983279, OC1983333, OC2481626, OC2520813		1
			OC2588447		1
113	04538–0812	121	OC2588448		9
114	04538–0795, 04538–0796, 04538–0823, 04538–0868	104,105,132,177	OC1983198, OC1983279, OC1983318	39, 40	
115	04538–0814 TO 04538–0823, 04538–0853, 04538–0868	123 TO 132, 162, 177	OC1983223		
116	04538–0788,04538–0789, 04538–0823 TO 04538–0827, 04538–0868	97,98,132 TO 136, 177	OC1983198, OC1983279, OC1983318	47	

COORDINATES WERE DERIVED FROM REGISTERED PLAN 4M–1593 MTM ZONE 9, NAD83 ORIGINAL.

COORDINATES HAVE BEEN DETERMINED TO AN URBAN ACCURACY IN ACCORDANCE WITH SECTION 14(2) OF O.REG 216/10.

POINT ID	NORTHING	EASTING
*	*	*
*	*	*
*	*	*
*	*	*

COORDINATES CANNOT IN THEMSELVES BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

APPROVED UNDER SECTION 51 OF
THE PLANNING ACT BY THE CITY OF OTTAWA
THIS _ _ _ _ DAY OF _ _ _ _

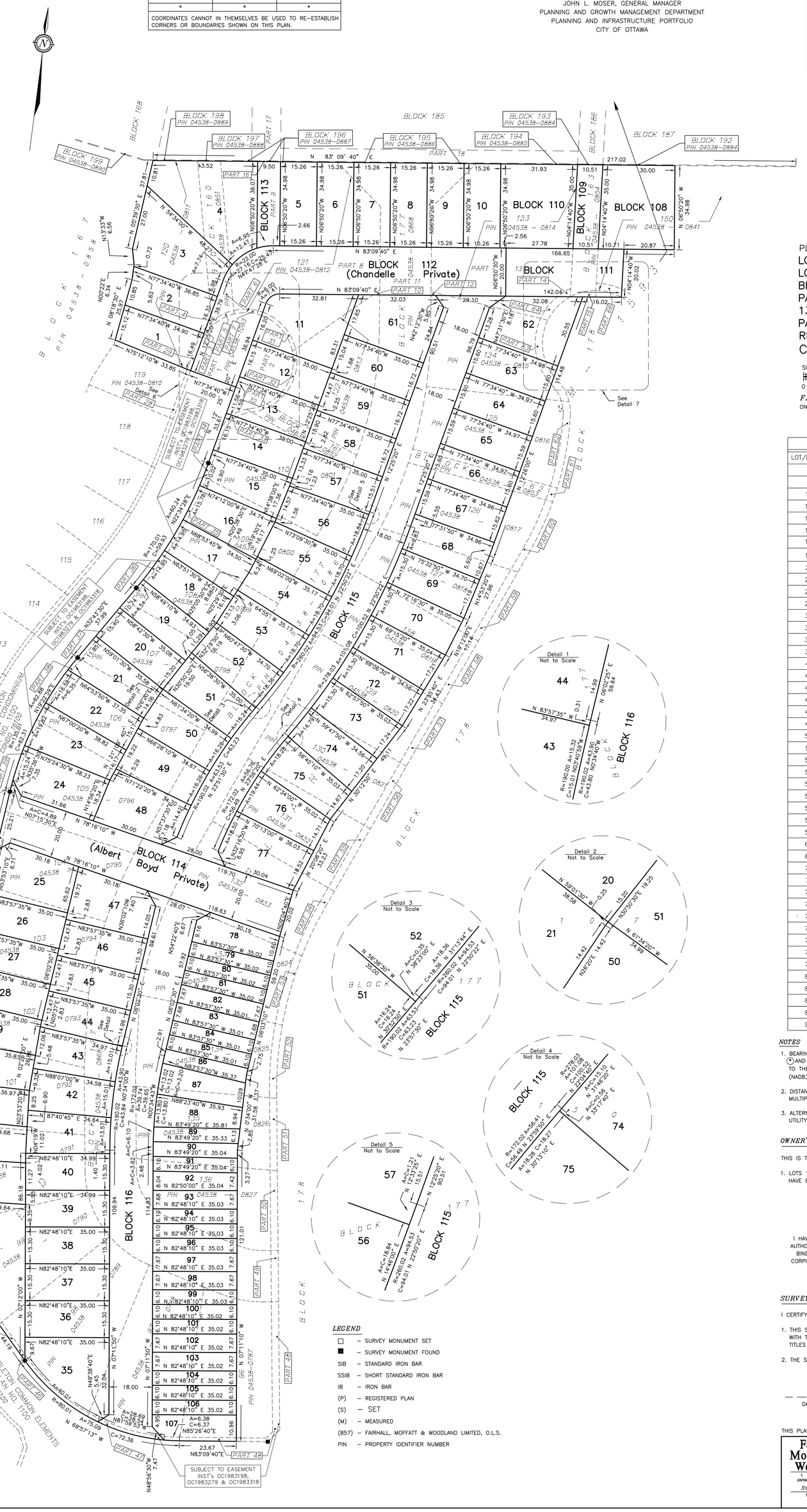
____
JOHN L. MOSER, GENERAL MANAGER
PLANNING AND GROWTH MANAGEMENT DEPARTMENT
PLANNING AND INFRASTRUCTURE PORTFOLIO
CITY OF OTTAWA

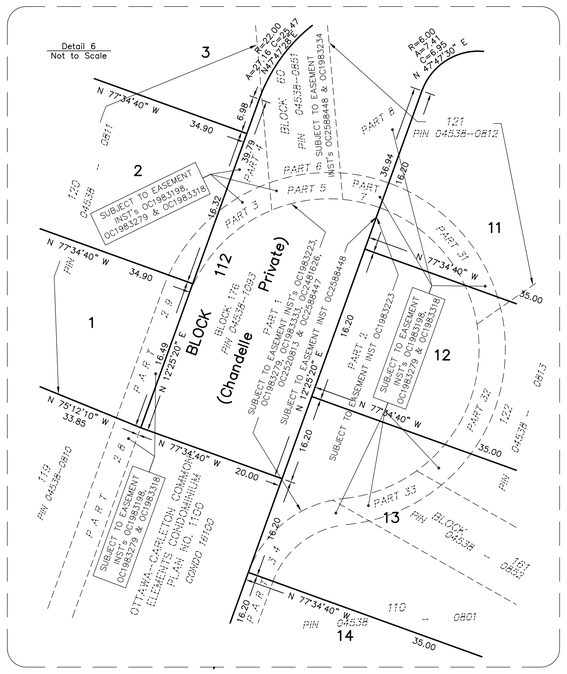
PLAN 4M–

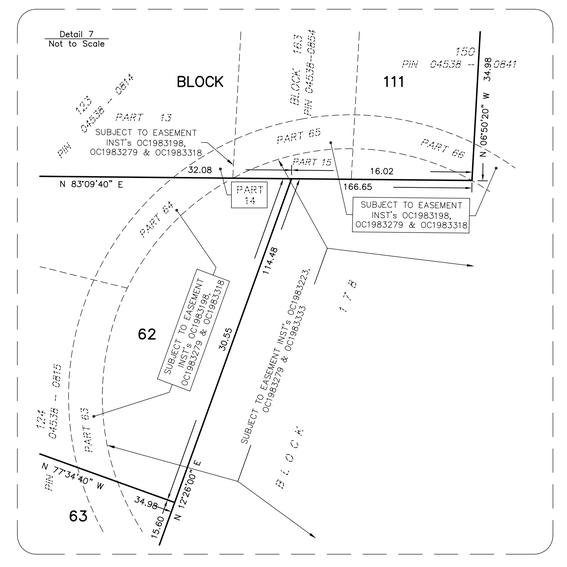
I certify that this Plan is registered in the Land Registry Office for the Land Titles Division of Ottawa–Carleton N° 4 at _ _ _ o'clock on the _ _ _ _ day of _ _ _ _ and entered in the register for Property Identifier _ _ _ _ and required consents are registered as Plan Document N° _ _ _ _ _ _ _

_ _ _ _ _ _ _ _ _ _ _ _
Representative for Land Registrar

THE SUBDIVISION REPRESENTED BY THIS PLAN AFFECTS







PLAN OF SUBDIVISION OF

LOTS 97 TO 110 (INCLUSIVE), LOTS 120, 121,122 & 123 BLOCKS 160,161,163 PART OF LOTS 96,124 TO 136(INCLUSIVE) &150 PART OF BLOCKS 162,176,177 & 178 REGISTERED PLAN 4M–1593 CITY OF OTTAWA

SCALE 1 : 750

0 10 20 50 75 metres

FAIRHALL, MOFFATT & WOODLAND LIMITED
ONTARIO LAND SURVEYORS

CURVE TABLE

LOT/BLOCK	RADIUS	ARC	CHORD	BEARING
3	22.00	7.74	7.70	N 22°37'52" E
4	22.00	12.47	12.30	N 48°44'00" E
11	6.00	7.41	6.95	N 47°47'30" E
15	170.01	10.02	10.01	N 14°06'44" E
16	170.01	15.78	15.77	N 18°27'30" E
17	170.01	14.95	14.95	N 23°38'40 " E
18	170.01	14.95	14.95	N 28°40'50" E
19	170.01	4.54	4.54	N 31°58'00" E
21	135.01	6.35	6.35	N 31°22'40" E
22	135.01	16.58	16.57	N 26°31'30" E
23	135.01	19.82	19.81	N 18°47'00" E
24	135.01	15.24	15.23	N 11°20'55 " E
32	80.01	16.56	16.53	N 00°06'33" E
33	80.01	17.41	17.37	N 12°03'20" W
34	80.01	34.60	34.33	N 30°40'44" W
35	80.01	40.01	39.57	N 57°28'40" W
41	190.02	13.57	13.56	N 05°09'00" W
42	190.02	15.01	15.01	N 00°50'37" W
43	190.02	15.01	15.01	N 03°40'59" E
44	190.02	0.31	0.31	N 05°59'30" E
48	190.02	14.42	14.42	N 16°27'10" E
49	190.02	16.26	16.25	N 21°04'41" E
50	190.02	16.26	16.25	N 25°58'50" E
51	190.02	16.24	16.24	N 30°52'50" E
52	260.02	18.36	18.36	N 31°13'44" E
52	190.02	0.35	0.35	N 33°23'00" E
53	260.02	18.70	18.70	N 27°08'40" E
54	260.02	18.70	18.70	N 23°01'26" E
55	260.02	18.70	18.70	N 18°54'12" E
56	260.02	18.84	18.84	N 14°46'00" E
57	260.02	1.21	1.21	N 12°33'30" E
68	278.03	9.83	9.83	N 13°26'10 E
69	278.03	15.30	15.30	N 16°01'35" E
70	278.03	15.30	15.30	N 19°11'30" E
71	278.03	15.30	15.30	N 22°19'20" E
72	278.03	15.30	15.30	N 25°30'15" E
73	278.03	15.30	15.30	N 28°38'25" E
74	278.03	14.74	14.74	N 31°44'11" E
74	172.02	0.56	0.56	N 33°17'40" E
75	172.02	18.28	18.27	N 30°13'10" E
76	172.02	19.44	19.43	N 23°56'15" E
77	172.02	18.50	18.49	N 17°37'09" E
86	172.02	3.21	3.21	N 05°30'18" E
87	172.02	13.04	13.04	N 02°48'38" E
88	172.02	13.79	13.79	N 01°39'36" W
89	172.02	6.10	6.10	N 04°59'24" W
90	172.02	3.60	3.60	N 06°36'21" W

NOTES

1. BEARINGS ARE GRID, DERIVED FROM OBSERVED REFERENCE POINTS (*) AND (*) BY REAL TIME NETWORK OBSERVATIONS AND ARE REFERRED TO THE CENTRAL MERIDIAN, 76°30'W LONGITUDE MTM ZONE 9, (NAD83 ORIGINAL).
2. DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR 0.999905.
3. ALTERNATE AND REDUCED LENGTH MONUMENTS SET DUE TO UNDERGROUND UTILITY HAZARD.

OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT:

1. LOTS 1 TO 107, BOTH INCLUSIVE, AND BLOCKS 108 TO 116, BOTH INCLUSIVE HAVE BEEN LAID OUT IN ACCORDANCE WITH OUR INSTRUCTIONS.

1514947 ONTARIO INC.

I HAVE THE
AUTHORITY TO
BIND THE
CORPORATION

_ _ _ _ _ _ _ _ _
ANDREW WILDEBOER
PRESIDENT

LEGEND

☐	SURVEY MONUMENT SET
■	SURVEY MONUMENT FOUND
SIB	STANDARD IRON BAR
SSIB	SHORT STANDARD IRON BAR
IB	IRON BAR
(P)	REGISTERED PLAN
(S)	SET
(M)	MEASURED
(857)	FAIRHALL, MOFFATT & WOODLAND LIMITED, O.L.S.
PIN	PROPERTY IDENTIFIER NUMBER

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON

_ _ _ _
DATE

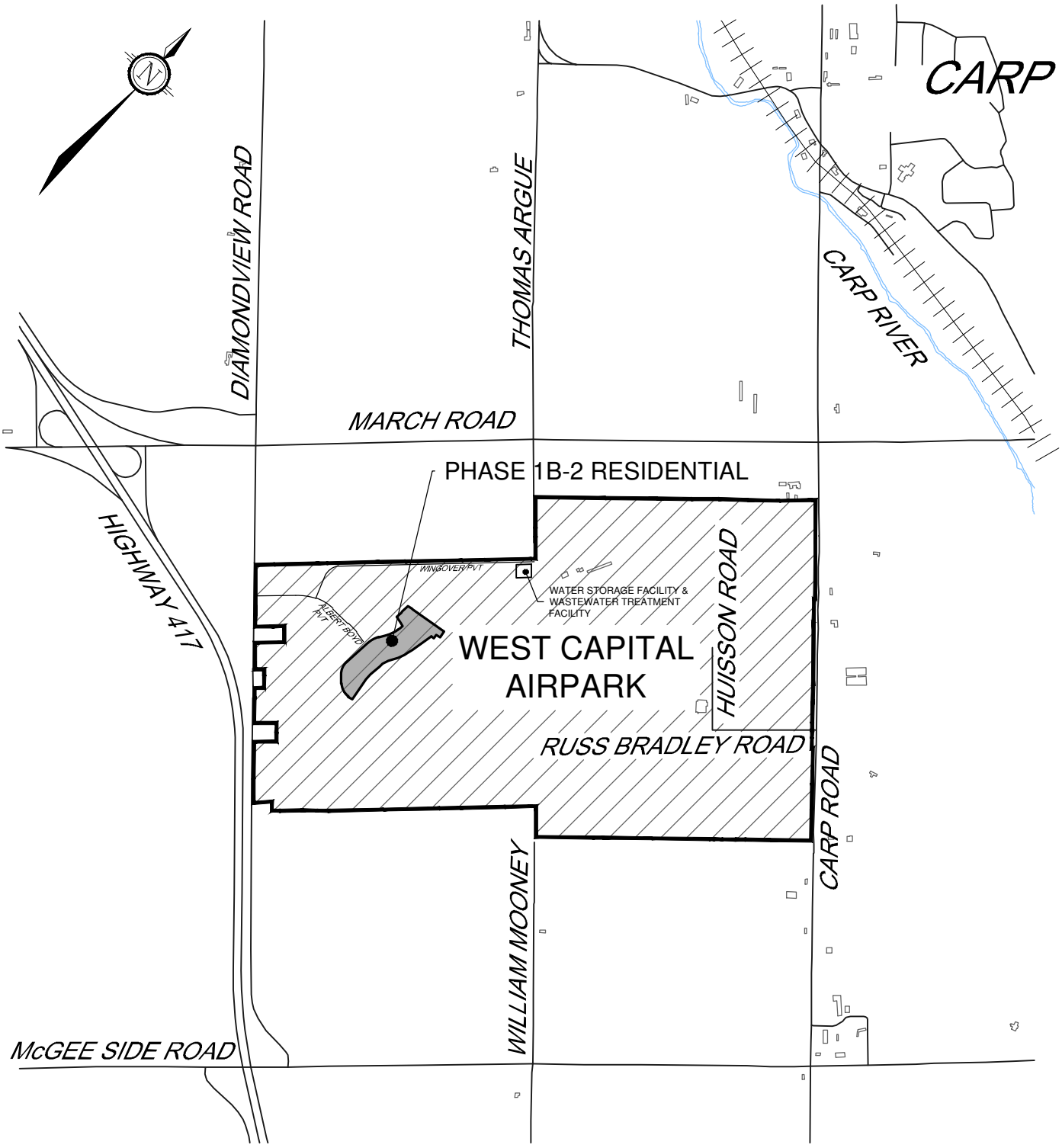
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER ......

Fairhall Moffatt & Woodland
LIMITED
OTTAWA
ONTARIO LAND SURVEYORS
Surveying and Land Information Services
100–600 TERRY FOX DRIVE, KANATA, ONTARIO K2L 4B6
TEL: (613) 591–2580 FAX: (613) 591–1495
www.fmw.on.ca

JOB No.
AB25901
E , N
REFERENCE No.
*
S:\JOBS\Z35100\DWG\
mplan–drafttonovatech

May 23, 2024



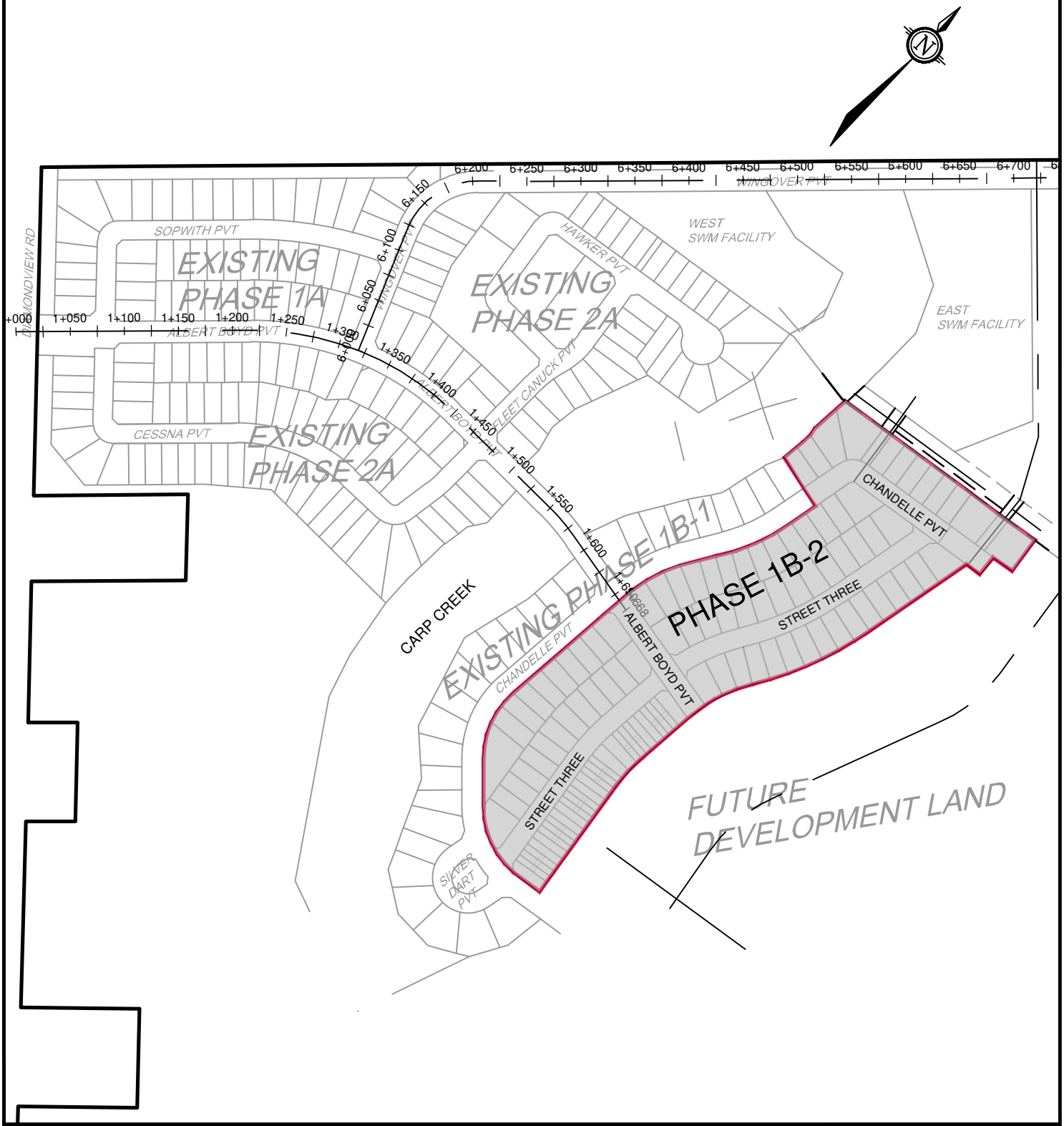
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

WEST CAPITAL AIRPARK

KEY PLAN

DATE	JOB	FIGURE
JUN 2024	102085	1



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WEST CAPITAL AIRPARK PHASE 1B-2 RESIDENTIAL

RESIDENTIAL PHASING PLAN

DATE	JOB	FIGURE
JUN 2024	102085	2

SHT8X11.DWG - 216mmx279mm

\\novatech2018\nova2\2002\102085\DATA\Phase 2B\Reports\Servicing_rev3 - for registration\Figures\102085-2B-KP.dwg, 8x11 Keyplan, Jun 26, 2024 - 3:33pm, mblanton

LEGEND

EXISTING WATERMAIN

PROPOSED WATERMAIN

CARP CREEK

EXISTING PHASE 1B-1

ALBERT BOYD PVT

CHANDELLE PVT

STREET THREE

SILVER DART PVT

200mmØ WATERMAIN

150mmØ WATERMAIN

CONNECT TO EXISTING

STUB FOR FUTURE CONNECTION

FUTURE DEVELOPMENT LOTS

FUTURE DEVELOPMENT LAND

BLOCK 157 PLAN 4M-1593

BLOCK 155 PLAN 4M-1593

PIN 04538-0688

NOVATECH

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WEST CAPITAL AIRPARK

WATERMAIN SERVICING PHASE 1B-2 RESIDENTIAL

SCALE 1 : 2000 (0, 20, 40, 60, 80)

DATE JUN 2024 | JOB 102085 | FIGURE 3

SHT11X17.DWG - 279mmX432mm

LEGEND

EXISTING SANITARY SEWER AND DIRECTION OF FLOW

PROPOSED SANITARY SEWER AND DIRECTION OF FLOW

CONNECT TO EXISTING

EXISTING SANITARY SEWER TO BE ABANDONED

CONNECT TO EXISTING

FUTURE DEVELOPMENT LOTS

CARP CREEK

EXISTING PHASE 1B-1

ALBERT BOYD PVT

CHANDELLE PVT

75mmØ SBS SANITARY

100mmØ SBS SANITARY

STREET THREE

SILVER DART PVT

FUTURE DEVELOPMENT LAND

NOVATECH
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Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

WEST CAPITAL AIRPARK

SANITARY SERVICING PHASE 1B-2 RESIDENTIAL

SCALE 1 : 2000 (0, 20, 40, 60, 80)

DATE JUN 2024 | JOB 102085 | FIGURE 4

SHT11X17.DWG - 279mmX432mm

LEGEND

- EXISTING STORM SEWER AND DIRECTION OF FLOW
- PROPOSED STORM SEWER AND DIRECTION OF FLOW
- PROPOSED REAR YARD INFILTRATION TRENCH AND DIRECTION OF FLOW (MODIFIED CITY DETAIL S29)

EXISTING SWM POND INLET

EXISTING OGS UNIT

STORMWATER MANAGEMENT FACILITY

BLOCK 157 PLAN 4M-1593

BLOCK 165 PLAN 4M-1593

PIN 04538-0888

BLOCK 164 PLAN 4M-1593

1650mmØ STORM

525mmØ STORM

825mmØ STORM

750mmØ STORM

525mmØ STORM

FUTURE STORM SEWER CONNECTION TO SERVICE FUTURE LANDS

FUTURE DEVELOPMENT LOTS

EXISTING PHASE 1B-1

ALBERT-BOYD PVT

250mmØ STORM

EXISTING PHASE 1B-1

CARP CREEK

CHANDELLE PVT

675mmØ STORM

STREET THREE

525mmØ STORM

FUTURE DEVELOPMENT LAND

300mmØ STORM

SILVER DART PVT

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WEST CAPITAL AIRPARK

STORM SERVICING PHASE 1B-2 RESIDENTIAL

SCALE 1 : 2000 (0 20 40 60 80)

DATE JUN 2024 | JOB 102085 | FIGURE 5

SHT11X17.DWG - 279mmX432mm

Appendix A – Documentation

1) Conditions of Final Approval
2) Phase 1 Subdivision Agreement – Schedule I
3) City Review Comments Email and Attachments (email received November 29, 2023)
4) Response to City Review Comments (dated February 23, 2024)
5) City Stormwater Review Comments (dated March 26, 2024)
6) City Stormwater Operations Comments (dated April 10, 2024)
7) Response to City Stormwater Review Comments (dated May 14, 2024)
8) Response to City Stormwater Operations Comments (dated May 14, 2024)
9) City Stormwater Review Comments (received June 12, 2024)
10) City Stormwater Operations Comments (received June 13, 2024)
11) Response to City Review Comments (dated June 28, 2024)

File: D07-16-22-0017

CONDITIONS FOR DRAFT APPROVAL
1514947 ONTARIO INC.
CARP AIRPORT COMMUNITY 1500 THOMAS ARGUE RD.
DRAFT APPROVED 00/00/2023.
REVISED DD/MM/YYYY
DRAFT APPROVAL EXTENDED FROM DD/MM/YYYY TO DD/MM/YYYY

INDEX

The City of Ottawa's conditions applying to the draft approval of 1514947 Ontario Inc. Carp Airport Community (1500 Thomas Argue Road) Subdivision are as follows:

		This approval applies to the draft plan certified by John Gutri, Ontario Land Surveyor, dated September, 16, 2022, showing 77 residential lots, 4 blocks and 1 future block for streets, 2 residential blocks for 30 townhomes, 1 future residential block, 2 servicing blocks, 1 open space block. This approval applies to the approved conceptual plans and reports in support of the draft plan as follows (list plans, reports and studies associated with the draft approval): • Draft Plan of Subdivision, by Novatech, dated September 2022 • Draft Plan of Condominium, by Novatech, dated October 2022 • Planning Rationale, by Novatech, dated September 1, 2022 • Phase One Environmental Site Assessment, by GEMTEC, dated August 12, 2022, Project No.: 101491.002 • Species at Risk Assessment, by Muncaster Environmental Planning Inc., dated February 17, 2023 and addendums • Geotechnical Investigation, by Paterson Group Inc., Revision 1, dated January 16, 2023, Report No. PG2450-2 West Capital Airpark, Phase 1B-2 Residential Serviceability and Conceptual Stormwater Management Report (R-2023-106), prepared by Novatech, revised June 20, 2023 • Transportation Impact Study REV 1 (R-2011-168) prepared by Novatech dated November 18, 2011 • Integrated Environmental Review prepared by Muncaster Environmental Planning Inc. dated March 2007 Subject to the conditions below, these plans and reports may require updating and/or additional details prior to final approval.	
		The Owner agrees, by entering into a Subdivision Agreement, to satisfy all terms, conditions and obligations, financial and otherwise, of the City of Ottawa, at the Owner's sole expense, all to the satisfaction of the City.	**Clearing Agency**[i]
		General	
1.		Prior to the issuance of a Commence Work Notification, the Owner shall obtain such permits as may be required from Municipal or Provincial authorities and shall file copies thereof with the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning**
2.		Prior to commencing construction, the Owner shall enter into a subdivision agreement with the City. The subdivision agreement shall, among other matters, require that the Owner post securities in a format approved by the	**OTTAWA Planning**

		City Solicitor, in an amount of 100% of the estimated cost of all works, save and except non-municipal buildings. The aforementioned security for site works shall be for works on both private and public property and shall include, but not be limited to, lot grading and drainage, landscaping and driveways, roads and road works, road drainage, underground infrastructure and services (storm, sanitary, watermains), streetlights, stormwater management works and park works. The amount secured by the City shall be determined by the General Manager, Planning, Real Estate and Economic Development Department, based on current City tender costs, which costs shall be reviewed and adjusted annually. Securities for on-site works may be at a reduced rate subject to the approval of the General Manager, Planning, Real Estate and Economic Development Department. Engineering, Inspection and Review fees will be collected based on the estimated cost of the works (+HST) and a park review and inspection fee will be based on 4% (+HST) of the total value of the park works as noted herein and in accordance with the City's Fees By-law for planning applications (By-law No. 2022-239 or as amended).	
3.		The Owner acknowledges and agrees that any residential blocks for street-oriented dwelling units on the final Plan shall be configured to ensure that there will be no more than 25 units per block.	**OTTAWA Planning**
4.		The Owner acknowledges and agrees that any person who, prior to the draft plan approval, entered into a purchase and sale agreement with respect to lots or blocks created by this Subdivision, shall be permitted to withdraw from such agreement without penalty and with full refund of any deposit paid, up until the acknowledgement noted above has been executed. The Owner agrees to provide to the General Manager, Planning, Real Estate and Economic Development Department an acknowledgement from those purchasers who signed a purchase and sale agreement before this Subdivision was draft approved, that the Subdivision had not received draft approval by the City. The Owner agrees that the purchase and sale agreements signed prior to draft approval shall be amended to contain a clause to notify purchasers of this fact, and to include any special warning clauses, such as but not limited to Noise Warnings and easements.	**OTTAWA Legal**
5.		A warning clause will be inserted into the subdivision agreement and in all offers of purchase and sale agreements, to read as follows:	**OTTAWA Legal**

		• The Purchasers of Lots 1 through 4 acknowledge the sensitive environmental nature of Carp Creek, and adjacent woodlands, the importance of good stewardship practices to ensure the health and sustainability of these natural features and that it is the City's intent to protect the Carp Creek corridor and woodlots and leave them in a natural state for the long term. • The Purchaser undertakes and agrees that composters, garden plots, yard waste pile or other disturbances will not occur on City owned land. • The Purchaser undertakes and agrees that all roof leaders will be directed to pervious areas such as lawns to enhance ground water recharge. • The Purchaser acknowledges that occupancy cannot be permitted until sanitary water and storm services are in operation to the satisfaction of the City. • The Purchasers acknowledge that the lots are located in an agricultural area and may therefore be subjected to noise, dust, odours and other activities associated with an agricultural area. • The Purchasers acknowledge that they are purchasing land that is part of an active airport and as owners of land in an active airport they are subject to Transport Canada rules and regulations established for the operation of the Airport and will develop, and operate and contribute to the life cycle and operational costs of the Airport as per the terms of the MCF Agreement. • The Purchasers acknowledge that they must enter into a Common Elements Agreement for all commonly owned components of the subdivision as described in the Common Elements Condominium Agreement. The City, through the Municipal Capital Facilities Agreement, will maintain portions of the common elements treated as public systems and facilities, save and except for private communal water and wastewater systems and communal hangars and taxiways.	
6.		The Owner acknowledges that prior to registration of the plan of subdivision, the City of Ottawa shall be satisfied that the Carp Airport Amended and Restated Municipal Capital Facilities and Development Agreement, dated June 9, 2021, (MCFA), for both the Residential and Business Park components of the development, has been signed and the development is proceeding in accordance with MCFA to the satisfaction of the director of CREO.	

7.		The Owner, or his agents, shall not commence or permit the commencement of any site related works until such time as a pre-construction meeting has been held with Planning, Real Estate and Economic Development Department staff and until the City issues a Commence Work Notification.	**OTTAWA Planning**
8.		The Owner must demonstrate through a detailed phasing plan that the ratio of fifteen (15) units per Communal Hangar will be met. The development of the communal hangars, should they be outside of the core airport area, are subject to Site Plan Approval. The detailed phasing plan shall set forth, in a summary manner, the anticipated timing of the provision of the communal hangars and shall contain a sketch indicating the anticipated locations for such communal hangars.	**OTTAWA Planning**
9.		The Owner agrees that the final design of the communal hangar blocks may, as a result of the Owner's determination, require more land outside of the core airport area in order to meet the 15:1 unit/hangar ratio. If the lands for the communal hangars need to be expanded outside of the core airport area, the Owner agrees that additional lands will be provided within the development area as identified in the plan of subdivision to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning**
10.		The Owner shall not demand of the City to issue, nor shall anyone claiming title from it or under its authority, demand of the City to issue, one or more building permits to construct any building or other structure on any lot or block on the Site until: • applicable roads in the Subdivision have been connected to a public street; • the Municipal Capital Facilities Agreement (MCFA) and a Responsibility Agreement for both the Residential and Business Park components of the Development has been signed and the Development is proceeding in accordance with the MCFA and Responsibility Agreement; • access for fire fighting equipment has been provided to each building by means of a street or private roadway, which shall be designated and posted to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department. and the Emergency and Protective Services Department; • the access route has been surfaced with concrete, asphalt, or Granular "A" base capable of permitting accessibility under all climatic conditions and is continuously maintained so as to be immediately ready for use by the Emergency and Protective Services Department vehicles or any other vehicles in the event of an emergency;	**OTTAWA Planning**

		• the City has approved, where applicable, a site plan, a grading plan and a design plan for the proposed building or structure and; • the water distribution system has received all applicable Certificates of Approval from MOE; • the Sanitary Waste Treatment Facility has received all applicable Certificates of Approval from MOE; • Storm Water Management Pond has received all applicable Certificates of Approval from MOE; • a development phasing plan and a construction phasing plan have been approved by the Director of Planning Real Estate and Development and securities consistent with the phasing plan have been posted with the City of Ottawa to the satisfaction of the Director of Planning Real Estate and Development	
		<u>Zoning</u>	
11.		The Owner agrees that prior to registration of the Plan of Subdivision, the Owner shall ensure that the proposed Plan of Subdivision shall conform with a Zoning By-law approved under the requirements of the *Planning Act*, with all possibility of appeal to the Ontario Land Tribunal exhausted.	**OTTAWA Planning**
12.		The Owner undertakes and agrees that prior to the registration of the Plan of Subdivision, the Owner shall deliver to the City a certificate executed by an Ontario Land Surveyor showing that the area and frontage of all lots and blocks within the Subdivision are in accordance with the applicable Zoning By-law.	**OTTAWA Planning**
		<u>Roadway Modifications</u>	
13.		Any dead ends and/or open spaces of road allowances created by this plan of subdivision may be terminated in 0.3 metre reserves. The Owner shall place 0.3 metre reserves on the following locations: • Block 84 Future Roadblock • Block 88 (Albert Boyd Private) at the end of	**OTTAWA Planning Legal**
14.		The Owner shall provide site triangles at the following locations on the final plan: • Local Road to Local Road: 3m x 3m	**OTTAWA Planning Legal**
15.		The Owner agrees to provide a construction traffic management plan for the subdivision prior to the earlier of registration of the Agreement or early servicing. Such plan shall be to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning**

16.		All streets shall be named to the satisfaction of the Director of Building Code Services and in accordance with the Municipal Addressing By-law or the Private Roadways By-law as applicable.	**OTTAWA Planning BCS**
17.		[Development on Private Streets] The Owner covenants and agrees to: a) obtain approval for a Common Elements Condominium, or other agreement as deemed appropriate, which condominium or other agreement once registered on title, will set out the obligations between the co-Owners of the common elements for the operation and maintenance of the private streets, private watermains, private hydrants and private water services, such agreement to be to the satisfaction of the City Solicitor. b) design all private watermains within the subdivision to the satisfaction of the City, and it will pay all related costs, including the cost of connection, inspection, and disinfection by City personnel. c) install the private infrastructure services in accordance with the staging schedule approved by the City.	**OTTAWA Planning Legal**
18.		The Owner acknowledges that the construction of buildings may be restricted on certain lots and/or blocks until such time as road connections are made so that snowplow turning and garbage collection can be implemented.	**OTTAWA Planning**
19.		The Owner agrees that it shall upgrade Diamondview Road at his sole cost, from the entrance to the subdivision north to March Road <u>when required</u> by and to the satisfaction of the City of Ottawa.	**OTTAWA Planning**
20.		The Owner agrees to provide access for emergency vehicles at all times by way of providing two (2) separate and distinct accesses to the Subdivision(s); one access may be temporary during construction.	
21.		The Owner acknowledges and agrees that all construction traffic shall enter the site primarily from Carp Road and where required Thomas Argue Road. Diamondview Road will not be used as a construction access. The Owner further agrees to post signs at appropriate locations on Diamondview Road to indicate that the road is not a construction access route and that all construction traffic should access the subdivision lands from Carp Road (or Thomas Argue as appropriate). The Owner further acknowledges and agrees that he will repair any damage caused to Thomas Argue Road as a result of construction traffic associated with this development.	
22.		The Owner shall be responsible for 100% of the cost and installation of all permanent and temporary street name signs, caution signs and traffic signs that may be required in accordance with City specifications. All signs shall be	

		installed and located to the satisfaction of the City and installed prior to the City's acceptance of the roads within the subdivision.	
		<u>Geotechnical</u>	
23.		The Owner shall submit an updated geotechnical report prepared in accordance with the City's Geotechnical Investigation and Reporting Guidelines and/or Slope Stability Guidelines for Development Applications by a geotechnical engineer or geoscientist, licensed in the Province of Ontario, containing detailed information on applicable geotechnical matters and recommendations to the satisfaction of the General Manager, Planning, Real Estate and Economic Development which include, but are not limited to: a) existing sub-surface soils, groundwater conditions; b) slope stability (including an assessment during seismic loading) and erosion protection, in addition to any building construction requirements adjacent to unstable slope; c) clearly indicate orientation of any cross-sections used in slope stability analysis and location of center of the slip circle; d) grade raise restrictions on the site and, if appropriate, the impacts this will have on the slope stability; e) design and construction of underground services to the building, including differential settlement near any buildings or structures; f) design and construction of roadway, fire routes and parking lots; g) design and construction of retaining walls and/or slope protection; h) design and construction of engineered fill; i) design and construction of building foundations; j) site dewatering; k) design and construction of swimming pools; l) design and construction of park blocks for its intended uses; and m) in areas of sensitive marine clay soils:	**OTTAWA Planning**
24.		[Sensitive marine clay soils] Subject to the specific recommendations of the geotechnical report, where applicable: a) The Owner agrees to any restrictions to landscaping, in particular the type and size of trees and the proximity of these to structures/buildings due to the presence of sensitive marine clay soils, as per the City's Tree Planting in Sensitive Marine Clay Soils – 2017 Guidelines. b) The Owner agrees to provide the following tests, data, and information prior to zoning approval , in order to determine the sensitivity of the clay soils and how it will impact street tree planting and potentially front yard setbacks:	**OTTAWA Planning**

		i. Shear Vane analysis including remolded values per ASTM D2573. ii. Atterberg Limit testing per ASTM D4318; with the following data clearly identified, Natural water content (W), Plastic Limit (PL), Plasticity Index (PI), Liquidity Index (LI), and Activity (A). iii. Shrinkage Limit testing per ASTM D4943 with Shrinkage Limit (SL). iv. A separate section within the geotechnical report on sensitive marine clay soils, which will include a signed letter and corresponding map that confirms the locations of low, medium sensitivity (generally <40% plasticity) or high sensitivity clay soils (generally >40% plasticity), as determined by the above tests and data. v. The report identifies that foundation walls are to be reinforced at least nominally, with a minimum of two upper and two lower 15M (rebar size) bars in the foundation wall. c) In locations where all six conditions in the Tree Planting in Sensitive Marine Clay Soils – 2017 Guidelines cannot be met (e.g. if soils are generally >40% plasticity) the 2005 Clay Soils Policy will apply, meaning only small, low-water demand trees can be planted at a minimum separation distance of 7.5m from a building foundation. In these cases, the Zoning By-law will be used to ensure sufficient front yard setbacks to accommodate street trees in the right-of-way. For example, if street trees are planted in the right-of-way at a distance of 2m from the front lot line, then the minimum front yard setback would be 5.5m (7.5m – 2m).	
25.		In areas of sensitive marine clay soils, the Owner agrees that, prior to registration, to prepare an information package for homeowners regarding tree planting and watering, in accordance with the supporting geotechnical report. This information must be approved by Forestry Services prior to circulation to homeowners.	**OTTAWA Forestry**
		<u>Pathways, Sidewalks, Walkways, Fencing, and Noise Barriers</u>	
26.		The Owner acknowledges and agrees that all pathways, sidewalks, walkways, and fencing, are to be designed and constructed in accordance with City specifications, at no cost to the City, and to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	
27.		[Pathways and fencing on private lands] The Owner shall construct a 1.5 metre wide stone dust pathway(s) as well as fencing (1.5 metre black vinyl-coated chain link) connecting Chandelle	**OTTAWA Planning**

		Private to Wingover Private for the purposes of accessing the Park Block (Block 1 on Plan 4M-1512)	
28.		The Owner agrees to connect all new pathways, sidewalks, walkways to the existing pathways, sidewalks, walkways located at the following locations: • along the east and north sides of Chandrelle Private through Block 84, Block 81, on the draft plan, to Block 193, 184 and 186 on Plan 4M-1593 and, • along the north side of the extension of Albert Boyd Private (Block 87)	**OTTAWA Planning**
29.		[Chain link fence between public and private lands] The Owner agrees to design and construct 1.5 metre black vinyl-coated chain link fences in accordance with the Fence By-law at the following locations: • along the rear and side property lines of all lots adjacent to the conservation lands (Block 167 Plan 4M-1593) to clearly indicate property limits while minimizing vegetation damage and/or loss. All chain link fencing that separate public lands and residential lots and blocks shall have a maximum opening (the diamond shape area) of no greater than 37 mm in order to comply with the applicable part of the "Pool Enclosure By-Law". The Owner agrees that any vinyl-coated chain link fence required to be installed with the exception of parks fencing shall be located a minimum of 0.15 metres inside the property line of the private property.	**OTTAWA Planning**
30.		Appropriate security fencing shall be installed by the Owner as per the MCFA Clause 7.4 j & k. (Carp Airport Amended and Restated Municipal Capital Facilities and Development Agreement, dated June 9, 2021).	**OTTAWA Planning Creo**
31.		The Owner shall insert a clause in each agreement of purchase and sale and shall be registered as a notice on title in respect of all lands which fences have been constructed stating that: "Purchasers are advised that they must maintain all fences in good repair, including those as constructed by *(developer name)* along the boundary of this land, to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department. The Purchaser agrees to include this clause in any future purchase and sale agreements".	**OTTAWA Planning**

		Landscaping/Streetscaping	
32.		The Owner agrees, prior to registration or early servicing, whichever is earlier, to have a landscape plan(s) for the plan of subdivision prepared by a Landscape Architect, in accordance with the recommendations contained in the geotechnical report(s), the Tree Conservation Report, and/or the Environmental Impact Statement (if appropriate). The landscape plan(s) shall include detailed planting locations, plant lists which include species, plant form and sizes, details of planting methods, pathway widths and materials, access points, fencing requirements and fencing materials, other landscape features and gateway features where required. The Owner agrees to implement the approved landscape plan(s) and bear all costs and responsibility for the preparation and implementation of the plan(s). The Owner agrees that where sensitive marine clay soils are present, and the geotechnical report has satisfied the applicable conditions of the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines, confirmation of adequate soil volumes in accordance with the subject guidelines shall be provided by a Landscape Architect prior to zoning approval. All streetscaping and landscaping plans will be subject to Transport Canada regulations. All of the aforementioned are to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning Forestry**
33.		The Owner agrees that for all single detached and semi-detached lots, a minimum of 1 tree per interior lot and 2 trees per exterior side yard lots (i.e. corner lots) shall be provided on the landscape plan(s). In areas of low/medium plasticity sensitive marine clay soils, the following exceptions in accordance with the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines will apply in order to maximize the number of medium size trees: a) Where abutting properties form a continuous greenspace between driveways, one medium size tree will be planted instead of two small size trees, provided the minimum soil volume can be achieved. In these cases only, for the purposes of determining the minimum number of trees to be planted, one medium size tree that replaces two small trees will be counted as two trees.	**OTTAWA Planning Forestry**

		b) The medium size tree should be planted as close as possible to the middle of this continuous greenspace (in the right-of-way) to maximize available soil volume. c) On larger lots with sufficient soil volume for a medium size tree, one medium size tree will be planted on each lot (or each side of a corner lot), even if the abutting properties form a continuous greenspace between driveways. Along park frontages, the Landscape Plan shall locate trees at a 6-8 metre on-centre separation distance along the full extent of the road right-of-way abutting any park block(s). Should specific site constraints prevent the required allocation of trees, the remaining number of required trees shall be provided within any proposed park(s), open space or environmental blocks, non-residential road right-of-way frontages, stormwater management facility(s), or other suitable alternative locations, to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	
34.		In areas of sensitive marine clay soils where the six conditions of the Tree Planting in Sensitive Marine Clay Soils – 2017 Guidelines have been met; the following shall be provided: a) The landscape plan shall include a note indicating that is has been developed as per the geotechnical report(s) (date, author), the letter (date, author), and Map (date, title), to the satisfaction of the General Manager, Planning, Real Estate and Economic Development. b) At the time of tree planting, in addition to providing an F1 inspection form, the Landscape Architect will provide a signed letter indicating that trees have been planted with appropriate soil volume in accordance with the approved Landscape Plan, to the satisfaction of the General Manager, Planning, Real Estate and Economic Development.	**OTTAWA Planning**
		<u>Tree Conservation</u>	
35.		The Owner agrees to maintain the tree protection measures until construction is complete and/or the City has provided written permission to remove them.	**OTTAWA Planning**
		<u>Parks</u>	
36.		In accordance with the *Planning Act* and the City of Ottawa Parkland Dedication By-law, the parkland dedication requirement has been based on the proposed residential use and calculated at a rate of 5% of the gross land area (residential <18units/ha).	**OTTAWA Parks**

Based on the estimated gross land area of for this subdivision for a parkland dedication requirement of 0.369 hectares, as shown in the table below.

Parkland Dedication Required:	***1B-2 Residential 107 units (77 single dwelling units and 30 townhouse units)***	
Rate 5% the Gross land area (residential <18 units/ha)	*Land area*	*Parkland required*
	7.379 ha	*0.369 ha*
Parkland Required total (ha):		***0.369***
Parkland Dedication:		***0.000***
Parkland Over/Under Dedication (ha)		***-0.369***

It is acknowledged that a 5.130 ha park block, being Block 1 on Plan 4M-1512 has been dedicated to the City within the Carp Airport development. The total Parkland Required and Dedication is as follows:

Phase/Registration	**Parkland dedication rate**	**Gross Land Area (ha)**	**Parkland Dedication Required (ha)**
Residential 1A 4M-1593	5% - Residential 77 Units	8.330	0.417
Business Phase 1 4M-1512	2% Commercial/ Industrial	20.081	0.402
Residential 1B-1 4M-1593	5% - Residential 28 Units	4.239	0.212
Residential 2A 4M-1683	5% Residential 130 Units	9.815	0.491
Residential 1B-2 (current application)	5% Residential 107 Units	7.379	0.369
Business Phase 2 (Draft approved)	2% Commercial/ Industrial	49.149	0.983
Total parkland dedication required			2.874
Total parkland dedicated to date (Block 1 Plan 4M-1512)			5.130

		<table><tr><td>**Parkland Over dedication (ha)**</td><td>**2.256**</td></tr></table> In the event that there is change in the proposed use, block area, residential product and/or number of dwelling units within the Final Plan, the required parkland dedication will also be subject to change. The Owner acknowledges and agrees that based on the final unit count and the area parkland calculations, should the parkland conveyed be in excess of the requirements under s.51 of the Planning Act, the City shall not compensate the Owner.	
37.		The Owner covenants and agrees to pay the city the Park Development Contribution (Rural) fee, as indexed annually, for each lot as per the Plan of Subdivision, at the time of registration of each phase of development, in order to satisfy the park development requirements for this subdivision. ($2,823.00/lot (as of July 1, 2023). It is acknowledged that a lump sum payment was provided by the Owner as a developer contribution for park development in the amount of $445,107.48, for the approval of 329 units. The Park Development Contribution (Rural) fee shall be required on all units above and beyond that figure, <u>being 13 units.</u>	**OTTAWA Parks**
		<u>Environmental Constraints</u>	
38.		The Owner shall acknowledge and adhere to the Integrated Environmental Review prepared by Muncaster Environmental Planning Inc. dated March 2007.	**OTTAWA Planning**
39.		The Owner acknowledges and agrees that the construction of the subdivision shall be in accordance with the recommendations of Species at Risk Assessment (17Feb 2023) and additionally: • include a statement in mitigation measure #9 (under Summary and Mitigation Measures, p9), to prohibit any gates in the permanent fencing along the Carp Creek Corridor to restrict intrusions and disturbances on the natural feature.	**OTTAWA Planning**
40.		The Owner agrees to abide by all appropriate regulations associated with Provincial and Federal statutes for the protection of wildlife, including migratory birds and species at risk.	**OTTAWA Planning**
41.		The Owner acknowledges that the Carp Creek Tributary is subject to the "Development, Interference with Wetlands **Mississippi Valley Conservation Authority's** and Alterations to Shorelines and Watercourses" regulation, made under Section 28 of the Conservation Authorities Act, R.S.O. 1990, c. C.27, as amended. The regulation requires	**OTTAWA Planning CA**

		that the Owner of the property obtain a permit from the Conservation Authority prior to straightening, changing, diverting, or interfering in any way with any watercourse. Any application received in this regard will be assessed within the context of approved policies for the administration of the regulation.	
42.		The Owner shall erect protective fencing and sediment and erosion control measures along the setback perimeter of the Carp Creek Tributary prior to any site preparation works within the Subdivision to ensure no disturbance of the watercourse during construction. These measures shall be maintained in good working order until the site has stabilized, after which any such measures that are not permanent shall be removed in a manner that minimizes disturbance to the site.	**OTTAWA Planning**
43.		The Owner acknowledges that any proposed works on or adjacent to the Carp Creek Tributary corridor will need to comply with the requirements of the Federal Fisheries Act and avoid causing death of fish and the harmful alteration, disruption or destruction of fish habitat, and that the Department of Fisheries and Oceans (DFO) has provided authorization to complete works in the Carp River Tributary corridor.	**OTTAWA Planning CA**
44.		Where required, the Owner shall prepare, to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department, an Owner Awareness Package (OAP) highlighting the advantages and responsibilities of a homeowner living in or adjacent to a natural area. The OAP shall describe the natural attributes of the community and the importance of good stewardship practices to ensure the long-term health and sustainability of the Natural Heritage System. Topics to be discussed include, but are not limited to, reducing environmental impacts from common household activities (e.g., water conservation, yard waste disposal, chemical use and storage, etc.), avoiding human-wildlife conflicts, and recommendations of locally appropriate native species for landscaping. The OAP shall be distributed to all purchasers with the Agreement of Purchase and Sale.	**OTTAWA Planning CA**
		Schools	
45.		The Owner is required to inform prospective purchasers that school accommodation problems exist in the Ottawa-Carleton District School Board schools designated to serve this development and that at the present time this problem is being addressed by the utilization of portable classrooms and/or by directing students to schools outside their community.	**OCDSB**
		Archaeology	

46.		The Owner shall adhere to the procedures of the "Contingency Plan for the Protection of Archaeological Resources in Urgent Situations" as approved by the Ministry of Citizenship, Culture and Recreation in the Archaeological Resource Potential Mapping Study of the City of Ottawa.	**OTTAWA Planning MTCS**
		<u>Stormwater Management</u>	
47.		The Owner shall provide any and all stormwater reports (list of reports, for example, a Stormwater Site Management Plan in accordance with a Conceptual Stormwater Site Management Plan) that may be required by the City for approval prior to the commencement of any works in any phase of the Plan of Subdivision. Such reports shall be in accordance with any watershed or subwatershed studies, conceptual stormwater reports, City or Provincial standards, specifications, and guidelines. The reports shall include, but not be limited to, the provision of erosion and sedimentation control measures, implementation, or phasing requirements of interim or permanent measures, and all stormwater monitoring and testing requirements. All reports and plans shall be to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning CA**
48.		(a) Prior to the commencement of construction of any phase of this Subdivision (roads, utilities, any off site work, etc.) the Owner shall: i. have a Stormwater Management Plan and an Erosion and Sediment Control Plan prepared by a Professional Engineer in accordance with current best management practices; ii. (if appropriate) provide all digital models and modelling analysis in an acceptable format; iii. have said plans approved by the General Manager, Planning, Real Estate and Economic Development Department, and iv. provide certification through a Professional Engineer licensed in the province of Ontario that the plans have been implemented. (b) All submissions and any changes made to the Plan shall be submitted to the satisfaction to the City. (c) The Owner shall implement an inspection and monitoring plan to maintain erosion control measures.	**OTTAWA Planning**
49.		On completion of all stormwater works, the Owner agrees to provide certification to the General Manager, Planning, Real Estate and Economic Development Department through a Professional Engineer, licensed in the province of Ontario, that all measures have been implemented in conformity with the approved Stormwater Site Management Plan.	**OTTAWA Planning**

50.		The Owner agrees that the development of the Subdivision shall be undertaken in such a manner as to prevent any adverse effects, and to protect, enhance or restore any of the existing or natural environment, through the preparation of any storm water management reports, as required by the City.	**OTTAWA Planning**
51.		The Owner covenants and agrees that the following clause shall be incorporated into all agreements of purchase and sale for the whole, or any part, of a lot or block on the Plan of Subdivision, and registered separately against the title: "The Owner acknowledges that some of the rear yards within this subdivision are used for on-site storage of infrequent storm events. Pool installation and/or grading alterations and/or coach houses on some of the lots may not be permitted and/or revisions to the approved Subdivision Stormwater Management Plan Report may be required to study the possibility of modification on any individual lot. The Owner must obtain approval of the General Manager, Planning, Real Estate and Economic Development Department of the City of Ottawa prior to undertaking any grading alterations."	**OTTAWA Legal**
52.		[To be used for lots that contain drainage swales, landscaping tees or any stormwater management conveyance infrastructure.] The Transferee, for themself, their heirs, executors, administrators, successors and assigns covenants and agrees to insert a clause in agreements of purchase and sale for the Lots/Blocks listed below that the Purchaser/Lessee is responsible to maintain conveyance of surface flow over the rear and/or side of their lot, and maintain sub-surface drainage infrastructure, all of which shall be to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department of the City of Ottawa.	**OTTAWA Planning**
		Sanitary Services	
53.		The Owner agrees to submit detailed municipal servicing plans, prepared by a Professional Civil Engineer licensed in the Province of Ontario, to the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning**
54.		Where the Owner is required under this Agreement to provide and install sanitary sewers of a diameter larger and/or at a greater depth than would be required to service the area to be developed, as detailed in the approved plans of this agreement, the Owner shall convey to the City such 0.3m reserves as may be necessary to prevent the Owners and	**OTTAWA Planning**

		developers of adjacent lands from making connections to the sanitary sewers installed by the Owner, the City will, insofar as it legally may, require other persons connecting to the sewer to pay an equitable share of the cost thereof to the Owner. The amount of payment shall be determined by the General Manager, Planning, Real Estate and Economic Development Department.	
55.		As the Owner proposes a road allowance(s) of less than 20 metres, and if the Owner also proposed boulevards between 4.0 and 5.0 metres wide, the Owner shall meet the following requirements: a) extend water, sanitary, and storm services a minimum of 2.0 metres onto private property during installation before being capped; b) install high voltage electrical cable through the transformer foundations to maintain adequate clearance from the gas main; c) provide and install conduits as required by each utility; d) provide and install transformer security walls when a 3.0 metres clearance, as required by the Electrical Code, cannot be maintained. The design and location of the security wall must be approved by the local hydro utility; and e) install all road-crossing ducts at a depth not to exceed 1.2 metres from top of duct to final grade.	**OTTAWA Planning**
		Water Services	
56.		The Owner agrees to design and construct all necessary watermains and the details of water servicing and metering for the lots abutting the watermains within the subject lands. The Owner shall pay all related costs, including the cost of connection, inspection and sterilization by City personnel, as well as the supply and installation of water meters by the City.	**OTTAWA Planning**
57.		The Owner shall prepare, at its cost, a hydraulic network analysis of the proposed water plant within the Plan of Subdivision and as it relates to the existing infrastructure. This analysis shall be submitted for review and approval as part of the water plant design submission.	**OTTAWA Planning**
58.		The Owner acknowledges and agrees not to permit any occupancy of buildings on the individual Lots described in Schedule "A" until the water plant has been installed, sterilized and placed in service to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning**

59.		The Owner further acknowledges and agrees that the service post, which is the fitting located near the property line that allows access to the shutoff valve, must be visible, raised to finished grade and in working condition.	**OTTAWA Planning**
60.		The Owner acknowledges and agrees not to apply for, nor shall the City issue, building permits for more than 50 dwelling units (or the equivalent) where the watermain for such units is not looped. Any unit serviced by a looped watermain that is not looped shall be required to have sufficient fire protection, to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning**
		Serviced Lands	
61.		The Owner shall be responsible for the provisions of the following works, including oversizing and over depth (where appropriate), at its cost, in accordance with plans approved by the General Manager, Planning, Real Estate and Economic Development Department, and/or the Province: a. Watermains; b. Sanitary Sewers; c. Storm Sewers; d. Roads and traffic plant(s); e. Street Lights; f. Sidewalks; g. Landscaping; h. Street name, municipal numbering, and traffic signs; i. Stormwater management facilities; and j. Grade Control and Drainage.	**OTTAWA Planning**
62.		The Owner shall not commence construction of any Works or cause or permit the commencement of any Works until the City issues a Commence Work Notification, and only then in accordance with the conditions contained therein.	**OTTAWA Planning**
63.		The Owner shall not be entitled to a building permit, early servicing, or commencement of work construction until they can demonstrate that there is adequate road, sanitary, storm, and watermain capacity and any Environmental Compliance Approvals (ECA) necessary are approved. All are to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning**
		Utilities	
64.		The Owner is hereby advised that prior to commencing any work within the subdivision, the Owner must confirm that sufficient wire-line communication /telecommunication infrastructure is currently available to the proposed development to provide communication/telecommunication service to the proposed development. In the event that such infrastructure	**OTTAWA Planning Bell Hydro One**

		is not available, the Owner is hereby advised that the Owner shall ensure, at no cost to the City, the connection to and/or extension of the existing communication / telecommunication infrastructure. The Owner shall be required to demonstrate to the municipality that sufficient communication /telecommunication infrastructure facilities are available within the proposed development to enable, at a minimum, the effective delivery of communication /telecommunication for emergency management services (i.e. 911 Emergency Services).	**Rogers Enbridge**
65.		The Owner agrees, prior to registration or early servicing, whichever is earlier, to provide a composite utility plan for the subdivision. Such plan shall be to the satisfaction of the General Manager, Planning, Real Estate and Economic Development Department.	**OTTAWA Planning Bell Hydro One Rogers Enbridge**
66.		The Owner acknowledges and agrees to convey any easement(s) as deemed necessary by Bell Canada to service this new development. The Owner further agrees and acknowledges to convey such easements at no cost to Bell Canada.	**Bell**
67.		The Owner agrees that should any conflict arise with existing Bell Canada facilities where a current and valid easement exists within the subject area, the Owner shall be responsible for the relocation of any such facilities or easements at their own cost.	**Bell**
68.		Upon receipt of this approval, the Owner is to provide Bell Canada with servicing plans/CUP at their earliest convenience to planninganddevelopment@bell.ca to confirm the provision of communication/telecommunication infrastructure needed to service the development.	**Bell**
69.		It shall be noted that it is the responsibility of the Owner to provide entrance/service duct(s) from Bell Canada's existing network infrastructure to service this development. In the event that no such network infrastructure exists, in accordance with the Bell Canada Act, the Owner may be required to pay for the extension of such network infrastructure.	**Bell**
70.		If the Owner elects not to pay for the above noted connection, Bell Canada may decide not to provide service to this development.	**Bell**
		Fire Services	
71.		Prior to registration the Owner acknowledges and agrees that Fire Protection has been addressed to the satisfaction of the General manager of Planning, Real Estate and Economic Development Department.	**OTTAWA Planning Fire**

		Land Transfers	
72.		The Owner shall convey, at no cost to the City, all lands required for public purposes, including but not limited to, reserves, road widenings, daylighting triangles, walkway blocks, open space blocks, and lands required for parks (or cash-in-lieu thereof) and for stormwater management. In particular, the Owner agrees to convey the following lands: i. 0.3 m Reserve Blocks –	**OTTAWA Planning Legal**
73.		The Owner agrees to convey, at no cost to the City, any easements that may be required for underground or overland stormwater drainage systems.	**OTTAWA Planning Legal**
		Blasting	
74.		The Owner agree that all blasting activities will conform to the City of Ottawa's standard S.P. No: F-1201 Use of Explosives. Prior to any blasting activities, a pre-blast survey shall be prepared as per F-1201, at the Owner expense for all buildings, utilities, structures, water wells, and facilities likely to be affected by the blast and those within 75 m of the location where explosives are to be used. The standard inspection procedure shall include the provision of an explanatory letter to the owner or occupant and owner with a formal request for permission to carry out an inspection. The Owner agree to provide a Notification Letter in compliance with City specification F-1201. Specification indicates that a minimum of 15 Business days prior to blasting the Contractor shall provide written notice to all owner(s) and tenants of buildings or facilities within a minimum of 150m of the blasting location. The Owner agrees to submit a copy of the Notification Letter to the City.	**OTTAWA Planning**
		Development Charges By-law	
75.		The Owner acknowledges that for building permits issued after January 15, 2010, payment of non-residential development charges, excluding development charges for institutional developments, may be calculated in two installments at the option of the Owner, such option to be exercised by the Owner at the time of the application for the building permit. The non-discounted portion of the development charge shall be paid at the time of issuance of the building permit and the discounted portion of the development charge shall be payable a maximum of two years from the date of issuance of the initial building permit subject to the following conditions:	**OTTAWA Planning Legal**

		a) a written acknowledgement from the Owner of the obligation to pay the discounted portion of the development charges; b) no reduction in the Letter of Credit below the amount of the outstanding discounted development charges; and c) indexing of the development charges in accordance with the provisions of the Development Charges By-law. The Owner further acknowledges that Council may terminate the eligibility for this two-stage payment at any time without notice, including for the lands subject to this agreement and including for a building permit for which an application has been filed but not yet issued. For the purposes of this provision, "discounted portion" means the costs of eligible services, except fire, police and engineered services that are subject to 90% cost recovery of growth-related net capital costs for purposes of funding from development charges. The 10% discounted portion, for applicable services, must be financed from non-development charge revenue sources. "Non-discounted portion" means the costs of eligible services, fire, police and engineered services, that are subject to 100% cost recovery of growth-related net capital costs for purposes of funding from development charges.	
		Survey Requirements	
76.		The Owner shall provide the final plan intended for registration in a digital format that is compatible with the City's computerized system.	**OTTAWA Planning**
77.		The Plan of Subdivision shall be referenced to the Horizontal Control Network in accordance with the City requirements and guidelines for referencing legal surveys.	**OTTAWA Surveys**
78.		The distance from the travelled Centreline of all existing adjacent roads to the subdivision boundary should be set out in the Plan of Subdivision.	**OTTAWA Surveys**
		Closing Conditions	
79.		The City Subdivision Agreement shall state that the conditions run with the land and are binding on the Owner's, heirs, successors and assigns.	**OTTAWA Legal**
80.		[Bill 163 and 20] At any time prior to final approval of this plan for registration, the City may, in accordance with Section 51 (44) of the *Planning Act*, amend, delete or add to the conditions and this may include the need for amended or new studies.	**OTTAWA Legal**

81.		The owner shall pay any outstanding taxes owing to the City of Ottawa prior to registration.	**OTTAWA Planning Revenue**
82.		Prior to registration of the Plan of Subdivision, the City is to be satisfied that conditions 1 to 81 have been fulfilled.	**OTTAWA Planning**
83.		The Owner covenants and agrees that should damage be caused to any of the Works in this Subdivision by any action or lack of any action whatsoever on its part, the General Manager, Planning, Real Estate and Economic Development Department may serve notice to the Owner to have the damage repaired and if such notification is without effect for a period of two full days after such notice, the General Manager, Planning, Real Estate and Economic Development Department may cause the damage to be repaired and shall recover the costs of the repair plus the Management Fee under Section 427, of the *Municipal Act*, *2001*, like manner as municipal taxes.	**OTTAWA Planning**
84.		[Bill 163 and 20] If the Plan(s) of Subdivision, including all phases within the draft approved plan of subdivision, has not been registered by 00/00/00, the draft approval shall lapse pursuant to Section 51 (32) of the *Planning Act*. Extensions may only be granted under the provisions of Section 51 (33) of said *Planning Act* prior to the lapsing date.	**OTTAWA Planning**

[i] For Clearing Agencies:
"Planning" refers to Planning Services.
"LG" refers to applicable landowners group, such as Kanata North (KNLG), Kanata West (KWLG), Fernbank (FLG), East Urban (EULG), Manotick SDA (MLG), and Barrhaven South (BSLG).
"CA" refers to applicable conservation authorities, including RVCA, MVCA, and SNCA.
"Legal" refers to Legal Services.
"Parks" refers to Parks and Facilities Planning Services.
"BCS" refers to Building Code Services.
"Transit" refers to Transit Planning.
"Transpo Plg" refers to Transportation Planning.
"Forestry" refers to Forest Management.
"MTCS" refers to the Ministry of Tourism, Culture and Sport.
"Revenue" refers to Revenue Services.

“Surveys” refers to Surveys & Mapping/City Surveyor.

SCHEDULE "I"

MAINTENANCE OF WORKS/FACILITIES

West Capital Airpark (Carp Airport)
Residential – Phase 1

In accordance with Section 7.6 of the Carp Airport Municipal Capital Facility and Development Agreement, the City is responsible for maintenance, repair and replacement of the works/facilities listed below:

1) **Roads including roadside ditches, grassed boulevards, sidewalks, curbs, culverts, streetlights, line painting, street name signs and traffic control signs:** Blocks 172 and 175 (Albert Boyd Private), Block 173 (Sopwith Private), Blocks 174, 180, 181 and 182 (Wingover Private), Blocks 159 and 176 (Chandelle Private) (from the cul-de-sac to Block 178 (Tailslide Private) and Block 178 (Tailslide Private).

2) **Storm Sewer Network including storm sewers, ICD's, road catchbasins, storm manholes):** Along Blocks 160, 169, 170, 171, 185, 197 and 201; Blocks 172 and 175 (Albert Boyd Private), Block 173 (Sopwith Private), Blocks 174, 180, 181 and 182 (Wingover Private), Blocks 159 and 176 (Chandelle Private) and Block 178 (Tailslide Private)

3) **Rearyard catachbasins and leads:**
   - Parts of Lots 1 and 2 being Parts 2, 3, 4 and 5 on an approved draft reference plan
   - Parts of Lots 5 and 6 being Parts 10, 11, 12 and 13 on an approved draft reference plan
   - Parts of Lots 45 and 46 being Parts 71, 72, 73 and 74 on an approved draft reference plan
   - Parts of Lots 33 and 34 being Parts 55, 56, 57 and 58 on an approved draft reference plan
   - Parts of Lots 25 and 26 being Parts 39, 40, 41 and 42 on an approved draft reference plan
   - Parts of Lots 22 and 23 being Parts 32, 33, 34 and 35 on an approved draft reference plan
   - Parts of Lots 69 and 70 being Parts 99, 100, 101 and 102 on an approved draft reference plan
   - Parts of Lots 74 and 75 being Parts 108, 109, 110 and 111 on an approved draft reference plan
   - Parts of Lots 31 and 32 being Parts 49, 50, 51 and 52 on an approved draft reference plan
   - Part of Lot 28 being Parts 114 and 115 on an approved draft reference plan

4) **Stormwater Management Pond:**
   - Block 157 - Stormwater Management Pond East
   - Block 156 - Stormwater Management Pond West

5) **Outlet Ditches:**
   - Blocks 163, 184, 186 and 193

6) **Stone Trench:** Beneath roadside ditches in Block 178 (Tailslide Private).

7) **Asphalt Walkways (including culverts, grassed areas and fence):**
   - Blocks 161, 162, 164, 165 and 170

8) **Stonedust Pathways including culverts:**
   - Along Blocks 174, 180, 181 and 182 (Wingover Private) from the west limit of the park to the bend in the road
   - Through Blocks 166, 167, 168 and 199

The City will be maintaining the roads in the Residential Phase 1 to the Class 5A standard as described in the City of Ottawa Maintenance Quality Standards for Roadway, Sidewalks and Pathways approved by Council and any future amendments.

Aden Rongve

From: Hall, Kevin <Kevin.Hall@ottawa.ca>
Sent: Wednesday, November 29, 2023 3:03 PM
To: Susan Gordon
Cc: Alex McAuley; Ostafichuk, Jeffrey
Subject: First Engineering Comments Carp Airport 1B-2
Attachments: Carp subd.revison 2.docx; Final stormwater comments Carp Airport Residential Phase 1-B2_Review Memo_2023-11-15.docx

Susan

Below and attached are the City's review comments on the First Engineering Submission reports and plans for the engineering design of Phase 1B-2 of the Carp Airport

General:

1. The City will not be accepting LIDs within the ROW. The City understands that due to the soils and high groundwater onsite, the development will not meet the requirements of LID design guidelines. Due to this the requirements of the Carp River Subwatershed Study will not be achieved. Best efforts to promote infiltration will be encouraged. Please continue with the rear yard and offsite infiltration trenches. Provide the amount of infiltration that will be achieved.
2. Storm sewers don't appear to be matching obvert to obvert along the streets. Please change that or provide a reason why they have to be designed that way.
3. Please add the manhole numbers to the SWM plan. Makes the review much easier.
4. GR-15. A culvert will be required at the intersection of the pathway and Wingover Private.
5. The outlet pipe from the OGS should continue to the pond.
6. No comments on the Hydraulic analysis of the watermains.
7. The draft plan conditions in Appendix A are not the correct conditions. The conditions shown are for the original draft approval. There are separate and new conditions for Phase 1B-2.
8. There is not much information provided to prove that the existing pond will work with the revised design of the drainage area to the pond. I generally agree that there will not be any issues with the change, but there still needs to be an analysis of the pond to confirm that the pond will perform as expected and no new HGL issues will arise.
9.

Stormwater Operations:

10. Please see attached document

Stormwater and Modelling Review:

11. Please see attached comments.

Kevin Hall, C.E.T.
Senior Project Manager
Development Review - Rural Services
Gestionnaire de projet, Approbation des demandes d'infrastructure

Examen des demandes d’aménagement (Services ruraux)
City of Ottawa | Ville d'Ottawa
ottawa.ca/planning / ottawa.ca/urbanisme

I am currently working from home. Email is the best way to contact me.

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City of Ottawa Stormwater Operations Comments
Received via email attachment November 29, 2023

West Capital Airpark

Carp Airport Phase 1B-2 General Plan of Services -Phase 1B-2

Design Drawings:

General Plan of Services -Phase 1B-2 10285-GP14

Grading Plan Phase 1B-2 10285-GR-13

The asphalt service road beside the Vortech Unit should be extended to the Unit to facilitate parking of a vacuum truck.

Arrows indicating the major flow pointing towards the CB 184; please provide a detail of the major flow channel entering the easement/block 81 towards the depression riprap.

The temporary ditch and major overland swale are discharging into a rip-rap depression where dimensions are not provided. The maintenance access for this feature is required.

DWG 102085 -P28 Plan and Profile Phase 1B-2 Block1 &Storm Sewer Outlet

Usually, upstream pipes are design to meet or exceed downstream pipe obverts and not as the profile indicated on the design drawing.

Can you please provide us with DWG. SWMF 6 detail since the profile is incomplete.

Date:	11/15/2023	File:	D07-16-22-0017
To:	Kevin Hall		
From:	Charles Warnock		
Project:	Carp Airport Residential Phase 1B-2		
Subject:	Stormwater Review – First Submission		

TECHNICAL MEMO

The following is a summary of the review that was undertaken by GM BluePlan Engineering (GMBP) of the West Capital Airpark Phase 1B-2 Residential SWM Report (NOVATECH, dated July 28, 2023), the West Capital Airpark Phase 1B-2 Residential Servicing Report (NOVATECH, dated July 28, 2023), and supporting modelling files and engineering drawings titled "WEST CAPITAL AIRPARK PHASE 1B-2 – RESIDENTIAL," JULY 28, 2023.

Comments:

THe comments below assume that the proposed ROW infiltration cb's are removed.
It is our recommendation that the following comments be provided to the applicant:

West Capital Airpark Phase 1B-2 Residential Servicing Report (NOVATECH, dated July 28, 2023):

1. The 2-year storm also requires a 10 minute TC not 15 minutes as shown.

West Capital Airpark Phase 1B-2 Residential SWM Report (NOVATECH, dated July 28, 2023)

1. Is it possible to provide a more details for selection of the 4-hour Chicago design storm as a critical design storm. Does the Chicago 4-hour storm create maximum peak flow or create maximum volume related to the inside of the pond elevation? Is there some excerpt from a previously approved SWM report in which the 4-hour Chicago storm was determined to be the critical design storm? The East SWM facility was designed using the SWMHYMO model, which used 4-hour Chicago storm distribution. And a 3-hour Chicago storm distribution is required to ensure that the pond's boundary conditions match the design storm being run for the development. It is assumed that the 3-hour Chicago storm is used as a boundary condition in the PCSWMM model. Please clarify.
2. On page 5, it is mentioned that "Refer to Section 4.3.4 for …". We assumed that it is typo of Section 2.3.4. please revise as required.
3. In Table 2, it is not clear why there is no capture flow within the RYCB's.
   The capture flow rate (2-year) shown as 'zero' in Table 2 for the rear yard catch basins are assumed to be because those flow/volume are not accounted for storage?
   City is in the process of updating guidelines with respect to LID's. Currently we do not allow for the elimination or downsizing of end-of-pipe facilities due to proposed infiltration methods. The model can be run to verify that the infiltration works. However outside of this the model runs for the different return periods used to estimate flows, volumes, HGL, etc. should assume that the LID is not present (or is full at the commencement of the storm). Please provide additional details about the rear yard infiltration trenches, including the quantity/storage information..
4. The information in Table 2 is not clear. In cases where the approach flow is greater than the capture flow, will there be ponding? If so, please add a column to this table to indicate the depth of the ponding. It should be minimal. The City of Ottawa Storm Sewer Design-Technical Bulletin, the minimum sewer size for local streets is based on 2-year storm and there should not have any surface ponding during 2-year event.
5. Based on the Table 3 in the SWM report, the current drainage area is about 9 ha less than it was designed to be at the time of Phase 1 Residential Registration. Is that +/- 9ha area that now drains uncontrolled to Carp Creek? Are any additional lands being directed directly to Carp Creek as part of the current proposal and if so, how will that impact the creek?

6. Based on the Table 3 in the SWM report, the current runoff coefficient comparing Phase 1 Residential Registration is reduced to 0.29. Please provide rationale of the reduced runoff coefficient in the SWM report? It seems that the future lands should be accounted for as developed, not undeveloped, so that proposed infrastructure is sized with the capacity for future development. What significant changes in land use resulted in lower A x C values when calculating the capacity of the East SWM facility? What is the stormwater quantity control plan for future development of undeveloped land?
7. Please provide rip-rap size and calculation for the rip-rap sizing.
8. Please provide capacity of the SWM pond inlet swale and please provide measures to prevent erosion in the SWM pond inlet swale (out-side of the rip-rap limits).
9. The groundwater from BH43-13 was observed below 1.51m from the surface. Please confirm if the infiltration trench in the backyard of Block 79 and Block 78 secures a minimum depth of 1.0m from the groundwater table. Please provide elevations for various cross sections along the infiltration trench and swales. The profiles should show the observed groundwater elevations from the Geotech report in the vicinity of the chosen cross-sections. In some areas near BH 9-11, BH 10-11, and BH 43-13, the elevation from the ground surface to the observed groundwater appears to be in the range of 0.4 to 1.54 m. Please review all infiltration trench, exfiltration, and infiltration swale measures.
10. The percolation rate should reflect the soil condition of the project site. Could you add details about the percolation rate of 25mm/h that is mentioned in the report (page 6). The most recent geotechnical report does not include a section on the proposal for infiltration. Please provide a reference to a Geotechnical report or an earlier approved report. There needs to be a minimum discussion on the ground water level and infiltration. Infiltration should be based on field measurements not assumptions made on based on soil types.
    The geotechnical report provided shows in Table 3 shows ground water elevations at a time that is not typically the highest level. Please comment on how this may affect the proposed infiltration practices proposed.
11. It is not clear in the Contech Sizing Report found in Appendix C what the contributing area to the OGS is in the Contech sizing software, as well as the imperviousness of that area. Please update accordingly and provide a drainage area plan for existing and proposed water quality treatment units.
12. Please verify that the OGS unit will treat a minimum of 90% of the total annual stormwater volume from the contributing area. Ensure that the bypass structure with the splitter weir does not allow too much of the flow to bypass the treatment system.
13. It would be helpful if a figure was provided that shows what catchment area contributes to the existing OGS, what area contributes to the proposed OGS, and what area contributes to the future OGS.
14. It is unclear how the annual infiltration rates found in the table on page 94 of the SWM report PDF were generated. Please provide details of how the infiltration rate per year was established for each location. Include calculations of infiltration depths for each of the infiltration/exfiltration units shown on page. The annual infiltration rates provided for the East Residential Water balance are not clear. Provide infiltration (mm) calculations for land use areas draining to an infiltration or exfiltration trench. Please note that, according to the table, post-development infiltration in the East Residential areas increased by 10.7% not decreased by.
15. It is assumed that the infiltration/water balance calculations and design details are taken from the 2015 SWM report. If so, please refer that as well in Section 2 of this report and include in the appendix any relevant information.
16. Section 2.2 is unclear about the water quality treatment measures proposed for Phases 1B-2 and future development areas. The new proposed treatment unit would consider half of the modelled 25 mm storm event from Phase 1B-2 and the entire future development area. But subsequently it stated that a second treatment unit would be provided for additional treatment for future development areas. Please review and clarify as necessary.

17. To compare and understand the changes, a table showing the water quality treatment areas, flows, and volumes from the previous submission (SWMMHYMO model result) and the recent submission (PCSWMM model output) is useful. For the SWM pond please provide a table that compares the previously approved inflows and outflows, volumes, and water levels with the proposed for this phase. Provide confirmation that all criteria listed in section 2.1 are being met or exceeded.
18. Section 2.3.4 stated that "...*was approved by the MOECC to meet the above noted criteria*." What criteria is it referring to?
19. Is the infiltration/water balance calculations, the same as in the 2015 SWM draft plan that was approved? Please make sure that all details such as length, bottom width, side slope, infiltration volume, etc. be provided for each infiltration trench type for the west and east residential communities in a table and compare the total volume meets the infiltration volume requirement for the site. Are the infiltration measures proposed in Phase 1B-2 the same as those proposed in the 2015 SWM report? If so, were the existing infiltration trenches in Phase 1B-2 area (marked as 'will be removed' in plans) excluded and used the new proposed ones in calculating the infiltration volume?
20. Grading plans must show the depths (elevations), volumes, and extent of ponding of all surface storage including spill areas. This would include the rear yards and the interim check dams.
21. Please provide the sizing details and infiltration drawdown times for the proposed interim swales. The extent of the interim swale should be clearly shown including grades at the top and bottom of the channel. The assumption is that all the water trapped upstream of the rock check dams will infiltrate. However, these check dams are permeable and only "slow down" the water. Was this factored into the calculations?
22. The total drainage area used in designing the water quality treatment units differ from the areas used in calculating the infiltration requirements for the East residential community. Please explain and/or correct the difference if necessary.
23. Please provide sample calculations sowing the C value for all zoning types and road cross sections. Include the minimum setbacks and maximum driveway widths allowed by the zoning.
24. It is assumed that the bypass structure (weir splitter) shown on the SWMF drawing is to divert flow for water quality treatment (required flow/volume) and the rest to the Pond without treatment. However, the Typical Bypass layout diagram provided in the report depicts bypassing the flow to two water quality treatment (either side) and the rest going to the Pond. It is assumed that a second water quality treatment unit will be installed as part of future development (this information is inconsistent in the report and drawings). Please include details on how the proposed water quality treatment unit works for this proposed development (including the drainage area).
25. Please consider protecting proposed infiltration units by capping end until the site is stabilized,
26. As per condition 63 of the subdivision agreement. Is the infiltration, OGS, SWM pond, temperature mitigation operating as designed. Please provide the monitoring information to date as required through the ECA.
27. PCSWMM hydrologic modeling routine chosen should not assume zero percent imperviousness. It will underestimate runoff and peak flows. A minimum 7% (C=0,25) should be used in the model.
28. Please describe how parameters width and slopes are determined. Please make sure they follow City guidelines.
29. Where are the HGL comparisons to the usf? There appears to be one location where the clearance is only 0.3 m from the usf. This is the minimum and leaves no room for error. Please comment.
30. If you could provide the C value and area in the ICD table this would help in checking the capacities.
31. Do cb's on grade even require an icd?
32. The cb's ICD's need to be designed to the rational method flows. Some areas such as the rear yards are over controlled. Example A-3 the 2-year rational flow is 48.8 l/s while the restriction at cb 170 is 28.6 l /s.
33. Why is the HGL 0.35m at the outlet from the 1650 mm pipe? Please extend the HGL profile to the outlet of the dry pond. Include the downstream receiving water surface elevation.
34. Show ponding areas upstream of proposed check dams. Provide the calculations for the volume estimate.

35. In the proposed infiltration trenches. Should there not be some sort of impermeable cutoff wall to keep water from draining out along the sewer trenches?

Engineering drawings titled "WEST CAPITAL AIRPARK PHASE 1B-2 – RESIDENTIAL," JULY 28, 2023.

1. Please add ICD sizes to the General Plan of Services.
2. Are the spill areas shown on the grading plan at the intersection of Street Three and Albert Boyd Private occur during the 2-year storm (at elevation of 116.83 m)? Note that, according to the City of Ottawa Storm Sewer Design-Technical Bulletin, there should be no surface ponding during the 2-year event. Please check all spill areas.
3. The design details of the inlet spillway (V-ditch) to the SWM facility, including cross-section and water levels (for the designed return period including the 100-year storm), must be provided in section E-E.
4. Riprap swale design details should include length of riprap areas on either side.
5. Are clear stone fillings of rock check dams within infiltration swales provided to the top of the bank of the swale, without any freeboard?
6. CB 200 and 170 connects to the existing system. Does it have the capacity? Why are the cb's 118 and 119 being swapped. Where are the calculations to show this requirement?
7. Drawing shows cb 119 and 118 to be swapped while table 2 indicates that cb's to be swapped 126 and 127 (can't locate these 2 cb's) and icd's in each of cb 138 and 139. Can't find these two locations in the previous phase on the drawings provided?
8. What is the purpose of having interconnected icd's each with their own icd? One of the most common reasons for interconnecting cb's is to have only one icd.
9. Show rear yard ponding and in the interim swale on the plans.
10. The spill elevation 116.33 behind lot 63 appears to be higher than the overflow to the undeveloped land set at 116.29. It would be a better if all the overflows to the adjacent lands were at least 15 cm higher than the internal spill elevation along the swale.
11. Profile drawing P28 show 1650 mm outlet 112.36 m then a slope down to the pond. Please extend the profile through the pond and out.
12. GR14, top left-hand corner, is the spill point drawing for Block 83?
13. Drawings show interconnected cb's 162A/162B and168A/168B with ponding on one side of the street but not the other. There is a continuous grade running from the T/G on 162A and 168A . Is it possible to have 6 and 7 cm of ponding on one side of the street without the water flowing up through the other cb? Similar at cross connected cb's 165A and 165B.
14. How do you model a segment that has one side in a sump and the other is on a continuous grade? Would it not be better to have them both the same?
15. SWMF5, provide inverts on the proposed offline exfiltration, provide inverts on Vortechs, provide details of the flow splitter upstream and downstream of Vortechs, Provide confirmation from Vortechs that the downstream weir will not affect the function of the OGS.

PCSWMM Modelling:

1. There are minor discrepancies regarding the size of the pipes in the PCSWMM. Please revise the size of the pipe as required. (ex.: between MH269-MH270- drawing 675mm, PCSWMM 686mm).
2. It seems that the infiltration ratio is calculated per the location of the trenches. Please provide rationale and/or calculation results regarding infiltration ratio into subsoil for the rear yard infiltration trenches, roadside exfiltration trenches, and an offline exfiltration trench in PCSWMM.
3. The volume between the modeling and report shows discrepancy for the rear yard infiltration trenches. In PCSWMM, the infiltration trenches are modeled as a combination of a box culvert (0.56mx1m) and 250mm pipe. The trenches are filled with 25 mm gravel, so the infiltration trenches in the PCSWMM are assumed to provide more volume. Please provide a rationale for the volume of the infiltration trenches applied in the model. In addition, please confirm if the volume of the 250mm pipe is subtracted from the volume of the trenches according to the model configuration.

4. Please review the model not to have any double accounting for storage (for example Albert Boyd Private Street).
5. Please acknowledge that City of Ottawa does not like to have interconnected catch basins. In some cases we have to allow for larger diameter icd's. Please review the design to see if you can eliminate interconnected CBs.
6. Please verify that the sawtooth flow conveyance in rear yard was not modeled as such but rather on a continuous grade.
7. The PCSWMM model files for 100 years are shown as outdated in the result tab. Please check and provide the most recent model with results.
8. How are the contributing areas to Infiltration RYCB to CB represented in the model calculated? The PCSWMM model is assumed to include only infiltration measures connected to storm sewers. Please note we do not allow for infiltration storage to be part of quantity and HGL calculations as noted earlier.
9. The report states the proposed water quality treatment units are for Phase 1B-2 and future development. The model shows only one water quality treatment unit. Please clarify.
10. According to the model, half of the stormwater from the development area goes to the OGS unit and the rest goes to the pond without treatment. Similarly, approximately 380 L/s of runoff is directed to the Pond via a swale, which includes external flows as well as approximately 68 L/s flow from development areas. The flows from the external areas are assumed to be from the existing conditions and do not require treatment at this Phase of development. Please clarify.

	City of Ottawa Comments (November 29, 2023)	Topic	Added	Hold/ Waiting for Info	Novatech Notes	Accepted
General						
1	The City will not be accepting LIDs within the ROW. The City understands that due to the soils and high groundwater onsite, the development will not meet the requirements of LID design guidelines. Due to this the requirements of the Carp River Subwatershed Study will not be achieved. Best efforts to promote infiltration will be encouraged. Please continue with the rear yard and offsite infiltration trenches. Provide the amount of infiltration that will be achieved.	LIDs			The infiltration trench LIDs within the ROW and the offline infiltration trench, located downstream of the OGS unit, have been removed per discussions with the City. The geotechnical grade raise restriction limits the ability to fill the site to raise the finished grade to allow for separation of the infiltration measures above the shallow groundwater. Explanation has been added to Section 3.0 (Water Balance) of the SWM report.	
2	Storm sewers don't appear to be matching obvert to obvert along the streets. Please change that or provide a reason why they have to be designed that way.	General			Storm sewers match obverts where possible. In some cases, sewer inverts were matched in order to increase the depth of the sewer and lower hydraulic grade line elevations so that geotechnical grade raise restrictions could be met.	
3	Please add the manhole numbers to the SWM plan. Makes the review much easier.	General			Manhole numbers have been added to the SWM plan (102085-SWM7).	
4	GR-15. A culvert will be required at the intersection of the pathway and Wingover Private.	General			The pathway occurs at the high point in the Wingover Private roadside ditches. Therefore, no culvert is required.	
5	The outlet pipe from the OGS should continue to the pond.	Pond Inlet and RipRap			The proposed outlet stops short of the pond to account for potential pond expansion as part of the future development lands.	
6	No comments on the Hydraulic analysis of the watermains.	General			Noted.	
7	The draft plan conditions in Appendix A are not the correct conditions. The conditions shown are for the original draft approval. There are separate and new conditions for Phase 1B-2.	General			The new correct draft plan conditions, received with the Notice of Approval of the revised Plan of Subdivision on September 20, 2023 have been added to Appendix A.	
8	There is not much information provided to prove that the existing pond will work with the revised design of the drainage area to the pond. I generally agree that there will not be any issues with the change, but there still needs to be an analysis of the pond to confirm that the pond will perform as expected and no new HGL issues will arise.	OGS, Pond Capacity, and Future Lands			The pond has been modelled with the current design and sufficient pond capacity has been confirmed. Refer to the results in Appendix D of the SWM report.	
Grading Plan (102085-GR13)						
1	The asphalt service road beside the Vortech Unit should be extended to the Unit to facilitate parking of a vacuum truck.	General			Refer to the Grading Plan (102085-GR14) for asphalt limits, which are shown around the Vortech unit to facilitate parking.	
2	Arrows indicating the major flow pointing towards the CB 184; please provide a detail of the major flow channel entering the easement/block 81 towards the depression riprap.	General			The access road to SWM Facility will act as a major flow channel through Block 81. Refer to details on drawings 102085-GR14 and 102085-SWMF5.	
3	The temporary ditch and major overland swale are discharging into a rip-rap depression where dimensions are not provided. The maintenance access for this feature is required.	General			Rip rap dimensions have been added to the 102085-SWMF5 drawing. Access to this feature is via the asphalt access area provided to the OGS unit.	
Plan and Profile Phase 1B-2 Block 81 & Storm Sewer Outlet (102085-P28)						
1	Usually, upstream pipes are design to meet or exceed downstream pipe obverts and not as the profile indicated on the design drawing.	General			See response to General comment 2.	
2	Can you please provide us with DWG. SWMF 6 detail since the profile is incomplete.	Pond Inlet & RipRap			Additional pond inlet details are provided on drawings 102085-SWMF5 and 102085-SWMF6.	

	City of Ottawa Comments (November 29, 2023)	Topic	Added	Hold/ Waiting for Info	Novatech Notes	Accepted
Servicing Report						
1	The 2-year storm also requires a 10 minute TC not 15 minutes as shown.	General			The storm sewer design sheet has been updated with a time of concentration of 10 minutes. Refer to Appendix D of the Servicing Report.	
SWM Report						
1	Is it possible to provide a more details for selection of the 4-hour Chicago design storm as a critical design storm. Does the Chicago 4-hour storm create maximum peak flow or create maximum volume related to the inside of the pond elevation? Is there some excerpt from a previously approved SWM report in which the 4-hour Chicago storm was determined to be the critical design storm? The East SWM facility was designed using the SWMHYMO model, which used 4-hour Chicago storm distribution. And a 3-hour Chicago storm distribution is required to ensure that the pond's boundary conditions match the design storm being run for the development. It is assumed that the 3-hour Chicago storm is used as a boundary condition in the PCSWMM model. Please clarify.	General			In order to be consistent with the original pond design in the Stormwater Site Management Report Residential, April 6, 2015, only the 4-hour Chicago storm was used in the analysis as the 2015 report indicates that this is the critical design storm. Additional text has been added to Section 2.3.1 of the SWM report to clarify.	
2	On page 5, it is mentioned that "Refer to Section 4.3.4 for …". We assumed that it is typo of Section 2.3.4. please revise as required.	General			This was a typo. Due to changes to the report, this reference was removed.	
3	In Table 2, it is not clear why there is no capture flow within the RYCB's. The capture flow rate (2-year) shown as 'zero' in Table 2 for the rear yard catch basins are assumed to be because those flow/volume are not accounted for storage? City is in the process of updating guidelines with respect to LID's. Currently we do not allow for the elimination or downsizing of end-of-pipe facilities due to proposed infiltration methods. The model can be run to verify that the infiltration works. However outside of this the model runs for the different return periods used to estimate flows, volumes, HGL, etc. should assume that the LID is not present (or is full at the commencement of the storm). Please provide additional details about the rear yard infiltration trenches, including the quantity/storage information.	LIDs			Rear yard infiltration was removed from the modelling. This corrected any issues with the ICD table (Table 5 in Section 2.3.4) for the rear yards. Infiltration volume calculations are provided in Appendix F of the SWM report.	
4	The information in Table 2 is not clear. In cases where the approach flow is greater than the capture flow, will there be ponding? If so, please add a column to this table to indicate the depth of the ponding. It should be minimal. The City of Ottawa Storm Sewer Design-Technical Bulletin, the minimum sewer size for local streets is based on 2-year storm and there should not have any surface ponding during 2-year event.	Ponding			A ponding table (Table 6) has been provided in Section 2.3.4 to show that there is no ponding in sags during the 2-year event. Updated ICD sizes show that the inlet rate of the ICDs can handle the 2-year flows.	
5	Based on the Table 3 in the SWM report, the current drainage area is about 9 ha less than it was designed to be at the time of Phase 1 Residential Registration. Is that +/- 9ha area that now drains uncontrolled to Carp Creek? Are any additional lands being directed directly to Carp Creek as part of the current proposal and if so, how will that impact the creek?	OGS, Pond Capacity, and Future Lands			The difference in areas is due to the interim condition having undeveloped area being directed to the Creek as per existing drainage patterns. The ultimate design of the East Residential Community will have a similar drainage area being controlled by the pond and there are no significant changes to the post-development drainage patterns from the original design of the subdivision. Note that Table 3 is no longer included in the report as the SWMF has been included in the PCSWMM model. The PCSWMM model, which includes the pond and outlet structure, shows that there are no impacts to the creek based on the proposed interim and ultimate conditions of the East Residential Community. Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond.	

	City of Ottawa Comments (November 29, 2023)	Topic	Added	Hold/ Waiting for Info	Novatech Notes	Accepted
6	Based on the Table 3 in the SWM report, the current runoff coefficient comparing Phase 1 Residential Registration is reduced to 0.29. Please provide rationale of the reduced runoff coefficient in the SWM report? It seems that the future lands should be accounted for as developed, not undeveloped, so that proposed infrastructure is sized with the capacity for future development. What significant changes in land use resulted in lower A x C values when calculating the capacity of the East SWM facility? What is the stormwater quantity control plan for future development of undeveloped land?	OGS, Pond Capacity, and Future Lands			Table 3, in Section 2.3.4, was for the capcity of the Existing SWM facility with the future lands being undeveloped. This table has been removed and replaced with further analysis and discussion on both the interim condtion (1B-2 with undeveloped future lands) and the ultimate condition (1B-2 with developed future lands) contributing to the SWM facility. The storm sewers near the pond outlet are sized to accommodate the future developed lands. A second OGS unit is proposed as part of the future development to meet the quality control requirements of the future development lands. Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond.	
7	Please provide rip-rap size and calculation for the rip-rap sizing.	Pond Inlet & RipRap			Refer to Appendix E of the SWM Report for supporting calculations.	
8	Please provide capacity of the SWM pond inlet swale and please provide measures to prevent erosion in the SWM pond inlet swale (out-side of the rip-rap limits).	Pond Inlet & RipRap			The capacity of the SWM pond inlet swale was evaluated in PCSWMM. The velocities in the swale show that erosion control measures are not required. Additional discussion is provided in Section 2.3.5 of the SWM Report.	
9	The groundwater from BH43-13 was observed below 1.51m from the surface. Please confirm if the infiltration trench in the backyard of Block 79 and Block 78 secures a minimum depth of 1.0m from the groundwater table. Please provide elevations for various cross sections along the infiltration trench and swales. The profiles should show the observed groundwater elevations from the Geotech report in the vicinity of the chosen cross-sections. In some areas near BH 9-11, BH 10-11, and BH 43-13, the elevation from the ground surface to the observed groundwater appears to be in the range of 0.4 to 1.54 m. Please review all infiltration trench, exfiltration, and infiltration swale measures.	LIDs			As discussed with City staff, a best management practice approach is being proposed for infiltration. Some rearyard systems may not meet the depth above groundwater, which is consistent with standard City of Ottawa rearyard subdrain systems. Refer to section 3.0 of the Stormwater Management Report for further discussion.	
10	The percolation rate should reflect the soil condition of the project site. Could you add details about the percolation rate of 25mm/h that is mentioned in the report (page 6). The most recent geotechnical report does not include a section on the proposal for infiltration. Please provide a reference to a Geotechnical report or an earlier approved report. There needs to be a minimum discussion on the ground water level and infiltration. Infiltration should be based on field measurements not assumptions made on based on soil types. The geotechnical report provided shows in Table 3 shows ground water elevations at a time that is not typically the highest level. Please comment on how this may affect the proposed infiltration practices proposed.	LIDs			The infiltration rate used is per the approved 2015 Master SWM Report and is per Table 4.4 of the MOE SWM Planning & Design Manual, based on the on-site soils. Based geotechnical and gorundwater constraints that limit infiltration measures to best management practices, in-situ testing does not provide additional benefit. Additional discussion on groundwater elevations has been added to Section 3.0 of the SWM Report.	
11	It is not clear in the Contech Sizing Report found in Appendix C what the contributing area to the OGS is in the Contech sizing software, as well as the imperviousness of that area. Please update accordingly and provide a drainage area plan for existing and proposed water quality treatment units.	OGS, Pond Capacity, and Future Lands			Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond and OGS units.	
12	Please verify that the OGS unit will treat a minimum of 90% of the total annual stormwater volume from the contributing area. Ensure that the bypass structure with the splitter weir does not allow too much of the flow to bypass the treatment system.	General			Per the Vortechs design sheets provided in Appendix C, 90% of the projected annual runoff volume would be treated. The bypass weir is designed to convey the 25mm 4-hour Chicago event to the OGS unit (for both the interim and ultimate condition).	
13	It would be helpful if a figure was provided that shows what catchment area contributes to the existing OGS, what area contributes to the proposed OGS, and what area contributes to the future OGS.	OGS, Pond Capacity, and Future Lands			Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond.	

	City of Ottawa Comments (November 29, 2023)	Topic	Added	Hold/ Waiting for Info	Novatech Notes	Accepted
14	It is unclear how the annual infiltration rates found in the table on page 94 of the SWM report PDF were generated. Please provide details of how the infiltration rate per year was established for each location. Include calculations of infiltration depths for each of the infiltration/exfiltration units shown on page. The annual infiltration rates provided for the East Residential Water balance are not clear. Provide infiltration (mm) calculations for land use areas draining to an infiltration or exfiltration trench. Please note that, according to the table, post-development infiltration in the East Residential areas increased by 10.7% not decreased by.	LIDs			The Infiltration rates on Page 94 were from the approved 2021 Servicing and Stormwater Report (Phase 2A, 2021). The calculations for this area were added to Appendix F of the SWM report. Additional notes to the Appendix F calculations are provided to clarify the calculations for the annual infiltration rates.	
15	It is assumed that the infiltration/water balance calculations and design details are taken from the 2015 SWM report. If so, please refer that as well in Section 2 of this report and include in the appendix any relevant information.	LIDs			The water balance calculations use the same methodology as the Stormwater Site Management Report Residential (April 6, 2015), but with updated design info for Phase 1B-2 and the West Residential Development (Phase 1A and 2A). Note that the water balance calculations that assumes no BMPs from the 2015 SWM report was added to Appendix F.	
16	Section 2.2 is unclear about the water quality treatment measures proposed for Phases 1B-2 and future development areas. The new proposed treatment unit would consider half of the modelled 25 mm storm event from Phase 1B-2 and the entire future development area. But subsequently it stated that a second treatment unit would be provided for additional treatment for future development areas. Please review and clarify as necessary.	OGS, Pond Capacity, and Future Lands			Additional clarification has been added to Section 2.2 of the SWM report to clarify existing, proposed, and future OGS units. Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond and OGS units.	
17	To compare and understand the changes, a table showing the water quality treatment areas, flows, and volumes from the previous submission (SWMMHYMO model result) and the recent submission (PCSWMM model output) is useful. For the SWM pond please provide a table that compares the previously approved inflows and outflows, volumes, and water levels with the proposed for this phase. Provide confirmation that all criteria listed in section 2.1 are being met or exceeded.	OGS, Pond Capacity, and Future Lands			Figures 102085-OGS1 and 102085-OGS2 have been prepared and added to the SWM report to clarify drainage areas to the pond and OGS units in both the interim and ultimate conditions. The SWMF was included in the PCSWMM model. The report discusses that the volumes, HGLs and outflows are in accordance with the previous design and all design criteria.	
18	Section 2.3.4 stated that "...was approved by the MOECC to meet the above noted criteria." What criteria is it referring to?	General			The report text has been updated to reference the design criteria in Section 2.1	
19	Is the infiltration/water balance calculations, the same as in the 2015 SWM draft plan that was approved? Please make sure that all details such as length, bottom width, side slope, infiltration volume, etc. be provided for each infiltration trench type for the west and east residential communities in a table and compare the total volume meets the infiltration volume requirement for the site. Are the infiltration measures proposed in Phase 1B-2 the same as those proposed in the 2015 SWM report? If so, were the existing infiltration trenches in Phase 1B-2 area (marked as 'will be removed' in plans) excluded and used the new proposed ones in calculating the infiltration volume?	LIDs			The water balance calculations uses the same methodology as the approved Stormwater Site Management Report Residential (April 6, 2015), but with updated design info for Phase 1B-2 and the West Residential Development. Storage volume calculations for the East and West Residential Communities have been provided in Appendix F. Due to the site constraints, and discussions with the City, the infiltration volume requirement no longer applies. The infiltration measures in the 2015 SWM report were assumed to be roadside ditches and taxiways which are no longer proposed in Phase 1B-2. The infiltration swales in Phase 1B-2 marked as "to be removed" were part of the West Residential Phase 2A design, in order to meet the requirement of matching the pre-development infiltration throughout construction. These removed swale have been excluded from the updated water balance calculations. Infiltration measures have been revised based on the proposed Phase 1B-2 design.	

	City of Ottawa Comments (November 29, 2023)	Topic	Added	Hold/ Waiting for Info	Novatech Notes	Accepted
20	Grading plans must show the depths (elevations), volumes, and extent of ponding of all surface storage including spill areas. This would include the rear yards and the interim check dams.	Ponding			Static ponding depths (elevations) and extents (contours) have been added to all surface storage areas in the right-of-way, rear yards, and interim infiltration swales. Ponding elevations have been shown for the 100-year and 100-yr + 20% storm events within the right-of-way. Refer to the Grading Plans. Ponding volumes are in provided in Table 6 of the SWM Report	
21	Please provide the sizing details and infiltration drawdown times for the proposed interim swales. The extent of the interim swale should be clearly shown including grades at the top and bottom of the channel. The assumption is that all the water trapped upstream of the rock check dams will infiltrate. However, these check dams are permeable and only "slow down" the water. Was this factored into the calculations?	LIDs			Additional sizing details and drawdown times for the interim infiltration swales are provided in Appendix F. Drawdown times provided in the infiltration summary in Appendix F. Check dams have been revised to have 0.20m earth berm to hold back and infiltrate the runoff. The volumes are based on a 0.20m depth. Refer to the Infiltration Measures Plan (102085-INF2) for check dam details.	
22	The total drainage area used in designing the water quality treatment units differ from the areas used in calculating the infiltration requirements for the East residential community. Please explain and/or correct the difference if necessary.	OGS, Pond Capacity, and Future Lands			Water balance includes direct runoff areas and external areas that are not captured by the OGS units. Figures 102085-OGS1 and 102085-OGS2 have been prepared and added to the SWM report to clarify existing, proposed, and future OGS units.	
23	Please provide sample calculations sowing the C value for all zoning types and road cross sections. Include the minimum setbacks and maximum driveway widths allowed by the zoning.	General			C value calculations have been revised to include minimum setbacks, maximum lot coverage and maximum driveway widths. Refer to Coefficient Calculations drawing 102085-SWM-CC.	
24	It is assumed that the bypass structure (weir splitter) shown on the SWMF drawing is to divert flow for water quality treatment (required flow/volume) and the rest to the Pond without treatment. However, the Typical Bypass layout diagram provided in the report depicts bypassing the flow to two water quality treatment (either side) and the rest going to the Pond. It is assumed that a second water quality treatment unit will be installed as part of future development (this information is inconsistent in the report and drawings). Please include details on how the proposed water quality treatment unit works for this proposed development (including the drainage area).	OGS, Pond Capacity, and Future Lands			Figures 102085-OGS1 and 102085-OGS2 have been prepared and added to the SWM report to clarify existing, proposed, and future OGS units. The SWM report and PCSWMM models include both an interim and ultimate condition. The ultimate condition model demonstrates the function of the OGS units and bypass weir for the future development areas. Note that the future OGS unit sizing and bypass weir elevation will be confirmed during the design of the future development.	
25	Please consider protecting proposed infiltration units by capping end until the site is stabilized.	LIDs			Filter bags are to be placed under all rear yard catch basin lids until the site is stabilized. Refer to drawing 102085-ESC3.	
26	As per condition 63 of the subdivision agreement. Is the infiltration, OGS, SWM pond, temperature mitigation operating as designed. Please provide the monitoring information to date as required through the ECA.	LIDs			Due to ongoing buildout of the homes in Phase 1B-1 residential, temperature monitoring has not begun. Temperature monitoring program will begin following additional buildout of Phase 1B-1.	
27	PCSWMM hydrologic modeling routine chosen should not assume zero percent imperviousness. It will underestimate runoff and peak flows. A minimum 7% (C=0,25) should be used in the model.	General			Noted, these areas have been updated to have a 7% imperviousness.	
28	Please describe how parameters width and slopes are determined. Please make sure they follow City guidelines.	General			It has been confirmed that the width and slopes for subcatchment parameters were determined per City guidelines. Additional text is provided in the SWM report (Section 2.3.2) to reflect this.	
29	Where are the HGL comparisons to the usf? There appears to be one location where the clearance is only 0.3 m from the usf. This is the minimum and leaves no room for error. Please comment.	General			Refer to the updated USF tables in Appendix D which outlines HGL clearances to USFs for both the interim and ultimate conditions. Table 8 in the SWM Report provides the HGLs for the ultimate condition.	

	City of Ottawa Comments (November 29, 2023)	Topic	Added	Hold/ Waiting for Info	Novatech Notes	Accepted
30	If you could provide the C value and area in the ICD table this would help in checking the capacities.	ICDs			Table 5 in the report body provides the rational method flows, and an expanded ICD table Appendix D of the Stormwater Management Report has been updated to provide the area and C value.	
31	Do cb's on grade even require an icd?	ICDs			On-grade CBs require ICDs to control the 100-year runoff to the 2-year peak flows from the subcatchment.	
32	The cb's ICD's need to be designed to the rational method flows. Some areas such as the rear yards are over controlled. Example A-3 the 2-year rational flow is 48.8 l/s while the restriction at cb 170 is 28.6 l /s.	ICDs			Rational Method flows have been added to Table 5. Previously the rear yards were under-controlled due to storage within the infiltration system. The ICD sizes have been updated with the model now reflecting that the rear yard infiltration system is full.	
33	Why is the HGL 0.35m at the outlet from the 1650 mm pipe? Please extend the HGL profile to the outlet of the dry pond. Include the downstream receiving water surface elevation.	Pond Inlet & RipRap			The HGL of 112.71 at the pond inlet pipe represents the 100-year water level in the pond. The approved design drawing for the existing pond has been included and provides a profile through the pond. Refer to drawing 102085-SWMF2 included in the SWM Report.	
34	Show ponding areas upstream of proposed check dams. Provide the calculations for the volume estimate.	Ponding			Static ponding contours have been added to the interim infiltration swales. Volumes are not quantified as the infiltration approach is "Best-Management Practices."	
35	In the proposed infiltration trenches. Should there not be some sort of impermeable cutoff wall to keep water from draining out along the sewer trenches?	LIDs			Infiltration trenches have been removed from within the right of ways.	
Drawings						
1	Please add ICD sizes to the General Plan of Services.	ICDs			The catchbasin table showing the ICD sizes previously located on the Notes and Details Plan 102085-ND1B2 has been moved to the General Plans of Services 102085-GP13 and 102085-GP14.	
2	Are the spill areas shown on the grading plan at the intersection of Street Three and Albert Boyd Private occur during the 2-year storm (at elevation of 116.83 m)? Note that, according to the City of Ottawa Storm Sewer Design-Technical Bulletin, there should be no surface ponding during the 2-year event. Please check all spill areas.	Ponding			Ponding contours shown on the grading plans represent static ponding elevations. No ponding is proposed during the 2-year event.	
3	The design details of the inlet spillway (V-ditch) to the SWM facility, including cross-section and water levels (for the designed return period including the 100-year storm), must be provided in section E-E.	Pond Inlet & RipRap			Additional pond inlet details are provided on drawings 102085-SWMF5 and 102085-SWMF6.	
4	Riprap swale design details should include length of riprap areas on either side.	Pond Inlet & RipRap			This information has been added to the drawing 102085-SWMF5.	
5	Are clear stone fillings of rock check dams within infiltration swales provided to the top of the bank of the swale, without any freeboard?	Ponding			Refer to drawing 102085-INF2 for updated details of the rock check dams. As the runoff originates from the undeveloped lands, freeboard is not provided on the undeveloped side of the swale.	

	City of Ottawa Comments (November 29, 2023)	Topic	Added	Hold/ Waiting for Info	Novatech Notes	Accepted
6	CB 200 and 170 connects to the existing system. Does it have the capacity? Why are the cb's 118 and 119 being swapped. Where are the calculations to show this requirement?	ICDs			The modelling results indicate sufficient capacity to connect CB 200 and CB 170 to the existing Phase 1B-1 system. Some existing ICDs are being swapped due to changes in system HGL with the development of Phase 1B-2. Refer to model results in Appendix D.	
7	Drawing shows cb 119 and 118 to be swapped while table 2 indicates that cb's to be swapped 126 and 127 (can't locate these 2 cb's) and icd's in each of cb 138 and 139. Can't find these two locations in the previous phase on the drawings provided?	ICDs			Drawing 102085-GP13 has been revised to indicate the location of CB 126 and CB 127. CB 138 and CB 139 are shown on drawing 102085-GP13 at approximately station 9+490.	
8	What is the purpose of having interconnected icd's each with their own icd? One of the most common reasons for interconnecting cb's is to have only one icd.	ICDs			Design has been revised such that there are no more interconnected catch basins. Each catch basin will have its own ICD, if required.	
9	Show rear yard ponding and in the interim swale on the plans.	Ponding			Static ponding contours have been added to the Grading Plans.	
10	The spill elevation 116.33 behind lot 63 appears to be higher than the overflow to the undeveloped land set at 116.29. It would be a better if all the overflows to the adjacent lands were at least 15 cm higher than the internal spill elevation along the swale.	General			The Lot 63 corner elevation has been revised. Refer to Grading Plan 102085-GR14.	
11	Profile drawing P28 show 1650 mm outlet 112.36 m then a slope down to the pond. Please extend the profile through the pond and out.	Pond Inlet & RipRap			Additional pond details are provided on drawings 102085-SWMF5 and 102085-SWMF6. The approved design drawing for the existing pond has been included and provides a profile through the pond. Refer to drawing 102085-SWMF2.	
12	GR14, top left-hand corner, is the spill point drawing for Block 83?	General			Yes. Name of detail has been updated to refer to Block 83.	
13	Drawings show interconnected cb's 162A/162B and168A/168B with ponding on one side of the street but not the other. There is a continuous grade running from the T/G on 162A and 168A . Is it possible to have 6 and 7 cm of ponding on one side of the street without the water flowing up through the other cb? Similar at cross connected cb's 165A and 165B.	Ponding			The ponding contours shown are static ponding elevations which would represent maximum ponding in emergency situations (i.e. blockage in CB162A or CB 168A).	
14	How do you model a segment that has one side in a sump and the other is on a continuous grade? Would it not be better to have them both the same?	General			In the PCSWMM model, both were modelled as on-grade. In the drawings, the ponding limits shown reflect the maximum static ponding for the CB in a sag.	
15	SWMF5, provide inverts on the proposed offline exfiltration, provide inverts on Vortechs, provide details of the flow splitter upstream and downstream of Vortechs, Provide confirmation from Vortechs that the downstream weir will not affect the function of the OGS.	General			The offline exfiltration trench and the weir in MH 277 have been removed. Refer to the Vortech 1929CIP Layout Detail on drawing 102085-SWMF5 for details.	
PCSWMM Modelling						
1	There are minor discrepancies regarding the size of the pipes in the PCSWMM. Please revise the size of the pipe as required. (ex.: between MH269-MH270- drawing 675mm, PCSWMM 686mm).	General			Actual pipe sizes were used in the model instead of nominal pipe sizes.	
2	It seems that the infiltration ratio is calculated per the location of the trenches. Please provide rationale and/or calculation results regarding infiltration ratio into subsoil for the rear yard infiltration trenches, roadside exfiltration trenches, and an offline exfiltration trench in PCSWMM.	LIDs			All infiltration measures have been removed from the PCSWMM model. Rear yard pipes are assumed to be full for modelling purposes.	
3	The volume between the modeling and report shows discrepancy for the rear yard infiltration trenches. In PCSWMM, the infiltration trenches are modeled as a combination of a box culvert (0.56mx1m) and 250mm pipe. The trenches are filled with 25 mm gravel, so the infiltration trenches in the PCSWMM are assumed to provide more volume. Please provide a rationale for the volume of the infiltration trenches applied in the model. In addition, please confirm if the volume of the 250mm pipe is subtracted from the volume of the trenches according to the model configuration.	LIDs			The rear yard infiltration was excluded from the PCSWMM model as they are assumed to be full for modelling purposes. Only the downstream rear yard pipe was modelled. Due to the perched outlet pipe for the rear yard systems (to promote infiltration) all rear yard pipes were modelled as full using an initial depth.	
4	Please review the model not to have any double accounting for storage (for example Albert Boyd Private Street).	General			Updated the major system conduits at intersections to ensure no double counting of storage. Set lengths shorter so as to not double count the road sections.	
5	Please acknowledge that City of Ottawa does not like to have interconnected catch basins. In some cases we have to allow for larger diameter icd's. Please review the design to see if you can eliminate interconnected CBs.	ICDs			The storm sewer design has been revised such that there are no more interconnected catch basins.	
6	Please verify that the sawtooth flow conveyance in rear yard was not modeled as such but rather on a continuous grade.	General			All major systems in the rear yards show a continuous grade to the road. No saw toothing was modelled.	

	City of Ottawa Comments (November 29, 2023)	Topic	Added	Hold/ Waiting for Info	Novatech Notes	Accepted
7	The PCSWMM model files for 100 years are shown as outdated in the result tab. Please check and provide the most recent model with results.	General			Updated PCSWMM model packages have been provided with updated results.	
8	How are the contributing areas to Infiltration RYCB to CB represented in the model calculated? The PCSWMM model is assumed to include only infiltration measures connected to storm sewers. Please note we do not allow for infiltration storage to be part of quantity and HGL calculations as noted earlier.	LIDs			All infiltration measures have been removed from the PCSWMM model. Rear yard pipes are assumed to be full for modelling purposes.	
9	The report states the proposed water quality treatment units are for Phase 1B-2 and future development. The model shows only one water quality treatment unit. Please clarify.	OGS, Pond Capacity, and Future Lands			An ultimate conditions model was added to the SWM analysis which includes the additional water quality treatment unit.	
10	According to the model, half of the stormwater from the development area goes to the OGS unit and the rest goes to the pond without treatment. Similarly, approximately 380 L/s of runoff is directed to the Pond via a swale, which includes external flows as well as approximately 68 L/s flow from development areas. The flows from the external areas are assumed to be from the existing conditions and do not require treatment at this Phase of development. Please clarify.	OGS, Pond Capacity, and Future Lands			Only minor system flows are directed through the OGS unit, and the OGS unit is only designed to treat the water quality event (25mm storm event). In the interim condition PCSWMM model, the future development area is undeveloped and does not require treatment. An ultimate condition PCSWMM model was included in the SWM report that shows the additional unit and the treatment of the future development area with a C = 0.65. Figures 102085-OGS1 and 102085-OGS2 clarify the interim and ultimate drainage areas to the pond and OGS units.	

Date:	3/26/2024	File:	D07-16-22-0017
To:	Kevin Hall		
From:	Charles Warnock, Sobha Kunjikutty		
Project:	Carp Airport Residential Phase 1B-2		
Subject:	Stormwater Review – Second Submission		

TECHNICAL MEMO

The following is a summary of the review that was undertaken by the City of Ottawa SWM review unit of the West Capital Airpark Phase 1B-2 Residential SWM Report (NOVATECH, Revised dated February 26, 2024), the West Capital Airpark Phase 1B-2 Residential Servicing Report (NOVATECH, Revised dated February 26,2024), and supporting modelling files and engineering drawings titled "WEST CAPITAL AIRPARK PHASE 1B-2 – RESIDENTIAL," February 2024.

Comments:

It is our recommendation that the following comments be provided to the applicant:

	Comments	Response	Outstanding/Additional info to discuss
West Capital Airpark Phase 1B-2 Residential Servicing Report			
1.	The 2-year storm also requires a 10 minute TC not 15 minutes as shown.	The storm sewer design sheet has been updated with a time of concentration of 10 minutes. Refer to Appendix D of the Servicing Report.	No further comment
West Capital Airpark Phase 1B-2 Residential SWM Report			
1.	Is it possible to provide a more details for selection of the 4-hour Chicago design storm as a critical design storm. Does the Chicago 4-hour storm create maximum peak flow or create maximum volume related to the inside of the pond elevation? Is there some excerpt from a previously approved SWM report in which the 4-hour Chicago storm was determined to be the critical design storm? The East SWM facility was designed using the SWMHYMO model, which used 4-hour Chicago storm distribution. And a 3-hour Chicago storm distribution is required to ensure that the pond's boundary conditions match the design storm being run for the development. It is assumed that the 3-hour Chicago storm is used as a	In order to be consistent with the original pond design in the Stormwater Site Management Report Residential, April 6, 2015, only the 4-hour Chicago storm was used in the analysis as the 2015 report indicates that this is the critical design storm. Additional text has been added to Section 2.3.1 of the SWM report to clarify.	Section 2.3.1 now states that the 4-hour Chicago design storm produces the maximum HGL levels and ponding depths for both the minor and major systems. The same design storm was utilized for the stress test, a 4-hour Chicago design storm with 20% more intensity and total volume than

	boundary condition in the PCSWMM model. Please clarify.		the 100-year event. In response to the previous comment, an excerpt of the prior report or table comparing the assessed design storms should have been provided when identifying critical design storms. No further comment
2.	On page 5, it is mentioned that "Refer to Section 4.3.4 for …". We assumed that it is typo of Section 2.3.4. please revise as required.	This was a typo. Due to changes to the report, this reference was removed.	No further comment
3.	In Table 2, it is not clear why there is no capture flow within the RYCB's. The capture flow rate (2-year) shown as 'zero' in Table 2 for the rear yard catch basins are assumed to be because those flow/volume are not accounted for storage? City is in the process of updating guidelines with respect to LID's. Currently we do not allow for the elimination or downsizing of end-of-pipe facilities due to proposed infiltration methods. The model can be run to verify that the infiltration works. However outside of this the model runs for the different return periods used to estimate flows, volumes, HGL, etc. should assume that the LID is not present (or is full at the commencement of the storm). Please provide additional details about the rear yard infiltration trenches, including the quantity/storage information.	Rear yard infiltration was removed from the modelling. This corrected any issues with the ICD table (Table 5 in Section 2.3.4) for the rear yards. Infiltration volume calculations are provided in Appendix F of the SWM report.	No further comment
4.	The information in Table 2 is not clear. In cases where the approach flow is greater than the capture flow, will there be ponding? If so, please add a column to	A ponding table (Table 6) has been provided in Section 2.3.4 to show that there is no ponding in sags	No further comment

	this table to indicate the depth of the ponding. It should be minimal. The City of Ottawa Storm Sewer Design-Technical Bulletin, the minimum sewer size for local streets is based on 2-year storm and there should not have any surface ponding during 2-year event.	during the 2-year event. Updated ICD sizes show that the inlet rate of the ICDs can handle the 2-year flows.	
5.	Based on the Table 3 in the SWM report, the current drainage area is about 9 ha less than it was designed to be at the time of Phase 1 Residential Registration. Is that +/- 9ha area that now drains uncontrolled to Carp Creek? Are any additional lands being directed directly to Carp Creek as part of the current proposal and if so, how will that impact the creek?	The difference in areas is due to the interim condition having undeveloped area being directed to the Creek as per existing drainage patterns. The ultimate design of the East Residential Community will have a similar drainage area being controlled by the pond and there are no significant changes to the post-development drainage patterns from the original design of the subdivision. Note that Table 3 is no longer included in the report as the SWMF has been included in the PCSWMM model. The PCSWMM model, which includes the pond and outlet structure, shows that there are no impacts to the creek based on the proposed interim and ultimate conditions of the East Residential Community. Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond.	No further comment
6.	Based on the Table 3 in the SWM report, the current runoff coefficient comparing Phase 1 Residential Registration is reduced to 0.29. Please provide rationale of the reduced runoff coefficient in the	Table 3, in Section 2.3.4, was for the capacity of the Existing SWM facility with the future lands being undeveloped. This table	No further comment

	SWM report? It seems that the future lands should be accounted for as developed, not undeveloped, so that proposed infrastructure is sized with the capacity for future development. What significant changes in land use resulted in lower A x C values when calculating the capacity of the East SWM facility? What is the stormwater quantity control plan for future development of undeveloped land?	has been removed and replaced with further analysis and discussion on both the interim condition (1B-2 with undeveloped future lands) and the ultimate condition (1B-2 with developed future lands) contributing to the SWM facility. The storm sewers near the pond outlet are sized to accommodate the future developed lands. A second OGS unit is proposed as part of the future development to meet the quality control requirements of the future development lands. Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond.	
7.	Please provide rip-rap size and calculation for the rip-rap sizing.	Refer to Appendix E of the SWM Report for supporting calculations.	No further comment.
8.	Please provide capacity of the SWM pond inlet swale and please provide measures to prevent erosion in the SWM pond inlet swale (out-side of the rip-rap limits).	The capacity of the SWM pond inlet swale was evaluated in PCSWMM. The velocities in the swale show that erosion control measures are not required. Additional discussion is provided in Section 2.3.5 of the SWM Report.	No further comment
9.	The groundwater from BH43-13 was observed below 1.51m from the surface. Please confirm if the infiltration trench in the backyard of Block 79 and Block 78 secures a minimum depth of 1.0m from the groundwater table. Please provide elevations for various cross sections along the infiltration trench and swales. The profiles should show the observed groundwater elevations from the Geotech report in the vicinity of the chosen cross-sections. In some areas near BH 9-11, BH 10-11, and BH 43-13, the elevation from	As discussed with City staff, a best management practice approach is being proposed for infiltration. Some rearyard systems may not meet the depth above groundwater, which is consistent with standard City of Ottawa rearyard subdrain systems. Refer to section 3.0 of the Stormwater Management Report for further discussion.	No further comment

	the ground surface to the observed groundwater appears to be in the range of 0.4 to 1.54 m. Please review all infiltration trench, exfiltration, and infiltration swale measures.		
10.	The percolation rate should reflect the soil condition of the project site. Could you add details about the percolation rate of 25mm/h that is mentioned in the report (page 6). The most recent geotechnical report does not include a section on the proposal for infiltration. Please provide a reference to a Geotechnical report or an earlier approved report. There needs to be a minimum discussion on the ground water level and infiltration. Infiltration should be based on field measurements not assumptions made on based on soil types. The geotechnical report provided shows in Table 3 shows ground water elevations at a time that is not typically the highest level. Please comment on how this may affect the proposed infiltration practices proposed.	The infiltration rate used is per the approved 2015 Master SWM Report and is per Table 4.4 of the MOE SWM Planning & Design Manual, based on the on-site soils. Based geotechnical and groundwater constraints that limit infiltration measures to best management practices, in-situ testing does not provide additional benefit. Additional discussion on groundwater elevations has been added to Section 3.0 of the SWM Report.	We do not agree with the statement "*in-situ testing does not provide additional benefit.*" However considering that best management practice approach is being proposed for infiltration the estimate of the infiltration rate is not as critical. No further comment.
11.	It is not clear in the Contech Sizing Report found in Appendix C what the contributing area to the OGS is in the Contech sizing software, as well as the imperviousness of that area. Please update accordingly and provide a drainage area plan for existing and proposed water quality treatment units.	Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond and OGS units.	No further comment.
12.	Please verify that the OGS unit will treat a minimum of 90% of the total annual stormwater volume from the contributing area. Ensure that the bypass structure with the splitter weir does not allow too much of the flow to bypass the treatment system.	Per the Vortechs design sheets provided in Appendix C, 90% of the projected annual runoff volume would be treated. The bypass weir is designed to convey the 25mm 4-hour Chicago event to the OGS unit (for both the interim and ultimate condition).	It is noted that the OGS device will treat runoff from 25 mm design storm (from the storm sewer). Is this accounted to 90 percent of the annual runoff volume?

13.	It would be helpful if a figure was provided that shows what catchment area contributes to the existing OGS, what area contributes to the proposed OGS, and what area contributes to the future OGS.	Refer to figures 102085-OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond.	No further comment.
14.	It is unclear how the annual infiltration rates found in the table on page 94 of the SWM report PDF were generated. Please provide details of how the infiltration rate per year was established for each location. Include calculations of infiltration depths for each of the infiltration/exfiltration units shown on page. The annual infiltration rates provided for the East Residential Water balance are not clear. Provide infiltration (mm) calculations for land use areas draining to an infiltration or exfiltration trench. Please note that, according to the table, post-development infiltration in the East Residential areas increased by 10.7% not decreased by.	The Infiltration rates on Page 94 were from the approved 2021 Servicing and Stormwater Report (Phase 2A, 2021). The calculations for this area were added to Appendix F of the SWM report. Additional notes to the Appendix F calculations are provided to clarify the calculations for the annual infiltration rates.	No further comment.
15	It is assumed that the infiltration/water balance calculations and design details are taken from the 2015 SWM report. If so, please refer that as well in Section 2 of this report and include in the appendix any relevant information.	The water balance calculations use the same methodology as the Stormwater Site Management Report Residential (April 6, 2015), but with updated design info for Phase 1B-2 and the West Residential Development (Phase 1A and 2A). Note that the water balance calculations that assumes no BMPs from the 2015 SWM report was added to Appendix F.	No further comment.
16.	Section 2.2 is unclear about the water quality treatment measures proposed for Phases 1B-2 and future development areas. The new proposed treatment unit would consider half of the modelled 25 mm storm event from Phase 1B-2 and the entire future development area. But subsequently it stated that a second treatment unit would be provided for additional treatment for future	Additional clarification has been added to Section 2.2 of the SWM report to clarify existing, proposed, and future OGS units. Refer to figures 102085OGS1 and 102085-OGS2 which clarify the interim and ultimate drainage areas to the pond and OGS units.	No further comment.

	development areas. Please review and clarify as necessary.		
17	To compare and understand the changes, a table showing the water quality treatment areas, flows, and volumes from the previous submission (SWMMHYMO model result) and the recent submission (PCSWMM model output) is useful. For the SWM pond please provide a table that compares the previously approved inflows and outflows, volumes, and water levels with the proposed for this phase. Provide confirmation that all criteria listed in section 2.1 are being met or exceeded.	Figures 102085-OGS1 and 102085-OGS2 have been prepared and added to the SWM report to clarify drainage areas to the pond and OGS units in both the interim and ultimate conditions. The SWMF was included in the PCSWMM model. The report discusses that the volumes, HGLs and outflows are in accordance with the previous design and all design criteria.	No further comment.
18.	Section 2.3.4 stated that "...*was approved by the MOECC to meet the above noted criteria*." What criteria is it referring to?	The report text has been updated to reference the design criteria in Section 2.1	No further comment.
19	Is the infiltration/water balance calculations, the same as in the 2015 SWM draft plan that was approved? Please make sure that all details such as length, bottom width, side slope, infiltration volume, etc. be provided for each infiltration trench type for the west and east residential communities in a table and compare the total volume meets the infiltration volume requirement for the site. Are the infiltration measures proposed in Phase 1B-2 the same as those proposed in the 2015 SWM report? If so, were the existing infiltration trenches in Phase 1B-2 area (marked as 'will be removed' in plans) excluded and used the new proposed ones in calculating the infiltration volume?	The water balance calculations uses the same methodology as the approved Stormwater Site Management Report Residential (April 6, 2015), but with updated design info for Phase 1B-2 and the West Residential Development. Storage volume calculations for the East and West Residential Communities have been provided in Appendix F. Due to the site constraints, and discussions with the City, the infiltration volume requirement no longer applies. The infiltration measures in the 2015 SWM report were assumed to be roadside ditches and taxiways which are no longer proposed in	No further comment.

		Phase 1B-2. The infiltration swales in Phase 1B-2 marked as "to be removed" were part of the West Residential Phase 2A design, in order to meet the requirement of matching the pre-development infiltration throughout construction. These removed swales have been excluded from the updated water balance calculations. Infiltration measures have been revised based on the proposed Phase 1B-2 design	
20	Grading plans must show the depths (elevations), volumes, and extent of ponding of all surface storage including spill areas. This would include the rear yards and the interim check dams.	Static ponding depths (elevations) and extents (contours) have been added to all surface storage areas in the right-of-way, rear yards, and interim infiltration swales. Ponding elevations have been shown for the 100-year and 100-yr + 20% storm events within the right-of-way. Refer to the Grading Plans. Ponding volumes are in provided in Table 6 of the SWM Report	No further comment.
21	Please provide the sizing details and infiltration drawdown times for the proposed interim swales. The extent of the interim swale should be clearly shown including grades at the top and bottom of the channel. The assumption is that all the water trapped upstream of the rock check dams will infiltrate. However, these check dams are permeable and only “slow down” the water. Was this factored into the calculations?	Additional sizing details and drawdown times for the interim infiltration swales are provided in Appendix F. Drawdown times provided in the infiltration summary in Appendix F. Check dams have been revised to have 0.20m earth berm to hold back and infiltrate the runoff. The volumes are based on a 0.20m depth. Refer to the Infiltration Measures Plan (102085INF2) for check dam details	No further comment.
22	The total drainage area used in designing the water quality treatment units differ from	Water balance includes direct runoff areas and	No further comment.

	the areas used in calculating the infiltration requirements for the East residential community. Please explain and/or correct the difference if necessary.	external areas that are not captured by the OGS units. Figures 102085-OGS1 and 102085-OGS2 have been prepared and added to the SWM report to clarify existing, proposed, and future OGS units.	
23	Please provide sample calculations sowing the C value for all zoning types and road cross sections. Include the minimum setbacks and maximum driveway widths allowed by the zoning.	C value calculations have been revised to include minimum setbacks, maximum lot coverage and maximum driveway widths. Refer to Coefficient Calculations drawing 102085-SWM-CC.	No further comment.
24	It is assumed that the bypass structure (weir splitter) shown on the SWMF drawing is to divert flow for water quality treatment (required flow/volume) and the rest to the Pond without treatment. However, the Typical Bypass layout diagram provided in the report depicts bypassing the flow to two water quality treatment (either side) and the rest going to the Pond. It is assumed that a second water quality treatment unit will be installed as part of future development (this information is inconsistent in the report and drawings). Please include details on how the proposed water quality treatment unit works for this proposed development (including the drainage area).	Figures 102085-OGS1 and 102085-OGS2 have been prepared and added to the SWM report to clarify existing, proposed, and future OGS units. The SWM report and PCSWMM models include both an interim and ultimate condition. The ultimate condition model demonstrates the function of the OGS units and bypass weir for the future development areas. Note that the future OGS unit sizing and bypass weir elevation will be confirmed during the design of the future development.	No further comment.
25	Please consider protecting proposed infiltration units by capping end until the site is stabilized,	Filter bags are to be placed under all rear yard catch basin lids until the site is stabilized. Refer to drawing 102085-ESC3.	No further comment.
26	As per condition 63 of the subdivision agreement. Is the infiltration, OGS, SWM pond, temperature mitigation operating as designed. Please provide the monitoring information to date as required through the ECA.	Due to ongoing buildout of the homes in Phase 1B-1 residential, temperature monitoring has not begun. Temperature monitoring program will begin following additional buildout of Phase 1B-1.	Noted

27	PCSWMM hydrologic modeling routine chosen should not assume zero percent imperviousness. It will underestimate runoff and peak flows. A minimum 7% (C=0,25) should be used in the model.	Noted, these areas have been updated to have a 7% imperviousness.	No further comment.
28	Please describe how parameters width and slopes are determined. Please make sure they follow City guidelines.	It has been confirmed that the width and slopes for subcatchment parameters were determined per City guidelines. Additional text is provided in the SWM report (Section 2.3.2) to reflect this.	No further comment.
29	Where are the HGL comparisons to the usf? There appears to be one location where the clearance is only 0.3 m from the usf. This is the minimum and leaves no room for error. Please comment	Refer to the updated USF tables in Appendix D which outlines HGL clearances to USFs for both the interim and ultimate conditions. Table 8 in the SWM Report provides the HGLs for the ultimate condition.	The OSDG states a minimum clearance 0.3 m from HGL or the pipe obvert whichever is greater. However we note in this case at the locations where it should be compared with the obvert the clearance is sufficient. No further comment.
30	If you could provide the C value and area in the ICD table this would help in checking the capacities.	Table 5 in the report body provides the rational method flows, and an expanded ICD table Appendix D of the Stormwater Management Report has been updated to provide the area and C value.	No further comment.
31	Do cb's on grade even require an icd?	On-grade CBs require ICDs to control the 100-year runoff to the 2-year peak flows from the subcatchment.	No further comment.
32	The cb's ICD's need to be designed to the rational method flows. Some areas such as the rear yards are over controlled. Example A-3 the 2-year rational flow is	Rational Method flows have been added to Table 5. Previously the rear yards were under-controlled due to storage within the	No further comment.

	48.8 l/s while the restriction at cb 170 is 28.6 l /s.	infiltration system. The ICD sizes have been updated with the model now reflecting that the rear yard infiltration system is full.	
33	Why is the HGL 0.35m at the outlet from the 1650 mm pipe? Please extend the HGL profile to the outlet of the dry pond. Include the downstream receiving water surface elevation.	The HGL of 112.71 at the pond inlet pipe represents the 100-year water level in the pond. The approved design drawing for the existing pond has been included and provides a profile through the pond. Refer to drawing 102085-SWMF2 included in the SWM Report.	No further comment.
34	Show ponding areas upstream of proposed check dams. Provide the calculations for the volume estimate.	Static ponding contours have been added to the interim infiltration swales. Volumes are not quantified as the infiltration approach is "BestManagement Practices."	No further comment.
35	In the proposed infiltration trenches. Should there not be some sort of impermeable cutoff wall to keep water from draining out along the sewer trenches?	Infiltration trenches have been removed from within the right of ways.	No further comment.
<u>Engineering drawings titled "WEST CAPITAL AIRPARK PHASE 1B-2 – RESIDENTIAL v .</u>			
1.	Please add ICD sizes to the General Plan of Services	The catchbasin table showing the ICD sizes previously located on the Notes and Details Plan 102085-ND1B2 has been moved to the General Plans of Services 102085-GP13 and 102085-GP14.	No further comment.
2.	Are the spill areas shown on the grading plan at the intersection of Street Three and Albert Boyd Private occur during the 2-year storm (at elevation of 116.83 m)? Note that, according to the City of Ottawa Storm Sewer Design-Technical Bulletin, there should be no surface ponding during the 2-year event. Please check all spill areas.	Ponding contours shown on the grading plans represent static ponding elevations. No ponding is proposed during the 2-year event.	No further comment.
3.	The design details of the inlet spillway (V-ditch) to the SWM facility, including cross-	Additional pond inlet details are provided on drawings	No further comment.

	section and water levels (for the designed return period including the 100-year storm), must be provided in section E-E.	102085-SWMF5 and 102085-SWMF6.	
4.	Riprap swale design details should include length of riprap areas on either side. .	This information has been added to the drawing 102085-SWMF5.	The rip-rap swale details provided on the 102085-SWMF-5 drawing are assumed to be general one and shall refer to the location where external flow through the swale occurs. Is the channel section between E-E and the headwall the same as E-E with the exception that it contains rip-rap? Please clarify.
5.	Are clear stone fillings of rock check dams within infiltration swales provided to the top of the bank of the swale, without any freeboard?	Refer to drawing 102085-INF2 for updated details of the rock check dams. As the runoff originates from the undeveloped lands, freeboard is not provided on the undeveloped side of the swale.	No further comment.
6.	CB 200 and 170 connects to the existing system. Does it have the capacity? Why are the cb's 118 and 119 being swapped. Where are the calculations to show this requirement?	The modelling results indicate sufficient capacity to connect CB 200 and CB 170 to the existing Phase 1B-1 system. Some existing ICDs are being swapped due to changes in system HGL with the development of Phase 1B2. Refer to model results in Appendix D.	No further comment.
7.	Drawing shows cb 119 and 118 to be swapped while table 2 indicates that cb's to be swapped 126 and 127 (can't locate these 2 cb's) and icd's in each of cb 138 and 139. Can't find these two locations in	Drawing 102085-GP13 has been revised to indicate the location of CB 126 and CB 127. CB 138 and CB 139 are shown on drawing 102085-GP13 at	No further comment.

	the previous phase on the drawings provided?	approximately station 9+490.	
8.	What is the purpose of having interconnected icd's each with their own icd? One of the most common reasons for interconnecting cb's is to have only one icd.	Design has been revised such that there are no more interconnected catch basins. Each catch basin will have its own ICD, if required.	It is noted the CB 138 and CB 139 with 1B-1 phase are interconnected with each its own ICDs (Table 5)? Please clarify.
9.	Show rear yard ponding and in the interim swale on the plans.	Static ponding contours have been added to the Grading Plans.	No further comment.
10.	The spill elevation 116.33 behind lot 63 appears to be higher than the overflow to the undeveloped land set at 116.29. It would be a better if all the overflows to the adjacent lands were at least 15 cm higher than the internal spill elevation along the swale.	The Lot 63 corner elevation has been revised. Refer to Grading Plan 102085GR14.	No further comment.
11.	Profile drawing P28 show 1650 mm outlet 112.36 m then a slope down to the pond. Please extend the profile through the pond and out.	Additional pond details are provided on drawings 102085-SWMF5 and 102085-SWMF6. The approved design drawing for the existing pond has been included and provides a profile through the pond. Refer to drawing 102085-SWMF2.	No further comment.
12.	GR14, top left-hand corner, is the spill point drawing for Block 83?	Yes. Name of detail has been updated to refer to Block 83.	No further comment.
13.	Drawings show interconnected cb's 162A/162B and168A/168B with ponding on one side of the street but not the other. There is a continuous grade running from the T/G on 162A and 168A . Is it possible to have 6 and 7 cm of ponding on one side of the street without the water flowing up through the other cb? Similar at cross connected cb's 165A and 165B.	The ponding contours shown are static ponding elevations which would represent maximum ponding in emergency situations (i.e. blockage in CB162A or CB 168A).	No further comment.
14.	How do you model a segment that has one side in a sump and the other is on a	In the PCSWMM model, both were modelled as on-grade. In the drawings, the	No further comment.

	continuous grade? Would it not be better to have them both the same?	ponding limits shown reflect the maximum static ponding for the CB in a sag.	
15.	SWMF5, provide inverts on the proposed offline exfiltration, provide inverts on Vortechs, provide details of the flow splitter upstream and downstream of Vortechs, Provide confirmation from Vortechs that the downstream weir will not affect the function of the OGS.	The offline exfiltration trench and the weir in MH 277 have been removed. Refer to the Vortech 1929CIP Layout Detail on drawing 102085-SWMF5 for details.	No further comment.
PCSWMM Modelling:			
1.	There are minor discrepancies regarding the size of the pipes in the PCSWMM. Please revise the size of the pipe as required. (ex.: between MH269-MH270-drawing 675mm, PCSWMM 686mm).	Actual pipe sizes were used in the model instead of nominal pipe sizes.	No further comment.
2.	It seems that the infiltration ratio is calculated per the location of the trenches. Please provide rationale and/or calculation results regarding infiltration ratio into subsoil for the rear yard infiltration trenches, roadside exfiltration trenches, and an offline exfiltration trench in PCSWMM.	All infiltration measures have been removed from the PCSWMM model. Rear yard pipes are assumed to be full for modelling purposes.	No further comment.
3.	The volume between the modeling and report shows discrepancy for the rear yard infiltration trenches. In PCSWMM, the infiltration trenches are modeled as a combination of a box culvert (0.56mx1m) and 250mm pipe. The trenches are filled with 25 mm gravel, so the infiltration trenches in the PCSWMM are assumed to provide more volume. Please provide a rationale for the volume of the infiltration trenches applied in the model. In addition, please confirm if the volume of the 250mm pipe is subtracted from the volume of the trenches according to the model configuration.	The rear yard infiltration was excluded from the PCSWMM model as they are assumed to be full for modelling purposes. Only the downstream rear yard pipe was modelled. Due to the perched outlet pipe for the rear yard systems (to promote infiltration) all rear yard pipes were modelled as full using an initial depth.	No further comment.
4.	Please review the model not to have any double accounting for storage (for example Albert Boyd Private Street).	Updated the major system conduits at intersections to ensure no double counting of storage. Set lengths shorter so as to not double count the road sections.	No further comment.

5.	Please acknowledge that City of Ottawa does not like to have interconnected catch basins. In some cases we have to allow for larger diameter icd's. Please review the design to see if you can eliminate interconnected CBs.	The storm sewer design has been revised such that there are no more interconnected catch basins	It is noted the CB 138 and CB 139 with 1B-1 phase are interconnected.
6.	Please verify that the sawtooth flow conveyance in rear yard was not modeled as such but rather on a continuous grade.	All major systems in the rear yards show a continuous grade to the road. No saw toothing was modelled.	No further comment.
7.	The PCSWMM model files for 100 years are shown as outdated in the result tab. Please check and provide the most recent model with results.	Updated PCSWMM model packages have been provided with updated results.	No further comment.
8.	How are the contributing areas to Infiltration RYCB to CB represented in the model calculated? The PCSWMM model is assumed to include only infiltration measures connected to storm sewers. Please note we do not allow for infiltration storage to be part of quantity and HGL calculations as noted earlier.	All infiltration measures have been removed from the PCSWMM model. Rear yard pipes are assumed to be full for modelling purposes.	No further comment.
9.	The report states the proposed water quality treatment units are for Phase 1B-2 and future development. The model shows only one water quality treatment unit. Please clarify.	An ultimate conditions model was added to the SWM analysis which includes the additional water quality treatment unit.	No further comment.
10.	According to the model, half of the stormwater from the development area goes to the OGS unit and the rest goes to the pond without treatment. Similarly, approximately 380 L/s of runoff is directed to the Pond via a swale, which includes external flows as well as approximately 68 L/s flow from development areas. The flows from the external areas are assumed to be from the existing conditions and do not require treatment at this Phase of development. Please clarify.	Only minor system flows are directed through the OGS unit, and the OGS unit is only designed to treat the water quality event (25mm storm event). In the interim condition PCSWMM model, the future development area is undeveloped and does not require treatment. An ultimate condition PCSWMM model was included in the SWM report that shows the additional unit and the treatment of the future development area with a C = 0.65. Figures 102085-OGS1 and 102085-	As per the response provided in comment #12 in SWM report section. It is noted that the OGS device will treat runoff from 25 mm design storm (from the storm sewer). Is this accounted to 90 percent of the annual runoff volume?

		OGS2 clarify the interim and ultimate drainage areas to the pond and OGS units	

Additional comments:

- Table 2 compares the OGS unit drainage area for Phase 1B-1. The 'Proposed Phase 1B-2 Residential Design' column is assumed to refer to the 1B-1 and rear yards 1B-2 drainage areas? A more appropriate column title would be preferable, as the current one is confusing concerning the proposed OGS unit for the 1B-2 development site is outlined in Table 3.
- It is noted that runoff from the entire future development areas will discharge to the East SWM Facility through the Phase 1B-2 pond inlet. Whether the proposed SWM plan can demonstrate that the proposed pond inlet can also regulate flows from future development regions, or whether it will be included in future development. Kindly clarify.
- The profile drawing for Block 81 (drawing 102085-P28) still includes offline exfiltration units. There are a few more references to exfiltration in legends and notes on various drawings. Please remove references to exfiltration units that are not part of the proposed SWM plan.
- It is noted that each of the two proposed OGS/Vortech units can treat runoff from 17.28 ha, for a total of 35.56 ha treated by both units. The proposed OGS unit for Phase 1B-2 is to treat runoff from 5.913 ha. This means that future development will direct flows to both the proposed interim and future OGS units. Please clarify.
- The west development resulted in an overall 34% decrease in infiltration, whereas the east development increased infiltration by 12%. However, the tables reveal that the total infiltration from the west and east development areas decreased by only 0.5%. Include calculation for the combined infiltration water balance for west and east developments, 245 mm/yr and 243 mm/yr, for pre and post-development circumstances, respectively.
- Where is the entrance to the construction or development site?

  Mud mat should be provided at the site's construction entrance(s) and egress(s).

  Erosion and Sediment Control (ESC) section include a heavy-duty silt fence if there any work in the area adjacent to water courses and include the type of erosion controls proposed for in stream works. Furthermore, the following should be added in ESC section:

  - Inspections of ESC measures at a frequency specified per the ESC plan, for dry weather periods (active and inactive construction phases), after Significant Storm Events (means a minimum of 25 mm of rain in any 24 hours period) and Significant Snowmelt Events **(means the melting of snow at a rate which adversely affects the performance and function of the system),** and after any extreme weather events.
  - Identify and rectify any deficiencies and undertake necessary maintenance measures as soon as possible.
  - Inspections and maintenance of temporary ESC measures shall continue until they are no longer required.
  - The contractor shall ensure that records of inspection, including at a minimum, the inspector's name, date of inspection, visual observations, and any necessary remedial measures to maintain the interim ESC measures.
- PCSWMM shows warning messages at several nodes, on Street 1-E, and in the cooling trenches. It is noted that the model automatically adds a small slope to any flat conduit that does not the above zero minimum slope requirements because the cooling trenches have a

flat or zero slope. However, why does the Street-1-E node have the same error?
The maximum depth increased at nodes CB-116A-B, CB-126-127, and CB-163A-B. When integrating with upstream nodes, the model automatically increased depth to match the top height of the highest connected links. Please check these nodes and adjust the offsets to eliminate number of warnings as feasible.

- Future development assumes 100m3/ha of storage for major flow to ROW. The 5.9 ha phase 1B is providing approximately 196 cu.m. surface storage.(Table 6). This translates to 33 cu.m./ha. This is closer to what we see in other subdivisions. Please look at what would happen if the assumed surface storage was reduced from the 100 cu.m./ha.

City of Ottawa Stormwater Operations Comments
Received via email attachment April 26, 2024

Carp Airport Development Phase 1B-2; East Pond Stormwater System,

April 10,2024

Although the city has not yet assumed responsibility for the pond, an inspection revealed the problem with the inlet and lower channel. The West Pond inlet is buried by sediments, potentially causing issues with the cooling trench inlet, which might be plugged. Sediment deposition from overland flow carrying sandy sediments might be the source of the problem.

It's necessary for a consultant to inspect both the inlet and the lower channel, as the cooling trench may also be compromised or plugged. This is particularly crucial as the new development in the East Pond inlet and cooling trench have the same design elements as the West Pond.

The proposed overland swale should be diverted to the pond instead of discharging into the riprapped cooling manhole 281 depression to prevent further potential inlet plugging issues. The cooling trench must be provided with a subdrain all the way up to the connection with the existing west cooling channel, to ensure functionality. Referring to the mark-up at DWG 102085 SWF-5 East Stormwater Management Facility Phase 1B-2 Inlet Details for specific details and guidance on addressing the issues.

The inspection and correction of the problem should be done expeditiously due to uncertainties about the system's short and long-term functionality.

In summary, it's imperative to address the sedimentation issue at the West Pond inlet promptly to prevent further complications with the cooling trench and ensure the functionality of the stormwater management facility as well.

Additionally, the consultant must update the 2023 geotechnical report to confirm the groundwater table elevations, as field measurements were taken in September 2011

Please provide response to our previous comment:
Who will be responsible for maintaining the rear yard infiltration trench while it’s in the place. Please provide a service road parallel to the trench.

Lastly the off-line Oil Grid separators must be provided with the gate to provide efficient maintenance.

	City of Ottawa Comments (November 29, 2023)	Novatech Notes (February 23, 2024)	City of Ottawa Comments (March 26, 2024)	Novatech Notes (May 14, 2024)	Accepted
General					
	Comments 1 to 8		No further comment		✓
Grading Plan (102085-GR13)					
	Comments 1 to 3		No further comment		✓
Plan and Profile Phase 1B-2 Block 81 & Storm Sewer Outlet (102085-P28)					
	Comments 1 to 2				
Servicing Report					
1	The 2-year storm also requires a 10 minute TC not 15 minutes as shown.	The storm sewer design sheet has been updated with a time of concentration of 10 minutes. Refer to Appendix D of the Servicing Report.	No further comment		✓
SWM Report					
	Comments 1 to 11		No further comment		✓
12	Please verify that the OGS unit will treat a minimum of 90% of the total annual stormwater volume from the contributing area. Ensure that the bypass structure with the splitter weir does not allow too much of the flow to bypass the treatment system.	Per the Vortechs design sheets provided in Appendix C, 90% of the projected annual runoff volume would be treated. The bypass weir is designed to convey the 25mm 4-hour Chicago event to the OGS unit (for both the interim and ultimate condition).	It is noted that the OGS device will treat runoff from 25 mm design storm (from the storm sewer). Is this accounted to 90 percent of the annual runoff volume?	Yes, the 25mm rainfall event is included in the 90% of the annual runoff volume treated. Please refer to Appendix E, page 226 for the estimated net annual solids load reductions table, prepared by Contech.	
	Comments 13 to 35		No further comment		✓
Drawings					
	Comments 1 to 3		No further comment		✓
4	Riprap swale design details should include length of riprap areas on either side.	This information has been added to the drawing 102085-SWMF5.	The rip-rap swale details provided on the 102085-SWMF-5 drawing are assumed to be general one and shall refer to the location where external flow through the swale occurs. Is the channel section between E-E and the headwall the same as E-E with the exception that it contains rip-rap? Please clarify.	An additional cross section through the rip-rap portion of the inlet swale has been added to drawing 102085-SWMF5.	
	Comments 5 to 7		No further comment		✓
8	What is the purpose of having interconnected icd's each with their own icd? One of the most common reasons for interconnecting cb's is to have only one icd.	Design has been revised such that there are no more interconnected catch basins. Each catch basin will have its own ICD, if required.	It is noted the CB 138 and CB 139 with 1B-1 phase are interconnected with each its own ICDs (Table 5)? Please clarify.	The Phase 1B-1 design drawings incorrectly indicated an ICD in the upstream CB. An ICD was installed in the downstream CB in order to control flows as intended. Only the downstream ICD was accounted for in the PCSMM model. The ICD in the upstream CB will not effect ponding as these CBs are on grade.	
	Comments 9 to 15		No further comment.		✓
PCSWMM Modelling					
	Comments 1 to 9		No further comment.		✓
10	According to the model, half of the stormwater from the development area goes to the OGS unit and the rest goes to the pond without treatment. Similarly, approximately 380 L/s of runoff is directed to the Pond via a swale, which includes external flows as well as approximately 68 L/s flow from development areas. The flows from the external areas are assumed to be from the existing conditions and do not require treatment at this Phase of development. Please clarify.	Only minor system flows are directed through the OGS unit, and the OGS unit is only designed to treat the water quality event (25mm storm event). In the interim condition PCSWMM model, the future development area is undeveloped and does not require treatment. An ultimate condition PCSWMM model was included in the SWM report that shows the additional unit and the treatment of the future development area with a C = 0.65. Figures 102085-OGS1 and 102085-OGS2 clarify the interim and ultimate drainage areas to the pond and OGS units.	As per the response provided in comment #12 in SWM report section. It is noted that the OGS device will treat runoff from 25 mm design storm (from the storm sewer). Is this accounted to 90 percent of the annual runoff volume?	Please see response to comment #12 of the SWM Report section above.	

	City of Ottawa Comments (November 29, 2023)	Novatech Notes (February 23, 2024)	City of Ottawa Comments (March 26, 2024)	Novatech Notes (May 14, 2024)	Accepted
Additional Comments					
1			Table 2 compares the OGS unit drainage area for Phase 1B-1. The 'Proposed Phase 1B-2 Residential Design' column is assumed to refer to the 1B-1 and rear yards 1B-2 drainage areas? A more appropriate column title would be preferable, as the current one is confusing concerning the proposed OGS unit for the 1B-2 development site is outlined in Table 3.	Table 2 is intended to show the change in AC value (drainage area times runoff coefficient) for the drainage area of the existing Phase 1B-1 OGS unit, from the time of original design as part of the 2015 SWM Report, to the current design of Phase 1B-2. As some of the Phase 1B-2 area is draining to the existing Phase 1B-1 OGS unit we wanted to clarify the total AC value serviced by the Phase 1B-1 OGS unit is within the capacity of the OGS unit.	
2			It is noted that runoff from the entire future development areas will discharge to the East SWM Facility through the Phase 1B-2 pond inlet. Whether the proposed SWM plan can demonstrate that the proposed pond inlet can also regulate flows from future development regions, or whether it will be included in future development. Kindly clarify.	Please refer to page 6 of the SWM Report. In the ultimate condition (full development of future development lands) the PCSWMM model has accounted for the entire future development area to inlet to the pond through the Phase 1B-2 inlet. The model has assumed expansion of the pond (additional pond volume and additional OGS unit) to accommodate the future development. The pond inlet (pipes and major system swale) have been sized based on the ultimate condition flows. Please refer to figure 102085-OGS2 for the approximate size and location of pond expansion assumed in the PCSWMM model.	
3			The profile drawing for Block 81 (drawing 102085-P28) still includes offline exfiltration units. There are a few more references to exfiltration in legends and notes on various drawings. Please remove references to exfiltration units that are not part of the proposed SWM plan.	The exfiltration trench has been removed from profile drawing 102085-P28.	
4			It is noted that each of the two proposed OGS/Vortech units can treat runoff from 17.28 ha, for a total of 35.56 ha treated by both units. The proposed OGS unit for Phase 1B-2 is to treat runoff from 5.913 ha. This means that future development will direct flows to both the proposed interim and future OGS units. Please clarify.	Please refer to page 4 of the SWM Report. The proposed OGS unit to be installed with Phase 1B-2 will treat runoff from Phase 1B-2 only (5.913 ha) in the interim condition. In the future, once the contributing drainage area to this unit exceeds 17.28 ha, the second unit will be required. In the ultimate condition once future development is complete, the OGS unit installed with Phase 1B-2 and the future OGS unit will both treat the total area equally (17.28 ha each, 35.56ha total).	
5			The west development resulted in an overall 34% decrease in infiltration, whereas the east development increased infiltration by 12%. However, the tables reveal that the total infiltration from the west and east development areas decreased by only 0.5%. Include calculation for the combined infiltration water balance for west and east developments, 245 mm/yr and 243 mm/yr, for pre and post-development circumstances, respectively.	The values referred to in your comment were taken from a table that was part of the original 2015 SWM Report. This table is outdated and was included in Appendix F, page 234-235, of the SWM Report as a reference tool for the updated water balance calculations. Please refer to Appendix F, page 240 of the SWM Report for the updated Pre vs. Post-development water balance comparison for Phase 1B-2. The combined values for the east and west developments were area weighted in the new calculations, as shown in the overall summary table. Refer to attached markup of excerpt from the Stormwater Management Report for clarity.	

	City of Ottawa Comments (November 29, 2023)	Novatech Notes (February 23, 2024)	City of Ottawa Comments (March 26, 2024)	Novatech Notes (May 14, 2024)	Accepted
6			Where is the entrance to the construction or development site? Mud mat should be provided at the site's construction entrance(s) and egress(s). Erosion and Sediment Control (ESC) section include a heavy-duty silt fence if there any work in the area adjacent to water courses and include the type of erosion controls proposed for in stream works. Furthermore, the following should be added in ESC section: o Inspections of ESC measures at a frequency specified per the ESC plan, for dry weather periods (active and inactive construction phases), after Significant Storm Events (means a minimum of 25 mm of rain in any 24 hours period) and Significant Snowmelt Events (means the melting of snow at a rate which adversely affects the performance and function of the system), and after any extreme weather events. o Identify and rectify any deficiencies and undertake necessary maintenance measures as soon as possible. o Inspections and maintenance of temporary ESC measures shall continue until they are no longer required. o The contractor shall ensure that records of inspection, including at a minimum, the inspector's name, date of inspection, visual observations, and any necessary remedial measures to maintain the interim ESC measures.	Construction access will be via the gravel access road which connects existing Wingover Private to Phase 1B-2. Refer to drawing 102085-GR15 for the location of the access road. Heavy-duty silt fence has been added along the rear of the lots backing onto the Carp Creek. A mud mat has been added to drawing 102085-ESC3. Proposed location of silt fence is shown on drawing 102085-ESC3. No in-stream works are proposed as part of Phase 1B-2 works. ESC notes have been added to drawing 102085-ESC3	
7			PCSWMM shows warning messages at several nodes, on Street 1-E, and in the cooling trenches. It is noted that the model automatically adds a small slope to any flat conduit that does not the above zero minimum slope requirements because the cooling trenches have a flat or zero slope. However, why does the Street-1-E node have the same error? The maximum depth increased at nodes CB-116A-B, CB-126-127, and CB-163A-B. When integrating with upstream nodes, the model automatically increased depth to match the top height of the highest connected links. Please check these nodes and adjust the offsets to eliminate number of warnings as feasible.	The PCSWMM model has been reviewed and the warning messages do not impact the results. The cooling trenches are designed with a zero slope, so the model will assign a minimum slope in order to calculate the flow through the cooling trench. The Street1-E conduit has the same error due to the lowest T/G between CB 162A and CB 162B is 116.72 (CB 162B) which was assigned for both CBs (as they are represented by a single node). The spill for CB 162A along Albert Boyd Private is also 116.72, which results in a flat conduit. When using irregular cross-sections, the maximum depth error sometimes occurs. These nodes were reviewed and the node depth was set to the anticipate top of the conduit. We checked the impact of raising the node depth by 0.01m to remove the error and the model results were unaffected.	
8			Future development assumes 100m3/ha of storage for major flow to ROW. The 5.9 ha phase 1B is providing approximately 196 cu.m. surface storage.(Table 6). This translates to 33 cu.m./ha. This is closer to what we see in other subdivisions. Please look at what would happen if the assumed surface storage was reduced from the 100 cu.m./ha.	We did a quick check in the model where we decreased the storage to 30m3/ha. This would result in an increase in major system flows to the pond from the future development areas, but would not impact the Phase 1B-2 system in any significant way. There is no impact on the total runoff volume or storage requirements in the pond. The surface storage available and the major system flows to the pond from the future development area will be determined at the detailed design of the future lands.	

WEST CAPITAL AIRPARK - PHASE 2A RESIDENTIAL
BMP CALCULATIONS

NOVATECH MARKUP - MAY 14, 2025
EXCERPT FROM APPENDIX E OF STORMWATER MANAGEMENT REPORT (PAGE 239 OF REPORT)

NOVATECH
Engineers, Planners & Landscape Architects

WEST RESIDENTIAL WATER BALANCE (with Infiltration Trenches)

Existing Conditions

Area	Land Use	Soil Type	Area		Individual				Weighted (by Area)			
			ha	%	Precip (mm)	ET (mm)	Infil (mm)	Runoff (mm)	Precip (mm)	ET (mm)	Infil (mm)	Runoff (mm)
A-1	Pasture/Meadow	Sand/Sandy Silt	12.27	52.6%	944	527	229	188	497	277	121	99
A-2	Pasture/Meadow	Sand/Sandy Silt	6.25	26.8%	944	527	229	188	253	141	61	50
A-3	Pasture/Meadow	Sand/Sandy Silt	1.87	8.0%	944	527	229	188	76	42	18	15
A-4	Woodland	Sand/Sandy Silt	2.92	12.5%	944	550	250	144	118	69	31	18
	Totals		**23.31**	**100.0%**					**944**	**530**	**232**	**182**

Developed Conditions (with Infiltration BMPs)

Land Use	Soil Type	Area		Individual				Weighted (by Area)			
		ha	%	Precip (mm)	ET (mm)	Infil (mm)	Runoff (mm)	Precip (mm)	ET (mm)	Infil (mm)	Runoff (mm)
Woodland	Sand/Sandy Silt	2.03	8.7%	944	550	250	144	82.2	47.9	21.8	12.5
SMWF *(surface area @ maximum storage)*	Topsoil over Sand/Sandy Silt	0.88	3.8%	944	660	50	234	35.6	24.9	1.9	8.8
SWMF Block *(grassed area, minus SWMF)*	Topsoil over Sand/Sandy Silt	0.55	2.4%	944	520	200	224	22.3	12.3	4.7	5.3
Rearyards and Frontyards *(grass)*	Topsoil over Sand/Sandy Silt	10.96	47.0%	944	520	200	224	443.7	244.4	94.0	105.3
Rearyards (directed to infiltration trenches)*	Topsoil over Sand/Sandy Silt	1.30	5.6%	944	520	388	36	52.6	29.0	21.6	2.0
Rear Rooftops *(directed to grassed rearyards)*	Topsoil over Sand/Sandy Silt	2.34	10.0%	944	95	200	649	94.7	9.5	20.1	65.1
Front Rooftops *(directed to impervious areas)*	Topsoil over Sand/Sandy Silt	2.34	10.0%	944	95	0	849	94.7	9.5	0.0	85.2
Impervious Areas *(roads, driveways)*	Topsoil over Sand/Sandy Silt	2.92	12.5%	944	95	0	849	118.2	11.9	0.0	106.3
Totals		**23.32**	**100%**					**944.0**	**389.4**	**164.1**	**390.6**

**Storage provided in infiltration trenches will infiltrate 388 mm/year; refer to Infiltration Calculations.*

Pre vs. Post-Development (West)

Component	Pre (mm/yr)	Post (mm/yr)	% Change
Precipitation	944	944	0.0%
Evapotranspiration	530	389	26.5% Decrease
Infiltration	232	164	29.2% Decrease
Runoff	182	391	114.0% Increase

Added to overall table
(next page)

NOVATECH MARKUP - MAY 14, 2025
EXCERPT FROM APPENDIX E OF STORMWATER MANAGEMENT REPORT (PAGE 240 OF REPORT)

EAST RESIDENTIAL WATER BALANCE

Existing Conditions *Taken from original Phase 1 SWM Report

Area	Land Use	Soil Type	Area		Individual				Weighted (by Area)			
			ha	%	Precip (mm)	ET (mm)	Infil (mm)	Runoff (mm)	Precip (mm)	ET (mm)	Infil (mm)	Runoff (mm)
A-1	Woodland	Sand/Sandy Silt	40.62	69.8%	944	550	250	144	659	384	175	101
A-2	Woodland	Sand/Sandy Silt	5.36	9.2%	944	550	250	144	87	51	23	13
E-1	Woodland	Sand/Sandy Silt	12.21	21.0%	944	550	250	144	198	115	52	30
	Totals		**58.19**	**100.0%**					**944**	**550**	**250**	**144**

Developed Conditions (with Infiltration BMPs)

Land Use	Soil Type	Area		Individual				Weighted (by Area)			
		ha	%	Precip (mm)	ET (mm)	Infil (mm)	Runoff (mm)	Precip (mm)	ET (mm)	Infil (mm)	Runoff (mm)
Woodland	Sand/Sandy Silt	12.24	21.0%	944	550	250	144	198.6	115.7	52.6	30.3
SMWF *(surface area @ maximum storage)*	Topsoil over Sand/Sandy Silt	1.68	2.9%	944	660	50	234	27.3	19.1	1.4	6.8
SWMF Block *(grassed area, minus SWMF)*	Topsoil over Sand/Sandy Silt	2.96	5.1%	944	520	200	224	48.0	26.5	10.2	11.4
PHASE 1B-1											
Rearyards and Frontyards (grass) (not draining to infiltration trench)	Topsoil over Sand/Sandy Silt	3.39	5.8%	944	520	200	224	55.0	30.3	11.7	13.1
Rear Rooftops (directed to grassed rearyards w/ no infiltration trench)	Topsoil over Sand/Sandy Silt	0.29	0.5%	944	95	200	649	4.7	0.5	1.0	3.2
Front Rooftops (directed to impervious areas)	Topsoil over Sand/Sandy Silt	0.56	1.0%	944	95	0	849	9.1	0.9	0.0	8.2
Impervious Areas *(roads, driveways) (directed to storm sewers)*	Topsoil over Sand/Sandy Silt	1.26	2.2%	944	95	0	849	20.4	2.1	0.0	18.4
PHASE 1B-2											
Frontyards (grass) (not draining to infiltration trench)	Topsoil over Sand/Sandy Silt	1.10	1.9%	944	520	200	224	17.9	9.8	3.8	4.2
*Rearyards (grass) (draining to infiltration trench)	Topsoil over Sand/Sandy Silt	3.01	5.2%	944	520	388	36	48.9	26.9	20.1	1.8
*Rear Rooftops (directed to grassed rearyards w/ infiltration trench)	Topsoil over Sand/Sandy Silt	1.14	2.0%	944	95	388	461	18.5	1.9	7.6	9.0
Front Rooftops (directed to impervious areas)	Topsoil over Sand/Sandy Silt	0.66	1.1%	944	95	0	849	10.7	1.1	0.0	9.6
Impervious Areas *(roads, driveways) (directed to storm sewers)*	Topsoil over Sand/Sandy Silt	1.24	2.1%	944	95	0	849	20.1	2.0	0.0	18.1
FUTURE PHASES											
*Future Lands w/ Rock Check dams (Woodland)	Topsoil over Sand/Sandy Silt	28.65	49.2%	944	550	287	107	464.8	270.8	141.3	52.7
Totals		**58.19**	**100%**					**944.0**	**507.5**	**249.7**	**186.8**

**Storage provided in rear yard infiltration trenches will infiltrate 388 mm/year; Interim Infiltration measures (rock check dams) will infiltrate an additional 37mm/year (from the baseline 250mm for woodland areas); Refer to Infiltration Calculations*

Pre vs. Post-Development East

Component	Pre (mm/yr)	Post (mm/yr)	% Change
Precipitation	944	944	0.0%
Evapotranspiration	550	508	7.7% Decrease
Infiltration	250	250	0.1% Decrease
Runoff	144	187	29.7% Increase

From West development table

Summary Pre vs Post-Development Water Balance (Overall)

Location	Area (ha)	Total Precipitation (mm/yr)	Infiltration (mm/yr)		Runoff (mm/yr)		Actual ET (mm/yr)	
			PRE	POST	PRE	POST	PRE	POST
West Residential Community	23.32	944	232	164	182	391	530	389
East Residential Community	58.19		250	250	144	187	550	508
Total (Weighted by Area)	**81.51**	**944**	**245**	**225**	**155**	**245**	**544**	**474**

overall values area weighted

	City of Ottawa Comments (April 26, 2024)	Novatech Notes (May 14, 2024)	Accepted
East Pond Stormwater System			
1	The West Pond inlet is buried by sediments, potentially causing issues with the cooling trench inlet, which might be plugged. Sediment deposition from overland flow carrying sandy sediments might be the source of the problem. It's necessary for a consultant to inspect both the inlet and the lower channel, as the cooling trench may also be compromised or plugged. This is particularly crucial as the new development in the East Pond inlet and cooling trench have the same design elements as the West Pond.	The existing west SWM pond is part of Phase 1A of the subdivision. Water levels in both the Carp creek and the SWM pond are high due to the time of year / heavy rainfall. The condition of the west SWM pond and cooling trench will be reviewed / inspected once the water levels have lowered.	
2	The proposed overland swale should be diverted to the pond instead of discharging into the riprapped cooling manhole 281 depression to prevent further potential inlet plugging issues.	The overland flow swale has been revised to have a separate inlet from the Phase 1B-2 storm sewer inlet.	
3	The cooling trench must be provided with a subdrain all the way up to the connection with the existing west cooling channel, to ensure functionality. Referring to the mark-up at DWG 102085 SWF-5 East Stormwater Management Facility Phase 1B-2 Inlet Details for specific details and guidance on addressing the issues.	A subdrain has been added for the full length of the cooling trench.	
4	Additionally, the consultant must update the 2023 geotechnical report to confirm the groundwater table elevations, as field measurements were taken in September 2011	October 2022 groundwater elevations were provided in the Paterson Geotechnical Investigation Report, dated January 16, 2023. Refer to pages 49 to 51 for the soil profile and test data sheets.	
5	Who will be responsible for maintaining the rear yard infiltration trench while it’s in the place? Please provide a service road parallel to the trench.	Maintenance of the rear yard infiltration trench would be the responsibility of the homeowners. This is consistent with standard City of Ottawa projects with a rear yard subdrain / infiltration system. Outlet catchbasins have been proposed within the ROW as part of the rear yard infiltration system and would provide maintenance access to the infiltration trench.No service road will be provided through the residential rear yards.	
6	Lastly the off-line Oil Grid separators must be provided with the gate to provide efficient maintenance.	The Stormwater Management Facility is a dry pond system and will not require the installation of gates in order to access the oil-grit separator for maintenance.	

City Review Comments
Received via email attachment June 12, 2023

	City of Ottawa Comments (November 29, 2023)	Novatech Notes (February 23, 2024)	City of Ottawa Comments (March 26, 2024)	Novatech Notes (May 14, 2024)	Accepted
General					
	Comments 1 to 8		No further comment		✓
Grading Plan (102085-GR13)					
	Comments 1 to 3		No further comment		✓
Plan and Profile Phase 1B-2 Block 81 & Storm Sewer Outlet (102085-P28)					
Comments 1 to 2					
Servicing Report					
1	The 2-year storm also requires a 10 minute TC not 15 minutes as shown.	The storm sewer design sheet has been updated with a time of concentration of 10 minutes. Refer to Appendix D of the Servicing Report.	No further comment		✓
SWM Report					
	Comments 1 to 11		No further comment		✓
12	Please verify that the OGS unit will treat a minimum of 90% of the total annual stormwater volume from the contributing area. Ensure that the bypass structure with the splitter weir does not allow too much of the flow to bypass the treatment system.	Per the Vortechs design sheets provided in Appendix C, 90% of the projected annual runoff volume would be treated. The bypass weir is designed to convey the 25mm 4-hour Chicago event to the OGS unit (for both the interim and ultimate condition).	It is noted that the OGS device will treat runoff from 25 mm design storm (from the storm sewer). Is this accounted to 90 percent of the annual runoff volume?	Yes, the 25mm rainfall event is included in the 90% of the annual runoff volume treated. Please refer to Appendix E, page 226 for the estimated net annual solids load reductions table, prepared by Contech.	Please include this clarification in the report with a reference to the associated Appendix.
	Comments 13 to 35		No further comment		✓
Drawings					
	Comments 1 to 3		No further comment		✓
4	Riprap swale design details should include length of riprap areas on either side.	This information has been added to the drawing 102085-SWMF5.	The rip-rap swale details provided on the 102085-SWMF-5 drawing are assumed to be general one and shall refer to the location where external flow through the swale occurs. Is the channel section between E-E and the headwall the same as E-E with the exception that it contains rip-rap? Please clarify.	An additional cross section through the rip-rap portion of the inlet swale has been added to drawing 102085-SWMF5.	Thank you for adding cross-section F-F
4a					The conveyance and discharge of major overland flows to the pond through the swale have been changed in the resubmission. Though no chnages in volume or flows to the pond is anticipated, the change in the conveyance plan needs to be added to the report.
	Comments 5 to 7		No further comment		✓
8	What is the purpose of having interconnected icd's each with their own icd? One of the most common reasons for interconnecting cb's is to have only one icd.	Design has been revised such that there are no more interconnected catch basins. Each catch basin will have its own ICD, if required.	It is noted the CB 138 and CB 139 with 1B-1 phase are interconnected with each its own ICDs (Table 5)?	The Phase 1B-1 design drawings incorrectly indicated an ICD in the upstream CB. An ICD was installed in the downstream CB in order to control flows as intended. Only the downstream ICD was accounted for in the PCSMM model. The ICD in the upstream CB will not effect ponding as these CBs are on grade.	Noted. However, the response was not provided with respect to Table 5 of the report and should be updated in the report, as required.
			Please clarify.		
	Comments 9 to 15		No further comment.		✓
PCSWMM Modelling					
	Comments 1 to 9		No further comment.		✓

10	According to the model, half of the stormwater from the development area goes to the OGS unit and the rest goes to the pond without treatment. Similarly, approximately 380 L/s of runoff is directed to the Pond via a swale, which includes external flows as well as approximately 68 L/s flow from development areas. The flows from the external areas are assumed to be from the existing conditions and do not require treatment at this Phase of development. Please clarify.	Only minor system flows are directed through the OGS unit, and the OGS unit is only designed to treat the water quality event (25mm storm event). In the interim condition PCSWMM model, the future development area is undeveloped and does not require treatment. An ultimate condition PCSWMM model was included in the SWM report that shows the additional unit and the treatment of the future development area with a C = 0.65. Figures 102085-OGS1 and 102085-OGS2 clarify the interim and ultimate drainage areas to the pond and OGS units.	As per the response provided in comment #12 in SWM report section. It is noted that the OGS device will treat runoff from 25 mm design storm (from the storm sewer). Is this accounted to 90 percent of the annual runoff volume?	Please see response to comment #12 of the SWM Report section above.	See comment # 12 above
City of Ottawa Comments (November 29, 2023)		**Novatech Notes (February 23, 2024)**	**City of Ottawa Comments (March 26, 2024)**	**Novatech Notes (May 14, 2024)**	**Accepted**
Additional Comments					
1			Table 2 compares the OGS unit drainage area for Phase 1B-1. The 'Proposed Phase 1B-2 Residential Design' column is assumed to refer to the 1B-1 and rear yards 1B-2 drainage areas? A more appropriate column title would be preferable, as the current one is confusing concerning the proposed OGS unit for the 1B-2 development site is outlined in Table 3.	Table 2 is intended to show the change in AC value (drainage area times runoff coefficient) for the drainage area of the existing Phase 1B1 OGS unit, from the time of original design as part of the 2015 SWM Report, to the current design of Phase 1B-2. As some of the Phase 1B-2 area is draining to the existing Phase 1B-1 OGS unit we wanted to clarify the total AC value serviced by the Phase 1B-1 OGS unit is within the capacity of the OGS unit.	Thank you for the clarification. Please include in the report that 'although some of the Phase 1B-2 area is draining to the existing Phase 1B-1 OGS unit, the total AC value serviced by the Phase 1B-1 OGS unit is within its proposed capacity'.
2			It is noted that runoff from the entire future development areas will discharge to the East SWM Facility through the Phase 1B-2 pond inlet. Whether the proposed SWM plan can demonstrate that the proposed pond inlet can also regulate flows from future development regions, or whether it will be included in future development. Kindly clarify.	Please refer to page 6 of the SWM Report. In the ultimate condition (full development of future development lands) the PCSWMM model has accounted for the entire future development area to inlet to the pond through the Phase 1B-2 inlet. The model has assumed expansion of the pond (additional pond volume and additional OGS unit) to accommodate the future development. The pond inlet (pipes and major system swale) have been sized based on the ultimate condition flows. Please refer to figure 102085-OGS2 for the approximate size and location of pond expansion assumed in the PCSWMM model.	Please note that the details provided under 'Ultimate Condition' were not clear enough. It was understood that a future pond stage-storage curve for the East SWMF was included in the ultimate model. However, the next statement reads, "The pond expansion required to accommodate the future development area runoff will be confirmed during the detailed design of the future phase." The previous comment was to confirm whether the inlet to the East SWMF is proposed to be sized to accommodate future flows as well. Please add to clarify that "the pond inlet and major system swale have been sized based on the ultimate condition flows" prior to the last sentence in that paragraph (The SWM Block has additional space for expansion and can accommodate a larger expansion volume if required).
3			The profile drawing for Block 81 (drawing 102085-P28) still includes offline exfiltration units. There are a few more references to exfiltration in legends and notes on various drawings. Please remove references to exfiltration units that are not part of the proposed SWM plan.	The exfiltration trench has been removed from profile drawing 102085P28.	OK

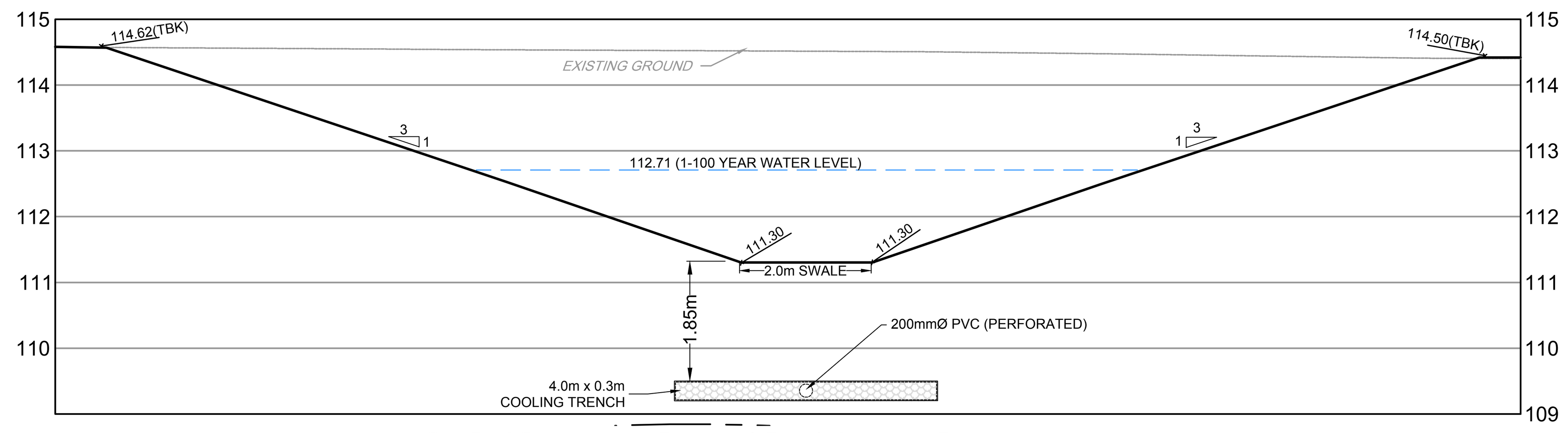
4			It is noted that each of the two proposed OGS/Vortech units can treat runoff from 17.28 ha, for a total of 35.56 ha treated by both units. The proposed OGS unit for Phase 1B-2 is to treat runoff from 5.913 ha. This means that future development will direct flows to both the proposed interim and future OGS units. Please clarify.	Please refer to page 4 of the SWM Report. The proposed OGS unit to be installed with Phase 1B-2 will treat runoff from Phase 1B-2 only (5.913 ha) in the interim condition. In the future, once the contributing drainage area to this unit exceeds 17.28 ha, the second unit will be required. In the ultimate condition once future development is complete, the OGS unit installed with Phase 1B-2 and the future OGS unit will both treat the total area equally (17.28 ha each, 35.56ha total).	OK
5			The west development resulted in an overall 34% decrease in infiltration, whereas the east development increased infiltration by 12%. However, the tables reveal that the total infiltration from the west and east development areas decreased by only 0.5%. Include calculation for the combined infiltration water balance for west and east developments, 245 mm/yr and 243 mm/yr, for pre and postdevelopment circumstances, respectively.	The values referred to in your comment were taken from a table that was part of the original 2015 SWM Report. This table is outdated and was included in Appendix F, page 234-235, of the SWM Report as a reference tool for the updated water balance calculations. Please refer to Appendix F, page 240 of the SWM Report for the updated Pre vs. Post-development water balance comparison for Phase 1B-2. The combined values for the east and west developments were area weighted in the new calculations, as shown in the overall summary table. Refer to attached markup of excerpt from the Stormwater Management Report for clarity.	OK
City of Ottawa Comments (November 29, 2023)		**Novatech Notes (February 23, 2024)**	**City of Ottawa Comments (March 26, 2024)**	**Novatech Notes (May 14, 2024)**	**Accepted**
6			Where is the entrance to the construction or development site? Mud mat should be provided at the site's construction entrance(s) and egress(s).	Construction access will be via the gravel access road which connects existing Wingover Private to Phase 1B-2. Refer to drawing 102085GR15 for the location of the access road. Heavy-duty silt fence has been added along the rear of the lots backing onto the Carp Creek. A mud mat has been added to drawing 102085-ESC3. Proposed location of silt fence is shown on drawing 102085-ESC3. No in-stream works are proposed as part of Phase 1B-2 works.	OK
			Erosion and Sediment Control (ESC) section include a heavy-duty silt fence if there any work in the area adjacent to water courses and include the type of erosion controls proposed for in stream works.	ESC notes have been added to drawing 102085-ESC3	
			Furthermore, the following should be added in ESC section:		This should be added to the ESC section of the report
			o Inspections of ESC measures at a frequency specified per the ESC plan, for dry weather periods (active and inactive construction phases), after Significant Storm Events (means a minimum of 25 mm of rain in any 24 hours period) and Significant Snowmelt Events (means the melting of snow at a rate which adversely affects the performance and function of the system), and after any extreme weather events. o Identify and rectify any deficiencies and undertake necessary maintenance measures as soon as possible.		
			o Inspections and maintenance of temporary ESC measures shall continue until they are no longer required.		
			o The contractor shall ensure that records of inspection, including at a minimum, the inspector's name, date of inspection, visual observations, and any necessary remedial measures to maintain the interim ESC measures.		
7			PCSWMM shows warning messages at several nodes, on Street 1-E, and in the cooling trenches. It is noted that the model automatically adds a small slope to any flat conduit that does not the above zero minimum slope requirements because the cooling trenches have a flat or zero slope. However, why does the Street-1-E node have the same error?	The PCSWMM model has been reviewed and the warning messages do not impact the results. The cooling trenches are designed with a zero slope, so the model will assign a minimum slope in order to calculate the flow through the cooling trench. The Street1-E conduit has the same error due to the lowest T/G between CB 162A and CB 162B is 116.72 (CB 162B) which was assigned for both CBs (as they are represented by a single node). The spill for CB 162A along Albert Boyd Private is also 116.72, which results in a flat conduit.	OK

			The maximum depth increased at nodes CB-116A-B, CB-126-127, and CB-163A-B. When integrating with upstream nodes, the model automatically increased depth to match the top height of the highest connected links. Please check these nodes and adjust the offsets to eliminate number of warnings as feasible.	When using irregular cross-sections, the maximum depth error sometimes occurs. These nodes were reviewed and the node depth was set to the anticipate top of the conduit. We checked the impact of raising the node depth by 0.01m to remove the error and the model results were unaffected.	
8			Future development assumes 100m3/ha of storage for major flow to ROW. The 5.9 ha phase 1B is providing approximately 196 cu.m. surface storage.(Table 6). This translates to 33 cu.m./ha. This is closer to what we see in other subdivisions. Please look at what would happen if the assumed surface storage was reduced from the 100 cu.m./ha.	We did a quick check in the model where we decreased the storage to 30m3/ha. This would result in an increase in major system flows to the pond from the future development areas, but would not impact the Phase 1B-2 system in any significant way. There is no impact on the total runoff volume or storage requirements in the pond. The surface storage available and the major system flows to the pond from the future development area will be determined at the detailed design of the future lands.	OK
9					A 600 mm CSP culvert is proposed to cross the gravel road (entrance to the site), but this was not included in the report, even though it might be under interim conditions.

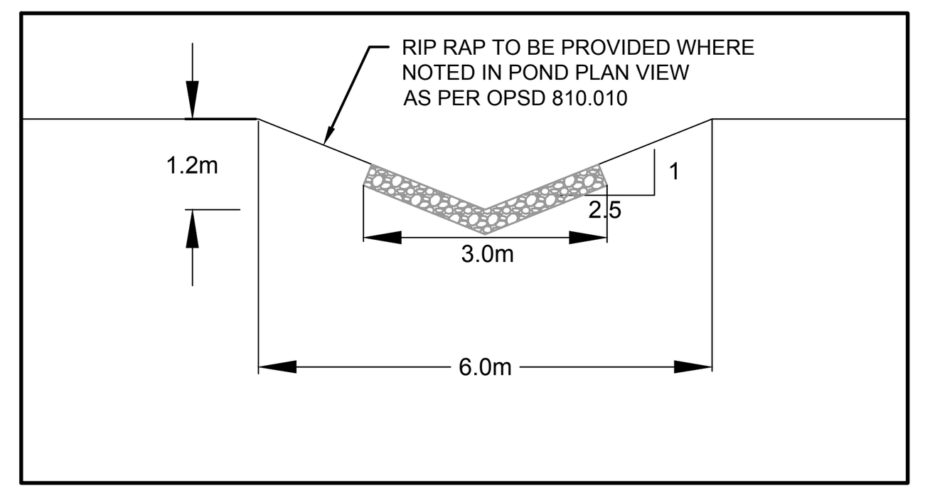
	City of Ottawa Comments (April 26, 2024)	Novatech Notes (May 14, 2024)	Accepted
East Pond Stormwater System			
1	The West Pond inlet is buried by sediments, potentially causing issues with the cooling trench inlet, which might be plugged. Sediment deposition from overland flow carrying sandy sediments might be the source of the problem. It's necessary for a consultant to inspect both the inlet and the lower channel, as the cooling trench may also be compromised or plugged. This is particularly crucial as the new development in the East Pond inlet and cooling trench have the same design elements as the West Pond.	The existing west SWM pond is part of Phase 1A of the subdivision. Water levels in both the Carp creek and the SWM pond are high due to the time of year / heavy rainfall. The condition of the west SWM pond and cooling trench will be reviewed / inspected once the water levels have lowered. Before we approve the cooling trench inlet design , a response to this comment is neccesary.	
2	The proposed overland swale should be diverted to the pond instead of discharging into the riprapped cooling manhole 281 depression to prevent further potential inlet plugging issues.	The overland flow swale has been revised to have a separate inlet from the Phase 1B-2 storm sewer inlet.	OK
3	The cooling trench must be provided with a subdrain all the way up to the connection with the existing west cooling channel, to ensure functionality. Referring to the mark-up at DWG 102085 SWF-5 East Stormwater Management Facility Phase 1B-2 Inlet Details for specific details and guidance on addressing the issues.	A subdrain has been added for the full length of the cooling trench.	OK
4	Additionally, the consultant must update the 2023 geotechnical report to confirm the groundwater table elevations, as field measurements were taken in September 2011	October 2022 groundwater elevations were provided in the Paterson Geotechnical Investigation Report, dated January 16, 2023. Refer to pages 49 to 51 for the soil profile and test data sheets.	OK
5	Who will be responsible for maintaining the rear yard infiltration trench while it's in the place? Please provide a service road parallel to the trench.	Maintenance of the rear yard infiltration trench would be the responsibility of the homeowners. This is consistent with standard City of Ottawa projects with a rear yard subdrain / infiltration system. Outlet catchbasins have been proposed within the ROW as part of the rear yard infiltration system and would provide maintenance access to the infiltration trench.No service road will be provided through the residential rear yards.	OK
6	Lastly the off-line Oil Grid separators must be provided with the gate to provide efficient maintenance.	The Stormwater Management Facility is a dry pond system and will not require the installation of gates in order to access the oil-grit separator for maintenance.	

The sluice gates or stoplogs are required to isolate the OGS unit during the cleanup process

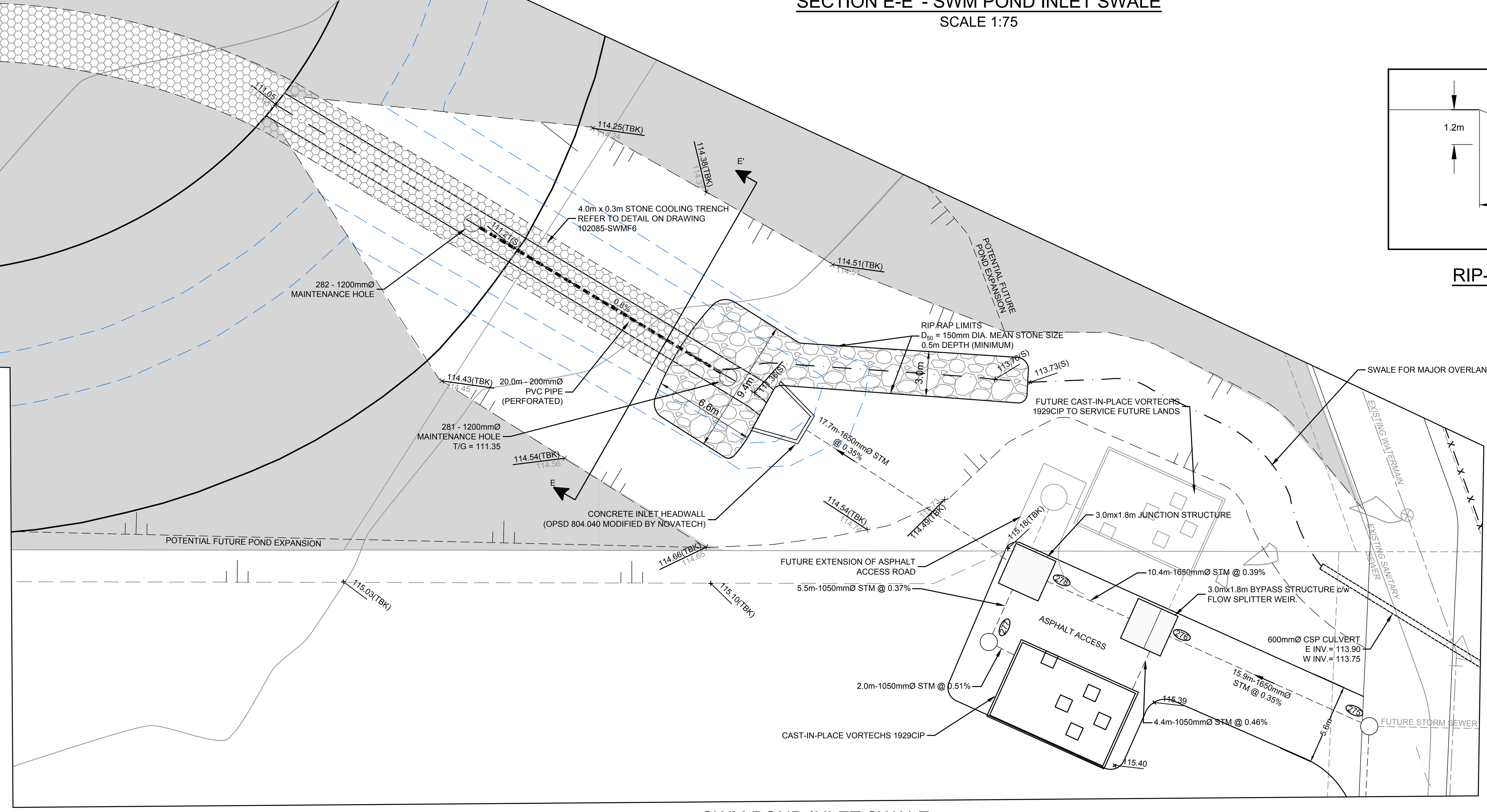
City of Ottawa Stormwater Operations Comments
Received via email attachment June 13, 2024



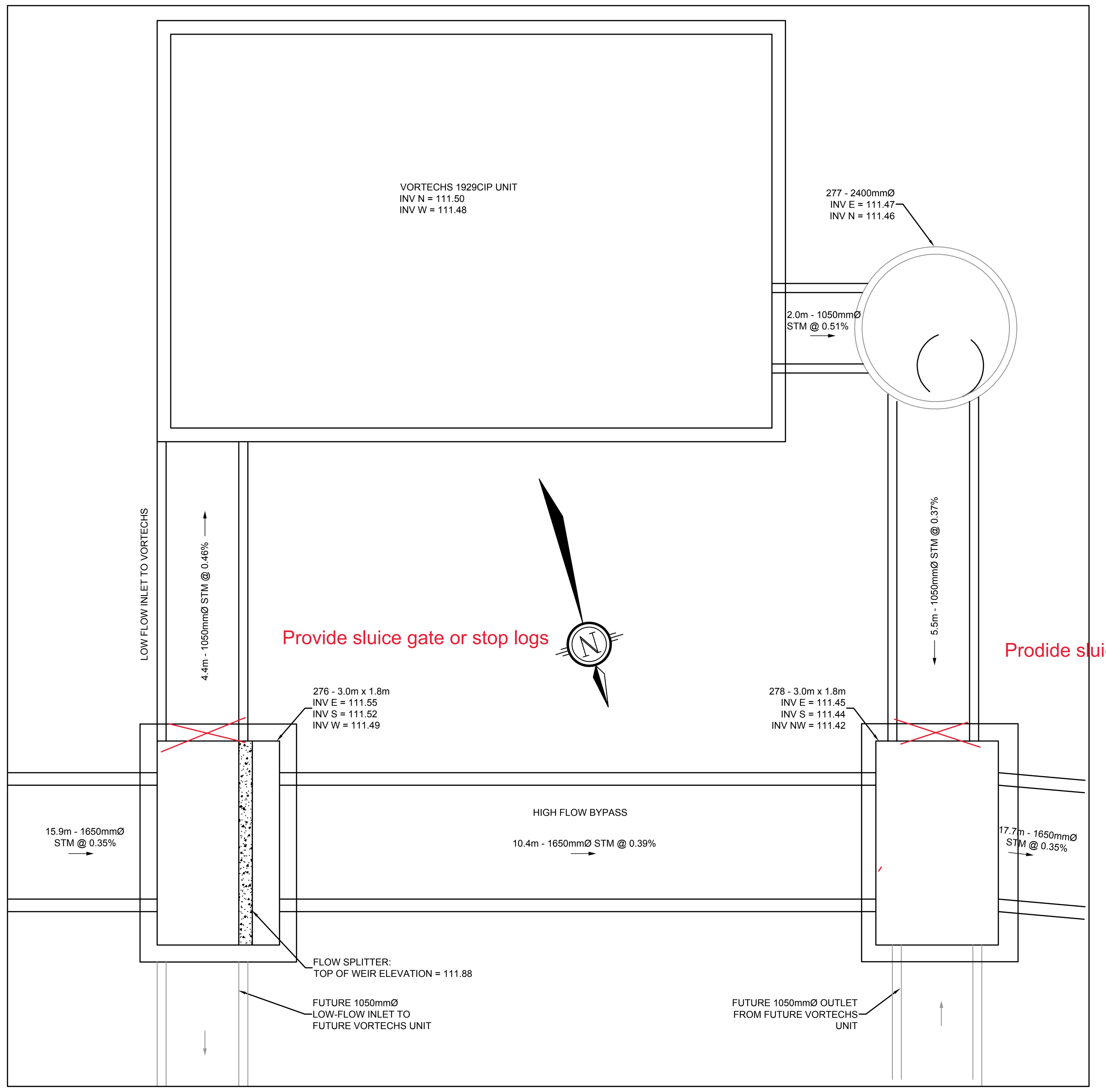
SECTION E-E' - SWM POND INLET SWALE
SCALE 1:75



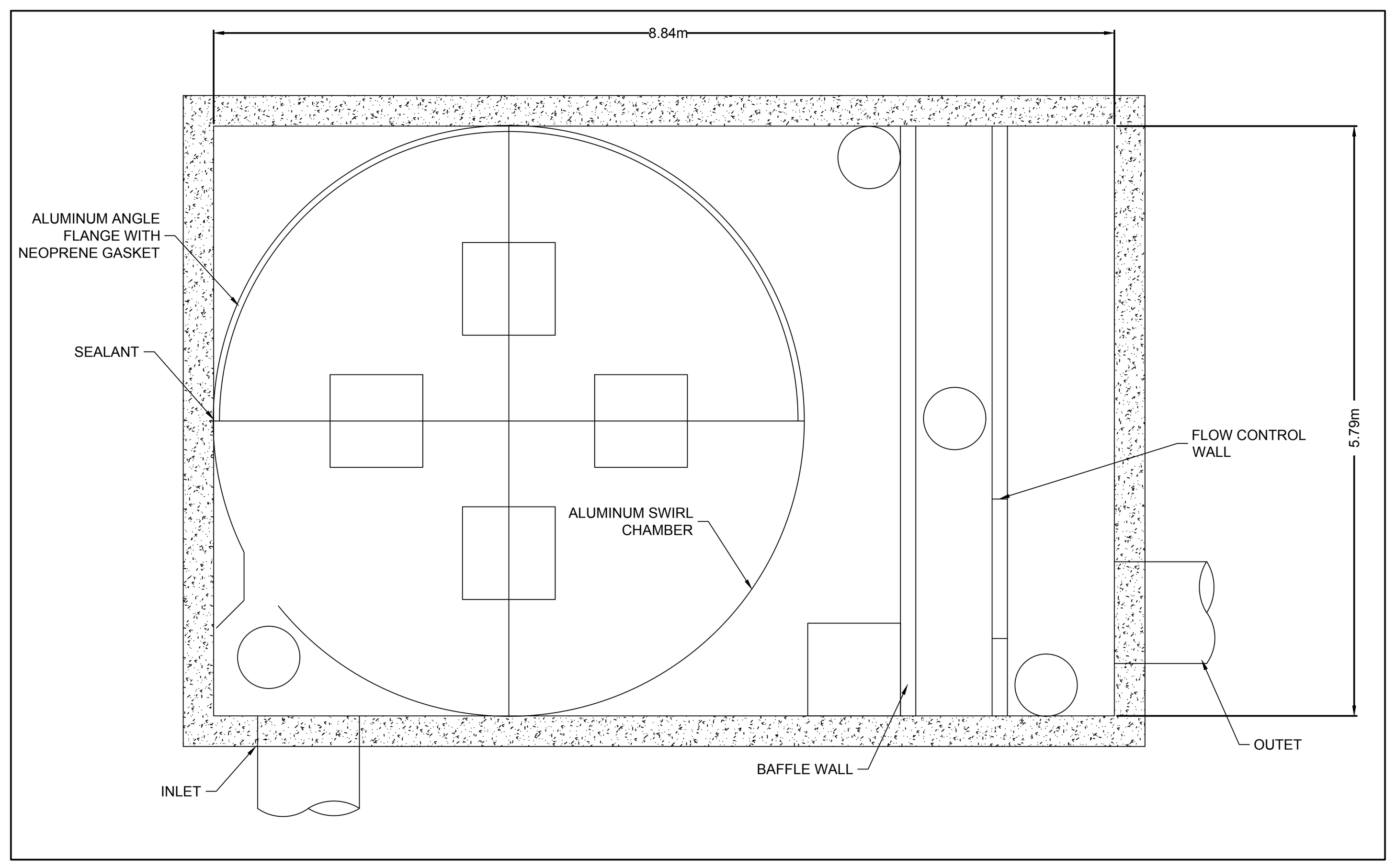
RIP-RAP SWALE DETAIL
SCALE: 1:100



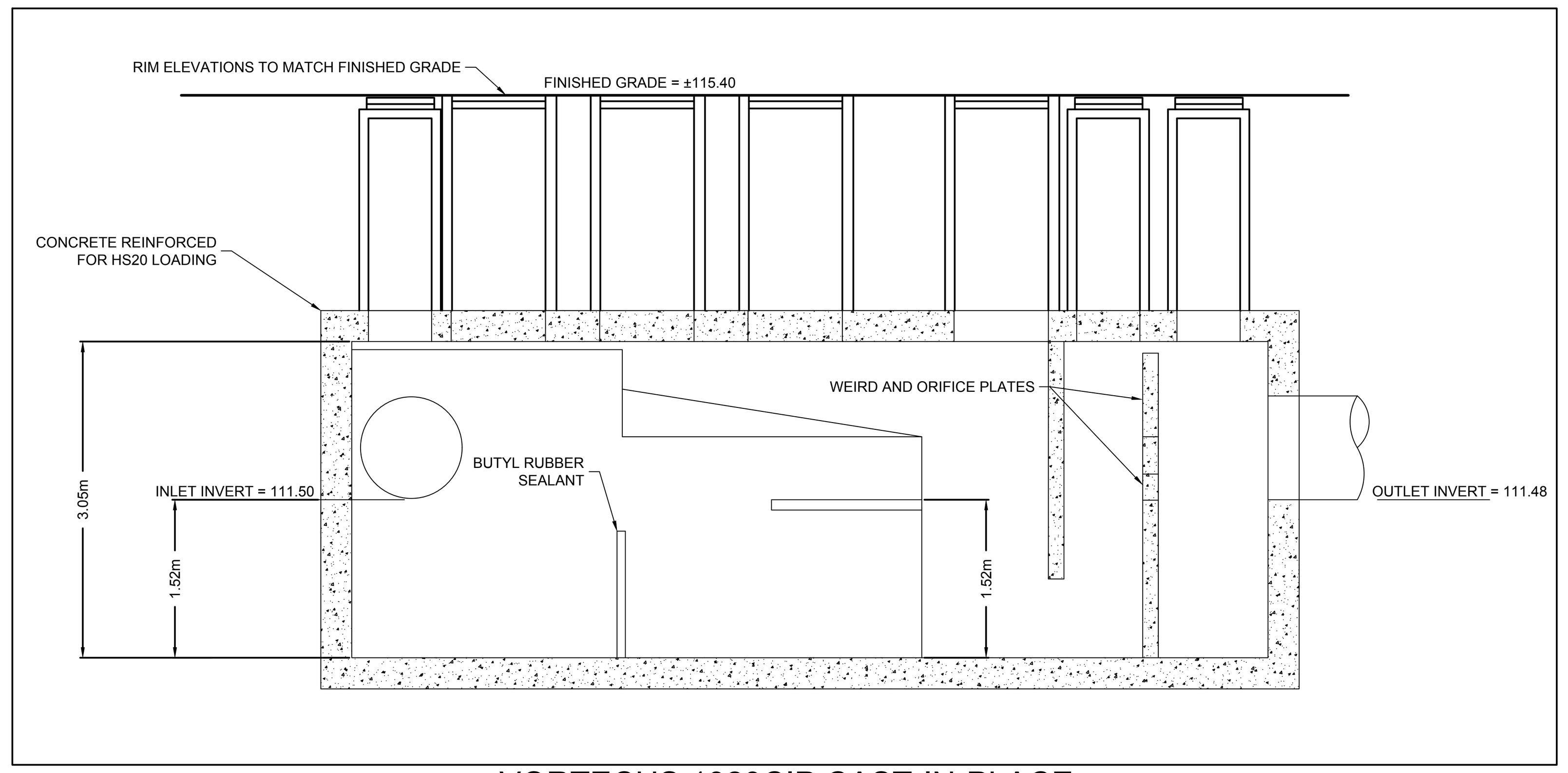
SWM POND INLET SWALE
SCALE 1:200



VORTECHS 1929CIP LAYOUT DETAIL
SCALE 1:50



VORTECHS 1929CIP CAST-IN-PLACE
LAYOUT DETAIL
SCALE 1:50



VORTECHS 1929CIP CAST-IN-PLACE
LAYOUT DETAIL
SCALE 1:50

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
6.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
5.	ISSUED WITH ADDENDUM #4	JAN 12/24	ARM
4.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
3.	ISSUED FOR TENDER	DEC 7/23	ARM
2.	ISSUED FOR REVIEW	JUL 28/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED XXX

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 Feb 20, 2024 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER S.M. GORDON Feb 20, 2024 PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
EAST STORMWATER MANAGEMENT FACILITY - PHASE 1B-2 INLET DETAILS

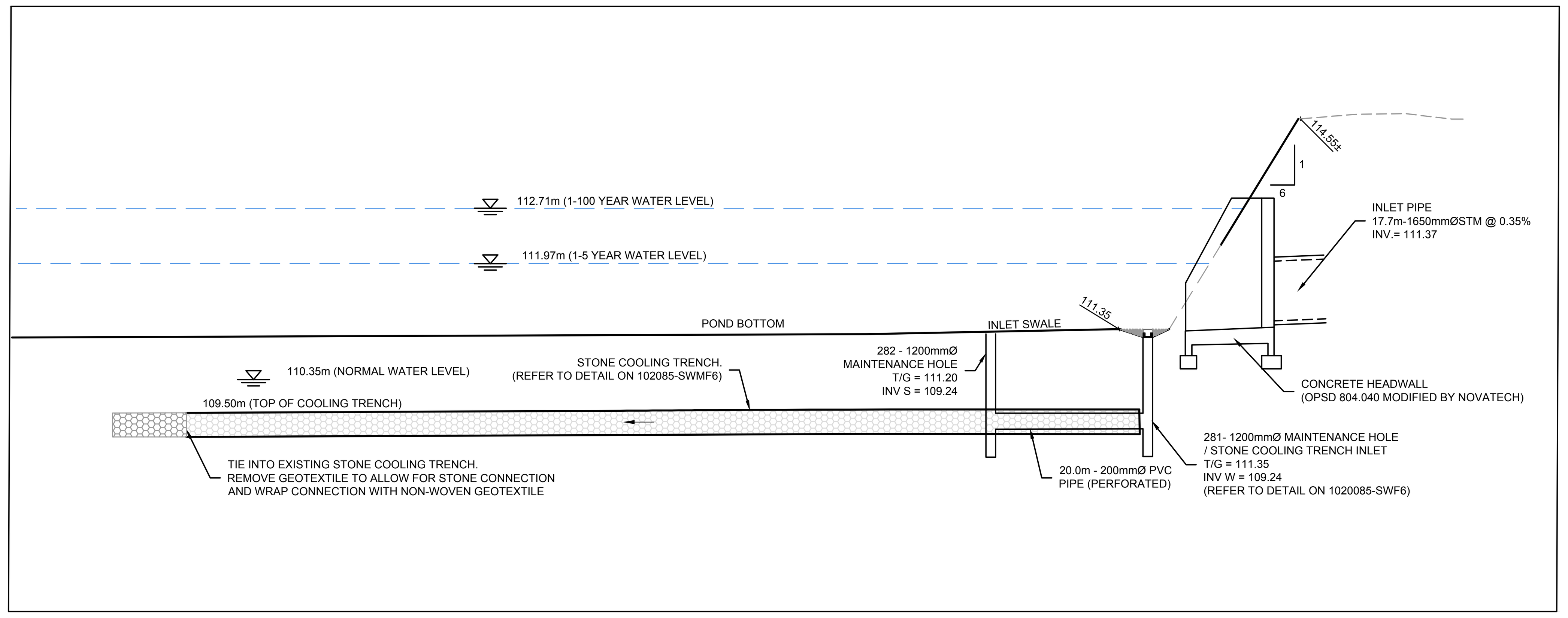
PROJECT No. 102085
REV
REV # 6
DRAWING No.
102085-SWMF5

COOLING TRENCH NOTES:

1. ALL DISTURBED AREAS TO BE REINSTATED WITH TOPSOIL, HYDROSEED AND MULCH - UNLESS OTHERWISE NOTED.

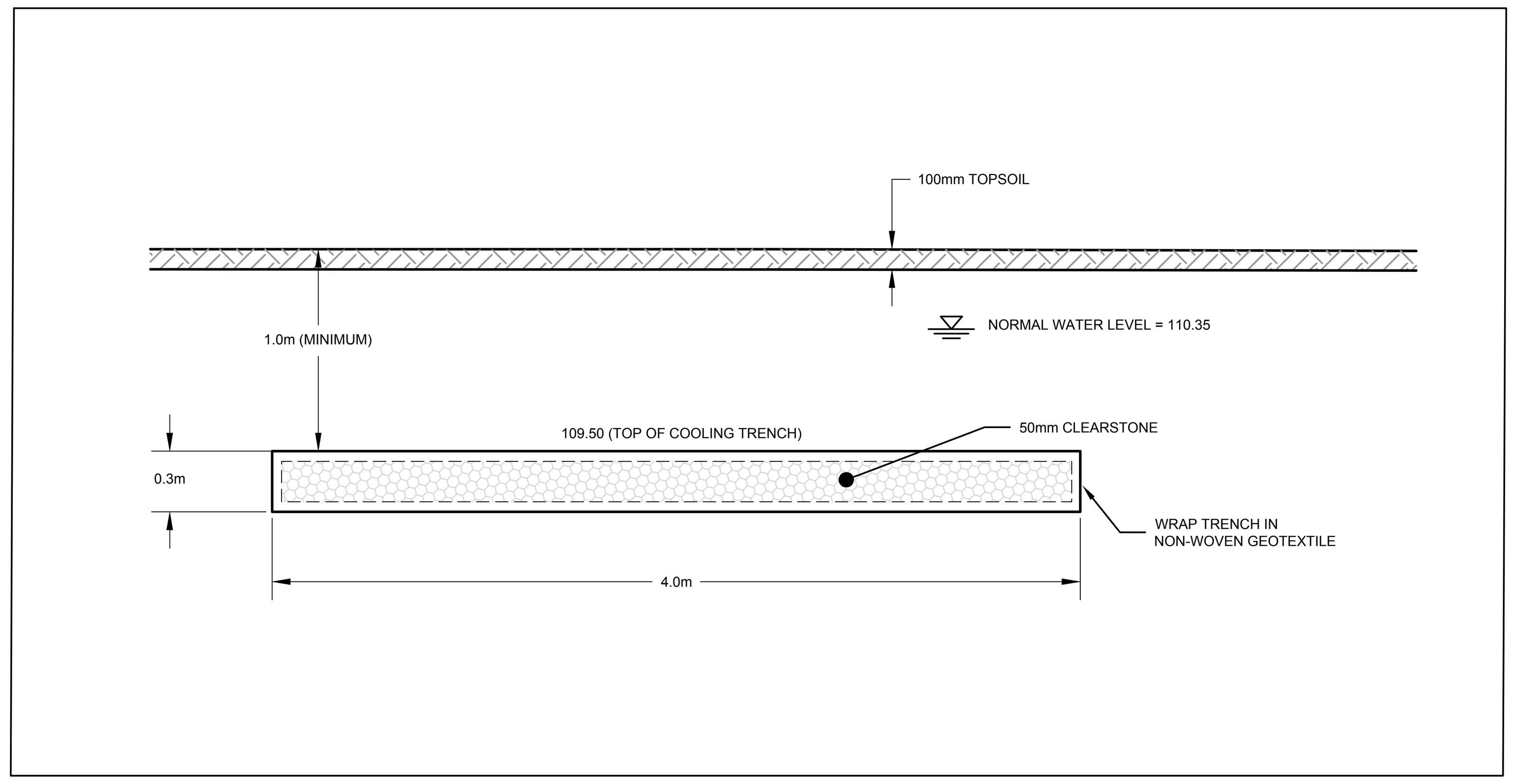
2. MAINTENANCE HOLE STRUCTURES WITHIN COOLING TRENCH SWM FACILITY TO BE AS PER OPSD 701.010. MAINTENANCE HOLE COVERS TO BE SOLID AS PER OPSD 401.060.

3. CUSTOM GRATES AT INLET AND OUTLET MAINTENANCE HOLES OF COOLING TRENCH TO BE DETAILED WITH SHOP DRAWINGS PRIOR TO ENGINEER REVIEW.



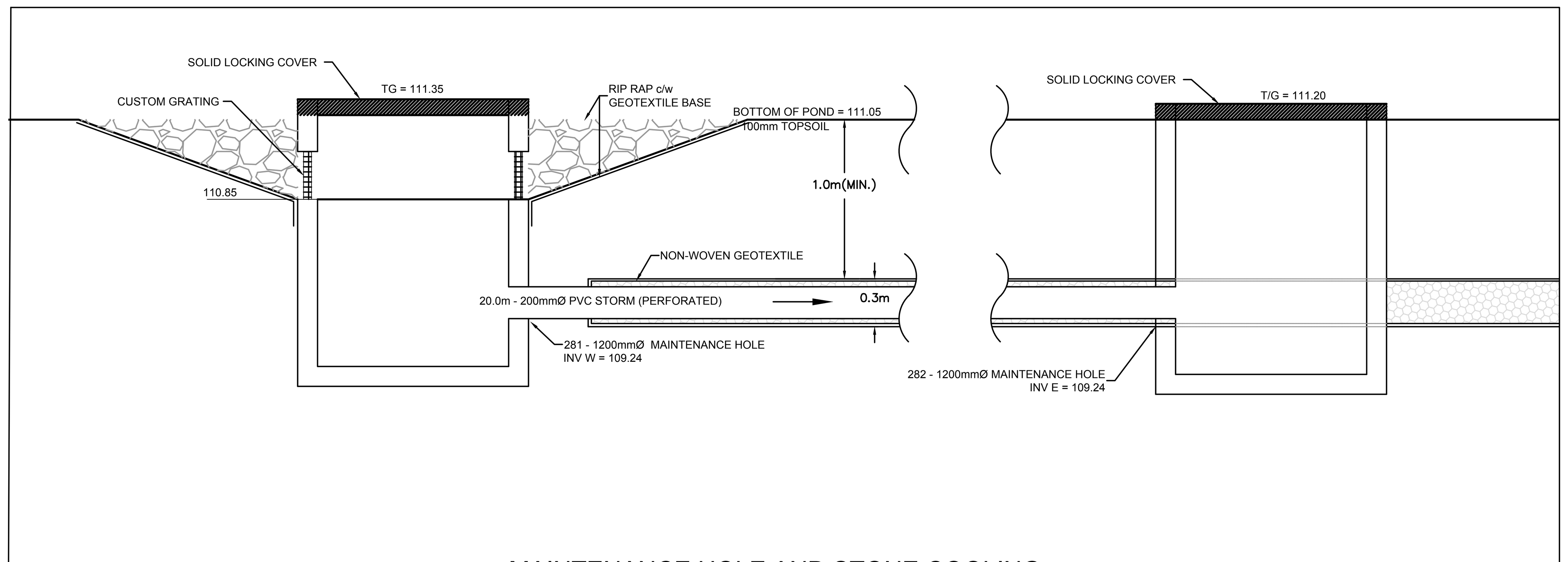
STONE COOLING TRENCH CROSS-SECTION

SCALE: N.T.S.



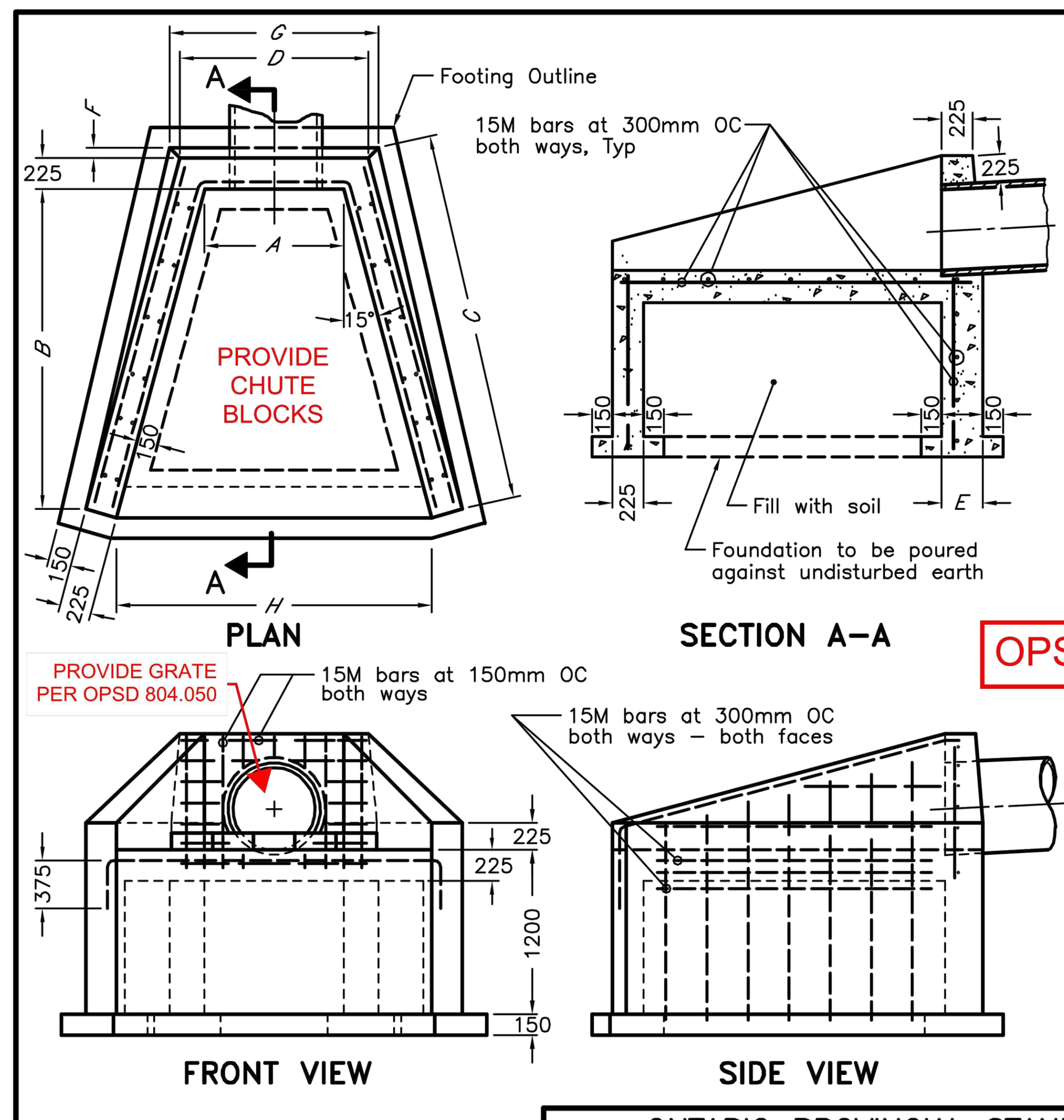
STONE COOLING TRENCH DETAIL

SCALE 1:50



MAINTENANCE HOLE AND STONE COOLING TRENCH INLET DETAIL

SCALE 1:50



PIPE DIA	ENDWALL DIMENSIONS							
	A	B	C	D	E	F	G	H
600	1050	2400	2725	1400	300	75	1525	2350
675	1125	2400	2725	1475	300	75	1600	2425
750	1200	2400	2725	1550	300	75	1675	2500
825	1275	2400	2725	1625	300	75	1755	2575
900	1350	2400	2725	1700	300	75	1825	2650
975	1425	2400	2725	1775	375	150	1975	2725
1050	1500	3000	3400	1850	375	150	2050	3100
1200	1650	3000	3400	2000	375	150	2200	3250
1350	1800	3000	3400	2150	375	150	2350	3400
1500	1950	3000	3400	2300	375	150	2500	3550
1650	2100	3000	3400	2450	375	150	2650	3700
1800	2250	3000	3400	2600	375	150	2800	3850
2400	3000	3000	3400	3350	375	150	3550	4600

OPSD MODIFIED BY NOVATECH JAN. 12/24

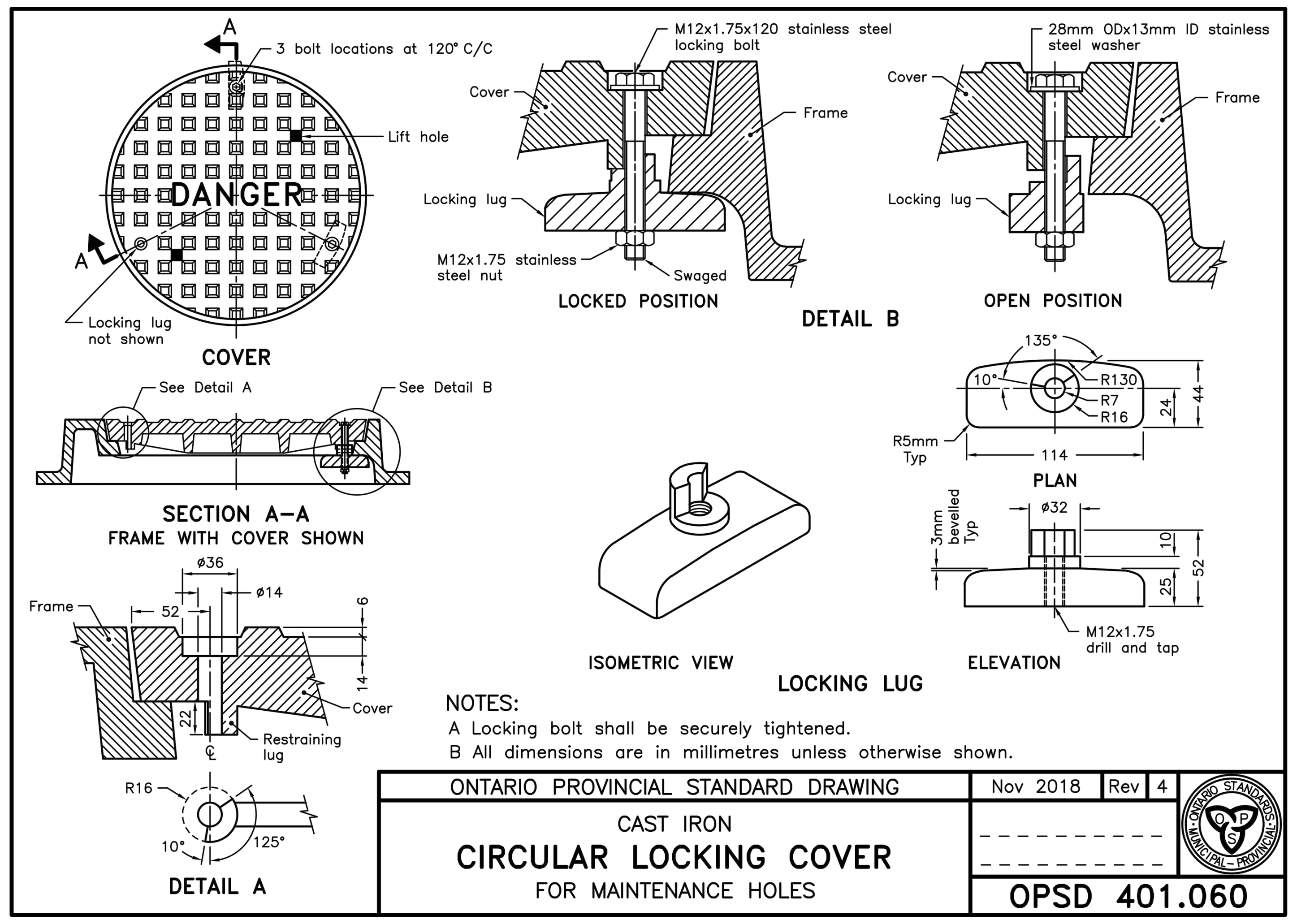
NOTES:
- A This OPSD to be read in conjunction with OPSD 3940.150.
- B Class of concrete: 30MPa.
- C Cover to reinforcing bars: 75mm ±20mm.
- D Granular backfill to be placed to 300mm min thickness on all sides.
- E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2017 | Rev 1

CONCRETE HEADWALL

FOR SEWER OR CULVERT PIPE OUTLET

OPSD 804.040



NOTES:
- A Locking bolt shall be securely tightened.
- B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2018 | Rev 4

CAST IRON

CIRCULAR LOCKING COVER

FOR MAINTENANCE HOLES

OPSD 401.060

NOTE:
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No.	REVISION	DATE	BY
2.	REVISED PER CITY COMMENTS (NO CHANGES)	FEB 20/24	ARM
1.	ISSUED WITH ADDENDUM #4	JAN 12/24	ARM

SCALE

DESIGN MNP | CHECKED ARM | DRAWN MNP | CHECKED ARM | APPROVED XXX

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 Feb 20, 2024 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER S.M. GORDON Feb 20, 2024 PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
EAST STORMWATER MANAGEMENT FACILITY DETAILS

PROJECT No. 102085

REV # 2

DRAWING No. 102085-SWMF6

Carp Airport Phase 1B-2 Residential (102085-22)
Novatech Response to City Comments Matrix
June 28, 2024

City of Ottawa Comments (November 2023)		Novatech Notes (February 23, 2024)	City of Ottawa Comments (March/April 2024)	Novatech Notes (May 14, 2024)	City of Ottawa Comments (June 2024)	Novatech Notes (June 28, 2024)
General						
	Comments 1 to 8		No further comment		✓	
Grading Plan (102085-GR13)						
	Comments 1 to 3		No further comment		✓	
Plan and Profile Phase 1B-2 Block 81 & Storm Sewer Outlet (102085-P28)						
Comments 1 to 2						
Servicing Report						
1	The 2-year storm also requires a 10 minute TC not 15 minutes as shown.	The storm sewer design sheet has been updated with a time of concentration of 10 minutes. Refer to Appendix D of the Servicing Report.	No further comment		✓	
SWM Report						
	Comments 1 to 11		No further comment		✓	
12	Please verify that the OGS unit will treat a minimum of 90% of the total annual stormwater volume from the contributing area. Ensure that the bypass structure with the splitter weir does not allow too much of the flow to bypass the treatment system.	Per the Vortechs design sheets provided in Appendix C, 90% of the projected annual runoff volume would be treated. The bypass weir is designed to convey the 25mm 4-hour Chicago event to the OGS unit (for both the interim and ultimate condition).	It is noted that the OGS device will treat runoff from 25 mm design storm (from the storm sewer). Is this accounted to 90 percent of the annual runoff volume?	Yes, the 25mm rainfall event is included in the 90% of the annual runoff volume treated. Please refer to Appendix E, page 226 for the estimated net annual solids load reductions table, prepared by Contech.	Please include this clarification in the report with a reference to the associated Appendix.	This clarification was added to the SWM report (Section 2.2) with reference to the appendix.
	Comments 13 to 35		No further comment		✓	
Drawings						
	Comments 1 to 3		No further comment		✓	
4	Riprap swale design details should include length of riprap areas on either side.	This information has been added to the drawing 102085-SWMF5.	The rip-rap swale details provided on the 102085-SWMF-5 drawing are assumed to be general one and shall refer to the location where external flow through the swale occurs. Is the channel section between E-E and the headwall the same as E-E with the exception that it contains rip-rap? Please clarify.	An additional cross section through the rip-rap portion of the inlet swale has been added to drawing 102085-SWMF5.	Thank you for adding cross-section F-F	
4a					The conveyance and discharge of major overland flows to the pond through the swale have been changed in the resubmission. Though no changes in volume or flows to the pond is anticipated, the change in the conveyance plan needs to be added to the report.	Rewording and additional text was added for the "Pond Inlet and Inlet Swale" in Section 2.3.5 to reflect the changes to the pond inlet swale.
	Comments 5 to 7		No further comment		✓	
8	What is the purpose of having interconnected icd's each with their own icd? One of the most common reasons for interconnecting cb's is to have only one icd.	Design has been revised such that there are no more interconnected catch basins. Each catch basin will have its own ICD, if required.	It is noted the CB 138 and CB 139 with 1B-1 phase are interconnected with each its own ICDs (Table 5)?	The Phase 1B-1 design drawings incorrectly indicated an ICD in the upstream CB. An ICD was installed in the downstream CB in order to control flows as intended. Only the downstream ICD was accounted for in the PCSMM model. The ICD in the upstream CB will not effect ponding as these CBs are on grade.	Noted. However, the response was not provided with respect to Table 5 of the report and should be updated in the report, as required.	Additional information was added to Note 4 under Table 5 to explain the ICDs on CB138 and CB139.
			Please clarify.			
	Comments 9 to 15		No further comment.		✓	

Carp Airport Phase 1B-2 Residential (102085-22)
Novatech Response to City Comments Matrix
June 28, 2024

City of Ottawa Comments (November 2023)		Novatech Notes (February 23, 2024)	City of Ottawa Comments (March/April 2024)	Novatech Notes (May 14, 2024)	City of Ottawa Comments (June 2024)	Novatech Notes (June 28, 2024)
PCSWMM Modelling						
	Comments 1 to 9		No further comment.		✓	
10	According to the model, half of the stormwater from the development area goes to the OGS unit and the rest goes to the pond without treatment. Similarly, approximately 380 L/s of runoff is directed to the Pond via a swale, which includes external flows as well as approximately 68 L/s flow from development areas. The flows from the external areas are assumed to be from the existing conditions and do not require treatment at this Phase of development. Please clarify.	Only minor system flows are directed through the OGS unit, and the OGS unit is only designed to treat the water quality event (25mm storm event). In the interim condition PCSWMM model, the future development area is undeveloped and does not require treatment. An ultimate condition PCSWMM model was included in the SWM report that shows the additional unit and the treatment of the future development area with a C = 0.65. Figures 102085-OGS1 and 102085-OGS2 clarify the interim and ultimate drainage areas to the pond and OGS units.	As per the response provided in comment #12 in SWM report section. It is noted that the OGS device will treat runoff from 25 mm design storm (from the storm sewer). Is this accounted to 90 percent of the annual runoff volume?	Please see response to comment #12 of the SWM Report section above.	See comment # 12 above	Please see response to comment #12 of the SWM Report section above.
Additional Comments						
1			Table 2 compares the OGS unit drainage area for Phase 1B-1. The 'Proposed Phase 1B-2 Residential Design' column is assumed to refer to the 1B-1 and rear yards 1B-2 drainage areas? A more appropriate column title would be preferable, as the current one is confusing concerning the proposed OGS unit for the 1B-2 development site is outlined in Table 3.	Table 2 is intended to show the change in AC value (drainage area times runoff coefficient) for the drainage area of the existing Phase 1B1 OGS unit, from the time of original design as part of the 2015 SWM Report, to the current design of Phase 1B-2. As some of the Phase 1B-2 area is draining to the existing Phase 1B-1 OGS unit we wanted to clarify the total AC value serviced by the Phase 1B-1 OGS unit is within the capacity of the OGS unit.	Thank you for the clarification. Please include in the report that 'although some of the Phase 1B-2 area is draining to the existing Phase 1B-1 OGS unit, the total AC value serviced by the Phase 1B-1 OGS unit is within its proposed capacity'.	The requested text was added to Section 2.2 (after Table 2).
2			It is noted that runoff from the entire future development areas will discharge to the East SWM Facility through the Phase 1B-2 pond inlet. Whether the proposed SWM plan can demonstrate that the proposed pond inlet can also regulate flows from future development regions, or whether it will be included in future development. Kindly clarify.	Please refer to page 6 of the SWM Report. In the ultimate condition (full development of future development lands) the PCSWMM model has accounted for the entire future development area to inlet to the pond through the Phase 1B-2 inlet. The model has assumed expansion of the pond (additional pond volume and additional OGS unit) to accommodate the future development. The pond inlet (pipes and major system swale) have been sized based on the ultimate condition flows. Please refer to figure 102085-OGS2 for the approximate size and location of pond expansion assumed in the PCSWMM model.	Please note that the details provided under 'Ultimate Condition' were not clear enough. It was understood that a future pond stage-storage curve for the East SWMF was included in the ultimate model. However, the next statement reads, "The pond expansion required to accommodate the future development area runoff will be confirmed during the detailed design of the future phase." The previous comment was to confirm whether the inlet to the East SWMF is proposed to be sized to accommodate future flows as well. Please add to clarify that "the pond inlet and major system swale have been sized based on the ultimate condition flows" prior to the last sentence in that paragraph (The SWM Block has additional space for expansion and can accommodate a larger expansion volume if required).	The requested text was added to the ultimate condition model scenario in Section 2.3.2.
3			The profile drawing for Block 81 (drawing 102085-P28) still includes offline exfiltration units. There are a few more references to exfiltration in legends and notes on various drawings. Please remove references to exfiltration units that are not part of the proposed SWM plan.	The exfiltration trench has been removed from profile drawing 102085P28.	✓	
4			It is noted that each of the two proposed OGS/Vortech units can treat runoff from 17.28 ha, for a total of 35.56 ha treated by both units. The proposed OGS unit for Phase 1B-2 is to treat runoff from 5.913 ha. This means that future development will direct flows to both the proposed interim and future OGS units. Please clarify.	Please refer to page 4 of the SWM Report. The proposed OGS unit to be installed with Phase 1B-2 will treat runoff from Phase 1B-2 only (5.913 ha) in the interim condition. In the future, once the contributing drainage area to this unit exceeds 17.28 ha, the second unit will be required. In the ultimate condition once future development is complete, the OGS unit installed with Phase 1B-2 and the future OGS unit will both treat the total area equally (17.28 ha each, 35.56ha total).	✓	

Carp Airport Phase 1B-2 Residential (102085-22)
Novatech Response to City Comments Matrix
June 28, 2024

City of Ottawa Comments (November 2023)		Novatech Notes (February 23, 2024)	City of Ottawa Comments (March/April 2024)	Novatech Notes (May 14, 2024)	City of Ottawa Comments (June 2024)	Novatech Notes (June 28, 2024)
5			The west development resulted in an overall 34% decrease in infiltration, whereas the east development increased infiltration by 12%. However, the tables reveal that the total infiltration from the west and east development areas decreased by only 0.5%. Include calculation for the combined infiltration water balance for west and east developments, 245 mm/yr and 243 mm/yr, for pre and postdevelopment circumstances, respectively.	The values referred to in your comment were taken from a table that was part of the original 2015 SWM Report. This table is outdated and was included in Appendix F, page 234-235, of the SWM Report as a reference tool for the updated water balance calculations. Please refer to Appendix F, page 240 of the SWM Report for the updated Pre vs. Post-development water balance comparison for Phase 1B-2. The combined values for the east and west developments were area weighted in the new calculations, as shown in the overall summary table. Refer to attached markup of excerpt from the Stormwater Management Report for clarity.	✓	
6			Where is the entrance to the construction or development site? Mud mat should be provided at the site's construction entrance(s) and egress(s).	Construction access will be via the gravel access road which connects existing Wingover Private to Phase 1B-2. Refer to drawing 102085GR15 for the location of the access road. Heavy-duty silt fence has been added along the rear of the lots backing onto the Carp Creek. A mud mat has been added to drawing 102085-ESC3. Proposed location of silt fence is shown on drawing 102085-ESC3. No in-stream works are proposed as part of Phase 1B-2 works.	✓	
			Erosion and Sediment Control (ESC) section include a heavy-duty silt fence if there any work in the area adjacent to water courses and include the type of erosion controls proposed for in stream works.	ESC notes have been added to drawing 102085-ESC3		
			Furthermore, the following should be added in ESC section:		This should be added to the ESC section of the report	Items were added to the ESC section of the SWM report.
			o Inspections of ESC measures at a frequency specified per the ESC plan, for dry weather periods (active and inactive construction phases), after Significant Storm Events (means a minimum of 25 mm of rain in any 24 hours period) and Significant Snowmelt Events (means the melting of snow at a rate which adversely affects the performance and function of the system), and after any extreme weather events. o Identify and rectify any deficiencies and undertake necessary maintenance measures as soon as possible.			
			o Inspections and maintenance of temporary ESC measures shall continue until they are no longer required.			
			o The contractor shall ensure that records of inspection, including at a minimum, the inspector's name, date of inspection, visual observations, and any necessary remedial measures to maintain the interim ESC measures.			
7			PCSWMM shows warning messages at several nodes, on Street 1-E, and in the cooling trenches. It is noted that the model automatically adds a small slope to any flat conduit that does not the above zero minimum slope requirements because the cooling trenches have a flat or zero slope. However, why does the Street-1-E node have the same error?	The PCSWMM model has been reviewed and the warning messages do not impact the results. The cooling trenches are designed with a zero slope, so the model will assign a minimum slope in order to calculate the flow through the cooling trench. The Street1-E conduit has the same error due to the lowest T/G between CB 162A and CB 162B is 116.72 (CB 162B) which was assigned for both CBs (as they are represented by a single node). The spill for CB 162A along Albert Boyd Private is also 116.72, which	✓	
			The maximum depth increased at nodes CB-116A-B, CB-126-127, and CB-163A-B. When integrating with upstream nodes, the model automatically increased depth to match the top height of the highest connected links. Please check these nodes and adjust the offsets to eliminate number of warnings as feasible.	When using irregular cross-sections, the maximum depth error sometimes occurs. These nodes were reviewed and the node depth was set to the anticipate top of the conduit. We checked the impact of raising the node depth by 0.01m to remove the error and the model results were unaffected.	✓	
8			Future development assumes 100m3/ha of storage for major flow to ROW. The 5.9 ha phase 1B is providing approximately 196 cu.m. surface storage.(Table 6). This translates to 33 cu.m./ha. This is closer to what we see in other subdivisions. Please look at what would happen if the assumed surface storage was reduced from the 100 cu.m./ha.	We did a quick check in the model where we decreased the storage to 30m3/ha. This would result in an increase in major system flows to the pond from the future development areas, but would not impact the Phase 1B-2 system in any significant way. There is no impact on the total runoff volume or storage requirements in the pond. The surface storage available and the major system flows to the pond from the future development	✓	
9					A 600 mm CSP culvert is proposed to cross the gravel road (entrance to the site), but this was not included in the report, even though it might be under interim conditions.	Additional text was added to the "Pond Inlet and Inlet Swale" in Section 2.3.5to discuss the culvert under the access road. Sizing information for HY-8 was included in Appendix E.

Carp Airport Phase 1B-2 Residential (102085-22)
Novatech Response to City Comments Matrix
June 28, 2024

City of Ottawa Comments (November 2023)		Novatech Notes (February 23, 2024)	City of Ottawa Comments (March/April 2024)	Novatech Notes (May 14, 2024)	City of Ottawa Comments (June 2024)	Novatech Notes (June 28, 2024)
Stormwater Operations Comments						
			The West Pond inlet is buried by sediments, potentially causing issues with the cooling trench inlet, which might be plugged. Sediment deposition from overland flow carrying sandy sediments might be the source of the problem. It's necessary for a consultant to inspect both the inlet and the lower channel, as the cooling trench may also be compromised or plugged. This is particularly crucial as the new development in the East Pond inlet and cooling trench have the same design elements as the West Pond.	The west SWM pond is part of Phase 1A of the subdivision. The condition of the west SWM pond and cooling trench will be reviewed / inspected once the water levels have lowered. Water levels in both the Carp creek and the SWM pond are high due to the time of year / heavy rainfall.	Before we approve the cooling trench inlet design, a response to this comment is necessary.	A site inspection of the Phase 1A pond was conducted with the City to investigate the performance of the pond with respect to sediment buildup. A memo was submitted to the City outlining the site inspection on June 20, 2024. Additional measures and notes have been added to the Erosion and Sediment Control Plan to provide additional sediment protection of the cooling trench and clarify OGS cleaning frequency requirements for Phase 1B-2.
			The proposed overland swale should be diverted to the pond instead of discharging into the riprapped cooling manhole 281 depression to prevent further potential inlet plugging issues.	The overland flow route has been revised to have a separate inlet from the Phase 1B-2 storm sewer inlet.	✓	
			The cooling trench must be provided with a subdrain all the way up to the connection with the existing west cooling channel, to ensure functionality. Referring to the mark-up at DWG 102085 SWF-5 East Stormwater Management Facility Phase 1B-2 Inlet Details for specific details and guidance on addressing the issues.	A subdrain has been added to the entirety of the cooling trench.	✓	
			Additionally, the consultant must update the 2023 geotechnical report to confirm the groundwater table elevations, as field measurements were taken in September 2011	October 2022 groundwater elevations were provided in the Paterson Geotechnical Investigation Report, dated January 16, 2023. Refer to pages 49 to 51 for the soil profile and test data sheets.	✓	
			Who will be responsible for maintaining the rear yard infiltration trench while it's in the place. Please provide a service road parallel to the trench.	Maintenance of the rear yard infiltration trench would be the responsibility of the homeowner. This is consistent with standard City of Ottawa projects with a rear yard subdrain / infiltration system. Outlet catchbasins which have been proposed within the ROW as part of the rear yard infiltration trench will provide maintenance access to the infiltration trench. No service road will be provided through the rear yards.	✓	
			Lastly the off-line Oil Grid separators must be provided with the gate to provide efficient maintenance.	The Stormwater Management Facility is a dry pond system and will not require the installation of gates in order to access the vortechs unit for maintenance.	The sluice gates or stop logs are required to isolate the OGS unit during the cleanup process.	Adjustable stop log restrictors per City detail S13.4 have been added to Storm Manholes 276 and 278 to isolate the OGS during maintenance. Refer to the OGS Layout Detail on the 102085-SWMF5 drawing.

Appendix B – Water Supply and Distribution

1) Carp Servicing Update Email (dated Feb. 8/22)
2) Excerpt from Novatech Hydraulic Network Analysis (R-2014-172, Nov 2014)
3) Ottawa Fire Services Email (dated July 16, 2015)
4) Fire Flows Letter – Novatech (dated July 17, 2023)
5) Ontario Building Code Water supply for Firefighting Calculations
6) Fire Underwriters Fire Flow Calculations
7) Phase 1B-2 Hydraulic Network Analysis Design Brief (prepared by Novatech July 2023)

From: Brown, Adam <Adam.Brown@ottawa.ca>
Sent: Tuesday, February 8, 2022 6:54 PM
To: 'Jack Stirling' <jack@tsgdi.ca>; 'Alison Stirling' <alison@tsgdi.ca>; Kyle MacHutchon <kyle@invernesshomes.ca>; 'Melissa Cote' <melissa.cote@taggart.ca>; Jim Moffatt <jmoffatt@ibigroup.com>; 'Matt Nesrallah' <MNesrallah@thomascavanagh.ca>; Pierre Dufresne (pdufresne@thomascavanagh.ca) <pdufresne@thomascavanagh.ca>; John Riddell <J.Riddell@novatech-eng.com>; Susan Gordon <s.gordon@novatech-eng.com>; 'Josh Kardish' <JKardish@eqhomes.ca>; 'andrew@wildeboer.ca' <andrew@wildeboer.ca>; Greg Winters <G.Winters@novatech-eng.com>
Cc: Xu, Lily <Lily.Xu@ottawa.ca>; Whittaker, Damien <Damien.Whittaker@ottawa.ca>; Hall, Kevin <Kevin.Hall@ottawa.ca>; Morgan, Brian <Brian.Morgan@ottawa.ca>; McWilliams, Cheryl <Cheryl.McWilliams@ottawa.ca>; McCormick, Sarah <sarah.mccormick@ottawa.ca>; Ostafichuk, Jeffrey <Jeffrey.Ostafichuk@ottawa.ca>; Zagorski, Joseph <Joseph.Zagorski@ottawa.ca>; Rogers, Christopher <Christopher.Rogers@ottawa.ca>
Subject: Carp Servicing update

Please see below for a status update of the servicing situation in Carp. If you have any questions, please advise

- There is currently no capacity for additional water users in Carp as the current GAC filters operating method is a limiting factor.
- For wastewater, based on the existing flow data, there is limited capacity available (equivalent of 100 single houses). However, because of no overflow protection at the station, Wastewater Operations do not support adding more connections at the present time.
- Infrastructure Planning, in conjunction with consultant RVA, already has a short-term project underway to increase capacity of the water and wastewater systems. The time frame including detailed design and construction phases, would be two to three years from today.
- Once the proposed short-term upgrades are in place, it is estimated that there should be additional water and wastewater capacity for the equivalent of 350 single houses in the Village. For the Carp Airport, there is expected to be an additional allocation of drinking of 0.2 ML/d for a total of 0.7 ML/d.
- It is noted that the City currently has two active Plan of Subdivision applications in the village of Carp.
    - Inverness Homes subdivision (D07-16-19-0034):147 Langstaff. Details here. Unit count is 67 townhouse dwellings and 128 apartment dwellings, total 195.
    - Tartan subdivision (D07-16-21-0035): 232 Donald B. Munro Drive. Details here. Unit count is 57 single detached, 6 semi-detached, 54 townhouse units, total 117.
    - Two other possible applications could be forthcoming, with combined unit count totals estimated at +/- 390.
- The available fire flow at the Carp water plant is 6500 L/min for two hours duration. Due to village topography, depending on the new development location, it could be a lot less. Developers will need to prove that their proposal meets the available fire flow through the development review process.
- Ongoing monitoring of flows will be undertaken in the village as developments advance to reassess capacity as necessary in the future.
- Infrastructure improvements beyond the short-term upgrades will be eight to ten years into the future assuming financing availability.

- The current water and wastewater infrastructure charge, paid at permit issuance for development in Carp, will continue to be assessed. City staff will review a possible change to an area-specific development charge in the 2024 DC by-law update.
- Staff propose reserving future water and wastewater capacity for development in the village at the draft approval stage. As applications are draft approved, water and wastewater flows will be reserved accordingly for that location. However, staff will reserve the right to reassess the allocation of flows to other areas when draft conditions expire if the development has not proceeded.
- Notwithstanding the above recommendation, if the development industry wishes to enter into an agreement for other arrangements to share allocations of flows, City staff are open to participating in these discussions.

Regards,
Adam Brown
City of Ottawa / Ville d'Ottawa
Manager, Development Review - Rural | Gestionnaire, Revue des projets d'aménagement - rurales
Planning, Real Estate and Economic Development Department | Direction générale de la planification, des biens immobiliers et du développement économique
(613) 580-2424 x:28352
http://ottawa.ca/rural
http://ottawa.ca/rurales

Note: I will be out of the office March 14 – 18.

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This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

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Ben Houle

From: McNaughton, Duncan [Duncan.McNaughton@ottawa.ca]
Sent: April 20, 2011 4:33 PM
To: c.sciuk@novatech-eng.com; Hutt, Paul
Cc: Susan Gordon
Subject: RE: Carp Airport Fire Flows

That is my take away from the meeting also.

Duncan McNaughton, P.Eng
Fire Protection Engineer
Ottawa Fire Services
613-580-2424 ext. 29603
613-978-0647 (cell)

Except from
Novatech Hydraulic Network Analysis
Appendix B
R-2014-172
November 5, 2014

From: Carl Sciuk [mailto:c.sciuk@novatech-eng.com]
Sent: April 20, 2011 16:06
To: Hutt, Paul; McNaughton, Duncan
Cc: 'Susan Gordon'
Subject: Carp Airport Fire Flows

Hi Paul/Duncan

Thanks again for meeting with us today. To summarize: We will utilize the 1,000usgpm for 30 minute fire flow for all buildings [residential and business/commercial], with the understanding that we will try to provide a charged non potable hydrant system [capable of delivering 1,000usgpm for 30min flow] to the business area. Our next step will be to discuss with city staff involved with water distribution approval to ensure we can put in appropriate backflow preventers to make this work & involve Paul/Duncan in discussions if we run into a roadblock.

Regards,

Carl Sciuk, P. Eng.
Senior Project Manager
Novatech Engineering Consultants Ltd.
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6
Tel: (613) 254-9643
Fax: (613) 254-5867
http://www.novatech-eng.com

From: Carl Sciuk [mailto:c.sciuk@novatech-eng.com]
Sent: Wednesday, April 13, 2011 10:58 AM
To: 'Hutt, Paul'
Subject: RE: Carp Airport Fire Flows

Alex McAuley

From: McNaughton, Duncan <Duncan.McNaughton@ottawa.ca>
Sent: Thursday, July 16, 2015 11:40 AM
To: McNaughton, Duncan; Susan Gordon; Burke, Chris; McNeely, Tim
Cc: Burke, Chris; Pete Van Grootheest (petev@sheldoncreek.com); Carl Sciuk; Adam Thompson; Hall, Kevin; Ostafichuk, Jeffrey
Subject: RE: Carp Airport - Fire Protection Plan
Attachments: 20140526-DP_Subdivision_Extension.pdf

To All,

Please proceed, OFS has no current comments or objections.

Duncan A. McNaughton, P.Eng
Fire Protection Engineer / Ingénieur Sécurité Incendie
City of Ottawa / Ville d'Ottawa
101 Centrepointe Drive - 3rd Floor
Nepean, ON
K2G 5K7
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www.ottawa.ca

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From: McNaughton, Duncan
Sent: Wednesday, July 15, 2015 11:26 AM
To: 'Susan Gordon'; Burke, Chris; McNeely, Tim
Cc: Burke, Chris; Pete Van Grootheest (petev@sheldoncreek.com); Carl Sciuk; Adam Thompson; Hall, Kevin; Ostafichuk, Jeffrey
Subject: RE: Carp Airport - Fire Protection Plan

Susan,

I see no problem with the proposal shown to me last week. I have copied two sector Chiefs on this to have final say if they see anything that I may have missed. We will get back to you soon.

Duncan A. McNaughton, P.Eng
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From: Susan Gordon [mailto:s.gordon@novatech-eng.com]
Sent: Friday, July 10, 2015 11:30 AM
To: McNaughton, Duncan
Cc: Burke, Chris; Pete Van Grootheest (petev@sheldoncreek.com); Carl Sciuk; Adam Thompson; Hall, Kevin; Ostafichuk, Jeffrey
Subject: Carp Airport - Fire Protection Plan

Duncan,

Thank you for meeting with us at the Carp Airport this week to discuss the proposed fire protection plan for the proposed residential and commercial developments. We understand that our approach is acceptable to the fire department, subject to the provision that no parking will be allowed on the streets and that the streets be registered as fire routes . This is to accommodate the fact that the asphalt width on the urban and rural roads are less than the City standards of 8.5m and 7.0m, respectively. The developer has indicated that the no parking provision will be included in the condominium documents.

We have attached the draft conditions for the subdivision and would appreciate it if you would provide your clearance of condition #14. Please call if you have questions or would like to discuss.

Thank you,

Susan M. Gordon, P.Eng., Senior Project Manager
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 269 | Cell: 613.265.5415 | Fax: 613.254.5867

NOVATECH
Engineers, Planners & Landscape Architects

July 17, 2023

City of Ottawa
Planning, Real Estate, and Economic Development Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: **Kevin Hall**

Reference: **Carp Airport Phase 1B-2 Residential**
Fire Flows
Our File No.: 102085-22

Background

We wanted to expand upon the fire protection discussion that was included in the previously provided Serviceability Report (June 20, 2023), in support of the revised Draft Plan of Subdivision Application for Phase 1B-2. The application addresses the proposed re-lotting of this phase and does not change the approved water system or the proposed unit types and does not substantially increase the number of lots.

The West Capital Airpark was Draft Approved in 2007 and includes the Phase 1B-2 Residential lands as a mix of single-family homes and townhomes being serviced by a privately owned and operated water system.

As this is a phased subdivision, a Hydraulic Network Analysis (Novatech, June 5, 2015) was prepared for all of the Draft Approved lands, both residential and business park, and was approved for registration of the first residential phase.

Criteria

The 2010 Ottawa Design Guidelines – Water Distribution, covering the design of municipal water systems, were in effect at the time. While the Guidelines require the use of Fire Underwriters Survey (FUS) calculations for the sizing of municipal watermains, the Carp Airport is a private site and therefore Section 4.2.11 applies, indicating the following:
"The requirements for levels of fire protection on private property are covered in Section 7.2.11 of the Ontario Building Code [OBC]*."*

In support of the Hydraulic Network Analysis, Novatech met with Ottawa Fire Services on April 20, 2011. Based on that meeting, Fire Services suggested a fire flow of 63.08L/s for 30 minutes was acceptable for all areas of the development, which reflects the standard for rural fire fighting in the area. Subsequent correspondence with Fire Services in 2015 reconfirmed they had no objections to the fire protection plan at the Carp Airport development.

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

Notwithstanding that, at the time of approval, the requirement to use FUS calculations for sizing of municipal water systems was well established, the City of Ottawa made a clear decision to approve fire protection at the Carp Airport on the basis of providing a 63.08L/s fire flow for 30 minutes. The ultimate system for providing fire protection, including the pumps and storage of water has been constructed on the above basis.

Water System Serviceability Design

Fire flow calculations for Phase 1B-2, per the OBC, are provided in the Serviceability Report and are within the available fire flow at the West Capital Airpark, as summarized below.

- Fire flow per OBC calculations: 45 L/s
- Fire flow available: 63.08L/s

Fire Underwriters Survey (FUS) calculations have been provided in the Serviceability Report, for reference only. Calculations for fire flows using the FUS method result in higher flow rates than required by OBC.

Conclusion

The development was designed and approved based on a fire flow suggested by Ontario Fire Services. The private watermain and fire protection system have been constructed on that basis. The Ontario Building Code fire flow requirement is within the fire flow available.

The proposed water system therefore meets the Ontario Building Code requirements for fire protection, as required by the Ottawa Water Design Guideline in place at the time of approval.

Yours truly,

NOVATECH

Alex McAuley, P.Eng.
Project Manager | Land Development Engineering

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

OBC Water Supply for Firefighting Calculation

Based on OBC 2012 (Div. B, Article 3.2.5.7)

References: Ontario Fire Marshal - OBC Fire Fighting Water Supply
Ontario Building Code 2012, Appendix A, Vol 2., A-3.2.5.7

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 102085-22
Project Name: Carp Airport Phase 1B-2 Residential
Date: 6/15/2023
Input By: A. Rongve
Reviewed By: A. McAuley

Legend
Input by User
No Input Required

Building Description: Single detached home classified as Occupancy C and is of combustible construction

Unsprinklered

Step		Calculation Inputs		Calculation Notes	Value
Minimum Fire Protection Water Supply Volume					
1	**Water Supply Coefficient**				
	Building Classification =	C		From Table 3.1.2.1	
	Water Supply Coefficient - K =			From Table 1 (A3.2.5.7)	**23**
2	**Total Building Volume**				
	Building Width - W	13.00	m		
	Building Length - L	15.00	m	Area (W * L) = 195 m2	
	Building Height - H	8	m		
	Total Building Volume - V =			W * L * H	**1560 m³**
3	**Spatial Coefficient Value**				
	Exposure Distances: (Exterior building face to property/lot line, to street centre, or to mid-point between proposed building and another building on same lot)			**Spatial Coefficients:** From Figure 1 (Spatial Coefficient vs Exposure Distance)	
	North	2.50	m	Sside 1 = **0.50**	
	East	15.00	m	Sside 2 = **0.00**	
	South	2.50	m	Sside 3 = **0.50**	
	West	14.00	m	Sside 4 = **0.00**	
	Total of Spacial Coefficient Values - S-Tot as obtained from the formula =			1.0 + (Sside 1 + Sside 2 + Sside 3 + Sside 4) (Max. value = 2.0)	**2.00**
4	**Minimum Fire Protection Water Supply Volume**				
	Q =			$K * V * S_{Tot}$	**71,760 L**
Required Minimum Water Supply Flow Rate					
5	**Minimum Water Supply Flow Rate =**			From Table 2 (For water supply from a municipal or industrial water supply system, min. pressure is 140 kPa)	**2,700 L/min** or **45 L/s**
Minimum Fire Protection Water Supply Volume for 30 minutes					
6	**Q =**			= Minimum Water Supply Flow Rate (L/min) * 30 minutes	**81,000 L**
Required Fire Protection Water Supply Volume					
7	**Q =**			Highest volume out of (4) and (6)	**81,000 L**
Notes					

OBC Water Supply for Firefighting Calculation

Based on OBC 2012 (Div. B, Article 3.2.5.7)

References: Ontario Fire Marshal - OBC Fire Fighting Water Supply
Ontario Building Code 2012, Appendix A, Vol 2., A-3.2.5.7

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Novatech Project #: 102085-22
Project Name: Carp Airport Phase 1B-2 Residential
Date: 6/15/2023
Input By: A. Rongve
Reviewed By: A. McAuley

Legend
Input by User
No Input Required

Building Description: Townhome classified as Occupancy C and is of combustible construction, 2-hr masonry fire wall between groups of no more than 3 townhome units

Unsprinklered

Step		Calculation Inputs		Calculation Notes	Value
Minimum Fire Protection Water Supply Volume					
1	**Water Supply Coefficient**				
	Building Classification =	C		From Table 3.1.2.1	
	Water Supply Coefficient - K =			From Table 1 (A3.2.5.7)	**23**
2	**Total Building Volume**				
	Building Width - W	18.30	m		
	Building Length - L	18.00	m	Area (W * L) = 329 m2	
	Building Height - H	9.2	m		
	Total Building Volume - V =			W * L * H	**3030 m³**
3	**Spatial Coefficient Value**				
	Exposure Distances: (Exterior building face to property/lot line, to street centre, or to mid-point between proposed building and another building on same lot)			**Spatial Coefficients:** From Figure 1 (Spatial Coefficient vs Exposure Distance)	
	North	2hr Fire Wa	m	Sside 1 =	**0.00**
	East	11.00	m	Sside 2 =	**0.00**
	South	3.00	m	Sside 3 =	**0.50**
	West	15.00	m	Sside 4 =	**0.00**
	Total of Spacial Coefficient Values - S-Tot as obtained from the formula =			1.0 + (Sside 1 + Sside 2 + Sside 3 + Sside 4) (Max. value = 2.0)	**1.50**
4	**Minimum Fire Protection Water Supply Volume**				
	Q =			$K * V * S_{Tot}$	**104,552 L**
Required Minimum Water Supply Flow Rate					
5	**Minimum Water Supply Flow Rate =**			From Table 2 (For water supply from a municipal or industrial water supply system, min. pressure is 140 kPa)	**2,700 L/min** or **45 L/s**
Minimum Fire Protection Water Supply Volume for 30 minutes					
6	**Q =**			= Minimum Water Supply Flow Rate (L/min) * 30 minutes	**81,000 L**
Required Fire Protection Water Supply Volume					
7	**Q =**			Highest volume out of (4) and (6)	**104,552 L**
Notes					

FUS - Fire Flow Calculations

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Novatech Project #: 102085-22
Project Name: Carp Airport Phase 1B-2 Residential
Date: 6/20/2023
Input By: A. Rongve
Reviewed By: A. McAuley

Legend: Input by User / No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)

Building Description: 2 Storey Single Family
Type V - Wood frame

Step			Input		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	184			
		Number of Floors/Storeys	2			
		Area of structure considered (m^2)			**368**	
	F	**Base fire flow without reductions**				**6,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,100**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	0 - 3 m		25%	**3,825**
		East Side	20.1 - 30 m		10%	
		South Side	0 - 3 m		25%	
		West Side	10.1 - 20 m		15%	
				Cumulative Total	**75%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**9,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**150**
				or	USGPM	2,378
7	**Storage Volume**	Required Duration of Fire Flow (hours)	**FUS Table 1**		Hours	2
		Required Volume of Fire Flow (m^3)			m^3	1080

FUS - Fire Flow Calculations

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Novatech Project #: 102085-22
Project Name: Carp Airport Phase 1B-2 Residential
Date: 6/20/2023
Input By: A. Rongve
Reviewed By: A. McAuley

Legend: Input by User / No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)

Building Description: 2 Storey Townhome, 2-hr masonry fire wall between groups of no more than 3 townhome units
Type V - Wood frame

Step			Input		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	330			
		Number of Floors/Storeys	2			
		Area of structure considered (m^2)			**660**	
	F	**Base fire flow without reductions**				**8,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**6,800**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	0 - 3 m		25%	**3,400**
		East Side	10.1 - 20 m		15%	
		South Side	2Hr Firewall		0%	
		West Side	20.1 - 30 m		10%	
				Cumulative Total	**50%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**10,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**167**
				or	USGPM	2,642
7	**Storage Volume**	Required Duration of Fire Flow (hours)	**FUS Table 1**		Hours	2
		Required Volume of Fire Flow (m^3)			m^3	1200

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West Capital Airpark, Carp, ON
Phase 1B-2 Residential
Novatech File#: 102085-22

July 28, 2023

Phase 1B-2 Hydraulic Network Analysis Design Brief

Reference Documents/Information:

- Hydraulic Network Analysis and Water Storage Facility Design Report [Novatech, R-2015-118, revised July 16, 2015]

Introduction

This Hydraulic Network Analysis Design Brief has been prepared in support of the revised draft plan approval for the proposed Phase 1B-2 Residential subdivision, which was originally part of the registered Phase 1 Residential subdivision. The hydraulic analysis uses EPA NET modelling software to confirm that the existing and proposed water distribution networks at West Capital Airpark can provide the domestic and fire flow demands required with the addition of Phase 1B-2. This approach is consistent with the Hydraulic Network Analysis and Water Storage Facility Design Report (Novatech, 2015).

The watermain network for the West Capital Airpark development is connected to the existing Village of Carp municipal watermain which supplies maximum day demand to the private watermain system. The private water system consists of an existing water storage facility and existing watermains which are private communal systems owned, operated, and maintained by a condominium corporation as common elements.

Proposed Development

Table 1 below summarizes the existing and proposed residential units and population counts for the development that were used in the hydraulic analysis.

Table 1: Unit Counts and Population

Phase	Single Family Homes	Townhouses	Population
Existing Approved Phases 1A, 2A, & 1B-1	187	48	435
Proposed Phase 1B-2	77	30	107
Subtotal	**264**	**78**	**1,109**

Water Distribution Network

The water distribution network used in this hydraulic analysis model consists of a reservoir at the existing water storage facility and a watermain network with pipes ranging from 150mm to 300mm diameter. A model schematic is included as an attachment for reference.

Hydraulic Analysis

Based on monitored flow data from occupied lots in previous phases, it is anticipated that maximum water demands will be considerably less than City of Ottawa Design Guidelines demand estimates. However, the City of Ottawa Design Guidelines average day demand of 280L/capita/day has been used in this analysis in order to conservatively validate the capacity of the water distribution network.

The following design parameters outlined in **Table 2** were used in the development of the hydraulic model.

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Table 2: Model Design Parameters

Parameter	Design Value
Average Day Domestic Demand	280 L/capita/day
Maximum Day Domestic Demand	2.0 x Avg. Day
Peak Hour Domestic Demand	2.2 x Max. Day
Fire Flow Demand	63.08 L/s
Hydraulic Head at Reservoir (Constant)*	161m

*Note: The hydraulic head at the reservoir is representative of the head supplied by the pumps at the Water Storage Facility which is consistent with the Hydraulic Network Analysis and Water Storage Facility Design Report.

A Water Demand Summary is attached which outlines the domestic demands assigned to each node in the model. It is noted that the existing watermain installed to service the Phase 2 Business Park was included in the model (Nodes BN and BO), but no demands are assigned to these nodes as the Phase 2 Business Park has not yet been approved.

The following scenarios were modelled to ensure that the required pressures were met at each node.

1) Average Day Demand (High Pressure) Scenario – Pressure at each node to be less than 56m (80psi) when average day demand is assigned to each node.
2) Peak Hour Demand (Low Pressure) Scenario – Pressure at each node to be greater than 28m (40psi) when peak hour demand is assigned to each node.
3) Maximum Day Demand Plus Fire Flow (Lowest Pressure) Scenario – Pressure at each node to be greater than 14m (20psi) when maximum day demand is assigned to each node and fire flow demand is assigned to any individual node.

Modelling Results

The modelling results are summarized in Table 3 below for the three pressure condition scenarios.

Table 3: Model Results Summary

Scenario	City of Ottawa Pressure Requirement	Pressure Provided
Average Day Demand (High Pressure)	Less than 56m	52.90m
Peak Hour Demand (Low Pressure)	Greater than 28m	42.88m
Maximum Day Demand Plus Fire Flow (Lowest Pressure)	Greater than 14m	27.26m

The modelling results confirm that the required pressures are achieved in each scenario. The Maximum Day Plus Fire Flow Scenario was run under multiple iterations with the fire flow demand being placed at various critical nodes. The modelling results tables are attached for reference.

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Conclusion

The existing water storage facility and the existing and proposed water distribution network can provide adequate domestic and fire flow demands to all residential phases of the subdivision including Phase 1B-2.

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Prepared by:

Aden Rongve, B.Sc., EIT

Reviewed by:

Carl Sciuk, P.Eng.
Senior Project Manager

Attachments

1. EPA NET Model Schematic (July 2023)
2. Water Demand Summary (July 2023)
3. EPA NET Modelling Results (July 2023)

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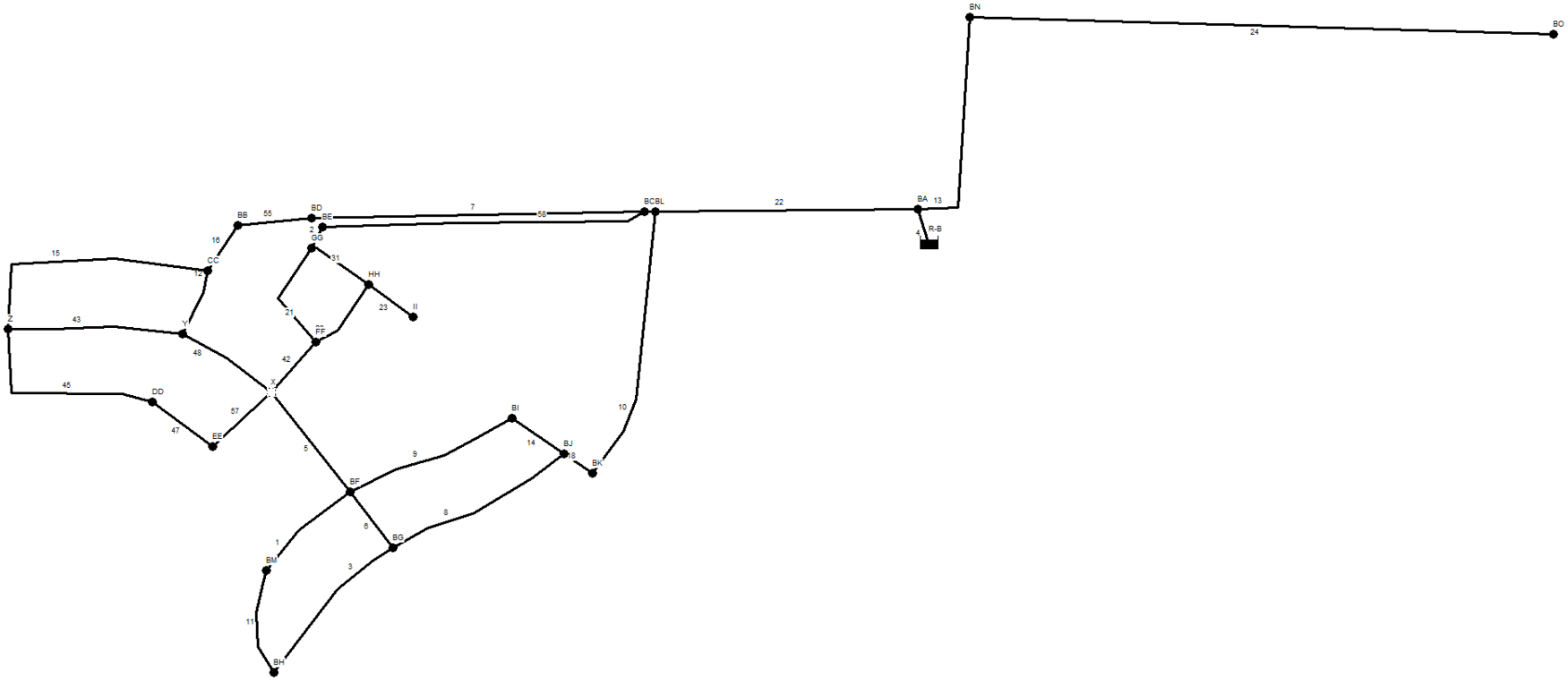
CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODEL SCHEMATIC

JOB NO. 102085-22
DATE: JULY 2023



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JOB NO. 102085-22
DATE: JULY 2023

Water Demand Summary

Node	Phase	Residential Population			Commercial	Residential Demand (L/s)			Commercial Demand (L/s)			Total Demand (L/s)		
						Avg Day	Max. Daily	Peak Hour	Avg Day	Max. Daily	Peak Hour	Avg Day	Max. Daily	Peak Hour
		Townhouse Units	Single Family Units	Total Population	Area (ha)									
Z	1A & 2A	0	54	184	0	0.60	1.19	2.62	0	0	0	0.60	1.19	2.62
Y	1A & 2A	0	17	58	0	0.19	0.37	0.82	0	0	0	0.19	0.37	0.82
CC	1A & 2A	0	23	78	0	0.25	0.51	1.12	0	0	0	0.25	0.51	1.12
DD	1A & 2A	0	11	37	0	0.12	0.24	0.53	0	0	0	0.12	0.24	0.53
EE	1A & 2A	0	12	41	0	0.13	0.26	0.58	0	0	0	0.13	0.26	0.58
X	1A & 2A	0	15	51	0	0.17	0.33	0.73	0	0	0	0.17	0.33	0.73
FF	1A & 2A	10	6	47	0	0.15	0.31	0.68	0	0	0	0.15	0.31	0.68
GG	1A & 2A	32	2	93	0	0.30	0.60	1.33	0	0	0	0.30	0.60	1.33
HH	1A & 2A	6	8	43	0	0.14	0.28	0.62	0	0	0	0.14	0.28	0.62
II	1A & 2A	0	11	37	0	0.12	0.24	0.53	0	0	0	0.12	0.24	0.53
BH	1B-1 & 1B-2	15	14	88	0	0.29	0.57	1.26	0	0	0	0.29	0.57	1.26
BG	1B-1 & 1B-2	15	20	109	0	0.35	0.70	1.55	0	0	0	0.35	0.70	1.55
BF	1B-1 & 1B-2	0	23	78	0	0.25	0.51	1.12	0	0	0	0.25	0.51	1.12
BI	1B-1 & 1B-2	0	17	58	0	0.19	0.37	0.82	0	0	0	0.19	0.37	0.82
BJ	1B-1 & 1B-2	0	21	71	0	0.23	0.46	1.02	0	0	0	0.23	0.46	1.02
BM	1B-1 & 1B-2	0	10	34	0	0.11	0.22	0.48	0	0	0	0.11	0.22	0.48
BN	2 Bus. Park	0	0	0	4.9	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
BO	2 Bus. Park	0	0	0	8.1	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
										Site Total (L/s)		3.59	7.18	15.80
										Site Total (ML/day)		0.31	0.62	1.37

Design Parameters:

Townhouse Population	2.7	persons/unit
Single Family Population	3.4	persons/unit

Section 4.0 Ottawa Water Distribution Design Guidelines

Theoretical Avg. Day Domestic Demand	280	L/capita/day	
Max. Day Domestic Demand	2.0	x Avg. Day	(per 2008 Stantec EA)
Peak Hour Domestic Demand	2.2	x Max. Day	

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CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

PIPES - AVERAGE DAY CONDITION

Link ID	Length m	Diameter mm	Roughness	Flow L/s	Velocity m/s	Unit Headloss m/km	Friction Factor
Pipe 1	155	150	100	-0.1	0.0	0.0	0.1
Pipe 10	370	300	120	-2.1	0.0	0.0	0.0
Pipe 11	150	150	100	0.0	0.0	0.0	0.0
Pipe 12	90	150	100	0.0	0.0	0.0	0.0
Pipe 13	50	150	100	0.0	0.0	0.0	0.0
Pipe 14	95	200	110	-1.0	0.0	0.0	0.0
Pipe 15	360	150	100	-0.2	0.0	0.0	0.1
Pipe 16	80	150	100	-0.5	0.0	0.0	0.1
Pipe 18	45	200	110	2.1	0.1	0.1	0.0
Pipe 19	2	300	120	-1.5	0.0	0.0	0.1
Pipe 2	50	200	110	1.1	0.0	0.0	0.0
Pipe 20	100	150	100	-0.2	0.0	0.0	0.1
Pipe 21	175	150	100	-0.3	0.0	0.0	0.1
Pipe 22	400	300	120	-3.6	0.1	0.0	0.0
Pipe 23	75	150	100	0.1	0.0	0.0	0.1
Pipe 24	50	150	100	0.0	0.0	0.0	0.0
Pipe 3	230	200	110	-0.3	0.0	0.0	0.1
Pipe 31	90	150	100	-0.4	0.0	0.0	0.1
Pipe 4	10	300	120	-3.6	0.1	0.0	0.0
Pipe 42	115	200	110	-0.3	0.0	0.0	0.1
Pipe 43	240	150	100	0.3	0.0	0.0	0.1
Pipe 45	280	150	100	-0.1	0.0	0.0	0.1
Pipe 47	114	150	100	-0.2	0.0	0.0	0.1
Pipe 48	140	200	110	-0.5	0.0	0.0	0.1
Pipe 5	185	200	110	-0.7	0.0	0.0	0.1
Pipe 55	100	150	100	0.5	0.0	0.0	0.1
Pipe 57	100	150	100	-0.4	0.0	0.0	0.1
Pipe 58	450	200	110	1.1	0.0	0.0	0.0
Pipe 6	90	200	110	-0.3	0.0	0.0	0.1
Pipe 7	450	150	100	0.5	0.0	0.0	0.1
Pipe 8	285	200	110	-0.9	0.0	0.0	0.0
Pipe 9	260	200	110	-0.8	0.0	0.0	0.1

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CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

NODES - AVERAGE DAY CONDITION

Node ID	Elevation m	Demand L/s	Head m	Pressure m
Resvr R-B	161.0	-3.59	161.00	0.00
Junc BH	117.9	0.29	160.99	43.09
Junc BM	117.3	0.11	160.99	43.69
Junc Z	117.1	0.60	160.98	43.88
Junc DD	117.0	0.12	160.98	43.98
Junc BG	117.0	0.35	160.99	43.99
Junc BF	116.4	0.25	160.99	44.59
Junc Y	116.3	0.19	160.98	44.68
Junc X	116.2	0.17	160.99	44.79
Junc BJ	116.2	0.23	160.99	44.79
Junc EE	116.1	0.13	160.98	44.88
Junc BK	116.0	0.00	160.99	44.99
Junc CC	115.9	0.25	160.98	45.08
Junc FF	115.7	0.15	160.99	45.29
Junc BI	115.6	0.19	160.99	45.39
Junc II	115.4	0.12	160.99	45.59
Junc GG	115.3	0.30	160.99	45.69
Junc BB	115.3	0.00	160.99	45.69
Junc HH	115.0	0.14	160.99	45.99
Junc BD	114.7	0.00	160.99	46.29
Junc BE	114.6	0.00	160.99	46.39
Junc BC	112.9	0.00	160.99	48.09
Junc BL	112.9	0.00	160.99	48.09
Junc BA	112.0	0.00	161.00	49.00
Junc BN	111.2	0.00	161.00	49.80
Junc BO	108.1	0.00	161.00	52.90

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CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

NODES - PEAK HOUR CONDITION

Node ID	Elevation m	Demand L/s	Head m	Pressure m
Resvr R-B	161.0	-15.80	161.00	0.00
Junc BH	117.9	1.28	160.78	42.88
Junc BM	117.3	0.48	160.78	43.48
Junc Z	117.1	2.64	160.74	43.64
Junc DD	117.0	0.53	160.75	43.75
Junc BG	117.0	1.54	160.79	43.79
Junc BF	116.4	1.10	160.79	44.39
Junc Y	116.3	0.84	160.76	44.46
Junc X	116.2	0.75	160.77	44.57
Junc BJ	116.2	1.01	160.83	44.63
Junc EE	116.1	0.57	160.75	44.65
Junc CC	115.9	1.10	160.76	44.86
Junc BK	116.0	0.00	160.87	44.87
Junc FF	115.7	0.66	160.77	45.07
Junc BI	115.6	0.84	160.82	45.22
Junc II	115.4	0.53	160.77	45.37
Junc BB	115.3	0.00	160.78	45.48
Junc GG	115.3	1.32	160.79	45.49
Junc HH	115.0	0.62	160.78	45.78
Junc BD	114.7	0.00	160.80	46.10
Junc BE	114.6	0.00	160.80	46.20
Junc BC	112.9	0.00	160.90	48.00
Junc BL	112.9	0.00	160.90	48.00
Junc BA	112.0	0.00	161.00	49.00
Junc BN	111.2	0.00	161.00	49.80
Junc BO	108.1	0.00	161.00	52.90

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CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

NODES - MAX DAY + FIRE FLOW AT NODE BJ

Node ID	Elevation m	Demand L/s	Head m	Pressure m
Resvr R-B	161.0	-70.28	161.00	0.00
Junc BH	117.9	0.58	157.89	39.99
Junc BM	117.3	0.22	157.90	40.60
Junc BG	117.0	0.70	157.89	40.89
Junc Z	117.1	1.20	158.27	41.17
Junc DD	117.0	0.24	158.26	41.26
Junc BF	116.4	0.50	157.92	41.52
Junc BJ	116.2	63.56	157.79	41.59
Junc Y	116.3	0.38	158.27	41.97
Junc X	116.2	0.34	158.26	42.06
Junc EE	116.1	0.26	158.26	42.16
Junc BI	115.6	0.38	157.82	42.22
Junc CC	115.9	0.50	158.33	42.43
Junc BK	116.0	0.00	158.61	42.61
Junc FF	115.7	0.30	158.39	42.69
Junc II	115.4	0.24	158.54	43.14
Junc BB	115.3	0.00	158.47	43.17
Junc GG	115.3	0.60	158.70	43.40
Junc HH	115.0	0.28	158.54	43.54
Junc BD	114.7	0.00	158.64	43.94
Junc BE	114.6	0.00	158.77	44.17
Junc BC	112.9	0.00	159.41	46.51
Junc BL	112.9	0.00	159.41	46.51
Junc BA	112.0	0.00	160.96	48.96
Junc BN	111.2	0.00	160.96	49.76
Junc BO	108.1	0.00	160.96	52.86

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CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

NODES - MAX DAY + FIRE FLOW AT NODE BF

Node ID	Elevation m	Demand L/s	Head m	Pressure m
Resvr R-B	161.0	-70.28	161.00	0.00
Junc BH	117.9	0.58	156.97	39.07
Junc BM	117.3	0.22	156.87	39.57
Junc BG	117.0	0.70	157.01	40.01
Junc Z	117.1	1.20	157.46	40.36
Junc BF	116.4	63.60	156.79	40.39
Junc DD	117.0	0.24	157.44	40.44
Junc Y	116.3	0.38	157.46	41.16
Junc X	116.2	0.34	157.43	41.23
Junc EE	116.1	0.26	157.43	41.33
Junc CC	115.9	0.50	157.58	41.68
Junc BJ	116.2	0.46	158.13	41.93
Junc FF	115.7	0.30	157.67	41.97
Junc BI	115.6	0.38	157.76	42.16
Junc BB	115.3	0.00	157.81	42.51
Junc II	115.4	0.24	157.93	42.53
Junc BK	116.0	0.00	158.78	42.78
Junc GG	115.3	0.60	158.20	42.90
Junc HH	115.0	0.28	157.93	42.93
Junc BD	114.7	0.00	158.10	43.40
Junc BE	114.6	0.00	158.32	43.72
Junc BC	112.9	0.00	159.41	46.51
Junc BL	112.9	0.00	159.41	46.51
Junc BA	112.0	0.00	160.96	48.96
Junc BN	111.2	0.00	160.96	49.76
Junc BO	108.1	0.00	160.96	52.86

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CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

NODES - MAX DAY + FIRE FLOW AT NODE BH

Node ID	Elevation m	Demand L/s	Head m	Pressure m
Resvr R-B	161.0	-70.28	161.00	0.00
Junc BH	117.9	63.68	153.20	35.30
Junc BM	117.3	0.22	155.03	37.73
Junc BG	117.0	0.70	156.65	39.65
Junc Z	117.1	1.20	157.60	40.50
Junc DD	117.0	0.24	157.58	40.58
Junc BF	116.4	0.50	156.98	40.58
Junc Y	116.3	0.38	157.60	41.30
Junc X	116.2	0.34	157.57	41.37
Junc EE	116.1	0.26	157.57	41.47
Junc CC	115.9	0.50	157.70	41.80
Junc BJ	116.2	0.46	158.08	41.88
Junc FF	115.7	0.30	157.79	42.09
Junc BI	115.6	0.38	157.78	42.18
Junc BB	115.3	0.00	157.92	42.62
Junc II	115.4	0.24	158.03	42.63
Junc BK	116.0	0.00	158.76	42.76
Junc GG	115.3	0.60	158.28	42.98
Junc HH	115.0	0.28	158.03	43.03
Junc BD	114.7	0.00	158.19	43.49
Junc BE	114.6	0.00	158.40	43.80
Junc BC	112.9	0.00	159.41	46.51
Junc BL	112.9	0.00	159.41	46.51
Junc BA	112.0	0.00	160.96	48.96
Junc BN	111.2	0.00	160.96	49.76
Junc BO	108.1	0.00	160.96	52.86

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CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

NODES - MAX DAY + FIRE FLOW AT NODE II

Node ID	Elevation m	Demand L/s	Head m	Pressure m
Resvr R-B	161.0	-70.28	161.00	0.00
Junc II	115.4	63.34	142.66	27.26
Junc HH	115.0	0.28	152.50	37.50
Junc Z	117.1	1.20	157.04	39.94
Junc DD	117.0	0.24	157.01	40.01
Junc BH	117.9	0.58	158.20	40.30
Junc FF	115.7	0.30	156.01	40.31
Junc GG	115.3	0.60	155.94	40.64
Junc Y	116.3	0.38	157.04	40.74
Junc X	116.2	0.34	157	40.8
Junc BM	117.3	0.22	158.15	40.85
Junc EE	116.1	0.26	157.01	40.91
Junc BG	117.0	0.70	158.22	41.22
Junc CC	115.9	0.50	157.18	41.28
Junc BE	114.6	0.00	156.29	41.69
Junc BF	116.4	0.50	158.11	41.71
Junc BB	115.3	0.00	157.47	42.17
Junc BJ	116.2	0.46	158.77	42.57
Junc BI	115.6	0.38	158.59	42.99
Junc BK	116.0	0.00	159.10	43.10
Junc BD	114.7	0.00	157.82	43.12
Junc BC	112.9	0.00	159.41	46.51
Junc BL	112.9	0.00	159.41	46.51
Junc BA	112.0	0.00	160.96	48.96
Junc BN	111.2	0.00	160.96	49.76
Junc BO	108.1	0.00	160.96	52.86

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Engineers, Planners & Landscape Architects

CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

NODES - MAX DAY + FIRE FLOW AT NODE DD

Node ID	Elevation m	Demand L/s	Head m	Pressure m
Resvr R-B	161.0	-70.28	161.00	0.00
Junc DD	117.0	63.34	145.96	28.96
Junc EE	116.1	0.26	151.35	35.25
Junc Z	117.1	1.20	153.46	36.36
Junc Y	116.3	0.38	155.80	39.50
Junc BH	117.9	0.58	157.78	39.88
Junc CC	115.9	0.50	155.79	39.89
Junc X	116.2	0.34	156.14	39.94
Junc BM	117.3	0.22	157.72	40.42
Junc BG	117.0	0.70	157.81	40.81
Junc FF	115.7	0.30	156.54	40.84
Junc BB	115.3	0.00	156.25	40.95
Junc BF	116.4	0.50	157.67	41.27
Junc II	115.4	0.24	156.99	41.59
Junc HH	115.0	0.28	156.99	41.99
Junc BD	114.7	0.00	156.82	42.12
Junc GG	115.3	0.60	157.44	42.14
Junc BJ	116.2	0.46	158.56	42.36
Junc BI	115.6	0.38	158.31	42.71
Junc BK	116.0	0.00	158.99	42.99
Junc BE	114.6	0.00	157.63	43.03
Junc BC	112.9	0.00	159.41	46.51
Junc BL	112.9	0.00	159.41	46.51
Junc BA	112.0	0.00	160.96	48.96
Junc BN	111.2	0.00	160.96	49.76
Junc BO	108.1	0.00	160.96	52.86

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CARP AIRPORT
PHASE 1B-2 RESIDENTIAL
EPA NET MODELLING RESULTS

JOB NO. 102085-22
DATE: JULY 2023

NODES - MAX DAY + FIRE FLOW AT NODE Z

Node ID	Elevation m	Demand L/s	Head m	Pressure m
Resvr R-B	161.0	-70.28	161	0.00
Junc Z	117.1	64.30	149.33	32.23
Junc DD	117.0	0.24	153.21	36.21
Junc EE	116.1	0.26	154.83	38.73
Junc Y	116.3	0.38	155.14	38.84
Junc CC	115.9	0.50	154.92	39.02
Junc BH	117.9	0.58	157.86	39.96
Junc X	116.2	0.34	156.29	40.09
Junc BB	115.3	0.00	155.49	40.19
Junc BM	117.3	0.22	157.80	40.50
Junc BG	117.0	0.70	157.88	40.88
Junc FF	115.7	0.30	156.67	40.97
Junc BF	116.4	0.50	157.74	41.34
Junc BD	114.7	0.00	156.20	41.50
Junc II	115.4	0.24	157.10	41.70
Junc HH	115.0	0.28	157.10	42.10
Junc GG	115.3	0.60	157.53	42.23
Junc BJ	116.2	0.46	158.60	42.40
Junc BI	115.6	0.38	158.36	42.76
Junc BK	116.0	0.00	159.01	43.01
Junc BE	114.6	0.00	157.71	43.11
Junc BC	112.9	0.00	159.41	46.51
Junc BL	112.9	0.00	159.41	46.51
Junc BA	112.0	0.00	160.96	48.96
Junc BN	111.2	0.00	160.96	49.76
Junc BO	108.1	0.00	160.96	52.86

Appendix C – Sanitary Sewage Collection and Treatment

1) Sewage Treatment Capacity Email (MECP, Jul. 13, 2021)

From: Susan Gordon
Sent: Tuesday, July 13, 2021 12:08 PM
To: Kevin Hall - City of Ottawa - Approvals (kevin.hall@ottawa.ca)
Cc: Jeff Ostafichuk (jeffrey.ostafichuk@ottawa.ca); Alex McAuley; Adam Thompson
Subject: FW: Carp Airport - Sewage Treatment Plant Capacity
Attachments: 20210616-SewageTreatmentCapacity.pdf; 0961-A9UHS8_2017Feb10.pdf

Hi Kevin,

The MECP has confirmed that all of the Phase 2A Residential lots can connect to the first module of the sewage treatment plant, which is in operation. The summary memo we provided to the MECP (Revised June 16, 2021) and a copy of the ECA (0961-A9UHS8) are attached for reference.

Susan Gordon, P.Eng., MBA, Director | Land Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 269 | Cell: 613.265.5415 | Fax: 613.254.5867

From: Diamond, Emily (MECP) <Emily.Diamond@ontario.ca>
Sent: Tuesday, July 13, 2021 9:13 AM
To: Susan Gordon <s.gordon@novatech-eng.com>
Subject: RE: Carp Airport - Sewage Treatment Plant Capacity

Hi Susan,

The developer can go ahead and connect the remaining Phase 2A lots to the first module.

Thanks and have a great vacation!

Emily Diamond
Environmental Officer
Ministry of the Environment, Conservation and Parks
Ottawa District Office
2430 Don Reid Drive
Ottawa, Ontario, K1H 1E1
Cell: 613-866-0938
Fax: 613-521-5437
e-mail: emily.diamond@ontario.ca

From: Susan Gordon <s.gordon@novatech-eng.com>
Sent: July 13, 2021 8:20 AM
To: Diamond, Emily (MECP) <Emily.Diamond@ontario.ca>
Subject: FW: Carp Airport - Sewage Treatment Plant Capacity

Hello again Emily,

We would like check in with you again about confirmation from the MECP that the developer can connect all of the Phase 2A residential subdivision lots to the first module of the sewage treatment plant currently in operation at the Carp Airport development. These units would exceed the theoretical capacity, but would be within 80% the Rated Capacity of the plant, based on monitored flows. As mentioned, the City of Ottawa has asked that we approach the MECP to obtain this confirmation.

I will be away on vacation next week. Do you think you could have an answer from Approvals Branch before then or perhaps we could set up a call in the next day to answer any questions they might have?

Thank you,

Susan Gordon, P.Eng., MBA, Director | Land Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 269 | Cell: 613.265.5415 | Fax: 613.254.5867

From: Susan Gordon
Sent: Wednesday, July 7, 2021 1:22 PM
To: Emily Diamond (Emily.Diamond@ontario.ca) <Emily.Diamond@ontario.ca>
Subject: FW: Carp Airport - Sewage Treatment Plant Capacity

Hello Emily,

Would you have a response for us on this?

Susan Gordon, P.Eng., MBA, Director | Land Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 269 | Cell: 613.265.5415 | Fax: 613.254.5867

From: Susan Gordon
Sent: Monday, June 28, 2021 10:49 AM
To: Emily Diamond (Emily.Diamond@ontario.ca) <Emily.Diamond@ontario.ca>
Cc: Fariha Pannu (fariha.pannu@ontario.ca) <fariha.pannu@ontario.ca>; Alex McAuley <a.mcauley@novatech-eng.com>
Subject: Carp Airport - Sewage Treatment Plant Capacity

Hello Emily,

As discussed, the City of Ottawa is looking for confirmation from the MECP that the developer can connect all of the Phase 2A residential subdivision to the first module of the sewage treatment plant currently in operation at the Carp Airport development. These units would exceed the theoretical capacity, but would be within the Rated Capacity of the plant, based on monitored flows. From our follow up in mid June, we understand that the MECP Approvals Branch has provided you with some preliminary feedback, indicating that they would prefer the sewage treatment plant operate at about 75% to 80% of capacity when using monitored flow data.

We have found that the monitored flow for the past five months of operation is about 76% of the theoretical design flow, and are requesting approval to connect all of the Phase 2A residential subdivision to the plant. With these flows and the current number of units for Phase 2A, the plant would be at about 80% of its Rated Capacity.

Operating the plant on this basis would not require any changes to the ECA, as the plant would still be operating within its Rated Capacity. Recently, on another file, the MECP Approvals Branch suggested that if an ECA amendment is not required, updated information could be appended to the MECP IDS file, and we would like to do the same in this case. The updated information (see below) provides rationale that the Phase 2A residential subdivision, which has more units than anticipated at the time the ECA was issued, can be accommodated within the plant.

The updated information is attached*, Sewage Treatment, Residential Development to Date and Pending (Novatech, Revised June 16, 2021)* and provides the following information:

- **Reference Documents/Information** which includes:
    - A list of the supporting documents that were included with the ECA application that pertain to the Sewage Treatment Plant and are referenced in Schedule B in the ECA.
    - The sewage treatment plant Rated Capacity from the ECA (186m3/day for the module constructed to date and 372m3/day total). The first module is in place and the second module will be constructed this fall.
- **Monitored Data:**
    - Data for December 2020 to April 2021 showing the monitored flows are approximately 76% of the theoretical sewage design flow.
- Updated **Design Flow** chart:
    - Sewage flow to the plant based on monitored data which would be 149.6m3/day, about 80% of the plant's 186m3/day Rated Capacity.
- **Monitored Wastewater Treatment Flows** chart
    - Summarizing the daily monitored flow data provided by the Licensed Operator (Clearford), used to establish the monitored flows are approximately 80% of the theoretical.

Please let us know if you would need anything further to provide us with a response we could forward to the City. We've copied Fariha Pannu, who signed the ECA and have attached a copy of the ECA for reference.

Attachments:

- ECA# 0961-A9UHS8
- Sewage Treatment, Residential Development to Date and Pending (Novatech, Revised June 16, 2021)

Susan Gordon, P.Eng., MBA, Director | Land Development
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Appendix D – Storm Drainage

1) 2-Year Storm Sewer Design Sheet (February 2024)

PROJECT #: 102085
PROJECT NAME: CARP AIRPORT PHASE 1B-2 RESIDENTIAL
LOCATION: CARP, ON

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: JULY 2023
REVISED: FEBRUARY 2024

2 Year Storm Sewer Design Sheet - Phase 1B-2 and Future Development Lands

Upstream Manhole	Downstream Manhole	AREA (ha)			FLOW					PROPOSED SEWER							
		AREA ID	TOTAL AREA	R	INDIV 2.78 AR	ACCUM 2.78 AR	TIME OF CONC.	RAINFALL INTENSITY I	*PEAK FLOW Q (l/s)	PIPE SIZE (mm)	PIPE SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min.)	EXCESS CAPACITY (l/s)	Q/Qfull
266	267	A-2, A-4	0.69	0.68	1.31	1.31	10.00	76.81	100.87	375	0.57	114.0	132.50	1.20	1.59	31.63	0.76
267	268				0.00	1.31	11.59	71.21	93.53	450	0.41	40.8	182.74	1.15	0.59	89.21	0.51
268	269	A-6	0.38	0.71	0.74	2.06	12.18	69.35	142.69	525	0.33	78.2	247.30	1.14	1.14	104.61	0.58
279	269	A-5, A-8, A-10	1.00	0.49	1.37	1.37	10.00	76.81	105.10	450	0.22	74.2	133.86	0.84	1.47	28.76	0.79
281	269	A-7, A-12	1.05	0.50	1.47	1.47	10.00	76.81	112.80	375	0.70	45.5	146.84	1.33	0.57	34.04	0.77
269	270	A-9	0.23	0.67	0.42	5.32	13.32	66.04	351.04	675	0.26	50.8	429.05	1.20	0.71	78.01	0.82
270	271	A-11	0.47	0.47	0.61	5.92	14.03	64.16	380.05	675	0.24	66.4	412.22	1.15	0.96	32.16	0.92
271	272				0.00	5.92	14.99	61.80	366.02	750	0.18	59.5	472.80	1.07	0.93	106.78	0.77
272	273	A-14	0.51	0.68	0.96	6.89	15.92	59.69	411.11	750	0.18	104.9	472.80	1.07	1.64	61.69	0.87
280	273	A-16, A-13	0.89	0.53	1.31	1.31	10.00	76.81	100.42	525	0.25	73.6	215.25	0.99	1.23	114.82	0.47
273	274	A-17	0.29	0.62	0.50	8.69	17.55	56.34	489.65	900	0.25	43.4	906.07	1.42	0.51	416.42	0.54
274	275	A-15	0.41	0.45	0.52	9.21	18.06	55.38	509.90	900	0.25	53.0	906.07	1.42	0.62	396.17	0.56
FUTURE LANDS[1]	275	FUTURE	28.56	0.62	49.22	49.22	10.00	76.81	3780								
Combined Stormwater Management Pond Inlet																	
275	276					58.42	18.68	54.26	3169.95	1650	0.35	15.9	5397.62	2.52	0.11	2227.67	0.59
276	278					58.42	18.78	54.07	3159.14	1650	0.38	10.4	5624.19	2.63	0.07	2465.05	0.56
278	POND					58.42	18.85	53.96	3152.40	1650	0.35	17.7	5397.62	2.52	0.12	2245.22	0.58

[1] Future development lands assumed R value = 0.65. Refer to drawing 102085-SWM7. Sewers downstream of MH 275 are sized for Phase 1B-2 and future development lands combined.

Definitions
Q = 2.78 AIR
Q = Peak Flow, in Litres per second (L/s)
A = Area in hectares (ha)
I = 5 YEAR Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min Velocity = 0.8 m/sec.
3) 2 Year intensity = 732.951 / (time + 6.199)$^{0.810}$

Appendix E – Servicing Report Checklist

Development Servicing Study Checklist

1.0 General Content	Addressed (Y/N/NA)	Section	Comments
Executive Summary (for larger reports only).	**N/A**		
Date and revision number of the report.	**Y**		Title Page
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y		Draft Plan of Subdivision, Figure 1, and Figure 2
Plan showing the site and location of all existing services.	Y		Figure 3, Figure 4 and Figure 5
Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Y		Section 1.0
Summary of Pre-consultation Meetings with City and other approval agencies.	N		
Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Y		Environmental Assessment, Hydraulic Network Analysis and Water Storage Facility Design Report
Statement of objectives and servicing criteria.	Y		Section 1.0
Identification of existing and proposed infrastructure available in the immediate area.	Y		General Plan of Services (102085-GP13 and 102085-GP14)
Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Y		Section 3.0 - reference to ECA approval for SWM Facility
Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Y		Grading Plans (102085-GR13, 102085-GR14102085-GR15)

Development Servicing Study Checklist

1.0 General Content	Addressed (Y/N/NA)	Section	Comments
Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	Y		
Proposed phasing of the development, if applicable.	Y		Figure 2
Reference to geotechnical studies and recommendations concerning servicing.	Y		Refer to Geotechnical Investigation (Paterson)
All preliminary and formal site plan submissions should have the following information:			
Metric scale	Y		
North arrow (including construction North)	Y		
Key plan	Y		
Name and contact information of applicant and property owner	Y		
Property limits including bearings and	Y		
Existing and proposed structures and	Y		
Easements, road widening and rights-of-	Y		
Adjacent street names	Y		

Development Servicing Study Checklist

2.0 Water	Addressed (Y/N/NA)	Section	Comments
Confirm consistency with Master Servicing Study, if available.	N/A		Section 4.0
Availability of public infrastructure to service proposed development.	Y		Section 4.0
Identification of system constraints.	Y		Section 4.0
Identify boundary conditions.	Y		Section 4.0
Confirmation of adequate domestic supply and pressure.	Y		Section 4.0
Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Y		Section 4.0
Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Y		Section 4.0
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	Y		Section 4.0
Address reliability requirements such as appropriate location of shut-off valves.	Y		Section 4.0
Check on the necessity of a pressure zone boundary modification.	Y		Section 4.0
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Y		Section 4.0
Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Y		Section 4.0
Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	Y		Section 4.0
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y		Section 4.0
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Y		Section 4.0

Development Servicing Study Checklist

3.0 Wastewater	Addressed (Y/N/NA)	Section	Comments
Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Y		Refer to Sanitary Collection System report (Clearford, July 2023) and Section 5.0
Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A		
Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	Y		Refer to Sanitary Collection System report (Clearford, July 2023) and Section 5.0
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y		Refer to Sanitary Collection System report (Clearford, July 2023) and Section 5.0
Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Y		Refer to Sanitary Collection System report (Clearford, July 2023) and Section 5.0
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Y		Refer to Sanitary Collection System report (Clearford, July 2023) and Section 5.0
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y		Refer to Sanitary Collection System report (Clearford, July 2023) and Section 5.0
Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N		
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	Y		Refer to Sanitary Collection System report (Clearford, July 2023) and Section 5.0
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A		
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A		
Special considerations such as contamination, corrosive environment etc.	Y		Refer to Geotechnical Investigation (Paterson)

Development Servicing Study Checklist

4.0 Stormwater	Addressed (Y/N/NA)	Section	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Analysis of the available capacity in existing public infrastructure.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Set-back from private sewage disposal systems.	Y		
Watercourse and hazard lands setbacks.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Any proposed diversion of drainage catchment areas from one outlet to another.	N/A		
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A		

Development Servicing Study Checklist

4.0 Stormwater	Addressed (Y/N/NA)	Section	Comments
Identification of municipal drains and related approval requirements.	N/A		
Description of how the conveyance and storage capacity will be achieved for the development.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Inclusion of hydraulic analysis including HGL elevations.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y		Refer to Stormwater Management Report dated July 2023 and Section 6.0
Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A		
Identification of fill constrains related to floodplain and geotechnical investigation.	Y		Refer to Geotechnical Investigation

Development Servicing Study Checklist

5.0 Approval and Permit Requirements	Addressed (Y/N/NA)	Section	Comments
Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Y		Refer to existing ECA approval - Appendix F
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N		
Changes to Municipal Drains.	N/A		
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A		

6.0 Conclusion	Addressed (Y/N/NA)	Section	Comments
Clearly stated conclusions and recommendations.	N/A		Section 9.0
Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	N/A		
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y		Report and Drawings

Appendix F – Existing Approvals

1) Wastewater Treatment Facility MOECC ECA# 0961-A9UHS8
2) East Stormwater Management Facility MOECC ECA# 244-C6UGGS

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 0961-A9UHS8
Issue Date: February 10, 2017

1514947 Ontario Inc.
1500 Thomas Argue Rd
Carp, Ontario
K0A 1L0

Site Location: Carp Airport Subdivision
1500 Thomas Argue Road
City of Ottawa
K0A 1L0

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

construction of private sewage treatment facilities for the collection, transmission, treatment and discharge of treated effluent to a dry ditch (which discharges to Carp Creek eventually to Carp River), designed at a Rated Capacity of 372,000 Litres per day and a maximum daily flow of 744,000 Litres per day, together with stormwater management facilities to serve the Phase I and Phase 2 residential development and business park at the West Capital Airpark located at the Carp Airport, in the City of Ottawa, consisting of the following:

Septic Tanks

- installation of clarifier tanks, each having a minimum volume of 4,000 L capacity complete with inlet and outlet hatches, hydraulic mixer and flow attenuator located on each residential lot and the communal hangar site, 9,000 L capacity for the wastewater treatment system/City park location, and a 45,000 L capacity tank for the community center site, discharging to the sanitary collection system, identified below;

Sewage Collection System

- a small diameter gravity sewer system (Small Bore Sewer (SBS) by Clearford Water Systems or equivalent), approximately 3,690 m in total length of collection mains with diameters ranging from 75 mm to 200 mm on the following streets:
  - Albert Boyd Private, 400 m;
  - Silver Dart Private 10 m;
  - Sopwith Private 360 m;
  - Wingover Private 985 m;

- Easements 550 m;
- Chandelle Private 670 m;
- Tailslide Private 415 m;
- TaxiwayE 300 m,

all complete with SAP type cleanouts;

- an inverted syphon, consisting of two (2) 100 mm diameter pipes, approximately 145 m in length, and one (1) 250 mm diameter sanitary sewer, approximately 30.7 m in length from the Wastewater Treatment Plant (described below), all discharging to the sanitary lift station, described below.

- one (1) 200mm diameter sanitary sewer, approximately 16.7m in length from the pump building, discharging to the equalization tanks located at the Wastewater Treatment Plan (described below);

Sanitary Lift Station

- a sanitary lift station, to convey sewage flows to the equalization tanks located at the wastewater treatment plant, and consisting of:

  - one (1) wet well with a minimum operating volume of approximately 1,840 L;
  - two (2) submersible pumps (one standby), each pump rated at 7.66 L/s at 6 m TDH, complete with a high liquid level alarm, and discharging via a 75 mm diameter forcemain to a 200 mm diameter sanitary sewer, approximately 21.6 m in length, discharging to the equalization tanks at the Wastewater Treatment Plant (described below);
  - one (1) covered control panel.

Wastewater Treatment Plant

A modular package type wastewater treatment system rated at an average daily flow of 186 m³/day for Phase 1 of the development and an additional average daily flow of 186 m^3/day for Phase 2 of the development (progressing to average daily flow of 910 m³/day at full build-out in Phase 5 in future), consisting of the following:

Phase 1

- an equalization tank system (multiple tanks) with a volume of 103 m³ for Phase 1 of the development (309 m³ at full build-out in Phase 5 in future), complete with an ultrasonic level transmitter to control pump operation and back-up high level alarm float switch.
- two rotary lobe blowers for aeration of the equalization tank system, as required.
- two variable speed pumps (one duty and one standby) to transfer wastewater through the screening system.
- two rotary brush screens (one duty and one standby) with 2 mm openings, each with a capacity of approximately 983 L/min, equipped with water level sensor and two feed forwards pumps (one duty and one standby).
- an aerobic tank with a storage volume of approximately 41 m³, equipped with two rotary lobe blowers (one duty and one standby) for fine bubble aeration, complete with dissolved oxygen and pH transmitters, and chemical metering pumps to feed sodium hydroxide for pH adjustment (as needed) and alum to promote

flocculation of suspended solids (as needed).

- a tank level transmitter and high level float alarm switch in aerobic tank as well as two centrifugal submersible feed pumps (one duty and one standby) rated at 12 L/s at 4.6 m TDH to pump wastewater to the membrane bioreactor.
- a membrane reactor system consisting of one membrane tank (approximate volume of 11.4 m³) and two flat sheet membrane modules (newterra MB3-2 MicroClear) equipped with two permeate extraction pumps (one duty and one standby), complete with an overflow return line to the aerobic tank.
- two blowers (one duty and one standby) within the membrane reactor system for scouring of the membrane modules.
- a sludge holding tank having an approximate volume of 7 m³ complete with a sludge dewatering system with mixing tank for polymer addition and dewatering press equipped with water return line to the equalization tank, with dried sludge stored in an outdoor bin.
- an effluent flow meter prior to effluent discharge to an onsite dry ditch via a 200mm diameter sanitary sewer, approximately 31.7m in length.

Phase 2

- a second equalization tank with a volume of 103 m^3 for Phase 2 of the development.
- an aerobic tank with a storage volume of approximately 41 m³, equipped with two rotary lobe blowers (one duty and one standby) for fine bubble aeration, complete with dissolved oxygen and pH transmitters, and chemical metering pumps to feed sodium hydroxide for pH adjustment (as needed) and alum to promote flocculation of suspended solids (as needed).
- a tank level transmitter and high level float alarm switch in aerobic tank as well as two centrifugal submersible feed pumps (one duty and one standby) rated at 12 L/s at 4.6 m TDH to pump wastewater to the membrane bioreactor.
- a membrane reactor system consisting of one membrane tank (approximate volume of 11.4 m³) and two flat sheet membrane modules (newterra MB3-2 MicroClear) equipped with two permeate extraction pumps (one duty and one standby), complete with an overflow return line to the aerobic tank.
- two blowers (one duty and one standby) within the membrane reactor system for scouring of the membrane modules.

Stomwater Management Facilities

Construction of stormwater management works related to the construction of the Wastewater Treatment and Water Storage Facility at the West Capital Airpark located at the Carp Airport, in the City of Ottawa, to provide on-site stormwater quality protection and erosion control and to attenuate post-development peak flows to pre-development release rates for all storm events up to and including the 100-year storm event for a catchment area of 0.489 hectares of industrial area, discharging to the roadside ditch along Wingover Private and ultimately discharging to Carp Creek, consisting of the following:

- enhanced grassed swales, located along the east, south and west property boundaries (180m total) designed to convey runoff from storms up to and including the 100-year return period, with a trapezoidal cross-section, bottom slope of approximately 0.50%, bottom width of 0.75 metres, and 3:1 side slopes, discharging to two ditch inlet catch basins (DICB A and B);

- stormwater management facility (catchment area 0.489 hectares): Two (2) dry swales (WSW and ESW), located along the east, south and west property boundaries, each having a total storage volume of 27.90 m^3 and 27.14 m^3 respectively at a depth of 0.30 m, with side slopes of 3H:1V (maximum) and a bottom slope of approximately 0.5%, complete with two inlet control structures (DICB A and DICB B), receiving inflow from enhanced grassed swales; two multi-staged outlet control structures, Tempest 115mm orifice (installed in outlet pipe of DICB A) controlling flows to 17.9 L/s and a Tempest 90mm orifice (installed din the outlet pipe of DICB B) controlling flows to 11.1 L/s during the 100-year event, connecting to a riprap lined swale, discharging to the Wingover Private roadside ditch and ultimately discharging to Carp Creek;

- including erosion/ sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works,

all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with the submitted supporting documents listed in **Schedule B.**

For the purpose of this environmental compliance approval, the following definitions apply:

"Annual Average Concentration" means the arithmetic mean of all Single Sample Concentrations of a contaminant in the Final Effluent sampled or measured, or both, during a calendar year;

"Annual Average Daily Flow" means the cumulative total sewage flow of Influent to the Sewage Treatment Plant during a calendar year divided by the number of days during which sewage was flowing to the Sewage Treatment Plant that year;

"Annual Average Loading" means the value obtained by multiplying the Annual Average Concentration of a contaminant by the Annual Average Daily Flow over the same calendar year;

"Approval" means this entire document and any schedules attached to it, and the application;

"BOD5" (also known as $TBOD_5$) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"Bypass" means diversion of sewage around one or more unit processes within the Sewage Treatment Plant with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling point, and discharging to the environment through the Sewage Treatment Plant outfall;

"CBOD5" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

"Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

"*E. coli* " refers to the thermally tolerant forms of Escherichia that can survive at 44.5 degrees Celsius;

"EPA" means the *Environmental Protection Act* , R.S.O. 1990, c.E.19, as amended;

"Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of a named equipment;

"Event" means an action or occurrence, at a given location within the Works that causes a Bypass or Overflow. An Event ends when there is no recurrence of a Bypass or Overflow in the 12-hour period following the last Bypass or Overflow. Two Events are separated by at least 12 hours during which there has been no recurrence of a Bypass or Overflow. An Overflow Event and a Bypass Event are two separate reportable events even when they occur concurrently;

"Final Effluent" means effluent that are discharged to the environment through the approved Final Effluent Outfall, including all Bypasses, that are required to comply with the effluent limits stipulated in the Approval for the Sewage Treatment Plant, pertaining specifically to the Final Effluent sampling point;

"Geometric Mean Density" is the nth root of the product of multiplication of the results of n number of samples over the period specified;

"Influent" means flows to the Sewage Treatment Plant through the collection system, excluding all process return flows;

"Limited Operational Flexibility" (LOF) means the minor modifications that the Owner is pre-approved to make to the Works under this Approval;

"Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

"Monthly Average Concentration" means the arithmetic mean of all Single Sample Concentrations of a contaminant in the Final Effluent sampled or measured, or both, during a calendar month;

"Monthly Average Effluent Flow" means the cumulative total Final Effluent discharged during a calendar month divided by the number of days during which Final Effluent was discharged that month;

"Monthly Average Loading" means the value obtained by multiplying the Monthly Average Concentration of a contaminant by the Monthly Average Effluent Flow over the same calendar month:

"Overflow" means a discharge to the environment from the Works at a location other than the Sewage Treatment Plant outfall or into the outfall downstream of the Final Effluent sampling point;

"Owner" means 1514947 Ontario Inc. and its successors and assignees;

"OWRA" means the *Ontario Water Resources Act* , R.S.O. 1990, c. O.40, as amended;

"Peak Daily Flow Rate" means the largest volume of flow to be received during a one-day period for which the sewage treatment process unit or equipment is designed to handle. This flow is also referred to as maximum daily flow or maximum day flow;

"Proposed Works" means those portions of the Works to be constructed under this Approval;

"Rated Capacity" means the Annual Average Daily Flow for which the Sewage Treatment Plant is designed to handle;

"Sewage Treatment Plant" means the entire sewage treatment and effluent outfall facility;

"Substantial Completion" has the same meaning as "substantial performance" in the *Construction Lien Act* ;

"Works" means the sewage works described in the Owner's application, and this Approval, and modifications made under Limited Operational Flexibility.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the terms and conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these terms and conditions, the Owner shall design, construct, operate and maintain the Works in accordance with this Approval.

(3) Where there is a conflict between a provision of any document referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the Schedule A, the document bearing the most recent date shall prevail.

(4) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

(5) This Approval is granted based upon a review of the Works in the context of its effect on the environment, its process performance and general principles of wastewater engineering. The review did not include a consideration of the architectural, mechanical, electrical or structural components and minor details of the Works except to the extent necessary to review the Works.

(6) This Approval only pertains to approval required under OWRA S.53 and does not include Air, Noise,

Waste, Renewable Energy and other media approvals that may be required under other sections of the EPA or the Green Energy Act or other Federal or Provincial regulations for any portion of the Works.

2. EXPIRY OF APPROVAL

This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

3. CHANGE OF OWNER

(1) The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

a. change of address of Owner or operating authority;
b. change of Owner or operating authority or both, including address of new Owner or operating authority, or both;
c. change of partners where the Owner or operating authority is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act, R.S.O. 1990, c. B.17* ; and
d. change of name of the corporation where the Owner or operating authority is or at any time becomes a corporation, and a copy of the "Initial Return" or "Notice of Change" filed under the *Corporations Information Act, R.S.O. 1990, c. C.39* , shall be included in the notification to the District Manager.

(2) In the event of any change in ownership of the Works, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager.

(3) The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

(4) Notwithstanding any other requirements in this Approval, upon transfer of the ownership or assumption of the Works to a municipality if applicable, any reference to the Regional Director shall be replaced with the Regional Water Compliance Manager.

4. UPON THE SUBSTANTIAL COMPLETION OF THE WORKS

(1) Upon the Substantial Completion of the Works, the Owner shall prepare a statement, certified by a Professional Engineer, that the works are constructed in accordance with this Approval, and upon request, shall make the written statement available for inspection by Ministry personnel.

(2) Within six (6) months of the Substantial Completion of the Works, a set of as-built drawings showing the works "as constructed" shall be prepared. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the Works for the operational life of the Works.

5A. BYPASSES

(1) Any Bypass is prohibited, except:

a. in an emergency situation when a structural, mechanical or electrical failure that causes a temporary reduction in the capacity of the Sewage Treatment Plant or in unexpected and/or unavoidable circumstance(s) that are likely to result in personal injury, loss of life, health hazard, basement flooding, severe property damage, equipment damage or treatment process upset;
b. where the Bypass is a direct and unavoidable result of a planned maintenance procedure or other circumstance(s), the Owner having notified the District Manager at least fifteen (15) days prior to the occurrence of Bypass, including an assessment of the potential adverse effects on the environment and the anticipated duration of the Bypass and the mitigation measures, and the District Manager has given written consent of the Bypass;

(2) For any Bypass Event, the Owner shall forthwith notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information for each Event:

a. the date and time of the Bypass;
b. the treatment process(es) Bypassed and the status of the disinfection;
c. the reason(s) for the Bypass.

(3) After each Bypass Event, the Owner shall collect and record the following information:

a. the duration of the Bypass Event;
b. the measured or the estimated volume of Bypass.

(4) For any Bypass Event, the Owner shall collect sample(s) of the Final Effluent, representative of the Event, at the Final Effluent Compliance sampling point, and analyze for all effluent parameters outlined in Effluent Limits condition. These samples shall be of the same type as the regular samples required in the Monitoring and Recording condition and shall follow the same protocols specified in the Monitoring and Recording condition. If the Bypass occurs within 48 hours prior to a scheduled regular sample, then the scheduled regular sample may be omitted for that one time only.

(5) The Owner shall submit a summary report of the Bypass Event(s) to the District Manager on a quarterly basis, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15. The summary reports shall be in an electronic format, which shall contain, at a minimum, the types of information set out in Subsections (2), (3) and (4) for Bypass(es). The District Manager may modify the reporting frequency at any time in writing.

5B. OVERFLOWS

(1) Any Overflow is prohibited, except:

a. in an emergency situation when a structural, mechanical or electrical failure that causes a temporary reduction in the capacity of the Sewage Treatment Plant or in unexpected and/or unavoidable circumstance(s) that are likely to result in personal injury, loss of life, health hazard, basement flooding, severe property damage, equipment damage or treatment process upset;
b. where the Overflow is a direct and unavoidable result of a planned maintenance procedure or other circumstance(s), the Owner having notified the District Manager at least fifteen (15) days prior to the occurrence of the Overflow, including an assessment of the potential adverse effects on the environment and the anticipated duration of the Overflow and the mitigation measures, and the District Manager has given written consent of the Overflow.

(2) For any Overflow Event, the Owner shall forthwith notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information for each Event:

a. the date and time of the Overflow;
b. the location of the Overflow and the receiver;
c. the reason(s) for the Overflow; and
d. the level of treatment the Overflow has received and disinfection status of same.

(3) After any Overflow Event, the Owner shall collect and record the following information:

a. the duration of the Overflow Event;
b. the monitored or estimated volume of the Overflow; and
c. the impact of Overflow on the receiver.

(4) For each Overflow Event, the Owner shall collect samples, representative of the Event, consisting of a minimum of two (2) grab samples of the Overflow, one at the beginning of the Event and one approximately near the end of the Event, and every 4 hours for the duration of the Event, and have them analyzed for effluent parameters outlined in Effluent Limits condition. For raw sewage and primary treatment system Overflow, BOD5 shall be monitored instead of CBOD5 and monitoring of *E. coli* is not required.

(5) The Owner shall submit a summary report of the Overflow Event(s) to the District Manager on a quarterly basis, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15. The summary report shall be in an electronic format, which shall contain, at a minimum; the types of information set out in Subsections (2), (3) and (4) for Overflow(s). The District Manager may modify the reporting frequency at any time in writing.

6. DESIGN OBJECTIVES

(1) The Owner shall use best efforts to design, construct and operate the Works with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the Works.

Table 1 - Design Objectives
(samples to be collected at the point discharge from the treatment system to the dry ditch)

Effluent Parameter	**Monthly Average Concentration** (milligrams per litre unless otherwise indicated)
Column 1	Column 2
CBOD5	5.0
Total Suspended Solids	5.0
Total Phosphorus	0.1
Total Ammonia Nitrogen	4.0 (winter) 2.0 (summer)
E.coli	100 CFU /100 mL

(2) The Concentration Objectives of all parameters named in Column 1 in Table 1, are based on monthly averages, with the exception of E. coli, which should be calculated as monthly geometric mean.

(3) The Owner shall use best efforts to:

(a) maintain the pH of the effluent from the Works within the range of 6.5 - 8.5, inclusive, at all times;
(b) operate the works within the Rated Capacity of the Works;
(c) ensure that the effluent from the Works is essentially free of floating and settable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.

(4) The Owner shall include in all reports submitted in accordance with Condition 10 a summary of the efforts made and results achieved under this Condition.

7. COMPLIANCE LIMITS

(1) The Owner shall operate and maintain the Works such that the compliance limits of the materials named below as effluent parameters are not exceeded in the Final Effluent from the Sewage Treatment Plant.

Table 2 - Compliance Limits
(samples to be collected at the point discharge from the treatment system to the dry ditch)

Effluent Parameter	**Monthly Average Concentration** (milligrams per litre unless otherwise indicated)	**Annual Average Loading** (kilograms per day unless otherwise indicated)
Column 1	Column 2	Column 3
$CBOD_5$	10.0	-
Total Suspended Solids	10.0	-
Total Phosphorus	0.15	10.2 kg/year[1] 49.8 kg/year[2]
Total Ammonia Nitrogen	5.0 (winter) 3.0 (summer)	-
E.coli	200 CFU /100 mL	-
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times		

1 - based on average daily flow of 186 m³/day for Phase 1
2 - based on average daily flow of 910 m³/day for full build-out Phase 5

(2) For the purposes of determining compliance with and enforcing subsection (3):

(a) The Monthly Average Concentration of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum concentration set out in Column 2 of subsection (1).

(b) The Annual Average Loading of a parameter named in Column 1 of subsection (1) shall not exceed the corresponding maximum waste loading set out in Column 3 of subsection (1).

(c) The Concentration Limits of all parameters named in Column 1 in Table 1, are based on monthly averages, with the exception of E.coli, which should be calculated as monthly geometric mean.

(d) The pH of the effluent shall be maintained between 6.0 to 9.5, inclusive, at all times.

(3) The effluent limits set out in this Condition shall apply upon ninety (90) days after Substantial Completion of the Works.

8. OPERATION AND MAINTENANCE

(1) The Owner shall exercise due diligence in ensuring that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding,

adequate operator staffing and training, including training in all procedures and other requirements of this Approval and the Act and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.

(2) The Owner shall prepare an operations manual at the start up of the Works operation, that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the Works;

(b) inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the Works;

(d) procedures for the inspection and calibration of monitoring equipment;

(e) a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the District Manager; and

(f) procedures for receiving, responding and recording public complaints, including recording any follow up actions taken.

(3) The Owner shall maintain the operations manual current and retain a copy at the location of the Works for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

(4) The Owner shall provide for the overall operation of the Works with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

9. MONITORING AND RECORDING

The Owner shall, upon commencement of operation of the Works, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) For the purposes of this condition, the following definitions apply:

(a) Weekly means once each week.

(b) Monthly means once every month.

(3) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 3 - Raw Sewage Monitoring (influent to the sewage treatment plant)		
Parameters	**Sample Type**	**Frequency**
BOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly

Table 4 - Final Effluent Monitoring (samples to be collected at the end-of-pipe discharge to receiving dry ditch)		
Parameters	**Sample Type**	**Frequency**
CBOD5	Composite	Weekly
Total Suspended Solids	Composite	Weekly
Total Phosphorus	Composite	Weekly
Total Ammonia Nitrogen	Composite	Weekly
E. coli	grab	Weekly
pH	grab	Weekly
Temperature	grab	Weekly

(4) Frequency of sampling in Table 4 may be changed from weekly to bi-weekly by the District Manager following a written request made by the Owner to the District Manager, after a minimum period of time of six (6) consecutive months of operation, providing that compliance limits as outlined in Table 2 are consistently met. Any other amendments to sampling parameters and frequency of sampling may be approved by the District Manager following a written request made by the Owner to the District Manager, after a minimum period of time of two (2) years of operation, providing that results of Works operation are acceptable to the Ministry.

(5) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 2016), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition),

as amended from time to time by more recently published editions;

(6) The Owner shall install and maintain (a) continuous flow measuring device(s), to measure the flowrate of the effluent from the Works with an accuracy to within plus or minus 15 per cent (+/-15%) of the actual flowrate for the entire design range of the flow measuring device, and record the flowrate at a daily frequency.

10. REPORTING

(1) One week prior to the start up of the operation of the Proposed Works, the Owner shall notify the District Manager (in writing) of the pending start up date.

(2) The Owner shall report to the District Manager orally as soon as possible any non-compliance with the effluent criteria, and in writing within seven (7) days of non-compliance.

(3) In addition to the obligations under Part X of the *Environmental Protection Act* , the Owner shall, within ten (10) working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(4) The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

(5) The Owner shall prepare performance reports on an annual basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The reports shall contain, but shall not be limited to, the following information:

a. a summary and interpretation of all monitoring data and a comparison to the final effluent limits outlined in Compliance Limits Condition, including an overview of the success and adequacy of the Works;

b. a description of any operating problems encountered and corrective actions taken;

c. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;

d. a summary of any effluent quality assurance or control measures undertaken in the reporting period;

e. a summary of the calibration and maintenance carried out on all effluent monitoring equipment;

f. a description of efforts made and results achieved in meeting the Design Objectives outlined in the Design Objectives Condition;

g. a tabulation of the volume of sludge generated in the reporting period, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the

sludge was disposed;

h. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

i. a summary of all By-pass, spill or abnormal discharge events;

j. a copy of all Notice of Modifications submitted to the District Manager as a result of Schedule B, Section 1, with a status report on the implementation of each modification;

k. a report summarizing all modifications completed as a result of Schedule B, Section 3; and

l. any other information the District Manager requires from time to time.

11. LIMITED OPERATIONAL FLEXIBILITY

(1) The Owner may make modifications to the Works in accordance with the Terms and Conditions of this Approval and subject to the Ministry's "Limited Operational Flexibility Criteria for Modifications to Sewage Works", included under Schedule A of this Approval, as amended.

(2) Sewage works under Limited Operational Flexibility shall adhere to the design guidelines contained within the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended.

(3) The Owner shall ensure at all times, that the Works, related equipment and appurtenances which are installed or used to achieve compliance are operated in accordance with all Terms and Conditions of this Approval.

(4) For greater certainty, the following are not permitted as part of Limited Operational Flexibility:

(a) Modifications to the Works that result in an increase of the approved Rated Capacity of the Works;

(b) Modifications to the Works that may adversely affect the approved effluent quality criteria or the location of the discharge/outfall;

(c) Modifications to the treatment process technology of the Works, or modifications that involve construction of new reactors (tanks) or alter the treatment train process design;

(d) Modifications to the Works approved under s.9 of the EPA, and

(e) Modifications to the Works pursuant to an order issued by the Ministry.

(5) Implementation of Limited Operational Flexibility is not intended to be used for piecemeal measures that result in major alterations or expansions.

(6) If the implementation of Limited Operational Flexibility requires changes to be made to the Emergency Response, Spill Reporting and Contingency Plan, the Owner shall, provide a revised copy of this plan to the local fire services authority prior to implementing Limited Operational Flexibility.

(7) For greater certainty, any modification made under the Limited Operational Flexibility may only be

carried out after other legal obligations have been complied with, including those arising from the *Environmental Protection Act, Niagara Escarpment Planning and Development Act, Oak Ridges Moraine Conservation Act, Lake Simcoe Protection Act* and *Greenbelt Act.*

(8) At least thirty (30) days prior to implementing Limited Operational Flexibility, the Owner shall complete a Notice of Modifications describing any proposed modifications to the Works and submit it to the District Manager.

(9) The Owner shall not proceed with implementation of Limited Operational Flexibility until the District Manager has provided written acceptance of the Notice of Modifications or a minimum of thirty (30) days have passed since the day the District Manager acknowledged the receipt of the Notice of Modifications.

SCHEDULE 'A'

Limited Operational Flexibility Criteria for Modifications to Industrial Sewage Works

1. The modifications to sewage works approved under an Environmental Compliance Approval (Approval) that are permitted under the Limited Operational Flexibility (LOF), are outlined below and are subject to the LOF conditions in the Approval, and require the submission of the Notice of Modifications. If there is a conflict between the sewage works listed below and the Terms and Conditions in the Approval, the Terms and Conditions in the Approval shall take precedence.

1.1 Sewage Pumping Stations

a. Alter pumping capacity by adding or replacing equipment where new equipment is located within an existing sewage treatment plant site or an existing sewage pumping station site, provided that the modifications do not result in an increase of the sewage treatment plant Rated Capacity and the existing flow process and/or treatment train are maintained, as applicable.

b. Forcemain relining and replacement with similar pipe size where the nominal diameter is not greater than 1,200mm.

1.2 Sewage Treatment Process

a. Installing additional chemical dosage equipment including replacing with alternative chemicals for pH adjustment or coagulants (non-toxic polymers) provided that there are no modifications of treatment processes or other modifications that may alter the intent of operations and may have negative impacts on the effluent quantity and quality.

b. Expanding the buffer zone between a sanitary sewage lagoon facility or land treatment area and adjacent uses provided that the buffer zone is entirely on the proponent's land.

c. Optimizing existing sanitary sewage lagoons with the purpose to increase efficiency of treatment operations provided that existing sewage treatment plant rated capacity is not exceeded and where no land acquisition is required.

d. Optimizing existing sewage treatment plant equipment with the purpose to increase the efficiency of the existing treatment operations, provided that there are no modifications to the works that result in an increase of the approved Rated Capacity, and may have adverse effects to the effluent quality or location of the discharge.

e. Replacement, refurbishment of previously approved equipment in whole or in part with Equivalent Equipment, like-for-like of different make and model, provided that the firm capacity, reliability, performance standard, level of quality and redundancy of the group of equipment is kept the same. For clarity purposes, the following equipment can be considered under this provision: pumps, screens, grit separators, blowers, aeration equipment, sludge thickeners, dewatering equipment, UV systems, chlorine contact equipment, bio-disks, and sludge digester

systems.

1.3 Sanitary Sewers

a. Pipe relining and replacement with similar pipe size within the Sewage Treatment Plant site, where the nominal diameter is not greater than 1,200mm.

1.4 Pilot Systems

a. Installation of pilot systems for new or existing technologies provided that:

i. any effluent from the pilot system is discharged to the inlet of the sewage treatment plant or hauled off-site for proper disposal,
ii. any effluent from the pilot system discharged to the inlet of the sewage treatment plant or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and District Manager three months after completion of the pilot project.

2. Sewage works that are exempt from section 53 of the OWRA by O. Reg. 525/98 continue to be exempt and are not required to follow the notification process under this Limited Operational Flexibility.

3. Normal or emergency operational modifications, such as repairs, reconstructions, or other improvements that are part of maintenance activities, including cleaning, renovations to existing approved sewage works equipment, provided that the modification is made with Equivalent Equipment, are considered pre-approved.

4. The modifications noted in section (3) above are <u>not</u> required to follow the notification protocols under Limited Operational Flexibility, provided that the number of pieces and description of the equipment as described in the Approval does not change.

Schedule 'B' forms part of this Approval and contains a list of supporting documentation / information received,
reviewed and relied upon in the issuance of this Approval.

SCHEDULE 'B'

Environmental Compliance Approval (ECA) supporting documents:

1. Application for Environmental Compliance Approval (ECA) dated April 6, 2015 signed by Andrew Wildeboer, Director, 1514947 Ontario Inc. and supporting documents submitted by Novatech, Consulting Engineers.

2. Report entitled "West Capital Airpark, 1500 Thomas Argue Road, Servicing Design Brief, Volume 1 of 4" dated April 2015 prepared by Novatech, Consulting Engineers.

3. Report entitled "West Capital Airpark, 1500 Thomas Argue Road, Servicing Design Brief, Drawings, Volume 2 of 4" dated April 2015 prepared by Novatech, Consulting Engineers.

4. Report entitled "West Capital Airpark, 1500 Thomas Argue Road, Servicing Design Brief, Drawings, Volume 3 of 4" dated April 2015 prepared by Novatech, Consulting Engineers.

5. Report entitled "West Capital Airpark, 1500 Thomas Argue Road, Servicing Design Brief, Drawings, Volume 4 of 4" dated April 2015 prepared by Novatech, Consulting Engineers.

6. Report entitled "West Capital Airpark, Carp, Ontario, Phase 1, Residential, SBS Design Brief" dated April 2015 prepared by Clearford Water Systems Inc.

7. Report entitled "Wastewater Treatment and Water Storage Facility, West Capital Airpark, (Carp Airport), City of Ottawa, Stormwater Management Report" revised April 22, 2015 prepared by Novatech, Consulting Engineers.

8. Report entitled "Wastewater Treatment System, Carp Airport, Carp, Ontario" dated January 2015 prepared by Golder Associates.

Ontario
Ministry of
the Environment

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL) OR DISTRICT MANAGER (FOR NON-MUNICIPAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)

ECA Owner	Municipality

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Description shall include:

1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:

1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number

Signature	Date (mm/dd/yy)

Name of Employer

Part 4 – Declaration by Owner

I hereby declare that:

1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)

Owner Representative's Signature	Date (mm/dd/yy)

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this Approval the existence of this Approval.

2. Condition 2 is included to ensure that the Works are constructed in a timely manner so that standards applicable at the time of Approval of the Works are still applicable at the time of construction, to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included to ensure that the Works are constructed in accordance with the approval and that record drawings of the Works "as constructed" are maintained for future references.

5. Condition 5 is included to indicate that by-passes of untreated sewage to the receiving watercourse is prohibited, save in certain limited circumstances where the failure to Bypass could result in greater injury to the public interest than the Bypass itself where a Bypass will not violate the approved effluent requirements, or where the Bypass can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Bypass events.

6. Condition 6 is imposed to establish non-enforceable effluent quality objectives which the Owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs and before the compliance limits of Condition 7 are exceeded.

7. Condition 7 is imposed to ensure that the effluent discharged from the Works to the dry ditch meets the Ministry's effluent quality requirements thus minimizing environmental impact on the receiver and to protect water quality, fish and other aquatic life in the receiving water body.

8. Condition 8 is included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the Ministry.Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a

benchmark for Ministry staff when reviewing the Owner's operation of the work.

9. Condition 9 is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives and effluent limits specified in the Approval and that the Works does not cause any impairment to the receiving watercourse.

10. Condition 10 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

11. Condition 11 is included to ensure that the Works are operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider. These Conditions are also included to ensure that a Professional Engineer has reviewed the proposed modifications and attests that the modifications are in line with that of Limited Operational Flexibility, and provide assurance that the proposed modifications comply with the Ministry's requirements stipulated in the Terms and Conditions of this Approval, MOE policies, guidelines, and industry engineering standards and best management practices.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment and
Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 10th day of February, 2017

Fariha Pannu, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

HV/

c: District Manager, MOECC Ottawa District Office
Susan M. Gordon, Novatech Engineering

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 2447-C6UGGS
Issue Date: September 24, 2021

1514947 Ontario Inc.
1500 Thomas Argue Road
Ottawa, Ontario
K0A 1L0

Site Location: West Capital Airpark - Phase 1B Residential
1500 Thomas Argue Road
Part of Lots 13 and 14, Concession 4, Huntly
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the establishment of stormwater management Works to serve Phase 1B of the West Capital Airpark East Residential Community, located in the City of Ottawa, including treatment and disposal of stormwater run-off from the development, to provide Enhanced Level water quality control and erosion protection, with a maximum outflow water temperature of 25 degrees Celcius, before entering Carp Creek, and to attenuate post-development peak flows to pre-development peak flows for all storm events up to and including the 100-year storm event, consisting of the following:

- **hydrodynamic separator (catchment area 6.9 hectares):** one (1) hydrodynamic separator, Vortechs Model 9000 or Equivalent Equipment, located on Stormwater Management East Pond Block 157, having a sediment storage capacity of 3.67 cubic metres, and a maximum treatment flow rate of 396 litres per second, discharging to the Stormwater Management East Pond located on the north-west corner of the East Residential Community on Block 157; and

- **stormwater management facility (catchment area 47.2 hectares):** one (1) dry pond, located at the north-west corner of the East Residential Community on Block 157, having a total storage volume of 17,020 cubic metres, at a total depth of approximately 1.66 metres, discharging via an outlet control structure to a 0.3 metres deep subsurface stone cooling trench, having a total volume of approximately 82 cubic metres, and an outfall weir at a maximum discharge rate of 1,180 litres per second and an outfall swale to Carp Creek;

including erosion/sedimentation control measures during construction and all other controls and

appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

3. "District Manager" means the District Manager of the appropriate local District Office of the Ministry, where the Works are geographically located;

4. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended;

5. "Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of the approved named equipment.

6. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

7. "Owner" means 1514947 Ontario Inc., and includes its successors and assignees;

8. "OWRA" means the *Ontario Water Resources Act, R.S.O. 1990, c. O.40* , as amended;

9. "Works" means the sewage Works described in the Owner's application, and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

4. Where there is a conflict between the documents listed in Schedule "A" and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

5. The conditions of this Approval are severable. If any condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

2. In the event that completion and commissioning of any portion of the Works is anticipated to be delayed beyond the specified expiry period, the Owner shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of Approval of the Works are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of Owner;

    b. change of address of the Owner;

    c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act,* R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or

    d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act,* R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

3. The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

2. The Owner shall make all necessary investigations, take all necessary steps and obtain all necessary approvals so as to ensure that the physical structure, siting and operations of the Works do not constitute a safety or health hazard to the general public.

3. The Owner shall undertake an inspection of the condition of the Works, at least once a year, and undertake any necessary cleaning and maintenance to ensure that sediment, debris and excessive decaying vegetation are removed from the Works to prevent the excessive build-up of sediment, oil/grit, debris and/or decaying vegetation, to avoid reduction of the capacity and/or permeability of the Works, as applicable. The Owner shall also regularly inspect and clean out the inlet to and outlet from the Works to ensure that these are not obstructed.

4. The Owner shall construct, operate and maintain the Works with the objective that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen, foam or discoloration on the receiving waters.

5. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Owner's administrative office for inspection by the Ministry. The logbook shall include the following:

    a. the name of the Works; and

    b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed and method of clean-out of the Works.

6. The Owner shall prepare an operations manual prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information:

    a. operating and maintenance procedures for routine operation of the Works;

    b. inspection programs, including frequency of inspection, for the Works and the methods or tests

employed to detect when maintenance is necessary;

c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;

d. contingency plans and procedures for dealing with potential spills and any other abnormal situations and for notifying the District Manager; and

e. procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

7. The Owner shall maintain the operations manual current and retain a copy at the Owner's administrative office for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

5. TEMPORARY EROSION AND SEDIMENT CONTROL

1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

6. REPORTING

1. One (1) week prior to the start-up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start-up date.

2. The Owner shall, upon request, make all reports, manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

3. The Owner shall prepare a performance report within ninety (90) days following the end of the period being reported upon, and submit the report(s) to the District Manager when requested. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be prepared to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

a. a description of any operating problems encountered and corrective actions taken;

b. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism

or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works;

c. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

d. a summary of all spill or abnormal discharge events; and

e. any other information the District Manager requires from time to time.

7. RECORD KEEPING

1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation, maintenance and monitoring activities required by this Approval.

Schedule "A"

1. Application for Environmental Compliance Approval, dated August 18, 2021, received on August 24, 2021, submitted by 1514947 Ontario Inc.;

2. Transfer of Review Letter of Recommendation, dated August 24, 2021, and signed by Damien Whittaker, P.Eng., Senior Engineer - Infrastructure Applications; Development Review, Rural Branch; City of Ottawa, including the following supporting documents:

    a. Final Plans and Specifications prepared by Novatech

    b. Stormwater Management Report prepared by Novatech

3. Email received on September 7, 2021, from Susan Gordon, Novatech

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from the Works are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the Works. The Condition also ensures that adequate storage is maintained in the Works at all times as required by the design. Furthermore, this Condition is included to ensure that the Works are operated and maintained to function as designed.

5. Condition 5 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.

6. Condition 6 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

7. Condition 7 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of September, 2021

Aziz Ahmed, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

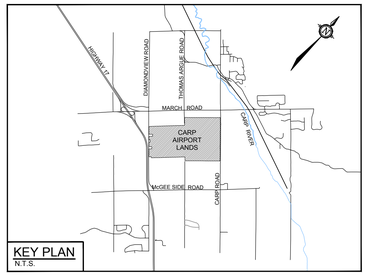
MM/
c: District Manager, MECP Ottawa District Office
City Clerk, City of Ottawa (D07-16-18-0007)
Damien Whittaker, City of Ottawa
Susan Gordon, Novatech

Drawings

WEST CAPITAL AIRPARK

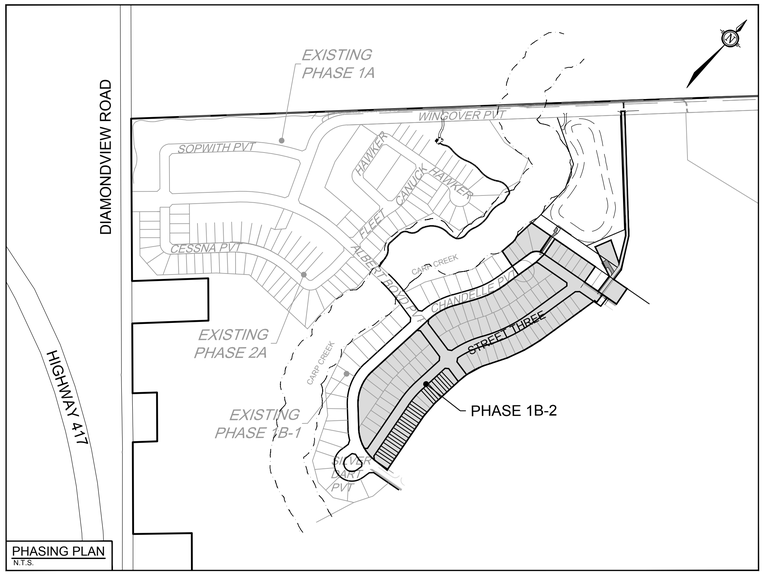
PHASE 1B-2 - RESIDENTIAL

CITY OF OTTAWA



KEY PLAN
N.T.S.

ISSUED FOR REGISTRATION
AND ECA



PHASING PLAN
N.T.S.

JUNE 2024

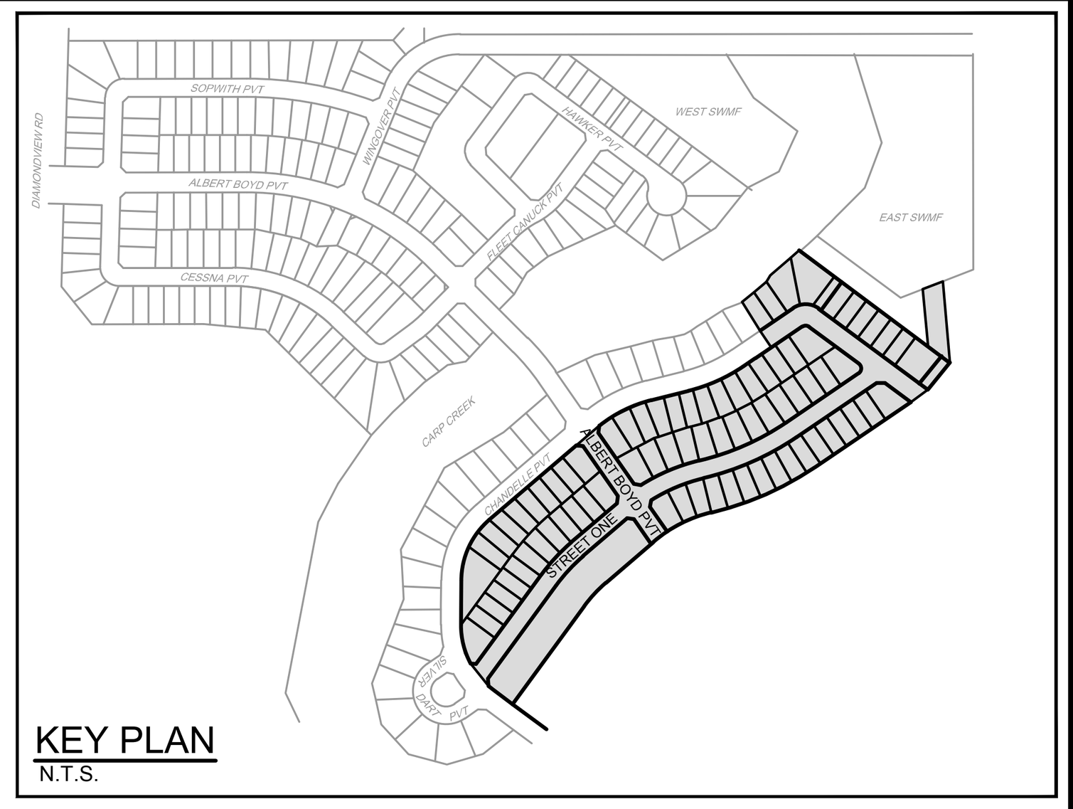
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

PROJECT No. 102085

INDEX

102085 - ISSUED FOR REGISTRATION AND ECA - PHASE 1B-2 RESIDENTIAL - JUNE 28, 2024



NOTE:
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No.	REVISION	DATE	BY
5.	ISSUED FOR REGISTRATION AND ECA (NO CHANGES)	JUN 28/24	ARM
4.	REVISED PER CITY COMMENTS (NO CHANGES)	FEB 20/24	ARM
3.	ISSUED WITH ADDENDUM #2 (NO CHANGES)	JAN 5/24	ARM
2.	ISSUED FOR TENDER (NO CHANGES)	DEC 7/23	ARM
1.	ISSUED FOR REVIEW	JUL 28/23	ARM

SCALE: N.T.S.

DESIGN: AAR
CHECKED: ARM
DRAWN: AAR
CHECKED: ARM
APPROVED: SMG

LICENSED PROFESSIONAL ENGINEER — A. A. RONGVE — 100616298 — June 28, 2024 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — A.R. MCAULEY — 100141256 — June 28, 2024 — PROVINCE OF ONTARIO

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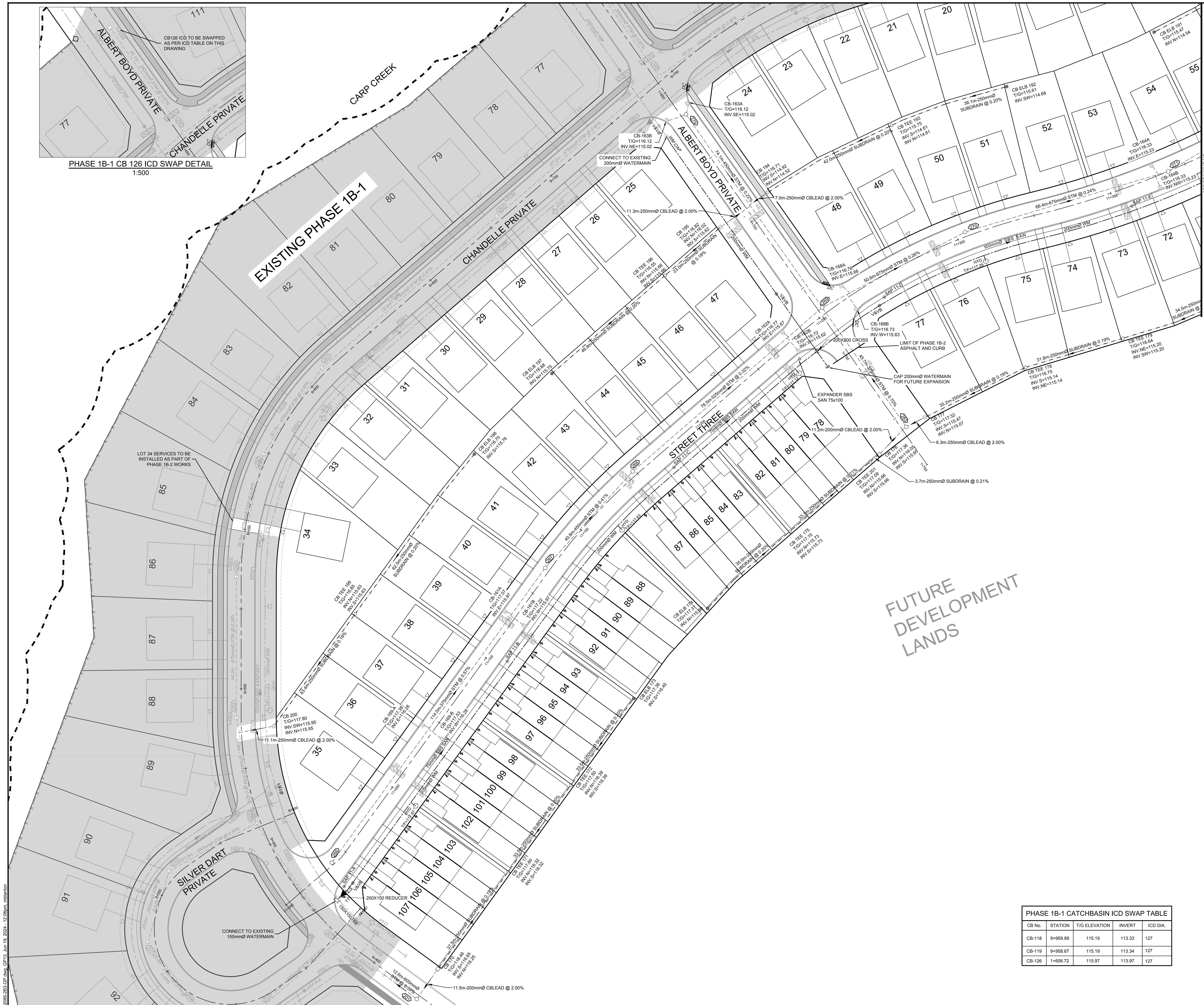
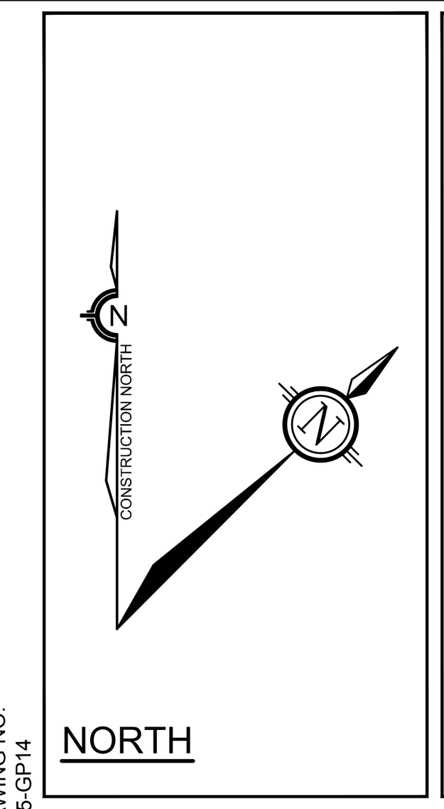
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

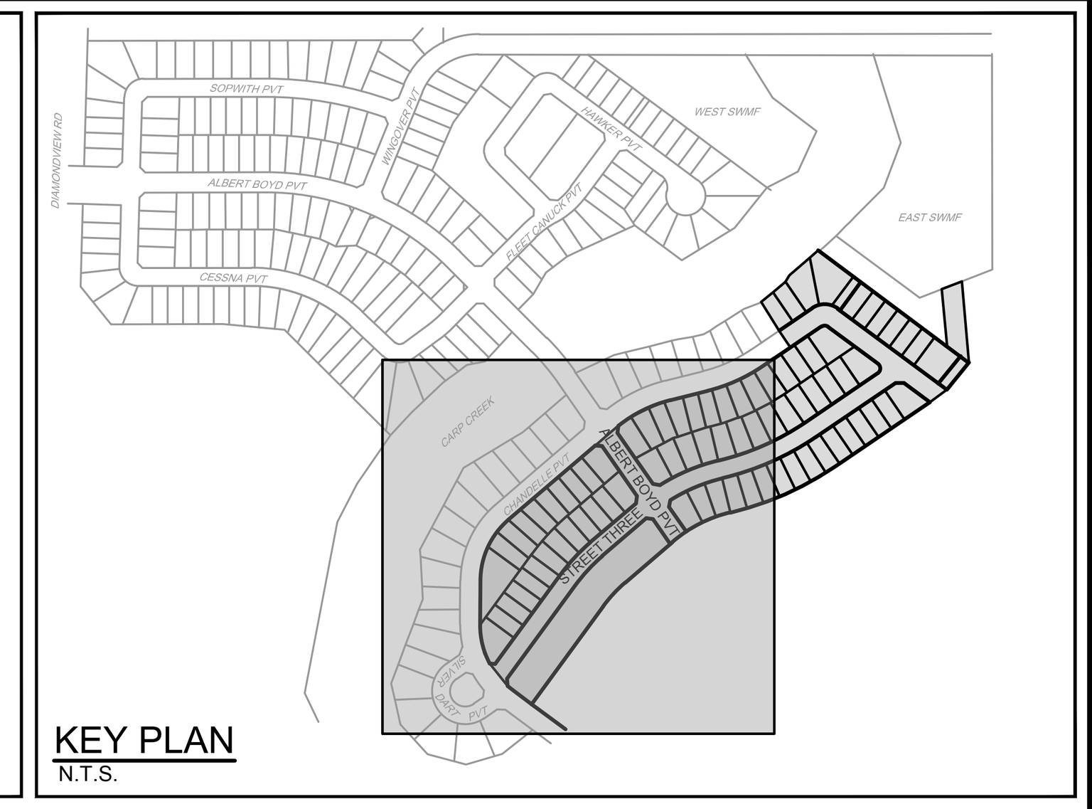
DRAWING NAME
DRAWING LAYOUT PLAN - PHASE 1B-2

PROJECT No. 102085
REV: REV # 5
DRAWING No. 102085-LP2

PLANB1.DWG - 1000mmx707mm







LEGEND

200mmØ WM	PROPOSED WATERMAIN AND DIAMETER
V&VB	PROPOSED VALVE & VALVE BOX
HYD	PROPOSED HYDRANT C/W VALVE & LEAD
T/F = 98.45	PROPOSED TOP OF BOTTOM FLANGE
200mmØ WM	EXISTING WATERMAIN AND DIAMETER
V&VB	EXISTING VALVE & VALVE BOX
HYD	EXISTING HYDRANT C/W VALVE & LEAD
SBS SANITARY	PROPOSED SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
SAP 1-A	PROPOSED SANITARY SYSTEM ACCESS POINT
SBS SANITARY	EXISTING SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
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	PROPOSED STORM SEWER AND DIRECTION OF FLOW
	PROPOSED REAR YARD SUBDRAIN, INFILTRATION TRENCH AND DIRECTION OF FLOW
	EXISTING STORM SEWER
222	PROPOSED STORM MANHOLE
222	EXISTING STORM MANHOLE
	PROPOSED SERVICE LOCATION
	SERVICE LOCATION - SERVICE INSTALLED AS PART OF PHASE 1B-1 WORKS
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CB	PROPOSED CATCHBASIN
CB	PROPOSED CATCHBASIN WITH INLET CONTROL DEVICE
	EXISTING ROADSIDE CATCHBASIN
CB ELB	PROPOSED LANDSCAPE CATCHBASIN ELBOW
CB TEE	PROPOSED LANDSCAPE CATCHBASIN TEE
SB	PROPOSED SEEPAGE BARRIER

CATCHBASIN TABLE

CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.	OUTLET DIAMETER
CB-161A	11+115.31	117.07	Out=115.97	152	200
CB-161B	11+115.22	117.22	Out=115.97	127	200
CB-162A	11+238.29	116.77	Out=115.67	108	200
CB-162B	11+238.17	116.72	Out=115.62	108	200
CB-163A	1+656.85	116.12	Out=115.02	108	200
CB-163B	1+657.60	116.12	Out=115.02	108	200
CB-164A	11+365.08	116.33	Out=115.23	127	200
CB-164B	11+365.08	116.33	Out=115.23	127	200
CB-165A	11+520.63	115.71	Out=114.61	152	200
CB-165B	11+523.18	115.79	Out=114.69	127	200
CB-166A	10+037.41	115.37	Out=114.27	94	200
CB-166B	11+512.01	115.37	Out=114.27	83	200
CB-167A	10+127.29	115.85	Out=114.75	94	200
CB-167B	10+127.29	115.85	Out=114.75	94	200
CB-168A	11+261.42	116.76	Out=115.66	83	200
CB-168B	11+261.28	116.73	Out=115.63	83	200
CB-169-A	11+071.35	117.38	Out=116.28	83	200
CB-169-B	11+071.36	117.53	Out=116.28	83	200
CB 170	9+382.72	118.48	Out=116.65 In=116.25	200(LEAD)	200
CB 176	1+781.37	117.36	Out=116.05 In=115.65	200 (LEAD)	200
CB 177	1+780.07	117.32	Out=115.47 In=115.07	178	250
CB 184	10+132.39	116.12	Out=115.40 In=115.00	152	250
CB 187	10+005.76	114.78	In=113.18 Out=113.58	94	250
CB 188	10+041.03	115.59	Out=114.72 In=114.31	250 (LEAD)	250
CB 194	1+694.10	116.71	Out=114.92 In=114.52	178	250
CB 195	1+694.48	116.82	Out=116.02 In=115.62	152	250
CB 200	9+487.97	117.80	Out=115.95 In=115.55	152	250

PHASE 1B-1 CATCHBASIN ICD SWAP TABLE

CB No.	STATION	T/G ELEVATION	INVERT	ICD DIA.
CB-118	9+959.89	115.19	113.33	127
CB-119	9+958.67	115.19	113.34	127
CB-126	1+606.72	115.97	113.97	127

REFER TO 102085-ND1B2 FOR ADDITIONAL NOTES

NOTE:
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CLEARFORD WATER SYSTEMS INC.

LICENSED PROFESSIONAL ENGINEER — W. G. STEFAN — PROVINCE OF ONTARIO

WEST CAPITAL Developments

No.	REVISION	DATE	BY
8.	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
7.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 9/24	ARM
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3.	ISSUED FOR REVIEW	JUL 25/23	ARM
2.	ISSUED FOR COORDINATION	JUL 11/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE 1:500

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED SMG

LICENSED PROFESSIONAL ENGINEER — A. A. RONGVE — 100616298 — June 28, 2024 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — A.R. MCAULEY — 100141256 — June 28, 2024 — PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
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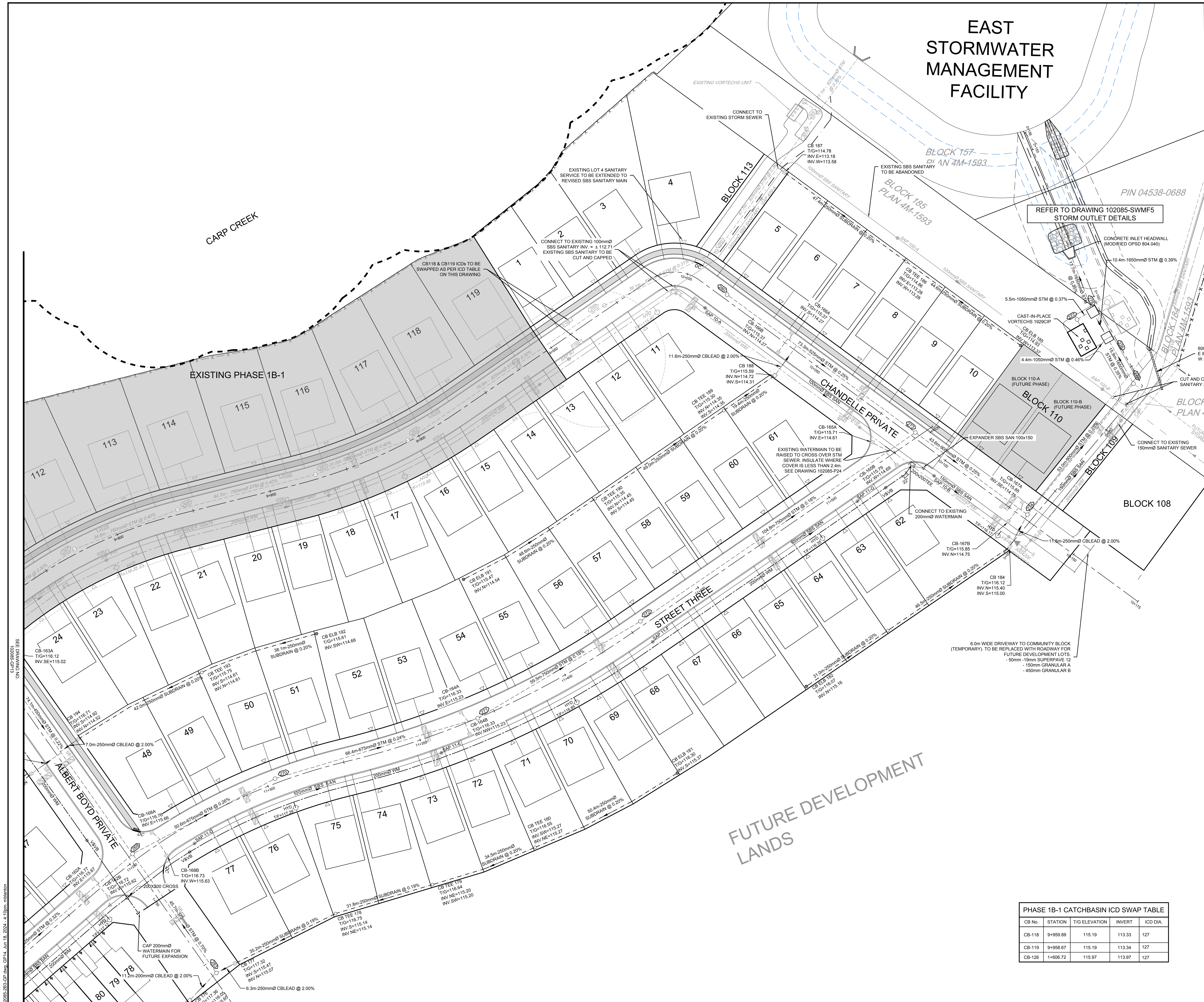
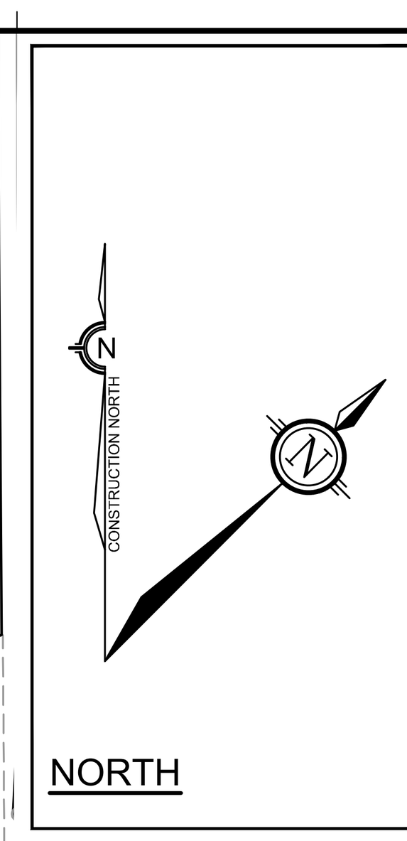
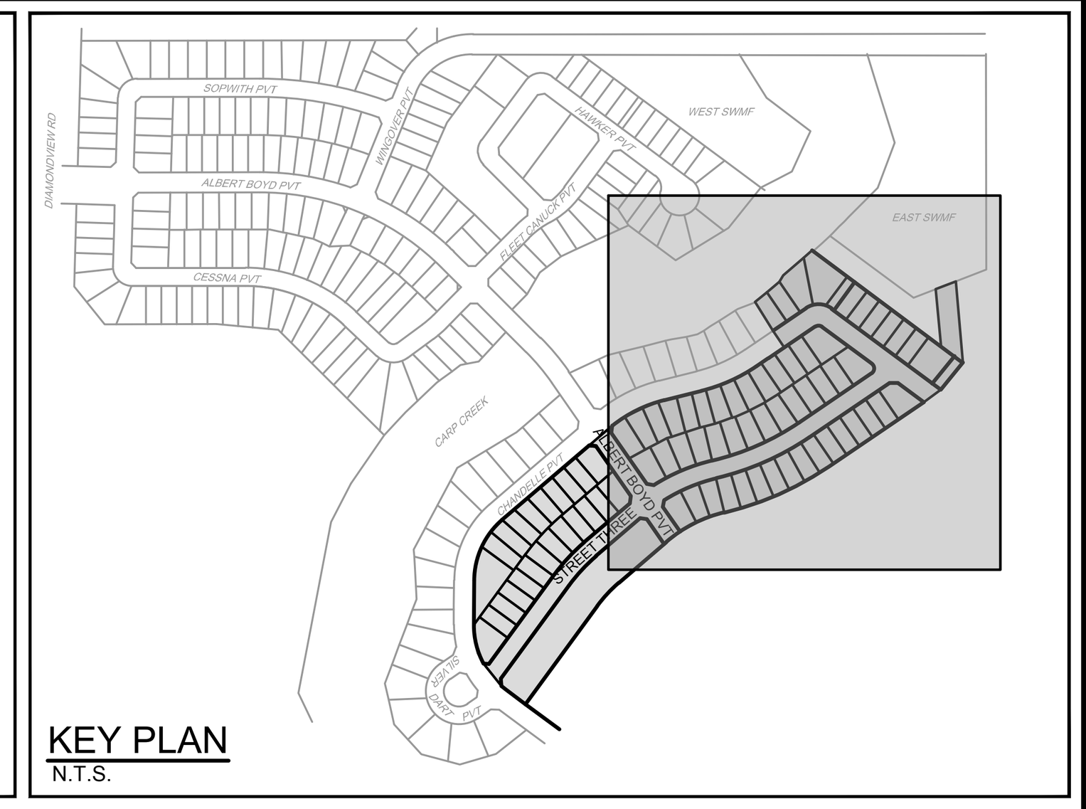
DRAWING NAME
GENERAL PLAN OF SERVICES - PHASE 1B-2

PROJECT No. 102085
REV: REV # 8
DRAWING No. 102085-GP13

PLANB1.DWG - 1000mmx707mm







LEGEND

- 200mmØ WM — PROPOSED WATERMAIN AND DIAMETER
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- HYD — PROPOSED HYDRANT C/W VALVE & LEAD
- T/F = 98.45 — PROPOSED TOP OF BOTTOM FLANGE
- 200mmØ WM — EXISTING WATERMAIN AND DIAMETER
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- SBS SANITARY — PROPOSED SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
- SAP 1-A — PROPOSED SANITARY SYSTEM ACCESS POINT
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CB-166B	11+512.01	115.37	Out=114.27	83	200
CB-167A	10+127.29	115.85	Out=114.75	94	200
CB-167B	10+127.29	115.85	Out=114.75	94	200
CB-168A	11+261.42	116.76	Out=115.66	83	200
CB-168B	11+261.28	116.73	Out=115.63	83	200
CB-169-A	11+071.35	117.38	Out=116.28	83	200
CB-169-B	11+071.36	117.53	Out=116.28	83	200
CB 170	9+382.72	118.48	Out=116.65 In=116.25	200(LEAD)	200
CB 176	1+781.37	117.36	Out=116.05 In=115.65	200 (LEAD)	200
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CB 187	10+005.76	114.78	In=113.18 Out=113.58	94	250
CB 188	10+041.03	115.59	Out=114.72 In=114.31	250 (LEAD)	250
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CLEARFORD WATER SYSTEMS INC.

CLEARFORD
LICENSED PROFESSIONAL ENGINEER — W. G. STEFAN — PROVINCE OF ONTARIO

WEST CAPITAL Developments

No.	REVISION	DATE	BY
10.	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
9.	REVISED POND INLET SWALE	MAY 14/24	ARM
8.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
7.	REVISED PER CITY COMMENTS	FEB 9/24	ARM
6.	ISSUED WITH ADDENDUM #4	JAN 12/24	ARM
5.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
4.	ISSUED FOR TENDER	DEC 7/23	ARM
3.	ISSUED FOR REVIEW	JUL 25/23	ARM
2.	ISSUED FOR COORDINATION	JUL 11/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE 1:500

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED SMG

LICENSED PROFESSIONAL ENGINEER — A. A. RONGVE — 100616298 — June 28, 2024 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — A.R. MCAULEY — 100141256 — June 28, 2024 — PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
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Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
GENERAL PLAN OF SERVICES - PHASE 1B-2

PROJECT No. 1020852
REV REV # 10
DRAWING No. 102085-GP14

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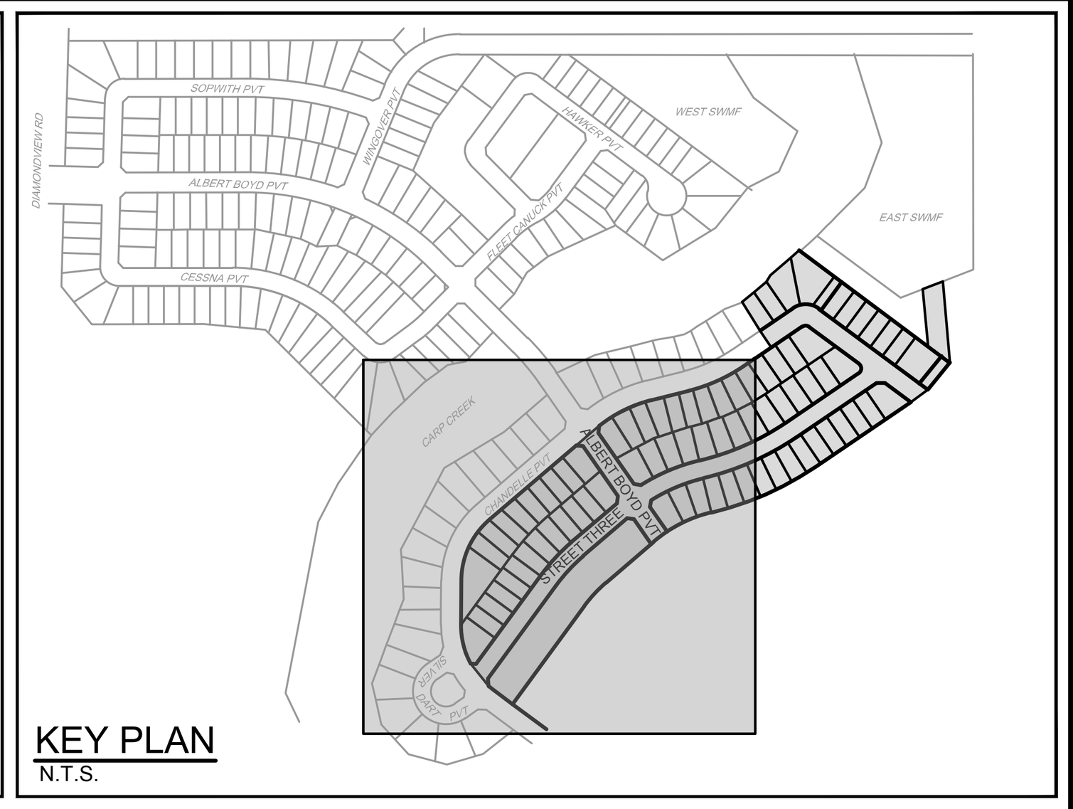
SEE DRAWING NO. 102085-GR14

NORTH



KEY PLAN
N.T.S.

LEGEND

Symbol	Description
1.5%	℄ REARYARD SWALE AND DIRECTION OF FLOW
117.00 / 116.50	PROPOSED ELEVATION / *EXISTING ELEVATION*
127.55(S)	PROPOSED SWALE ELEVATION
0.6%	PROPOSED GRADING DIRECTION AND SLOPE
TF=117.03	TOP OF FOUNDATION ELEVATION (STANDARD 8' BASEMENT HEIGHT)
MUSF=114.28	MINIMUM UNDERSIDE OF FOOTING ELEVATION
MFOF=116.63	MINIMUM FOUNDATION OPENING FRONT ELEVATION
MFOR=115.32	MINIMUM FOUNDATION OPENING REAR ELEVATION
116.63	PROPOSED TERRACE ELEVATION
116.93	PROPOSED CENTRELINE OF ROAD ELEVATION
116.96	PROPOSED CENTRELINE OF ROAD ELEVATION - HIGH POINT
116.90	PROPOSED CENTRELINE OF ROAD ELEVATION - LOW POINT
HYD T/F=127.55	PROPOSED HYDRANT LOCATION PROPOSED TOP OF BOTTOM FLANGE
WS	PROPOSED WATER SAMPLING STATION
CB	PROPOSED CATCHBASIN
CB	PROPOSED CATCHBASIN WITH INLET CONTROL DEVICE
CB ELB	PROPOSED LANDSCAPE CATCHBASIN ELBOW
CB TEE	PROPOSED LANDSCAPE CATCHBASIN TEE
100	PROPOSED STORM MANHOLE
	TERRACING
	MAJOR OVERLAND FLOW
	DEVELOPMENT SETBACK
— X — X —	PROPOSED 1.5m CHAINLINK FENCE
	PROPOSED 1.5m UTILITY EASEMENT
	PROPOSED TOP OF SLOPE
	PROPOSED ROCK FLOW CHECK DAM (MODIFIED OPSD 219.211)
	MAXIMUM STATIC PONDING CONTOUR

REFER TO 102085-ND1B2 FOR ADDITIONAL NOTES

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No.	REVISION	DATE	BY
7.	ISSUED FOR REGISTRATION AND ECA	JUN 28/24	ARM
6.	ADDITIONAL ORIGINAL GROUND SURFACE CONTOUR INTERVALS ADDED	APR 24/24	ARM
5.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
4.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
3.	ISSUED FOR TENDER (NO CHANGES)	DEC 7/23	ARM
2.	ISSUED FOR REVIEW	JULY 28/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED SMG

LICENSED PROFESSIONAL ENGINEER
A. A. RONGVE
100616298
June 28, 2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
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PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
GRADING PLAN - PHASE 1B-2

PROJECT No. 102085
REV REV # 7
DRAWING No. 102085-GR13

PLANB1.DWG - 1000mmx707mm

EAST STORMWATER MANAGEMENT FACILITY
NORTH
KEY PLAN
N.T.S.
SECTION A-A' - BLOCK 113 CROSS SECTION
1:100
9.5m SERVICING BLOCK (BLOCK 63)
100mm TOPSOIL, SEED, & MULCH
EXISTING 3.0m SWMF ACCESS ROAD
1.0m GRASSED SHOULDER
1.0m SWALE
EXISTING GROUND
LOT 4
LOT 5
BLOCK 113 MAJOR OVERLAND SPILL POINT DETAIL (CITY DETAIL SC17)
1:100
ACCESS ROAD TO BE PAVED AS PART OF PHASE 1B-2 WORKS (50mm SUPERPAVE 12.5)
ASPHALT (50mm - 12.5mm SUPERPAVE)
DRIVEWAY
DC
SECTION B-B' - BLOCK 109 CROSS SECTION
1:100
10.51m SERVICING BLOCK (BLOCK 81)
100mm TOPSOIL, SEED, & MULCH
PROPOSED 6.0m ACCESS ROAD
- 50mm 12.5 SUPERPAVE (FUTURE)
- 150mm GRANULAR A
- 450mm GRANULAR B
EXISTING GROUND
BLOCK 109 SWMF ACCESS ROAD AND MAJOR OVERLAND SPILL POINT DETAIL
1:100
PROPOSED 6.0m GRANULAR ACCESS ROAD
FUTURE SIDEWALK
FUTURE BARRIER CURB
FUTURE DEPRESSED CURB
BLOCK 108
DRIVEWAY TO COMMUNITY BLOCK
- 50mm - 19mm SP 12.5
- 150mm GRANULAR A
- 450mm GRANULAR B
BLOCK 113
BLOCK 109
CHANDELLE PVT.
STREET THREE
ALBERT BOYD PRIVATE
FUTURE DEVELOPMENT LANDS
BLOCK 157 PLAN 4M-1593
BLOCK 185 PLAN 4M-1593
PIN 04538-0688
SEE DRAWING NO. 102085-GR13
TEMPORARY INFILTRATION DITCH
LIMIT OF PHASE 1B-2 CURB AND SIDEWALK
LIMIT OF PHASE 1B-2 ASPHALT
LIMIT OF PHASE 1B-2 PAVING, CURB AND SIDEWALK
SWM POND INLET SWALE. SEE DRAWING 102085-SWMF5 FOR DETAILS.
MAJOR OVERLAND FLOW INLET SWALE
TIE INTO EXISTING ASPHALT
ADJUST EX. V&VB TO FINISHED GRADE c/w ASPHALT COLLAR
ADJUST EX. SAP TO FINISHED GRADE
600mmØ CSP CULV E INV. = 113.90 W INV. = 113.75
SEE ATTACHED SECTION DETAIL
SEE ATTACHED BLOWUP DETAIL
1.5% ℄ REARYARD SWALE AND DIRECTION OF FLOW
117.00 / 116.50 PROPOSED ELEVATION / EXISTING ELEVATION
127.55(S) PROPOSED SWALE ELEVATION
0.6% PROPOSED GRADING DIRECTION AND SLOPE
TF=117.03 TOP OF FOUNDATION ELEVATION (STANDARD 8' BASEMENT HEIGHT)
MUSF=114.28 MINIMUM UNDERSIDE OF FOOTING ELEVATION
MFOF=116.63 MINIMUM FOUNDATION OPENING FRONT ELEVATION
MFOR=115.32 MINIMUM FOUNDATION OPENING REAR ELEVATION
116.63 PROPOSED TERRACE ELEVATION
116.97 PROPOSED CENTRELINE OF ROAD ELEVATION
116.96 PROPOSED CENTRELINE OF ROAD ELEVATION - HIGH POINT
116.90 PROPOSED CENTRELINE OF ROAD ELEVATION - LOW POINT
HYD T/F=127.55 PROPOSED HYDRANT LOCATION PROPOSED TOP OF BOTTOM FLANGE
WS PROPOSED WATER SAMPLING STATION
CB PROPOSED CATCHBASIN
CB PROPOSED CATCHBASIN WITH INLET CONTROL DEVICE
CB ELB PROPOSED LANDSCAPE CATCHBASIN ELBOW
CB TEE PROPOSED LANDSCAPE CATCHBASIN TEE
100 PROPOSED STORM MANHOLE
TERRACING
MAJOR OVERLAND FLOW
DEVELOPMENT SETBACK
PROPOSED 1.5m CHAINLINK FENCE
PROPOSED 1.5m UTILITY EASEMENT
PROPOSED TOP OF SLOPE
PROPOSED ROCK FLOW CHECK DAM (MODIFIED OPSD 219.211)
MAXIMUM STATIC PONDING CONTOUR

REFER TO 102085-ND1B2 FOR ADDITIONAL NOTES

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
9.	ISSUED FOR REGISTRATION AND ECA	JUN 28/24	ARM

No.	REVISION	DATE	BY
8.	REVISED POND INLET SWALE	MAY 14/24	ARM
7.	ADDITIONAL ORIGINAL GROUND SURFACE CONTOUR INTERVALS ADDED	APR 24/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
5.	ISSUED WITH ADDENDUM #4	JAN 12/24	ARM
4.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
3.	ISSUED FOR TENDER	DEC 7/23	ARM
2.	ISSUED FOR REVIEW	JUL 28/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE
1:500

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED SMG

LICENSED PROFESSIONAL ENGINEER
A. A. RONGVE
100616298
June 28, 2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
A.R. MCAULEY
100141256
June 28, 2024
PROVINCE OF ONTARIO

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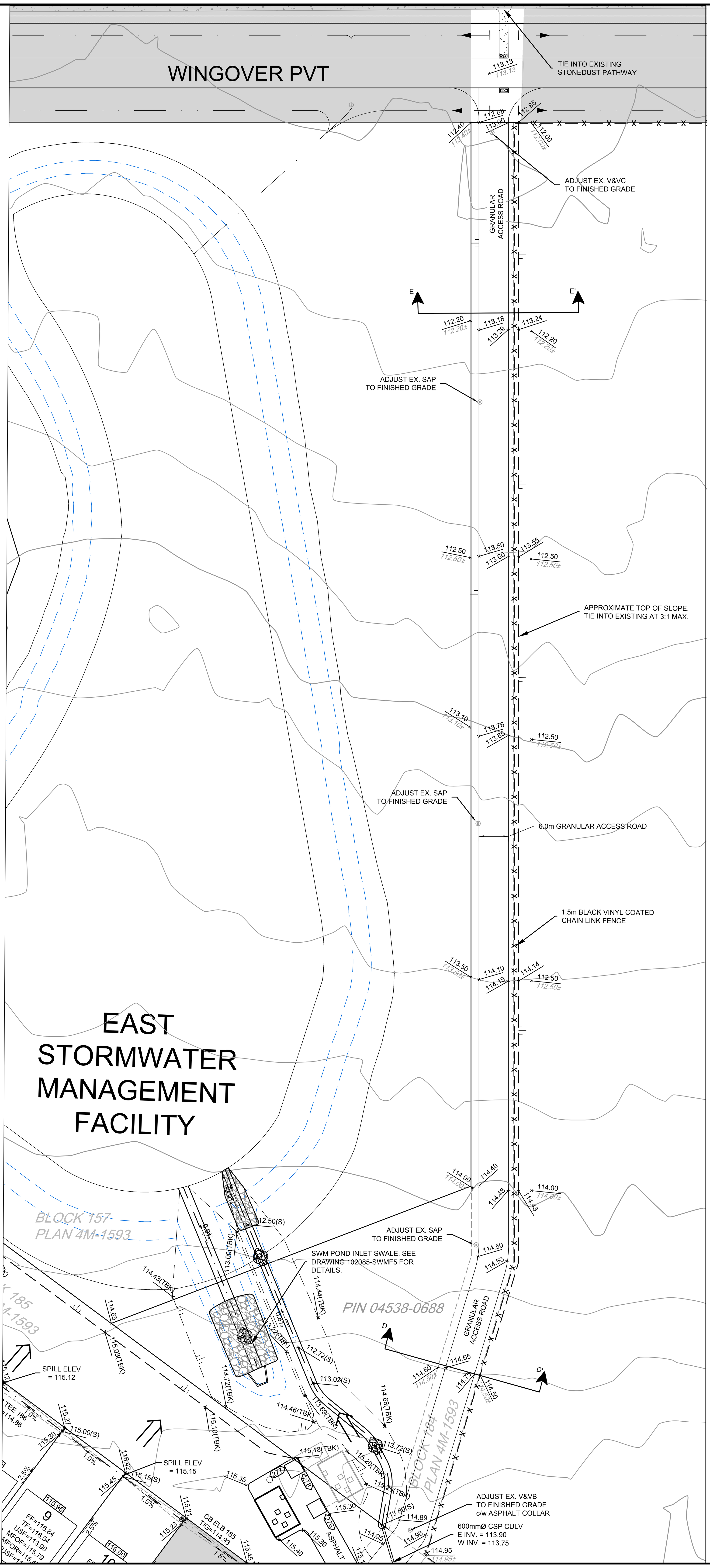
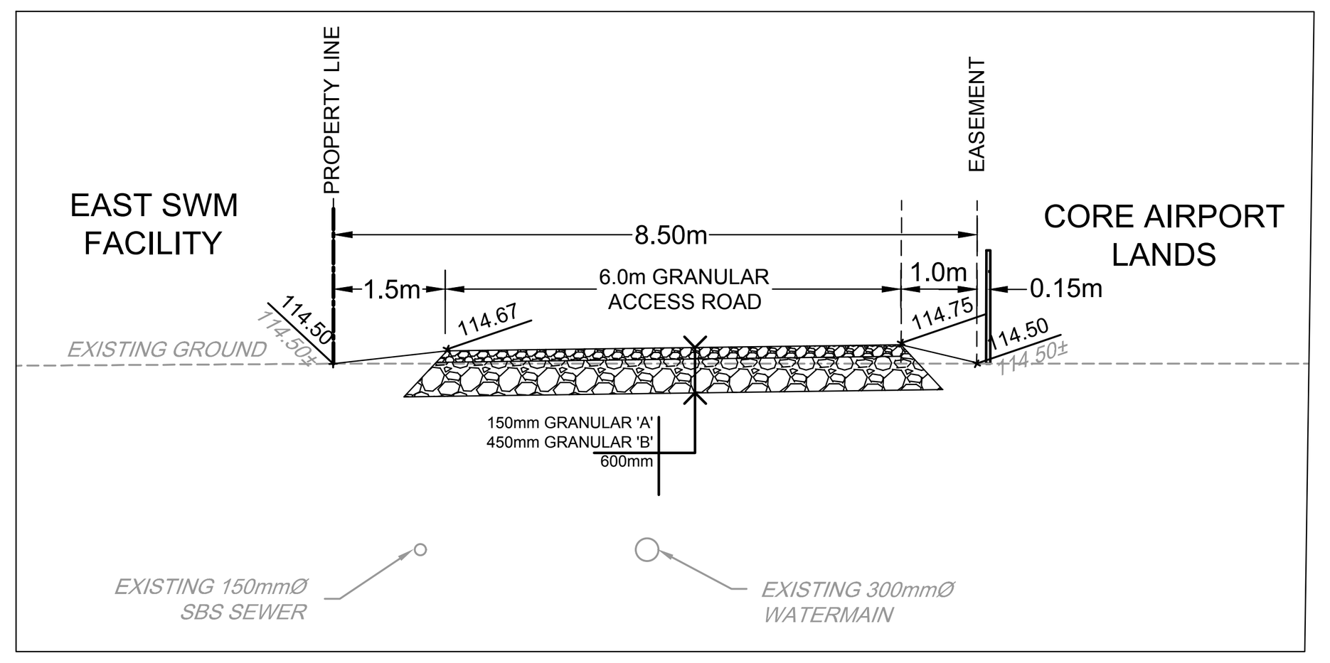
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
GRADING PLAN - PHASE 1B-2

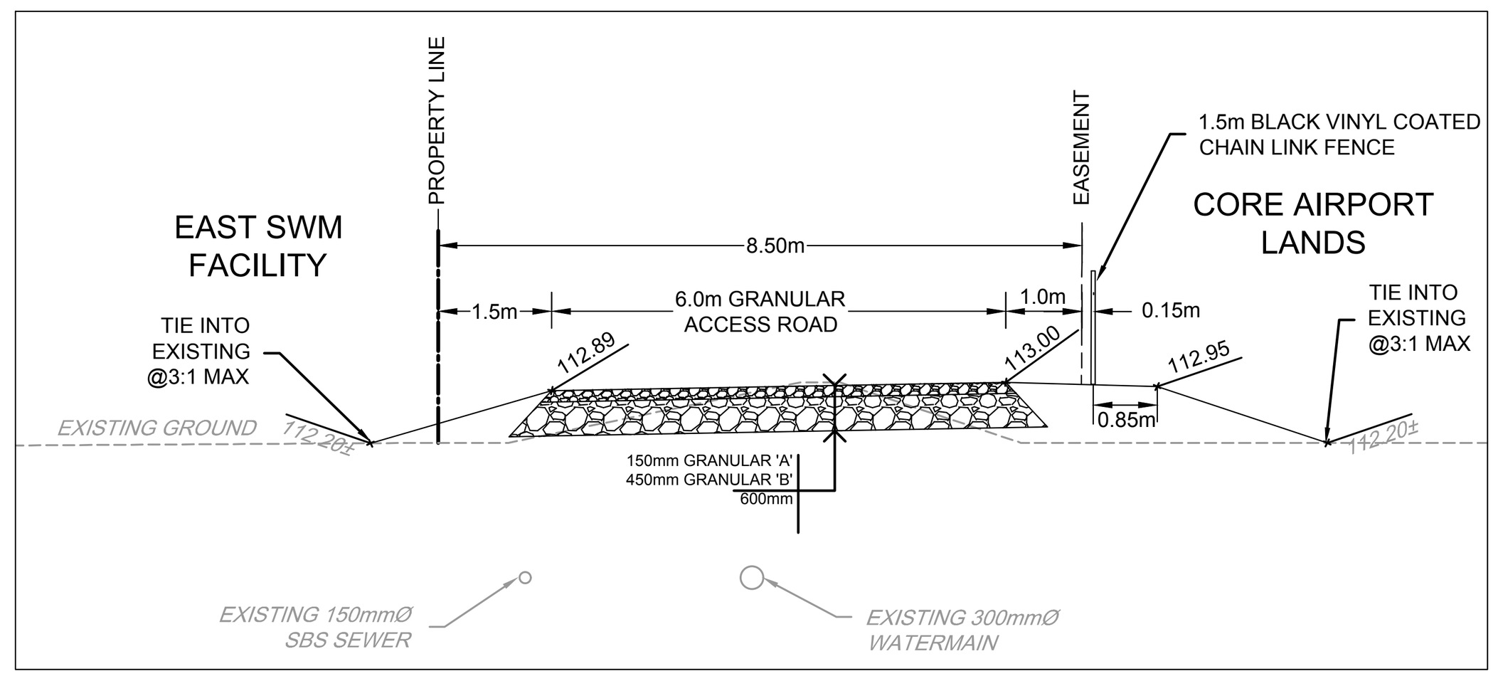
PROJECT No. 102085
REV # 9
DRAWING No. 102085-GR14

M:\2020\102085\CAD\...\102085-GR14, Jun 28, 2024 - 2:01pm, mblanton

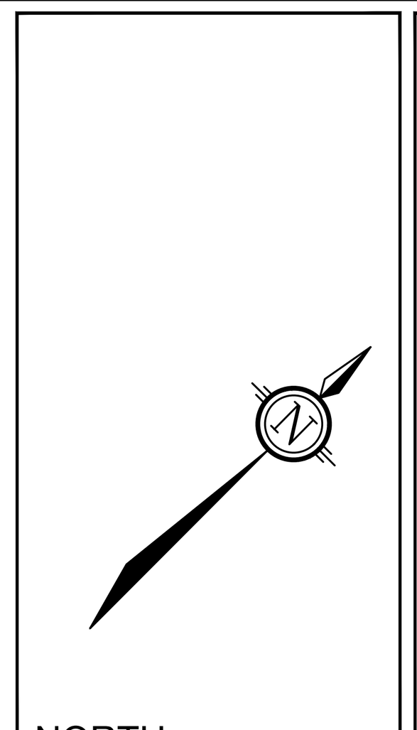




BLOCK 184 - CROSS SECTION D-D'
1:100



BLOCK 184 - CROSS SECTION E-E'
1:100


NORTH


KEY PLAN
N.T.S.

1.5% ℄ REARYARD SWALE AND DIRECTION OF FLOW
117.00 PROPOSED ELEVATION
116.50 EXISTING ELEVATION
127.55(S) PROPOSED SWALE ELEVATION
0.6% PROPOSED GRADING DIRECTION AND SLOPE
TERRACING
MAJOR OVERLAND FLOW
— x — x — PROPOSED 1.5m CHAINLINK FENCE

REFER TO 102085-ND1B2 FOR ADDITIONAL NOTES

NOTE:
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No.	REVISION	DATE	BY
7.	ISSUED FOR REGISTRATION AND ECA (NO CHANGES)	JUN 28/24	ARM
6.	REVISED POND INLET SWALE	MAY 14/24	ARM
5.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
4.	ISSUED WITH ADDENDUM #4	JAN 12/24	ARM
3.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
2.	ISSUED FOR TENDER	DEC 7/23	ARM
1.	ISSUED FOR REVIEW	JUL 28/23	ARM

SCALE
1:500

DESIGN	AAR
CHECKED	ARM
DRAWN	AAR
CHECKED	ARM
APPROVED	SMG

LICENSED PROFESSIONAL ENGINEER
A. A. RONGVE
100616298
June 28, 2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
A.R. MCAULEY
100141256
June 28, 2024
PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
GRADING PLAN - BLOCK 184

PROJECT No. 102085
REV # 7
DRAWING No. 102085-GR15

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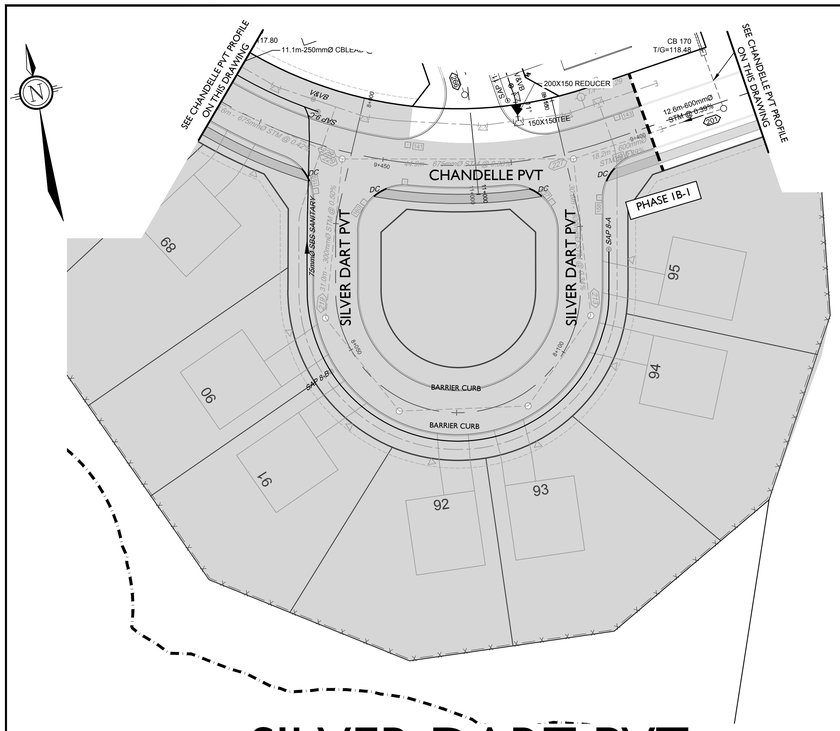

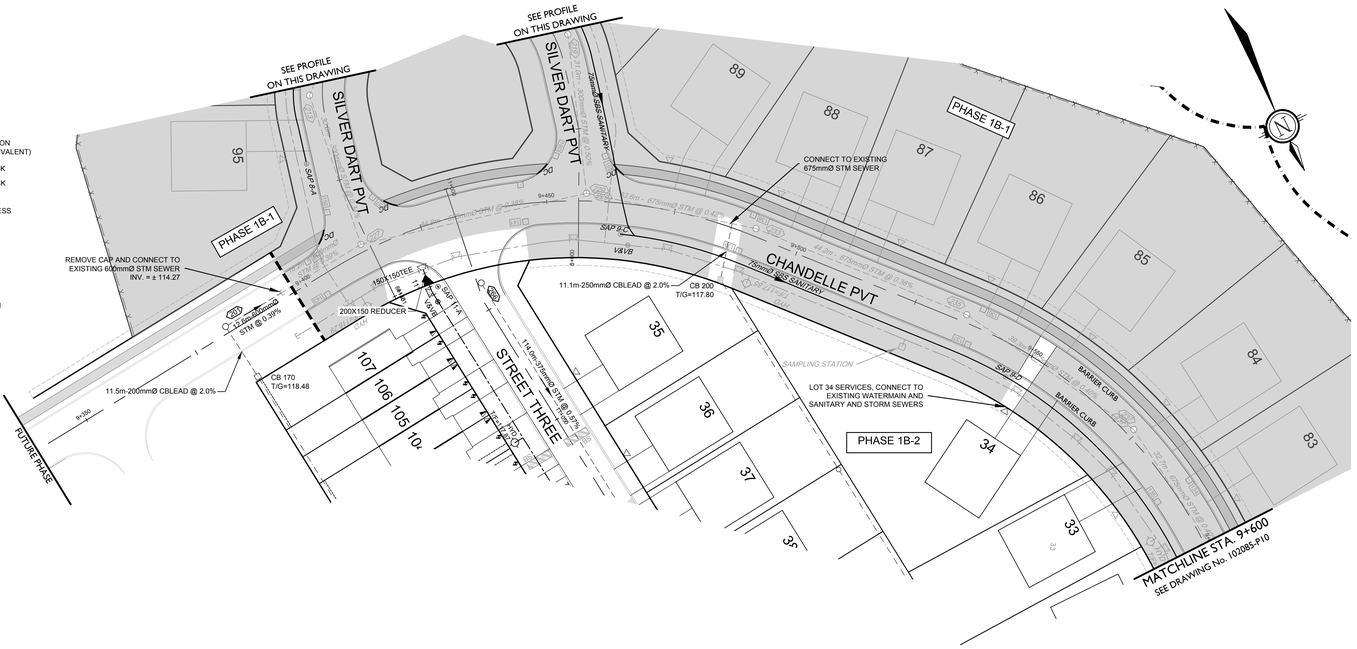

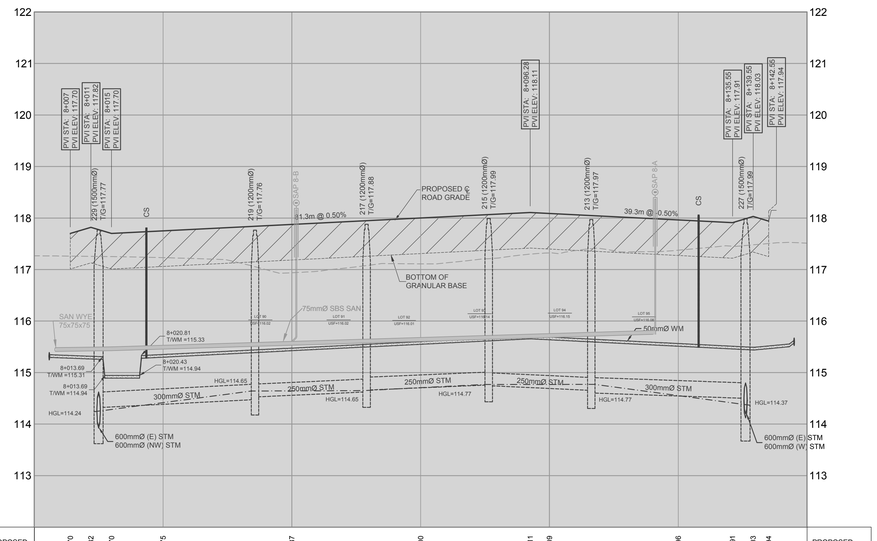

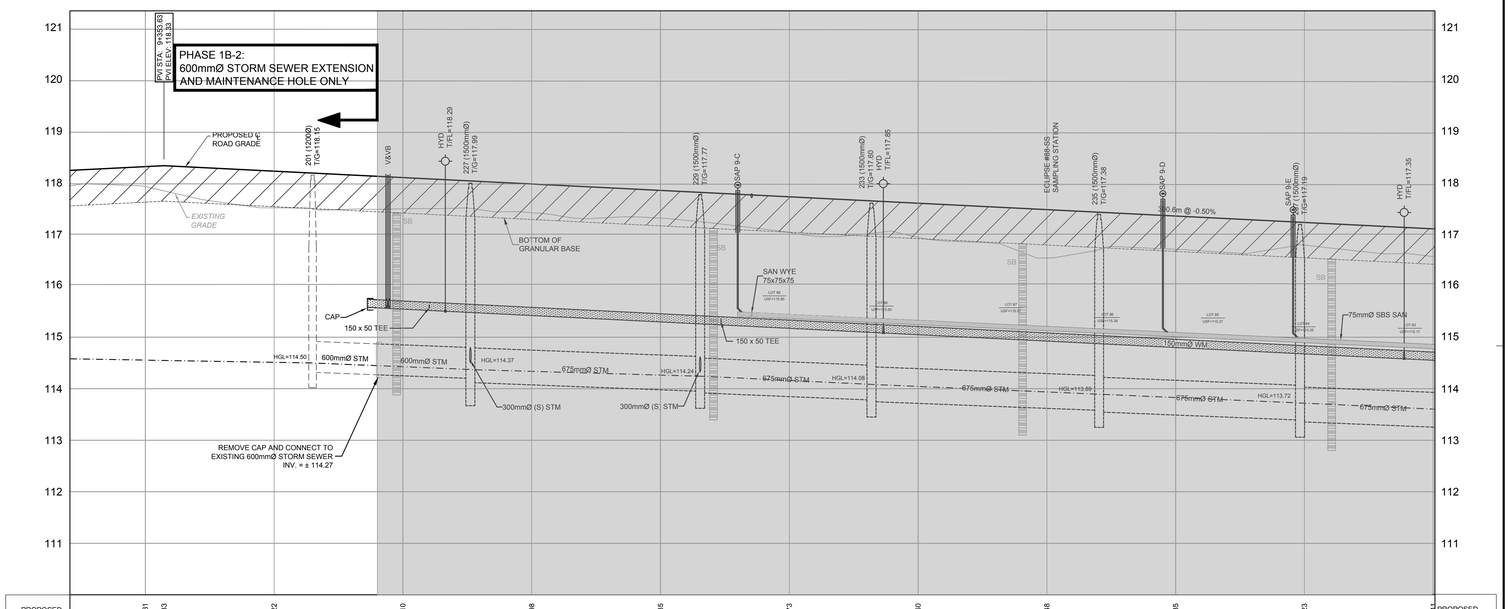

SILVER DART PVT

LEGEND

—⊗—	PROPOSED VALVE LOCATION
V&VB	VALVE & VALVE BOX
V&VC	VALVE & VALVE CHAMBER
—▶—	REDUCER
HYD	PROPOSED HYDRANT LOCATION COMPLETE WITH VALVES
▫	PROPOSED WATER SAMPLING STATION (ECLIPSE #88-22 OR APPROVED EQUIVALENT) COMPLETE WITH VALVES PROPOSED BEND AND THRUSTBLOCK
11°	PROPOSED BEND AND THRUSTBLOCK (SEE PLAN AND PROFILES)
SAP 2-D	PROPOSED SANITARY SYSTEM ACCESS POINT
SBS SANITARY	PROPOSED SMALL BORE SEWER-SANITARY
107	PROPOSED STORM MH & SEWER
— — —	PROPOSED CB LEAD
⊡ CB 2	PROPOSED ROAD CATCHBASIN
▣ RYCB 12	PROPOSED REARYARD CATCHBASIN
◙ CBMH 10	PROPOSED CATCHBASIN MANHOLE
▼	PROPOSED SERVICE LOCATION FOR HANGAR LOTS
▽	PROPOSED SERVICE LOCATION FOR ALL OTHER LOTS
►	PROPOSED DIRECTION OF FLOW
▭	1.8m CONCRETE SIDEWALK
——►	PROPOSED DITCH
SB ▨	SEEPAGE BARRIER AS PER CITY OF OTTAWA DETAIL S8.
░	STONEDUST PATH
—ST—	PROPOSED DITCH COMPLETE WITH CLEAR STONE TRENCH
—S—	PROPOSED DITCH COMPLETE WITH SUBDRAIN

CHANDELLE PVT

M:\2002\102085\CAD_PHASES2B&3\Civil\102085-2B3-P9.dwg, STR9-P9, Jun 19, 2024 - 3:49pm, mblanton

NOTE:
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CLEARFORD
WATER SYSTEMS INC.

CLEARFORD
W. G. STEFAN
27 JUN 2024

WEST CAPITAL
Developments

No.	REVISION	DATE	BY
19	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
18	REVISED PER CITY COMMENTS (NO CHANGES)	FEB 20/24	ARM
17	ISSUED WITH ADDENDUM #2 (NO CHANGES)	JAN 5/24	ARM
16	ISSUED FOR TENDER - PHASE 1B-2 (NO CHANGES)	DEC 7/23	ARM
15	ISSUED FOR REVIEW - PHASE 1B-2	JUL 28/23	ARM
14	REVISED PER CITY & CLEARFORD COMMENTS	SEPT 23/21	ARM
13	REVISED PER PHASE 1B LIMITS	JUL 12/21	ARM
12	IFC (PH1B CREEK SIDE STM SEWER MAINS)	MAR 22/21	AAR
11	ISSUED FOR TENDER (PH1B CREEK SIDE STM SEWERS)	FEB 23/21	AAR
10	REVISED AS PER CLEARFORD COMMENTS	APR 1/15	DJC
9	ISSUED FOR TENDER	FEB 26/14	DJC
8	ISSUED FOR PHASE 1 RESIDENTIAL REGISTRATION	OCT 15/14	DJC
7	REVISED PER CITY / MVC COMMENTS	SEPT 26/13	DJC
6	REVISED PER CITY / MVC COMMENTS	MAY 28/13	MSP
5	REVISED FOR ISSUE TO MOE	MAR 09/12	MSP
4	REVISED PER CITY COMMENTS / ISSUED TO MOE	MAR 08/12	MSP

SCALE
1:500
0 5 10 15 20
HORIZONTAL
1:50
0 0.5 1.0 1.5 2.0
VERTICAL

DESIGN	CAH/MSP
CHECKED	MSP/SMG
DRAWN	CAH
CHECKED	MSP
APPROVED	JGR

NOVATECH
A. A. RONGVE
100616298
June 28, 2024

NOVATECH
A.R. MCAULEY
100141256
June 28, 2024

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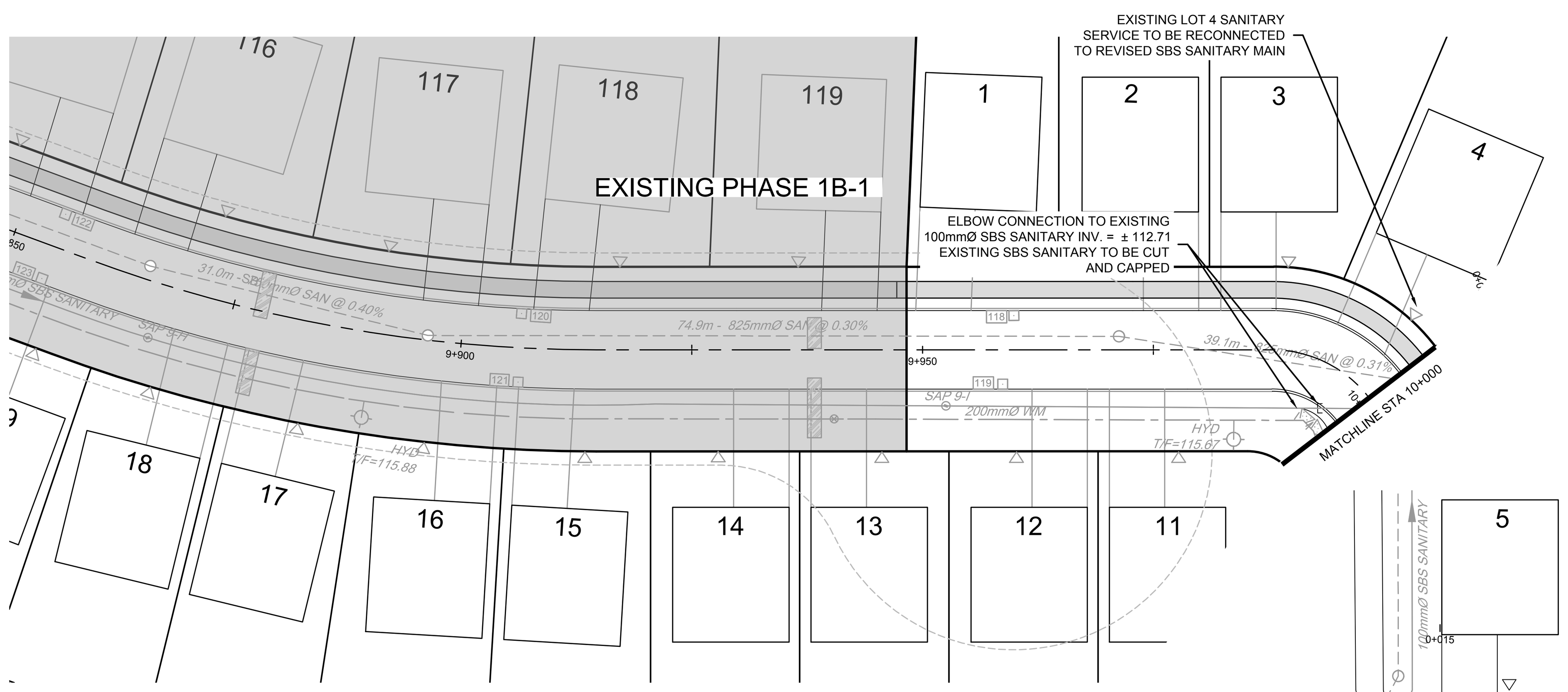
CITY OF OTTAWA
WEST CAPITAL AIRPARK

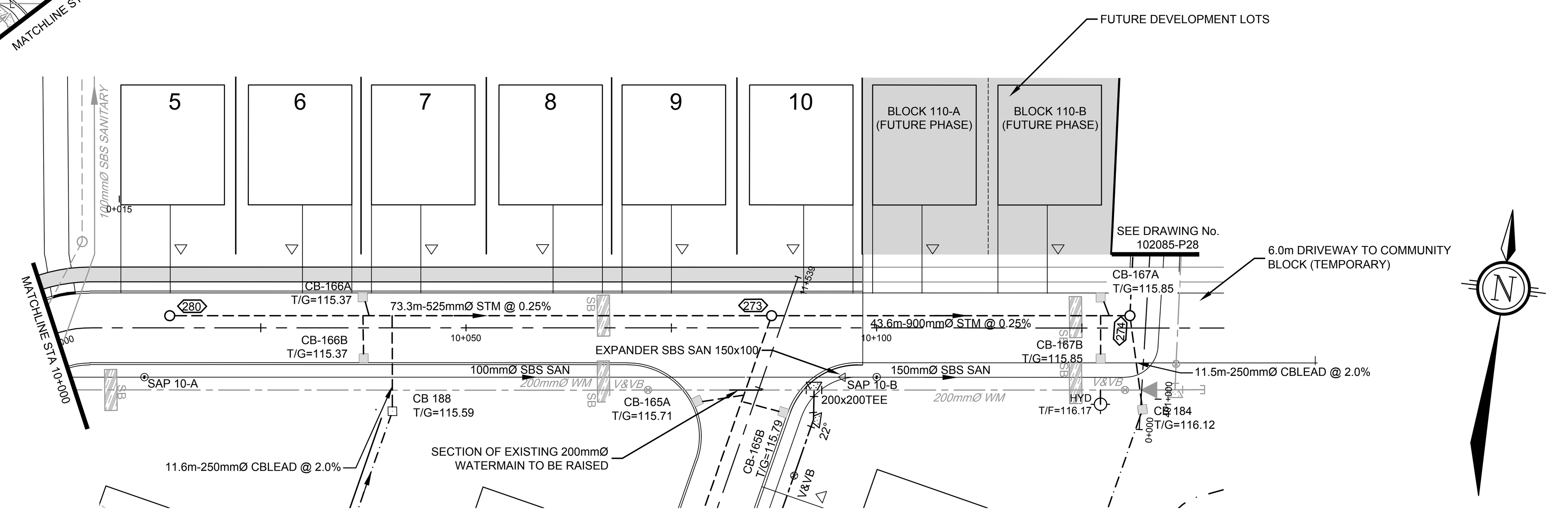
PLAN & PROFILE
SILVER DART PRIVATE
STA. 8+000 TO 8+150
CHANDELLE PRIVATE
STA. 9+335 TO 9+600

PROJECT No. 102085-08
REV: REV # 19
DRAWING No. 102085-P9

PLANB1.DWG - 1000mmx707mm



CHANDELLE PVT



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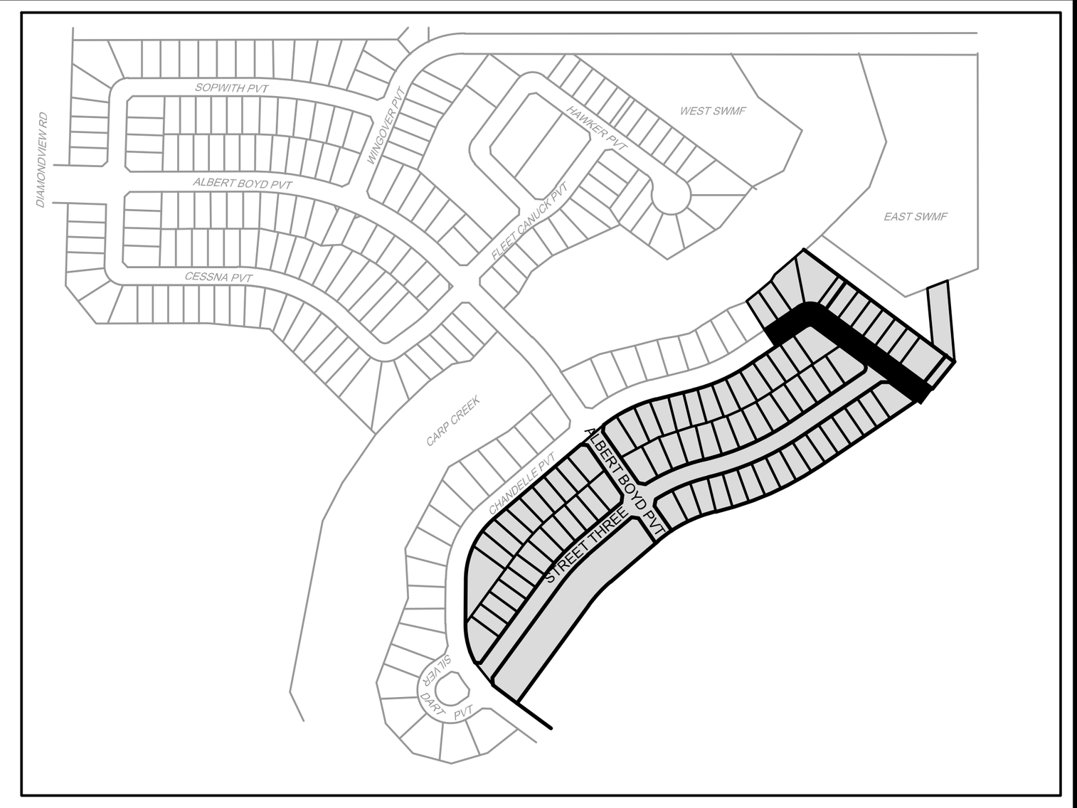

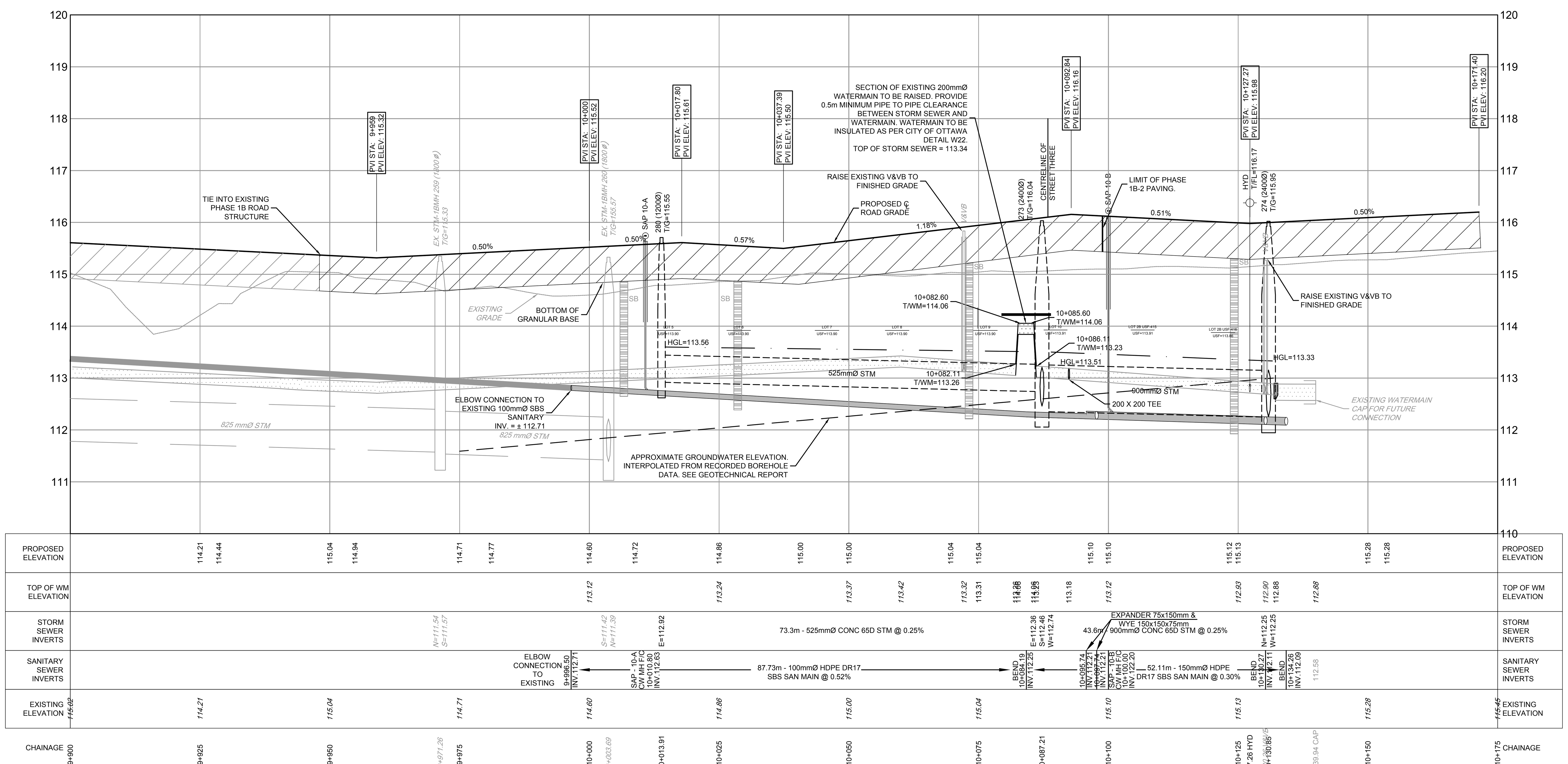

LEGEND

- 200mmØ WM — PROPOSED WATERMAIN AND DIAMETER
- V&VB — PROPOSED VALVE & VALVE BOX
- HYD — PROPOSED HYDRANT C/W VALVE & LEAD
- T/F = 98.45 — PROPOSED TOP OF BOTTOM FLANGE
- 200mmØ WM — EXISTING WATERMAIN AND DIAMETER
- V&VB — EXISTING VALVE & VALVE BOX
- HYD — EXISTING HYDRANT C/W VALVE & LEAD
- SBS SANITARY — PROPOSED SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
- SAP 1-A — PROPOSED SANITARY SYSTEM ACCESS POINT
- SBS SANITARY — EXISTING SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
- SAP 1-A — EXISTING SANITARY SYSTEM ACCESS POINT
- PROPOSED STORM SEWER AND DIRECTION OF FLOW
- PROPOSED REAR YARD SUBDRAIN, INFILTRATION TRENCH AND DIRECTION OF FLOW
- EXISTING STORM SEWER
- PROPOSED STORM MANHOLE
- EXISTING STORM MANHOLE
- PROPOSED SERVICE LOCATION
- SERVICE LOCATION - SERVICE INSTALLED AS PART OF PHASE 1B-1 WORKS
- PROPOSED SERVICE LOCATION (WATER AND STORM)
- PROPOSED SERVICE LOCATION (SANITARY ONLY)
- 1.8m CONCRETE SIDEWALK
- CB — PROPOSED CATCHBASIN
- CB — PROPOSED CATCHBASIN WITH INLET CONTROL DEVICE
- EXISTING ROADSIDE CATCHBASIN
- CB ELB — PROPOSED LANDSCAPE CATCHBASIN ELBOW
- CB TEE — PROPOSED LANDSCAPE CATCHBASIN TEE
- SB — PROPOSED SEEPAGE BARRIER

REFER TO 102085-ND1B2 FOR ADDITIONAL NOTES

NOTE:
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CLEARFORD WATER SYSTEMS INC.

LICENSED PROFESSIONAL ENGINEER W. G. STEFAN PROVINCE OF ONTARIO

WEST CAPITAL Developments

No.	REVISION	DATE	BY
8.	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
7.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 9/24	ARM
5.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
4.	ISSUED FOR TENDER	DEC 7/23	ARM
3.	ISSUED FOR REVIEW	JUL 25/23	ARM
2.	ISSUED FOR COORDINATION	JUL 11/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE 1:500

DESIGN MNP
CHECKED ARM
DRAWN ARM
CHECKED ARM
APPROVED SMG

LICENSED PROFESSIONAL ENGINEER A. A. RONGVE 100616298 June 28, 2024 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 June 28, 2024 PROVINCE OF ONTARIO

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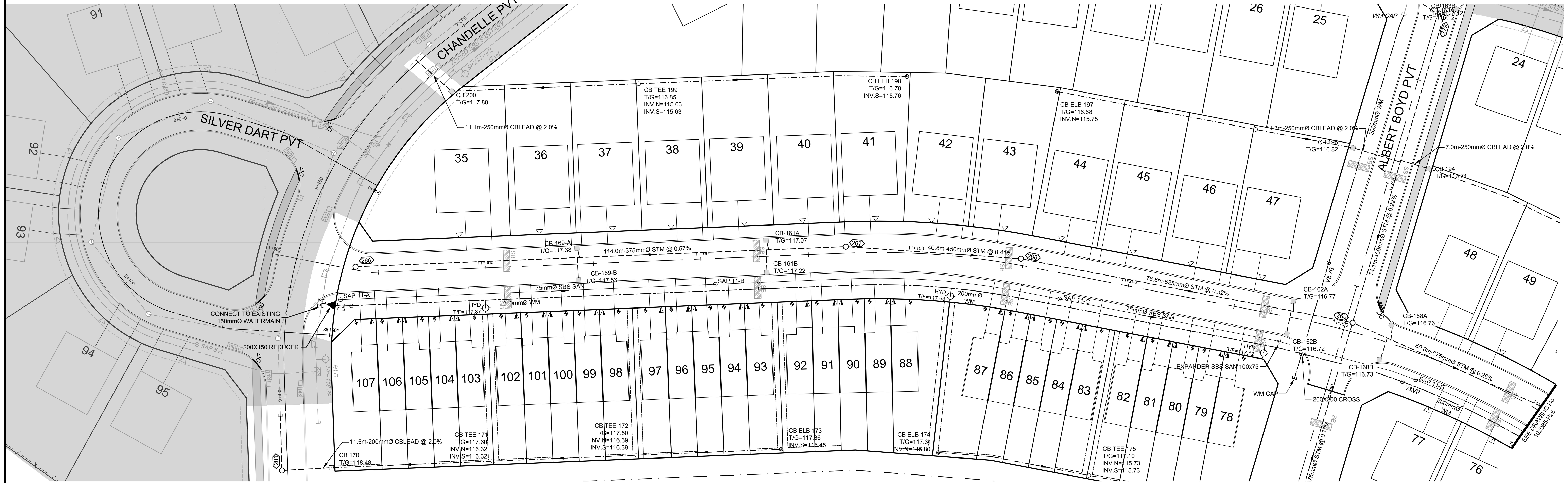
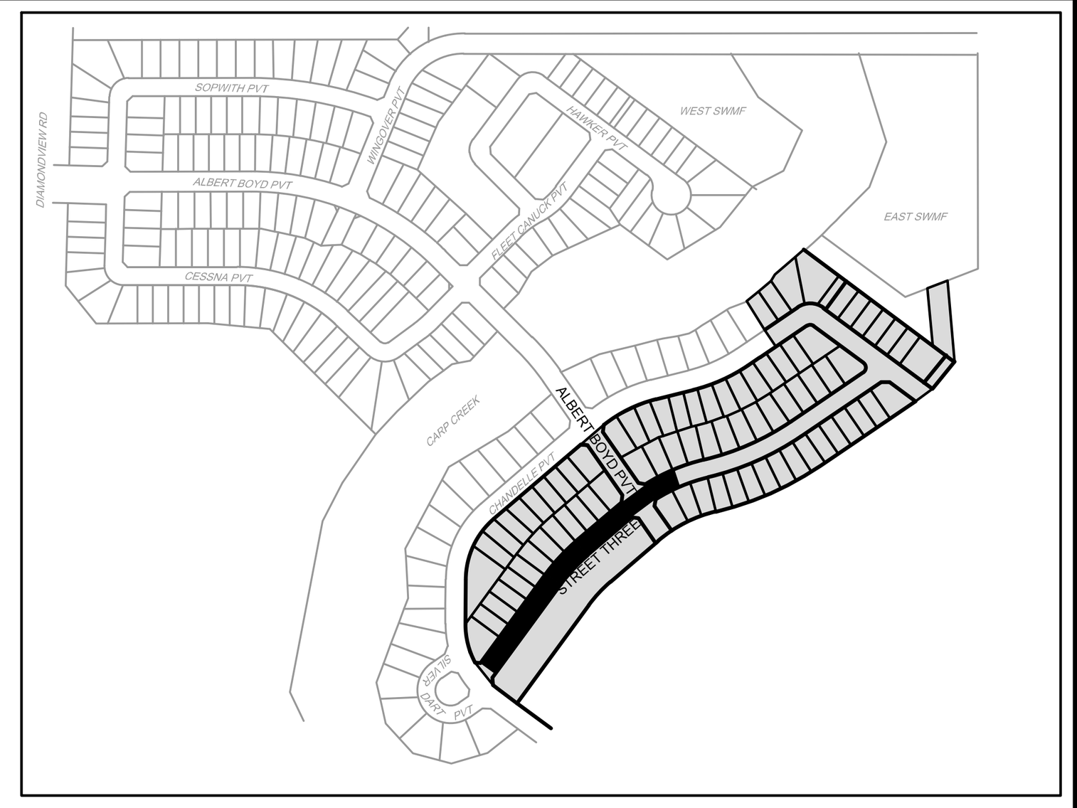
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

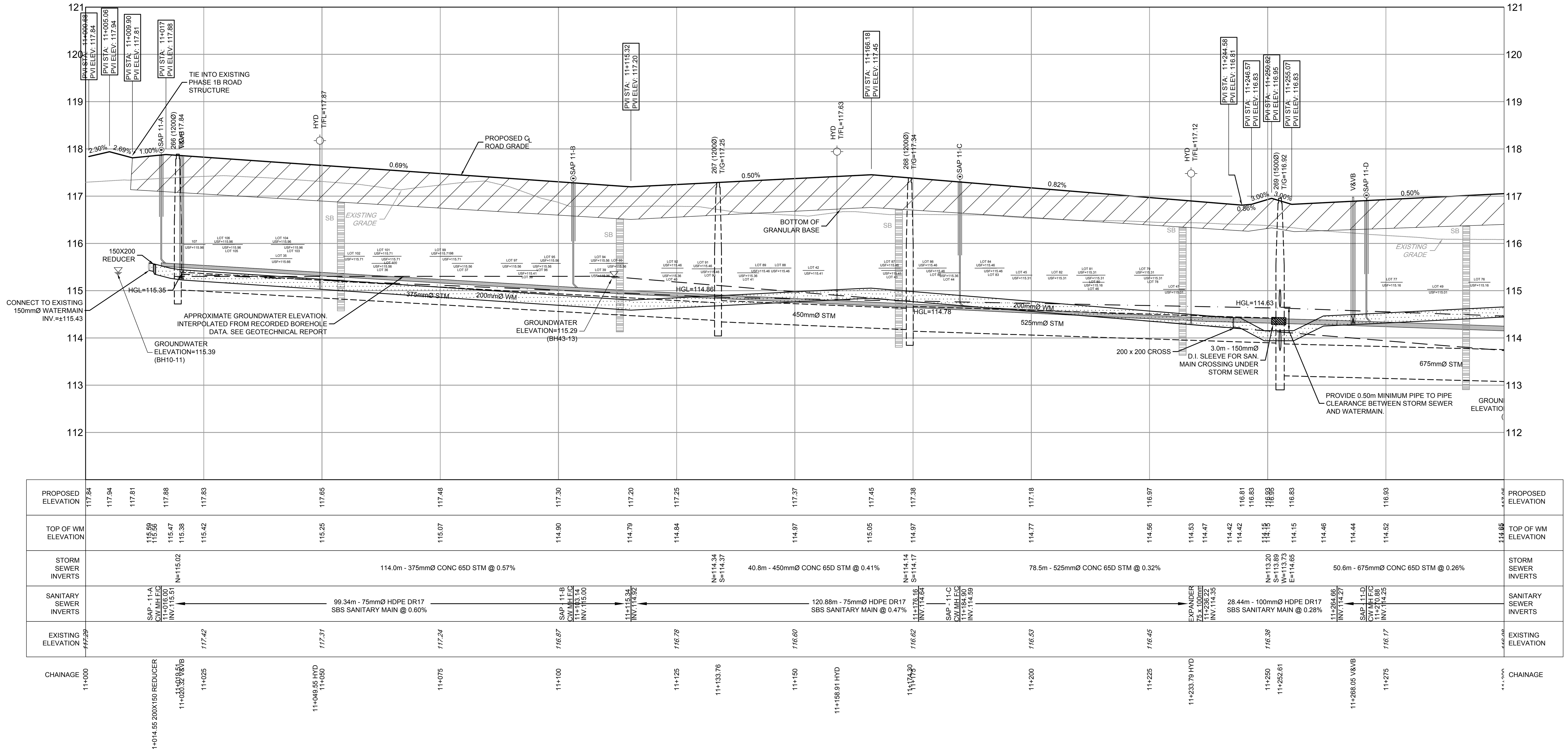
DRAWING NAME
PLAN & PROFILE - PHASE 1B-2
CHANDELLE PRIVATE
STA 9+900 TO STA 10+175

PROJECT No. 102085
REV # 8
DRAWING No. 102085-P24





STREET THREE



LEGEND

200mmØ WM	PROPOSED WATERMAIN AND DIAMETER
V&VB	PROPOSED VALVE & VALVE BOX
HYD	PROPOSED HYDRANT C/W VALVE & LEAD
T/F = 98.45	PROPOSED TOP OF BOTTOM FLANGE
200mmØ WM	EXISTING WATERMAIN AND DIAMETER
V&VB	EXISTING VALVE & VALVE BOX
HYD	EXISTING HYDRANT C/W VALVE & LEAD
SBS SANITARY	PROPOSED SMALL BORE SEWER-SANITARY AND DIRECTION OF FLOW
SAP 1-A	PROPOSED SANITARY SYSTEM ACCESS POINT
SBS SANITARY	EXISTING SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
SAP 1-A	EXISTING SANITARY SYSTEM ACCESS POINT
	PROPOSED STORM SEWER AND DIRECTION OF FLOW
	PROPOSED REAR YARD SUBDRAIN, INFILTRATION TRENCH AND DIRECTION OF FLOW
	EXISTING STORM SEWER
222	PROPOSED STORM MANHOLE
	EXISTING STORM MANHOLE
	PROPOSED SERVICE LOCATION
	SERVICE LOCATION - SERVICE INSTALLED AS PART OF PHASE 1B-1 WORKS
	PROPOSED SERVICE LOCATION (WATER AND STORM)
	PROPOSED SERVICE LOCATION (SANITARY ONLY)
	1.8m CONCRETE SIDEWALK
CB	PROPOSED CATCHBASIN
CB	PROPOSED CATCHBASIN WITH INLET CONTROL DEVICE
	EXISTING ROADSIDE CATCHBASIN
CB ELB	PROPOSED LANDSCAPE CATCHBASIN ELBOW
CB TEE	PROPOSED LANDSCAPE CATCHBASIN TEE
SB	PROPOSED SEEPAGE BARRIER

REFER TO 102085-ND1B2 FOR ADDITIONAL NOTES

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CLEARFORD WATER SYSTEMS INC.

LICENSED PROFESSIONAL ENGINEER W. G. STEFAN PROVINCE OF ONTARIO

WEST CAPITAL Developments

No.	REVISION	DATE	BY
8.	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
7.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 9/24	ARM
5.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
4.	ISSUED FOR TENDER	DEC 7/23	ARM
3.	ISSUED FOR REVIEW	JUL 25/23	ARM
2.	ISSUED FOR COORDINATION	JUL 11/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE 1:500

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED SMG

LICENSED PROFESSIONAL ENGINEER A. A. RONGVE 100616298 June 28, 2024 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 June 28, 2024 PROVINCE OF ONTARIO

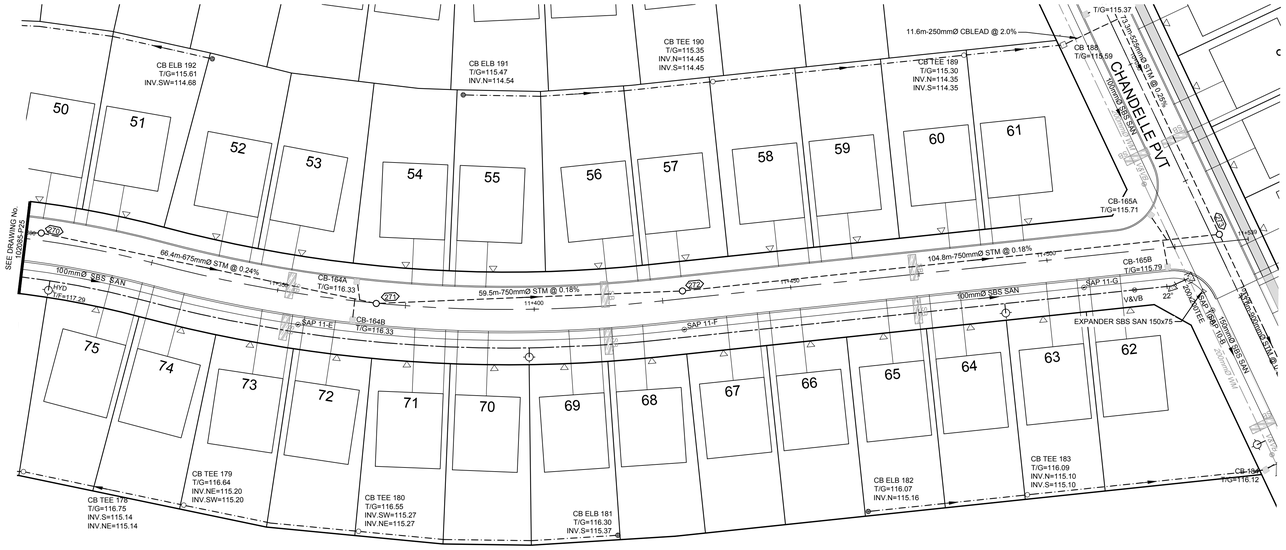
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

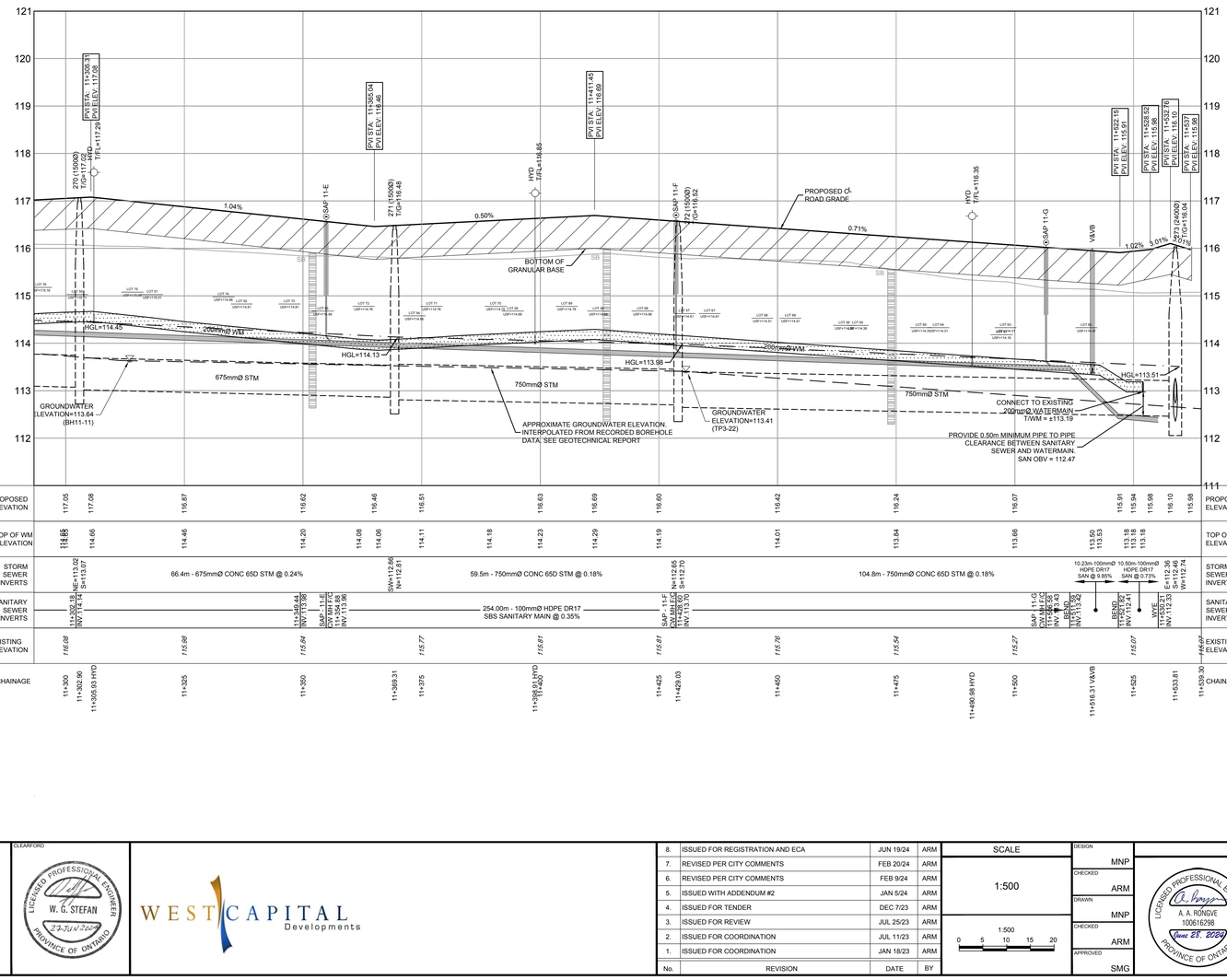
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
PLAN & PROFILE - PHASE 1B-2
STREET THREE
STA 11+000 TO STA 11+300

PROJECT No. 102085
REV REV # 8
DRAWING No. 102085-P25

PLANB1.DWG - 1000mmx707mm





STREET THREE

LEGEND

200mmØ WM	PROPOSED WATERMAIN AND DIAMETER
⊗ V&VB	PROPOSED VALVE & VALVE BOX
HYD	PROPOSED HYDRANT C/W VALVE & LEAD
T/F = 98.45	PROPOSED TOP OF BOTTOM FLANGE
200mmØ WM	EXISTING WATERMAIN AND DIAMETER
⊗ *V&VB*	EXISTING VALVE & VALVE BOX
HYD	EXISTING HYDRANT C/W VALVE & LEAD
SBS SANITARY	PROPOSED SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
SAP 1-A	PROPOSED SANITARY SYSTEM ACCESS POINT
SBS SANITARY	EXISTING SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
SAP 1-A	EXISTING SANITARY SYSTEM ACCESS POINT
	PROPOSED STORM SEWER AND DIRECTION OF FLOW
	PROPOSED REAR YARD SUBDRAIN, INFILTRATION TRENCH AND DIRECTION OF FLOW
	EXISTING STORM SEWER
222 ○	PROPOSED STORM MANHOLE
○	EXISTING STORM MANHOLE
▽	PROPOSED SERVICE LOCATION
▽	SERVICE LOCATION - SERVICE INSTALLED AS PART OF PHASE 1B-1 WORKS
▼	PROPOSED SERVICE LOCATION (WATER AND STORM)
◆	PROPOSED SERVICE LOCATION (SANITARY ONLY)
▭	1.8m CONCRETE SIDEWALK
CB ⊡	PROPOSED CATCHBASIN
CB ▣	PROPOSED CATCHBASIN WITH INLET CONTROL DEVICE
⊡	EXISTING ROADSIDE CATCHBASIN
⊕ CB ELB	PROPOSED LANDSCAPE CATCHBASIN ELBOW
○ CB TEE	PROPOSED LANDSCAPE CATCHBASIN TEE
SB ▨	PROPOSED SEEPAGE BARRIER

REFER TO 102085-ND1B2 FOR ADDITIONAL NOTES

M:\2002\102085\CAD_PHASES2B&3\Civil\102085-2B3-P24-28.dwg, P26, Jun 18, 2024 - 10:07am mparker

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CLEARFORD WATER SYSTEMS INC.

CLEARFORD
W. G. STEFAN
27 JUN 2024

WEST CAPITAL Developments

No.	REVISION	DATE	BY
8.	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
7.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 9/24	ARM
5.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
4.	ISSUED FOR TENDER	DEC 7/23	ARM
3.	ISSUED FOR REVIEW	JUL 25/23	ARM
2.	ISSUED FOR COORDINATION	JUL 11/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE
1:500
1:500
0 5 10 15 20

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED SMG

A. A. RONGVE
100616298
June 28. 2024

A.R. MCAULEY
100141256
June 28, 2024

NOVATECH
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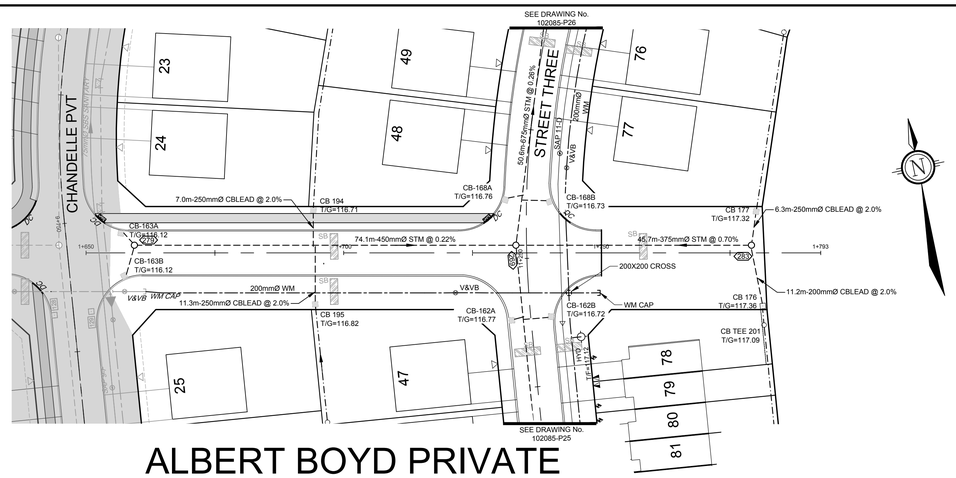
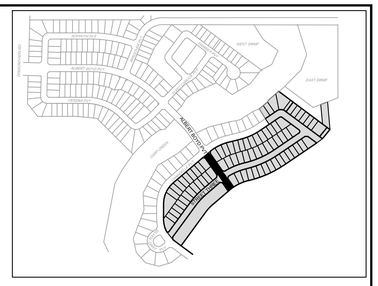
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

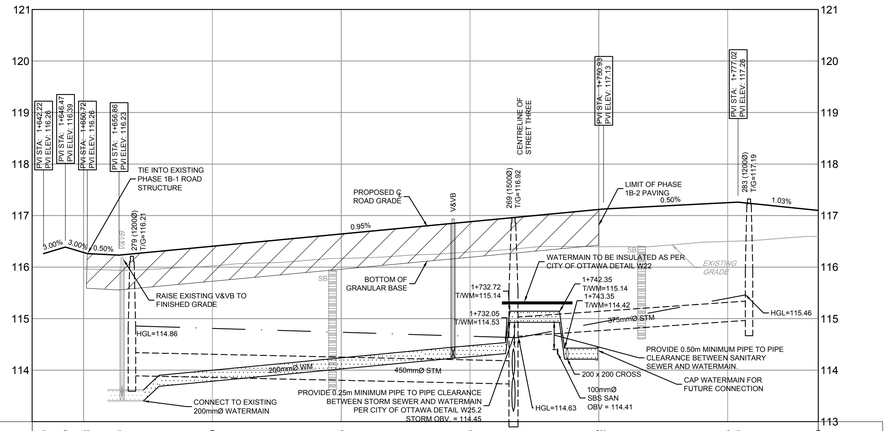
DRAWING NAME
PLAN & PROFILE - PHASE 1B-2
STREET THREE
STA 11+300 TO STA 11+539

PROJECT No. 102085
REV # 8
DRAWING No. 102085-P26

PLANB1.DWG - 1000mmx707mm







ALBERT BOYD PRIVATE

LEGEND

200mmØ WM	PROPOSED WATERMAIN AND DIAMETER
⊗ V&VB	PROPOSED VALVE & VALVE BOX
HYD	PROPOSED HYDRANT C/W VALVE & LEAD
T/F = 98.45	PROPOSED TOP OF BOTTOM FLANGE
200mmØ WM	EXISTING WATERMAIN AND DIAMETER
⊗ *V&VB*	EXISTING VALVE & VALVE BOX
HYD	EXISTING HYDRANT C/W VALVE & LEAD
SBS SANITARY	PROPOSED SMALL BORE SEWER- SANITARY AND DIRECTION OF FLOW
SAP 1-A	PROPOSED SANITARY SYSTEM ACCESS POINT
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SAP 1-A	EXISTING SANITARY SYSTEM ACCESS POINT
— ◄ —	PROPOSED STORM SEWER AND DIRECTION OF FLOW
— — —	EXISTING STORM SEWER
222 ○	PROPOSED STORM MANHOLE
○	EXISTING STORM MANHOLE
▽	PROPOSED SERVICE LOCATION
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▼	PROPOSED SERVICE LOCATION (WATER AND STORM)
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CB ▢	PROPOSED CATCHBASIN WITH INLET CONTROL DEVICE
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CB ELB	PROPOSED LANDSCAPE CATCHBASIN ELBOW
○ CB TEE	PROPOSED LANDSCAPE CATCHBASIN TEE
SB ▨	PROPOSED SEEPAGE BARRIER

REFER TO 102085-ND1B2 FOR ADDITIONAL NOTES

M:\2002\102085\CAD_PHASES2B&3\Civil\102085-2B3-P24-28.dwg, P27, Jun 18, 2024 - 10:07am, mparker

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CLEARFORD
WATER SYSTEMS INC.

CLEARFORD

W. G. STEFAN
27 JUN 2024

WEST CAPITAL
Developments

No.	REVISION	DATE	BY
8.	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
7.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 9/24	ARM
5.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
4.	ISSUED FOR TENDER	DEC 7/23	ARM
3.	ISSUED FOR REVIEW	JUL 25/23	ARM
2.	ISSUED FOR COORDINATION	JUL 11/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE
1:500

1:500
0 5 10 15 20

DESIGN	MNP
CHECKED	ARM
DRAWN	MNP
CHECKED	ARM
APPROVED	SMG

A. A. RONGVE
100616298
June 28, 2024

A.R. MCAULEY
100141256
June 28, 2024

NOVATECH
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Telephone	(613) 254-9643
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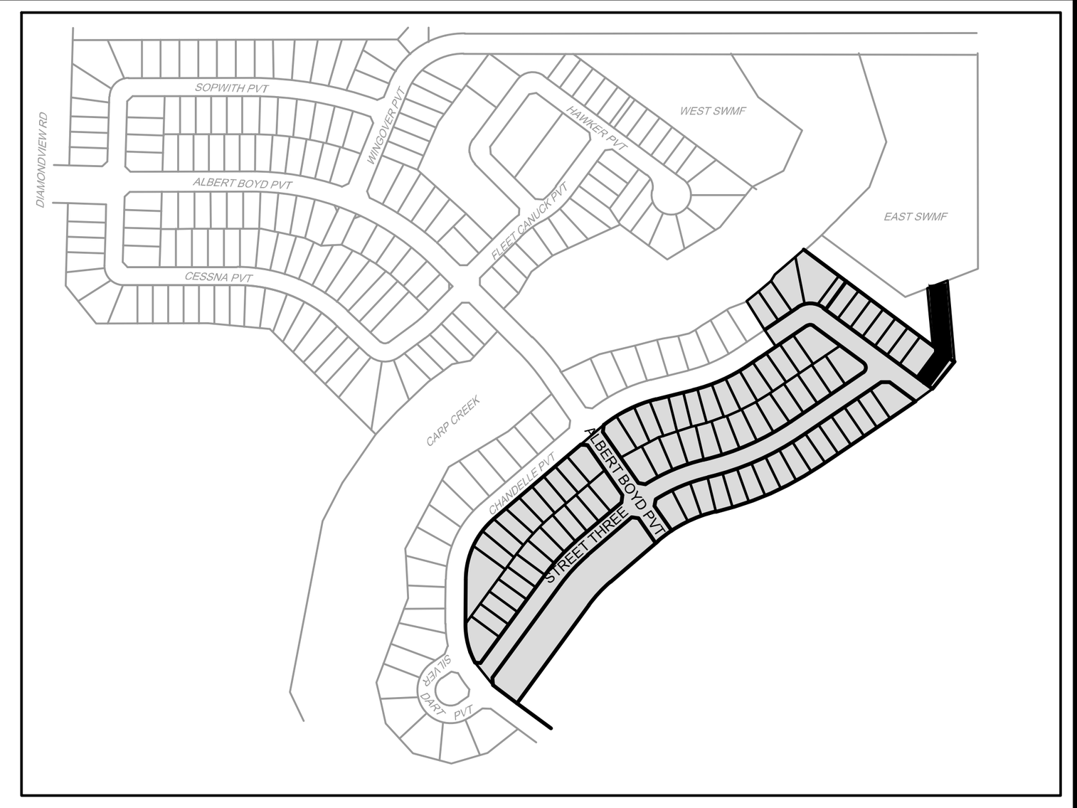
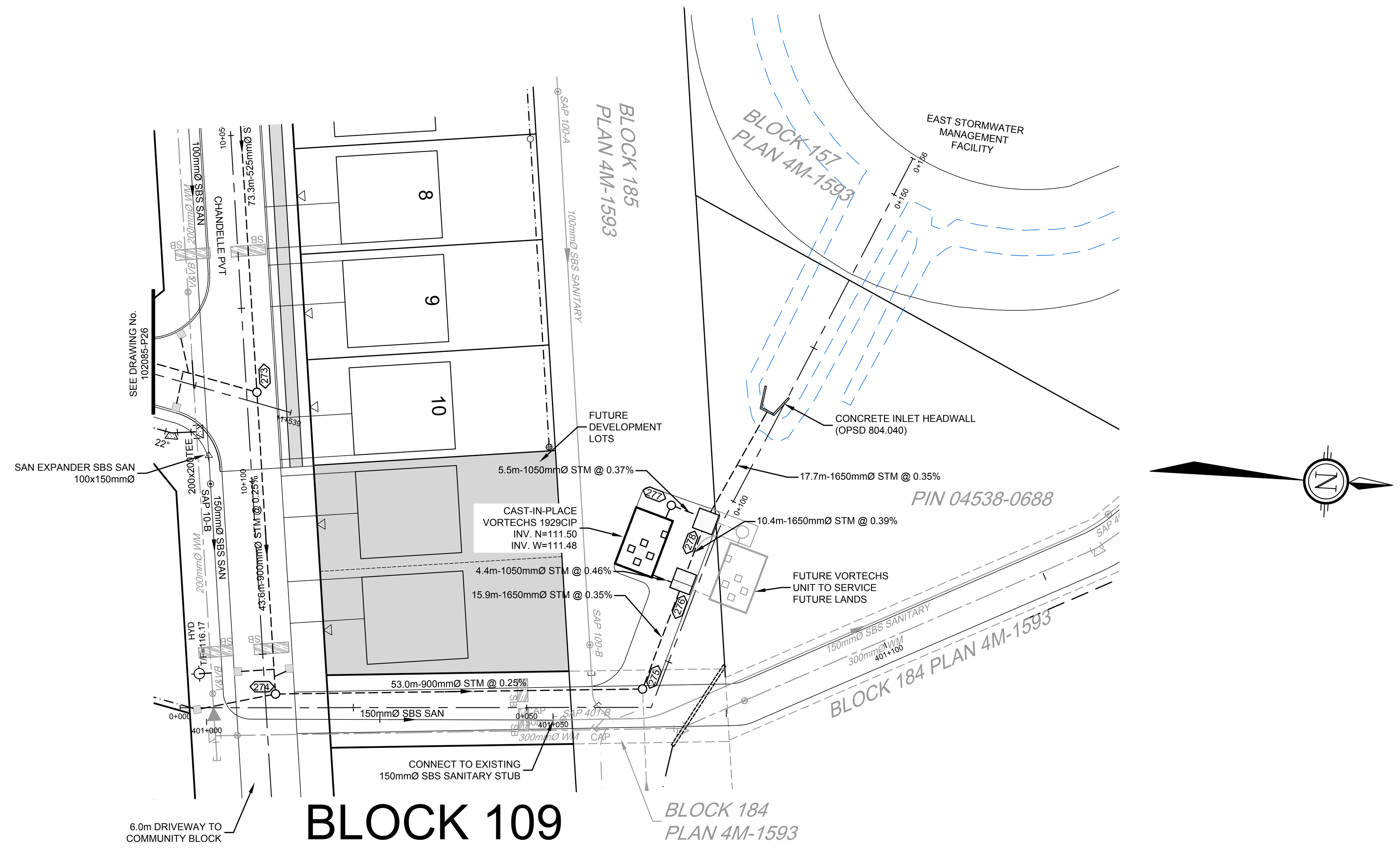
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
PLAN & PROFILE - PHASE 1B-2
ALBERT BOYD PRIVATE
STA 1+640 TO STA 1+792

PROJECT No.	102085
REV	REV # 8
DRAWING No.	102085-P27

PLANB1.DWG - 1000mmx707mm





LEGEND

- 200mmØ WM — PROPOSED WATERMAIN AND DIAMETER
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- HYD — PROPOSED HYDRANT C/W VALVE & LEAD
- T/F = 98.45 — PROPOSED TOP OF BOTTOM FLANGE
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- SAP 1-A — PROPOSED SANITARY SYSTEM ACCESS POINT
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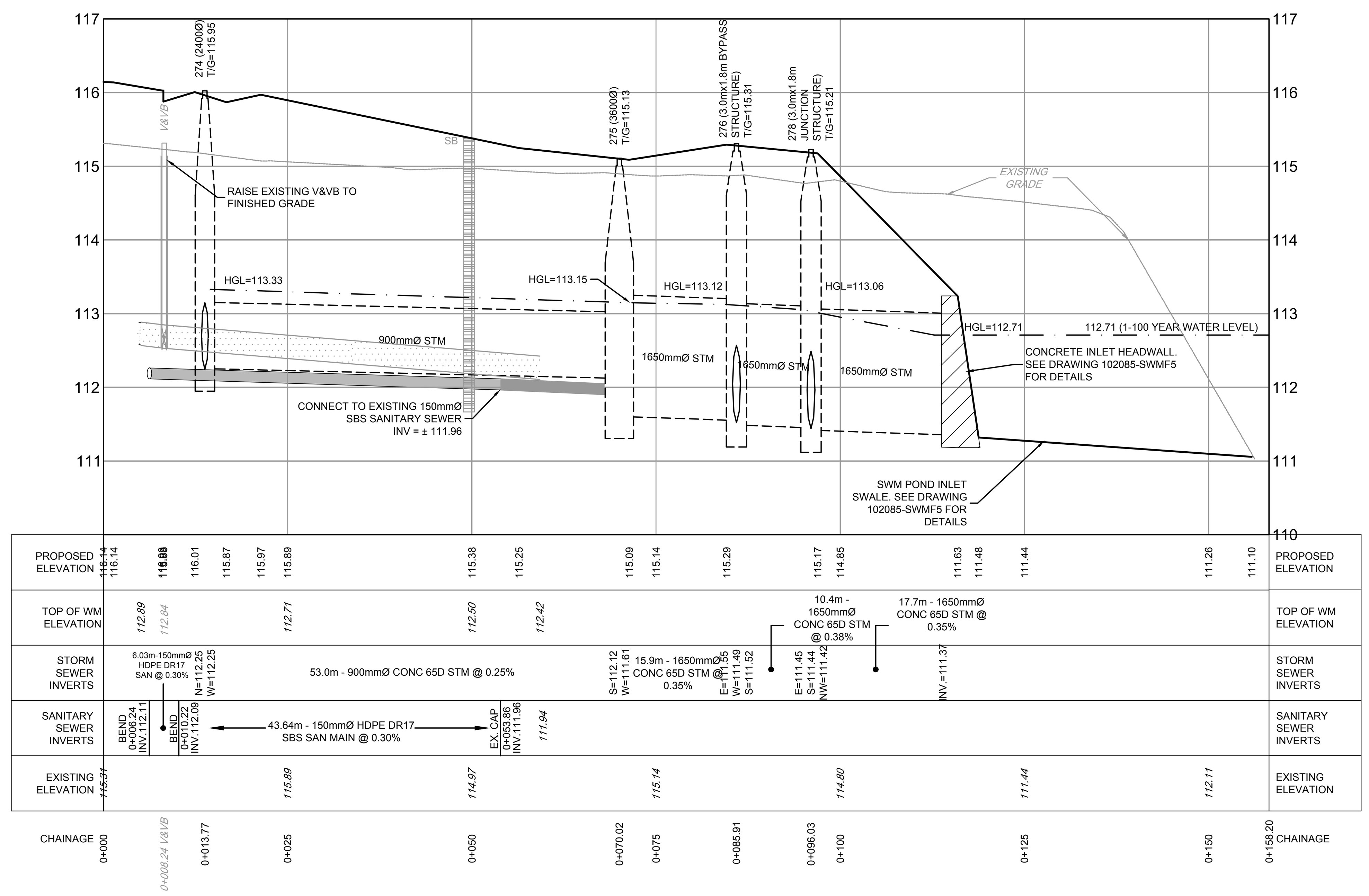
- PROPOSED SEEPAGE BARRIER



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CLEARFORD WATER SYSTEMS INC.

LICENSED PROFESSIONAL ENGINEER W. G. STEFAN PROVINCE OF ONTARIO

WEST CAPITAL Developments

No.	REVISION	DATE	BY
9.	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
8.	REVISED POND INLET SWALE	MAY 14/24	ARM
7.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 9/24	ARM
5.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
4.	ISSUED FOR TENDER	DEC 7/23	ARM
3.	ISSUED FOR REVIEW	JUL 25/23	ARM
2.	ISSUED FOR COORDINATION	JUL 11/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE 1:500

DESIGN MNP | CHECKED ARM | DRAWN MNP | CHECKED ARM | APPROVED SMG

LICENSED PROFESSIONAL ENGINEER A. A. RONGVE 100616298 June 28, 2024 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 June 28, 2024 PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
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Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
PLAN & PROFILE - PHASE 1B-2 BLOCK 109 & STORM SEWER OUTLET

PROJECT No. 102085
REV # 9
DRAWING No. 102085-P28

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3.	ISSUED FOR REGISTRATION AND ECA	JUN 28/24	ARM
2.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
1.	ISSUED FOR REVIEW	JUL 28/23	ARM

SCALE
1:750

1:750
0 10 20 30

DESIGN	MNP
CHECKED	ARM
DRAWN	MNP
CHECKED	ARM
APPROVED	SMG

LICENSED PROFESSIONAL ENGINEER
A. A. RONGVE
100616298
June 28, 2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
A.R. MCAULEY
100141256
June 28, 2024
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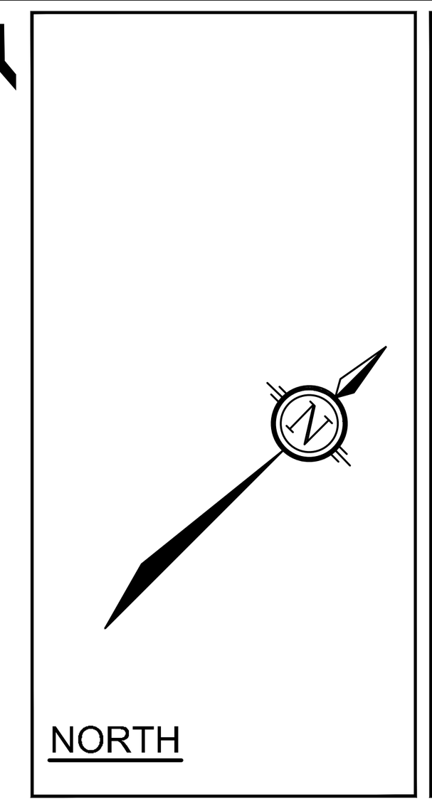
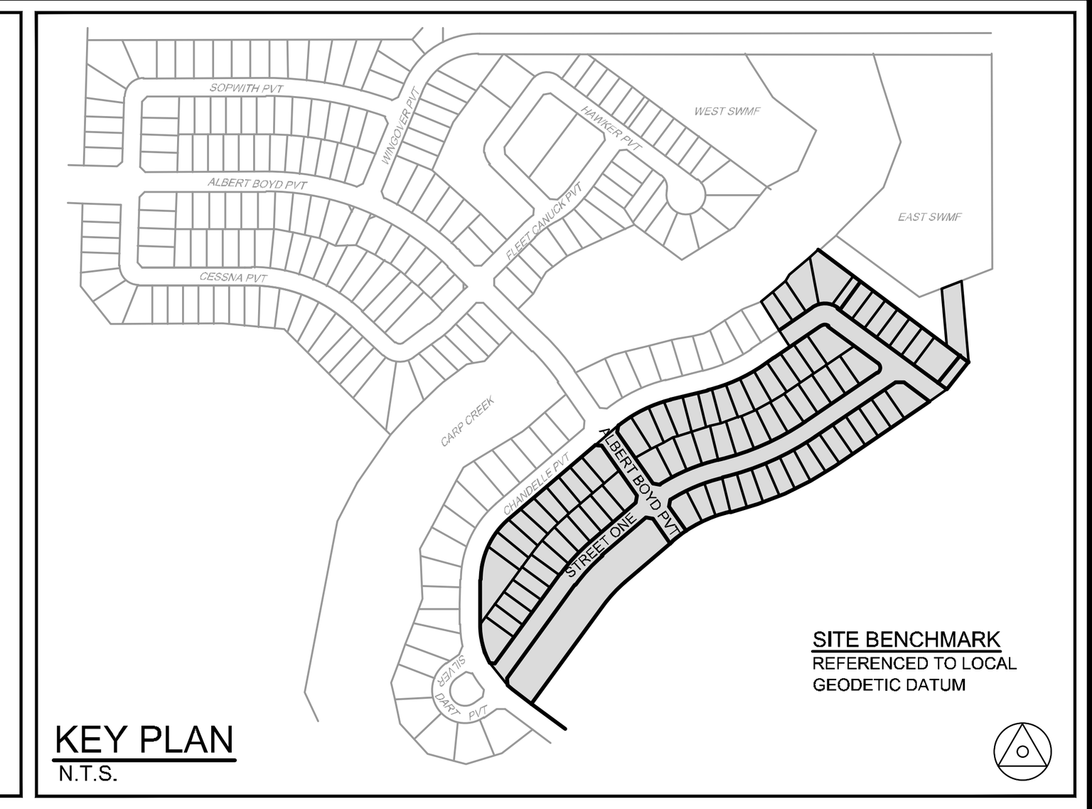
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
PHASE 1B-2 STORMWATER MANAGEMENT PLAN

PROJECT No. 102085
REV: REV # 3
DRAWING No. 102085-SWM7

PLANB1.DWG - 1000mmx707mm





LEGEND

0.39	PHASE 1B-2 DRAINAGE AREA (ha)
A-1	AREA ID
0.60	ADJUSTED RUNOFF COEFFICIENT
0.39	EXISTING PHASE 1B-1 DRAINAGE AREA (ha)
A-1	AREA ID
0.60	RUNOFF COEFFICIENT
	DRAINAGE AREA
	BUILDING SETBACK AS PER ZONING (SEE TABLES BELOW)
	ZONING - PERVIOUS AREA
	ZONING - IMPERVIOUS AREA

ZONING TABLES

I Exception Number	II Applicable Zone	Exception Provisions: III Additional Land Uses Permitted	Exception Provisions: IV Land Uses Prohibited	Exception Provisions: V Provisions
SINGLE FAMILY HOMES				
357r	T1B[357r]	- detached dwelling - home-based business - park	All uses except additional permitted uses and the following: - airport and related facilities	- in this zone, land that is legally transferable, but does not comply with the definition of a lot, will: (i) be considered to have frontage if it fronts on a private street; and (ii) need to comply with all zone provisions as if it were a lot - minimum lot area: 530 m2 - minimum lot width: 15 m - maximum lot coverage: 40% - minimum front yard setback: (i) 4.0 m for detached dwelling unit; (ii) 6.0 m for a single car garage. - minimum corner side yard setback: 4 m - minimum rear yard setback: 7.5 m - minimum interior side setback: 1.2 m - maximum building height: 10 m - minimum dwelling unit area: (i) ground floor: 90 m2 (ii) entire dwelling: 130 m2 - minimum landscaping area: 30%
TOWNHOMES				
358r (By-law 2019-40) (By-law 2012-334)	T1B[358r] T1B[358r]-h	- home-based business - townhouse dwelling - planned unit development	All uses except for additional permitted uses	- in this zone, land that is legally transferable, but does not comply with the definition of a lot, will: (i) be considered to have frontage if it fronts on a private street; and (ii) need to comply with all zone provisions as if it were a lot - minimum lot area: 180 m2 - minimum lot width: 6.0 m - maximum lot coverage: 60% - minimum front yard setback: (i) 4.metres for dwelling unit; (ii) 6.metres for garage. - minimum corner side yard setback: 4 m - minimum interior side yard setback for end units: 1.5 m - minimum rear yard setback: 7.5 m - maximum building height: 2 storeys - minimum dwelling unit area: no minimum - minimum landscaping area: 30% - minimum parking spaces: (i) 2 for each dwelling unit; (ii) 1 for each home-base business. - on any lands zoned T1B[1565]-h, the holding symbol cannot be removed until such time as one of the following is met: 1. the pit is exhausted and the licence surrendered; or 2. an impact assessment study is completed which demonstrates that the mineral aggregate operation will not be negatively impacted by the proposed residential development.

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1.	ISSUED FOR REVIEW	FEB 20/24	ARM

SCALE 1:750

DESIGN	MNP
CHECKED	ARM
DRAWN	MNP
CHECKED	ARM
APPROVED	SMG

LICENSED PROFESSIONAL ENGINEER A. A. RONGVE 100616298 June 28, 2024 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 June 28, 2024 PROVINCE OF ONTARIO

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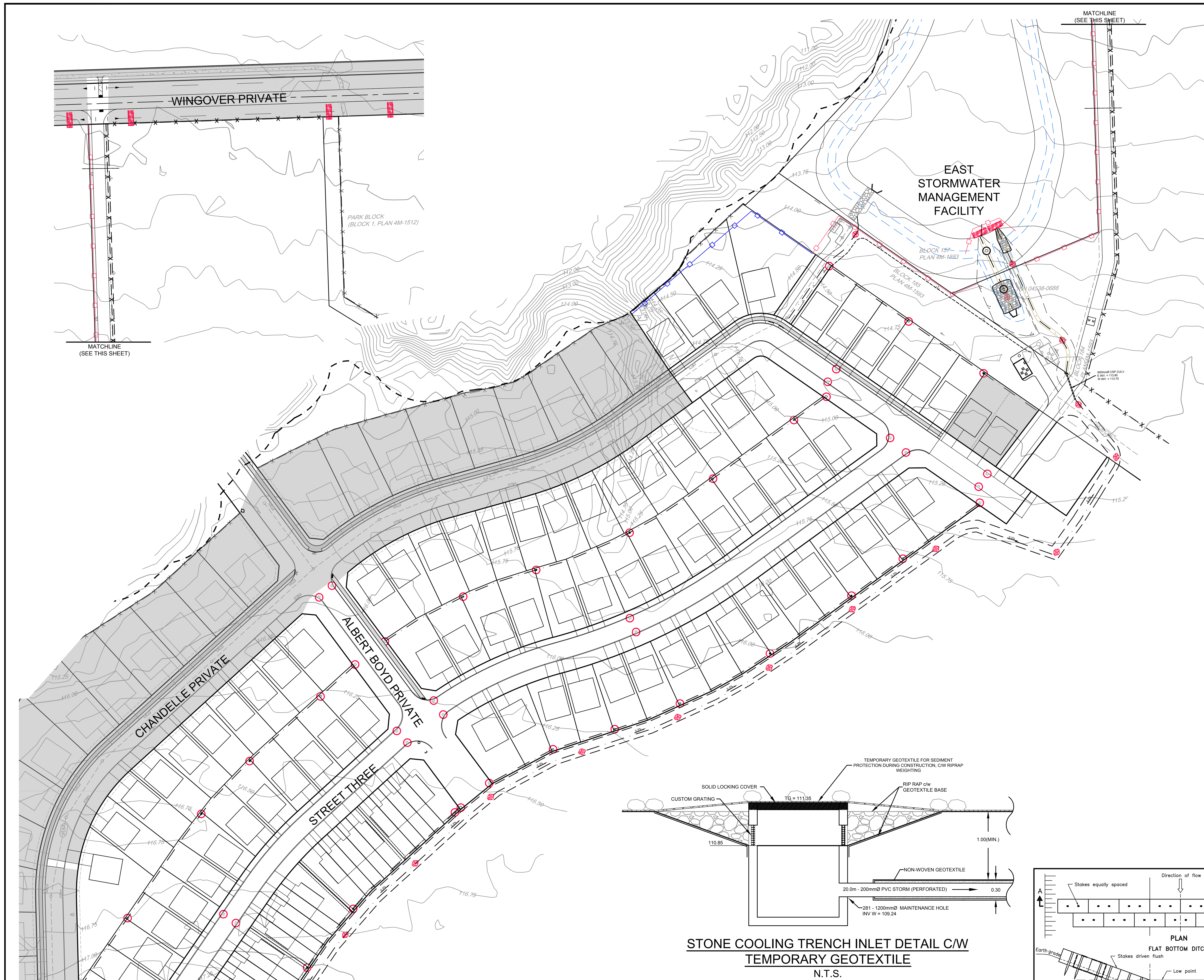
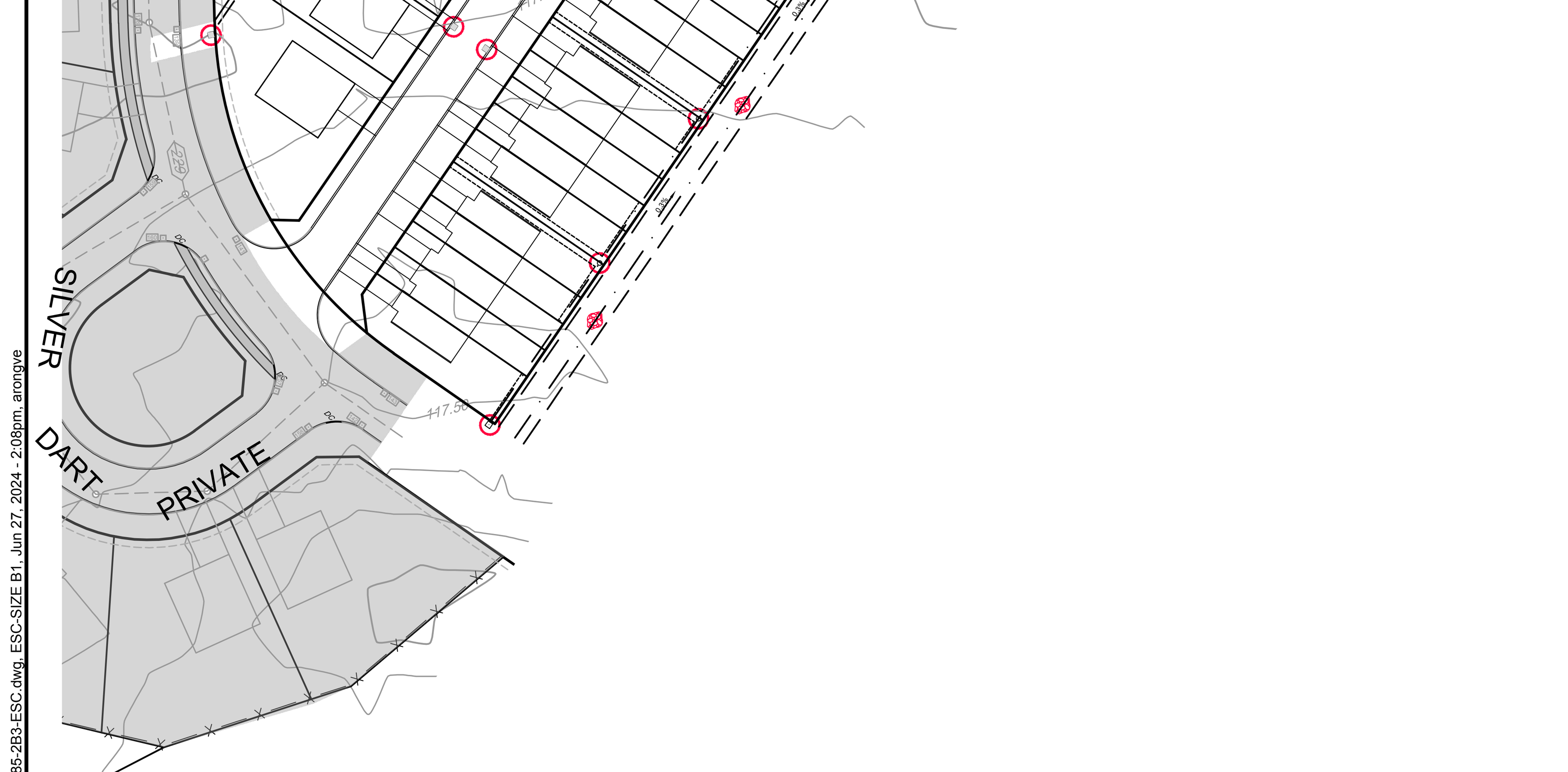
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
PHASE 1B-2 STORMWATER MANAGEMENT PLAN - COEFFICIENT CALCULATIONS

PROJECT No. 102085
REV REV # 2
DRAWING No. 102085-SWM-CC





STONE COOLING TRENCH INLET DETAIL C/W TEMPORARY GEOTEXTILE

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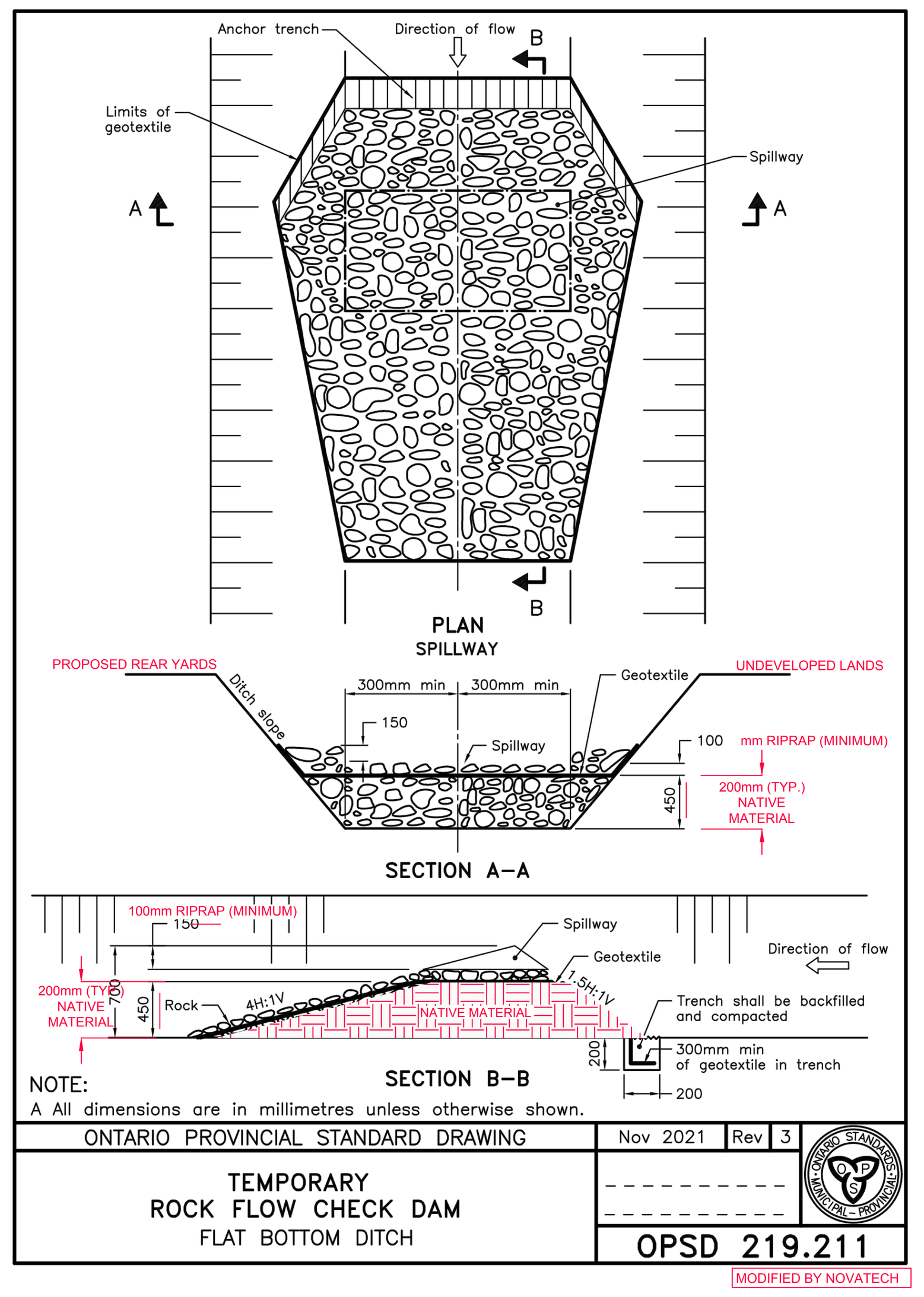
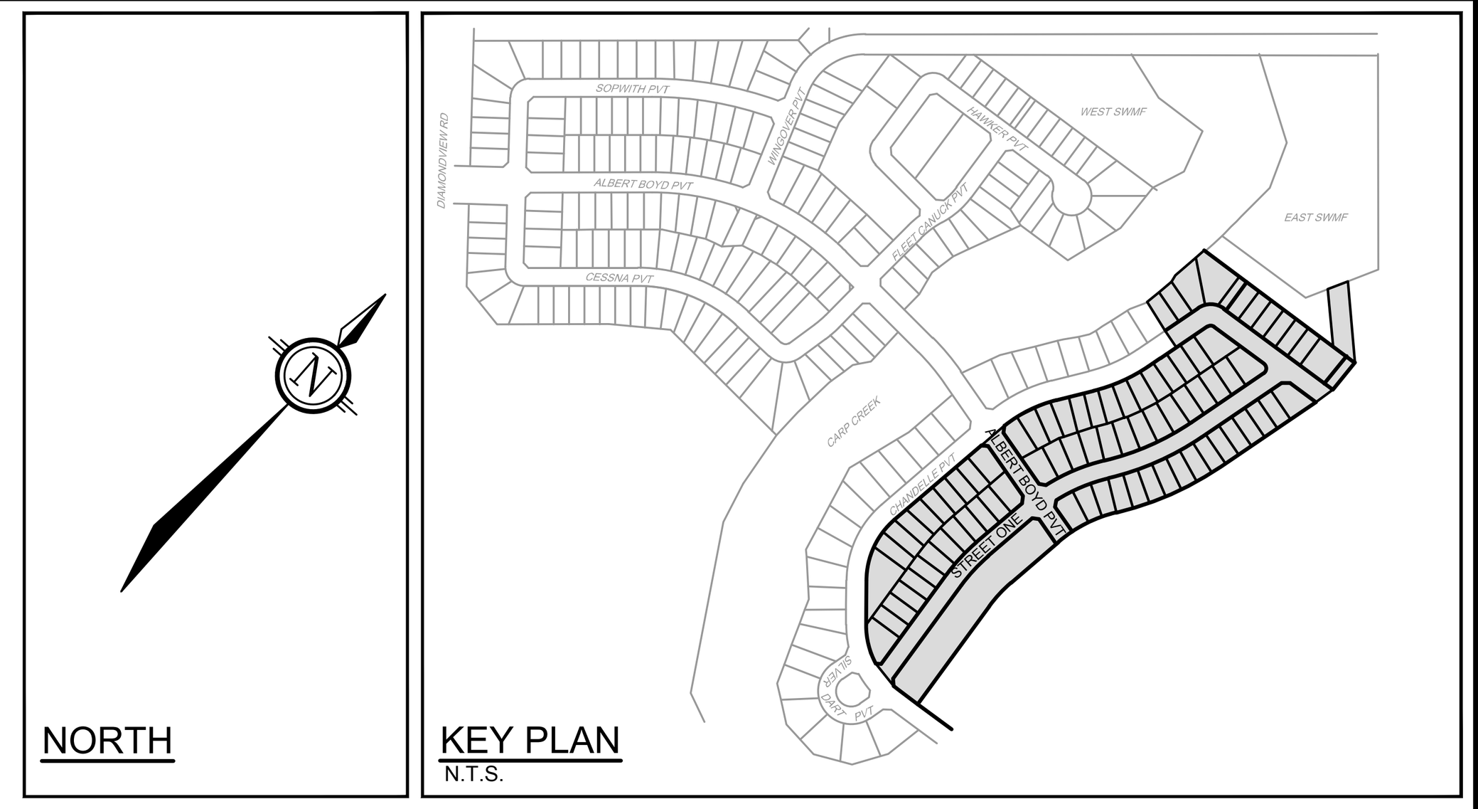




EROSION AND SEDIMENT CONTROL NOTES

1. THE CONTRACTOR AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA AND CONSERVATION AUTHORITY (MVCA), APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL.

2. THE EROSION AND SEDIMENT CONTROL PLANS ARE TO BE READ IN CONJUNCTION WITH THE ENVIRONMENTAL IMPACT STATEMENT AND TREE CONSERVATION REPORT PREPARED BY MUNCASTER ENVIRONMENTAL PLANNING INC. DATED NOVEMBER, 2021.

3. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

4. THE CONTRACTOR IS TO INSTALL FILTER BAGS UNDER ROADWAY AND REARYARD CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES. FILTER BAGS MUST BE KEPT IN PLACE AND REGULARLY INSPECTED AND MAINTAINED UNTIL SOD OR VEGETATION HAS FULLY ESTABLISHED.

5. THE CONTRACTOR IS TO INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER.

6. THE CONTRACTOR IS ADVISED THAT THE EXISTING VORTECHS UNIT WILL REMAIN IN SERVICE DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN FREE OF DEBRIS, MONITOR ON A REGULAR BASIS, AND CLEAN AS REQUIRED (AT LEAST ONCE A YEAR).

7. THE CONTRACTOR IS TO INSPECT ALL EROSION AND SEDIMENT CONTROL DAILY DURING ACTIVE CONSTRUCTION AND IMMEDIATELY AFTER EVERY RAINFALL EVENT, SIGNIFICANT SNOWMELT EVENT, AND ANY EXTREME WEATHER EVENT, AND REPAIR ANY DAMAGED OR NON FUNCTIONING MEASURES IMMEDIATELY.

8. THE CONTRACTOR SHALL ENSURE THAT RECORDS OF INSPECTION, INCLUDING AT A MINIMUM, THE INSPECTOR'S NAME, DATE OF INSPECTION, VISUAL OBSERVATIONS, AND ANY NECESSARY REMEDIAL MEASURES TO MAINTAIN INTERIM ESC MEASURES.

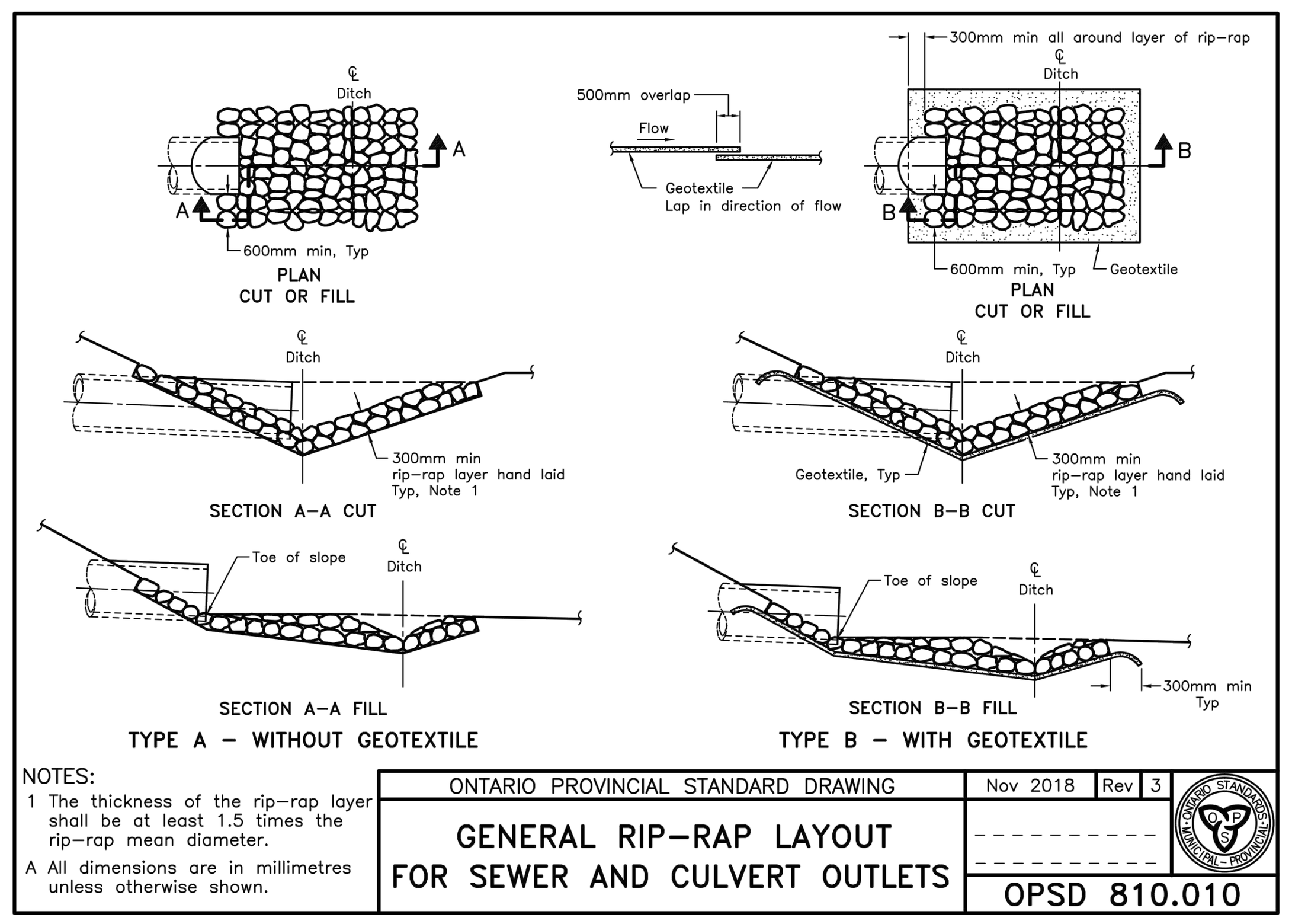
9. THE EROSION AND SEDIMENT CONTROL PLANS ARE TO BE CONSIDERED A 'LIVING DOCUMENT' WHICH MAY BE MODIFIED IN THE EVENT THE EROSION AND SEDIMENT CONTROL MEASURES ARE INSUFFICIENT.

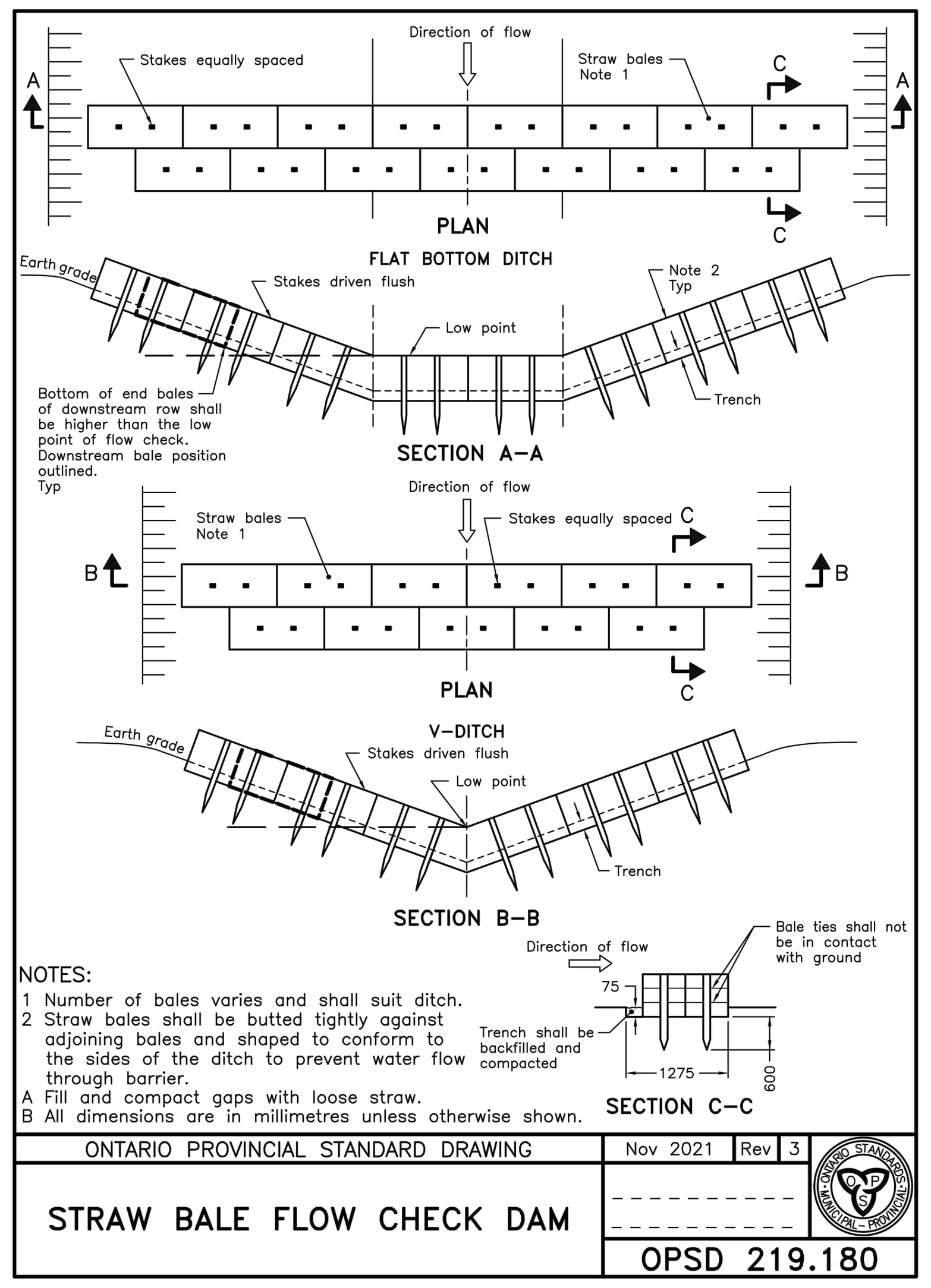
7. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL THE SITE HAS STABILIZED, AFTER WHICH ANY SUCH MEASURES THAT ARE NOT PERMANENT, AS PER THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, SHALL BE REMOVED IN A MANNER THAT MINIMIZES DISTURBANCE TO THE SITE. THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER

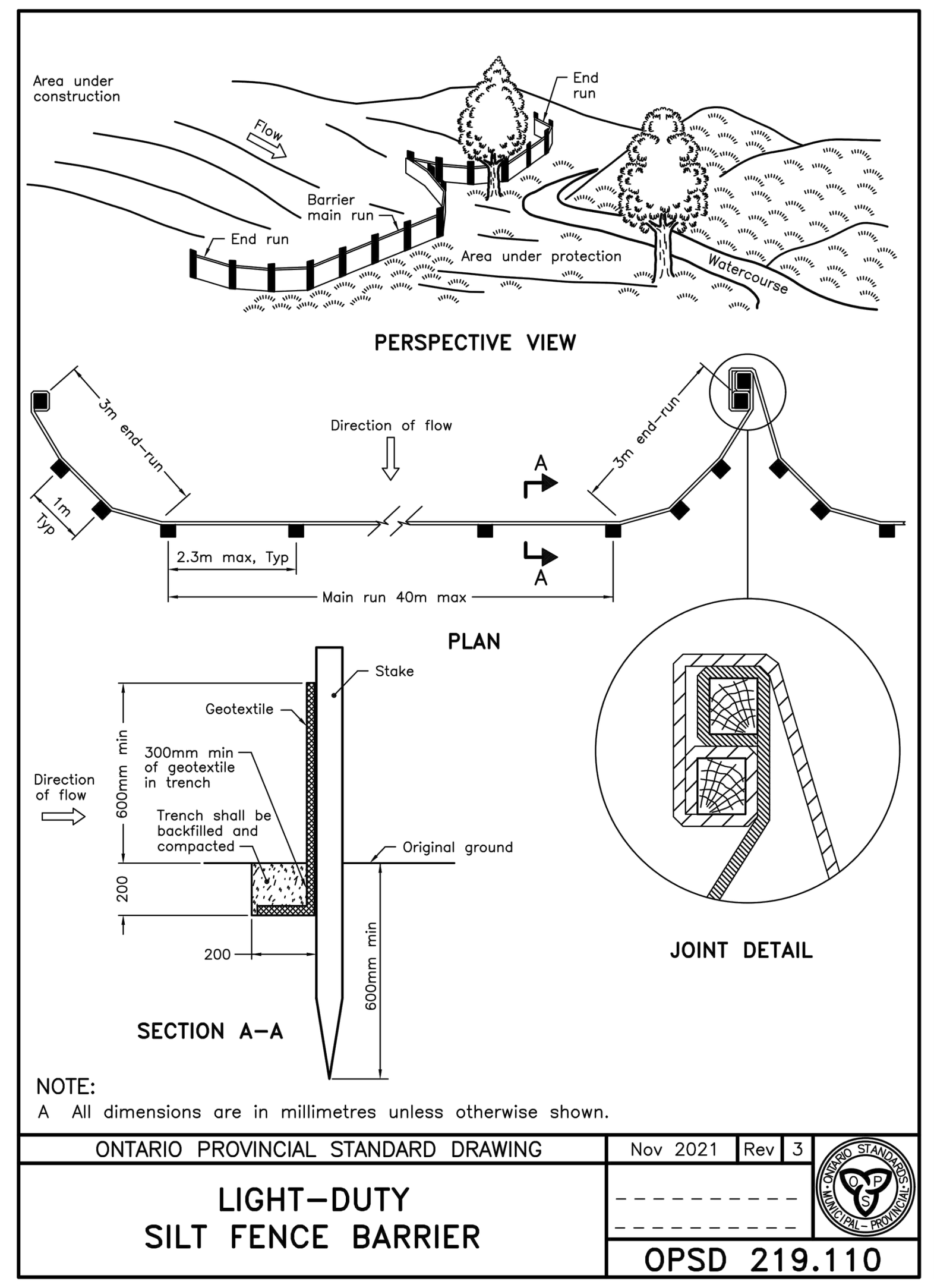
8. FOR MATERIAL STOCKPILING, MINIMIZE THE AMOUNT OF EXPOSED MATERIALS AT ANY GIVEN TIME: APPLY TEMPORARY SEEDING, TARPS, COMPACTION AND/OR SURFACE ROUGHENING AS REQUIRED TO STABILIZE STOCKPILED MATERIALS THAT WILL NOT BE USED WITHIN 14 DAYS.

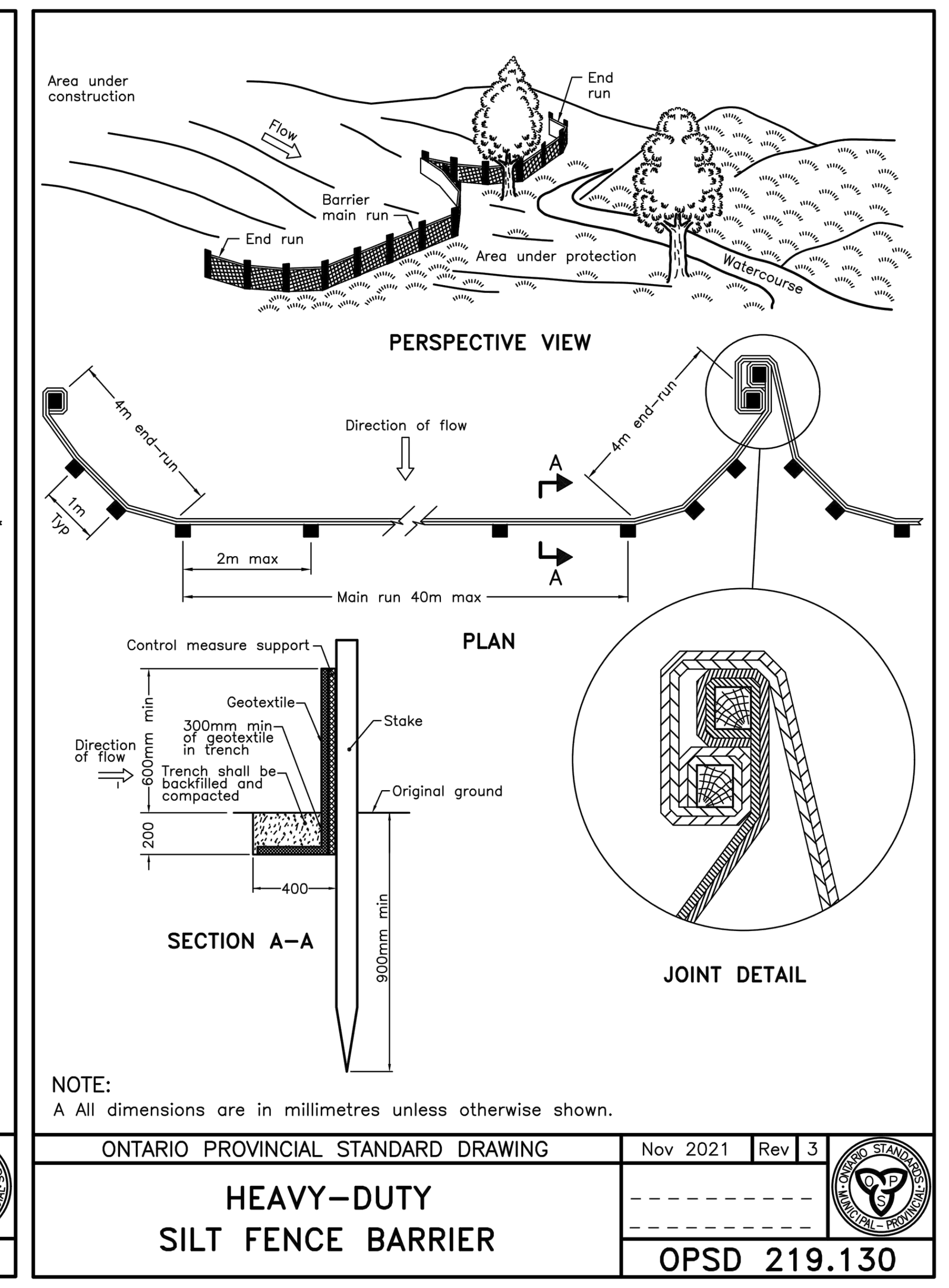
9. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR THE REPRESENTATIVE OF THE CITY OF OTTAWA.

				During Construction		After Construction Prior to Final Acceptance		After Final Acceptance
	ESC Measure	Symbol	OPSD No.	Installation Responsibility	Inspection Responsibility	Inspection/Maintenance Responsibility	Removal Responsibility	Inspection/Maintenance Responsibility
Temporary Measures	Light-Duty Silt Fence		219.110	Developer's Contractor	Developer's Contractor	Developer	Developer	N/A
	Heavy-Duty Silt Fence		219.130	Developer's Contractor	Developer's Contractor	Developer	Developer	N/A
	Straw Bale Flow Check Dam		219.180	Developer's Contractor	Developer's Contractor	Developer	Developer	N/A
	Filter Bags		Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Developer	Developer	N/A
	Mud Mats		N/A	Developer's Contractor	Developer's Contractor	Developer	Developer	N/A
	Geotextile Protection of Cooling Trench Inlet		N/A	Developer's Contractor	Developer's Contractor	Developer	Developer	N/A
Permament Measures	Rock Flow Check Dam		219.211	Developer's Contractor	Developer's Contractor	Developer	N/A	Municipality
	Vortech Unit		N/A	Developer's Contractor	Developer's Contractor	Developer	N/A	Municipality
	Riprap		810.010	Developer's Contractor	Developer's Contractor	Developer	N/A	Municipality
	Roof Leaders Directed to Grassed Areas	N/A	N/A	Builder	Builder	Homeowner	N/A	Homeowner
	Roadside Ditches, Swales (Grading and Vegetation)	N/A	N/A	Developer's Contractor	Developer's Contractor	Developer	N/A	Municipality









NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
6.	ISSUED FOR REGISTRATION AND ECA	JUN 28/24	ARM
5.	REVISED POND INLET SWALE	MAY 14/24	ARM
4.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
3.	ISSUED WITH ADDENDUM #2 (NO CHANGES)	JAN 5/24	ARM
2.	ISSUED FOR TENDER	DEC 7/23	ARM
1.	ISSUED FOR REVIEW	JUL 28/23	ARM

SCALE 1:1000

1:1000 (0 10 20 30 40)

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED SMG

LICENSED PROFESSIONAL ENGINEER A. A. RONGVE 100616298 June 28, 2024 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 June 28, 2024 PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 102085
REV REV # 6
DRAWING No. 102085-ESC3

PLANB1.DWG - 1000mmx707mm

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA, MINISTRY OF THE ENVIRONMENT AND THE MISSISSIPPI VALLEY CONSERVATION AUTHORITY BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS.
8. TO PROTECT BREEDING BIRDS, NO TREE OR SHRUB REMOVAL IS TO OCCUR BETWEEN APRIL 1ST AND AUGUST 15TH (MUNCASTER ENVIRONMENTAL PLANNING).
9. NO IN-STREAM WORKS WITHIN THE WATERCOURSE IS TO OCCUR BETWEEN MARCH 15TH AND JUNE 30TH (MUNCASTER ENVIRONMENTAL PLANNING.
10. REFER TO STORMWATER MANAGEMENT REPORT(R-2023-010) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

GRADING NOTES:

1. ALL WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH CURRENT CITY OF OTTAWA AND ONTARIO PROVINCIAL STANDARDS.
2. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
3. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
4. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
5. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
6. MATCH EXISTING ELEVATIONS AT ALL BOUNDARIES WITH ADJACENT LOTS.
7. SIDEWALK CROSSFALL NOT TO EXCEED 2%.
8. MINIMUM REARYARD SWALE GRADE IS 1.5%. MINIMUM REARYARD SWALE GRADE WITH THE INSTALLATION OF A SUBDRAIN SYSTEM IS 1.0%. SWALES TO BE 0.9m OFFSET FROM REAR PROPERTY LINE.
9. ALL DRIVEWAY SLOPES ARE TO BE BETWEEN 2% AND 6%.
10. IF MINIMUM PERMISSIBLE USF (MUSF) IS TO BE USED FOR A LOT, THEN TOP OF FOUNDATION, LOT GRADING, ETC IS TO BE ADJUSTED ACCORDINGLY.
11. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM MANHOLE (1200Ø)	701.010	OPSD
CB, FRAME & COVER	400.020	OPSD
STORM MH FRAME	401.010	OPSD
STORM MH COVER	S24.1	CITY OF OTTAWA
SEWER TRENCH - BEDDING (GRANULAR A)		
COVER (GRANULAR A OR GRANULAR B TYPE I, WITH MAXIMUM PARTICLE SIZE=25mm)		
STORM SEWER (250mmØ to 375mmØ)	PVC DR 35	
STORM SEWER (450mmØ to 1650mmØ)	CONC 65-D	
CATCHBASIN LEAD	PVC DR 35	
ROAD SUBDRAIN (6m STUBS (3mx2) AT EACH CB)	R1	CITY OF OTTAWA

2. INSULATE ALL STORM PIPES THAT HAVE LESS THAN 1.5m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
3. SERVICES ARE TO BE CONSTRUCTED TO 2.0m PAST PROPERTY LINE AT A MINIMUM SLOPE OF 1.0%.
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
6. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
7. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.
8. THE CONTRACTOR IS ADVISED THAT THE EXISTING VORTECHS UNIT WILL REMAIN IN SERVICE DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN FREE OF DEBRIS, MONITOR ON A REGULAR BASIS, AND CLEAN AS REQUIRED AND ONCE CONSTRUCTION IS COMPLETE.

GEOTECHNICAL NOTES:

1. REFER TO GEOTECHNICAL INVESTIGATION REPORT (PG2450-2, REVISION 1, DATED JANUARY 16, 2023), PREPARED BY GEMTEC FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
2. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED ROADWAYS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
3. EXPOSED SUBGRADE IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. THE SUBGRADE SHOULD BE SHAPED AND CROWNED TO PROMOTE DRAINAGE OF THE ROADWAY GRANULARS.
6. FOR AREAS OF THE ROADWAY THAT REQUIRE THE SUBGRADE TO BE RAISED, IT IS CONSIDERED THAT SOME OF THE DRIER NATIVE MATERIALS COULD BE USED FOR THIS PURPOSE OR THE MATERIAL COULD CONSIST OF OPSS SELECT SUBGRADE MATERIAL OR OPSS GRANULAR B TYPE I OR TYPE II. ANY MATERIALS PROPOSED FOR THIS USE MUST BE APPROVED BY THE GEOTECHNICAL ENGINEER BEFORE PLACEMENT.
7. GEOTECHNICAL INSPECTION OF SUBGRADE AND CONFIRMATION OF PAVEMENT STRUCTURE IS REQUIRED BEFORE PLACEMENT OF ANY GRANULAR MATERIAL.
8. GRANULAR MATERIALS (GRANULAR A AND GRANULAR B) SHOULD BE COMPACTED IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATION REPORT.

WATERMAIN NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN	PVC DR 18	
HYDRANT	WSD-24	CITY OF OTTAWA
VALVE AND VALVE BOX	WSD-19	CITY OF OTTAWA

2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
4. PROVIDE MINIMUM 0.3m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.
5. WATER SERVICE IS TO BE CONSTRUCTED 2.0m PAST PROPERTY LINE, PLUS AN 8m COIL, UNLESS OTHERWISE INDICATED.

PAVEMENT STRUCTURE NOTES:

REFER TO GEOTECHNICAL NOTES.

1. ALL ROADWAYS TO HAVE 3% CROSSFALL INCLUDING SUBGRADE AND GRANULAR BASE.
2. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS ARE PER CITY OF OTTAWA STANDARD DETAIL (R10).
3. PERFORATED PIPE SUB-DRAINS TO BE PROVIDED AT SUBGRADE LEVEL EXTENDING FROM THE CATCHBASIN FOR A DISTANCE OF 3.0m, PARALLEL TO THE CURB IN TWO DIRECTIONS. REFER TO CITY OF OTTAWA SUBDRAIN INSTALLATION DETAIL (R1).
4. TYPICAL ROADSIDE CATCHBASIN'S SHALL BE INSULATED AS PER CITY OF OTTAWA STANDARD W23, WHERE REQUIRED.
5. PROVIDE LINE PAINTING.

PAVEMENT STRUCTURE:

RESIDENTIAL ROADWAYS:

40mm ASPHALTIC CONCRETE (WEAR COURSE, SUPERPAVE 12.5, PG 58 - 34)
50mm ASPHALTIC CONCRETE (BINDER COURSE, SUPERPAVE 19.0, PG 58 - 34)
150mm OPSS GRANULAR "A" CRUSHED STONE
450mm OPSS GRANULAR "B" TYPE II
690mm

EROSION AND SEDIMENT CONTROL NOTES:

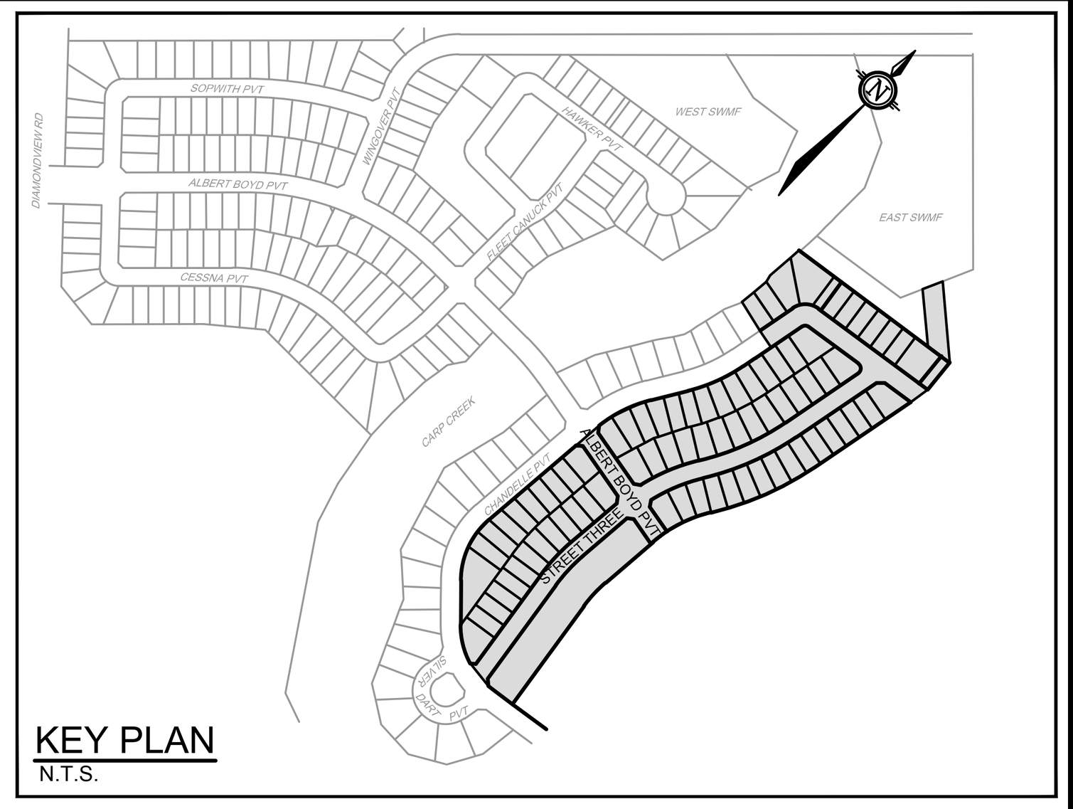
(REFER TO DRAWING 102085-ESC FOR EROSION AND SEDIMENT CONTROL NOTES)

SEEPAGE BARRIERS NOTES:

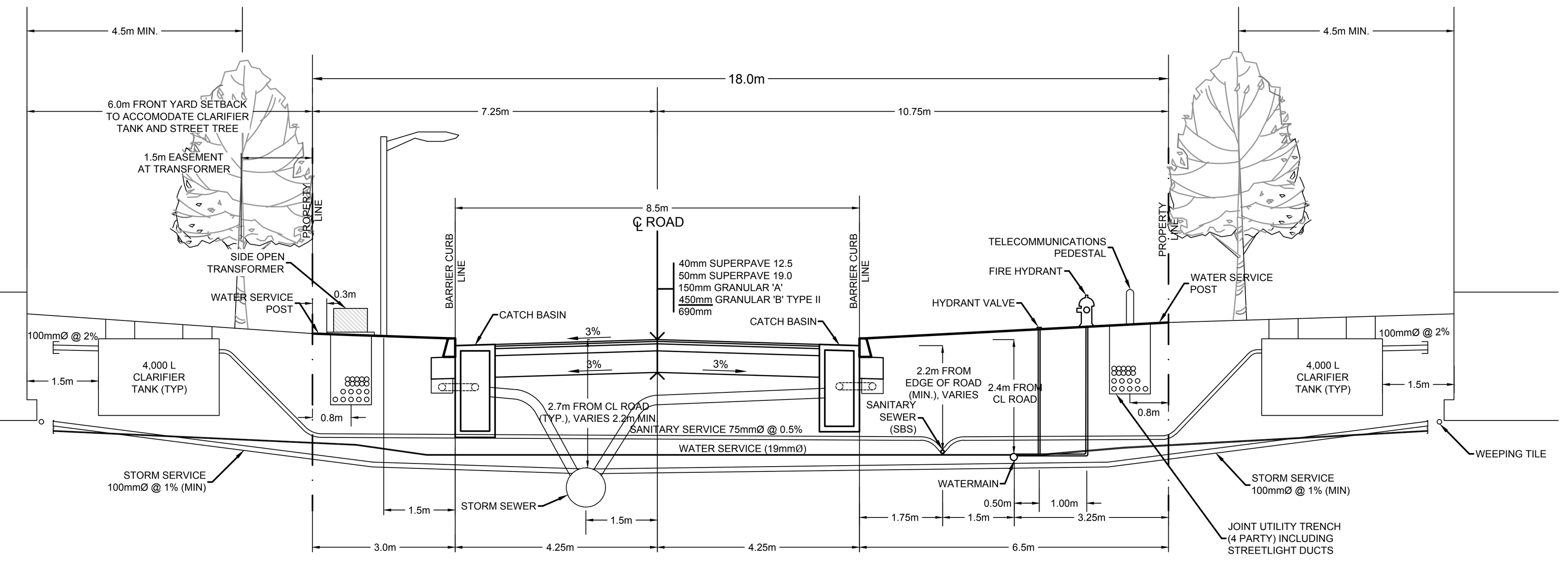
1. INSTALL SEEPAGE BARRIERS AS PER CITY OF OTTAWA STANDARD (S8).
2. SEEPAGE BARRIER SHALL EXTEND FROM TRENCH WALL TO TRENCH WALL, AND FROM SEWER SUB GRADE LEVEL TO TERMINATE EITHER WITHIN THE NATIVE SOIL BACK FILL OR TOP OF THE EXISTING SUB SURFACE ROCK.
3. SEEPAGE BARRIERS SHALL CONSIST OF 1.5m WIDE WEATHERED DRY (COMPATIBLE) SILTY CLAY COMPACTED IN THIN LIFTS TO AT LEAST 95% STANDARD PROCTOR DENSITY.
4. REFER TO PLAN AND PROFILE DRAWINGS FOR LOCATION OF SEEPAGE BARRIERS.

LOT DEVELOPMENT NOTES:

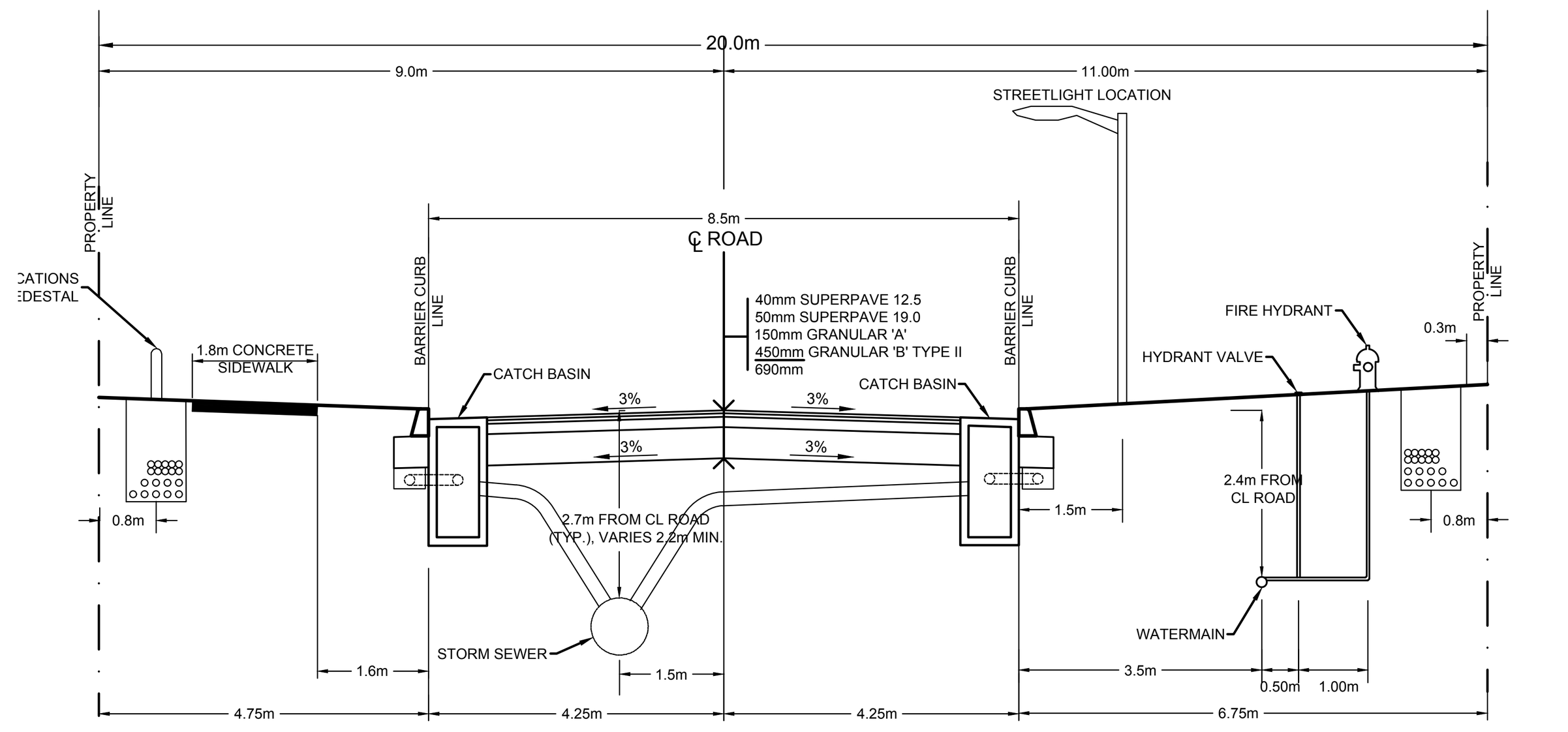
1. HOUSE FOOTPRINTS ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED AT THE TIME OF APPLICATION FOR BUILDING PERMIT.
2. MAINTAIN A MINIMUM 200mm CLEARANCE BETWEEN THE PROPOSED TOP OF FOUNDATION AND THE FINISHED GRADE AT THE STRUCTURE. MAINTAIN POSITIVE SURFACE DRAINAGE AWAY FROM THE FOUNDATION WALL.
3. HOUSE SETBACK REQUIRED PER ZONING BY-LAW: (URBAN RESIDENTIAL)
   FRONT YARD - 4.0m (min) (DWELLING UNIT)
   FRONT YARD - 6.0m (min) (GARAGE)
   REAR YARD - 7.5m (min)
   EXTERIOR SIDE YARD - 4.0m (min)
   INTERIOR SIDE YARD - 1.2m (min)
4. HOUSE SETBACK REQUIRED PER ZONING BY-LAW: (TOWNHOMES)
   FRONT YARD - 4.0m (min) (DWELLING UNIT)
   FRONT YARD - 6.0m (min) (GARAGE)
   REAR YARD - 7.5m (min)
   EXTERIOR SIDE YARD - 4.0m (min)
   INTERIOR SIDE YARD - 1.5m (min)
5. ROOF LEADERS ARE TO BE DIRECTED TO GRASSED AREAS.



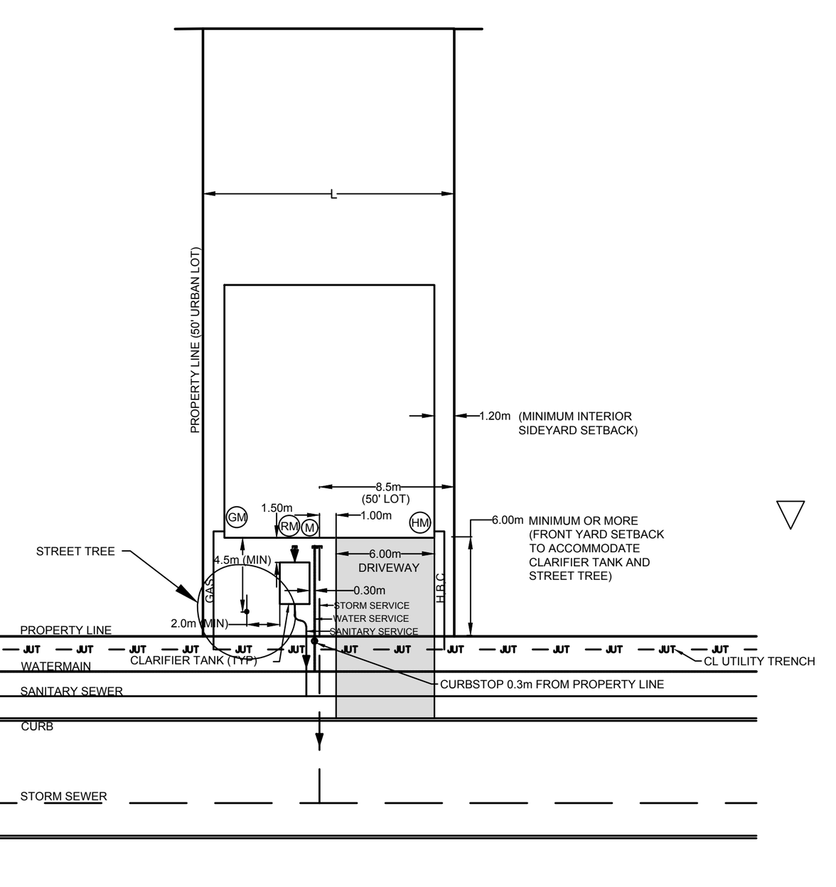
KEY PLAN
N.T.S.



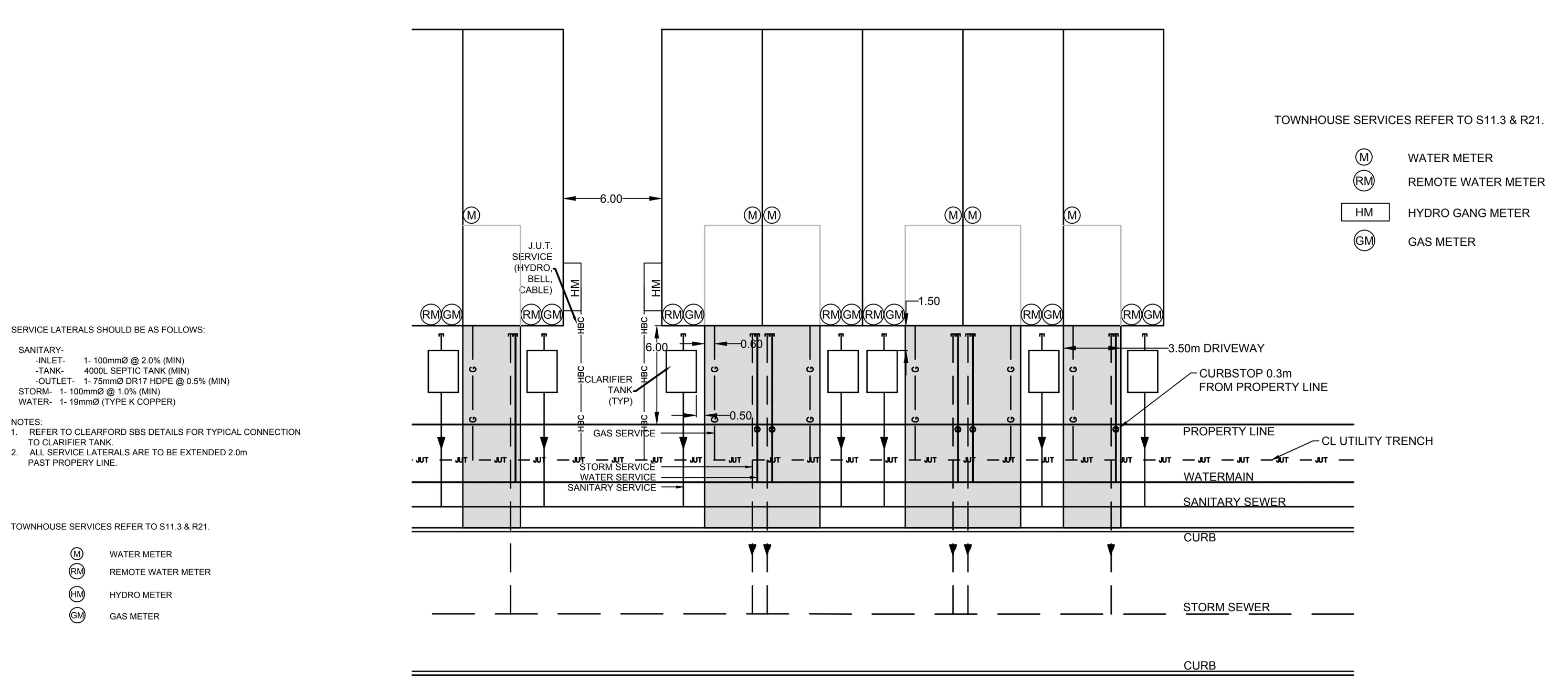
RESIDENTIAL ROAD 18.0m ROAD ALLOWANCE
URBAN SECTION 4 PARTY JOINT USE TRENCH
STREET THREE
1:100



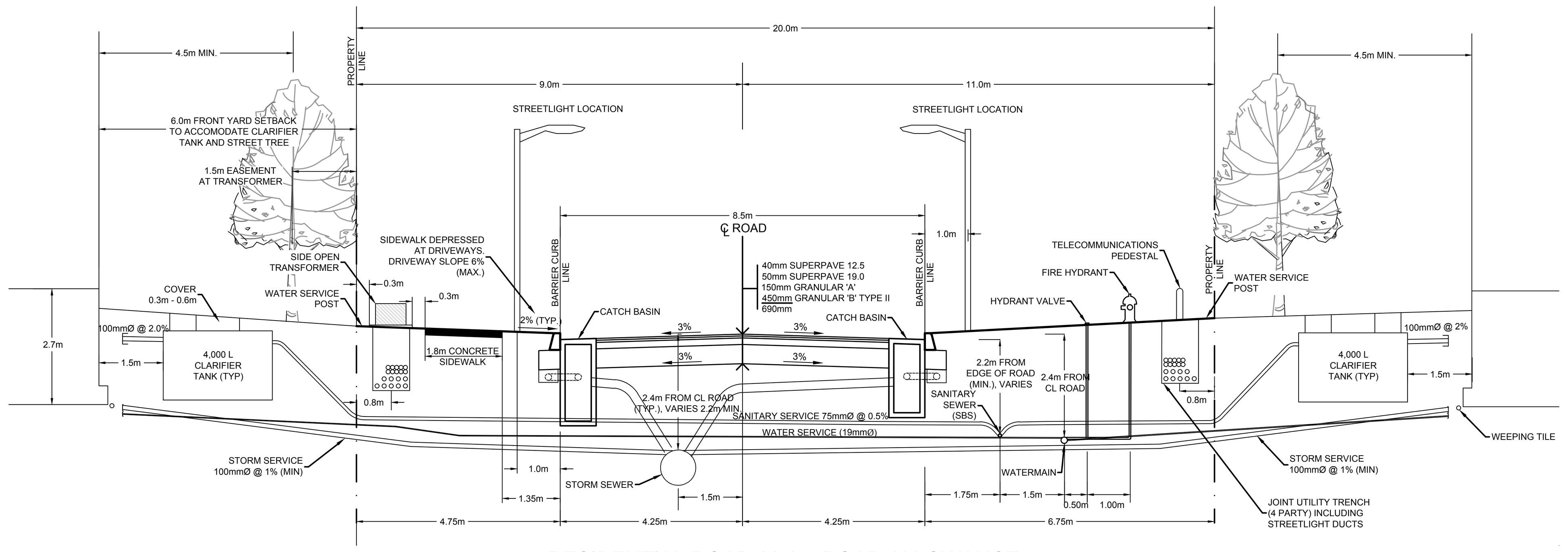
RESIDENTIAL ROAD 20.0m ROAD ALLOWANCE
URBAN SECTION 4 PARTY JOINT USE TRENCH
ALBERT BOYD PVT.
1:100



TYPICAL LOT SERVICING DETAIL - URBAN LOT
N.T.S.



TYPICAL LOT SERVICING DETAIL - TOWNHOUSE
N.T.S.



RESIDENTIAL ROAD 20.0m ROAD ALLOWANCE
URBAN SECTION 4 PARTY JOINT USE TRENCH
CHANDELLE PVT
1:100

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CLEARFORD WATER SYSTEMS INC.

LICENSED PROFESSIONAL ENGINEER W. G. STEFAN PROVINCE OF ONTARIO

WEST CAPITAL Developments

No.	REVISION	DATE	BY
8.	ISSUED FOR REGISTRATION AND ECA	JUN 19/24	ARM
7.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 9/24	ARM
5.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
4.	ISSUED FOR TENDER	DEC 7/23	ARM
3.	ISSUED FOR REVIEW	JUL 25/23	ARM
2.	ISSUED FOR COORDINATION	JUL 11/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE

DESIGN: MNP
CHECKED: ARM
DRAWN: MNP
CHECKED: ARM
APPROVED: SMG

LICENSED PROFESSIONAL ENGINEER A. A. RONGVE 100616298 June 28, 2024 PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 June 28, 2024 PROVINCE OF ONTARIO

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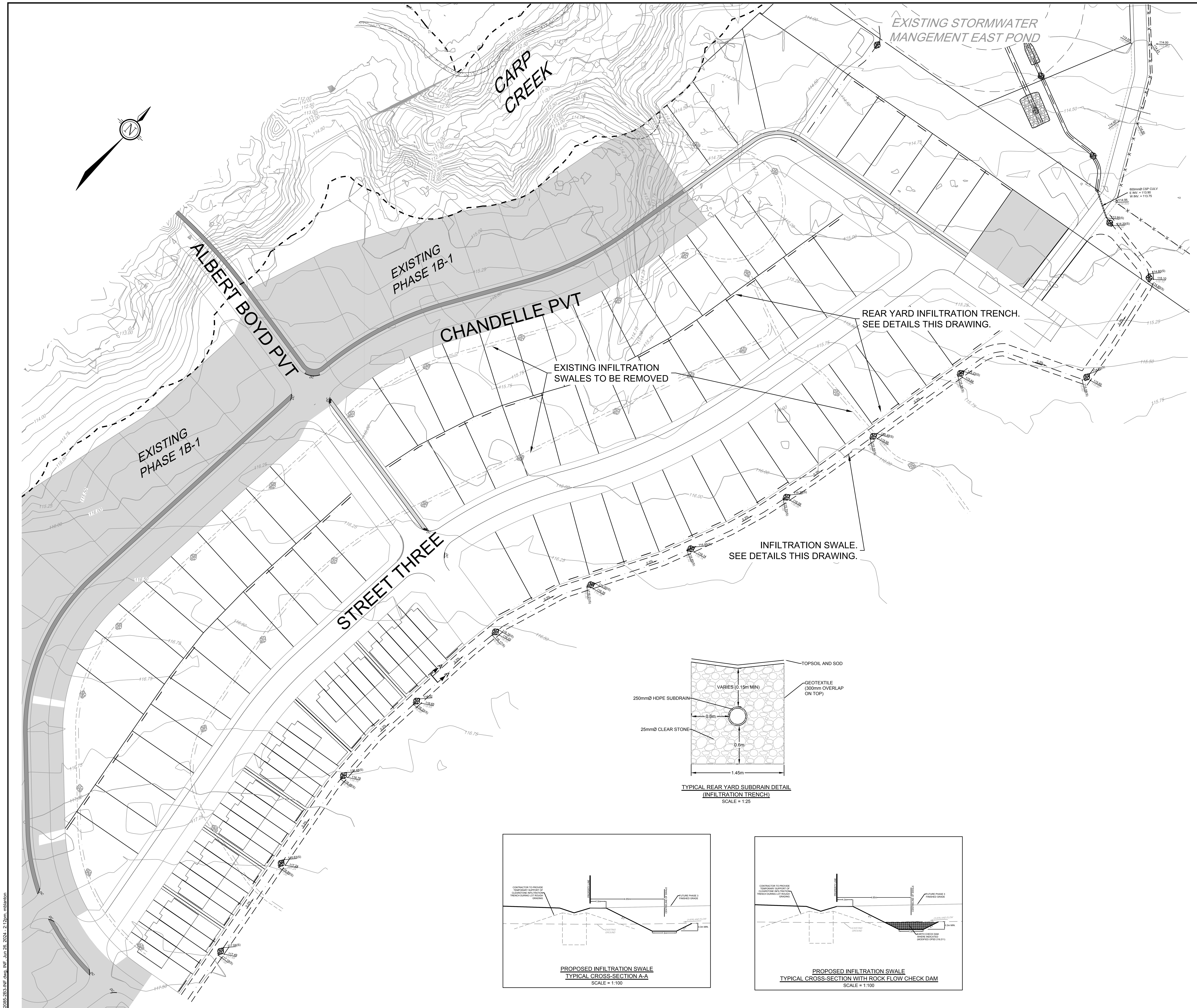
Website www.novatech-eng.com

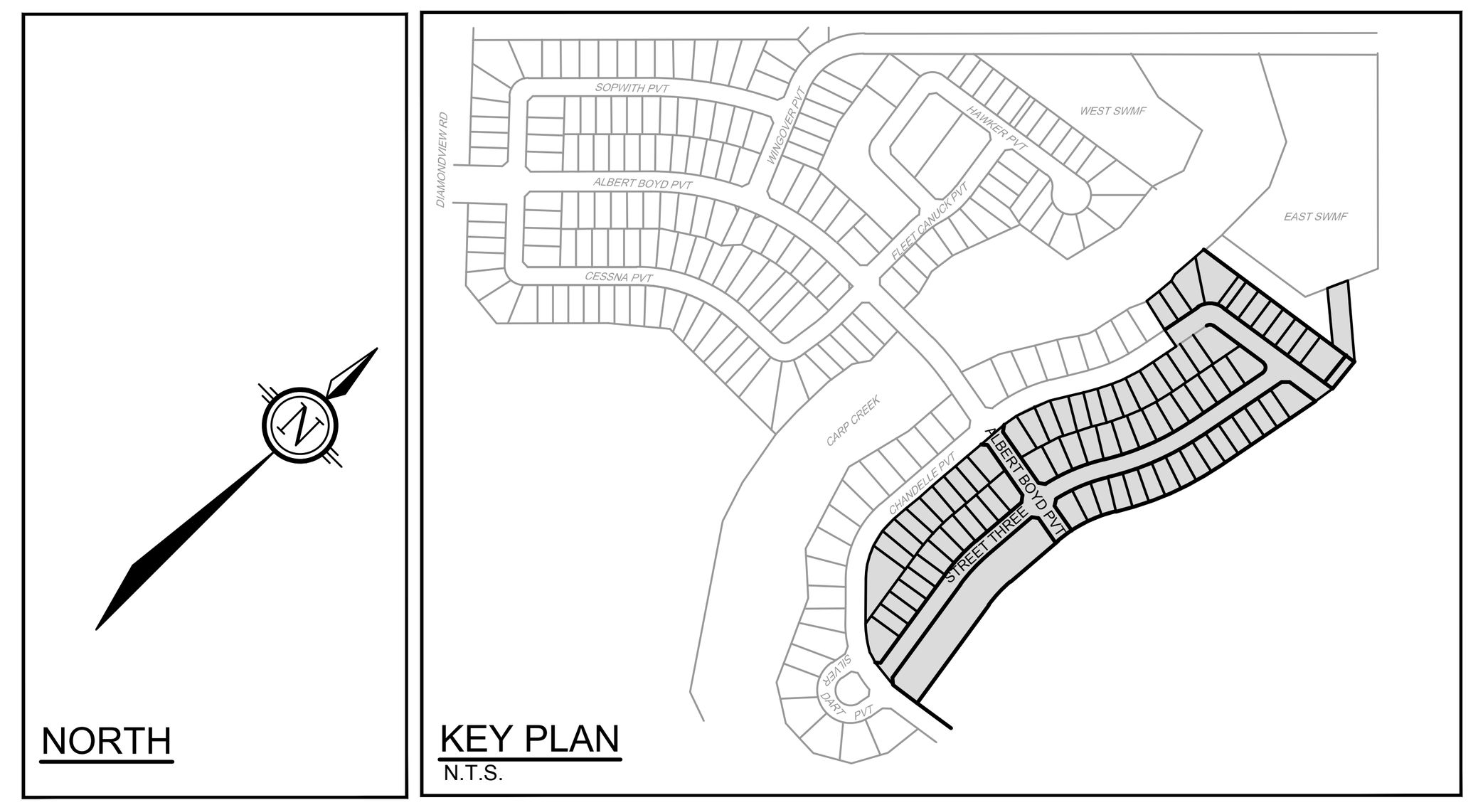
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
PHASE 1B-2 RESIDENTIAL NOTES AND DETAILS PLAN

PROJECT No. 102085
REV: REV # 8
DRAWING No. 102085-ND1B2

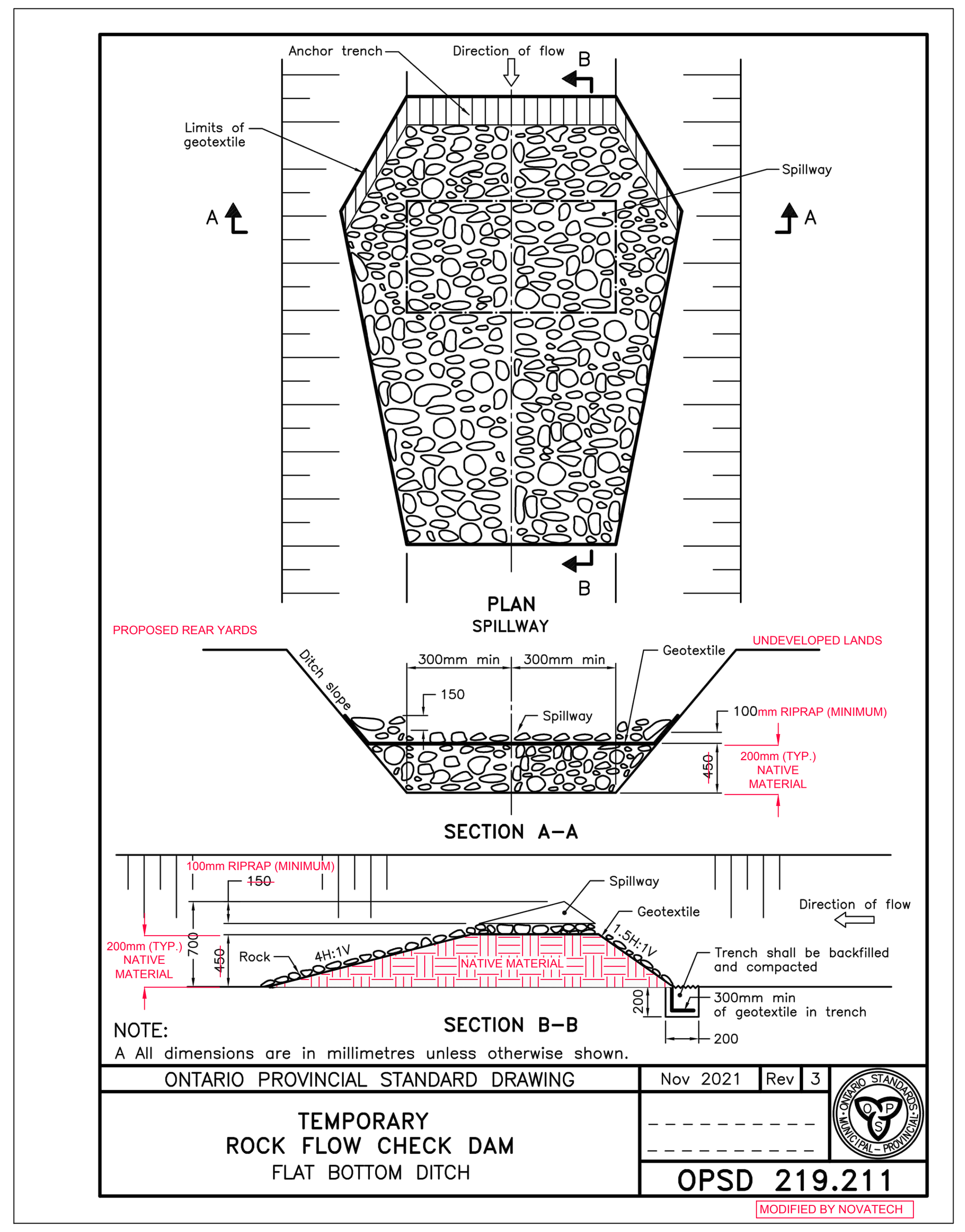
PLANB1.DWG - 1000mmx707mm





LEGEND

- PROPOSED REAR YARD INFILTRATION TRENCH
- PROPOSED CENTRELINE OF INFILTRATION SWALE
- PROPOSED TOP OF BERM
- CENTRELINE OF EXISTING INFILTRATION SWALE
- EXISTING TOP OF BERM
- 115.30(S) / 115.60 — PROPOSED SWALE ELEVATION / *EXISTING ELEVATION*
- 0.6% — PROPOSED GRADING DIRECTION AND SLOPE
- PROPOSED EARTH CHECK DAM (OPSD 219.211)
- EXISTING ROCK FLOW CHECK DAM TO BE REMOVED



TYPICAL REAR YARD SUBDRAIN DETAIL
(INFILTRATION TRENCH)
SCALE = 1:25

PROPOSED INFILTRATION SWALE
TYPICAL CROSS-SECTION A-A
SCALE = 1:100

PROPOSED INFILTRATION SWALE
TYPICAL CROSS-SECTION WITH ROCK FLOW CHECK DAM
SCALE = 1:100

NOTES:

1. INFILTRATION TRENCHES SHOULD BE CONSTRUCTED AT THE END OF THE DEVELOPMENT CONSTRUCTION.

2. SMEARING OF THE NATIVE MATERIAL AT THE INTERFACE WITH THE INFILTRATION TRENCH FLOOR MUST BE AVOIDED AND/OR CORRECTED BY RAKING OR ROTO-TILING.

3. COMPACTION OF THE INFILTRATION TRENCH DURING CONSTRUCTION MUST BE MINIMIZED.

4. DURING CONSTRUCTION, EROSION AND SEDIMENT CONTROL MEASURES ARE REQUIRED TO PROTECT THE INLETS. THIS INCLUDES, BUT IS NOT LIMITED TO FILTER BAGS PLACED UNDER THE LID OF EACH MANHOLE AND ROADWAY AND REARYARD CATCHBASIN. FILTER BAGS MUST ALWAYS BE IN PLACE AND REGULARLY INSPECTED UNTIL SOD OR VEGETATION HAS FULLY ESTABLISHED. ROUTINE MAINTENANCE DURING CONSTRUCTION MAY ALSO BE REQUIRED TO PROTECT THE SUBDRAINS FROM CLOGGING.

5. OCCASIONAL POST-CONSTRUCTION MAINTENANCE WILL BE REQUIRED TO REMOVE ACCUMULATED SEDIMENTS FROM THE INFILTRATION AND EXFILTRATION TRENCHES TO PREVENT CLOGGING. THIS MAY INCLUDE CATCH BASIN CLEANOUT AND SUBDRAIN PIPE FLUSHING.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

WEST CAPITAL Developments

No.	REVISION	DATE	BY
7.	ISSUED FOR REGISTRATION AND ECA	JUN 28/24	ARM
6.	REVISED POND INLET SWALE	MAY 14/24	ARM
5.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
4.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
3.	ISSUED FOR TENDER	DEC 7/23	ARM
2.	ISSUED FOR REVIEW	JUL 28/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE 1:750

DESIGN	ARM
CHECKED	ARM
DRAWN	MNP
CHECKED	ARM
APPROVED	SMG

LICENSED PROFESSIONAL ENGINEER — A. A. RONGVE — 100616298 — June 28, 2024 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — A.R. MCAULEY — 100141256 — June 28, 2024 — PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

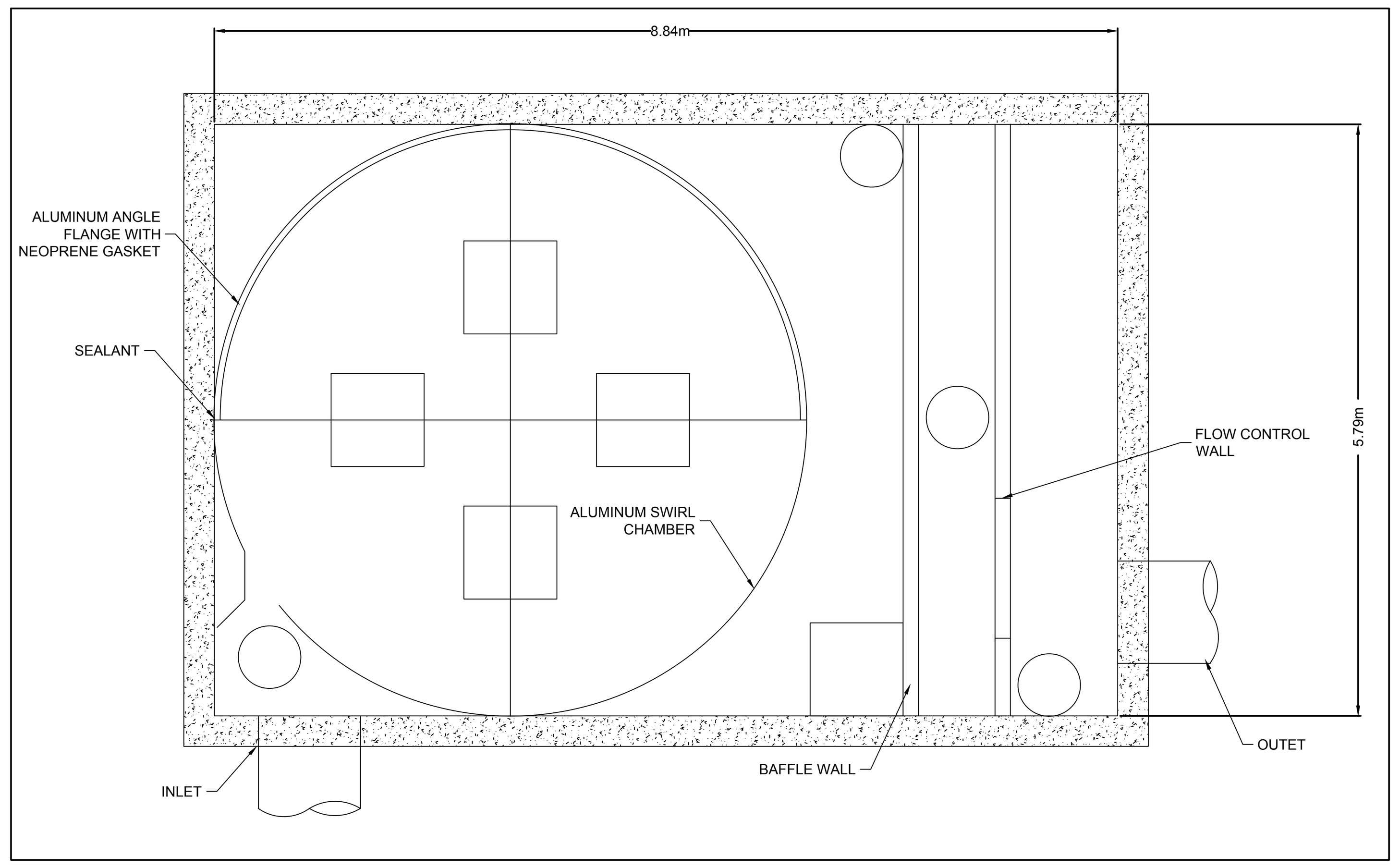
CITY OF OTTAWA
WEST CAPITAL AIRPARK

PHASE 1B-2 RESIDENTIAL INFILTRATION MEASURES PLAN

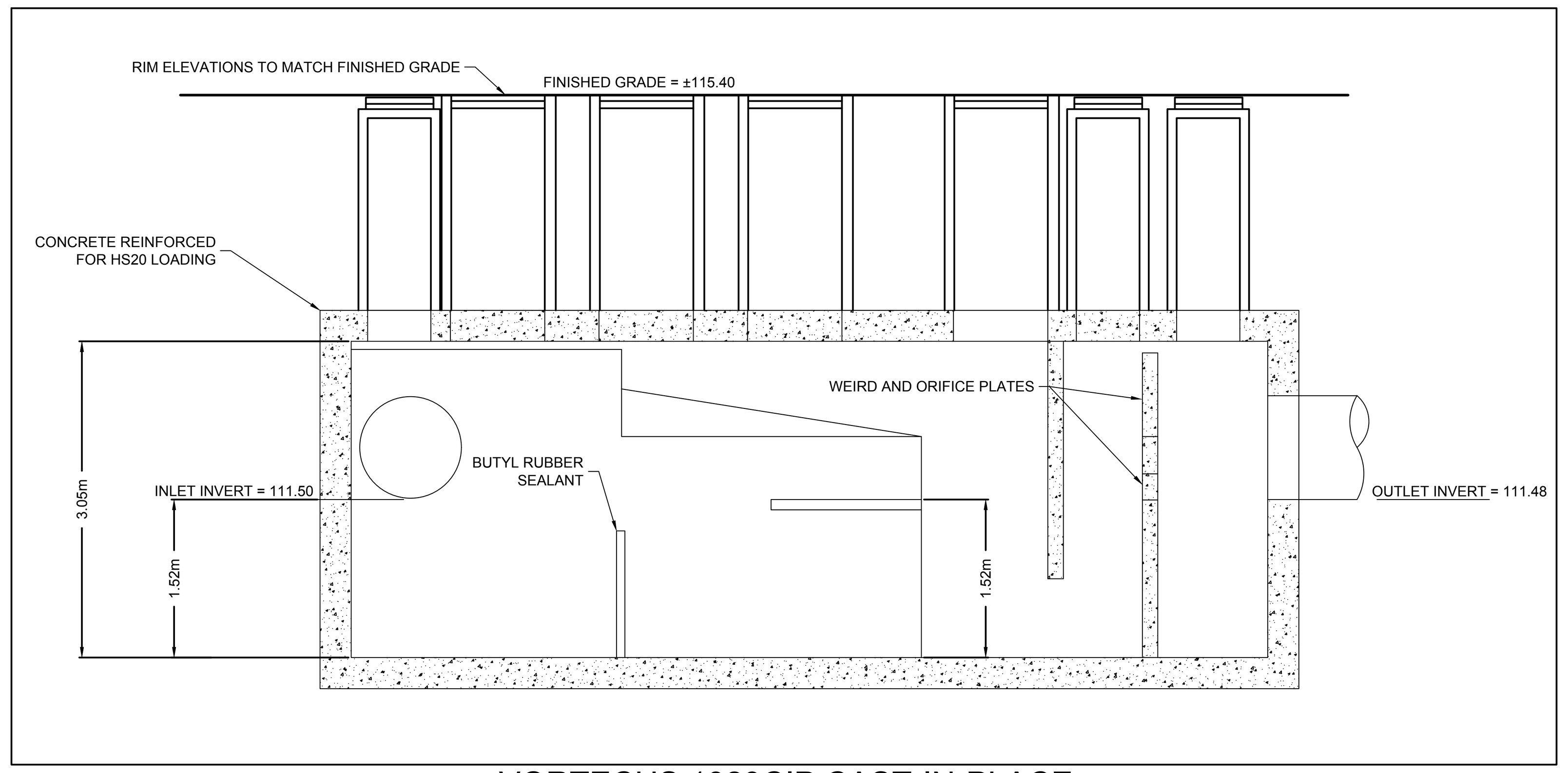
PROJECT No. 102085-08
REV: REV # 7
DRAWING No. 102085-INF2

M:\2002\102085\CAD_PHASES2B&3\Civil\102085-2B3-INF.dwg, INF, Jun 26, 2024 - 2:12pm, mblanton

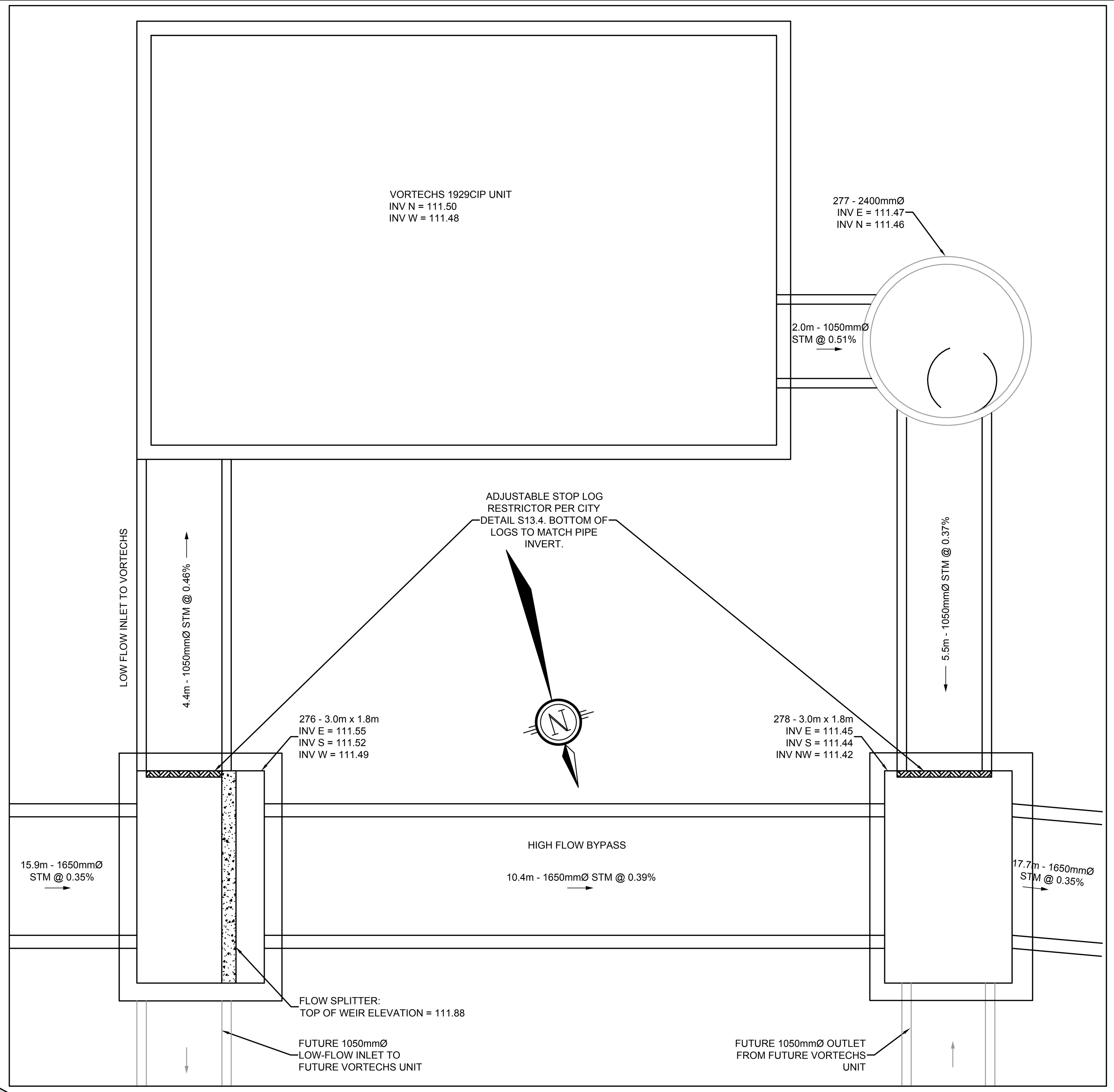
PLANB1.DWG - 1000mmx707mm



VORTECHS 1929CIP CAST-IN-PLACE
LAYOUT DETAIL
SCALE 1:50



VORTECHS 1929CIP CAST-IN-PLACE
LAYOUT DETAIL
SCALE 1:50



VORTECHS 1929CIP LAYOUT DETAIL
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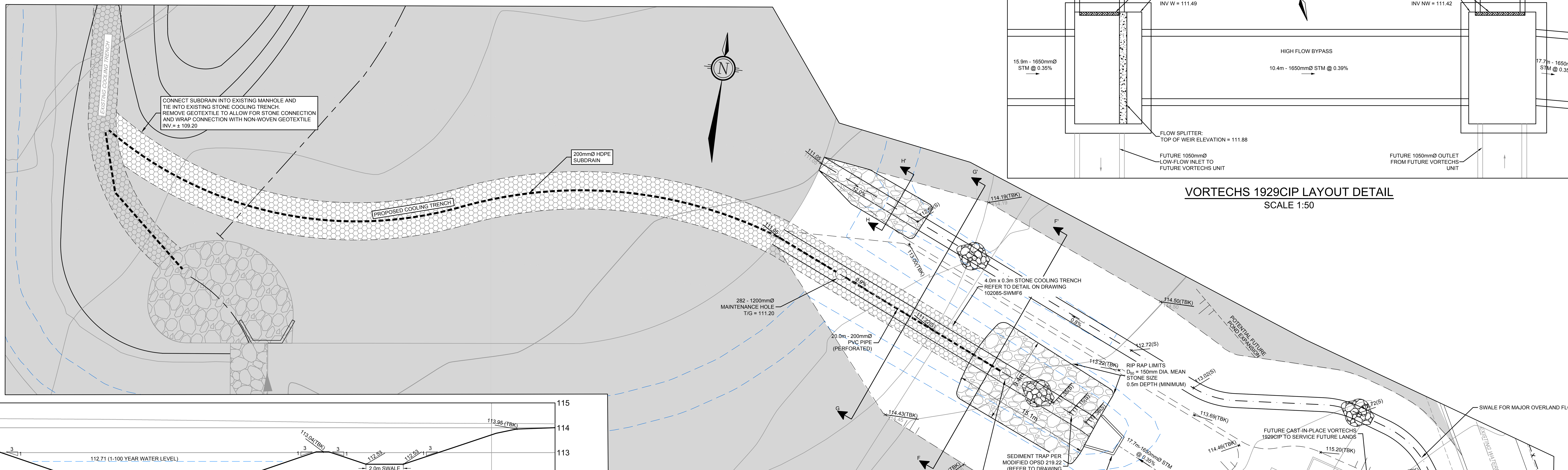
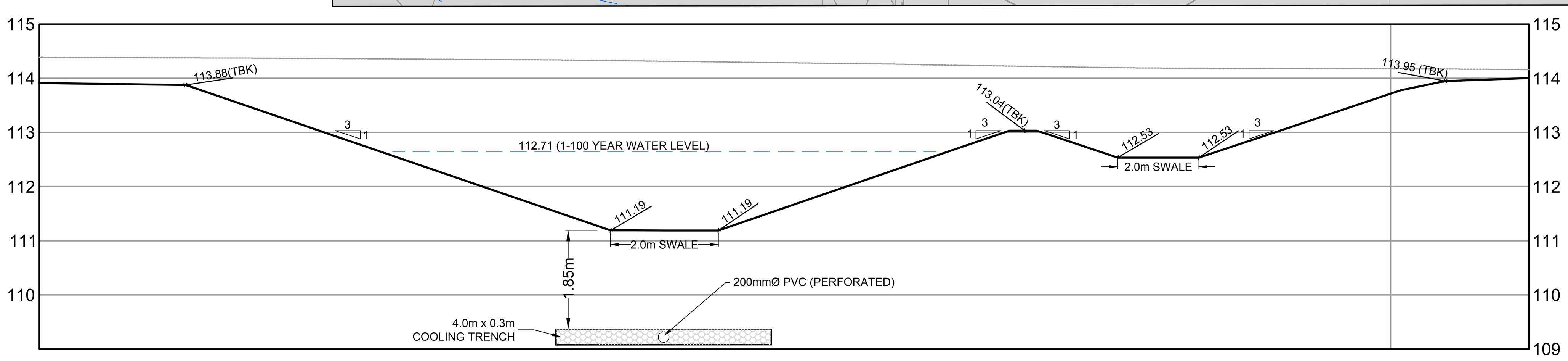
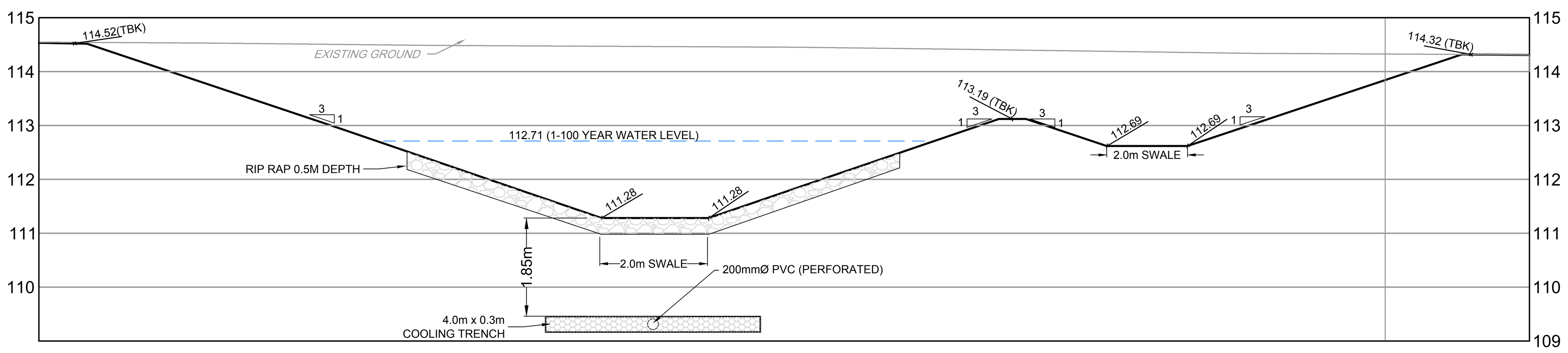


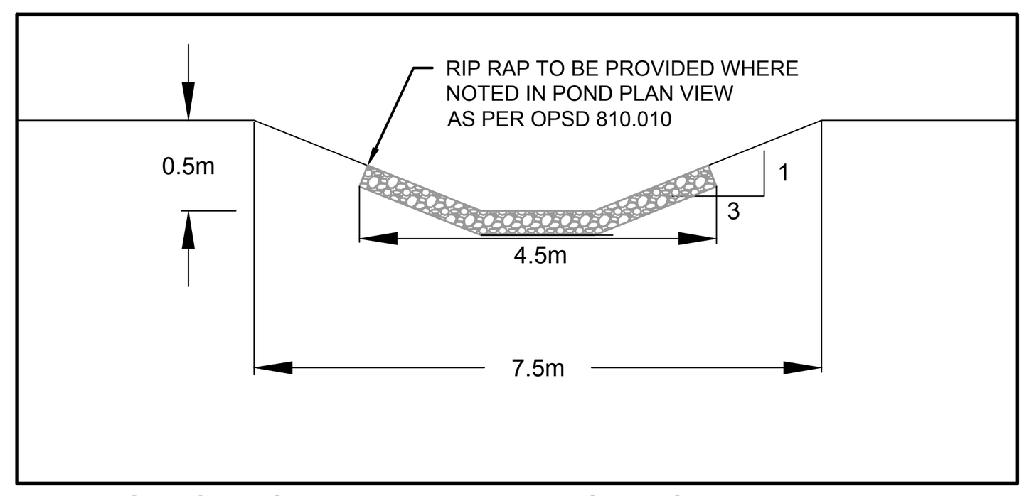
SWM POND INLET SWALE
SCALE 1:200



SECTION G-G' - SWM POND INLET SWALE
SCALE 1:75



SECTION F-F' - SWM POND INLET SWALE
SCALE 1:75



SECTION H-H' - MAJOR OVERLAND
FLOW INLET SWALE DETAIL
SCALE: 1:100

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
8.	ISSUED FOR REGISTRATION AND ECA	JUN 28/24	ARM
7.	REVISED POND INLET SWALE	MAY 14/24	ARM
6.	REVISED PER CITY COMMENTS	FEB 20/24	ARM
5.	ISSUED WITH ADDENDUM #4	JAN 12/24	ARM
4.	ISSUED WITH ADDENDUM #2	JAN 5/24	ARM
3.	ISSUED FOR TENDER	DEC 7/23	ARM
2.	ISSUED FOR REVIEW	JUL 28/23	ARM
1.	ISSUED FOR COORDINATION	JAN 18/23	ARM

SCALE

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED XXX

LICENSED PROFESSIONAL ENGINEER
A. A. RONGVE
100616298
June 28, 2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
A.R. MCAULEY
100141256
June 28, 2024
PROVINCE OF ONTARIO

NOVATECH
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Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

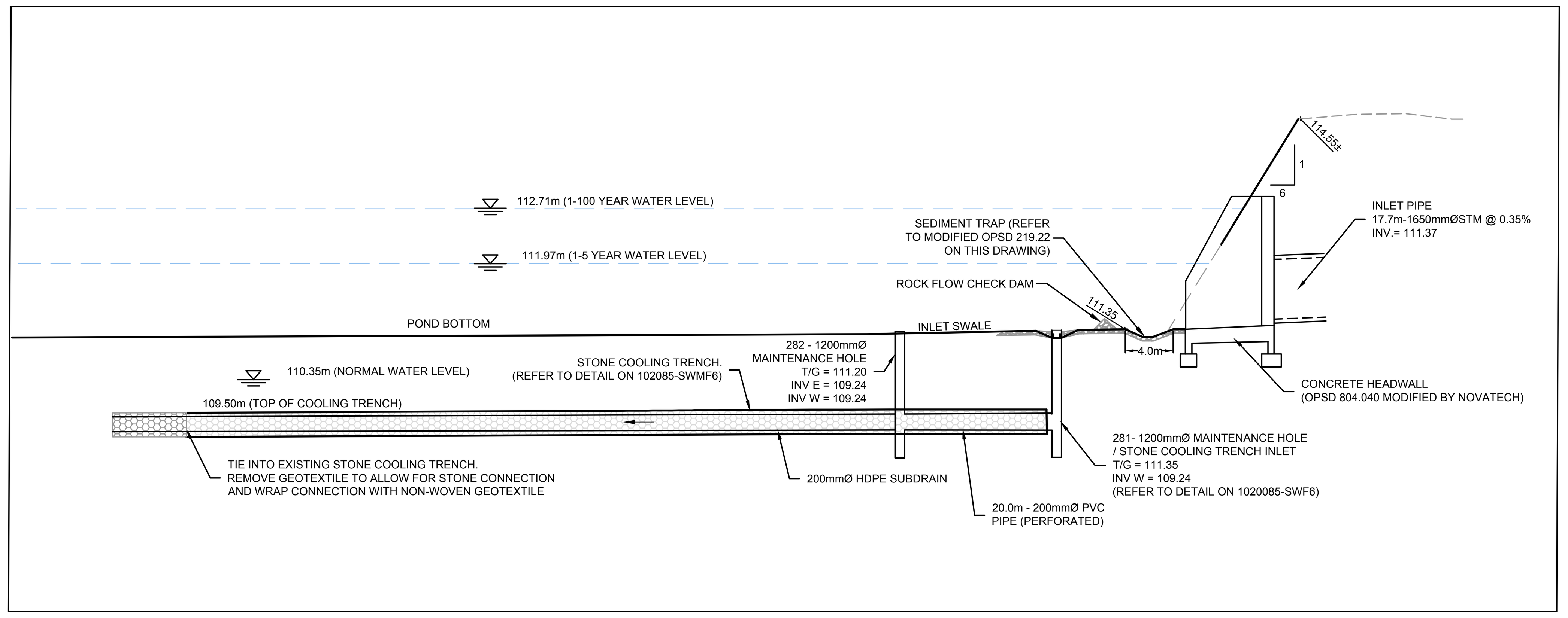
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
EAST STORMWATER MANAGEMENT FACILITY - PHASE 1B-2 INLET DETAILS

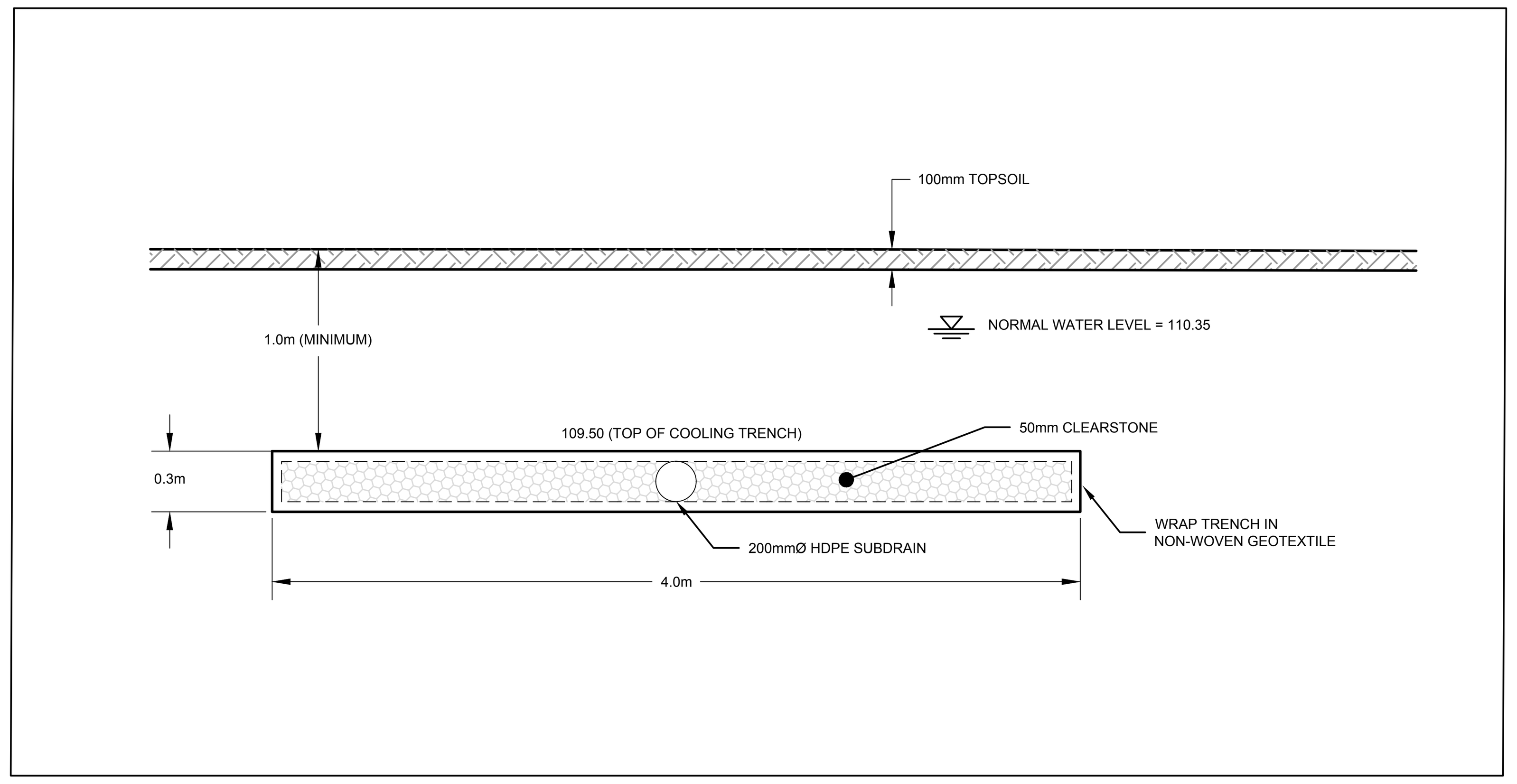
PROJECT No. 102085
REV
REV # 8
DRAWING No.
102085-SWMF5

COOLING TRENCH NOTES:

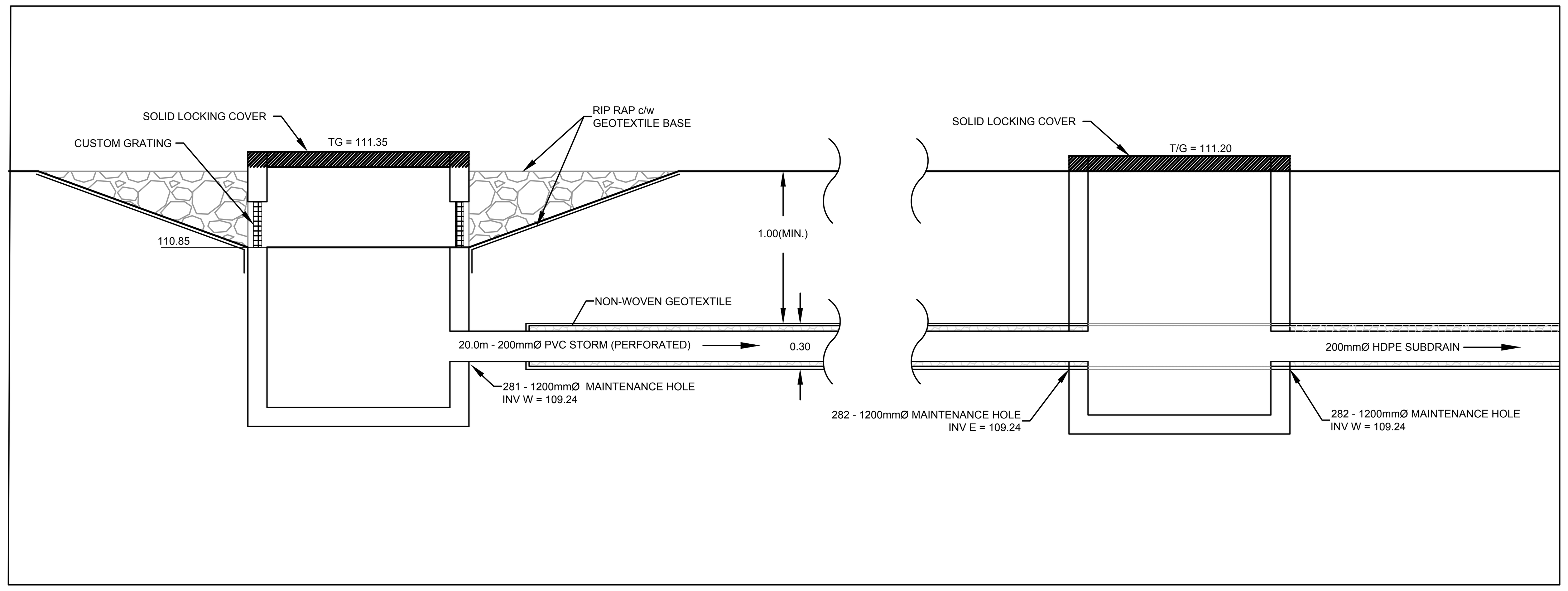
1. ALL DISTURBED AREAS TO BE REINSTATED WITH TOPSOIL, HYDROSEED AND MULCH - UNLESS OTHERWISE NOTED.
2. MAINTENANCE HOLE STRUCTURES WITHIN COOLING TRENCH SWM FACILITY TO BE AS PER OPSD 701.010. MAINTENANCE HOLE COVERS TO BE SOLID AS PER OPSD 401.060.
3. CUSTOM GRATES AT INLET AND OUTLET MAINTENANCE HOLES OF COOLING TRENCH TO BE DETAILED WITH SHOP DRAWINGS PRIOR TO ENGINEER REVIEW.



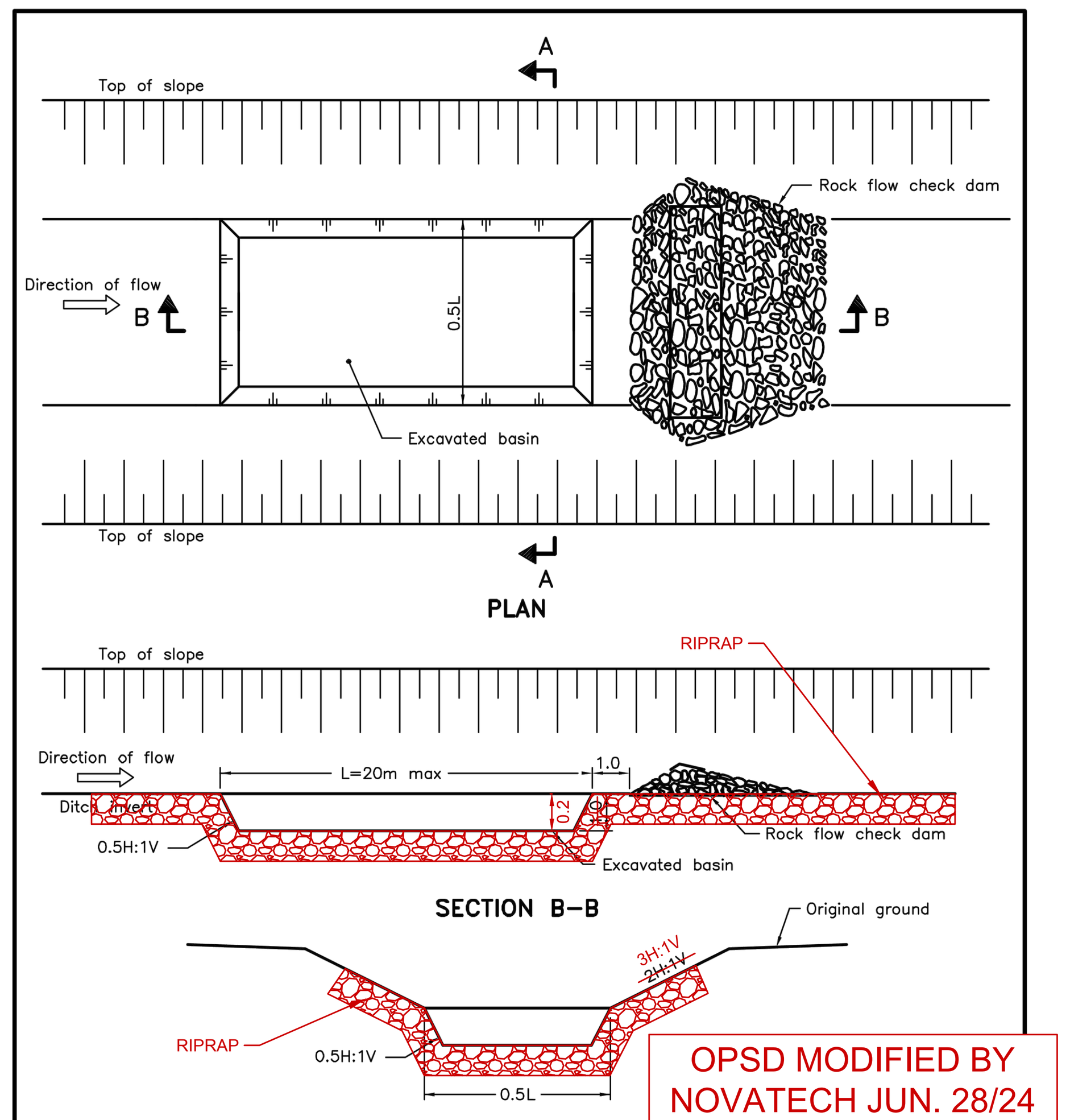
STONE COOLING TRENCH CROSS-SECTION
SCALE: N.T.S.



STONE COOLING TRENCH DETAIL
SCALE 1:50



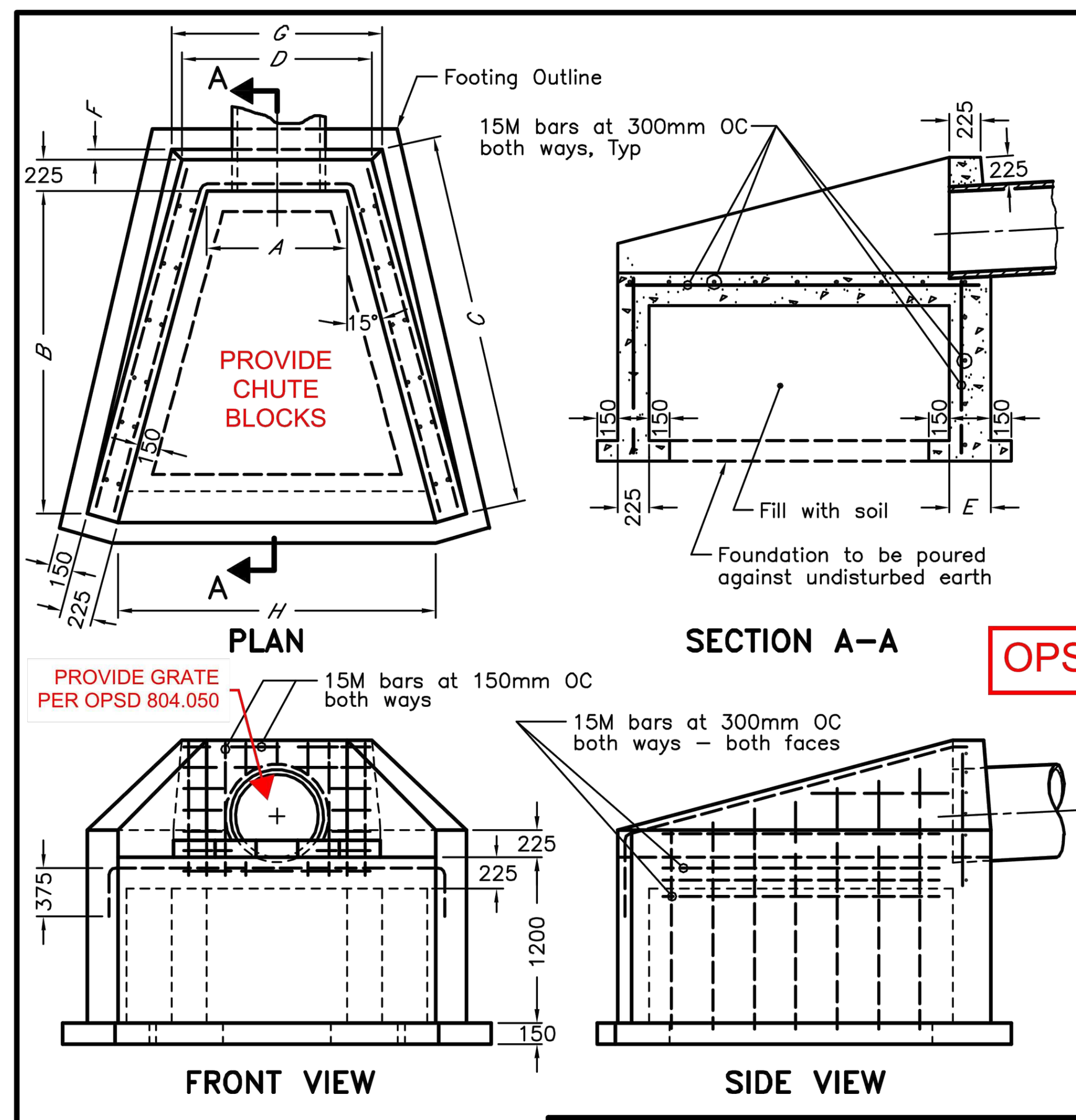
MAINTENANCE HOLE AND STONE COOLING TRENCH INLET DETAIL
SCALE 1:50



NOTES:
A Ditch cross-section upstream or downstream of sediment trap may be flat bottom or V-shaped. Flat bottom shown.
B This OPSD shall be read in conjuction with OPSD 219.210 or 219.211.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING — Nov 2015 — Rev 2

SEDIMENT TRAP IN DITCH — OPSD 219.220



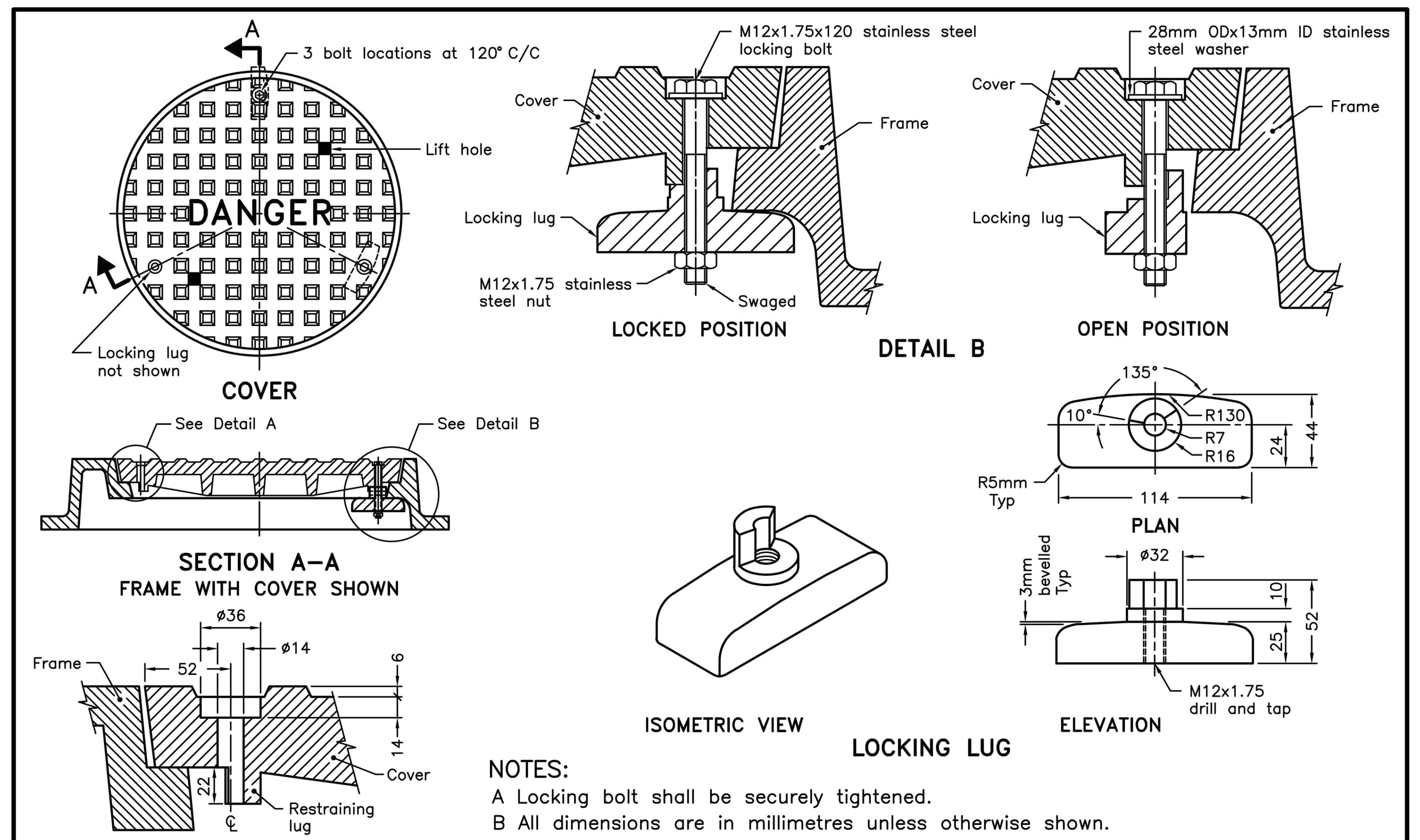
PIPE DIA	A	B	C	D	E	F	G	H
600	1050	2400	2725	1400	300	75	1525	2350
675	1125	2400	2725	1475	300	75	1600	2425
750	1200	2400	2725	1550	300	75	1675	2500
825	1275	2400	2725	1625	300	75	1755	2575
900	1350	2400	2725	1700	300	75	1825	2650
975	1425	2400	2725	1775	375	150	1975	2725
1050	1500	3000	3400	1850	375	150	2050	3100
1200	1650	3000	3400	2000	375	150	2200	3250
1350	1800	3000	3400	2150	375	150	2350	3400
1500	1950	3000	3400	2300	375	150	2500	3550
1650	2100	3000	3400	2450	375	150	2650	3700
1800	2250	3000	3400	2600	375	150	2800	3850
2400	3000	3000	3400	3350	375	150	3550	4600

OPSD MODIFIED BY NOVATECH JAN. 12/24

NOTES:
A This OPSD to be read in conjunction with OPSD 3940.150.
B Class of concrete: 30MPa.
C Cover to reinforcing bars: 75mm ±20mm.
D Granular backfill to be placed to 300mm min thickness on all sides.
E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING — Nov 2017 — Rev 1

CONCRETE HEADWALL FOR SEWER OR CULVERT PIPE OUTLET — OPSD 804.040



NOTES:
A Locking bolt shall be securely tightened.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING — Nov 2018 — Rev 4

CAST IRON CIRCULAR LOCKING COVER FOR MAINTENANCE HOLES — OPSD 401.060

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No.	REVISION	DATE	BY
4.	ISSUED FOR REGISTRATION AND ECA	JUN 28/24	ARM
3.	REVISED POND INLET SWALE	MAY 14/24	ARM
2.	REVISED PER CITY COMMENTS (NO CHANGES)	FEB 20/24	ARM
1.	ISSUED WITH ADDENDUM #4	JAN 12/24	ARM

SCALE

DESIGN MNP — CHECKED ARM — DRAWN MNP — CHECKED ARM — APPROVED XXX

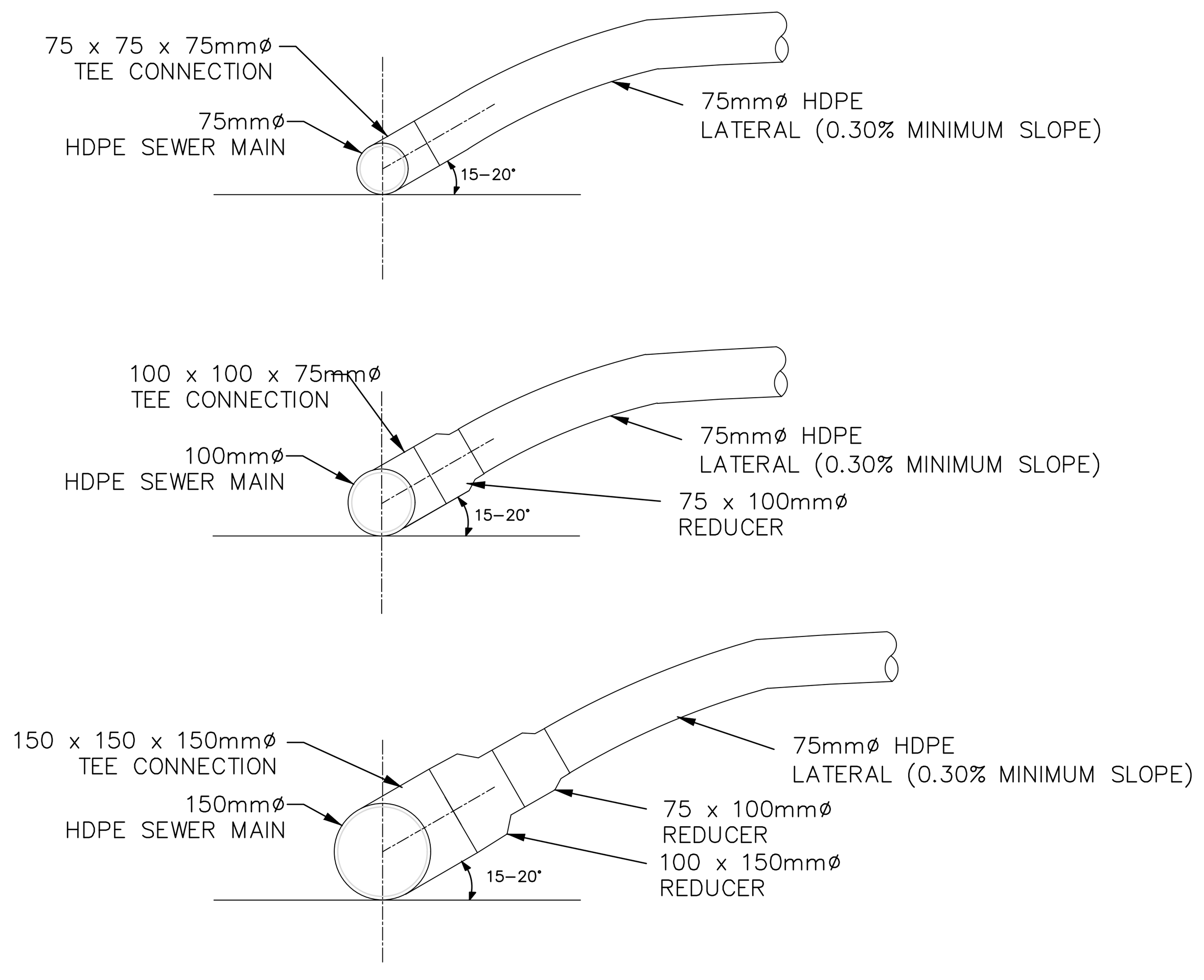
LICENSED PROFESSIONAL ENGINEER A. A. RONGVE 100616298 June 28, 2024 PROVINCE OF ONTARIO
LICENSED PROFESSIONAL ENGINEER A.R. MCAULEY 100141256 June 28, 2024 PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

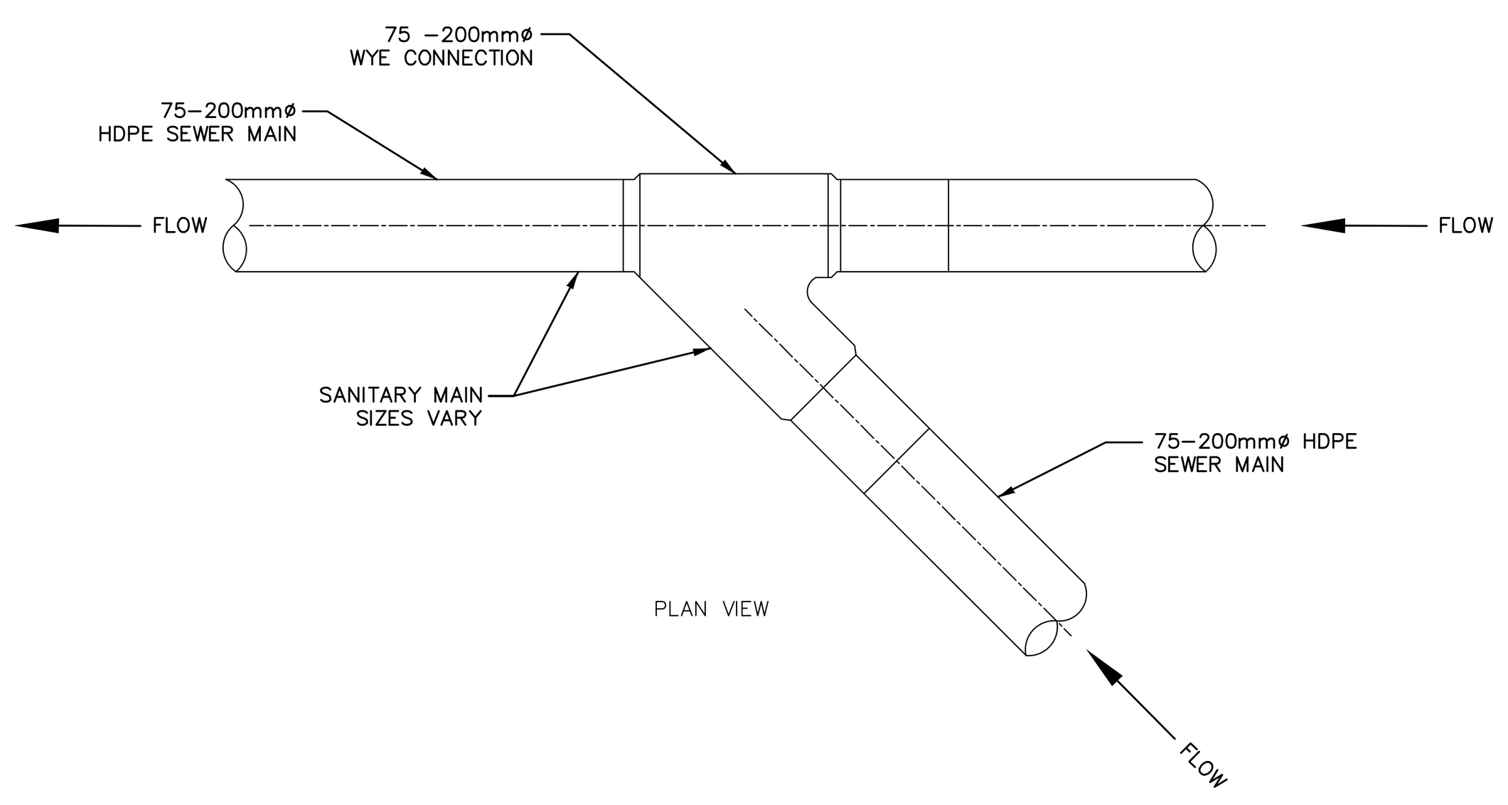
LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
EAST STORMWATER MANAGEMENT FACILITY DETAILS

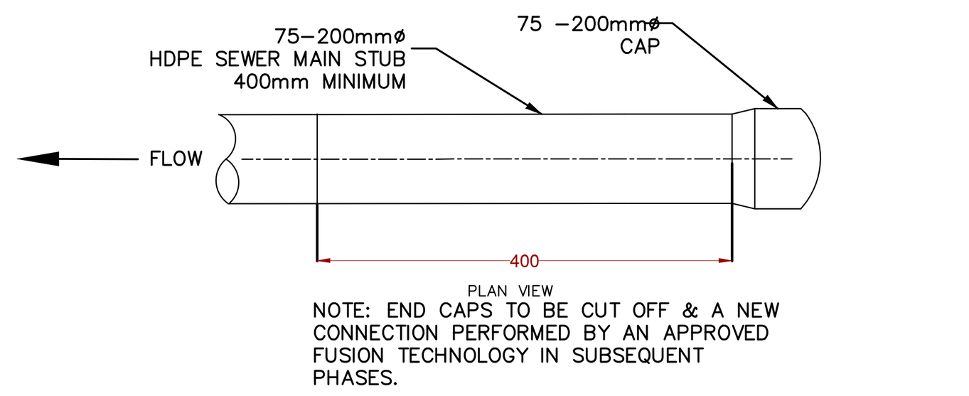
PROJECT No. 102085
REV # 4
DRAWING No. 102085-SWMF6



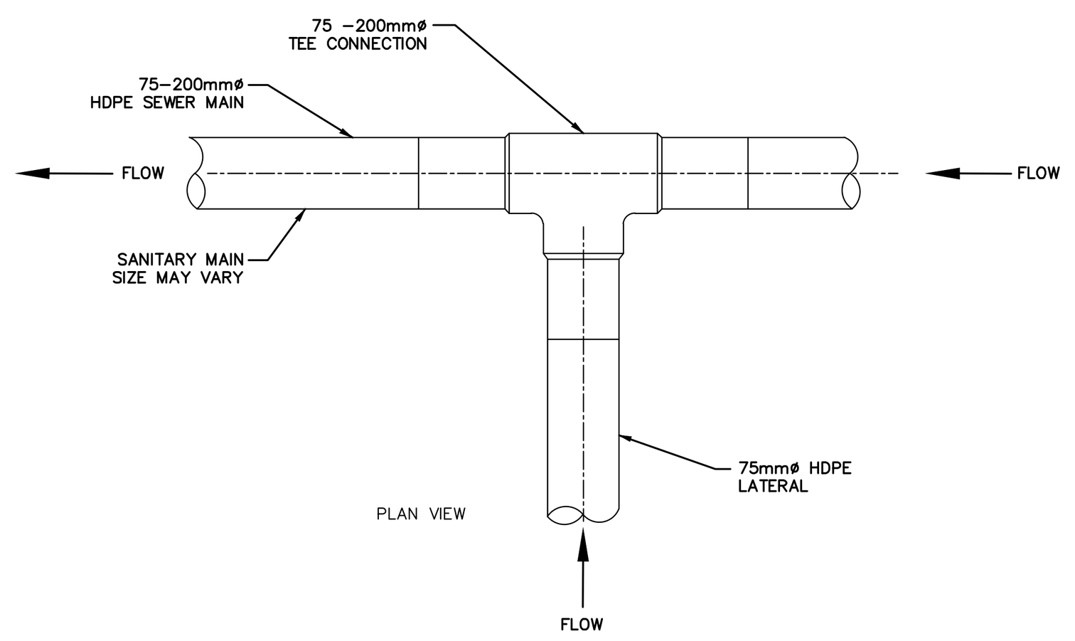
LATERAL TO MAIN CONNECTION (TYP)



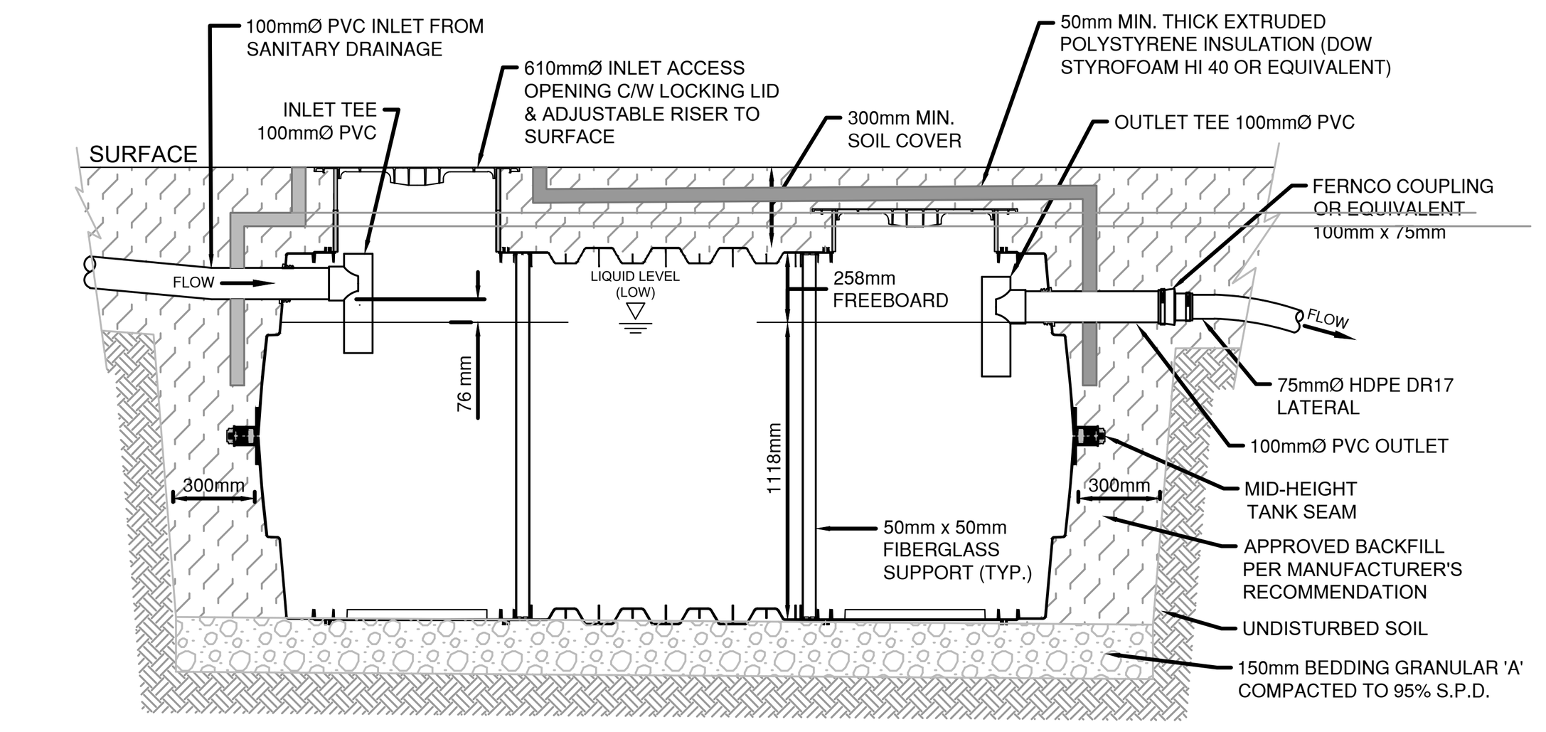
MAIN TO MAIN CONNECTION (TYP)



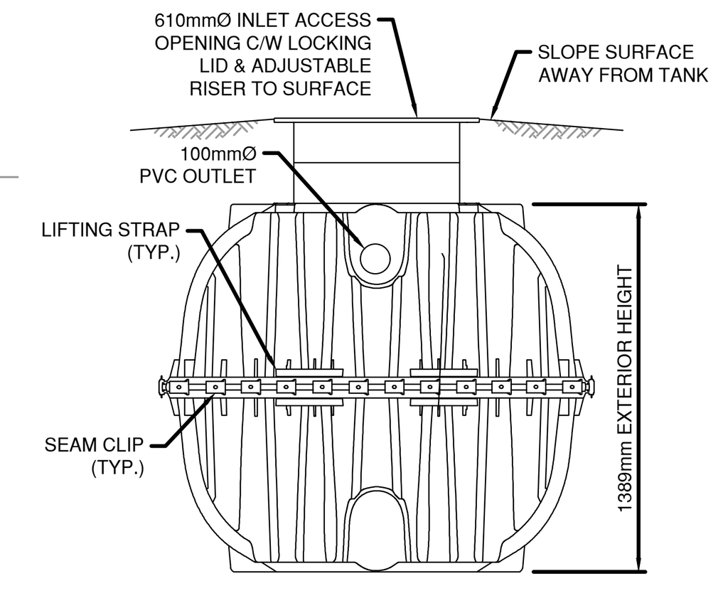
END CAP- FUTURE PHASE CONNECTION



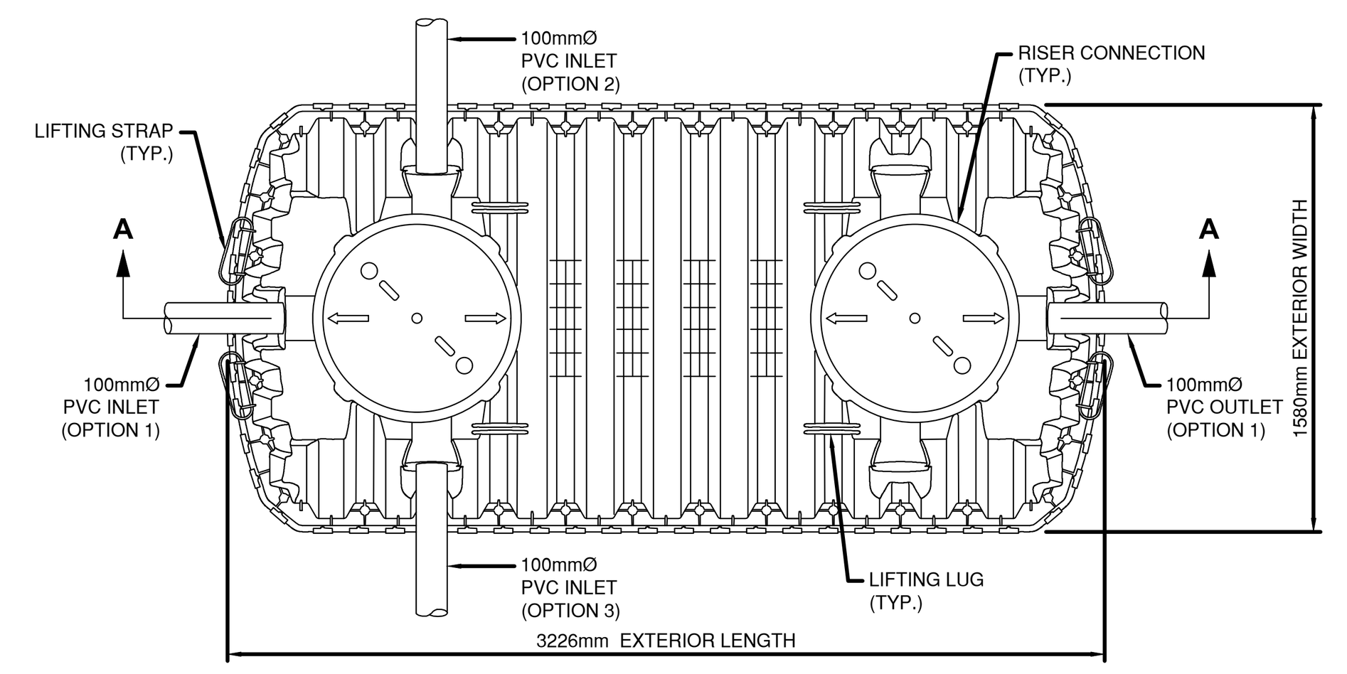
LATERAL TO MAIN CONNECTION (TYP)



SECTION A-A WITH EXCAVATION DETAIL



END VIEW



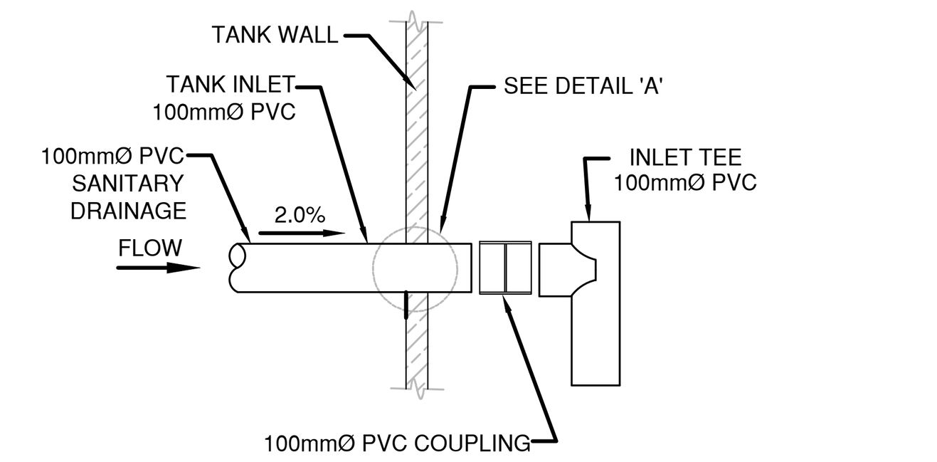
TOP VIEW

CLEARFORD INTERCEPTOR TANK DETAIL (TYP.)

N.T.S.

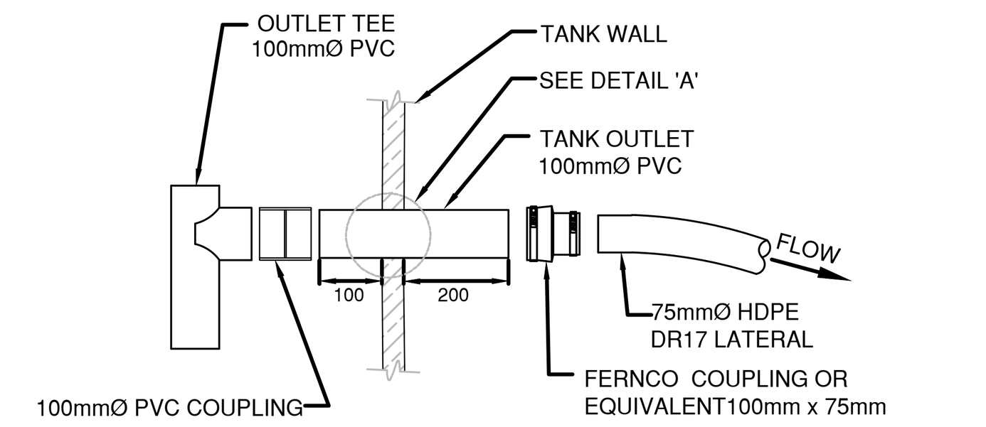
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. PVC PIPES AND FITTINGS TO BE SDR 35 PER CSA B182.1.
3. ALL PVC PARTS TO BE GLUED TOGETHER WITH APPROPRIATE SOLVENT CEMENT AND PRIMER.
4. CONTRACTOR SHALL TO PROVIDE SHOP DRAWINGS OF PVC COMPONENTS AND COUPLINGS.



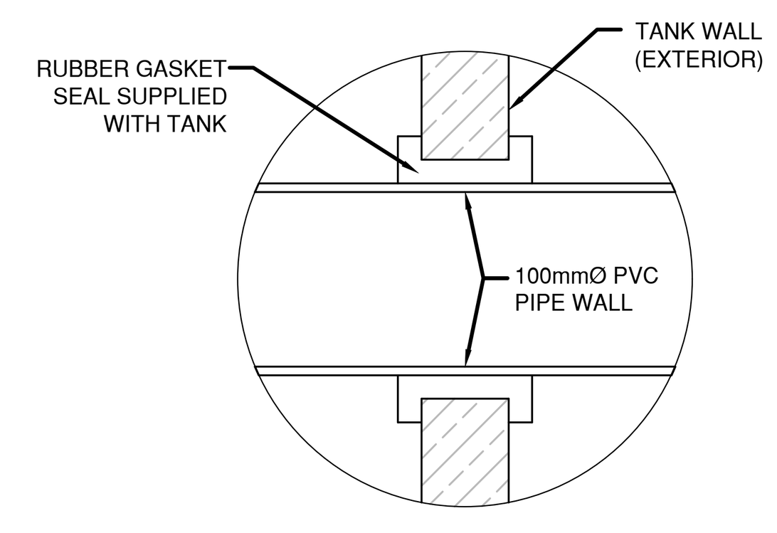
CLEARFORD INTERCEPTOR TANK INLET DETAIL

N.T.S.



CLEARFORD INTERCEPTOR TANK OUTLET DETAIL

N.T.S.



DETAIL 'A' - RUBBER GASKET PIPE SEAL

N.T.S.

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CLEARFORD WATER SYSTEMS INC.

LICENSED PROFESSIONAL ENGINEER W. G. STEFAN 26 FEB 2024 PROVINCE OF ONTARIO

WEST CAPITAL Developments

No.	REVISION	DATE	BY
10.	REVISED PER CITY COMMENTS (NO CHANGES)	FEB 20/24	ARM
9.	REVISED PER CITY COMMENTS (NO CHANGES)	FEB 9/24	ARM
8.	ISSUED WITH ADDENDUM #2 (NO CHANGES)	JAN 5/24	ARM
7.	ISSUED FOR TENDER - PHASE 1B-2 (NO CHANGES)	DEC 7/23	ARM
6.	ISSUED FOR REVIEW - PHASE 1B-2 (NO CHANGES)	JUL 25/23	ARM
5.	ISSUED FOR CONSTRUCTION - PHASE 1B (NO CHANGES)	NOV 4/21	ARM
4.	ISSUED FOR REGISTRATION - PHASE 2A	APR 26/21	ARM
3.	ISSUED FOR CONSTRUCTION	AUG 14/20	ARM
2.	REVISED PER CLEARFORD REVIEW	JUL 14/20	ARM
1.	ISSUED FOR REVIEW	JUL 10/20	ARM

SCALE: AS SHOWN

DESIGN / CHECKED / DRAWN / CHECKED / APPROVED

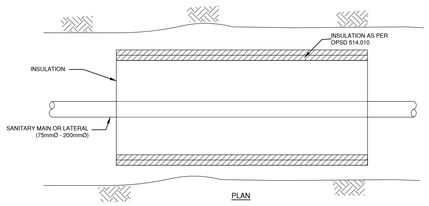
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK - PHASE 2A RESIDENTIAL

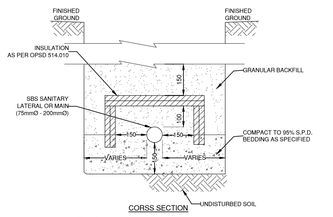
CLEARFORD SBS^{TM} DETAIL SHEET

PROJECT No. 102085-03
REV: REV # 10
DRAWING No. 102085-C1

M:\2020\102085\CAD\...\DETAILS_102085-C1-C2.dwg, 102085-C1, Feb 20, 2024 - 11:13am



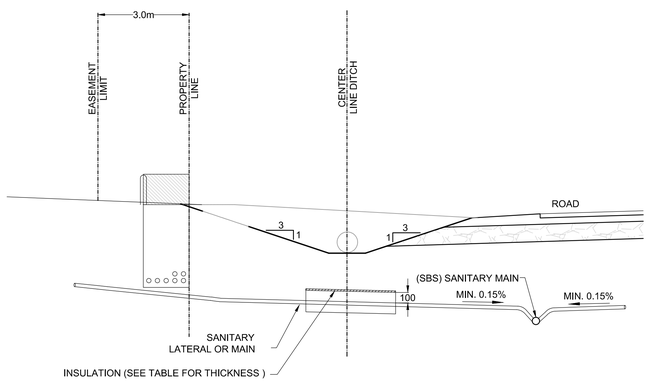
PLAN



CORSS SECTION

NOTES:
1. EARTH COVER DEPTH LESS THAN 1.2m REQUIRES SPECIAL DESIGN
2. STAGGER JOINTS OF MULTIPLE SHEETS

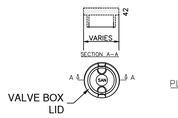
INSULATION IN TRENCH DETAIL (TYP)



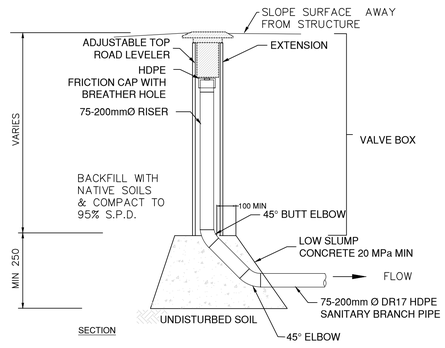
NOTES:
1. FOR MAINS AND SERVICES IN DITCHED AREAS WHERE DEPTH OF COVER OR SEPARATION IS LESS THAN 2200mm.
2. THE INSULATION SHALL BE MINIMUM 1.2m WIDE AND SHALL BE CENTERED OVER THE PIPE.
3. INSULATION SHALL EXTEND 1000mm BEYOND THE DEFINED DITCH SECTION.
4. IF DEPTH FROM BOTTOM OF DITCH TO TOP OF PIPE IS LESS THAN 1000m, SPECIAL DESIGN IS REQUIRED.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

EFFECTIVE EARTH COVER H_C(m)	REQUIRED THICKNESS (mm)
1.9 ≤H_C<2.2	25
1.6 ≤H_C<1.9	50
1.3 ≤H_C<1.6	75
1.0 ≤H_C<1.3	100

INSULATION UNDER SWALE DETAIL (TYP)

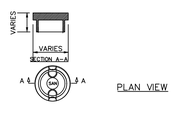


PLAN VIEW

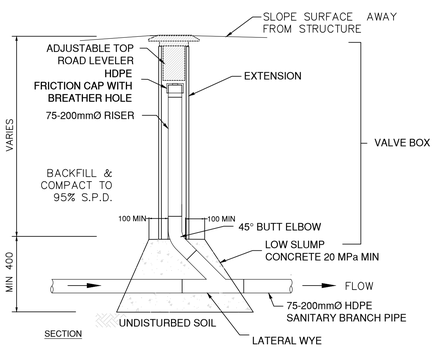


SECTION

LOAD BEARING SAP (SYSTEM ACCESS POINT) END OF LINE (TYP)



PLAN VIEW



SECTION

LOAD BEARING SAP (SYSTEM ACCESS POINT) IN LINE (TYP)

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED. PIPE DIAMETER SIZES ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. REPORT ANY UNUSUAL CONDITIONS TO THE INSPECTING ENGINEER IMMEDIATELY.
3. REINSTATE SANITARY UTILITY CUTS TO ORIGINAL OR BETTER CONDITION WITH APPROVED BASE GRANULAR MATERIALS. PAVEMENT RESTORATION IF APPLICABLE, TO O.P.S.D. 509.01 REVISION 1.
4. IN THE EVENT OF HIGH GROUNDWATER TABLE, CRUSHED STONE AND APPROVED DEWATERING TECHNIQUES SHALL BE EMPLOYED. CONTRACTOR SHALL SUBMIT GROUNDWATER REMOVAL PLAN TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING.
5. CONTRACTOR SHALL SUPPLY AND INSTALL ALL PIPING AND APPURTENANCES AS SHOWN FROM THE CLARIFIER OUTLET. CONNECTIONS TO THE CLARIFIER FROM THE RESIDENCE WILL BE PROVIDED BY THE BUILDING PLUMBER.
6. EXISTING UTILITY ALIGNMENT AND ELEVATIONS ARE FOR INFORMATION ONLY. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITY ALIGNMENTS & ELEVATIONS PRIOR TO CONSTRUCTION ON SITE.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE CROSSING OF EXISTING UTILITIES INCLUDING ANY SUPPORTS AND PRECAUTIONS REQUIRED.
8. THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. ANY ERRORS AND/OR OMISSIONS SHALL BE REPORTED TO THE ENGINEER WITHOUT DELAY.
9. BUILDING DRAINS (NOT IN SCOPE) WHICH FLOW TO THE CLARIFIERS SHALL BE SUFFICIENTLY STRONG TO RESIST SURFACE LOAD AND SHALL BE INSTALLED AT A MINIMUM GRADE OF 2%. APPLICATION OF THERMAL INSULATION SHALL TAKE PLACE WHERE DRAINS ARE GREATER THAN 1.5m LONG AND/OR SHALLOW BURY TAKES PLACE AND/OR RISK OF FROST PENETRATION DUE TO SIDEWALKS, STORMWATER DITCHES, DRIVEWAYS OR OTHER UNUSUAL EXPOSURES. REF. O.B.C. 7.3.5.4.

SBS^{TM} SANITARY MAIN & LATERAL NOTES

1. ALL SANITARY MAINS SHALL HAVE 2.2m COVER OR SPECIFIED COVER (MINIMUM) AS NOTED ON DRAWINGS.
2. ALL SANITARY MAINS SHALL BE BEDDED ON A SHAPED BEDDING OF COMPACTED GRANULAR 'A' MEASURING 150mm IN DEPTH. GRANULAR 'A' BEDDING SHALL BE COMPACTED TO 95% S.P.D. AND SHALL BE 200mm ABOVE THE CROWN OF THE PIPE AND SHALL EXTEND 300mm (MINIMUM) LATERALLY IN ALL CASES. SOFT FOUNDATION MATERIALS MAY REQUIRE ADDITIONAL COMPACTED FILL SUPPORT AS DIRECTED BY THE GEOTECHNICAL ENGINEER. TRENCH BACKFILL TO ROAD SUBGRADE ELEVATION SHALL CONSIST OF GRANULAR 'B' OR APPROVED NATIVE MATERIALS COMPACTED TO 95 % S.P.D.
3. COATED No. 12 GAUGE TRACER WIRE SHALL BE INSTALLED ALONG ALL SBS SEWER MAINS.
4. UNLESS OTHERWISE NOTED, ALL SBS SANITARY SEWER MAINS, LATERALS AND CONNECTIONS SHALL BE THERMALLY WELDED HDPE DR17 PIPE IN ACCORDANCE WITH CAN/CSA- B182.11-06 AND SHALL BE INSTALLED IN ACCORDANCE WITH THE DRAWINGS, O.P.S.D, SPECIFICATIONS AND CLEARFORD INDUSTRIES "SPECIFICATIONS FOR THE INSTALLATION OF HDPE SBS SANITARY SEWERS AND FORCEMAINS."
5. SANITARY SEWERS SHALL BE WATER TESTED TO OPSD 410.07.16.04 TO ENSURE LEAK-PROOF CONSTRUCTION. COMPLETED MAINS SHALL BE CCTV INSPECTED.
6. SANITARY LATERALS FROM THE CLARIFIER TO THE MAIN SHALL BE HDPE DR17 PIPE UNLESS OTHERWISE NOTED. WHERE RADII ARE SHOWN ON THE DRAWINGS, SANITARY MAINS AND LATERALS MAY EMPLOY LONG RADIUS CURVATURE OF 25 x OUTSIDE DIAMETER FOR 75 mm THROUGH 200mm HDPE DR17 IN LIEU OF FITTINGS.
7. NO CONNECTIONS, OTHER THAN APPROVED RESIDENTIAL SANITARY LATERALS, ARE PERMITTED TO THE CLARIFIER OR SANITARY SEWER MAINS.

SBS^{TM} SYSTEM ACCESS POINTS NOTES

1. CAST IRON SYSTEM ACCESS POINT (SAP) FRAMES C/W COVERS AND SPECIFICATIONS WILL BE SUPPLIED BY CONTRACTOR AND APPROVED BY CLEARFORD ENGINEERS. EQUIVALENT PRE-CAST CONCRETE FRAMES MAY BE CONSIDERED.
2. CONTRACTOR IS RESPONSIBLE FOR SOURCING, STORAGE AND INSTALLATION OF SAPS. CONTRACTOR SHALL PROVIDE ADEQUATE PROTECTION AGAINST DAMAGE.

SBS^{TM} CLARIFIER & STRUCTURES NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR UNLOADING, STORAGE AND INSTALLATION. CONTRACTOR SHALL PROVIDE ADEQUATE PROTECTION AGAINST DAMAGE
2. CLARIFIERS SHALL BE INSTALLED IN AREAS NOT SUBJECT TO WHEEL LOADINGS UNLESS SPECIFIED AS LOAD BEARING.
3. CLARIFIERS SHALL BE INSULATED ON THE TOP AND SIDES OF TANK TO 610mm BELOW TOP OF TANK IN EARTH AND TO 1200mm BELOW TOP OF TANK IN ROCK OR AS PER CLEARFORD DRAWING. INSULATION SHALL BE STYROFOAM^{TM} DOW HI40 BOARD OR EQUIVALENT.
4. CLARIFIERS SHALL BE PLACED ON 200mm GRANULAR A BEDDING COMPACTED TO 95% STANDARD PROCTOR DENSITY (S.P.D.) UNLESS OTHERWISE NOTED ON THE DRAWING.
5. CLARIFIERS INSTALLED IN HIGH GROUNDWATER CONDITIONS SHALL BE BALLASTED WITH WATER DURING INSTALLATION TO PREVENT UPLIFT. ONCE INSTALLED 300mm (MINIMUM) OF BACKFILL SOIL MUST BE PLACED ON TOP OF THE CLARIFIER TANK IN ORDER TO EVACUATE THE CONTENTS.

WEST CAPITAL AIRPARK DEVELOPMENT

1. FUTURE PHASING INFORMATION FOR DEVELOPMENT OF RESIDENTIAL & COMMERCIAL FACILITIES SHALL BE PROVIDED TO CLEARFORD INDUSTRIES FOR REVIEW & APPROVAL TO ENSURE CAPACITY WITHIN THE COLLECTION SYSTEM.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

CLEARFORD WATER SYSTEMS INC.

LICENCED PROFESSIONAL ENGINEER W. C. STEFAN 25758 2024 PROVINCE OF ONTARIO

WEST CAPITAL Developments

No.	REVISION	DATE	BY
9.	REVISED PER CITY COMMENTS (NO CHANGES)	FEB 20/24	ARM

No.	REVISION	DATE	BY
8.	REVISED PER CITY COMMENTS (NO CHANGES)	FEB 9/24	ARM
7.	ISSUED WITH ADDENDUM #2 (NO CHANGES)	JAN 5/24	ARM
6.	ISSUED FOR TENDER - PHASE 1B-2 (NO CHANGES)	DEC 7/23	ARM
5.	ISSUED FOR REVIEW - PHASE 1B-2 (NO CHANGES)	JUL 25/23	ARM
4.	ISSUED FOR CONSTRUCTION - PHASE 1B (NO CHANGES)	NOV 4/21	ARM
3.	ISSUED FOR REGISTRATION - PHASE 2A	APR 26/21	ARM
2.	ISSUED FOR CONSTRUCTION	AUG 14/20	ARM
1.	ISSUED FOR REVIEW	JUL 10/20	ARM

SCALE: AS SHOWN

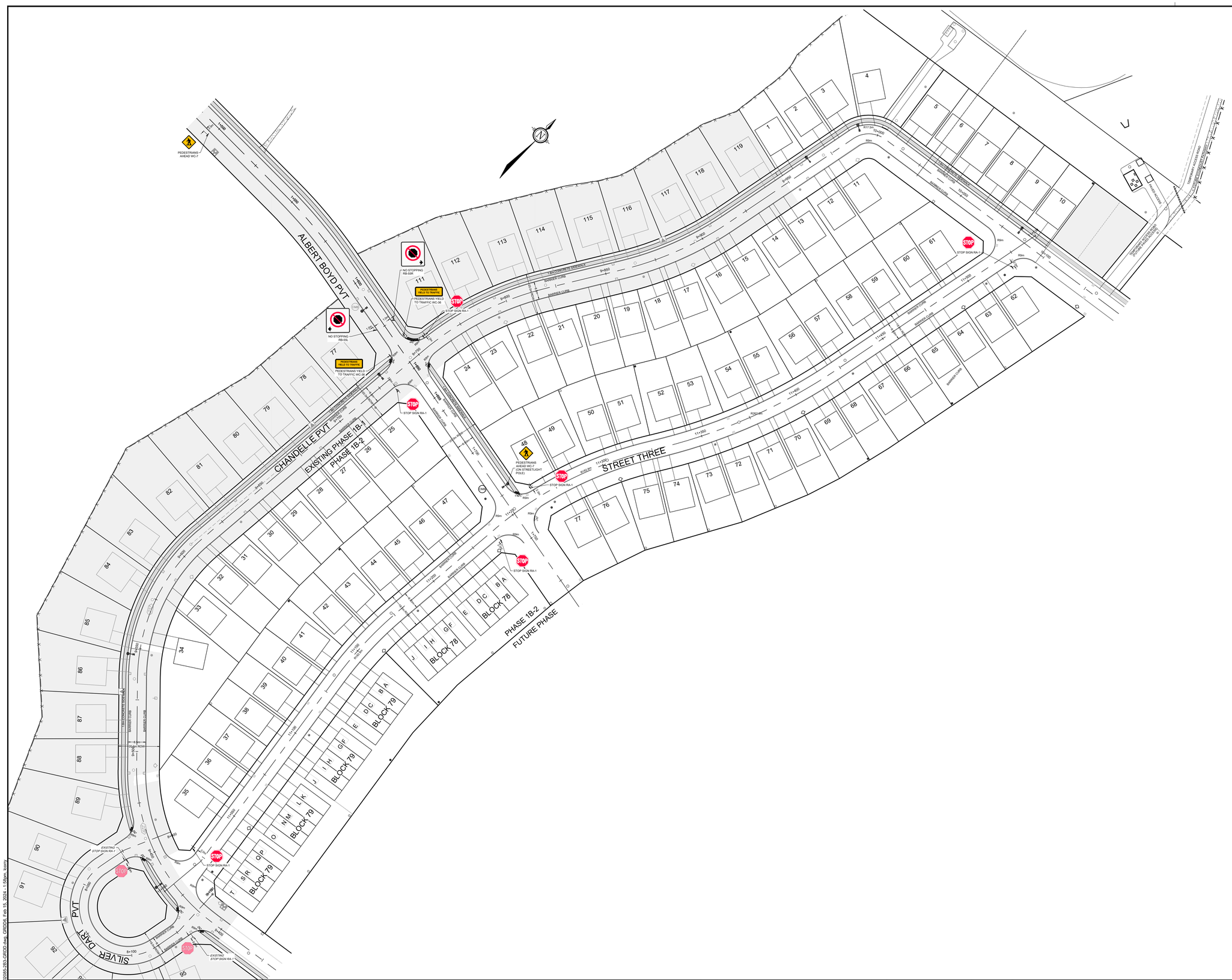
DESIGN
CHECKED
DRAWN
CHECKED
APPROVED

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
WEST CAPITAL AIRPARK - PHASE 2A RESIDENTIAL

CLEARFORD SBS^{TM} DETAIL SHEET

PROJECT No. 102085-03
REV REV # 9
DRAWING No. 102085-C2



LEGEND

▨	CONCRETE SIDEWALK
▨	STONEDUST PATH
⊸	SIGN AND POST LOCATION
▨	TACTILE WALKING SURFACE INDICATOR IN CONCRETE (AS PER CITY OF OTTAWA DETAIL SC7.3)
DC	DEPRESSED CURB
⊗	VALVE LOCATION
⌖	HYDRANT
◉	SANITARY SYSTEM ACCESS POINT
○	STORM MANHOLE
□	ROAD CATCHBASIN
▣	REARYARD CATCHBASIN
●	LANDSCAPE CATCHBASIN ELBOW
⊗—⌘	STREETLIGHT

NOTE:
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No.	REVISION	DATE	BY
1.	ISSUED FOR REVIEW	FEB 20/24	ARM

SCALE
1:750

1:750
0 10 20 30

DESIGN	AAR
CHECKED	ARM
DRAWN	AAR
CHECKED	ARM
APPROVED	SMG

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

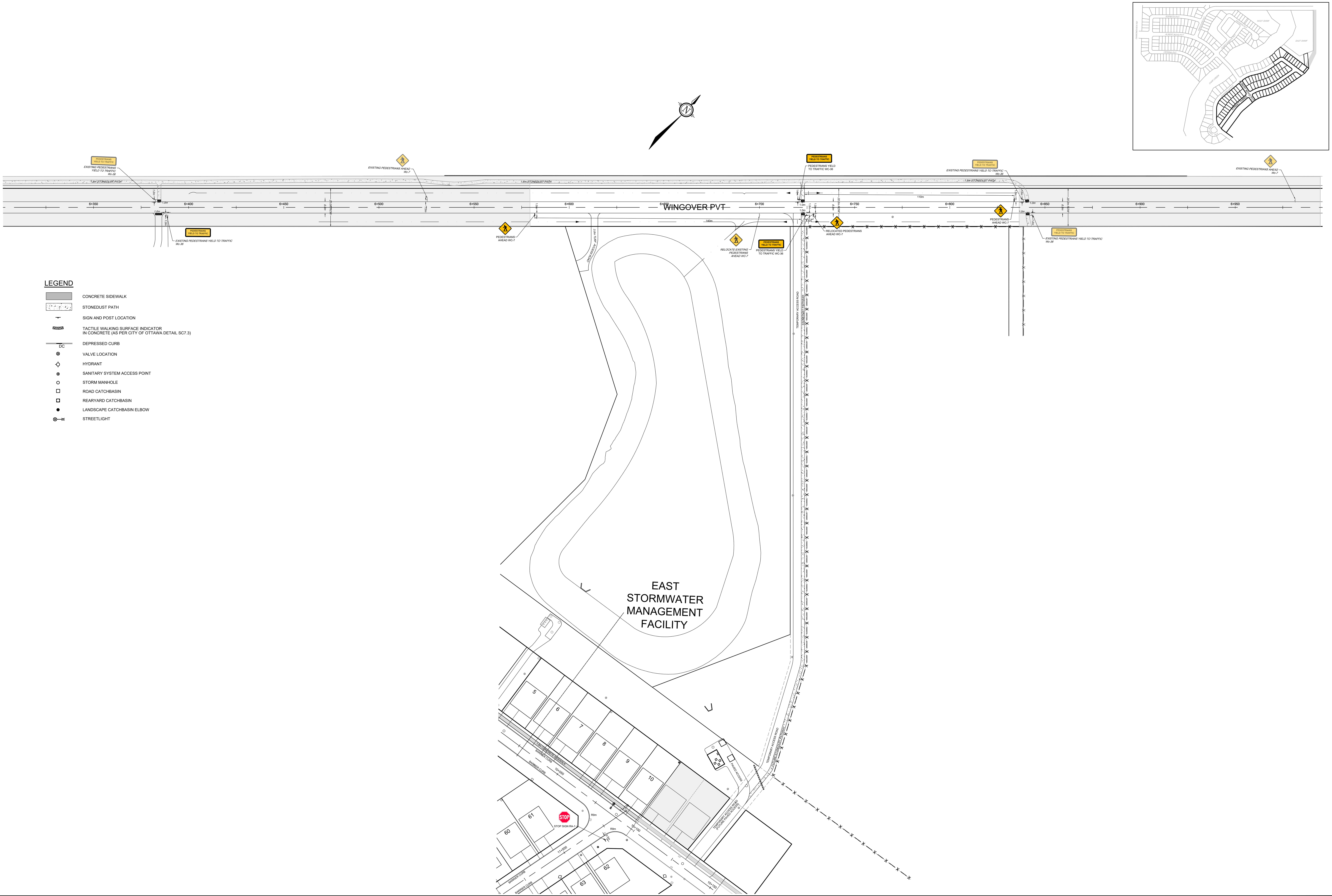
LOCATION
WEST CAPITAL AIRPARK
PHASE 1B-2 RESIDENTIAL

DRAWING NAME
PHASE 1B-2 RESIDENTIAL
GEOMETRIC ROAD
DESIGN DRAWING

PROJECT No. 102085
REV REV # 1
DRAWING No. 102085-GRDD6

PLANB1.DWG - 1000mmx707mm

M:\2002\102085\CAD_PHASES2B&3\Civil\102085-2B3-GRDD.dwg, GRDD6, Feb 15, 2024 - 1:58pm, lcorry



LEGEND

- CONCRETE SIDEWALK
- STONEDUST PATH
- SIGN AND POST LOCATION
- TACTILE WALKING SURFACE INDICATOR IN CONCRETE (AS PER CITY OF OTTAWA DETAIL SC7.3)
- DEPRESSED CURB
- VALVE LOCATION
- HYDRANT
- SANITARY SYSTEM ACCESS POINT
- STORM MANHOLE
- ROAD CATCHBASIN
- REARYARD CATCHBASIN
- LANDSCAPE CATCHBASIN ELBOW
- STREETLIGHT

NOTE:
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No.	REVISION	DATE	BY
1.	ISSUED FOR REVIEW	FEB 20/24	ARM

SCALE 1:750

DESIGN AAR
CHECKED ARM
DRAWN AAR
CHECKED ARM
APPROVED SMG

FOR REVIEW ONLY

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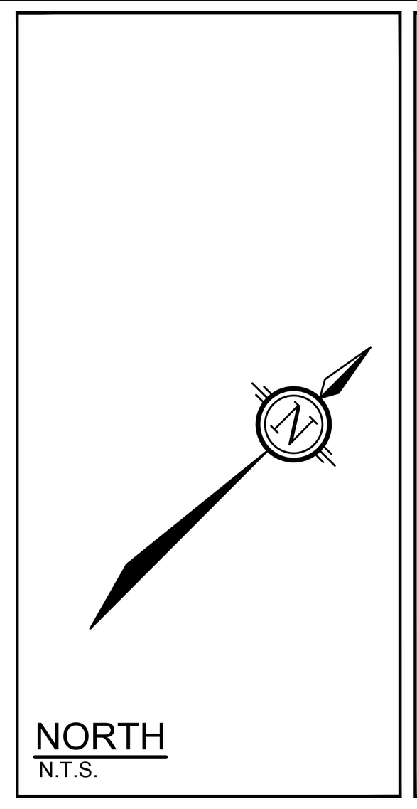
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

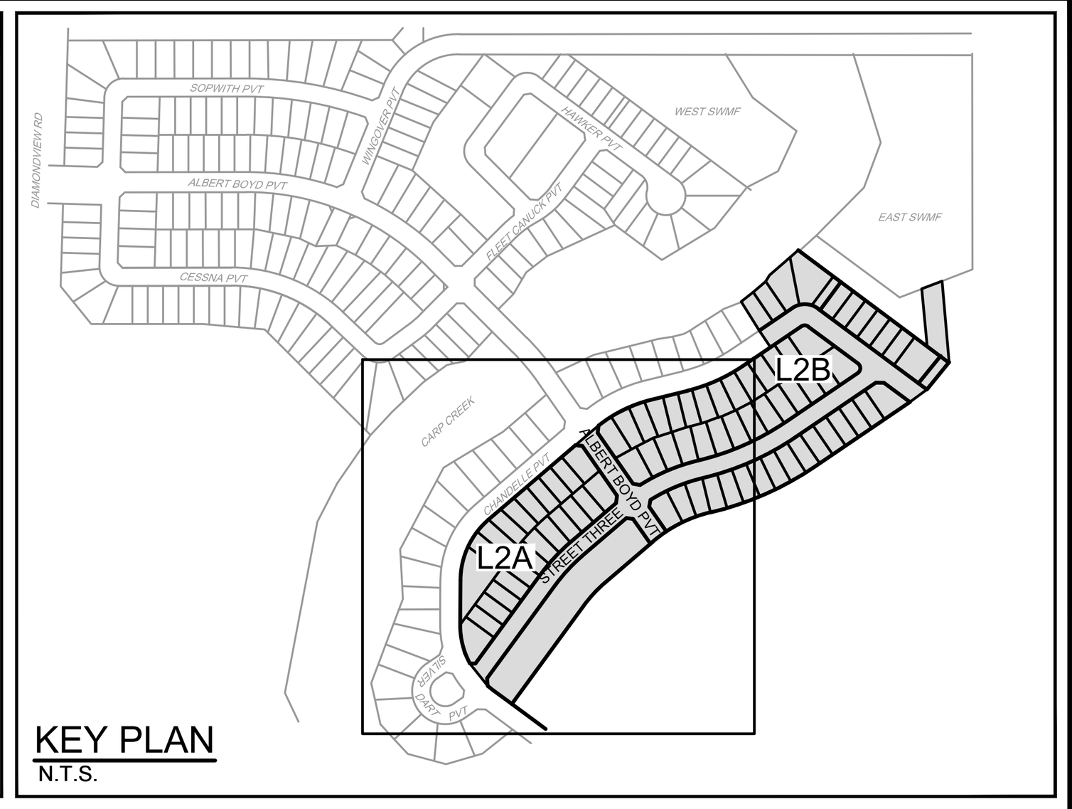
LOCATION
WEST CAPITAL AIRPARK
PHASE 1B-2 RESIDENTIAL

DRAWING NAME
PHASE 1B-2 RESIDENTIAL
GEOMETRIC ROAD
DESIGN DRAWING

PROJECT No. 102085
REV REV # 1
DRAWING No. 102085-GRDD7

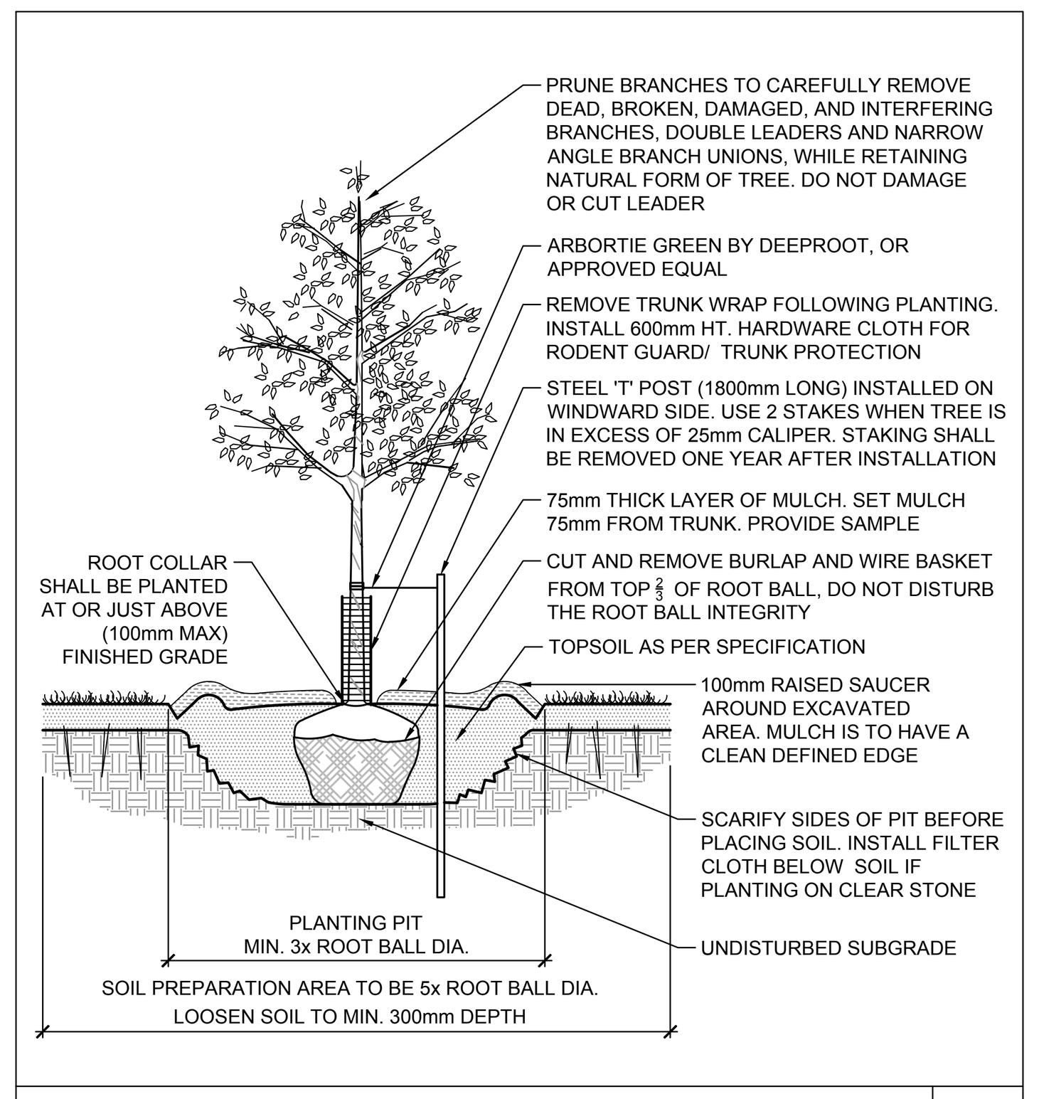
PLANB1.DWG - 1000mmx707mm



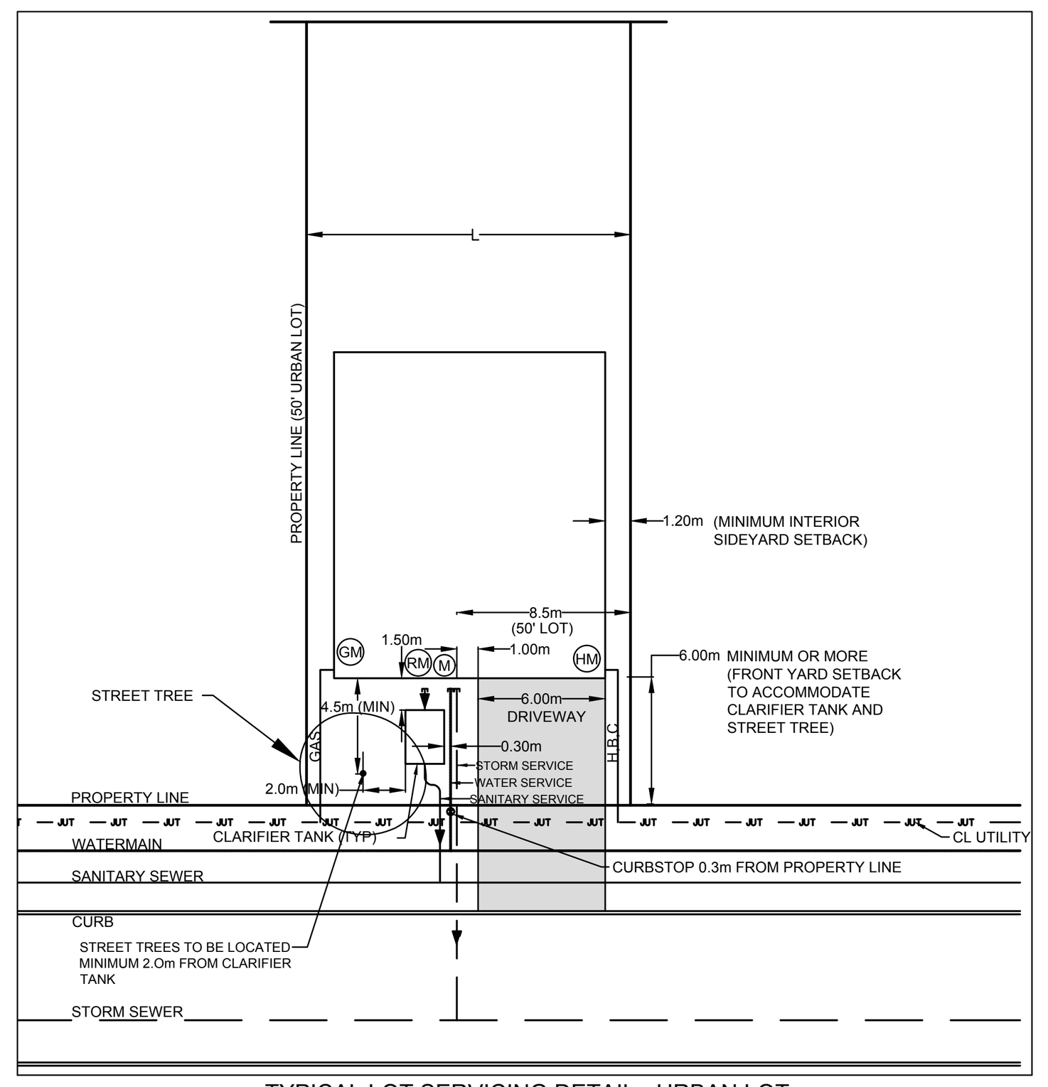


LANDSCAPE LEGEND:

- PROPOSED DECIDUOUS TREE
- KEY ## — SPECIES (SEE PLANT LIST); QUANTITY
- GEOTECHNICAL SOIL AREA DELINEATION



STANDARD DECIDUOUS TREE PLANTING — D1



TYPICAL LOT SERVICING DETAIL - URBAN LOT
N.T.S.

GENERAL

1. Read and interpret this drawing/ drawing set in conjunction with all the contract details and specifications, including related civil, utility, structural, architectural, mechanical, electrical, environmental, geotechnical, and survey information.
2. The Contractor is to determine the exact location, size, material, and elevation of all existing utilities prior to commencing construction. Protect and assume responsibility for all existing utilities regardless of being shown on the drawings.
3. It is essential to use the plans and details in conjunction with the specifications and notes.
4. Do not scale drawings. Work to dimensions only.
5. Protect all existing and retained vegetation for the duration of construction according to the contract details and specifications.
6. Reinstate all areas and items damaged or disturbed, beyond the Limit of Work, because of construction activities, including but not limited to construction staging areas, haul roads, stockpile areas, etc. to the satisfaction of the Consultant. Unless otherwise noted, Contractor is to reinstate all areas to pre-construction condition or better to the satisfaction of the Contract Administrator.

PLANTING

1. Plant material to be No. 1 Grade and is to comply with Canadian Standards for Nursery Stock (latest edition) published by the Canadian Nursery Landscape Association.
2. Use structurally sound plant material with strong fibrous root system free of disease, defects, and injuries. Use trees with straight trunks, well and characteristically branched for species. Obtain approval from consultant of plant material at source prior to digging. All trees and shrubs to be container grown, potted, W/B or B/B, as indicated on Plant List. Bare root plants are only acceptable for certain species and as approved by the Landscape Architect.
3. Plant material substitutions are not be permitted without the written approval from the Consultant, **with 48 hours notice**, prior to shipping plant material.
4. Plant locations are schematic / approximate only. **Contractor is to stake out locations on site for approval by the Landscape Architect prior to installation.**
5. The illustrated number of plants shown in the Planting Plan supersedes the estimated number in the Plant List. Contractor to report any discrepancies to the Landscape Architect prior to installation. Contractor will assume full responsibility if the Landscape Architect is not notified.
6. Ensure trees are thoroughly watered following planting. Monitor material and ensure adequate moisture until acceptance.
7. In heavy clay or poorly drained soils, set root ball with root collar 75-100mm higher than finished grade.
8. Approved topsoil depths are as follows:
   a. Plant Beds - **450mm** continuous depth. Applies to shrubs, perennials, vines, and groundcovers.
   b. Sod/ Seed Areas - **100mm** depth.
   c. Reforestation - **300mm** depth.
9. Sod to be No. 1 Kentucky Bluegrass Sod grown from minimum mixture of 3 Kentucky Bluegrass cultivars. Quality and source are to comply with Canadian Standards for Nursery Stock, Section 17, (latest edition) published by the Canadian Nursery Landscape Nursery Landscape Association.
10. Apply the following mineral fertilizer unless soil tests show other requirements:
   a. Plant Beds - (8-32-16), i.e. 8% Nitrogen, 32% Phosphorus, 16% Potash per manufacturer specifications.
   b. Sod Areas - (8-32-16), i.e. 8% Nitrogen, 32% Phosphorus, 16% Potash at a rate of 350kg/ha.
12. Where applicable, for any plant areas with a mix of species/ cultivars notes, Contractor is to cluster like plants in groups of 3-5 and evenly distribute these in the noted area.

GEOTECHNICAL INFORMATION

For the trees proposed on this plan,
AREA 1 Tree Planting Setback of 4.5 m from building foundation as per Section 6.9 of the Geotechnical Report.
AREA 2 - No Tree Planting Restrictions - per Section 6.9 of the Geotechnical Report.
Trees are to be as specified.
This set of landscape plans have been developed as per the Geotechnical Investigation Carp Airport Servicing and Residential Development - Phase 1, (Carp) Ottawa, Ontario January 16, 2023. Prepared by Paterson Group, and the Tree Planting Setback Plan, Dwg. No. PG2450-4, November 2022.

NOTE:
Street trees for the front yards of lots 5, 6 and 7 have not been provided and there are limitations for the side/rear yards of lots 48 and 61. They do not meet the minimum requirement as set out in 6.9 Landscaping Consideration, Tree Planting Restrictions (- The underside of footing (USF) is 2.1m or greater) outlined in the Geotechnical Investigation Carp Airport Servicing and Residential Development - Phase 1, (Carp) Ottawa, Ontario January 16, 2023. Prepared by Paterson Group.

PLANT LIST

102085 - West Capital Airpark - Phase 1B-2 - L2A - Plant List

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	MATURE SIZE	COND	SPACING
Deciduous Trees							
AR	4	*Acer rubrum*	Red Maple	50mm Cal	20m ht. x 12m spd.	WB	As Shown
ARC	3	*Acer rubrum 'Scarsen'*	Scarlet Sentinel Red Maple	50mm Cal	14m ht. x 8m spd.	WB	As Shown
AFCM	3	*Acer x freemanii 'Celzam'*	Celebration Maple	50mm Cal	14m ht. x 8m spd.	WB	As Shown
CEL	3	*Celtis occidentalis*	Hackberry	50mm Cal	18m ht. x 17m spd.	WB	As Shown
CCO	8	*Corylus colurna*	Turkish Hazelnut	50mm Cal	15m ht. x 8m spd.	WB	As Shown
GBP	6	*Ginkgo biloba 'Princeton Sentry'*	Princeton Sentry Gingko	50mm Cal	15m ht. x 8m spd.	WB	As Shown
QXA	6	*Quercus x alba x robur 'Streetspire' (JFS-KW1QX)*	Streetspire Oak	50mm Cal	14m ht. x 5m spd.	WB	As Shown
UNH	6	*Ulmus japonica x pumila 'New Horizon'*	New Horizon Elm	50mm Cal	13m ht. x 8m spd.	WB	As Shown

NOTE:
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WEST CAPITAL Developments

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
1.	ISSUED FOR REVIEW	FEB 23/24	RGJ

SCALE 1:500

DESIGN MEL · CHECKED RGJ · DRAWN MEL · CHECKED RGJ · APPROVED RGJ

FOR REVIEW ONLY

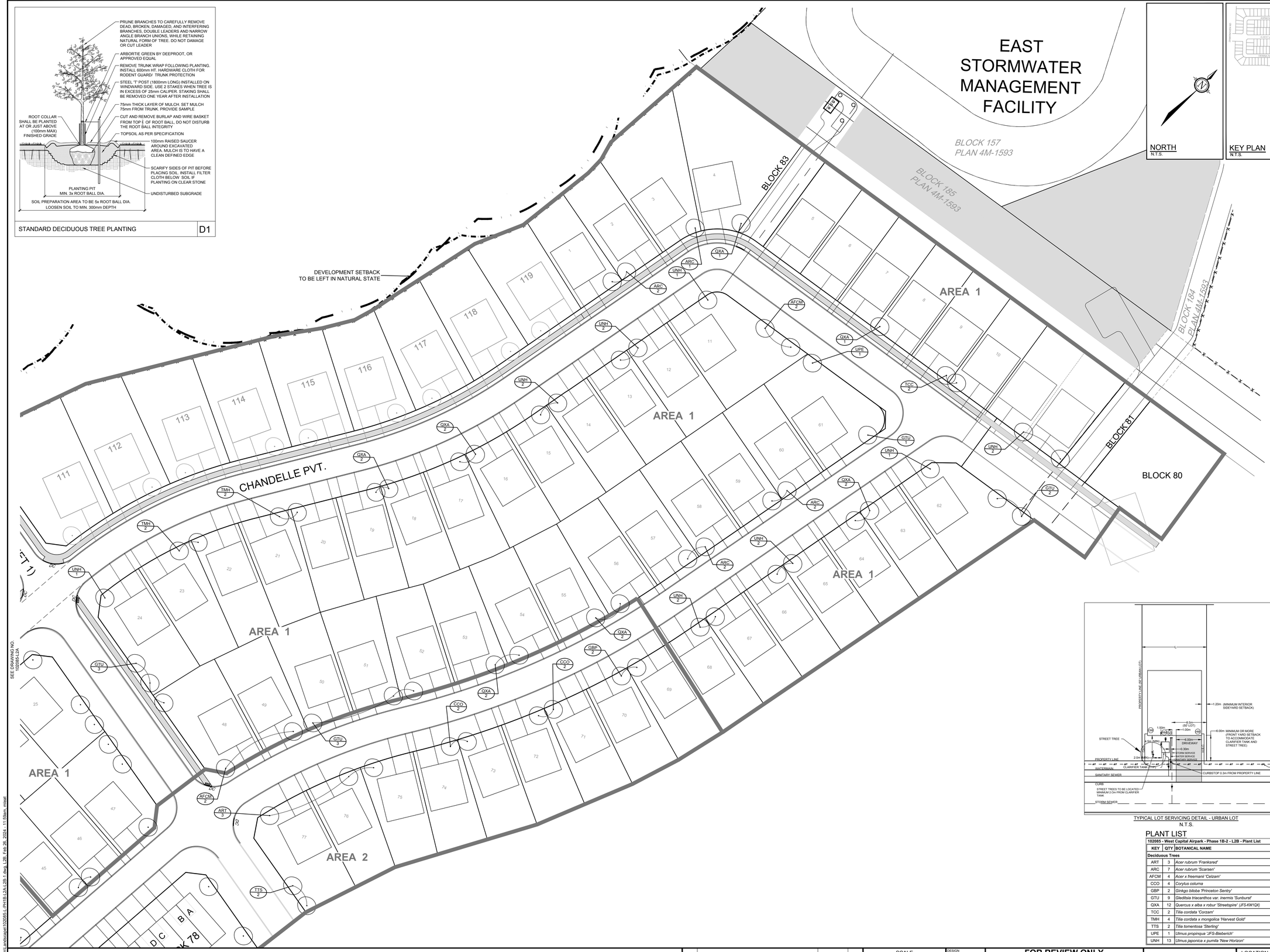
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY of OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
LANDSCAPE PLAN - PHASE 1B-2

PROJECT No. 102085-22
REV #1
DRAWING No. 102085-L2A

STANDARD DECIDUOUS TREE PLANTING D1



LANDSCAPE LEGEND:

- PROPOSED DECIDUOUS TREE
- KEY ## — SPECIES (SEE PLANT LIST); QUANTITY
- GEOTECHNICAL SOIL AREA DELINEATION

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GEOTECHNICAL INFORMATION

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January 16, 2023. Prepared by Paterson Group, and the Tree Planting Setback Plan, Dwg. No. PG2450-4, November 2022.

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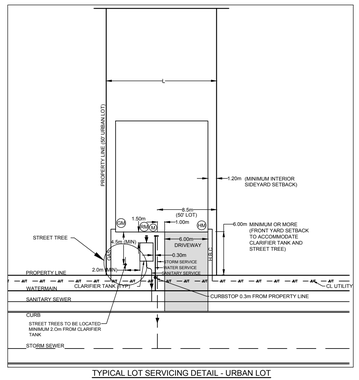

TYPICAL LOT SERVICING DETAIL - URBAN LOT
N.T.S.

PLANT LIST

102085 - West Capital Airpark - Phase 1B-2 - L2B - Plant List

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	MATURE SIZE	COND	SPACING
Deciduous Trees							
ART	3	*Acer rubrum 'Franksred'*	Red Sunset Red Maple	50mm Cal	15m ht. x 12m spd.	WB	As Shown
ARC	7	*Acer rubrum 'Scarsen'*	Scarlet Sentinel Red Maple	50mm Cal	14m ht. x 8m spd.	WB	As Shown
AFCM	4	*Acer x freemanii 'Celzam'*	Celebration Maple	50mm Cal	14m ht. x 8m spd.	WB	As Shown
CCO	4	*Corylus columa*	Turkish Hazelnut	50mm Cal	15m ht. x 8m spd.	WB	As Shown
GBP	2	*Ginkgo biloba 'Princeton Sentry'*	Princeton Sentry Gingko	50mm Cal	15m ht. x 8m spd.	WB	As Shown
GTU	9	*Gleditsia triacanthos var. inermis 'Sunburst'*	Sunburst Honeylocust	50mm Cal	12m ht. x 12m spd.	WB	As Shown
QXA	12	*Quercus x alba x robur 'Streetspire' (JFS-KW1QX)*	Streetspire Oak	50mm Cal	14m ht. x 5m spd.	WB	As Shown
TCC	2	*Tilia cordata 'Corzam'*	Corinthian Linden	50mm Cal	12m ht. x 5m spd.	WB	As Shown
TMH	4	*Tilia cordata x mongolica 'Harvest Gold'*	Harvest Gold Linden	50mm Cal	13m ht. x 10m spd.	WB	As Shown
TTS	2	*Tilia tomentosa 'Sterling'*	Sterling Silver Linden	50mm Cal	15m ht. x 10m spd.	WB	As Shown
UPE	1	*Ulmus propinqua 'JFS-Bieberich'*	Emerald Sunshine Elm	50mm Cal	11m ht. x 8m spd.	WB	As Shown
UNH	13	*Ulmus japonica x pumila 'New Horizon'*	New Horizon Elm	50mm Cal	13m ht. x 8m spd.	WB	As Shown

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THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

WEST CAPITAL Developments

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
1.	ISSUED FOR REVIEW	FEB 23/24	RGJ

SCALE 1:500

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DESIGN MEL
CHECKED RGJ
DRAWN MEL
CHECKED RGJ
APPROVED RGJ

FOR REVIEW ONLY

ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO — PAUL G. JAKES — FEB 23/24 — MEMBER

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LOCATION
CITY of OTTAWA
WEST CAPITAL AIRPARK

DRAWING NAME
LANDSCAPE PLAN - PHASE 1B-2

PROJECT No. 102085-22
REV REV #1
DRAWING No. 102085-L2B

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