Prologis Meadowvale DC4/DC5 & Data Centre

Functional Servicing & SWM Report

Project Location:
7700 Tenth Line West, Mississauga, ON (Data Centre)
0 Argentia Road, Mississauga, ON (DC4/DC5)

Prepared for:
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MTE File No.: 60549_001

Engineers, Scientists, Surveyors.

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1.0 Introduction

1.1 Overview

MTE Consultants Inc. were retained by Petroff Partnership Architects to complete a functional servicing and stormwater management report for a proposed industrial development consisting of two (2) large industrial buildings (DC4 & DC5) along with a Data Centre and Substation, located respectively at 0 Argentia Road and 7700 Tenth Line West in Mississauga, Ontario (see Figure 1 for location plan). The proponent plans to sever the Data Centre and Substation from the industrial buildings and merge the industrial buildings with the existing industrial development to the south of the site.

The site is bound by Highway 401 to the northwest, Tenth Line West to the northeast, an existing industrial distribution centre to the southeast, and a landscaped area to the southwest. The proposed development has a total area of 16.17 ha. Under existing conditions, the site consists of a vegetated field previously used for agricultural purposes.

The proponent plans to develop directly on the previously used agricultural land, removing any existing vegetation.

This report will outline a functional grading, servicing and stormwater management strategy for the proposed development in support Site Plan Approval. Please refer to MTE Drawings along with the site plan prepared by Petroff Partnership Architects for more details.

1.2 Background Information

The following documents were referenced in the preparation of this report:

Ref. 1: *Stormwater Management Practices Planning and Design Manual* (Ministry of Environment, March 2003).

Ref. 2: *Erosion & Sediment Control Guideline for Urban Construction* (December, 2006).

Ref. 3: *Design Guidelines for Drinking-Water Systems*, Ministry of the Environment and Climate Change (2008).

Ref. 4: *Design Guidelines for Sewage Works*, Ministry of the Environment and Climate Change (2008).

Ref. 5: *Low Impact Development Stormwater Management Planning and Design Guideline, Credit Valley Conservation & Toronto and Region Conservation for the Living City, Version 1.0* (2010).

Ref. 6: *Region of Peel Public Works Design, Specifications & Procedures Manual Linear Infrastructure* (June 2010)

Ref. 7: *Region of Peel Watermain Design Criteria* (June 2010)

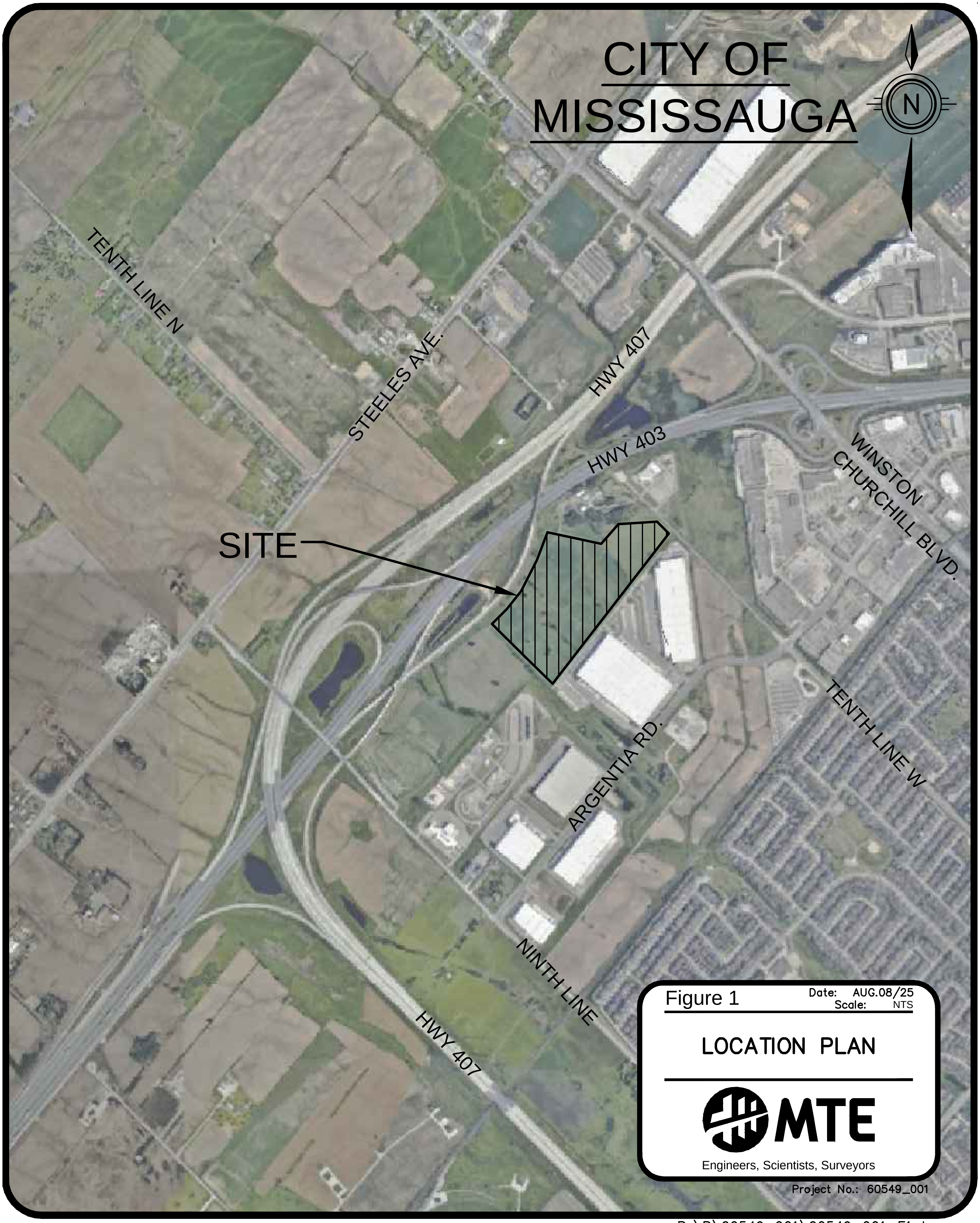
Ref. 8: *Ontario Building Code* (2020).

Ref. 9: *Water Supply for Public Fire Protection*, Fire Underwriters Survey (2020).

Ref. 10: *Region of Peel Development Charges Background Study* (September 2020)

Ref. 11: *City of Mississauga Transportation and Works Development Requirements Manual* (November 2021)

Ref. 12: *Region of Peel Linear Wastewater Standards* (November 2022)



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1.3 Geotechnical Investigation

A geotechnical investigation was completed by Pinchin Ltd., dated October 30, 2024 and thirty (30) boreholes were advanced throughout the site, along with the installation of two (2) groundwater monitoring wells within the boreholes. Soil conditions encountered at the site generally consisted of topsoil, with a layer of sandy silt, and glacial till deposits comprised of silty clay or sandy silt and clay.

The topsoil layer encountered typically ranged in thickness from 100mm to 300mm. Underlying the topsoil, sandy silt was encountered up to 0.8 metres in depth. The native soils below consisted of silty clay to sandy silty clay till between 4.2m and 6.7m depth.

Groundwater levels were measured upon completion of drilling and generally ranged from 5.0m to 6.7m below the existing ground surface. Groundwater levels were not yet measured from the monitoring wells for this investigation at the time of this report. Refer to the Geotechnical Investigation by Pinchin in Appendix D for additional details.

1.4 Hydrogeological Investigation

A preliminary hydrogeological investigation was completed by MTE Consultants Inc., dated September 23, 2025. Based on manual measurements collected, groundwater elevations at the site range from 209.5 to 207.3 mAMSL (2.7m to 5.4 m BGS). Additionally, grain size analysis was conducted to provide preliminary infiltration rate estimates ranging from 10mm/hr to 30mm/hr.

Subsequent to the preliminary hydrogeological investigation, Insitu infiltration testing was completed on November 26, 2025 at two (2) locations onsite. Results indicate that at a test depth of approximately 208.8 to 208.6 mAMSL, the corresponding unfactored infiltration rate ranges from 51 to 82 mm/hr. Refer to Appendix D for additional details.

2.0 Stormwater Management

The following sections will describe the proposed stormwater management (SWM) plan for the site.

2.1 Stormwater Management Criteria

As provided by the City of Mississauga, the following stormwater management (SWM) criteria will be applied to the site:

- **Quantity Control:** Attenuation of the proposed conditions 2-year to 100-year peak flows to Tenth Line for the City of Mississauga design storm events to the existing levels for all storms.
  As per the Meadowvale Business Park District Stormwater Management Report by AECOM, the site in the proposed conditions will be controlled to a maximum allowable flow of 1.3 m^3/s to the Lisgar Channel Southeast of the Development.

- **Quality Control:** An enhanced (Level 1) water quality treatment (80% TSS Removal) is required for all impacted surface runoff prior to discharging to the receiving system.

- **Water Balance:** 5mm of rainfall to be retained on-site through infiltration (maximum 72-hour drawdown), re-use or evapotranspiration. The total volume to be retained is calculated as impervious site area multiplied by 5 mm.

2.2 Existing Conditions

Under existing conditions, the site is entirely landscaped with sporadic vegetation and is currently unoccupied. There is an existing 825mm diameter storm sewer flowing southeast at 0.3% in the southwest corner of the site, which connects to a downstream SWM Facility. Existing catchbasins along the southeast property line capture storm runoff, meanwhile stormwater that flows northwest is captured by a drainage swale parallel to the Tenth Line ROW. There also exists a steep embankment along the southwest property line in which connects to the Lisgar Channel. The site currently slopes from east to west with a berm at the northwest portion of the site discharging storm runoff northeast.

There are no known stormwater management quantity or quality control existing on the site.

The existing site can be delineated by two (2) sub-catchment areas. Table 2.1 provides a brief description of the sub-catchment areas as well as their size and impervious cover. Figure 2 provides an illustration of the existing conditions catchment areas.

Table 2.1 – Existing Conditions Catchment Area

Catchment ID	Catchment Description	Area (ha)	Runoff Coefficient 'C'
101	Existing Drainage to Lisgar Channel	12.15	0.25
102	Existing Drainage to Tenth Line Swale	4.02	0.25
	Total	**16.17**	**0.25**

The allowable release rate for the proposed development is governed by the AECOM Stormwater Management Report for the Meadowvale Business Park District – Phase 1 (May, 2012) which allocated an allowable release rate for the site of 1.3 m^3/s. Refer to Appendix D for the AECOM SWM Report.

For discharge directed to the drainage swale at the northeast of the site, the allowable release rate must also be attenuated such that the 2 to 100-year pre-development peak flow rates are not exceeded. The allowable release rates for discharge directed towards the Tenth Line swale were assessed using the SWMHYMO hydrologic modelling program developed by J.F. Sabourin & Associates for the 2 to 100-year City of Mississauga 24-hour SCS Type II design storm distribution. Appendix A contains detailed hydrologic modelling parameters and input/output printouts for the existing conditions.

Table 2.2 – Allowable Site Discharge to Tenth Line Swale (Catchment 102)

Storm Event	Allowable Peak Discharge Rate (m^3/s) [A]
2-Year	0.099
5-Year	0.184
10-Year	0.274
25-Year	0.354
50-Year	0.431
100-Year	0.516
[A] Discharge rate taken from SWMHYMO Output (see Appendix A)	

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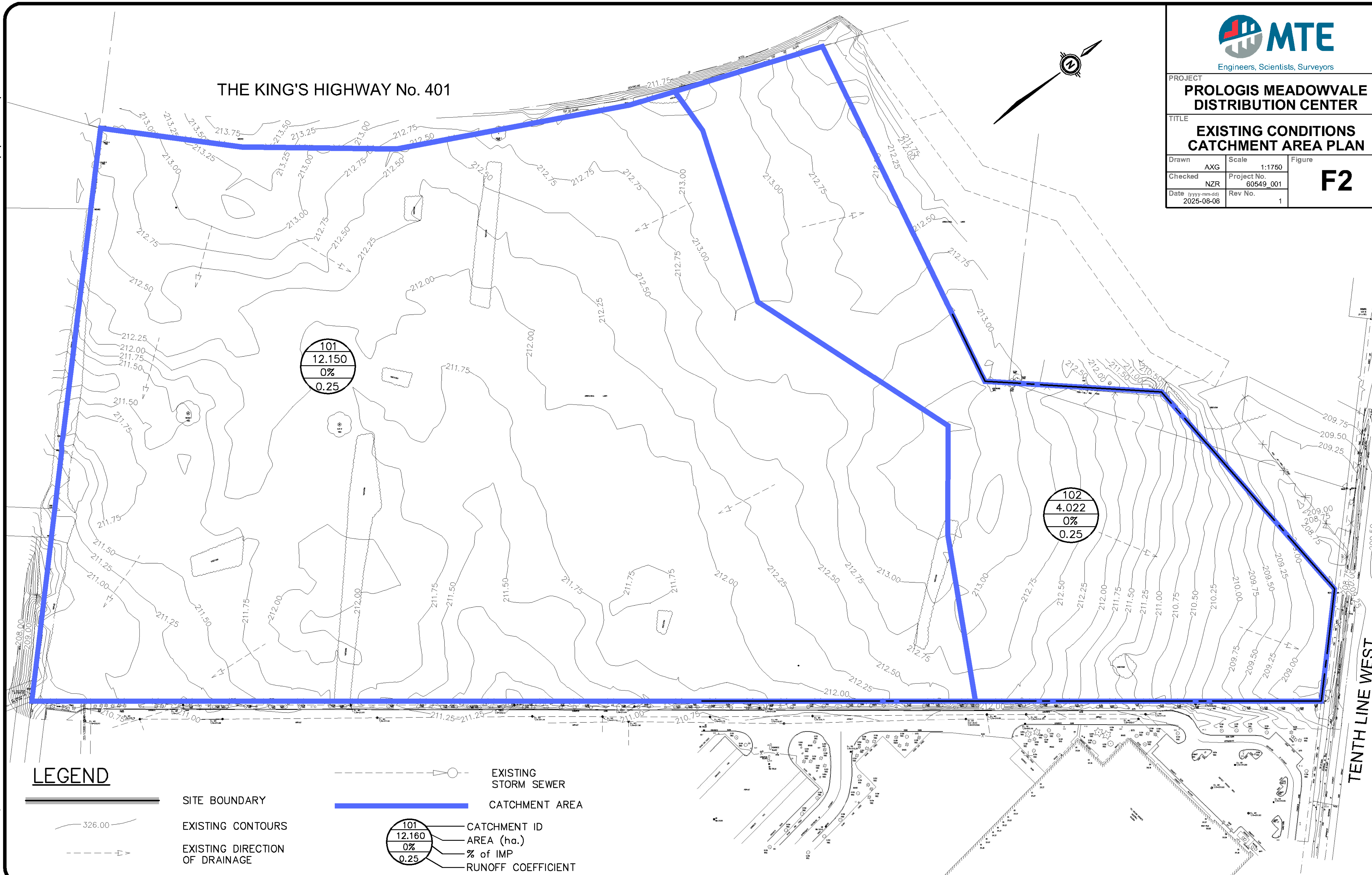

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PROJECT
PROLOGIS MEADOWVALE DISTRIBUTION CENTER

TITLE
EXISTING CONDITIONS CATCHMENT AREA PLAN

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2.3 Proposed Conditions

The proposed development for the site will consist of two 1-storey industrial buildings and a 2-storey data centre, complete with asphalt parking, driveways, walkways, landscaped areas, and loading docks. No underground levels are proposed. The proponent plans to sever the site, with the two industrial buildings merging with the lands to the south, and the Data Centre lands being independent.

The proposed drainage pattern under post-development conditions is delineated by six (6) sub-catchment areas. Stormwater runoff from the site will be collected by newly proposed storm sewer networks and will convey flows to various outlet locations across the site.

A significant portion of the stormwater generated from the areas surrounding the distribution centres will be captured via catch basins and routed to a 400mm diameter orifice tube located at the southern property line. This flow will be attenuated in a quantity control stormwater management (SWM) tank wrapped in an impermeable liner, with additional storage volume provided by the pipes and structures within the storm sewer network.

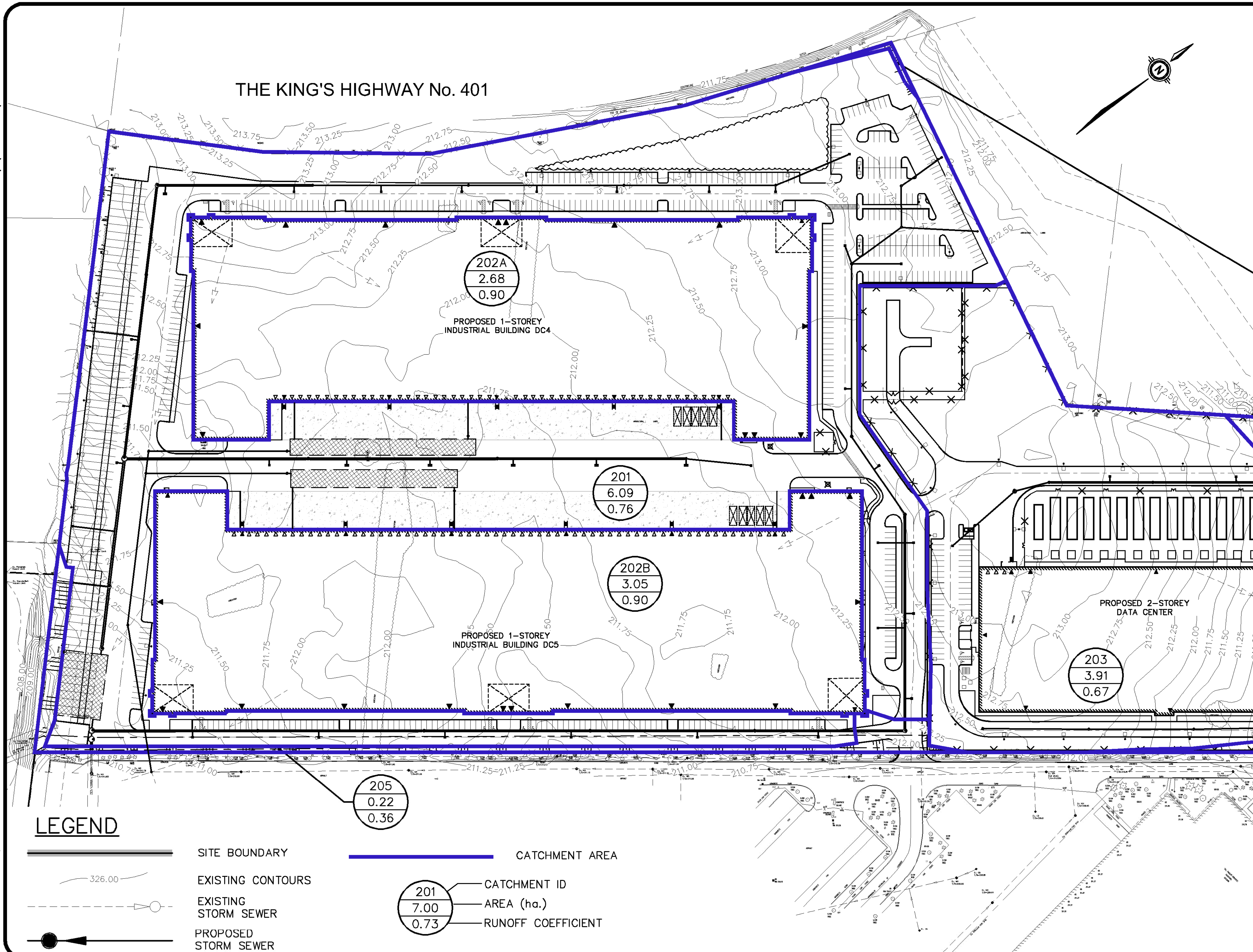
Roof runoff from Distribution Centre’s 4 and 5 (DC4 and DC5) will be directed to flow control roof drains (FCRDs), then conveyed to underground infiltration tanks. After temporary storage and infiltration, excess flow will be discharged to the SWM facility bypass storm network located south of the site.

Stormwater collected from the Data Center and its immediate surroundings will be conveyed to a dry pond located at the southeast corner of the site. This facility will attenuate stormwater via an orifice-controlled outlet pipe, ultimately discharging to the Tenth Line swale. The swale discharge will act as a temporary solution, and flow rates from the dry pond are to be redirected to the future municipal storm sewer once it becomes available along Tenth Line.

Due to grading constraints, portions of the perimeter area along the property line will drain uncontrolled towards the adjacent rights-of-way (ROWs). Table 2.3 provides a brief description of each catchment area as well as the size and impervious cover associated with each. Figure 3 provides an illustration of the post-development catchment areas. Detailed information pertaining to the stormwater management model can be found in Appendix A.

Table 2.3 - Proposed Conditions Catchment Areas

Catchment ID	Catchment Description	Area (ha)	Imperviousness (%)	Perv. CN
201	Site Drainage to SWM Facility SE of Site	6.09	78%	0.76
202A	Distribution Centre 4 Roof (controlled)	2.68	100%	0.90
202B	Distribution Centre 5 Roof (controlled)	3.05	100%	0.90
203	Site Drainage to Tenth Line Swale (controlled)	3.91	65%	0.67
204	Perimeter Discharge to Tenth Line Swale (uncontrolled)	0.21	0%	0.25
205	Uncontrolled Perimeter Discharge to Lisgar Channel (uncontrolled)	0.22	17%	0.36
	Total	**16.17**		



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PROJECT
PROLOGIS MEADOWVALE DISTRIBUTION CENTER

TITLE
PROPOSED CONDITIONS CATCHMENT AREA PLAN

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2.3.1 Water Quantity Control

As described above, stormwater management quantity control for the site will be provided using a total of three underground storm tanks, orifice controls, a dry pond, pipes and structures volume, and rooftop FCRDs for both industrial buildings. The following tables summarize the stage-storage discharge characteristics for the underground storm tanks, dry pond, and rooftop FCRDs.

The proposed conditions were assessed using the SWMHYMO hydrologic modelling program developed by J.F. Sabourin & Associates for the 2 to 100-year City of Mississauga 24-hour SCS Type II design storm distribution. Appendix A contains detailed hydrologic modelling parameters and input/output printouts for the proposed conditions.

2.3.1.1. Discharge to SWM Facility Southeast of Development

Table 2.4 - Stage-Storage Discharge Calculations for Proposed Storm Quantity Control Tank + Pipes & Structures (Catchment 201)

Stage (m)	Head (m)	Storage Volume (m^3)[A]	Discharge, Q (m^3/s)[A B]	Remarks
207.70	0.000	0.00	0.0000	Orifice Invert
207.72	0.000	0.00	0.0000	Tank outlet Invert
210.08	2.180	2011.26	0.6575	Top of Tank
210.38	2.480	2153.17	0.7013	Top of Stone
210.75	2.850	2229.56	0.7517	Top of All Pipes

[A] Refer to Appendix A for detailed volume and discharge calculations.
[B] Discharge based on Orifice Discharge Equation with 400mm orifice size.

2.3.1.2. SWM Facility Bypass Network to Lisgar Channel

Table 2.5 - Stage-Storage Discharge Calculations for Proposed DC4 FCRDs (Catchment 202A)

Depth (m)	Storage Volume (m^3) [A]	Discharge, Q (m^3/s)[B]	Comments
0.000	0.00	0.0000	Building Roof
0.126	1689.80	0.1026	Maximum of 126mm of ponding proposed

[A] Refer to Appendix A for detailed volume calculations. Roof slope assumed to be 1%.
[B] Peak discharge provided by Mechanical Engineer (Hammerschlag & Joffe Inc.) based on ***55 roof drains.*** Note that these FCRDs are to have **one (1) notch each**. (See Appendix A)

Table 2.6 - Stage-Storage Discharge Calculations for Proposed DC5 FCRDs (Catchment 202B)

Depth (m)	Storage Volume (m^3) [A]	Discharge, Q (m^3/s)[B]	Comments
0.000	0.00	0.000	Building Roof
0.125	1906.40	0.1078	Maximum of 125mm of ponding proposed

[A] Refer to Appendix A for detailed volume calculations. Roof slope assumed to be 1%.
[B] Peak discharge provided by Mechanical Engineer (Hammerschlag & Joffe Inc.) based on ***63 roof drains.*** Note that these FCRDs are to have **one (1) notch each**. (See Appendix A)

2.3.1.3. Drainage to Tenth Line Swale

Table 2.7 - Stage-Storage Discharge Calculations for Proposed Dry Pond (Catchment 203)

Stage (m)	Storage Volume (m^3)[A]	Orifice 1 Discharge (m^3/s) [B]	Orifice 2 Discharge (m^3/s) [C]	Total Discharge (m^3/s) [D]	Remarks
208.40	0	0.0000	-	0.0000	Invert of Orifice 1 & Bottom of Pond
208.48	45	0.0000	-	0.0000	Centerline of Orifice 1
209.18	607	0.0524	0.0000	0.0524	Centerline of Orifice 2
209.65	1109	0.0679	0.3884	0.4563	
209.78	1263	0.0715	0.4384	0.5099	Top of Pond

[A] Refer to Appendix A for detailed volume and discharge calculations.
[B] From orifice equation $Q = CA(2gH)^{0.5}$ for a **150mm** diameter orifice tube **[invert = 208.40]**
Where: C = 0.80, A = cross sectional area, g = 9.81, H = pressure head
[C] From orifice equation $Q = CA(2gH)^{0.5}$ for a **450mm** diameter orifice tube **[invert = 208.95]**
Where: C = 0.80, A = cross sectional area, g = 9.81, H = pressure head
[D] Total Discharge = Orifice 1 Flow + Orifice 2 Flow

Table 2.8 and 2.9 summarizes the existing and proposed conditions peak flow rates from the site. Refer to Appendix A for detailed calculations.

Table 2.8 - Proposed vs Allowable Peak Flow Rate (To Lisgar Channel)

100-Year Site Allowable Release Rate(m^3/s) [A]	Proposed Conditions 100-Year Peak Discharge Rates (m^3/s) [B]			
	Catchment 201 (controlled to SWM Facility Downstream) (m^3/s)	Catchment 202 (controlled to SWM Facility Bypass) (m^3/s)	Catchment 205 (uncontrolled) (m^3/s)	Total Proposed (m^3/s)
1.300	0.641	0.162	0.045	**0.848**

[A] Per AECOM Stormwater Management Report for the Meadowvale Business Park District – Phase 1 (May, 2012)
[B] Refer to Appendix A for detailed calculations.

Table 2.9 – Proposed vs Existing Peak Flow Rate (To Tenth Line)

Storm Event	Allowable Peak Discharge Rate to Tenth Line (m^3/s) [A]	Proposed Peak Discharge Rate to Tenth Line (Catchment 203 + 204) [A]
2-Year	0.099	0.053
5-Year	0.184	0.157
10-Year	0.274	0.259
25-Year	0.354	0.351
50-Year	0.431	0.430
100-Year	0.516	0.494
[A] Discharge rate taken from SWMHYMO Output (see Appendix A)		

2.3.1.4. Quantity Control Summary

The analysis indicates the following:

- The total proposed 100-year peak discharge rate for the site does not exceed the allowable release rate as illustrated in Table 2.8.
- For the 2-year to 100-year events, the total proposed conditions peak discharge rate discharging to Tenth Line from the site does not exceed the allowable release rate as illustrated in Table 2.9. This satisfies the stormwater management quantity control requirement set by the City of Mississauga.
- Sufficient storage volume is provided on the distribution center rooftops as well as within the storm tanks, dry pond, and pipes and structures volume to contain the stormwater as illustrated above and in Appendix A.
- The maximum roof release rates of 102.6 L/s for DC4, and 107.8 L/s for DC5 are less than the allowable roof release rates of 112.64 L/s (for DC4) and 128.11 L/s (for DC5).

2.3.2 Water Quality Control

As mentioned above, Level 1 (Enhanced) water quality treatment (80% TSS removal) is required for the site. Due to the nature of the development being mostly impervious and the constraints with regards to groundwater levels and grading, there are limited opportunities to provide water quality controls via low impact development surface and underground features.

Therefore, stormwater quality control for the site will be provided via three Stormceptor (or approved equivalent) oil/grit separator (OGS) units. One OGS unit (OGS1) will treat runoff from the area surrounding the distribution centers, the second OGS unit (OGS2) will treat runoff from the northwest Data Centre driveway, and the third OGS unit (OGS3) will treat runoff from the southeast Data Centre driveway. As mentioned previously, drainage from the building roofs will bypass the OGS units as the clean water from the building roofs do not require treatment (Refer to MTE Drawing C2.2 for details). The following catchment parameters were used to size the oil/grit separator devices:

<u>Catchment 201 – Distribution Centre Driveway Area</u>

- Catchment Area = 6.09 ha
- Impervious Percentage = 78%
- Particle Distribution = CA ETV

Catchment 203 – Northwest Data Center Driveway

- Catchment Area = 2.30 ha
- Impervious Percentage = 48%
- Particle Distribution = CA ETV
-

Catchment 203 – Southeast Data Center Driveway

- Catchment Area = 0.40 ha
- Impervious Percentage = 56%
- Particle Distribution = CA ETV

The analysis indicates that the Stormceptor EFO12, EFO10, and EFO4 OGS units will provide 56%, 62%, and 61% TSS removal, respectively, and capture more than 90% of annual runoff volume.

Stormwater runoff generated from catchment areas 204 and 205 will continue to drain uncontrolled to the Lisgar channel and Tenth Line swale respectively, as in existing conditions. These catchments are comprised primarily of landscaped areas and are therefore considered to be clean. Therefore, no water quality controls will be provided for this area.

Table 2.10 below outlines the cumulative TSS removal efficiency of the site and shows that the site meets the requirements for a "Enhanced" (Level 1, or 80% TSS removal) level of water quality protection. Best management practices have been used to achieve the highest level of water quality control feasible due to site constraints and the extent of new development on the site.

Table 2.10 – *TSS Removal Efficiencies*

Catchment ID	Area (ha)	% of Total Area	Treatment Process	%TSS Removal for Treatment Process [A]	Weighted % TSS Removal [B]
201	6.09	37.6%	Oil/Grit Separator + Downstream SWM Facility [C]	80%	30.1%
202A	2.68	16.6%	Roof Area inherently clean	100%	16.6%
202B	3.05	18.9%	Roof Area inherently clean	100%	18.9%
203	1.05	6.5%	Roof Area inherently clean	100%	6.5%
	2.86	17.7%	Oil/Grit Separator	50%	8.9%
204	0.21	1.3%	Clean Landscape Areas	100%	1.3%
205	0.22	1.4%	Primarily Clean Landscape Areas	80%	1.1%
Total Area	**16.17**	**100%**	**Total Weighted %TSS Removal Efficiency:**		**83.4%**

[A] %TSS removal for treatment process from Table 4.4.3 of the LID SWM Design Manual.
[B] Weighted % TSS removal = (% of total area) x (% TSS removal for treatment process)
[C] TSS Removal = 50 + 60 - (50x60) / 100 = 80%

2.3.3 Water Retention

As per City of Mississauga requirements, the site is required to provide 5mm of on-site retention via infiltration, reuse, or evapotranspiration. Based on the development site area, the volume of water required to be retained on-site is calculated as follows:

Volume = Impervious Site Area (m^2) x Depth of Rainfall (m)

= 130,044m^2 x 0.005m

= 650.22 m^3

The required retention volume is provided via dead storage in the two (2) proposed storm tanks within the distribution centre loading docks. The total retention volume provided on site can be summarized in Table 2.11 below.

Table 2.11 – *Summary of Retention Storage Volumes*

Stormwater Management Tank	Retention Volume Provided (m^3) [A]
DC4 Tank	358.67
DC5 Tank	364.97
Total	**723.64 m^3**
[A] Refer to Appendix A for detailed calculations on Tank sizing.	

The proposed retention tanks will be an open-bottom Brentwood ST-18 system with system footprints of 670.5m^2 (DC4) and 681.7m^2 (DC5) respectively, and a total dead storage volume of 723.64 m^3.

The infiltration rate within the tank area was established using a Guelph Permeameter (GP) device to conduct insitu infiltration testing. Results indicate that at a test depth of 2.5m below ground surface, the unfactored infiltration rate is 51 mm/hr at the tank location. Applying a 2.5x factor of safety per conservation authority guidelines, results in a factored infiltration rate of 20.4 mm/hr. The retention tanks will be able to infiltrate the required 5mm retention volume of 650.22 m^3 in less than 72hrs.

The following drawdown time was calculated:

- 65.56 hrs for an infiltration volume of 358.67m^3 (DC4 Tank)
- 65.61 hrs for an infiltration volume of 364.97m^3 (DC5 Tank)

Therefore, sufficient retention volume and drawdown time can be provided within the retention tank to meet City of Mississauga requirements for water balance. Refer to Appendix A for detailed calculations.

3.0 Sediment and Erosion Control

Sediment and erosion control measures will be implemented on site during construction. These measures will include:

- Installation of sediment control fencing at strategic locations around the perimeter of the site.
- Preventing silt or sediment laden water from entering inlets (catchbasins / catchbasin manholes) by wrapping the inlet grates with filter fabric or installing silt sacks.

- The Contractor shall clean up and remove any mud or debris tracked onto the surrounding rights-of-way, on a regular basis.
- Maintaining sediment and erosion control structures in good repair (including periodic cleaning as required) until such time that the Engineer approves their removal. Erosion control measures to be inspected weekly and after any rainfall event.

4.0 Sanitary Sewer Servicing

4.1 Existing Conditions

An existing sanitary service pipe has been installed for this development as part of the Meadowvale Business Park District Phase 1 Development. An existing 250mm diameter sanitary service sloped at 1.0% conveys flows south at the south corner of the site. The full flow capacity of this sewer is approximately 62.04 L/s.

4.2 Sanitary Demand

The anticipated sanitary discharge from the proposed development was calculated using Region of Peel design criteria. Populations have been estimated based on the population densities provided in the Region of Peels standards. Table 4.1 provides an estimate of the population for the proposed site. Detailed calculations are found in Appendix B.

Table 4.1 - Population Estimate

Land-Use	Site Area (ha) A	Population Density (Persons per ha) B	Population (people)
Distribution Centre's	12.04	70	843
Data Centre	4.13	-	50
		Total Population	**893**

A See Table 2.3
B Population Density based on Region of Peel Linear Wastewater Standards. Population of Data Centre obtained from Stantek Water Use Table, outlining a peak occupancy of 50 employees. (Refer to Table in Appendix C)

Table 4.2 summarizes the sanitary sewer discharge rates from the proposed site to the existing sanitary service.

Table 4.2 - Sanitary Discharge Rates

Land Use	Area (ha)	Population (persons) A	Peaking Factor B	Average Flow (L/s) C	Infiltration Allowance (L/s) D	Peak Flow (L/s) E
Distribution Centre's	12.04	843	3.83	2.63	4.21	10.09
Data Centre	4.13	50		0.16		0.60
					Total Sanitary Demand from Site G =	**14.90**

A Population Estimate: See Table 4.1
B Peaking factor based on Harmon's Equation $(PF) = 1+14/(4+(P/1000)^{0.5})$ where, $2.0 \leq PF \leq 4.0$
C Average flow based on 270 L/c/day see Appendix B
D Infiltration allowance based on 0.26 L/s/ha
E Peak Flow = (Avg. Flow) x (PF).
F Area reflects site area for each land use.
G Total Sanitary Demand = Sum of Peak Flows + Infiltration Allowance

Please refer to Appendix B for detailed calculations. As summarized in Table 4.2, the total peak sanitary discharge from the site under proposed conditions is 14.90 L/s.

4.3 Proposed Sanitary Servicing Plan

The proposed developments will be serviced by the existing 250mm diameter sanitary service at 1.0% that discharges southwest of the site. A 250mm diameter sanitary service will be provided to each building within the proposed development and will convey drainage to the existing 250mm sanitary lateral at the southwest corner of the site. The 250mm diameter sanitary lateral will then convey flows to the existing 300mm diameter sanitary sewer located within the neighboring site south of the proposed development. The sites lateral will be at 24.0% capacity based on the calculated peak demand. The proposed 250mm lateral will be connected via a 250mm diameter pipe extension and sanitary control manhole (Refer to MTE Drawing C2.2A for details).

Since the proponent plans to sever the distribution lands from the data centre lands, a 6.0m wide sanitary sewer easement along the south of Distribution Centre 5 is proposed to facilitate the connection from the existing municipal sanitary sewer to the Data Centre.

5.0 Domestic and Fire Water Supply Servicing

5.1 Existing Conditions

There is an existing 300mm diameter watermain along Tenth Line West within the road fronting the site. There are no existing hydrants within the site limits or fronting the site.

5.2 Domestic Water Demands

The expected domestic water demand for the proposed development was estimated using the Region of Peel design criteria. Table 5.1 summarizes the domestic water demand requirements for the Average Day, Maximum Day and Peak Hour demand scenarios. Detailed calculations are found in Appendix C.

Table 5.1 - Water Demand

Industrial Usage – Distribution Centre 4/5		
Population:	843 people (see Table 4.1)	
Average Day Demand ^{A}:	250 L/c/d x 843 people =	**2.44 L/s**
Max. Day Peaking Factor ^{B}:	1.4	
Peak Hour Peaking Factor ^{B}:	3.0	
Maximum Day Demand:	1.4 x 2.44 L/s =	**3.42 L/s**
Peak Hour Demand:	3.0 x 2.44 L/s =	**7.32 L/s**
Industrial Usage – Data Centre		
Population:	50 people (see Table 4.1)	
Average Day Demand ^{A}:	250 L/c/d x 50 people =	**0.02 L/s**
Max. Day Peaking Factor ^{B}:	1.4	
Peak Hour Peaking Factor ^{B}:	3.0	

Maximum Day Demand:	1.4 x 0.02 L/s =	**0.02 L/s**
Peak Hour Demand:	3.0 x 0.02 L/s =	**0.05 L/s**
[A] Water Demands based on Region of Peel 2020 Development Charges Background Study. [B] Peaking factors based on Region of Peel Design Criteria.		

5.3 Fire Flow Demand

Fire flow demands for the proposed development were determined using the methodology outlined in *Water Supply for Public Fire Protection* (Fire Underwriters Survey (FUS, 2020)). A sprinkler system designed to NFPA13 is proposed for the building. As the water supply for both the sprinkler system and fire hose lines will be provided by the municipal system, a total sprinkler reduction of 50% will be applied to the calculated fire flow demand. This is based on a 30% reduction for a sprinkler system adequately designed per NFPA13, an additional 10% for fully supervised systems, and an additional 10% reduction if the water supply for the system and fire hose lines is standard (i.e. supplied by a municipal water main). The fire demand for the building is summarized in Table 5.2. Detailed calculations are provided in Appendix C.

Table 5.2 - Fire Flow Requirements

Building	Fire Underwriters Survey (FUS) Flow Rate
Building DC4	316.7 L/s
Building DC5	333.3 L/s
Data Center	200.0 L/s

The maximum day + largest fire flow demand is therefore 336.75 L/s (333.33 + 3.42 L/s).

5.4 Proposed Water Servicing Plan

Water servicing for the Data Centre site will include the installation of a dual 250mm diameter fire and 200mm diameter domestic service tapped off the existing 300mm diameter watermain on Tenth Line West. Water servicing for the Distribution Centre's will include the installation of a dual 250mm diameter fire and 150mm diameter domestic service tapped off the existing services from southern development. Refer to mechanical plans for details on internal plumbing, water metering and back flow prevention devices.

New private hydrants will be installed throughout both the Distribution Centre and Data Centre sites to provide sufficient coverage. The proposed hydrants will be within 90m of the proposed building's primary entrances. Refer to MTE Drawing C2.2 and the site plan by Petroff Partnership Architects.

A hydrant flow test was completed December 18, 2024 by Superior Sprinkler. Using the lowest residual pressure to analyze the available flow, the water distribution system is able to maintain a minimum residual pressure of 140 kPa (20 psi) when subject to Maximum Day + Fire Flow demands. Refer to Appendix C for flow analysis and hydrant flow test results.

6.0 Conclusions and Recommendations

Based on the information provided herein, it is concluded that the development can be constructed to meet the requirements of the City of Mississauga. Therefore, it is recommended that:

i. Stormwater quantity control criteria can be achieved using on-site orifice controls, with storage provided in three stormwater tanks, a dry pond, FCRDs, and pipes and structures volume as described in Section 2.3.

ii. Quality control for the site can be provided using three OGS units as described in Section 2.3.

iii. Erosion and sediment controls be installed as described in Section 3.0 of this report.

iv. Sanitary servicing for the development be installed as described in Section 4.3 of this report.

v. Water servicing for the development be installed as described in Section 5.4 of this report to meet FUS minimum water supply requirements.

vi. The proposed stormwater management plan presented in this report and the site servicing works described in this report and as shown on Drawings C2.1 and C2.2 be accepted in support of the site plan approval process.

We trust the information enclosed herein is satisfactory. Should you have any questions please do not hesitate to contact our office.

All of which is respectfully submitted,

MTE Consultants Inc.

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https://mte85.sharepoint.com/sites/60549_001/Shared Documents/02 - Reports/MTE/FSR+SWM Report/60549-001- Functional Servicing & Stormwater Management Report.docx

Appendix A

Stormwater Management

MTE

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA
STORMWATER MANAGEMENT - HYDROLOGIC PARAMETERS

EXISTING DEVELOPMENT CONDITIONS HYDROLOGIC MODELING PARAMETERS

Catchment ID	Catchment Description	Hydrograph Method	Area (ha)	Perv. CN	Perv. Ia (mm)	Impervious (%)		Flow Length (m)		Manning "n"		Slope (%)		Time to Peak Tp (hrs)
						TIMP	XIMP	Perv.	Imperv.	Perv.	Imperv.	Perv.	Imperv.	
101	Existing drainage to Lisgar Channel	NASHYD	12.15	79	5.0	0	0							0.35
102	Existing drainage to Tenth Line Swale	NASHYD	4.02	79	5.0	0	0							0.19
		TOTAL	**16.17**			**0**								

PROPOSED DEVELOPMENT CONDITIONS HYDROLOGIC MODELING PARAMETERS

Catchment ID	Catchment Description	Hydrograph Method	Area (ha)	Perv. CN	Perv. Ia (mm)	Impervious (%)		Flow Length (m)		Manning "n"		Slope (%)		Time to Peak Tp (hrs)
						TIMP	XIMP	Perv.	Imperv.	Perv.	Imperv.	Perv.	Imperv.	
201	Site Drainage to SWM Facility SE of Site	STANDHYD	6.09	79	5.0	78	78	20	30	0.250	0.013	2.0	1.5	
202A	Distribution Centre 4 Roof	STANDHYD	2.68	79	5.0	99	99	0	262	0.250	0.013	0.0	1.0	
202B	Distribution Centre 5 Roof	STANDHYD	3.05	79	5.0	99	99	0	282	0.250	0.013	0.0	1.0	
203	Site Drainage to Tenth Line Swale	STANDHYD	3.91	79	5.0	65	65	32	53	0.250	0.013	5.0	1.0	
204	Uncontrolled Perimeter Discharge to Tenth Line Swale	NASHYD	0.21	79	5.0	0	0							0.07
205	Uncontrolled Perimeter Discharge to Lisgar Channel	NASHYD	0.22	79	5.0	17	17							0.08
		TOTAL	**16.17**			**80.42**								

Notes: For NASHYD Commands:
- DT=1
- DWF=0
- N=3

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA
STORMWATER MANAGEMENT

Time to Peak Calculations - Existing Conditions

Time to peak (Tp) values derived from time of concentration (Tc) calculations based on the Airport Method Equation:

$$T_c = \frac{3.26\,(1.1 - C)\,L^{0.5}}{S_W{}^{0.33}}$$

(MTO Drainage Manual Design Chart 1.12)

T_c = Overland flow time of concentration (min)
L = Flow travel length (m)
S = Basin slope (%)
C = Runoff coefficient

From this, **Time-to-peak (Tp) = 0.67 Tc**

The time to peak values used in the NASHYD command for the existing conditions hydrologic modeling are shown below.

Catchment ID	Area (ha)	Length (m)	"C"	Slope (m/m)	Tc (min)	Tp	
						(min)	(hrs)
101	12.15	174.3	0.25	0.016	31.40	21.03	0.35
102	4.02	100.3	0.25	0.045	16.87	11.30	0.19

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA
STORMWATER MANAGEMENT

Time to Peak Calculations - Proposed Conditions

Time to peak (Tp) values derived from time of concentration (Tc) calculations based on the Airport Method Equation:

$$T_c = \frac{3.26\,(1.1 - C)\,L^{0.5}}{S_w^{\ 0.33}}$$

(MTO Drainage Manual Design Chart 1.12)

T_c = Overland flow time of concentration (min)
L = Flow travel length (m)
S = Basin slope (%)
C = Runoff coefficient

From this, **Time-to-peak (Tp) = 0.67 Tc**

The time to peak values used in the NASHYD command for the existing conditions hydrologic modeling are shown below.

Catchment ID	Area (ha)	Length (m)	"C"	Slope (m/m)	Tc (min)	Tp	
						(min)	(hrs)
204	0.19	21.8	0.25	0.100	6.05	4.05	0.07
205	0.22	23.5	0.36	0.050	6.87	4.60	0.08

PROLOGIS MEADOWVALE DISTRIBUTON CENTRE
7564 Tenth Line West
STORMWATER MANAGEMENT

Stage-Storage-Discharge Relationship Rooftop Flow Controls (DC4 Roof)

Proposed Building

Total Roof Area = 26823 m^2
Total Roof Area Avail for Ponding= 26823 m^2
Number of roof drains = 55 (min. # drains = 1 per 900m^2)

Head (mm)	Area (m^2)	Incremental Volume (m^3)	Cumulative Volume (m^3)	Total Discharge (m^3/s)
0	0	0	0.0	0
126	26823	1689.8	1689.8	0.1026

Notes:
Contributing Area per Drain: 487.691 m^2
-1% roof slope was assumed
Total discharge provided by Mechanical Engineer (Hammerschlag & Joffe Inc.)

PROLOGIS MEADOWVALE DISTRIBUTON CENTRE
7564 Tenth Line West
STORMWATER MANAGEMENT

Stage-Storage-Discharge Relationship Rooftop Flow Controls (DC5 Roof)

Proposed Building

Total Roof Area =	30503	m^2
Total Roof Area Avail for Ponding=	30503	m^2
Number of roof drains =	63	(min. # drains = 1 per 900m^2)

Head (mm)	Area (m^2)	Incremental Volume (m^3)	Cumulative Volume (m^3)	Total Discharge (m^3/s)
0	0	0	0.0	0
125	30503	1906.4	1906.4	0.1078

Notes:

Contributing Area per Drain: 484.175 m^2

-1% roof slope was assumed

Total discharge provided by Mechanical Engineer (Hammerschlag & Joffe Inc.)

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA
STORMWATER MANAGEMENT
TANK VOLUME CALCULATIONS

Quantity Control Tank (Catchment 201)		
6 Layers of StormSmart		
Height	2.4	m
Void Space Volume	96.0%	
Module Footprint	635.28	sq.m
System Footprint	666.48	sq.m
Module Unit Footprint	0.56	sq.m
Volume per unit	0.42912	m^3
Total Number of Tanks	3410	Units
Storage Volume (Net)	1463.30	m^3
Volume of Top Stone	79.978	m^3
Volume of Side Stone	29.952	m^3
Volume of Bottom Stone	26.659	m^3
Total Volume Provided	1599.89	m^3
Bottom of Tank Elevation	207.68	m
Top of Dead Storage/Outlet Invert	207.72	m
Top of Tank Elevation	210.08	m
Top of Stone	210.38	m
Active Storage	**1599.9**	m^3

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA

STORMWATER MANAGEMENT

Stage Storage Discharge Curve - Catchment 201

Outlet Device No. 1 (Quantity)	
Type:	Orifice Tube
Diameter (mm)	400
Area (m^2)	0.12566
Invert Elev. (m)	207.70
C/L Elev. (m)	207.90
Disch. Coeff. (C_d)	0.8
Discharge (Q) =	$C_d A (2 g H)^{0.5}$
Number of Orifices:	1

		SWM Storage Volumes			Outlet No. 1		Total
Description	Elevation m	Area m^2	Increm. Volume m^3	Cumulative Volume m^3	Head m	Discharge m^3/s	Discharge m^3/s
Orifice Invert	207.70	-	0	0.00	0.000	0.0000	0.0000
Tank Outlet	207.74	-	0	0.00	0.000	0.0000	0.0000
Top of Tank	210.08	-	2011	2011.26	2.180	0.6575	0.6575
Tank Top of Stone	210.38	-	142	2153.17	2.480	0.7013	0.7013
Top of All Pipes	210.75	-	76	2229.56	2.850	0.7517	0.7517

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA
STORMWATER MANAGEMENT
STORM PIPES AND STRUCTURES VOLUME CALCULATIONS

Pipe Volumes		
Diameter (m)	Length (m)	Volume (m^3)
Southeast (To SWM Facility)		
0.250	278.40	13.67
0.300	46.00	3.25
0.450	72.10	11.47
0.525	275.00	59.53
0.600	266.80	75.44
0.675	695.00	248.70
0.900	96.30	61.26
	Total	**473.32**

Structure Volumes						
Structure ID	Diameter (m)	Area (m2)	Outlet Invert (m)	Spill Point or T/G (m)	Height (m)	Volume (m^3)
MH1	2.4	4.52	207.70	211.45	3.75	16.96
MH2	1.8	2.54	207.78	211.45	3.67	9.34
MH3	1.8	2.54	207.89	211.45	3.56	9.06
MH4	2.4	4.52	208.10	211.45	3.35	15.16
MH5	1.5	1.77	208.68	211.45	2.77	4.89
MH6	1.8	2.54	208.83	211.45	2.62	6.67
MH7	1.2	1.13	209.13	211.45	2.32	2.62
MH8	1.2	1.13	209.43	211.45	2.02	2.28
MH9	1.2	1.13	209.67	211.45	1.78	2.01
MH10	1.2	1.13	209.97	211.45	1.48	1.67
MH12	1.5	1.77	208.54	211.25	2.71	4.79
MH13	1.5	1.77	208.83	211.17	2.34	4.14
MH14	1.2	1.13	209.12	211.24	2.12	2.40
MH15	1.5	1.77	208.02	211.45	3.43	6.06
MH16	1.5	1.77	208.27	211.45	3.18	5.62
MH17	1.5	1.77	208.53	211.45	2.92	5.16
MH18	1.5	1.77	208.78	211.45	2.67	4.72
MH19	1.8	2.54	209.02	211.45	2.43	6.18
MH20	1.5	1.77	209.25	211.45	2.20	3.89
MH21	1.5	1.77	209.42	211.45	2.03	3.59
MH22	1.5	1.77	209.63	211.45	1.82	3.22
MH23	1.5	1.77	209.93	211.45	1.52	2.69
CBMH24	1.2	1.13	210.28	211.45	1.17	1.32
CB1.1	-	0.36	208.80	211.30	2.50	0.90
CB1.2	-	0.36	209.34	211.45	2.11	0.76
CB1.3	-	0.36	208.79	211.30	2.51	0.90
CB3.1	-	0.36	208.85	211.30	2.45	0.88
CB3.2	-	0.36	208.96	211.45	2.49	0.90
CB3.3	-	0.36	209.00	211.40	2.40	0.86
CB3.3	-	0.36	208.73	211.10	2.37	0.85
CB4.1	-	0.36	209.09	211.45	2.36	0.85
CB4.2	-	0.36	209.27	211.45	2.18	0.78
CB5.1	-	0.36	209.50	211.45	1.95	0.70
DCB6.1	-	0.72	209.50	211.45	1.95	1.40
CB6.2	-	0.36	209.48	211.45	1.97	0.71
CB7.1	-	0.36	209.50	211.45	1.95	0.70
CB7.2	-	0.36	209.59	211.45	1.86	0.67
CB8.1	-	0.36	209.72	211.45	1.73	0.62
CB8.2	-	0.36	209.83	211.45	1.62	0.58
CB9.1	-	0.36	210.10	211.45	1.35	0.49
CB10.1	-	0.36	210.20	211.45	1.25	0.45
CB10.2	-	0.36	210.31	211.45	1.14	0.41
DCB12.1	-	0.72	208.83	211.10	2.27	1.63
DCB12.2	-	0.72	208.96	211.10	2.14	1.54
DCB13.1	-	0.72	209.07	211.10	2.03	1.46
DCB13.2	-	0.72	209.18	211.10	1.92	1.38
DCB14.1	-	0.72	209.24	211.10	1.86	1.34
CB14.2	-	0.36	209.32	211.10	1.78	0.64
CB15.1	-	0.36	209.45	211.45	2.00	0.72
CB16.1	-	0.36	209.45	211.45	2.00	0.72
CB16.2	-	0.36	209.45	211.45	2.00	0.72
CB17.1	-	0.36	209.45	211.45	2.00	0.72
CB18.1	-	0.36	209.39	211.45	2.06	0.74
CB19.1	-	0.36	209.35	211.45	2.10	0.76
CB19.2	-	0.36	209.47	211.45	1.98	0.71
CB20.1	-	0.36	209.47	211.45	1.98	0.71
CB20.2	-	0.36	209.61	211.45	1.84	0.66
CB20.3	-	0.36	209.67	211.45	1.78	0.64
CB21.1	-	0.36	209.73	211.45	1.72	0.62
CB22.1	-	0.36	209.90	211.45	1.55	0.56
CB23.1	-	0.36	210.26	211.45	1.19	0.43
CB23.2	-	0.36	210.33	211.45	1.12	0.40
CB24.1	-	0.36	210.43	211.45	1.02	0.37
					Total	**156.35**

Total Volume (m^3)	
Southeast (To SWM Facility)	**629.67**

PROLOGIS MEADOWVALE DISTRIBUTON CENTRE
7564 Tenth Line West
STORMWATER MANAGEMENT

STAGE-STORAGE-DISCHARGE CALCULATIONS FOR PROPOSED DRY POND SWM FACILITY

Outlet Device No. 1		Outlet No. 2	
Type:	Orifice Tube	Type:	Orifice Tube
Diameter (mm)	150	Diameter (mm)	450
Area (m^2)	0.01767	Area (m^2)	0.15904
Invert Elev. (m)	208.40	Invert Elev. (m)	208.95
C/L Elev. (m)	208.48	C/L Elev. (m)	209.18
Disch. Coeff. (C_d)	0.8	Disch. Coeff. (C_d)	0.8
Discharge (Q) =	$C_d A (2 g H)^{0.5}$	Discharge (Q) =	$C_d A (2 g H)^{0.5}$
Number of Orifices:	1	Number of Orifices:	1

		SWM Pond Volumes				Outlet No. 1		Outlet No. 2		
	Elevation m	Area m^2	Incremental Volume m^3	Cumulative Volume m^3	Active Storage Volume m^3	H m	Discharge m^3/s	H m	Discharge m^3/s	Total Discharge m^3/s
Invert of Orifice/Bottom of Pond	208.40	569.58	0	0	0	0.000	0.0000			0.0000
CL Orifice 1	208.48	640.14	45	45	45	0.000	0.0000			0.0000
CL Orifice 2	209.18	964.41	562	607	607	0.700	0.0524	0.000	0.0000	0.0524
	209.65	1150.54	502	1109	1109	1.175	0.0679	0.475	0.3884	0.4563
Top of Pond	209.78	1217.20	154	1263	1263	1.305	0.0715	0.605	0.4384	0.5099

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA
STORMWATER MANAGEMENT
TANK VOLUME CALCULATIONS

MTE

Tank-1 (Catchment 202A) - DC4 Roof		
Single Stack of Brentwood ST-18		
Height	0.457	m
Void Space Volume	95.5%	
System Footprint	670.48	sq.m
Module Footprint	614.11	sq.m
Module Unit Footprint	0.42	sq.m
Volume per unit	0.182378	m^3
Total Number of Tanks	1469	Units
Storage Volume (Net)	267.91	m^3
Volume of Top Stone	80.457	m^3
Volume of Side Stone	10.304	m^3
*Void Ratio = 0.4, exclude bottom stone		
Total Volume Provided	358.67	m^3
Estimated GW Elev @ Tank Location	207.55	m
Bottom of Tank Elevation	208.75	m
Top of Dead Storage	209.51	m
Top of Tank Elevation	209.21	m
Top of Stone	209.51	m
Dead Storage	**358.67**	**m^3**

Tank-2 (Catchment 202B) - DC5 Roof		
Single Stack of Brentwood ST-18		
Height	0.457	m
Void Space Volume	95.5%	
System Footprint	681.67	sq.m
Module Footprint	625.16	sq.m
Module Unit Footprint	0.42	sq.m
Volume per unit	0.1823778	m^3
Total Number of Tanks	1496	Units
Storage Volume (Net)	272.84	m^3
Volume of Top Stone	81.8004	m^3
Volume of Side Stone	10.330028	m^3
*Void Ratio = 0.4, exclude bottom stone		
Total Volume Provided	364.97	m^3
Estimated GW Elev @ Tank Location	207.55	m
Bottom of Tank Elevation	208.55	m
Top of Dead Storage	209.31	m
Top of Tank Elevation	209.01	m
Top of Stone	209.31	m
Dead Storage	**364.97**	**m^3**

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA
Tank Retention Draw Down Calculations

Project Number: 60549-001
Date: March 24, 2026
Design By: NZR
File: Q:\60549_001\SWM\60549-001-SWM Calcs.xls

MTE

Infiltration Volume (5mm Event) (m3)
650.22

Storage Provided in Retention Tank 1- DC4 Roof
DRAWDOWN TIME

Note: drawdown time calculated based on equation 4.3 from MOE SWM Manual (2003)

Surface Area (m^2)	Volume of Water (m^3)	Percolation Rate [1] (mm/hr)	Void Ratio	Drawdown Time [2] (hrs)
670.5	358.67	20.4	0.40	65.56

Note 1: Percolation Rate based on In-Situ Infiltration Testing prepared by MTE Consultants Inc. Refer to Appendix D for more details.
Note 2: Drawdown Time = (1000V)/(P*n*A) where V is the volume of water, P is the percolation rate, n is the void ratio of the storage media (stone + tank), and A is the surface area. Drawdown time to be maximum 72 hours as required by City of Mississauga.

Storage Provided in Retention Tank 2 - DC5 Roof
DRAWDOWN TIME

Note: drawdown time calculated based on equation 4.3 from MOE SWM Manual (2003)

Surface Area (m^2)	Volume of Water (m^3)	Percolation Rate [1] (mm/hr)	Void Ratio	Drawdown Time [2] (hrs)
681.7	364.97	20.4	0.40	65.61

Note 1: Percolation Rate based on In-Situ Infiltration Testing prepared by MTE Consultants Inc. Refer to Appendix D for more details.
Note 2: Drawdown Time = (1000V)/(P*n*A) where V is the volume of water, P is the percolation rate, n is the void ratio of the storage media (stone + tank), and A is the surface area. Drawdown time to be maximum 72 hours as

PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
7564 TENTH LINE WEST, MISSISSAUGA
STORMWATER MANAGEMENT

Dualhyd Input

Soil Percolation Rate	51	mm/hr	
Factor of Safety	2.5		
Design percolation rate	20	mm/hr	
	0.020	m3/hr	
	5.67E-06	m3/s	

DC4 Tank			
Area at bottom of Tank=	670.476	m2	(taken from CAD)
Dead Storage =	**358.67**	m3	*SWMHYMO INPUT
Average inlet capacity =	**0.00380**	m3/s	*SWMHYMO INPUT

DC5 Tank			
Area at bottom of Tank=	681.67	m2	(taken from CAD)
Dead Storage =	**364.97**	m3	*SWMHYMO INPUT
Average inlet capacity =	**0.00386**	m3/s	*SWMHYMO INPUT

```
2     Metric units
*#*************************************************************************|
*#  Project Name: PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
*#  JOB NUMBER  : 60549-001
*#       Date   : FEBRUARY 2026
*#  Modeller    : NZR
*#    Company   : MTE CONSULTANTS INC.
*#       File   : 60549.DAT
*%-----------------|----------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    ["MISSG002.stm"]
READ STORM          STORM_FILENAME=["STORM.001"]
*
*##########################################################################|
*#
*#                         EXISTING CONDITIONS HYDROLOGIC MODELING
*#
*#                    ====================================================
*#
*##########################################################################|
*#*************************************************************************|
*AREA 101 - EXISTING DRAINAGE SE TO LISGAR CHANNEL
*#*************************************************************************|
CALIB NASHYD        ID=[1], NHYD=["101"], DT=[1]min, AREA=[12.15](ha),
                    DWF=[0](cms),  CN/C=[79], IA=[5.0](mm),
                    N=[3], TP=[0.35]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*#************************************************************************|
*AREA 102 - EXISTING DRAINAGE NE TO TENTH LINE SWALE
*#*************************************************************************|
CALIB NASHYD        ID=[2], NHYD=["102"], DT=[1]min, AREA=[4.02](ha),
                    DWF=[0](cms),  CN/C=[79], IA=[5.0](mm),
                    N=[3], TP=[0.19]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*#************************************************************************|
*##########################################################################|
*#
*#                         PROPOSED CONDITIONS HYDROLOGIC MODELING
*#
*#                    ====================================================
*#
*##########################################################################|
*#************************************************************************|
*AREA 201 - SITE DRAINAGE TO SWM FACILITY SE OF SITE
*#*************************************************************************|
CALIB STANDHYD      ID=[1], NHYD=["201"], DT=[5.0](min), AREA=[6.09](ha),
                    XIMP=[0.78], TIMP=[0.78], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[79],
                    Pervious   surfaces: IAper=[5.0](mm), SLPP=[2.0](%),
                                         LGP=[20](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.5](%),
                                         LGI=[30](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*#*************************************************************************|
*ORIFICE PIPE PLACED DOWNSTREAM OF MH1
*%-----------------|----------------------------------------------------------|
ROUTE RESERVOIR     IDout=[2],   NHYD=["Orifice"],  IDin=[1],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                      (cms) - (ha-m)
 0.0000     0.0000
 0.0000     0.0000
 0.6575     0.2011
 0.7013     0.2153
 0.7517     0.2230
                                      -1       -1   (max twenty pts)
                          IDovf=[3], NHYDovf=["OVF"]
*#************************************************************************|
*FLOW CHECK - SITE DISCHARGE TO DOWNSTREAM SWM FACILITY
ADD HYD             IDsum=[10], NHYD=["TOPOND"], IDs to add=[2,3]
*#*************************************************************************|
*AREA 202A - DISTRIBUTION CENTRE 4 ROOF
*#*************************************************************************|
CALIB STANDHYD      ID=[1], NHYD=["202A"], DT=[5.0](min), AREA=[2.68](ha),
                    XIMP=[0.99], TIMP=[0.99], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[79],
                    Pervious   surfaces: IAper=[5.0](mm), SLPP=[1.0](%),
                                         LGP=[5.0](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.0](%),
                                         LGI=[262](m), MNI=[0.013], SCI=[0](min)
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*#*************************************************************************|
*FLOW CONTROL ROOF DRAINS DC4
*%-----------------|----------------------------------------------------------|
ROUTE RESERVOIR     IDout=[2],   NHYD=["FCRD"],  IDin=[1],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                      (cms) - (ha-m)
 0.0000     0.0000
 0.1026     0.1690
                                      -1       -1   (max twenty pts)
                          IDovf=[3], NHYDovf=["OVF"]
*#************************************************************************|
*DC4 INFILTRATION TANK
*#*************************************************************************|
COMPUTE DUALHYD     IDin=[2], CINLET=[0.00380](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["TO-LISGAR"],
                    MINID=[4], MinNHYD=["INFIL"],
                    TMJSTO=[358.67](cu-m)
*%-----------------|----------------------------------------------------------|
*AREA 202B - DISTRIBUTION CENTRE 5 ROOF
*#*************************************************************************|
CALIB STANDHYD      ID=[5], NHYD=["202B"], DT=[5.0](min), AREA=[3.05](ha),
                    XIMP=[0.99], TIMP=[0.99], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[79],
                    Pervious   surfaces: IAper=[5.0](mm), SLPP=[1.0](%),
                                         LGP=[5.0](m), MNP=[0.25], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.0](%),
                                         LGI=[282](m), MNI=[0.013], SCI=[0](min)
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*#*************************************************************************|
*FLOW CONTROL ROOF DRAINS DC5
*%-----------------|----------------------------------------------------------|
ROUTE RESERVOIR     IDout=[5],   NHYD=["FCRD"],  IDin=[1],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                      (cms) - (ha-m)
 0.0000     0.0000
 0.1078     0.1906
                                      -1       -1   (max twenty pts)
                          IDovf=[6], NHYDovf=["OVF"]
*#************************************************************************|
*DC5 INFILTRATION TANK
*#*************************************************************************|
COMPUTE DUALHYD     IDin=[5], CINLET=[0.00386](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["TO-LISGAR"],
                    MINID=[7], MinNHYD=["INFIL"],
                    TMJSTO=[364.97](cu-m)
*%-----------------|----------------------------------------------------------|
*FLOW CHECK - DC4/5 DISCHARGING TO LISGAR BYPASS NETWORK SE OF SITE
ADD HYD             IDsum=[9], NHYD=["BYPASS"], IDs to add=[3,6]
*#*************************************************************************|
*AREA 203 - SITE DRAINING TO TENTH LINE SWALE
*#*************************************************************************|
CALIB STANDHYD      ID=[1], NHYD=["203"], DT=[5.0](min), AREA=[3.91](ha),
                    XIMP=[0.65], TIMP=[0.65], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[79],
                    Pervious   surfaces: IAper=[5.0](mm), SLPP=[5.0](%),
                                         LGP=[32.0](m), MNP=[0.25], SCP=[0](min)
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.0](%),
                                         LGI=[53.0](m), MNI=[0.013], SCI=[0](min
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*#*************************************************************************|
*DRY POND
*%-----------------|----------------------------------------------------------|
ROUTE RESERVOIR     IDout=[2],   NHYD=["POND"],  IDin=[1],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                      (cms) - (ha-m)
 0.0000 0.0000
 0.0000 0.0045
 0.0524 0.0607
 0.4563 0.1109
 0.5099 0.1263
                                      -1       -1   (max twenty pts)
                          IDovf=[3], NHYDovf=["OVF"]
*#************************************************************************|
*AREA 204 - UNCONTROLLED SITE DISCHARGE TO TENTH LINE SWALE
*#*************************************************************************|
CALIB NASHYD        ID=[4], NHYD=["204"], DT=[1]min, AREA=[0.16](ha),
                    DWF=[0](cms),  CN/C=[79], IA=[5.0](mm),
                    N=[3], TP=[0.07]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*#************************************************************************|
*COMBINE TOTAL FLOW TO SWALE
ADD HYD             IDsum=[8], NHYD=["SWALE"], IDs to add=[2,3,4]
*#*************************************************************************|
*AREA 205 - UNCONTROLLED SITE DISCHARGE TO ADJACENT LAND
*#*************************************************************************|
CALIB NASHYD        ID=[1], NHYD=["205"], DT=[1]min, AREA=[0.22](ha),
                    DWF=[0](cms),  CN/C=[79], IA=[5.0](mm),
                    N=[3], TP=[0.08]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*#************************************************************************|
*FLOW CHECK - TOTAL SITE DISCHARGE
ADD HYD             IDsum=[2], NHYD=["TOTAL"], IDs to add=[1,8,9,10]
*#*************************************************************************|
*%-----------------|----------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                    MISSG005.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                    MISSG010.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                    MISSG025.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                    MISSG050.stm
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[100]
                    MISSG100.stm
*
*%-----------------|----------------------------------------------------------|
FINISH
```

```
===============================================================================

  SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
  S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
  SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
      S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
  SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9   =========
                                                       9   9  9   9   # 3053466
       StormWater Management HYdrologic Model           999    999    =========

 ******************************************************************************
 ***************************** SWMHYMO Ver/4.05 ******************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                 OTTHYMO-83 and OTTHYMO-89.                  *********
 ******************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.Com                   *********
 ******************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: MTE Consultants Inc.                        +++++++++
 +++++++++                Burlington             SERIAL#:3053466      +++++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ******************************************************************************
 *********            ++++++ PROGRAM ARRAY DIMENSIONS ++++++           *********
 *********            Maximum value for ID numbers  :     10           *********
 *********            Max. number of rainfall points: 105408           *********
 *********            Max. number of flow points    : 105408           *********
 ******************************************************************************

 *********************   D E T A I L E D   O U T P U T   *********************
 ******************************************************************************
 *         DATE: 2026-03-23     TIME: 16:01:47     RUN COUNTER: 000486        *
 ******************************************************************************
 * Input   filename: Q:\60549_~1\SWM\SWMHYMO\60549.dat                        *
 * Output  filename: Q:\60549_~1\SWM\SWMHYMO\60549.out                        *
 * Summary filename: Q:\60549_~1\SWM\SWMHYMO\60549.sum                        *
 * User comments:                                                             *
 * 1:_________________________________________________________________________*
 * 2:_________________________________________________________________________*
 * 3:_________________________________________________________________________*
 ******************************************************************************

-------------------------------------------------------------------------------
001:0001-----------------------------------------------------------------------
*#****************************************************************************|
*#  Project Name: PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
*#  JOB NUMBER  : 60549-001
*#       Date   : FEBRUARY 2026
*#  Modeller    : NZR
*#     Company  : MTE CONSULTANTS INC.
*#       File   : 60549.DAT
  ** END OF RUN :   1

******************************************************************************

--------------------
| START            |  Project  dir.: Q:\60549_~1\SWM\SWMHYMO\
--------------------  Rainfall dir.: Q:\60549_~1\SWM\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 002
    NSTORM=   1
          #  1=MISSG002.stm
-------------------------------------------------------------------------------
002:0002-----------------------------------------------------------------------
*#****************************************************************************|
*#  Project Name: PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
*#  JOB NUMBER  : 60549-001
*#       Date   : FEBRUARY 2026
*#  Modeller    : NZR
*#     Company  : MTE CONSULTANTS INC.
*#       File   : 60549.DAT
-------------------------------------------------------------------------------
002:0002-----------------------------------------------------------------------
--------------------
| READ STORM       |    Filename: MISSISSAUGA 2-YR CHICAGO (A=610 B=4.6 C=
| Ptotal=  33.44 mm|    Comments: MISSISSAUGA 2-YR CHICAGO (A=610 B=4.6 C=
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   2.222 |   1.17  16.858 |   2.17   5.202 |   3.17   2.661
               .33   2.538 |   1.33  75.359 |   2.33   4.443 |   3.33   2.476
               .50   2.979 |   1.50  22.169 |   2.50   3.894 |   3.50   2.317
               .67   3.641 |   1.67  11.770 |   2.67   3.476 |   3.67   2.180
               .83   4.766 |   1.83   8.163 |   2.83   3.148 |   3.83   2.060
              1.00   7.163 |   2.00   6.323 |   3.00   2.882 |   4.00   1.954

-------------------------------------------------------------------------------
002:0003-----------------------------------------------------------------------
*
*#############################################################################|
*#
*#                     EXISTING CONDITIONS HYDROLOGIC MODELING
*#
*#              ====================================================
*#
*#############################################################################|
*#****************************************************************************|
*AREA 101 - EXISTING DRAINAGE SE TO LISGAR CHANNEL
*#****************************************************************************|
----------------------
| CALIB NASHYD       |   Area    (ha)=   12.15   Curve Number   (CN)=79.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .350

     Unit Hyd Qpeak  (cms)=    1.326

     PEAK FLOW       (cms)=     .208 (i)
     TIME TO PEAK    (hrs)=    1.783
     RUNOFF VOLUME    (mm)=    8.429
     TOTAL RAINFALL   (mm)=   33.441
     RUNOFF COEFFICIENT   =     .252

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
002:0004-----------------------------------------------------------------------
*#***************************************************************************|
*AREA 102 - EXISTING DRAINAGE NE TO TENTH LINE SWALE
*#****************************************************************************|
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.02   Curve Number   (CN)=79.00
| 02:102    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .808

     PEAK FLOW       (cms)=     .099 (i)
     TIME TO PEAK    (hrs)=    1.550
     RUNOFF VOLUME    (mm)=    8.429
     TOTAL RAINFALL   (mm)=   33.441
     RUNOFF COEFFICIENT   =     .252

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
002:0005-----------------------------------------------------------------------
*#****************************************************************************|
*#############################################################################|
*#
*#                     PROPOSED CONDITIONS HYDROLOGIC MODELING
*#
*#              ====================================================
*#
*#############################################################################|
*#****************************************************************************|
*AREA 201 - SITE DRAINAGE TO SWM FACILITY SE OF SITE
*#****************************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    6.09
| 01:201    DT= 5.00 |   Total Imp(%)=   78.00   Dir. Conn.(%)=   78.00
----------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.75         1.34
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.50         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      75.36        14.66
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.23 (ii)   11.27 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=        .33          .10
                                                           *TOTALS*
     PEAK FLOW       (cms)=        .99          .03          1.017 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42          1.333
     RUNOFF VOLUME    (mm)=      32.44         8.43         27.158
     TOTAL RAINFALL   (mm)=      33.44        33.44         33.441
     RUNOFF COEFFICIENT   =        .97          .25           .812
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
002:0006-----------------------------------------------------------------------
*#****************************************************************************|
*ORIFICE PIPE PLACED DOWNSTREAM OF MH1
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201    )  |
| OUT<02:(Orific)   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .701  .2153E+00
                            .000  .0000E+00   |     .752  .2230E+00
                            .658  .2011E+00   |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )       6.09     1.017     1.333     27.158
     OUTFLOW<02: (Orific)       6.09      .250     1.550     27.158
    OVERFLOW<03: (OVF   )        .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   24.556
                   TIME SHIFT OF PEAK FLOW         (min)=    13.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.7637E-01

-------------------------------------------------------------------------------
002:0007-----------------------------------------------------------------------
*#****************************************************************************|
*FLOW CHECK - SITE DISCHARGE TO DOWNSTREAM SWM FACILITY
------------------------
| ADD HYD (TOPOND    ) | ID: NHYD        AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 02:Orifice      6.09      .250    1.55  27.16    .000
                     +ID2 03:OVF           .00      .000     .00    .00    .000
                      =========================================================
                      SUM 10:TOPOND       6.09      .250    1.55  27.16    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
002:0008-----------------------------------------------------------------------
*#****************************************************************************|
*AREA 202A - DISTRIBUTION CENTRE 4 ROOF
*#****************************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    2.68
| 01:202A   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.65          .03
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     262.00         5.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      75.36        14.66
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       5.10 (ii)   10.48 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=        .21          .11
                                                           *TOTALS*
     PEAK FLOW       (cms)=        .49          .00           .494 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42          1.333
     RUNOFF VOLUME    (mm)=      32.44         8.43         32.201
     TOTAL RAINFALL   (mm)=      33.44        33.44         33.441
     RUNOFF COEFFICIENT   =        .97          .25           .963

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
002:0009-----------------------------------------------------------------------
*#****************************************************************************|
*FLOW CONTROL ROOF DRAINS DC4
```

```
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(202A  )   |
| OUT<02:(FCRD  )   |    =========  OUTFLOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .103  .1690E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK        R.V.
     --------------------         (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (202A  )         2.68      .494     1.333      32.201
     OUTFLOW<02: (FCRD  )         2.68      .036     2.233      32.200
    OVERFLOW<03: (OVF   )          .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    7.371
                   TIME SHIFT OF PEAK FLOW         (min)=    54.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.5994E-01

--------------------------------------------------------------------------------
002:0010------------------------------------------------------------------------
*#*************************************************************************|
*DC4 INFILTRATION TANK
*#*************************************************************************|
---------------------
| COMPUTE DUALHYD     |    Average inlet capacities   [CINLET] =    .004  (cms)
| TotalHyd 02:FCRD    |    Number of inlets in system [NINLET] =       1
---------------------      Total minor system capacity         =    .004  (cms)
                           Total major system storage [TMJSTO] =     359.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK      R.V.       DWF
                                  (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   02:FCRD         2.68      .036     2.233    32.200      .000
     ====================================================================
     MAJOR SYST   03:TO-LIS        .82      .024     4.700    32.200      .000
     MINOR SYST   04:INFIL        1.86      .004     1.033    32.207      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     Maximum MAJOR SYSTEM storage used =     359.(cu.m.)

--------------------------------------------------------------------------------
002:0011------------------------------------------------------------------------
*AREA 202B - DISTRIBUTION CENTRE 5 ROOF
*#*************************************************************************|
---------------------
| CALIB STANDHYD      |    Area     (ha)=     3.05
| 05:202B   DT= 5.00 |    Total Imp(%)=    99.00   Dir. Conn.(%)=    99.00
---------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        3.02          .03
     Dep. Storage     (mm)=        1.00         5.00
     Average Slope     (%)=        1.00         1.00
     Length            (m)=      282.00         5.00
     Mannings n           =        .013         .250

     Max.eff.Inten.(mm/hr)=       75.36        14.66
                over (min)        5.00        10.00
     Storage Coeff.  (min)=        5.33 (ii)   10.71 (ii)
     Unit Hyd. Tpeak (min)=        5.00        10.00
     Unit Hyd. peak  (cms)=         .21          .11
                                                             *TOTALS*
     PEAK FLOW       (cms)=         .55          .00            .555 (iii)
     TIME TO PEAK    (hrs)=        1.33         1.42           1.333
     RUNOFF VOLUME    (mm)=       32.44         8.43          32.201
     TOTAL RAINFALL   (mm)=       33.44        33.44          33.441
     RUNOFF COEFFICIENT   =         .97          .25            .963

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
002:0012------------------------------------------------------------------------
*#*************************************************************************|
*FLOW CONTROL ROOF DRAINS DC5
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(202A  )   |
| OUT<05:(FCRD  )   |    =========  OUTFLOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .108  .1906E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK        R.V.
     --------------------         (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (202A  )         2.68      .494     1.333      32.201
     OUTFLOW<05: (FCRD  )         2.68      .034     2.317      32.200
    OVERFLOW<06: (OVF   )          .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    6.954
                   TIME SHIFT OF PEAK FLOW         (min)=    59.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.6071E-01

--------------------------------------------------------------------------------
002:0013------------------------------------------------------------------------
*#*************************************************************************|
*DC5 INFILTRATION TANK
*#*************************************************************************|
---------------------
| COMPUTE DUALHYD     |    Average inlet capacities   [CINLET] =    .004  (cms)
| TotalHyd 05:FCRD    |    Number of inlets in system [NINLET] =       1
---------------------      Total minor system capacity         =    .004  (cms)
                           Total major system storage [TMJSTO] =     365.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK      R.V.       DWF
                                  (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   05:FCRD         2.68      .034     2.317    32.200      .000
     ====================================================================
     MAJOR SYST   06:TO-LIS        .76      .021     5.050    32.200      .000
     MINOR SYST   07:INFIL        1.92      .004     1.050    32.210      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     Maximum MAJOR SYSTEM storage used =     365.(cu.m.)

--------------------------------------------------------------------------------
002:0014------------------------------------------------------------------------
*FLOW CHECK - DC4/5 DISCHARGING TO LISGAR BYPASS NETWORK SE OF SITE
-----------------------
| ADD HYD (BYPASS    ) | ID: NHYD         AREA      QPEAK   TPEAK   R.V.     DWF
-----------------------                   (ha)      (cms)   (hrs)   (mm)   (cms)
                       ID1 03:TO-LISGAR     .82       .024    4.70  32.20    .000
                      +ID2 06:TO-LISGAR     .76       .021    5.05  32.20    .000
                       =======================================================
                       SUM 09:BYPASS       1.58       .042    5.05  32.20    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
002:0015------------------------------------------------------------------------
*#*************************************************************************|
*AREA 203 - SITE DRAINING TO TENTH LINE SWALE
*#*************************************************************************|
---------------------
| CALIB STANDHYD      |    Area     (ha)=     3.91
| 01:203    DT= 5.00 |    Total Imp(%)=    65.00   Dir. Conn.(%)=    65.00
---------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        2.54         1.37
     Dep. Storage     (mm)=        1.00         5.00
     Average Slope     (%)=        1.00         5.00
     Length            (m)=       53.00        32.00
     Mannings n           =        .013         .250

     Max.eff.Inten.(mm/hr)=       75.36        14.66
                over (min)        5.00        10.00
     Storage Coeff.  (min)=        1.95 (ii)   12.06 (ii)
     Unit Hyd. Tpeak (min)=        5.00        10.00
     Unit Hyd. peak  (cms)=         .31          .10
                                                             *TOTALS*
     PEAK FLOW       (cms)=         .53          .03            .551 (iii)
     TIME TO PEAK    (hrs)=        1.33         1.42           1.333
     RUNOFF VOLUME    (mm)=       32.44         8.43          24.037
     TOTAL RAINFALL   (mm)=       33.44        33.44          33.441
     RUNOFF COEFFICIENT   =         .97          .25            .719
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
002:0016------------------------------------------------------------------------
*#*************************************************************************|
*DRY POND
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(203   )   |
| OUT<02:(POND  )   |    =========  OUTFLOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .456  .1109E+00
                            .000  .4500E-02   |     .510  .1263E+00
                            .052  .6070E-01   |     .000  .0000E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK        R.V.
     --------------------         (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (203   )         3.91      .551     1.333      24.037
     OUTFLOW<02: (POND  )         3.91      .052     2.067      22.886
    OVERFLOW<03: (OVF   )          .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    9.398
                   TIME SHIFT OF PEAK FLOW         (min)=    44.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.6008E-01

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
002:0017------------------------------------------------------------------------
*#*************************************************************************|
*AREA 204 - UNCONTROLLED SITE DISCHARGE TO TENTH LINE SWALE
*#*************************************************************************|
---------------------
| CALIB NASHYD        |    Area     (ha)=      .16   Curve Number   (CN)=79.00
| 04:204    DT= 1.00 |    Ia       (mm)=    5.000   # of Linear Res.(N)= 3.00
---------------------      U.H. Tp(hrs)=     .070

     Unit Hyd Qpeak  (cms)=     .087

     PEAK FLOW       (cms)=     .007 (i)
     TIME TO PEAK    (hrs)=    1.367
     RUNOFF VOLUME    (mm)=    8.428
     TOTAL RAINFALL   (mm)=   33.441
     RUNOFF COEFFICIENT   =     .252

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
002:0018------------------------------------------------------------------------
*#*************************************************************************|
*COMBINE TOTAL FLOW TO SWALE
-----------------------
| ADD HYD (SWALE     ) | ID: NHYD         AREA      QPEAK   TPEAK   R.V.     DWF
-----------------------                   (ha)      (cms)   (hrs)   (mm)   (cms)
                       ID1 02:POND         3.91       .052    2.07  22.89    .000
                      +ID2 03:OVF           .00       .000     .00    .00    .000
                      +ID3 04:204           .16       .007    1.37   8.43    .000
                       =======================================================
                       SUM 08:SWALE        4.07       .053    2.03  22.32    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
002:0019------------------------------------------------------------------------
*#*************************************************************************|
*AREA 205 - UNCONTROLLED SITE DISCHARGE TO ADJACENT LAND
*#*************************************************************************|
---------------------
| CALIB NASHYD        |    Area     (ha)=      .22   Curve Number   (CN)=79.00
| 01:205    DT= 1.00 |    Ia       (mm)=    5.000   # of Linear Res.(N)= 3.00
---------------------      U.H. Tp(hrs)=     .080

     Unit Hyd Qpeak  (cms)=     .105

     PEAK FLOW       (cms)=     .009 (i)
     TIME TO PEAK    (hrs)=    1.383
     RUNOFF VOLUME    (mm)=    8.428
     TOTAL RAINFALL   (mm)=   33.441
     RUNOFF COEFFICIENT   =     .252

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
002:0020------------------------------------------------------------------------
*#*************************************************************************|
*FLOW CHECK - TOTAL SITE DISCHARGE
-----------------------
| ADD HYD (TOTAL     ) | ID: NHYD         AREA      QPEAK   TPEAK   R.V.     DWF
-----------------------                   (ha)      (cms)   (hrs)   (mm)   (cms)
                       ID1 01:205           .22       .009    1.38   8.43    .000
                      +ID2 08:SWALE        4.07       .053    2.03  22.32    .000
```

```
                   +ID3 09:BYPASS         1.58     .042    5.05  32.20    .000
                   +ID4 10:TOPOND         6.09     .250    1.55  27.16    .000
                    ===========================================================
                    SUM 02:TOTAL         11.96     .304    1.55  25.83    .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 -------------------------------------------------------------------------------
 002:0021-----------------------------------------------------------------------
 *#****************************************************************************|
   ** END OF RUN :   4

 ******************************************************************************





 --------------------
 | START              |  Project  dir.: Q:\60549_~1\SWM\SWMHYMO\
 --------------------  Rainfall dir.: Q:\60549_~1\SWM\SWMHYMO\
     TZERO =   .00 hrs on        0
     METOUT=   2 (output = METRIC)
     NRUN  = 005
     NSTORM=   1
            #  1=MISSG005.stm
 -------------------------------------------------------------------------------
 005:0002-----------------------------------------------------------------------
 *#****************************************************************************|
 *#  Project Name: PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
 *#  JOB NUMBER  : 60549-001
 *#       Date   : FEBRUARY 2026
 *#  Modeller    : NZR
 *#    Company   : MTE CONSULTANTS INC.
 *#       File   : 60549.DAT
 -------------------------------------------------------------------------------
 005:0002-----------------------------------------------------------------------
 --------------------
 | READ STORM         |    Filename: MISSISSAUGA 5-YR CHICAGO (A=820 B=4.6 C=
 | Ptotal=  44.95 mm|    Comments: MISSISSAUGA 5-YR CHICAGO (A=820 B=4.6 C=
 --------------------
               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
                .17   2.987 |   1.17  22.661 |   2.17   6.992 |   3.17   3.578
                .33   3.412 |   1.33 101.302 |   2.33   5.973 |   3.33   3.328
                .50   4.004 |   1.50  29.801 |   2.50   5.234 |   3.50   3.115
                .67   4.895 |   1.67  15.822 |   2.67   4.673 |   3.67   2.931
                .83   6.407 |   1.83  10.974 |   2.83   4.231 |   3.83   2.769
               1.00   9.629 |   2.00   8.500 |   3.00   3.874 |   4.00   2.626

 -------------------------------------------------------------------------------
 005:0003-----------------------------------------------------------------------
 *
 *#############################################################################|
 *#
 *#                    EXISTING CONDITIONS HYDROLOGIC MODELING
 *#
 *#               ==================================================
 *#
 *#############################################################################|
 *#***************************************************************************|
 *AREA 101 - EXISTING DRAINAGE SE TO LISGAR CHANNEL
 *#****************************************************************************|
 ----------------------
 | CALIB NASHYD         |   Area    (ha)=   12.15   Curve Number   (CN)=79.00
 | 01:101    DT= 1.00 |   Ia       (mm)=   5.000   # of Linear Res.(N)= 3.00
 ----------------------   U.H. Tp(hrs)=    .350

     Unit Hyd Qpeak  (cms)=    1.326

     PEAK FLOW       (cms)=     .383 (i)
     TIME TO PEAK    (hrs)=    1.750
     RUNOFF VOLUME    (mm)=   14.853
     TOTAL RAINFALL   (mm)=   44.953
     RUNOFF COEFFICIENT   =     .330

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -------------------------------------------------------------------------------
 005:0004-----------------------------------------------------------------------
 *#***************************************************************************|
 *AREA 102 - EXISTING DRAINAGE NE TO TENTH LINE SWALE
 *#****************************************************************************|
 ----------------------
 | CALIB NASHYD         |   Area    (ha)=    4.02   Curve Number   (CN)=79.00
 | 02:102    DT= 1.00 |   Ia       (mm)=   5.000   # of Linear Res.(N)= 3.00
 ----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .808

     PEAK FLOW       (cms)=     .184 (i)
     TIME TO PEAK    (hrs)=    1.533
     RUNOFF VOLUME    (mm)=   14.853
     TOTAL RAINFALL   (mm)=   44.953
     RUNOFF COEFFICIENT   =     .330

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -------------------------------------------------------------------------------
 005:0005-----------------------------------------------------------------------
 *#***************************************************************************|
 *#############################################################################|
 *#
 *#                    PROPOSED CONDITIONS HYDROLOGIC MODELING
 *#
 *#               ==================================================
 *#
 *#############################################################################|
 *#***************************************************************************|
 *AREA 201 - SITE DRAINAGE TO SWM FACILITY SE OF SITE
 *#****************************************************************************|
 ----------------------
 | CALIB STANDHYD      |   Area    (ha)=    6.09
 | 01:201    DT= 5.00 |   Total Imp(%)=   78.00   Dir. Conn.(%)=   78.00
 ----------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.75          1.34
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.50          2.00
     Length            (m)=      30.00         20.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=     101.30         28.26
                over (min)        5.00         10.00
     Storage Coeff.  (min)=       1.09 (ii)     8.81 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=        .34           .12
                                                             *TOTALS*
     PEAK FLOW       (cms)=       1.34           .07          1.389 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.42          1.333
     RUNOFF VOLUME    (mm)=      43.95         14.85         37.551
     TOTAL RAINFALL   (mm)=      44.95         44.95         44.953
     RUNOFF COEFFICIENT   =        .98           .33           .835
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -------------------------------------------------------------------------------
 005:0006-----------------------------------------------------------------------
 *#****************************************************************************|
 *ORIFICE PIPE PLACED DOWNSTREAM OF MH1
 --------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(201   )   |
 | OUT<02:(Orific)   |    =========  OUTLFOW STORAGE TABLE  =========
 --------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |   (cms)    (ha.m.)
                            .000  .0000E+00   |     .701  .2153E+00
                            .000  .0000E+00   |     .752  .2230E+00
                            .658  .2011E+00   |     .000  .0000E+00

     ROUTING RESULTS             AREA     QPEAK      TPEAK       R.V.
     --------------------        (ha)     (cms)      (hrs)       (mm)
     INFLOW >01: (201   )        6.09     1.389      1.333     37.551
     OUTFLOW<02: (Orific)        6.09      .344      1.550     37.551
   OVERFLOW<03: (OVF   )          .00      .000       .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   24.734
                  TIME SHIFT OF PEAK FLOW        (min)=    13.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1051E+00

 -------------------------------------------------------------------------------
 005:0007-----------------------------------------------------------------------
 *#***************************************************************************|
 *FLOW CHECK - SITE DISCHARGE TO DOWNSTREAM SWM FACILITY
 ------------------------
 | ADD HYD (TOPOND    ) | ID: NHYD        AREA     QPEAK   TPEAK   R.V.    DWF
 ------------------------                 (ha)     (cms)   (hrs)   (mm)   (cms)
                   ID1 02:Orifice         6.09      .344    1.55  37.55    .000
                  +ID2 03:OVF              .00      .000     .00    .00    .000
                   ===========================================================
                   SUM 10:TOPOND          6.09      .344    1.55  37.55    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 -------------------------------------------------------------------------------
 005:0008-----------------------------------------------------------------------
 *#****************************************************************************|
 *AREA 202A - DISTRIBUTION CENTRE 4 ROOF
 *#****************************************************************************|
 ----------------------
 | CALIB STANDHYD      |   Area    (ha)=    2.68
 | 01:202A   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
 ----------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.65           .03
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.00          1.00
     Length            (m)=     262.00          5.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=     101.30         28.26
                over (min)        5.00         10.00
     Storage Coeff.  (min)=       4.53 (ii)     8.67 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=        .23           .12
                                                             *TOTALS*
     PEAK FLOW       (cms)=        .68           .00           .683 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.42          1.333
     RUNOFF VOLUME    (mm)=      43.95         14.85         43.662
     TOTAL RAINFALL   (mm)=      44.95         44.95         44.953
     RUNOFF COEFFICIENT   =        .98           .33           .971
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -------------------------------------------------------------------------------
 005:0009-----------------------------------------------------------------------
 *#****************************************************************************|
 *FLOW CONTROL ROOF DRAINS DC4
 --------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(202A  )   |
 | OUT<02:(FCRD  )   |    =========  OUTLFOW STORAGE TABLE  =========
 --------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |   (cms)    (ha.m.)
                            .000  .0000E+00   |     .103  .1690E+00

     ROUTING RESULTS             AREA     QPEAK      TPEAK       R.V.
     --------------------        (ha)     (cms)      (hrs)       (mm)
     INFLOW >01: (202A  )        2.68      .683      1.333     43.662
     OUTFLOW<02: (FCRD  )        2.68      .049      2.217     43.662
   OVERFLOW<03: (OVF   )          .00      .000       .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=    7.228
                  TIME SHIFT OF PEAK FLOW        (min)=    53.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.8128E-01

 -------------------------------------------------------------------------------
 005:0010-----------------------------------------------------------------------
 *#***************************************************************************|
 *DC4 INFILTRATION TANK
 *#****************************************************************************|
 ----------------------
 | COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =    .004  (cms)
 | TotalHyd 02:FCRD    |   Number of inlets in system [NINLET] =       1
 ----------------------   Total minor system capacity         =    .004  (cms)
                          Total major system storage [TMJSTO] =     359.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                  (ha)     (cms)     (hrs)     (mm)    (cms)
     TOTAL HYD.   02:FCRD         2.68      .049     2.217   43.662     .000
     ==================================================================
     MAJOR SYST   03:TO-LIS       1.26      .041     3.617   43.662     .000
     MINOR SYST   04:INFIL        1.42      .004      .900   43.661     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     Maximum MAJOR SYSTEM storage used =     359.(cu.m.)

```

```
 ------------------------------------------------------------------------------
 005:0011----------------------------------------------------------------------
 *AREA 202B - DISTRIBUTION CENTRE 5 ROOF
 *#***************************************************************************|
 ----------------------
 | CALIB STANDHYD      |   Area    (ha)=    3.05
 | 05:202B   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
 ----------------------
                               IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=       3.02          .03
      Dep. Storage     (mm)=       1.00         5.00
      Average Slope     (%)=       1.00         1.00
      Length            (m)=     282.00         5.00
      Mannings n          =        .013         .250

      Max.eff.Inten.(mm/hr)=     101.30        28.26
                 over (min)        5.00        10.00
      Storage Coeff.  (min)=       4.73 (ii)    8.87 (ii)
      Unit Hyd. Tpeak (min)=       5.00        10.00
      Unit Hyd. peak  (cms)=        .22          .12
                                                              *TOTALS*
      PEAK FLOW       (cms)=        .77          .00            .769 (iii)
      TIME TO PEAK    (hrs)=       1.33         1.42           1.333
      RUNOFF VOLUME    (mm)=      43.95        14.85          43.662
      TOTAL RAINFALL   (mm)=      44.95        44.95          44.953
      RUNOFF COEFFICIENT   =        .98          .33            .971
       *** WARNING: Storage Coefficient is smaller than DT!
                    Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ------------------------------------------------------------------------------
 005:0012----------------------------------------------------------------------
 *#***************************************************************************|
 *FLOW CONTROL ROOF DRAINS DC5
 ---------------------
 | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
 |  IN>01:(202A  )    |
 | OUT<05:(FCRD  )    |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
                              .000  .0000E+00   |     .108  .1906E+00

      ROUTING RESULTS             AREA     QPEAK     TPEAK       R.V.
      --------------------        (ha)     (cms)     (hrs)       (mm)
      INFLOW >01: (202A  )        2.68      .683     1.333     43.662
      OUTFLOW<05: (FCRD  )        2.68      .047     2.283     43.662
     OVERFLOW<06: (OVF   )         .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    6.819
                    TIME SHIFT OF PEAK FLOW         (min)=    57.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.8232E-01

 ------------------------------------------------------------------------------
 005:0013----------------------------------------------------------------------
 *#*************************************************************************|
 *DC5 INFILTRATION TANK
 *#***************************************************************************|
 ----------------------
 | COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =    .004  (cms)
 | TotalHyd 05:FCRD    |   Number of inlets in system [NINLET] =       1
 ----------------------    Total minor system capacity         =    .004  (cms)
                           Total major system storage [TMJSTO] =     365.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK     R.V.       DWF
                                  (ha)     (cms)     (hrs)     (mm)     (cms)
      TOTAL HYD.   05:FCRD        2.68      .047     2.283   43.662      .000
      =====================================================================
      MAJOR SYST   06:TO-LIS      1.21      .038     3.817   43.662      .000
      MINOR SYST   07:INFIL       1.47      .004      .917   43.664      .000

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

      Maximum MAJOR SYSTEM storage used =     365.(cu.m.)

 ------------------------------------------------------------------------------
 005:0014----------------------------------------------------------------------
 *FLOW CHECK - DC4/5 DISCHARGING TO LISGAR BYPASS NETWORK SE OF SITE
 ------------------------
 | ADD HYD (BYPASS    ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.     DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 03:TO-LISGAR    1.26      .041    3.62  43.66    .000
                      +ID2 06:TO-LISGAR    1.21      .038    3.82  43.66    .000
                       =======================================================
                       SUM 09:BYPASS       2.47      .078    3.82  43.66    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 005:0015----------------------------------------------------------------------
 *#***************************************************************************|
 *AREA 203 - SITE DRAINING TO TENTH LINE SWALE
 *#***************************************************************************|
 ----------------------
 | CALIB STANDHYD      |   Area    (ha)=    3.91
 | 01:203    DT= 5.00 |   Total Imp(%)=   65.00   Dir. Conn.(%)=   65.00
 ----------------------
                               IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=       2.54         1.37
      Dep. Storage     (mm)=       1.00         5.00
      Average Slope     (%)=       1.00         5.00
      Length            (m)=      53.00        32.00
      Mannings n          =        .013         .250

      Max.eff.Inten.(mm/hr)=     101.30        28.26
                 over (min)        5.00        10.00
      Storage Coeff.  (min)=       1.74 (ii)    9.51 (ii)
      Unit Hyd. Tpeak (min)=       5.00        10.00
      Unit Hyd. peak  (cms)=        .32          .12
                                                              *TOTALS*
      PEAK FLOW       (cms)=        .71          .07            .765 (iii)
      TIME TO PEAK    (hrs)=       1.33         1.42           1.333
      RUNOFF VOLUME    (mm)=      43.95        14.85          33.768
      TOTAL RAINFALL   (mm)=      44.95        44.95          44.953
      RUNOFF COEFFICIENT   =        .98          .33            .751
       *** WARNING: Storage Coefficient is smaller than DT!
                    Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ------------------------------------------------------------------------------
 005:0016----------------------------------------------------------------------
 *#***************************************************************************|
 *DRY POND
 ---------------------
 | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
 |  IN>01:(203   )    |
 | OUT<02:(POND  )    |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
                              .000  .0000E+00   |     .456  .1109E+00
                              .000  .4500E-02   |     .510  .1263E+00
                              .052  .6070E-01   |     .000  .0000E+00

      ROUTING RESULTS             AREA     QPEAK     TPEAK       R.V.
      --------------------        (ha)     (cms)     (hrs)       (mm)
      INFLOW >01: (203   )        3.91      .765     1.333     33.768
      OUTFLOW<02: (POND  )        3.91      .153     1.667     32.617
     OVERFLOW<03: (OVF   )         .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   19.969
                    TIME SHIFT OF PEAK FLOW         (min)=    20.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.7318E-01

       *** WARNING: Outflow volume is less than inflow volume.
 ------------------------------------------------------------------------------
 005:0017----------------------------------------------------------------------
 *#*************************************************************************|
 *AREA 204 - UNCONTROLLED SITE DISCHARGE TO TENTH LINE SWALE
 *#***************************************************************************|
 ----------------------
 | CALIB NASHYD        |   Area    (ha)=     .16   Curve Number   (CN)=79.00
 | 04:204    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
 ----------------------    U.H. Tp(hrs)=    .070

      Unit Hyd Qpeak  (cms)=     .087

      PEAK FLOW       (cms)=     .012 (i)
      TIME TO PEAK    (hrs)=    1.367
      RUNOFF VOLUME    (mm)=   14.852
      TOTAL RAINFALL   (mm)=   44.953
      RUNOFF COEFFICIENT   =     .330

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ------------------------------------------------------------------------------
 005:0018----------------------------------------------------------------------
 *#*************************************************************************|
 *COMBINE TOTAL FLOW TO SWALE
 ------------------------
 | ADD HYD (SWALE     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.     DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 02:POND         3.91      .153    1.67  32.62    .000
                      +ID2 03:OVF           .00      .000     .00    .00    .000
                      +ID3 04:204           .16      .012    1.37  14.85    .000
                       =======================================================
                       SUM 08:SWALE        4.07      .157    1.67  31.92    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 005:0019----------------------------------------------------------------------
 *#***************************************************************************|
 *AREA 205 - UNCONTROLLED SITE DISCHARGE TO ADJACENT LAND
 *#***************************************************************************|
 ----------------------
 | CALIB NASHYD        |   Area    (ha)=     .22   Curve Number   (CN)=79.00
 | 01:205    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
 ----------------------    U.H. Tp(hrs)=    .080

      Unit Hyd Qpeak  (cms)=     .105

      PEAK FLOW       (cms)=     .016 (i)
      TIME TO PEAK    (hrs)=    1.367
      RUNOFF VOLUME    (mm)=   14.852
      TOTAL RAINFALL   (mm)=   44.953
      RUNOFF COEFFICIENT   =     .330

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ------------------------------------------------------------------------------
 005:0020----------------------------------------------------------------------
 *#*************************************************************************|
 *FLOW CHECK - TOTAL SITE DISCHARGE
 ------------------------
 | ADD HYD (TOTAL     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.     DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 01:205           .22      .016    1.37  14.85    .000
                      +ID2 08:SWALE        4.07      .157    1.67  31.92    .000
                      +ID3 09:BYPASS       2.47      .078    3.82  43.66    .000
                      +ID4 10:TOPOND       6.09      .344    1.55  37.55    .000
                       =======================================================
                       SUM 02:TOTAL       12.85      .505    1.57  36.56    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 005:0021----------------------------------------------------------------------
 *#*************************************************************************|
 ------------------------------------------------------------------------------
 005:0002----------------------------------------------------------------------
 *
   ** END OF RUN :   9

 *****************************************************************************






 --------------------
 | START              |  Project  dir.: Q:\60549_~1\SWM\SWMHYMO\
 --------------------    Rainfall dir.: Q:\60549_~1\SWM\SWMHYMO\
      TZERO =   .00 hrs on        0
      METOUT=   2 (output = METRIC)
      NRUN  = 010
      NSTORM=   1
             #  1=MISSG010.stm
 ------------------------------------------------------------------------------
 010:0002----------------------------------------------------------------------
 *#*************************************************************************|
 *#  Project Name: PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
 *#  JOB NUMBER  : 60549-001
 *#       Date   : FEBRUARY 2026
 *#  Modeller    : NZR
 *#    Company   : MTE CONSULTANTS INC.
 *#       File   : 60549.DAT
 ------------------------------------------------------------------------------
 010:0002----------------------------------------------------------------------
 --------------------
 | READ STORM         |    Filename: MISSISSAUGA 10-YR CHICAGO (A=1010 B=4.6
 | Ptotal=  55.37 mm|    Comments: MISSISSAUGA 10-YR CHICAGO (A=1010 B=4.6
```

```
--------------------
           TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
            hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
            .17   3.679 |   1.17  27.912 |   2.17   8.613 |   3.17   4.407
            .33   4.203 |   1.33 124.775 |   2.33   7.356 |   3.33   4.100
            .50   4.932 |   1.50  36.707 |   2.50   6.447 |   3.50   3.837
            .67   6.029 |   1.67  19.488 |   2.67   5.756 |   3.67   3.610
            .83   7.891 |   1.83  13.516 |   2.83   5.212 |   3.83   3.411
           1.00  11.860 |   2.00  10.470 |   3.00   4.771 |   4.00   3.235

-----------------------------------------------------------------------------
010:0003---------------------------------------------------------------------
*
*#############################################################################|
*#
*#                     EXISTING CONDITIONS HYDROLOGIC MODELING
*#
*#                ===================================================
*#
*#############################################################################|
*#***************************************************************************|
*AREA 101 - EXISTING DRAINAGE SE TO LISGAR CHANNEL
*#***************************************************************************|
---------------------
| CALIB NASHYD       |   Area    (ha)=   12.15   Curve Number   (CN)=79.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
---------------------    U.H. Tp(hrs)=    .350

     Unit Hyd Qpeak  (cms)=    1.326

     PEAK FLOW       (cms)=     .570 (i)
     TIME TO PEAK    (hrs)=    1.733
     RUNOFF VOLUME    (mm)=   21.521
     TOTAL RAINFALL   (mm)=   55.369
     RUNOFF COEFFICIENT   =     .389

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
010:0004---------------------------------------------------------------------
*#**************************************************************************|
*AREA 102 - EXISTING DRAINAGE NE TO TENTH LINE SWALE
*#***************************************************************************|
---------------------
| CALIB NASHYD       |   Area    (ha)=    4.02   Curve Number   (CN)=79.00
| 02:102    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
---------------------    U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .808

     PEAK FLOW       (cms)=     .274 (i)
     TIME TO PEAK    (hrs)=    1.533
     RUNOFF VOLUME    (mm)=   21.521
     TOTAL RAINFALL   (mm)=   55.369
     RUNOFF COEFFICIENT   =     .389

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
010:0005---------------------------------------------------------------------
*#**************************************************************************|
*#############################################################################|
*#
*#                     PROPOSED CONDITIONS HYDROLOGIC MODELING
*#
*#                ===================================================
*#
*#############################################################################|
*#**************************************************************************|
*AREA 201 - SITE DRAINAGE TO SWM FACILITY SE OF SITE
*#***************************************************************************|
---------------------
| CALIB STANDHYD     |   Area    (ha)=    6.09
| 01:201    DT= 5.00 |   Total Imp(%)=   78.00   Dir. Conn.(%)=   78.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.75         1.34
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.50         2.00
     Length            (m)=     30.00        20.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    124.77        53.04
                over (min)       5.00         5.00
     Storage Coeff.  (min)=      1.01 (ii)    7.01 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=       .34          .17
                                                         *TOTALS*
     PEAK FLOW       (cms)=      1.65          .13          1.780 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.33          1.333
     RUNOFF VOLUME    (mm)=     54.37        21.52         47.142
     TOTAL RAINFALL   (mm)=     55.37        55.37         55.369
     RUNOFF COEFFICIENT   =       .98          .39           .851
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
010:0006---------------------------------------------------------------------
*#***************************************************************************|
*ORIFICE PIPE PLACED DOWNSTREAM OF MH1
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(201   )    |
| OUT<02:(Orific)    |    =========  OUTLFOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000  .0000E+00    |     .701  .2153E+00
                            .000  .0000E+00    |     .752  .2230E+00
                            .658  .2011E+00    |     .000  .0000E+00

     ROUTING RESULTS             AREA     QPEAK     TPEAK        R.V.
     --------------------        (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (201    )       6.09     1.780     1.333      47.142
     OUTFLOW<02: (Orific)        6.09      .435     1.550      47.142
    OVERFLOW<03: (OVF    )        .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =          0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=        .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=        .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   24.432
                   TIME SHIFT OF PEAK FLOW         (min)=    13.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1330E+00

-----------------------------------------------------------------------------
010:0007---------------------------------------------------------------------
*#**************************************************************************|
*FLOW CHECK - SITE DISCHARGE TO DOWNSTREAM SWM FACILITY
```

```
------------------------
| ADD HYD (TOPOND    ) | ID: NHYD        AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                 (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 02:Orifice      6.09      .435    1.55  47.14    .000
                    +ID2 03:OVF           .00      .000     .00    .00    .000
                    ===========================================================
                     SUM 10:TOPOND       6.09      .435    1.55  47.14    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
010:0008---------------------------------------------------------------------
*#**************************************************************************|
*AREA 202A - DISTRIBUTION CENTRE 4 ROOF
*#**************************************************************************|
---------------------
| CALIB STANDHYD     |   Area    (ha)=    2.68
| 01:202A   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.65          .03
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         1.00
     Length            (m)=    262.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    124.77        42.91
                over (min)       5.00        10.00
     Storage Coeff.  (min)=      4.17 (ii)    7.67 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=       .24          .13
                                                         *TOTALS*
     PEAK FLOW       (cms)=       .85          .00           .856 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.42          1.333
     RUNOFF VOLUME    (mm)=     54.37        21.52         54.041
     TOTAL RAINFALL   (mm)=     55.37        55.37         55.369
     RUNOFF COEFFICIENT   =       .98          .39           .976
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
010:0009---------------------------------------------------------------------
*#**************************************************************************|
*FLOW CONTROL ROOF DRAINS DC4
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(202A   )   |
| OUT<02:(FCRD   )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000  .0000E+00    |     .103  .1690E+00

     ROUTING RESULTS             AREA     QPEAK     TPEAK        R.V.
     --------------------        (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (202A   )       2.68      .856     1.333      54.041
     OUTFLOW<02: (FCRD   )       2.68      .061     2.217      54.040
    OVERFLOW<03: (OVF    )        .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =          0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=        .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=        .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    7.138
                   TIME SHIFT OF PEAK FLOW         (min)=    53.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1006E+00

-----------------------------------------------------------------------------
010:0010---------------------------------------------------------------------
*#*************************************************************************|
*DC4 INFILTRATION TANK
*#***************************************************************************|
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .004  (cms)
| TotalHyd 02:FCRD   |   Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity         =    .004  (cms)
                         Total major system storage [TMJSTO] =    359.(cu.m.)

              ID: NHYD        AREA     QPEAK     TPEAK      R.V.     DWF
                              (ha)     (cms)     (hrs)      (mm)    (cms)
     TOTAL HYD.   02:FCRD     2.68      .061     2.217    54.040     .000
     ==================================================================
     MAJOR SYST   03:TO-LIS   1.51      .054     3.117    54.040     .000
     MINOR SYST   04:INFIL    1.17      .004      .783    54.041     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     Maximum MAJOR SYSTEM storage used =     359.(cu.m.)

-----------------------------------------------------------------------------
010:0011---------------------------------------------------------------------
*AREA 202B - DISTRIBUTION CENTRE 5 ROOF
*#**************************************************************************|
---------------------
| CALIB STANDHYD     |   Area    (ha)=    3.05
| 05:202B   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.02          .03
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         1.00
     Length            (m)=    282.00         5.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    124.77        42.91
                over (min)       5.00        10.00
     Storage Coeff.  (min)=      4.36 (ii)    7.86 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=       .23          .13
                                                         *TOTALS*
     PEAK FLOW       (cms)=       .96          .00           .965 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.42          1.333
     RUNOFF VOLUME    (mm)=     54.37        21.52         54.041
     TOTAL RAINFALL   (mm)=     55.37        55.37         55.369
     RUNOFF COEFFICIENT   =       .98          .39           .976
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
010:0012---------------------------------------------------------------------
*#**************************************************************************|
*FLOW CONTROL ROOF DRAINS DC5
--------------------
```

```
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(202A  )   |
| OUT<05:(FCRD  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000  .0000E+00   |     .108  .1906E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK       R.V.
     --------------------         (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (202A  )         2.68      .856     1.333     54.041
     OUTFLOW<05: (FCRD  )         2.68      .058     2.267     54.040
    OVERFLOW<06: (OVF   )          .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=     6.735
                    TIME SHIFT OF PEAK FLOW         (min)=     56.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1019E+00

--------------------------------------------------------------------------------
010:0013------------------------------------------------------------------------
*#*************************************************************************|
*DC5 INFILTRATION TANK
*#**************************************************************************|
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .004  (cms)
| TotalHyd 05:FCRD   |   Number of inlets in system [NINLET] =       1
----------------------   Total minor system capacity         =    .004  (cms)
                         Total major system storage [TMJSTO] =     365.(cu.m.)

                ID: NHYD        AREA     QPEAK      TPEAK     R.V.       DWF
                                (ha)     (cms)      (hrs)     (mm)     (cms)
     TOTAL HYD.   05:FCRD        2.68      .058      2.267   54.040      .000
     ======================================================================
     MAJOR SYST   06:TO-LIS      1.46      .051      3.267   54.040      .000
     MINOR SYST   07:INFIL       1.22      .004       .817   54.057      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     Maximum MAJOR SYSTEM storage used =     365.(cu.m.)

--------------------------------------------------------------------------------
010:0014------------------------------------------------------------------------
*FLOW CHECK - DC4/5 DISCHARGING TO LISGAR BYPASS NETWORK SE OF SITE
------------------------
| ADD HYD (BYPASS    ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 03:TO-LISGAR    1.51      .054    3.12  54.04    .000
                     +ID2 06:TO-LISGAR    1.46      .051    3.27  54.04    .000
                      ===========================================================
                      SUM 09:BYPASS       2.97      .104    3.27  54.04    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
010:0015------------------------------------------------------------------------
*#**************************************************************************|
*AREA 203 - SITE DRAINING TO TENTH LINE SWALE
*#**************************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    3.91
| 01:203    DT= 5.00 |   Total Imp(%)=   65.00   Dir. Conn.(%)=   65.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.54          1.37
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.00          5.00
     Length            (m)=      53.00         32.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=     124.77         42.91
                over (min)       5.00         10.00
     Storage Coeff.  (min)=       1.60 (ii)     8.18 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=        .32           .13
                                                           *TOTALS*
     PEAK FLOW       (cms)=        .88           .12         .967 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.42        1.333
     RUNOFF VOLUME    (mm)=      54.37         21.52       42.872
     TOTAL RAINFALL   (mm)=      55.37         55.37       55.369
     RUNOFF COEFFICIENT   =        .98           .39         .774
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
010:0016------------------------------------------------------------------------
*#**************************************************************************|
*DRY POND
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(203   )   |
| OUT<02:(POND  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000  .0000E+00   |     .456  .1109E+00
                            .000  .4500E-02   |     .510  .1263E+00
                            .052  .6070E-01   |     .000  .0000E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK       R.V.
     --------------------         (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (203   )         3.91      .967     1.333     42.872
     OUTFLOW<02: (POND  )         3.91      .251     1.567     41.721
    OVERFLOW<03: (OVF   )          .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    25.986
                    TIME SHIFT OF PEAK FLOW         (min)=     14.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.8543E-01

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
010:0017------------------------------------------------------------------------
*#*************************************************************************|
*AREA 204 - UNCONTROLLED SITE DISCHARGE TO TENTH LINE SWALE
*#**************************************************************************|
----------------------
| CALIB NASHYD       |   Area     (ha)=      .16   Curve Number   (CN)=79.00
| 04:204    DT= 1.00 |   Ia       (mm)=    5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=     .070

     Unit Hyd Qpeak  (cms)=     .087

     PEAK FLOW       (cms)=     .019 (i)
     TIME TO PEAK    (hrs)=    1.367
     RUNOFF VOLUME    (mm)=   21.520
     TOTAL RAINFALL   (mm)=   55.369
     RUNOFF COEFFICIENT   =     .389

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
010:0018------------------------------------------------------------------------
*#*************************************************************************|
*COMBINE TOTAL FLOW TO SWALE
------------------------
| ADD HYD (SWALE     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 02:POND         3.91      .251    1.57  41.72    .000
                     +ID2 03:OVF           .00      .000     .00    .00    .000
                     +ID3 04:204           .16      .019    1.37  21.52    .000
                      ===========================================================
                      SUM 08:SWALE        4.07      .259    1.55  40.93    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
010:0019------------------------------------------------------------------------
*#**************************************************************************|
*AREA 205 - UNCONTROLLED SITE DISCHARGE TO ADJACENT LAND
*#**************************************************************************|
----------------------
| CALIB NASHYD       |   Area     (ha)=      .22   Curve Number   (CN)=79.00
| 01:205    DT= 1.00 |   Ia       (mm)=    5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=     .080

     Unit Hyd Qpeak  (cms)=     .105

     PEAK FLOW       (cms)=     .024 (i)
     TIME TO PEAK    (hrs)=    1.367
     RUNOFF VOLUME    (mm)=   21.520
     TOTAL RAINFALL   (mm)=   55.369
     RUNOFF COEFFICIENT   =     .389

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
010:0020------------------------------------------------------------------------
*#*************************************************************************|
*FLOW CHECK - TOTAL SITE DISCHARGE
------------------------
| ADD HYD (TOTAL     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:205           .22      .024    1.37  21.52    .000
                     +ID2 08:SWALE        4.07      .259    1.55  40.93    .000
                     +ID3 09:BYPASS       2.97      .104    3.27  54.04    .000
                     +ID4 10:TOPOND       6.09      .435    1.55  47.14    .000
                      ===========================================================
                      SUM 02:TOTAL       13.35      .706    1.55  46.36    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
010:0021------------------------------------------------------------------------
*#**************************************************************************|
--------------------------------------------------------------------------------
010:0002------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
010:0002------------------------------------------------------------------------
*
  ** END OF RUN :  24

*******************************************************************************






--------------------
| START              |  Project  dir.: Q:\60549_~1\SWM\SWMHYMO\
--------------------  Rainfall dir.: Q:\60549_~1\SWM\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 025
    NSTORM=   1
           #  1=MISSG025.stm
--------------------------------------------------------------------------------
025:0002------------------------------------------------------------------------
*#**************************************************************************|
*#  Project Name: PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
*#  JOB NUMBER  : 60549-001
*#       Date   : FEBRUARY 2026
*#  Modeller    : NZR
*#    Company   : MTE CONSULTANTS INC.
*#       File   : 60549.DAT
--------------------------------------------------------------------------------
025:0002------------------------------------------------------------------------
--------------------
| READ STORM         |    Filename: MISSISSAUGA 25-YR CHICAGO (A=1160 B=4.6
| Ptotal=  63.59 mm|    Comments: MISSISSAUGA 25-YR CHICAGO (A=1160 B=4.6
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   4.226 |   1.17  32.057 |   2.17   9.892 |   3.17   5.061
               .33   4.827 |   1.33 143.305 |   2.33   8.449 |   3.33   4.708
               .50   5.665 |   1.50  42.158 |   2.50   7.404 |   3.50   4.407
               .67   6.925 |   1.67  22.382 |   2.67   6.611 |   3.67   4.146
               .83   9.063 |   1.83  15.524 |   2.83   5.986 |   3.83   3.917
              1.00  13.621 |   2.00  12.025 |   3.00   5.480 |   4.00   3.716

--------------------------------------------------------------------------------
025:0003------------------------------------------------------------------------
*
*###########################################################################|
*#
*#                       EXISTING CONDITIONS HYDROLOGIC MODELING
*#
*#                 ===================================================
*#
*###########################################################################|
*#**************************************************************************|
*AREA 101 - EXISTING DRAINAGE SE TO LISGAR CHANNEL
*#**************************************************************************|
----------------------
| CALIB NASHYD       |   Area     (ha)=    12.15   Curve Number   (CN)=79.00
| 01:101    DT= 1.00 |   Ia       (mm)=    5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=     .350

     Unit Hyd Qpeak  (cms)=    1.326

     PEAK FLOW       (cms)=     .732 (i)
     TIME TO PEAK    (hrs)=    1.733
     RUNOFF VOLUME    (mm)=   27.222
     TOTAL RAINFALL   (mm)=   63.592
     RUNOFF COEFFICIENT   =     .428

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```

---------------------------------------------------------------------------------
025:0004-------------------------------------------------------------------------
*#*************************************************************************|
*AREA 102 - EXISTING DRAINAGE NE TO TENTH LINE SWALE
*#*************************************************************************|
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.02   Curve Number   (CN)=79.00
| 02:102    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .190

     Unit Hyd Qpeak  (cms)=     .808

     PEAK FLOW       (cms)=     .354 (i)
     TIME TO PEAK    (hrs)=    1.517
     RUNOFF VOLUME    (mm)=   27.222
     TOTAL RAINFALL   (mm)=   63.592
     RUNOFF COEFFICIENT  =     .428

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---------------------------------------------------------------------------------
025:0005-------------------------------------------------------------------------
*#*************************************************************************|
*##########################################################################|
*#
*#                     PROPOSED CONDITIONS HYDROLOGIC MODELING
*#
*#                ================================================
*#
*##########################################################################|
*#*************************************************************************|
*AREA 201 - SITE DRAINAGE TO SWM FACILITY SE OF SITE
*#*************************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    6.09
| 01:201    DT= 5.00 |   Total Imp(%)=   78.00   Dir. Conn.(%)=   78.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.75         1.34
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.50         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=     143.31        67.72
                over (min)        5.00         5.00
     Storage Coeff.  (min)=        .95 (ii)    6.39 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .34          .18
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.89          .18         2.071 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33         1.333
     RUNOFF VOLUME    (mm)=      62.59        27.22        54.811
     TOTAL RAINFALL   (mm)=      63.59        63.59        63.592
     RUNOFF COEFFICIENT  =         .98          .43          .862
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---------------------------------------------------------------------------------
025:0006-------------------------------------------------------------------------
*#*************************************************************************|
*ORIFICE PIPE PLACED DOWNSTREAM OF MH1
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201   )   |
| OUT<02:(Orific)   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)    |   (cms)    (ha.m.)
                            .000  .0000E+00    |     .701  .2153E+00
                            .000  .0000E+00    |     .752  .2230E+00
                            .658  .2011E+00    |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )       6.09     2.071     1.333     54.811
     OUTFLOW<02: (Orific)       6.09      .506     1.550     54.811
   OVERFLOW<03: (OVF   )         .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   24.419
                   TIME SHIFT OF PEAK FLOW         (min)=    13.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1547E+00

---------------------------------------------------------------------------------
025:0007-------------------------------------------------------------------------
*#*************************************************************************|
*FLOW CHECK - SITE DISCHARGE TO DOWNSTREAM SWM FACILITY
------------------------
| ADD HYD (TOPOND    ) | ID: NHYD          AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                       ID1 02:Orifice      6.09      .506    1.55  54.81    .000
                      +ID2 03:OVF           .00      .000     .00    .00    .000
                      =======================================================
                       SUM 10:TOPOND       6.09      .506    1.55  54.81    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

---------------------------------------------------------------------------------
025:0008-------------------------------------------------------------------------
*#*************************************************************************|
*AREA 202A - DISTRIBUTION CENTRE 4 ROOF
*#*************************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    2.68
| 01:202A   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.65          .03
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     262.00         5.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=     143.31        67.72
                over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.94 (ii)    6.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .24          .18
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .99          .00          .994 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33         1.333
     RUNOFF VOLUME    (mm)=      62.59        27.22        62.238
     TOTAL RAINFALL   (mm)=      63.59        63.59        63.592
     RUNOFF COEFFICIENT  =         .98          .43          .979
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---------------------------------------------------------------------------------
025:0009-------------------------------------------------------------------------
*#*************************************************************************|
*FLOW CONTROL ROOF DRAINS DC4
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(202A  )   |
| OUT<02:(FCRD  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)    |   (cms)    (ha.m.)
                            .000  .0000E+00    |     .103  .1690E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (202A  )       2.68      .994     1.333     62.238
     OUTFLOW<02: (FCRD  )       2.68      .070     2.217     62.238
   OVERFLOW<03: (OVF   )         .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    7.077
                   TIME SHIFT OF PEAK FLOW         (min)=    53.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1159E+00

---------------------------------------------------------------------------------
025:0010-------------------------------------------------------------------------
*#*************************************************************************|
*DC4 INFILTRATION TANK
*#*************************************************************************|
----------------------
| COMPUTE DUALHYD    |    Average inlet capacities   [CINLET] =    .004  (cms)
| TotalHyd 02:FCRD   |    Number of inlets in system [NINLET] =       1
----------------------    Total minor system capacity         =    .004  (cms)
                          Total major system storage [TMJSTO] =     359.(cu.m.)

                 ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                 (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   02:FCRD        2.68      .070     2.217   62.238     .000
     ====================================================================
     MAJOR SYST   03:TO-LIS      1.65      .064     2.850   62.238     .000
     MINOR SYST   04:INFIL       1.03      .004      .717   62.253     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     Maximum MAJOR SYSTEM storage used =     359.(cu.m.)

---------------------------------------------------------------------------------
025:0011-------------------------------------------------------------------------
*AREA 202B - DISTRIBUTION CENTRE 5 ROOF
*#*************************************************************************|
----------------------
| CALIB STANDHYD     |   Area    (ha)=    3.05
| 05:202B   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.02          .03
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     282.00         5.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=     143.31        67.72
                over (min)        5.00         5.00
     Storage Coeff.  (min)=       4.12 (ii)    7.04 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .24          .17
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.12          .00         1.122 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33         1.333
     RUNOFF VOLUME    (mm)=      62.59        27.22        62.238
     TOTAL RAINFALL   (mm)=      63.59        63.59        63.592
     RUNOFF COEFFICIENT  =         .98          .43          .979
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---------------------------------------------------------------------------------
025:0012-------------------------------------------------------------------------
*#*************************************************************************|
*FLOW CONTROL ROOF DRAINS DC5
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(202A  )   |
| OUT<05:(FCRD  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)    |   (cms)    (ha.m.)
                            .000  .0000E+00    |     .108  .1906E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (202A  )       2.68      .994     1.333     62.238
     OUTFLOW<05: (FCRD  )       2.68      .066     2.250     62.238
   OVERFLOW<06: (OVF   )         .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    6.677
                   TIME SHIFT OF PEAK FLOW         (min)=    55.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1173E+00

---------------------------------------------------------------------------------
025:0013-------------------------------------------------------------------------
*#*************************************************************************|
*DC5 INFILTRATION TANK
*#*************************************************************************|
----------------------
| COMPUTE DUALHYD    |    Average inlet capacities   [CINLET] =    .004  (cms)
| TotalHyd 05:FCRD   |    Number of inlets in system [NINLET] =       1
----------------------    Total minor system capacity         =    .004  (cms)
                          Total major system storage [TMJSTO] =     365.(cu.m.)

                 ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                 (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   05:FCRD        2.68      .066     2.250   62.238     .000
     ====================================================================
```

```
      MAJOR SYST   06:TO-LIS       1.61      .060     2.983   62.238      .000
      MINOR SYST   07:INFIL        1.07      .004      .750   62.253      .000
      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
      Maximum MAJOR SYSTEM storage used =     365.(cu.m.)
 --------------------------------------------------------------------------------
 025:0014------------------------------------------------------------------------
 *FLOW CHECK - DC4/5 DISCHARGING TO LISGAR BYPASS NETWORK SE OF SITE
 ------------------------
 | ADD HYD (BYPASS    ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 03:TO-LISGAR      1.65      .064    2.85  62.24    .000
                    +ID2 06:TO-LISGAR      1.61      .060    2.98  62.24    .000
                     ===========================================================
                     SUM 09:BYPASS         3.26      .124    2.98  62.24    .000
    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 --------------------------------------------------------------------------------
 025:0015------------------------------------------------------------------------
 *#*************************************************************************|
 *AREA 203 - SITE DRAINING TO TENTH LINE SWALE
 *#*************************************************************************|
 ---------------------
 | CALIB STANDHYD     |   Area    (ha)=    3.91
 | 01:203    DT= 5.00 |   Total Imp(%)=   65.00   Dir. Conn.(%)=   65.00
 ---------------------
                               IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=       2.54         1.37
      Dep. Storage     (mm)=       1.00         5.00
      Average Slope     (%)=       1.00         5.00
      Length            (m)=      53.00        32.00
      Mannings n           =       .013         .250

      Max.eff.Inten.(mm/hr)=     143.31        67.72
                 over (min)        5.00         5.00
      Storage Coeff.  (min)=       1.51 (ii)    6.99 (ii)
      Unit Hyd. Tpeak (min)=       5.00         5.00
      Unit Hyd. peak  (cms)=        .33          .17
                                                           *TOTALS*
      PEAK FLOW       (cms)=       1.01          .18         1.187 (iii)
      TIME TO PEAK    (hrs)=       1.33         1.33         1.333
      RUNOFF VOLUME    (mm)=      62.59        27.22        50.213
      TOTAL RAINFALL   (mm)=      63.59        63.59        63.592
      RUNOFF COEFFICIENT   =        .98          .43          .790
       *** WARNING: Storage Coefficient is smaller than DT!
                    Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 --------------------------------------------------------------------------------
 025:0016------------------------------------------------------------------------
 *#*************************************************************************|
 *DRY POND
 ---------------------
 | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
 |  IN>01:(203   )    |
 | OUT<02:(POND  )    |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
                              .000  .0000E+00   |      .456  .1109E+00
                              .000  .4500E-02   |      .510  .1263E+00
                              .052  .6070E-01   |      .000  .0000E+00

      ROUTING RESULTS             AREA     QPEAK     TPEAK       R.V.
      --------------------        (ha)     (cms)     (hrs)       (mm)
      INFLOW >01: (203   )        3.91     1.187     1.333     50.213
      OUTFLOW<02: (POND  )        3.91      .339     1.533     49.061
     OVERFLOW<03: (OVF   )         .00      .000      .000       .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=   28.596
                    TIME SHIFT OF PEAK FLOW         (min)=    12.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.9639E-01

       *** WARNING: Outflow volume is less than inflow volume.
 --------------------------------------------------------------------------------
 025:0017------------------------------------------------------------------------
 *#*************************************************************************|
 *AREA 204 - UNCONTROLLED SITE DISCHARGE TO TENTH LINE SWALE
 *#*************************************************************************|
 ---------------------
 | CALIB NASHYD       |   Area    (ha)=     .16   Curve Number   (CN)=79.00
 | 04:204    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
 ---------------------    U.H. Tp(hrs)=    .070

      Unit Hyd Qpeak  (cms)=     .087

      PEAK FLOW       (cms)=     .024 (i)
      TIME TO PEAK    (hrs)=    1.350
      RUNOFF VOLUME    (mm)=   27.222
      TOTAL RAINFALL   (mm)=   63.592
      RUNOFF COEFFICIENT   =     .428

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 --------------------------------------------------------------------------------
 025:0018------------------------------------------------------------------------
 *#*************************************************************************|
 *COMBINE TOTAL FLOW TO SWALE
 ------------------------
 | ADD HYD (SWALE     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 02:POND           3.91      .339    1.53  49.06    .000
                    +ID2 03:OVF             .00      .000     .00    .00    .000
                    +ID3 04:204             .16      .024    1.35  27.22    .000
                     ===========================================================
                     SUM 08:SWALE          4.07      .351    1.53  48.20    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 --------------------------------------------------------------------------------
 025:0019------------------------------------------------------------------------
 *#*************************************************************************|
 *AREA 205 - UNCONTROLLED SITE DISCHARGE TO ADJACENT LAND
 *#*************************************************************************|
 ---------------------
 | CALIB NASHYD       |   Area    (ha)=     .22   Curve Number   (CN)=79.00
 | 01:205    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
 ---------------------    U.H. Tp(hrs)=    .080

      Unit Hyd Qpeak  (cms)=     .105

      PEAK FLOW       (cms)=     .031 (i)
      TIME TO PEAK    (hrs)=    1.367
      RUNOFF VOLUME    (mm)=   27.222
      TOTAL RAINFALL   (mm)=   63.592
      RUNOFF COEFFICIENT   =     .428

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 --------------------------------------------------------------------------------
 025:0020------------------------------------------------------------------------
 *#*************************************************************************|
 *FLOW CHECK - TOTAL SITE DISCHARGE
 ------------------------
 | ADD HYD (TOTAL     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 01:205             .22      .031    1.37  27.22    .000
                    +ID2 08:SWALE          4.07      .351    1.53  48.20    .000
                    +ID3 09:BYPASS         3.26      .124    2.98  62.24    .000
                    +ID4 10:TOPOND         6.09      .506    1.55  54.81    .000
                     ===========================================================
                     SUM 02:TOTAL         13.64      .873    1.53  54.17    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
 --------------------------------------------------------------------------------
 025:0021------------------------------------------------------------------------
 *#*************************************************************************|
 --------------------------------------------------------------------------------
 025:0002------------------------------------------------------------------------
 *
 --------------------------------------------------------------------------------
 025:0002------------------------------------------------------------------------
 *
 --------------------------------------------------------------------------------
 025:0002------------------------------------------------------------------------
 *
   ** END OF RUN :  49

 ******************************************************************************

 --------------------
 | START             |  Project  dir.: Q:\60549_~1\SWM\SWMHYMO\
 --------------------   Rainfall dir.: Q:\60549_~1\SWM\SWMHYMO\
     TZERO =   .00 hrs on        0
     METOUT=   2 (output = METRIC)
     NRUN  = 050
     NSTORM=   1
             #  1=MISSG050.stm
 --------------------------------------------------------------------------------
 050:0002------------------------------------------------------------------------
 *#*************************************************************************|
 *#  Project Name: PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
 *#  JOB NUMBER  : 60549-001
 *#        Date  : FEBRUARY 2026
 *#  Modeller    : NZR
 *#     Company  : MTE CONSULTANTS INC.
 *#        File  : 60549.DAT
 --------------------------------------------------------------------------------
 050:0002------------------------------------------------------------------------
 --------------------
 | READ STORM        |    Filename: MISSISSAUGA 50-YR CHICAGO (A=1300 B=4.7
 | Ptotal=  71.24 mm|    Comments: MISSISSAUGA 50-YR CHICAGO (A=1300 B=4.7
 --------------------
                TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
                 hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
                 .17   4.741 |   1.17  36.053 |   2.17  11.113 |   3.17   5.680
                 .33   5.417 |   1.33 159.748 |   2.33   9.489 |   3.33   5.283
                 .50   6.358 |   1.50  47.410 |   2.50   8.314 |   3.50   4.945
                 .67   7.775 |   1.67  25.176 |   2.67   7.422 |   3.67   4.651
                 .83  10.181 |   1.83  17.454 |   2.83   6.719 |   3.83   4.395
                1.00  15.311 |   2.00  13.514 |   3.00   6.150 |   4.00   4.168

 --------------------------------------------------------------------------------
 050:0003------------------------------------------------------------------------
 *
 *##########################################################################|
 *#
 *#                   EXISTING CONDITIONS HYDROLOGIC MODELING
 *#
 *#             ===============================================
 *#
 *##########################################################################|
 *#*************************************************************************|
 *AREA 101 - EXISTING DRAINAGE SE TO LISGAR CHANNEL
 *#*************************************************************************|
 ---------------------
 | CALIB NASHYD       |   Area    (ha)=   12.15   Curve Number   (CN)=79.00
 | 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
 ---------------------    U.H. Tp(hrs)=    .350

      Unit Hyd Qpeak  (cms)=    1.326

      PEAK FLOW       (cms)=     .892 (i)
      TIME TO PEAK    (hrs)=    1.733
      RUNOFF VOLUME    (mm)=   32.807
      TOTAL RAINFALL   (mm)=   71.244
      RUNOFF COEFFICIENT   =     .460

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 --------------------------------------------------------------------------------
 050:0004------------------------------------------------------------------------
 *#*************************************************************************|
 *AREA 102 - EXISTING DRAINAGE NE TO TENTH LINE SWALE
 *#*************************************************************************|
 ---------------------
 | CALIB NASHYD       |   Area    (ha)=    4.02   Curve Number   (CN)=79.00
 | 02:102    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
 ---------------------    U.H. Tp(hrs)=    .190

      Unit Hyd Qpeak  (cms)=     .808

      PEAK FLOW       (cms)=     .431 (i)
      TIME TO PEAK    (hrs)=    1.517
      RUNOFF VOLUME    (mm)=   32.807
      TOTAL RAINFALL   (mm)=   71.244
      RUNOFF COEFFICIENT   =     .460

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
 --------------------------------------------------------------------------------
 050:0005------------------------------------------------------------------------
 *#*************************************************************************|
 *##########################################################################|
 *#
 *#                   PROPOSED CONDITIONS HYDROLOGIC MODELING
 *#
 *#             ===============================================
 *#
 *##########################################################################|
 *#*************************************************************************|
 *AREA 201 - SITE DRAINAGE TO SWM FACILITY SE OF SITE
 *#*************************************************************************|
```

```
 ----------------------
 | CALIB STANDHYD     |   Area    (ha)=    6.09
 | 01:201    DT= 5.00 |   Total Imp(%)=   78.00   Dir. Conn.(%)=   78.00
 ----------------------
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area     (ha)=       4.75         1.34
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.50         2.00
     Length            (m)=      30.00        20.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     159.75        81.65
                over (min)        5.00         5.00
     Storage Coeff.  (min)=        .91 (ii)    5.96 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .34          .19
                                                            *TOTALS*
     PEAK FLOW       (cms)=       2.11          .23          2.334 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.333
     RUNOFF VOLUME    (mm)=      70.24        32.81         62.008
     TOTAL RAINFALL   (mm)=      71.24        71.24         71.244
     RUNOFF COEFFICIENT   =        .99          .46           .870
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -------------------------------------------------------------------------------
 050:0006-----------------------------------------------------------------------
 *#*************************************************************************|
 *ORIFICE PIPE PLACED DOWNSTREAM OF MH1
 ---------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(201   )   |
 | OUT<02:(Orific)   |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .701  .2153E+00
                             .000  .0000E+00   |     .752  .2230E+00
                             .658  .2011E+00   |     .000  .0000E+00

     ROUTING RESULTS               AREA     QPEAK     TPEAK       R.V.
     --------------------          (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )          6.09     2.334     1.333     62.008
     OUTFLOW<02: (Orific)          6.09      .572     1.550     62.008
    OVERFLOW<03: (OVF   )           .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=    24.488
                  TIME SHIFT OF PEAK FLOW         (min)=     13.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1749E+00

 -------------------------------------------------------------------------------
 050:0007-----------------------------------------------------------------------
 *#************************************************************************|
 *FLOW CHECK - SITE DISCHARGE TO DOWNSTREAM SWM FACILITY
 ------------------------
 | ADD HYD (TOPOND    ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.     DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)    (cms)
                    ID1 02:Orifice         6.09      .572    1.55  62.01     .000
                   +ID2 03:OVF              .00      .000     .00    .00     .000
                    ===========================================================
                    SUM 10:TOPOND          6.09      .572    1.55  62.01     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 -------------------------------------------------------------------------------
 050:0008-----------------------------------------------------------------------
 *#*************************************************************************|
 *AREA 202A - DISTRIBUTION CENTRE 4 ROOF
 *#*************************************************************************|
 ----------------------
 | CALIB STANDHYD     |   Area    (ha)=    2.68
 | 01:202A   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
 ----------------------
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area     (ha)=       2.65          .03
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     262.00         5.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     159.75        81.65
                over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.78 (ii)    6.48 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .25          .18
                                                            *TOTALS*
     PEAK FLOW       (cms)=       1.11          .00          1.116 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.333
     RUNOFF VOLUME    (mm)=      70.24        32.80         69.870
     TOTAL RAINFALL   (mm)=      71.24        71.24         71.244
     RUNOFF COEFFICIENT   =        .99          .46           .981
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -------------------------------------------------------------------------------
 050:0009-----------------------------------------------------------------------
 *#*************************************************************************|
 *FLOW CONTROL ROOF DRAINS DC4
 ---------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(202A  )   |
 | OUT<02:(FCRD  )   |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .103  .1690E+00

     ROUTING RESULTS               AREA     QPEAK     TPEAK       R.V.
     --------------------          (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (202A  )          2.68     1.116     1.333     69.870
     OUTFLOW<02: (FCRD  )          2.68      .079     2.217     69.869
    OVERFLOW<03: (OVF   )           .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=     7.070
                  TIME SHIFT OF PEAK FLOW         (min)=     53.00
```

```
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1300E+00

 -------------------------------------------------------------------------------
 050:0010-----------------------------------------------------------------------
 *#*************************************************************************|
 *DC4 INFILTRATION TANK
 *#*************************************************************************|
 ----------------------
 | COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .004  (cms)
 | TotalHyd 02:FCRD   |   Number of inlets in system [NINLET] =       1
 ----------------------   Total minor system capacity         =    .004  (cms)
                          Total major system storage [TMJSTO] =     359.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                  (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   02:FCRD         2.68      .079     2.217   69.869     .000
     ===================================================================
     MAJOR SYST   03:TO-LIS       1.75      .074     2.667   69.869     .000
     MINOR SYST   04:INFIL         .93      .004      .667   69.874     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     Maximum MAJOR SYSTEM storage used =     359.(cu.m.)

 -------------------------------------------------------------------------------
 050:0011-----------------------------------------------------------------------
 *AREA 202B - DISTRIBUTION CENTRE 5 ROOF
 *#*************************************************************************|
 ----------------------
 | CALIB STANDHYD     |   Area    (ha)=    3.05
 | 05:202B   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
 ----------------------
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area     (ha)=       3.02          .03
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         1.00
     Length            (m)=     282.00         5.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     159.75        81.65
                over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.95 (ii)    6.65 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .24          .18
                                                            *TOTALS*
     PEAK FLOW       (cms)=       1.26          .00          1.261 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.333
     RUNOFF VOLUME    (mm)=      70.24        32.80         69.870
     TOTAL RAINFALL   (mm)=      71.24        71.24         71.244
     RUNOFF COEFFICIENT   =        .99          .46           .981
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -------------------------------------------------------------------------------
 050:0012-----------------------------------------------------------------------
 *#*************************************************************************|
 *FLOW CONTROL ROOF DRAINS DC5
 ---------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(202A  )   |
 | OUT<05:(FCRD  )   |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .108  .1906E+00

     ROUTING RESULTS               AREA     QPEAK     TPEAK       R.V.
     --------------------          (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (202A  )          2.68     1.116     1.333     69.870
     OUTFLOW<05: (FCRD  )          2.68      .074     2.250     69.869
    OVERFLOW<06: (OVF   )           .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=     6.671
                  TIME SHIFT OF PEAK FLOW         (min)=     55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1317E+00

 -------------------------------------------------------------------------------
 050:0013-----------------------------------------------------------------------
 *#*************************************************************************|
 *DC5 INFILTRATION TANK
 *#*************************************************************************|
 ----------------------
 | COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .004  (cms)
 | TotalHyd 05:FCRD   |   Number of inlets in system [NINLET] =       1
 ----------------------   Total minor system capacity         =    .004  (cms)
                          Total major system storage [TMJSTO] =     365.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                  (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   05:FCRD         2.68      .074     2.250   69.869     .000
     ===================================================================
     MAJOR SYST   06:TO-LIS       1.71      .069     2.783   69.869     .000
     MINOR SYST   07:INFIL         .97      .004      .700   69.890     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     Maximum MAJOR SYSTEM storage used =     365.(cu.m.)

 -------------------------------------------------------------------------------
 050:0014-----------------------------------------------------------------------
 *FLOW CHECK - DC4/5 DISCHARGING TO LISGAR BYPASS NETWORK SE OF SITE
 ------------------------
 | ADD HYD (BYPASS    ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.     DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)    (cms)
                    ID1 03:TO-LISGAR       1.75      .074    2.67  69.87     .000
                   +ID2 06:TO-LISGAR       1.71      .069    2.78  69.87     .000
                    ===========================================================
                    SUM 09:BYPASS          3.46      .142    2.78  69.87     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 -------------------------------------------------------------------------------
 050:0015-----------------------------------------------------------------------
 *#*************************************************************************|
 *AREA 203 - SITE DRAINING TO TENTH LINE SWALE
 *#*************************************************************************|
 ----------------------
 | CALIB STANDHYD     |   Area    (ha)=    3.91
 | 01:203    DT= 5.00 |   Total Imp(%)=   65.00   Dir. Conn.(%)=   65.00
 ----------------------
                              IMPERVIOUS   PERVIOUS (i)
     Surface Area     (ha)=       2.54         1.37
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         5.00
     Length            (m)=      53.00        32.00
```

```
     Mannings n          =      .013        .250

     Max.eff.Inten.(mm/hr)=    159.75       81.65
                over (min)       5.00        5.00
     Storage Coeff.  (min)=      1.45 (ii)    6.53 (ii)
     Unit Hyd. Tpeak (min)=      5.00        5.00
     Unit Hyd. peak  (cms)=       .33         .18
                                                        *TOTALS*
     PEAK FLOW       (cms)=      1.13         .22         1.349 (iii)
     TIME TO PEAK    (hrs)=      1.33        1.33         1.333
     RUNOFF VOLUME    (mm)=     70.24       32.81        57.141
     TOTAL RAINFALL   (mm)=     71.24       71.24        71.244
     RUNOFF COEFFICIENT   =       .99         .46          .802
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
050:0016------------------------------------------------------------------------
*#***************************************************************************|
*DRY POND
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
|  IN>01:(203   )    |
| OUT<02:(POND  )    |    =========  OUTLFOW STORAGE TABLE  =========
---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000  .0000E+00    |     .456  .1109E+00
                            .000  .4500E-02    |     .510  .1263E+00
                            .052  .6070E-01    |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (203   )       3.91     1.349     1.333     57.141
     OUTFLOW<02: (POND  )       3.91      .416     1.517     55.990
    OVERFLOW<03: (OVF   )        .00      .000      .000       .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   30.832
                   TIME SHIFT OF PEAK FLOW         (min)=    11.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1059E+00

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
050:0017------------------------------------------------------------------------
*#**************************************************************************|
*AREA 204 - UNCONTROLLED SITE DISCHARGE TO TENTH LINE SWALE
*#***************************************************************************|
----------------------
| CALIB NASHYD        |   Area    (ha)=     .16   Curve Number   (CN)=79.00
| 04:204    DT= 1.00 |   Ia       (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------    U.H. Tp(hrs)=     .070

     Unit Hyd Qpeak  (cms)=     .087

     PEAK FLOW       (cms)=     .029 (i)
     TIME TO PEAK    (hrs)=    1.350
     RUNOFF VOLUME    (mm)=   32.806
     TOTAL RAINFALL   (mm)=   71.244
     RUNOFF COEFFICIENT   =     .460

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
050:0018------------------------------------------------------------------------
*#**************************************************************************|
*COMBINE TOTAL FLOW TO SWALE
------------------------
| ADD HYD (SWALE     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 02:POND          3.91      .416    1.52  55.99    .000
                     +ID2 03:OVF            .00      .000     .00    .00    .000
                     +ID3 04:204            .16      .029    1.35  32.81    .000
                      =========================================================
                      SUM 08:SWALE         4.07      .430    1.52  55.08    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
050:0019------------------------------------------------------------------------
*#***************************************************************************|
*AREA 205 - UNCONTROLLED SITE DISCHARGE TO ADJACENT LAND
*#***************************************************************************|
----------------------
| CALIB NASHYD        |   Area    (ha)=     .22   Curve Number   (CN)=79.00
| 01:205    DT= 1.00 |   Ia       (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------    U.H. Tp(hrs)=     .080

     Unit Hyd Qpeak  (cms)=     .105

     PEAK FLOW       (cms)=     .038 (i)
     TIME TO PEAK    (hrs)=    1.367
     RUNOFF VOLUME    (mm)=   32.806
     TOTAL RAINFALL   (mm)=   71.244
     RUNOFF COEFFICIENT   =     .460

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
050:0020------------------------------------------------------------------------
*#**************************************************************************|
*FLOW CHECK - TOTAL SITE DISCHARGE
------------------------
| ADD HYD (TOTAL     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
------------------------                   (ha)     (cms)   (hrs)   (mm)   (cms)
                      ID1 01:205            .22      .038    1.37  32.81    .000
                     +ID2 08:SWALE         4.07      .430    1.52  55.08    .000
                     +ID3 09:BYPASS        3.46      .142    2.78  69.87    .000
                     +ID4 10:TOPOND        6.09      .572    1.55  62.01    .000
                      =========================================================
                      SUM 02:TOTAL        13.84     1.021    1.52  61.47    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
050:0021------------------------------------------------------------------------
*#***************************************************************************|
--------------------------------------------------------------------------------
050:0002------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
050:0002------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
050:0002------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
050:0002------------------------------------------------------------------------
*
  ** END OF RUN :  99

*******************************************************************************






--------------------
| START              |  Project  dir.: Q:\60549_~1\SWM\SWMHYMO\
--------------------  Rainfall dir.: Q:\60549_~1\SWM\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 100
    NSTORM=   1
           #  1=MISSG100.stm
--------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
*#***************************************************************************|
*#  Project Name: PROLOGIS MEADOWVALE DISTRIBUTION CENTRE
*#  JOB NUMBER  : 60549-001
*#       Date   : FEBRUARY 2026
*#  Modeller    : NZR
*#    Company   : MTE CONSULTANTS INC.
*#       File   : 60549.DAT
--------------------------------------------------------------------------------
100:0002------------------------------------------------------------------------
--------------------
| READ STORM         |    Filename: MISSISSAUGA 100-YR CHICAGO (A=1450 B=4.9
| Ptotal=  79.41 mm|    Comments: MISSISSAUGA 100-YR CHICAGO (A=1450 B=4.9
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   5.300 |   1.17  40.488 |   2.17  12.455 |   3.17   6.353
               .33   6.057 |   1.33 176.312 |   2.33  10.630 |   3.33   5.908
               .50   7.114 |   1.50  53.230 |   2.50   9.310 |   3.50   5.528
               .67   8.704 |   1.67  28.284 |   2.67   8.307 |   3.67   5.200
               .83  11.407 |   1.83  19.591 |   2.83   7.518 |   3.83   4.912
              1.00  17.180 |   2.00  15.157 |   3.00   6.880 |   4.00   4.658

--------------------------------------------------------------------------------
100:0003------------------------------------------------------------------------
*
*#############################################################################|
*#
*#                    EXISTING CONDITIONS HYDROLOGIC MODELING
*#
*#               ====================================================
*#
*#############################################################################|
*#***************************************************************************|
*AREA 101 - EXISTING DRAINAGE SE TO LISGAR CHANNEL
*#***************************************************************************|
----------------------
| CALIB NASHYD        |   Area    (ha)=   12.15   Curve Number   (CN)=79.00
| 01:101    DT= 1.00 |   Ia       (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------    U.H. Tp(hrs)=     .350

     Unit Hyd Qpeak  (cms)=    1.326

     PEAK FLOW       (cms)=    1.068 (i)
     TIME TO PEAK    (hrs)=    1.717
     RUNOFF VOLUME    (mm)=   39.015
     TOTAL RAINFALL   (mm)=   79.414
     RUNOFF COEFFICIENT   =     .491

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
100:0004------------------------------------------------------------------------
*#**************************************************************************|
*AREA 102 - EXISTING DRAINAGE NE TO TENTH LINE SWALE
*#***************************************************************************|
----------------------
| CALIB NASHYD        |   Area    (ha)=    4.02   Curve Number   (CN)=79.00
| 02:102    DT= 1.00 |   Ia       (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------    U.H. Tp(hrs)=     .190

     Unit Hyd Qpeak  (cms)=     .808

     PEAK FLOW       (cms)=     .516 (i)
     TIME TO PEAK    (hrs)=    1.517
     RUNOFF VOLUME    (mm)=   39.015
     TOTAL RAINFALL   (mm)=   79.414
     RUNOFF COEFFICIENT   =     .491

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
100:0005------------------------------------------------------------------------
*#**************************************************************************|
*#############################################################################|
*#
*#                    PROPOSED CONDITIONS HYDROLOGIC MODELING
*#
*#               ====================================================
*#
*#############################################################################|
*#**************************************************************************|
*AREA 201 - SITE DRAINAGE TO SWM FACILITY SE OF SITE
*#***************************************************************************|
----------------------
| CALIB STANDHYD      |   Area    (ha)=    6.09
| 01:201    DT= 5.00 |   Total Imp(%)=   78.00   Dir. Conn.(%)=   78.00
----------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.75         1.34
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.50         2.00
     Length            (m)=      30.00        20.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=     176.31        96.46
                over (min)        5.00         5.00
     Storage Coeff.  (min)=        .88 (ii)     5.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .34          .20
                                                         *TOTALS*
     PEAK FLOW       (cms)=       2.33          .28          2.603 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.333
     RUNOFF VOLUME    (mm)=      78.41        39.01         69.746
     TOTAL RAINFALL   (mm)=      79.41        79.41         79.414
     RUNOFF COEFFICIENT   =        .99          .49           .878
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  79.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
 ---------------------------------------------------------------------------------
 100:0006--------------------------------------------------------------------------
 *#***********************************************************************|
 *ORIFICE PIPE PLACED DOWNSTREAM OF MH1
 ---------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(201   )   |
 | OUT<02:(Orific)   |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |      .701  .2153E+00
                            .000  .0000E+00   |      .752  .2230E+00
                            .658  .2011E+00   |      .000  .0000E+00

      ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
      --------------------       (ha)     (cms)     (hrs)        (mm)
      INFLOW >01: (201   )       6.09     2.603     1.333      69.746
      OUTFLOW<02: (Orific)       6.09      .641     1.550      69.746
     OVERFLOW<03: (OVF   )        .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   24.638
                   TIME SHIFT OF PEAK FLOW         (min)=    13.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1962E+00

 ---------------------------------------------------------------------------------
 100:0007--------------------------------------------------------------------------
 *#***********************************************************************|
 *FLOW CHECK - SITE DISCHARGE TO DOWNSTREAM SWM FACILITY
 ------------------------
 | ADD HYD (TOPOND    ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 02:Orifice        6.09      .641    1.55  69.75    .000
                    +ID2 03:OVF             .00      .000     .00    .00    .000
                     =========================================================
                     SUM 10:TOPOND         6.09      .641    1.55  69.75    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ---------------------------------------------------------------------------------
 100:0008--------------------------------------------------------------------------
 *#***********************************************************************|
 *AREA 202A - DISTRIBUTION CENTRE 4 ROOF
 *#***********************************************************************|
 ----------------------
 | CALIB STANDHYD     |   Area    (ha)=    2.68
 | 01:202A   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
 ----------------------
                             IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=       2.65          .03
      Dep. Storage     (mm)=       1.00         5.00
      Average Slope     (%)=       1.00         1.00
      Length            (m)=     262.00         5.00
      Mannings n          =        .013         .250

      Max.eff.Inten.(mm/hr)=     176.31        96.46
                 over (min)        5.00         5.00
      Storage Coeff.  (min)=       3.63 (ii)    6.16 (ii)
      Unit Hyd. Tpeak (min)=       5.00         5.00
      Unit Hyd. peak  (cms)=        .25          .19
                                                             *TOTALS*
      PEAK FLOW       (cms)=       1.24          .01          1.240 (iii)
      TIME TO PEAK    (hrs)=       1.33         1.33          1.333
      RUNOFF VOLUME    (mm)=      78.41        39.01         78.020
      TOTAL RAINFALL   (mm)=      79.41        79.41         79.414
      RUNOFF COEFFICIENT   =        .99          .49           .982
       *** WARNING: Storage Coefficient is smaller than DT!
                    Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ---------------------------------------------------------------------------------
 100:0009--------------------------------------------------------------------------
 *#***********************************************************************|
 *FLOW CONTROL ROOF DRAINS DC4
 ---------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(202A  )   |
 | OUT<02:(FCRD  )   |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |      .103  .1690E+00

      ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
      --------------------       (ha)     (cms)     (hrs)        (mm)
      INFLOW >01: (202A  )       2.68     1.240     1.333      78.020
      OUTFLOW<02: (FCRD  )       2.68      .088     2.217      78.019
     OVERFLOW<03: (OVF   )        .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    7.101
                   TIME SHIFT OF PEAK FLOW         (min)=    53.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1451E+00

 ---------------------------------------------------------------------------------
 100:0010--------------------------------------------------------------------------
 *#***********************************************************************|
 *DC4 INFILTRATION TANK
 *#***********************************************************************|
 ----------------------
 | COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =     .004  (cms)
 | TotalHyd 02:FCRD   |   Number of inlets in system [NINLET] =        1
 ----------------------   Total minor system capacity          =     .004  (cms)
                          Total major system storage [TMJSTO] =      359.(cu.m.)

                    ID: NHYD        AREA     QPEAK      TPEAK      R.V.       DWF
                                    (ha)     (cms)      (hrs)      (mm)      (cms)
      TOTAL HYD.   02:FCRD          2.68      .088      2.217    78.019      .000
      ======================================================================
      MAJOR SYST   03:TO-LIS        1.84      .084      2.517    78.019      .000
      MINOR SYST   04:INFIL          .84      .004       .617    78.020      .000

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

      Maximum MAJOR SYSTEM storage used =      359.(cu.m.)

 ---------------------------------------------------------------------------------
 100:0011--------------------------------------------------------------------------
 *AREA 202B - DISTRIBUTION CENTRE 5 ROOF
 *#***********************************************************************|
 ----------------------
 | CALIB STANDHYD     |   Area    (ha)=    3.05
 | 05:202B   DT= 5.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
 ----------------------
                             IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=       3.02          .03
      Dep. Storage     (mm)=       1.00         5.00
      Average Slope     (%)=       1.00         1.00
      Length            (m)=     282.00         5.00
      Mannings n          =        .013         .250

      Max.eff.Inten.(mm/hr)=     176.31        96.46
                 over (min)        5.00         5.00
      Storage Coeff.  (min)=       3.79 (ii)    6.32 (ii)
      Unit Hyd. Tpeak (min)=       5.00         5.00
      Unit Hyd. peak  (cms)=        .25          .19
                                                             *TOTALS*
      PEAK FLOW       (cms)=       1.40          .01          1.402 (iii)
      TIME TO PEAK    (hrs)=       1.33         1.33          1.333
      RUNOFF VOLUME    (mm)=      78.41        39.01         78.020
      TOTAL RAINFALL   (mm)=      79.41        79.41         79.414
      RUNOFF COEFFICIENT   =        .99          .49           .982
       *** WARNING: Storage Coefficient is smaller than DT!
                    Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ---------------------------------------------------------------------------------
 100:0012--------------------------------------------------------------------------
 *#***********************************************************************|
 *FLOW CONTROL ROOF DRAINS DC5
 ---------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(202A  )   |
 | OUT<05:(FCRD  )   |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |      .108  .1906E+00

      ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
      --------------------       (ha)     (cms)     (hrs)        (mm)
      INFLOW >01: (202A  )       2.68     1.240     1.333      78.020
      OUTFLOW<05: (FCRD  )       2.68      .083     2.250      78.019
     OVERFLOW<06: (OVF   )        .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    6.700
                   TIME SHIFT OF PEAK FLOW         (min)=    55.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1469E+00

 ---------------------------------------------------------------------------------
 100:0013--------------------------------------------------------------------------
 *#***********************************************************************|
 *DC5 INFILTRATION TANK
 *#***********************************************************************|
 ----------------------
 | COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =     .004  (cms)
 | TotalHyd 05:FCRD   |   Number of inlets in system [NINLET] =        1
 ----------------------   Total minor system capacity          =     .004  (cms)
                          Total major system storage [TMJSTO] =      365.(cu.m.)

                    ID: NHYD        AREA     QPEAK      TPEAK      R.V.       DWF
                                    (ha)     (cms)      (hrs)      (mm)      (cms)
      TOTAL HYD.   05:FCRD          2.68      .083      2.250    78.019      .000
      ======================================================================
      MAJOR SYST   06:TO-LIS        1.80      .078      2.617    78.019      .000
      MINOR SYST   07:INFIL          .88      .004       .650    78.033      .000

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

      Maximum MAJOR SYSTEM storage used =      365.(cu.m.)

 ---------------------------------------------------------------------------------
 100:0014--------------------------------------------------------------------------
 *FLOW CHECK - DC4/5 DISCHARGING TO LISGAR BYPASS NETWORK SE OF SITE
 ------------------------
 | ADD HYD (BYPASS    ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 03:TO-LISGAR      1.84      .084    2.52  78.02    .000
                    +ID2 06:TO-LISGAR      1.80      .078    2.62  78.02    .000
                     =========================================================
                     SUM 09:BYPASS         3.64      .162    2.62  78.02    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ---------------------------------------------------------------------------------
 100:0015--------------------------------------------------------------------------
 *#***********************************************************************|
 *AREA 203 - SITE DRAINING TO TENTH LINE SWALE
 *#***********************************************************************|
 ----------------------
 | CALIB STANDHYD     |   Area    (ha)=    3.91
 | 01:203    DT= 5.00 |   Total Imp(%)=   65.00   Dir. Conn.(%)=   65.00
 ----------------------
                             IMPERVIOUS    PERVIOUS (i)
      Surface Area     (ha)=       2.54         1.37
      Dep. Storage     (mm)=       1.00         5.00
      Average Slope     (%)=       1.00         5.00
      Length            (m)=      53.00        32.00
      Mannings n          =        .013         .250

      Max.eff.Inten.(mm/hr)=     176.31        96.46
                 over (min)        5.00         5.00
      Storage Coeff.  (min)=       1.39 (ii)    6.15 (ii)
      Unit Hyd. Tpeak (min)=       5.00         5.00
      Unit Hyd. peak  (cms)=        .33          .19
                                                             *TOTALS*
      PEAK FLOW       (cms)=       1.24          .27          1.516 (iii)
      TIME TO PEAK    (hrs)=       1.33         1.33          1.333
      RUNOFF VOLUME    (mm)=      78.41        39.01         64.624
      TOTAL RAINFALL   (mm)=      79.41        79.41         79.414
      RUNOFF COEFFICIENT   =        .99          .49           .814
       *** WARNING: Storage Coefficient is smaller than DT!
                    Use a smaller DT or a larger area.

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  79.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ---------------------------------------------------------------------------------
 100:0016--------------------------------------------------------------------------
 *#***********************************************************************|
 *DRY POND
 ---------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
 |  IN>01:(203   )   |
 | OUT<02:(POND  )   |    =========  OUTLFOW STORAGE TABLE  =========
 ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
```

```
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .456  .1109E+00
                            .000  .4500E-02   |     .510  .1263E+00
                            .052  .6070E-01   |     .000  .0000E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK       R.V.
     --------------------         (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (203   )         3.91     1.516     1.333     64.624
     OUTFLOW<02: (POND  )         3.91      .476     1.517     63.473
    OVERFLOW<03: (OVF   )          .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   31.436
                  TIME SHIFT OF PEAK FLOW         (min)=    11.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1167E+00

      *** WARNING: Outflow volume is less than inflow volume.
 --------------------------------------------------------------------------------
 100:0017------------------------------------------------------------------------
 *#*************************************************************************|
 *AREA 204 - UNCONTROLLED SITE DISCHARGE TO TENTH LINE SWALE
 *#**************************************************************************|
 ----------------------
 | CALIB NASHYD       |   Area    (ha)=     .16   Curve Number   (CN)=79.00
 | 04:204    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
 ----------------------   U.H. Tp(hrs)=    .070

     Unit Hyd Qpeak  (cms)=     .087

     PEAK FLOW       (cms)=     .035 (i)
     TIME TO PEAK    (hrs)=    1.350
     RUNOFF VOLUME    (mm)=   39.014
     TOTAL RAINFALL   (mm)=   79.414
     RUNOFF COEFFICIENT   =     .491

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 --------------------------------------------------------------------------------
 100:0018------------------------------------------------------------------------
 *#*************************************************************************|
 *COMBINE TOTAL FLOW TO SWALE
 ------------------------
 | ADD HYD (SWALE     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 02:POND           3.91      .476    1.52  63.47    .000
                    +ID2 03:OVF             .00      .000     .00    .00    .000
                    +ID3 04:204             .16      .035    1.35  39.01    .000
                     =========================================================
                     SUM 08:SWALE          4.07      .494    1.50  62.51    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 --------------------------------------------------------------------------------
 100:0019------------------------------------------------------------------------
 *#**************************************************************************|
 *AREA 205 - UNCONTROLLED SITE DISCHARGE TO ADJACENT LAND
 *#**************************************************************************|
 ----------------------
 | CALIB NASHYD       |   Area    (ha)=     .22   Curve Number   (CN)=79.00
 | 01:205    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
 ----------------------   U.H. Tp(hrs)=    .080

     Unit Hyd Qpeak  (cms)=     .105

     PEAK FLOW       (cms)=     .045 (i)
     TIME TO PEAK    (hrs)=    1.367
     RUNOFF VOLUME    (mm)=   39.014
     TOTAL RAINFALL   (mm)=   79.414
     RUNOFF COEFFICIENT   =     .491

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 --------------------------------------------------------------------------------
 100:0020------------------------------------------------------------------------
 *#*************************************************************************|
 *FLOW CHECK - TOTAL SITE DISCHARGE
 ------------------------
 | ADD HYD (TOTAL     ) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
 ------------------------                  (ha)     (cms)   (hrs)   (mm)   (cms)
                     ID1 01:205             .22      .045    1.37  39.01    .000
                    +ID2 08:SWALE          4.07      .494    1.50  62.51    .000
                    +ID3 09:BYPASS         3.64      .162    2.62  78.02    .000
                    +ID4 10:TOPOND         6.09      .641    1.55  69.75    .000
                     =========================================================
                     SUM 02:TOTAL         14.02     1.158    1.52  69.31    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 --------------------------------------------------------------------------------
 100:0021------------------------------------------------------------------------
 *#**************************************************************************|
 --------------------------------------------------------------------------------
 100:0002------------------------------------------------------------------------
 *
 --------------------------------------------------------------------------------
 100:0002------------------------------------------------------------------------
 *
 --------------------------------------------------------------------------------
 100:0002------------------------------------------------------------------------
 *
 --------------------------------------------------------------------------------
 100:0002------------------------------------------------------------------------
 *
 --------------------------------------------------------------------------------
 100:0002------------------------------------------------------------------------
 *
      FINISH
 --------------------------------------------------------------------------------
 ********************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
  002:0005 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  002:0015 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  002:0016 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
  005:0005 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  005:0008 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  005:0011 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  005:0015 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  005:0016 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
  010:0005 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  010:0008 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  010:0011 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  010:0015 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  010:0016 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
  025:0005 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  025:0008 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  025:0011 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  025:0015 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  025:0016 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
  050:0005 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  050:0008 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  050:0011 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  050:0015 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  050:0016 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
  100:0005 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  100:0008 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  100:0011 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  100:0015 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
  100:0016 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
    Simulation ended on 2026-03-23     at 16:01:52
 ================================================================================
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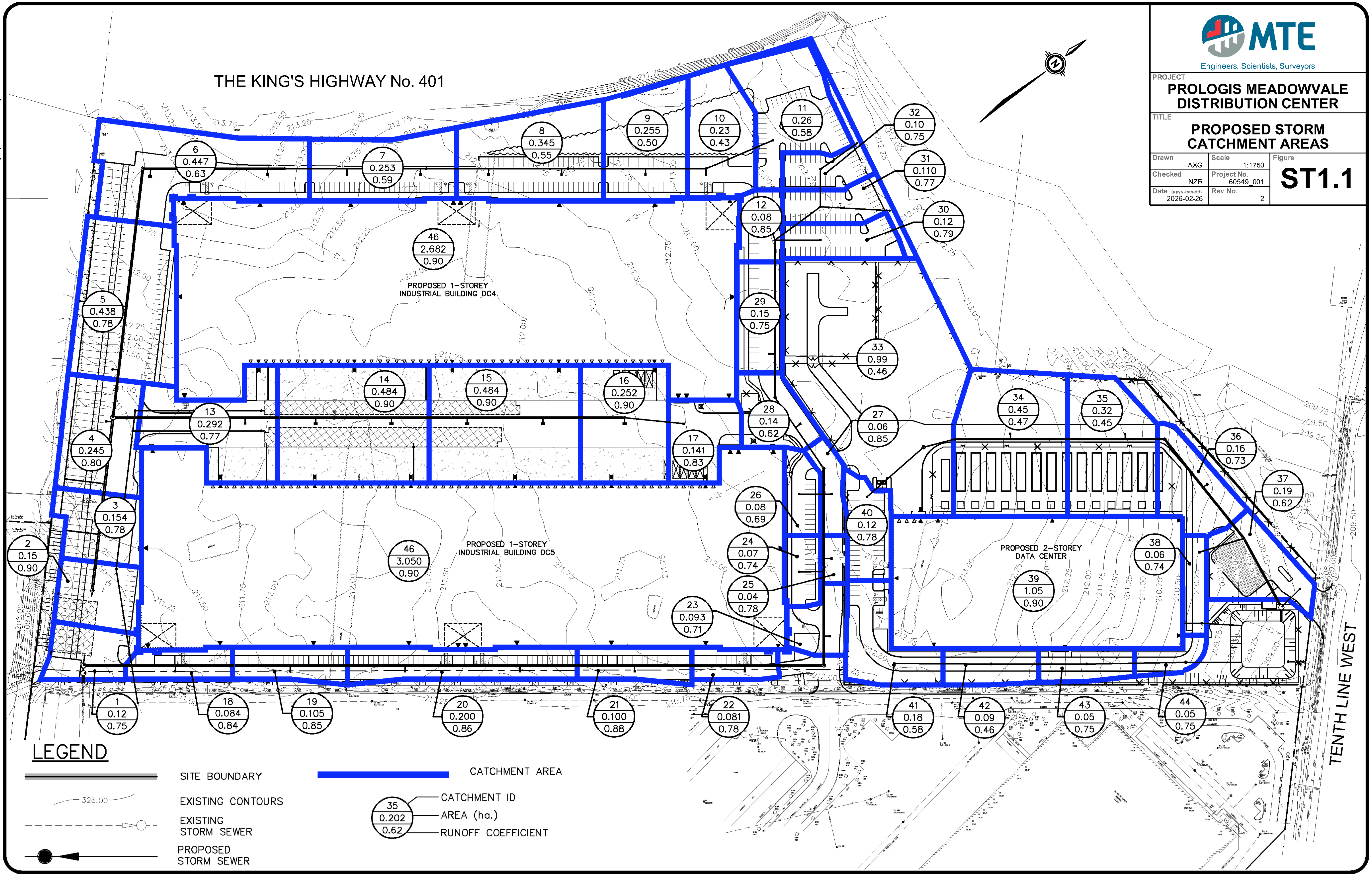
Project No.	60549-001
Sheet No.	1 of 1
Checked by:	RDZ
Designed by:	NZR
Date:	March 24, 2026

CITY OF MISSISSAUGA
ON-SITE STORM SEWER DESIGN
PROLOGIS MEADOWVALE DISTRIBUTION CENTRE

DESIGN PARAMETERS

Min Velocity:	0.75 m/s	
Max Velocity:	4 m/s	Initial Tc = 15 min
Manning's "n"	0.013	Pipe capacity limit = 85%
Year Storm	*FACTOR 1	10 YEAR
$i = \frac{A}{(Tc+B)^C}$	A =	1010.0
	B =	4.6
	C =	0.78

AREA No.	DESCRIPTION	FROM	TO	AREA A (ha.)	RUNOFF COEFF "C"	* A x C	CUMMUL A x C	TIME OF CONCEN (min.)	RAIN INTENSITY (mm/hr)	PEAK FLOW "Q" (m^3/sec)	PIPE SIZE (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (m^3/sec)	VELOCITY (m/sec)	TIME IN PIPE (min.)	% Pipe FULL	REMARKS
DISCHARGE TO POND SE DEVELOPMENT				0.0000	0.00	0.000	0.000	15.00	99.2	0.000	375	0.3%	1.0	0.088	0.79	0.021	0.0	(Starter Row)
11		CB10.2	MH10	0.260	0.58	0.151	0.151	15.00	99.2	0.042	300	0.5%	38.1	0.068	0.97	0.656	61%	
10	NW Distribution Centre 4	CB10.1	MH10	0.230	0.43	0.099	0.099	15.00	99.2	0.027	250	1.0%	3.0	0.059	1.21	0.041	46%	
9		MH10	MH9	0.255	0.50	0.128	0.377	15.66	96.7	0.102	450	0.3%	72.1	0.156	0.98	1.224	65%	
8		MH9	MH8	0.345	0.55	0.190	0.567	16.88	92.3	0.147	525	0.3%	74.0	0.235	1.09	1.133	62%	
7		MH8	MH7	0.253	0.59	0.149	0.716	18.01	88.7	0.178	525	0.3%	74.0	0.235	1.09	1.133	76%	
6		MH7	MH6	0.447	0.63	0.279	0.996	19.15	85.4	0.238	600	0.3%	74.0	0.336	1.19	1.037	71%	
	SW Distribution Centre 4	MH6	MH5	0.000	0.00	0.000	0.996	20.18	82.6	0.230	675	0.3%	42.8	0.460	1.29	0.554	50%	
5		MH5	MH4	0.438	0.78	0.342	1.337	20.74	81.2	0.304	675	0.3%	88.1	0.460	1.29	1.141	66%	
17	DC4/5 Loading Docks	CB14.2	MH14	0.141	0.83	0.117	0.117	15.00	99.2	0.032	250	0.5%	31.0	0.042	0.86	0.603	77%	
16		DCB14.1	MH14	0.252	0.90	0.227	0.344	15.00	99.2	0.095	300	1.4%	3.1	0.114	1.62	0.032	83%	
15	DC4/5 Loading Docks	MH14	MH13	0.484	0.90	0.436	0.896	15.60	96.8	0.243	600	0.3%	89.8	0.336	1.19	1.258	72%	
14		MH13	MH12	0.484	0.90	0.436	1.332	16.86	92.4	0.345	675	0.3%	90.0	0.460	1.29	1.166	75%	
13		MH12	MH4	0.292	0.77	0.225	1.557	18.03	88.7	0.386	675	0.3%	87.4	0.460	1.29	1.132	84%	
4		MH4	MH3	0.245	0.80	0.196	3.090	21.88	78.4	0.679	900	0.3%	63.0	0.991	1.56	0.674	68%	
3		CB3.1	MH3	0.154	0.78	0.120	0.120	15.00	99.2	0.033	250	2.0%	17.4	0.084	1.71	0.169	40%	
-		MH3	MH2	0.000	0.00	0.000	3.210	22.55	76.9	0.691	900	0.3%	31.0	0.991	1.56	0.331	70%	
2		CB2.1	TANK	0.150	0.90	0.135	0.135	15.00	99.2	0.037	250	2.3%	1.3	0.090	1.84	0.012	42%	
-		MH2	TANK	0.000	0.00	0.000	3.345	22.88	76.2	0.714	900	0.3%	2.8	0.991	1.56	0.030	72%	
1		CB1.1	TANK	0.120	0.75	0.090	0.135	15.00	99.2	0.037	250	0.9%	2.2	0.056	1.15	0.032	66%	
-		TANK	MH1	0.000	0.00	0.000	3.615	22.91	76.1	0.770	900	0.3%	5.5	0.991	1.56	0.059	78%	
32		CBMH24.1	CBMH24	0.100	0.75	0.075	0.075	15.00	99.2	0.021	250	0.5%	19.6	0.042	0.86	0.381	50%	
31		CBMH24	MH23	0.110	0.77	0.085	0.160	15.38	97.7	0.044	300	0.4%	29.4	0.061	0.87	0.566	71%	
30		CB23.2	MH23	0.120	0.79	0.095	0.095	15.00	99.2	0.026	250	0.5%	23.7	0.042	0.86	0.461	63%	
12		CB23.1	MH23	0.080	0.85	0.068	0.068	15.00	99.2	0.019	250	0.5%	9.3	0.042	0.86	0.181	45%	
29		MH23	MH22	0.150	0.75	0.113	0.435	15.95	95.6	0.116	525	0.3%	82.1	0.235	1.09	1.258	49%	
28		MH22	MH21	0.140	0.62	0.087	0.522	17.21	91.3	0.133	525	0.3%	44.9	0.235	1.09	0.688	57%	
25, 26, 27		MH21	MH20	0.180	0.76	0.137	0.659	17.89	89.1	0.164	600	0.3%	51.7	0.336	1.19	0.724	49%	
23, 24		MH20	MH19	0.163	0.72	0.117	0.776	18.62	86.9	0.189	600	0.3%	51.3	0.336	1.19	0.719	56%	
22		MH19	MH18	0.081	0.78	0.063	0.839	19.34	84.9	0.199	675	0.3%	71.4	0.460	1.29	0.925	43%	
21		MH18	MH17	0.100	0.88	0.088	0.927	20.26	82.4	0.214	675	0.3%	78.3	0.460	1.29	1.014	46%	
20		MH17	MH16	0.200	0.86	0.172	1.099	21.28	79.8	0.246	675	0.3%	79.0	0.460	1.29	1.023	53%	
19		MH16	MH15	0.105	0.85	0.089	1.188	22.30	77.5	0.258	675	0.3%	79.0	0.460	1.29	1.023	56%	
18		MH15	MH1	0.084	0.84	0.071	1.259	23.32	75.2	0.265	675	0.3%	79.0	0.460	1.29	1.023	58%	
DISCHARGE FROM DC4/5 TO LISGAR BYPASS				0.0000	0.00	0.000	0.000	15.00	99.2	0.000	100	1.0%	1.0	0.005	0.66	0.025	0%	(Starter Row)
46	Distribution Centre 4 Roof	STM STUB	DC4 TANK	2.6820	0.90	2.414	2.414	15.00	99.2	0.061	300	0.7%	18.5	0.081	1.14	0.269	75%	WORST CASE PEAK FLOW RATE FROM ROOF (FROM 10-YR SWMHYMO OUTPUT)
45	Distribution Centre 5 Roof	STM STUB	DC5 TANK	3.0500	0.90	2.745	2.745	15.00	99.2	0.058	300	0.7%	18.5	0.081	1.14	0.269	72%	WORST CASE PEAK FLOW RATE FROM ROOF (FROM 10-YR SWMHYMO OUTPUT)
-	DC4 TANK SPILLPOINT AT MH40	MH40	MH37	0.000	0.00	0.000	5.159	15.00	99.2	0.054	375	1.0%	10.5	0.175	1.59	0.110	31%	10-YR PEAK FLOW RATE DISCHARGING DC4 TANK (SWMHYMO OUTPUT)
	DC5 TANK SPILLPOINT AT MH38	MH38	MH37	0.000	0.00	0.000	5.159	15.00	99.2	0.051	375	1.6%	67.0	0.222	2.01	0.556	23%	10-YR PEAK FLOW RATE DISCHARGING DC5 TANK (SWMHYMO OUTPUT)
-		MH37	MH36	0.000	0.00	0.000	5.159	15.56	97.0	0.105	450	1.0%	72.7	0.285	1.79	0.676	37%	
-		MH36	OUTLET	0.000	0.00	0.000	5.159	16.23	94.6	0.105	450	1.0%	70.7	0.285	1.79	0.657	37%	
DISCHARGE TO DRY POND NE OF DATA CENTRE				0.0000	0.00	0.000	0.000	15.00	99.2	0.000	100	1.0%	1.0	0.005	0.66	0.025	0%	(Starter Row)
40	NW Data Centre	CB30.1	DCBMH30	0.140	0.78	0.109	0.109	15.00	99.2	0.030	250	0.40%	39.3	0.038	0.77	0.855	81%	
33		DCBMH30	MH29	0.950	0.46	0.437	0.546	15.85	95.9	0.147	375	1.00%	17.0	0.175	1.59	0.178	84%	
34		MH29	MH28	0.450	0.47	0.212	0.758	16.03	95.3	0.202	600	0.30%	49.3	0.336	1.19	0.691	60%	
35	N Data Centre	MH28	MH27	0.3200	0.45	0.144	0.902	16.72	92.9	0.234	600	0.30%	60.1	0.336	1.19	0.842	70%	
36		MH27	MH26	0.160	0.73	0.117	1.019	17.57	90.1	0.257	600	0.30%	66.4	0.336	1.19	0.930	76%	
38		MH26	MH25 (OGS2)	0.060	0.74	0.044	1.063	18.50	87.2	0.260	600	0.30%	40.9	0.336	1.19	0.573	77%	
37		CB25.1	MH25 (OGS2)	0.190	0.62	0.118	0.118	15.00	99.2	0.033	250	0.70%	9.6	0.050	1.01	0.158	66%	
-		MH25 (OGS2)	DRY POND	0.000	0.00	0.000	1.181	19.07	85.6	0.283	600	0.50%	7.0	0.434	1.54	0.076	65%	
41	SE Data Centre	CB35.1	CBMH35	0.180	0.58	0.104	0.104	15.00	99.2	0.029	250	0.4%	50.4	0.038	0.77	1.096	77%	
42		CBMH35	CBMH34	0.090	0.46	0.041	0.146	16.10	95.0	0.039	300	0.4%	50.0	0.061	0.87	0.963	63%	
43		CBMH34	CBMH33 (OGS3)	0.080	0.49	0.039	0.144	17.06	91.7	0.037	300	0.4%	51.6	0.061	0.87	0.994	60%	
44		CBMH33 (OGS3)	DRY POND	0.050	0.75	0.038	0.181	18.05	88.6	0.045	300	1.3%	29.1	0.110	1.56	0.311	41%	
39	Data Centre Roof	STM STUB	MH32	1.050	0.90	0.945	0.945	15.00	99.2	0.262	525	1.0%	8.9	0.430	1.99	0.075	61%	
-		MH30	DRY POND	0.0000	0.00	0.000	0.945	15.07	98.9	0.262	525	1.6%	20.7	0.544	2.51	0.137	48%	
-		DRY POND	CSP CULVERT	0.0000	0.00	0.000	2.307	19.15	85.4	0.259	525	0.50%	2.6	0.304	1.40	0.031	85%	PEAK FLOW RATE BASED ON 10-YR SWMHYMO OUTPUT FOR DRY POND
-	Future Connection	DRY POND	TO MUNI SEWER	0.0000	0.00	0.000	2.046	18.76	86.5	0.259	450	1.2%	4.0	0.312	1.96	0.034	83%	FUTURE MUNICIPAL SEWER CONNECTION



MTE
Engineers, Scientists, Surveyors

PROJECT
PROLOGIS MEADOWVALE DISTRIBUTION CENTER

TITLE
PROPOSED STORM CATCHMENT AREAS

Drawn	Scale	Figure
AXG	1:1750	ST1.1
Checked NZR	Project No. 60549_001	
Date (yyyy-mm-dd) 2026-02-26	Rev No. 2	

CAD: P:\P\60549_001\60549_001-ST1.DWG

Plot Date: March 25, 2026 – 10:43 AM

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

03/19/2026

Province:	Ontario
City:	Mississauga
Nearest Rainfall Station:	TORONTO INTL AP
Climate Station Id:	6158731
Years of Rainfall Data:	20

Site Name:	Meadowvale DC - OGS1

Drainage Area (ha):	6.09
% Imperviousness:	78.00

Runoff Coefficient 'c': 0.76

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	56.0
Required Water Quality Runoff Volume Capture (%):	
Estimated Water Quality Flow Rate (L/s):	145.45
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	662.00
Peak Conveyance (maximum) Flow Rate (L/s):	662.00
Influent TSS Concentration (mg/L):	150
Estimated Average Annual Sediment Load (kg/yr):	2449
Estimated Average Annual Sediment Volume (L/yr):	1991

Project Name:	Prologis Meadowvale Distribution Centre
Project Number:	60549-001
Designer Name:	Nick Rednulic
Designer Company:	MTE Consultants
Designer Email:	nrendulic@mte85.com
Designer Phone:	905-639-2552
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	26
EFO5	32
EFO6	37
EFO8	45
EFO10	50
EFO12	56

Recommended Stormceptor EFO Model: EFO12

Estimated Net Annual Sediment (TSS) Load Reduction (%): 56

Water Quality Runoff Volume Capture (%): > 90

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

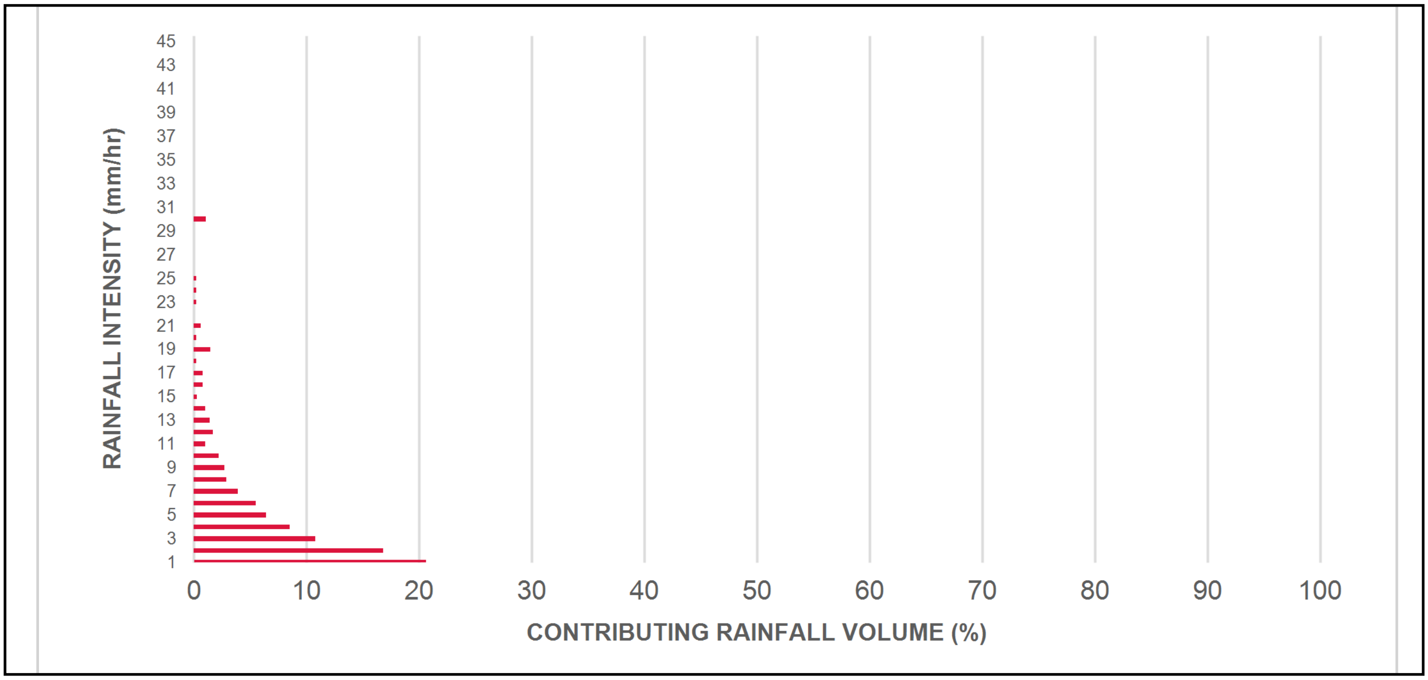
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Upstream Flow Controlled Results

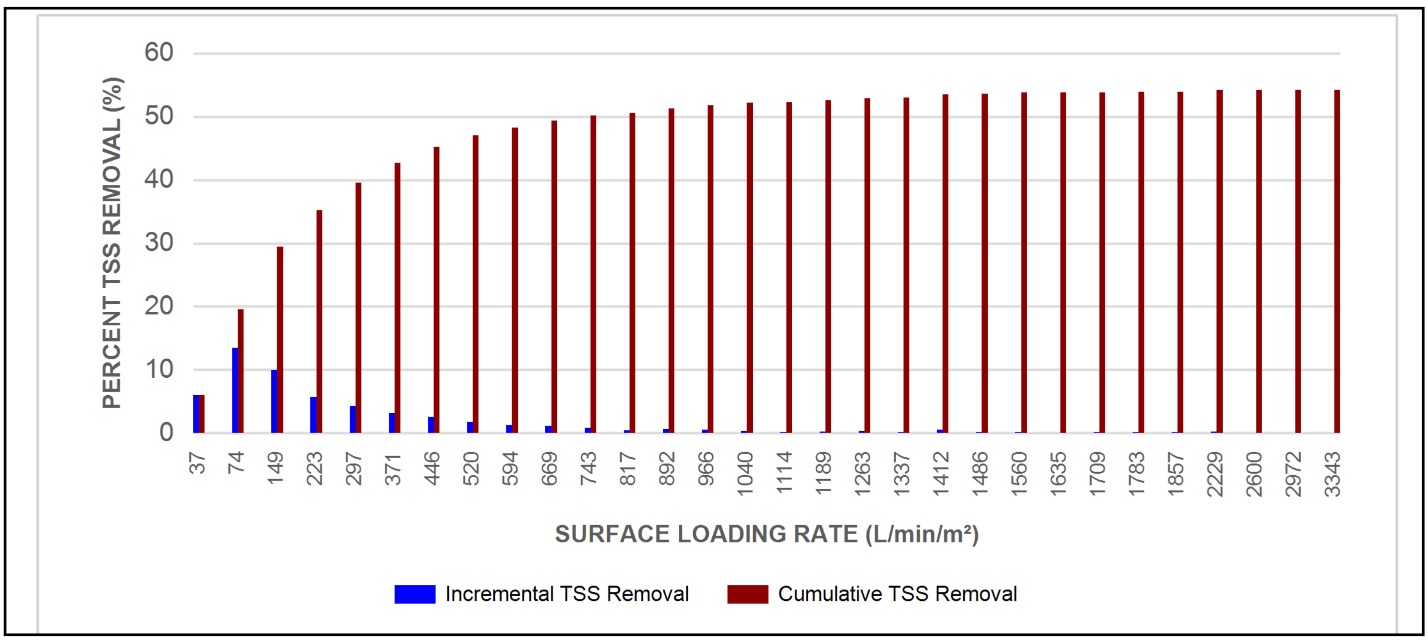
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	6.50	390.0	31.0	70	6.0	6.0
1.00	20.6	29.1	13.00	780.0	62.0	67	13.9	19.9
2.00	16.8	45.9	26.00	1560.0	125.0	61	10.2	30.1
3.00	10.8	56.7	39.01	2340.0	187.0	56	6.0	36.0
4.00	8.5	65.2	52.01	3121.0	250.0	53	4.4	40.5
5.00	6.4	71.6	65.01	3901.0	312.0	51	3.3	43.7
6.00	5.5	77.0	78.01	4681.0	374.0	49	2.7	46.4
7.00	3.9	81.0	91.02	5461.0	437.0	47	1.9	48.3
8.00	2.9	83.9	104.02	6241.0	499.0	45	1.3	49.6
9.00	2.7	86.5	117.02	7021.0	562.0	43	1.2	50.7
10.00	2.2	88.7	130.02	7801.0	624.0	42	0.9	51.6
11.00	1.0	89.7	143.03	8582.0	687.0	42	0.4	52.0
12.00	1.7	91.3	156.03	9362.0	749.0	41	0.7	52.7
13.00	1.4	92.8	169.03	10142.0	811.0	41	0.6	53.3
14.00	1.0	93.7	182.03	10922.0	874.0	41	0.4	53.7
15.00	0.3	94.0	195.04	11702.0	936.0	40	0.1	53.8
16.00	0.8	94.8	208.04	12482.0	999.0	40	0.3	54.1
17.00	0.8	95.7	221.04	13262.0	1061.0	39	0.3	54.5
18.00	0.2	95.8	234.04	14043.0	1123.0	38	0.1	54.5
19.00	1.5	97.3	247.05	14823.0	1186.0	37	0.6	55.1
20.00	0.2	97.5	260.05	15603.0	1248.0	36	0.1	55.2
21.00	0.6	98.2	273.05	16383.0	1311.0	35	0.2	55.4
22.00	1.8	100.0	286.05	17163.0	1373.0	34	0.6	56.0
23.00	0.2	100.2	299.06	17943.0	1435.0	33	0.1	56.1
24.00	0.2	100.5	312.06	18723.0	1498.0	32	0.1	56.2
25.00	0.2	100.7	325.06	19504.0	1560.0	31	0.1	56.2
30.00	1.1	101.8	390.07	23404.0	1872.0	25	0.3	56.5
35.00	-1.8	100.0	455.08	27305.0	2184.0	22	N/A	56.1
40.00	0.0	100.0	520.10	31206.0	2496.0	19	0.0	56.1
45.00	0.0	100.0	585.11	35106.0	2809.0	17	0.0	56.1
Estimated Net Annual Sediment (TSS) Load Reduction =								**56 %**

Climate Station ID: 6158731 *Years of Rainfall Data*: 20

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL
FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

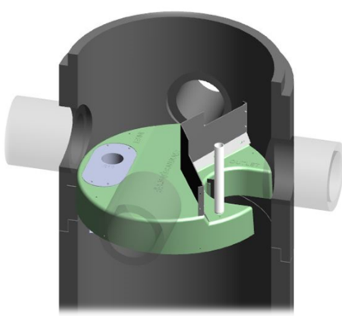
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

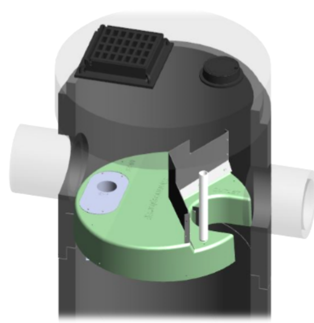
DESIGN FLEXIBILITY

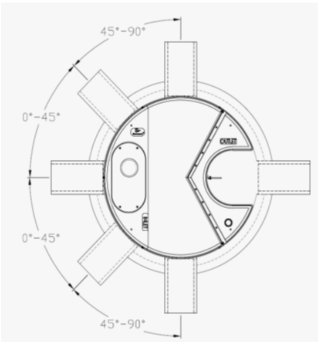
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR
"OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREAMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** Separators

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-

entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Imbrium® Systems

ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

02/24/2026

Province:	Ontario
City:	Mississauga
Nearest Rainfall Station:	TORONTO INTL AP
Climate Station Id:	6158731
Years of Rainfall Data:	20

Project Name:	Prologis Meadowvale Distribution Centre
Project Number:	60549-001
Designer Name:	Nick Rednulic
Designer Company:	MTE Consultants
Designer Email:	nrendulic@mte85.com
Designer Phone:	905-639-2552
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Site Name:	Meadowvale DC - OGS2
Drainage Area (ha):	2.30
% Imperviousness:	48.00

Runoff Coefficient 'c': 0.58

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0
Required Water Quality Runoff Volume Capture (%):	
Estimated Water Quality Flow Rate (L/s):	42.06
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	150
Estimated Average Annual Sediment Load (kg/yr):	630
Estimated Average Annual Sediment Volume (L/yr):	512

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	43
EFO5	49
EFO6	53
EFO8	59
EFO10	62
EFO12	64

Recommended Stormceptor EFO Model: EFO10

Estimated Net Annual Sediment (TSS) Load Reduction (%): 62

Water Quality Runoff Volume Capture (%): > 90

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

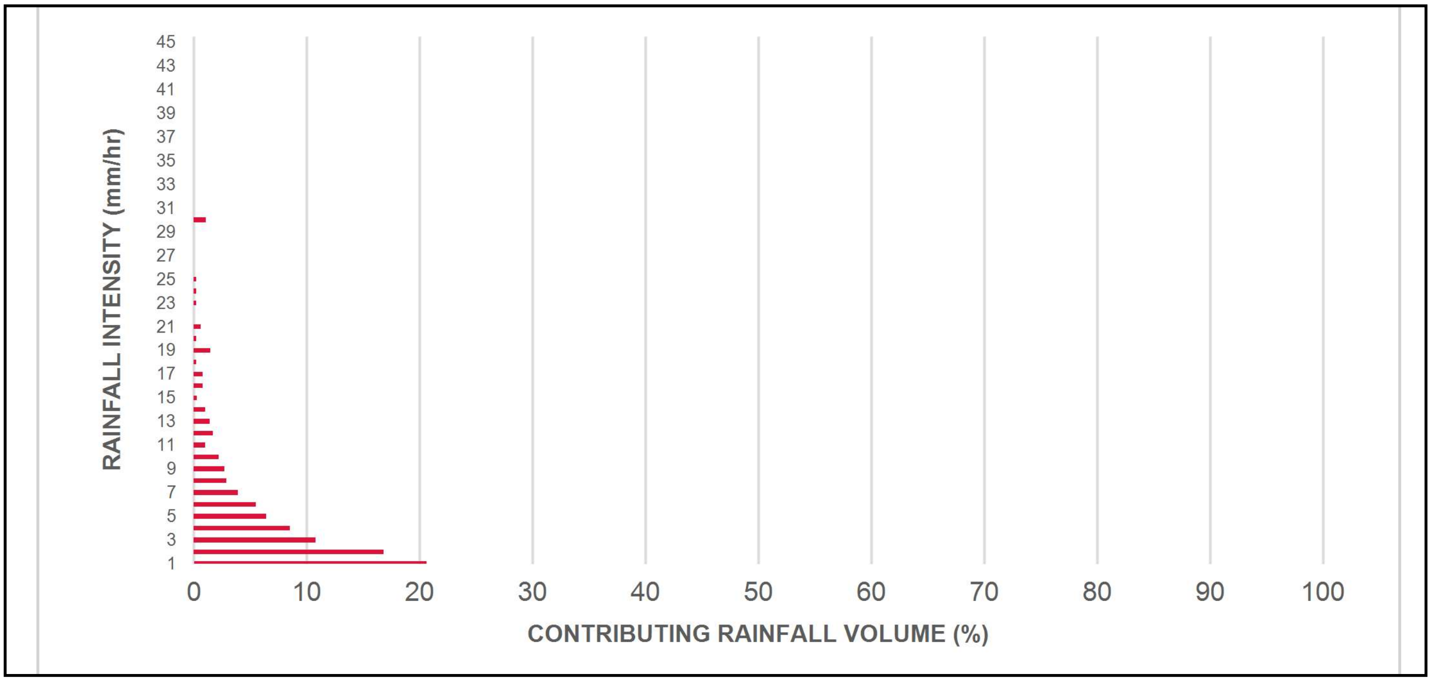
►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

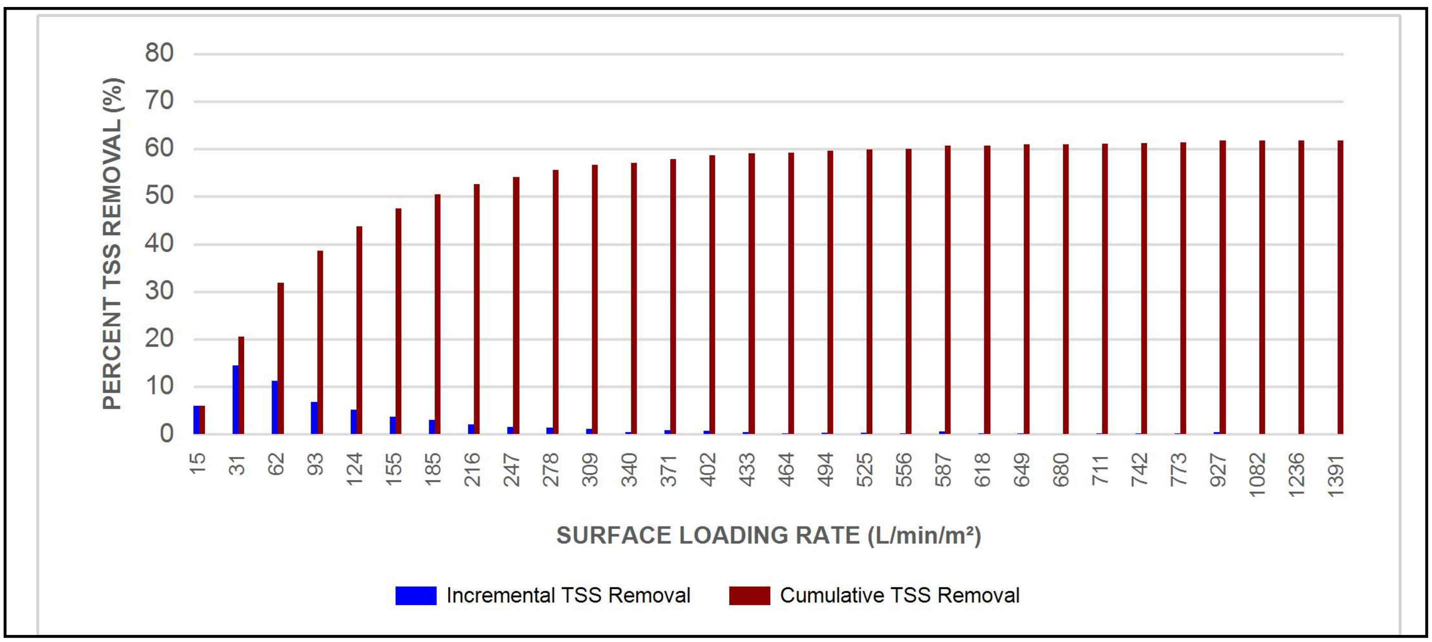
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	1.88	113.0	15.0	70	6.0	6.0
1.00	20.6	29.1	3.76	226.0	31.0	70	14.5	20.5
2.00	16.8	45.9	7.52	451.0	62.0	67	11.3	31.8
3.00	10.8	56.7	11.28	677.0	93.0	63	6.8	38.6
4.00	8.5	65.2	15.04	902.0	124.0	61	5.1	43.7
5.00	6.4	71.6	18.80	1128.0	155.0	58	3.7	47.5
6.00	5.5	77.0	22.56	1353.0	185.0	56	3.0	50.5
7.00	3.9	81.0	26.32	1579.0	216.0	54	2.1	52.6
8.00	2.9	83.9	30.08	1805.0	247.0	53	1.5	54.1
9.00	2.7	86.5	33.84	2030.0	278.0	52	1.4	55.5
10.00	2.2	88.7	37.60	2256.0	309.0	51	1.1	56.6
11.00	1.0	89.7	41.36	2481.0	340.0	50	0.5	57.1
12.00	1.7	91.3	45.12	2707.0	371.0	49	0.8	57.9
13.00	1.4	92.8	48.88	2933.0	402.0	48	0.7	58.6
14.00	1.0	93.7	52.64	3158.0	433.0	47	0.5	59.1
15.00	0.3	94.0	56.40	3384.0	464.0	46	0.1	59.2
16.00	0.8	94.8	60.15	3609.0	494.0	45	0.4	59.6
17.00	0.8	95.7	63.91	3835.0	525.0	44	0.4	59.9
18.00	0.2	95.8	67.67	4060.0	556.0	44	0.1	60.0
19.00	1.5	97.3	71.43	4286.0	587.0	43	0.6	60.7
20.00	0.2	97.5	75.19	4512.0	618.0	42	0.1	60.7
21.00	0.6	98.2	78.95	4737.0	649.0	42	0.3	61.0
22.00	0.0	98.2	82.71	4963.0	680.0	42	0.0	61.0
23.00	0.2	98.4	86.47	5188.0	711.0	41	0.1	61.1
24.00	0.2	98.6	90.23	5414.0	742.0	41	0.1	61.2
25.00	0.2	98.9	93.99	5640.0	773.0	41	0.1	61.3
30.00	1.1	100.0	112.79	6767.0	927.0	40	0.5	61.7
35.00	0.0	100.0	131.59	7895.0	1082.0	39	0.0	61.7
40.00	0.0	100.0	150.39	9023.0	1236.0	37	0.0	61.7
45.00	0.0	100.0	169.19	10151.0	1391.0	34	0.0	61.7
							Estimated Net Annual Sediment (TSS) Load Reduction =	**62 %**

Climate Station ID: 6158731 *Years of Rainfall Data*: 20

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter (m)	Model Diameter (ft)	Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter (mm)	Max Inlet Pipe Diameter (in)	Max Outlet Pipe Diameter (mm)	Max Outlet Pipe Diameter (in)	Peak Conveyance Flow Rate (L/s)	Peak Conveyance Flow Rate (cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

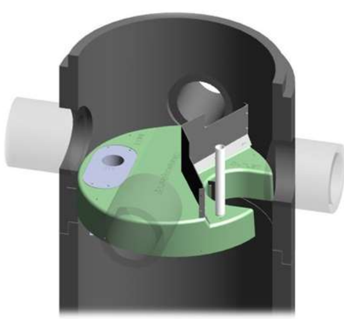
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

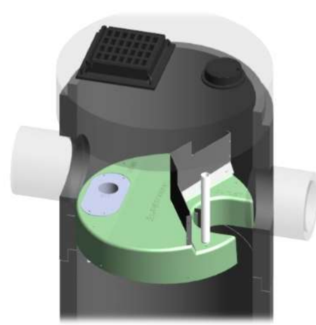
DESIGN FLEXIBILITY

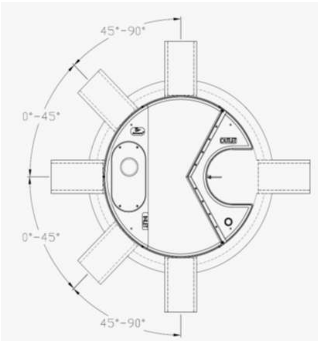
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREAMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** Separators

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-

entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

Stormceptor® | Stormceptor® EF Sizing Report | Rinker Materials™

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

02/24/2026

Province:	Ontario
City:	Mississauga
Nearest Rainfall Station:	TORONTO INTL AP
Climate Station Id:	6158731
Years of Rainfall Data:	20
Site Name:	Meadowvale DC - OGS3
Drainage Area (ha):	0.40
% Imperviousness:	56.00

Runoff Coefficient 'c': 0.63

Project Name:	Prologis Meadowvale Distribution Centre
Project Number:	60549-001
Designer Name:	Nick Rednulic
Designer Company:	MTE Consultants
Designer Email:	nrendulic@mte85.com
Designer Phone:	905-639-2552
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0
Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	7.91
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	150
Estimated Average Annual Sediment Load (kg/yr):	126
Estimated Average Annual Sediment Volume (L/yr):	102

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	61
EFO5	64
EFO6	66
EFO8	68
EFO10	70
EFO12	70

Recommended Stormceptor EFO Model: EFO4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 61

Water Quality Runoff Volume Capture (%): > 90

imbrium

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

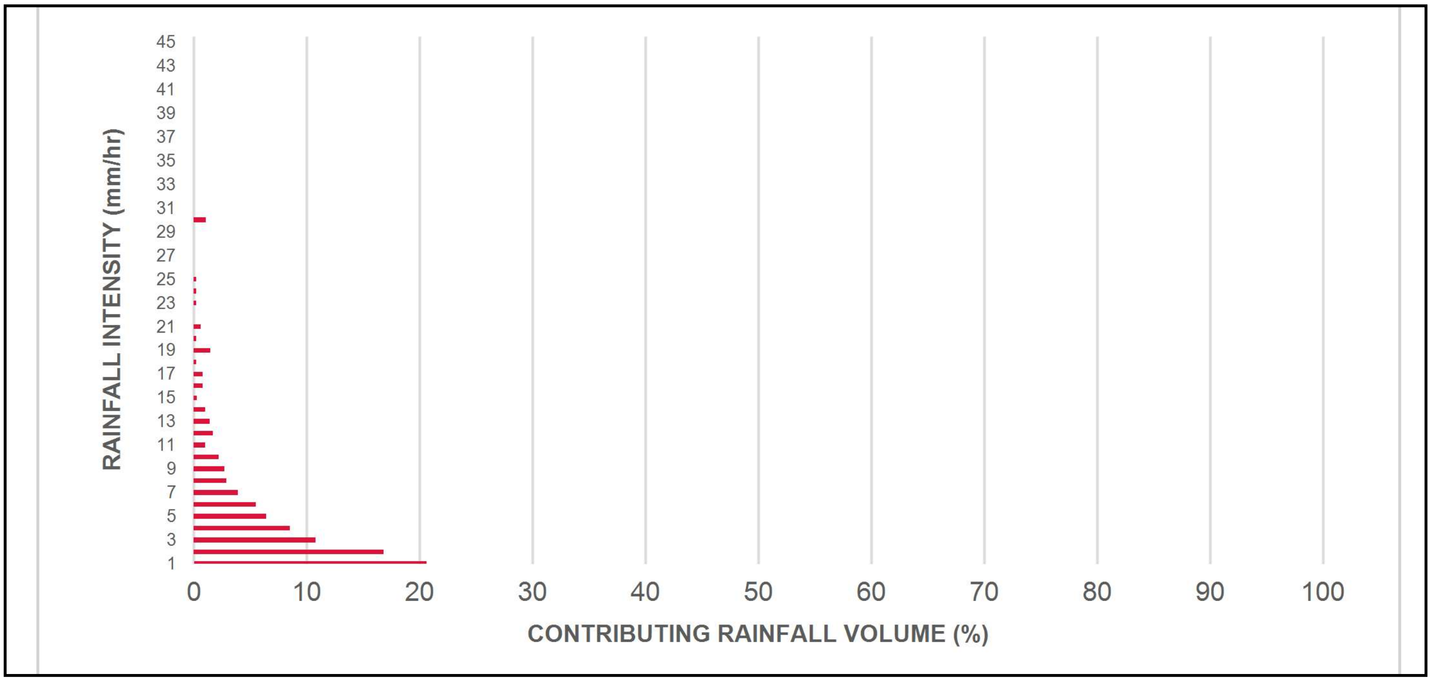
►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

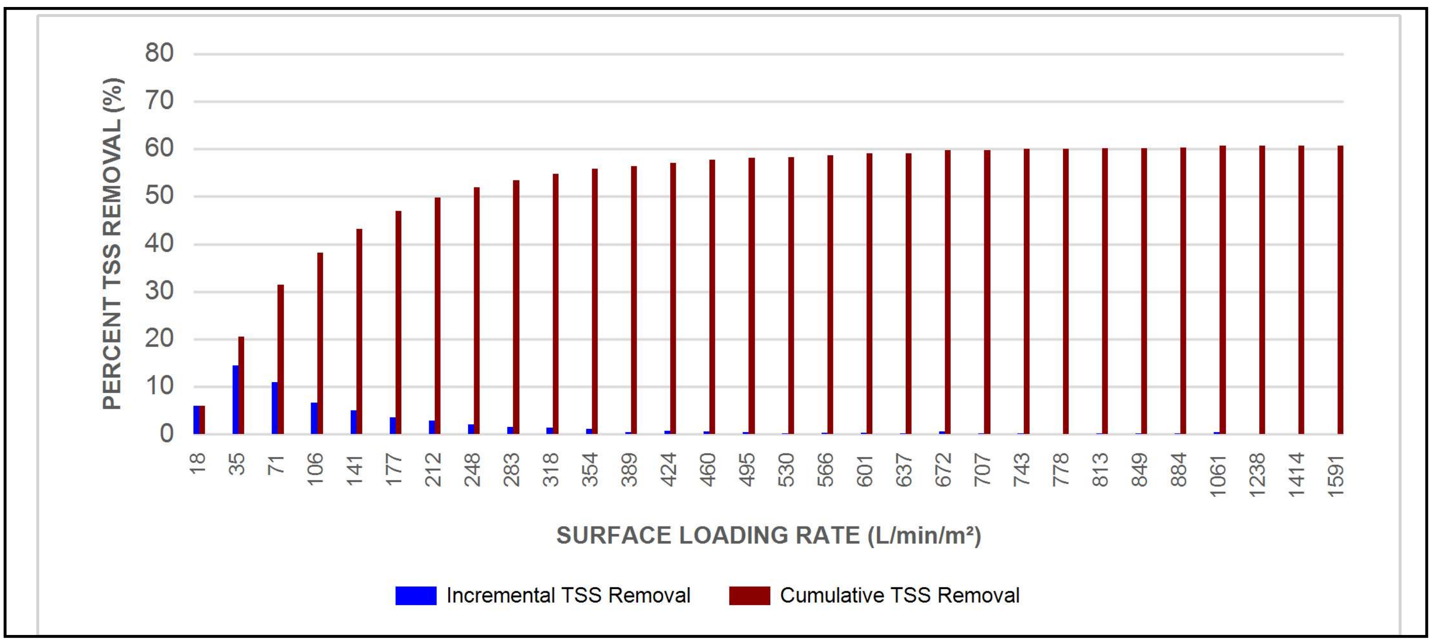
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	0.35	21.0	18.0	70	6.0	6.0
1.00	20.6	29.1	0.71	42.0	35.0	70	14.5	20.5
2.00	16.8	45.9	1.41	85.0	71.0	66	11.0	31.5
3.00	10.8	56.7	2.12	127.0	106.0	62	6.7	38.2
4.00	8.5	65.2	2.83	170.0	141.0	59	5.0	43.2
5.00	6.4	71.6	3.54	212.0	177.0	57	3.6	46.9
6.00	5.5	77.0	4.24	255.0	212.0	54	2.9	49.8
7.00	3.9	81.0	4.95	297.0	248.0	53	2.1	51.9
8.00	2.9	83.9	5.66	339.0	283.0	52	1.5	53.4
9.00	2.7	86.5	6.37	382.0	318.0	51	1.4	54.7
10.00	2.2	88.7	7.07	424.0	354.0	50	1.1	55.8
11.00	1.0	89.7	7.78	467.0	389.0	49	0.5	56.3
12.00	1.7	91.3	8.49	509.0	424.0	47	0.8	57.1
13.00	1.4	92.8	9.19	552.0	460.0	46	0.7	57.7
14.00	1.0	93.7	9.90	594.0	495.0	45	0.4	58.1
15.00	0.3	94.0	10.61	637.0	530.0	44	0.1	58.3
16.00	0.8	94.8	11.32	679.0	566.0	43	0.3	58.6
17.00	0.8	95.7	12.02	721.0	601.0	42	0.4	59.0
18.00	0.2	95.8	12.73	764.0	637.0	42	0.1	59.0
19.00	1.5	97.3	13.44	806.0	672.0	42	0.6	59.7
20.00	0.2	97.5	14.14	849.0	707.0	42	0.1	59.8
21.00	0.6	98.2	14.85	891.0	743.0	41	0.3	60.0
22.00	0.0	98.2	15.56	934.0	778.0	41	0.0	60.0
23.00	0.2	98.4	16.27	976.0	813.0	41	0.1	60.1
24.00	0.2	98.6	16.97	1018.0	849.0	41	0.1	60.2
25.00	0.2	98.9	17.68	1061.0	884.0	41	0.1	60.3
30.00	1.1	100.0	21.22	1273.0	1061.0	39	0.4	60.7
35.00	0.0	100.0	24.75	1485.0	1238.0	37	0.0	60.7
40.00	0.0	100.0	28.29	1697.0	1414.0	34	0.0	60.7
45.00	0.0	100.0	31.83	1910.0	1591.0	30	0.0	60.7
							Estimated Net Annual Sediment (TSS) Load Reduction =	**61 %**

Climate Station ID: 6158731 *Years of Rainfall Data*: 20

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

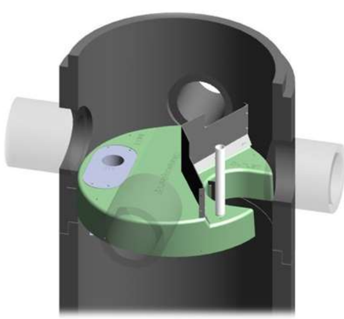
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

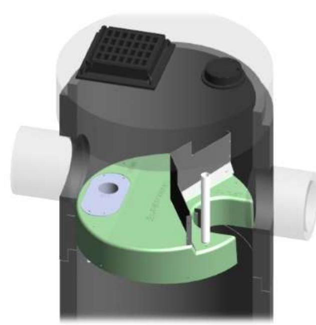
DESIGN FLEXIBILITY

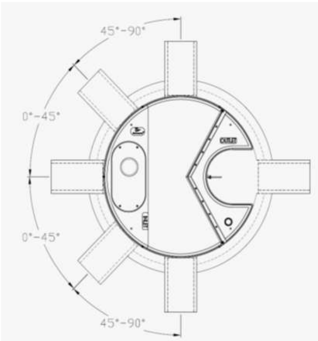
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
Stormceptor® EFO

SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREAMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit** Separators

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
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PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-

entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m^2 to 2600 L/min/m^2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.** However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

◆ Verification Statement ◆ Verification Statement ◆ Verification Statement ◆

VERIFICATION STATEMENT

GLOBE Performance Solutions

Verifies the performance of

Stormceptor® EF and EFO Oil-Grit Separators

Developed by Imbrium Systems, Inc.,
Whitby, Ontario, Canada

Registration: GPS-ETV_VR2020-11-15_Imbrium-SC

In accordance with

ISO 14034:2016

**Environmental management —
Environmental technology verification (ETV)**

John D. Wiebe, PhD
Executive Chairman
GLOBE Performance Solutions

November 15, 2020
Vancouver, BC, Canada

Verification Body
GLOBE Performance Solutions
404 – 999 Canada Place | Vancouver, B.C | Canada |V6C 3E2

Technology description and application

The Stormceptor® EF and EFO are treatment devices designed to remove oil, sediment, trash, debris, and pollutants attached to particulates from Stormwater and snowmelt runoff. The device takes the place of a conventional manhole within a storm drain system and offers design flexibility that works with various site constraints. The EFO is designed with a shorter bypass weir height, which accepts lower surface loading rate into the sump, thereby reducing re-entrainment of captured free floating light liquids.

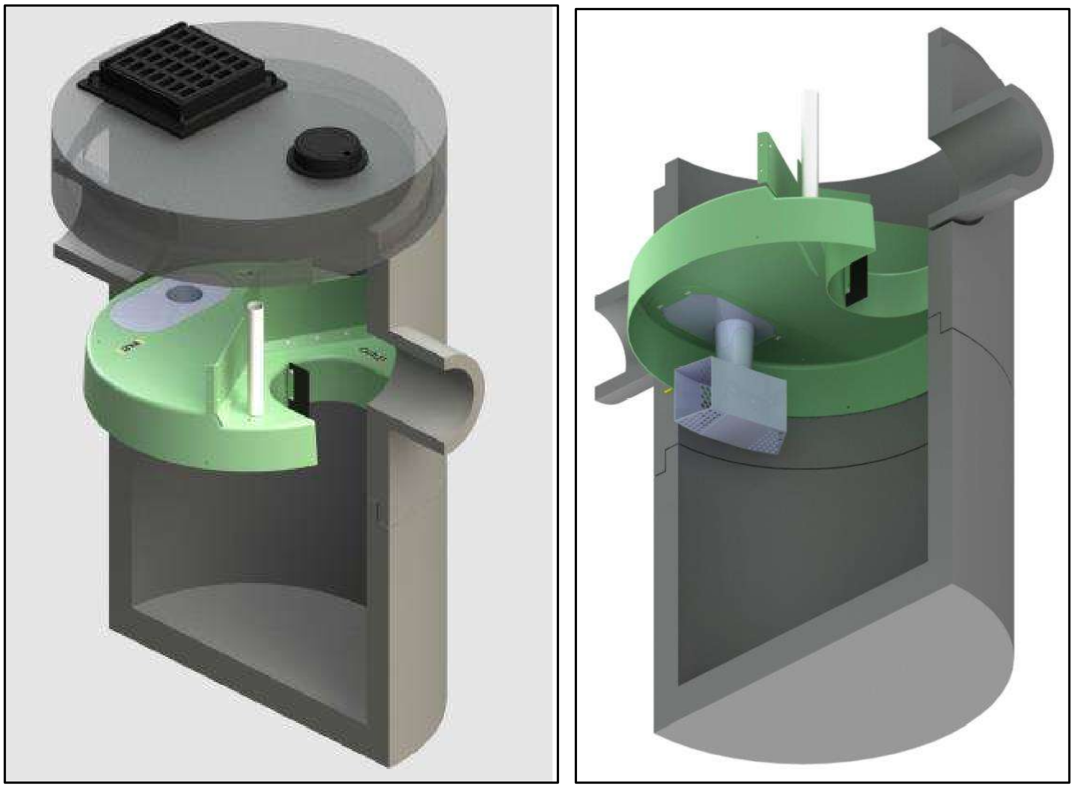

Figure 1. Graphic of typical inline Stormceptor® unit and core components.

Stormwater and snowmelt runoff enters the Stormceptor® EF/EFO's upper chamber through the inlet pipe(s) or a surface inlet grate. An insert divides the unit into lower and upper chambers and incorporates a weir to reduce influent velocity and separate influent (untreated) from effluent (treated) flows. Influent water ponds upstream of the insert's weir providing driving head for the water flowing downwards into the drop pipe where a vortex pulls the water into the lower chamber. The water diffuses at lower velocities in multiple directions through the drop pipe outlet openings. Oil and other floatables rise up and are trapped beneath the insert, while sediments undergo gravitational settling to the sump's bottom. Water from the sump can exit by flowing upward to the outlet riser onto the top side of the insert and downstream of the weir, where it discharges through the outlet pipe.

Maximum flow rate into the lower chamber is a function of weir height and drop pipe orifice diameter. The Stormceptor® EF and EFO are designed to allow a surface loading rate of 1135 L/min/m^2 (27.9 gal/min/ft^2) and 535 L/min/m^2 (13.1 gal/min/ft^2) into the lower chamber, respectively. When prescribed surface loading rates are exceeded, ponding water can overtop the weir height and bypass the lower treatment chamber, exiting directly through the outlet pipe. Hydraulic testing and scour testing demonstrate that the internal bypass effectively prevents scour at all bypass flow rates. Increasing the bypass flow rate does not increase the orifice-controlled flow rate into the lower treatment chamber where sediment is stored. This internal bypass feature allows for in-line installation, avoiding the cost of additional bypass structures. During bypass, treatment continues in the lower chamber at the maximum flow rate. The Stormceptor® EFO's lower design surface loading rate is favorable for minimizing re-entrainment and washout of captured light liquids. Inspection of Stormceptor® EF and EFO devices is performed from grade by inserting a sediment probe through the outlet riser and an oil dipstick through the oil inspection pipe. The unit can be maintained by using a vacuum hose through the outlet riser.

Performance conditions

The data and results published in this Technology Fact Sheet were obtained from the testing program conducted on the Imbrium Systems Inc.'s Stormceptor® EF4 and EFO4 Oil-Grit Separators, in accordance with the Procedure for Laboratory Testing of Oil-Grit Separators (Version 3.0, June 2014). The Procedure was prepared by the Toronto and Region Conservation Authority (TRCA) for Environment Canada's Environmental Technology Verification (ETV) Program. A copy of the Procedure may be accessed on the Canadian ETV website at www.etvcanada.ca.

Performance claim(s)

Capture test [a]:

During the capture test, the Stormceptor® EF4 OGS device, with a false floor set to 50% of the manufacturer's recommended maximum sediment storage depth and a constant influent test sediment concentration of 200 mg/L, removes 70, 64, 54, 48, 46, 44, and 49 percent of influent sediment by mass at surface loading rates of 40, 80, 200, 400, 600, 1000, and 1400 L/min/m^2, respectively.

Stormceptor® EFO4, with a false floor set to 50% of the manufacturer's recommended maximum sediment storage depth and a constant influent test sediment concentration of 200 mg/L, removes 70, 64, 54, 48, 42, 40, and 34 percent of influent sediment by mass at surface loading rates of 40, 80, 200, 400, 600, 1000, and 1400 L/min/m^2, respectively.

Scour test [a]:

During the scour test, the Stormceptor® EF4 and Stormceptor® EFO4 OGS devices, with 10.2 cm (4 inches) of test sediment pre-loaded onto a false floor reaching 50% of the manufacturer's recommended maximum sediment storage depth, generate corrected effluent concentrations of 4.6, 0.7, 0, 0.2, and 0.4 mg/L at 5-minute duration surface loading rates of 200, 800, 1400, 2000, and 2600 L/min/m^2, respectively.

Light liquid re-entrainment test[a]:

During the light liquid re-entrainment test, the Stormceptor® EFO4 OGS device with surrogate low-density polyethylene beads preloaded within the lower chamber oil collection zone, representing a floating light liquid volume equal to a depth of 50.8 mm over the sedimentation area, retained 100, 99.5, 99.8, 99.8, and 99.9 percent of loaded beads by mass during the 5-minute duration surface loading rates of 200, 800, 1400, 2000, and 2600 L/min/m^2.

[a] The claim can be applied to other units smaller or larger than the tested unit as long as the untested units meet the scaling rule specified in the Procedure for Laboratory of Testing of Oil Grit Separators (Version 3.0, June 2014)

Performance results

The test sediment consisted of ground silica (1 – 1000 micron) with a specific gravity of 2.65, uniformly mixed to meet the particle size distribution specified in the testing procedure. The *Procedure for Laboratory Testing of Oil Grit Separators* requires that the three sample average of the test sediment particle size distribution (PSD) meet the specified PSD percent less than values within a boundary threshold of 6%. The comparison of the average test sediment PSD to the CETV specified PSD in Figure 2 indicates that the test sediment used for the capture and scour tests met this condition.

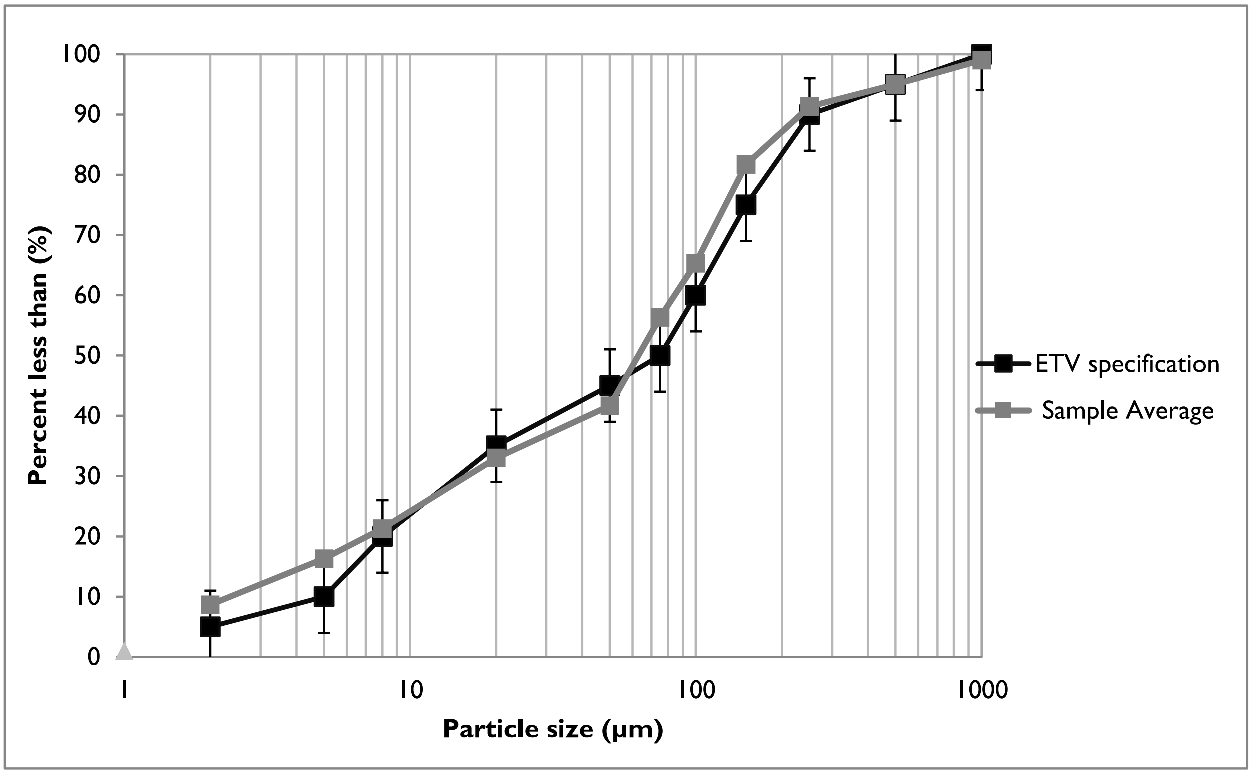

Figure 2. The three sample average particle size distribution (PSD) of the test sediment used for the capture and scour test compared to the specified PSD.

The capacity of the device to retain sediment was determined at seven surface loading rates using the modified mass balance method. This method involved measuring the mass and particle size distribution of the injected and retained sediment for each test run. Performance was evaluated with a false floor simulating the technology filled to 50% of the manufacturer's recommended maximum sediment storage depth. The test was carried out with clean water that maintained a sediment concentration below 20 mg/L. Based on these conditions, removal efficiencies for individual particle size classes and for the test sediment as a whole were determined for each of the tested surface loading rates (Table 1). Since the EF and EFO models are identical except for the weir height, which bypasses flows from the EFO model at a surface loading rate of 535 L/min/m² (13.1 gpm/ft²), sediment capture tests at surface loading rates from 40 to 400 L/min/m² were only performed on the EF unit. Surface loading rates of 600, 1000, and 1400 L/min/m² were tested on both units separately. Results for the EFO model at these higher flow rates are presented in Table 2.

In some instances, the removal efficiencies were above 100% for certain particle size fractions. These discrepancies are not unique to any one test laboratory and may be attributed to errors relating to the blending of sediment, collection of representative samples for laboratory submission, and laboratory analysis of PSD. Due to these errors, caution should be exercised in applying the removal efficiencies by particle size fraction for the purposes of sizing the tested device (see Bulletin # CETV 2016-11-0001). The results for "all particle sizes by mass balance" (see Table 1 and 2) are based on measurements of the total injected and retained sediment mass, and are therefore not subject to blending, sampling or PSD analysis errors.

Table 1. Removal efficiencies (%) of the EF4 at specified surface loading rates

Particle size fraction (µm)	Surface loading rate (L/min/m²)						
	40	80	200	400	600	1000	1400
>500	90	58	58	100*	86	72	100*
250 - 500	100*	100*	100	100*	100*	100*	100*
150 - 250	90	82	26	100*	100*	67	90
105 - 150	100*	100*	100*	100*	100*	100*	100
75 - 105	100*	92	74	82	77	68	76
53 - 75	Undefined [a]	56	100*	72	69	50	80
20 - 53	54	100*	54	33	36	40	31
8 - 20	67	52	25	21	17	20	20
5 – 8	33	29	11	12	9	7	19
<5	13	0	0	0	0	0	4
All particle sizes by mass balance	**70.4**	**63.8**	**53.9**	**47.5**	**46.0**	**43.7**	**49.0**

[a] An outlier in the feed sample sieve data resulted in a negative removal efficiency for this size fraction.
* Removal efficiencies were calculated to be above 100%. Calculated values ranged between 101 and 171% (average 128%). See text and Bulletin # CETV 2016-11-0001 for more information.

Table 2. Removal efficiencies (%) of the EFO4 at surface loading rates above the bypass rate of 535 L/min/m²

Particle size fraction (µm)	Surface loading rate (L/min/m²)		
	600	1000	1400
>500	89	83	100*
250 - 500	90	100*	92
150 - 250	90	67	100*
105 - 150	85	92	77
75 - 105	80	71	65
53 - 75	60	31	36
20 - 53	33	43	23
8 - 20	17	23	15
5 – 8	10	3	3
<5	0	0	0
All particle sizes by mass balance	**41.7**	**39.7**	**34.2**

* Removal efficiencies were calculated to be above 100%. Calculated values ranged between 103 and 111% (average 107%). See text and Bulletin # CETV 2016-11-0001 for more information.

Figure 3 compares the particle size distribution (PSD) of the three sample average of the test sediment to the PSD of the sediment retained by the EF4 at each of the tested surface loading rates. Figure 4 shows the same graph for the EFO4 unit at surface loading rates above the bypass rate of 535 L/min/m².

As expected, the capture efficiency for fine particles in both units was generally found to decrease as surface loading rates increased.

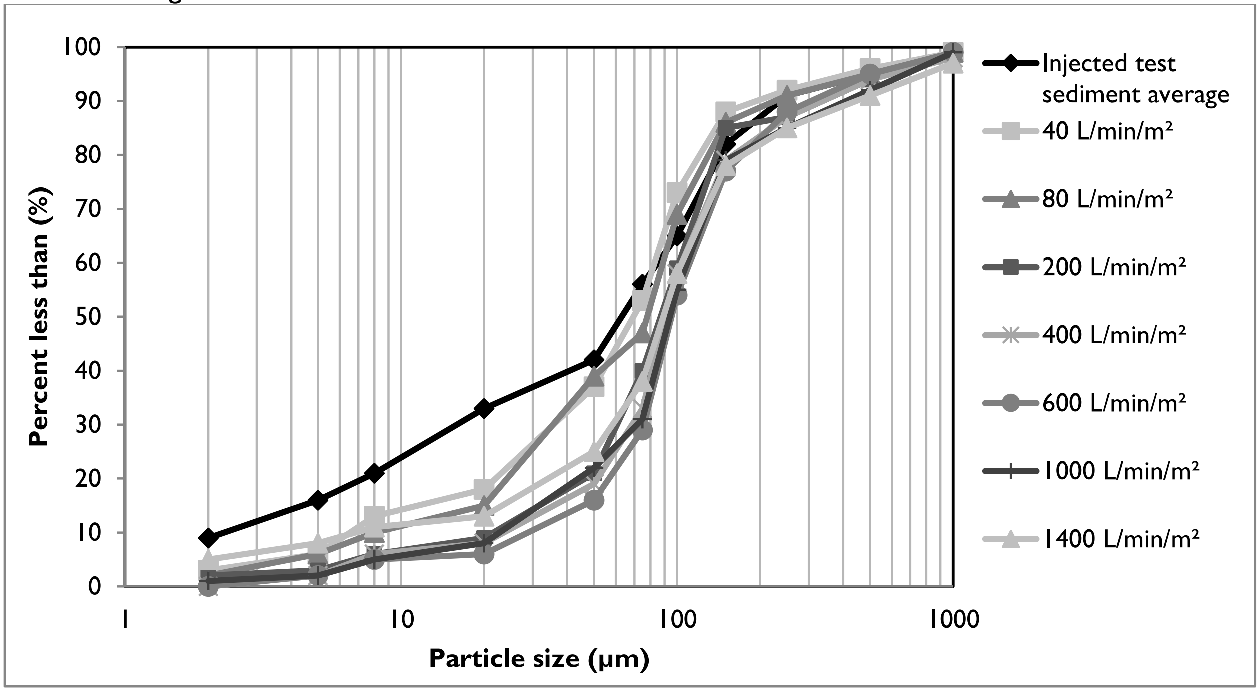

Figure 3. Particle size distribution of sediment retained in the EF4 in relation to the injected test sediment average.

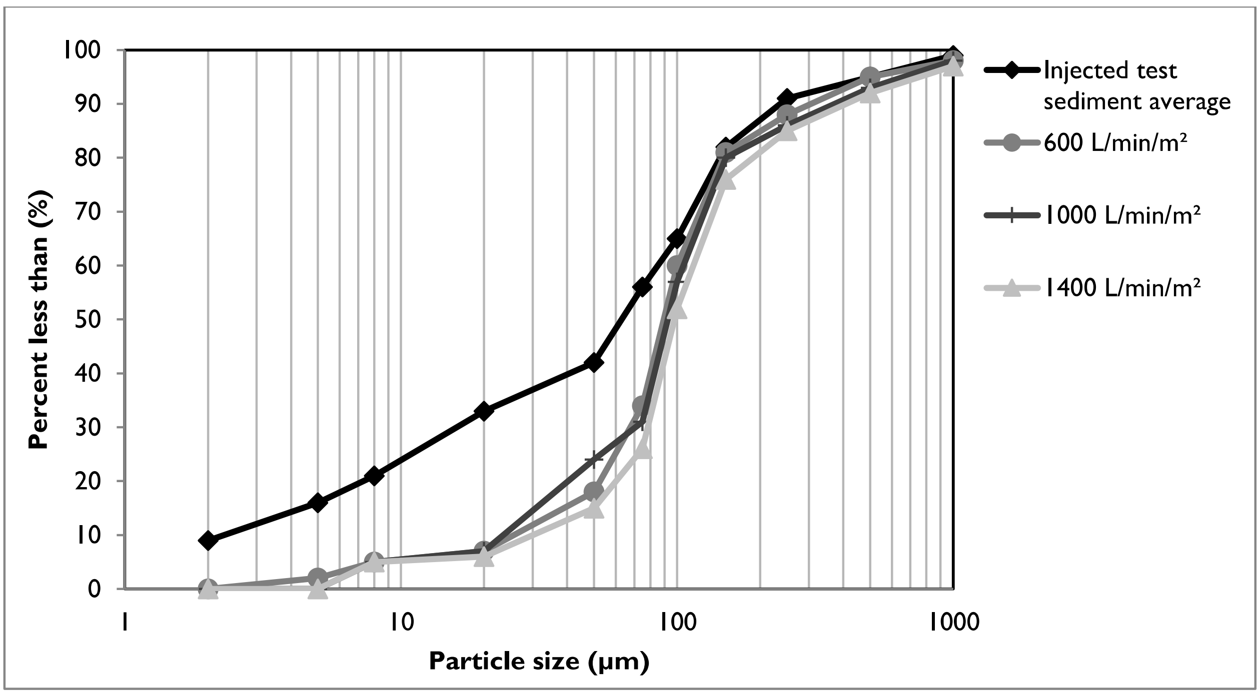

Figure 4. Particle size distribution of sediment retained in the EFO4 in relation to the injected test sediment average at surface loading rates above the bypass rate of 535 L/min/m²

Table 4 shows the results of the sediment scour and re-suspension test for the EF4 unit. The EFO4 was not tested as it was reasonably assumed that scour rates would be lower given that flow bypass occurs at a lower surface loading rate. The scour test involved preloading 10.2 cm of fresh test sediment into the sedimentation sump of the device. The sediment was placed on a false floor to mimic a device filled to 50% of the maximum recommended sediment storage depth. Clean water was run through the device at five surface loading rates over a 30 minute period. Each flow rate was maintained for 5 minutes with a one minute transition time between flow rates. Effluent samples were collected at one minute sampling intervals and analyzed for Suspended Sediment Concentration (SSC) and PSD by recognized methods. The effluent samples were subsequently adjusted based on the background concentration of the influent water. Typically, the smallest 5% of particles captured during the 40 L/min/m² sediment capture test is also used to adjust the concentration, as per the method described in Bulletin # CETV 2016-09-0001. However, since the composites of effluent concentrations were below the Reporting Detection Limit of the Laser Diffraction PSD methodology, this adjustment was not made. Results showed average adjusted effluent sediment concentrations below 5 mg/L at all tested surface loading rates.

It should be noted that the EF4 starts to internally bypass water at 1135 L/min/m², potentially resulting in the dilution of effluent concentrations, which would not normally occur under typical field conditions because the field influent concentration would contain a much higher sediment concentration than during the lab test. Recalculation of effluent concentrations to account for dilution at surface loading rates above the bypass rate showed sediment effluent concentrations to be below 1.6 mg/L.

Table 4. Scour test adjusted effluent sediment concentration.

Run	Surface loading rate (L/min/m²)	Run time (min)	Background sample concentration (mg/L)	Adjusted effluent suspended sediment concentration (mg/L) [a]	Average (mg/L)
1	200	1:00	<RDL	11.9	4.6
		2:00		7.0	
		3:00		4.4	
		4:00		2.2	
		5:00		1.0	
		6:00		1.2	
2	800	7:00	<RDL	1.1	0.7
		8:00		0.9	
		9:00		0.6	
		10:00		1.4	
		11:00		0.1	
		12:00		0	
3	1400	13:00	<RDL	0	0
		14:00		0.1	
		15:00		0	
		16:00		0	
		17:00		0	
		18:00		0	
4	2000	19:00	1.2	0.2	0.2
		20:00		0	
		21:00		0	
		22:00		0.7	
		23:00		0	
		24:00		0.4	

5	2600	25:00	1.6	0.3	0.4
		26:00		0.4	
		27:00		0.7	
		28:00		0.4	
		29:00		0.2	
		30:00		0.4	

[a] The adjusted effluent suspended sediment concentration represents the actual measured effluent concentration minus the background concentration. For more information see Bulletin # CETV 2016-09-0001.

The results of the light liquid re-entrainment test used to evaluate the unit's capacity to prevent re-entrainment of light liquids are reported in Table 5. The test involved preloading 58.3 L (corresponding to a 5 cm depth over the collection sump area of 1.17m^2) of surrogate low-density polyethylene beads within the oil collection skirt and running clean water through the device continuously at five surface loading rates (200, 800, 1400, 2000, and 2600 L/min/m^2). Each flow rate was maintained for 5 minutes with approximately 1 minute transition time between flow rates. The effluent flow was screened to capture all re-entrained pellets throughout the test.

Table 5. Light liquid re-entrainment test results for the EFO4.

Surface Loading Rate (L/min/m2)	Time Stamp	Amount of Beads Re-entrained			
		Mass (g)	Volume (L)[a]	% of Pre-loaded Mass Re-entrained	% of Pre-loaded Mass Retained
200	62	0	0	0.00	100
800	247	168.45	0.3	0.52	99.48
1400	432	51.88	0.09	0.16	99.83
2000	617	55.54	0.1	0.17	99.84
2600	802	19.73	0.035	0.06	99.94
Total Re-entrained		295.60	0.525	0.91	--
Total Retained		32403	57.78	--	99.09
Total Loaded		32699	58.3	--	--

[a] Determined from bead bulk density of 0.56074 g/cm^3

Variances from testing Procedure

The following minor deviations from the *Procedure for Laboratory Testing of Oil-Grit Separators* (Version 3.0, June 2014) have been noted:

1. During the capture test, the 40 L/min/m^2 and 80 L/min/m^2 surface loading rates were evaluated over 3 and 2 days respectively due to the long duration needed to feed the required minimum of 11.3 kg of test sediment into the unit at these lower flow rates. Pumps were shut down at the end of each intermediate day, and turned on again the following morning. The target flow rate was re-established within 30 seconds of switching on the pump. This procedure may have allowed sediments to be captured that otherwise may have exited the unit if the test was continuous. On the basis of practical considerations, this variance was approved by the verifier prior to testing.

2. During the scour test, the coefficient of variation (COV) for the lowest flow rate tested (200 L/min/m²) was 0.07, which exceeded the specified limit of 0.04 target specified in the OGS Procedure. A pump capable of attaining the highest flow rate of 3036 L/min had difficulty maintaining the lowest flow of 234 L/min but still remained within +/- 10% of the target flow and is viewed as having very little impact on the observed results. Similarly, for the light liquid re-entrainment test the COV for the flow rate of the 200 L/min/m² run was 0.049, exceeding the limit of 0.04, but is believed to introduce negligible bias.

3. Due to pressure build up in the filters, the runs at 1000 L/min/m² for the Stormceptor® EF4 and 1000 and 1400 L/min/m² for the Stormceptor® EFO4 were slightly shorter than the target. The run times were 54, 59 and 43 minutes respectively, versus targets of 60 and 50 minutes. The final feed samples were timed to coincide with the end of the run. Since >25 lbs of sediment was fed, the shortened time did not invalidate the runs.

Verification

The verification was completed by the Verification Expert, Toronto and Region Conservation Authority, contracted by GLOBE Performance Solutions, using the International Standard ***ISO 14034:2016 Environmental management -- Environmental technology verification (ETV)***. Data and information provided by Imbrium Systems Inc. to support the performance claim included the following: Performance test report prepared by Good Harbour Laboratories, and dated September 8, 2017; the report is based on testing completed in accordance with the Procedure for Laboratory Testing of Oil-Grit Separators (Version 3.0, June 2014).

What is ISO14034:2016 Environmental management – Environmental technology verification (ETV)?

ISO 14034:2016 specifies principles, procedures and requirements for environmental technology verification (ETV), and was developed and published by the *International Organization for Standardization (ISO)*. The objective of ETV is to provide credible, reliable and independent verification of the performance of environmental technologies. An environmental technology is a technology that either results in an environmental added value or measures parameters that indicate an environmental impact. Such technologies have an increasingly important role in addressing environmental challenges and achieving sustainable development.

For more information on the Stormceptor® EF and EFO OGS please contact:

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407 Fairview Drive
Whitby, ON
L1N 3A9, Canada
Tel: 416-960-9900
info@imbriumsystems.com

For more information on ISO 14034:2016 / ETV please contact:

GLOBE Performance Solutions
World Trade Centre
404 – 999 Canada Place
Vancouver, BC
V6C 3E2 Canada
Tel: 604-695-5018 / Toll Free: 1-855-695-5018
etv@globeperformance.com

Nicholas Rendulic

From: Rishard Ragoonanan <rishard.ragoonanan@hamjof.com>
Sent: Monday, March 16, 2026 4:48 PM
To: Nicholas Rendulic; Ehsan Tahghighi
Cc: Aly Hamdy; Rui Zhou
Subject: RE: Prologis Meadowvale DC4/DC5 Coordination - Flow Control Roof Drains
Attachments: ZIL-Control-Flo-Bro-Form-81-31.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Nick,

Our calculations are done with the Zurn Control Flow Roof Drain selection criteria. Attaching the supplier brochure in case you need more info.

Thanks,
Rish

Rishard Ragoonanan, P.Eng
Lead Mechanical Engineer

HAMMERSCHLAG & JOFFE INC.
Consulting Engineers

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Direct: 437-222-4431
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rishard.ragoonanan@hamjof.com | www.hamjof.com | vCard

From: Nicholas Rendulic <NRendulic@mte85.com>
Sent: March 16, 2026 4:35 PM
To: Rishard Ragoonanan <rishard.ragoonanan@hamjof.com>; Ehsan Tahghighi <Etahghighi@petroff.com>
Cc: Aly Hamdy <ahamdy@arkinc.ca>; Rui Zhou <RZhou@mte85.com>
Subject: RE: Prologis Meadowvale DC4/DC5 Coordination - Flow Control Roof Drains

Thanks Rishard,

Can you please specify the type of roof drain you have used in your calculations? We would like to ensure our drawings are consistent.

Thanks,
Nick

Nicholas Rendulic, B.Eng. | Designer
MTE Consultants Inc.
T: 905-639-2552 | NRendulic@mte85.com

From: Rishard Ragoonanan <rishard.ragoonanan@hamjof.com>
Sent: Monday, March 16, 2026 4:07 PM
To: Ehsan Tahghighi <Etahghighi@petroff.com>; Nicholas Rendulic <NRendulic@mte85.com>
Cc: Aly Hamdy <ahamdy@arkinc.ca>; Rui Zhou <RZhou@mte85.com>
Subject: RE: Prologis Meadowvale DC4/DC5 Coordination - Flow Control Roof Drains

Hi Nicholas,

We were able to do the calculations per the roof plans received Dec 9 2025, apologies I missed this as I was away the entire month of December.

For DC4 we have a total roof flow of 92370.26 L/15min.

For DC5 we have a total roof flow of 96987.86 L/15min.

@Ehsan Tahghighi please see attached roof plan for DC5, we will need to add dummy drains to the area as noted in the yellow text box to achieve at least 10000ft2 per drain as required, the calculation accounts for these additional drains.

Please let us know if there are any concerns.

Thanks,
Rish

Rishard Ragoonanan, P.Eng
Lead Mechanical Engineer

HAMMERSCHLAG & JOFFE INC.
Consulting Engineers

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From: Ehsan Tahghighi <Etahghighi@petroff.com>
Sent: March 16, 2026 3:07 PM
To: 'Nicholas Rendulic' <NRendulic@mte85.com>; Rishard Ragoonanan <rishard.ragoonanan@hamjof.com>
Cc: Aly Hamdy <ahamdy@arkinc.ca>; Rui Zhou <RZhou@mte85.com>
Subject: RE: Prologis Meadowvale DC4/DC5 Coordination - Flow Control Roof Drains

Hi Nick,

Based on our review, we cannot reduce the number of FCRDs. The current layout has been designed in accordance with the applicable code requirements, which limit the spacing to a maximum of 15 m from

the roof edge/parapet and a maximum of 30 m between each FCRD. Reducing the number of drains would result in exceeding these spacing limits.
Also, there are a couple of dummy FCRDs shown on the drawings. Could you please confirm whether these are included in your count?
Please let us know if you would like to discuss this further.

Regards,

Ehsan Tahghighi
Project Coordinator

P E T R O F F

Petroff Partnership Architects
10 Aviva Way, Suite 400
Markham, Ontario
Canada L6G 0G1

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From: Nicholas Rendulic <NRendulic@mte85.com>
Sent: Monday, March 16, 2026 2:54 PM
To: Rishard Ragoonanan <rishard.ragoonanan@hamjof.com>; Ehsan Tahghighi <etahghighi@petroff.com>
Cc: Aly Hamdy <ahamdy@arkinc.ca>; Rui Zhou <RZhou@mte85.com>
Subject: Prologis Meadowvale DC4/DC5 Coordination - Flow Control Roof Drains

Hi Rishard and Ehsan,

Can you please confirm the number of required flow control roof drains (FCRDs) for each industrial building (DC4 and DC5) for our use in stormwater management calculations?

In the first SPA submission, we used a value of 57 FCRDs for DC4, and 61 FCRDs for DC5. Due to the City of Mississauga's allowable release rate requirement of 42 L/s/ha of roof area, we will be required to reduce the amount of FCRDs to 50 for DC4, and 57 for DC5. Please confirm that this is acceptable, along with the total roof area available for ponding for each building.

Please feel free to give me a call to discuss further.

Thanks,
Nick

Nicholas Rendulic, B.Eng. | **Designer**
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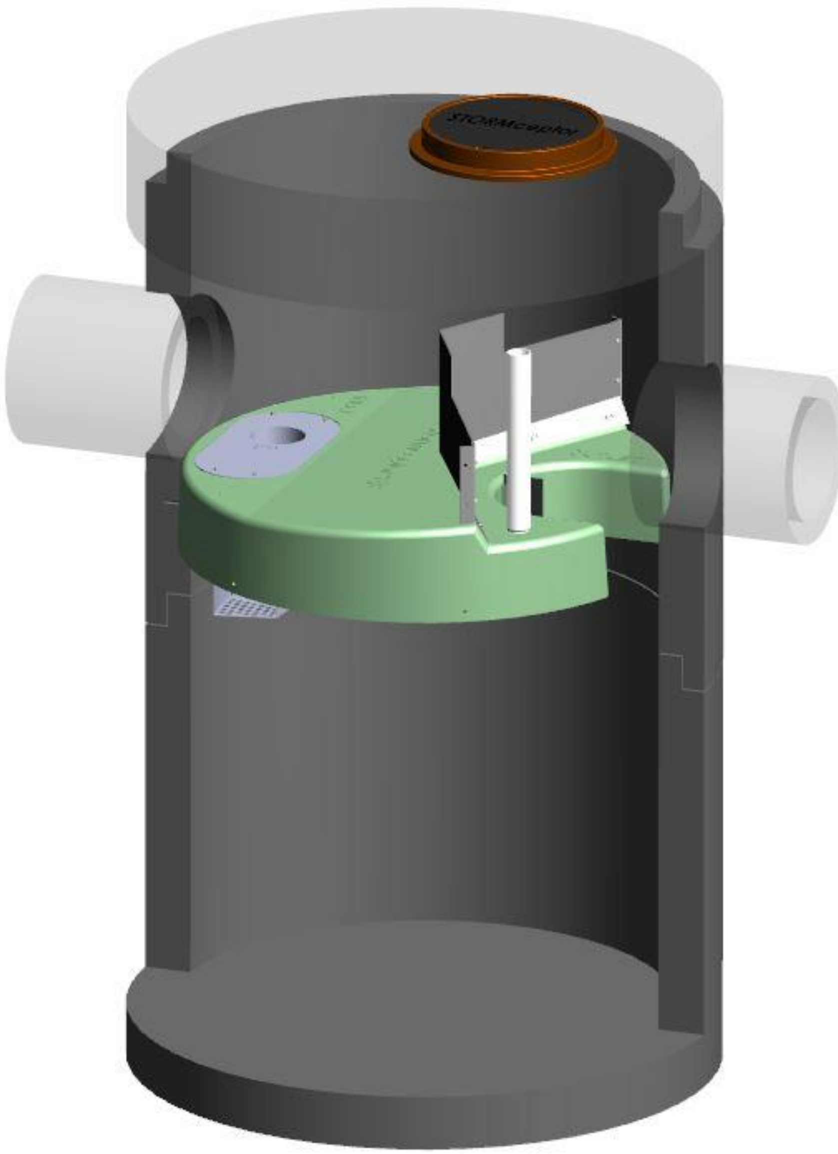
Stormceptor® EF

Owner's Manual



Stormceptor is protected by one or more of the following patents:

Canadian Patent No. 2,137,942
Canadian Patent No. 2,180,305
Canadian Patent No. 2,327,768
Canadian Patent No. 2,694,159
Canadian Patent No. 2,697,287
U.S. Patent No. 6,068,765
U.S. Patent No. 6,371,690
U.S. Patent No. 7,582,216
U.S. Patent No. 7,666,303
Australia Patent No. 693.164
Australia Patent No. 729,096
Australia Patent No. 2008,279,378
Australia Patent No. 2008,288,900
Japanese Patent No. 5,997,750
Japanese Patent No. 5,555,160
Korean Patent No. 0519212
Korean Patent No. 1451593
New Zealand Patent No. 583,008
New Zealand Patent No. 583,583
South African Patent No. 2010/00682
South African Patent No. 2010/01796
Patent pending

Table of Contents:

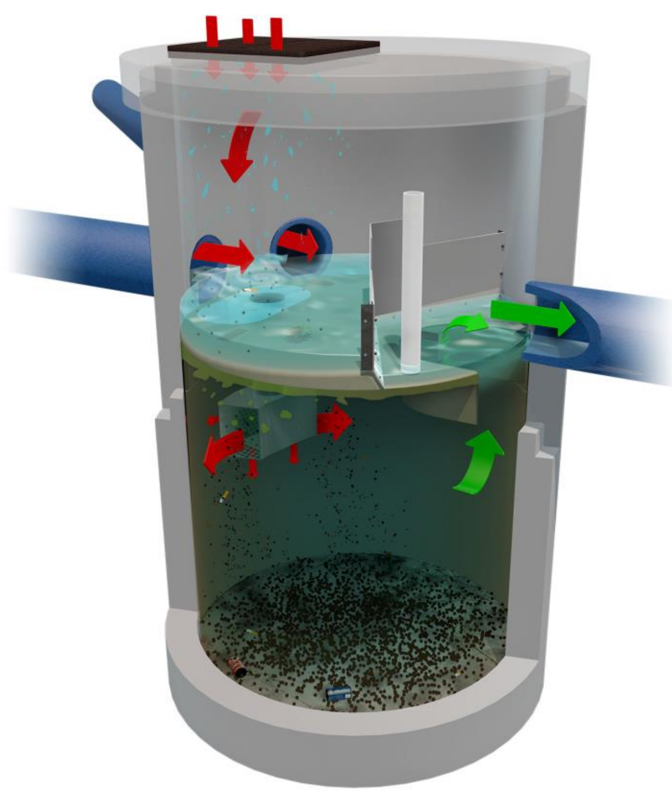
OVERVIEW

Stormceptor® EF is a continuation and evolution of the most globally recognized oil grit separator (OGS) stormwater treatment technology - ***Stormceptor®***. Also known as a hydrodynamic separator, the enhanced flow Stormceptor EF is a high performing oil grit separator that effectively removes a wide variety of pollutants from stormwater and snowmelt runoff at flow rates higher than the original Stormceptor. Stormceptor EF captures and retains sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals. Stormceptor EF's patent-pending treatment and scour prevention platform ensures sediment is retained during all rainfall events.

Stormceptor EF offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe, multiple inlet pipes, and/or from the surface through an inlet grate. Stormceptor EF can also serve as a junction structure, accommodate a 90-degree inlet to outlet bend angle, and be modified to ensure performance in submerged conditions. With its scour prevention and internal bypass, Stormceptor EF can be installed online, eliminating the need for costly additional bypass structures.

OPERATION

- Stormwater enters the Stormceptor upper chamber through the inlet pipe(s) or a surface inlet grate. A specially designed insert reduces the influent velocity by creating a pond upstream of the insert's weir. Sediment particles immediately begin to settle. Swirling flow sweeps water, sediment, and floatables across the sloped surface of the insert to the inlet opening of the drop pipe, where a strong vortex draws water, sediment, oil, and debris down the drop pipe cone.
- Influent exits the cone into the drop pipe duct. The duct has two large rectangular outlet openings as well as perforations in the backside and floor of the duct. Influent is diffused through these various opening in multiple directions and at low velocity into the lower chamber.
- Free oils and other floatables rise up within the channel surrounding the central riser pipe and are trapped beneath the insert, while sediment settles to the sump. Pollutants are retained for later removal during maintenance cleaning.
- Treated effluent enters the outlet riser, moves upward, and discharges to the top side of the insert downstream of the weir, where it flows out the outlet pipe.
- During intense storm events with very high influent flow rates, the pond height on the upstream side of the weir may exceed the height of the weir, and the excess flow passes over the top of the weir to the downstream side of the insert, and exits through the outlet pipe. This internal bypass feature allows for in-line installation, avoiding the cost of additional bypass structures. During bypass, the pond separates sediment from all incoming flows, while full treatment in the lower chamber continues at the maximum flow rate.
- Stormceptor EF's patent-pending enhanced flow and scour prevention technology ensures pollutants are captured and retained, allowing excess flows to bypass during infrequent, high intensity storms.



COMPONENTS

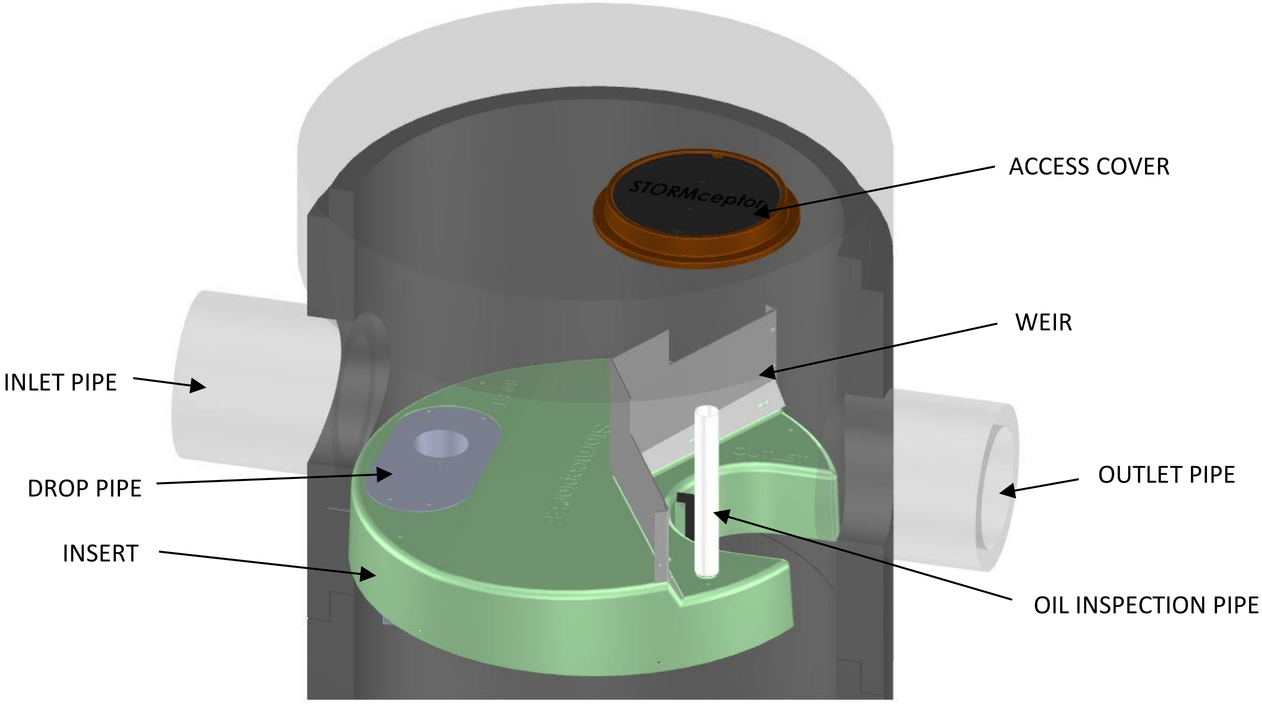


Figure 1

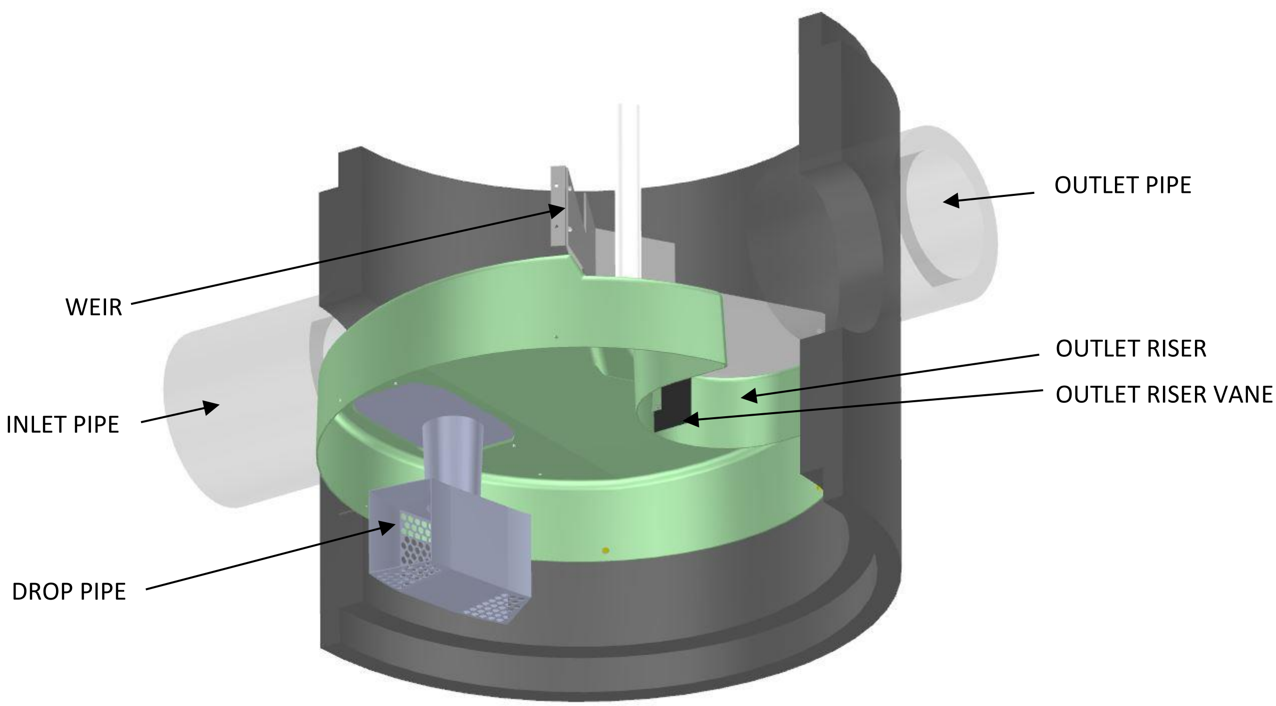


Figure 2

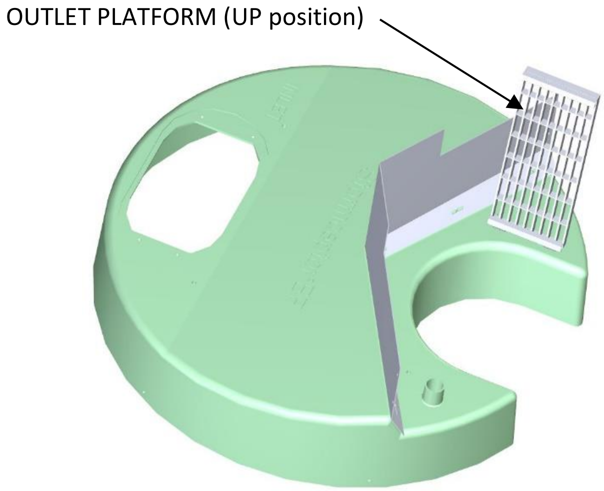


Figure 3A

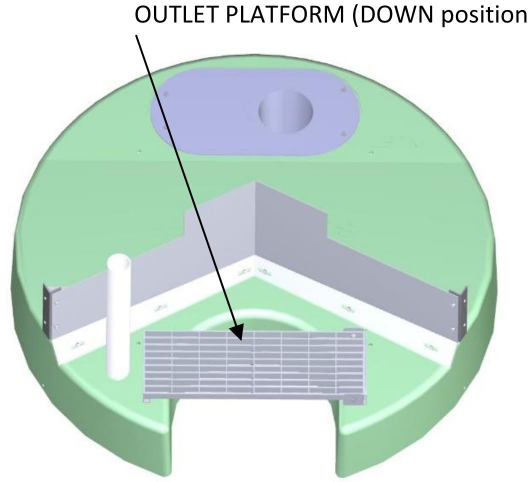


Figure 3B

- **Insert** – separates vessel into upper and lower chambers, and provides double-wall containment of hydrocarbons
- **Weir** – creates stormwater ponding and driving head on top side of insert
- **Drop pipe** – conveys stormwater and pollutants into the lower chamber
- **Outlet riser** – conveys treated stormwater from the lower chamber to the outlet pipe, and provides primary inspection and maintenance access into the lower chamber
- **Outlet riser vane** – prevents formation of a vortex in the outlet riser during high flow rate conditions
- **Outlet platform (optional)** – safety platform in the event of manned entry into the unit
- **Oil inspection pipe** – primary access for measuring oil depth

PRODUCT DETAILS

METRIC DIMENSIONS AND CAPACITIES

Table 1

Stormceptor Model	Inside Diameter (m)	Minimum Surface to Outlet Invert Depth (mm)	Depth Below Outlet Pipe Invert (mm)	Wet Volume (L)	Sediment Capacity [1] (m^3)	Hydrocarbon Storage Capacity [2] (L)	Maximum Flow Rate into Lower Chamber [3] (L/s)	Peak Conveyance Flow Rate [4] (L/s)
EF4 / EFO4	1.22	1219/914	1524	1780	1.19	265	22.1 / 10.4	425
EF5/EFO5	1.52	1219	1626	3150	1.95	420	34.6 / 16.2	708
EF6 / EFO6	1.83	1219	1930	5070	3.47	610	49.6 / 23.4	990
EF8 / EFO8	2.44	1219	2591	12090	8.78	1070	88.3 / 41.6	1700
EF10 / EFO10	3.05	1219	3251	23700	17.79	1670	138 / 65	2830
EF12 / EFO12	3.66	1219	3886	40800	31.22	2475	198.7 / 93.7	2830

[1] Sediment Capacity is measured from the floor to the bottom of the drop pipe duct. Sediment Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
[2] Hydrocarbon Storage Capacity is measured from the bottom of the outlet riser to the underside of the insert. Hydrocarbon Storage Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
[3] EF Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 1135 L/min/m^2.
EFO Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 535 L/min/m^2.
[4] Peak Conveyance Flow Rate is limited by a maximum velocity of 1.5 m/s.

U.S. DIMENSIONS AND CAPACITIES

Table 2

Stormceptor Model	Inside Diameter (ft)	Minimum Surface to Outlet Invert Depth (in)	Depth Below Outlet Pipe Invert (in)	Wet Volume (gal)	Sediment Capacity [1] (ft^3)	Hydrocarbon Storage Capacity [2] (gal)	Maximum Flow Rate into Lower Chamber [3] (cfs)	Peak Conveyance Flow Rate [4] (cfs)
EF4 / EFO4	4	48 / 36	60	471	42	70	0.78 / 0.37	15
EF5 / EFO5	5	48	64	833	75	111	1.22 / 0.57	25
EF6 / EFO6	6	48	76	1339	123	160	1.75 / 0.83	35
EF8 / EFO8	8	48	102	3194	310	280	3.12 / 1.47	60
EF10 / EFO10	10	48	128	6261	628	440	4.87 / 2.30	100
EF12 / EFO12	12	48	153	10779	1103	655	7.02 / 3.31	100

[1] Sediment Capacity is measured from the floor to the bottom of the drop pipe duct. Sediment Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
[2] Hydrocarbon Storage Capacity is measured from the bottom of the outlet riser to the underside of the insert. Hydrocarbon Storage Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
[3] EF Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 27.9 gpm/ft^2.
EFO Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 13.1 gpm/ft^2.
[4] Peak Conveyance Flow Rate is limited by a maximum velocity of 5 fps.

IDENTIFICATION

Each Stormceptor EF/EFO unit is easily identifiable by the trade name ***Stormceptor®*** embossed on the access cover at grade as shown in **Figure 3**. The tradename ***Stormceptor®*** is also embossed on the top of the insert upstream of the weir as shown in **Figure 3**.

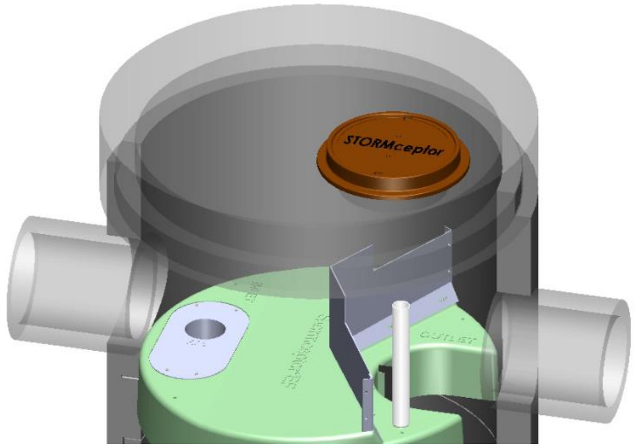


Figure 4

The specific Stormceptor EF/EFO model number is identified on the top of the aluminum Drop Pipe as shown in **Figure 4**. The unit serial number is identified on the top of the insert upstream of the weir as shown in **Figure 4**.

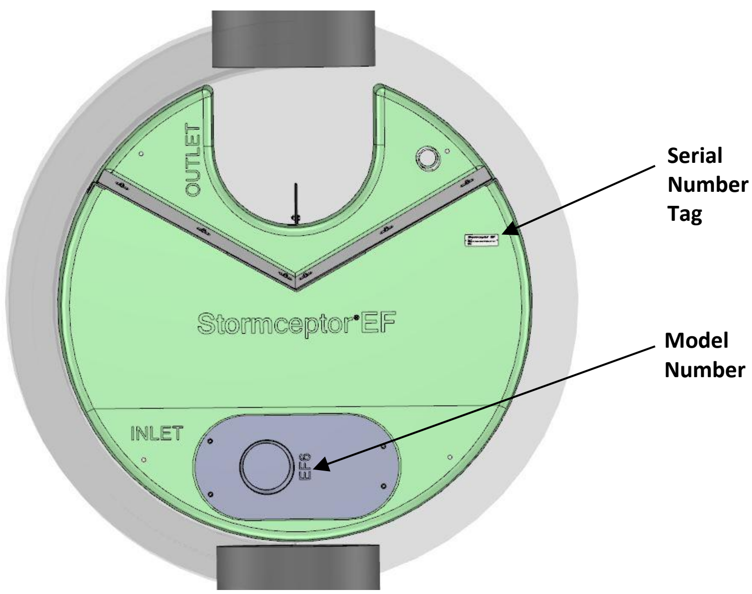


Figure 5

INSPECTION AND MAINTENANCE

It is very important to perform regular inspection and maintenance. Regular inspection and maintenance ensures maximum operation efficiency, keeps maintenance costs low, and provides continued of natural waterways.

Quick Reference

- Typical inspection and maintenance is performed from grade
- Remove manhole **cover(s)** or **inlet grate** to access insert and lower chamber
  NOTE: EF4/EFO4 & EF5/EFO5 require the removal of a **flow deflector** beneath inlet grate
- Use Sludge Judge® or similar sediment probe to check sediment depth through the **outlet riser**
- Oil dipstick can be inserted through the **oil inspection pipe**
- Visually inspect the **insert** for debris, remove debris if present
- Visually inspect the **drop pipe** opening for blockage, remove blockage if present
- Visually inspect **insert** and **weir** for damage, schedule repair if needed
- Insert vacuum hose and jetting wand through the outlet riser and extract sediment and floatables
- Replace flow deflector (EF4/EFO4 & EF5/EFO5), inlet grate, and cover(s)
- **NOTE:** If the unit has an **outlet platform**, the outlet platform is typically in the UP position (see Figure 3A) for normal treatment conditions, and for inspection and maintenance. If manned entry into the unit is required, the outlet platform must first be placed in the DOWN position (see Figure 3B). After manned entry is completed, return the outlet platform to the UP position for treatment.

When is inspection needed?

- Post-construction inspection is required prior to putting the Stormceptor into service.
- Routine inspections are recommended during the first year of operation to accurately assess pollutant accumulation.
- Inspection frequency in subsequent years is based on the maintenance plan developed in the first year.
- Inspections should also be performed immediately after oil, fuel, or other chemical spills.

What equipment is typically required for inspection?

- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones and caution tape
- Hard hat, safety shoes, safety glasses, and chemical-resistant gloves

When is maintenance cleaning needed?

- If the post-construction inspection indicates presence of construction sediment of a depth greater than a few inches, maintenance is recommended at that time.
- For optimum performance and normal operation the unit should be cleaned out once the sediment depth reaches the recommended maintenance sediment depth, see **Table 3**.
- Maintain immediately after an oil, fuel, or other chemical spill.

Table 3

Recommended Sediment Depths for Maintenance Service*	
MODEL	Sediment Depth (in/mm)
EF4 / EFO4	8 / 203
EF5 / EFO5	12 /305
EF6 / EFO6	12 /305
EF8 / EFO8	24 / 610
EF10 / EFO10	24 / 610
EF12 / EFO12	24 / 610

* Based on a minimum distance of 41 inches (1,041 mm) from bottom of outlet riser to top of sediment bed

The frequency of inspection and maintenance may need to be adjusted based on site conditions to ensure the unit is operating and performing as intended. Maintenance costs will vary based on the size of the unit, site conditions, local requirements, disposal costs, and transportation distance.

What equipment is typically required for maintenance?

- Vacuum truck equipped with water hose and jet nozzle
- Small pump and tubing for oil removal
- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones
- Hard hats, safety shoes, safety glasses, chemical-resistant gloves, and hearing protection for service providers
- Gas analyzer, respiratory gear, and safety harness for specially trained personnel if confined space entry is required (adhere to all OSHA / CCOSH standards)

What conditions can compromise Stormceptor performance?

- Presence of construction sediment and debris in the unit prior to activation
- Excessive sediment depth beyond the recommended maintenance depth
- Oil spill in excess of the oil storage capacity
- Clogging or restriction of the drop pipe inlet opening with debris
- Downstream blockage that results in a backwater condition

Maintenance Procedures

- Maintenance should be conducted during dry weather conditions when no flow is entering the unit.
- Stormceptor is maintained from grade through a standard surface manhole access cover or inlet grate.
- In the case of submerged or tailwater conditions, extra measures are likely required, such as plugging the inlet and outlet pipes prior to conducting maintenance.
- Inspection and maintenance of upstream catch basins and other stormwater conveyance structures is also recommended to extend the time between future maintenance cycles.

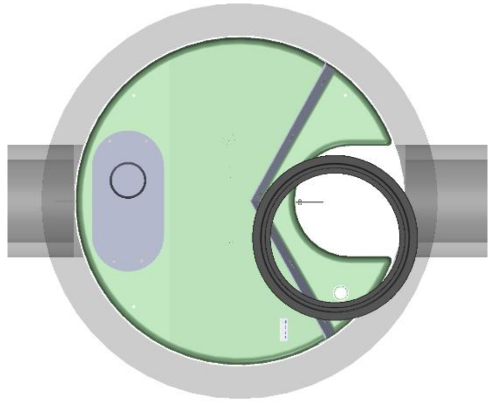


Figure 6

- Sediment depth inspections are performed through the **Outlet Riser** and oil presence can be determined through the **Oil Inspection Pipe**.
- Oil presence and sediment depth are determined by inserting a Sludge Judge® or measuring stick to quantify the pollutant depths.

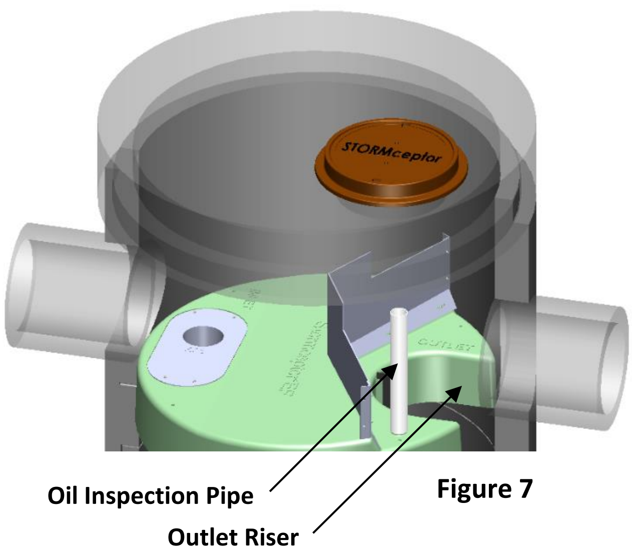


Figure 7

Figure 8

- Visually inspect the insert, weir, and drop pipe inlet opening to ensure there is no damage or blockage.
- **NOTE:** If the unit has an **outlet platform**, the outlet platform is typically in the UP position (see Figure 3A) for normal treatment conditions, and for inspection and maintenance. If manned entry into the unit is required, the outlet platform must first be placed in the DOWN position (see Figure 3B). After manned entry is completed, return the outlet platform to the UP position for treatment.

- When maintenance is required, a standard vacuum truck is used to remove the pollutants from the lower chamber of the unit through the **Outlet Riser**.

Figure 9

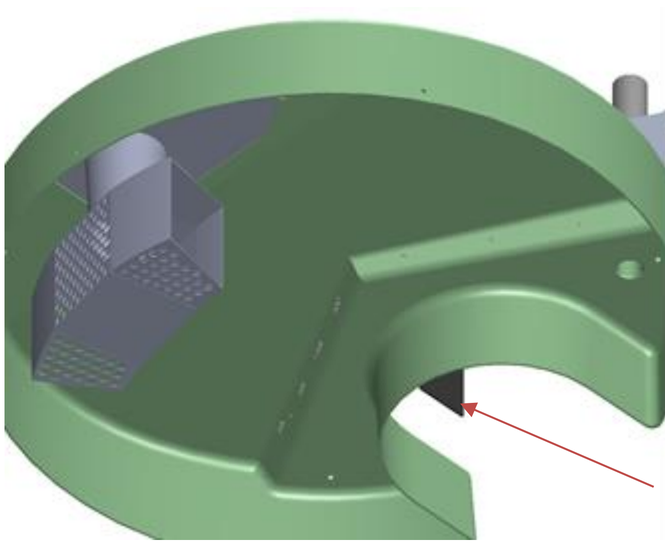


Figure 10

NOTE: The Outlet Riser Vane is durable and flexible and designed to allow maintenance activities with minimal, if any, interference.

Removable Flow Deflector

- Top grated inlets for the Stormceptor EF4/EFO4 & EF5/EFO5 models require a removable flow deflector staged underneath a 24-inch x 24-inch (600 mm x 600 mm) square inlet grate to direct flow towards the inlet side of the insert, and avoid flow and pollutants from entering the outlet side of the insert from grade. The EF6/EFO6 and larger models do not require the flow deflector.

How to Remove:

1. Loosen anchor bolts
2. Pull up and out using the handle

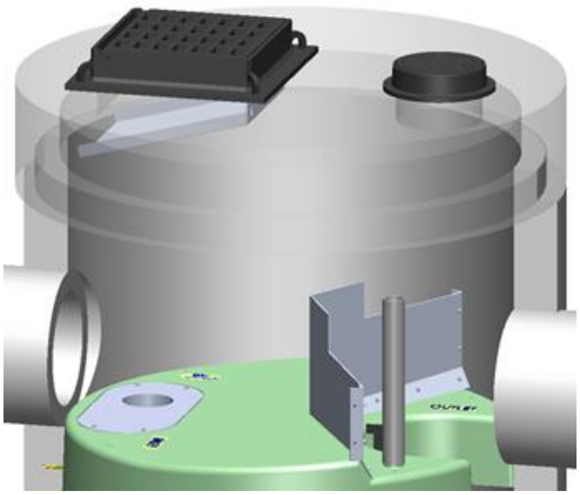
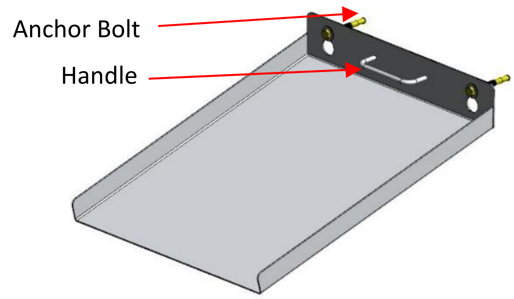


Figure 11



Removable Flow Deflector

Hydrocarbon Spills

Stormceptor is often installed on high pollutant load hotspot sites with vehicular traffic where hydrocarbon spill potential exists. Should a spill occur, or presence of oil be identified within a Stormceptor EF/EFO, it should be cleaned immediately by a licensed liquid waste hauler.

Disposal

Maintenance providers are to follow all federal, state/ provincial, and local requirements for disposal of material.

Oil Sheens

When oil is present in stormwater runoff, a sheen may be noticeable at the Stormceptor outlet. An oil rainbow or sheen can be noticeable at very low oil concentrations (< 10 mg/L). Despite the appearance of a sheen, Stormceptor EF/EFO may still be functioning as intended.

Oil Level Alarm

To mitigate spill liability with 24/7 detection, an electronic monitoring system can be employed to trigger a visual and audible alarm when a pre-set level of oil is captured within the lower chamber or when an oil spill occurs. The oil level alarm is available as an optional feature to include with Stormceptor EF/EFO as shown in **Figure 11**. For additional details about the Oil Level Alarm please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-systems.

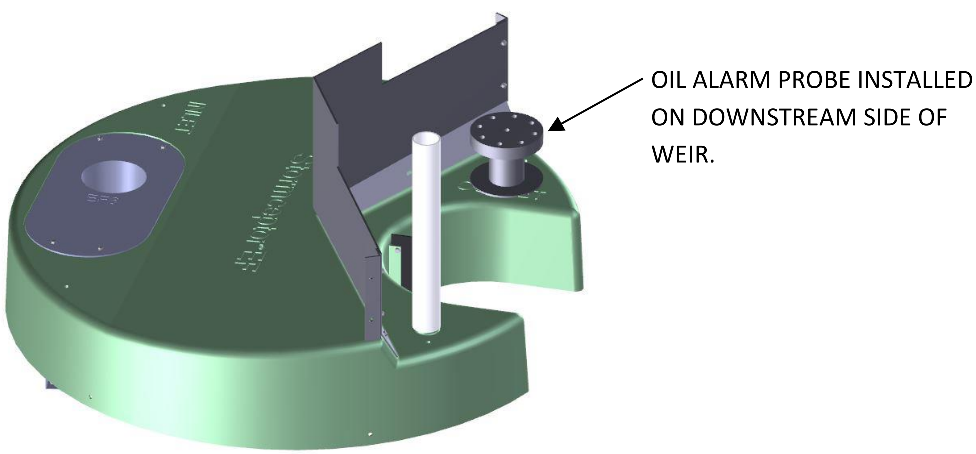


Figure 12

Replacement Parts

Stormceptor has no moving parts to wear out. Therefore inspection and maintenance activities are generally focused on pollutant removal. Since there are no moving parts during operation in a Stormceptor, broken, damaged, or worn parts are not typically encountered. However, if replacement parts are necessary, they may be purchased by contacting your local Stormceptor representative.

Stormceptor Inspection and Maintenance Log

Stormceptor Model No: ________________________

Serial Number: ________________________

Installation Date: ________________________

Location Description of Unit: ________________________

Recommended Sediment Maintenance Depth: ________________________

DATE	SEDIMENT DEPTH (inch or mm)	OIL DEPTH (inch or mm)	SERVICE REQUIRED (Yes / No)	MAINTENANCE PERFORMED	MAINTENANCE PROVIDER	COMMENTS

Other Comments:

Contact Information

Questions regarding Stormceptor EF/EFO can be addressed by contacting your local Imbrium representative or by visiting our website at www.imbriumsystems.com.

Imbrium Systems Inc. & Imbrium Systems LLC

Canada	1-416-960-9900 / 1-800-565-4801
United States	1-301-279-8827 / 1-888-279-8826
International	+1-416-960-9900 / +1-301-279-8827

www.imbriumsystems.com
info@imbriumsystems.com

Appendix B

Sanitary

Prologis Meadowvale Distribution Centre/ Data Centre

City of Mississauga
Project No: 60549_001
Date: March 2026
By: NZR

Sanitary Demand Calculations

	Light Industrial				Total		
Location	Site Area (ha)	Population Density (persons/ha) [1]	Population (persons)	Demand (L/s)	Total Average Demand (L/s)	Total Peaked Demand (L/s)	Total Peaked Demand + Infiltration (L/s)
Distribution Centre 4/5	12.04	70	843	2.634	2.634	10.093	
Data Centre [5]	4.13	-	50	0.1563	0.156	0.599	
Totals	**16.17**		**893**	**2.791**	**2.791**	**10.691**	**14.90**

Sanitary Demand		
Average Daily Demands [2]	270	L/ca/day
	0.0031	L/ca/sec
Harmon Peaking Factor [3]	3.83	
Site Area	16.172	ha
Infiltration Allowance [4]	0.26	L/s/ha
	4.205	L/s

Note 1: Population Density based on Region of Peel Linear Wastewater Standards
Note 2: Average Daily Demand based on Region of Peel Linear Wastewater Standards
Note 3: Harmon Peaking Factor = $1 + (14/(4+(P/1000)^{½}))$, (4.0 max)
Note 4: Infiltration allowance based on Region of Peel Linear Wastewater Standards
Note 5: Population of Data Centre obtained from Stantek Water Use Table, outlining a peak occupancy of 50 employees.(Refer to table in Appendix C)

Appendix C

Fire and Domestic Water

Prologis Meadowvale Distribution Centre

City of Mississauga
Project No: 60549_001
Date: March 2026
By: NZR

Peaking Factors[1]:	
	Industrial
Avg. Day	1.0
Max. Day	1.4
Peak Hour	3.0

Water Demand Calculations

	Light Industrial				Final Demand		
Location	Site Area (ha)	Population Density [2] (persons/ha)	Population (persons) [5]	Demand (L/s) [6]	Avg Day Demand Qavg (L/s)	Max Day Demand Qmax.day (L/s)	Peak Hour Demand Qpeak (L/s)
Distribution Centre 4/5	12.04	70	843	2.439	2.439	3.415	7.318
Data Centre	4.13	-	50	0.017	0.017	0.023	0.050
Totals	**16.17**		**893**	**2.456**	**2.456**	**3.438**	**7.367**

Water Demand [3]		
Average Daily Demands	250	L/d/person
	0.0029	L/s/person

Fire Flow [4]		
Fire Flow - Distribution Centre	20,000	L/min
	333.33	L/s
Fire Flow - Data Centre	12,000	L/min
	200.00	L/s

Max Day + Fire Flow Demand		
DC 4/5	336.75	L/s
Data Centre	200.02	L/s

Note 1: Peaking factors based on Region of Peel Watermain Design Criteria
Note 2: Population Density based on Region of Peel Watermain Design Criteria
Note 3: Water Demands based on R.O.P 2020 Development Charges background study
Note 4: Fire flows from FUS (2020) - See attached worksheet
Note 5: Data Centre Population estimate based on Facility water use Table provided by Stantek (See Appendix C)
Note 6: Water Demand for the Data Centre based on Facility Water use Table provided by Stantek (See Appendix C)

Prologis Meadowvale Distribution Centre
City of Mississauga
Project No: 60549_001
Date: March 2026
By: NZR

FIRE FLOW DEMAND REQUIREMENTS - FIRE UNDERWRITERS SURVEY (FUS GUIDELINES)

Fire flow demands for the FUS method is based on information and guidance provided in "Water Supply for Public Protection" (Fire Underwriters Survey, 2020).

An estimate of the fire flow required is given by the followir (persons) 5

$$RFF = 220C\sqrt{A}$$

where:

RFF = the required fire flow in litres per minute
C = coefficient related to the type of construction
= 1.5 for **Type V** Wood Frame Construction
= 0.8 for **Type IV-A** Mass Timber Construction
= 0.9 for **Type IV-B** Mass Timber Construction
= 1.0 for **Type IV-C** Mass Timber Construction
= 1.5 for **Type IV-D** Mass Timber Construction
= 1.0 for **Type III** Ordinary Construction
= 0.8 for **Type II** Noncombustible Costruction
= 0.6 for **Type I** Fire Resistive Construction
A = Total floor area in square metres from Site Plan
(for Type II Noncombustible Costruction,
A = Gross Floor Area in Square Meters

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The table below summarizes the adjustments made to the basic fire flow demand.

Building	Area "A"	C	(1) Fire Flow "RFF"		(2) Occupancy		(3) Sprinkler		(4) Exposure		**Final Adjusted Fire Flow**		
	(m^2)	(Type II)	(l/min)	(l/s)	%	Adjusted Fire Flow (L/min)	%	Adjustment (L/min)	%	Adjustment (L/min)	**(L/min)**	**Rounded(L/min)**	**(L/s)**
Building DC4	26,823.0	0.8	29,000	483.3	10	31,900	-50	-15,950	10	3,190	19,140	19,000	**316.7**
Building DC5	30,503.0	0.8	31,000	516.7	10	34,100	-50	-17,050	10	3,410	20,460	20,000	**333.3**
Data Center	13,152.5	0.8	20,000	333.3	20	24,000	-50	-12,000	0	0	12,000	12,000	**200.0**

(2) Occupancy

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

30% - Automatic sprinkler protection designed and installed in accordance with NFPA 13
+10% - Water supply is standard for both the system and Fire Department hose line
+ 10% - Fully Supervised System

(4) Exposure

0 to 3m	25%
3.1 to 10m	20%
10.1 to 20m	15%
20.1 to 30m	10%
>30	0%

Calculate for all sides. Maximum charge shall not exceed 75%

***NOTE:** Occupancy Adjustment Factor based on mixed group F2 and Group D building usage (DC4/DC5)

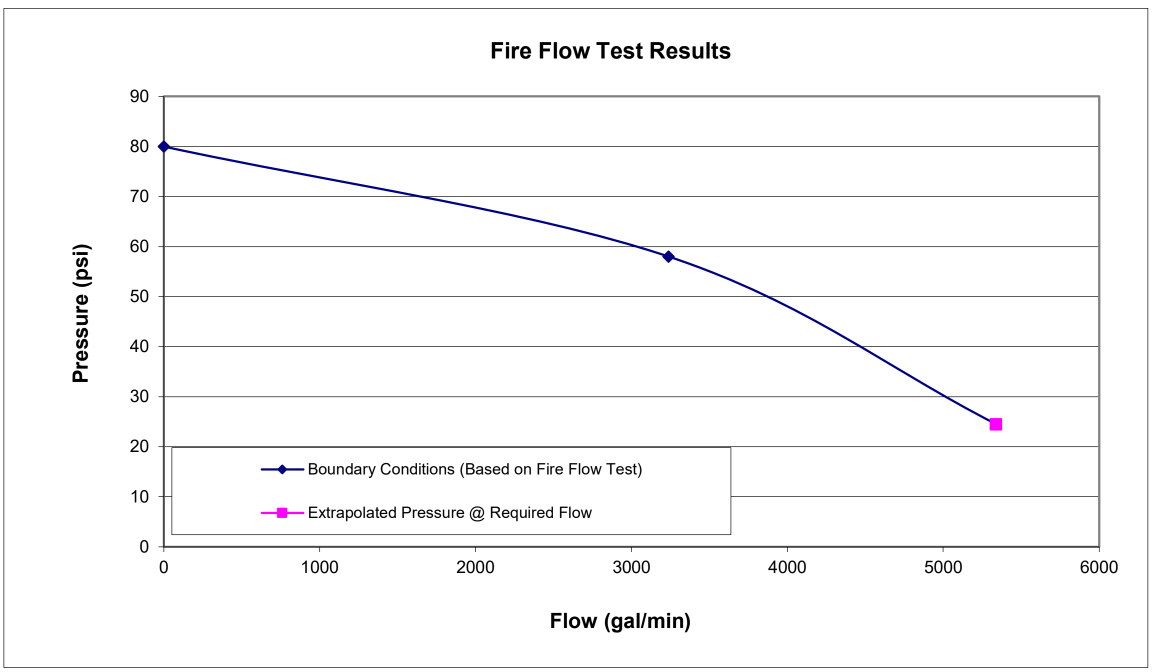
Prologis Meadowvale Distribution Centre

City of Mississauga
Project No: 60549_001
Date: March 2026
By: NZR

File: Q:\60549_001\WTM\60549_001 Water Calculations (Fire Flow).xlsx

CALCULATION OF RESIDUAL PRESSURE AT EXISTING HYDRANT (Residual 4)

1. Boundary Conditions (Based on Fire Flow Test Results):	Metric		Imperial		
P0 - Starting Pressure	56.26	*m*	**80**	*psi*	
P1 - Pressure at Q1	40.79	*m*	**58**	*psi*	
Q1 - From Fire Flow Test	14725	*L/min*	**3239**	*U.S. gal/min*	
Q2 - Required Flow	**20205**	*L/min*	5338	*U.S. gal/min*	From: Water Demand calculations by MTE
P-loss 1	15.47	*m*	22	*psi*	
P-loss 2	39.02	*m*	55	*psi*	
P2 - Residual Pressure	**17.24**	***m***	**25**	***psi***	Extrapolated from Fire Flow Test Results



Main Office
2175 Teston Rd
Maple, Ontario L6A 1R3
Phone : 905.602.5798
Mobile : 647.224.5795
tchaykowsky@superiorsprinkler.ca

HYDRANT FLOW TEST

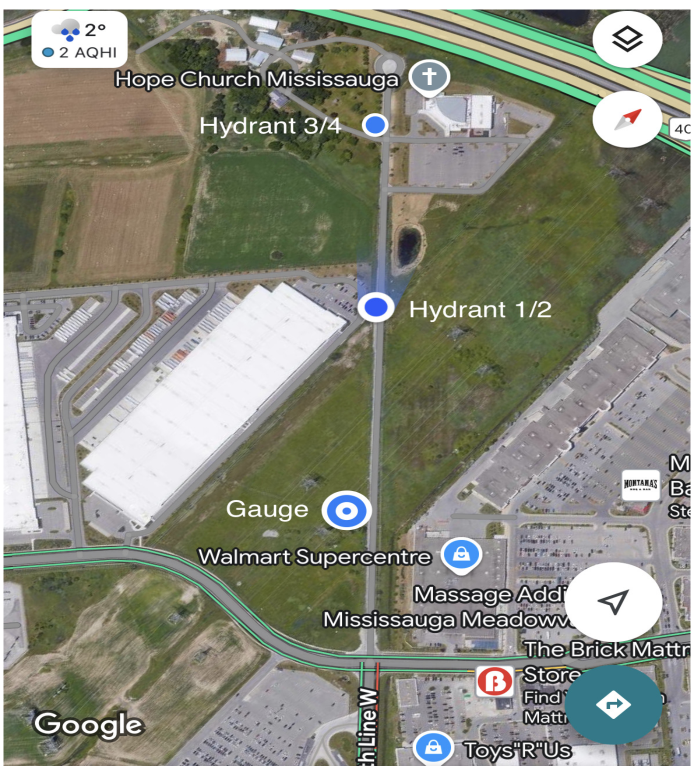
Summary:

Technicians:	Duane Dobbs, Cory Beacom and Chris Bayton
Date:	December 18, 2024
Time:	1:00pm
Weather:	2°C
Location/Address:	7564 Tenth Line West, Mississauga Ontario
Main Size:	300mm PVC

Results:

Static:	80 psi
Residual 1:	1 - 2-1/2 @ 1325 GPM @ 74 psi
Residual 2:	2 - 2-1/2 @ 2040 GPM @ 76 psi
Residual 3:	3 – 2-1/2” @ 2776 GPM @ 63 psi
Residual 4:	4 – 2-1/2” @ 3239 GPM @ 58 psi

Map: https://maps.app.goo.gl/10th Line Mississauga, ON



Hydrant type:
Coefficient 0.9 smooth bore / rounded outlet

Authorized Signature:

Tyson Chaykowsky
Sales & Contract Manager
SuperiorSprinkler.ca

Date: March 19, 2025

Project Particulars

Name	Project Crimson
Location	Tenth Line West, Meadowvale. Mississauga
Facility Type	Data Center
Full Time Employees	50 (Peak Occupancy)
Cooling System	Closed Loop Air Cooled Chilled Water Plant

Water Uses

Water Use	***Estimated Annual Consumption***
Domestic Uses: Drinking, Handwashing, Flushing,	Use estimated at 10 Gal/FTE/Workday Estimated Annual Use: 130,000 US Gallons
Housekeeping	15 Gal / Workday Estimated Annual Use: 3900 US Gallons
Space Humidification	250 US Gallons
Cooling System	Annual Filter Flushing (80 US Gal) + Chiller Coil Cleaning (450 US Gal) + Make-up Water (50 Gal) Estimated Annual Use: 580 US Gallons
Total Annual Estimated Water Use	***134,730 US Gallons / 510,009 L***

Demand Profile

<table>
<tr><td>Anticipated Maximum Day Demand</td><td>525 US Gallons / 1987 L</td></tr>
<tr><td>Anticipated Instantaneous Demand</td><td>15 GPM / 57 LPM</td></tr>
<tr><td>Anticipated Monthly Use Profile (Estimate)</td><td>
<table>
<tr><th rowspan="2">Month</th><th colspan="2">Estimated Use</th></tr>
<tr><th>Gallon</th><th>Liters</th></tr>
<tr><td>January</td><td>11,223.00</td><td>42,484</td></tr>
<tr><td>February</td><td>11,223.00</td><td>42,484</td></tr>
<tr><td>March</td><td>11,223.00</td><td>42,484</td></tr>
<tr><td>April</td><td>11,161.00</td><td>42,249</td></tr>
<tr><td>May</td><td>11,691.00</td><td>44,255</td></tr>
<tr><td>June</td><td>11,161.00</td><td>42,249</td></tr>
<tr><td>July</td><td>11,161.00</td><td>42,249</td></tr>
<tr><td>August</td><td>11,161.00</td><td>42,249</td></tr>
<tr><td>September</td><td>11,161.00</td><td>42,249</td></tr>
<tr><td>October</td><td>11,161.00</td><td>42,249</td></tr>
<tr><td>November</td><td>11,161.00</td><td>42,249</td></tr>
<tr><td>December</td><td>11,243.00</td><td>42,560</td></tr>
<tr><td>Total Annual Use</td><td>134,730</td><td>510,009</td></tr>
</table>
</td></tr>
</table>

Key Dates / Durations

Estimated Commissioning Date	June 2028
Estimated Ramp-up / Buildout Schedule	Sequentially between June 2028 – December 2030

LICENSED PROFESSIONAL ENGINEER
S. A. PANDIT
90550112
PROVINCE OF ONTARIO

Nicholas Rendulic

From: Viktoria Chenash <VChenash@wzmh.com>
Sent: Wednesday, February 25, 2026 3:37 PM
To: Nicholas Rendulic; Anastasiia Kalinichenko
Cc: Zenon Radewych; Rui Zhou
Subject: RE: 60549_001 - Prologis Data Centre Fire Flow Calculations

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Nicholas,

Please see the responses in red below.

Let us know if you need any further clarification.

Regards,
Viktoria

Viktoria Chenash
416.961.4111 ext. 229

From: Nicholas Rendulic <NRendulic@mte85.com>
Sent: Wednesday, February 25, 2026 11:38 AM
To: Anastasiia Kalinichenko <AKalinichenko@wzmh.com>; Viktoria Chenash <VChenash@wzmh.com>
Cc: Zenon Radewych <radewych@wzmh.com>; Rui Zhou <RZhou@mte85.com>
Subject: [EXTERNAL] RE: 60549_001 - Prologis Data Centre Fire Flow Calculations

Hi Anastasiia and Viktoria,

Just following up on my request below. Can you please confirm the below requirements for our FUS fireflow calcs?

Thanks,

Nicholas Rendulic, B.Eng. | **Designer**
MTE Consultants Inc.
T: 905-639-2552 | NRendulic@mte85.com
1016 Sutton Drive, Unit A, Burlington, Ontario L7L 6B8
www.mte85.com | LinkedIn | Instagram

From: Nicholas Rendulic
Sent: Tuesday, February 24, 2026 9:43 AM
To: Anastasiia Kalinichenko <akalinichenko@wzmh.com>
Cc: Zenon Radewych <radewych@wzmh.com>; Rui Zhou <RZhou@mte85.com>
Subject: 60549_001 - Prologis Data Centre Fire Flow Calculations

Hi Anastasiia,

Could you please confirm the following information in order to update our FUS fireflow calcs?

- Confirm total GFA 21 224 m2
- Confirm the construction type per Pages 20 and 21 of the attached FUS 2020 Guidelines (page numbers are on the bottom right corner) C coefficient - 0.8 for Noncombustible Construction
- Confirm if all vertical openings in the building are protected (or not) per Page 22 of the attached FUS 2020 Guidelines All vertical openings are protected, except for the roof openings
- Confirm the occupancy and contents per Page 24 of the attached FUS 2020 Guidelines

  Major occupancy: Group **F** Division **2** (medium hazard industrial) - Data Processing Centre
  Description of Major Occupancies – **Warehouses (Medium Hazard)**
  Occupancy and Contents - **Free to Rapid Burning**
  Adjustment factor **15% to 25%**

  Subsidiary occupancy: Group **D** – office spaces
  Occupancy and Contents - **Limited**
  Adjustment factor **-15%**

- Confirm if building is sprinklered and whether the systems are fully supervised or not per Page 28 of the attached FUS 2020 Guidelines
  The building is fully sprinklered and the system are fully supervised. Additionally, a standpipe system will be installed in the building.

Please let me know if you have any questions.

Thanks,
Nick

Nicholas Rendulic

From: Ehsan Taghghighi <Etahghighi@petroff.com>
Sent: Friday, March 20, 2026 1:28 PM
To: Nicholas Rendulic
Cc: Aly Hamdy; Rui Zhou
Subject: RE: 60549_001 - Prologis DC4/DC5 Fire Flow Calculations

Hi Nick,

Please see below:

DC4:

- GFA : 26,823 SM
- Confirm the construction type : Non combustible
- Confirm if all vertical openings in the building are protected (or not) per Page 22 of the attached FUS 2020 guidelines. : Not Protected
- Confirm the occupancy : Group F2 / Group D
- Confirm if building is sprinklered and whether the systems are fully : Sprinklered / Full

DC5:

- GFA : 30,503 SM
- Confirm the construction type : Non combustible
- Confirm if all vertical openings in the building are protected (or not) per Page 22 of the attached FUS 2020 guidelines. : Not Protected
- Confirm the occupancy : Group F2 / Group D
- Confirm if building is sprinklered and whether the systems are fully : Sprinklered / Full

Regards,

Ehsan Taghghighi
Project Coordinator

P E T R O F F

Petroff Partnership Architects
10 Aviva Way, Suite 400
Markham, Ontario
Canada L6G 0G1

t: 905.470.7000 x 3307
d: 905.754.3307
etahghighi@petroff.com
www.petroff.com

From: Nicholas Rendulic <NRendulic@mte85.com>
Sent: Friday, March 20, 2026 9:32 AM
To: Ehsan Taghghighi <etahghighi@petroff.com>
Cc: Aly Hamdy <ahamdy@arkinc.ca>; Rui Zhou <RZhou@mte85.com>
Subject: 60549_001 - Prologis DC4/DC5 Fire Flow Calculations

Hi Ehsan,

Could you please confirm the following information to ensure our FUS fireflow calcs are correct?

- Confirm total GFA per building
- Confirm the construction type per Page 20 and 21 of the attached FUS 2020 Guidelines (page number are on the bottom right corner)
- Confirm if all vertical openings in the building are protected (or not) per Page 22 of the attached FUS 2020 guidelines.
- Confirm the occupancy and contents per Page 24 of the attached FUS 2020 Guidelines.
- Confirm if building is sprinklered and whether the systems are fully supervised or not per Page 28 of the attached FUS 2020 guidelines.

Let me know if you have any questions.

Thanks,
Nick

Nicholas Rendulic, B.Eng. | **Designer**
MTE Consultants Inc.
T: 905-639-2552 | NRendulic@mte85.com
1016 Sutton Drive, Unit A, Burlington, Ontario L7L 6B8
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Appendix D

Region of Peel Water and Wastewater Modelling Demand Table

Region of Peel
working with you

Water and Wastewater Modelling Demand Table

Site Plan Applications

Version	Date	Description of Revision
1.0	January 10 2023	Posted to Peel Website
2.0	August 30 2024	Reflects 2023 Linear Wastewater Standards and ICI population estimates as per Peel 2020 DC background study

Introduction

Water and wastewater modelling may be required as a condition of the development approval process or prior to regional site servicing connection approval where intensification is proposed, where a possible increase in water demand or wastewater discharge is identified or where deemed necessary by Regional staff.

A completed table includes the Professional Engineer's signature and stamp as well as a site servicing concept. The table will be deemed complete once all the information below is submitted and/or included. Modelling will commence once the information is deemed complete. All required calculations must be submitted with the completed demand table. The calculations shall be based on the specific development proposal.

Application Information

Application Number:	SP 25-63 W9/SP 25-65 W9
Address:	7700 Tenth Line West/ 0 Argentia Road
Consulting Engineer:	MTE Consultants Inc.
Date Prepared:	March 24, 2026

Population

Existing

		Units	Persons
1	Residential [8)]		
2	Institutional/Employment [8)]		0
3	Total		0

Proposed

			Units	Persons
4	Residential [1)]	singles/semis (4.2 ppu)		
5		Townhomes (3.4 ppu)		
6		Large apartments (>1 bedroom – 3.1 ppu)		
7		Small apartments (<=1 bedroom – 1.7 ppu)		
8		Total proposed residential		
9	Proposed Institutional[2)]			
10	Proposed employment [3)]			893
11	Total Proposed			893

Other

12	Existing gross floor area for commercial and/or retail (sqm)	*0 sqm*
13	Proposed gross floor area for commercial and/or retail (sqm)	*78,370 sqm*
14	Land area (ha)	*16.17ha*

Water Connection

Hydrant flow test [4)]

15	Location 1	First hydrant south of 401, on west side of Tenth Line
16	Location 2	Second hydrant south of 401, on west side of Tenth Line

		Pressure (kPa)	Flow (L/s)	Time
17	Minimum water pressure	399.90	204.35	1:00pm
18	Maximum water pressure	551.58	0	1:00pm

Water Demands (L/s)

		Use 1 [6)]	Use 2 [6)]	Use 3 [6)]	Total
19	Existing fire flow [5)] [8)]				
20	Proposed average day flow	2.439 L/s	0.017 L/s		2.456 L/s
21	Proposed maximum day flow	*3.415 L/s*	*0.023 L/s*		3.438 L/s
22	Proposed peak hour flow	*7.318 L/s*	*0.050 L/s*		*7.367 L/s*
23	Proposed fire flow [5)]				333.33 L/s

Water calculations

Please use the following updated typical water demand criteria as per Peel's 2020 Development Charges background study.

Population Type	Unit	Average Consumption Rate	Max Day Factor	Peak Hour Factor
Residential	L/cap/d	270	1.8	3.0
Institutional/Commercial/ Industrial	L/emp/d	250	1.4	3.0

Wastewater Connection

Wastewater Effluent (L/s)

		Discharge location [7)]	Flow
24	Existing effluent [8)]		
25	Proposed effluent	Lisgar Channel Sanitary Sewer	14.90 L/s
26	Proposed effluent		
27	Proposed effluent		
28	Proposed additional effluent [8)]		
29	Other proposed effluent*		
30	Total proposed effluent		14.90 L/s

*Please specify other proposed effluent (ex. occasional tank purges, off peak discharge, pool drainage)

N/A

Wastewater calculations

Please use the following updated daily per capita as per 2023 Peel Linear Wastewater Standards

Population Type	Unit	Average Day Demand	Min Peaking Factor	Max Peaking Factor	Inflow and Infiltration**
Residential	L/cap/d	290	2	4	0.26L/s/Ha
Non-residential	L/emp/d	270	2	4	0.26L/s/Ha

**For maintenance holes that are flood prone or located in low lying areas, an extra 0.28 L/s per maintenance hole may be added to the I&I calculation.

Notes

1) In accordance with Peel Linear Wastewater Standards and Region of Peel 2020 DC background Study
2) refer to Peel Linear Wastewater Standards
3) For the commercial and industrial design flow calculations, please refer to Schedule 8b on page A-9 of the Region of Peel 2020 DC background Study to determine population.
4) Please include the graphs associated with the hydrant flow test data. Hydrant flow tests should be performed within 2 years of submission to the Region. The Region will not permit hydrant flow tests during the winter, please contact Region Water Operations for scheduling. The Region reserves the right to request an updated hydrant flow test as required at any time.
5) Please reference the Fire Underwriters Survey Document
6) Please identify the flows for each use type, **if applicable**
7) Please include drainage plan for multiple discharge locations
8) For Intensification, sites with additions to buildings or additional buildings please provide existing flow for existing buildings and the added flows for the new proposal, **if applicable**

Appendix E

Reference Material

MTE

March 24, 2026

MTE File No.: 61720_001

Tony Nguyen
Development Manager
Prologis Inc.
185 The West Mall, Suite 700
Toronto, ON M9C 5L5

Dear Tony:

Re: Infiltration Testing
7564 10th Line West, Mississauga, Ontario

MTE Consultants Inc. (MTE) was retained by Prologis Inc. (Client) to conduct an infiltration rate assessment to facilitate the design of infiltration tanks at 7564 10th Line West, Mississauga, Ontario (Site).

METHODOLOGY

Based on Drawing No. C2.2A and C2.2B Site Servicing Plan 1 & 2, prepared by MTE, dated October 28, 2025, it is our understanding that two infiltration tanks are proposed, one located at western portion, and another located at eastern portion of the Site. MTE advanced two test pits (TP1-25, TP2-25) within the footprint of proposed infiltration tanks to a depth of approximately 2.5 and 1.0 meters below ground surface (m bgs) respectively on November 26, 2025.

Test pits were excavated using an excavator operated by a specialist contractor (Nexxgen Environmental Ltd.), under supervision of an experienced MTE hydrogeological personnel. Prior to the excavating, public and private utility locates clearance were completed. The locations of test pits are shown on **Figure 1**.

Insitu infiltration tests GP1 and GP2 were carried out using a Guelph Permeameter (GP) device at test pit locations TP1-25 and TP2-25 respectively at elevations of approximately 208.8 and 208.6 meters above mean sea level (m amsl) i.e., approximately 2.5 and 1.0 m bgs. The soil stratigraphy encountered during excavating at the TP1-25 and TP2-25 indicated that the topsoil layer comprising of sandy silt underlain by native sandy silt to sandy clayey silt. The test pit logs are attached in **Appendix A**. Particle size distribution analysis on the collected native soil sample is attached in **Appendix B**.

A confirmatory sample was also collected at each test pit location at around 1m below the testing depth i.e., 3.5 and 2.0 m bgs (207.8 and 207.6 m amsl) to confirm the soil and groundwater conditions. The test pits remained open for over one hour, during which no groundwater was observed at the bottom of the test pits. However, for details related to seasonal high groundwater elevations at the proposed infiltration tanks please refer to hydrogeological investigation report completed by MTE under separate cover.

TESTING RESULTS

The saturated hydraulic conductivity (Kfs) and infiltration rate are provided in Table 1 below and **Appendix C**.

Table 1: Summary of Testing Results

Testing Location ID	Testing Elevation (m amsl)	Testing Depth (m bgs)	Soil Description	Saturated Hydraulic Conductivity (Kfs) cm/s	Unfactored Infiltration Rate[1] (mm/hour)	Factored Infiltration Rate (mm/hour)
TP1-25	208.8	2.5	Sandy Clayey Silt	1.5×10^{-4}	51	20
TP2-25	208.6	1.0	Sandy Silt	8.7×10^{-4}	82	33

1. *Based on Low Impact Development Stormwater Management Planning and Design Guide, 2010, CVC & TRCA.*

Based on above, the factored infiltration rate is estimated to be approximately 20 mm/hour at TP1-25 location and approximately 33 mm/hour at TP2-25 location, calculated by applying a safety factor of 2.5 (as recommended by design engineer) to the unfactored infiltration rate of approximately 51 mm/hour at TP1-25 location and approximately 82 mm/hour at TP2-25 location.

We trust the above meets your current needs. If you require additional information or need clarification, please do not hesitate to contact the undersigned.

Sincerely,

MTE Consultants Inc.

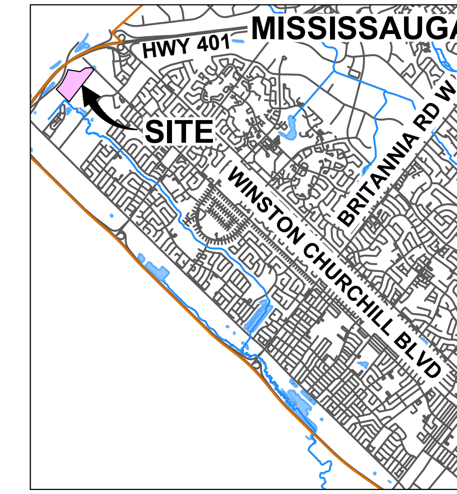
Usman Arshad, M.Eng., P.Eng., PMP
Project Manager - Hydrogeology
Office: 905-639-2552
UArshad@mte85.com

Attached: Figure 1 – Infiltration Test Location Plan
Appendix A – Test Pit Logs
Appendix B – Particle Size Distribution Analysis
Appendix C – Guelph Permeameter Test Results

WXG/UMA: jpo
https://mte85.sharepoint.com/sites/61720_001/Shared Documents/7_Infiltration letter/61720_001_7564 10th Line, Mississauga_Infiltration Testing.docx

Figure

CAD: P:\P\61720_001\61720_001-IT.DWG



KEY PLAN (nts)

LEGEND

SITE

INFILTRATION TEST

REFERENCES

2020 PEEL AERIAL IMAGE WMS; AND
CITY OF MISSISSAUGA, PARCEL, ROAD, RAIL, AND WATER NETWORK, OPEN DATA SET.

NOTES

THIS FIGURE IS SCHEMATIC ONLY AND TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE.

0 30 60 90 120 150m

MTE
Engineers, Scientists, Surveyors

PROJECT
INFILTRATION TESTING
7564 10TH LINE WEST
MISSISSAUGA, ONTARIO

TITLE
INFILTRATION TEST LOCATION PLAN

Drawn IC	Scale 1:3,000	Figure 1
Checked WG	Project No. 61720_001	
Date 2025-11-18	Rev No. 0	

Plot Date: November 18, 2025 – 9:48 AM

Appendix A

Test Pit Logs

MTE

ID No.: TP1-25

Project Name: Infiltration Testing

MTE File No.: 61720_001

Client: Prologis

Site Location: 7564 10th Line, Mississauga, ON

Date Completed: 11/26/2025

Contractor: Nexxgen Environmental Ltd.

Excavation Method: Excavation

Subsurface Profile				Sample		
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Soil Sample Lab Analysis	PID (ppm)	Hydrocarbon (ppm)
0 / 0		Ground Surface	211.3			
	Topsoil	**TOPSOIL** brownish grey sandy silt with clay, trace grass, trace organics, moist	0.0			
	Sandy silt	**SANDY SILT** greyish brown sandy silt with clay, trace brick, trace gravel, moist	210.8 0.5			
	Sandy silt	grey, no brick	208.8 2.5			
		Excavation Terminated	207.8 3.5			

Depth scale: ft 0, 2, 4, 6, 8, 10, 12; m 0, 2

Field Technician: NBW

Drafted by: NBW

Reviewed by: WXG

MTE

Sheet: 1 of 1

ID No.: TP2-25

Project Name: Infiltration Testing

MTE File No.: 61720_001

Client: Prologis

Site Location: 7564 10th Line, Mississauga, ON

Date Completed: 11/26/2025

Contractor: Nexxgen Environmental Ltd.

Excavation Method: Excavation

Subsurface Profile				Sample		
Depth (ft / m)	**Symbol**	**Soil Description**	**Elevation (masl) Depth (m)**	**Soil Sample Lab Analysis**	**PID (ppm)**	**Hydrocarbon (ppm)**
0 / 0		Ground Surface	209.6			
		TOPSOIL dark brown sandy silt, trace roots, trace organics, moist	0.0			
2		**SANDY SILT** brown sandy silt, trace clay, some gravel, moist	209.1 0.5			
		trace gravel	208.8 0.8			
4, 6 / 2		Excavation Terminated	207.6 2.0			
8, 10, 12						

Field Technician: NBW

Drafted by: NBW

Reviewed by: WXG

Sheet: 1 of 1

Appendix B

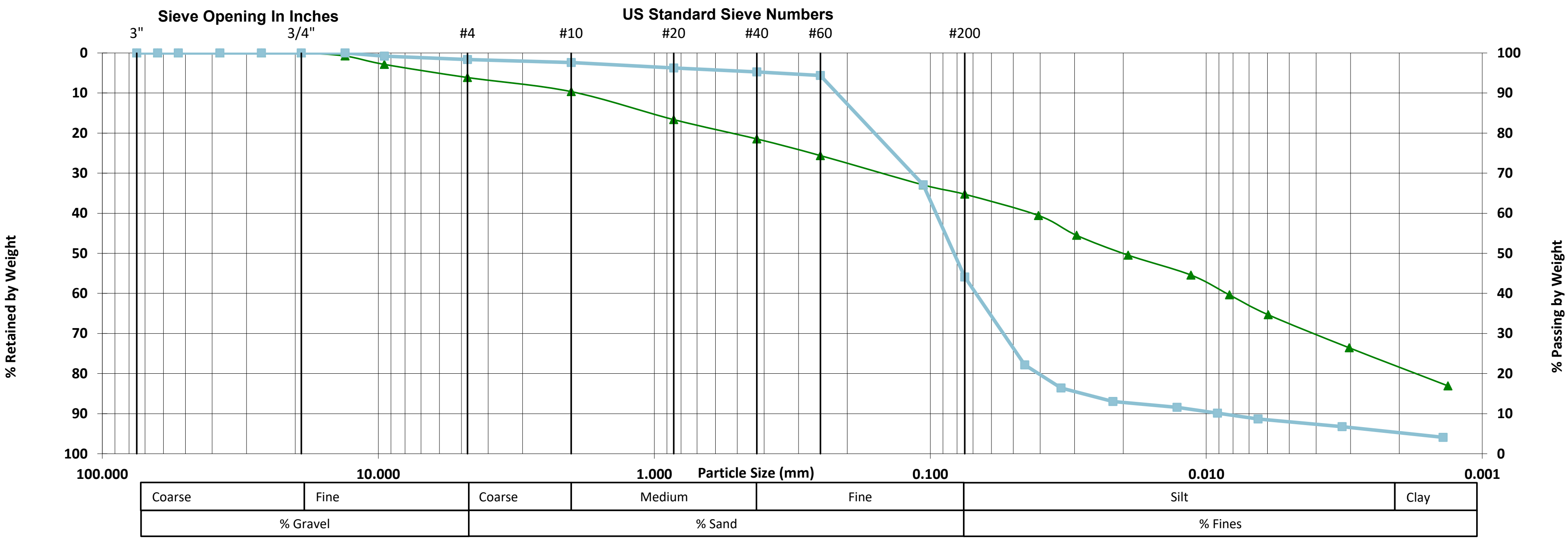
Particle Size Distribution Analysis

MTE

Particle Size Distribution Analysis Test Results

Project Name: Infiltration Testing
Client: Prologis Inc.
Project Location: 7564 10th Line West, Mississauga
Date Tested: December 12, 2025
MTE File No.: 61720_001
Table No: 102

Unified Soil Classification



Symbol	Borehole ID	Sample #	Sample Depth	Description
▲ (green)		IT-1	2.0 - 2.1 mbgs	Sandy Clayey SILT, trace Gravel
■ (blue)		IT-2	1.0 - 1.1 mbgs	Sandy SILT, trace Clay and Gravel

CERTIFIED BY CCIL
Canadian Council of Independent Laboratories
For specific tests as listed on www.ccil.com

NOTES:

Appendix C

Guelph Permeameter Test Results

GP1 Guelph Permeameter Calculations

Input

Result

Support: ali@soilmoisture.com

Head #1

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1
Enter water Head Height ("H" in cm): 5
Enter the Borehole Radius ("a" in cm): 5

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.2300

Res Type	35.22
H	5
a	5
H/a	1
a*	0.12
C0.01	0.588
C0.04	0.606
C0.12	0.558
C0.36	0.558
C	0.558
R	0.230
Q	0.135
pi	3.142

$\alpha^* =$ 0.12 (cm^{-1})

$C =$ 0.558165

$Q =$ 0.13501

$K_{fs} =$ 1.63E-04 cm/sec; 9.77E-03 cm/min; 1.63E-06 m/sec; 3.85E-03 inch/min; 6.41E-05 inch/sec

$\Phi_m =$ 1.36E-03 (cm^2/min)

Head #2

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): 1
Enter water Head Height ("H" in cm): 10
Enter the Borehole Radius ("a" in cm): 5

Enter the soil texture-structure category (enter one of the below numbers): 3

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.3000

Res Type	35.22
H	10
a	5
H/a	2
a*	0.12
C0.01	0.90429
C0.04	0.94462
C0.12	0.91197
C0.36	0.91197
C	0.91197
R	0.300
Q	0.1761
pi	3.1415

$\alpha^* =$ 0.12 (cm^{-1})

$C =$ 0.911966

$Q =$ 0.1761

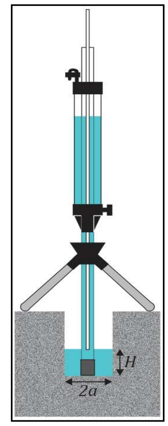
$K_{fs} =$ 1.31E-04 cm/sec; 7.88E-03 cm/min; 1.31E-06 m/ses; 3.10E-03 inch/min; 5.17E-05 inch/sec

$\Phi_m =$ 1.09E-03 (cm^2/min)

Average

$K_{fs} =$ 1.47E-04 cm/sec; 8.82E-03 cm/min; 1.47E-06 m/s; 3.47E-03 inch/min; 5.79E-05 inch/sec

$\Phi_m =$ 1.23E-03 (cm^2/min)



Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	$\alpha^*(\mathrm{cm}^{-1})$	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_1/a}{2.102 + 0.118(H_1/a)}\right)^{0.655}$ $C_2 = \left(\frac{H_2/a}{2.102 + 0.118(H_2/a)}\right)^{0.655}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091(H_1/a)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091(H_2/a)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), a^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{a^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)a^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi(2H_1 H_2(H_2 - H_1) + a^2(H_1 C_2 - H_2 C_1))}$ $G_2 = \frac{H_1 C_2}{\pi(2H_1 H_2(H_2 - H_1) + a^2(H_1 C_2 - H_2 C_1))}$ $K_{fs} = G_2 Q_2 - G_1 Q_1$ $G_3 = \frac{(2H_2^2 + a^2 C_2)C_1}{2\pi(2H_1 H_2(H_2 - H_1) + a^2(H_1 C_2 - H_2 C_1))}$ $G_4 = \frac{(2H_1^2 + a^2 C_1)C_2}{2\pi(2H_1 H_2(H_2 - H_1) + a^2(H_1 C_2 - H_2 C_1))}$ $\Phi_m = G_3 Q_1 - G_4 Q_2$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	

SOILMOISTURE® GP1 Guelph Permeameter Calculations

Input

Result

Support: ali@soilmoisture.com

Head #1

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): **1**
Enter water Head Height ("H" in cm): **5**
Enter the Borehole Radius ("a" in cm): **5**

Enter the soil texture-structure category (enter one of the below numbers): **3**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **1.1000**

Res Type	35.22
H	5
a	5
H/a	1
a*	0.12
C0.01	0.588
C0.04	0.606
C0.12	0.558
C0.36	0.558
C	0.558
R	1.100
Q	0.646
pi	3.142

$\alpha^* =$ **0.12** (cm^{-1})

$C =$ 0.558165

$Q =$ 0.6457

$K_{fs} =$ 7.79E-04	cm/sec
4.67E-02	cm/min
7.79E-06	m/sec
1.84E-02	inch/min
3.07E-04	inch/sec

$\Phi_m =$ 6.49E-03 (cm^2/min)

Head #2

Reservoir Type (enter "1" for Combined and "2" for Inner reservoir): **1**
Enter water Head Height ("H" in cm): **10**
Enter the Borehole Radius ("a" in cm): **5**

Enter the soil texture-structure category (enter one of the below numbers): **3**

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): **2.2000**

Res Type	35.22
H	10
a	5
H/a	2
a*	0.12
C0.01	0.90429
C0.04	0.94462
C0.12	0.91197
C0.36	0.91197
C	0.91197
R	2.200
Q	1.2914
pi	3.1415

$\alpha^* =$ **0.12** (cm^{-1})

$C =$ 0.911966

$Q =$ 1.2914

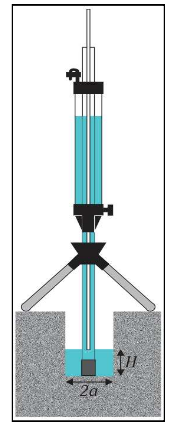
$K_{fs} =$ 9.63E-04	cm/sec
5.78E-02	cm/min
9.63E-06	m/ses
2.27E-02	inch/min
3.79E-04	inch/sec

$\Phi_m =$ 8.02E-03 (cm^2/min)

Average

$K_{fs} =$ 8.71E-04	cm/sec
5.22E-02	cm/min
8.71E-06	m/s
2.06E-02	inch/min
3.43E-04	inch/sec

$\Phi_m =$ 7.26E-03 (cm^2/min)



Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	$\alpha^*(cm^{-1})$	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_1/a}{2.102 + 0.118(H_1/a)}\right)^{0.655}$ $C_2 = \left(\frac{H_2/a}{2.102 + 0.118(H_2/a)}\right)^{0.655}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091(H_1/a)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091(H_2/a)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), a^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{a^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)a^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $G_2 = \frac{H_1 C_2}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $K_{fs} = G_2Q_2 - G_1Q_1$ $G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $\Phi_m = G_3Q_1 - G_4Q_2$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	

Prologis Canada

Meadowvale Business Park District - Block 1 Argentia Road Extension – Phase 1

Stormwater Management Report

Prepared by:

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Project Number:

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Date:

May, 2012

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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0		November 23, 2011	Original Report
1	tc	January 23, 2012	Update SWM strategy to include external lands to the north
2	dpg	February 17, 2012	Update to reflect City meeting comments
3	dpg	May 22, 2012	Updated to reflect Conservation Halton comments

AECOM Signatures

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May 18/12
PROVINCE OF ONTARIO

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Brian Richert, P.Eng.

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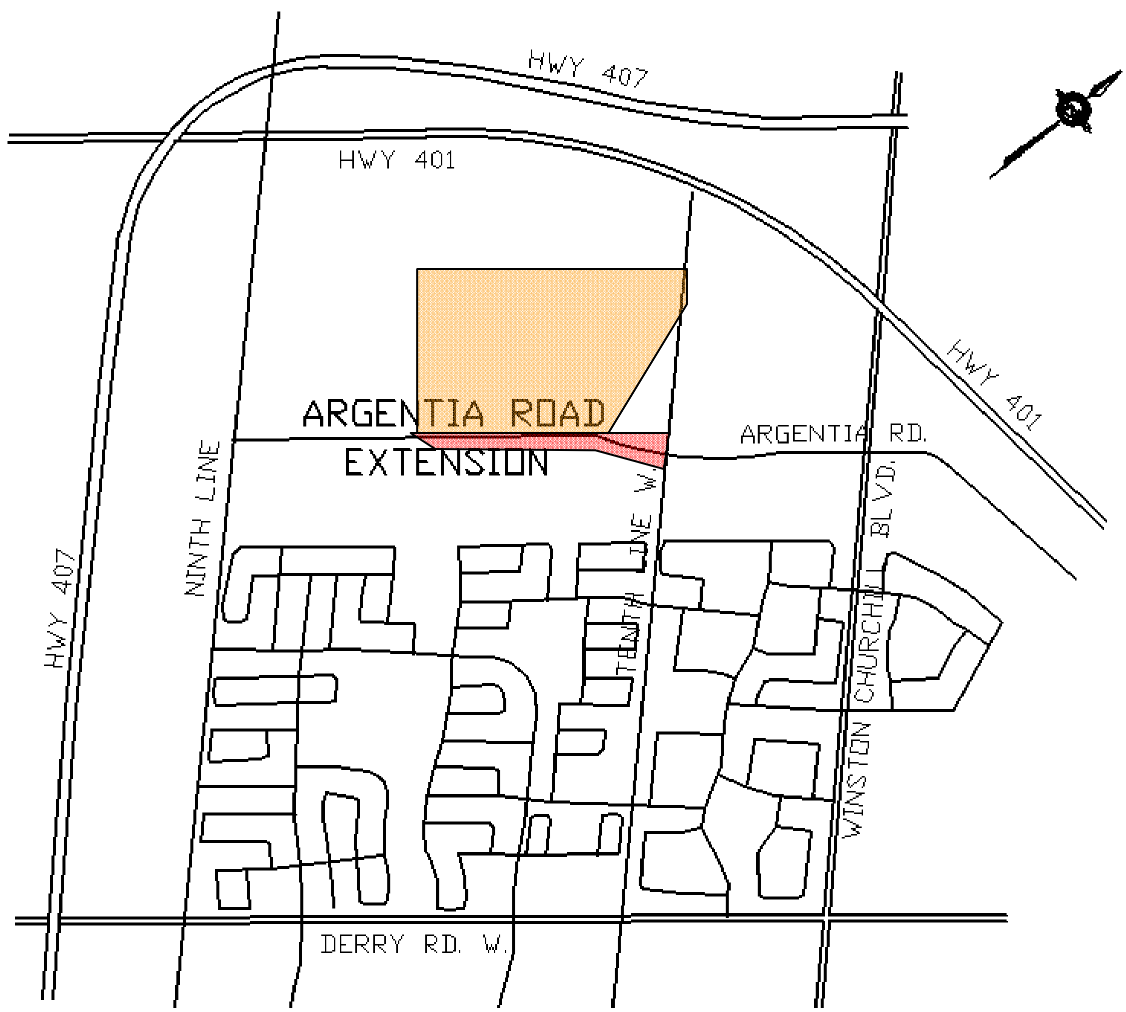
1. Introduction

Prologis Canada proposes to develop Block 1 of the Meadowvale Business Park District in concert with Phase 1 of the Argentia Road extension works from 10th Line to the proposed Lisgar channel crossing.

The subject site is located within North Sixteen District (NSD) in the northwest corner of the City of Mississauga and within the Meadowvale Business Park District. It is bound by 10th Line to the north east, the proposed Argentia Road extension to the south east, the realigned Lisgar channel to the south west and undeveloped lands to the north west, refer Diagram 1 below. The site is part of the Sixteen Mile Creek watershed, within Conservation Halton's jurisdiction. It is also within the City of Mississauga and the Region of Peel.

Diagram 1 Subject Site



AECOM has been retained by Prologis Canada to prepare a stormwater management (SWM) strategy for the proposed development. The strategy includes preliminary design details for the construction of a SWM facility that provides water quality control for the 2-year storm event and on-site storage controls providing additional 5-year storm event peak flow control.

1.1 Background

A number of subwatershed studies have been completed for the study area. The most recent and relevant is the *North Sixteen District Scoped Subwatershed Study and Ninth Line District Floodplain Mapping* (Philips Engineering Ltd., December 2004) (NSDSSS). This study identified a master plan approach to provide a single central watercourse, the Lisgar channel, for conveyance of drainage within the NSD lands. The Lisgar channel replaces multiple small watercourses. The study accounts for all contributing areas as part of the design of the centralized channel including the subject site.

The Detailed Design Sanitary, Water and Storm Services Mississauga Fire and Emergency Services Training Centre City of Mississauga (Sernas Associates, August 2008, revised July 2009) refined the storm drainage and stormwater management plan provided in the NSDSSS. This detailed design includes the requirements of the centralized drainage channel to provide form and function to convey post development flows from areas which include the subject site. This report also identified three offline stormwater facilities within the study area to provide quality control. In addition, an online quantity control storage component is provided within the centralized channel extending from upstream of the utility corridor to the northeast corner of the Mississauga Fire and Emergency Services Training Centre site. The centralized channel is designed to provide peak flow control for storms up to the 100-year storm event and conveyance of the Regional storm with 0.3 m of freeboard provided.

The subject site is located in the Pond Q2 catchment area on the Sernas drawings. Pond Q2 is required to provide quality control for the 2-year storm event. The future development lands to the north of the subject site are also identified in the catchment area of Pond Q2 and as such are accommodated in the SWM strategy. In addition to the development sites must also provide on-site storage of 75 l/s/ha for the 5-year storm event

Preliminary plans for site development were submitted to Conservation Halton on August 24, 2011 for preliminary review. Comments were received from Conservation Halton on October 3, 2011 and identified the following to be addressed in the submission of the SWM report:

- Provide thermal mitigation measures at the pond outlet such as a cooling trench and/or bottom draw outlet.
- Outfalls should be situated such that the discharge flow is in the same direction as the flow in the main creek.
- Provide additional details of the emergency overflow weir.
- Provide additional details of the riprap spillway.
- The outlet invert will require mitigation measures to prevent backwater if the outlet is lower than the 2-year water mark.
- Verify that the SWM facility performance will not be negatively impacted by predicted flood elevations in the watercourse channel.

Conservation Halton also requested that sufficient information be provided to size a single span culvert at the Lisgar channel crossing. This crossing is requested to be able to convey the Regional storm with 0.3 m of freeboard, in addition to ensuring fish passage is maintained as well as preventing negative impacts on stream erosion/migration and sediment transport. It is not proposed to detail this crossing as part of this submission. The details of the crossing will be provided in subsequent applications.

2. Pre-Development Conditions

2.1 Receiving Watercourse

The receiving watercourse for the subject site is the Lisgar channel. The accepted detailed design of the Lisgar channel is contained in the Detailed Design Sanitary, Water and Storm Services Mississauga Fire and Emergency Services Training Centre City of Mississauga (Sernas Associates, August 2008, revised July 2009). This study includes hydraulic, hydrologic, and geomorphologic investigations to provide a dynamically stable channel within a naturalized corridor. The channel is designed and constructed to accommodate uncontrolled post development treated flows, up to the 100-year event, from the subject site.

The post development flood levels estimated by Sernas Associates in the Lisgar channel adjacent to the subject site are provided in Table 1 below.

Table 1: Lisgar Channel Flood Levels (m)

Location	Regional	100-year	50-year	25-year	10-year	5-year
Upstream of Argentia Road Crossing	206.97	206.50	206.42	206.34	206.22	205.70
Downstream of Argentia Road Crossing	206.67	206.45	206.38	206.32	206.21	205.70

2.2 Soils

The subject site consists mainly of Chinguacousy clay loam with pockets of Jeddo clay loam, as identified in Report No. 43 of the Ontario Soil Survey, *The Soils of Halton County*. Table 2 provides a description for each of the soil types found within the SWM facility contributing area.

Table 2: Soil Descriptions

Soils Association Name	Soil Material Description	Soil Type[1]
Chinguacousy	Clay Loam	C
Jeddo	Clay Loam	C

1 Chart H2-5 – Hydrologic Soil Groups for Soil Associations in Southern Ontario

2.3 Pre-development Land Use

The pre-development land use in the subject site is generally agricultural. The land generally drains to a number of low depressions as it flows north to south through the subject site. The low depressions either discharge into the recently constructed Lisgar channel directly or via a drainage ditch through the utility corridor.

3. Post Development Conditions

3.1 Stormwater Management Criteria

The following stormwater management criteria are required for the proposed development:

SWM Facility

- Water quality sizing criteria for the development is based on MOE values for Level 2 (normal) protection as outlined in the 2003 MOE Guidelines.
- Extended detention of 40 m^3/ha based on the 2003 MOE Guidelines.
- Temperature mitigation is to be provided via a bottom draw outlet.

5-year Quantity Control

- Quantity control criteria of 75 l/s/ha for the 5-year storm event based on the requirements of Sernas Associates report.

Conveyance

- Storm sewers are to be sized for the 10-year storm event.
- Bypass structures are to be incorporated into the storm sewer system upstream of the pond. This is to allow flows up to the 2-year event to be directed to the pond. Flows greater than the 2-year event are to be directly discharged to the Lisgar Channel.
- A separate storm sewer system is to be utilized for the discharge of the rooftop diversions directly into the Lisgar channel, bypassing the SWM facility.
- The rooftop diversion sewer is to be tied into the 10-year bypass pipe north of the SWM facility. This is to limit the number of outlets into the Lisgar Channel.
- The depth of major flows at the crown of the road must not exceed 0.15 m.
- The product of the depth and velocity of water at the gutter must not exceed 0.65 m^2/s.

Rooftop Discharge

- Rainwater will be detained on the rooftops up to the 100-year event and discharged at controlled rates directly into the Lisgar channel via a separate storm sewer system.
- The roof drain sewer will be a perforated pipe contained in a gravel trench wrapped in geofabric. Where applicable, some sections of this pipe may be non-perforated in order to accommodate vehicle loading concerns through some areas of the site.

Argentia Road Drainage Culvert Crossing

- A culvert crossing of Argentia Road is to be provided to maintain the minor drainage ditch adjacent to the GO Transit Station entrance. The design criteria and design parameters used are based on the MTO Drainage Management Technical Guidelines and the City of Mississauga design requirements. The City of Mississauga requires culvert crossings to be designed for the 50-year event for urban local and collector road classifications.

3.2 Catchment Characteristics

The catchment draining to the SWM facility is 29.4 ha of developed area. This area includes the Block 1 development (catchment 101), lands north of the Block 1 development (catchment 102), and the Argentia Road Phase 1 extension (catchment 103). The 29.4 ha catchment excludes the Block 1 rooftop areas totalling 8.5 ha (catchment 104 and 105). Drainage from the Block 1 rooftop areas will be stored on the roofs and released directly to the Lisgar channel. Table 3 and Table 4 provide a summary of the SWM facility catchment characteristics used in the SWMHYMO modeling of the site. Figure 1 of Appendix A provides an overview of these catchments.

Table 3: Developed Catchment Characteristics to SWM Facility (STANDHYD)

Catchment ID	Area	XIMP	TIMP	CN	Pervious				Impervious			
					IA	Slope	Length	Manning's n	IA	Slope	Length	Manning's n
	(ha)	(%)	(%)		(mm)	(%)	(m)		(mm)	(%)	(m)	
101	10.8	89	89	70	5	2.0	50	0.250	2	0.5	260	0.013
102	1.3	85	85	70	5	2.0	50	0.250	2	0.5	90	0.013
103	17.3	90	90	70	5	2.0	50	0.250	2	0.5	340	0.013

Table 4: Rooftop Characteristics to Lisgar Channel (STANDHYD)

Catchment ID	Area	XIMP	TIMP	CN	Impervious				Controlled Flow (m^3/s) / Required Storage for 100-yr event (m^3)
					IA	Slope	Length	Manning's n	
	(ha)	(%)	(%)		(mm)	(%)	(m)		
104	5.0	99	99	99	2.0	0.5	180	0.013	0.078 / 3900
105	3.5	99	99	99	2.0	0.5	150	0.013	0.057 / 2700

4. SWM Facility

The proposed SWM facility is designed as a wet pond providing normal (level 2) water quality control and extended detention for the total development minus the 8.5 ha rooftop area. Table 5 provides a general summary of the requirements for the SWM facility. Figure 2 of Appendix A provides an overview of the SWM facility layout.

Table 5: SWM Facility General Requirement Information

Characteristics	Value
Level of Water Quality Protection	Level 2
Developed Impervious Level (%)	90
Water Quality Protection Volume (m^3/ha)	154
Developed Area Discharged to the Pond (areas: 101, 102, 103) (ha)	29.4
Permanent Pool Volume (m^3/ha)	114
Required Permanent Pool Volume (m^3)	3,360
Provided Permanent Pool Volume (m^3)	3,370
Extended Detention Volume (m^3/ha)	40
Required Extended Detention Volume (m^3)	1,180
Provided Extended Detention Volume (m^3)	1,190
Extended Detention Drawdown Time (hours)	24
Permanent Pool Depth (m)	2.7
Total Pond Depth (Permanent Pool + Extended Detention) (m)	3.1
SWM Block Size (ha)	0.75

4.1.1 Forebay and Inlet Design

The SWM facility is composed of a single cell within the SWM block. Appropriate forebay parameters are used in the design of the single cell facility and are provided in Appendix B.

The minor flow into the SWM facility consists of two storm sewer systems:

- A storm sewer from the north that will convey 2-year flows from the proposed Block 1 development and lands north of Block 1 bypass structure, and
- A storm sewer from the south that will convey 2-year flows from the Phase 1 Argentia Road extension bypass structure.

4.1.2 Outlet Design

The outlet of the SWM facility has a bottom draw reverse slope outlet with an orifice providing extended detention control (discharged over 24 hours). The inlet of the reverse slope pipe is to be installed 0.3 m above the facility invert to allow for sediment accumulation. An additional sump area will also be provided around the outlet location to further mitigate the chance of clogging. A spillway is provided for flows greater than the extended detention volume. Figure 3 in Appendix A provides details of the proposed outlet. Table 6 provides an outlet design summary.

Table 6: Outlet Design Summary

Component		Size	Upstream Elevation (m)	Downstream Elevation (m)
1	Reverse Slope Pipe	375 mm circular STM	204.00	206.40
2	Manhole	1200 mm	-	-
	Orifice	150 mm circular	206.40	
	Outlet Pipe	375 mm circular STM	206.40	206.34
3	Spillway / Overflow Weir	5 m long crest	206.80	

4.1.3 SWM Facility Lining

In November, 2007, Trow completed a geotechnical investigation with a number of boreholes on the Prologis site, including boreholes in the vicinity of the proposed SWM facility. Following that investigation Trow issued two letters, dated November 11, 2009 and February 25, 2010, that describe the overall site as comprised of sandy soils with an observed groundwater elevation of 206.0 m in the boreholes closest to the proposed SWM facility. The proposed invert of the SWM facility is 203.7 m, which is approximately 2.3 m below the observed groundwater level in the nearest boreholes.

Based on the identified sandy soils, AECOM recommends that the SWM facility should be lined to maintain the design permanent pool elevation. A borehole at the SWM facility location should be provided during detailed design, prior to tender, to confirm the sandy material at the pond location and confirm the lining requirements.

It may also be necessary to dewater the excavation during construction, which may be subject to a permit to take water application as described in Section 8.3.

4.1.4 Access Route

The access route to the SWM facility for maintenance is on the west side of the facility adjacent to the Lisgar channel. The access route is 3 m wide and has an 8% grade from the top of the freeboard down to the bottom of the facility. The access route also provides maintenance access to the storm sewer inlet, sediment drying area and spillway.

4.1.5 Sediment Drying Area

A 750 m^2 sediment drying area is provided at the north boundary of the SWM facility.

4.1.6 Spillway / Overflow Weir

A spillway is located at the west side of the SWM facility. The base of the spillway is set at an elevation of 206.8 m. When the water surface rises above this elevation stormwater will spill over the spillway into the Lisgar channel. Table 7 provides a summary of the SWM facility spillway parameters.

Table 7: Spillway Parameters

Parameter	Value
Base Width (m)	5
Side Slopes	10:1
Top Elevation (m)	208.0
Bottom Elevation (m)	206.8
Provide Turfstone / Slope Protection to (m)	207.5
Total Depth (m)	1.2

4.2 Post-development Model

The SWMHYMO input and output files for the design of the SWM facility are provided in Appendix C. Refer to Figure 1 of Appendix A for a corresponding overview of the catchment locations. Parameters used in the modeling of the post-development conditions are provided in Appendix B and summarized in Section 3.2.

Table 8 provides an overview of the discharge rate and associated peak facility storage volumes during various rainfall events.

Table 8: SWM Facility Peak Outflow Rate, Associated Peak Storage Volumes and Water Level Elevations

Design Storm	SWM Facility				Lisgar Channel
	Peak Outflow Rate (m^3/s)	Peak Storage Volume (m^3)	Water Level Elevation (m)	Freeboard (m)	Water Level Elevation (m)
25 mm	0.99	1,977	207.03	0.97	-
2 Year (24 hour)	1.80	2,401	207.14	0.86	204.92
5-year (24 hour)	2.24	2,616	207.19	0.81	205.70
10 Year (24 hour)	2.43	2,692	207.21	0.79	206.22
25-year (24 hour)	2.50	2,721	207.22	0.78	206.34
50 Year (24 hour)	2.55	2,746	207.23	0.77	206.42
100 Year (24 hour)	2.60	2,760	207.23	0.77	206.50
Hazel (60 hour)	2.67	2,790	207.27*	0.73	206.97

**Regional water level elevation in pond takes into account Lisgar Channel Regional water level elevation.*

4.3 Rip Rap Sizing Calculations

Calculations supporting the rock rip rap sizing are provided in Appendix B of this report. The calculations are also provided in the Civil drawing set.

5. Rooftop Discharge

Clean rooftop runoff will discharge directly to the Lisgar Channel, bypassing the SWM facility. The site rooftops are represented as catchments 104 & 105 on Figure 1 of Appendix B. The rooftop diversions have several benefits. These benefits include:

- Mitigation of thermal impacts.
    - This is achieved through the use of white roofs, removal of the initial runoff volume through the use of the perforated pipe in granular trenches, and reducing flows which pass through the SWM facility.
- Reduction in required permanent pool volumes.
- Provision of the required on-site storage.

5.1 Rooftop Storage

The rooftop storage volumes and peak outflow rates are sized to discharge the 5-year storm storage volume over approximately 24 hours and retain the 100-year storm event to a maximum ponding depth of less than 100 mm. This equates to the west rooftop having a 100-year peak outflow rate of 78 L/s with a storage volume of 3,900 m^3, and the east rooftop having a 100-year peak outflow rate of 20 L/s with a storage volume of 3,500 m^3. Table 9 provides a summary of the rooftop peak outflow rates, storage volumes and drawdown time.

Table 9: Rooftop Storage Volumes and Peak Outflow Rates

Development	Catchment ID	Peak Outflow Rate (L/s)		On-site Storage Volume (m^3)		Drawdown Time (hrs)	
		5-Year	100-Year	5-Year	100-Year	5-Year	100-Year
West Rooftop	104	44	78	2,140	3,900	27	42
East Rooftop	105	32	57	1,490	2,700	26	40

The drawdown times for the rooftop storage volumes are greater than the 24 hours requirement and provide adequate extended detention storage for catchments 104 and 105.

5.2 Roof Drainage Sewer System

It is proposed that the roof drainage sewer system will have sections comprising of perforated pipe in granular trenches. Some sections of the pipe may not be perforated and may incorporate normal pipe bedding in areas of vehicle loading concern. The granular trench will be sized to provide retention of 10 mm of runoff from the rooftops. This equates to a volume of 850 m^3 for the 8.5 ha roof top areas. Table 10 provides the peak flow rates.

Table 10: Third Pipe Peak Flow Rates

Development	Catchment ID	100- Year Peak Outflow Rate (L/s)
West Rooftop	104	44
East Rooftop	105	32
Combined	104 & 105	76

It is proposed that the pipe outlet is connected to the outlet pipe of 10-year bypass located north of the SWM facility. This will reduce the number of outlets discharging into the Lisgar Channel.

6. On-site Quantity Control

Quantity control of 75 l/s/ha for the 5-year storm event, based on the requirements of Sernas Associates report, is to be provided through on-site storage. It is proposed that the Block 1 development (catchments 101, 104 and 105), will achieve the required onsite quantity control through rooftop storage. The rooftop storage on catchments 104 & 105 will over control in order to compensate for uncontrolled portions of the paved area and catchment 101. Further details of the roof top ponding areas are provided in Section 5. The lands north of Block 1 (catchment 103), will require a separate on-site storage volume of approximately 3,000 m^3 to meet its flow target of 1.3 m^3/s. Overall the total development will be controlled to a 5-year discharge peak flow rate of 2.76 m^3/s. This is below the target peak discharge rate of 2.85 m^3/s. Table 11 provides a summary of the required on-site storage volumes. Table 12 provides a comparison of the 5-year site flow rate.

Table 11: Required Onsite Storage Volumes

Development	Catchment ID	On-site Storage Volume (m^3)
Block 1	101	-
Argentia Road Phase 1	102	-
Land North of Block 1	103	3,000
West Rooftop	104	3,900
East Rooftop	105	2,700

Table 12: 5-year Site Discharge Flow Rate

Development	Catchment	Area (ha)	Allowable Flow Rate (m^3/s)	Actual Flow Rate (m^3/s)
Total Site*	101, 102, 103, 104 & 105	37.9	2.85	2.76

*Total site includes Argentia Road Phase 1 extension, Block 1 and lands north of Block 1.

7. Culvert Crossing

A culvert crossing is required for the Argentia Road extension approximately 180 m west of Tenth Line West. The catchment was modeled in SWMHYMO using the parameters outlined in Table 13. The resulting 50-year flow rate for the 24 hour Chicago storm distribution is 0.23 m^3/s. A 600 mm circular concrete culvert will provide adequate flow capacity for the 50 year storm flow. Refer to Appendix B for the inlet control evaluation.

Table 13: Catchment Characteristics (NASHYD)

Catchment Number	Area (ha)	CN	IA (mm)	TP (hr)
100	4.8	70	8	0.7

8. Erosion and Sediment Control Plan

8.1 Erosion / Sediment Control Devices

The sediment and erosion control measures to be implemented as part of the site servicing will include the following:

- Heavy duty silt fencing
- Light duty silt fencing
- Rock check damns
- Strawbale filters
- Filter fabric under catchbasins frame and gates
- Mud mats

8.2 Implementation of Control Devices

Table 14 provides further information on each of the erosion and sediment control devices; while Table 15 provides site staging information.

Table 14: Control Devices

Control Device	Further Information
Heavy duty silt fencing	• Heavy duty silt fencing to be implemented as per OPSD 219.130. • Heavy duty silt fencing to be implemented around the down gradient western portion of the SWM block as indicated in drawing S1.
Light duty silt fencing	• Light duty silt fencing to be implemented as per OPSD 219.110. • Light duty silt fencing to be implemented at all remaining perimeter locations as indicated in drawing S1.
Rock check dams	• Rock check dams to be implemented as per OPSD 219.210.
Straw bale filters	• Straw bale filters to be implemented as per OPSD 219.180. • Straw bales to be implemented in localized areas as shown in the erosion and sediment control plan and as directed by the engineer during construction. • Straw bales to be terminated by rounding bales to contain and filter runoff.
Filter fabric under catchbasins frame and gates	• Protect all catchbasins / maintenance holes and pipe ends from sediment intrusion with geotextile as specified on drawings.
Mud mats	• Mud mats to be placed at all exit points of the site.

Table 15: Staging Information

Stage	Implementation of ESCP Devices
Pre Construction	All erosion and sediment control measures are to be in place before starting construction and remain in place until restoration is complete.
Construction	All erosion control and sediment control measures are to be inspected and maintained with site records kept.
Post Construction	Remove erosion and sediment control measures once area has stabilized; and complete final landscaping.

All topsoil stripping stockpiles will be located in strategic locations to allow for easy access for removal of excess topsoil while also ensuring that the stockpiles are protected with light duty silt fencing on the downward gradient sides of the stockpiles. All disturbed areas left inactive for 30 days or more shall be revegetated in order to minimize erosion.

Individual site servicing and grading plans for the development lands to the north will have to be prepared to ensure proper controls are in place to avoid unnecessary erosion or sediment release into the SWM facility. It will be the responsibility of the site owners to have the sediment and erosion control measures installed and maintained throughout the development period of the specific site.

8.3 Dewatering Requirements

The construction of the SWM facility will require some dewatering specifically with regards to the deeper excavated areas, or to address surface runoff. The contractor's proposed dewatering program will be reviewed by the Geotechnical Consultant to ensure that the dewatering will provide for adequate installation conditions and will not result in any detrimental effects to any local wells or aquifers. The contractor will determine if a Permit To Take Water (PTTW) will be required based upon the proposed dewatering program. The requirement to obtain a PTTW will be that of the contractor.

8.4 Seeding

All disturbed areas left inactive for 30 days or more shall be revegetated in accordance to OPSS 572 in order to minimize erosion. Where steeper grading is required, the use of a bonded fibre matrix (BFM) with hydroseed is recommended.

8.5 Contingency Plan

8.5.1 General Contingency Plan

The Contractor shall be responsible for the contingency plan and will prepare the following items:

- Create an emergency contact list for emergency situations.
- Workers shall be on call for emergency situations and for all aspects of the emergency from the design to construction of emergency sediment and erosion control measures.
    - Any associated health and safety issues are the responsibility of the Contractor.
- Heavy duty silt fence, straw bales and stakes, sandbags, appropriate sized rip-rap, clean gravel fill and robust silt fence shall be available for emergency installation.
- Gas powered pumps, hoses, filtration hose socks, and filter cloth shall be available for emergency dewatering events.
- Heavy equipment shall be on standby for emergency works.
- Fuel spill equipment – absorbent cloth shall be available for emergency spills of deleterious substances.
- A contact list for any further required equipment or materials shall be prepared and made available for emergency use.

8.5.2 Contingency Measures in Case of Failure

In cases where failure of Erosion and Sediment Control Devices (ESCDs) occurs the Contractor shall complete the following.

- Cease all construction work and focus on erosion and sediment control.
- Stabilize site of failure.
- Make report within a 2 hour period to MOE, Conservation Halton, DFO and the City of Mississauga if discharge of sediment to watercourse occurs.
- Establish a restoration plan if damage to fish habitat has occurred. Restoration plan to include:
    - Removal and disposal of sediment from flood plain
    - Restoration of flood plain
    - Restoration of any disturbed areas.

8.5.3 Severe Weather Contingency Plan

When severe weather is anticipated for the construction area, the Contractor shall complete the following.

- Ensure all erosion and sediment control devices are secure and in good working order.
- Backfill any open excavations.
- Remove all equipment and stockpiled materials outside of the 10 year flood boundary.
- Monitor measures during rainfall event.

8.6 Inspection Requirements

During the period when the contractor is onsite, and for the duration of the contract, the day to day maintenance of the sediment and erosion controls will be undertaken by the contractor. Once the contractor has left the site (i.e. work is complete), the day to day maintenance of the sediment and erosion controls will become the responsibility of the owner. The owner will be made aware of the need to maintain the sediment and erosion controls and be prepared to address any immediate needs caused by significant runoff events such as large rain storms or snow melt.

The owner's engineer will be required to ensure that the sediment and erosion controls are implemented during construction and are then subsequently decommissioned appropriately once the need for the sediment and erosion controls has lapsed.

8.7 Proposed Reporting System

A record of the sediment and erosion control implementation should be maintained from the initial stages during the municipal service stage to the day to day maintenance and monitoring of the sediment and erosion controls after the initial municipal servicing stage. Such record keeping would include a submission of a certificate certifying that the sediment and erosion controls were installed prior to construction and maintained during construction and then subsequent semi-annual submission of inspection reports detailing how the sediment and erosion controls have been maintained and replaced/repaired as necessary.

9. Operation and Maintenance

An operation and maintenance manual will be completed for the finished SWM facility. Calculations regarding clean out frequency for the SWM facility have been completed and are included in Appendix B. The calculations show that the main cell cleanout frequency will be approximately 9 years based on a maximum reduction in total suspended solids (TSS) removal efficiency of 5% from 70% to 65%.

To ensure that the bottom draw outlet continues to function as intended it has been elevated by 0.3 m from the base of the SWM facility. This will allow for the accumulation of sediment without blocking the outlet. The depth of sediment accumulation around the outlet will need to be monitored and maintenance of the pond completed as required.

10. Summary

The proposed stormwater management strategy will ensure that the objectives of the subwatershed study are achieved in the Phase 1 extension of Argentia Road and the Block 1 development of Meadowvale Business Park.

The proposed solution includes the following details:

- Rooftop storage will be implemented on buildings in the Block 1 area. The rooftop drainage will discharge directly to the Lisgar channel, bypassing the SWM facility.
- A SWM facility will be constructed, providing normal (Level 2) water quality control for the 2-year flow from Block 1, the external area north of Block 1, and Phase 1 of Argentia Road.
- Two diversion MH's are to be installed upstream of the SWM facility and will direct minor system flows larger than the 2-year flow directly to the channel. One diversion MH is for flows from Phase 1 of Argentia Road. The second diversion MH is for Block 1 and the lands north of Block 1.
- The quantity control target is met through the combined flow from the SWM facility, roof areas, controlled portions of the site (external area north of Block 1) and uncontrolled portions of the site (Block 1 and Phase 1 of Argentia Road) to no exceed 75 L/s/ha.
- The erosion control target is met with extended detention in the SWM facility exceeding 24 hours, in addition to the 5-year drawdown time for the roof areas exceeding 24 hours.

Table 5 provides a general summary of the SWM facility characteristics and parameters. Table 9 provides a summary of the required on-site storage volumes. A 600 mm circular concrete culvert will provide adequate flow capacity for the Argentia Road Phase 1 crossing.

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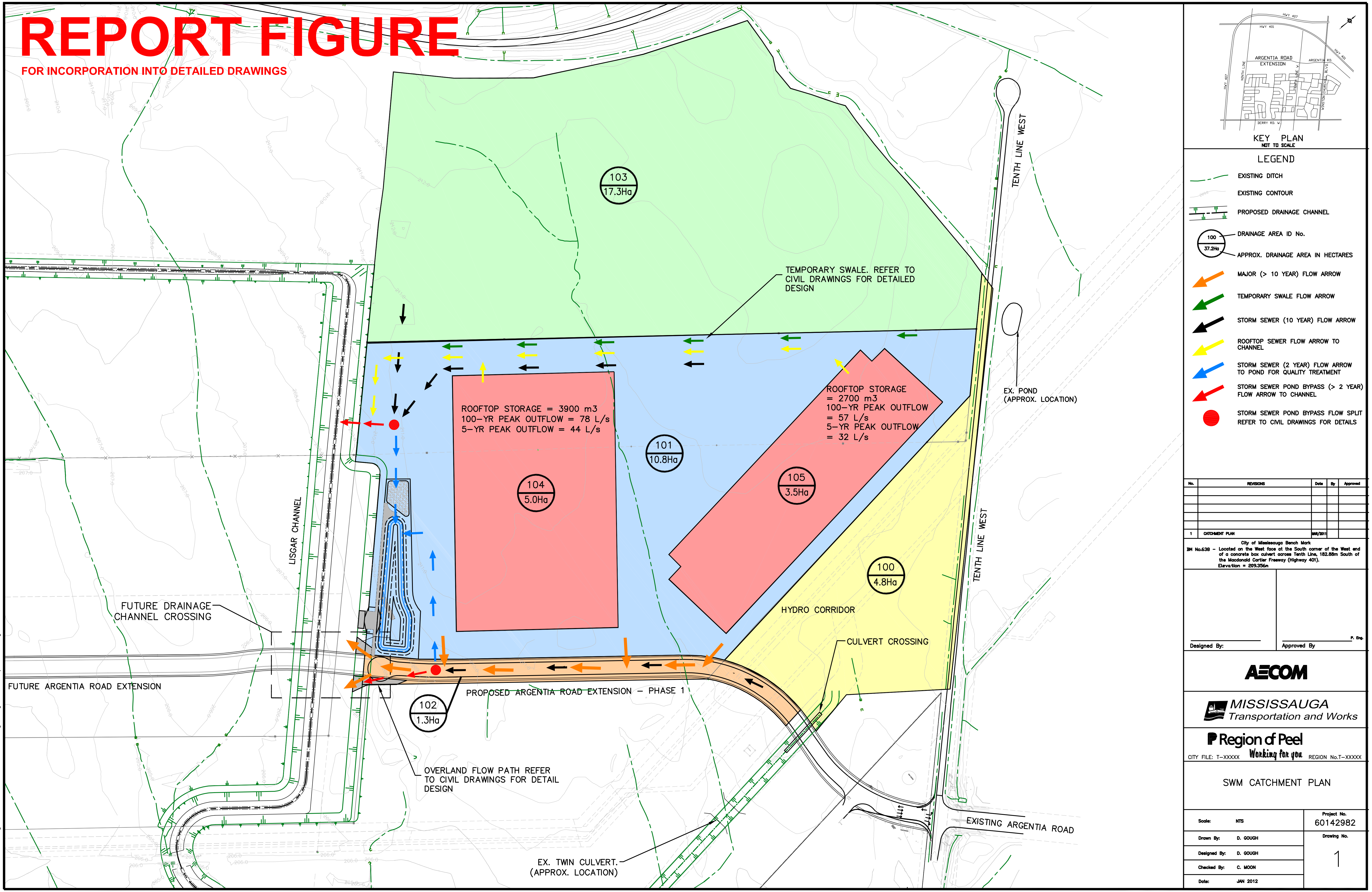
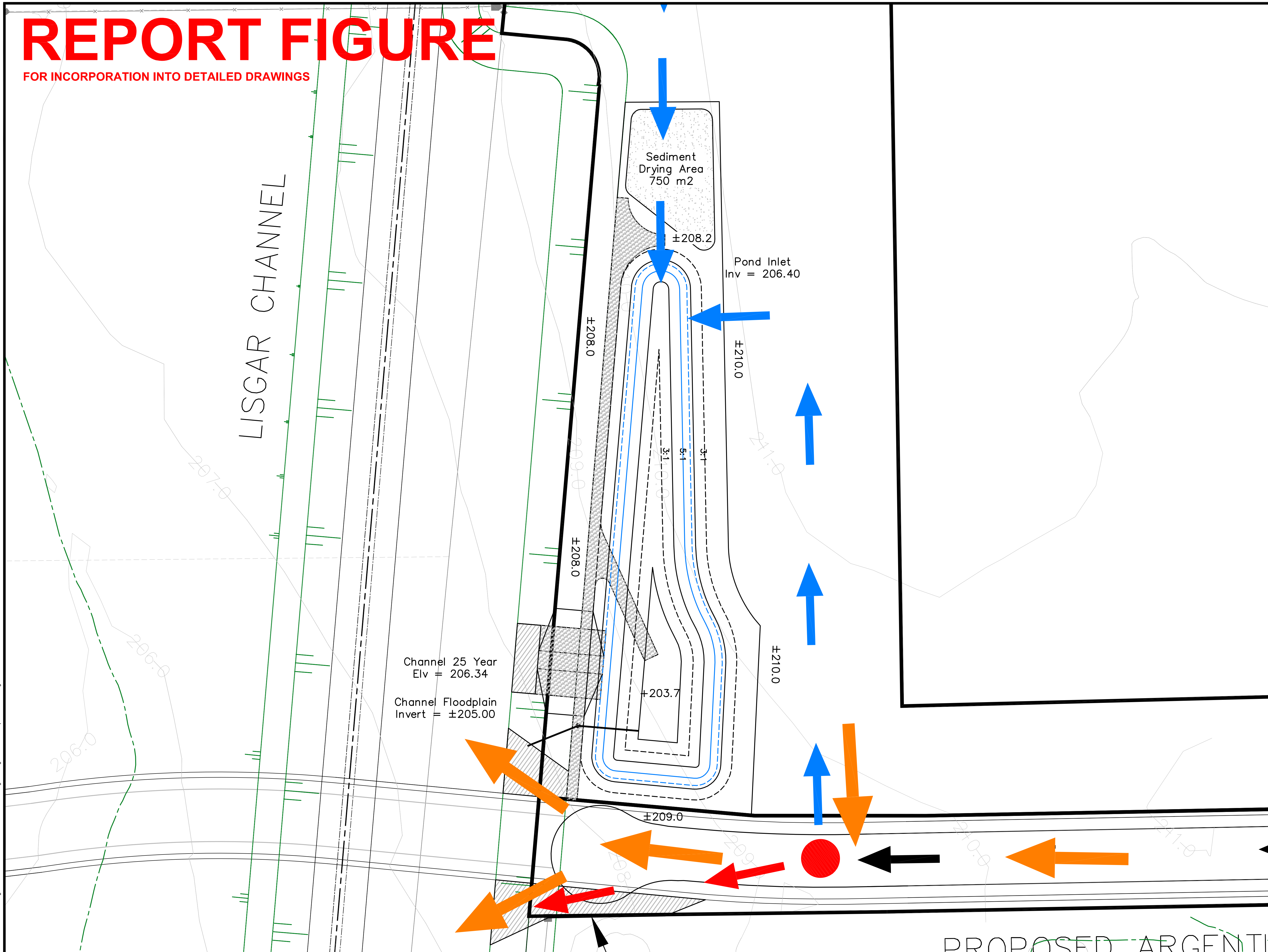
Appendix A

Report Figures



REPORT FIGURE
FOR INCORPORATION INTO DETAILED DRAWINGS
103
17.3Ha
101
10.8Ha
104
5.0Ha
105
3.5Ha
100
4.8Ha
102
1.3Ha
TEMPORARY SWALE. REFER TO CIVIL DRAWINGS FOR DETAILED DESIGN
ROOFTOP STORAGE = 3900 m3
100–YR PEAK OUTFLOW = 78 L/s
5–YR PEAK OUTFLOW = 44 L/s
ROOFTOP STORAGE = 2700 m3
100–YR PEAK OUTFLOW = 57 L/s
5–YR PEAK OUTFLOW = 32 L/s
EX. POND (APPROX. LOCATION)
TENTH LINE WEST
LISGAR CHANNEL
FUTURE DRAINAGE CHANNEL CROSSING
FUTURE ARGENTIA ROAD EXTENSION
PROPOSED ARGENTIA ROAD EXTENSION – PHASE 1
HYDRO CORRIDOR
CULVERT CROSSING
OVERLAND FLOW PATH REFER TO CIVIL DRAWINGS FOR DETAIL DESIGN
EX. TWIN CULVERT. (APPROX. LOCATION)
EXISTING ARGENTIA ROAD
KEY PLAN
NOT TO SCALE
LEGEND
EXISTING DITCH
EXISTING CONTOUR
PROPOSED DRAINAGE CHANNEL
DRAINAGE AREA ID No.
APPROX. DRAINAGE AREA IN HECTARES
MAJOR (> 10 YEAR) FLOW ARROW
TEMPORARY SWALE FLOW ARROW
STORM SEWER (10 YEAR) FLOW ARROW
ROOFTOP SEWER FLOW ARROW TO CHANNEL
STORM SEWER (2 YEAR) FLOW ARROW TO POND FOR QUALITY TREATMENT
STORM SEWER POND BYPASS (> 2 YEAR) FLOW ARROW TO CHANNEL
STORM SEWER POND BYPASS FLOW SPLIT REFER TO CIVIL DRAWINGS FOR DETAILS
AECOM
MISSISSAUGA Transportation and Works
Region of Peel Working for you
CITY FILE: T-XXXXX
REGION No.T-XXXXX
SWM CATCHMENT PLAN
Scale: NTS
Drawn By: D. GOUGH
Designed By: D. GOUGH
Checked By: C. MOON
Date: JAN 2012
Project No. 60142982
Drawing No. 1



No.	REVISIONS	Date	By	Approved
1	CATCHMENT PLAN	MAR/2011		

City of Mississauga Bench Mark
BM No.638 – Located on the West face at the South corner of the West end of a concrete box culvert across Tenth Line, 182.88m South of the Macdonald Cartier Freeway (Highway 401).
Elevation = 209.356m

Designed By:
Approved By P. Eng.

AECOM

MISSISSAUGA Transportation and Works

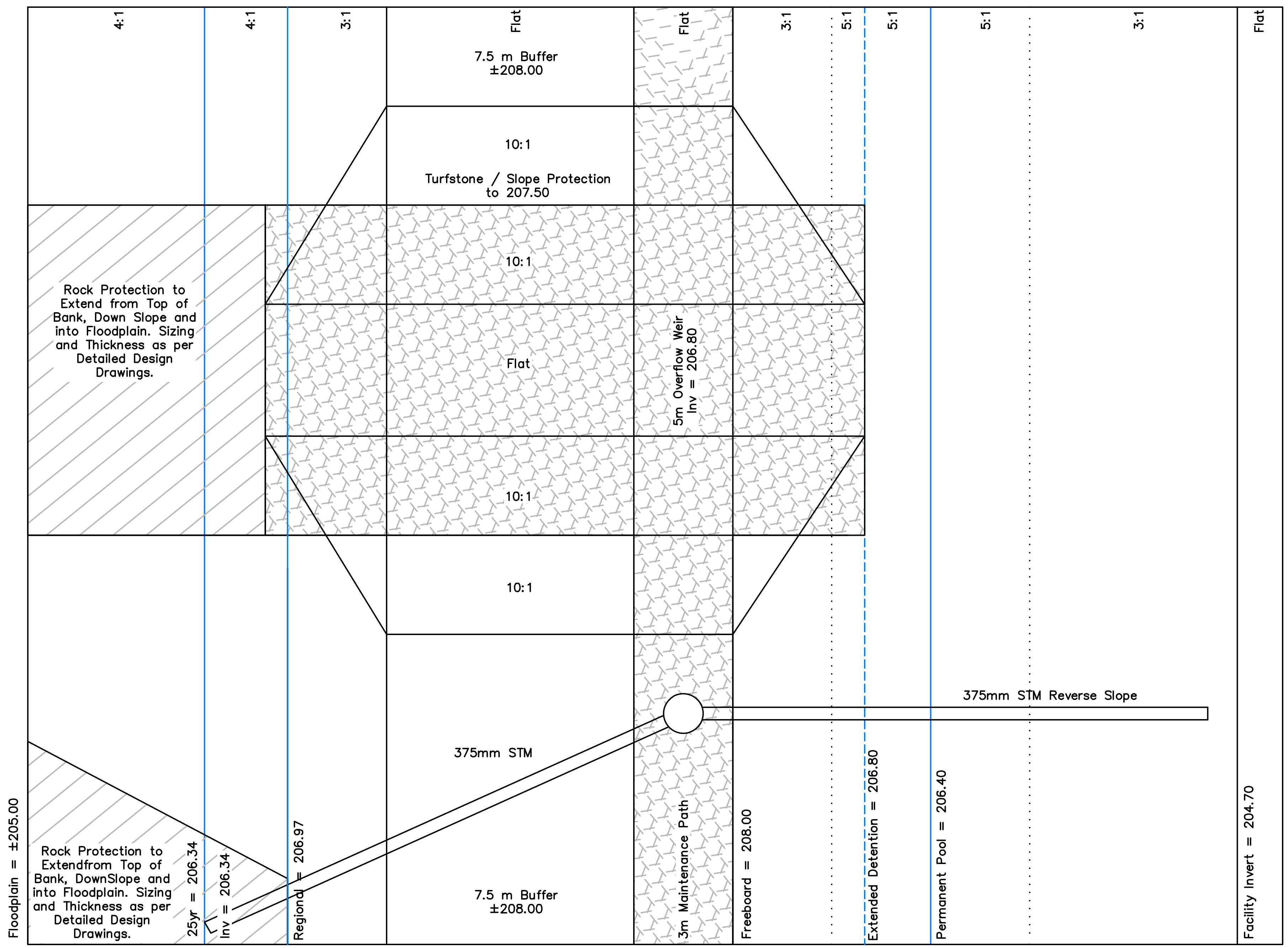
Region of Peel Working for you
CITY FILE: T–XXXXX REGION No.T–XXXXX

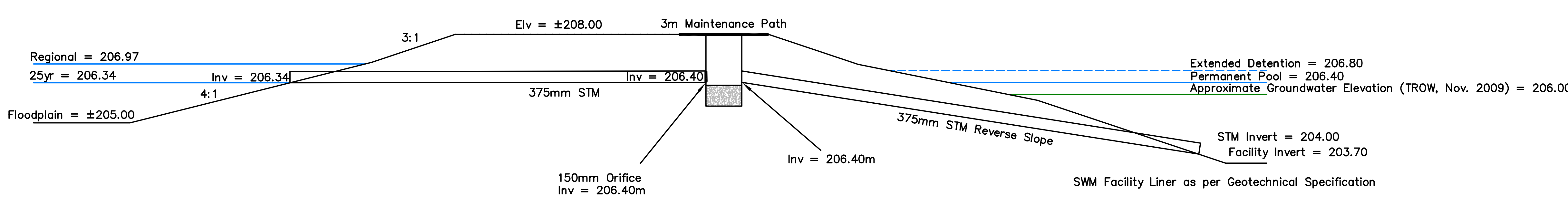
SWM FACILITY

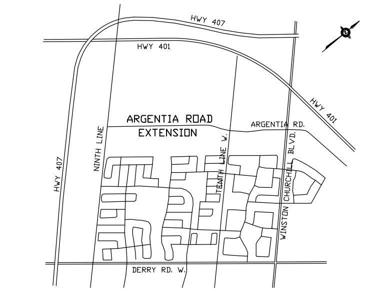
Scale:	NTS	Project No. 60142982
Drawn By:	D. GOUGH	Drawing No. 2
Designed By:	D. GOUGH	
Checked By:	C. MOON	
Date:	JAN 2012	

REPORT FIGURE (N.T.S.)

FOR INCORPORATION INTO DETAILED DRAWINGS







KEY PLAN
NOT TO SCALE

LEGEND

- EXISTING DITCH
- EXISTING CONTOUR
- PROPOSED DRAINAGE CHANNEL
- DRAINAGE AREA ID No. (100) / APPROX. DRAINAGE AREA IN HECTARES (37.2Ha)
- MAJOR (> 10 YEAR) FLOW ARROW
- TEMPORARY SWALE FLOW ARROW
- STORM SEWER (10 YEAR) FLOW ARROW
- ROOFTOP SEWER FLOW ARROW TO CHANNEL
- STORM SEWER (2 YEAR) FLOW ARROW TO POND FOR QUALITY TREATMENT
- STORM SEWER POND BYPASS (> 2 YEAR) FLOW ARROW TO CHANNEL
- STORM SEWER POND BYPASS FLOW SPLIT REFER TO CIVIL DRAWINGS FOR DETAILS

No.	REVISIONS	Date	By	Approved
1	CATCHMENT PLAN	MAR/2011		

City of Mississauga Bench Mark
BM No.638 – Located on the West face at the South corner of the West end of a concrete box culvert across Tenth Line, 182.88m South of the Macdonald Cartier Freeway (Highway 401).
Elevation = 209.356m

Designed By:

Approved By ______ P. Eng.

AECOM

MISSISSAUGA Transportation and Works

Region of Peel Working for you

CITY FILE: T–XXXXX REGION No.T–XXXXX

OUTLET DETAIL

Scale:	NTS	Project No. 60142982
Drawn By:	D. GOUGH	Drawing No. 3
Designed By:	D. GOUGH	
Checked By:	C. MOON	
Date:	JAN 2012	

O:\PROJECTS\60142982 - Argentia Rd extension\Gen Corp\London SWM - Prologis Site\Figures\SWM Concept-Feb2012-r1.dwg

Appendix B

Design Calculations

Land Use										
Catchment Number	Total Area	Undeveloped	SWM	Road ROW	High Commercial	Parking	Roof	Net % XImp	Net % TImp	Drainage length
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)			(m)
TIMP		0.00	0.80	0.85	0.90	0.90	0.99			
XIMP		0.00	0.80	0.85	0.90	0.90	0.99			
100	4.8	4.8						-	-	-
101	10.8		0.8			10.0		0.89	0.89	260
102	1.3			1.3				0.85	0.85	90
103	17.3				17.3			0.90	0.90	340
104	5.0						5.0	0.99	0.99	180
105	3.5						3.5	0.99	0.99	150
Totals	42.7	4.8	0.8	1.3	17.3	10.0	8.5			

Catchment to Pond			
Catchment Number	**Area** (ha)	**TIMP** (%)	**Area x TIMP**
101	10.8	0.90	9.72
102	1.3	0.85	1.11
103	17.3	0.90	15.57
Total	29.4		0.90

Parameters						
Catchment Number	Length	US Elevation	DS Elevation	Slope	CN	C
	(m)	(m)	(m)	(%)		100 yr
100	600			0.50%	70	0.45

SCS Method					
Catchment Number	Length	Slope	CN	Tc	Tp
	(m)	(%)		(min)	(hr)
100	600	0.50%	70	100	1.0

$$T_c = \frac{2.58 L^{0.8}\left[(1000/CN)-9\right]^{0.7}}{1900 S^{0.5}} \times 100$$

Airport Method					
Catchment Number	Length	Slope	C	Tc	Tp
	(m)	(m/m)	100 Yr	(min)	(hr)
100	600	0.50%	0.45	70	0.7

$$T_c = \frac{3.26(1.1-C)L^{0.5}}{S^{0.33}}$$

Uplands Method								
Catchment Number	Overland Flow			Channel Flow				
	Length	Slope	Velocity[1]	Length	Slope	Velocity[2]	Tc	Tp
	(m)	(%)	(m/s)	(m)	(%)	(m/s)	(min)	(hr)
100	600	0.50%	0.35				30	0.3

Catchment Number	Time of Concentration (min)				Time to Peak (hr)			
	SCS	Airport	UP-OL	Mean	SCS	Airport	UP-OL	Mean
100	100	70	30	67	1.0	0.7	0.3	0.7

Developed Area												
Catchment Number	Area	XIMP	TIMP	CN	Pervious				Impervious			
					IA	Slope	Length	Manning's n	IA	Slope	Length	Manning's n
	(ha)	(%)	(%)		(mm)	(%)	(m)		(mm)	(%)	(m)	
101	10.8	0.89	0.89	70	5	2.0	50	0.250	2	0.5	260	0.013
102	1.3	0.85	0.85	70	5	2.0	50	0.250	2	0.5	90	0.013
103	17.3	0.90	0.90	70	5	2.0	50	0.250	2	0.5	340	0.013
104	5.0	0.99	0.99	70	5	2.0	50	0.250	2	0.5	180	0.013
105	3.5	0.99	0.99	70	5	2.0	50	0.250	2	0.5	150	0.013

Un-Developed Area				
Catchment Number	Area	CN	IA	TP
	(ha)		(mm)	(hr)
100	4.8	70	8	0.7

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SWM Facility Quality Requirement	
Permanent Pool	
Developed Area (ha) =	29.4
Developed Impervious Level (%) =	90%
Quality Protection :	Level 2
Water Quality Requirement (m^3/ha) =	154
Water Quality Volume (m^3) =	4,500
Permanent Pool Requirement (m^3/ha) =	114
Permanent Pool Volume (m^3) =	3,360
Extended Detention	
Developed Area (ha) =	29.4
Extended Detention Requirement (m^3/ha) =	40
Extended Detention Volume (m^3) =	1,180
5 Year Quantity Outlet For Total Development*	
Water Quantity Requirement (l/s/ha) =	75
Total Developed Area (ha) =	37.9
Water Quantity Requirement (l/s) =	2,843
Total Water Quantity Requirement (m^3/s) =	2.84
Granular Trench Roof Runoff Volume	
Roof Area (ha) =	8.5
Runoff Depth (mm) =	10
Runoff Volume (m^3) =	850
Granular Void Space (%) =	40
Granular Volume (m^3) =	2,125

Storm	Total Site Discharge	SWM Pond	
		Flow Rate Out	Volume
	(m^3/s)	(m^3/s)	(m^3)
25 mm (4 hour)	1.02	0.99	1,977
2 yr (24 hour)	1.85	1.80	2,401
5 yr (24 hour)	2.61	2.24	2,616
10 yr (24 hour)	5.74	2.43	2,692
25 yr (24 hour)	7.50	2.50	2,721
50 yr (24 hour)	9.25	2.55	2,746
100 yr (24 hour)	10.50	2.60	2,760
Hazel (60 hour)	5.50	2.67	2,790

**Includes North and South Commercial Site, Roof Tops and Treated Portion of Argentia Road*

SWM Facility Design												
Component	Elevation	Overall Pond Depth	Area	Stage Volume	Cumulative Storage Volume	Orifice 1 Plate Flow	Overflow Weir	Total Flow	Cumulative Storage volume	Drawdown Time		
										Stage	Cumulative	Cumulative
	(m)	(m)	(m^2)	(m^3)	(m^3)	(m^3/s)	(m^3/s)	(m^3/s)	(ha.m)	(min)	(min)	(hr)
Perm Pool	203.70	0.00	353	0	0							
	204.80	1.10	922	701	701							
	205.80	2.10	1,758	1,340	2,041							
	206.40	2.70	2,665	1,327	3,368							
Extended Detention	206.40	2.70	2,665	0	0	0.00		0.000	0.000	0	0	0.0
	206.80	3.10	3,301	1,193	1,193	0.03		0.028	0.119	1440	1,440	24.0
Freeboard	206.80	3.10	3,301	0	1,193	0.03	0.00	0.028	0.119	0	1,440	24.0
	206.90	3.20	3,464	338	1,531	0.03	0.28	0.311	0.153	33	1,473	24.6
	207.00	3.30	3,629	355	1,886	0.04	0.79	0.827	0.189	10	1,484	24.7
	207.10	3.40	3,728	368	2,254	0.04	1.45	1.492	0.225	5	1,489	24.8
	207.20	3.50	3,828	378	2,632	0.04	2.24	2.280	0.263	3	1,492	24.9
	207.45	3.75	4,081	989	3,620	0.05	4.64	4.686	0.362	5	1,497	24.9
	207.70	4.00	4,337	1,052	4,673	0.05	7.56	7.610	0.467	3	1,500	25.0
	208.00	4.30	4,649	1,348	6,021	0.06	11.63	11.693	0.602	2	1,502	25.0

	Required	Provided	Orifice 1 Size	Overflow Weir
Permanent Pool Volume (m^3)	3,360	3,368	Dia (m) = 0.149	Crest (m) = 5
Extended Detention Volume (m^3)	1,180	1,193	Area (m²) = 0.02	Invert (m) = 206.80
			Invert (m) = 206.40	

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Main Cell (Forebay) Sizing

1. Check Main Cell (Forebay) Settling Length

Qp	=	0.99	m^3/s	Peak release rate from forebay (25mm storm)
Vs	=	0.0003	m/s	Particle settling velocity
Length	=	125	m	Forebay flow path length
Avg. Width	=	29	m	Average width

$$\text{Distance} = \left| \frac{r \;*\; Qp}{Vs} \right|^{0.5} \qquad r = \frac{\text{Length (flow path)}}{\text{Average Width}}$$

$$\text{Distance} = \left| \frac{4.31 \;*\; 0.987}{0.0003} \right|^{0.5} \qquad r = \frac{125}{29}$$

Distance = 119.1 m   r = 4.31

Actual Length = 125.0 m

Since actual length is larger than forebay settling length, length is ok.

2. Check Dispersion Settling Length

Vf	=	0.50	m/s	Desired velocity in the forebay
Q	=	2.31	m^3/s	Minor storm system inlet flowrate (2 year)
d	=	2.70	m	Depth of permanent pool in forebay

$$\text{Distance} = \frac{8 \;*\; Q}{d \;*\; Vf}$$

$$\text{Distance} = \frac{8 \;*\; 2.31}{2.70 \;*\; 0.50}$$

Distance = 13.7 m

Actual Length = 125.0 m

Since actual length is larger than dispersion settling length, length is ok.

3. Check Main Cell (Forebay) Velocity

A	=	50.0	m^2	Average cross sectional area
Q	=	1.63	m^3/s	Inlet flow rate (25mm storm)

$$\text{Velocity} = \frac{Q}{A}$$

$$\text{Velocity} = \frac{1.63}{50.0}$$

Velocity = 0.033 m/s

Since the velocity is equal to or less than 0.15m/s, forebay velocity is ok.

4. Check Minimum Main Cell (Forebay) Bottom Width

Actual Width	=	16.0	m	Actual Bottom Width

$$\text{Width} = \frac{\text{Distance}}{8} = \frac{125}{8}$$

Width = 15.6 m

Actual Width = 16.0 m

Since the actual bottom width is more than the minimum width required, width is ok.

RIP RAP SIZING

525 ϕ @ 0.38 % V = 1.25 m/sec.

375 ϕ @ 0.40 % V = 1.01 m/sec.

450 ϕ @ 0.18 % V = 0.79 m/sec.

1200 ϕ @ 0.24 % V = 1.71 m/sec.

1350 ϕ @ 0.30 % V = 2.06 m/sec.

Stone ϕ

$d_s = 0.25 \times D_o \times F_o$

d_s = rip rap ϕ (m)
D_o = pipe ϕ (m)
F_o = Froude number $= V/(g \times d_p)^{0.5}$ $g = 9.8\,m/sec^2$
d_p = depth of flow in pipe (m)
V = velocity of flow in pipe (m/sec.)

∴ $d_s = 0.25 \times 1.35 \times 0.566 = 0.191\,m$ $F_o = \frac{V = 2.06\,m/sec.}{(9.8\,m/sec^2 \times 1.35)^{0.5}} = 0.56$

$\sqrt{13.23} = 3.637$

0.191 < 0.30 used

2 layers of 0.30 m Rip Rap used

Height of rip rap is 0.3 m above pipe obvert

- Also – in accordance with Table 5.1 Guide to Bridge Hydraulics, 'Class 1' rip rap is suitable for velocities < 3 m/s.
'Class 1' rip rap = nominal 300 mm

Length of outfall protection

$$L_a = D_o\left(8 + [17 \times \log F_o](0.566)\right)$$

$$= 1.35\left(8 + [17 \times -0.247]\right)$$

$$= 1.35\left(8 + (-4.20)\right)$$

$$= 1.35\,(3.8)$$

$$= 5.13\ m \quad \text{use } 10.0\,m$$

AECOM

Main Cell (Forebay) Cleanout Frequency

It is difficult to estimate the frequency of cleaning due to other influences, such as the efficiency of street sweepings, the intensity of building activities, effectiveness of at-source sediment and erosion control measures, etc. Table 1 below provides a theoretical approximation as to when the pond's ability to settle suspended solids is reduced by 5% as outlined in section 6.4.1 of the MOE SWM Planning & Design Manual. The accumulated sediments should theoretically be removed every 9 years based on a maximum reduction in TSS removal efficiency of 5% from 70% down to 65%. This will be subject to refinement as a result of on-going operational monitoring of the established benchmarks.

Table 1

Year	%TSS Removal	Storage Volume (m^3/ha)	Erosion (m^3/ha)	Quality (m^3/ha)	Minor Area (ha)	Quality Volume (m^3)	% Imp	Annual Loading* (m^3/ha)	Annual Loading (m^3)	Retained Loading (m^3)	Reduced Quality Volume (m^3)
1	**70.0%**	154	40	114	29.4	3363	90	4.10	120	84.3	3279
2	69.5%	151	40	111	29.4	3269	90	4.10	120	83.7	3186
3	68.5%	146	40	106	29.4	3105	90	4.10	120	82.5	3022
4	67.5%	140	40	100	29.4	2940	90	4.10	120	81.3	2859
5	67.0%	137	40	97	29.4	2858	90	4.10	120	80.7	2777
6	66.5%	134	40	94	29.4	2775	90	4.10	120	80.1	2695
7	66.0%	132	40	92	29.4	2693	90	4.10	120	79.5	2614
8	65.5%	129	40	89	29.4	2611	90	4.10	120	78.9	2532
9	**65.0%**	126	40	86	29.4	2528	90	4.10	120	78.3	2450
10	64.5%	123	40	83	29.4	2446	90	4.10	120	77.7	2368
11	64.0%	120	40	80	29.4	2364	90	4.10	120	77.1	2287

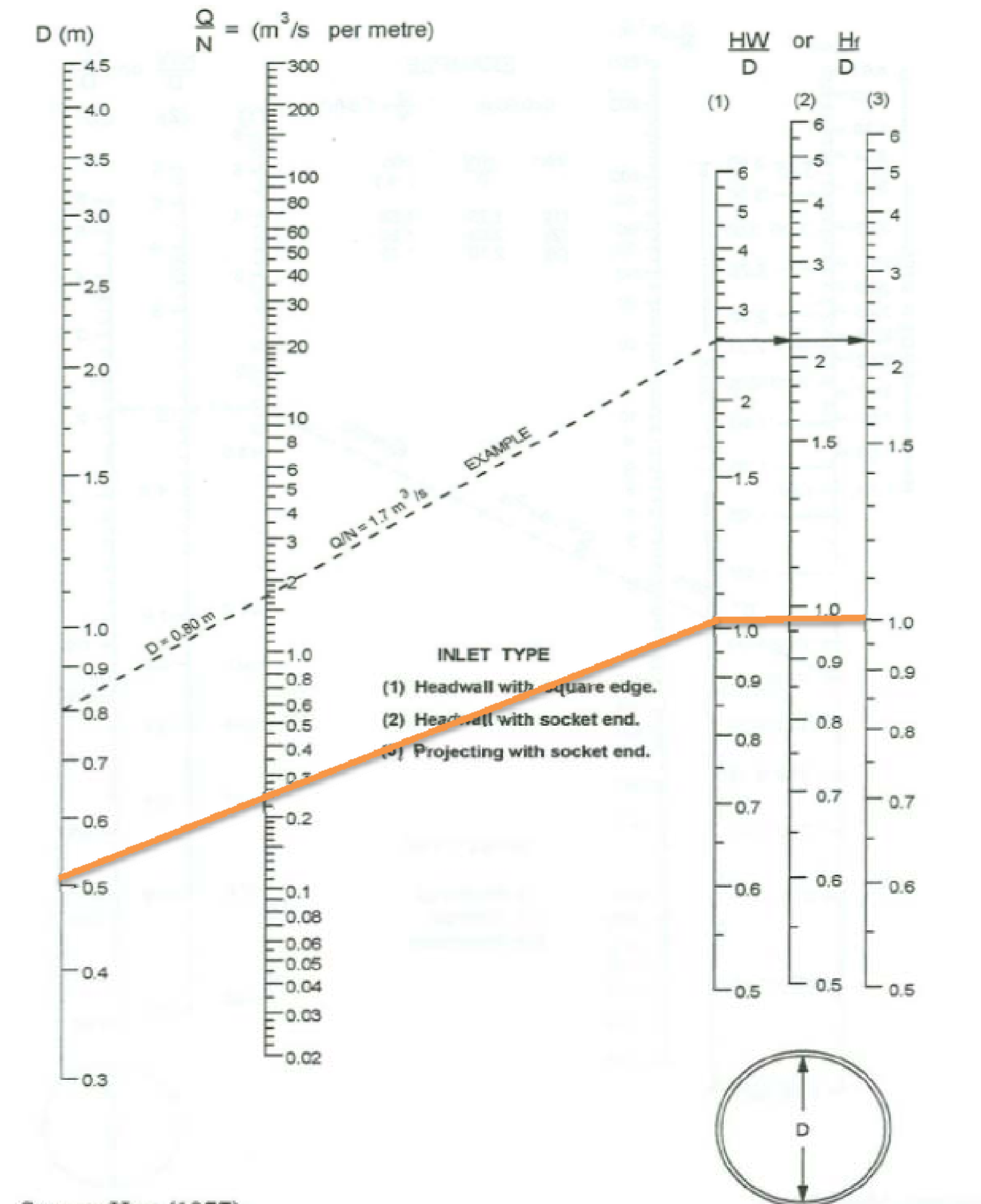
*Table 6.3 - MOE SWM Planning & Design Manual

Storm Event	Flow (m^3/s)
50 Year (24 Hour)	0.23

Suggested Size	600 mm

Design Charts

Design Chart 2.31: Inlet Control: Circular Pipes



Source: Herr (1977)

AECOM

Drainage Channel HEC-RAS Results - SERNAS ASSOCIATES - Mississauga Fire and Emergency Servies Training Center (July 2009)

HEC-RAS Plan: Prop 20090708 River: Channel Reach: Main (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Main	1500	2 yr	0.66	204.60	204.95	204.79	204.97	0.006025	0.74	0.89	2.75	0.41
Main	1500	5 yr	2.03	204.60	205.70	205.08	205.70	0.000134	0.24	9.44	55.80	0.07
Main	1500	10 yr	4.77	204.60	206.21	205.20	206.22	0.000141	0.32	15.58	59.89	0.08
Main	1500	25 yr	6.06	204.60	206.32	205.25	206.33	0.000174	0.37	16.68	60.76	0.09
Main	1500	50 yr	8.34	204.60	206.38	205.31	206.40	0.000264	0.49	17.66	61.28	0.12
Main	1500	100 yr	10.75	204.60	206.45	205.38	206.46	0.000413	0.60	18.39	61.76	0.14
Main	1500	Regional	24.14	204.60	206.67	205.67	206.74	0.001318	1.17	21.10	63.57	0.26
Main	1520		Culvert									
Main	1540	2 yr	0.66	204.72	204.92	204.92	205.01	0.039461	1.36	0.49	2.59	1.00
Main	1540	5 yr	2.03	204.72	205.70	205.20	205.71	0.000230	0.29	8.00	54.89	0.10
Main	1540	10 yr	4.77	204.72	206.22	205.32	206.23	0.000190	0.36	14.23	59.08	0.09
Main	1540	25 yr	6.06	204.72	206.34	205.37	206.35	0.000226	0.41	15.61	60.01	0.10
Main	1540	50 yr	8.34	204.72	206.42	205.43	206.43	0.000351	0.53	16.58	60.66	0.13
Main	1540	100 yr	10.75	204.72	206.50	205.49	206.52	0.000481	0.63	17.56	61.32	0.15
Main	1540	Regional	24.14	204.72	206.97	205.80	207.03	0.000957	1.05	23.22	65.13	0.22

Appendix C

SWMHYMO

Input Files

```
2     Metric units
*#*****************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date        : 01-03-2012
*#  Modeller    : [DPG]
*#  Revision    : 02-15-2012
*#  Revised by  : [dpg]
*#  Company     : Earth Tech Canada
*#  License #   :  2649264
*#*****************************************************************************
*%-----------------|-------------------------------------------------------------|
* Phase 1
*%-----------------|-------------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[0],  NRUN=[0]
*%                   [  ] <--storm filename
*%-----------------|-------------------------------------------------------------|
*#
*# 5-year design storm, City of Mississauga standards
*#
*%-----------------|-------------------------------------------------------------|
CHICAGO STORM       IUNITS=[2],  TD=[24](hrs), TPRAT=[0.4],  CSDT=[10](min),
                    ICASEcs=[1],
                     A=[820],  B=[4.6], and C=[0.78],
*%-----------------|-------------------------------------------------------------|
* Future North Site Development
*%-----------------|-------------------------------------------------------------|
CALIB STANDHYD      ID=1 NHYD=103 DT=2.0 AREA=17.3
                    XIMP=0.90 TIMP=0.90 DWF=0.00 LOSS=2
                    CN=70.0
                    DPSP=5.0 mm SLPP=2.0 LGP=50   MNP=0.250 SCP=0
                    DPSI=2.0 mm SLPI=0.5 LGI=340  MNP=0.013 SCI=0
                    -1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[2],   NHYD=["NORTH"],  IDin=[1],
                    RDT=[2.0](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [   0.0 ,  0.00 ]
                                   [   1.3 ,  0.30 ]
                                   [   -1  ,  -1  ]  (max twenty pts)
                          IDovf=[3], NHYDovf=["OVRFLW"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[4], NHYD=["N1"], IDs to add=[2+3]
*%-----------------|-------------------------------------------------------------|
*Split out 10 year flow
*%-----------------|-------------------------------------------------------------|
COMPUTE DUALHYD     IDin=[4], CINLET=[3.649](cms), NINLET=[1],
                    MAJID=[5], MajNHYD=["103MJ"],
                    MINID=[6], MinNHYD=["103MN"],
                    TMJSTO=[0](cu-m)
*%-----------------|-------------------------------------------------------------|
*Split out 2 year flow
*%-----------------|-------------------------------------------------------------|
COMPUTE DUALHYD     IDin=[6], CINLET=[0.928](cms), NINLET=[1],
                    MAJID=[7], MajNHYD=["103CH"],
                    MINID=[8], MinNHYD=["103PD"],
                    TMJSTO=[0](cu-m)
*%-----------------|-------------------------------------------------------------|
* Prologis Park Development
*%-----------------|-------------------------------------------------------------|
CALIB STANDHYD      ID=9 NHYD=101 DT=2.0 AREA=10.8
                    XIMP=0.89 TIMP=0.89 DWF=0.00 LOSS=2
                    CN=70.0
                    DPSP=5.0 mm SLPP=2.0 LGP=50   MNP=0.250 SCP=0
                    DPSI=2.0 mm SLPI=0.5 LGI=260  MNP=0.013 SCI=0
                    -1
*%-----------------|-------------------------------------------------------------|
*Route Reservoir placed as a holder if needed, otherwise leave empty
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[10],   NHYD=["SOUTH"],  IDin=[9],
                    RDT=[2.0](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [   0.0 ,  0.0 ]
                                   [   0.0 ,  0.0 ]
                                   [   -1  ,  -1  ]  (max twenty pts)
                          IDovf=[1], NHYDovf=["OVRFLW"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[2], NHYD=["S1"], IDs to add=[10+1]
*%-----------------|-------------------------------------------------------------|
*Split out 10 year flow
*%-----------------|-------------------------------------------------------------|
COMPUTE DUALHYD     IDin=[2], CINLET=[2.762](cms), NINLET=[1],
                    MAJID=[3], MajNHYD=["101MJ"],
                    MINID=[4], MinNHYD=["101MN"],
                    TMJSTO=[0](cu-m)
*%-----------------|-------------------------------------------------------------|
*Split out 2 year flow
*%-----------------|-------------------------------------------------------------|
COMPUTE DUALHYD     IDin=[4], CINLET=[1.557](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["101CH"],
                    MINID=[9], MinNHYD=["101PD"],
                    TMJSTO=[0](cu-m)
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[10], NHYD=["MJ1"], IDs to add=[5+3]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["CH1"], IDs to add=[7+6]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[2], NHYD=["PD1"], IDs to add=[8+9]
*%-----------------|-------------------------------------------------------------|
* East Roof
*%-----------------|-------------------------------------------------------------|
CALIB STANDHYD      ID=3 NHYD=105 DT=2.0 AREA=3.5
                    XIMP=0.99 TIMP=0.99 DWF=0.00 LOSS=2
                    CN=99.0
                    DPSP=5.0 mm SLPP=2.0 LGP=50   MNP=0.250 SCP=0
                    DPSI=2.0 mm SLPI=0.5 LGI=150  MNP=0.013 SCI=0
                    -1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[4],   NHYD=["EASTRF"],  IDin=[3],
                    RDT=[2.0](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [   0.0 ,  0.0  ]
                                   [ 0.060 ,  0.28 ]
                                   [   -1  ,  -1  ]  (max twenty pts)
                          IDovf=[5], NHYDovf=["OVRFLW"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[6], NHYD=["E1"], IDs to add=[4+5]
*%-----------------|-------------------------------------------------------------|
* West Roof
*%-----------------|-------------------------------------------------------------|
CALIB STANDHYD      ID=7 NHYD=104 DT=2.0 AREA=5.0
                    XIMP=0.99 TIMP=0.99 DWF=0.00 LOSS=2
                    CN=99.0
                    DPSP=5.0 mm SLPP=2.0 LGP=50   MNP=0.250 SCP=0
                    DPSI=2.0 mm SLPI=0.5 LGI=180  MNP=0.013 SCI=0
                    -1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[8],   NHYD=["WESTRF"],  IDin=[7],
                    RDT=[2.0](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [   0.0 ,  0.0 ]
                                   [ 0.080 ,  0.39]
                                   [   -1  ,  -1  ]  (max twenty pts)
                          IDovf=[9], NHYDovf=["OVRFLW"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["W1"], IDs to add=[8+9]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[4], NHYD=["EWROOF"], IDs to add=[6+3]
*%-----------------|-------------------------------------------------------------|
* Argentia Road Extension
*%-----------------|-------------------------------------------------------------|
CALIB STANDHYD      ID=5 NHYD=102 DT=2.0 AREA=1.3
                    XIMP=0.85 TIMP=0.85 DWF=0.00 LOSS=2
                    CN=70.0
                    DPSP=5.0 mm SLPP=2.0 LGP=50   MNP=0.250 SCP=0
                    DPSI=2.0 mm SLPI=0.5 LGI=90   MNP=0.013 SCI=0
                    -1
*%-----------------|-------------------------------------------------------------|
*Split out 10 year flow
*%-----------------|-------------------------------------------------------------|
COMPUTE DUALHYD     IDin=[5], CINLET=[0.383](cms), NINLET=[1],
                    MAJID=[6], MajNHYD=["102MJ"],
                    MINID=[7], MinNHYD=["102MN"],
                    TMJSTO=[0](cu-m)
*%-----------------|-------------------------------------------------------------|
*Split out 2 year flow
*%-----------------|-------------------------------------------------------------|
COMPUTE DUALHYD     IDin=[7], CINLET=[0.220](cms), NINLET=[1],
                    MAJID=[8], MajNHYD=["102CH"],
                    MINID=[9], MinNHYD=["102PD"],
                    TMJSTO=[0](cu-m)
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["MJ2"], IDs to add=[10+6]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[5], NHYD=["CH2"], IDs to add=[1+4+8]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[6], NHYD=["PD2"], IDs to add=[2+9]
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[7],   NHYD=["POND"],  IDin=[6],
                    RDT=[2.0](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                  [   0.000,  0.000 ]
                                  [   0.028,  0.119 ]
                                  [   0.311,  0.153 ]
                                  [   0.827,  0.189 ]
                                  [   1.492,  0.225 ]
                                  [   2.280,  0.263 ]
                                  [   4.686,  0.362 ]
                                  [   7.610,  0.467 ]
                                  [  11.693,  0.602 ]
                                  [   -1   ,    -1  ]  (max twenty pts)
                            IDovf= [8], NHYDovf=["OVRFLW"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[9], NHYD=["PNDOUT"], IDs to add=[7+8]
*%-----------------|-------------------------------------------------------------|
* 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
* 37.9 total site hectares.
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[10], NHYD=["5YROUT"], IDs to add=[9+5]
*%-----------------|-------------------------------------------------------------|
* TOTAL is all flows from development site and argentia road
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["TOTAL"], IDs to add=[3+10]
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=2 NHYD=["100"], DT=[2.0]min, AREA=[4.8](ha),
                    DWF=[0](cms),  CN/C=[70], IA=[8](mm),
                    N=[3], TP=[0.7]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%-----------------|-------------------------------------------------------------|
FINISH
```

Output Files

```
==============================================================================

 SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999  =========
 S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
 SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9 Ver. 4.02
     S   W W   M   M  H   H    Y    M   M  O   O       9999   9999 July 1999
 SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9 =========
                                                      9   9  9   9 # 2649264
      StormWater Management HYdrologic Model           999    999  =========

 **************************************************************************
 *************************** SWMHYMO-99 Ver/4.02 **************************
 *******  A single event and continuous hydrologic simulation model  *******
 *******     based on the principles of HYMO and its successors      *******
 *******                OTTHYMO-83 and OTTHYMO-89.                   *******
 **************************************************************************
 ******* Distributed by:  J.F. Sabourin and Associates Inc.           *******
 *******                 Ottawa,  Ontario: (613) 727-5199            *******
 *******                 Gatineau, Quebec: (819) 243-6858            *******
 *******                 E-Mail: swmhymo@jfsa.Com                    *******
 **************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++ Licensed user: Earth Tech Canada                            +++++++
 +++++++                London                 SERIAL#:2649264       +++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 **************************************************************************
 *******          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *******
 *******          Maximum value for ID numbers  :     10             *******
 *******          Max. number of rainfall points:  15000             *******
 *******          Max. number of flow points    :  15000             *******
 **************************************************************************


 ********************   D E T A I L E D   O U T P U T   *******************
 **************************************************************************
 *       DATE: 2012-05-16     TIME: 14:53:59     RUN COUNTER: 002777       *
 **************************************************************************
 * Input   filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\25mmHz.*
 * Output  filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\25mmHz.*
 * Summary filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\25mmHz.*
 * User comments:                                                         *
 * 1:_____________________________________________________________________*
 * 2:_____________________________________________________________________*
 * 3:_____________________________________________________________________*
 **************************************************************************

-------------------------------------------------------------------------------
001:0001-----------------------------------------------------------------------
*#****************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date         : 01-03-2012
*#  Modeller     : [DPG]
*#  Revision     : 02-15-2012
*#  Revised by   : [dpg]
*#  Company      : Earth Tech Canada
*#  License #    :  2649264
*#****************************************************************************
* Phase 1
--------------------
| START              |  Project  dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
--------------------  Rainfall dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   1
           #  1=25mm_4hr.stm
-------------------------------------------------------------------------------
001:0002-----------------------------------------------------------------------
--------------------
| READ STORM         |    Filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\S
| Ptotal=  25.00 mm|    Comments: 25 mm - derived from 4 hr Chicago distri
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .08   1.400 |   1.08   4.100 |   2.08   5.700 |   3.08   2.000
               .17   1.400 |   1.17   4.100 |   2.17   5.700 |   3.17   2.000
               .25   1.600 |   1.25   6.300 |   2.25   4.300 |   3.25   1.900
               .33   1.600 |   1.33   6.300 |   2.33   4.300 |   3.33   1.900
               .42   1.800 |   1.42  14.500 |   2.42   3.500 |   3.42   1.700
               .50   1.800 |   1.50  14.500 |   2.50   3.500 |   3.50   1.700
               .58   2.100 |   1.58  55.900 |   2.58   3.000 |   3.58   1.600
               .67   2.100 |   1.67  55.900 |   2.67   3.000 |   3.67   1.600
               .75   2.400 |   1.75  17.100 |   2.75   2.500 |   3.75   1.500
               .83   2.400 |   1.83  17.100 |   2.83   2.500 |   3.83   1.500
               .92   3.000 |   1.92   8.500 |   2.92   2.200 |   3.92   1.400
              1.00   3.000 |   2.00   8.500 |   3.00   2.200 |   4.00   1.400

-------------------------------------------------------------------------------
001:0003-----------------------------------------------------------------------
* Future North Site Development
----------------------
| CALIB STANDHYD     |   Area    (ha)=   17.30
| 01:000103 DT= 2.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      15.57          1.73
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=        .50          2.00
     Length            (m)=     340.00         50.00
     Mannings n          =        .013          .250

     Max.eff.Inten.(mm/hr)=      55.90          2.85
               over (min)        7.50         42.50
     Storage Coeff.  (min)=       8.27 (ii)    41.77 (ii)
     Unit Hyd. Tpeak (min)=       7.50         42.50
     Unit Hyd. peak  (cms)=        .14           .03
                                                           *TOTALS*
     PEAK FLOW       (cms)=       1.69           .01          1.691 (iii)
     TIME TO PEAK    (hrs)=       1.71          2.46          1.708
     RUNOFF VOLUME    (mm)=      23.00          3.10         21.010
     TOTAL RAINFALL   (mm)=      25.00         25.00         25.000
     RUNOFF COEFFICIENT   =        .92           .12           .840

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0004-----------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>01:(000103)   |
| OUT<02:(NORTH )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |   (cms)    (ha.m.)
                            .000  .0000E+00   |   1.300  .3000E+00

     ROUTING RESULTS            AREA      QPEAK     TPEAK        R.V.
     --------------------       (ha)      (cms)     (hrs)        (mm)
     INFLOW >01: (000103)      17.30      1.691     1.708      21.010
     OUTFLOW<02: (NORTH )      17.30       .664     2.000      21.010
    OVERFLOW<03: (OVRFLW)        .00       .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    39.263
                   TIME SHIFT OF PEAK FLOW        (min)=    17.50
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1533E+00

-------------------------------------------------------------------------------
001:0005-----------------------------------------------------------------------
--------------------
| ADD HYD (N1    ) | ID: NHYD     AREA     QPEAK   TPEAK  R.V.    DWF
--------------------               (ha)     (cms)   (hrs)  (mm)   (cms)
                 ID1 02:NORTH     17.30      .664    2.00  21.01    .000
                +ID2 03:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 ======================================================
                 SUM 04:N1        17.30      .664    2.00  21.01    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0006-----------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   3.649  (cms)
| TotalHyd 04:N1     |   Number of inlets in system [NINLET] =       1
----------------------   Total minor system capacity          =   3.649  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD         AREA      QPEAK     TPEAK      R.V.       DWF
                                  (ha)      (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   04:N1          17.30       .664     2.000    21.010      .000
     ======================================================================
     MAJOR SYST   05:103MJ         .00       .000      .000      .000      .000
     MINOR SYST   06:103MN       17.30       .664     2.000    21.010      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0007-----------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .928  (cms)
| TotalHyd 06:103MN  |   Number of inlets in system [NINLET] =       1
----------------------   Total minor system capacity          =    .928  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD         AREA      QPEAK     TPEAK      R.V.       DWF
                                  (ha)      (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   06:103MN       17.30       .664     2.000    21.010      .000
     ======================================================================
     MAJOR SYST   07:103CH         .00       .000      .000      .000      .000
     MINOR SYST   08:103PD       17.30       .664     2.000    21.010      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0008-----------------------------------------------------------------------
* Prologis Park Development
----------------------
| CALIB STANDHYD     |   Area    (ha)=   10.80
| 09:000101 DT= 2.00 |   Total Imp(%)=   89.00   Dir. Conn.(%)=   89.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       9.61          1.19
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=        .50          2.00
     Length            (m)=     260.00         50.00
     Mannings n          =        .013          .250

     Max.eff.Inten.(mm/hr)=      55.90          2.96
               over (min)        7.50         40.00
     Storage Coeff.  (min)=       7.04 (ii)    40.02 (ii)
     Unit Hyd. Tpeak (min)=       7.50         40.00
     Unit Hyd. peak  (cms)=        .16           .03
                                                           *TOTALS*
     PEAK FLOW       (cms)=       1.10           .01          1.105 (iii)
     TIME TO PEAK    (hrs)=       1.71          2.42          1.708
     RUNOFF VOLUME    (mm)=      23.00          3.10         20.811
     TOTAL RAINFALL   (mm)=      25.00         25.00         25.000
     RUNOFF COEFFICIENT   =        .92           .12           .832

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0009-----------------------------------------------------------------------
*Route Reservoir placed as a holder if needed, otherwise leave empty
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>09:(000101)   |
| OUT<10:(SOUTH )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |   (cms)    (ha.m.)
                            .000  .0000E+00   |    .000  .0000E+00

     ROUTING RESULTS            AREA      QPEAK     TPEAK        R.V.
     --------------------       (ha)      (cms)     (hrs)        (mm)
     INFLOW >09: (000101)      10.80      1.105     1.708      20.811
     OUTFLOW<10: (SOUTH )        .00       .000      .000        .000
    OVERFLOW<01: (OVRFLW)      10.80      1.079     1.708      20.811

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         1
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      9.71
                   PERCENTAGE OF TIME OVERFLOWING    (%)=     82.92


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=      .000
                   TIME SHIFT OF PEAK FLOW        (min)=  -102.50
                   MAXIMUM  STORAGE   USED       (ha.m.)=.4874E-09

      *** WARNING: Outflow volume is less than inflow volume.
-------------------------------------------------------------------------------
001:0010-----------------------------------------------------------------------
--------------------
| ADD HYD (S1    ) | ID: NHYD     AREA     QPEAK   TPEAK  R.V.    DWF
--------------------               (ha)     (cms)   (hrs)  (mm)   (cms)
                 ID1 10:SOUTH       .00      .000     .00    .00    .000
                +ID2 01:OVRFLW    10.80     1.079    1.71  20.81    .000
                 ======================================================
                 SUM 02:S1        10.80     1.079    1.71  20.81    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0011-----------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   2.762  (cms)
| TotalHyd 02:S1     |   Number of inlets in system [NINLET] =       1
----------------------   Total minor system capacity          =   2.762  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD         AREA      QPEAK     TPEAK      R.V.       DWF
                                  (ha)      (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   02:S1          10.80      1.079     1.708    20.811      .000
     ======================================================================
     MAJOR SYST   03:101MJ         .00       .000      .000      .000      .000
     MINOR SYST   04:101MN       10.80      1.079     1.708    20.811      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0012-----------------------------------------------------------------------
*Split out 2 year flow
```

```
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   1.557  (cms)
| TotalHyd 04:101MN  |   Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity         =   1.557  (cms)
                         Total major system storage [TMJSTO] =      0.(cu.m.)

                ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   04:101MN      10.80    1.079     1.708    20.811     .000
     ========================================================================
     MAJOR SYST   06:101CH        .00     .000      .000      .000     .000
     MINOR SYST   09:101PD      10.80    1.079     1.708    20.811     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0013-----------------------------------------------------------------------
--------------------
| ADD HYD (MJ1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.     DWF
--------------------              (ha)     (cms)   (hrs)   (mm)    (cms)
                ID1 05:103MJ        .00      .000     .00     .00    .000 **DRY**
               +ID2 03:101MJ        .00      .000     .00     .00    .000 **DRY**
                ====================================================
                SUM 10:MJ1          .00      .000     .00     .00    .000 **DRY**
-------------------------------------------------------------------------------
001:0014-----------------------------------------------------------------------
--------------------
| ADD HYD (CH1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.     DWF
--------------------              (ha)     (cms)   (hrs)   (mm)    (cms)
                ID1 07:103CH        .00      .000     .00     .00    .000 **DRY**
               +ID2 06:101CH        .00      .000     .00     .00    .000 **DRY**
                ====================================================
                SUM 01:CH1          .00      .000     .00     .00    .000 **DRY**
-------------------------------------------------------------------------------
001:0015-----------------------------------------------------------------------
--------------------
| ADD HYD (PD1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.     DWF
--------------------              (ha)     (cms)   (hrs)   (mm)    (cms)
                ID1 08:103PD      17.30      .664    2.00   21.01    .000
               +ID2 09:101PD      10.80     1.079    1.71   20.81    .000
                ====================================================
                SUM 02:PD1        28.10     1.546    1.75   20.93    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0016-----------------------------------------------------------------------
* East Roof
---------------------
| CALIB STANDHYD     |   Area    (ha)=    3.50
| 03:000105 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.46          .03
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     150.00        50.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      55.90        34.76
                over (min)        5.00        17.50
     Storage Coeff.  (min)=       5.06 (ii)   17.38 (ii)
     Unit Hyd. Tpeak (min)=       5.00        17.50
     Unit Hyd. peak  (cms)=        .22          .07
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .46          .00          .461 (iii)
     TIME TO PEAK    (hrs)=       1.67         1.92         1.667
     RUNOFF VOLUME    (mm)=      23.00        17.73        22.947
     TOTAL RAINFALL   (mm)=      25.00        25.00        25.000
     RUNOFF COEFFICIENT   =        .92          .71          .918

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0017-----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>03:(000105)   |
| OUT<04:(EASTRF)   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .060  .2800E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK        R.V.
     --------------------         (ha)     (cms)     (hrs)        (mm)
     INFLOW >03: (000105)         3.50      .461     1.667      22.947
     OUTFLOW<04: (EASTRF)         3.50      .015     3.875      22.946
    OVERFLOW<05: (OVRFLW)          .00      .000      .000        .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=    3.168
                  TIME SHIFT OF PEAK FLOW         (min)=   132.50
                  MAXIMUM  STORAGE   USED       (ha.m.)=.6811E-01

-------------------------------------------------------------------------------
001:0018-----------------------------------------------------------------------
--------------------
| ADD HYD (E1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.     DWF
--------------------              (ha)     (cms)   (hrs)   (mm)    (cms)
                ID1 04:EASTRF      3.50      .015    3.88   22.95    .000
               +ID2 05:OVRFLW       .00      .000     .00     .00    .000 **DRY**
                ====================================================
                SUM 06:E1          3.50      .015    3.88   22.95    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0019-----------------------------------------------------------------------
* West Roof
---------------------
| CALIB STANDHYD     |   Area    (ha)=    5.00
| 07:000104 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.95          .05
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     180.00        50.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      55.90        34.76
                over (min)        5.00        17.50
     Storage Coeff.  (min)=       5.65 (ii)   17.96 (ii)
     Unit Hyd. Tpeak (min)=       5.00        17.50
     Unit Hyd. peak  (cms)=        .21          .06
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .64          .00          .637 (iii)
     TIME TO PEAK    (hrs)=       1.67         1.92         1.667
     RUNOFF VOLUME    (mm)=      23.00        17.73        22.947
     TOTAL RAINFALL   (mm)=      25.00        25.00        25.000
     RUNOFF COEFFICIENT   =        .92          .71          .918

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0020-----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>07:(000104)   |
| OUT<08:(WESTRF)   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .080  .3900E+00

     ROUTING RESULTS              AREA     QPEAK     TPEAK        R.V.
     --------------------         (ha)     (cms)     (hrs)        (mm)
     INFLOW >07: (000104)         5.00      .637     1.667      22.947
     OUTFLOW<08: (WESTRF)         5.00      .020     3.958      22.946
    OVERFLOW<09: (OVRFLW)          .00      .000      .000        .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=    3.153
                  TIME SHIFT OF PEAK FLOW         (min)=   137.50
                  MAXIMUM  STORAGE   USED       (ha.m.)=.9793E-01

-------------------------------------------------------------------------------
001:0021-----------------------------------------------------------------------
--------------------
| ADD HYD (W1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.     DWF
--------------------              (ha)     (cms)   (hrs)   (mm)    (cms)
                ID1 08:WESTRF      5.00      .020    3.96   22.95    .000
               +ID2 09:OVRFLW       .00      .000     .00     .00    .000 **DRY**
                ====================================================
                SUM 03:W1          5.00      .020    3.96   22.95    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0022-----------------------------------------------------------------------
--------------------
| ADD HYD (EWROOF) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.     DWF
--------------------              (ha)     (cms)   (hrs)   (mm)    (cms)
                ID1 06:E1          3.50      .015    3.88   22.95    .000
               +ID2 03:W1          5.00      .020    3.96   22.95    .000
                ====================================================
                SUM 04:EWROOF      8.50      .035    3.92   22.95    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0023-----------------------------------------------------------------------
* Argentia Road Extension
---------------------
| CALIB STANDHYD     |   Area    (ha)=    1.30
| 05:000102 DT= 2.00 |   Total Imp(%)=   85.00   Dir. Conn.(%)=   85.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11          .19
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=      90.00        50.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=      55.90         3.19
                over (min)        2.50        35.00
     Storage Coeff.  (min)=       3.73 (ii)   35.72 (ii)
     Unit Hyd. Tpeak (min)=       2.50        35.00
     Unit Hyd. peak  (cms)=        .33          .03
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .16          .00          .163 (iii)
     TIME TO PEAK    (hrs)=       1.67         2.33         1.667
     RUNOFF VOLUME    (mm)=      23.00         3.10        20.016
     TOTAL RAINFALL   (mm)=      25.00        25.00        25.000
     RUNOFF COEFFICIENT   =        .92          .12          .801

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0024-----------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .383  (cms)
| TotalHyd 05:000102 |   Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity         =    .383  (cms)
                         Total major system storage [TMJSTO] =      0.(cu.m.)

                ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   05:000102      1.30     .163     1.667    20.016     .000
     ========================================================================
     MAJOR SYST   06:102MJ        .00     .000      .000      .000     .000
     MINOR SYST   07:102MN       1.30     .163     1.667    20.016     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0025-----------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .220  (cms)
| TotalHyd 07:102MN  |   Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity         =    .220  (cms)
                         Total major system storage [TMJSTO] =      0.(cu.m.)

                ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   07:102MN       1.30     .163     1.667    20.016     .000
     ========================================================================
     MAJOR SYST   08:102CH        .00     .000      .000      .000     .000
     MINOR SYST   09:102PD       1.30     .163     1.667    20.016     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0026-----------------------------------------------------------------------
--------------------
| ADD HYD (MJ2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.     DWF
--------------------              (ha)     (cms)   (hrs)   (mm)    (cms)
                ID1 10:MJ1          .00      .000     .00     .00    .000 **DRY**
               +ID2 06:102MJ        .00      .000     .00     .00    .000 **DRY**
                ====================================================
                SUM 03:MJ2          .00      .000     .00     .00    .000 **DRY**
-------------------------------------------------------------------------------
001:0027-----------------------------------------------------------------------
--------------------
| ADD HYD (CH2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.     DWF
--------------------              (ha)     (cms)   (hrs)   (mm)    (cms)
                ID1 01:CH1          .00      .000     .00     .00    .000 **DRY**
               +ID2 04:EWROOF      8.50      .035    3.92   22.95    .000
               +ID3 08:102CH        .00      .000     .00     .00    .000 **DRY**
                ====================================================
                SUM 05:CH2         8.50      .035    3.92   22.95    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
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001:0028-----------------------------------------------------------------------
--------------------
| ADD HYD (PD2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 02:PD1       28.10     1.546    1.75  20.93    .000
                +ID2 09:102PD      1.30      .163    1.67  20.02    .000
                 =======================================================
                 SUM 06:PD2       29.40     1.628    1.75  20.89    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0029-----------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>06:(PD2   )   |
| OUT<07:(POND  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)    |    (cms)    (ha.m.)
                           .000  .0000E+00    |    2.280  .2630E+00
                           .028  .1190E+00    |    4.686  .3620E+00
                           .311  .1530E+00    |    7.610  .4670E+00
                           .827  .1890E+00    |   11.693  .6020E+00
                          1.492  .2250E+00    |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
     --------------------       (ha)     (cms)     (hrs)        (mm)
     INFLOW >06: (PD2   )      29.40     1.628     1.750      20.893
     OUTFLOW<07: (POND  )      29.40      .987     2.083      20.893
    OVERFLOW<08: (OVRFLW)        .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   60.613
                   TIME SHIFT OF PEAK FLOW         (min)=    20.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1977E+00

-------------------------------------------------------------------------------
001:0030-----------------------------------------------------------------------
--------------------
| ADD HYD (PNDOUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:POND      29.40      .987    2.08  20.89    .000
                +ID2 08:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 =======================================================
                 SUM 09:PNDOUT    29.40      .987    2.08  20.89    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0031-----------------------------------------------------------------------
* 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
* 37.9 total site hectares.
--------------------
| ADD HYD (5YROUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 09:PNDOUT    29.40      .987    2.08  20.89    .000
                +ID2 05:CH2        8.50      .035    3.92  22.95    .000
                 =======================================================
                 SUM 10:5YROUT    37.90     1.016    2.08  21.35    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0032-----------------------------------------------------------------------
* TOTAL is all flows from development site and argentia road
--------------------
| ADD HYD (TOTAL ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 03:MJ2         .00      .000     .00    .00    .000 **DRY**
                +ID2 10:5YROUT    37.90     1.016    2.08  21.35    .000
                 =======================================================
                 SUM 01:TOTAL     37.90     1.016    2.08  21.35    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0033-----------------------------------------------------------------------
---------------------
| CALIB NASHYD       |   Area    (ha)=    4.80   Curve Number   (CN)=70.00
| 02:100    DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
---------------------    U.H. Tp(hrs)=     .700

     Unit Hyd Qpeak  (cms)=     .262

     PEAK FLOW       (cms)=     .014 (i)
     TIME TO PEAK    (hrs)=    2.708
     RUNOFF VOLUME    (mm)=    2.296
     TOTAL RAINFALL   (mm)=   25.000
     RUNOFF COEFFICIENT   =     .092

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0034-----------------------------------------------------------------------
  ** END OF RUN : 100

*******************************************************************************




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| START             |  Project  dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
--------------------  Rainfall dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 101
    NSTORM=   1
           #  1=HAZEL.stm
-------------------------------------------------------------------------------
101:0002-----------------------------------------------------------------------
*#*****************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date        : 01-03-2012
*#  Modeller    : [DPG]
*#  Revision    : 02-15-2012
*#  Revised by  : [dpg]
*#  Company     : Earth Tech Canada
*#  License #   :  2649264
*#*****************************************************************************
* Phase 1
-------------------------------------------------------------------------------
101:0002-----------------------------------------------------------------------
--------------------
| READ STORM        |    Filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\S
| Ptotal= 308.00 mm|    Comments: Hurrican Hazel - 1 hour time step (10 mi
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   2.000 |  15.17   2.000 |  30.17   2.000 |  45.17   2.000
               .33   2.000 |  15.33   2.000 |  30.33   2.000 |  45.33   2.000
               .50   2.000 |  15.50   2.000 |  30.50   2.000 |  45.50   2.000
               .67   2.000 |  15.67   2.000 |  30.67   2.000 |  45.67   2.000
               .83   2.000 |  15.83   2.000 |  30.83   2.000 |  45.83   2.000
              1.00   2.000 |  16.00   2.000 |  31.00   2.000 |  46.00   2.000
              1.17   2.000 |  16.17   2.000 |  31.17   2.000 |  46.17   2.000
              1.33   2.000 |  16.33   2.000 |  31.33   2.000 |  46.33   2.000
              1.50   2.000 |  16.50   2.000 |  31.50   2.000 |  46.50   2.000
              1.67   2.000 |  16.67   2.000 |  31.67   2.000 |  46.67   2.000
              1.83   2.000 |  16.83   2.000 |  31.83   2.000 |  46.83   2.000
              2.00   2.000 |  17.00   2.000 |  32.00   2.000 |  47.00   2.000
              2.17   2.000 |  17.17   2.000 |  32.17   2.000 |  47.17   2.000
              2.33   2.000 |  17.33   2.000 |  32.33   2.000 |  47.33   2.000
              2.50   2.000 |  17.50   2.000 |  32.50   2.000 |  47.50   2.000
              2.67   2.000 |  17.67   2.000 |  32.67   2.000 |  47.67   2.000
              2.83   2.000 |  17.83   2.000 |  32.83   2.000 |  47.83   2.000
              3.00   2.000 |  18.00   2.000 |  33.00   2.000 |  48.00   2.000
              3.17   2.000 |  18.17   2.000 |  33.17   2.000 |  48.17   6.000
              3.33   2.000 |  18.33   2.000 |  33.33   2.000 |  48.33   6.000
              3.50   2.000 |  18.50   2.000 |  33.50   2.000 |  48.50   6.000
              3.67   2.000 |  18.67   2.000 |  33.67   2.000 |  48.67   6.000
              3.83   2.000 |  18.83   2.000 |  33.83   2.000 |  48.83   6.000
              4.00   2.000 |  19.00   2.000 |  34.00   2.000 |  49.00   6.000
              4.17   2.000 |  19.17   2.000 |  34.17   2.000 |  49.17   4.000
              4.33   2.000 |  19.33   2.000 |  34.33   2.000 |  49.33   4.000
              4.50   2.000 |  19.50   2.000 |  34.50   2.000 |  49.50   4.000
              4.67   2.000 |  19.67   2.000 |  34.67   2.000 |  49.67   4.000
              4.83   2.000 |  19.83   2.000 |  34.83   2.000 |  49.83   4.000
              5.00   2.000 |  20.00   2.000 |  35.00   2.000 |  50.00   4.000
              5.17   2.000 |  20.17   2.000 |  35.17   2.000 |  50.17   6.000
              5.33   2.000 |  20.33   2.000 |  35.33   2.000 |  50.33   6.000
              5.50   2.000 |  20.50   2.000 |  35.50   2.000 |  50.50   6.000
              5.67   2.000 |  20.67   2.000 |  35.67   2.000 |  50.67   6.000
              5.83   2.000 |  20.83   2.000 |  35.83   2.000 |  50.83   6.000
              6.00   2.000 |  21.00   2.000 |  36.00   2.000 |  51.00   6.000
              6.17   2.000 |  21.17   2.000 |  36.17   2.000 |  51.17  13.000
              6.33   2.000 |  21.33   2.000 |  36.33   2.000 |  51.33  13.000
              6.50   2.000 |  21.50   2.000 |  36.50   2.000 |  51.50  13.000
              6.67   2.000 |  21.67   2.000 |  36.67   2.000 |  51.67  13.000
              6.83   2.000 |  21.83   2.000 |  36.83   2.000 |  51.83  13.000
              7.00   2.000 |  22.00   2.000 |  37.00   2.000 |  52.00  13.000
              7.17   2.000 |  22.17   2.000 |  37.17   2.000 |  52.17  17.000
              7.33   2.000 |  22.33   2.000 |  37.33   2.000 |  52.33  17.000
              7.50   2.000 |  22.50   2.000 |  37.50   2.000 |  52.50  17.000
              7.67   2.000 |  22.67   2.000 |  37.67   2.000 |  52.67  17.000
              7.83   2.000 |  22.83   2.000 |  37.83   2.000 |  52.83  17.000
              8.00   2.000 |  23.00   2.000 |  38.00   2.000 |  53.00  17.000
              8.17   2.000 |  23.17   2.000 |  38.17   2.000 |  53.17  13.000
              8.33   2.000 |  23.33   2.000 |  38.33   2.000 |  53.33  13.000
              8.50   2.000 |  23.50   2.000 |  38.50   2.000 |  53.50  13.000
              8.67   2.000 |  23.67   2.000 |  38.67   2.000 |  53.67  13.000
              8.83   2.000 |  23.83   2.000 |  38.83   2.000 |  53.83  13.000
              9.00   2.000 |  24.00   2.000 |  39.00   2.000 |  54.00  13.000
              9.17   2.000 |  24.17   2.000 |  39.17   2.000 |  54.17  23.000
              9.33   2.000 |  24.33   2.000 |  39.33   2.000 |  54.33  23.000
              9.50   2.000 |  24.50   2.000 |  39.50   2.000 |  54.50  23.000
              9.67   2.000 |  24.67   2.000 |  39.67   2.000 |  54.67  23.000
              9.83   2.000 |  24.83   2.000 |  39.83   2.000 |  54.83  23.000
             10.00   2.000 |  25.00   2.000 |  40.00   2.000 |  55.00  23.000
             10.17   2.000 |  25.17   2.000 |  40.17   2.000 |  55.17  13.000
             10.33   2.000 |  25.33   2.000 |  40.33   2.000 |  55.33  13.000
             10.50   2.000 |  25.50   2.000 |  40.50   2.000 |  55.50  13.000
             10.67   2.000 |  25.67   2.000 |  40.67   2.000 |  55.67  13.000
             10.83   2.000 |  25.83   2.000 |  40.83   2.000 |  55.83  13.000
             11.00   2.000 |  26.00   2.000 |  41.00   2.000 |  56.00  13.000
             11.17   2.000 |  26.17   2.000 |  41.17   2.000 |  56.17  13.000
             11.33   2.000 |  26.33   2.000 |  41.33   2.000 |  56.33  13.000
             11.50   2.000 |  26.50   2.000 |  41.50   2.000 |  56.50  13.000
             11.67   2.000 |  26.67   2.000 |  41.67   2.000 |  56.67  13.000
             11.83   2.000 |  26.83   2.000 |  41.83   2.000 |  56.83  13.000
             12.00   2.000 |  27.00   2.000 |  42.00   2.000 |  57.00  13.000
             12.17   2.000 |  27.17   2.000 |  42.17   2.000 |  57.17  53.000
             12.33   2.000 |  27.33   2.000 |  42.33   2.000 |  57.33  53.000
             12.50   2.000 |  27.50   2.000 |  42.50   2.000 |  57.50  53.000
             12.67   2.000 |  27.67   2.000 |  42.67   2.000 |  57.67  53.000
             12.83   2.000 |  27.83   2.000 |  42.83   2.000 |  57.83  53.000
             13.00   2.000 |  28.00   2.000 |  43.00   2.000 |  58.00  53.000
             13.17   2.000 |  28.17   2.000 |  43.17   2.000 |  58.17  38.000
             13.33   2.000 |  28.33   2.000 |  43.33   2.000 |  58.33  38.000
             13.50   2.000 |  28.50   2.000 |  43.50   2.000 |  58.50  38.000
             13.67   2.000 |  28.67   2.000 |  43.67   2.000 |  58.67  38.000
             13.83   2.000 |  28.83   2.000 |  43.83   2.000 |  58.83  38.000
             14.00   2.000 |  29.00   2.000 |  44.00   2.000 |  59.00  38.000
             14.17   2.000 |  29.17   2.000 |  44.17   2.000 |  59.17  13.000
             14.33   2.000 |  29.33   2.000 |  44.33   2.000 |  59.33  13.000
             14.50   2.000 |  29.50   2.000 |  44.50   2.000 |  59.50  13.000
             14.67   2.000 |  29.67   2.000 |  44.67   2.000 |  59.67  13.000
             14.83   2.000 |  29.83   2.000 |  44.83   2.000 |  59.83  13.000
             15.00   2.000 |  30.00   2.000 |  45.00   2.000 |  60.00  13.000

-------------------------------------------------------------------------------
101:0003-----------------------------------------------------------------------
* Future North Site Development
---------------------
| CALIB STANDHYD     |   Area    (ha)=   17.30
| 01:000103 DT= 2.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
---------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       15.57         1.73
     Dep. Storage     (mm)=        2.00         5.00
     Average Slope     (%)=         .50         2.00
     Length            (m)=      340.00        50.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=       53.00        47.93
                over (min)        8.00        20.00
     Storage Coeff.  (min)=        8.45 (ii)   19.28 (ii)
     Unit Hyd. Tpeak (min)=        8.00        20.00
     Unit Hyd. peak  (cms)=         .14          .06
                                                        *TOTALS*
     PEAK FLOW       (cms)=        2.29          .22        2.505 (iii)
     TIME TO PEAK    (hrs)=       58.00        58.07       58.000
     RUNOFF VOLUME    (mm)=      305.99       222.90      297.692
     TOTAL RAINFALL   (mm)=      308.00       308.00      308.000
     RUNOFF COEFFICIENT   =         .99          .72         .967

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
101:0004-----------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>01:(000103)   |
| OUT<02:(NORTH )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)    |    (cms)    (ha.m.)
                           .000  .0000E+00    |    1.300  .3000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
     --------------------       (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (000103)      17.30     2.505    58.000     297.692
     OUTFLOW<02: (NORTH )      15.74     1.300    57.533     297.692
    OVERFLOW<03: (OVRFLW)       1.56     1.204    58.000     297.692

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         1
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      1.63
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      2.37


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   51.902
                   TIME SHIFT OF PEAK FLOW         (min)=   -28.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2992E+00

-------------------------------------------------------------------------------
101:0005-----------------------------------------------------------------------
--------------------
| ADD HYD (N1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
```

```
--------------------         (ha)     (cms)   (hrs)  (mm)   (cms)
                 ID1 02:NORTH    15.74    1.300   57.53 297.69    .000
                +ID2 03:OVRFLW    1.56    1.204   58.00 297.69    .000
                 ====================================================
                 SUM 04:N1       17.30    2.504   58.00 297.69    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0006----------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    3.649  (cms)
| TotalHyd 04:N1     |   Number of inlets in system [NINLET] =        1
----------------------   Total minor system capacity         =    3.649  (cms)
                         Total major system storage [TMJSTO] =        0.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                  (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   04:N1          17.30     2.504    58.000  297.692     .000
     ========================================================================
     MAJOR SYST   05:103MJ         .00      .000      .000     .000     .000
     MINOR SYST   06:103MN       17.30     2.504    58.000  297.692     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0007----------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =     .928  (cms)
| TotalHyd 06:103MN  |   Number of inlets in system [NINLET] =        1
----------------------   Total minor system capacity         =     .928  (cms)
                         Total major system storage [TMJSTO] =        0.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                  (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   06:103MN       17.30     2.504    58.000  297.692     .000
     ========================================================================
     MAJOR SYST   07:103CH        2.53     1.576    58.000  297.692     .000
     MINOR SYST   08:103PD       14.77      .928    54.933  297.691     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0008----------------------------------------------------------------------
* Prologis Park Development
----------------------
| CALIB STANDHYD     |   Area    (ha)=   10.80
| 09:000101 DT= 2.00 |   Total Imp(%)=   89.00   Dir. Conn.(%)=   89.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       9.61         1.19
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     260.00        50.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=      53.00        47.95
                over (min)       8.00        18.00
     Storage Coeff.  (min)=       7.19 (ii)   18.02 (ii)
     Unit Hyd. Tpeak (min)=       8.00        18.00
     Unit Hyd. peak  (cms)=        .15          .06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.41          .15         1.564 (iii)
     TIME TO PEAK    (hrs)=      58.00        58.07        58.000
     RUNOFF VOLUME    (mm)=     305.98       222.90       296.861
     TOTAL RAINFALL   (mm)=     308.00       308.00       308.000
     RUNOFF COEFFICIENT   =        .99          .72          .964

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
101:0009----------------------------------------------------------------------
*Route Reservoir placed as a holder if needed, otherwise leave empty
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>09:(000101)    |
| OUT<10:(SOUTH )    |    =========  OUTLFOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |   (cms)    (ha.m.)
                            .000  .0000E+00   |    .000  .0000E+00

     ROUTING RESULTS           AREA      QPEAK     TPEAK        R.V.
     --------------------      (ha)      (cms)     (hrs)        (mm)
     INFLOW >09: (000101)     10.80      1.564    58.000     296.861
     OUTFLOW<10: (SOUTH )       .00       .000      .000        .000
   OVERFLOW<01: (OVRFLW)      10.80      1.564    58.000     296.861

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        1
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=    63.03
                   PERCENTAGE OF TIME OVERFLOWING    (%)=    98.44


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=     .000
                   TIME SHIFT OF PEAK FLOW         (min)= -3480.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.4061E-08

      *** WARNING: Outflow volume is less than inflow volume.
------------------------------------------------------------------------------
101:0010----------------------------------------------------------------------
--------------------
| ADD HYD (S1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 10:SOUTH       .00     .000     .00    .00    .000
                +ID2 01:OVRFLW    10.80    1.564   58.00 296.86    .000
                 ====================================================
                 SUM 02:S1        10.80    1.564   58.00 296.86    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0011----------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    2.762  (cms)
| TotalHyd 02:S1     |   Number of inlets in system [NINLET] =        1
----------------------   Total minor system capacity         =    2.762  (cms)
                         Total major system storage [TMJSTO] =        0.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                  (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   02:S1          10.80     1.564    58.000  296.861     .000
     ========================================================================
     MAJOR SYST   03:101MJ         .00      .000      .000     .000     .000
     MINOR SYST   04:101MN       10.80     1.564    58.000  296.861     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0012----------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    1.557  (cms)
| TotalHyd 04:101MN  |   Number of inlets in system [NINLET] =        1
----------------------   Total minor system capacity         =    1.557  (cms)
                         Total major system storage [TMJSTO] =        0.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
```

```
                                  (ha)     (cms)     (hrs)     (mm)     (cms)
     TOTAL HYD.   04:101MN       10.80     1.564    58.000  296.861     .000
     ========================================================================
     MAJOR SYST   06:101CH         .00      .007    58.000  296.861     .000
     MINOR SYST   09:101PD       10.80     1.557    57.867  296.861     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0013----------------------------------------------------------------------
--------------------
| ADD HYD (MJ1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 05:103MJ       .00     .000     .00    .00    .000 **DRY**
                +ID2 03:101MJ       .00     .000     .00    .00    .000 **DRY**
                 ====================================================
                 SUM 10:MJ1         .00     .000     .00    .00    .000 **DRY**
------------------------------------------------------------------------------
101:0014----------------------------------------------------------------------
--------------------
| ADD HYD (CH1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:103CH      2.53    1.576   58.00 297.69    .000
                +ID2 06:101CH       .00     .007   58.00 296.86    .000
                 ====================================================
                 SUM 01:CH1        2.53    1.582   58.00 297.69    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0015----------------------------------------------------------------------
--------------------
| ADD HYD (PD1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:103PD     14.77     .928   54.93 297.69    .000
                +ID2 09:101PD     10.80    1.557   57.87 296.86    .000
                 ====================================================
                 SUM 02:PD1       25.57    2.485   57.87 297.34    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0016----------------------------------------------------------------------
* East Roof
----------------------
| CALIB STANDHYD     |   Area    (ha)=    3.50
| 03:000105 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.46          .03
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     150.00        50.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=      53.00        52.99
                over (min)       6.00        16.00
     Storage Coeff.  (min)=       5.17 (ii)   15.57 (ii)
     Unit Hyd. Tpeak (min)=       6.00        16.00
     Unit Hyd. peak  (cms)=        .21          .07
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .51          .01          .515 (iii)
     TIME TO PEAK    (hrs)=      58.00        58.03        58.000
     RUNOFF VOLUME    (mm)=     306.00       300.44       305.948
     TOTAL RAINFALL   (mm)=     308.00       308.00       308.000
     RUNOFF COEFFICIENT   =        .99          .98          .993

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
101:0017----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>03:(000105)    |
| OUT<04:(EASTRF)    |    =========  OUTLFOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |   (cms)    (ha.m.)
                            .000  .0000E+00   |    .060  .2800E+00

     ROUTING RESULTS           AREA      QPEAK     TPEAK        R.V.
     --------------------      (ha)      (cms)     (hrs)        (mm)
     INFLOW >03: (000105)      3.50       .515    58.000     305.948
     OUTFLOW<04: (EASTRF)      2.34       .060    54.967     305.938
   OVERFLOW<05: (OVRFLW)       1.16       .455    58.000     305.948

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        2
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=     5.13
                   PERCENTAGE OF TIME OVERFLOWING    (%)=     2.53


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   11.648
                   TIME SHIFT OF PEAK FLOW         (min)=  -182.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2799E+00

------------------------------------------------------------------------------
101:0018----------------------------------------------------------------------
--------------------
| ADD HYD (E1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 04:EASTRF     2.34     .060   54.97 305.94    .000
                +ID2 05:OVRFLW     1.16     .455   58.00 305.95    .000
                 ====================================================
                 SUM 06:E1         3.50     .515   58.00 305.94    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
101:0019----------------------------------------------------------------------
* West Roof
----------------------
| CALIB STANDHYD     |   Area    (ha)=    5.00
| 07:000104 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.95          .05
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     180.00        50.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=      53.00        52.99
                over (min)       6.00        16.00
     Storage Coeff.  (min)=       5.77 (ii)   16.17 (ii)
     Unit Hyd. Tpeak (min)=       6.00        16.00
     Unit Hyd. peak  (cms)=        .19          .07
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .73          .01          .736 (iii)
     TIME TO PEAK    (hrs)=      58.00        58.03        58.000
     RUNOFF VOLUME    (mm)=     305.99       300.44       305.948
     TOTAL RAINFALL   (mm)=     308.00       308.00       308.000
     RUNOFF COEFFICIENT   =        .99          .98          .993

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
```

```
101:0020------------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>07:(000104)   |
| OUT<08:(WESTRF)   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)    |    (cms)    (ha.m.)
                           .000  .0000E+00    |     .080  .3900E+00

     ROUTING RESULTS            AREA      QPEAK      TPEAK        R.V.
     --------------------       (ha)      (cms)      (hrs)        (mm)
     INFLOW >07: (000104)       5.00       .736     58.000     305.948
     OUTFLOW<08: (WESTRF)       3.25       .080     54.767     305.941
    OVERFLOW<09: (OVRFLW)       1.75       .656     58.000     305.948

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         2
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      5.37
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      2.52


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   10.872
                   TIME SHIFT OF PEAK FLOW         (min)=  -194.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.3899E+00

--------------------------------------------------------------------------------
101:0021------------------------------------------------------------------------
--------------------
| ADD HYD (W1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 08:WESTRF     3.25      .080   54.77 305.94    .000
               +ID2 09:OVRFLW     1.75      .656   58.00 305.95    .000
                ====================================================
                SUM 03:W1         5.00      .736   58.00 305.94    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0022------------------------------------------------------------------------
--------------------
| ADD HYD (EWROOF) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 06:E1         3.50      .515   58.00 305.94    .000
               +ID2 03:W1         5.00      .736   58.00 305.94    .000
                ====================================================
                SUM 04:EWROOF     8.50     1.251   58.00 305.94    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0023------------------------------------------------------------------------
* Argentia Road Extension
---------------------
| CALIB STANDHYD     |   Area    (ha)=    1.30
| 05:000102 DT= 2.00 |   Total Imp(%)=   85.00   Dir. Conn.(%)=   85.00
---------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11          .19
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=      90.00        50.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=      53.00        48.01
                over (min)        4.00        14.00
     Storage Coeff.  (min)=       3.81 (ii)   14.63 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=        .29          .08
                                                         *TOTALS*
     PEAK FLOW       (cms)=        .16          .03         .188 (iii)
     TIME TO PEAK    (hrs)=      57.97        58.00       58.000
     RUNOFF VOLUME    (mm)=     305.99       222.91      293.537
     TOTAL RAINFALL   (mm)=     308.00       308.00      308.000
     RUNOFF COEFFICIENT   =        .99          .72         .953

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
101:0024------------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .383  (cms)
| TotalHyd 05:000102 |   Number of inlets in system [NINLET] =      1
---------------------    Total minor system capacity         =    .383  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD         AREA      QPEAK      TPEAK      R.V.      DWF
                                  (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   05:000102       1.30       .188     58.000   293.537      .000
     =======================================================================
     MAJOR SYST   06:102MJ         .00       .000       .000      .000      .000
     MINOR SYST   07:102MN        1.30       .188     58.000   293.537      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0025------------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .220  (cms)
| TotalHyd 07:102MN  |   Number of inlets in system [NINLET] =      1
---------------------    Total minor system capacity         =    .220  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD         AREA      QPEAK      TPEAK      R.V.      DWF
                                  (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   07:102MN        1.30       .188     58.000   293.537      .000
     =======================================================================
     MAJOR SYST   08:102CH         .00       .000       .000      .000      .000
     MINOR SYST   09:102PD        1.30       .188     58.000   293.537      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0026------------------------------------------------------------------------
--------------------
| ADD HYD (MJ2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 10:MJ1         .00      .000     .00    .00    .000 **DRY**
               +ID2 06:102MJ       .00      .000     .00    .00    .000 **DRY**
                ====================================================
                SUM 03:MJ2         .00      .000     .00    .00    .000 **DRY**
--------------------------------------------------------------------------------
101:0027------------------------------------------------------------------------
--------------------
| ADD HYD (CH2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 01:CH1        2.53     1.582   58.00 297.69    .000
               +ID2 04:EWROOF     8.50     1.251   58.00 305.94    .000
               +ID3 08:102CH       .00      .000     .00    .00    .000 **DRY**
                ====================================================
                SUM 05:CH2       11.03     2.833   58.00 304.05    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0028------------------------------------------------------------------------
--------------------
| ADD HYD (PD2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 02:PD1       25.57     2.485   57.87 297.34    .000
               +ID2 09:102PD      1.30      .188   58.00 293.54    .000
                ====================================================
                SUM 06:PD2       26.87     2.673   58.00 297.16    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0029------------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>06:(PD2   )   |
| OUT<07:(POND  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)    |    (cms)    (ha.m.)
                           .000  .0000E+00    |    2.280  .2630E+00
                           .028  .1190E+00    |    4.686  .3620E+00
                           .311  .1530E+00    |    7.610  .4670E+00
                           .827  .1890E+00    |   11.693  .6020E+00
                          1.492  .2250E+00    |     .000  .0000E+00

     ROUTING RESULTS            AREA      QPEAK      TPEAK        R.V.
     --------------------       (ha)      (cms)      (hrs)        (mm)
     INFLOW >06: (PD2   )      26.87      2.673     58.000     297.157
     OUTFLOW<07: (POND  )      26.87      2.667     58.033     297.154
    OVERFLOW<08: (OVRFLW)        .00       .000       .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   99.788
                   TIME SHIFT OF PEAK FLOW         (min)=     2.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2790E+00

--------------------------------------------------------------------------------
101:0030------------------------------------------------------------------------
--------------------
| ADD HYD (PNDOUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 07:POND      26.87     2.667   58.03 297.15    .000
               +ID2 08:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                ====================================================
                SUM 09:PNDOUT    26.87     2.667   58.03 297.15    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0031------------------------------------------------------------------------
* 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
* 37.9 total site hectares.
--------------------
| ADD HYD (5YROUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 09:PNDOUT    26.87     2.667   58.03 297.15    .000
               +ID2 05:CH2       11.03     2.833   58.00 304.05    .000
                ====================================================
                SUM 10:5YROUT    37.90     5.500   58.00 299.16    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0032------------------------------------------------------------------------
* TOTAL is all flows from development site and argentia road
--------------------
| ADD HYD (TOTAL ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 03:MJ2         .00      .000     .00    .00    .000 **DRY**
               +ID2 10:5YROUT    37.90     5.500   58.00 299.16    .000
                ====================================================
                SUM 01:TOTAL     37.90     5.500   58.00 299.16    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
101:0033------------------------------------------------------------------------
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.80   Curve Number   (CN)=70.00
| 02:100    DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .700

     Unit Hyd Qpeak  (cms)=     .262

     PEAK FLOW       (cms)=     .511 (i)
     TIME TO PEAK    (hrs)=   58.667
     RUNOFF VOLUME    (mm)=  220.126
     TOTAL RAINFALL   (mm)=  308.000
     RUNOFF COEFFICIENT   =     .715

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
101:0034------------------------------------------------------------------------
--------------------------------------------------------------------------------
101:0002------------------------------------------------------------------------
      FINISH
--------------------------------------------------------------------------------
********************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
 001:0009 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
      *** WARNING: Outflow volume is less than inflow volume.
   Simulation ended on 2012-05-16     at 14:54:00
================================================================================
```

```
===========================================================================

 SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999  =========
 S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
 SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9 Ver. 4.02
     S   W W   M   M  H   H    Y    M   M  O   O       9999   9999 July 1999
 SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9 =========
                                                      9   9  9   9 # 2649264
      StormWater Management HYdrologic Model           999    999  =========

 *************************************************************************
 ************************* SWMHYMO-99 Ver/4.02 ***************************
 *******  A single event and continuous hydrologic simulation model  *******
 *******     based on the principles of HYMO and its successors      *******
 *******                OTTHYMO-83 and OTTHYMO-89.                    *******
 *************************************************************************
 ******* Distributed by:  J.F. Sabourin and Associates Inc.            *******
 *******                 Ottawa,  Ontario: (613) 727-5199             *******
 *******                 Gatineau, Quebec: (819) 243-6858             *******
 *******                 E-Mail: swmhymo@jfsa.Com                     *******
 *************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++ Licensed user: Earth Tech Canada                           +++++++
 +++++++                London              SERIAL#:2649264         +++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 *************************************************************************
 *******          ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *******
 *******          Maximum value for ID numbers  :     10            *******
 *******          Max. number of rainfall points:  15000            *******
 *******          Max. number of flow points    :  15000            *******
 *************************************************************************


 *******************   D E T A I L E D   O U T P U T   *******************
 *************************************************************************
 *      DATE: 2012-05-16     TIME: 14:58:07     RUN COUNTER: 002781      *
 *************************************************************************
 * Input   filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\2YR.DAT*
 * Output  filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\2YR.out*
 * Summary filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\2YR.sum*
 * User comments:                                                         *
 * 1:_____________________________________________________________________*
 * 2:_____________________________________________________________________*
 * 3:_____________________________________________________________________*
 *************************************************************************

--------------------------------------------------------------------------------
001:0001------------------------------------------------------------------------
*#******************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date        : 01-03-2012
*#  Modeller    : [DPG]
*#  Revision    : 02-15-2012
*#  Revised by  : [dpg]
*#  Company     : Earth Tech Canada
*#  License #   :  2649264
*#******************************************************************************
* Phase 1
--------------------
| START              |  Project  dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
--------------------  Rainfall dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
--------------------------------------------------------------------------------
001:0002------------------------------------------------------------------------
*#
*# 2-year design storm, City of Mississauga standards
*#
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 610.000
| Ptotal= 50.23 mm |                          B=   4.600
--------------------                          C=    .780
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  = 24.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =   .40

             TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
              hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
              .17    .470 |   6.17   1.042 |  12.17   1.888 |  18.17    .706
              .33    .477 |   6.33   1.084 |  12.33   1.790 |  18.33    .695
              .50    .484 |   6.50   1.130 |  12.50   1.704 |  18.50    .684
              .67    .491 |   6.67   1.181 |  12.67   1.626 |  18.67    .674
              .83    .498 |   6.83   1.237 |  12.83   1.556 |  18.83    .665
             1.00    .506 |   7.00   1.299 |  13.00   1.493 |  19.00    .655
             1.17    .513 |   7.17   1.370 |  13.17   1.435 |  19.17    .646
             1.33    .521 |   7.33   1.449 |  13.33   1.382 |  19.33    .637
             1.50    .530 |   7.50   1.540 |  13.50   1.333 |  19.50    .629
             1.67    .539 |   7.67   1.645 |  13.67   1.288 |  19.67    .620
             1.83    .548 |   7.83   1.768 |  13.83   1.247 |  19.83    .612
             2.00    .557 |   8.00   1.914 |  14.00   1.208 |  20.00    .604
             2.17    .567 |   8.17   2.091 |  14.17   1.172 |  20.17    .597
             2.33    .577 |   8.33   2.310 |  14.33   1.138 |  20.33    .589
             2.50    .588 |   8.50   2.588 |  14.50   1.106 |  20.50    .582
             2.67    .599 |   8.67   2.957 |  14.67   1.077 |  20.67    .575
             2.83    .610 |   8.83   3.469 |  14.83   1.049 |  20.83    .569
             3.00    .622 |   9.00   4.238 |  15.00   1.023 |  21.00    .562
             3.17    .635 |   9.17   5.534 |  15.17    .998 |  21.17    .555
             3.33    .648 |   9.33   8.251 |  15.33    .974 |  21.33    .549
             3.50    .662 |   9.50  18.302 |  15.50    .952 |  21.50    .543
             3.67    .677 |   9.67  75.359 |  15.67    .931 |  21.67    .537
             3.83    .692 |   9.83  21.356 |  15.83    .911 |  21.83    .531
             4.00    .708 |  10.00  10.947 |  16.00    .891 |  22.00    .526
             4.17    .725 |  10.17   7.527 |  16.17    .873 |  22.17    .520
             4.33    .743 |  10.33   5.811 |  16.33    .856 |  22.33    .515
             4.50    .762 |  10.50   4.773 |  16.50    .839 |  22.50    .509
             4.67    .783 |  10.67   4.074 |  16.67    .823 |  22.67    .504
             4.83    .804 |  10.83   3.569 |  16.83    .808 |  22.83    .499
             5.00    .827 |  11.00   3.186 |  17.00    .793 |  23.00    .494
             5.17    .852 |  11.17   2.884 |  17.17    .779 |  23.17    .489
             5.33    .878 |  11.33   2.640 |  17.33    .766 |  23.33    .485
             5.50    .906 |  11.50   2.438 |  17.50    .753 |  23.50    .480
             5.67    .936 |  11.67   2.269 |  17.67    .740 |  23.67    .476
             5.83    .969 |  11.83   2.123 |  17.83    .728 |  23.83    .471
             6.00   1.004 |  12.00   1.998 |  18.00    .717 |  24.00    .467

--------------------------------------------------------------------------------
001:0003------------------------------------------------------------------------
* Future North Site Development
---------------------
| CALIB STANDHYD      |   Area    (ha)=   17.30
| 01:000103 DT= 2.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     15.57          1.73
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    340.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=     75.36         10.17
                over (min)       8.00         28.00
     Storage Coeff.  (min)=      7.34 (ii)    27.48 (ii)
     Unit Hyd. Tpeak (min)=      8.00         28.00
     Unit Hyd. peak  (cms)=       .15           .04
                                                          *TOTALS*
     PEAK FLOW       (cms)=      2.32           .03          2.325 (iii)
     TIME TO PEAK    (hrs)=      9.70         10.10          9.700
     RUNOFF VOLUME    (mm)=     48.22         13.27         44.732
     TOTAL RAINFALL   (mm)=     50.23         50.23         50.227
     RUNOFF COEFFICIENT   =       .96           .26           .891

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
001:0004------------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>01:(000103)    |
| OUT<02:(NORTH )    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000   .0000E+00   |   1.300   .3000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
     --------------------       (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (000103)      17.30     2.325     9.700      44.732
      OUTFLOW<02: (NORTH )     17.30      .928    10.000      44.732
    OVERFLOW<03: (OVRFLW)        .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    39.931
                   TIME SHIFT OF PEAK FLOW         (min)=     18.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2145E+00

--------------------------------------------------------------------------------
001:0005------------------------------------------------------------------------
-------------------
| ADD HYD (N1    ) | ID: NHYD       AREA     QPEAK   TPEAK   R.V.    DWF
-------------------                 (ha)     (cms)   (hrs)   (mm)   (cms)
              ID1 02:NORTH         17.30      .928   10.00  44.73    .000
             +ID2 03:OVRFLW          .00      .000     .00    .00    .000 **DRY**
              ===============================================================
              SUM 04:N1            17.30      .928   10.00  44.73    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0006------------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD    |    Average inlet capacities   [CINLET] =   3.649  (cms)
| TotalHyd 04:N1     |    Number of inlets in system [NINLET] =       1
---------------------     Total minor system capacity         =   3.649  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                ID: NHYD        AREA      QPEAK      TPEAK       R.V.      DWF
                                (ha)      (cms)      (hrs)       (mm)     (cms)
     TOTAL HYD.   04:N1        17.30       .928     10.000     44.732      .000
     ====================================================================
     MAJOR SYST   05:103MJ       .00       .000       .000       .000      .000
     MINOR SYST   06:103MN     17.30       .928     10.000     44.732      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0007------------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD    |    Average inlet capacities   [CINLET] =    .928  (cms)
| TotalHyd 06:103MN  |    Number of inlets in system [NINLET] =       1
---------------------     Total minor system capacity         =    .928  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                ID: NHYD        AREA      QPEAK      TPEAK       R.V.      DWF
                                (ha)      (cms)      (hrs)       (mm)     (cms)
     TOTAL HYD.   06:103MN     17.30       .928     10.000     44.732      .000
     ====================================================================
     MAJOR SYST   07:103CH       .00       .000     10.000     44.732      .000
     MINOR SYST   08:103PD     17.30       .928     10.000     44.732      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0008------------------------------------------------------------------------
* Prologis Park Development
---------------------
| CALIB STANDHYD      |   Area    (ha)=   10.80
| 09:000101 DT= 2.00 |   Total Imp(%)=   89.00   Dir. Conn.(%)=   89.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      9.61          1.19
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    260.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=     75.36         10.64
                over (min)       6.00         26.00
     Storage Coeff.  (min)=      6.25 (ii)    26.02 (ii)
     Unit Hyd. Tpeak (min)=      6.00         26.00
     Unit Hyd. peak  (cms)=       .18           .04
                                                          *TOTALS*
     PEAK FLOW       (cms)=      1.56           .02          1.571 (iii)
     TIME TO PEAK    (hrs)=      9.70         10.07          9.700
     RUNOFF VOLUME    (mm)=     48.23         13.27         44.382
     TOTAL RAINFALL   (mm)=     50.23         50.23         50.227
     RUNOFF COEFFICIENT   =       .96           .26           .884

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
001:0009------------------------------------------------------------------------
*Route Reservoir placed as a holder if needed, otherwise leave empty
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>09:(000101)    |
| OUT<10:(SOUTH )    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000   .0000E+00   |    .000   .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
     --------------------       (ha)     (cms)     (hrs)        (mm)
     INFLOW >09: (000101)      10.80     1.571     9.700      44.382
      OUTFLOW<10: (SOUTH )       .00      .000      .000        .000
    OVERFLOW<01: (OVRFLW)      10.80     1.557     9.700      44.382

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         1
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=     25.27
                   PERCENTAGE OF TIME OVERFLOWING    (%)=     87.53


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=      .000
                   TIME SHIFT OF PEAK FLOW         (min)=   -582.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.3540E-09

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
```

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001:0010---------------------------------------------------------------------
--------------------
| ADD HYD (S1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 10:SOUTH       .00      .000     .00    .00    .000
                +ID2 01:OVRFLW    10.80     1.557    9.70  44.38    .000
                 ====================================================
                 SUM 02:S1        10.80     1.557    9.70  44.38    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0011---------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =   2.762  (cms)
| TotalHyd 02:S1      |   Number of inlets in system [NINLET] =      1
----------------------    Total minor system capacity         =   2.762  (cms)
                          Total major system storage [TMJSTO] =      0.(cu.m.)

                  ID: NHYD        AREA      QPEAK     TPEAK      R.V.      DWF
                                  (ha)      (cms)     (hrs)      (mm)    (cms)
     TOTAL HYD.   02:S1          10.80      1.557     9.700    44.382     .000
     =======================================================================
     MAJOR SYST   03:101MJ         .00       .000      .000      .000     .000
     MINOR SYST   04:101MN       10.80      1.557     9.700    44.382     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0012---------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =   1.557  (cms)
| TotalHyd 04:101MN   |   Number of inlets in system [NINLET] =      1
----------------------    Total minor system capacity         =   1.557  (cms)
                          Total major system storage [TMJSTO] =      0.(cu.m.)

                  ID: NHYD        AREA      QPEAK     TPEAK      R.V.      DWF
                                  (ha)      (cms)     (hrs)      (mm)    (cms)
     TOTAL HYD.   04:101MN       10.80      1.557     9.700    44.382     .000
     =======================================================================
     MAJOR SYST   06:101CH         .00       .000      .000      .000     .000
     MINOR SYST   09:101PD       10.80      1.557     9.700    44.382     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0013---------------------------------------------------------------------
--------------------
| ADD HYD (MJ1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 05:103MJ       .00      .000     .00    .00    .000 **DRY**
                +ID2 03:101MJ       .00      .000     .00    .00    .000 **DRY**
                 ====================================================
                 SUM 10:MJ1         .00      .000     .00    .00    .000 **DRY**
-----------------------------------------------------------------------------
001:0014---------------------------------------------------------------------
--------------------
| ADD HYD (CH1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:103CH       .00      .000   10.00  44.73    .000
                +ID2 06:101CH       .00      .000     .00    .00    .000 **DRY**
                 ====================================================
                 SUM 01:CH1         .00      .000   10.00  44.73    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0015---------------------------------------------------------------------
--------------------
| ADD HYD (PD1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:103PD     17.30      .928   10.00  44.73    .000
                +ID2 09:101PD     10.80     1.557    9.70  44.38    .000
                 ====================================================
                 SUM 02:PD1       28.10     2.162    9.73  44.60    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0016---------------------------------------------------------------------
* East Roof
----------------------
| CALIB STANDHYD      |   Area    (ha)=    3.50
| 03:000105 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.46          .03
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     150.00        50.00
     Mannings n          =       .013         .250

     Max.eff.Inten.(mm/hr)=      75.36        58.75
                over (min)        4.00        14.00
     Storage Coeff.  (min)=       4.49 (ii)   14.47 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=        .26          .08
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .65          .00          .648 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.83         9.667
     RUNOFF VOLUME    (mm)=      48.23        42.80        48.173
     TOTAL RAINFALL   (mm)=      50.23        50.23        50.227
     RUNOFF COEFFICIENT   =        .96          .85          .959

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
001:0017---------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>03:(000105)    |
| OUT<04:(EASTRF)    |    =========  OUTFLOW STORAGE TABLE  =========
---------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
                              .000  .0000E+00   |     .060  .2800E+00

     ROUTING RESULTS           AREA      QPEAK      TPEAK         R.V.
     -------------------       (ha)      (cms)      (hrs)         (mm)
     INFLOW >03: (000105)      3.50       .648      9.667       48.173
      OUTFLOW<04: (EASTRF)     3.50       .023     11.533       48.171
    OVERFLOW<05: (OVRFLW)       .00       .000       .000         .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    3.624
                    TIME SHIFT OF PEAK FLOW         (min)=   112.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1095E+00

-----------------------------------------------------------------------------
001:0018---------------------------------------------------------------------
--------------------
| ADD HYD (E1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 04:EASTRF     3.50      .023   11.53  48.17    .000
                +ID2 05:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 ====================================================
                 SUM 06:E1         3.50      .023   11.53  48.17    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0019---------------------------------------------------------------------
* West Roof
----------------------
| CALIB STANDHYD      |   Area    (ha)=    5.00
| 07:000104 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.95          .05
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     180.00        50.00
     Mannings n          =       .013         .250

     Max.eff.Inten.(mm/hr)=      75.36        54.06
                over (min)        6.00        16.00
     Storage Coeff.  (min)=       5.01 (ii)   15.33 (ii)
     Unit Hyd. Tpeak (min)=       6.00        16.00
     Unit Hyd. peak  (cms)=        .21          .07
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .85          .00          .856 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.87         9.667
     RUNOFF VOLUME    (mm)=      48.23        42.80        48.173
     TOTAL RAINFALL   (mm)=      50.23        50.23        50.227
     RUNOFF COEFFICIENT   =        .96          .85          .959

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
001:0020---------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>07:(000104)    |
| OUT<08:(WESTRF)    |    =========  OUTFLOW STORAGE TABLE  =========
---------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
                              .000  .0000E+00   |     .080  .3900E+00

     ROUTING RESULTS           AREA      QPEAK      TPEAK         R.V.
     -------------------       (ha)      (cms)      (hrs)         (mm)
     INFLOW >07: (000104)      5.00       .856      9.667       48.173
      OUTFLOW<08: (WESTRF)     5.00       .032     11.667       48.172
    OVERFLOW<09: (OVRFLW)       .00       .000       .000         .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    3.774
                    TIME SHIFT OF PEAK FLOW         (min)=   120.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1576E+00

-----------------------------------------------------------------------------
001:0021---------------------------------------------------------------------
--------------------
| ADD HYD (W1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:WESTRF     5.00      .032   11.67  48.17    .000
                +ID2 09:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 ====================================================
                 SUM 03:W1         5.00      .032   11.67  48.17    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0022---------------------------------------------------------------------
--------------------
| ADD HYD (EWROOF) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 06:E1         3.50      .023   11.53  48.17    .000
                +ID2 03:W1         5.00      .032   11.67  48.17    .000
                 ====================================================
                 SUM 04:EWROOF     8.50      .056   11.60  48.17    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0023---------------------------------------------------------------------
* Argentia Road Extension
----------------------
| CALIB STANDHYD      |   Area    (ha)=    1.30
| 05:000102 DT= 2.00 |   Total Imp(%)=   85.00   Dir. Conn.(%)=   85.00
----------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11          .19
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=      90.00        50.00
     Mannings n          =       .013         .250

     Max.eff.Inten.(mm/hr)=      75.36        11.87
                over (min)        4.00        22.00
     Storage Coeff.  (min)=       3.31 (ii)   22.23 (ii)
     Unit Hyd. Tpeak (min)=       4.00        22.00
     Unit Hyd. peak  (cms)=        .31          .05
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .22          .00          .220 (iii)
     TIME TO PEAK    (hrs)=       9.67        10.00         9.667
     RUNOFF VOLUME    (mm)=      48.23        13.27        42.984
     TOTAL RAINFALL   (mm)=      50.23        50.23        50.227
     RUNOFF COEFFICIENT   =        .96          .26          .856

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
001:0024---------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =    .383  (cms)
| TotalHyd 05:000102 |   Number of inlets in system [NINLET] =      1
----------------------    Total minor system capacity         =    .383  (cms)
                          Total major system storage [TMJSTO] =      0.(cu.m.)

                  ID: NHYD        AREA      QPEAK     TPEAK      R.V.      DWF
                                  (ha)      (cms)     (hrs)      (mm)    (cms)
     TOTAL HYD.   05:000102       1.30       .220     9.667    42.984     .000
     =======================================================================
     MAJOR SYST   06:102MJ         .00       .000      .000      .000     .000
     MINOR SYST   07:102MN        1.30       .220     9.667    42.984     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0025---------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =    .220  (cms)
| TotalHyd 07:102MN   |   Number of inlets in system [NINLET] =      1
```

```
---------------------   Total minor system capacity         =    .220  (cms)
                        Total major system storage [TMJSTO] =       0.(cu.m.)

             ID: NHYD        AREA     QPEAK     TPEAK      R.V.      DWF
                             (ha)     (cms)     (hrs)      (mm)    (cms)
     TOTAL HYD.   07:102MN        1.30      .220     9.667    42.984     .000
     ======================================================================
     MAJOR SYST   08:102CH         .00      .000      .000      .000     .000
     MINOR SYST   09:102PD        1.30      .220     9.667    42.984     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0026-----------------------------------------------------------------------
--------------------
| ADD HYD (MJ2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 10:MJ1         .00      .000     .00    .00    .000 **DRY**
               +ID2 06:102MJ       .00      .000     .00    .00    .000 **DRY**
                ===================================================
                SUM 03:MJ2         .00      .000     .00    .00    .000 **DRY**
-------------------------------------------------------------------------------
001:0027-----------------------------------------------------------------------
--------------------
| ADD HYD (CH2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 01:CH1         .00      .000   10.00  44.73    .000
               +ID2 04:EWROOF     8.50      .056   11.60  48.17    .000
               +ID3 08:102CH       .00      .000     .00    .00    .000 **DRY**
                ===================================================
                SUM 05:CH2        8.50      .056   11.60  48.17    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0028-----------------------------------------------------------------------
--------------------
| ADD HYD (PD2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 02:PD1       28.10     2.162    9.73  44.60    .000
               +ID2 09:102PD      1.30      .220    9.67  42.98    .000
                ===================================================
                SUM 06:PD2       29.40     2.309    9.70  44.53    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0029-----------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>06:(PD2   )   |
| OUT<07:(POND  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |    2.280  .2630E+00
                            .028  .1190E+00   |    4.686  .3620E+00
                            .311  .1530E+00   |    7.610  .4670E+00
                            .827  .1890E+00   |   11.693  .6020E+00
                           1.492  .2250E+00   |     .000  .0000E+00

     ROUTING RESULTS           AREA     QPEAK     TPEAK        R.V.
     -------------------       (ha)     (cms)     (hrs)        (mm)
     INFLOW >06: (PD2   )     29.40     2.309     9.700      44.526
     OUTFLOW<07: (POND  )     29.40     1.803     9.867      44.526
    OVERFLOW<08: (OVRFLW)       .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   78.088
                   TIME SHIFT OF PEAK FLOW         (min)=    10.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2401E+00

-------------------------------------------------------------------------------
001:0030-----------------------------------------------------------------------
--------------------
| ADD HYD (PNDOUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 07:POND      29.40     1.803    9.87  44.53    .000
               +ID2 08:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                ===================================================
                SUM 09:PNDOUT    29.40     1.803    9.87  44.53    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0031-----------------------------------------------------------------------
* 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
* 37.9 total site hectares.
--------------------
| ADD HYD (5YROUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 09:PNDOUT    29.40     1.803    9.87  44.53    .000
               +ID2 05:CH2        8.50      .056   11.60  48.17    .000
                ===================================================
                SUM 10:5YROUT    37.90     1.847    9.87  45.34    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0032-----------------------------------------------------------------------
* TOTAL is all flows from development site and argentia road
--------------------
| ADD HYD (TOTAL ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 03:MJ2         .00      .000     .00    .00    .000 **DRY**
               +ID2 10:5YROUT    37.90     1.847    9.87  45.34    .000
                ===================================================
                SUM 01:TOTAL     37.90     1.847    9.87  45.34    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0033-----------------------------------------------------------------------
---------------------
| CALIB NASHYD      |   Area    (ha)=    4.80   Curve Number   (CN)=70.00
| 02:100    DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .700

     Unit Hyd Qpeak  (cms)=     .262

     PEAK FLOW       (cms)=     .050 (i)
     TIME TO PEAK    (hrs)=   10.500
     RUNOFF VOLUME    (mm)=   11.802
     TOTAL RAINFALL   (mm)=   50.227
     RUNOFF COEFFICIENT   =     .235

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0034-----------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
 001:0009 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
   Simulation ended on 2012-05-16     at 14:58:07
===============================================================================
```

```
===========================================================================

 SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999  =========
 S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
 SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9 Ver. 4.02
     S   W W   M   M  H   H    Y    M   M  O   O       9999   9999 July 1999
 SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9 =========
                                                      9   9  9   9 # 2649264
      StormWater Management HYdrologic Model           999    999  =========

 **************************************************************************
 ************************** SWMHYMO-99 Ver/4.02 **************************
 *******  A single event and continuous hydrologic simulation model  *******
 *******     based on the principles of HYMO and its successors      *******
 *******                 OTTHYMO-83 and OTTHYMO-89.                  *******
 **************************************************************************
 ******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
 *******                  Ottawa,  Ontario: (613) 727-5199           *******
 *******                  Gatineau, Quebec: (819) 243-6858           *******
 *******                  E-Mail: swmhymo@jfsa.Com                   *******
 **************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++ Licensed user: Earth Tech Canada                            +++++++
 +++++++                London               SERIAL#:2649264         +++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 **************************************************************************
 *******            ++++++ PROGRAM ARRAY DIMENSIONS ++++++           *******
 *******            Maximum value for ID numbers  :     10           *******
 *******            Max. number of rainfall points:  15000           *******
 *******            Max. number of flow points    :  15000           *******
 **************************************************************************


 ******************   D E T A I L E D   O U T P U T   ******************
 **************************************************************************
 *      DATE: 2012-05-16     TIME: 14:58:49     RUN COUNTER: 002782      *
 **************************************************************************
 * Input   filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\5YR.DAT*
 * Output  filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\5YR.out*
 * Summary filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\5YR.sum*
 * User comments:                                                         *
 * 1:_____________________________________________________________________*
 * 2:_____________________________________________________________________*
 * 3:_____________________________________________________________________*
 **************************************************************************

-----------------------------------------------------------------------------
001:0001--------------------------------------------------------------------
*#**************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date         : 01-03-2012
*#  Modeller     : [DPG]
*#  Revision     : 02-15-2012
*#  Revised by   : [dpg]
*#  Company      : Earth Tech Canada
*#  License #    :  2649264
*#**************************************************************************
* Phase 1
--------------------
| START              |  Project  dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
--------------------  Rainfall dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
-----------------------------------------------------------------------------
001:0002--------------------------------------------------------------------
*#
*# 5-year design storm, City of Mississauga standards
*#
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 820.000
| Ptotal= 67.52 mm |                          B=   4.600
--------------------                          C=    .780
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  = 24.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =   .40

              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17    .632 |   6.17   1.401 |  12.17   2.537 |  18.17    .948
               .33    .641 |   6.33   1.457 |  12.33   2.407 |  18.33    .934
               .50    .650 |   6.50   1.519 |  12.50   2.290 |  18.50    .920
               .67    .660 |   6.67   1.587 |  12.67   2.186 |  18.67    .906
               .83    .669 |   6.83   1.663 |  12.83   2.092 |  18.83    .893
              1.00    .680 |   7.00   1.747 |  13.00   2.007 |  19.00    .881
              1.17    .690 |   7.17   1.841 |  13.17   1.929 |  19.17    .868
              1.33    .701 |   7.33   1.948 |  13.33   1.858 |  19.33    .857
              1.50    .712 |   7.50   2.071 |  13.50   1.792 |  19.50    .845
              1.67    .724 |   7.67   2.212 |  13.67   1.732 |  19.67    .834
              1.83    .736 |   7.83   2.377 |  13.83   1.676 |  19.83    .823
              2.00    .749 |   8.00   2.573 |  14.00   1.624 |  20.00    .813
              2.17    .762 |   8.17   2.811 |  14.17   1.575 |  20.17    .802
              2.33    .776 |   8.33   3.105 |  14.33   1.530 |  20.33    .792
              2.50    .790 |   8.50   3.479 |  14.50   1.487 |  20.50    .783
              2.67    .805 |   8.67   3.974 |  14.67   1.448 |  20.67    .773
              2.83    .820 |   8.83   4.663 |  14.83   1.410 |  20.83    .764
              3.00    .837 |   9.00   5.697 |  15.00   1.375 |  21.00    .755
              3.17    .854 |   9.17   7.440 |  15.17   1.341 |  21.17    .747
              3.33    .871 |   9.33  11.092 |  15.33   1.310 |  21.33    .738
              3.50    .890 |   9.50  24.603 |  15.50   1.280 |  21.50    .730
              3.67    .910 |   9.67 101.302 |  15.67   1.251 |  21.67    .722
              3.83    .930 |   9.83  28.708 |  15.83   1.224 |  21.83    .714
              4.00    .952 |  10.00  14.716 |  16.00   1.198 |  22.00    .707
              4.17    .975 |  10.17  10.118 |  16.17   1.174 |  22.17    .699
              4.33    .999 |  10.33   7.812 |  16.33   1.150 |  22.33    .692
              4.50   1.025 |  10.50   6.416 |  16.50   1.128 |  22.50    .685
              4.67   1.052 |  10.67   5.476 |  16.67   1.107 |  22.67    .678
              4.83   1.081 |  10.83   4.797 |  16.83   1.086 |  22.83    .671
              5.00   1.112 |  11.00   4.282 |  17.00   1.066 |  23.00    .664
              5.17   1.145 |  11.17   3.877 |  17.17   1.047 |  23.17    .658
              5.33   1.180 |  11.33   3.549 |  17.33   1.029 |  23.33    .652
              5.50   1.218 |  11.50   3.278 |  17.50   1.012 |  23.50    .645
              5.67   1.258 |  11.67   3.049 |  17.67    .995 |  23.67    .639
              5.83   1.302 |  11.83   2.854 |  17.83    .979 |  23.83    .633
              6.00   1.349 |  12.00   2.685 |  18.00    .963 |  24.00    .628

-----------------------------------------------------------------------------
001:0003--------------------------------------------------------------------
* Future North Site Development
---------------------
| CALIB STANDHYD     |   Area    (ha)=   17.30
| 01:000103 DT= 2.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     15.57          1.73
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    340.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=    101.30         20.97
                over (min)       6.00         22.00
     Storage Coeff.  (min)=      6.52 (ii)    21.59 (ii)
     Unit Hyd. Tpeak (min)=      6.00         22.00
     Unit Hyd. peak  (cms)=       .18           .05
                                                             *TOTALS*
     PEAK FLOW       (cms)=      3.36           .06           3.388 (iii)
     TIME TO PEAK    (hrs)=      9.70         10.00           9.700
     RUNOFF VOLUME    (mm)=     65.52         22.80          61.247
     TOTAL RAINFALL   (mm)=     67.52         67.52          67.518
     RUNOFF COEFFICIENT   =       .97           .34            .907

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
001:0004--------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>01:(000103)    |
| OUT<02:(NORTH )    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |    1.300  .3000E+00

     ROUTING RESULTS           AREA     QPEAK      TPEAK       R.V.
     -------------------       (ha)     (cms)      (hrs)       (mm)
     INFLOW >01: (000103)     17.30     3.388      9.700     61.247
     OUTFLOW<02: (NORTH )     17.30     1.274      9.933     61.247
    OVERFLOW<03: (OVRFLW)       .00      .000       .000       .000

              TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
              CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
              PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


              PEAK   FLOW   REDUCTION [Qout/Qin](%)=    37.608
              TIME SHIFT OF PEAK FLOW         (min)=     14.00
              MAXIMUM  STORAGE   USED       (ha.m.)=.2945E+00

-----------------------------------------------------------------------------
001:0005--------------------------------------------------------------------
--------------------
| ADD HYD (N1    ) | ID: NHYD       AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                 (ha)     (cms)   (hrs)   (mm)   (cms)
              ID1 02:NORTH      17.30     1.274    9.93  61.25    .000
             +ID2 03:OVRFLW       .00      .000     .00    .00    .000 **DRY**
              ==============================================
              SUM 04:N1         17.30     1.274    9.93  61.25    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0006--------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD     |    Average inlet capacities   [CINLET] =   3.649  (cms)
| TotalHyd 04:N1      |    Number of inlets in system [NINLET] =       1
---------------------      Total minor system capacity         =   3.649  (cms)
                           Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA      QPEAK      TPEAK      R.V.       DWF
                                  (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   04:N1          17.30      1.274      9.933    61.247      .000
     ====================================================================
     MAJOR SYST   05:103MJ         .00       .000       .000      .000      .000
     MINOR SYST   06:103MN       17.30      1.274      9.933    61.247      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0007--------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD     |    Average inlet capacities   [CINLET] =    .928  (cms)
| TotalHyd 06:103MN   |    Number of inlets in system [NINLET] =       1
---------------------      Total minor system capacity         =    .928  (cms)
                           Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA      QPEAK      TPEAK      R.V.       DWF
                                  (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   06:103MN       17.30      1.274      9.933    61.247      .000
     ====================================================================
     MAJOR SYST   07:103CH         .90       .346      9.933    61.247      .000
     MINOR SYST   08:103PD       16.40       .928      9.733    61.247      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0008--------------------------------------------------------------------
* Prologis Park Development
---------------------
| CALIB STANDHYD     |   Area    (ha)=   10.80
| 09:000101 DT= 2.00 |   Total Imp(%)=   89.00   Dir. Conn.(%)=   89.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      9.61          1.19
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    260.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=    101.30         22.42
                over (min)       6.00         20.00
     Storage Coeff.  (min)=      5.55 (ii)    20.23 (ii)
     Unit Hyd. Tpeak (min)=      6.00         20.00
     Unit Hyd. peak  (cms)=       .20           .06
                                                             *TOTALS*
     PEAK FLOW       (cms)=      2.17           .04           2.192 (iii)
     TIME TO PEAK    (hrs)=      9.70          9.97           9.700
     RUNOFF VOLUME    (mm)=     65.52         22.80          60.820
     TOTAL RAINFALL   (mm)=     67.52         67.52          67.518
     RUNOFF COEFFICIENT   =       .97           .34            .901

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
001:0009--------------------------------------------------------------------
*Route Reservoir placed as a holder if needed, otherwise leave empty
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>09:(000101)    |
| OUT<10:(SOUTH )    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .000  .0000E+00

     ROUTING RESULTS           AREA     QPEAK      TPEAK       R.V.
     -------------------       (ha)     (cms)      (hrs)       (mm)
     INFLOW >09: (000101)     10.80     2.192      9.700     60.820
     OUTFLOW<10: (SOUTH )       .00      .000       .000       .000
    OVERFLOW<01: (OVRFLW)     10.80     2.182      9.700     60.820

              TOTAL NUMBER OF SIMULATED OVERFLOWS  =         1
              CUMULATIVE TIME OF OVERFLOWS  (hours)=     25.17
              PERCENTAGE OF TIME OVERFLOWING    (%)=     89.99


              PEAK   FLOW   REDUCTION [Qout/Qin](%)=      .000
              TIME SHIFT OF PEAK FLOW         (min)=   -582.00
              MAXIMUM  STORAGE   USED       (ha.m.)=.0000E+00

      *** WARNING: Outflow volume is less than inflow volume.
-----------------------------------------------------------------------------
```

```
001:0010------------------------------------------------------------------------
--------------------
| ADD HYD (S1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 10:SOUTH       .00      .000     .00    .00    .000
                +ID2 01:OVRFLW    10.80     2.182    9.70  60.82    .000
                 ======================================================
                 SUM 02:S1        10.80     2.182    9.70  60.82    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0011------------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD     |    Average inlet capacities   [CINLET] =    2.762  (cms)
| TotalHyd 02:S1      |    Number of inlets in system [NINLET] =      1
----------------------     Total minor system capacity         =    2.762  (cms)
                           Total major system storage [TMJSTO] =        0.(cu.m.)

                  ID: NHYD         AREA     QPEAK      TPEAK      R.V.      DWF
                                   (ha)     (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   02:S1           10.80     2.182      9.700    60.820     .000
     =========================================================================
     MAJOR SYST   03:101MJ          .00      .000       .000      .000     .000
     MINOR SYST   04:101MN        10.80     2.182      9.700    60.820     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0012------------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD     |    Average inlet capacities   [CINLET] =    1.557  (cms)
| TotalHyd 04:101MN   |    Number of inlets in system [NINLET] =      1
----------------------     Total minor system capacity         =    1.557  (cms)
                           Total major system storage [TMJSTO] =        0.(cu.m.)

                  ID: NHYD         AREA     QPEAK      TPEAK      R.V.      DWF
                                   (ha)     (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   04:101MN        10.80     2.182      9.700    60.820     .000
     =========================================================================
     MAJOR SYST   06:101CH          .42      .625      9.700    60.820     .000
     MINOR SYST   09:101PD        10.38     1.557      9.633    60.820     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0013------------------------------------------------------------------------
--------------------
| ADD HYD (MJ1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 05:103MJ       .00      .000     .00    .00    .000 **DRY**
                +ID2 03:101MJ       .00      .000     .00    .00    .000 **DRY**
                 ======================================================
                 SUM 10:MJ1         .00      .000     .00    .00    .000 **DRY**
--------------------------------------------------------------------------------
001:0014------------------------------------------------------------------------
--------------------
| ADD HYD (CH1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:103CH       .90      .346    9.93  61.25    .000
                +ID2 06:101CH       .42      .625    9.70  60.82    .000
                 ======================================================
                 SUM 01:CH1        1.32      .625    9.70  61.11    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0015------------------------------------------------------------------------
--------------------
| ADD HYD (PD1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:103PD     16.40      .928    9.73  61.25    .000
                +ID2 09:101PD     10.38     1.557    9.63  60.82    .000
                 ======================================================
                 SUM 02:PD1       26.78     2.485    9.73  61.08    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0016------------------------------------------------------------------------
* East Roof
----------------------
| CALIB STANDHYD      |   Area    (ha)=    3.50
| 03:000105 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.46          .03
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     150.00        50.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=     101.30        88.28
                over (min)        4.00        12.00
     Storage Coeff.  (min)=       3.99 (ii)   12.47 (ii)
     Unit Hyd. Tpeak (min)=       4.00        12.00
     Unit Hyd. peak  (cms)=        .28          .09
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .89          .01          .895 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.80         9.667
     RUNOFF VOLUME    (mm)=      65.52        60.05        65.464
     TOTAL RAINFALL   (mm)=      67.52        67.52        67.518
     RUNOFF COEFFICIENT   =        .97          .89          .970

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
001:0017------------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>03:(000105)    |
| OUT<04:(EASTRF)    |    =========  OUTFLOW STORAGE TABLE  =========
---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000   .0000E+00   |    .060   .2800E+00

     ROUTING RESULTS             AREA      QPEAK      TPEAK         R.V.
     --------------------        (ha)      (cms)      (hrs)         (mm)
     INFLOW >03: (000105)        3.50       .895      9.667       65.464
     OUTFLOW<04: (EASTRF)        3.50       .032     11.533       65.463
    OVERFLOW<05: (OVRFLW)         .00       .000       .000         .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=     3.559
                  TIME SHIFT OF PEAK FLOW         (min)=   112.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1486E+00

--------------------------------------------------------------------------------
001:0018------------------------------------------------------------------------
--------------------
| ADD HYD (E1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 04:EASTRF     3.50      .032   11.53  65.46    .000
                +ID2 05:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 ======================================================
                 SUM 06:E1         3.50      .032   11.53  65.46    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0019------------------------------------------------------------------------
* West Roof
----------------------
| CALIB STANDHYD      |   Area    (ha)=    5.00
| 07:000104 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.95          .05
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     180.00        50.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=     101.30        79.75
                over (min)        4.00        14.00
     Storage Coeff.  (min)=       4.45 (ii)   13.29 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=        .26          .08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.24          .01         1.247 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.83         9.667
     RUNOFF VOLUME    (mm)=      65.52        60.05        65.464
     TOTAL RAINFALL   (mm)=      67.52        67.52        67.518
     RUNOFF COEFFICIENT   =        .97          .89          .970

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
001:0020------------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>07:(000104)    |
| OUT<08:(WESTRF)    |    =========  OUTFLOW STORAGE TABLE  =========
---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000   .0000E+00   |    .080   .3900E+00

     ROUTING RESULTS             AREA      QPEAK      TPEAK         R.V.
     --------------------        (ha)      (cms)      (hrs)         (mm)
     INFLOW >07: (000104)        5.00      1.247      9.667       65.464
     OUTFLOW<08: (WESTRF)        5.00       .044     11.600       65.463
    OVERFLOW<09: (OVRFLW)         .00       .000       .000         .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=     3.517
                  TIME SHIFT OF PEAK FLOW         (min)=   116.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.2138E+00

--------------------------------------------------------------------------------
001:0021------------------------------------------------------------------------
--------------------
| ADD HYD (W1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:WESTRF     5.00      .044   11.60  65.46    .000
                +ID2 09:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 ======================================================
                 SUM 03:W1         5.00      .044   11.60  65.46    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0022------------------------------------------------------------------------
--------------------
| ADD HYD (EWROOF) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 06:E1         3.50      .032   11.53  65.46    .000
                +ID2 03:W1         5.00      .044   11.60  65.46    .000
                 ======================================================
                 SUM 04:EWROOF     8.50      .076   11.57  65.46    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0023------------------------------------------------------------------------
* Argentia Road Extension
----------------------
| CALIB STANDHYD      |   Area    (ha)=    1.30
| 05:000102 DT= 2.00 |   Total Imp(%)=   85.00   Dir. Conn.(%)=   85.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11          .19
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=      90.00        50.00
     Mannings n          =        .013         .250

     Max.eff.Inten.(mm/hr)=     101.30        23.51
                over (min)        2.00        18.00
     Storage Coeff.  (min)=       2.94 (ii)   17.34 (ii)
     Unit Hyd. Tpeak (min)=       2.00        18.00
     Unit Hyd. peak  (cms)=        .42          .06
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .30          .01          .306 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.90         9.667
     RUNOFF VOLUME    (mm)=      65.52        22.81        59.112
     TOTAL RAINFALL   (mm)=      67.52        67.52        67.518
     RUNOFF COEFFICIENT   =        .97          .34          .875

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
001:0024------------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD     |    Average inlet capacities   [CINLET] =     .383  (cms)
| TotalHyd 05:000102 |    Number of inlets in system [NINLET] =      1
----------------------     Total minor system capacity         =     .383  (cms)
                           Total major system storage [TMJSTO] =        0.(cu.m.)

                  ID: NHYD         AREA     QPEAK      TPEAK      R.V.      DWF
                                   (ha)     (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   05:000102        1.30      .306      9.667    59.112     .000
     =========================================================================
     MAJOR SYST   06:102MJ          .00      .000       .000      .000     .000
     MINOR SYST   07:102MN         1.30      .306      9.667    59.112     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0025------------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD     |    Average inlet capacities   [CINLET] =     .220  (cms)
| TotalHyd 07:102MN   |    Number of inlets in system [NINLET] =      1
```

```
---------------------   Total minor system capacity        =    .220  (cms)
                        Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                 (ha)     (cms)     (hrs)     (mm)    (cms)
     TOTAL HYD.   07:102MN       1.30      .306     9.667   59.112     .000
     ======================================================================
     MAJOR SYST   08:102CH        .05      .086     9.667   59.112     .000
     MINOR SYST   09:102PD       1.25      .220     9.567   59.112     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0026-----------------------------------------------------------------------
--------------------
| ADD HYD (MJ2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------             (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 10:MJ1        .00      .000     .00     .00    .000 **DRY**
               +ID2 06:102MJ      .00      .000     .00     .00    .000 **DRY**
                ==========================================================
                SUM 03:MJ2        .00      .000     .00     .00    .000 **DRY**
-------------------------------------------------------------------------------
001:0027-----------------------------------------------------------------------
--------------------
| ADD HYD (CH2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------             (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 01:CH1       1.32      .625    9.70  61.11    .000
               +ID2 04:EWROOF    8.50      .076   11.57  65.46    .000
               +ID3 08:102CH      .05      .086    9.67  59.11    .000
                ==========================================================
                SUM 05:CH2       9.88      .673    9.70  64.85    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0028-----------------------------------------------------------------------
--------------------
| ADD HYD (PD2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------             (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 02:PD1      26.78     2.485    9.73  61.08    .000
               +ID2 09:102PD     1.25      .220    9.57  59.11    .000
                ==========================================================
                SUM 06:PD2      28.02     2.633    9.73  60.99    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0029-----------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |     Requested routing time step =  2.0 min.
|  IN>06:(PD2   )   |
| OUT<07:(POND  )   |     =========  OUTFLOW STORAGE TABLE  =========
---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |   (cms)     (ha.m.)
                             .000  .0000E+00   |    2.280  .2630E+00
                             .028  .1190E+00   |    4.686  .3620E+00
                             .311  .1530E+00   |    7.610  .4670E+00
                             .827  .1890E+00   |   11.693  .6020E+00
                            1.492  .2250E+00   |     .000  .0000E+00

     ROUTING RESULTS             AREA     QPEAK     TPEAK        R.V.
     -------------------         (ha)     (cms)     (hrs)        (mm)
     INFLOW >06: (PD2   )       28.02     2.633     9.733      60.994
     OUTFLOW<07: (POND  )       28.02     2.239     9.867      60.993
    OVERFLOW<08: (OVRFLW)         .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   85.029
                   TIME SHIFT OF PEAK FLOW          (min)=     8.00
                   MAXIMUM  STORAGE   USED        (ha.m.)=.2616E+00

-------------------------------------------------------------------------------
001:0030-----------------------------------------------------------------------
--------------------
| ADD HYD (PNDOUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------             (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 07:POND     28.02     2.239    9.87  60.99    .000
               +ID2 08:OVRFLW     .00      .000     .00     .00    .000 **DRY**
                ==========================================================
                SUM 09:PNDOUT   28.02     2.239    9.87  60.99    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0031-----------------------------------------------------------------------
* 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
* 37.9 total site hectares.
--------------------
| ADD HYD (5YROUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------             (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 09:PNDOUT   28.02     2.239    9.87  60.99    .000
               +ID2 05:CH2       9.88      .673    9.70  64.85    .000
                ==========================================================
                SUM 10:5YROUT   37.90     2.614    9.87  62.00    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0032-----------------------------------------------------------------------
* TOTAL is all flows from development site and argentia road
--------------------
| ADD HYD (TOTAL ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------             (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 03:MJ2        .00      .000     .00     .00    .000 **DRY**
               +ID2 10:5YROUT   37.90     2.614    9.87  62.00    .000
                ==========================================================
                SUM 01:TOTAL    37.90     2.614    9.87  62.00    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0033-----------------------------------------------------------------------
----------------------
| CALIB NASHYD       |    Area    (ha)=    4.80   Curve Number   (CN)=70.00
| 02:100    DT= 2.00 |    Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------    U.H. Tp(hrs)=    .700

     Unit Hyd Qpeak  (cms)=     .262

     PEAK FLOW       (cms)=     .095 (i)
     TIME TO PEAK    (hrs)=   10.467
     RUNOFF VOLUME    (mm)=   21.039
     TOTAL RAINFALL   (mm)=   67.518
     RUNOFF COEFFICIENT   =     .312

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0034-----------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
 001:0009 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
   Simulation ended on 2012-05-16     at 14:58:49
===============================================================================
```

```
==============================================================================

 SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999  =========
 S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
 SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9 Ver. 4.02
     S   W W   M   M  H   H    Y    M   M  O   O       9999   9999 July 1999
 SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9 =========
                                                      9   9  9   9 # 2649264
      StormWater Management HYdrologic Model           999    999  =========

 **************************************************************************
 ************************** SWMHYMO-99 Ver/4.02 **************************
 *******  A single event and continuous hydrologic simulation model  *******
 *******     based on the principles of HYMO and its successors      *******
 *******                OTTHYMO-83 and OTTHYMO-89.                   *******
 **************************************************************************
 ******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
 *******                  Ottawa,  Ontario: (613) 727-5199           *******
 *******                  Gatineau, Quebec: (819) 243-6858           *******
 *******                  E-Mail: swmhymo@jfsa.Com                   *******
 **************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++ Licensed user: Earth Tech Canada                           +++++++
 +++++++                London              SERIAL#:2649264         +++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 **************************************************************************
 *******          ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *******
 *******          Maximum value for ID numbers  :     10            *******
 *******          Max. number of rainfall points:  15000            *******
 *******          Max. number of flow points    :  15000            *******
 **************************************************************************


 ********************   D E T A I L E D   O U T P U T   *******************
 **************************************************************************
 *       DATE: 2012-05-16     TIME: 14:53:09     RUN COUNTER: 002776       *
 **************************************************************************
 * Input   filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\10YR.DA*
 * Output  filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\10YR.ou*
 * Summary filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\10YR.su*
 * User comments:                                                          *
 * 1:______________________________________________________________________*
 * 2:______________________________________________________________________*
 * 3:______________________________________________________________________*
 **************************************************************************

--------------------------------------------------------------------------------
001:0001------------------------------------------------------------------------
*#*******************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date         : 01-03-2012
*#  Modeller     : [DPG]
*#  Revision     : 02-15-2012
*#  Revised by   : [dpg]
*#  Company      : Earth Tech Canada
*#  License #    :  2649264
*#*******************************************************************************
* Phase 1
--------------------
| START             |  Project  dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
--------------------  Rainfall dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
--------------------------------------------------------------------------------
001:0002------------------------------------------------------------------------
*#
*# 10-year design storm, City of Mississauga standards
*#
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1010.000
| Ptotal= 83.16 mm |                          B=   4.600
--------------------                          C=    .780
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  = 24.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =   .40

              TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
               .17    .778 |  6.17   1.726 | 12.17   3.125 | 18.17   1.168
               .33    .789 |  6.33   1.795 | 12.33   2.964 | 18.33   1.150
               .50    .801 |  6.50   1.871 | 12.50   2.821 | 18.50   1.133
               .67    .812 |  6.67   1.955 | 12.67   2.693 | 18.67   1.116
               .83    .825 |  6.83   2.048 | 12.83   2.577 | 18.83   1.100
              1.00    .837 |  7.00   2.151 | 13.00   2.472 | 19.00   1.085
              1.17    .850 |  7.17   2.268 | 13.17   2.376 | 19.17   1.070
              1.33    .863 |  7.33   2.400 | 13.33   2.288 | 19.33   1.055
              1.50    .877 |  7.50   2.550 | 13.50   2.208 | 19.50   1.041
              1.67    .892 |  7.67   2.724 | 13.67   2.133 | 19.67   1.027
              1.83    .907 |  7.83   2.928 | 13.83   2.064 | 19.83   1.014
              2.00    .922 |  8.00   3.170 | 14.00   2.000 | 20.00   1.001
              2.17    .939 |  8.17   3.462 | 14.17   1.940 | 20.17    .988
              2.33    .955 |  8.33   3.824 | 14.33   1.884 | 20.33    .976
              2.50    .973 |  8.50   4.286 | 14.50   1.832 | 20.50    .964
              2.67    .991 |  8.67   4.895 | 14.67   1.783 | 20.67    .953
              2.83   1.011 |  8.83   5.744 | 14.83   1.737 | 20.83    .941
              3.00   1.031 |  9.00   7.016 | 15.00   1.693 | 21.00    .930
              3.17   1.051 |  9.17   9.163 | 15.17   1.652 | 21.17    .920
              3.33   1.073 |  9.33  13.662 | 15.33   1.613 | 21.33    .909
              3.50   1.096 |  9.50  30.304 | 15.50   1.576 | 21.50    .899
              3.67   1.121 |  9.67 124.775 | 15.67   1.541 | 21.67    .889
              3.83   1.146 |  9.83  35.360 | 15.83   1.508 | 21.83    .880
              4.00   1.173 | 10.00  18.126 | 16.00   1.476 | 22.00    .870
              4.17   1.201 | 10.17  12.462 | 16.17   1.446 | 22.17    .861
              4.33   1.231 | 10.33   9.622 | 16.33   1.417 | 22.33    .852
              4.50   1.262 | 10.50   7.903 | 16.50   1.389 | 22.50    .843
              4.67   1.296 | 10.67   6.745 | 16.67   1.363 | 22.67    .835
              4.83   1.332 | 10.83   5.909 | 16.83   1.338 | 22.83    .827
              5.00   1.369 | 11.00   5.274 | 17.00   1.313 | 23.00    .818
              5.17   1.410 | 11.17   4.775 | 17.17   1.290 | 23.17    .810
              5.33   1.453 | 11.33   4.371 | 17.33   1.268 | 23.33    .803
              5.50   1.500 | 11.50   4.037 | 17.50   1.246 | 23.50    .795
              5.67   1.550 | 11.67   3.756 | 17.67   1.226 | 23.67    .788
              5.83   1.604 | 11.83   3.516 | 17.83   1.206 | 23.83    .780
              6.00   1.662 | 12.00   3.307 | 18.00   1.187 | 24.00    .773

--------------------------------------------------------------------------------
001:0003------------------------------------------------------------------------
* Future North Site Development
----------------------
| CALIB STANDHYD      |   Area    (ha)=   17.30
| 01:000103 DT= 2.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      15.57          1.73
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=        .50          2.00
     Length            (m)=     340.00         50.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=     124.77         34.32
               over (min)       6.00          18.00
     Storage Coeff.  (min)=       6.00 (ii)    18.38 (ii)
     Unit Hyd. Tpeak (min)=       6.00         18.00
     Unit Hyd. peak  (cms)=        .19           .06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       4.24           .10         4.296 (iii)
     TIME TO PEAK    (hrs)=       9.70          9.90         9.700
     RUNOFF VOLUME    (mm)=      81.16         32.66        76.313
     TOTAL RAINFALL   (mm)=      83.16         83.16        83.163
     RUNOFF COEFFICIENT   =        .98           .39          .918

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
001:0004------------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>01:(000103)   |
| OUT<02:(NORTH )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .000  .0000E+00    |   1.300  .3000E+00

     ROUTING RESULTS           AREA     QPEAK     TPEAK       R.V.
     --------------------      (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (000103)     17.30     4.296     9.700     76.313
     OUTFLOW<02: (NORTH )     16.16     1.300     9.767     76.313
    OVERFLOW<03: (OVRFLW)      1.14     2.349     9.767     76.313

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        2
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .20
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .65


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   30.258
                   TIME SHIFT OF PEAK FLOW         (min)=     4.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2982E+00

--------------------------------------------------------------------------------
001:0005------------------------------------------------------------------------
--------------------
| ADD HYD (N1    ) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 02:NORTH      16.16     1.300    9.77  76.31    .000
                +ID2 03:OVRFLW      1.14     2.349    9.77  76.31    .000
                 ==================================================
                 SUM 04:N1         17.30     3.649    9.77  76.31    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0006------------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD    |    Average inlet capacities   [CINLET] =   3.649  (cms)
| TotalHyd 04:N1     |    Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity         =   3.649  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD         AREA      QPEAK     TPEAK      R.V.      DWF
                                  (ha)      (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   04:N1          17.30      3.649     9.767    76.313      .000
     ======================================================================
     MAJOR SYST   05:103MJ         .00       .000     9.767    76.313      .000
     MINOR SYST   06:103MN       17.30      3.649     9.767    76.313      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0007------------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD    |    Average inlet capacities   [CINLET] =    .928  (cms)
| TotalHyd 06:103MN  |    Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity         =    .928  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD         AREA      QPEAK     TPEAK      R.V.      DWF
                                  (ha)      (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   06:103MN       17.30      3.649     9.767    76.313      .000
     ======================================================================
     MAJOR SYST   07:103CH        2.15      2.721     9.767    76.313      .000
     MINOR SYST   08:103PD       15.15       .928     9.700    76.313      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0008------------------------------------------------------------------------
* Prologis Park Development
----------------------
| CALIB STANDHYD      |   Area    (ha)=   10.80
| 09:000101 DT= 2.00 |   Total Imp(%)=   89.00   Dir. Conn.(%)=   89.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       9.61          1.19
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=        .50          2.00
     Length            (m)=     260.00         50.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=     124.77         34.32
               over (min)       6.00          18.00
     Storage Coeff.  (min)=       5.11 (ii)    17.48 (ii)
     Unit Hyd. Tpeak (min)=       6.00         18.00
     Unit Hyd. peak  (cms)=        .21           .06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       2.73           .07         2.766 (iii)
     TIME TO PEAK    (hrs)=       9.70          9.90         9.700
     RUNOFF VOLUME    (mm)=      81.16         32.66        75.828
     TOTAL RAINFALL   (mm)=      83.16         83.16        83.163
     RUNOFF COEFFICIENT   =        .98           .39          .912

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
001:0009------------------------------------------------------------------------
*Route Reservoir placed as a holder if needed, otherwise leave empty
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>09:(000101)   |
| OUT<10:(SOUTH )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .000  .0000E+00    |    .000  .0000E+00

     ROUTING RESULTS           AREA     QPEAK     TPEAK       R.V.
     --------------------      (ha)     (cms)     (hrs)       (mm)
     INFLOW >09: (000101)     10.80     2.766     9.700     75.828
     OUTFLOW<10: (SOUTH )       .00      .000      .000       .000
    OVERFLOW<01: (OVRFLW)     10.80     2.762     9.700     75.828

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        1
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=    25.23
                   PERCENTAGE OF TIME OVERFLOWING    (%)=    91.54


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=     .000
                   TIME SHIFT OF PEAK FLOW         (min)=  -582.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.1421E-09

      *** WARNING: Outflow volume is less than inflow volume.
--------------------------------------------------------------------------------
```

```
001:0010-----------------------------------------------------------------------
--------------------
| ADD HYD (S1    ) | ID: NHYD     AREA    QPEAK  TPEAK  R.V.   DWF
--------------------               (ha)    (cms)  (hrs)  (mm)  (cms)
                 ID1 10:SOUTH       .00     .000    .00   .00   .000
                +ID2 01:OVRFLW    10.80    2.762   9.70 75.83   .000
                 ====================================================
                 SUM 02:S1        10.80    2.762   9.70 75.83   .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0011-----------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   2.762  (cms)
| TotalHyd 02:S1     |   Number of inlets in system [NINLET] =      1
---------------------    Total minor system capacity         =   2.762  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD       AREA     QPEAK     TPEAK      R.V.      DWF
                                 (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   02:S1         10.80     2.762     9.700    75.828     .000
     ======================================================================
     MAJOR SYST   03:101MJ        .00      .000     9.700    75.828     .000
     MINOR SYST   04:101MN      10.80     2.762     9.700    75.828     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0012-----------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   1.557  (cms)
| TotalHyd 04:101MN  |   Number of inlets in system [NINLET] =      1
---------------------    Total minor system capacity         =   1.557  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD       AREA     QPEAK     TPEAK      R.V.      DWF
                                 (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   04:101MN      10.80     2.762     9.700    75.828     .000
     ======================================================================
     MAJOR SYST   06:101CH        .83     1.205     9.700    75.828     .000
     MINOR SYST   09:101PD       9.97     1.557     9.600    75.828     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0013-----------------------------------------------------------------------
--------------------
| ADD HYD (MJ1   ) | ID: NHYD     AREA    QPEAK  TPEAK  R.V.   DWF
--------------------               (ha)    (cms)  (hrs)  (mm)  (cms)
                 ID1 05:103MJ       .00     .000   9.77 76.31   .000
                +ID2 03:101MJ       .00     .000   9.70 75.83   .000
                 ====================================================
                 SUM 10:MJ1         .00     .000   9.77 76.17   .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0014-----------------------------------------------------------------------
--------------------
| ADD HYD (CH1   ) | ID: NHYD     AREA    QPEAK  TPEAK  R.V.   DWF
--------------------               (ha)    (cms)  (hrs)  (mm)  (cms)
                 ID1 07:103CH      2.15    2.721   9.77 76.31   .000
                +ID2 06:101CH       .83    1.205   9.70 75.83   .000
                 ====================================================
                 SUM 01:CH1        2.98    3.436   9.77 76.18   .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0015-----------------------------------------------------------------------
--------------------
| ADD HYD (PD1   ) | ID: NHYD     AREA    QPEAK  TPEAK  R.V.   DWF
--------------------               (ha)    (cms)  (hrs)  (mm)  (cms)
                 ID1 08:103PD     15.15     .928   9.70 76.31   .000
                +ID2 09:101PD      9.97    1.557   9.60 75.83   .000
                 ====================================================
                 SUM 02:PD1       25.12    2.485   9.70 76.12   .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0016-----------------------------------------------------------------------
* East Roof
---------------------
| CALIB STANDHYD     |   Area    (ha)=    3.50
| 03:000105 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.46          .03
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=       .50         2.00
     Length            (m)=    150.00        50.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    124.77       109.15
                over (min)       4.00        12.00
     Storage Coeff.  (min)=      3.67 (ii)   11.46 (ii)
     Unit Hyd. Tpeak (min)=      4.00        12.00
     Unit Hyd. peak  (cms)=       .29          .10
                                                       *TOTALS*
     PEAK FLOW       (cms)=      1.11          .01       1.120 (iii)
     TIME TO PEAK    (hrs)=      9.67         9.80       9.667
     RUNOFF VOLUME    (mm)=     81.16        75.68      81.108
     TOTAL RAINFALL   (mm)=     83.16        83.16      83.163
     RUNOFF COEFFICIENT   =       .98          .91        .975

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0017-----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |   Requested routing time step =  2.0 min.
|  IN>03:(000105)    |
| OUT<04:(EASTRF)    |   =========  OUTFLOW STORAGE TABLE  =========
--------------------     OUTFLOW   STORAGE   |  OUTFLOW   STORAGE
                           (cms)    (ha.m.)  |    (cms)    (ha.m.)
                            .000  .0000E+00  |     .060  .2800E+00

     ROUTING RESULTS           AREA     QPEAK      TPEAK        R.V.
     -------------------       (ha)     (cms)      (hrs)        (mm)
     INFLOW >03: (000105)      3.50     1.120      9.667      81.108
      OUTFLOW<04: (EASTRF)     3.50      .039     11.500      81.107
    OVERFLOW<05: (OVRFLW)       .00      .000       .000        .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    3.518
                    TIME SHIFT OF PEAK FLOW         (min)=   110.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.1839E+00

-------------------------------------------------------------------------------
001:0018-----------------------------------------------------------------------
--------------------
| ADD HYD (E1    ) | ID: NHYD     AREA    QPEAK  TPEAK  R.V.   DWF
--------------------               (ha)    (cms)  (hrs)  (mm)  (cms)
                 ID1 04:EASTRF     3.50     .039  11.50 81.11   .000
                +ID2 05:OVRFLW      .00     .000    .00   .00   .000 **DRY**
                 ====================================================
                 SUM 06:E1         3.50     .039  11.50 81.11   .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0019-----------------------------------------------------------------------
* West Roof
---------------------
| CALIB STANDHYD     |   Area    (ha)=    5.00
| 07:000104 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.95          .05
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=       .50         2.00
     Length            (m)=    180.00        50.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    124.77       109.15
                over (min)       4.00        12.00
     Storage Coeff.  (min)=      4.10 (ii)   11.89 (ii)
     Unit Hyd. Tpeak (min)=      4.00        12.00
     Unit Hyd. peak  (cms)=       .28          .09
                                                       *TOTALS*
     PEAK FLOW       (cms)=      1.56          .01       1.566 (iii)
     TIME TO PEAK    (hrs)=      9.67         9.80       9.667
     RUNOFF VOLUME    (mm)=     81.16        75.68      81.108
     TOTAL RAINFALL   (mm)=     83.16        83.16      83.163
     RUNOFF COEFFICIENT   =       .98          .91        .975

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0020-----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |   Requested routing time step =  2.0 min.
|  IN>07:(000104)    |
| OUT<08:(WESTRF)    |   =========  OUTFLOW STORAGE TABLE  =========
--------------------     OUTFLOW   STORAGE   |  OUTFLOW   STORAGE
                           (cms)    (ha.m.)  |    (cms)    (ha.m.)
                            .000  .0000E+00  |     .080  .3900E+00

     ROUTING RESULTS           AREA     QPEAK      TPEAK        R.V.
     -------------------       (ha)     (cms)      (hrs)        (mm)
     INFLOW >07: (000104)      5.00     1.566      9.667      81.108
      OUTFLOW<08: (WESTRF)     5.00      .054     11.567      81.107
    OVERFLOW<09: (OVRFLW)       .00      .000       .000        .000

                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    3.466
                    TIME SHIFT OF PEAK FLOW         (min)=   114.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.2645E+00

-------------------------------------------------------------------------------
001:0021-----------------------------------------------------------------------
--------------------
| ADD HYD (W1    ) | ID: NHYD     AREA    QPEAK  TPEAK  R.V.   DWF
--------------------               (ha)    (cms)  (hrs)  (mm)  (cms)
                 ID1 08:WESTRF     5.00     .054  11.57 81.11   .000
                +ID2 09:OVRFLW      .00     .000    .00   .00   .000 **DRY**
                 ====================================================
                 SUM 03:W1         5.00     .054  11.57 81.11   .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0022-----------------------------------------------------------------------
--------------------
| ADD HYD (EWROOF) | ID: NHYD     AREA    QPEAK  TPEAK  R.V.   DWF
--------------------               (ha)    (cms)  (hrs)  (mm)  (cms)
                 ID1 06:E1         3.50     .039  11.50 81.11   .000
                +ID2 03:W1         5.00     .054  11.57 81.11   .000
                 ====================================================
                 SUM 04:EWROOF     8.50     .094  11.53 81.11   .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0023-----------------------------------------------------------------------
* Argentia Road Extension
---------------------
| CALIB STANDHYD     |   Area    (ha)=    1.30
| 05:000102 DT= 2.00 |   Total Imp(%)=   85.00   Dir. Conn.(%)=   85.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.11          .19
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=       .50         2.00
     Length            (m)=     90.00        50.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    124.77        39.13
                over (min)       2.00        14.00
     Storage Coeff.  (min)=      2.70 (ii)   14.45 (ii)
     Unit Hyd. Tpeak (min)=      2.00        14.00
     Unit Hyd. peak  (cms)=       .44          .08
                                                       *TOTALS*
     PEAK FLOW       (cms)=       .38          .01        .383 (iii)
     TIME TO PEAK    (hrs)=      9.67         9.83       9.667
     RUNOFF VOLUME    (mm)=     81.16        32.67      73.888
     TOTAL RAINFALL   (mm)=     83.16        83.16      83.163
     RUNOFF COEFFICIENT   =       .98          .39        .888

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0024-----------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .383  (cms)
| TotalHyd 05:000102 |   Number of inlets in system [NINLET] =      1
---------------------    Total minor system capacity         =    .383  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD       AREA     QPEAK     TPEAK      R.V.      DWF
                                 (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   05:000102      1.30      .383     9.667    73.888     .000
     ======================================================================
     MAJOR SYST   06:102MJ        .00      .000      .000      .000     .000
     MINOR SYST   07:102MN       1.30      .383     9.667    73.888     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0025-----------------------------------------------------------------------
*Split out 2 year flow
```

```
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .220  (cms)
| TotalHyd 07:102MN  |   Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity        =    .220  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA      QPEAK      TPEAK      R.V.       DWF
                                 (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   07:102MN       1.30       .383      9.667    73.888      .000
     =========================================================================
     MAJOR SYST   08:102CH        .10       .163      9.667    73.888      .000
     MINOR SYST   09:102PD       1.20       .220      9.533    73.888      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0026-----------------------------------------------------------------------
--------------------
| ADD HYD (MJ2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 10:MJ1        .00      .000    9.77  76.17    .000
                +ID2 06:102MJ      .00      .000     .00    .00    .000 **DRY**
                 ===================================================
                 SUM 03:MJ2        .00      .000    9.77  76.17    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0027-----------------------------------------------------------------------
--------------------
| ADD HYD (CH2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 01:CH1       2.98     3.436    9.77  76.18    .000
                +ID2 04:EWROOF    8.50      .094   11.53  81.11    .000
                +ID3 08:102CH      .10      .163    9.67  73.89    .000
                 ===================================================
                 SUM 05:CH2      11.58     3.506    9.77  79.78    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0028-----------------------------------------------------------------------
--------------------
| ADD HYD (PD2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 02:PD1      25.12     2.485    9.70  76.12    .000
                +ID2 09:102PD     1.20      .220    9.53  73.89    .000
                 ===================================================
                 SUM 06:PD2      26.32     2.705    9.70  76.02    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0029-----------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>06:(PD2   )   |
| OUT<07:(POND  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |    2.280  .2630E+00
                            .028  .1190E+00   |    4.686  .3620E+00
                            .311  .1530E+00   |    7.610  .4670E+00
                            .827  .1890E+00   |   11.693  .6020E+00
                           1.492  .2250E+00   |     .000  .0000E+00

     ROUTING RESULTS             AREA     QPEAK      TPEAK        R.V.
     --------------------        (ha)     (cms)      (hrs)        (mm)
     INFLOW >06: (PD2   )       26.32     2.705      9.700      76.019
     OUTFLOW<07: (POND  )       26.32     2.428      9.867      76.018
    OVERFLOW<08: (OVRFLW)         .00      .000       .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   89.774
                   TIME SHIFT OF PEAK FLOW         (min)=    10.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2692E+00

-------------------------------------------------------------------------------
001:0030-----------------------------------------------------------------------
--------------------
| ADD HYD (PNDOUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:POND     26.32     2.428    9.87  76.02    .000
                +ID2 08:OVRFLW     .00      .000     .00    .00    .000 **DRY**
                 ===================================================
                 SUM 09:PNDOUT   26.32     2.428    9.87  76.02    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0031-----------------------------------------------------------------------
* 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
* 37.9 total site hectares.
--------------------
| ADD HYD (5YROUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 09:PNDOUT   26.32     2.428    9.87  76.02    .000
                +ID2 05:CH2      11.58     3.506    9.77  79.78    .000
                 ===================================================
                 SUM 10:5YROUT   37.90     5.738    9.77  77.17    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0032-----------------------------------------------------------------------
* TOTAL is all flows from development site and argentia road
--------------------
| ADD HYD (TOTAL ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 03:MJ2        .00      .000    9.77  76.17    .000
                +ID2 10:5YROUT   37.90     5.738    9.77  77.17    .000
                 ===================================================
                 SUM 01:TOTAL    37.90     5.738    9.77  77.17    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0033-----------------------------------------------------------------------
---------------------
| CALIB NASHYD       |   Area    (ha)=    4.80   Curve Number   (CN)=70.00
| 02:100    DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
---------------------    U.H. Tp(hrs)=    .700

     Unit Hyd Qpeak  (cms)=     .262

     PEAK FLOW       (cms)=     .142 (i)
     TIME TO PEAK    (hrs)=   10.467
     RUNOFF VOLUME    (mm)=   30.700
     TOTAL RAINFALL   (mm)=   83.163
     RUNOFF COEFFICIENT   =     .369

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0034-----------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
    ------------------------
    001:0009 ROUTE RESERVOIR
        *** WARNING: Outflow volume is less than inflow volume.
      Simulation ended on 2012-05-16     at 14:53:09
===============================================================================
```

```
==========================================================================

 SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO       999   999  =========
 S      W W W  MM MM  H   H   Y Y   MM MM  O   O     9   9 9   9
 SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ## 9   9 9   9 Ver. 4.02
     S   W W   M   M  H   H    Y    M   M  O   O      9999  9999 July 1999
 SSSSS   W W   M   M  H   H    Y    M   M   OOO          9     9 =========
                                                     9   9 9   9 # 2649264
      StormWater Management HYdrologic Model          999   999  =========

 ***************************************************************************
 ************************* SWMHYMO-99 Ver/4.02 *****************************
 *******  A single event and continuous hydrologic simulation model  *******
 *******     based on the principles of HYMO and its successors      *******
 *******                OTTHYMO-83 and OTTHYMO-89.                   *******
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 *******                  Ottawa,  Ontario: (613) 727-5199            *******
 *******                  Gatineau, Quebec: (819) 243-6858            *******
 *******                  E-Mail: swmhymo@jfsa.Com                    *******
 ***************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++ Licensed user: Earth Tech Canada                           +++++++
 +++++++                London                SERIAL#:2649264       +++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ***************************************************************************
 *******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *******
 *******           Maximum value for ID numbers  :     10           *******
 *******           Max. number of rainfall points:  15000           *******
 *******           Max. number of flow points    :  15000           *******
 ***************************************************************************


 *******************   D E T A I L E D   O U T P U T   *******************
 ***************************************************************************
 *       DATE: 2012-05-16     TIME: 14:57:13     RUN COUNTER: 002780       *
 ***************************************************************************
 * Input   filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\25YR.DA*
 * Output  filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\25YR.ou*
 * Summary filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\25YR.su*
 * User comments:                                                          *
 * 1:_____________________________________________________________________*
 * 2:_____________________________________________________________________*
 * 3:_____________________________________________________________________*
 ***************************************************************************

-----------------------------------------------------------------------------
001:0001--------------------------------------------------------------------
*#**************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date        : 01-03-2012
*#  Modeller    : [DPG]
*#  Revision    : 02-15-2012
*#  Revised by  : [dpg]
*#  Company     : Earth Tech Canada
*#  License #   :  2649264
*#**************************************************************************
* Phase 1
--------------------
| START              |  Project  dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
--------------------  Rainfall dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
-----------------------------------------------------------------------------
001:0002--------------------------------------------------------------------
*#
*# 25-year design storm, City of Mississauga standards
*#
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1160.000
| Ptotal= 95.51 mm |                          B=   4.600
--------------------                          C=    .780
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  = 24.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =   .40

               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
                .17    .894 |   6.17   1.982 |  12.17   3.589 |  18.17   1.342
                .33    .907 |   6.33   2.062 |  12.33   3.405 |  18.33   1.321
                .50    .920 |   6.50   2.149 |  12.50   3.240 |  18.50   1.301
                .67    .933 |   6.67   2.245 |  12.67   3.093 |  18.67   1.282
                .83    .947 |   6.83   2.352 |  12.83   2.960 |  18.83   1.264
               1.00    .961 |   7.00   2.471 |  13.00   2.839 |  19.00   1.246
               1.17    .976 |   7.17   2.605 |  13.17   2.729 |  19.17   1.229
               1.33    .992 |   7.33   2.756 |  13.33   2.628 |  19.33   1.212
               1.50   1.008 |   7.50   2.929 |  13.50   2.535 |  19.50   1.195
               1.67   1.024 |   7.67   3.129 |  13.67   2.450 |  19.67   1.180
               1.83   1.041 |   7.83   3.363 |  13.83   2.371 |  19.83   1.164
               2.00   1.059 |   8.00   3.641 |  14.00   2.297 |  20.00   1.149
               2.17   1.078 |   8.17   3.977 |  14.17   2.228 |  20.17   1.135
               2.33   1.097 |   8.33   4.392 |  14.33   2.164 |  20.33   1.121
               2.50   1.118 |   8.50   4.922 |  14.50   2.104 |  20.50   1.107
               2.67   1.139 |   8.67   5.622 |  14.67   2.048 |  20.67   1.094
               2.83   1.161 |   8.83   6.597 |  14.83   1.995 |  20.83   1.081
               3.00   1.184 |   9.00   8.058 |  15.00   1.945 |  21.00   1.069
               3.17   1.208 |   9.17  10.524 |  15.17   1.897 |  21.17   1.056
               3.33   1.233 |   9.33  15.691 |  15.33   1.853 |  21.33   1.044
               3.50   1.259 |   9.50  34.804 |  15.50   1.810 |  21.50   1.033
               3.67   1.287 |   9.67 143.305 |  15.67   1.770 |  21.67   1.021
               3.83   1.316 |   9.83  40.611 |  15.83   1.732 |  21.83   1.010
               4.00   1.347 |  10.00  20.818 |  16.00   1.695 |  22.00   1.000
               4.17   1.379 |  10.17  14.313 |  16.17   1.660 |  22.17    .989
               4.33   1.414 |  10.33  11.051 |  16.33   1.627 |  22.33    .979
               4.50   1.450 |  10.50   9.077 |  16.50   1.596 |  22.50    .969
               4.67   1.488 |  10.67   7.747 |  16.67   1.565 |  22.67    .959
               4.83   1.529 |  10.83   6.786 |  16.83   1.536 |  22.83    .949
               5.00   1.573 |  11.00   6.058 |  17.00   1.509 |  23.00    .940
               5.17   1.619 |  11.17   5.484 |  17.17   1.482 |  23.17    .931
               5.33   1.669 |  11.33   5.021 |  17.33   1.456 |  23.33    .922
               5.50   1.722 |  11.50   4.637 |  17.50   1.431 |  23.50    .913
               5.67   1.780 |  11.67   4.314 |  17.67   1.408 |  23.67    .904
               5.83   1.842 |  11.83   4.038 |  17.83   1.385 |  23.83    .896
               6.00   1.909 |  12.00   3.799 |  18.00   1.363 |  24.00    .888

-----------------------------------------------------------------------------
001:0003--------------------------------------------------------------------
* Future North Site Development
---------------------
| CALIB STANDHYD     |   Area    (ha)=   17.30
| 01:000103 DT= 2.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=     15.57          1.73
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    340.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=    143.31         46.37
                over (min)      6.00         16.00
     Storage Coeff.   (min)=      5.68 (ii)    16.65 (ii)
     Unit Hyd. Tpeak (min)=      6.00         16.00
     Unit Hyd. peak  (cms)=       .19           .07
                                                            *TOTALS*
     PEAK FLOW       (cms)=      4.95           .14          5.028 (iii)
     TIME TO PEAK    (hrs)=      9.70          9.87          9.700
     RUNOFF VOLUME    (mm)=     93.51         41.09         88.272
     TOTAL RAINFALL   (mm)=     95.51         95.51         95.514
     RUNOFF COEFFICIENT   =       .98           .43           .924

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
001:0004--------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>01:(000103)   |
| OUT<02:(NORTH )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |    1.300  .3000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
     --------------------       (ha)     (cms)     (hrs)        (mm)
     INFLOW >01: (000103)      17.30     5.028     9.700      88.272
     OUTFLOW<02: (NORTH )      15.40     1.300     9.733      88.272
    OVERFLOW<03: (OVRFLW)       1.90     3.532     9.733      88.272

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =         1
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=       .27
                  PERCENTAGE OF TIME OVERFLOWING    (%)=       .86


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   25.855
                  TIME SHIFT OF PEAK FLOW         (min)=     2.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.2991E+00

-----------------------------------------------------------------------------
001:0005--------------------------------------------------------------------
--------------------
| ADD HYD (N1    ) | ID: NHYD      AREA      QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)      (cms)   (hrs)   (mm)   (cms)
                    ID1 02:NORTH     15.40     1.300    9.73  88.27    .000
                   +ID2 03:OVRFLW     1.90     3.532    9.73  88.27    .000
                    ===================================================
                    SUM 04:N1        17.30     4.832    9.73  88.27    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0006--------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =   3.649  (cms)
| TotalHyd 04:N1      |   Number of inlets in system [NINLET] =      1
---------------------   Total minor system capacity          =   3.649  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD         AREA      QPEAK      TPEAK       R.V.       DWF
                                   (ha)      (cms)      (hrs)       (mm)     (cms)
     TOTAL HYD.   04:N1           17.30      4.832      9.733    88.271      .000
     ========================================================================
     MAJOR SYST   05:103MJ          .24      1.183      9.733    88.271      .000
     MINOR SYST   06:103MN        17.06      3.649      9.733    88.271      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0007--------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =    .928  (cms)
| TotalHyd 06:103MN   |   Number of inlets in system [NINLET] =      1
---------------------   Total minor system capacity          =    .928  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD         AREA      QPEAK      TPEAK       R.V.       DWF
                                   (ha)      (cms)      (hrs)       (mm)     (cms)
     TOTAL HYD.   06:103MN        17.06      3.649      9.733    88.271      .000
     ========================================================================
     MAJOR SYST   07:103CH         2.67      2.721      9.733    88.271      .000
     MINOR SYST   08:103PD        14.39       .928      9.667    88.272      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
001:0008--------------------------------------------------------------------
* Prologis Park Development
---------------------
| CALIB STANDHYD     |   Area    (ha)=   10.80
| 09:000101 DT= 2.00 |   Total Imp(%)=   89.00   Dir. Conn.(%)=   89.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      9.61          1.19
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    260.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=    143.31         46.37
                over (min)      4.00         16.00
     Storage Coeff.   (min)=      4.83 (ii)    15.81 (ii)
     Unit Hyd. Tpeak (min)=      4.00         16.00
     Unit Hyd. peak  (cms)=       .25           .07
                                                            *TOTALS*
     PEAK FLOW       (cms)=      3.34           .10          3.389 (iii)
     TIME TO PEAK    (hrs)=      9.67          9.87          9.667
     RUNOFF VOLUME    (mm)=     93.51         41.09         87.747
     TOTAL RAINFALL   (mm)=     95.51         95.51         95.514
     RUNOFF COEFFICIENT   =       .98           .43           .919

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
001:0009--------------------------------------------------------------------
*Route Reservoir placed as a holder if needed, otherwise leave empty
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>09:(000101)   |
| OUT<10:(SOUTH )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |     .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK        R.V.
     --------------------       (ha)     (cms)     (hrs)        (mm)
     INFLOW >09: (000101)      10.80     3.389     9.667      87.747
     OUTFLOW<10: (SOUTH )        .00      .000      .000        .000
    OVERFLOW<01: (OVRFLW)      10.80     3.278     9.700      87.747

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =         1
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=     25.20
                  PERCENTAGE OF TIME OVERFLOWING    (%)=     92.42


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=      .000
                  TIME SHIFT OF PEAK FLOW         (min)=   -580.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.0000E+00

      *** WARNING: Outflow volume is less than inflow volume.
-----------------------------------------------------------------------------
```

```
001:0010------------------------------------------------------------------------------
--------------------
| ADD HYD (S1    ) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 10:SOUTH       .00      .000     .00    .00    .000 **DRY**
                +ID2 01:OVRFLW    10.80     3.278    9.70  87.75    .000
                 =====================================================
                 SUM 02:S1        10.80     3.278    9.70  87.75    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0011------------------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    2.762  (cms)
| TotalHyd 02:S1     |   Number of inlets in system [NINLET] =      1
----------------------   Total minor system capacity          =    2.762  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA      QPEAK      TPEAK      R.V.      DWF
                                  (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   02:S1          10.80      3.278      9.700    87.747     .000
     ========================================================================
     MAJOR SYST   03:101MJ         .17       .516      9.700    87.747     .000
     MINOR SYST   04:101MN       10.63      2.762      9.633    87.747     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0012------------------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    1.557  (cms)
| TotalHyd 04:101MN  |   Number of inlets in system [NINLET] =      1
----------------------   Total minor system capacity          =    1.557  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA      QPEAK      TPEAK      R.V.      DWF
                                  (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   04:101MN       10.63      2.762      9.633    87.747     .000
     ========================================================================
     MAJOR SYST   06:101CH         .97      1.205      9.633    87.747     .000
     MINOR SYST   09:101PD        9.66      1.557      9.567    87.747     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0013------------------------------------------------------------------------------
--------------------
| ADD HYD (MJ1   ) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 05:103MJ         .24     1.183    9.73  88.27    .000
              +ID2 03:101MJ         .17      .516    9.70  87.75    .000
                 =====================================================
                 SUM 10:MJ1         .41     1.250    9.73  88.05    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0014------------------------------------------------------------------------------
--------------------
| ADD HYD (CH1   ) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:103CH      2.67     2.721    9.73  88.27    .000
                +ID2 06:101CH       .97     1.205    9.63  87.75    .000
                 =====================================================
                 SUM 01:CH1        3.64     3.926    9.73  88.13    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0015------------------------------------------------------------------------------
--------------------
| ADD HYD (PD1   ) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:103PD     14.39      .928    9.67  88.27    .000
                +ID2 09:101PD      9.66     1.557    9.57  87.75    .000
                 =====================================================
                 SUM 02:PD1       24.05     2.485    9.67  88.06    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0016------------------------------------------------------------------------------
* East Roof
----------------------
| CALIB STANDHYD     |   Area    (ha)=    3.50
| 03:000105 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.46          .03
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=       .50         2.00
     Length            (m)=    150.00        50.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    143.31       142.59
                over (min)      4.00        10.00
     Storage Coeff.  (min)=      3.47 (ii)   10.48 (ii)
     Unit Hyd. Tpeak (min)=      4.00        10.00
     Unit Hyd. peak  (cms)=       .31          .11
                                                         *TOTALS*
     PEAK FLOW       (cms)=      1.29          .01          1.300 (iii)
     TIME TO PEAK    (hrs)=      9.67         9.77          9.667
     RUNOFF VOLUME    (mm)=     93.51        88.02         93.459
     TOTAL RAINFALL   (mm)=     95.51        95.51         95.514
     RUNOFF COEFFICIENT   =       .98          .92           .978

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =   99.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
001:0017------------------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>03:(000105)    |
| OUT<04:(EASTRF)    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000  .0000E+00    |     .060  .2800E+00

     ROUTING RESULTS            AREA      QPEAK       TPEAK        R.V.
     -------------------        (ha)      (cms)       (hrs)        (mm)
     INFLOW >03: (000105)       3.50      1.300       9.667      93.459
      OUTFLOW<04: (EASTRF)      3.50       .045      11.500      93.457
    OVERFLOW<05: (OVRFLW)        .00       .000        .000        .000

                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =          0
                     CUMULATIVE TIME OF OVERFLOWS  (hours)=        .00
                     PERCENTAGE OF TIME OVERFLOWING    (%)=        .00


                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=     3.490
                     TIME SHIFT OF PEAK FLOW          (min)=   110.00
                     MAXIMUM  STORAGE   USED       (ha.m.)=.2117E+00

------------------------------------------------------------------------------
001:0018------------------------------------------------------------------------------
--------------------
| ADD HYD (E1    ) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 04:EASTRF     3.50      .045   11.50  93.46    .000
                +ID2 05:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 =====================================================
                 SUM 06:E1         3.50      .045   11.50  93.46    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0019------------------------------------------------------------------------------
* West Roof
----------------------
| CALIB STANDHYD     |   Area    (ha)=    5.00
| 07:000104 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.95          .05
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=       .50         2.00
     Length            (m)=    180.00        50.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    143.31       125.57
                over (min)      4.00        12.00
     Storage Coeff.  (min)=      3.88 (ii)   11.24 (ii)
     Unit Hyd. Tpeak (min)=      4.00        12.00
     Unit Hyd. peak  (cms)=       .29          .10
                                                         *TOTALS*
     PEAK FLOW       (cms)=      1.81          .01          1.819 (iii)
     TIME TO PEAK    (hrs)=      9.67         9.80          9.667
     RUNOFF VOLUME    (mm)=     93.51        88.02         93.459
     TOTAL RAINFALL   (mm)=     95.51        95.51         95.514
     RUNOFF COEFFICIENT   =       .98          .92           .978

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =   99.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
001:0020------------------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>07:(000104)    |
| OUT<08:(WESTRF)    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)     (ha.m.)   |   (cms)     (ha.m.)
                            .000  .0000E+00    |     .080  .3900E+00

     ROUTING RESULTS            AREA      QPEAK       TPEAK        R.V.
     -------------------        (ha)      (cms)       (hrs)        (mm)
     INFLOW >07: (000104)       5.00      1.819       9.667      93.459
      OUTFLOW<08: (WESTRF)      5.00       .062      11.567      93.457
    OVERFLOW<09: (OVRFLW)        .00       .000        .000        .000

                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =          0
                     CUMULATIVE TIME OF OVERFLOWS  (hours)=        .00
                     PERCENTAGE OF TIME OVERFLOWING    (%)=        .00


                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=     3.435
                     TIME SHIFT OF PEAK FLOW          (min)=   114.00
                     MAXIMUM  STORAGE   USED       (ha.m.)=.3046E+00

------------------------------------------------------------------------------
001:0021------------------------------------------------------------------------------
--------------------
| ADD HYD (W1    ) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:WESTRF     5.00      .062   11.57  93.46    .000
                +ID2 09:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 =====================================================
                 SUM 03:W1         5.00      .062   11.57  93.46    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0022------------------------------------------------------------------------------
--------------------
| ADD HYD (EWROOF) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 06:E1         3.50      .045   11.50  93.46    .000
                +ID2 03:W1         5.00      .062   11.57  93.46    .000
                 =====================================================
                 SUM 04:EWROOF     8.50      .108   11.53  93.46    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0023------------------------------------------------------------------------------
* Argentia Road Extension
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.30
| 05:000102 DT= 2.00 |   Total Imp(%)=   85.00   Dir. Conn.(%)=   85.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.11          .19
     Dep. Storage     (mm)=      2.00         5.00
     Average Slope     (%)=       .50         2.00
     Length            (m)=     90.00        50.00
     Mannings n           =      .013         .250

     Max.eff.Inten.(mm/hr)=    143.31        49.88
                over (min)      2.00        14.00
     Storage Coeff.  (min)=      2.56 (ii)   13.21 (ii)
     Unit Hyd. Tpeak (min)=      2.00        14.00
     Unit Hyd. peak  (cms)=       .46          .08
                                                         *TOTALS*
     PEAK FLOW       (cms)=       .43          .02           .443 (iii)
     TIME TO PEAK    (hrs)=      9.67         9.83          9.667
     RUNOFF VOLUME    (mm)=     93.51        41.09         85.651
     TOTAL RAINFALL   (mm)=     95.51        95.51         95.514
     RUNOFF COEFFICIENT   =       .98          .43           .897

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =   70.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
001:0024------------------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =     .383  (cms)
| TotalHyd 05:000102 |   Number of inlets in system [NINLET] =      1
----------------------   Total minor system capacity          =     .383  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA      QPEAK      TPEAK      R.V.      DWF
                                  (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   05:000102       1.30       .443      9.667    85.651     .000
     ========================================================================
     MAJOR SYST   06:102MJ         .02       .060      9.667    85.651     .000
     MINOR SYST   07:102MN        1.28       .383      9.600    85.650     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
001:0025------------------------------------------------------------------------------
*Split out 2 year flow
```

```
 ---------------------
 | COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .220  (cms)
 | TotalHyd 07:102MN  |   Number of inlets in system [NINLET] =       1
 ---------------------    Total minor system capacity        =    .220  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA      QPEAK     TPEAK     R.V.      DWF
                                  (ha)      (cms)     (hrs)     (mm)     (cms)
      TOTAL HYD.   07:102MN       1.28       .383     9.600   85.650     .000
      ======================================================================
      MAJOR SYST   08:102CH        .11       .163     9.600   85.650     .000
      MINOR SYST   09:102PD       1.17       .220     9.533   85.651     .000

      NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 001:0026----------------------------------------------------------------------
 --------------------
 | ADD HYD (MJ2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
 --------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 10:MJ1           .41     1.250    9.73  88.05    .000
               +ID2 06:102MJ         .02      .060    9.67  85.65    .000
                ======================================================
                SUM 03:MJ2           .43     1.250    9.73  87.94    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 001:0027----------------------------------------------------------------------
 --------------------
 | ADD HYD (CH2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
 --------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 01:CH1          3.64     3.926    9.73  88.13    .000
               +ID2 04:EWROOF       8.50      .108   11.53  93.46    .000
               +ID3 08:102CH         .11      .163    9.60  85.65    .000
                ======================================================
                SUM 05:CH2         12.25     4.003    9.73  91.81    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 001:0028----------------------------------------------------------------------
 --------------------
 | ADD HYD (PD2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
 --------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 02:PD1         24.05     2.485    9.67  88.06    .000
               +ID2 09:102PD        1.17      .220    9.53  85.65    .000
                ======================================================
                SUM 06:PD2         25.22     2.705    9.67  87.95    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 001:0029----------------------------------------------------------------------
 ---------------------
 | ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
 |  IN>06:(PD2   )   |
 | OUT<07:(POND  )   |    =========  OUTFLOW STORAGE TABLE  =========
 ---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)     (ha.m.)   |   (cms)     (ha.m.)
                             .000  .0000E+00    |    2.280  .2630E+00
                             .028  .1190E+00    |    4.686  .3620E+00
                             .311  .1530E+00    |    7.610  .4670E+00
                             .827  .1890E+00    |   11.693  .6020E+00
                            1.492  .2250E+00    |     .000  .0000E+00

      ROUTING RESULTS            AREA      QPEAK      TPEAK        R.V.
      --------------------       (ha)      (cms)      (hrs)        (mm)
      INFLOW >06: (PD2   )      25.22      2.705      9.667      87.949
      OUTFLOW<07: (POND  )      25.22      2.502      9.867      87.948
     OVERFLOW<08: (OVRFLW)        .00       .000       .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   92.489
                   TIME SHIFT OF PEAK FLOW         (min)=    12.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2721E+00

 ------------------------------------------------------------------------------
 001:0030----------------------------------------------------------------------
 --------------------
 | ADD HYD (PNDOUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
 --------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 07:POND        25.22     2.502    9.87  87.95    .000
               +ID2 08:OVRFLW        .00      .000     .00    .00    .000 **DRY**
                ======================================================
                SUM 09:PNDOUT      25.22     2.502    9.87  87.95    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 001:0031----------------------------------------------------------------------
 * 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
 * 37.9 total site hectares.
 --------------------
 | ADD HYD (5YROUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
 --------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 09:PNDOUT      25.22     2.502    9.87  87.95    .000
               +ID2 05:CH2         12.25     4.003    9.73  91.81    .000
                ======================================================
                SUM 10:5YROUT      37.47     6.249    9.73  89.21    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 001:0032----------------------------------------------------------------------
 * TOTAL is all flows from development site and argentia road
 --------------------
 | ADD HYD (TOTAL ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
 --------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                ID1 03:MJ2           .43     1.250    9.73  87.94    .000
               +ID2 10:5YROUT      37.47     6.249    9.73  89.21    .000
                ======================================================
                SUM 01:TOTAL       37.90     7.499    9.73  89.19    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ------------------------------------------------------------------------------
 001:0033----------------------------------------------------------------------
 ---------------------
 | CALIB NASHYD      |   Area    (ha)=    4.80   Curve Number   (CN)=70.00
 | 02:100    DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
 ---------------------   U.H. Tp(hrs)=    .700

      Unit Hyd Qpeak  (cms)=     .262

      PEAK FLOW       (cms)=     .184 (i)
      TIME TO PEAK    (hrs)=   10.433
      RUNOFF VOLUME    (mm)=   39.001
      TOTAL RAINFALL   (mm)=   95.514
      RUNOFF COEFFICIENT   =     .408

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ------------------------------------------------------------------------------
 001:0034----------------------------------------------------------------------
       FINISH
 ------------------------------------------------------------------------------
 ******************************************************************************
      WARNINGS / ERRORS / NOTES
    ------------------------
  001:0009 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
    Simulation ended on 2012-05-16     at 14:57:13
 ==============================================================================
```

```
===============================================================================

 SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999  =========
 S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
 SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9 Ver. 4.02
     S   W W   M   M  H   H    Y    M   M  O   O       9999   9999 July 1999
 SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9 =========
                                                      9   9  9   9 # 2649264
      StormWater Management HYdrologic Model           999    999  =========

 **************************************************************************
 ************************** SWMHYMO-99 Ver/4.02 ***************************
 *******  A single event and continuous hydrologic simulation model  *******
 *******     based on the principles of HYMO and its successors      *******
 *******                OTTHYMO-83 and OTTHYMO-89.                   *******
 **************************************************************************
 ******* Distributed by:  J.F. Sabourin and Associates Inc.           *******
 *******                  Ottawa,  Ontario: (613) 727-5199            *******
 *******                  Gatineau, Quebec: (819) 243-6858            *******
 *******                  E-Mail: swmhymo@jfsa.Com                    *******
 **************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++ Licensed user: Earth Tech Canada                           +++++++
 +++++++                London                 SERIAL#:2649264      +++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 **************************************************************************
 *******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++           *******
 *******           Maximum value for ID numbers  :     10           *******
 *******           Max. number of rainfall points:  15000           *******
 *******           Max. number of flow points    :  15000           *******
 **************************************************************************


 *******************   D E T A I L E D   O U T P U T   *******************
 **************************************************************************
 *       DATE: 2012-05-16     TIME: 14:56:40     RUN COUNTER: 002779      *
 **************************************************************************
 * Input   filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\50YR.DA*
 * Output  filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\50YR.ou*
 * Summary filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\50YR.su*
 * User comments:                                                          *
 * 1:______________________________________________________________________*
 * 2:______________________________________________________________________*
 * 3:______________________________________________________________________*
 **************************************************************************

-------------------------------------------------------------------------------
001:0001-----------------------------------------------------------------------
*#****************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date        : 01-03-2012
*#  Modeller    : [DPG]
*#  Revision    : 02-15-2012
*#  Revised by  : [dpg]
*#  Company     : Earth Tech Canada
*#  License #   :  2649264
*#****************************************************************************
* Phase 1
-------------------
| START              |  Project  dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
--------------------  Rainfall dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
-------------------------------------------------------------------------------
001:0002-----------------------------------------------------------------------
*#
*# 50-year design storm, City of Mississauga standards
*#
-------------------
| CHICAGO STORM     |     IDF curve parameters: A=1300.000
| Ptotal=107.04 mm  |                           B=   4.700
-------------------                             C=    .780
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  = 24.00 hrs
                         Storm time step    = 10.00 min
                         Time to peak ratio =   .40

             TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
              hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
              .17   1.002 |   6.17   2.222 |  12.17   4.026 |  18.17   1.504
              .33   1.016 |   6.33   2.312 |  12.33   3.819 |  18.33   1.481
              .50   1.031 |   6.50   2.410 |  12.50   3.634 |  18.50   1.459
              .67   1.046 |   6.67   2.518 |  12.67   3.469 |  18.67   1.437
              .83   1.061 |   6.83   2.637 |  12.83   3.320 |  18.83   1.417
             1.00   1.078 |   7.00   2.771 |  13.00   3.184 |  19.00   1.397
             1.17   1.094 |   7.17   2.921 |  13.17   3.061 |  19.17   1.377
             1.33   1.112 |   7.33   3.091 |  13.33   2.947 |  19.33   1.358
             1.50   1.129 |   7.50   3.285 |  13.50   2.843 |  19.50   1.340
             1.67   1.148 |   7.67   3.509 |  13.67   2.747 |  19.67   1.322
             1.83   1.167 |   7.83   3.772 |  13.83   2.658 |  19.83   1.305
             2.00   1.187 |   8.00   4.084 |  14.00   2.576 |  20.00   1.289
             2.17   1.208 |   8.17   4.461 |  14.17   2.499 |  20.17   1.272
             2.33   1.230 |   8.33   4.928 |  14.33   2.427 |  20.33   1.257
             2.50   1.253 |   8.50   5.523 |  14.50   2.359 |  20.50   1.241
             2.67   1.276 |   8.67   6.310 |  14.67   2.296 |  20.67   1.226
             2.83   1.301 |   8.83   7.406 |  14.83   2.236 |  20.83   1.212
             3.00   1.327 |   9.00   9.050 |  15.00   2.180 |  21.00   1.198
             3.17   1.354 |   9.17  11.825 |  15.17   2.127 |  21.17   1.184
             3.33   1.382 |   9.33  17.642 |  15.33   2.077 |  21.33   1.171
             3.50   1.412 |   9.50  39.143 |  15.50   2.030 |  21.50   1.158
             3.67   1.443 |   9.67 159.748 |  15.67   1.984 |  21.67   1.145
             3.83   1.476 |   9.83  45.671 |  15.83   1.941 |  21.83   1.133
             4.00   1.510 |  10.00  23.415 |  16.00   1.901 |  22.00   1.120
             4.17   1.546 |  10.17  16.091 |  16.17   1.862 |  22.17   1.109
             4.33   1.585 |  10.33  12.417 |  16.33   1.824 |  22.33   1.097
             4.50   1.626 |  10.50  10.196 |  16.50   1.789 |  22.50   1.086
             4.67   1.669 |  10.67   8.700 |  16.67   1.755 |  22.67   1.075
             4.83   1.715 |  10.83   7.619 |  16.83   1.722 |  22.83   1.064
             5.00   1.763 |  11.00   6.800 |  17.00   1.691 |  23.00   1.054
             5.17   1.816 |  11.17   6.156 |  17.17   1.661 |  23.17   1.043
             5.33   1.871 |  11.33   5.634 |  17.33   1.632 |  23.33   1.033
             5.50   1.931 |  11.50   5.203 |  17.50   1.605 |  23.50   1.023
             5.67   1.996 |  11.67   4.840 |  17.67   1.578 |  23.67   1.014
             5.83   2.065 |  11.83   4.530 |  17.83   1.553 |  23.83   1.004
             6.00   2.140 |  12.00   4.261 |  18.00   1.528 |  24.00    .995

-------------------------------------------------------------------------------
001:0003-----------------------------------------------------------------------
* Future North Site Development
---------------------
| CALIB STANDHYD      |   Area    (ha)=   17.30
| 01:000103 DT= 2.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      15.57         1.73
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     340.00        50.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     159.75        56.00
                over (min)       6.00        16.00
     Storage Coeff.  (min)=       5.43 (ii)   15.61 (ii)
     Unit Hyd. Tpeak (min)=       6.00        16.00
     Unit Hyd. peak  (cms)=        .20          .07
                                                           *TOTALS*
     PEAK FLOW       (cms)=       5.58          .17         5.683 (iii)
     TIME TO PEAK    (hrs)=       9.70         9.87         9.700
     RUNOFF VOLUME    (mm)=     105.03        49.36        99.469
     TOTAL RAINFALL   (mm)=     107.04       107.04       107.035
     RUNOFF COEFFICIENT   =        .98          .46          .929

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0004-----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>01:(000103)    |
| OUT<02:(NORTH )    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------       OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |    1.300  .3000E+00

     ROUTING RESULTS            AREA      QPEAK      TPEAK        R.V.
     -------------------        (ha)      (cms)      (hrs)        (mm)
     INFLOW >01: (000103)       17.30      5.683      9.700      99.469
      OUTFLOW<02: (NORTH )      14.81      1.300      9.700      99.468
    OVERFLOW<03: (OVRFLW)        2.49      4.357      9.700      99.469

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =          2
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=        .30
                   PERCENTAGE OF TIME OVERFLOWING   (%)=        .96


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   22.877
                   TIME SHIFT OF PEAK FLOW          (min)=      .00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2989E+00

-------------------------------------------------------------------------------
001:0005-----------------------------------------------------------------------
--------------------
| ADD HYD (N1    ) | ID: NHYD      AREA     QPEAK    TPEAK   R.V.     DWF
--------------------                 (ha)     (cms)    (hrs)   (mm)    (cms)
               ID1 02:NORTH        14.81     1.300     9.70  99.47     .000
              +ID2 03:OVRFLW        2.49     4.357     9.70  99.47     .000
               ==================================================
               SUM 04:N1          17.30     5.657     9.70  99.47     .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0006-----------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD      |   Average inlet capacities   [CINLET] =   3.649  (cms)
| TotalHyd 04:N1       |   Number of inlets in system [NINLET] =       1
---------------------      Total minor system capacity          =   3.649  (cms)
                           Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA      QPEAK      TPEAK       R.V.      DWF
                                  (ha)      (cms)      (hrs)       (mm)     (cms)
     TOTAL HYD.   04:N1          17.30      5.657      9.700     99.469      .000
     ====================================================================
     MAJOR SYST   05:103MJ         .63      2.008      9.700     99.469      .000
     MINOR SYST   06:103MN       16.67      3.649      9.700     99.468      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0007-----------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD      |   Average inlet capacities   [CINLET] =    .928  (cms)
| TotalHyd 06:103MN    |   Number of inlets in system [NINLET] =       1
---------------------      Total minor system capacity          =    .928  (cms)
                           Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA      QPEAK      TPEAK       R.V.      DWF
                                  (ha)      (cms)      (hrs)       (mm)     (cms)
     TOTAL HYD.   06:103MN       16.67      3.649      9.700     99.468      .000
     ====================================================================
     MAJOR SYST   07:103CH        2.84      2.721      9.700     99.468      .000
     MINOR SYST   08:103PD       13.83       .928      9.633     99.469      .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0008-----------------------------------------------------------------------
* Prologis Park Development
---------------------
| CALIB STANDHYD      |   Area    (ha)=   10.80
| 09:000101 DT= 2.00 |   Total Imp(%)=   89.00   Dir. Conn.(%)=   89.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       9.61         1.19
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     260.00        50.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     159.75        60.27
                over (min)       4.00        14.00
     Storage Coeff.  (min)=       4.63 (ii)   14.51 (ii)
     Unit Hyd. Tpeak (min)=       4.00        14.00
     Unit Hyd. peak  (cms)=        .25          .08
                                                           *TOTALS*
     PEAK FLOW       (cms)=       3.77          .12         3.836 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.83         9.667
     RUNOFF VOLUME    (mm)=     105.03        49.36        98.912
     TOTAL RAINFALL   (mm)=     107.04       107.04       107.035
     RUNOFF COEFFICIENT   =        .98          .46          .924

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0009-----------------------------------------------------------------------
*Route Reservoir placed as a holder if needed, otherwise leave empty
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>09:(000101)    |
| OUT<10:(SOUTH )    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------       OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .000  .0000E+00

     ROUTING RESULTS            AREA      QPEAK      TPEAK        R.V.
     -------------------        (ha)      (cms)      (hrs)        (mm)
     INFLOW >09: (000101)       10.80      3.836      9.667      98.912
      OUTFLOW<10: (SOUTH )        .00       .000       .000        .000
    OVERFLOW<01: (OVRFLW)       10.80      3.704      9.700      98.912

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =          1
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      25.20
                   PERCENTAGE OF TIME OVERFLOWING   (%)=      93.10


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=     .000
                   TIME SHIFT OF PEAK FLOW          (min)=  -580.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.4736E-09

      *** WARNING: Outflow volume is less than inflow volume.
-------------------------------------------------------------------------------
```

```
001:0010--------------------------------------------------------------------------
--------------------
| ADD HYD (S1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 10:SOUTH       .00      .000     .00    .00    .000
                +ID2 01:OVRFLW    10.80     3.704    9.70  98.91    .000
                 ==================================================
                 SUM 02:S1        10.80     3.704    9.70  98.91    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0011--------------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   2.762  (cms)
| TotalHyd 02:S1     |   Number of inlets in system [NINLET] =      1
----------------------   Total minor system capacity          =   2.762  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK      R.V.      DWF
                                  (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   02:S1          10.80     3.704     9.700    98.912     .000
     ======================================================================
     MAJOR SYST   03:101MJ         .35      .942     9.700    98.912     .000
     MINOR SYST   04:101MN       10.45     2.762     9.600    98.912     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0012--------------------------------------------------------------------------
*Split out 2 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   1.557  (cms)
| TotalHyd 04:101MN  |   Number of inlets in system [NINLET] =      1
----------------------   Total minor system capacity          =   1.557  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK      R.V.      DWF
                                  (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   04:101MN       10.45     2.762     9.600    98.912     .000
     ======================================================================
     MAJOR SYST   06:101CH        1.02     1.205     9.600    98.912     .000
     MINOR SYST   09:101PD        9.43     1.557     9.567    98.912     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0013--------------------------------------------------------------------------
--------------------
| ADD HYD (MJ1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 05:103MJ        .63     2.008    9.70  99.47    .000
              +ID2 03:101MJ        .35      .942    9.70  98.91    .000
                 ==================================================
                 SUM 10:MJ1         .98     2.950    9.70  99.27    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0014--------------------------------------------------------------------------
--------------------
| ADD HYD (CH1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:103CH      2.84     2.721    9.70  99.47    .000
                +ID2 06:101CH      1.02     1.205    9.60  98.91    .000
                 ==================================================
                 SUM 01:CH1        3.86     3.926    9.70  99.32    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0015--------------------------------------------------------------------------
--------------------
| ADD HYD (PD1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:103PD     13.83      .928    9.63  99.47    .000
                +ID2 09:101PD      9.43     1.557    9.57  98.91    .000
                 ==================================================
                 SUM 02:PD1       23.26     2.485    9.63  99.24    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0016--------------------------------------------------------------------------
* East Roof
----------------------
| CALIB STANDHYD     |   Area    (ha)=    3.50
| 03:000105 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       3.46          .03
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     150.00        50.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     159.75       159.12
                over (min)        4.00        10.00
     Storage Coeff.  (min)=       3.33 (ii)   10.03 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .31          .11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       1.45          .01         1.459 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.77         9.667
     RUNOFF VOLUME    (mm)=     105.03        99.53       104.980
     TOTAL RAINFALL   (mm)=     107.04       107.04       107.035
     RUNOFF COEFFICIENT   =        .98          .93          .981

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =   99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------
001:0017--------------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |   Requested routing time step =  2.0 min.
|  IN>03:(000105)   |
| OUT<04:(EASTRF)   |   =========  OUTFLOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |   (cms)     (ha.m.)
                           .000  .0000E+00   |     .060  .2800E+00

     ROUTING RESULTS          AREA     QPEAK      TPEAK        R.V.
     -------------------      (ha)     (cms)      (hrs)        (mm)
     INFLOW >03: (000105)     3.50     1.459      9.667     104.980
     OUTFLOW<04: (EASTRF)     3.50      .051     11.500     104.979
    OVERFLOW<05: (OVRFLW)      .00      .000       .000        .000

                 TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                 CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                 PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                 PEAK   FLOW   REDUCTION [Qout/Qin](%)=     3.489
                 TIME SHIFT OF PEAK FLOW         (min)=    110.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=.2376E+00

--------------------------------------------------------------------------
001:0018--------------------------------------------------------------------------
--------------------
| ADD HYD (E1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 04:EASTRF     3.50      .051   11.50 104.98    .000
                +ID2 05:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 ==================================================
                 SUM 06:E1         3.50      .051   11.50 104.98    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0019--------------------------------------------------------------------------
* West Roof
----------------------
| CALIB STANDHYD     |   Area    (ha)=    5.00
| 07:000104 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       4.95          .05
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=     180.00        50.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     159.75       159.12
                over (min)        4.00        10.00
     Storage Coeff.  (min)=       3.71 (ii)   10.41 (ii)
     Unit Hyd. Tpeak (min)=       4.00        10.00
     Unit Hyd. peak  (cms)=        .29          .11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       2.04          .01         2.047 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.77         9.667
     RUNOFF VOLUME    (mm)=     105.03        99.53       104.980
     TOTAL RAINFALL   (mm)=     107.04       107.04       107.035
     RUNOFF COEFFICIENT   =        .98          .93          .981

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =   99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------
001:0020--------------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |   Requested routing time step =  2.0 min.
|  IN>07:(000104)   |
| OUT<08:(WESTRF)   |   =========  OUTFLOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |   (cms)     (ha.m.)
                           .000  .0000E+00   |     .080  .3900E+00

     ROUTING RESULTS          AREA     QPEAK      TPEAK        R.V.
     -------------------      (ha)     (cms)      (hrs)        (mm)
     INFLOW >07: (000104)     5.00     2.047      9.667     104.980
     OUTFLOW<08: (WESTRF)     5.00      .070     11.567     104.979
    OVERFLOW<09: (OVRFLW)      .00      .000       .000        .000

                 TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                 CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                 PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                 PEAK   FLOW   REDUCTION [Qout/Qin](%)=     3.427
                 TIME SHIFT OF PEAK FLOW         (min)=    114.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=.3419E+00

--------------------------------------------------------------------------
001:0021--------------------------------------------------------------------------
--------------------
| ADD HYD (W1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 08:WESTRF     5.00      .070   11.57 104.98    .000
                +ID2 09:OVRFLW      .00      .000     .00    .00    .000 **DRY**
                 ==================================================
                 SUM 03:W1         5.00      .070   11.57 104.98    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0022--------------------------------------------------------------------------
--------------------
| ADD HYD (EWROOF) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------               (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 06:E1         3.50      .051   11.50 104.98    .000
                +ID2 03:W1         5.00      .070   11.57 104.98    .000
                 ==================================================
                 SUM 04:EWROOF     8.50      .121   11.53 104.98    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0023--------------------------------------------------------------------------
* Argentia Road Extension
----------------------
| CALIB STANDHYD     |   Area    (ha)=    1.30
| 05:000102 DT= 2.00 |   Total Imp(%)=   85.00   Dir. Conn.(%)=   85.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.11          .19
     Dep. Storage     (mm)=       2.00         5.00
     Average Slope     (%)=        .50         2.00
     Length            (m)=      90.00        50.00
     Mannings n           =       .013         .250

     Max.eff.Inten.(mm/hr)=     159.75        66.02
                over (min)        2.00        12.00
     Storage Coeff.  (min)=       2.45 (ii)   11.97 (ii)
     Unit Hyd. Tpeak (min)=       2.00        12.00
     Unit Hyd. peak  (cms)=        .47          .09
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .48          .02          .498 (iii)
     TIME TO PEAK    (hrs)=       9.67         9.80         9.667
     RUNOFF VOLUME    (mm)=     105.03        49.37        96.685
     TOTAL RAINFALL   (mm)=     107.04       107.04       107.035
     RUNOFF COEFFICIENT   =        .98          .46          .903

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =   70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------
001:0024--------------------------------------------------------------------------
*Split out 10 year flow
----------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .383  (cms)
| TotalHyd 05:000102 |   Number of inlets in system [NINLET] =      1
----------------------   Total minor system capacity          =    .383  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                  ID: NHYD        AREA     QPEAK     TPEAK      R.V.      DWF
                                  (ha)     (cms)     (hrs)      (mm)     (cms)
     TOTAL HYD.   05:000102       1.30      .498     9.667    96.685     .000
     ======================================================================
     MAJOR SYST   06:102MJ         .04      .115     9.667    96.685     .000
     MINOR SYST   07:102MN        1.26      .383     9.567    96.685     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
001:0025--------------------------------------------------------------------------
*Split out 2 year flow
```

```
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .220  (cms)
| TotalHyd 07:102MN  |   Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity         =    .220  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA     QPEAK     TPEAK     R.V.      DWF
                                 (ha)     (cms)     (hrs)     (mm)    (cms)
     TOTAL HYD.   07:102MN       1.26      .383     9.567   96.685     .000
     ========================================================================
     MAJOR SYST   08:102CH        .11      .163     9.567   96.685     .000
     MINOR SYST   09:102PD       1.15      .220     9.533   96.685     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0026------------------------------------------------------------------------
--------------------
| ADD HYD (MJ2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 10:MJ1        .98     2.950    9.70  99.27    .000
                +ID2 06:102MJ      .04      .115    9.67  96.69    .000
                 ======================================================
                 SUM 03:MJ2       1.02     2.950    9.70  99.16    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0027------------------------------------------------------------------------
--------------------
| ADD HYD (CH2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 01:CH1       3.86     3.926    9.70  99.32    .000
                +ID2 04:EWROOF    8.50      .121   11.53 104.98    .000
                +ID3 08:102CH      .11      .163    9.57  96.69    .000
                 ======================================================
                 SUM 05:CH2      12.47     4.096    9.70 103.16    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0028------------------------------------------------------------------------
--------------------
| ADD HYD (PD2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 02:PD1      23.26     2.485    9.63  99.24    .000
                +ID2 09:102PD     1.15      .220    9.53  96.69    .000
                 ======================================================
                 SUM 06:PD2      24.41     2.705    9.63  99.12    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0029------------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>06:(PD2   )   |
| OUT<07:(POND  )   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
                            .000  .0000E+00   |    2.280  .2630E+00
                            .028  .1190E+00   |    4.686  .3620E+00
                            .311  .1530E+00   |    7.610  .4670E+00
                            .827  .1890E+00   |   11.693  .6020E+00
                           1.492  .2250E+00   |     .000  .0000E+00

     ROUTING RESULTS             AREA     QPEAK     TPEAK        R.V.
     --------------------        (ha)     (cms)     (hrs)        (mm)
     INFLOW >06: (PD2   )       24.41     2.705     9.633      99.122
     OUTFLOW<07: (POND  )       24.41     2.553     9.867      99.121
    OVERFLOW<08: (OVRFLW)         .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=   94.365
                   TIME SHIFT OF PEAK FLOW         (min)=    14.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2746E+00

--------------------------------------------------------------------------------
001:0030------------------------------------------------------------------------
--------------------
| ADD HYD (PNDOUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:POND     24.41     2.553    9.87  99.12    .000
                +ID2 08:OVRFLW     .00      .000     .00    .00    .000 **DRY**
                 ======================================================
                 SUM 09:PNDOUT   24.41     2.553    9.87  99.12    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0031------------------------------------------------------------------------
* 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
* 37.9 total site hectares.
--------------------
| ADD HYD (5YROUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 09:PNDOUT   24.41     2.553    9.87  99.12    .000
                +ID2 05:CH2      12.47     4.096    9.70 103.16    .000
                 ======================================================
                 SUM 10:5YROUT   36.88     6.343    9.73 100.49    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0032------------------------------------------------------------------------
* TOTAL is all flows from development site and argentia road
--------------------
| ADD HYD (TOTAL ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 03:MJ2       1.02     2.950    9.70  99.16    .000
                +ID2 10:5YROUT   36.88     6.343    9.73 100.49    .000
                 ======================================================
                 SUM 01:TOTAL    37.90     9.252    9.70 100.45    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
001:0033------------------------------------------------------------------------
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.80   Curve Number   (CN)=70.00
| 02:100    DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .700

     Unit Hyd Qpeak  (cms)=     .262

     PEAK FLOW       (cms)=     .225 (i)
     TIME TO PEAK    (hrs)=   10.433
     RUNOFF VOLUME    (mm)=   47.178
     TOTAL RAINFALL   (mm)=  107.035
     RUNOFF COEFFICIENT   =     .441

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
001:0034------------------------------------------------------------------------
      FINISH
--------------------------------------------------------------------------------
********************************************************************************
     WARNINGS / ERRORS / NOTES
```

```
    -------------------------
 001:0009 ROUTE RESERVOIR
     *** WARNING: Outflow volume is less than inflow volume.
   Simulation ended on 2012-05-16     at 14:56:41
================================================================================
```

```
==============================================================================

 SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999  =========
 S      W W W  MM MM  H   H   Y Y   MM MM  O   O     9   9  9   9
 SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9 Ver. 4.02
     S   W W   M   M  H   H    Y    M   M  O   O      9999   9999 July 1999
 SSSSS   W W   M   M  H   H    Y    M   M   OOO          9      9 =========
                                                      9   9  9   9 # 2649264
      StormWater Management HYdrologic Model          999    999  =========

 ***************************************************************************
 *************************** SWMHYMO-99 Ver/4.02 ***************************
 *******  A single event and continuous hydrologic simulation model  *******
 *******     based on the principles of HYMO and its successors     *******
 *******                OTTHYMO-83 and OTTHYMO-89.                  *******
 ***************************************************************************
 ******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
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 *******                 Gatineau, Quebec: (819) 243-6858           *******
 *******                 E-Mail: swmhymo@jfsa.Com                   *******
 ***************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++ Licensed user: Earth Tech Canada                           +++++++
 +++++++                London                SERIAL#:2649264       +++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ***************************************************************************
 *******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++           *******
 *******           Maximum value for ID numbers  :     10           *******
 *******           Max. number of rainfall points:  15000           *******
 *******           Max. number of flow points    :  15000           *******
 ***************************************************************************


 ********************   D E T A I L E D   O U T P U T   ********************
 ***************************************************************************
 *       DATE: 2012-05-16     TIME: 14:52:11     RUN COUNTER: 002775       *
 ***************************************************************************
 * Input   filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\100YR.D*
 * Output  filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\100YR.o*
 * Summary filename: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\100YR.s*
 * User comments:                                                          *
 * 1:______________________________________________________________________*
 * 2:______________________________________________________________________*
 * 3:______________________________________________________________________*
 ***************************************************************************

-------------------------------------------------------------------------------
001:0001-----------------------------------------------------------------------
*#****************************************************************************
*#  Project Name: [PROLOGIS PARK MEADOWVALE]    Project Number: [60142982]
*#  Date        : 01-03-2012
*#  Modeller    : [DPG]
*#  Revision    : 02-15-2012
*#  Revised by  : [dpg]
*#  Company     : Earth Tech Canada
*#  License #   :  2649264
*#****************************************************************************
* Phase 1
--------------------
| START              |  Project  dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
--------------------  Rainfall dir.: O:\PROJECTS\601429~1\GENCOR~1\LONDON~2\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 001
    NSTORM=   0
-------------------------------------------------------------------------------
001:0002-----------------------------------------------------------------------
*#
*# 100-year design storm, City of Mississauga standards
*#
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1450.000
| Ptotal=119.37 mm |                          B=   4.900
--------------------                          C=    .780
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  = 24.00 hrs
                        Storm time step    = 10.00 min
                        Time to peak ratio =   .40

              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .17   1.118 |   6.17   2.481 |  12.17   4.500 |  18.17   1.679
               .33   1.134 |   6.33   2.581 |  12.33   4.268 |  18.33   1.653
               .50   1.150 |   6.50   2.691 |  12.50   4.061 |  18.50   1.628
               .67   1.167 |   6.67   2.811 |  12.67   3.875 |  18.67   1.604
               .83   1.184 |   6.83   2.945 |  12.83   3.708 |  18.83   1.581
              1.00   1.202 |   7.00   3.095 |  13.00   3.557 |  19.00   1.559
              1.17   1.221 |   7.17   3.263 |  13.17   3.419 |  19.17   1.537
              1.33   1.240 |   7.33   3.453 |  13.33   3.292 |  19.33   1.516
              1.50   1.260 |   7.50   3.670 |  13.50   3.176 |  19.50   1.496
              1.67   1.281 |   7.67   3.921 |  13.67   3.068 |  19.67   1.476
              1.83   1.303 |   7.83   4.215 |  13.83   2.969 |  19.83   1.457
              2.00   1.325 |   8.00   4.564 |  14.00   2.876 |  20.00   1.438
              2.17   1.348 |   8.17   4.987 |  14.17   2.790 |  20.17   1.420
              2.33   1.373 |   8.33   5.510 |  14.33   2.710 |  20.33   1.402
              2.50   1.398 |   8.50   6.177 |  14.50   2.634 |  20.50   1.385
              2.67   1.424 |   8.67   7.060 |  14.67   2.564 |  20.67   1.369
              2.83   1.452 |   8.83   8.290 |  14.83   2.497 |  20.83   1.352
              3.00   1.481 |   9.00  10.136 |  15.00   2.434 |  21.00   1.337
              3.17   1.511 |   9.17  13.256 |  15.17   2.375 |  21.17   1.321
              3.33   1.542 |   9.33  19.803 |  15.33   2.319 |  21.33   1.306
              3.50   1.575 |   9.50  43.957 |  15.50   2.266 |  21.50   1.292
              3.67   1.610 |   9.67 176.312 |  15.67   2.215 |  21.67   1.278
              3.83   1.647 |   9.83  51.281 |  15.83   2.167 |  21.83   1.264
              4.00   1.685 |  10.00  26.302 |  16.00   2.122 |  22.00   1.250
              4.17   1.726 |  10.17  18.057 |  16.17   2.078 |  22.17   1.237
              4.33   1.769 |  10.33  13.923 |  16.33   2.037 |  22.33   1.224
              4.50   1.814 |  10.50  11.424 |  16.50   1.997 |  22.50   1.212
              4.67   1.863 |  10.67   9.743 |  16.67   1.959 |  22.67   1.199
              4.83   1.914 |  10.83   8.529 |  16.83   1.923 |  22.83   1.187
              5.00   1.968 |  11.00   7.609 |  17.00   1.888 |  23.00   1.176
              5.17   2.027 |  11.17   6.886 |  17.17   1.854 |  23.17   1.164
              5.33   2.089 |  11.33   6.302 |  17.33   1.822 |  23.33   1.153
              5.50   2.156 |  11.50   5.818 |  17.50   1.791 |  23.50   1.142
              5.67   2.228 |  11.67   5.411 |  17.67   1.761 |  23.67   1.131
              5.83   2.305 |  11.83   5.064 |  17.83   1.733 |  23.83   1.121
              6.00   2.390 |  12.00   4.763 |  18.00   1.705 |  24.00   1.110

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001:0003-----------------------------------------------------------------------
* Future North Site Development
----------------------
| CALIB STANDHYD     |   Area    (ha)=   17.30
| 01:000103 DT= 2.00 |   Total Imp(%)=   90.00   Dir. Conn.(%)=   90.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      15.57          1.73
     Dep. Storage     (mm)=       2.00          5.00
     Average Slope     (%)=        .50          2.00
     Length            (m)=     340.00         50.00
     Mannings n           =       .013          .250

     Max.eff.Inten.(mm/hr)=     176.31         71.56
               over (min)        6.00         14.00
     Storage Coeff.  (min)=       5.22 (ii)    14.45 (ii)
     Unit Hyd. Tpeak (min)=       6.00         14.00
     Unit Hyd. peak  (cms)=        .21           .08
                                                            *TOTALS*
     PEAK FLOW       (cms)=       6.23           .22          6.371 (iii)
     TIME TO PEAK    (hrs)=       9.70          9.83          9.700
     RUNOFF VOLUME    (mm)=     117.37         58.59        111.495
     TOTAL RAINFALL   (mm)=     119.37        119.37        119.373
     RUNOFF COEFFICIENT   =        .98           .49           .934

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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001:0004-----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>01:(000103)   |
| OUT<02:(NORTH )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |   (cms)    (ha.m.)
                           .000  .0000E+00   |   1.300  .3000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (000103)      17.30     6.371     9.700    111.495
     OUTFLOW<02: (NORTH )      14.30     1.300     9.667    111.495
    OVERFLOW<03: (OVRFLW)       3.00     5.050     9.700    111.495

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        3
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .37
                  PERCENTAGE OF TIME OVERFLOWING    (%)=     1.18


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   20.406
                  TIME SHIFT OF PEAK FLOW         (min)=    -2.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.3001E+00

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001:0005-----------------------------------------------------------------------
-------------------
| ADD HYD (N1    ) | ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
-------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 02:NORTH     14.30     1.300    9.67 111.50    .000
                +ID2 03:OVRFLW     3.00     5.050    9.70 111.50    .000
                 ==================================================
                 SUM 04:N1        17.30     6.350    9.70 111.50    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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001:0006-----------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =   3.649  (cms)
| TotalHyd 04:N1     |   Number of inlets in system [NINLET] =      1
---------------------    Total minor system capacity         =   3.649  (cms)
                         Total major system storage [TMJSTO] =      0.(cu.m.)

                 ID: NHYD        AREA     QPEAK     TPEAK      R.V.     DWF
                                 (ha)     (cms)     (hrs)      (mm)   (cms)
     TOTAL HYD.  04:N1          17.30     6.350     9.700   111.495    .000
     =====================================================================
     MAJOR SYST  05:103MJ        1.06     2.701     9.700   111.495    .000
     MINOR SYST  06:103MN       16.24     3.649     9.667   111.495    .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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001:0007-----------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =    .928  (cms)
| TotalHyd 06:103MN  |   Number of inlets in system [NINLET] =      1
---------------------    Total minor system capacity         =    .928  (cms)
                         Total major system storage [TMJSTO] =      0.(cu.m.)

                 ID: NHYD        AREA     QPEAK     TPEAK      R.V.     DWF
                                 (ha)     (cms)     (hrs)      (mm)   (cms)
     TOTAL HYD.  06:103MN       16.24     3.649     9.667   111.495    .000
     =====================================================================
     MAJOR SYST  07:103CH        2.90     2.721     9.667   111.495    .000
     MINOR SYST  08:103PD       13.34      .928     9.600   111.495    .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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001:0008-----------------------------------------------------------------------
* Prologis Park Development
---------------------
| CALIB STANDHYD     |   Area    (ha)=   10.80
| 09:000101 DT= 2.00 |   Total Imp(%)=   89.00   Dir. Conn.(%)=   89.00
---------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      9.61          1.19
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    260.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=    176.31         71.56
               over (min)       4.00         14.00
     Storage Coeff.  (min)=      4.45 (ii)    13.67 (ii)
     Unit Hyd. Tpeak (min)=      4.00         14.00
     Unit Hyd. peak  (cms)=       .26           .08
                                                         *TOTALS*
     PEAK FLOW       (cms)=      4.20           .15         4.287 (iii)
     TIME TO PEAK    (hrs)=      9.67          9.83         9.667
     RUNOFF VOLUME    (mm)=    117.37         58.59       110.908
     TOTAL RAINFALL   (mm)=    119.37        119.37       119.373
     RUNOFF COEFFICIENT   =       .98           .49          .929

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0009-----------------------------------------------------------------------
*Route Reservoir placed as a holder if needed, otherwise leave empty
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  2.0 min.
|  IN>09:(000101)   |
| OUT<10:(SOUTH )   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |   (cms)    (ha.m.)
                           .000  .0000E+00   |    .000  .0000E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >09: (000101)      10.80     4.287     9.667    110.908
     OUTFLOW<10: (SOUTH )        .00      .000      .000       .000
    OVERFLOW<01: (OVRFLW)      10.80     4.134     9.667    110.908

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        1
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=    25.23
                  PERCENTAGE OF TIME OVERFLOWING    (%)=    93.69


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=     .000
                  TIME SHIFT OF PEAK FLOW         (min)=  -580.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.0000E+00

      *** WARNING: Outflow volume is less than inflow volume.
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001:0010-----------------------------------------------------------------------
--------------------
| ADD HYD (S1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 10:SOUTH       .00      .000     .00    .00    .000
              +ID2 01:OVRFLW    10.80     4.134    9.67 110.91    .000
               =====================================================
               SUM 02:S1        10.80     4.134    9.67 110.91    .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0011-----------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =   2.762  (cms)
| TotalHyd 02:S1      |   Number of inlets in system [NINLET] =     1
---------------------     Total minor system capacity         =   2.762  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA      QPEAK      TPEAK      R.V.      DWF
                                 (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   02:S1         10.80      4.134      9.667   110.908     .000
     ======================================================================
     MAJOR SYST   03:101MJ        .53      1.372      9.667   110.908     .000
     MINOR SYST   04:101MN      10.27      2.762      9.600   110.908     .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0012-----------------------------------------------------------------------
*Split out 2 year flow
---------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =   1.557  (cms)
| TotalHyd 04:101MN   |   Number of inlets in system [NINLET] =     1
---------------------     Total minor system capacity         =   1.557  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA      QPEAK      TPEAK      R.V.      DWF
                                 (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   04:101MN      10.27      2.762      9.600   110.908     .000
     ======================================================================
     MAJOR SYST   06:101CH       1.02      1.205      9.600   110.908     .000
     MINOR SYST   09:101PD       9.24      1.557      9.567   110.908     .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0013-----------------------------------------------------------------------
--------------------
| ADD HYD (MJ1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 05:103MJ      1.06     2.701    9.70 111.50    .000
              +ID2 03:101MJ       .53     1.372    9.67 110.91    .000
               =====================================================
               SUM 10:MJ1        1.60     4.070    9.70 111.30    .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0014-----------------------------------------------------------------------
--------------------
| ADD HYD (CH1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 07:103CH      2.90     2.721    9.67 111.50    .000
              +ID2 06:101CH      1.02     1.205    9.60 110.91    .000
               =====================================================
               SUM 01:CH1        3.92     3.926    9.67 111.34    .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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001:0015-----------------------------------------------------------------------
--------------------
| ADD HYD (PD1   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 08:103PD     13.34      .928    9.60 111.50    .000
              +ID2 09:101PD      9.24     1.557    9.57 110.91    .000
               =====================================================
               SUM 02:PD1       22.58     2.485    9.60 111.25    .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0016-----------------------------------------------------------------------
* East Roof
---------------------
| CALIB STANDHYD      |   Area    (ha)=    3.50
| 03:000105 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      3.46           .03
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    150.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=    176.31        175.76
                over (min)       4.00         10.00
     Storage Coeff.  (min)=      3.20 (ii)     9.64 (ii)
     Unit Hyd. Tpeak (min)=      4.00         10.00
     Unit Hyd. peak  (cms)=       .32           .12
                                                          *TOTALS*
     PEAK FLOW       (cms)=      1.61           .01          1.621 (iii)
     TIME TO PEAK    (hrs)=      9.67          9.77          9.667
     RUNOFF VOLUME    (mm)=    117.37        111.86        117.318
     TOTAL RAINFALL   (mm)=    119.37        119.37        119.373
     RUNOFF COEFFICIENT   =       .98           .94           .983

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0017-----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>03:(000105)    |
| OUT<04:(EASTRF)    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .060  .2800E+00

     ROUTING RESULTS              AREA     QPEAK      TPEAK        R.V.
     -------------------          (ha)     (cms)      (hrs)        (mm)
     INFLOW >03: (000105)         3.50     1.621      9.667     117.318
     OUTFLOW<04: (EASTRF)         3.50      .057     11.500     117.316
    OVERFLOW<05: (OVRFLW)          .00      .000       .000        .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=     3.508
                  TIME SHIFT OF PEAK FLOW         (min)=    110.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.2653E+00

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001:0018-----------------------------------------------------------------------
--------------------
| ADD HYD (E1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 04:EASTRF     3.50      .057   11.50 117.32    .000
              +ID2 05:OVRFLW      .00      .000     .00    .00    .000 **DRY**
               =====================================================
               SUM 06:E1         3.50      .057   11.50 117.32    .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0019-----------------------------------------------------------------------
* West Roof
---------------------
| CALIB STANDHYD      |   Area    (ha)=    5.00
| 07:000104 DT= 2.00 |   Total Imp(%)=   99.00   Dir. Conn.(%)=   99.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      4.95           .05
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=    180.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=    176.31        175.76
                over (min)       4.00         10.00
     Storage Coeff.  (min)=      3.57 (ii)    10.01 (ii)
     Unit Hyd. Tpeak (min)=      4.00         10.00
     Unit Hyd. peak  (cms)=       .30           .11
                                                          *TOTALS*
     PEAK FLOW       (cms)=      2.26           .02          2.276 (iii)
     TIME TO PEAK    (hrs)=      9.67          9.77          9.667
     RUNOFF VOLUME    (mm)=    117.37        111.86        117.318
     TOTAL RAINFALL   (mm)=    119.37        119.37        119.373
     RUNOFF COEFFICIENT   =       .98           .94           .983

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  99.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0020-----------------------------------------------------------------------
--------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>07:(000104)    |
| OUT<08:(WESTRF)    |    =========  OUTFLOW STORAGE TABLE  =========
--------------------      OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |     .080  .3900E+00

     ROUTING RESULTS              AREA     QPEAK      TPEAK        R.V.
     -------------------          (ha)     (cms)      (hrs)        (mm)
     INFLOW >07: (000104)         5.00     2.276      9.667     117.318
     OUTFLOW<08: (WESTRF)         5.00      .078     11.567     117.316
    OVERFLOW<09: (OVRFLW)          .00      .000       .000        .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=     3.441
                  TIME SHIFT OF PEAK FLOW         (min)=    114.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.3818E+00

-------------------------------------------------------------------------------
001:0021-----------------------------------------------------------------------
--------------------
| ADD HYD (W1    ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 08:WESTRF     5.00      .078   11.57 117.32    .000
              +ID2 09:OVRFLW      .00      .000     .00    .00    .000 **DRY**
               =====================================================
               SUM 03:W1         5.00      .078   11.57 117.32    .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0022-----------------------------------------------------------------------
--------------------
| ADD HYD (EWROOF) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------                (ha)     (cms)   (hrs)   (mm)   (cms)
               ID1 06:E1         3.50      .057   11.50 117.32    .000
              +ID2 03:W1         5.00      .078   11.57 117.32    .000
               =====================================================
               SUM 04:EWROOF     8.50      .135   11.53 117.32    .000

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0023-----------------------------------------------------------------------
* Argentia Road Extension
---------------------
| CALIB STANDHYD      |   Area    (ha)=    1.30
| 05:000102 DT= 2.00 |   Total Imp(%)=   85.00   Dir. Conn.(%)=   85.00
---------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.11           .19
     Dep. Storage     (mm)=      2.00          5.00
     Average Slope     (%)=       .50          2.00
     Length            (m)=     90.00         50.00
     Mannings n           =      .013          .250

     Max.eff.Inten.(mm/hr)=    176.31         78.37
                over (min)       2.00         12.00
     Storage Coeff.  (min)=      2.35 (ii)    11.25 (ii)
     Unit Hyd. Tpeak (min)=      2.00         12.00
     Unit Hyd. peak  (cms)=       .49           .10
                                                          *TOTALS*
     PEAK FLOW       (cms)=       .54           .03           .553 (iii)
     TIME TO PEAK    (hrs)=      9.67          9.80          9.667
     RUNOFF VOLUME    (mm)=    117.37         58.60        108.556
     TOTAL RAINFALL   (mm)=    119.37        119.37        119.373
     RUNOFF COEFFICIENT   =       .98           .49           .909

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  70.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0024-----------------------------------------------------------------------
*Split out 10 year flow
---------------------
| COMPUTE DUALHYD     |   Average inlet capacities   [CINLET] =    .383  (cms)
| TotalHyd 05:000102  |   Number of inlets in system [NINLET] =     1
---------------------     Total minor system capacity         =    .383  (cms)
                          Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA      QPEAK      TPEAK      R.V.      DWF
                                 (ha)      (cms)      (hrs)      (mm)     (cms)
     TOTAL HYD.   05:000102      1.30       .553      9.667   108.556     .000
     ======================================================================
     MAJOR SYST   06:102MJ        .06       .170      9.667   108.556     .000
     MINOR SYST   07:102MN       1.24       .383      9.567   108.557     .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0025-----------------------------------------------------------------------
*Split out 2 year flow
```

```
---------------------
| COMPUTE DUALHYD    |   Average inlet capacities   [CINLET] =     .220  (cms)
| TotalHyd 07:102MN  |   Number of inlets in system [NINLET] =       1
---------------------    Total minor system capacity         =     .220  (cms)
                         Total major system storage [TMJSTO] =       0.(cu.m.)

                 ID: NHYD        AREA      QPEAK      TPEAK     R.V.      DWF
                                 (ha)      (cms)      (hrs)     (mm)     (cms)
     TOTAL HYD.   07:102MN        1.24       .383      9.567  108.557     .000
     ======================================================================
     MAJOR SYST   08:102CH         .11       .163      9.567  108.557     .000
     MINOR SYST   09:102PD        1.13       .220      9.533  108.557     .000

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0026-----------------------------------------------------------------------
--------------------
| ADD HYD (MJ2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 10:MJ1        1.60    4.070    9.70 111.30    .000
                +ID2 06:102MJ       .06     .170    9.67 108.56    .000
                 ======================================================
                 SUM 03:MJ2        1.66    4.070    9.70 111.20    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0027-----------------------------------------------------------------------
--------------------
| ADD HYD (CH2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 01:CH1        3.92    3.926    9.67 111.34    .000
                +ID2 04:EWROOF     8.50     .135   11.53 117.32    .000
                +ID3 08:102CH       .11     .163    9.57 108.56    .000
                 ======================================================
                 SUM 05:CH2       12.53    4.170    9.67 115.37    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0028-----------------------------------------------------------------------
--------------------
| ADD HYD (PD2   ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 02:PD1       22.58    2.485    9.60 111.25    .000
                +ID2 09:102PD      1.13     .220    9.53 108.56    .000
                 ======================================================
                 SUM 06:PD2       23.71    2.705    9.60 111.13    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0029-----------------------------------------------------------------------
---------------------
| ROUTE RESERVOIR    |    Requested routing time step =  2.0 min.
|  IN>06:(PD2    )   |
| OUT<07:(POND   )   |    =========  OUTFLOW STORAGE TABLE  =========
---------------------     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)    (ha.m.)   |    (cms)    (ha.m.)
                             .000  .0000E+00   |    2.280  .2630E+00
                             .028  .1190E+00   |    4.686  .3620E+00
                             .311  .1530E+00   |    7.610  .4670E+00
                             .827  .1890E+00   |   11.693  .6020E+00
                            1.492  .2250E+00   |     .000  .0000E+00

     ROUTING RESULTS             AREA     QPEAK     TPEAK        R.V.
     -------------------         (ha)     (cms)     (hrs)        (mm)
     INFLOW >06: (PD2    )      23.71     2.705     9.600     111.126
     OUTFLOW<07: (POND   )      23.71     2.592     9.900     111.125
    OVERFLOW<08: (OVRFLW)         .00      .000      .000        .000

                   TOTAL NUMBER OF SIMULATED OVERFLOWS  =          0
                   CUMULATIVE TIME OF OVERFLOWS  (hours)=        .00
                   PERCENTAGE OF TIME OVERFLOWING    (%)=        .00


                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=    95.841
                   TIME SHIFT OF PEAK FLOW         (min)=     18.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=.2760E+00

-------------------------------------------------------------------------------
001:0030-----------------------------------------------------------------------
--------------------
| ADD HYD (PNDOUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 07:POND      23.71    2.592    9.90 111.12    .000
                +ID2 08:OVRFLW      .00     .000     .00    .00    .000 **DRY**
                 ======================================================
                 SUM 09:PNDOUT    23.71    2.592    9.90 111.12    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0031-----------------------------------------------------------------------
* 5YROUT must be 2.84 m3/s or less for 5 year event based on 75 l/s/ha for
* 37.9 total site hectares.
--------------------
| ADD HYD (5YROUT) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 09:PNDOUT    23.71    2.592    9.90 111.12    .000
                +ID2 05:CH2       12.53    4.170    9.67 115.37    .000
                 ======================================================
                 SUM 10:5YROUT    36.24    6.506    9.77 112.59    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0032-----------------------------------------------------------------------
* TOTAL is all flows from development site and argentia road
--------------------
| ADD HYD (TOTAL ) | ID: NHYD     AREA     QPEAK   TPEAK   R.V.    DWF
--------------------              (ha)     (cms)   (hrs)   (mm)   (cms)
                 ID1 03:MJ2        1.66    4.070    9.70 111.20    .000
                +ID2 10:5YROUT    36.24    6.506    9.77 112.59    .000
                 ======================================================
                 SUM 01:TOTAL     37.90   10.503    9.70 112.53    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
001:0033-----------------------------------------------------------------------
---------------------
| CALIB NASHYD       |   Area    (ha)=    4.80   Curve Number   (CN)=70.00
| 02:100    DT= 2.00 |   Ia      (mm)=   8.000   # of Linear Res.(N)= 3.00
---------------------    U.H. Tp(hrs)=    .700

     Unit Hyd Qpeak  (cms)=     .262

     PEAK FLOW       (cms)=     .271 (i)
     TIME TO PEAK    (hrs)=   10.433
     RUNOFF VOLUME    (mm)=   56.322
     TOTAL RAINFALL   (mm)=  119.373
     RUNOFF COEFFICIENT   =     .472

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
001:0034-----------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
    ------------------------
 001:0009 ROUTE RESERVOIR
      *** WARNING: Outflow volume is less than inflow volume.
   Simulation ended on 2012-05-16     at 14:52:12
===============================================================================
```

DRAFT

Preliminary Geotechnical Investigation

7564 Tenth Line Road, Mississauga, Ontario

Prepared for:

Prologis Inc.
500 – 1800 Wazee Street
Denver, CO USA 80202

October 30, 2024

Pinchin File: 342044.001

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Issuing Office: **Mississauga, ON**

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Geotechnical Project Manager

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Director, Geotechnical Services

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1.0 INTRODUCTION AND SCOPE

Pinchin Ltd. (Pinchin) was retained by Prologis Inc. (Client) to conduct a Preliminary Geotechnical Investigation and provide subsequent geotechnical design recommendations as part of due diligence requirements for potential acquisition of 7564 Tenth Line Road, Mississauga, Ontario (Site).

Based on information provided by the Client, the current plans for development consist of three one-storey industrial buildings, with no basement levels, and associated access roadways and parking. Proposed final grades were not know at the time of this report's preparation.

Pinchin's geotechnical comments and recommendations are based on the results of the Preliminary Geotechnical Investigation and our understanding of the project scope.

The purpose of the Preliminary Geotechnical Investigation was to delineate the subsurface conditions and soil engineering characteristics by advancing a total of thirty (30) sampled boreholes (Boreholes BH1 to BH30), at the Site.

Based on a desk top review and the results of the Preliminary Geotechnical Investigation, the following geotechnical data and engineering design recommendations are provided herein:

- A detailed description of the soil and groundwater conditions;
- Site preparation recommendations;
- Open cut excavations;
- Anticipated groundwater management;
- Site service trench design;
- Preliminary foundation design recommendations including soil bearing resistances at Ultimate Limit States (ULS) and Serviceability Limit States (SLS) design;
- Potential total and differential settlements;
- Foundation frost protection and engineered fill specifications and installation;
- Seismic Site classification for seismic Site response;
- Concrete floor slab-on-grade support recommendations; and,
- Potential construction concerns.

Abbreviations terminology and principle symbols commonly used throughout the report, borehole logs and appendices are enclosed in Appendix I.

2.0 SITE DESCRIPTION AND GEOLOGICAL SETTING

The Site is located at 7564 Tenth Line Road in Mississauga, Ontario. The Site is currently undeveloped and used for agricultural purposes. The site is adjacent to Highway 401 right-of-way to the north and industrial buildings to the south.

Data obtained from the Ontario Geological Survey Maps, as published by the Ontario Ministry of Natural Resources, indicates that the Site is located on glaciolacustrine deposits generally comprising silty clay or clay cohesive till. The underlying bedrock at this Site is of the Queenston Formation consisting of shale, limestone, dolostone and siltstone (Ontario Geological Survey Map 1972, published 1978).

3.0 GEOTECHNICAL FIELD INVESTIGATION AND METHODOLOGY

Pinchin completed field investigations at the Site between September 26th and October 2nd , 2024 by advancing a total of thirty (30) sampled boreholes throughout the Site. The boreholes were advanced to depths of approximately 6.4 metres below existing ground surface (mbgs). The approximate spatial locations of the boreholes advanced at the Site are shown on the sketch in Figure 1. A drafted borehole location plan will be provided in the final version of this report.

The boreholes were advanced with the use of a CME 55 track-mounted rotary drill rig which was equipped with standard soil sampling equipment. Soil samples were collected at 0.75 and 1.5 m intervals using a 51 mm outside diameter (OD) split spoon barrel in conjunction with Standard Penetration Tests (SPT) "N" values (ASTM D1586). The SPT "N" values were used to assess the compactness condition of the non-cohesive soils and estimate the consistency of cohesive soils.

Monitoring wells were installed in two boreholes to allow measurement of stabilized groundwater levels . The monitoring wells were constructed using flush-threaded 50 mm diameter Trilock pipe with 3.0 meter long 10-slot well screens, delivered to the Site in pre-cleaned individually sealed plastic bags. The screen and riser pipes were not allowed to come into contact with the ground or drilling equipment prior to installation.

A completed well record was submitted to the property owner and the Ministry of the Environment, Conservation and Parks for Ontario (MECP) as per Ontario Regulation 903, as amended. A licensed well technician must properly decommission the monitoring wells prior to construction according to Regulation 903 of the Ontario Water Resources Act.

Groundwater observations and measurements were obtained from the open boreholes during and upon completion of drilling. Groundwater levels were not measured at the time of the draft version of this report, but will be included in the final report. The groundwater observations and measurements recorded are included on the appended borehole logs.

The borehole locations were not surveyed at the time of the draft version of this report. Surveyed borehole locations and ground surface elevations will be provided in the final version of this report.

The field investigation was monitored by experienced Pinchin personnel. Pinchin logged the drilling operations and identified the soil samples as they were retrieved. The recovered soil samples were sealed into plastic bags and carefully transported to Pinchin's accredited materials testing laboratory for detailed analysis and testing. All soil samples were classified according to visual and index properties by the project engineer.

The field logging of the soil and groundwater conditions was performed to collect geotechnical engineering design information. The borehole logs include textural descriptions of the subsoil in accordance with a modified Unified Soil Classification System (USCS) and indicate the soil boundaries inferred from non-continuous sampling and observations made during the borehole advancement. These boundaries reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. The modified USCS classification is explained in further detail in Appendix I. Details of the soil and groundwater conditions encountered within the boreholes are included on the Borehole Logs within Appendix II.

Select soil samples collected from the boreholes were submitted to Pinchin's material testing laboratory to determine the grain size distribution and plasticity characteristics of the soil. At the time of writing this report, the laboratory results are not yet available, and will be included in the final version of this report.

4.0 SUBSURFACE CONDITIONS

4.1 Borehole Soil Stratigraphy

In general, the soil stratigraphy at the Site comprises topsoil underlain with a layer of sandy silt, underlain by glacial till deposits. The upper layer of glacial till typically comprises cohesive silty clay or sandy silt and clay, which overlies sandy silt til silty sand till. The appended borehole logs provide detailed soil descriptions and stratigraphies, results of SPTs, moisture content profiles, details of monitoring well installations, and groundwater measurements.

4.1.1 Topsoil

All borehole on site encountered topsoil at surface, ranging in thickness from 100 mm to 300 mm.

4.1.2 Sandy Silt

A 0.4 to 0.6 m thick layer of sandy silt was found beneath the topsoil in most boreholes on site, extending to depths of 0.8 mbgs. This sandy silt layer contained trace gravel, was brown in colour and was described as moist.

SPT 'N'-values within this sandy silt layer ranged between 4 and 10 blows per 0.3 m of penetration, indicating a loose stat of compactness.

4.1.3 Silty Clay to Sandy Silty Clay Till

Underlying the topsoil in all boreholes, a 4.0 to 6.5 m thick deposit of silty clay was encountered, extending to depths between about 4.2 to 6.7 mbgs. Boreholes BH9, BH21, BH27 and BH28 were terminated in this deposit. The silty clay was described as sandy to containing some sand, trace to some gravel and brown in colour. The moisture content of this deposit was generally described as being about the plastic limit (APL) to drier than the plastic limit (DTPL).

SPT 'N'-values within the silty clay deposit ranged between 5 and greater than 50 blows per 0.3 m of penetration, suggesting a firm to hard consistency. The majority of this glacial till deposit more than 1.5 m below existing grade was very stiff to hard.

4.1.4 Sandy Silt to Silty Sand to Silty Sand and Gravel Till

Underlying the upper cohesive glacial till in all boreholes except Boreholes BH9, BH21, BH27 and BH28, a deposit of sandy silt to silty sand to silty sand and gravel till was encountered. This lower non-cohesive glacial till deposit extended to the termination depth of all boreholes in which it was encountered. This non-cohesive deposit was generally described as grey, wet, and containing trace rock fragments.

SPT 'N'-values within this deposit ranged from 13 to greater than 50 blow per 0.3 m of penetration, indicating a compact to very dense state of compactness.

4.2 Groundwater Conditions

Groundwater observations and measurements were obtained in the open boreholes at the completion of drilling and are summarized on the appended borehole logs. Groundwater levels in the open boreholes generally ranged from 5.0 to 6.7 mbgs. Groundwater had not been measured in the monitoring wells installed for this investigation at the time of the draft version of this report.

Typically, the grey colour of the soils noted in the boreholes between 5.0 to 5.5 mbgs is indicative of permanent saturated conditions, and therefore, the fluctuations of the long-term groundwater should not be expected to drop below this depth. Perched groundwater may occur above these depths particularly following heavy rainfall or snowmelt.

Seasonal variations in the water table should be expected, with higher levels occurring during wet weather conditions in the spring and fall and lower levels occurring during dry weather conditions.

5.0 PRELIMINARY GEOTECHNICAL DESIGN RECOMMENDATIONS

5.1 General Information

The recommendations presented in the following sections of this report are based on the information available regarding the proposed construction, the results obtained from the preliminary geotechnical investigation, and Pinchin's experience with similar projects. Since the investigation only represents a portion of the subsurface conditions, it is possible that conditions may be encountered during construction that are substantially different than those encountered during the investigation. If these situations are encountered, adjustments to the design may be necessary. A qualified geotechnical engineer should be on-Site during the foundation preparation to ensure the subsurface conditions are the same/similar to what was observed during the investigation.

It is Pinchin's understanding that the development will consist of a three one-storey slab-on-grade (i.e. no basement level) industrial buildings and associated parking areas and access roadways. Information on proposed finished grades was not available at the time of this report's preparation.

5.2 Site Preparation

The existing topsoil is not considered suitable to remain below the proposed buildings, driveways and parking areas and will need to be removed. In calculating the approximate quantity of topsoil to be stripped, we recommend that the topsoil thicknesses provided on the individual borehole logs be increased by 50 mm to account for variations and some stripping of the mineral soil below.

Pinchin recommends that any engineered fill required at the Site be compacted in accordance with the criteria stated in the following table:

Type of Engineered Fill	Maximum Loose Lift Thickness (mm)	Compaction Requirements	Moisture Content (Percent of Optimum)
Structural fill to support foundations and floor slabs	200	100% SPMDD	Plus 2 to minus 4
Subgrade fill beneath parking lots and access roadways	300	98% SPMDD	Plus 2 to minus 4

Prior to placing any fill material at the Site, the subgrade should be inspected by a qualified geotechnical engineer, and loosened/soft pockets should be sub excavated and replaced with engineered fill.

Engineered structural fill must extend at least 1 m beyond the edge of proposed footings, and then downwards and outwards to competent subgrade at 1 horizontal to 1 vertical. It is also recommended that engineered structural fill be overbuilt at least 300 mm above the design underside of footing elevations.

The native sandy silty clay to silty clay till should be suitable for use as engineered fill and subgrade fill provided the grading work is carried out during periods of time with warmer weather and limited precipitation. Any wet portions of the native soils may need to be placed in thin lifts over large areas and allowed to dry. Placement in thin lifts is also important to ensure that any drier blocky portions of the native soils are properly broken down such that there are no air voids left in the fill. Use of heavy sheepsfoot packers will help to properly compact the fill.

It is recommended that any additional material imported to Site to raise grades below the proposed buildings comprise imported Ontario Provincial Standard Specification (OPSS) 1010 Granular 'B' Type I material. It is noted that Granular 'B' Type I material may consist of up to 100% Reclaimed Concrete Materials (RCM). RCM used as Granular 'B' shall not contain any loose reinforcing material. It is also noted that RCM will tend to increase the pH level of the Site and potentially contain environmental contaminants. The presence of thick RCM fills could affect the environmental conditions of the Site and become an issue in the future should the Site be sold or redeveloped.

If the work is carried out during very dry weather, water may have to be added to the material to improve compaction. Other types of imported soil may be suitable for use on Site but should be approved by a geotechnical engineer prior to import. A qualified geotechnical engineering technician should be on site to observe fill placement operations and perform field density tests at random locations throughout each lift, to indicate the specified compaction is being achieved.

5.3 Open Cut Excavations

It is anticipated that the foundations will be constructed at conventional frost depths, approximately 1.5 metres below finished floor elevation. Excavations for site services are expected at conventional depths of 2 to 3 mbgs.

Based on the subsurface information obtained from within the boreholes, it is anticipated that the excavated material will predominately consist of topsoil, sandy silt and native silty clay material. Groundwater was generally encountered at depths between 5.0 and 6.7 mbgs.

Where workers must enter trench excavations deeper than 1.2 m, the trench excavations should be suitably sloped and/or braced in accordance with the Occupational Health and Safety Act (OHSA), Ontario Regulation 213/91, Construction Projects, July 1, 2011, Part III - Excavations, Section 226. Alternatively, the excavation walls may be supported by either closed shoring, bracing, or trench boxes complying with sections 235 to 239 and 241 under O. Reg. 231/91, s. 234(1). The use of trench boxes can most likely be used for temporary support of vertical side walls. The appropriate trench should be designed/confirmed for use in this soil deposit.

Based on the OHSA, the silty clay soils would be classified as Type 2 soil and temporary excavations in these soils may be cut vertical in the bottom 1.2 m and must be sloped back at an inclination of 1 horizontal to 1 vertical (H to V) above this. The sandy silt soils would be classified as Type 3 soil and temporary excavations in these soils must be sloped back at an inclination of 1 horizontal to 1 vertical (H to V)from the base of the excavation. Excavations extending below the groundwater table would be classified as a Type 4 soil and temporary excavations will have to be sloped back at 3 horizontal to 1 vertical from the base of the excavation. Excavations through more than one soil type must be sloped as per the requirements of the soil type with the highest number.

In addition to compliance with the OHSA, the excavation procedures must also be in compliance to any potential other regulatory authorities, such as federal and municipal safety standards.

Alternatively, the excavation walls may be supported by either closed shoring, or bracing, complying with sections 235 to 239 and 241 under O. Reg. 231/91, s. 234(1). Pinchin would be pleased to provide further recommendations on shoring design once the building plans have been completed.

Seasonal variations in the water table should be expected, with higher levels occurring during wet weather conditions in the spring and fall and lower levels occurring during dry weather conditions. If construction commences during wet periods (typically spring or fall), there is a greater potential that the groundwater elevation could be higher and/or perched groundwater may be present. Any potential precipitation or perched groundwater should be able to be controlled from pumping from filtered sumps.

Prior to commencing excavations, it is critical that all existing surface water and potential surface water is controlled and diverted away from the Site to prevent infiltration and subgrade softening. At no time should excavations be left open for a period of time that will expose them to precipitation and cause subgrade softening.

All collected water is to discharge a sufficient distance away from the excavation to prevent re-entry. Sediment control measures, such as a silt fence should be installed at the discharge point of the dewatering system. The utmost care should be taken to avoid any potential impacts on the environment.

It is the responsibility of the contractor to propose a suitable dewatering system based on the groundwater elevation at the time of construction. The method used should not adversely impact any nearby structures. Excavations to conventional design depths for the building foundations are not expected to require a Permit to Take Water or a submission to the Environmental Activity and Sector Registry (EASR). It is the responsibility of the contractor to make this application if required.

As previously mentioned, above average seasonal variations in the groundwater table should be expected, with higher levels occurring during wet weather conditions in the spring and fall and lower levels occurring during dry weather conditions. As such, depending on the groundwater at the time of the excavation works, a more involved dewatering system may be required.

5.4 Site Servicing

5.4.1 Pipe Bedding and Cover Materials for Flexible and Rigid Pipes

The subgrade soil conditions beneath the site services will likely comprise natural glacial till soils. Any organic or excessively loose/soft soil encountered below the pipe inverts should be removed and replaced with additional pipe bedding. No support problems are anticipated for flexible or rigid pipes founded in the natural mineral soils. It is critical that the pipe subgrade is inspected by a geotechnical engineer prior to placement of pipe bedding material to ensure adequate support is available for the services.

Service pipes require an adequate base to ensure proper pipe connection and positive flow is maintained post construction. As such, pipe bedding should be placed to be of uniform thickness and compactness. The pipe bedding and cover material should conform to OPSD 802.010 and 802.013 specifications for flexible pipes and to OPSD 802.031 to 802.033 with Class “B” bedding for rigid pipes. The pipe bedding material should consist of a minimum thickness of 150 mm Granular “A” (OPSS 1010) below the pipe and extend up the sides to the spring line. However, the bedding thickness may have to be increased depending on the pipe diameter or if wet or weak subgrade conditions are encountered. The pipe cover material from the spring line should consist of a Granular “B” Type I (OPSS 1010) and should extend to a minimum of 300 mm above the top of the pipe. All granular fill material is to be placed in maximum 200 mm thick loose lifts compacted to a minimum of 98% SPMDD.

The bedding material, pipe and cover material should be installed as soon as practically possible after the excavation subgrade is exposed. The longer the excavated subgrade soil remains open to weather conditions and groundwater seepage, the greater the chance for construction problems to occur. Where it is difficult to stabilize the subgrade due to groundwater or the material is higher than the optimum moisture content, a Granular “B” Type II material may be required. Alternatively, if constant groundwater infiltration becomes an issue, then an approximate 150 mm granular pad consisting of 19 mm clear stone gravel (OPSS 1004) wrapped in a non-woven geotextile should be considered to maintain the integrity of the natural subgrade soil.

The clear stone should contain a minimum of 50% crushed particles. Water collected within the stone should be controlled through sumps and filtered pumps.

5.4.2 Trench Backfill

Following placement of the pipe bedding cover the trench shall be backfilled. The on-Site glacial till soils from above the groundwater table will be suitable for use at trench backfill. Portions of the material may be too wet and will require drying prior to placing as backfill. The natural clayey soils will have a blocky/lumpy texture, and a sheepsfoot roller is recommended in order to achieve proper compaction and ensure that all air voids are removed to avoid long term softening and settlement.

The soil should be placed to the design subgrade level, and be compacted in maximum 200 mm thick lifts to 98% SPMDD within 4% of the optimum moisture content for hardscaped areas and 95% SPMDD within 4% of the optimum moisture content for landscaped areas. The natural material must be free of organics or other deleterious material.

All stockpiled material should be protected from deleterious materials, additional moisture and be kept from freezing.

Quality control will be the utmost importance when selecting the material to use as backfill whether natural material or imported granular. The selection of the material should be done as early in the contract as possible to allow sufficient time for gradation and proctor testing on representative samples to ensure it meets the projects specifications.

Where the natural soil will be exposed, adequate compaction may prove difficult if the material becomes wet (i.e., above the optimum moisture content). Depending on the moisture content of the natural materials at the time of construction, they may either require moisture to be added or stockpiled and left to dry to achieve moisture content within plus 2% to minus 4% of optimum.

Depending on weather conditions at the time of construction, an imported material may be required regardless to achieve adequate compaction. If the imported material is not the same/similar to the soil observed on the side walls of the excavation, then a horizontal transition between the materials should be sloped as per frost heave taper OPSD 205.060.

Any natural material is to be placed in maximum 200 mm thick lifts compacted to 98% SPMDD within plus 2% to minus 4% optimum moisture content. Imported material should consist of a Granular “A”, Granular “B” Type I, or Select Subgrade Material (OPSS 1010). Heavy construction equipment and truck traffic should not cross any pipe until at least 1 m of compacted soil is placed above the top of the pipe.

Post compaction settlement of finer grained soil can be expected, even when placed to compaction specifications. As such, fill materials should be installed as far in advance as possible before finishing the roadway in order to mitigate post compaction settlements.

5.5 Foundation Design

5.5.1 Shallow Foundations Bearing on Engineered Fill or Undisturbed Native Soils

The existing glacial till deposits is considered suitable to support the proposed building, provided all of the topsoil and any previously disturbed native material is removed, and the subgrade prepared as above. In the event that design underside of footing elevations are above the level of undisturbed native soils, the engineered structural fill must be placed as described in Section 5.2 of this report.

Conventional shallow strip or spread footings between 0.5 m and 3.0 in width, established on properly placed engineered structural fill or on the upper inorganic undisturbed native soils, may be designed using a bearing resistance for 25 mm of settlement at Serviceability Limit States of 150 kPa, and a factored geotechnical bearing resistance of 225 kPa at Ultimate Limit States (ULS).

Conventional shallow strip or spread footings between 0.5 m and 3.0 in width, established on the inorganic glacial till more than 1.5 m below existing grade, may be designed using a bearing resistance for 25 mm of settlement at Serviceability Limit States of 200 kPa, and a factored geotechnical bearing resistance of 225 kPa at Ultimate Limit States (ULS).

Higher bearing resistances may be available for deeper footings; however, as the actual building designs are unknown, Pinchin should be consulted to confirm the design bearing resistances provided are suitable for the design footing elevations.

As the actual service loads were not known at the time of this report, these should be reviewed by the project structural engineer to determine if SLS or ULS governs the footing design.

It is noted that there is a likelihood of weaker subgrade soil to be encountered between the investigation locations. Pinchin presumes that any areas of weaker subgrade soil will consist of small pockets of soft/loose natural soil which can be compacted to match the density of the remainder of the Site. As such, the material must be compacted to a minimum of 100% Standard Proctor Maximum Dry Density (SPMDD) prior to installing the concrete formwork. Any soft/loose areas which are not able to achieve the recommended 100% SPMDD are to be removed and replaced with a low strength concrete.

Pinchin notes that a qualified geotechnical engineering consultant should be on-Site during the proof roll and foundation preparation activities to verify the recommended level of compaction is achieved and to verify the design assumptions and recommendations. This is especially critical with respect to the recommended soil bearing pressures. If variations occur in the soil conditions between the borehole locations, site verification and site review by Pinchin is recommended to provide appropriate recommendations at that time.

The natural subgrade soil is sensitive to change in moisture content and can become loose/soft if subjected to additional water or precipitation. As well, it could be easily disturbed if travelled on during construction. Once it becomes disturbed it is no longer considered adequate to support the recommended design bearing pressures. It is recommended that a working slab of lean concrete (mud slab) be placed in the footing areas immediately after excavation and inspection to protect the founding soils during placement of formwork and reinforcing steel.

In addition, to ensure and protect the integrity of the subgrade soil during construction operations, the following is recommended:

- Prior to commencing excavations, it is critical that all existing surface water, potential surface water and perched groundwater are controlled and diverted away from the work Site to prevent infiltration and subgrade softening. At no time should excavations be left open for a period of time that will expose them to inclement weather conditions and cause subgrade softening;
- The subgrade should be sloped to a sump outside the excavation to promote surface drainage and the collected water pumped out of the excavation. Any potential precipitation or seepage entering the excavations should be pumped away immediately (not allowed to pond);
- The footing areas should be cleaned of all deleterious materials such as topsoil, organics, fill, disturbed, or caved material;
- Any potential large cobbles or boulders (i.e. greater than 200 mm in diameter) within the subgrade material are to be removed and replaced with a similar soil type not containing particles greater than 200 mm in diameter. It is critical that particles greater than 200 mm in diameter are not in contact with the foundation to prevent point loading and overstressing; and,
- If the excavated subgrade soil remains open to weather conditions and groundwater seepage, sidewall stability and suitability of the subgrade soil will need to be verified prior to construction.

If construction proceeds during freezing weather conditions, adequate temporary frost protection for the footing bases and concrete must be provided and maintained above freezing at all times.

5.5.2 Cast-in-place Concrete Caissons

Bored piles (drilled shafts) may be considered as an alternative for the building foundations. Bored piles typically involve drilling a vertical hole into the ground, and filling the hole with structural concrete and reinforcing steel. Once additional information on proposed grades and proposed building loads is available, further assessment on the potential use of caisson foundations can be provided.

5.5.3 Earth Pressure Parameters

The following parameters (un-factored) should be used for the design of structural elements subject to unbalanced earth pressures.

Soil Layer	Bulk Unit Weight (kN/m^3)	Angle of Internal Friction	Active Earth Pressure Coefficient	At-Rest Earth Pressure Coefficient	Passive Earth Pressure Coefficient
Glacial Till	21	30°	0.33	0.50	3.00

5.5.4 Site Classification for Seismic Site Response & Soil Behaviour

The following information has been provided to assist the building designer from a geotechnical perspective only. These geotechnical seismic design parameters should be reviewed in detail by the structural engineer and be incorporated into the design as required.

The seismic site classification has been based on the 2012 OBC. The parameters for determination of Site Classification for Seismic Site Response are set out in Table 4.1.8.4.A of the OBC. The site classification is based on the average shear wave velocity in the top 30 m of the site stratigraphy. If the average shear wave velocity is not known, the site class can be estimated from energy corrected Standard Penetration Resistance (N60) and/or the average undrained shear strength of the soil in the top 30 m.

The boreholes advanced at this Site extended to approximately 6.4 mbgs and were terminated in the glacial till deposit. SPT “N” values within this soil deposit ranged between 10 and greater than 50 blows per 300 mm. As such, based on Table 4.1.8.4.A of the OBC, this Site has been classified as Class D. A Site Class D has an average shear wave velocity (Vs) of between 180 and 360 m/s. It is recommended that shear wave velocity soundings be completed at the Site once final design and depths of foundations are known as a higher Site Classification may be available for deeper foundations at the Site.

5.5.5 Foundation Transition Zones

Excessive differential settlements can occur where the subgrade support material types differ below the underside of continuous strip footings, (i.e., structural fill to native silty clay). As such, where strip footings transition from one material to another the transition between the materials should be suitably sloped or benched to mitigate differential settlements.

Pinchin also recommends the following transition precautions to mitigate/accommodate potential differential settlements:

- For strip footings, the transition zones should be adequately reinforced with additional reinforced steel lap lengths or widened footings;
- Steel reinforced poured concrete foundation walls; and
- Control joints throughout the transition zone(s).

The above recommendations should be reviewed by the structural engineer and incorporated into the design as necessary.

Where strip footings are founded at different elevations, the subgrade soil is to have a maximum slope of 2 H to 1 V, with the concrete footing having a maximum rise of 600 mm and a minimum run of 600 mm between each step, as detailed in the 2012 Ontario Building Code (OBC). The lower footing should be installed first to mitigate the risk of undermining the upper footing.

Individual spread footings are to be spaced a minimum distance of one and a half times the largest footing width apart from each other to avoid stress bulb interaction between footings. This assumes the footings are at the same elevation.

Foundations may be placed at a higher elevation relative to one another provided that the slope between the outside face of the foundations are separated at a minimum slope of 2H: 1V with an imaginary line drawn from the underside of the foundations. The lower footing should be installed first to mitigate the risk of undermining the upper footing.

5.5.6 Estimated Settlement

All individual spread footings should be founded on uniform subgrade soils, reviewed and approved by a licensed geotechnical engineer.

Foundations installed in accordance with the recommendations outlined in the preceding sections are not expected to exceed total settlements of 25 mm and differential settlements of 19 mm.

All foundations are to be designed and constructed to the minimum widths as detailed in the 2012 OBC.

5.5.7 Building Drainage

To assist in maintaining the buildings dry from surface water seepage, it is recommended that exterior grades around the buildings be sloped away at a 2% gradient or more, for a distance of at least 2.0 m. Roof drains should discharge a minimum of 1.5 m away from the structure to a drainage swale or appropriate storm drainage system.

Exterior perimeter foundations drains are not required, where the finished floor elevation is established a minimum of 150 mm above the exterior final grades or that the exterior gradient is properly sloped to divert surface water away from the buildings.

5.5.8 Shallow Foundations Frost Protection & Foundation Backfill

In the Mississauga, Ontario area, exterior perimeter foundations for heated buildings require a minimum of 1.2 m of soil cover above the underside of the footing to provide soil cover for frost protection.

Where the foundations for heated buildings do not have the minimum 1.2 m of soil cover frost protection, they should be protected from frost with a combination of soil cover and rigid polystyrene insulation, such as Dow Styrofoam or equivalent product. If required, Pinchin can provide appropriate foundation frost protection recommendations as part of the design review.

To minimize potential frost movements from soil frost adhesion, the perimeter foundation backfill should consist of a free draining granular material, such as a Granular 'B' Type I (OPSS 1010) or an approved sand fill, extending a minimum lateral distance of 600 mm beyond the foundation. The existing glacial till soils are not considered suitable for reuse as foundation wall backfill due to poor hydraulic conductivity. Backfill must be brought up evenly on both sides of walls not designed to resist lateral earth pressure. All backfill material is to be placed in maximum 300 mm thick lifts compacted to a minimum of 100% SPMDD below the interior of building and exterior hard landscaping areas; and, 95% SPMDD below exterior soft landscaping areas. It is recommended that inspection and testing be carried out during construction to confirm backfill quality, thickness and to ensure compaction requirements are achieved.

5.6 Floor Slabs

Prior to the installation of the engineered fill material, all organics and deleterious materials should be removed to the underlying organic free in-situ soil. The natural subgrade soil is to be proof roll compacted with a minimum 10 tonne non-vibratory steel drum roller to observe for weak/soft spots. It is noted that some locations will not be accessible by the steel drum roller; as such, these locations can be proof roll compacted with a minimum 450 kg vibratory plate compactor.

The in-situ inorganic glacial till material encountered within the boreholes is considered adequate for the support of the concrete floor slabs provided it is proof roll compacted as outlined above. Any soft area(s) encountered during proof rolling should be excavated and replaced with a similar soil type.

Once the subgrade soil is exposed it is to be inspected and approved by a qualified geotechnical engineering consultant to ensure that the material conforms to the soil type and consistency observed during the subsurface investigation work.

Based on the in-situ soil conditions, it is recommended to establish the concrete floor slab on a minimum 300 mm thick layer of Granular "A" (OPSS 1010) compacted to 100% SPMDD. To create a better draining working pad within the building prior to floor slab placement, consideration can be given to placing a 300 mm thick layer of crusher run Granular 'B' with a maximum particle size of 50 mm, compacted to 100% SPMDD, with an underlying subdrain system Any required up-fill should consist of a Granular "B" Type I or Type II (OPSS 1010).

The installation of a vapour barrier may be required under the floor slab. If required, the vapour barrier should conform to the flooring manufacturer's and designer's requirements. Consideration may be given to carrying out moisture emission and/or relative humidity testing of the slab to determine the concrete condition prior to flooring installation. To minimize the potential for excess moisture in the floor slab, a concrete mixture with a low water-to-cement ratio (i.e. 0.5 to 0.55) should be used.

The following table provides the unfactored modulus of subgrade reaction values:

Material Type	Modulus of Subgrade Reaction (kN/m^3)
Granular A (OPSS 1010)	85,000
Granular "B" Type I (OPSS 1010)	75,000
Granular "B" Type II (OPSS 1010)	85,000
Native Glacial Till or Engineered Fill	20,000

5.7 Asphaltic Concrete Pavement Structure Design for Parking Lot and Driveways

5.7.1 Discussion

Parking areas and driveway access will be constructed around the proposed buildings. The in-situ glacial till deposit is considered a sufficient bearing material for an asphaltic concrete pavement structure provided all organics, deleterious materials and areas of disturbed native soil are removed prior to installing the engineered fill material.

At this time Pinchin is unaware of the proposed final grades for the parking lot and access roadways. As such, provided the pavement structure overlies the in-situ silty clay material, the following pavement structure is recommended.

5.7.2 Pavement Structure

The following table presents the minimum specifications for a flexible asphaltic concrete pavement structure:

Pavement Layer	Compaction Requirements	Parking Areas	Driveways
Surface Course Asphaltic Concrete HL-3 (OPSS 1150)	92% MRD as per OPSS 310	35 mm	35 mm

Pavement Layer	Compaction Requirements	Parking Areas	Driveways
Binder Course Asphaltic Concrete HL-8 (OPSS 1150)	92 % MRD as per OPSS 310	55 mm	80 mm
Base Course: Granular “A” (OPSS 1010)	100% Standard Proctor Maximum Dry Density (ASTM-D698)	150 mm	150 mm
Subbase Course: Granular “B” Type I (OPSS 1010)	100% Standard Proctor Maximum Dry Density (ASTM D698)	400 mm	450 mm

Notes:

I. Prior to placing the pavement structure, the subgrade soil is to be proof rolled with a smooth drum roller without vibration to observe weak spots and the deflection of the soil; and

II. The recommended pavement structure may have to be adjusted according to Region of Peel standards. Also, if construction takes place during times of substantial precipitation and the subgrade soil becomes wet and disturbed, the granular thickness may have to be increased to compensate for the weaker subgrade soil. In addition, the granular fill material thickness may have to be temporarily increased to allow heavy construction equipment access the Site, in order to avoid the subgrade from “pumping” up into the granular material.

III. Performance grade PG 58-28 asphaltic concrete should be specified for Marshall mixes. Consideration should be given to increasing the grade to 64-28 in areas designed for heavy truck traffic.

It is understood that consideration may be given to using asphalt reinforcement or granular reinforcement to optimize the pavement design. It is also understood that the Client has previous experience utilizing FORTA-FI asphalt reinforcement on other projects. As the native subgrade soils at this Site are silty, they may have frost susceptibility. As such, a significant reduction in the overall pavement structure thickness may result in increased potential for pavement distress due to frost heave. As such, it is recommended that the optimization be limited to asphalt reinforcement, subject to reassessment once additional information is available on proposed grades and engineered fill type if the pavement structure will be supported on engineered fill. The following optimized pavement structure utilizing FORTA-FI asphalt reinforcement could be considered:

Pavement Layer	Compaction Requirements	Light Duty Traffic and Parking Areas	Heavy Duty Traffic Areas and Access Roads
Surface Course: Asphaltic Concrete HL-3 (OPSS 1150) FORTA-FI Reinforced	92% MRD as per OPSS.MUNI 310	35 mm	35 mm
Binder Course: Asphaltic Concrete FORTA-FI Reinforced	92% MRD as per OPSS.MUNI 310	45 mm HL-4	55 mm HL-8
Base Course: Granular “A” (OPSS 1010)	100% Standard Proctor Maximum Dry Density (ASTM-D698)	150 mm	150 mm

Pavement Layer	Compaction Requirements	Light Duty Traffic and Parking Areas	Heavy Duty Traffic Areas and Access Roads
Subbase Course: Granular "B" Type II (OPSS 1010)	100% Standard Proctor Maximum Dry Density (ASTM D698)	350 mm	400 mm

Notes:

i) Prior to placing the pavement structure, the subgrade soil is to be proof rolled with a smooth drum roller without vibration to observe weak spots and the deflection of the soil; and

ii) The recommended pavement structure may have to be adjusted according to the Town of Caledon municipal standards. Also, if construction takes place during times of substantial precipitation and the subgrade soil becomes wet and disturbed, the granular thickness may have to be increased to compensate for the weaker subgrade soil. In addition, the granular fill material thickness may have to be temporarily increased to allow heavy construction equipment to access the Site, in order to avoid the subgrade from "pumping" up into the granular material.

iii) Performance grade PG 58-28 asphaltic concrete should be specified for Marshall mixes. Consideration should be given to increasing the grade to 64-28 in areas designed for heavy truck traffic.

The FORTA-FI reinforcement must be introduced into the asphalt mixes as per the manufacturer's instructions, ensuring a homogenous asphalt mix with no clumps of reinforcement fibres. It is understood that the typical dosing of FORTA-Fi reinforcement is 0.5 kg per metric tonne.

It is also noted that there is potential that significant amounts of soil may be imported during site preparation. There may be potential for additional pavement structure optimization for areas where pavement overly fill that has low frost susceptibility, such as imported clean sand or sand and gravel.

It is also noted that the subbase thicknesses provided in these pavement designs are expected to be suitable to support gravel truck traffic (assumed 60 t, five axle gravel trucks) and crane loads (outriggers on 2.1 m by 2.7 m pads with bearing pressures up to 125 kPa), prior to placement of Granular 'A' base and asphalt. Some re-grading and recompaction of the surface of the Granular 'B' may be required, particularly in any areas where trucks have turning movements.

5.7.3 Rigid Pavement Structure

Alternatively, consideration may also be given to the use of Portland cement concrete pavement where there is intense truck use and turning of transport vehicles in conjunction with the waste handling, loading docks or delivery facilities. Dolly pads are also to comprise concrete pavement.

The following table provides the minimum recommended rigid pavement structures:

Pavement Layer	Compaction Requirements	Light Duty Pavement	Heavy Duty Pavement
Portland Cement Concrete, CAN/CSA A23.1- Class C-2	CAN/CSA A23.1	150 mm	200 mm
Base Course, OPSS MUNI 1010 Granular A	100% Standard Proctor Maximum Dry Density (ASTM-D698)	200 mm	200 mm

Note:

I. Prior to installation of the concrete pavement structure, in addition to the granular base course, it is recommended to install a granular subbase consisting of OPSS 1010 Granular "B", with a minimum thickness of 400 mm for the heavy duty apron slab areas. The purpose of the Granular "B" is to provide a stable working base for construction equipment, as well as providing a free-draining layer and added frost protection beneath the concrete.

All concrete pavement and dolly pads at this Site are to be rebar reinforced.

5.7.4 Pavement Structure Subgrade Preparation and Granular up Fill

The proper placement of base and subbase fill materials becomes very important in addressing the proper load distribution to provide a durable pavement structure.

The pavement subgrade materials should be thoroughly proof-rolled prior to placement of the Granular 'B' subbase course. If any unstable areas are noted, then the Granular 'B' thickness may need to be increased to support pavement construction traffic. This should be left as a field decision by a qualified geotechnical engineer at the time of construction, but it is recommended that additional Granular 'B' be carried as a provisional item under the construction contract.

Where fill material is required to increase the grade to the underside of the pavement structure it should consist of Granular 'B' Type I (OPSS 1010). The up fill material is to be placed in maximum 300 mm thick lifts compacted to 98% SPMDD within 4% of the optimum moisture content.

It is noted that as per OPSS.MUNI 1010, Granular 'A' and Granular 'B' Type I may consist of up to 100% Reclaimed Concrete Material (RCM). It is noted that RCM must not include any loose reinforcing materials, and reclaimed materials must be homogeneously blended.

Samples of both the Granular 'A' and Granular 'B' Type I aggregates should be tested for conformance to OPSS 1010 prior to utilization on Site and during construction. All stockpiled material should be protected from deleterious materials, additional moisture and be kept from freezing.

Post compaction settlement of fine grained soil can be expected, even when placed to compaction specifications. As such, fill material should be installed as far in advance as possible before finishing the parking lot and access roadways for best grade integrity.

Where the subgrade material types differ below the underside of the pavement structure, the transition between the materials should be sloped as per frost heave taper OPSD 205.60.

5.7.5 Drainage

Control of surface water is a critical factor in achieving good pavement structure life. The pavement thickness designs are based on a drained pavement subgrade via sub-drains or ditches.

The glacial till soils have poor natural drainage and therefore it is recommended that pavement subdrains be installed in the lower areas and be connected to the catch basins. Subdrains should comprise 150 mm diameter perforated pipe infilter sock, bedded in concrete sand. The upper limit of the concrete sand bedding should be at the lower limit of the pavement subbase, with the subgrade below the subbase sloped towards the subdrain.

The surface of the roadways should be free of depressions and be sloped at a minimum grade of 1% in order to drain to appropriate drainage areas. Subgrade soil should slope a minimum of 3% toward stormwater collection points. Positive slopes are very important for the proper performance of the drainage system. The granular base and subbase materials should extend horizontally to any potential ditches or swales.

In addition, routine maintenance of the drainage systems will assist with the longevity of the pavement structure. Ditches, culverts, sewers and catch basins should be regularly cleared of debris and vegetation.

6.0 SITE SUPERVISION & QUALITY CONTROL

It is recommended that all geotechnical aspects of the project be reviewed and confirmed under the appropriate geotechnical supervision, to routinely check such items. This includes but is not limited to inspection and confirmation of the undisturbed natural subgrade material prior to subgrade preparation, pouring any foundations or footings, backfilling, or engineered fill installation to ensure that the actual conditions are not markedly different than what was observed at the borehole locations and geotechnical components are constructed as per Pinchin's recommendations. Compaction quality control of engineered fill material (full-time monitoring) is recommended as standard practice, as well as regular sampling and testing of aggregates and concrete, to ensure that physical characteristics of materials for compliance during installation and satisfies all specifications presented within this report.

7.0 TERMS AND LIMITATIONS

This Geotechnical Investigation was performed for the exclusive use of Prologis Inc. (Client) in order to evaluate the subsurface conditions at 7564 Tenth Line Road, Mississauga, Ontario. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practises in the field of geotechnical engineering for the Site.

Classification and identification of soil, and geologic units have been based upon commonly accepted methods employed in professional geotechnical practice. No warranty or other conditions, expressed or implied, should be understood. Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations.

Performance of this Geotechnical Investigation to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the subgrade soil at the Site, and recognizes reasonable limits on time and cost.

Regardless how exhaustive a Geotechnical Investigation is performed, the investigation cannot identify all the subsurface conditions. Therefore, no warranty is expressed or implied that the entire Site is representative of the subsurface information obtained at the specific locations of our investigation. If during construction, subsurface conditions differ from then what was encountered within our test location and the additional subsurface information provided to us, Pinchin should be contacted to review our recommendations. This report does not alleviate the contractor, owner, or any other parties of their respective responsibilities.

This report has been prepared for the exclusive use of the Client and their authorized agents. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice.

The liability of Pinchin or our officers, directors, shareholders or staff will be limited to the lesser of the fees paid or actual damages incurred by the Client. Pinchin will not be responsible for any consequential or indirect damages. Pinchin will only be liable for damages resulting from the negligence of Pinchin. Pinchin will not be liable for any losses or damage if the Client has failed, within a period of two years following the date upon which the claim is discovered (Claim Period), to commence legal proceedings against Pinchin to recover such losses or damage unless the laws of the jurisdiction which governs the Claim Period which is applicable to such claim provides that the applicable Claim Period is greater than two years and cannot be abridged by the contract between the Client and Pinchin, in which case the Claim Period shall be deemed to be extended by the shortest additional period which results in this provision being legally enforceable.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

Please refer to Appendix IV, Report Limitations and Guidelines for Use, which pertains to this report.

Specific limitations related to the legal and financial and limitations to the scope of the current work are outlined in our proposal, the attached Methodology and the Authorization to Proceed, Limitation of Liability and Terms of Engagement which accompanied the proposal.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.

342044.001 DRAFT Preliminary Geotechnical Investigation 7564 Tenth Line Mississauga ON Oct 30 2024

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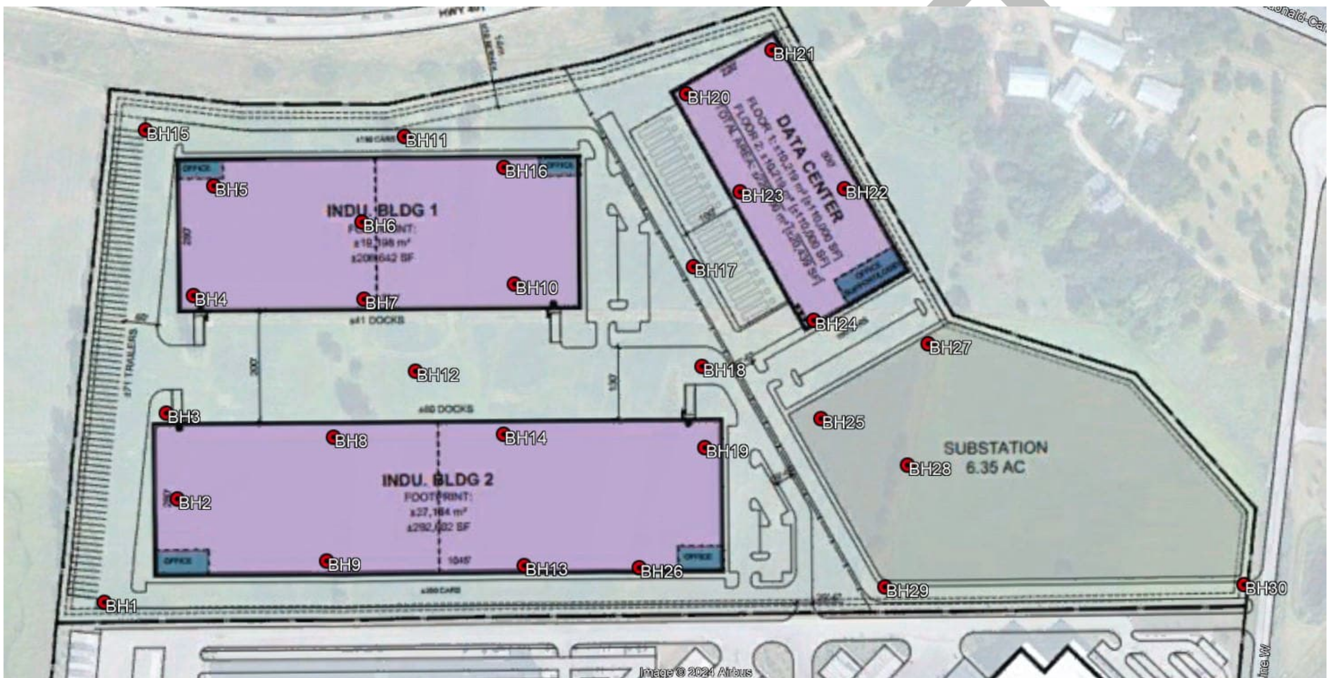
FIGURES



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LEGEND

● BOREHOLE

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PINCHIN

INFERRED GROUNDWATER FLOW DIRECTION

PROJECT NAME: GEOTECHNICAL INVESTIGATION	
CLIENT NAME: PROLOGIS	
PROJECT LOCATION: 7564 TENTH LINE ROAD, MISSISSAUGA, ONTARIO	
FIGURE NAME: BOREHOLE LOCATION PLAN	
PROJECT NUMBER: 342044.000	SCALE:
DRAWN BY: EN	REVIEWED BY: EN
DATE: OCT 2024	FIGURE NUMBER: 1

APPENDIX I

Abbreviations, Terminology and Principle Symbols used in Report and Borehole Logs

ABBREVIATIONS, TERMINOLOGY & PRINCIPAL SYMBOLS USED

Sampling Method

AS	Auger Sample	**w**	Washed Sample
SS	Split Spoon Sample	**HQ**	Rock Core (63.5 mm diam.)
ST	Thin Walled Shelby Tube	**NQ**	Rock Core (47.5 mm diam.)
BS	Block Sample	**BQ**	Rock Core (36.5 mm diam.)

In-Situ Soil Testing

Standard Penetration Test (SPT), "N" value is the number of blows required to drive a 51 mm outside diameter spilt barrel sampler into the soil a distance of 300 mm with a 63.5 kg weight free falling a distance of 760 mm after an initial penetration of 150 mm has been achieved. The SPT, "N" value is a qualitative term used to interpret the compactness condition of cohesionless soils and is used only as a very approximation to estimate the consistency and undrained shear strength of cohesive soils.

Dynamic Cone Penetration Test (DCPT) is the number of blows required to drive a cone with a 60 degree apex attached to "A" size drill rods continuously into the soil for each 300 mm penetration with a 63.5 kg weight free falling a distance of 760 mm.

Cone Penetration Test (CPT) is an electronic cone point with a 10 cm2 base area with a 60 degree apex pushed through the soil at a penetration rate of 2 cm/s.

Field Vane Test (FVT) consists of a vane blade, a set of rods and torque measuring apparatus used to determine the undrained shear strength of cohesive soils.

Soil Descriptions

The soil descriptions and classifications are based on an expanded Unified Soil Classification System (USCS). The USCS classifies soils on the basis of engineering properties. The system divides soils into three major categories; coarse grained, fine grained and highly organic soils. The soil is then subdivided based on either gradation or plasticity characteristics. The classification excludes particles larger than 75 mm. To aid in quantifying material amounts by weight within the respective grain size fractions the following terms have been included to expand the USCS:

Soil Classification		Terminology	Proportion
Clay	< 0.002 mm		
Silt	0.002 to 0.06 mm	“trace”, trace sand, etc.	1 to 10%
Sand	0.075 to 4.75 mm	“some”, some sand, etc.	10 to 20%
Gravel	4.75 to 75 mm	Adjective, sandy, gravelly, etc.	20 to 35%
Cobbles	75 to 200 mm	And, and gravel, and silt, etc.	>35%
Boulders	>200 mm	Noun, Sand, Gravel, Silt, etc.	>35% and main fraction

Notes:

- Soil properties, such as strength, gradation, plasticity, structure, etcetera, dictate the soils engineering behaviour over grain size fractions; and
- With the exception of soil samples tested for grain size distribution or plasticity, all soil samples have been classified based on visual and tactile observations. The accuracy of visual and tactile observation is not sufficient to differentiate between changes in soil classification or precise grain size and is therefore an approximate description.

The following table outlines the qualitative terms used to describe the compactness condition of cohesionless soil:

Cohesionless Soil	
Compactness Condition	**SPT N-Index (blows per 300 mm)**
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	> 50

The following table outlines the qualitative terms used to describe the consistency of cohesive soils related to undrained shear strength and SPT, N-Index:

Cohesive Soil		
Consistency	**Undrained Shear Strength (kPa)**	**SPT N-Index (blows per 300 mm)**
Very Soft	<12	<2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

Note: Utilizing the SPT, N-Index value to correlate the consistency and undrained shear strength of cohesive soils is only very approximate and needs to be used with caution.

Soil & Rock Physical Properties

General

W Natural water content or moisture content within soil sample
γ Unit weight
γ' Effective unit weight
γ_d Dry unit weight
γ_{sat} Saturated unit weight
ρ Density
ρ_s Density of solid particles
ρ_w Density of Water
ρ_d Dry density
ρ_{sat} Saturated density e Void ratio
n Porosity
S_r Degree of saturation
E_{50} Strain at 50% maximum stress (cohesive soil)

Consistency

W_L	Liquid limit
W_P	Plastic Limit
I_P	Plasticity Index
W_S	Shrinkage Limit
I_L	Liquidity Index
I_C	Consistency Index
e_{max}	Void ratio in loosest state
e_{min}	Void ratio in densest state
I_D	Density Index (formerly relative density)

Shear Strength

C_u, S_u	Undrained shear strength parameter (total stress)
C'_d	Drained shear strength parameter (effective stress)
r	Remolded shear strength
τ_p	Peak residual shear strength
τ_r	Residual shear strength
ø'	Angle of interface friction, coefficient of friction = tan ø'

Consolidation (One Dimensional)

C_C	Compression index (normally consolidated range)
C_r	Recompression index (over consolidated range)
C_S	Swelling index
m_V	Coefficient of volume change
c_V	Coefficient of consolidation
T_V	Time factor (vertical direction)
U	Degree of consolidation
σ'_O	Overburden pressure
$\sigma'p$	Preconsolidation pressure (most probable)
OCR	Overconsolidation ratio

Permeability

The following table outlines the terms used to describe the degree of permeability of soil and common soil types associated with the permeability rates**:**

Permeability (k cm/s)	Degree of Permeability	Common Associated Soil Type
> 10^{-1}	Very High	Clean gravel
10^{-1} to 10^{-3}	High	Clean sand, Clean sand and gravel
10^{-3} to 10^{-5}	Medium	Fine sand to silty sand
10^{-5} to 10^{-7}	Low	Silt and clayey silt (low plasticity)
>10^{-7}	Practically Impermeable	Silty clay (medium to high plasticity)

Rock Coring

Rock Quality Designation (RQD) is an indirect measure of the number of fractures within a rock mass, Deere et al. (1967). It is the sum of sound pieces of rock core equal to or greater than 100 mm recovered from the core run, divided by the total length of the core run, expressed as a percentage. If the core section is broken due to mechanical or handling, the pieces are fitted together and if 100 mm or greater included in the total sum**.**

RQD is calculated as follows:

$$\text{RQD (\%)} = \frac{\Sigma \text{ Length of core pieces} > 100 \text{ mm} \times 100}{\text{Total length of core run}}$$

The following is the Classification of Rock with Respect to RQD Value:

RQD Classification	RQD Value (%)
Very poor quality	**<25**
Poor quality	25 to 50
Fair quality	50 to 75
Good quality	75 to 90
Excellent quality	90 to 100

APPENDIX II

Pinchin's Borehole Logs

Log of Borehole: BH2

Project #: 342044.000 **Logged By:** CG

Project: Preliminary Geotechnical Investigation

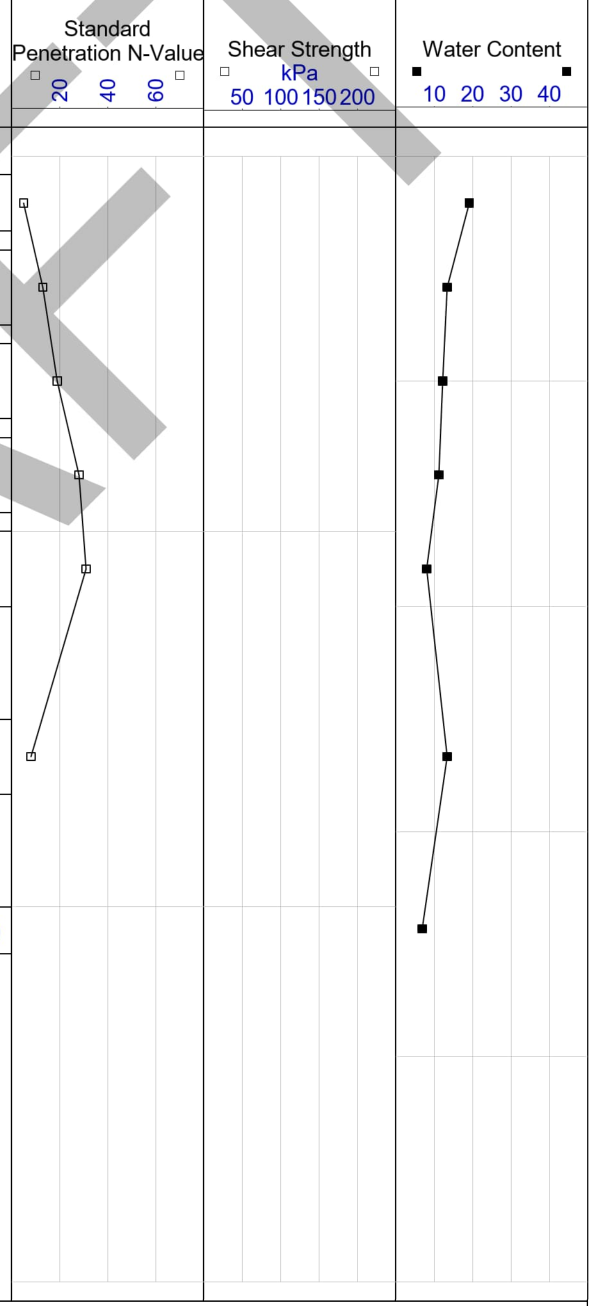
Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 26, 2024 **Project Manager:** EN

SUBSURFACE PROFILE / SAMPLE

Depth (m)	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0	Ground Surface	0.00	No Monitoring Well Installed				
	Topsoil Approximately 150 mm			SS	1	100	5
	Silty Clay brown silty clay, some sand to sandy, trace gravel, stiff, DTPL	-1.52		SS	2	100	13
	very stiff	-2.90		SS	3	100	19
				SS	4	100	28
	hard	-4.11		SS	5	100	31
	Silty Sand grey silty sand, trace gravel, wet, loose	-6.10		SS	6	100	8
	trace rock fragments, moist, very dense	-6.48		SS	7	50	>50
	End of Borehole						



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH3

Project #: 342044.000 **Logged By:** CG

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 26, 2024 **Project Manager:** EN

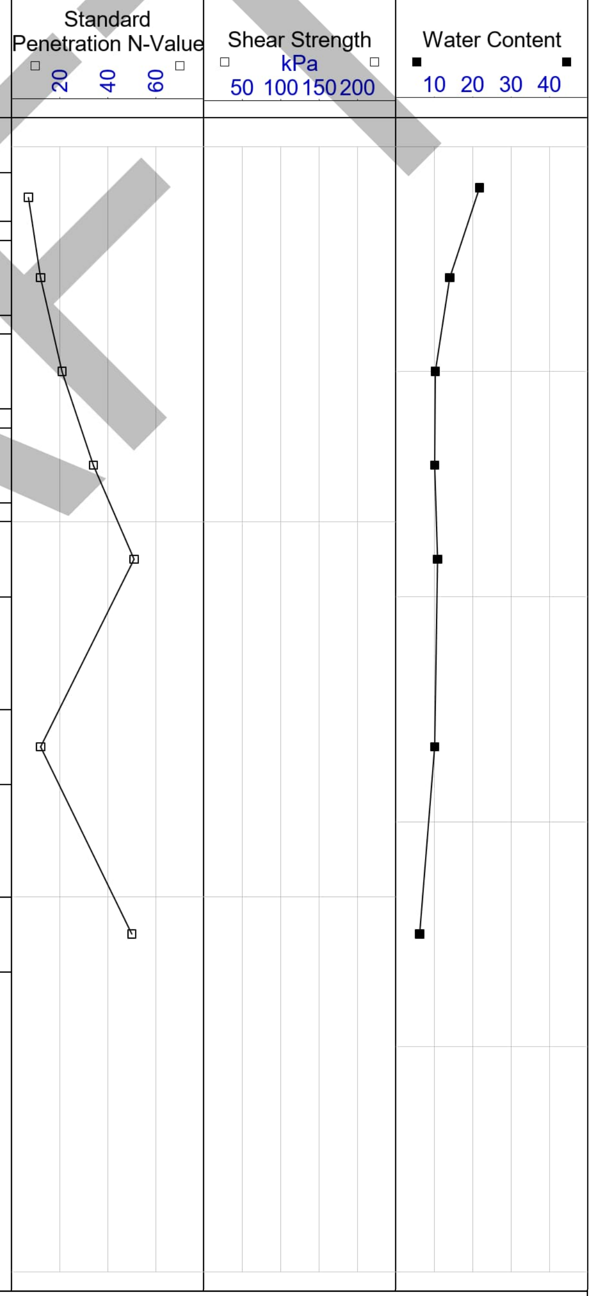
SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0.21	**Topsoil** Approximately 200 mm	-0.21
0.76	**Silty Clay** brown silty clay, some sand, trace gravel, firm, DTPL	-0.76
1.52	stiff	-1.52
2.29	very stiff	-2.29
4.11	hard	-4.11
5.64	stiff	-5.64
6.71	**Sandy Silt** grey sandy silt, some gravel, wet, very dense	-6.71
	End of Borehole	

Monitoring Well Details: No Monitoring Well Installed

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	75	7
SS	2	85	12
SS	3	85	21
SS	4	90	34
SS	5	85	51
SS	6	100	12
SS	7	65	50



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH4

Project #: 342044.000 **Logged By:** CG

Project: Preliminary Geotechnical Investigation

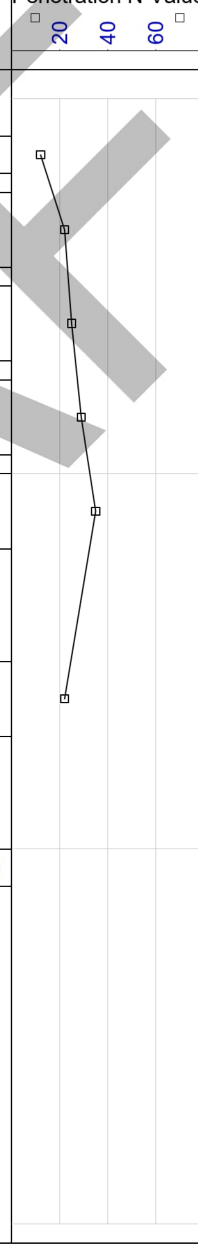
Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 26, 2024 **Project Manager:** EN

SUBSURFACE PROFILE / SAMPLE

Depth (m)	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0	Ground Surface	0.00					
0–0.30	**Topsoil** Approximately 300 mm	-0.30					
0.30–2.90	brown silty clay, some sand to sandy, trace gravel, very stiff, DTPL			SS	1	100	12
				SS	2	100	22
				SS	3	100	25
		-2.90		SS	4	100	29
2.90–4.11	hard			SS	5	100	35
		-4.11					
4.11–6.10	**Sandy Silt** grey sandy silt, trace gravel, moist, compact			SS	6	100	22
		-6.10					
6.10–6.40	**Silty Sand** grey silty sand, trace gravel and rock fragments, moist, very dense	-6.40		SS	7	50	>50
	End of Borehole						



Shear Strength kPa: 50 100 150 200

Water Content: 10 20 30 40

Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH5

Project #: 342044.000 **Logged By:** EN/TV

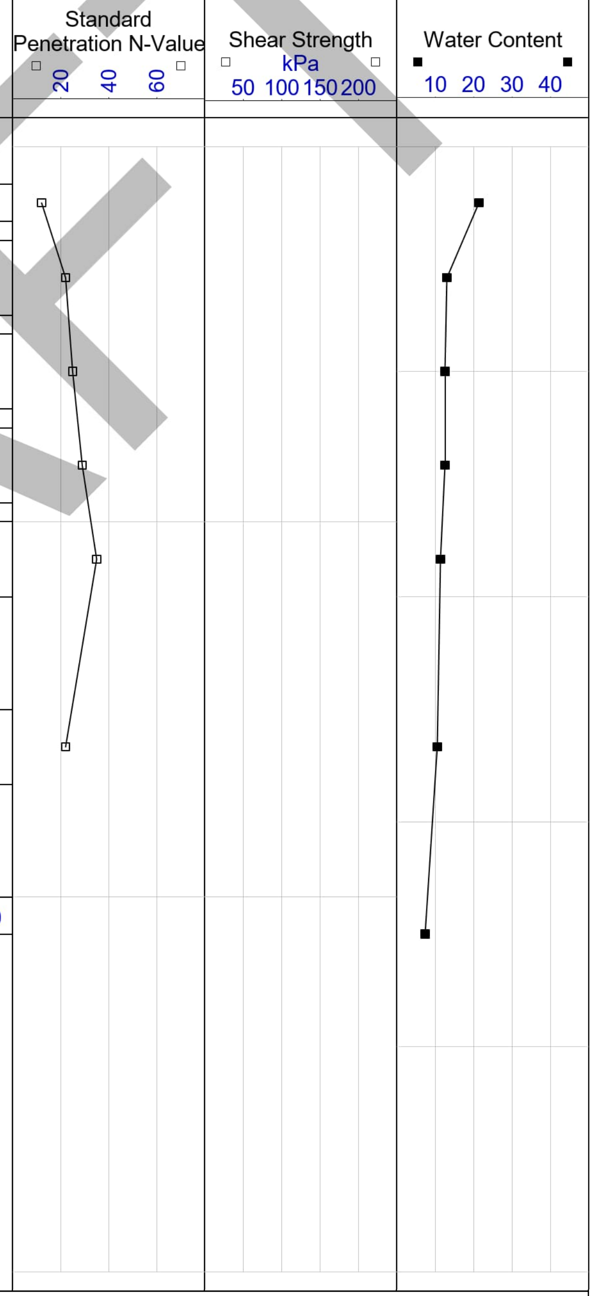
Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 27, 2024 **Project Manager:** EN

SUBSURFACE PROFILE				SAMPLE			
Depth (m)	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0	Ground Surface	0.00					
0–0.30	**Topsoil** Approximately 300 mm	-0.30		SS	1	100	12
0.30–2.90	**Silty Clay** brown silty clay, some sand to sandy, trace gravel, very stiff, DTPL			SS	2	100	22
				SS	3	100	25
		-2.90		SS	4	100	29
2.90–4.11	hard			SS	5	100	35
		-4.11					
4.11–6.10	**Sandy Silt** grey sandy silt, trace gravel, moist, compact			SS	6	100	22
		-6.10					
6.10–6.40	**Silty Sand** grey silty sand, trace gravel and rock fragments, moist, very dense	-6.40		SS	7	50	>50
	End of Borehole						



Contractor: Geo-Environmental

Drilling Method: 200 mm OD Hollow Stem Augers

Well Casing Size: N/A

Grade Elevation: TBD

Top of Casing Elevation: N/A

Sheet: 1 of 1

Log of Borehole: BH6

Project #: 342044.000 **Logged By:** TV

Project: Preliminary Geotechnical investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: Sept 27 , 2024 **Project Manager:** EN

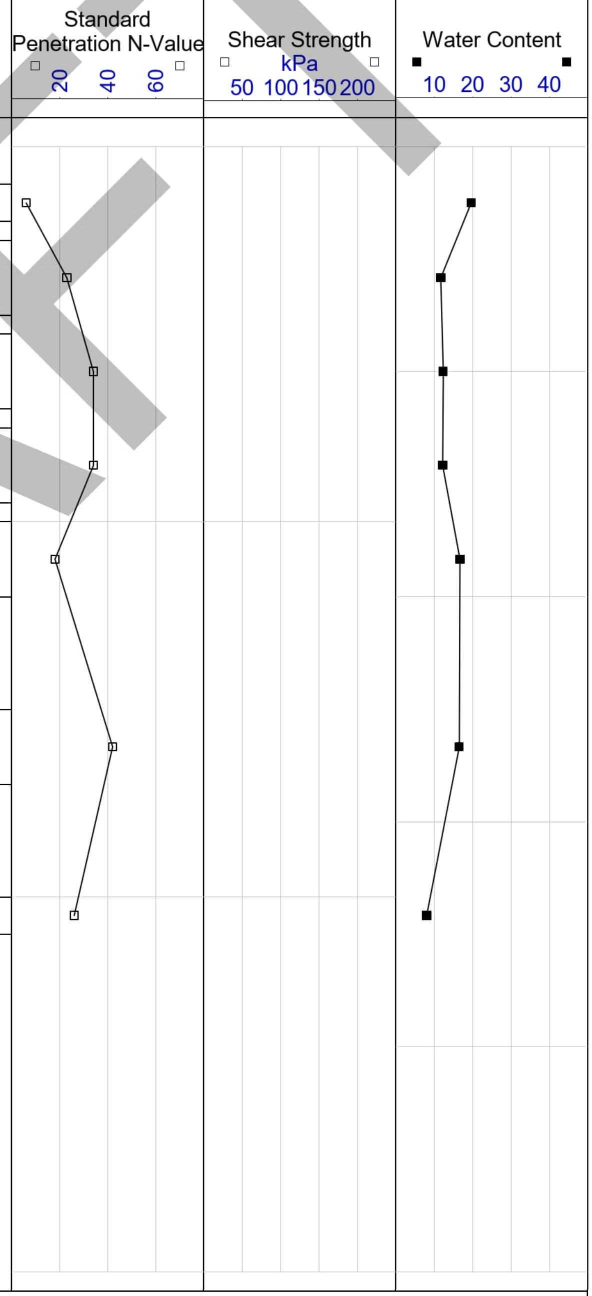
SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0–0.30	***Topsoil*** Approximately 300 mm	-0.30
0.30–0.76	***Sandy Silt*** Sandy silt, trace gravel, brown, moist, loose	-0.76
0.76–1.52	***Silty Clay*** sandy silty clay, trace gravel, APL, very stiff	-1.52
1.52–2.90	some sand, hard	-2.90
2.90–4.11	very stiff	-4.11
4.11–6.10	***Sandy Silt*** trace gravel, wet, dense	-6.10
6.10–6.40	***Sand and Gravel*** Sand and gravel, brown, wet compact	-6.40
	End of Borehole	

Monitoring Well Details

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	100	6
SS	3	100	23
SS	3	21	34
SS	4	100	34
SS	5	100	18
SS	6	83	42
SS	7	50	26



Contractor: GEO-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Holow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH7

Project #: 342044.000 ***Logged By:*** EN/TV

Project: Preliminary Geotechnical Investigation

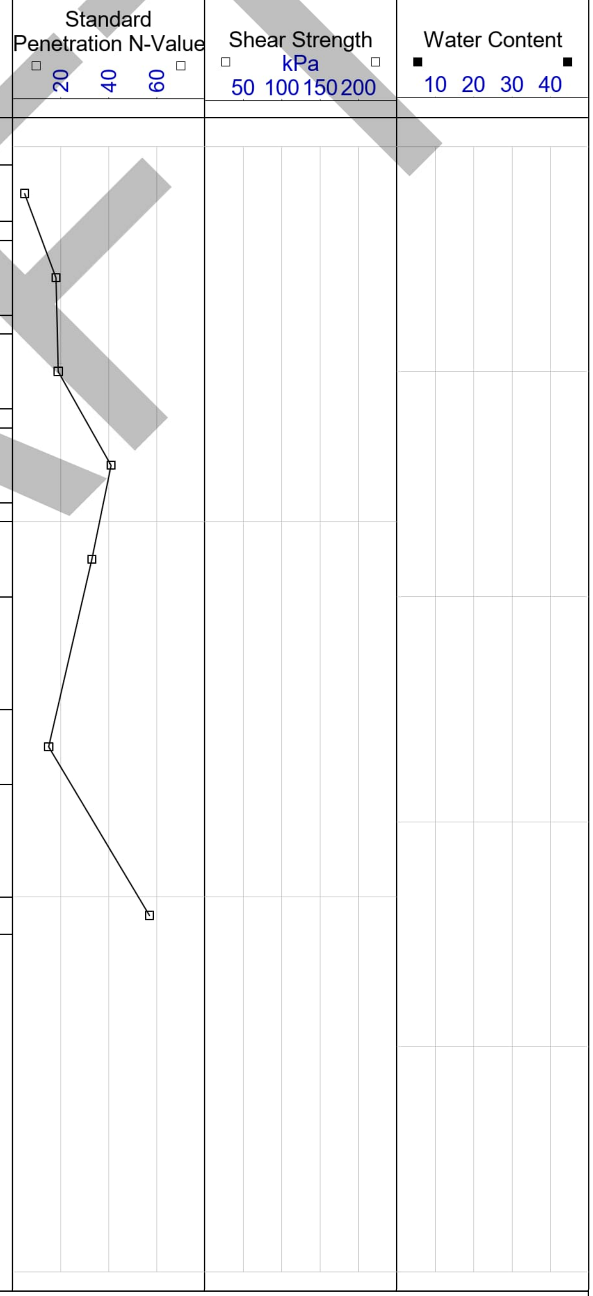
Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 27 , 2024 ***Project Manager:*** EN

SUBSURFACE PROFILE | **SAMPLE**

Depth (m)	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0	Ground Surface	0.00					
	Topsoil Approximately 150 mm			SS	1	67	5
1	***Silty Clay*** sandy silty clay, trace gravel, APL, firm			SS	2	100	18
2		-2.13		SS	3	100	19
	some sand, DTPL, hard	-2.90		SS	4	100	41
3	Brown to grey			SS	5	100	33
4		-4.11					
	Silty Sand Silty sand, some gravel, brown, wet, compact			SS	6	71	15
6		-6.10					
	Sand and Gravel Sand and gravel, brown, wet, very dense	-6.40		SS	7	75	57
7	End of Borehole						
8							
9							



Contractor: Geo-Enviromental ***Grade Elevation:*** TBD

Drilling Method: 200 mm OD Hollow Stem Augers ***Top of Casing Elevation:*** N/A

Well Casing Size: N/A ***Sheet:*** 1 of 1

Log of Borehole: BH8

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 27, 2024 **Project Manager:** EN

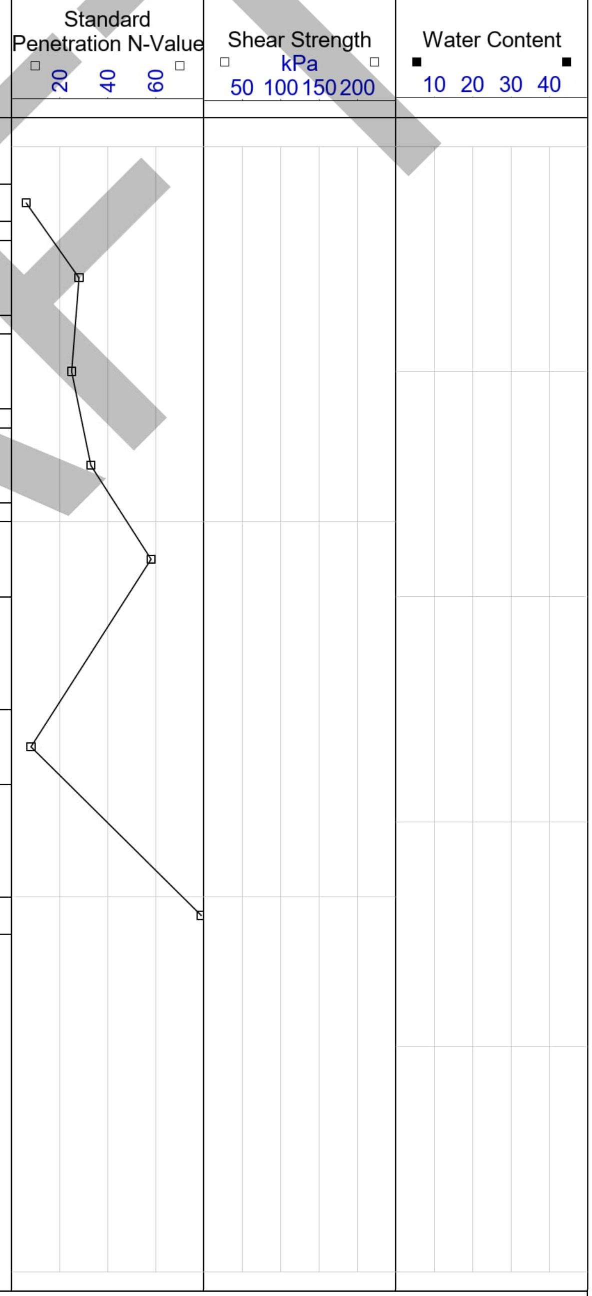
SUBSURFACE PROFILE

Elevation (m)	Description
0.00	Ground Surface
-0.30	**Topsoil** Approximately 150 mm
	Silty Clay Sandy silty clay, trace gravel, brown, DTPL, firm to very stiff
-2.13	Hard
-2.90	trace rock fragments
-4.11	some sand, brown to grey, APL, stiff
-6.10	**Sandy Silt** trace gravel, brown, moist, very dense
-6.40	End of Borehole

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	67	6
SS	2	100	28
SS	3	100	25
SS	4	100	33
SS	5	25	58
SS	6	83	8
SS	7	67	79

Columns: Depth (m), Symbol, Description, Elevation (m), Monitoring Well Details, Sample Type, Sampler #, Recovery (%), SPT N-Value



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH9

Project #: 342044.00 **Logged By:** EN/TV

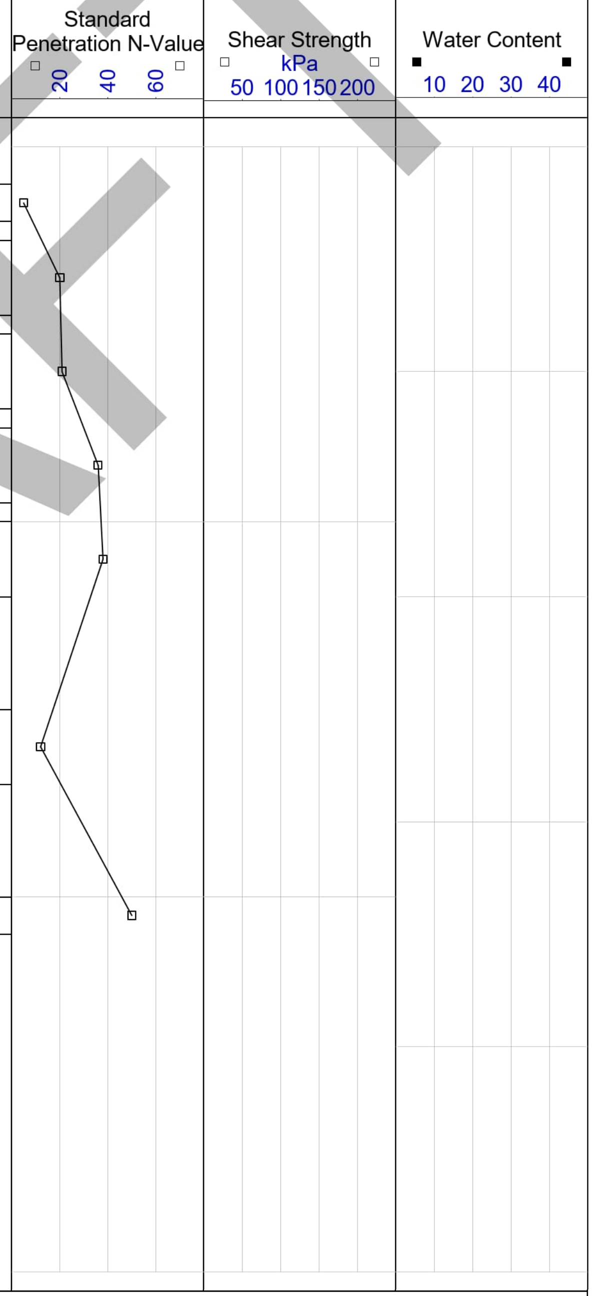
Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 27 , 2024 **Project Manager:** EN

SUBSURFACE PROFILE					SAMPLE			
Depth (m)	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0	Ground Surface	0.00					
	Topsoil Approximately 200 mm	-0.30		SS	1	100	5
1	**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, firm to very stiff			SS	2	100	20
2		-2.13		SS	3	100	21
	Hard			SS	4	100	36
3				SS	5	100	38
4		-4.11					
5	some sand, brown to grey, APL, stiff			SS	6	83	12
6		-6.10					
	Sandy, DTPL, hard	-6.40		SS	7	75	50
	End of Borehole						



DRAFT

Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH10

Project #: 342044.00 ***Logged By:*** EN/TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

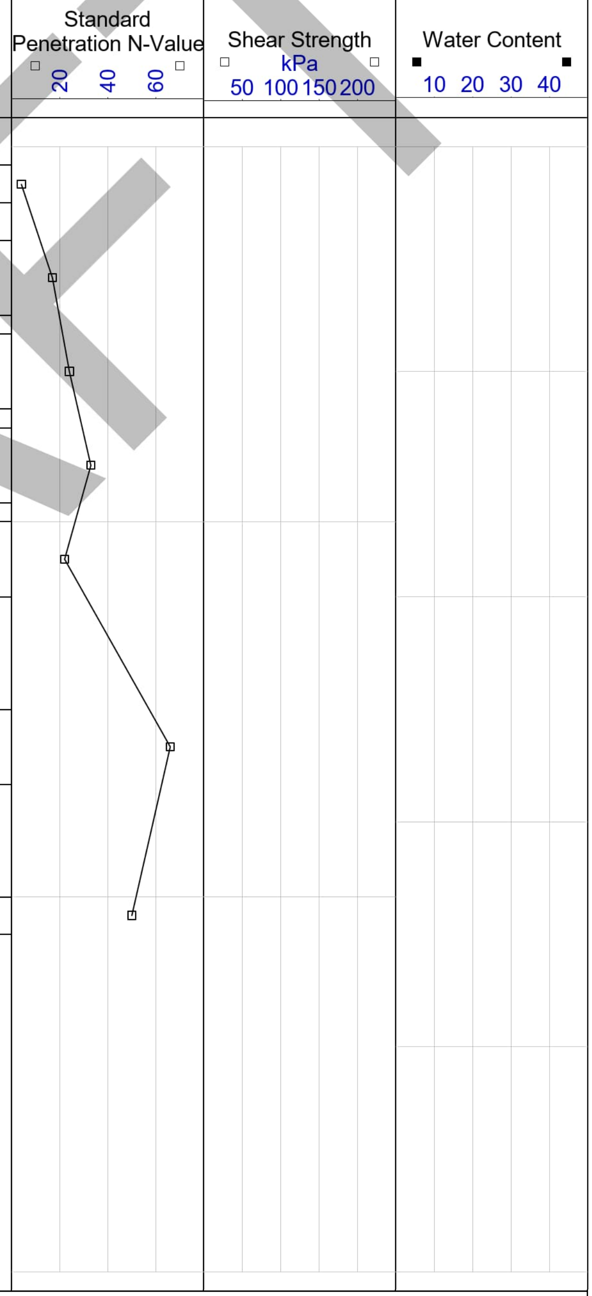
Drill Date: September 27, 2024 ***Project Manager:*** EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)	Monitoring Well Details
0	Ground Surface	0.00	
	Topsoil Approximately 150 mm		
	Sandy Silt Sandy silt, trace gravel,brown, moist, loose	-0.76	
1	***Silty Clay*** sandy silty clay, trace gravel, brown, DTPL, very stiff		
2		-2.13	
	hard		
3		-3.05	
	some sand, very stiff		
4		-4.57	
5	***Silty Sand*** Silty sand, trace gravel, brown moist, very dense		
6		-6.40	
7	End of Borehole		
8			
9			

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	62	4
SS	2	100	17
SS	3	100	24
SS	4	100	33
SS	5	100	22
SS	6	83	66
SS	7	12	50



Contractor: Geo-Environmental ***Grade Elevation:*** TBD

Drilling Method: 200 mm OD Hollow Stem Augers ***Top of Casing Elevation:*** N/A

Well Casing Size: N/A ***Sheet:*** 1 of 1

Log of Borehole: BH11

Project #: 342044.00 ***Logged By:*** EN/TV

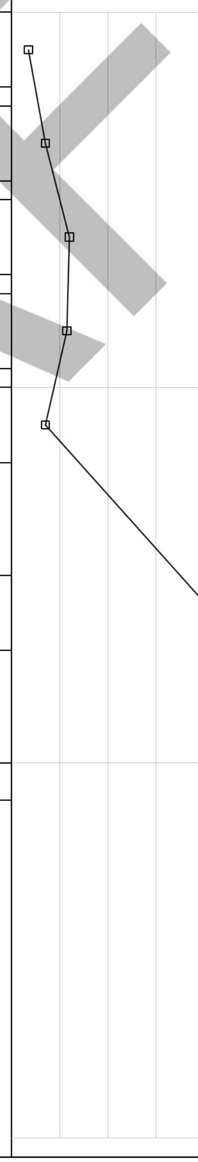
Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 27 , 2024 ***Project Manager:*** EN

SUBSURFACE PROFILE				SAMPLE						
Depth (m)	Symbol	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value	Standard Penetration N-Value (20 40 60)	Shear Strength kPa (50 100 150 200) / Water Content (10 20 30 40)
0		Ground Surface	0.00							
		Topsoil Approximately 250 mm	-0.30		SS	1	100	7		
		Sandy Silt Sandy silt, trace gravel, brown, moist, loose	-0.76		SS	2	92	14		
		Silty Clay Sandy silty clay, trace gravel, brown DTPL, stiff	-1.52		SS	3	100	24		
2		very stiff			SS	4	100	23		
3		stiff	-3.05		SS	5	100	14		
		Silty Sand Silty sand, some gravel, brown, wet, very dense	-4.57		SS	6	50	84		
6		gravelly	-6.10		SS	7	50	93		
		End of Borehole	-6.40							



Groundwater in open borehole measured at 5.6 mbgs upon completion of drilling.

Contractor: Geo-Environmental ***Grade Elevation:*** TBD

Drilling Method: 200 mm OD Hollow Stem Augers ***Top of Casing Elevation:*** N/A

Well Casing Size: N/A ***Sheet:*** 1 of 1

Log of Borehole: BH12

Project #: 342044.00 ***Logged By:*** EN/TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 27 , 2024 ***Project Manager:*** EN

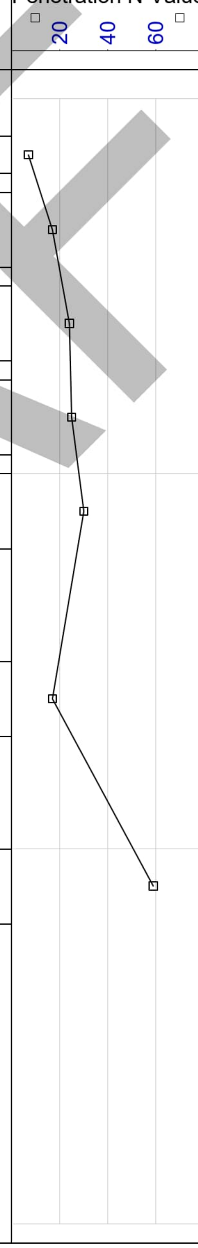
SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0.21	**Topsoil** Approximately 200 mm	-0.21
0.21–4.11	**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, firm to very stiff	-4.11
4.11–6.10	**Silty Sand** Silty sand, trace gravel, brown, moist, compact	-6.10
6.10–6.71	**Sand and Gravel** Silty sand and gravel, brown, wet, very dense	-6.71
6.71	End of Borehole	

Monitoring Well Details

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	67	7
SS	2	100	17
SS	3	100	24
SS	4	100	25
SS	5	100	30
SS	6	75	17
SS	7	75	59



Shear Strength kPa 50 100 150 200

Water Content 10 20 30 40

Contractor: Geo-Environmental ***Grade Elevation:*** TBD

Drilling Method: 200 mm OD Hollow Stem Augers ***Top of Casing Elevation:*** N/A

Well Casing Size: N/A ***Sheet:*** 1 of 1

Log of Borehole: BH13

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 27 , 2024 **Project Manager:** EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0–0.30	**Topsoil** Approximately 200 mm	-0.30
0.30–6.10	**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, firm to very stiff	-6.10
6.10–6.40	**Silty Sand** Silty sand, trace gravel, brown, wet, very dense	-6.40
	End of Borehole	

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	83	6
SS	2	96	16
SS	3	100	20
SS	4	100	24
SS	5	100	30
SS	6	100	19
SS	7	33	50

Standard Penetration N-Value: 20 40 60
Shear Strength kPa: 50 100 150 200
Water Content: 10 20 30 40

Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH14

Project #: 342044.00 ***Logged By:*** TV

Project: Preliminary Geotechnical Investigation

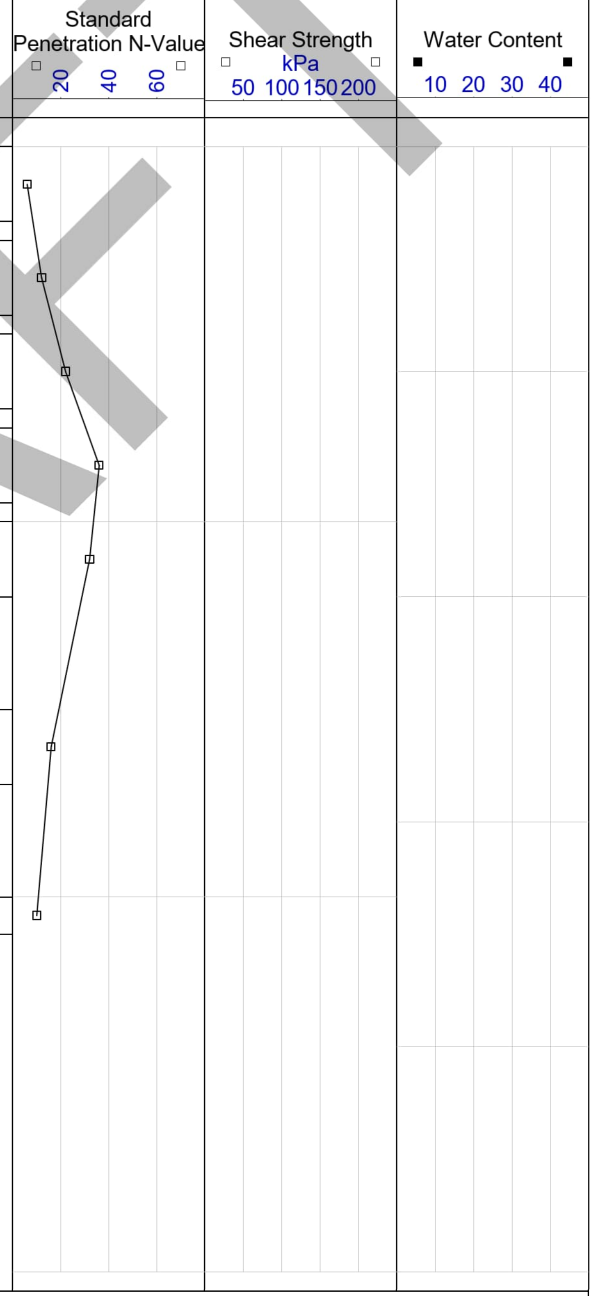
Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 27 , 2024 ***Project Manager:*** EN

SUBSURFACE PROFILE				SAMPLE			
Depth (m)	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0	Ground Surface	0.00					
0–0.30	**Topsoil** Approximately 200 mm	-0.30		SS	1	96	6
0.30–1.37	**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, stiff	-1.37		SS	2	96	12
1.37–2.13	Very stiff	-2.13		SS	3	100	22
2.13–4.11	Hard	-4.11		SS	4	100	36
				SS	5	100	32
4.11–6.10	Very stiff	-6.10		SS	6	100	16
6.10–6.40	No recovery	-6.40		SS	7	0	10
	End of Borehole						

Groundwater level at 4.9 mbgs in open borehole upon completion of drilling.



Contractor: Geo-Environmental ***Grade Elevation:*** TBD

Drilling Method: 200 mm OD Hollow Stem Augers ***Top of Casing Elevation:*** N/A

Well Casing Size: N/A ***Sheet:*** 1 of 1

Log of Borehole: BH15

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

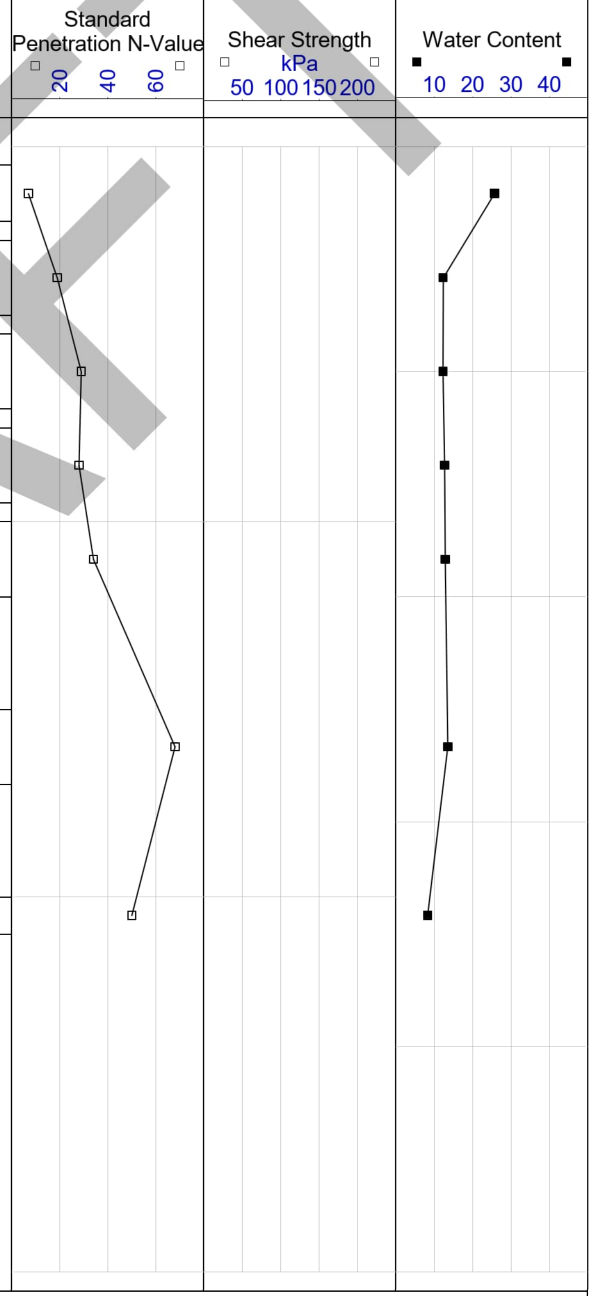
Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 30, 2024 **Project Manager:** EN

SUBSURFACE PROFILE / SAMPLE

Depth (m)	Symbol	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0		Ground Surface	0.00					
0–0.15		**Topsoil** Approximately 150 mm			SS	1	92	7
0.15–0.76		**Sandy Silt** Sandy silt, trace gravel, brown, moist, loose	-0.76		SS	2	92	19
0.76–2.90		**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, very stiff	-2.90		SS	3	100	29
					SS	4	100	28
2.90–4.11		Hard	-4.11		SS	5	100	34
4.11–6.10		**Silty Sand** Silty sand, trace gravel, rock fragments, moist, brown, very dense	-6.10		SS	6	50	68
6.10–6.40		Wet	-6.40		SS	7	17	50
6.40		End of Borehole						



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH16

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 30, 2024 **Project Manager:** EN

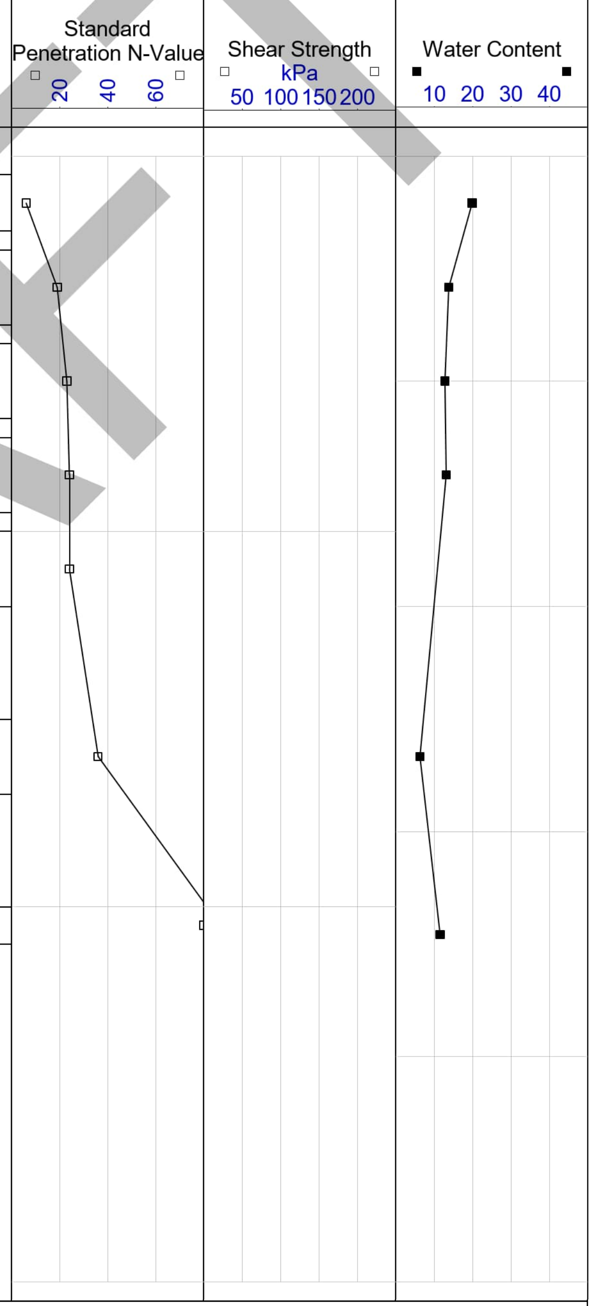
SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0–0.15	**Topsoil** Approximately 150 mm	
	Sandy Silt Sandy silt, trace gravel, brown, moist, loose	-0.76
	Silty Clay sandy Silty Clay, trace gravel, brown, DTPL, very stiff	-4.11
	Silty Sand Silty sand, trace gravel, brown, wet,dense	-6.10
	Grey, very dense	-6.55
	End of Borehole	

Monitoring Well Details: (none shown)

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	92	6
SS	2	100	19
SS	3	100	23
SS	4	100	24
SS	5	92	24
SS	6	83	36
SS	7	38	87



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH17

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

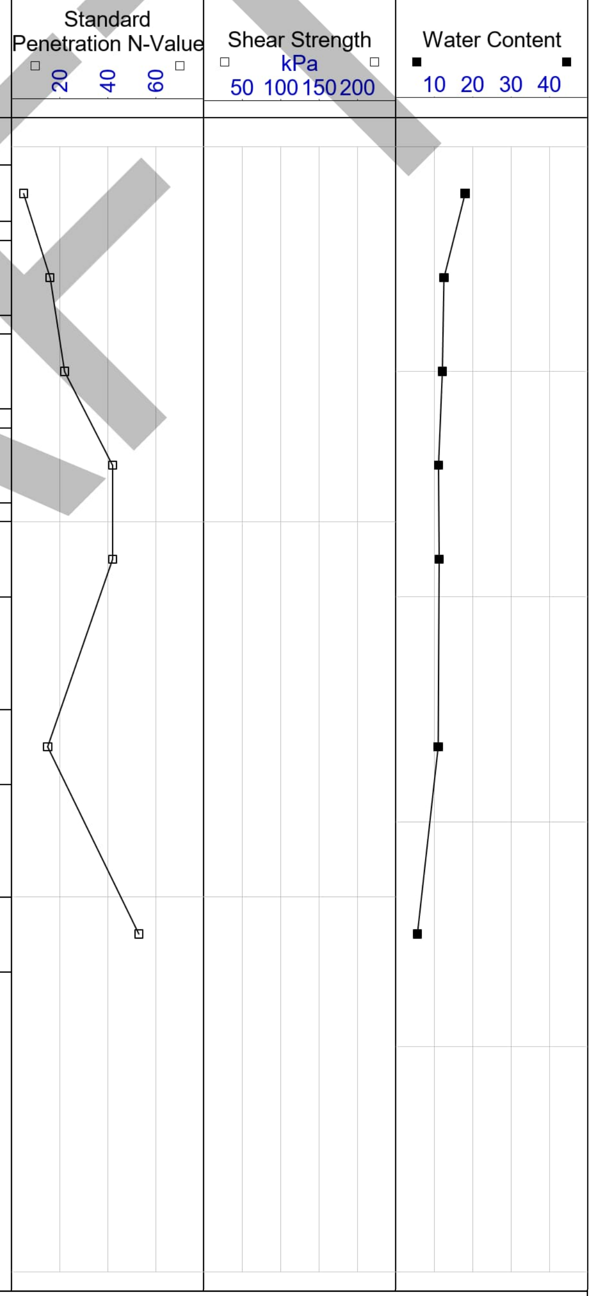
Drill Date: September 30 , 2024 **Project Manager:** EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0 – 0.76	***Topsoil*** Approximately 150 mm ***Sandy Silt*** sandy silt, trace gravel, brown, moist, loose	-0.76
0.76 – 2.13	***Silty Clay*** sandy silty clay, trace gravel, DTPL, very stiff	-2.13
2.13 – 4.11	Hard	-4.11
4.11 – 6.10	***Sandy Silt*** Sandy silt, trace gravel, brown to grey, moist, compact	-6.10
6.10 – 6.71	very dense, some rock fragments	-6.71
6.71	End of Borehole Open borehole dry upon completion of drilling.	

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	75	5
SS	2	100	16
SS	3	100	22
SS	4	100	42
SS	5	100	42
SS	6	100	15
SS	7	100	53



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH18

Project #: 342044.00 **Logged By:** TV

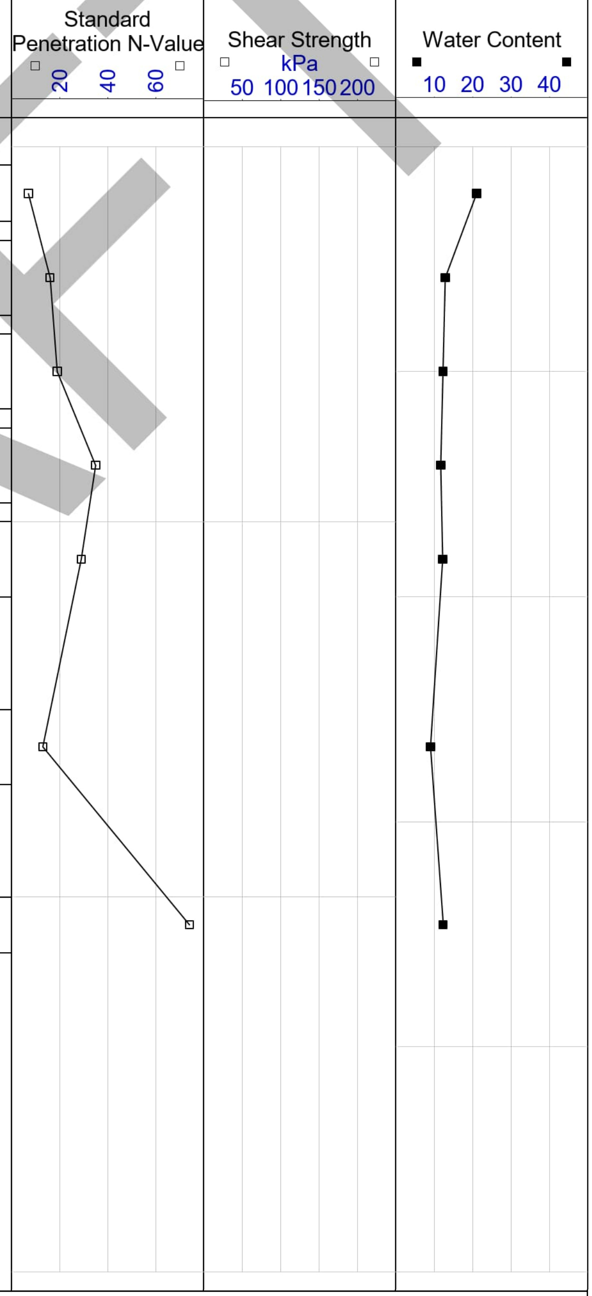
Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 30 , 2024 **Project Manager:** EN

SUBSURFACE PROFILE					SAMPLE			
Depth (m)	Symbol	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0		Ground Surface	0.00					
		Topsoil Approximately 150 mm			SS	1	92	7
		Sandy Silt sandy silt, trace gravel, brown, moist, loose	-0.76					
1		**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, very stiff			SS	2	100	16
2			-2.13		SS	3	200	19
		hard			SS	4	100	35
3			-3.05					
		very stiff			SS	5	100	29
4			-4.11					
		Sandy Silt Sandy silt, trace gravel, brown to grey, moist, compact						
5					SS	6	100	13
6			-6.10					
		Wet, very dense	-6.55		SS	7	75	74
		End of Borehole						
7								
8								
9								



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH19

Project #: 342044.00
Logged By: TV
Project: Preliminary Geotechnical Investigation
Client: Prologis
Location: 7564 Tenth Line Road, Mississauga
Drill Date: September 30, 2024
Project Manager: EN

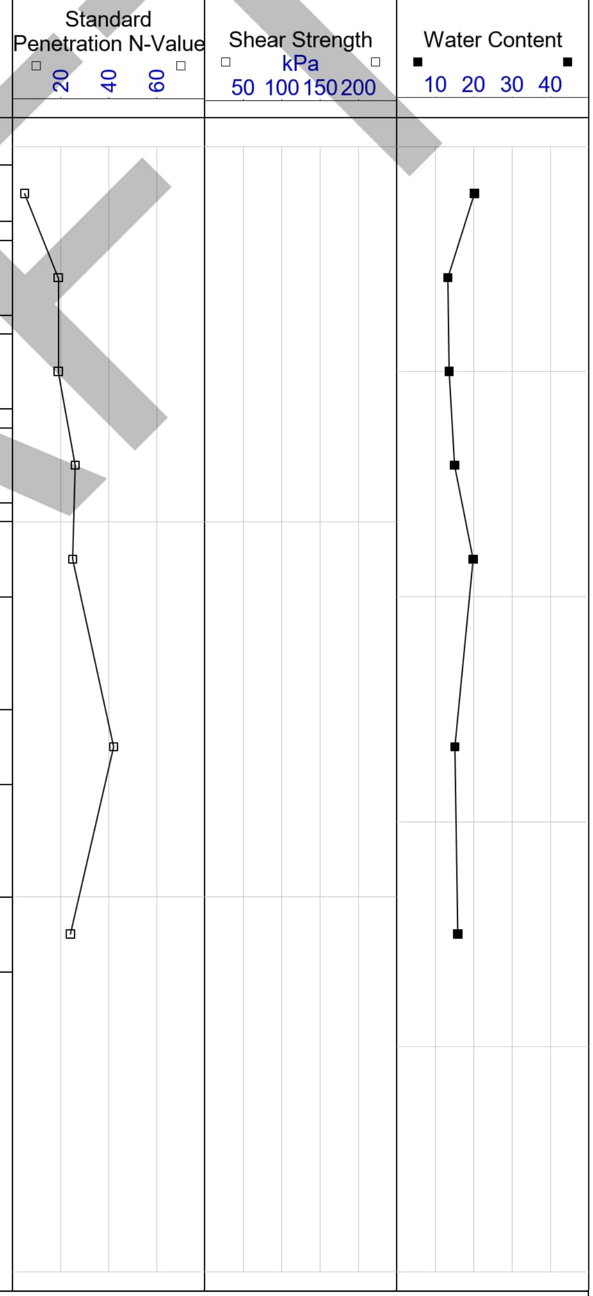
SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
	Topsoil Approximately 150 mm	
	Sandy Silt Sandy silt, trace gravel, brown, moist, loose	-0.76
	Silty Clay Sandy silty clay, trace gravel, brown, DTPL, very stiff	
	trace rock fragments, APL	-2.90
	grey, hard	-4.11
	Silty Sand Silty sand, trace gravel, brown, wet, compact	-5.49
	End of Borehole	-6.71

Groundwater level in open borehole at 5.5 mbgs upon completion of drilling.

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	75	5
SS	2	100	19
SS	3	92	19
SS	4	100	26
SS	5	42	25
SS	6	75	42
SS	7	100	24



Contractor: Geo-Environmental
Grade Elevation: TBD
Drilling Method: 200 mm OD Hollow Stem Augers
Top of Casing Elevation: N/A
Well Casing Size: N/A
Sheet: 1 of 1

Log of Borehole: BH20

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: September 30 , 2024 **Project Manager:** EN

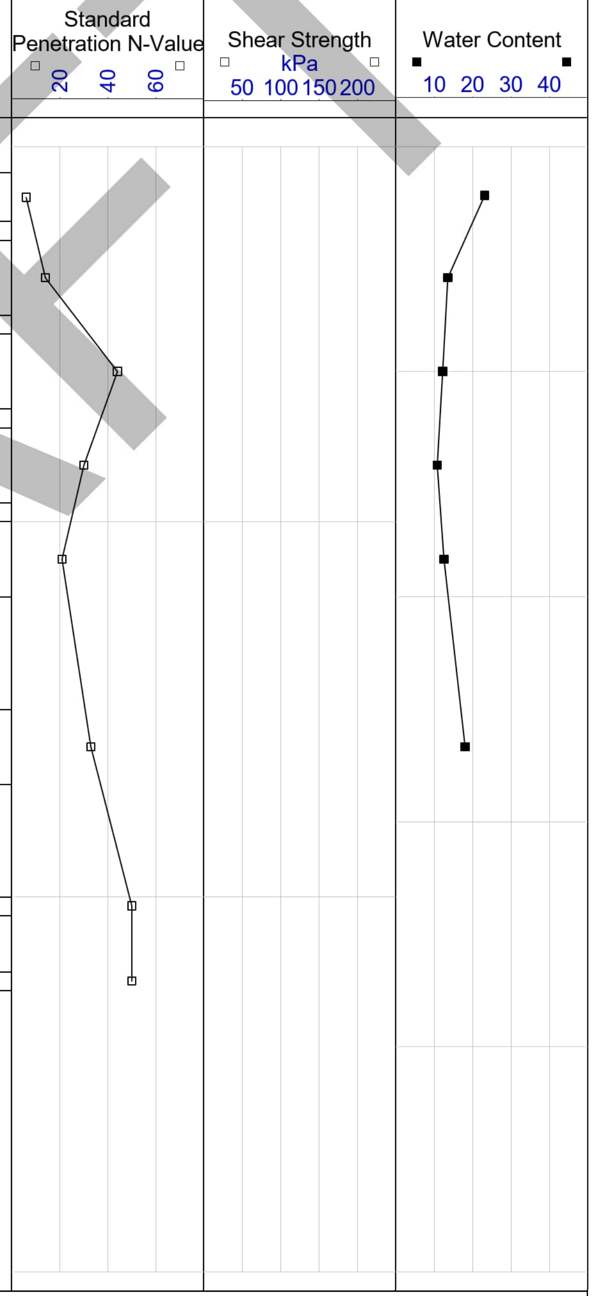
SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
	Topsoil Approximately 200 mm	-0.21
	Sandy Silt Sandy Silt, trace gravel, brown, moist, loose	-0.76
1	**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, stiff	-1.37
2	Hard	-2.13
	Very stiff	
3		
4	**Silty Sand** Silty sand, trace gravel, brown, moist, dense	-4.11
5		
6	No Recovery	-6.10
		-6.86
7	End of Borehole	
	Open borehole dry upon completion of driling.	
8		
9		

Monitoring Well Details

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	92	6
SS	2	83	14
SS	3	50	44
SS	4	100	30
SS	5	100	21
SS	6	96	33
	7		50
	8		50



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH21

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

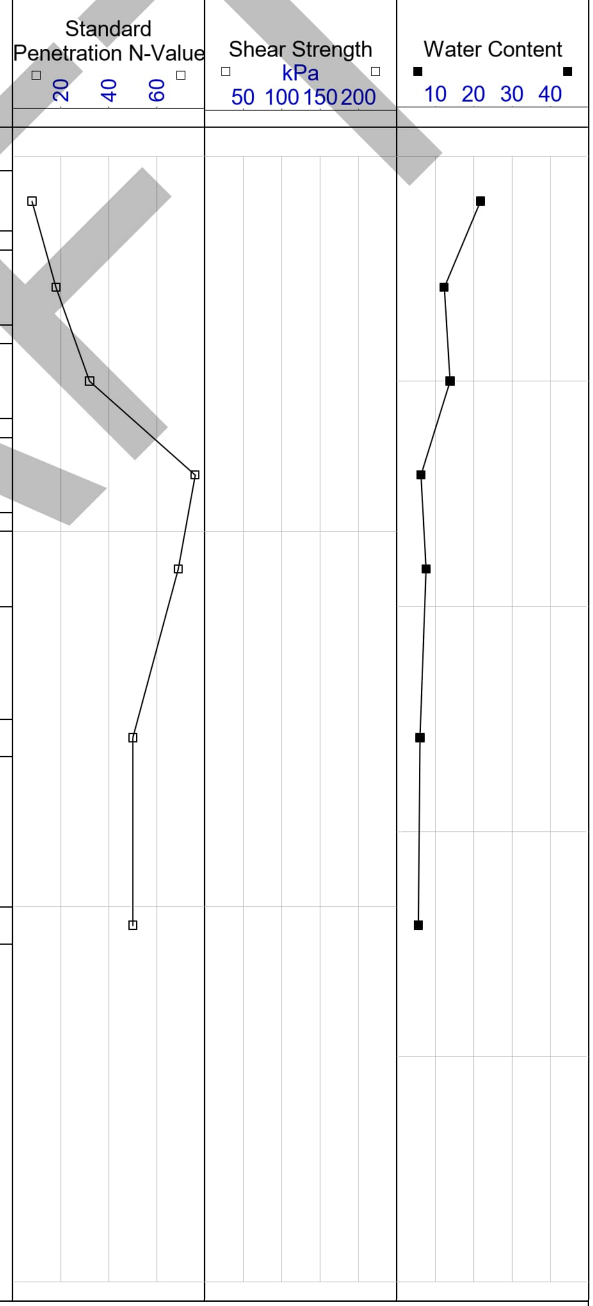
Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: October 1, 2024 **Project Manager:** EN

SUBSURFACE PROFILE				SAMPLE			
Depth (m)	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0	Ground Surface	0.00					
	Topsoil Approximately 100 mm			SS	1	18	8
	Sandy Silt Sandy silt, trace gravel, brown, moist, loose	-0.76		SS	2	100	18
	Silty Clay Sandy silty clay, trace gravel, brown, DTPL, very stiff	-1.37		SS	3	100	32
	Hard	-2.13					
	trace rock fragments			SS	4	83	76
				SS	5	92	69
				SS	6	100	50
		-6.40		SS	7	75	50
	End of Borehole Open Borehole dry upon completion of drilling.						

Depth scale (m): 0, 1, 2, 3, 4, 5, 6, 7, 8, 9



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH22

Project #: 342044.00 ***Logged By:*** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

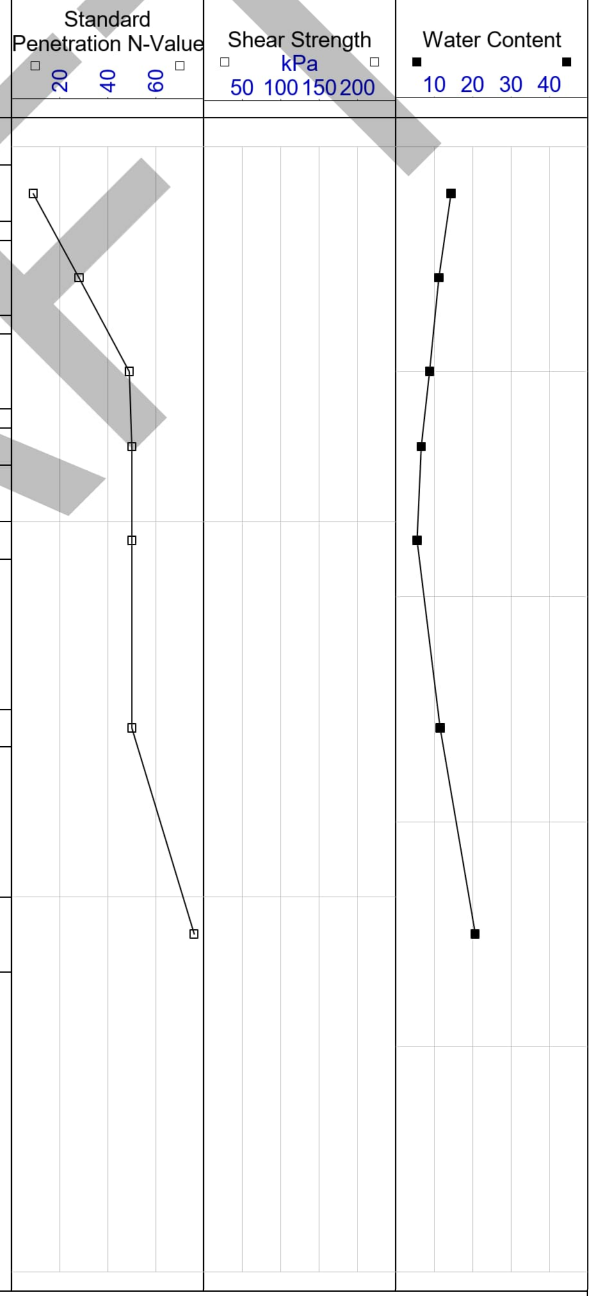
Drill Date: October 1 , 2024 ***Project Manager:*** EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
	Topsoil Approximately 150 mm	
	Sandy Silt Sandy Silt, trace gravel, brown, moist, loose	-0.76
	Silty Clay Sandy silty clay, trace gravel, brown, DTPL, very stiff	-1.37
	trace rock fragments, hard	-2.13
	Silty Sand Silty sand, trace gravel, brown, moist, very dense	-6.10
	Grey, wet	-6.71
	End of Borehole Open borehole dry upon completion of drilling.	

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	92	9
SS	2	100	28
SS	3	62	49
SS	4	42	50
SS	5	42	50
SS	6	42	50
SS	7	58	76



DRAFT

Contractor: Geo-Environmental ***Grade Elevation:*** TBD

Drilling Method: 200 mm OD Hollow Stem Augers ***Top of Casing Elevation:*** N/A

Well Casing Size: N/A ***Sheet:*** 1 of 1

Log of Borehole: BH23

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

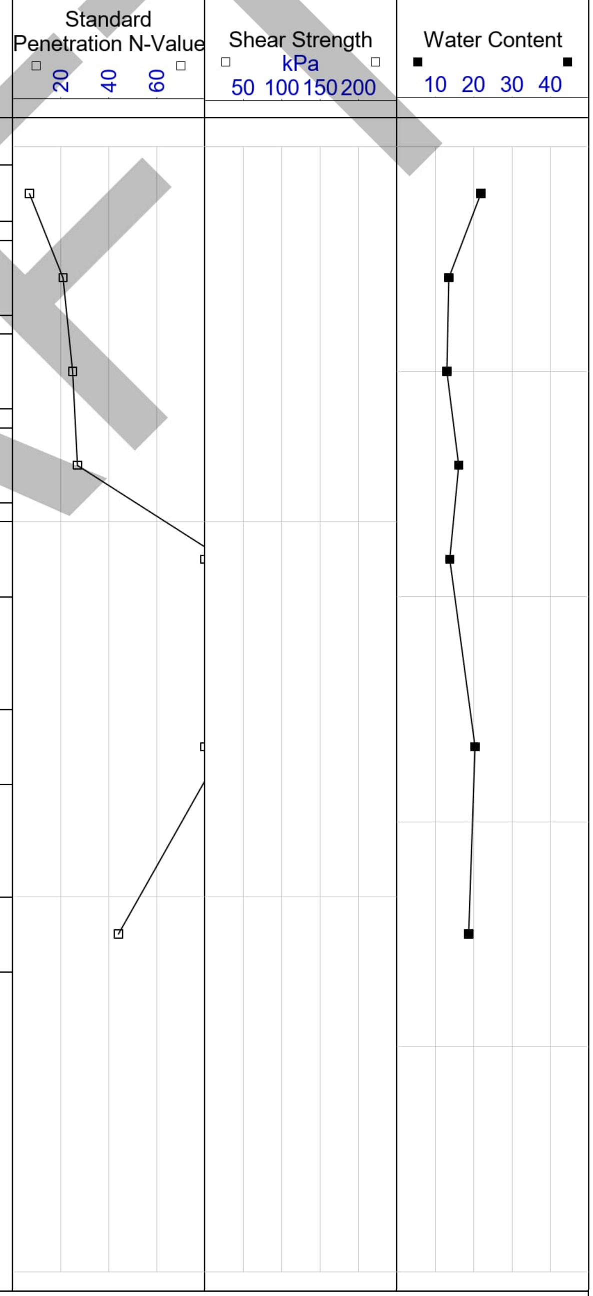
Drill Date: October 1, 2024 **Project Manager:** EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)	Monitoring Well Details
0	Ground Surface	0.00	
	Topsoil Approximately 130 mm		
	Sandy Silt sandy silt, trace gravel, brown, moist, loose	-0.76	
	Silty Clay Sandy silty clay, trace gravel, brown, DTPL, very stiff	-2.90	
	hard	-4.11	
	Silty Sand Silty sand, trace gravel and rock fragments, brown, very dense	-6.10	
	Grey, wet, dense	-6.71	
	End of Borehole		

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	88	7
SS	2	100	21
SS	3	100	25
SS	4	100	27
SS	5	13	88
SS	6	100	88
SS	7	75	44



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH24

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

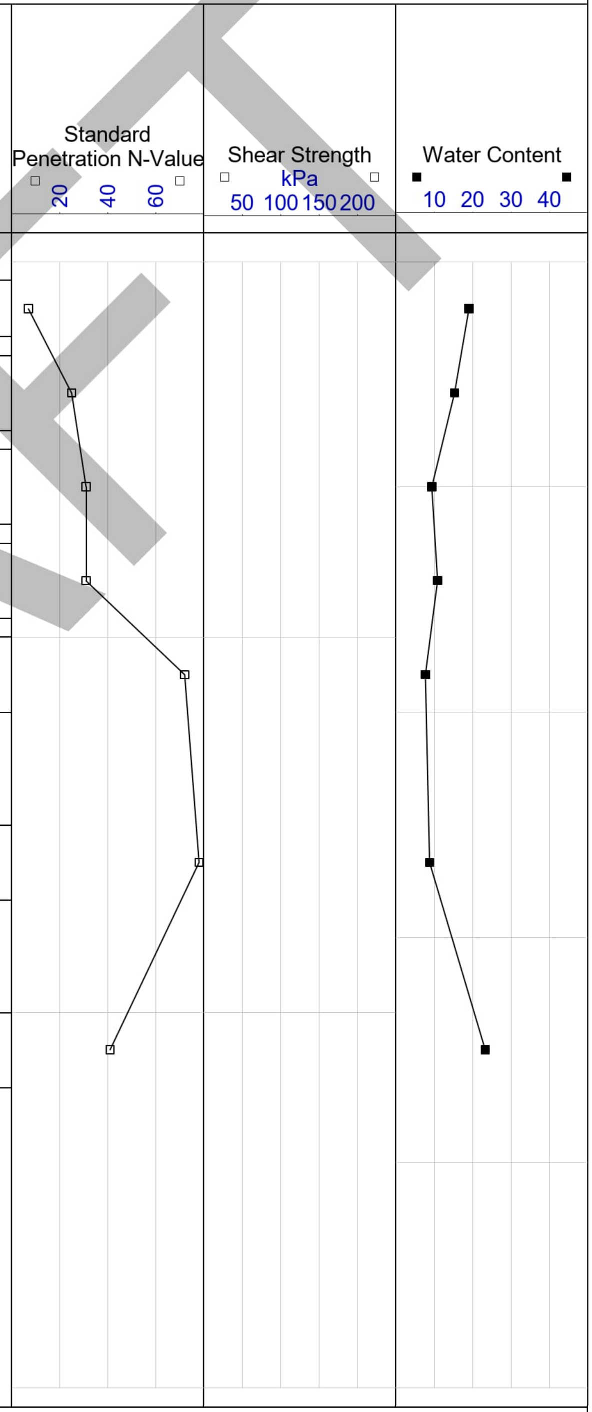
Drill Date: October 1, 2024 **Project Manager:** EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
	Topsoil Approximately 130 mm	-0.76
	Sandy Silt Sandy Silt, trace gravel, moist, loose	-1.37
	Sandy Silty clay Sandy silt and clay, trace gravel, brown, DTPL, very stiff	
	hard	-2.90
	Sandy Silt Sandy silt, trace gravel, brown, moist, very dense	-4.11
	grey	-6.10
	Wet, dense	-6.71
	End of Borehole	

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	83	7
SS	2	100	25
SS	3	100	31
SS	4	100	31
SS	5	92	72
SS	6	100	78
SS	7	33	41



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH25

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: October 1, 2024 **Project Manager:** EN

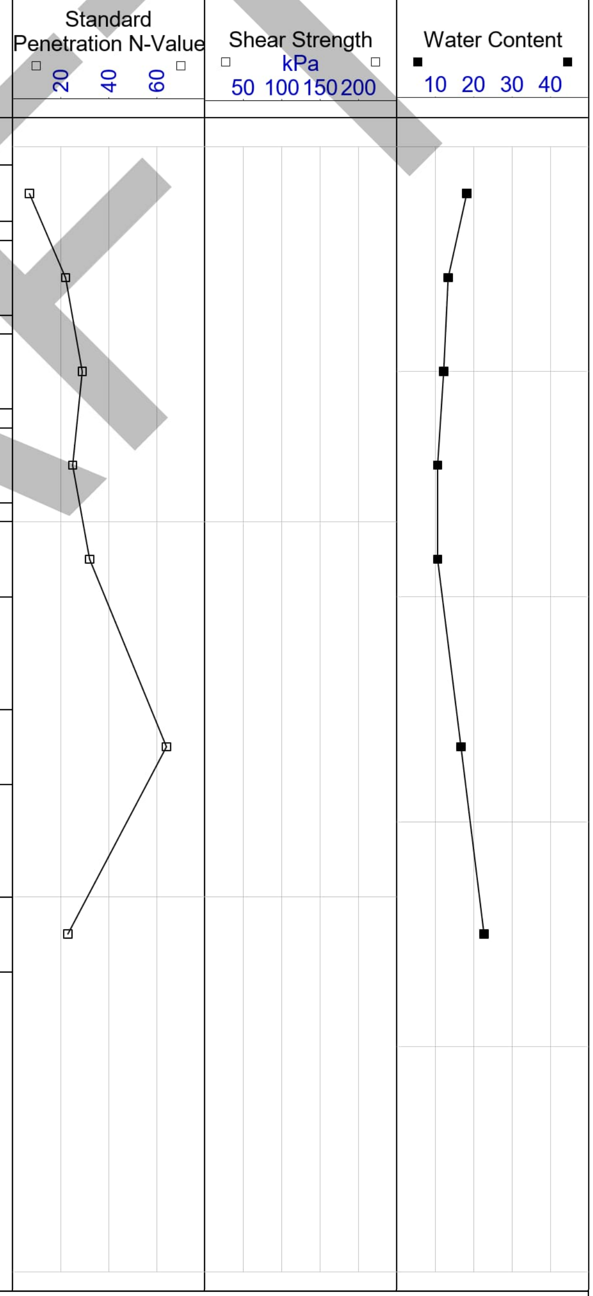
SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0 – 0.15	**Topsoil** Approximately 150 mm	
0.15 – 0.76	**Sandy Silt** Sandy Silt, trace gravel, brown, moist, loose	-0.76
0.76 – 2.90	**Sandy Silty clay** Sandy silty clay, trace gravel, brown, DTPL, very stiff	-2.90
2.90 – 4.11	Hard	-4.11
4.11 – 6.10	**Sandy silt** Sandy silt, trace gravel, brown, moist, very dense	-6.10
6.10 – 6.71	Grey, wet, compact	-6.71
6.71	End of Borehole	

Monitoring Well Details: (none shown)

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	92	7
SS	2	100	22
SS	3	100	29
SS	4	100	25
SS	5	88	32
SS	6	75	64
SS	7	92	23



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH26

Project #: 342044.00 **Logged By:** EN/TV

Project: Preliminary Geotechnical Investigation

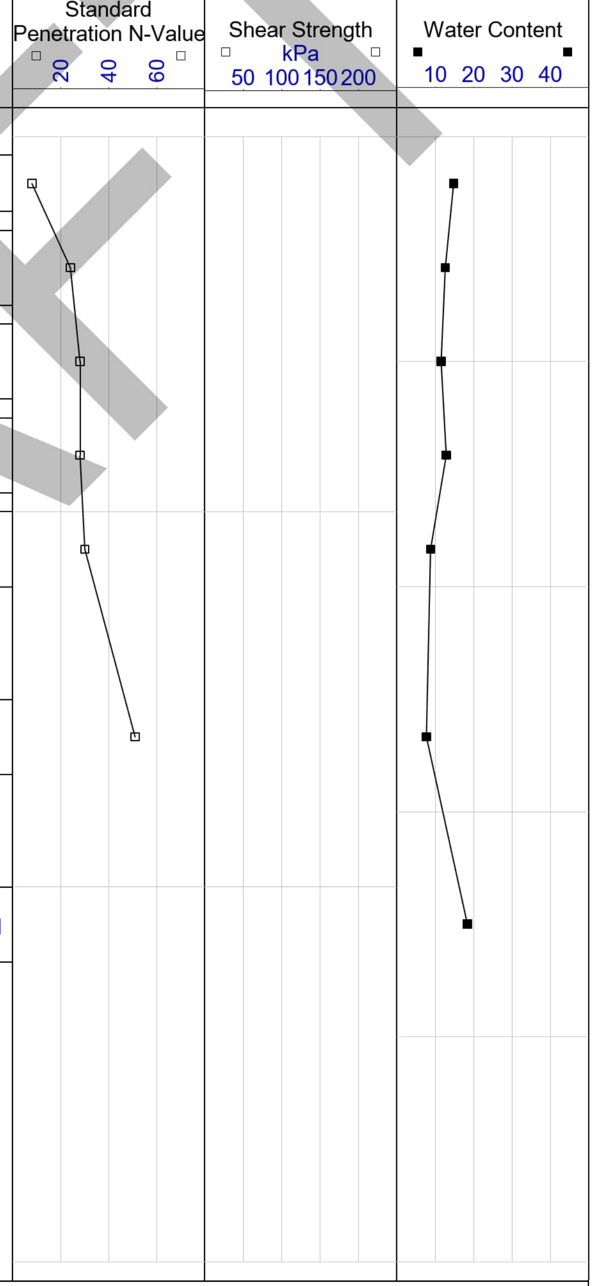
Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: October 1, 2024 **Project Manager:** EN

SUBSURFACE PROFILE / SAMPLE

Depth (m)	Description	Elevation (m)	Monitoring Well Details	Sample Type	Sampler #	Recovery (%)	SPT N-Value
0	Ground Surface	0.00					
	Topsoil Approximately 150 mm			SS	1	85	8
	Sandy Silt Sandy silt, trace gravel, brown, moist, loose	-0.76					
1	**Silty Clay** sandy silty clay, trace gravel, brown, DTPL, very stiff			SS	2	100	24
2			Riser	SS	3	100	28
		-2.90	Bentonite	SS	4	100	28
3	hard			SS	5	100	30
4			Silica Sand				
5			Screen	SS	6	100	51
6		-6.10					
	Sand Sand, trace gravel, grey, wet, very loose	-6.71		SS	7	75	WH
7	End of Borehole						
8							
9							



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH27

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: October 2, 2024 **Project Manager:** EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0–0.15	**Topsoil** Approximately 150 mm	
0.15–0.76	**Sandy Silt** sandy silt, trace gravel, brown, moist, loose	-0.76
0.76–4.11	**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, hard	-4.11
4.11–6.10	Grey	-6.10
6.10–6.71	APL	-6.71
6.71	End of Borehole	

Monitoring Well Details: Riser, Bentonite, Silica Sand, Screen

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	83	8
SS	2	100	34
SS	3	100	51
SS	4	100	39
SS	5	67	50
SS	6	83	38
SS	7	42	34

Standard Penetration N-Value: 20 40 60

Shear Strength kPa: 50 100 150 200

Water Content: 10 20 30 40

Depth (m): 0 1 2 3 4 5 6 7 8 9

Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

Log of Borehole: BH28

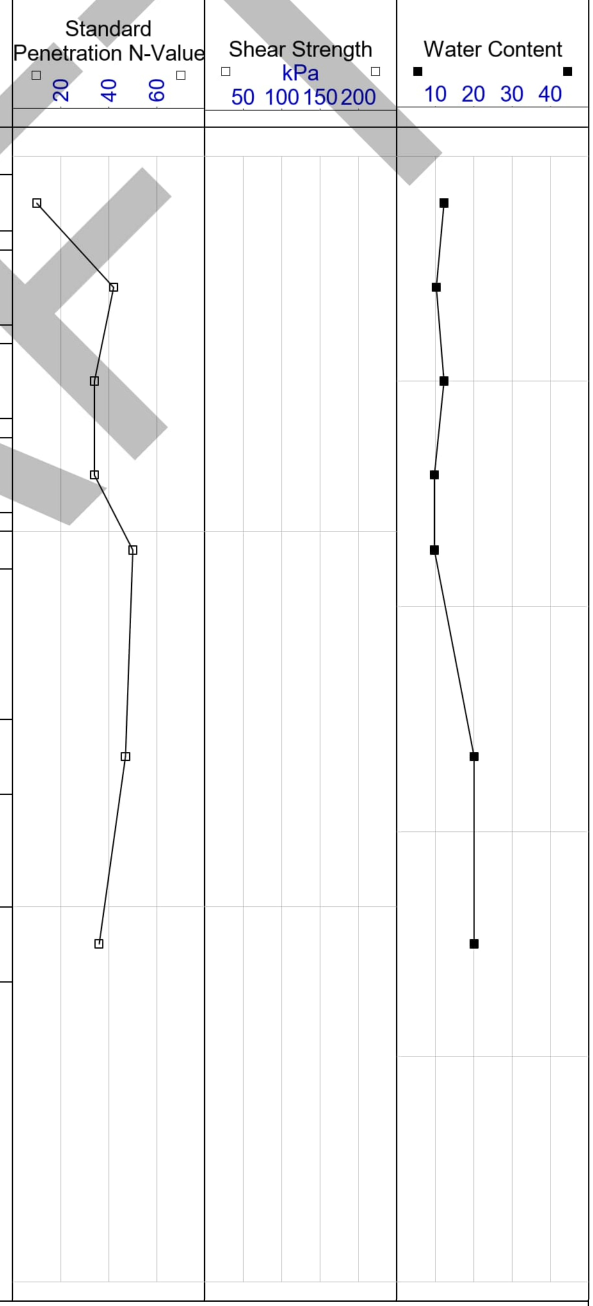
Project #: 342044.00
Logged By: EN/TV
Project: Preliminary Geotechnical Investigation
Client: Prologis
Location: 7564 Tenth Line Road, Mississauga
Drill Date: October 2, 2024
Project Manager: EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0–0.15	**Topsoil** Approximately 150 mm	
0.15–0.76	**Sandy Silt** Sandy Silt, trace gravel, brown, moist, loose	-0.76
0.76–4.11	**Silty Clay** Sandy silty clay, trace gravel, brown, DTPL, hard	-4.11
4.11–6.71	Grey, APL	-6.71
6.71	End of Borehole Open Borehole dry upon completion of drilling.	

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	88	10
SS	2	100	42
SS	3	100	34
SS	4	100	34
SS	5	33	50
SS	6	88	47
SS	7	88	36



Contractor: Geo-Environmental
Grade Elevation: TBD
Drilling Method: 200 mm OD Hollow Stem Augers
Top of Casing Elevation: N/A
Well Casing Size: N/A
Sheet: 1 of 1

Log of Borehole: BH29

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

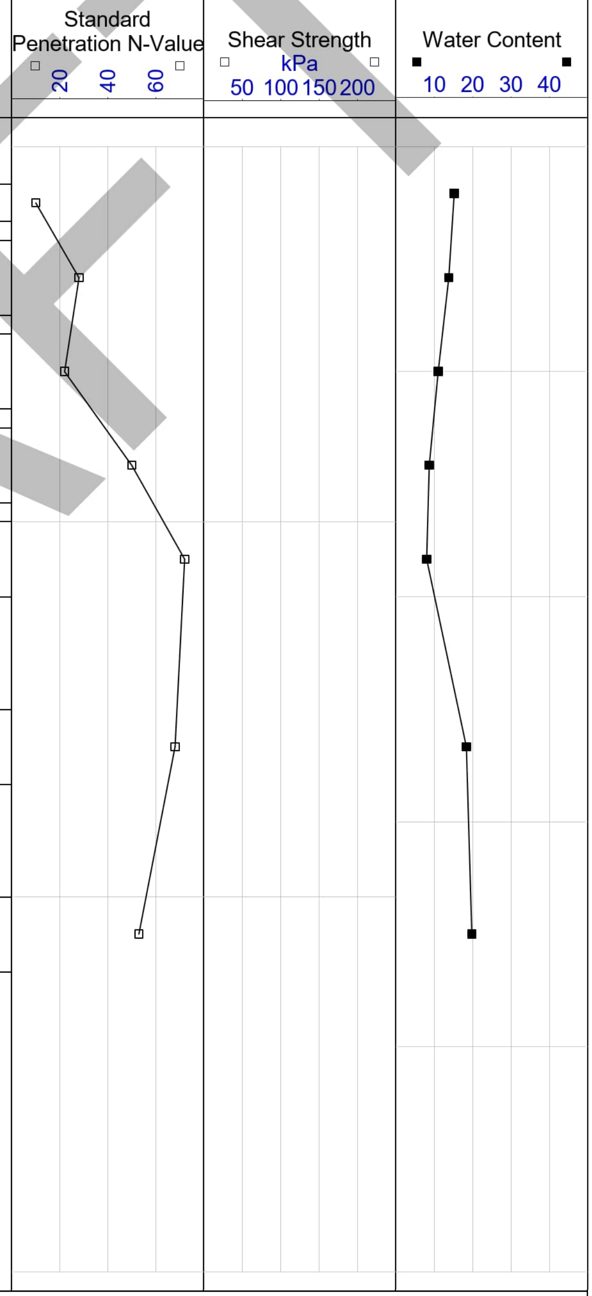
Drill Date: October 2, 2024 **Project Manager:** EN

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
	Topsoil Approximately 150 mm	
	Sandy Silt Sandy silt, trace gravel, brown, moist, loose	-0.76
	Silty Clay Sandy silty clay, trace gravel, brown, DTPL, very stiff	-2.13
	hard	-4.11
	Silty Sand Silty sand, trace gravel, grey, wet, very dense	-6.71
	End of Borehole	

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	67	10
SS	2	100	28
SS	3	100	22
SS	4	29	50
SS	5	100	72
SS	6	75	68
SS	7	75	53



Contractor: Geo-Environmental

Drilling Method: 200 mm OD Hollow Stem Augers

Well Casing Size: N/A

Grade Elevation: TBD

Top of Casing Elevation: N/A

Sheet: 1 of 1

Log of Borehole: BH30

Project #: 342044.00 **Logged By:** TV

Project: Preliminary Geotechnical Investigation

Client: Prologis

Location: 7564 Tenth Line Road, Mississauga

Drill Date: October 2, 2024 **Project Manager:** EN

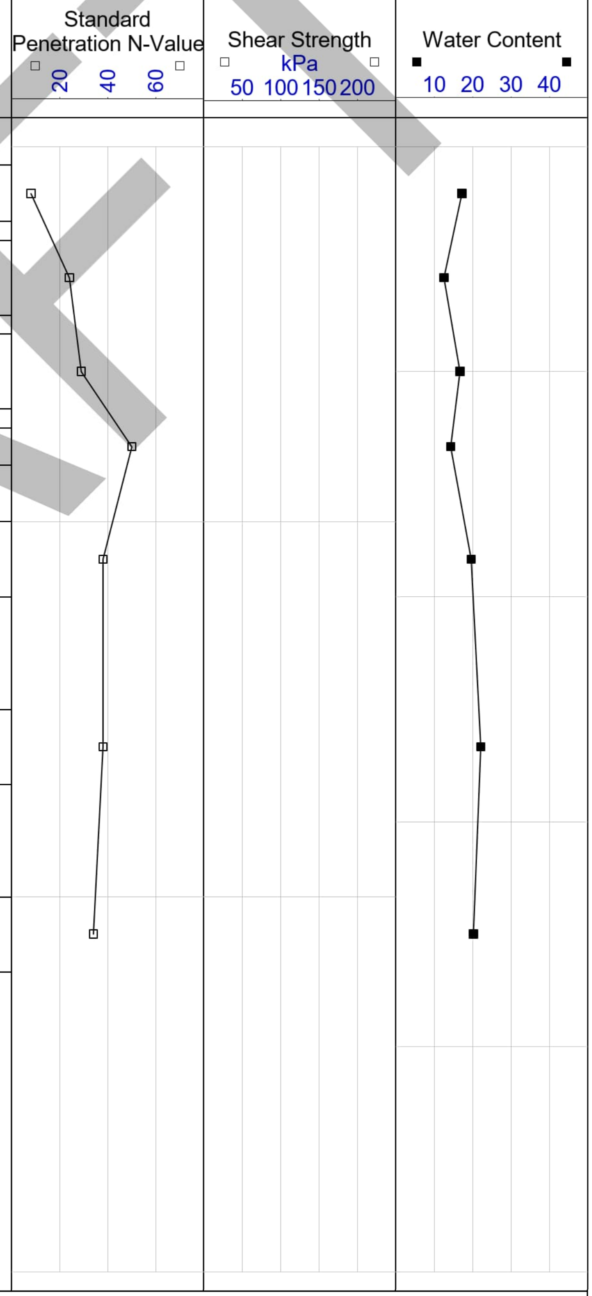
SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	0.00
0–0.76	***Topsoil*** Aproximately 150 mm	
	Sandy Silt Sandy Silt, trace gravel, brown, moist, loose	-0.76
0.76–2.13	***Silty Clay*** Sandy silty clay, trace gravel, brown, DTPL, very stiff	-2.13
2.13–2.90	Hard	-2.90
2.90–6.71	***Silty Sand*** Silty sand, trace gravel, gray, wet, dense	-6.71
6.71	End of Borehole	

Monitoring Well Details: (none shown)

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	71	8
SS	2	100	24
SS	3	100	29
SS	4	65	50
SS	5	75	38
SS	6	75	38
SS	7	100	34



Contractor: Geo-Environmental **Grade Elevation:** TBD

Drilling Method: 200 mm OD Hollow Stem Augers **Top of Casing Elevation:** N/A

Well Casing Size: N/A **Sheet:** 1 of 1

APPENDIX III

Report Limitations and Guidelines for Use

REPORT LIMITATIONS & GUIDELINES FOR USE

This information has been provided to help manage risks with respect to the use of this report.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report was prepared for the exclusive use of the Client and their authorized agents, subject to the conditions and limitations contained within the duly authorized work plan. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice.

SUBSURFACE CONDITIONS CAN CHANGE

This geotechnical report is based on the existing conditions at the time the study was performed, and Pinchin's opinion of soil conditions are strictly based on soil samples collected at specific test hole locations. The findings and conclusions of Pinchin's reports may be affected by the passage of time, by manmade events such as construction on or adjacent to the Site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations.

LIMITATIONS TO PROFESSIONAL OPINIONS

Interpretations of subsurface conditions are based on field observations from test holes that were spaced to capture a 'representative' snap shot of subsurface conditions. Site exploration identifies subsurface conditions only at points of sampling. Pinchin reviews field and laboratory data and then applies professional judgment to formulate an opinion of subsurface conditions throughout the Site. Actual subsurface conditions may differ, between sampling locations, from those indicated in this report.

LIMITATIONS OF RECOMMENDATIONS

Subsurface soil conditions should be verified by a qualified geotechnical engineer during construction. Pinchin should be notified if any discrepancies to this report or unusual conditions are found during construction.

Sufficient monitoring, testing and consultation should be provided by Pinchin during construction and/or excavation activities, to confirm that the conditions encountered are consistent with those indicated by the test hole investigation, and to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated. In addition, monitoring, testing and consultation by Pinchin should be completed to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining Pinchin for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions. However, please be advised that any construction/excavation observations by Pinchin is over and above the mandate of this geotechnical evaluation and therefore, additional fees would apply.

MISINTERPRETATION OF GEOTECHNICAL ENGINEERING REPORT

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having Pinchin confer with appropriate members of the design team after submitting the report. Also retain Pinchin to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having Pinchin participate in pre-bid and preconstruction conferences, and by providing construction observation. Please be advised that retaining Pinchin to participation in any 'other' activities associated with this project is over and above the mandate of this geotechnical investigation and therefore, additional fees would apply.

CONTRACTORS RESPONSIBILITY FOR SITE SAFETY

This geotechnical report is not intended to direct the contractor's procedures, methods, schedule or management of the work Site. The contractor is solely responsible for job Site safety and for managing construction operations to minimize risks to on-Site personnel and to adjacent properties. It is ultimately the contractor's responsibility that the Ontario Occupational Health and Safety Act is adhered to, and Site conditions satisfy all 'other' acts, regulations and/or legislation that may be mandated by federal, provincial and/or municipal authorities.

SUBSURFACE SOIL AND/OR GROUNDWATER CONTAMINATION

This report is geotechnical in nature and was not performed in accordance with any environmental guidelines. As such, any environmental comments are very preliminary in nature and based solely on field observations. Accordingly, the scope of services do not include any interpretations, recommendations, findings, or conclusions regarding the, assessment, prevention or abatement of contaminants, and no conclusions or inferences should be drawn regarding contamination, as they may relate to this project. The term "contamination" includes, but is not limited to, molds, fungi, spores, bacteria, viruses, PCBs, petroleum hydrocarbons, inorganics, pesticides/insecticides, volatile organic compounds, polycyclic aromatic hydrocarbons and/or any of their by-products.

Pinchin will not be responsible for any consequential or indirect damages. Pinchin will only be held liable for damages resulting from the negligence of Pinchin. Pinchin will not be liable for any losses or damage if the Client has failed, within a period of two years following the date upon which the claim is discovered within the meaning of the Limitations Act, 2002 (Ontario), to commence legal proceedings against Pinchin to recover such losses or damage.