Draft Functional Servicing Report

SE Watson Farm Condo Development
21829 Nissouri Road, Thorndale, Ontario

Project Number: DEL19-103
Date: June 16, 2023

Prepared For:
1732435 Ontario Ltd.

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Revisions

Original Report, dated: June 16, 2023

Statement of Qualifications and Limitations

This Report has been prepared for 1732435 Ontario Ltd. based upon currently available information, to support the Site Plan Application to be filed for the proposed Watson Farm Condominium Development. This report has been prepared for the sole use of 1732435 Ontario Ltd. and any reliance upon this information by any third party is made at the risk of that party. Development Engineering (London) Limited assumes no liability for any injury, loss or damage suffered by any third party based upon decisions made or actions that arise due to that party's reliance upon or interpretation of the contents of this report.

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1.0 Introduction

Development Engineering (London) Limited, *DevEng*, has been retained by 1732435 Ontario Inc. to undertake engineering design for a proposed 91-unit condo development referred to as Watson Farm condo development at 21829 Nissouri Road. The subject site is comprised of a +/- 3.2 ha agricultural parcel in the southeast part of the existing Watson Farm, bound by Thorndale Road to the south, Nissouri Road to the east, existing residential to the southeast, and existing agricultural to the north and west. The subject site is described by AGM Legal Survey plan 8-L-5871-Z (June 09, 2022) as Part of Lot 16, Concession 2, Geographic Township of West Nissouri, in the Municipality of Thames Centre.

The existing topography within the development area is undulating but ultimately slopes west directing runoff into the existing farm field under higher storm events, also owned by the applicant, with geodetic elevations across the site ranging between ±284.75m along Nissouri Road in the east, down to ±282.20m along the existing farm field to the west.

The condo development is proposed to be serviced with new watermain, sanitary sewers, storm sewers, and a dry basin/infiltration gallery stormwater management facility (SWMF). Road access to the site is proposed from two points through a proposed extension of Elliott Trail West, which would connect to Nissouri Road at the north limit of the site. Emergency access is to be available from Thorndale Rd. at the south limit per County of Middlesex requirements.

The purpose of this Functional Servicing Report is to support Site Plan Approval by demonstrating an effective approach to address servicing, grading, and stormwater management, while also showing due regard for municipal and provincial design guidelines for this private condo development.

2.0 Background Information

2.1 Previous Consultations

- Pre-consultation with the County of Middlesex (November 05, 2020).

2.2 Previous and Concurrent Studies and Reports

- Geotechnical Investigation – Watson Farm Development (EXP Services Inc., Nov. 2020).
- Hydrogeological Investigation – Watson Farm Aggregate Resources Study (EXP Services Inc., Jan 2016).
- Noise Feasibility Study – (Howe Gastmeier Chapnik Ltd., Jan 2023).
- Stage 1-2 Archaeological Assessment (Lincoln Environmental Consulting Corp., May 2020).
- McGuffin Drain Plan and Profile (Spriet Associates, 1979).

2.3 Related Design Specifications

- Municipality of Thames Centre Design Standards (2021).
- Ontario Building Code.
- MECP SWM Design Guidelines (2003).

3.0 Approval Agencies

3.1 Municipality of Thames Centre

The subject site is located with the Municipality of Thames Centre, Ward of West Nissouri. The condo site plan and engineering design must be submitted to and subsequently approved by the Municipality and County of Middlesex. The Municipality will also be responsible for the approval of any zoning by-law amendments and building permits associated within the subject site (private servicing, residential units).

3.2 County of Middlesex

The subject site is located within the County of Middlesex. The Plan of Condominium Application must be submitted to and subsequently approved by the County.

3.3 Ministry of Environment, Conservation, and Parks

The proposed private stormwater management facility (SWMF) and infiltration gallery may require ECA approval subject to further agency discussion. If required, an Environmental Compliance Approval (ECA) submission to the Ministry would be submitted during the detailed engineering design stage unless the Municipality agrees to approve servicing under Part 7 OBC as a private condo drainage system.

4.0 Existing Conditions

As discussed in Section 1.0, under existing conditions, the 3.2 ha undeveloped site (C=0.20; 0% imperviousness) is currently bound by Thorndale Road to the south, Nissouri Road to the East, existing residential to the southeast, and existing agricultural farmland to the north and west. Primary access to the site is to be provided from an extension of Elliott Trail (West of Nissouri Road) to the north.

4.1 Site Topography and Drainage

Review of the topo survey indicates the 3.2 ha site appears to be rolling at approximately 1.2% from +/-284.50m in the northwest corner to +/-283.5m in the centre of the site. The existing field currently pools runoff in the southwest portion of the site. The existing field is currently undulating but in larger storm events, the runoff bypassing the existing sag would tend to spill west toward the McGuffin drain which crosses the Watson farm. In consideration of a proposed aggregate operation on this farm, the proposed ground conditions at pit rehabilitation would direct such flow toward an infiltration pond located at the far west end of the property. Based on the pit grading strategy, there would be ample available active storage for runoff below original ground.

4.2 Soil Conditions

A geotechnical study was completed for the proposed development by EXP Services Inc. in November of 2020 based on six (6) boreholes drilled in March of 2020. Following the completion of the boreholes, three (3) monitoring wells were strategically installed across the site to observe groundwater conditions over a twelve (12) month period.

The site contains a surficial topsoil layer ranging from 250 to 300mm thick. The underlying soils primarily consist of sand and gravel with three (3) of the boreholes containing a layer of clayey silt/sandy silt.

Groundwater was encountered at depths of 1.8 and 3.0 mbgs. The groundwater monitoring program indicates the general direction of groundwater flow is to the south and is generally expected to be influenced by a nearby fluvial terrace.

On-site testing was conducted to confirm the hydraulic conductivity of native subsoils. The resulting infiltration rates ranged from 130mm/hr for the sand and between 80 to 135 mm/hr for the sand and gravel, indicating that the native subsoils are highly conducive to infiltration.

A gas detection meter was used on-site to test the presence of methane. It was determined that no methane gas producing materials or significant organic matter were present within the boreholes, except a thin veneer of topsoil. No significant methane gas concentration was detected in the boreholes.

Based on the information provided from the boreholes/monitoring wells, near surface soils encountered at some of the test hole locations have a potential for use in LID stormwater management or recharge design.

Refer to the Geotechnical Investigation report (EXP Project Number LON-00017870-GE) dated November 25, 2020 for more information.

4.3 Existing Roads

The existing roadways surrounding the site are Thorndale Road (County Road 28) to the south, and Nissouri Road to the east. Condo access is proposed from a new extension of Elliott Trail West from Nissouri Road. An emergency access is also proposed from Thorndale Rd. at the south limit per County requirements but will be blocked off from regular vehicle traffic with bollards and a chain.

4.4 Existing Servicing

Based on our review of the records identified above, the following observations have been made regarding servicing in proximity to the site:

- There is an existing municipal 200mm dia. PVC watermain on Thorndale Road to the south as well as a 150mm dia. PVC watermain on Nissouri Road to the east.
- There is an existing 300mm diameter sanitary sewer located on Thorndale Road to the south available to service the condo.
- There are no existing storm sewers within the vicinity to service the proposed development. Local road side ditches are located on both sides of Thorndale Road to the south and Nissouri Road to the east but these are not to be used for drainage outlet as they are too shallow for service.
- The existing McGuffin Drain tile traverses the Watson farm to the northwest of this condo site. It currently provides outlet for field drainage systems.

5.0 Proposed Conditions

The proposed scope of work includes a 91-unit condominium development, comprising of: five (5) private roads, various parking areas, a common element area, a private SWMF (dry basin), and a public road extension (Elliott Trail West).

5.1 Roads

Vehicular access to the subdivision is proposed with connection to two existing roadway systems: Thorndale Road (County Road 28) to the south for emergency access, and a proposed street extension (Elliott Trail West) connecting to Nissouri Road to the east. Approximately 570m of private, local streets are proposed for this

development. Best efforts have been implemented to align east bound traffic from the proposed Elliott Trail West extension with the ROW across Nissouri Road. The intersection is proposed as a stop condition and a terminal bulb is proposed at the west end for ease of road maintenance.

Design of the local streets will be completed in accordance with the recommended pavement structure in the Geotechnical Report by EXP Services Inc. The associated pavement design for local traffic has been established as follows:

- 40mm HL-3 top course asphalt;
- 50mm HL-8 base course asphalt;
- 150mm Granular 'A' Base; and,
- 300mm Granular 'B' Base.

The County Road Tie-ins require pavement design which includes:

- 50mm HL-3 top course asphalt;
- 100mm HL-8 base course asphalt;
- 150mm Granular 'A' Base; and,
- 450mm Granular 'B' Base.

It is anticipated the new (private) local roadways would include semi-mountable curb and gutter (OPSD 600.060), with no local sidewalks other than on the south side of the Elliott Trail West, and superelevated section with 2% cross fall throughout the condo. The profile of local roads is designed to serve as major overland flow route to the stormwater management (SWM) block. Elliott Trail West is anticipated to be assumed by Thames Centre ultimately as a public road and would have a standard crown cross section. If this arrangement does not meet with agency approval, then a private road could be considered at this location. Refer to Appendix A for Engineering Drawings for more information.

Future maintenance of all internal (condo) roadways would become the responsibility of the condominium corporation. Upon assumption of Elliott Trail West in the future, roadway maintenance would become the responsibility of Thames Centre.

5.2 Grading and Drainage Design

It is anticipated the site will require existing grades to be raised to accommodate the proposed development. Accordingly, the development area (3.2 ha) is proposed to convey drainage via new storm sewers southwest to a proposed landscaped SWM dry basin/infiltration gallery.

The proposed site has potential to restrict flow from the adjacent Nissouri Road west ditch, causing runoff to pool in the ditch system on the northeast side of the development. The design as proposed will collect this external ditch runoff through the minor system and treat / infiltrate it through the proposed condo SWMF.

There is approximately 2.73 ha of external agricultural catchment, north of the subject site which grades toward Elliott Trail West. The elevated road embankment of the Elliott Trail West extension could trap runoff in the area just north of the ROW. As such, this area and ROW drainage is proposed to be collected and bypass the private SWMF and outlet through a headwall and grassed waterway in the adjacent field to the west, also owned by the applicants, and ultimately toward the McGuffin Drain. The implementation mechanics of this ROW drainage system will be subject to further Municipal discussion but could be under section 2 of the Drainage Act. Refer to the Grading Plan (SE3) in Appendix A for more information.

5.3 Proposed Servicing

New private on-site watermains, sanitary sewers, and storm sewers are proposed to service the new development. Private condo storm sewers are proposed to an on-site stormwater management facility (SWMF) dry basin/infiltration gallery system. A new sanitary connection to Thorndale Road as well as new watermain connections to Thorndale Road and Nissouri Road are also proposed to service the development.

5.3.1 Watermain

The subject site will require a private water service for domestic and fire flow demands. A new ±520m 150mm diameter private watermain is proposed to supply the site from a 200mm municipal watermain on Thorndale Road to the south and the Elliot Trail West extension to the north, which connects via a reducer to the 150mm diameter watermain on Nissouri Road to the east, to meet domestic demands and to supply the fire flow needs.

For private water service connections, the following Municipal design criteria are understood to apply:

- Watermains shall maintain:
  - Max Day + Fire: residual pressure not less than 140 kPa (20 psi); notwithstanding this is a private condo, velocity should not exceed 2.4 m/s.
  - Peak Hour: residential residual pressure not less than 275 kPa (40 psi); velocity may not exceed 1.5 m/s.
  - Average Day: residual pressure not less than 275 kPa (40 psi).
  - Maximum residual pressure shall not exceed 550 kPa (80 psi) and a minimum residual pressure shall not be below 275 kPa (40 psi).
  - All pressures shall be calculated/determined assuming minimum hydraulic grade line conditions apply.
- Watermains shall be designed so that water shall not remain unused in the watermain for more than three (3) days (72 hours) under average day demand.

Anticipated water demands were calculated using the Thames Centre Engineering Design standards:

- Average Day Demands = 350 L/per/day
- Population Density = 2.4 People/Unit
- Max Day Peaking Factor = 2.75
- Peak Hour Peaking Factor = 4.13

A detailed water model will be completed for second submission to verify pressures, velocities, and turnover for the site.

Domestic Water Demand

Using the design population density of 2.4 persons/unit, the total design population for the site is estimated at 218 persons. Using the previously listed design parameters from the Thames Centre Engineering Design standards, the Total Average Daily Demand, Max. Day Demand, and Peak hour Demand are 53, 146, and 219 L/min, respectively. Refer to Appendix C for sanitary calculations.

Max Day + Fire

To achieve fire protection for the site, new hydrants are proposed at three (3) locations. Fire demands for select units (chosen at critical locations for the highest fire demand at each hydrant) were calculated using the Ontario Building Code (OBC) method, in accordance with Thames Centre Engineering Design standards Chapter 7.2.4 for private property.

Using the OBC method, the maximum fire demand was calculated to be 75 L/s (1,189 USGPM). Refer to SE2 in Appendix A for more information and to Appendix B for the fire flow and demand calculations.

Upon completion of the water model, colour coded hydrant collars in accordance with the requirements of NFPA 61 will be verified for the on-site hydrants in this condo development.

5.3.2 Sanitary Sewers

The development would be serviced locally though a system of 200mm diameter private sewers which would convey sewage to the existing trunk sanitary sewer on the south side Thorndale Road. Approximately 500m of local sanitary sewers are proposed to service the development.

In accordance with Thames Centre design criteria, the average per capita daily sewage production would be computed at a rate of 230 L/per/day, the extraneous inflow/infiltration allowance would be 0.10 L/s/ha, the population density would be 2.4 people/unit for all condo units, and the peak sewage flow would be derived using the Harmon Peaking Factor formula.

The proposed Draft Plan of condo concept includes 91 street townhouse units. This amounts to a design population of 219 resulting in a Harmon Peaking Factor of 3.20. The sanitary catchment area amounts to 3.1 ha as it excludes the SWM block. The peak sanitary outflow from the condo is estimated to be on the order of 2.18 L/s.

The ongoing maintenance of the private sanitary sewers would become the responsibility of the condominium corporation.

Refer to plan SE2 in the Engineering Drawing Set in Appendix A for more information and Appendix C for sanitary calculations.

5.3.3 Storm sewers and Local Drainage

The site is proposed to have a local private storm sewer system designed to collect the site runoff as well as the adjacent external runoff from the southeast neighbouring lots and direct it to an on-site dry basin/infiltration gallery SWMF.

A portion of the west roadside ditch on Nissouri Road is proposed to be regraded for ultimate ROW grading along the flanking condo site. This regrading will restrict approximately 0.19 ha of the right-of-way and ditch system from draining southerly. A ditch inlet catchbasin is proposed to collect and convey the stormwater from this ditch area to the on-site SWMF.

The proposed Elliott Trail West extension as well as approximately 2.73 ha of land north of the site is proposed to be collected and transported via a 450mm storm sewer to a headwall outlet on the Watson farm (owned by the applicant) before making its way through a grassed waterway toward the McGuffin Drain to the west. This drainage works could potentially be implemented as a mutual agreement drain under the Drainage Act with a nominal tile connection to the McGuffin Drain. Refer to SE2 in Appendix A for more information.

6.0 Stormwater Management Strategy

6.1 SWM Design Approach

The proposed scope of work includes a 91-unit condominium development as well as various parking areas, private roadways, and landscaped areas. The total impervious area will increase to approximately 59% (C=0.62). With no available local minor outlet for the subject site, on-site attenuation will be needed and put in place in the form of a dry-basin/infiltration/OGS system to contain, treat flows, and infiltrate up to and including the 100-year storm event. The proposed dry basin will be landscaped to provide aesthetic benefits and encourage local enjoyment as an amenity (green space) feature. Refer to SE4 in Appendix A for more information.

As noted previously, on-site surface attenuation of stormwater for the majority of the site will be employed to infiltrate post-development peak flows for all storm events up to and including the 100-year design storm event and to safely convey 250-year flows overland.

6.2 SWM Modelling

The SWM analysis was completed with PCSWMM hydrologic modelling software using the Intensity-Duration-Frequency (IDF) Parameters outlined as per the Thames Centre Design Standards. A pre-development model was created to determine post-development outflow targets and a post-development (proposed conditions) model was completed to assess the performance of the quantity control measures including the dry basin and infiltration gallery. Refer to Appendix E pre- and post-development model schematics, inputs, and outputs.

6.3 SWM Facility Design

6.3.1 SWMF Quantity Control

As noted previously, on-site surface storage and infiltration of stormwater for the site will be employed to infiltrate post-development peak flows for all storm events up to and including the 100-year design storm while safely conveying the 250-year design storm event. A private dry basin and infiltration gallery SWMF is proposed to capture the runoff from the site before recharge into the native subsoils through an infiltration gallery. A 450mm culvert in the west side of the basin would convey major overland flow (>100-year storm event) from the basin, through a proposed berm at the adjacent aggregate site, and ultimately into the adjacent site, owned by the applicants. The proposed private SWMF is 2.35m deep with approximately 3,255m^3 of active storage volume in the dry basin and 300m^3 of void space (750 m^3 of clear stone) in the underlying infiltration gallery. The bottom of the dry basin is to be underlain with 150mm of topsoil and 500mm of clear stone for infiltration and includes three (3) inlet structures. The inlet structures are set 0.25m above the bottom of the basin to promote infiltration of the smaller events through the soil to the gravel for additional filtration. The infiltration layer is 0.50m thick by 50m long and 30m wide for a surface area of 1,500m^2. The gallery is to be comprised of 19mm clear stone wrapped with geotextile fabric to prevent fines from washing into the native stone subsoils.

The proposed landscaped dry basin and infiltration gallery SWMF can significantly reduce discharge rates from the subject site and external lands to below the existing runoff. Considering the existing topography of the site, and the lack of allowable outlet, this SWM strategy effectively 'over controls' the site while also providing a valuable landscape amenity to this development and achieves water balance objectives with favourable subsoils.

Table 1: Summary of Post-Development Flows and Infiltration Volumes

Design Storm Event Return Period	Pre-Development Site Peak Runoff (L/s)	Post-Development Infiltration Volume (m^3)	Post-Development Peak Overland Flow (L/s)
2-year	15	1,237	0
5-year	20	1,328	0
10-year	35	1,587	0
25-year	55	1,870	0
50-year	72	2,083	0
100-year	92	2,294	0
250-year	175	2,451	76

Table 2: Summary of SWMF Depth/Active Storage Volumes Flows

Design Storm Event Return Period	SWMF Depth (1) / Elev. (m)	Peak Active Storage Volume (m^3)
2-year	1.36 / 283.11	976
5-year	1.44 / 283.19	1,062
10-year	1.65 / 283.40	1,304
25-year	1.86 / 283.61	1,569
50-year	2.01 / 283.76	1,767
100-year	2.14 / 283.89	1,967
250-year	2.34 / 284.09	2,102

Notes: (1) depth per active storage above bottom of infiltration gallery.

Table 1 above summarizes the infiltration volumes from the subject site as well as the overland flow to the lands to the west. These total outflows under the proposed ultimate condition are less than that of the peak site outflow under the existing conditions, up to and including the 250-year event. As such, it has been demonstrated that the site SWM works can provide sufficient storage and infiltration to mitigate impacts to the adjacent roadside ditch systems. Refer to Appendix D for summary SWM tables and Appendix E for the proposed conditions PCSWMM model outputs.

6.3.2 SWMF Quality Control

Multiple water quality measures are proposed within the SWM system before infiltrating into the native subsoils. The overall effect is a treatment train approach to water quality. An in-series treatment train approach is proposed as follows:

- Upstream OGS unit at the dry basin inlet, designed and sized to treat 80% of the incoming total suspended solids (TSS). See below for more information on the proposed OGS unit.
- Extended detention dry basin SWMF via no minor outlet pipe, allowing outflow to be solely based on the infiltration rates of the native subsoils. This mitigates impacts to surface waters.

- Enhanced plantings, and cable concrete armouring on the bottom of the pond inlet to reduce velocity and allow for more infiltration. These measures allow for increased settling before reaching the underlying stone gallery.
- A geotextile wrap around the infiltration gallery allows for damped velocities by extending flow path, encouraging particle settling. The geotextile wrap also provides for a level of filtration through the fabric.

Due to the sensitivity of an infiltration gallery an 'Enhanced' (80% TSS removal) level of treatment is proposed on-site through an oil grit separator (OGS) unit to pre-treat stormwater before being infiltrated. The quality control device will be installed in series with and upstream of the dry basin to provide the required level of protection. The device selected for this project is a Contech Engineering Solutions CDS (continuous deflection separation) unit Model PSMU 3035_6C or approved equivalent, for a 4.6 ha development area, with a 108 L/s peak treatment capacity based on a fine particle size distribution with an average annual TSS removal efficiency of 80.0% treating 96.1% of the average annual total runoff volume. A unit sizing has been provided by Echelon Environmental Inc. Refer to Appendix F for CDS unit cut sheets.

North of the subject site, the existing farm field and residence catchment runoff will be collected and conveyed west and the Elliott Trail West extension is proposed to be collected with the northern runoff and be directed via a 450mm outlet pipe to a 100m long grassed waterway which should allow for buffer filtration and velocity reduction. The grassed waterway is also proposed to contain two (2) rock flow check dams to promote velocity reduction to promote settling and infiltration.

6.3.3 SWMF Inlet and Outlets

Minor flows from the condo development are designed to inlet into the dry basin/infiltration gallery SWMF via a 675mm inlet pipe at 0.20%, through the CDS unit, and out a headwall. The basin below the inlet and approximately 3m of the bottom of the pond are to be lined with cable concrete mattress surrounded by turf reinforcement mat.

The dry basin is proposed to outlet stormwater via the underground infiltration gallery into the native subsoil below. The basin also includes provision for a 450mm diameter emergency overflow culvert (invert 283.90), which is only anticipated to be utilized in any storm event beyond a 100-year storm event.

6.4 Major System Conveyance

The major overland flow route for the development is proposed to convey flows to the on-site dry basin via local private roadways, which in emergency situations, will direct major flows to the lands to the west under common ownership. The onsite landscaped dry basin has been sized to store and infiltrate all major overland flows up to and including the 100-year design storm event.

6.5 Low-Impact Development

The proposed landscaped dry basin incorporates an infiltration system below the floor for storm event control and filtration. As an LID feature, the infiltration system will facilitate full, long-term recharge into native sandy subsoils after each minor precipitation event. Proposed landscape plantings within the dry basin will seek to encourage water tolerant species that have potential to support evapotranspiration and root uptake.

6.6 Water Balance

Containing and treating the site runoff before infiltrating from storm events up to and including the 100-year storm event easily exceeds pre-development targets, satisfying any water balance requirements. Refer to the Hydrogeological Report by EXP for more information on groundwater.

7.0 Erosion and Sediment Control

Complementary to the site servicing and grading design for the on-site development, erosion and sediment control (ESC) details will be included with the detailed Engineering design drawings. Temporary ESC measures will be designed to mitigate the offsite migration of sediments by incorporation of various best management practices and control measures. Typical control measures to be implemented on site include:

- Installation of silt control fencing (light duty/robust) around the site perimeter at down-gradient locations;
- Preventing silt or sediment laden runoff from entering inlets (catchbasins / catchbasin maintenance holes) by installing pre-fabricated temporary inlet filter bags and incorporating straw bale or rock dam flow checks;
- Temporary sediment traps/basins (dewatering stations where required);
- Sodding the invert of swales as soon as possible after being constructed to mitigate erosion and down cutting; in general, minimizing the duration of soil exposure in erosion prone areas by temporary vegetation coverage (i.e. hydro-seeding) is recommended;
- Maintaining sediment and erosion control structures in good repair (including periodic cleaning as required) until such time as the Engineer or the Municipality approves their removal;
- Incorporation of temporary measures at site construction entrances to minimize tracking of mud and debris onto municipal road allowances;
- Scheduling of critical conveyance works during forecasts of little to no precipitation.

An ESC plan (SE1) is provided for review in the civil drawing package.

8.0 Summary and Conclusions

The following summary outlines the main discussion points from the report:

- The 3.2 ha site is proposed as a 91-unit condominium development complete with parking, drive aisles, parks, and landscaping.
- A 150mm diameter water service connection is proposed to connect to the existing 200mm and 150mm watermains on Nissouri Road and Thorndale Road, respectively, to supply potable water and meet domestic and fire protection demands.
- Connection of a 200mm private sanitary sewer to the 300mm Thorndale Road trunk sewer is proposed to provide sewage conveyance for the proposed development.
- A private storm sewer system, complete with catchbasins and landscaped areas, is proposed to collect site runoff and convey it to the proposed on-site dry basin infiltration gallery SWMF.
- SWM quantity control is provided via a dry basin infiltration gallery SWMF to store and infiltrate all runoff from the site up to and including the 100-year design storm event.
- SWM quality control is proposed via a treatment train approach, including an oil grit separator, soil and plantings within the SWMF to filter and settle particles through velocity reduction, and a filtered stone gallery for infiltration.
- The external lands (north) and proposed Elliott Trail West extension are proposed to be contained and outlet via a 450mm storm sewer toward the McGuffin Drain via a grassed waterway complete with rock check flow dams to allow for infiltration and velocity reduction to settle particles.
- An inspection protocol, with private condo maintenance as required, should be implemented to preserve the lifespan of the storm conveyance system and quality control device.
- Erosion and sediment control measures should be implemented to help mitigate potential sediment transport and erosion resulting from construction activities.

We trust this report adequately describes the servicing strategy in support of planning approvals for this condo development project.

Development Engineering (London) Limited

Appendix A: Engineering Drawings

PRELIMINARY
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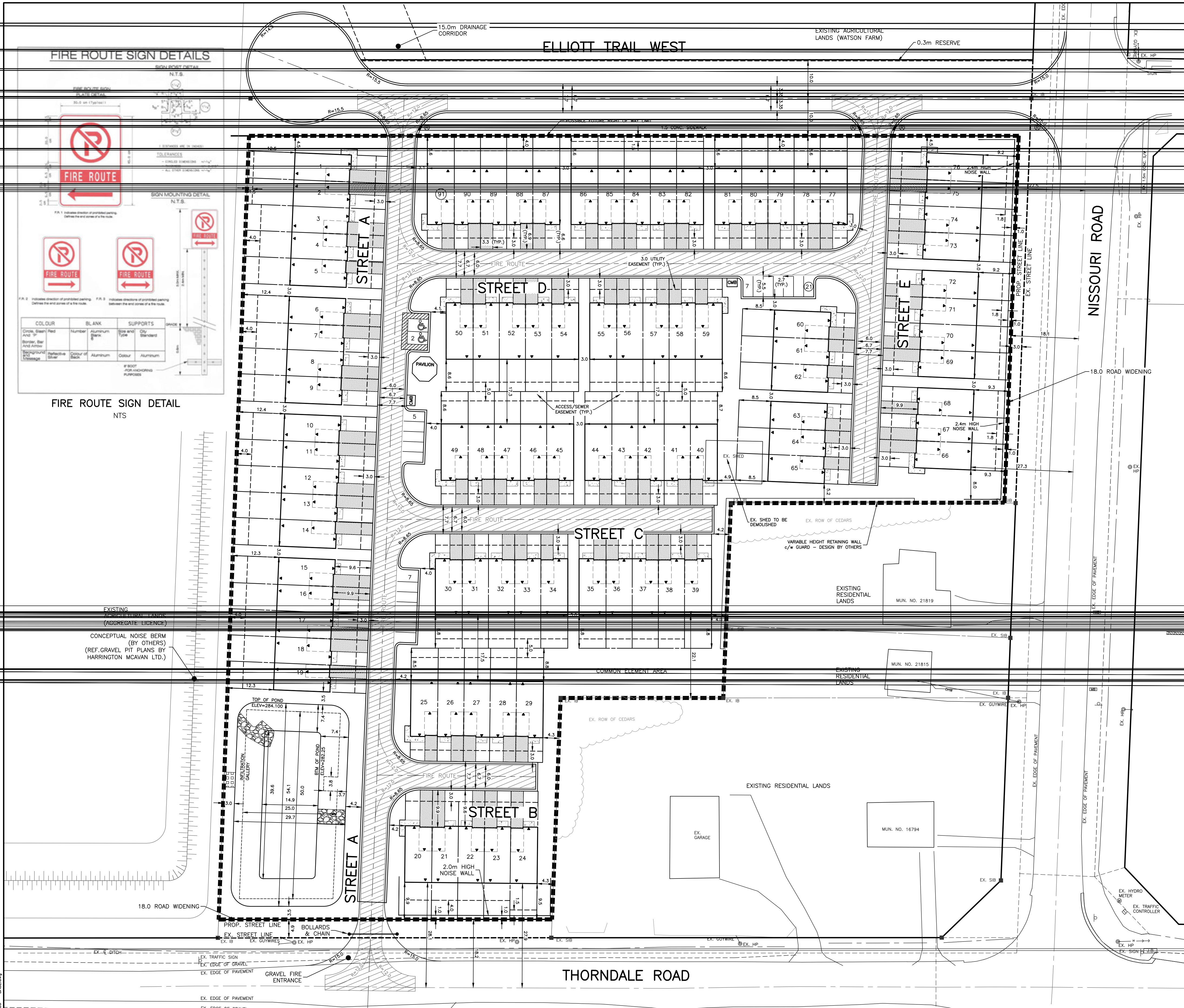

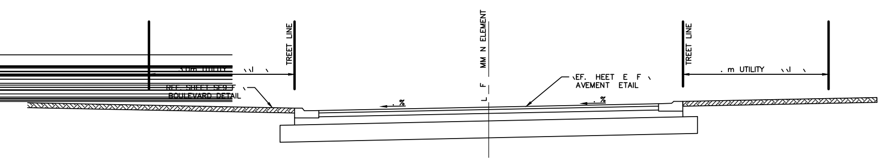

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SITE DATA TABLE CURRENT FD-4, PROPOSED R3-9		
TOWNHOUSE		
ZONING REGULATION	Regulation	**PROPOSED**
LOT AREA (MIN)	6000 m²	32,274.76 m²
UNIT WIDTH (MIN)	6.0 m	7.0 m
FRONT YARD (MIN)	4.5 m TO MAIN BUILDING 6.0 m TO GARAGE	6.60 m TO BUILDING 6.89 m TO GARAGE
INTERIOR SIDE YARD (MIN)	1.2 m	3.0 m
EXTERIOR SIDE YARD (MIN)	4.5 m	4.5 m
REAR YARD (MIN)	7.5 m	8.5 m
HEIGHT (MAX)	12.0 m	2 STORIES
LOT COVERAGE (MAX)	45 %	31.43 %
LANDSCAPED OPEN SPACE (MIN)	30 %	46.51 %
DENSITY OF DWELLING UNITS WITH BLOCK WITHIN A REGISTERED PLAN (MAX)	35.0 UPH	28.2 UPH

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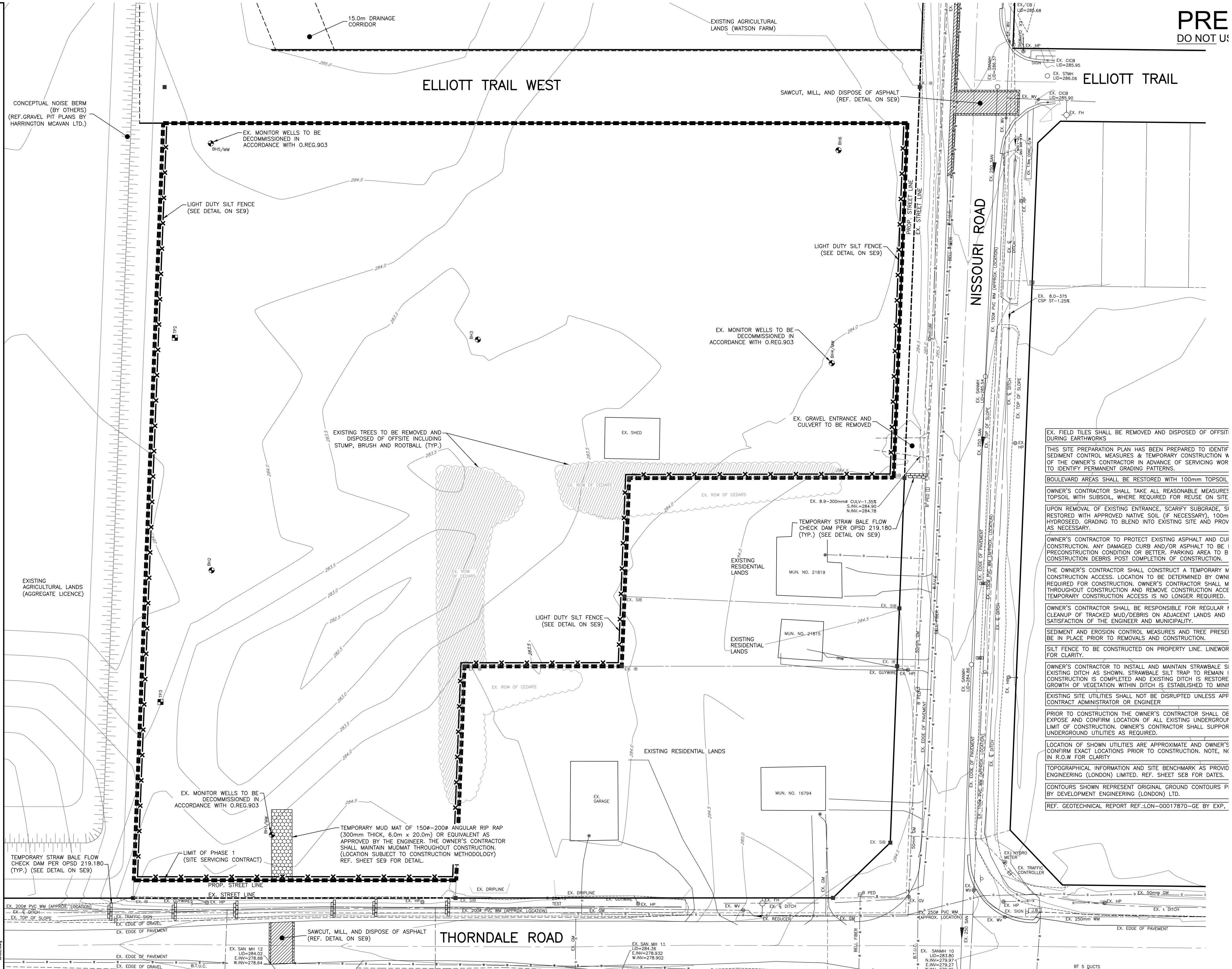

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CONCEPTUAL NOISE BERM (BY OTHERS) (REF.GRAVEL PIT PLANS BY HARRINGTON MCAVAN LTD.)
EX. MONITOR WELLS TO BE DECOMMISSIONED IN ACCORDANCE WITH O.REG.903
LIGHT DUTY SILT FENCE (SEE DETAIL ON SE9)
SAWCUT, MILL, AND DISPOSE OF ASPHALT (REF. DETAIL ON SE9)
EX. GRAVEL ENTRANCE AND CULVERT TO BE REMOVED
EXISTING TREES TO BE REMOVED AND DISPOSED OF OFFSITE INCLUDING STUMP, BRUSH AND ROOTBALL (TYP.)
EX. SHED
EX. ROW OF CEDARS
TEMPORARY STRAW BALE FLOW CHECK DAM PER OPSD 219.180 (TYP.) (SEE DETAIL ON SE9)
EXISTING RESIDENTIAL LANDS
MUN. NO. 21819
MUN. NO. 21815
MUN. NO. 16794
EX. GARAGE
EXISTING AGRICULTURAL LANDS (AGGREGATE LICENCE)
TEMPORARY MUD MAT OF 150ø-200ø ANGULAR RIP RAP (300mm THICK, 6.0m x 20.0m) OR EQUIVALENT AS APPROVED BY THE ENGINEER. THE OWNER'S CONTRACTOR SHALL MAINTAIN MUDMAT THROUGHOUT CONSTRUCTION. (LOCATION SUBJECT TO CONSTRUCTION METHODOLOGY) REF. SHEET SE9 FOR DETAIL.
LIMIT OF PHASE 1 (SITE SERVICING CONTRACT)
PROP. STREET LINE
EX. STREET LINE
EX. SAN MH 12 LID=284.02 E.INV=278.68 W.INV=278.64
EX. SAN MH 11 LID=284.36 E.INV=278.932 W.INV=278.902
EX. SANMH 10 LID=283.80 N.INV=279.97 E.INV=279.27 W.INV=279.25

EX. FIELD TILES SHALL BE REMOVED AND DISPOSED OF OFFSIT DURING EARTHWORKS
THIS SITE PREPARATION PLAN HAS BEEN PREPARED TO IDENTIF SEDIMENT CONTROL MEASURES & TEMPORARY CONSTRUCTION W OF THE OWNER'S CONTRACTOR IN ADVANCE OF SERVICING WOR TO IDENTIFY PERMANENT GRADING PATTERNS.
BOULEVARD AREAS SHALL BE RESTORED WITH 100mm TOPSOIL
OWNER'S CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TOPSOIL WITH SUBSOIL, WHERE REQUIRED FOR REUSE ON SITE
UPON REMOVAL OF EXISTING ENTRANCE, SCARIFY SUBGRADE, S RESTORED WITH APPROVED NATIVE SOIL (IF NECESSARY), 100m HYDROSEED. GRADING TO BLEND INTO EXISTING SITE AND PROV AS NECESSARY.
OWNER'S CONTRACTOR TO PROTECT EXISTING ASPHALT AND CU CONSTRUCTION. ANY DAMAGED CURB AND/OR ASPHALT TO BE PRECONSTRUCTION CONDITION OR BETTER. PARKING AREA TO B CONSTRUCTION DEBRIS POST COMPLETION OF CONSTRUCTION.
THE OWNER'S CONTRACTOR SHALL CONSTRUCT A TEMPORARY M CONSTRUCTION ACCESS. LOCATION TO BE DETERMINED BY OWN REQUIRED FOR CONSTRUCTION. OWNER'S CONTRACTOR SHALL M THROUGHOUT CONSTRUCTION AND REMOVE CONSTRUCTION ACCE TEMPORARY CONSTRUCTION ACCESS IS NO LONGER REQUIRED.
OWNER'S CONTRACTOR SHALL BE RESPONSIBLE FOR REGULAR CLEANUP OF TRACKED MUD/DEBRIS ON ADJACENT LANDS AND SATISFACTION OF THE ENGINEER AND MUNICIPALITY.
SEDIMENT AND EROSION CONTROL MEASURES AND TREE PRESE BE IN PLACE PRIOR TO REMOVALS AND CONSTRUCTION.
SILT FENCE TO BE CONSTRUCTED ON PROPERTY LINE. LINEWOR FOR CLARITY.
OWNER'S CONTRACTOR TO INSTALL AND MAINTAIN STRAWBALE S EXISTING DITCH AS SHOWN. STRAWBALE SILT TRAP TO REMAIN CONSTRUCTION IS COMPLETED AND EXISTING DITCH IS RESTORE GROWTH OF VEGETATION WITHIN DITCH IS ESTABLISHED TO MINI
EXISTING SITE UTILITIES SHALL NOT BE DISRUPTED UNLESS APP CONTRACT ADMINISTRATOR OR ENGINEER
PRIOR TO CONSTRUCTION THE OWNER'S CONTRACTOR SHALL OE EXPOSE AND CONFIRM LOCATION OF ALL EXISTING UNDERGROU LIMIT OF CONSTRUCTION. OWNER'S CONTRACTOR SHALL SUPPOR UNDERGROUND UTILITIES AS REQUIRED.
LOCATION OF SHOWN UTILITIES ARE APPROXIMATE AND OWNER'S CONFIRM EXACT LOCATIONS PRIOR TO CONSTRUCTION. NOTE, N IN R.O.W FOR CLARITY
TOPOGRAPHICAL INFORMATION AND SITE BENCHMARK AS PROVID ENGINEERING (LONDON) LIMITED. REF. SHEET SE8 FOR DATES.
CONTOURS SHOWN REPRESENT ORIGINAL GROUND CONTOURS P BY DEVELOPMENT ENGINEERING (LONDON) LTD.
REF. GEOTECHNICAL REPORT REF.:LON-00017870-GE BY EXP,

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION
SANITARY, STORM, & WATER	STANTEC, 165500587	OCTOBER, 2010		
WATER	STANTEC, 165500633	FEBRUARY, 2011		

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY RAS	1	SPA1	JUNE 13, 2023	DEVENG
DRAWN BY RAS				
CHECKED BY SD/RAH				
F.BK. 1040				
FILE: DEL19-103 – BASE.DWG				

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41 Adelaide St. N., Unit 71
(519) 672-8310

Paris Office
31 Mechanic St., Unit 301
(519) 442-1441

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

[redacted]

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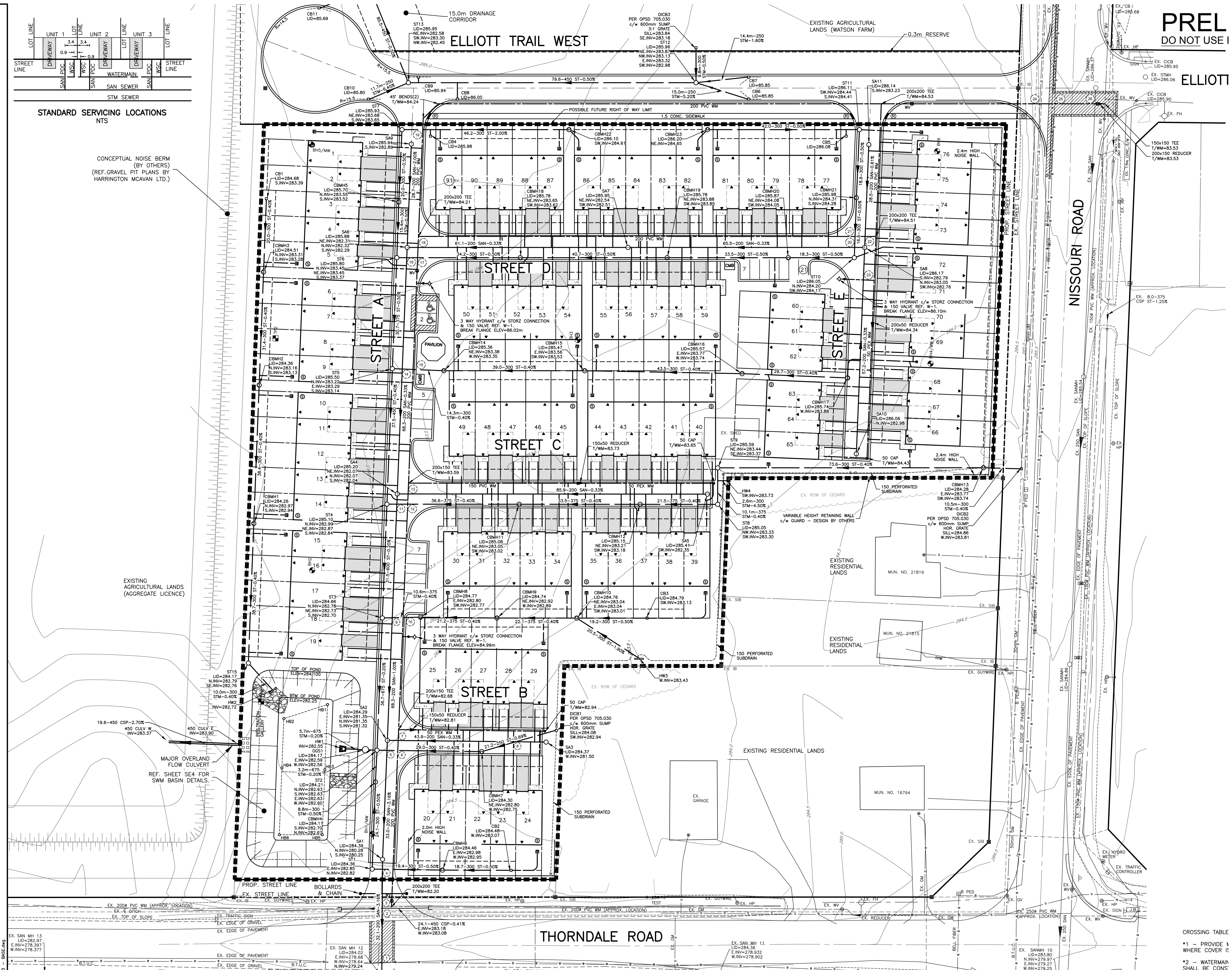
rstevens Jun.13/23–4:47pm DEL19-103 – BASE.dwg



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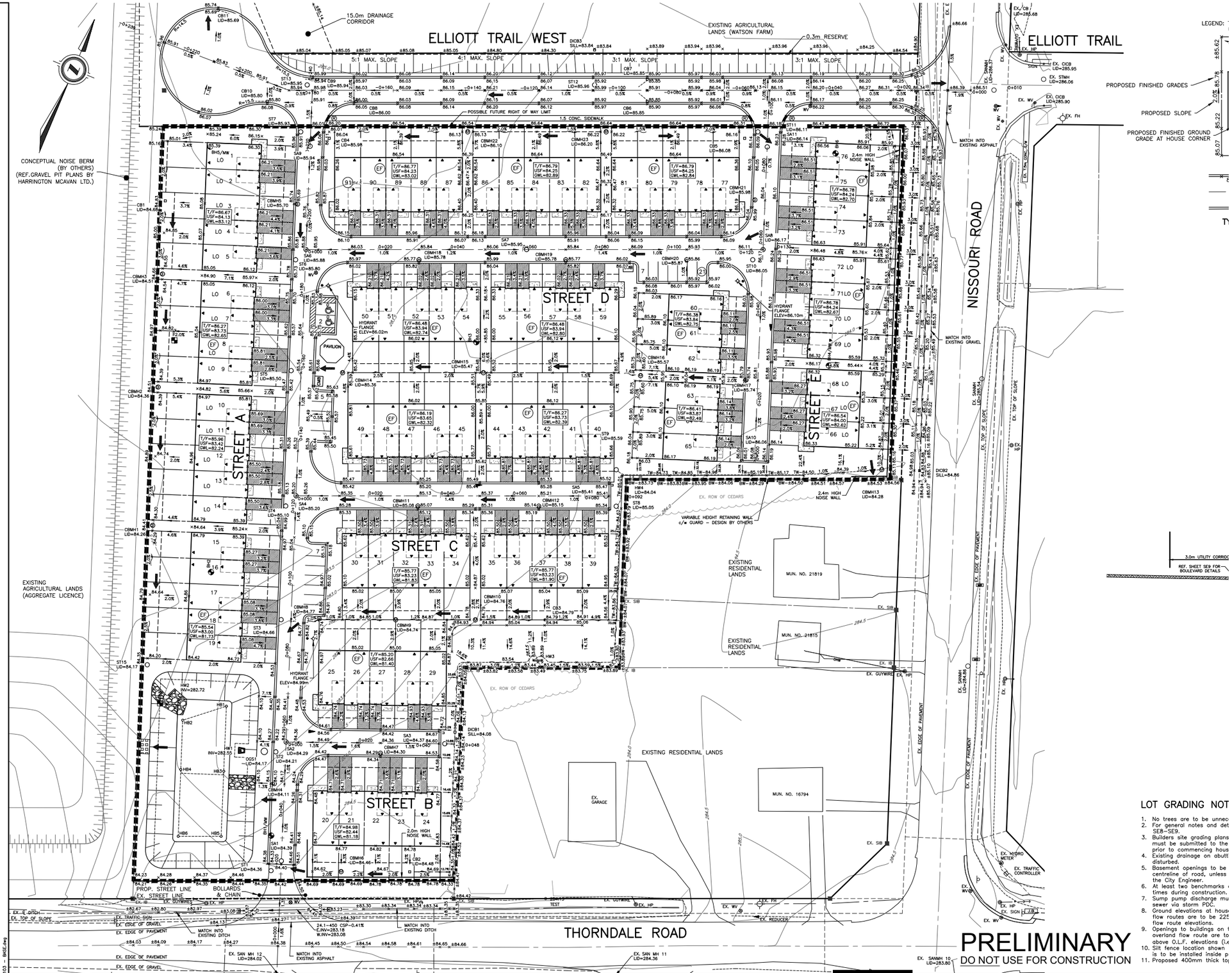

LOT GRADING NOT

1. No trees are to be unnec
2. For general notes and det SE8-SE9.
3. Builders site grading plans must be submitted to the prior to commencing hous
4. Existing drainage on abutt disturbed.
5. Basement openings to be centreline of road, unless the City Engineer.
6. At least two benchmarks times during construction.
7. Sump pump discharge mu sewer via storm PDC.
8. Ground elevations at hous flow routes are to be 225 flow route elevations.
9. Openings to buildings on overland flow route are to above O.L.F. elevations (i
10. Silt fence location shown is to be installed inside p
11. Proposed 400mm thick to

PRELIMINARY

DO NOT USE FOR CONSTRUCTION

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION
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drawings Jun 13/23-4:47pm DEL19-103 - BASE.dwg

PRIVATE SEWER DESIGNED TO O.B.C. 7.1.5.5 AND M.O.E. PIBS 6879.
PRIVATE WATERMAIN DESIGNED TO O.B.C. 7.1.5.5 AND M.O.E. PIBS 6881e.

ALL EXCESS SUBSOIL TO BE REMOVED OFFSITE BY OWNER'S CONTRACTOR AT NO EXTRA COST TO THE CONTRACT.

ALL SIDE SLOPES SHALL HAVE SUBGRADE FACES LIGHTLY SCARIFIED PRIOR TO PLACING 150mm ORGANIC TOPSOIL DRESSING.

EXCEPT WHERE INDICATED OTHERWISE, GRASSED AREAS ONSITE SHALL BE RESTORED WITH 150mm TOPSOIL AND HYDROSEED

STORM SEWERS EQUAL TO OR GREATER THAN 525ø SHALL BE REINFORCED CONCRETE PIPE MIN. CLASS 65D

DRY BASIN TO BE DRESSED WITH 150mm OF TOPSOIL AND HYDROSEED WITH FLEXIBLE GROWTH MEDIUM (40% KENTUCKY BLUE GRASS, 40% CREEPING RED FESCUE, AND 20% SELF REPAIRING PERENNIAL RYEGRASS MIX.)

OIL GRIT SEPARATOR (OGS) SHALL BE CDS MODEL PMSU3035-6-C OR APPROVED EQUIVALENT. SHOP DRAWINGS ARE TO BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION

RIP RAP PROTECTION SHALL BE ANGULAR QUARRY STONE, SIZE AND DEPTH AS NOTED ON THE PLANS. AN UNDERLAY OF TERRAFIX 270R GEOTEXTILE (CLASS 2 OPSS 1860) OR APPROVED EQUIVALENT, SHALL BE PROVIDED WITH MINIMUM OVERLAPS OF 300mm IN THE DOWN GRADIENT DIRECTION AND PROPER KEY ANCHORING AT BOUNDARIES.

PRIOR TO CONSTRUCTION THE OWNER'S CONTRACTOR SHALL OBTAIN LOCATES FOR, EXPOSE AND CONFIRM LOCATION OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF CONSTRUCTION. OWNER'S CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED.

THE OWNERS CONSULTING ENGINEER IS REQUIRED TO INSPECT THE INSTALLATION OF SERVICES INCLUDED IN THIS PROJECT, IN ACCORDANCE WITH THE GENERAL REVIEW COMMITMENT CERTIFICATION PROCESS. THE OWNER'S CONTRACTOR IS TO ADVISE DEVELOPMENT ENGINEERING (LONDON) LTD. (519-672-8310) AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION ON THE SITE SERVICES.

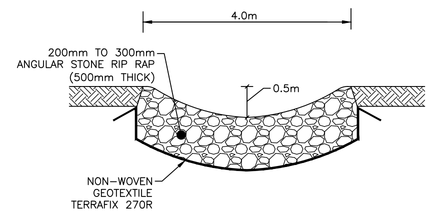
PROPOSED PEAK SITE OUTFLOW SUMMARY

STORM EVENT	MAX. HGL ELEV. (m)
25mm	282.41
2 YEAR	283.11
5 YEAR	283.19
10 YEAR	283.40
25 YEAR	283.61
50 YEAR	283.76
100 YEAR	283.89
250 YEAR	284.09

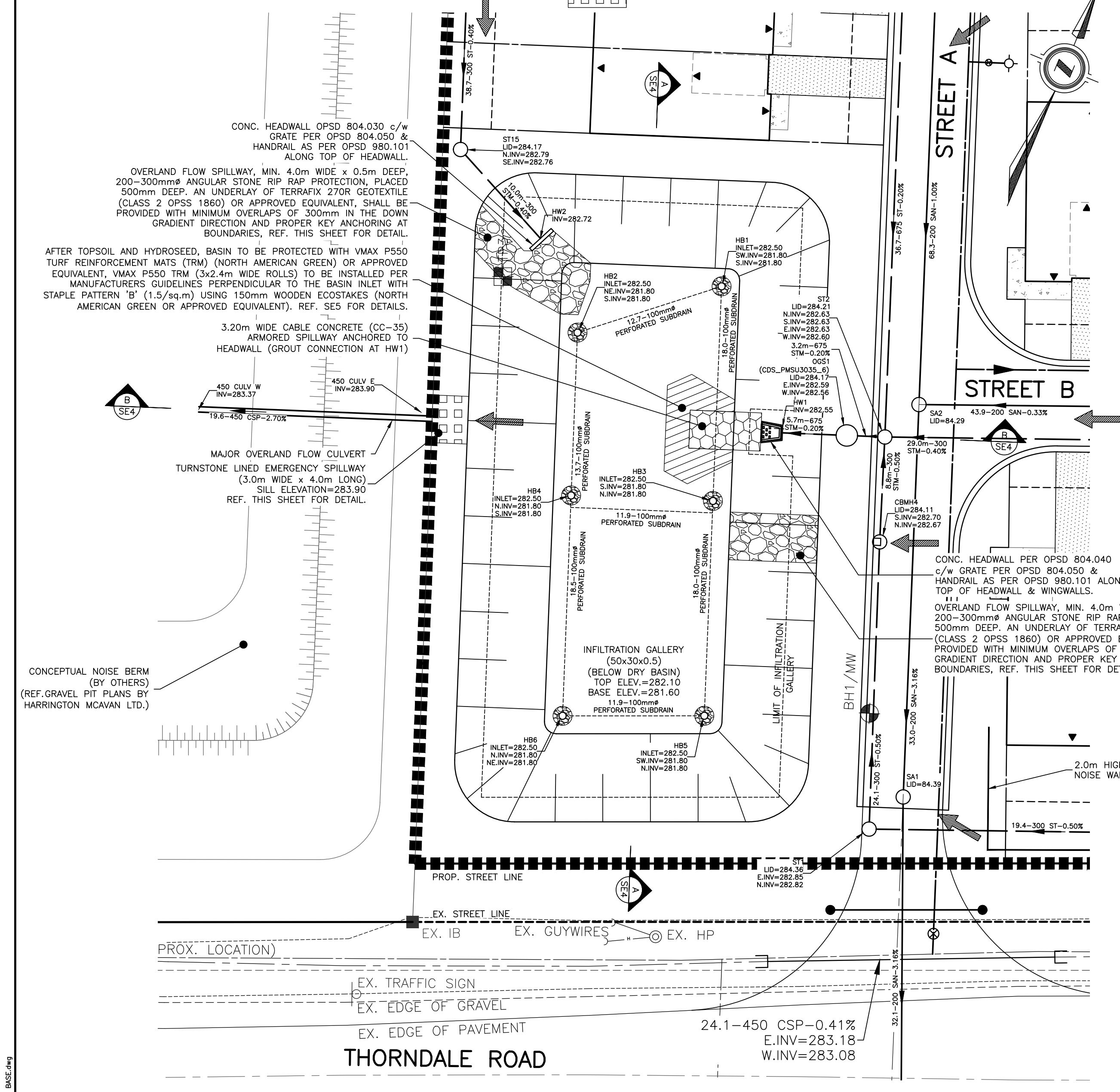
* PRIVATE DRY BASIN

LEGEND

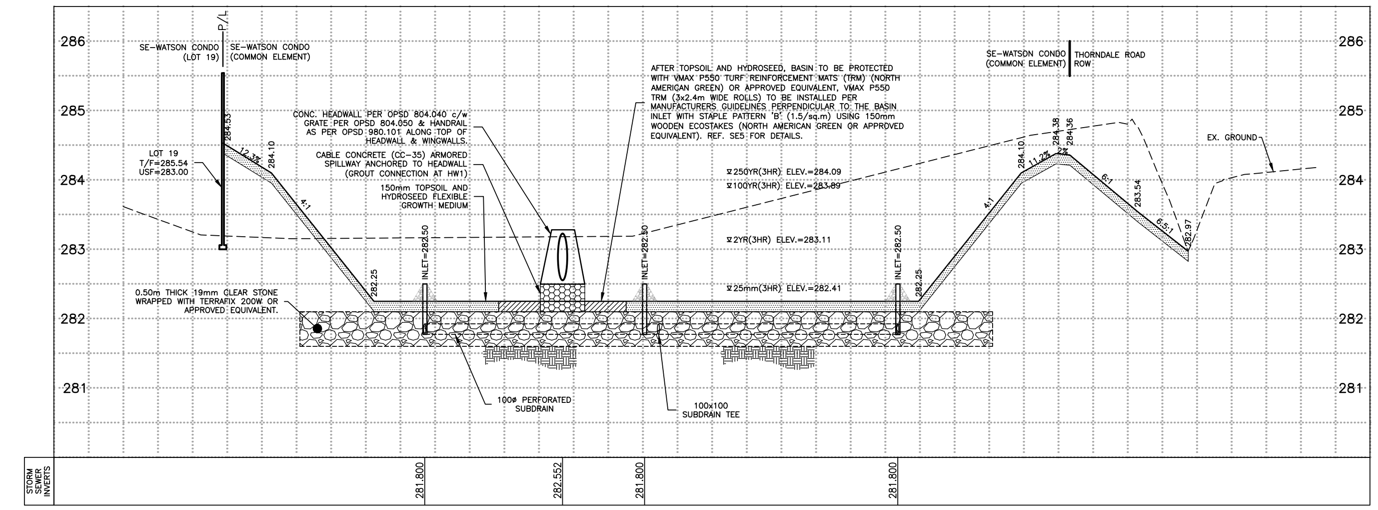
Symbol	Description
EX. 200 PVC WM	EXISTING WATERMAIN
EX. HP	EXISTING HYDRO POLE
	EXISTING DOOR ACCESS
ST1	PROPOSED STORM MANHOLE
CBMH1	PROPOSED CATCHBASIN MANHOLE c/w SUBDRAINS
CB1	PROPOSED STANDARD CATCHBASIN c/w SUBDRAINS
HB1	PROPOSED HICKENBOTTOM DRAIN
50.0-600 ST-0.5%	PROPOSED STORM SEWER
50.0-200 SAN-0.5%	PROPOSED SANITARY SEWER
200 PVC WM	PROPOSED WATERMAIN
TP1	TEST PIT LOCATION
255	EXISTING GROUND CONTOUR
78.65×	EXISTING GROUND GRADE
78.65×	PROPOSED GRADE
±78.65×	EXISTING GRADE TO BE MATCHED
	OVERLAND FLOW DIRECTION
	100mm PERFORATED SUBDRAIN
	PROPOSED BOLLARD
	PROPOSED RIP RAP ARMORING
	PROPOSED CABLE CONCRETE ARMORING (REF. DETAIL ON SHEET SE5)
	PROPOSED VMAX TURF REINFORCEMENT MAT
	PROPOSED TURFSTONE



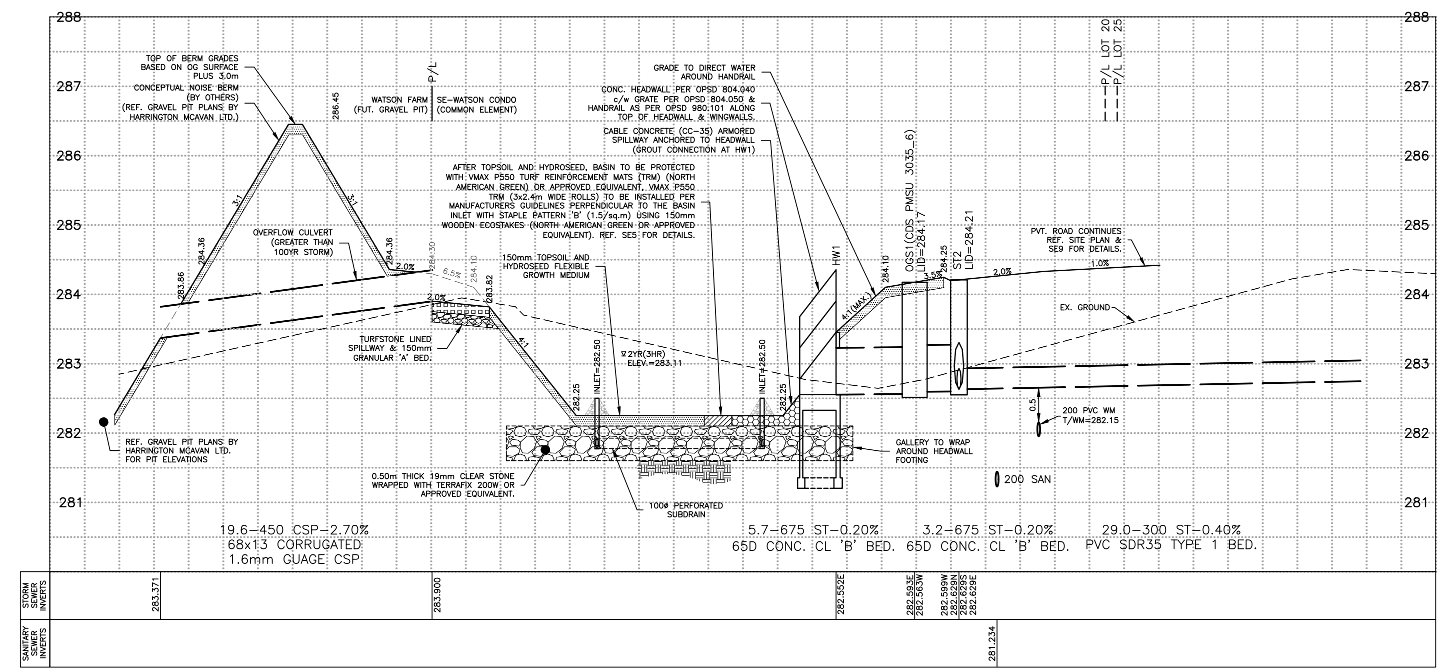
PARABOLIC RIP RAP SPILLWAY
NTS



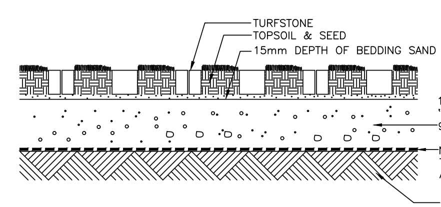
TURFSTONE SHALL BE "TURFSLAB" BY OAKS CONCRETE PRODUCTS OR APPROVED EQUIVALENT. PAVERS SHALL CONSIST OF PRECAST CONCRETE UNITS EACH 600mm x 400mm x 80mm WITH A 40% OPEN LATTICE STRUCTURE. EACH UNIT (28kg) SHALL BE CAPABLE OF SUPPORTING H-20 VEHICLE LOADS WHEN CONSTRUCTED WITH PROPER GRANULAR BASE.



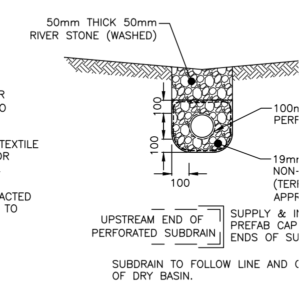
SECTION
H-1:250, V



SECTION B-B
H-1:250, V-1:5



TURFSTONE PLACEMENT
1:10



DRY BASIN SUBDRAIN INSTA
NTS

PRELIMIN

DO NOT USE FOR CON

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT
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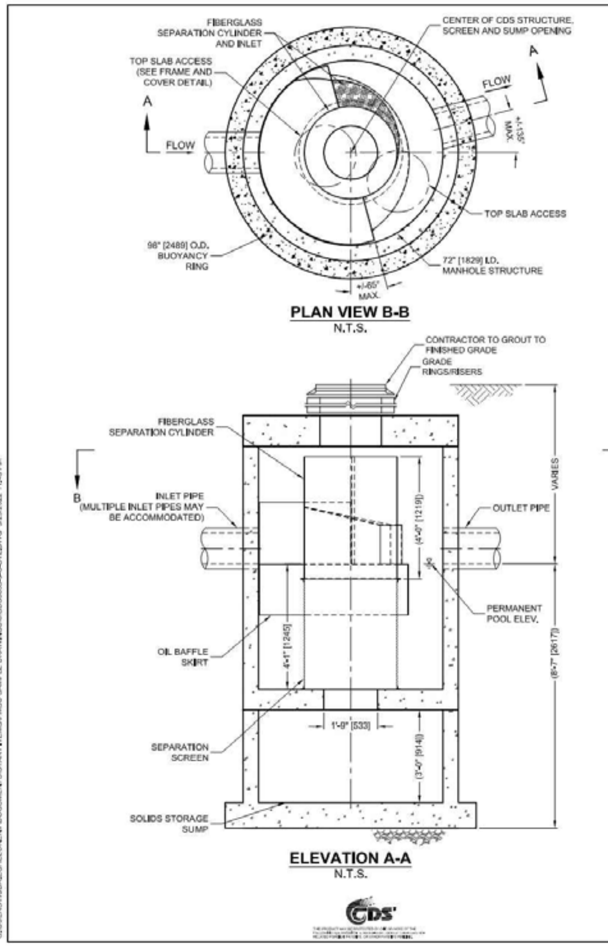
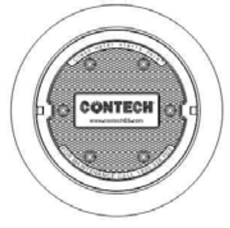
rstevens Jun.13/23-4:47pm DEL19-103 - BASE.dwg



CDS PMSU3035-6-C DESIGN NOTES

THE STANDARD CDS PMSU3035-6-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
CUSTOMIZABLE SUMP DEPTH AVAILABLE
ANTI-FLOTATION DESIGN AVAILABLE UPON REQUEST



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS PMSU3035-6-C
INLINE CDS
STANDARD DETAIL

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EROSION CONTROL Products
Guaranteed SOLUTIONS
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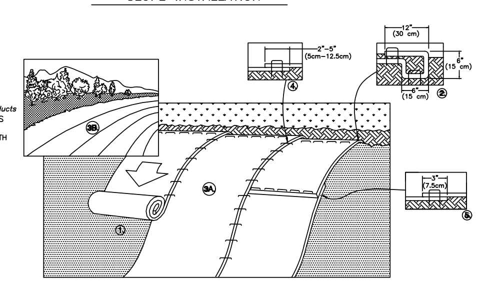
EVANSVILLE, IN 47725
800-772-2040
www.nagreen.com

SLOPE INSTALLATION



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
   NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

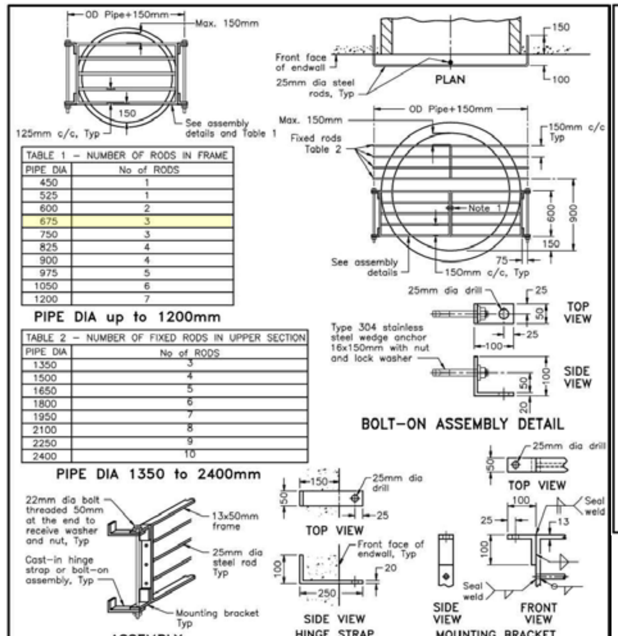


TABLE 1 – NUMBER OF RODS IN FRAME	
PIPE DIA	No of RODS
450	1
525	1
600	2
675	3
750	3
825	4
900	4
975	5
1050	6
1200	7

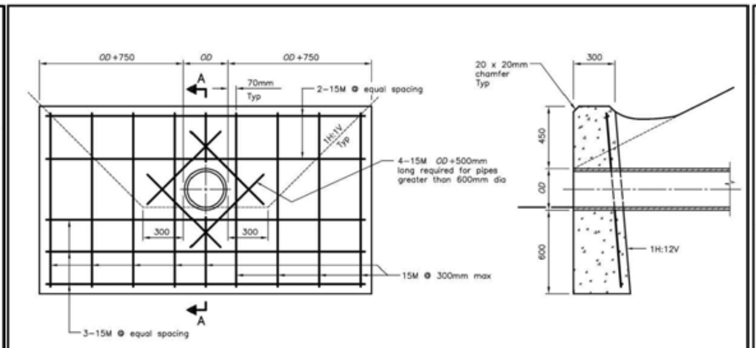
PIPE DIA up to 1200mm

TABLE 2 – NUMBER OF FIXED RODS IN UPPER SECTION	
PIPE DIA	No of RODS
1350	3
1500	4
1650	5
1800	6
1950	7
2100	8
2250	9
2400	10

PIPE DIA 1350 to 2400mm

NOTES:
1 Grates shall be secured by either a bolt and nut or a locking device as specified.
A Metal surfaces shall be either painted with 2 coats of self priming abrasion resistant immersion grade epoxy or hot dip galvanized as specified.
B Frame, hinge strap, mounting bracket, and steel rods shall be medium grade steel.
C All welding shall be according to CSA W59.
D All dimensions are in millimetres unless otherwise shown.

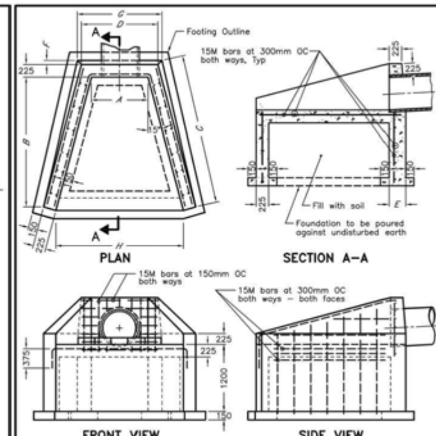
ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2021 | Rev 3
GRATING
FOR CONCRETE ENDWALL
OPSD 804.050



LEGEND:
OD – Outside diameter of pipe

NOTES:
A This OPSD to be read in conjunction with OPSD 3940.150.
B If a steel grate is required, refer to OPSD 804.05.
C Class of concrete: 30MPa.
D Cover to reinforcing bars 70mm ± 20mm.
E All dimensions are in millimetres unless otherwise shown.

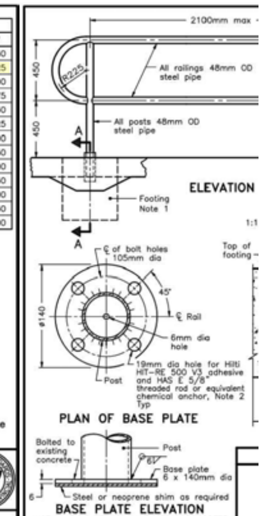
ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2017 | Rev 2
CONCRETE HEADWALL
FOR PIPE LESS THAN 900mm DIAMETER
OPSD 804.030



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

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

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2017 | Rev 1
CONCRETE HEADWALL
FOR SEWER OR CULVERT PIPE OUTLET
OPSD 804.040



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					DESIGN BY RAS	1	SPA1	JUNE 13, 2023	DEVENG
					DRAWN BY RAS				
					CHECKED BY SD/RAH				
					F.BK. 1040				
					FILE: DEL19-103 – BASE.DWG				

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TOPOGRAPHICAL INFORMATION AND SITE BENCHMARK AS PROVIDED BY DEVELOPMENT ENGINEERING (LONDON) LIMITED

AREAS DISTURBED WITHIN NISSOURI ROAD SHALL BE RESTORED AS FOLLOWS:
- 450mm OF GRAN. 'B' COMPACTED TO 98% SPMDD
- 150mm OF GRAN. 'A' COMPACTED TO 100% SPMDD
- 100mm OF HL8 BINDER ASPHALT COMPACTED TO 97% MRD
- 50mm OF HL3 SHEET ASPHALT COMPACTED TO 97% MRD
- SAWCUT ASPHALT & MILL AS PER DETAIL ON SHEET SE9
- BOULEVARDS RESTORED WITH MIN. 150mm OF TOPSOIL AND APPROVED NURSERY SOD. (TYP.)

PRIOR TO CONSTRUCTION THE OWNER'S CONTRACTOR SHALL OBTAIN LOCATES FOR, EXPOSE AND CONFIRM LOCATION OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF CONSTRUCTION. OWNER'S CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED TO THE SATISFACTION OF THE UTILITY OWNER

WHEN WORKING WITHIN 20m OF THE GAS MAIN, UNION GAS SHALL BE PROPERLY NOTIFIED IN ADVANCE OF ANY CONSTRUCTION ACTIVITIES

LOCATIONS OF SHOWN UTILITIES ARE APPROXIMATE AND LOCATES SHALL BE DONE BY THE OWNER'S CONTRACTOR TO CONFIRM EXACT LOCATIONS PRIOR TO CONSTRUCTION. NOTE, NOT ALL UTILITIES SHOWN IN R.O.W FOR CLARITY

REF. SHEET SE2 FOR PIPE CROSSING TABLE.

SITE BENCHMARK:

BENCHMARK #1 – SOUTH CORNER OF TRANSFORMER PAD #504 ON NORTHEAST CORNER OF ELLIOT TRAIL & LEESBORO TRAIL.
ELEVATION=286.023m

BENCHMARK #2 – TOP SPINDLE OF FIRE HYDRANT ON SOUTHEAST CORNER OF ELLIOT TRAIL & LEESBORO TRAIL
ELEVATION=287.094m

BENCHMARK #3 – HORIZONTAL SPIKE SET IN WEST FACE OF HYDRO POLE ON EAST SIDE OF NISSOURI ROAD (SECOND POLE SOUTH OF ELLIOT TRAIL.)
ELEVATION=285.235m

BENCHMARK #4 – HORIZONTAL SPIKE SET IN EAST FACE OF HYDRO POLE ON WEST SIDE OF NISSOURI ROAD AT SOUTH LOT LINE TO MN 21815.
ELEVATION=284.866m

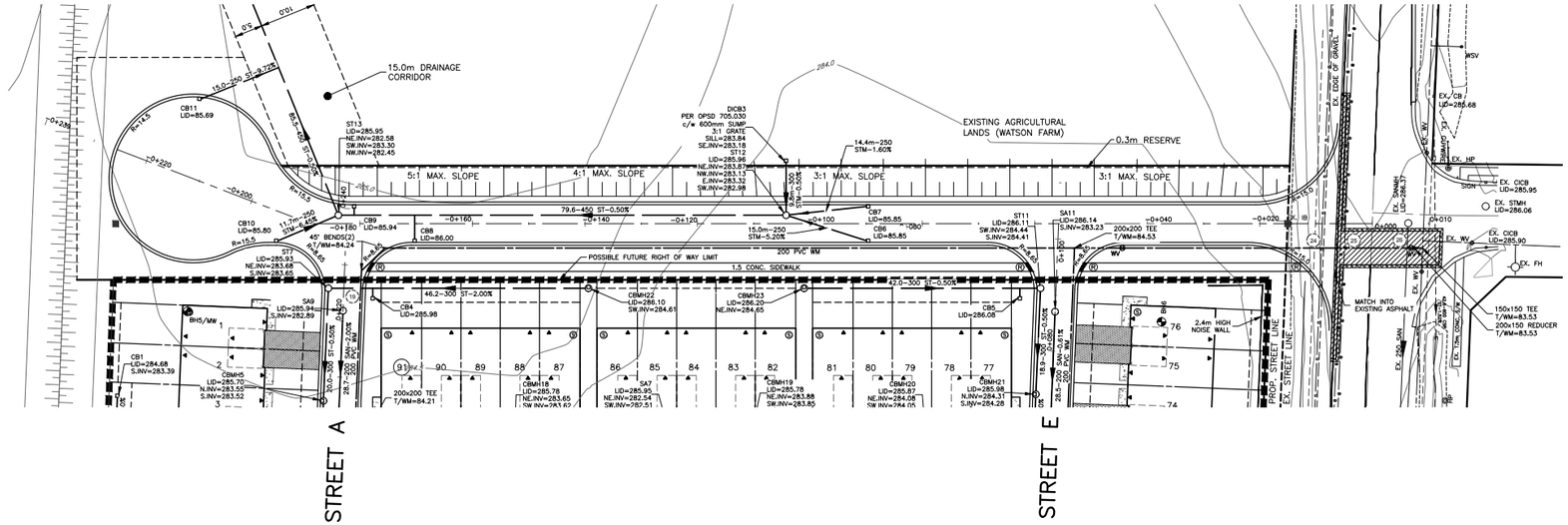
BENCHMARK #5 – CUT CROSS SET IN BACK OF CURB NORTHWEST CORNER OF NISSOURI ROAD & KING STREET, JUST WEST OF SPILLWAY.
ELEVATION=284.18m

BENCHMARK #6 – TOP SPINDLE OF FIRE HYDRANT NORTH SIDE OF THORNDALE ROAD & KING STREET ±60m WEST OF NISSOURI ROAD.
ELEVATION=285.168m

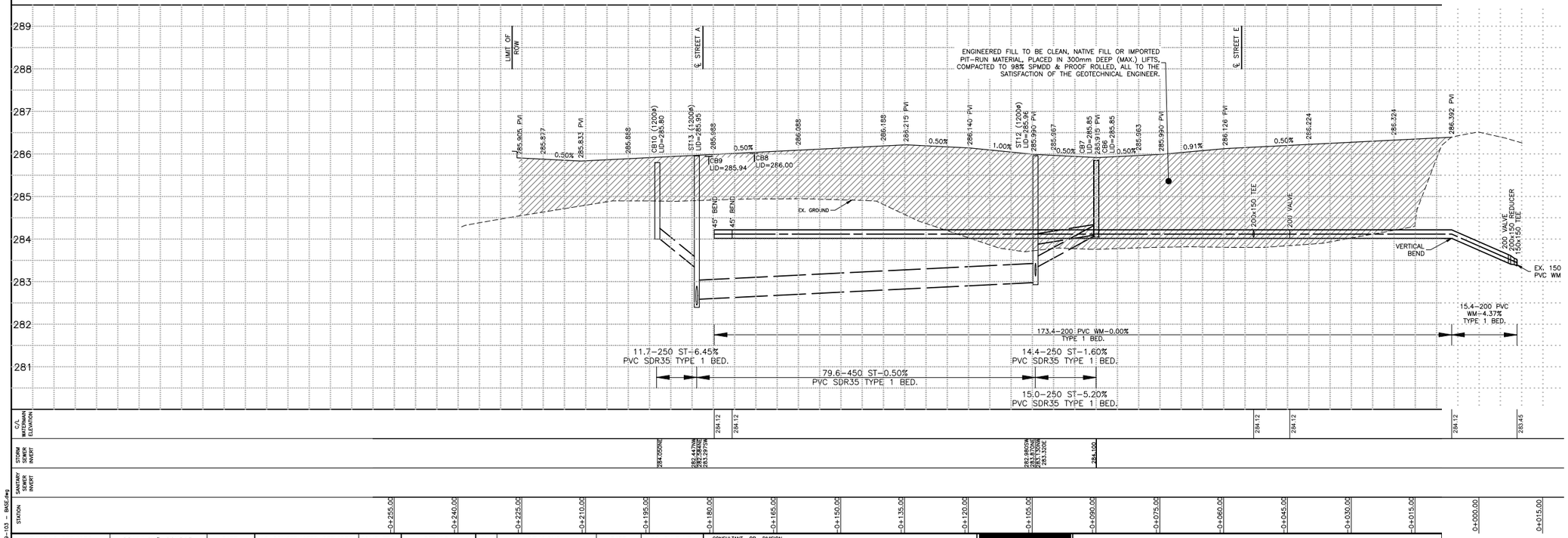
BENCHMARK #7 – HORIZONTAL SPIKE SET IN EAST FACE OF HYDRO POLE ON NORTH SIDE OF THORNDALE ROAD 3RD WEST OF NISSOURI ROAD.
ELEVATION=284.679m

BENCHMARK #8 – HORIZONTAL SPIKE SET IN EAST FACE OF HYDRO POLE ON NORTH SIDE OF THORNDALE ROAD 5TH WEST OF NISSOURI ROAD.
ELEVATION=281.944m

CURB AND GUTTER OPSD 600.060



ELLIOTT TRAIL WEST



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION
SANITARY, STORM, & WATER	STANTEC, 165500587	OCTOBER, 2010		

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY RAS	1	SPA1	JUNE 13, 2023	DEVENG
DRAWN BY RAS				
CHECKED BY SD/RAH				
F.BK. 1040				
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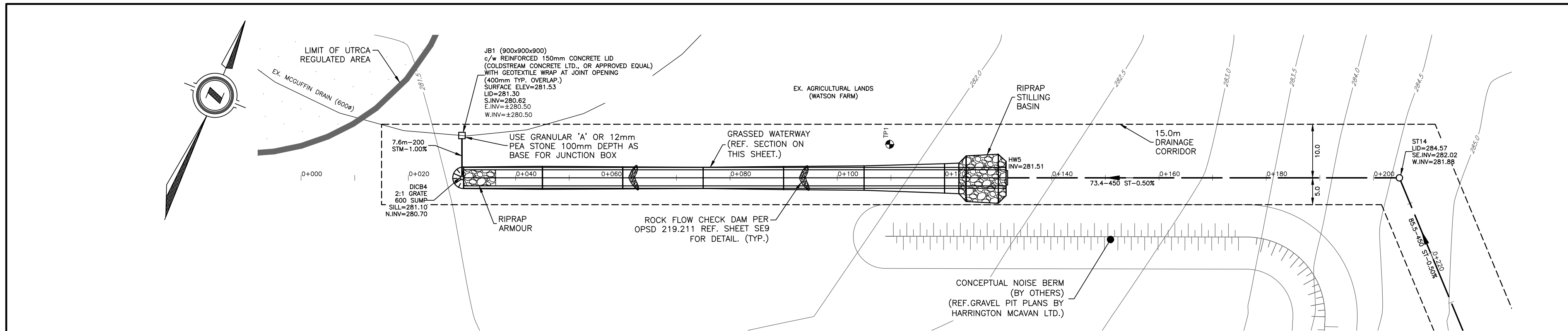
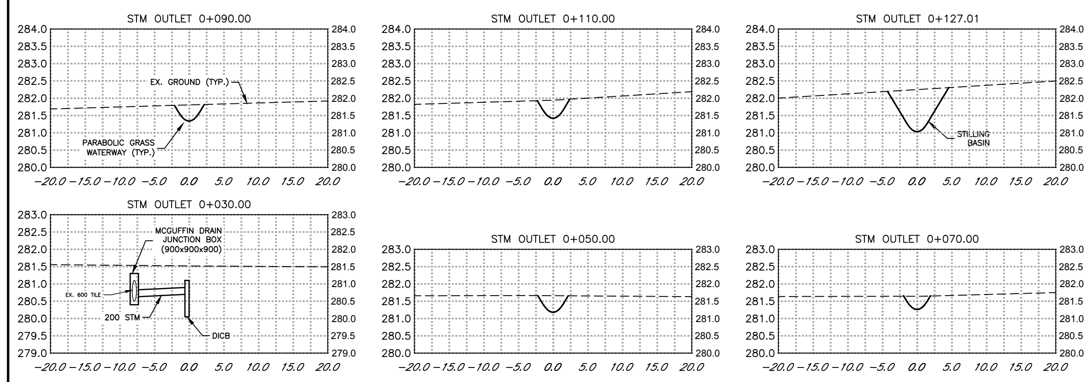
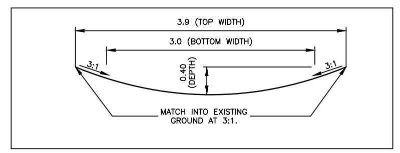


LEGEND

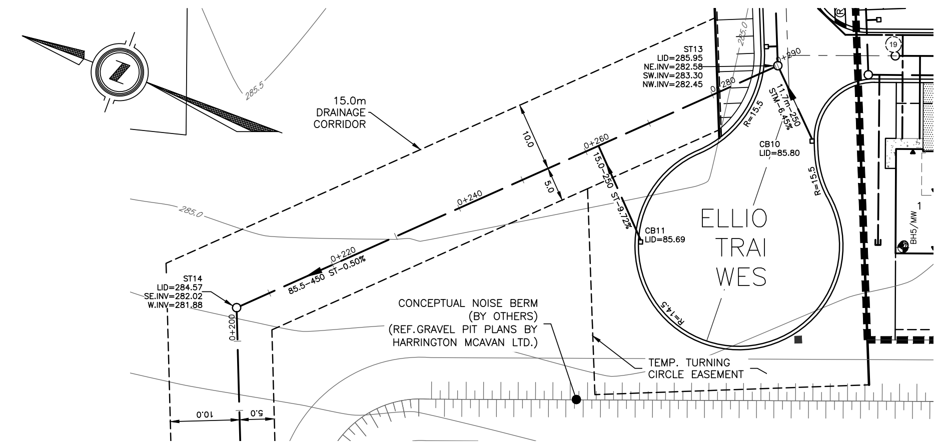
ST1	PROPOSED STORM MANHOLE
SA1	PROPOSED SANITARY MANHO
CBMH1	PROPOSED CATCHBASIN MAN
CB1	PROPOSED STANDARD CATCH
	PROPOSED SUMP PUMP
50.0–200 SAN–1.0%	PROPOSED SANITARY SEWER
50.0–600 ST–0.5%	PROPOSED STORM SEWER
EX. 50.0–600 CSP–0.5%	PROPOSED STORM CULVERT
150ø PVC WM	PROPOSED WATERMAIN
FH	PROPOSED WM TEE, GATE V/ HYDRANT WITH STORZ CONNI
WV	PROPOSED VALVE
	150mm PERFORATED SUBDR.
LS	DENOTES PROPOSED LIGHT S
BH1	EXISTING BOREHOLE LOCATIO (REF. GEOTECHNICAL REPORT
	UTRCA REGULATED AREA



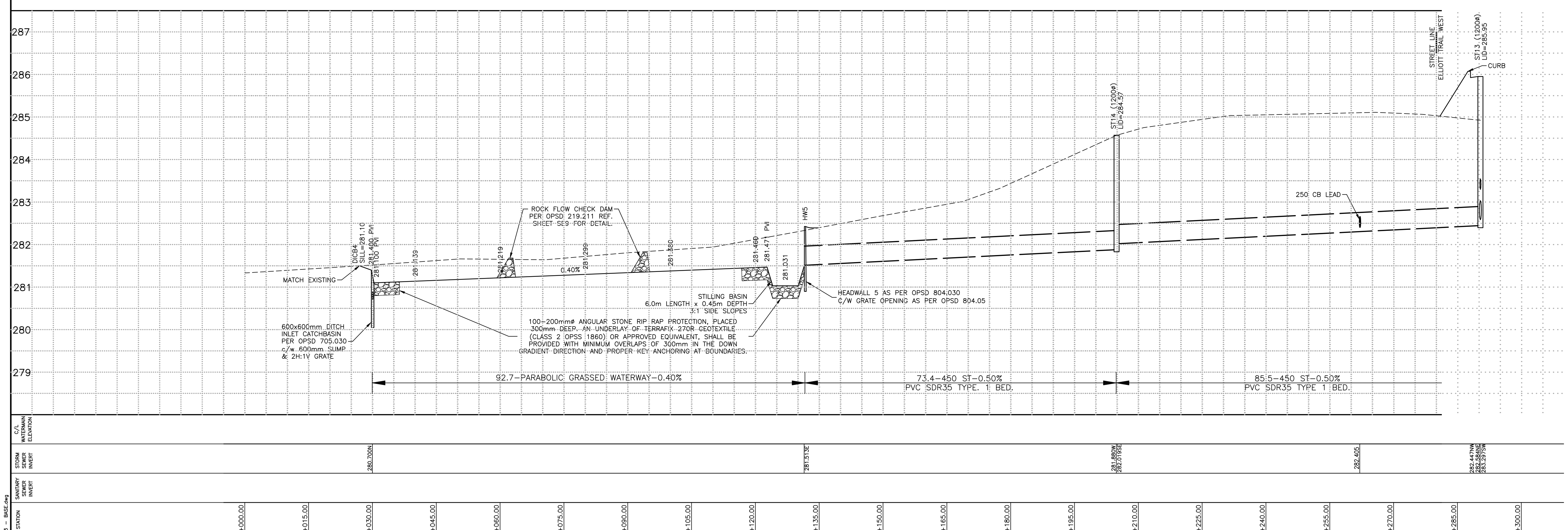
GRASSED WATERWAY SECTIONS
H–1:500, V–1:100



TYPICAL GRASSED WATERWAY SECTION
1:50



STORM OUTLET



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT
MCGUFFIN DRAIN	SPRIET ASSOCIATES, 78278	OCTOBER, 1979			DESIGN BY RAS	1	SPA1	JUNE 13, 2023	DEVENG
					DRAWN BY RAS				
					CHECKED BY SD/RAH				
					F.BK. 1040				
					FILE: DEL19–103 – BASE.DWG				

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Appendix B: Water Servicing Design Calculations

Project: DEL19-103 - Watson Farm Condo. Development
Date: June 07, 2023
Prepared By: Kyle Zehr, E.I.T.

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Watermain Demand Calculations

Determine the Domestic Water Demand:

Development Type:	Low-Density Residential			
Total Population:	91	Units		
	218	Persons		
Per Capita Average Daily Flow:	350.0	L/per/day		
Average Daily Flow:	76,440	L/day	53	L/min
Maximum Day Demand:	146	L/min		
Maximum Hour Demand:	219*	L/min		

Assumptions:

Population Density of 2.4 Persons/Unit, based on the Thames Centre Engineering Design Standards.

Maximum Day Peaking Factor =	2.75
Peak Hour Peaking Factor =	4.13

Total Average Daily Demand =	53	L/min	0.88	L/s	14	USGPM
Total Max. Day Domestic Water Demand =	146	L/min	2.43	L/s	38.57	USGPM
Total Peak Hour Domestic Water Demand =	219	L/min	3.65	L/s	57.85	USGPM

FIRE FLOW WATERMAIN CALCULATIONS
DEL19-103 - Watson Farm Development

Date: June 2023
By: K.Zehr, E.I.T. Checked: R.Hern, P.Eng.

CHECK WATER FLOW DEMAND TO THE PROPOSED FIRE HYDRANT UNDER FIRE FIGHTING CONDITIONS

CALCULATE FIRE FLOW DEMAND:

Water supply for fire fighting of an unsprinklered building is determined using OBC A-3.2.5.7.

Occupancy Classification = Group C (Residential Occupancy)

Type of Construction = combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, load bearing walls, columns and arches do not have a fire-resistance rating.

Minimum supply of water = $Q = K \cdot V \cdot S_{TOT}$

K = water supply coefficient = see Table 1 = 23

V = total volume of building in m^3 = 3168.0

S_{TOT} = spatial coefficient of all sides = 1.0 + [$S_{side\ 1}$ + $S_{side\ 2}$ + $S_{side\ 3}$ + ... etc.]

	Separation Distance	Spatial Coeff.
N Side	>10	0.00
E Side	>10	0.00
S Side	3.0	0.50
W Side	3.0	0.50

Stot = 1.0 + [0 + 0 + 0.5 + 0.5] = 2.00

Q = 145728.0 L, look this value up in Table 2 to determine the Required Minimum Water Supply Flow rate (L/min)

In Table 2, required minimum water supply flow rate = 4500 L/min = 75.0 L/s = 1188.8 USGPM =

Appendix C: Sanitary Design Flow Calculations

Project #: **DEL19-103**
Project Name **Watson Farm Development**
Date: June 7, 2023
By: K.Zehr, E.I.T.

development engineering (London) Limited
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London, Ontario, N6B 3P4
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e-mail:deveng@deveng.net
website: www.deveng.net

PRELIMINARY SANITARY FLOW CALCULATION

91 Unit Condo Development		
Population:	219	persons
Dry Weather Design Flow:	**0.58**	**L/s**
Peaking Factor (Harmon):	3.20	
Total Site Infiltration Allowance:	0.31	L/s
Combined Flow:	**2.18**	L/s

<-----(Min 2.0, Max 4.0)

Residential Site

Number of Units:	91	
Sanitary Catchment Area:	3.1	ha

Assumptions

Maximum Residential PPU (Medium Density):	2.40	persons/unit[1]
Residential Dry Weather Design Flow:	230	L/cap/day[1]
Peaking Factor (commercial Harmon)[1]:	$M_e=1.0+(14/(4+P^{0.5}))$	
Infiltration Allowance:	0.10	L/s/ha[1]

References:
(1) Taken from the Thames Centre Engineering Design Standards, Dated 2021

Appendix D: Stormwater Management Summary Tables

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TABLE 1: SITE CHARACTERISTICS

Runoff Area	Area (m^2)	Area (Ha)	Imp. Area (m^2)	Imperv. (%)	Runoff Coeff. (C)
Existing Conditions					
E1 - Subject Site Area	32,974	3.297	172	1%	0.20
EXT1 - Southeast Lands (Potential Future)	11,463	1.146	1,707	15%	0.30
Total Site Area =	*32,974*	*3.297*	*172*	*1%*	*0.20*
Total Tributary Area =	**44,437**	**4.444**	**1,879**	**4%**	**0.23**
Proposed Conditions					
P1 - Phase 1 & 2 - Street A, B & C	16,219	1.622	10,056	62%	0.63
P2 - Phase 3 - Street D	7,693	0.769	4,770	62%	0.63
P3 - Phase 4 - Street E	6,575	0.658	4,077	62%	0.63
P4 - Dry Basin	2,487	0.249	339	14%	0.30
P5 - Possible Future Development	12,441	1.244	7,713	62%	0.63
EXT1 - North Residential Catchment Area	27,301	2.730	1,303	5%	0.23
ROW1 - Elliot Trail West ROW	3,377	0.338	2,665	79%	0.75
ROW2 - Nissouri Road ROW	600	0.060	600	100%	0.90
Total Site Area =	*45,415*	*4.542*	*26,954*	*59%*	*0.62*
Total Tributary Area =	**76,693**	**7.669**	**31,522**	**41%**	**0.49**

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DEL19-103: Watson Farm Lands, Thorndale
Prepared By: Kyle Zehr, E.I.T.
Checked By: Ryan Hern, P.Eng.
June 7, 2023

TABLE 2: SUMMARY OF FLOWS

Existing Conditions =	3.297	ha
Runoff Coefficient =	0.20	C
% Imperviousness =	1%	

Proposed Conditions =	4.542	ha
Runoff Coefficient =	0.62	C
% Imperviousness =	59%	

Storm Event	Existing Conditions		Proposed Conditions						
	Peak Site Runoff (L/s)[1]	Peak Site Runoff (Including EXT1) (L/s)	Site Peak Runoff (L/s)	Peak SWMF Attenuation (m^3)	Peak SWMF Depth / Elev. (m)	Peak Runoff to McGuffin Drain (L/s)	Total Volume Infiltrated (m^3)	Peak Overflow Discharge from SWMF (L/s)	Total Peak Site Discharge (L/s)
25mm	0	2	479	398	0.66 / 282.41	87	643	0	0
2-year	15	28	909	997	1.36 / 283.11	142	1,237	0	0
5-year	20	36	1,000	1,082	1.44 / 283.19	154	1,328	0	0
10-year	35	59	1,249	1,322	1.65 / 283.40	186	1,587	0	0
25-year	55	89	1,597	1,587	1.86 / 283.61	234	1,870	0	0
50-year	72	115	1,859	1,787	2.01 / 283.76	269	2,083	0	0
100-year	92	144	2,143	1,987	2.14 / 283.89	307	2,294	0	0
250-year	175	262	2,253	2,287	2.34 / 284.09	315	2,451	76	76

1. Peak Flows Exclude EXT1

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DEL19-103: Watson Farm Lands, Thorndale
Prepared By: Kyle Zehr, E.I.T.
Checked By: Ryan Hern, P.Eng.
June 7, 2023

Assumptions
Void Ratio, Vr = **0.40**

Table 3: Infiltration Gallery Sizing and Outflow Curve

	Inlet	OUTLET	Length of Infiltration Trench* (m)	Width of Infiltration Trench (m)	Height of Infiltration Trench (m)	Trench X-Sect Area	Void Ratio	Area x Void Ratio (m2)	Storage Volume (m3)	Storage Node Area (m2)	Volume w/ Stone
DB	Dry Basin	Subsoil	**50.2**	**30.00**	**0.50**	15.000	0.40	6.000	301.2	**602.4**	**753.0**

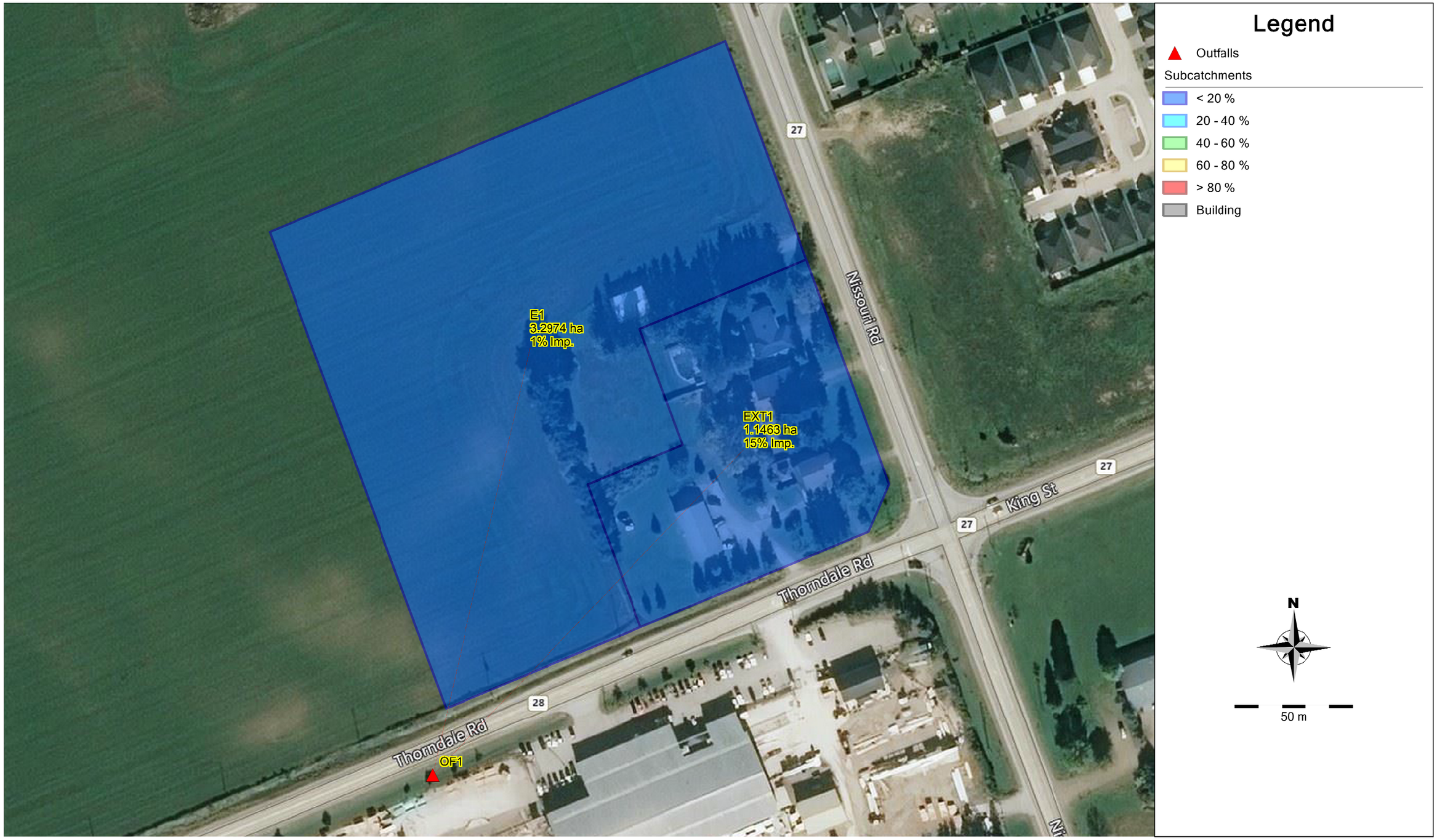
* Length of pipe less 1.2m for structures.

Factored Infiltration Rate= 5.20E+01* mm/hr 1.44E-05 m/s

	Trench/Gallery Geometry						Effective Areas		Infiltration Rates	
Storage Node	Length of Infiltration Trench* (m)	Width of Infiltration Trench (m)	Height of Infiltration Trench (m)	Base Surface Area	Wall Surface Area	Porosity	Base Surface Area x Porosity	Wall Surface Area x Porosity	Base Infiltration Rate (l/s)	Base + Wall Infiltration Rate (l/s)
Infiltration Gallery	50.2	30.0	0.50	1506	80.20	1.00	1506	80.20	**21.75**	**22.91**

Outflow Curve - Infil	
Head (m)	Outflow (L/s)
0.00	21.75
0.25	22.33
0.50	22.91
3.00	22.91

Appendix E: SWM Modelling Input, Outputs, and Schematics


E1
3.2974 ha
1% Imp.
EXT1
1.1463 ha
15% Imp.
OF1
Nissouri Rd
Thorndale Rd
Thorndale Rd
King St
27
27
27
28
Legend
Outfalls
Subcatchments
< 20 %
20 - 40 %
40 - 60 %
60 - 80 %
> 80 %
Building
N
50 m

```
[TITLE]
DEL19-103 - Watson Farm Lands

[OPTIONS]
;;Options            Value
;;------------------ ------------
FLOW_UNITS           LPS
INFILTRATION         CURVE_NUMBER
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           04/10/2015
START_TIME           00:00:00
REPORT_START_DATE    04/10/2015
REPORT_START_TIME    00:00:00
END_DATE             04/12/2015
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:01:00
DRY_STEP             00:01:00
ROUTING_STEP         0.5

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              2

[EVAPORATION]
;;Type           Parameters
;;-------------- ----------
CONSTANT         0.0
DRY_ONLY         NO

[RAINGAGES]
;;               Rain      Time     Snow     Data
;;Name           Type      Intrvl   Catch    Source
;;-------------- --------- -------- -------- ----------
London           INTENSITY 0:05     1.0      TIMESERIES London-25mm

[SUBCATCHMENTS]
;;                                              Total     Pcnt.             Pcnt.    Curb     Snow
;;Name           Raingage         Outlet          Area      Imperv   Width    Slope    Length   Pack
;;-------------- ---------------- --------------- --------- -------- -------- -------- -------- --------
E1               London           OF1             3.2974    1        274.783  1.5      0
EXT1             London           OF1             1.1463    15       127.367  1        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
E1               0.013      0.17       2          5          25         PERVIOUS   100
EXT1             0.013      0.25       2          5          25         PERVIOUS   100

[INFILTRATION]
;;Subcatchment   CurveNum   HydCon     DryTime
;;-------------- ---------- ---------- ----------
E1               65         0.5        7
EXT1             65         0.5        7

[OUTFALLS]
;;               Invert     Outfall    Stage/Table      Tide
;;Name           Elev.      Type       Time Series      Gate     Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
OF1              0          FREE                        NO

[CURVES]
;;Name           Type       X-Value    Y-Value
```

DEL19-103: Watson Farm Condominium Development
Existing Conditions PCSWMM Input

```
;;-------------- ---------- ---------- ----------
SWMF_200828      Storage    0          2090.4
SWMF_200828                 0.3        2788.9
SWMF_200828                 1.75       5126.6
SWMF_200828                 2.64       6056

SWMF_201005      Storage    0          2117
SWMF_201005                 0.2        2721
SWMF_201005                 0.4        3095
SWMF_201005                 0.6        3368
SWMF_201005                 0.8        3649
SWMF_201005                 1          3943
SWMF_201005                 1.2        4249
SWMF_201005                 1.4        4578
SWMF_201005                 1.6        4961
SWMF_201005                 1.8        5244
SWMF_201005                 2          5504
SWMF_201005                 2.2        5746
SWMF_201005                 2.4        5977
SWMF_201005                 2.64       6088

SWMF_TEST        Storage    0          2000
SWMF_TEST                   2.3        4500

SWMF_v1          Storage    0          1936
SWMF_v1                     2          3321
SWMF_v1                     2.3        3544

SWMF_v2          Storage    0          2357
SWMF_v2                     0.2        2782
SWMF_v2                     0.8        3478
SWMF_v2                     1.35       3891
SWMF_v2                     1.65       4126

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
London-100yr                0:00       5.443
London-100yr                0:05       5.819
London-100yr                0:10       6.26
London-100yr                0:15       6.783
London-100yr                0:20       7.415
London-100yr                0:25       8.196
London-100yr                0:30       9.189
London-100yr                0:35       10.496
London-100yr                0:40       12.303
London-100yr                0:45       14.978
London-100yr                0:50       19.377
London-100yr                0:55       28.048
London-100yr                1:00       53.584
London-100yr                1:05       257.109
London-100yr                1:10       126.718
London-100yr                1:15       54.547
London-100yr                1:20       34.915
London-100yr                1:25       25.869
London-100yr                1:30       20.677
London-100yr                1:35       17.306
London-100yr                1:40       14.937
London-100yr                1:45       13.178
London-100yr                1:50       11.818
London-100yr                1:55       10.734
London-100yr                2:00       9.848
London-100yr                2:05       9.109
London-100yr                2:10       8.483
London-100yr                2:15       7.946
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London-100yr                2:25       7.07
London-100yr                2:30       6.707
London-100yr                2:35       6.383
London-100yr                2:40       6.093
London-100yr                2:45       5.831
London-100yr                2:50       5.592
London-100yr                2:55       5.375
London-100yr                3:00       0

London-10yr                 0:00       3.324
London-10yr                 0:05       3.596
London-10yr                 0:10       3.92
London-10yr                 0:15       4.312
London-10yr                 0:20       4.795
```

London-10yr	0:25	5.405
London-10yr	0:30	6.2
London-10yr	0:35	7.277
London-10yr	0:40	8.814
London-10yr	0:45	11.168
London-10yr	0:50	15.184
London-10yr	0:55	23.34
London-10yr	1:00	46.748
London-10yr	1:05	164.792
London-10yr	1:10	101.694
London-10yr	1:15	47.792
London-10yr	1:20	29.832
London-10yr	1:25	21.275
London-10yr	1:30	16.389
London-10yr	1:35	13.272
London-10yr	1:40	11.129
London-10yr	1:45	9.572
London-10yr	1:50	8.395
London-10yr	1:55	7.475
London-10yr	2:00	6.738
London-10yr	2:05	6.135
London-10yr	2:10	5.633
London-10yr	2:15	5.208
London-10yr	2:20	4.844
London-10yr	2:25	4.53
London-10yr	2:30	4.255
London-10yr	2:35	4.012
London-10yr	2:40	3.797
London-10yr	2:45	3.605
London-10yr	2:50	3.432
London-10yr	2:55	3.275
London-10yr	3:00	0
London-250yr	0:00	4.785
London-250yr	0:05	5.232
London-250yr	0:10	5.77
London-250yr	0:15	6.429
London-250yr	0:20	7.252
London-250yr	0:25	8.308
London-250yr	0:30	9.705
London-250yr	0:35	11.626
London-250yr	0:40	14.412
London-250yr	0:45	18.747
London-250yr	0:50	26.224
London-250yr	0:55	41.407
London-250yr	1:00	83.174
London-250yr	1:05	254.614
London-250yr	1:10	170.473
London-250yr	1:15	85.215
London-250yr	1:20	53.354
London-250yr	1:25	37.588
London-250yr	1:30	28.475
London-250yr	1:35	22.656
London-250yr	1:40	18.672
London-250yr	1:45	15.8
London-250yr	1:50	13.647
London-250yr	1:55	11.981
London-250yr	2:00	10.66
London-250yr	2:05	9.588
London-250yr	2:10	8.705
London-250yr	2:15	7.965
London-250yr	2:20	7.337
London-250yr	2:25	6.798
London-250yr	2:30	6.332
London-250yr	2:35	5.924
London-250yr	2:40	5.565
London-250yr	2:45	5.246
London-250yr	2:50	4.961
London-250yr	2:55	4.706
London-250yr	3:00	0
London-25mm	0.083333	1.45
London-25mm	0.166667	1.54
London-25mm	0.250000	1.65
London-25mm	0.333333	1.77
London-25mm	0.416667	1.91
London-25mm	0.500000	2.09
London-25mm	0.583333	2.30
London-25mm	0.666667	2.56
London-25mm	0.750000	2.90

DEL19-103: Watson Farm Condominium Development
Existing Conditions PCSWMM Input

London-25mm	0.833333	3.37
London-25mm	0.916667	4.02
London-25mm	1.000000	5.03
London-25mm	1.083333	6.79
London-25mm	1.166667	10.64
London-25mm	1.250000	25.07
London-25mm	1.333333	77.80
London-25mm	1.416667	32.39
London-25mm	1.500000	17.77
London-25mm	1.583333	12.12
London-25mm	1.666667	9.18
London-25mm	1.750000	7.40
London-25mm	1.833333	6.21
London-25mm	1.916667	5.36
London-25mm	2.000000	4.72
London-25mm	2.083333	4.22
London-25mm	2.166667	3.83
London-25mm	2.250000	3.50
London-25mm	2.333333	3.24
London-25mm	2.416667	3.01
London-25mm	2.500000	2.81
London-25mm	2.583333	2.64
London-25mm	2.666667	2.49
London-25mm	2.750000	2.36
London-25mm	2.833333	2.24
London-25mm	2.916667	2.14
London-25mm	3.000000	2.04
London-25mm	3.083333	1.96
London-25mm	3.166667	1.88
London-25mm	3.250000	1.81
London-25mm	3.333333	1.74
London-25mm	3.416667	1.68
London-25mm	3.500000	1.62
London-25mm	3.583333	1.57
London-25mm	3.666667	1.52
London-25mm	3.750000	1.48
London-25mm	3.833333	1.43
London-25mm	3.916667	1.39
London-25mm	4.000000	1.36
London-25yr	0:00	4.21
London-25yr	0:05	4.524
London-25yr	0:10	4.894
London-25yr	0:15	5.336
London-25yr	0:20	5.876
London-25yr	0:25	6.551
London-25yr	0:30	7.417
London-25yr	0:35	8.574
London-25yr	0:40	10.199
London-25yr	0:45	12.647
London-25yr	0:50	16.757
London-25yr	0:55	25.022
London-25yr	1:00	49.335
London-25yr	1:05	202.437
London-25yr	1:10	112.952
London-25yr	1:15	50.323
London-25yr	1:20	31.618
London-25yr	1:25	22.93
London-25yr	1:30	17.982
London-25yr	1:35	14.809
London-25yr	1:40	12.608
London-25yr	1:45	10.993
London-25yr	1:50	9.759
London-25yr	1:55	8.786
London-25yr	2:00	7.998
London-25yr	2:05	7.347
London-25yr	2:10	6.8
London-25yr	2:15	6.334
London-25yr	2:20	5.932
London-25yr	2:25	5.581
London-25yr	2:30	5.272
London-25yr	2:35	4.998
London-25yr	2:40	4.754
London-25yr	2:45	4.534
London-25yr	2:50	4.335
London-25yr	2:55	4.154
London-25yr	3:00	0
London-2yr	0:00	2.649
London-2yr	0:05	2.875

```
London-2yr              0:10       3.145
London-2yr              0:15       3.472
London-2yr              0:20       3.878
London-2yr              0:25       4.393
London-2yr              0:30       5.067
London-2yr              0:35       5.984
London-2yr              0:40       7.299
London-2yr              0:45       9.322
London-2yr              0:50       12.778
London-2yr              0:55       19.764
London-2yr              1:00       39.292
London-2yr              1:05       127.195
London-2yr              1:10       82.291
London-2yr              1:15       40.209
London-2yr              1:20       25.278
London-2yr              1:25       18.005
London-2yr              1:30       13.814
London-2yr              1:35       11.133
London-2yr              1:40       9.288
London-2yr              1:45       7.95
London-2yr              1:50       6.94
London-2yr              1:55       6.153
London-2yr              2:00       5.524
London-2yr              2:05       5.011
London-2yr              2:10       4.585
London-2yr              2:15       4.226
London-2yr              2:20       3.919
London-2yr              2:25       3.655
London-2yr              2:30       3.424
London-2yr              2:35       3.221
London-2yr              2:40       3.042
London-2yr              2:45       2.882
London-2yr              2:50       2.738
London-2yr              2:55       2.608
London-2yr              3:00       0

London-50yr             0:00       4.77
London-50yr             0:05       5.114
London-50yr             0:10       5.518
London-50yr             0:15       6
London-50yr             0:20       6.585
London-50yr             0:25       7.312
London-50yr             0:30       8.242
London-50yr             0:35       9.476
London-50yr             0:40       11.198
London-50yr             0:45       13.773
London-50yr             0:50       18.06
London-50yr             0:55       26.623
London-50yr             1:00       51.93
London-50yr             1:05       229.029
London-50yr             1:10       121.172
London-50yr             1:15       52.92
London-50yr             1:20       33.445
London-50yr             1:25       24.459
London-50yr             1:30       19.334
London-50yr             1:35       16.033
London-50yr             1:40       13.732
London-50yr             1:45       12.036
London-50yr             1:50       10.734
London-50yr             1:55       9.701
London-50yr             2:00       8.862
London-50yr             2:05       8.167
London-50yr             2:10       7.58
London-50yr             2:15       7.079
London-50yr             2:20       6.644
London-50yr             2:25       6.265
London-50yr             2:30       5.93
London-50yr             2:35       5.632
London-50yr             2:40       5.365
London-50yr             2:45       5.125
London-50yr             2:50       4.907
London-50yr             2:55       4.709
London-50yr             3:00       0

London-5yr              0:00       2.846
London-5yr              0:05       3.084
London-5yr              0:10       3.368
London-5yr              0:15       3.712
London-5yr              0:20       4.137
London-5yr              0:25       4.676
```

DEL19-103: Watson Farm Condominium Development
Existing Conditions PCSWMM Input

```
London-5yr              0:30       5.38
London-5yr              0:35       6.335
London-5yr              0:40       7.702
London-5yr              0:45       9.8
London-5yr              0:50       13.382
London-5yr              0:55       20.636
London-5yr              1:00       41.127
London-5yr              1:05       137.641
London-5yr              1:10       87.426
London-5yr              1:15       42.07
London-5yr              1:20       26.379
London-5yr              1:25       18.805
London-5yr              1:30       14.457
London-5yr              1:35       11.677
London-5yr              1:40       9.765
London-5yr              1:45       8.377
London-5yr              1:50       7.329
London-5yr              1:55       6.511
London-5yr              2:00       5.857
London-5yr              2:05       5.322
London-5yr              2:10       4.877
London-5yr              2:15       4.502
London-5yr              2:20       4.181
London-5yr              2:25       3.904
London-5yr              2:30       3.662
London-5yr              2:35       3.449
London-5yr              2:40       3.26
London-5yr              2:45       3.091
London-5yr              2:50       2.94
London-5yr              2:55       2.803
London-5yr              3:00       0

[REPORT]
;;Reporting Options
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS       486991.26425     4771879.7435     487278.66675     4772230.3465
UNITS            Meters

[COORDINATES]
;;Node            X-Coord          Y-Coord
;;--------------- ---------------- ----------------
OF1              487072.651       4771905.68

[VERTICES]
;;Link            X-Coord          Y-Coord
;;--------------- ---------------- ----------------

[POLYGONS]
;;Subcatchment    X-Coord          Y-Coord
;;--------------- ---------------- ----------------
E1               487160.579       4771967.87
E1               487138.427       4772027.923
E1               487178.51        4772044.538
E1               487160.514       4772093.324
E1               487230.721       4772122.42
E1               487196.788       4772214.41
E1               487004.328       4772134.483
E1               487078.39        4771933.719
E1               487160.579       4771967.87
EXT1             487160.514       4772093.324
EXT1             487230.721       4772122.42
EXT1             487248.717       4772073.634
EXT1             487265.603       4772027.859
EXT1             487256.766       4772007.838
EXT1             487160.579       4771967.87
EXT1             487138.427       4772027.923
EXT1             487178.51        4772044.538
EXT1             487160.514       4772093.324

[SYMBOLS]
;;Gage            X-Coord          Y-Coord
;;--------------- ---------------- ----------------
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 2
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-25mm                 INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
E1                           3.30    274.78      1.00    1.5000 London               OF1
EXT1                         1.15    127.37     15.00    1.0000 London               OF1


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0


*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.111        25.000
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.104        23.435
Surface Runoff ...........         0.001         0.291
Final Storage ............         0.006         1.275
```

DEL19-103: Watson Farm Condominium Development
25mm Design Storm Event – Existing Conditions PCSWMM Output

```
Continuity Error (%) .....        -0.005


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.001          0.013
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         0.000          0.000
External Outflow .........         0.001          0.013
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000


**************************
Subcatchment Runoff Summary
**************************

-----------------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                 mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------------
E1                        25.00       0.00       0.00      23.73       0.00       0.00      0.00    0.000
EXT1                      25.00       0.00       0.00      22.58       1.13       0.01      1.63    0.045


Analysis begun on:  Wed Jun 07 15:44:37 2023
Analysis ended on:  Wed Jun 07 15:44:37 2023
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 2
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-2yr                  INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
E1                           3.30    274.78      1.00    1.5000 London               OF1
EXT1                         1.15    127.37     15.00    1.0000 London               OF1


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.190        42.751
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.165        37.176
Surface Runoff ...........         0.019         4.303
Final Storage ............         0.006         1.274
```

DEL19-103: Watson Farm Condominium Development
2-year Design Storm Event – Existing Conditions PCSWMM Output

```
Continuity Error (%) .....        -0.005


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.019          0.191
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         0.000          0.000
External Outflow .........         0.019          0.191
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000


**************************
Subcatchment Runoff Summary
**************************

-----------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff     Coeff
Subcatchment                 mm         mm         mm         mm         mm  10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------
E1                        42.75       0.00       0.00      38.37       3.12       0.10      15.33     0.073
EXT1                      42.75       0.00       0.00      33.76       7.70       0.09      13.37     0.180


Analysis begun on:  Wed Jun 07 15:45:54 2023
Analysis ended on:  Wed Jun 07 15:45:54 2023
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 2
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-5yr                  INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
E1                           3.30    274.78      1.00    1.5000 London               OF1
EXT1                         1.15    127.37     15.00    1.0000 London               OF1


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.202        45.373
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.172        38.802
Surface Runoff ...........         0.024         5.311
Final Storage ............         0.006         1.261
```

DEL19-103: Watson Farm Condominium Development
5-year Design Storm Event – Existing Conditions PCSWMM Output

```
Continuity Error (%) .....        -0.006


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.024          0.236
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         0.000          0.000
External Outflow .........         0.024          0.236
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                 mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------
E1                        45.37       0.00       0.00      40.07       4.06       0.13      19.68    0.089
EXT1                      45.37       0.00       0.00      35.16       8.91       0.10      15.90    0.196


Analysis begun on:  Wed Jun 07 15:46:19 2023
Analysis ended on:  Wed Jun 07 15:46:19 2023
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 2
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-10yr                 INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
E1                           3.30    274.78      1.00    1.5000 London               OF1
EXT1                         1.15    127.37     15.00    1.0000 London               OF1


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.234        52.597
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.191        42.938
Surface Runoff ...........         0.037         8.407
Final Storage ............         0.006         1.256
```

DEL19-103: Watson Farm Condominium Development
10-year Design Storm Event – Existing Conditions PCSWMM Output

```
Continuity Error (%) .....        -0.007


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.037          0.374
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         0.000          0.000
External Outflow .........         0.037          0.374
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                 mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------
E1                        52.60       0.00       0.00      44.38       6.98       0.23      34.79    0.133
EXT1                      52.60       0.00       0.00      38.80      12.52       0.14      24.23    0.238


Analysis begun on:  Wed Jun 07 15:46:46 2023
Analysis ended on:  Wed Jun 07 15:46:46 2023
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 2
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-25yr                 INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
E1                           3.30    274.78      1.00    1.5000 London               OF1
EXT1                         1.15    127.37     15.00    1.0000 London               OF1


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0


*******************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*******************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.268        60.382
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.209        47.102
Surface Runoff ...........         0.053        12.023
Final Storage ............         0.006         1.262
```

DEL19-103: Watson Farm Condominium Development
25-year Design Storm Event – Existing Conditions PCSWMM Output

```
Continuity Error (%) .....        -0.009


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.053          0.534
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         0.000          0.000
External Outflow .........         0.053          0.534
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                 mm         mm         mm         mm         mm  10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------------
E1                        60.38       0.00       0.00      48.70      10.43       0.34      54.60    0.173
EXT1                      60.38       0.00       0.00      42.52      16.59       0.19      34.23    0.275


Analysis begun on:  Wed Jun 07 15:47:18 2023
Analysis ended on:  Wed Jun 07 15:47:19 2023
Total elapsed time: 00:00:01
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 2
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                  Data       Recording
Name                 Data Source                  Type       Interval
----------------------------------------------------------------------
London               London-50yr                  INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
E1                           3.30    274.78      1.00    1.5000 London               OF1
EXT1                         1.15    127.37     15.00    1.0000 London               OF1


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.294        66.122
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.222        49.912
Surface Runoff ...........         0.066        14.948
Final Storage ............         0.006         1.269
```

DEL19-103: Watson Farm Condominium Development
50-year Design Storm Event – Existing Conditions PCSWMM Output

```
Continuity Error (%) .....        -0.010


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.066          0.664
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         0.000          0.000
External Outflow .........         0.066          0.664
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000


**************************
Subcatchment Runoff Summary
**************************

-----------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                 mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------
E1                        66.12       0.00       0.00      51.62      13.25       0.44      72.48    0.200
EXT1                      66.12       0.00       0.00      45.01      19.83       0.23      42.90    0.300


Analysis begun on:  Wed Jun 07 15:47:48 2023
Analysis ended on:  Wed Jun 07 15:47:48 2023
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 2
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-100yr                INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
------------------------------------------------------------------------------------------
E1                           3.30    274.78      1.00    1.5000 London               OF1
EXT1                         1.15    127.37     15.00    1.0000 London               OF1


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
------------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0


*******************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*******************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.319        71.801
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.234        52.560
Surface Runoff ...........         0.080        17.972
Final Storage ............         0.006         1.278
```

DEL19-103: Watson Farm Condominium Development
100-year Design Storm Event – Existing Conditions PCSWMM Output

```
Continuity Error (%) .....        -0.012


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.080          0.799
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         0.000          0.000
External Outflow .........         0.080          0.799
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000


**************************
Subcatchment Runoff Summary
**************************

-----------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff     Coeff
Subcatchment                 mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------
E1                        71.80       0.00       0.00      54.36      16.17       0.53      92.07     0.225
EXT1                      71.80       0.00       0.00      47.39      23.14       0.27      52.12     0.322


Analysis begun on:  Wed Jun 07 15:48:12 2023
Analysis ended on:  Wed Jun 07 15:48:13 2023
Total elapsed time: 00:00:01
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 2
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                  Data       Recording
Name                 Data Source                  Type       Interval
----------------------------------------------------------------------
London               London-250yr                 INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
E1                           3.30    274.78      1.00    1.5000 London               OF1
EXT1                         1.15    127.37     15.00    1.0000 London               OF1


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.385        86.611
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.258        58.055
Surface Runoff ...........         0.121        27.296
Final Storage ............         0.006         1.268
```

DEL19-103: Watson Farm Condominium Development
250-year Design Storm Event – Existing Conditions PCSWMM Output

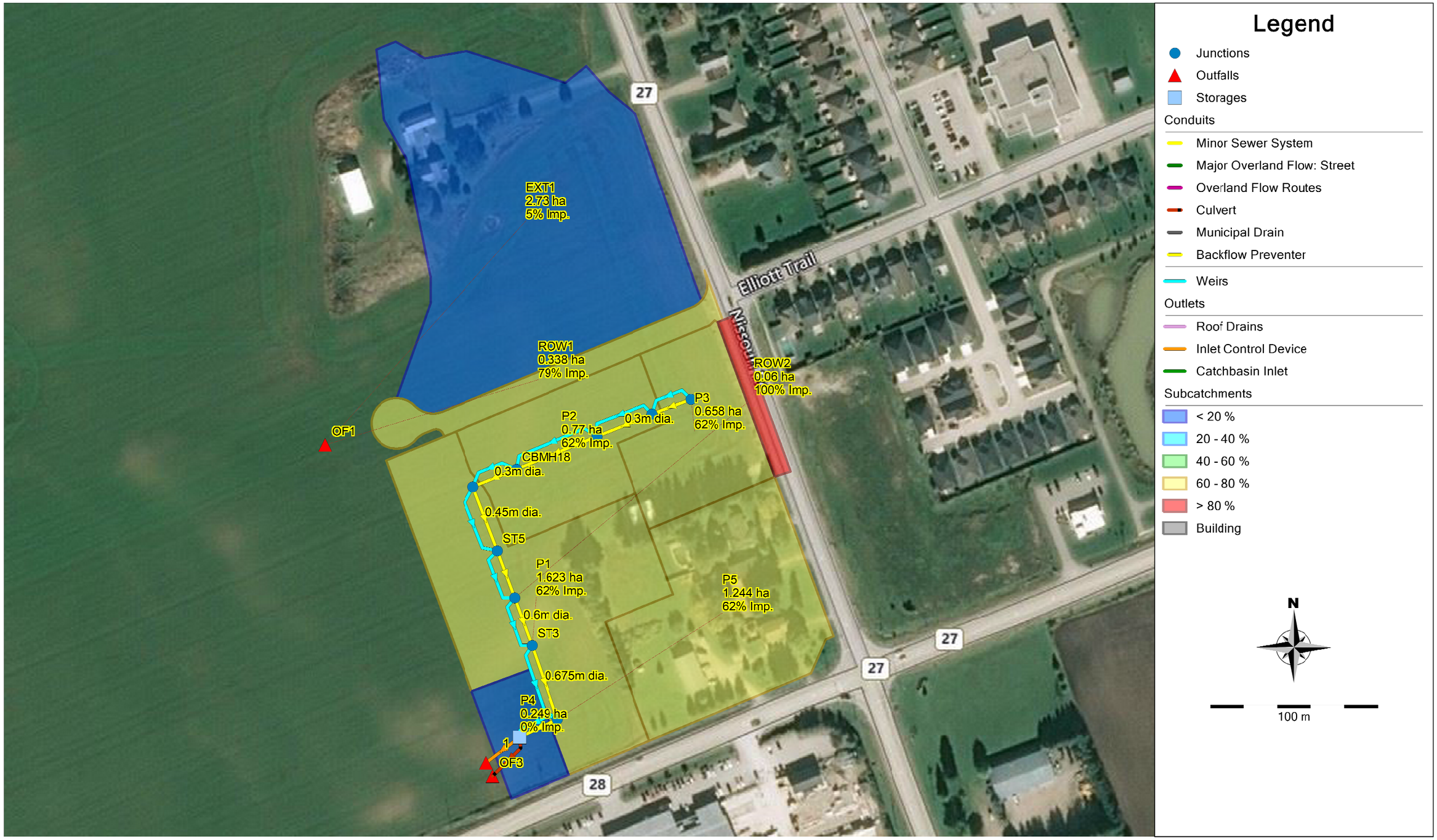
```
Continuity Error (%) .....        -0.009


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.121          1.213
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........         0.000          0.000
External Outflow .........         0.121          1.213
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.000          0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                 mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------
E1                        86.61       0.00       0.00      60.10      25.26       0.83     174.59    0.292
EXT1                      86.61       0.00       0.00      52.18      33.16       0.38      87.30    0.383


Analysis begun on:  Wed Jun 07 15:48:48 2023
Analysis ended on:  Wed Jun 07 15:48:49 2023
Total elapsed time: 00:00:01
```


EXT1
2.73 ha
5% Imp.
ROW1
0.338 ha
79% Imp.
ROW2
0.06 ha
100% Imp.
P1
1.623 ha
62% Imp.
P2
0.77 ha
62% Imp.
P3
0.658 ha
62% Imp.
P4
0.249 ha
0% Imp.
P5
1.244 ha
62% Imp.
OF1
OF3
1
CBMH18
ST5
ST3
0.3m dia.
0.3m dia.
0.45m dia.
0.6m dia.
0.675m dia.
Elliott Trail
Nissouri
27
27
27
28
Legend
Junctions
Outfalls
Storages
Conduits
Minor Sewer System
Major Overland Flow: Street
Overland Flow Routes
Culvert
Municipal Drain
Backflow Preventer
Weirs
Outlets
Roof Drains
Inlet Control Device
Catchbasin Inlet
Subcatchments
< 20 %
20 - 40 %
40 - 60 %
60 - 80 %
> 80 %
Building
N
100 m

```
[TITLE]
DEL19-103 - Watson Farm Lands

[OPTIONS]
;;Options             Value
;;------------------- ------------
FLOW_UNITS           LPS
INFILTRATION         CURVE_NUMBER
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           04/10/2015
START_TIME           00:00:00
REPORT_START_DATE    04/10/2015
REPORT_START_TIME    00:00:00
END_DATE             04/13/2015
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:01:00
DRY_STEP             00:01:00
ROUTING_STEP         0.5

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              2

[EVAPORATION]
;;Type           Parameters
;;-------------- ----------
CONSTANT         0.0
DRY_ONLY         NO

[RAINGAGES]
;;               Rain      Time     Snow     Data
;;Name           Type      Intrvl   Catch    Source
;;-------------- --------- -------- -------- ----------
London           INTENSITY 0:05     1.0      TIMESERIES London-25mm

[SUBCATCHMENTS]
;;                                                Total     Pcnt.             Pcnt.    Curb     Snow
;;Name           Raingage         Outlet          Area      Imperv   Width    Slope    Length   Pack
;;-------------- ---------------- --------------- --------- -------- -------- -------- -------- --------
EXT1             London           OF1             2.73      5        182      1        0
P1               London           ST3             1.623     62       405.75   2        0
P2               London           CBMH20          0.77      62       220      2        0
P3               London           ST10            0.658     62       188      2        0
P4               London           DB_INFL         0.249     0        124.5    20       0
P5               London           ST2             1.244     62       311      2        0
ROW1             London           OF1             0.338     79       169      2        0
ROW2             London           ST4             0.06      100      24       0.2      0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
EXT1             0.013      0.25       2          3          25         OUTLET
P1               0.013      0.25       2          3          25         PERVIOUS   40
P2               0.013      0.25       2          3          25         PERVIOUS   40
P3               0.013      0.25       2          3          25         PERVIOUS   40
P4               0.013      0.25       3          5          25         OUTLET
P5               0.013      0.25       2          3          25         PERVIOUS   40
ROW1             0.013      0.25       2          3          25         OUTLET
ROW2             0.013      0.25       1          2          25         OUTLET

[INFILTRATION]
;;Subcatchment   CurveNum   HydCon     DryTime
```

DEL19-103: Watson Farm Condominium Development
Proposed Conditions PCSWMM Input

```
;;-------------- ---------- ---------- ----------
EXT1             65         12.7       7
P1               65         12.7       7
P2               65         12.7       7
P3               65         12.7       7
P4               65         12.7       7
P5               65         12.7       7
ROW1             65         12.7       7
ROW2             65         12.7       7

[JUNCTIONS]
;;               Invert     Max.       Init.      Surcharge  Ponded
;;Name           Elev.      Depth      Depth      Depth      Area
;;-------------- ---------- ---------- ---------- ---------- ----------
CBMH18           283.61     2.53       0          0          0
CBMH19           283.84     2.31       0          0          0
CBMH20           284.04     2.14       0          0          0
ST10             284.16     2.11       0          0          0
ST2              282.6      1.86       0          0          0
ST3              282.69     2.15       0          0          0
ST4              282.83     2.53       0          0          0
ST5              283.13     2.53       0          0          0
ST6              283.36     2.6        0          0          0

[OUTFALLS]
;;               Invert     Outfall    Stage/Table      Tide
;;Name           Elev.      Type       Time Series      Gate     Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
OF1              0          FREE                        NO
OF2              281.75     FREE                        NO
OF3              283        FREE                        NO

[STORAGE]
;;               Invert   Max.       Init.      Storage    Curve                            Evap.
;;Name           Elev.    Depth      Depth      Curve      Params                           Frac.
Infiltration parameters
;;-------------- -------- ---------- ---------- ---------- ---------- -------- -------- -------- ---
--------------------
DB_INFL          281.75   2.35       0          TABULAR    DB_230601                 0        0

[CONDUITS]
;;               Inlet            Outlet                      Manning    Inlet      Outlet     Init.
Max.
;;Name           Node             Node             Length     N          Offset     Offset     Flow
Flow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ---
-------
15               CBMH20           CBMH19           33.5       0.013      284.05     283.88     0          0
16               CBMH19           CBMH18           40.7       0.013      283.85     283.65     0          0
19               ST5              ST4              37.5       0.013      283.14     282.99     0          0
2                DB_INFL          OF3              15         0.03       283.9      283.5      0          0
3                ST10             CBMH20           18.3       0.013      284.17     284.08     0          0
4                CBMH18           ST6              34.2       0.013      283.62     283.45     0          0
5                ST6              ST5              30.7       0.013      283.37     283.22     0          0
6                ST4              ST3              31.5       0.013      282.84     282.78     0          0
7                ST3              ST2              36.7       0.013      282.7      282.63     0          0
8                ST2              DB_INFL          15.4       0.013      282.61     282.55     0          0

[WEIRS]
;;               Inlet            Outlet           Weir         Crest      Disch.     Flap       End        End
;;Name           Node             Node             Type         Height     Coeff.     Gate       Con.
Coeff.     Surcharge  RoadWidth  RoadSurf
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- -------- -----
----- ---------- ---------- ----------
10               CBMH18           ST6              TRANSVERSE   285.97     1.84       NO       0          0
YES
11               ST6              ST5              TRANSVERSE   285.8      1.84       NO       0          0
YES
12               ST4              ST3              TRANSVERSE   285.2      1.84       NO       0          0
YES
13               ST3              ST2              TRANSVERSE   284.66     1.84       NO       0          0
YES
14               ST2              DB_INFL          TRANSVERSE   284.15     1.84       NO       0          0
YES
17               CBMH20           CBMH19           TRANSVERSE   286.02     1.84       NO       0          0
YES
18               CBMH19           CBMH18           TRANSVERSE   285.99     1.84       NO       0          0
YES
20               ST5              ST4              TRANSVERSE   285.5      1.84       NO       0          0
YES
```

```
9               ST10            CBMH20          TRANSVERSE   286.11     1.84       NO       0        0
YES

[OUTLETS]
;;              Inlet           Outlet          Outflow    Outlet          Qcoeff/
Flap
;;Name          Node            Node            Height     Type            QTable          Qexpon
Gate
;;------------- --------------- --------------- ---------- --------------- --------------- ---------- --
--
1               DB_INFL         OF2             281.75     TABULAR/DEPTH   INFL_50x30x0.5              NO

[XSECTIONS]
;;Link          Shape        Geom1           Geom2      Geom3      Geom4      Barrels
;;------------- ------------ --------------- ---------- ---------- ---------- ----------
15              CIRCULAR     0.3             0          0          0          1
16              CIRCULAR     0.3             0          0          0          1
19              CIRCULAR     0.45            0          0          0          1
2               CIRCULAR     0.45            0          0          0          1
3               CIRCULAR     0.3             0          0          0          1
4               CIRCULAR     0.3             0          0          0          1
5               CIRCULAR     0.45            0          0          0          1
6               CIRCULAR     0.6             0          0          0          1
7               CIRCULAR     0.675           0          0          0          1
8               CIRCULAR     0.675           0          0          0          1
10              RECT_OPEN    0.15            15         0          0
11              RECT_OPEN    0.15            15         0          0
12              RECT_OPEN    0.15            15         0          0
13              RECT_OPEN    0.15            15         0          0
14              RECT_OPEN    0.3             5          0          0
17              RECT_OPEN    0.15            15         0          0
18              RECT_OPEN    0.15            15         0          0
20              RECT_OPEN    0.15            15         0          0
9               RECT_OPEN    0.15            15         0          0

[LOSSES]
;;Link          Inlet      Outlet     Average    Flap Gate  SeepageRate
;;------------- ---------- ---------- ---------- ---------- ----------

[CURVES]
;;Name          Type       X-Value    Y-Value
;;------------- ---------- ---------- ----------
INFL_34.9X15X0.5 Rating     0          7.56
INFL_34.9X15X0.5            0.25       7.92
INFL_34.9X15X0.5            0.5        8.28
INFL_34.9X15X0.5            3          8.28

INFL_37X17X0.5   Rating     0          9.09
INFL_37X17X0.5              0.25       9.48
INFL_37X17X0.5              0.5        9.87
INFL_37X17X0.5              3          9.87

INFL_38.4X38.4X13 Rating     0          7.21
INFL_38.4X38.4X13            0.25       7.58
INFL_38.4X38.4X13            0.5        7.95
INFL_38.4X38.4X13            3          7.95

INFL_40.9X15X0.5 Rating     0          18.13
INFL_40.9X15X0.5            0.25       18.67
INFL_40.9X15X0.5            0.5        19.21
INFL_40.9X15X0.5            3          19.21

INFL_50x25x0.5   Rating     0          18.13
INFL_50x25x0.5              0.25       18.67
INFL_50x25x0.5              0.5        19.21
INFL_50x25x0.5              3          19.21

INFL_50x30x0.5   Rating     0          21.75
INFL_50x30x0.5              0.25       22.33
INFL_50x30x0.5              0.5        22.91
INFL_50x30x0.5              3          22.91

OptB-Gallery-Drybasin Rating     0          8.67
OptB-Gallery-Drybasin            0.1        8.83
OptB-Gallery-Drybasin            0.2        8.98
OptB-Gallery-Drybasin            0.3        9.14
OptB-Gallery-Drybasin            0.4        9.3
OptB-Gallery-Drybasin            0.5        9.46
OptB-Gallery-Drybasin            2.35       9.46
```

DEL19-103: Watson Farm Condominium Development
Proposed Conditions PCSWMM Input

```
DB_230601       Storage    0          602
DB_230601                  0.5        602
DB_230601                  0.51       585
DB_230601                  2.36       1587

DrybasinOptB    Storage    0          502
DrybasinOptB               0.5        502
DrybasinOptB               0.51       608
DrybasinOptB               2.35       1632

[TIMESERIES]
;;Name          Date       Time       Value
;;------------- ---------- ---------- ----------
London-100yr                0:00       5.443
London-100yr                0:05       5.819
London-100yr                0:10       6.26
London-100yr                0:15       6.783
London-100yr                0:20       7.415
London-100yr                0:25       8.196
London-100yr                0:30       9.189
London-100yr                0:35       10.496
London-100yr                0:40       12.303
London-100yr                0:45       14.978
London-100yr                0:50       19.377
London-100yr                0:55       28.048
London-100yr                1:00       53.584
London-100yr                1:05       257.109
London-100yr                1:10       126.718
London-100yr                1:15       54.547
London-100yr                1:20       34.915
London-100yr                1:25       25.869
London-100yr                1:30       20.677
London-100yr                1:35       17.306
London-100yr                1:40       14.937
London-100yr                1:45       13.178
London-100yr                1:50       11.818
London-100yr                1:55       10.734
London-100yr                2:00       9.848
London-100yr                2:05       9.109
London-100yr                2:10       8.483
London-100yr                2:15       7.946
London-100yr                2:20       7.479
London-100yr                2:25       7.07
London-100yr                2:30       6.707
London-100yr                2:35       6.383
London-100yr                2:40       6.093
London-100yr                2:45       5.831
London-100yr                2:50       5.592
London-100yr                2:55       5.375
London-100yr                3:00       0

London-10yr                 0:00       3.324
London-10yr                 0:05       3.596
London-10yr                 0:10       3.92
London-10yr                 0:15       4.312
London-10yr                 0:20       4.795
London-10yr                 0:25       5.405
London-10yr                 0:30       6.2
London-10yr                 0:35       7.277
London-10yr                 0:40       8.814
London-10yr                 0:45       11.168
London-10yr                 0:50       15.184
London-10yr                 0:55       23.34
London-10yr                 1:00       46.748
London-10yr                 1:05       164.792
London-10yr                 1:10       101.694
London-10yr                 1:15       47.792
London-10yr                 1:20       29.832
London-10yr                 1:25       21.275
London-10yr                 1:30       16.389
London-10yr                 1:35       13.272
London-10yr                 1:40       11.129
London-10yr                 1:45       9.572
London-10yr                 1:50       8.395
London-10yr                 1:55       7.475
London-10yr                 2:00       6.738
London-10yr                 2:05       6.135
London-10yr                 2:10       5.633
London-10yr                 2:15       5.208
London-10yr                 2:20       4.844
```

London-10yr	2:25	4.53
London-10yr	2:30	4.255
London-10yr	2:35	4.012
London-10yr	2:40	3.797
London-10yr	2:45	3.605
London-10yr	2:50	3.432
London-10yr	2:55	3.275
London-10yr	3:00	0
London-250yr	0:00	4.785
London-250yr	0:05	5.232
London-250yr	0:10	5.77
London-250yr	0:15	6.429
London-250yr	0:20	7.252
London-250yr	0:25	8.308
London-250yr	0:30	9.705
London-250yr	0:35	11.626
London-250yr	0:40	14.412
London-250yr	0:45	18.747
London-250yr	0:50	26.224
London-250yr	0:55	41.407
London-250yr	1:00	83.174
London-250yr	1:05	254.614
London-250yr	1:10	170.473
London-250yr	1:15	85.215
London-250yr	1:20	53.354
London-250yr	1:25	37.588
London-250yr	1:30	28.475
London-250yr	1:35	22.656
London-250yr	1:40	18.672
London-250yr	1:45	15.8
London-250yr	1:50	13.647
London-250yr	1:55	11.981
London-250yr	2:00	10.66
London-250yr	2:05	9.588
London-250yr	2:10	8.705
London-250yr	2:15	7.965
London-250yr	2:20	7.337
London-250yr	2:25	6.798
London-250yr	2:30	6.332
London-250yr	2:35	5.924
London-250yr	2:40	5.565
London-250yr	2:45	5.246
London-250yr	2:50	4.961
London-250yr	2:55	4.706
London-250yr	3:00	0
London-25mm	0.083333	1.45
London-25mm	0.166667	1.54
London-25mm	0.250000	1.65
London-25mm	0.333333	1.77
London-25mm	0.416667	1.91
London-25mm	0.500000	2.09
London-25mm	0.583333	2.30
London-25mm	0.666667	2.56
London-25mm	0.750000	2.90
London-25mm	0.833333	3.37
London-25mm	0.916667	4.02
London-25mm	1.000000	5.03
London-25mm	1.083333	6.79
London-25mm	1.166667	10.64
London-25mm	1.250000	25.07
London-25mm	1.333333	77.80
London-25mm	1.416667	32.39
London-25mm	1.500000	17.77
London-25mm	1.583333	12.12
London-25mm	1.666667	9.18
London-25mm	1.750000	7.40
London-25mm	1.833333	6.21
London-25mm	1.916667	5.36
London-25mm	2.000000	4.72
London-25mm	2.083333	4.22
London-25mm	2.166667	3.83
London-25mm	2.250000	3.50
London-25mm	2.333333	3.24
London-25mm	2.416667	3.01
London-25mm	2.500000	2.81
London-25mm	2.583333	2.64
London-25mm	2.666667	2.49
London-25mm	2.750000	2.36

DEL19-103: Watson Farm Condominium Development
Proposed Conditions PCSWMM Input

London-25mm	2.833333	2.24
London-25mm	2.916667	2.14
London-25mm	3.000000	2.04
London-25mm	3.083333	1.96
London-25mm	3.166667	1.88
London-25mm	3.250000	1.81
London-25mm	3.333333	1.74
London-25mm	3.416667	1.68
London-25mm	3.500000	1.62
London-25mm	3.583333	1.57
London-25mm	3.666667	1.52
London-25mm	3.750000	1.48
London-25mm	3.833333	1.43
London-25mm	3.916667	1.39
London-25mm	4.000000	1.36
London-25yr	0:00	4.21
London-25yr	0:05	4.524
London-25yr	0:10	4.894
London-25yr	0:15	5.336
London-25yr	0:20	5.876
London-25yr	0:25	6.551
London-25yr	0:30	7.417
London-25yr	0:35	8.574
London-25yr	0:40	10.199
London-25yr	0:45	12.647
London-25yr	0:50	16.757
London-25yr	0:55	25.022
London-25yr	1:00	49.335
London-25yr	1:05	202.437
London-25yr	1:10	112.952
London-25yr	1:15	50.323
London-25yr	1:20	31.618
London-25yr	1:25	22.93
London-25yr	1:30	17.982
London-25yr	1:35	14.809
London-25yr	1:40	12.608
London-25yr	1:45	10.993
London-25yr	1:50	9.759
London-25yr	1:55	8.786
London-25yr	2:00	7.998
London-25yr	2:05	7.347
London-25yr	2:10	6.8
London-25yr	2:15	6.334
London-25yr	2:20	5.932
London-25yr	2:25	5.581
London-25yr	2:30	5.272
London-25yr	2:35	4.998
London-25yr	2:40	4.754
London-25yr	2:45	4.534
London-25yr	2:50	4.335
London-25yr	2:55	4.154
London-25yr	3:00	0
London-2yr	0:00	2.649
London-2yr	0:05	2.875
London-2yr	0:10	3.145
London-2yr	0:15	3.472
London-2yr	0:20	3.878
London-2yr	0:25	4.393
London-2yr	0:30	5.067
London-2yr	0:35	5.984
London-2yr	0:40	7.299
London-2yr	0:45	9.322
London-2yr	0:50	12.778
London-2yr	0:55	19.764
London-2yr	1:00	39.292
London-2yr	1:05	127.195
London-2yr	1:10	82.291
London-2yr	1:15	40.209
London-2yr	1:20	25.278
London-2yr	1:25	18.005
London-2yr	1:30	13.814
London-2yr	1:35	11.133
London-2yr	1:40	9.288
London-2yr	1:45	7.95
London-2yr	1:50	6.94
London-2yr	1:55	6.153
London-2yr	2:00	5.524
London-2yr	2:05	5.011

```
London-2yr              2:10       4.585
London-2yr              2:15       4.226
London-2yr              2:20       3.919
London-2yr              2:25       3.655
London-2yr              2:30       3.424
London-2yr              2:35       3.221
London-2yr              2:40       3.042
London-2yr              2:45       2.882
London-2yr              2:50       2.738
London-2yr              2:55       2.608
London-2yr              3:00       0

London-50yr             0:00       4.77
London-50yr             0:05       5.114
London-50yr             0:10       5.518
London-50yr             0:15       6
London-50yr             0:20       6.585
London-50yr             0:25       7.312
London-50yr             0:30       8.242
London-50yr             0:35       9.476
London-50yr             0:40       11.198
London-50yr             0:45       13.773
London-50yr             0:50       18.06
London-50yr             0:55       26.623
London-50yr             1:00       51.93
London-50yr             1:05       229.029
London-50yr             1:10       121.172
London-50yr             1:15       52.92
London-50yr             1:20       33.445
London-50yr             1:25       24.459
London-50yr             1:30       19.334
London-50yr             1:35       16.033
London-50yr             1:40       13.732
London-50yr             1:45       12.036
London-50yr             1:50       10.734
London-50yr             1:55       9.701
London-50yr             2:00       8.862
London-50yr             2:05       8.167
London-50yr             2:10       7.58
London-50yr             2:15       7.079
London-50yr             2:20       6.644
London-50yr             2:25       6.265
London-50yr             2:30       5.93
London-50yr             2:35       5.632
London-50yr             2:40       5.365
London-50yr             2:45       5.125
London-50yr             2:50       4.907
London-50yr             2:55       4.709
London-50yr             3:00       0

London-5yr              0:00       2.846
London-5yr              0:05       3.084
London-5yr              0:10       3.368
London-5yr              0:15       3.712
London-5yr              0:20       4.137
London-5yr              0:25       4.676
London-5yr              0:30       5.38
London-5yr              0:35       6.335
London-5yr              0:40       7.702
London-5yr              0:45       9.8
London-5yr              0:50       13.382
London-5yr              0:55       20.636
London-5yr              1:00       41.127
London-5yr              1:05       137.641
London-5yr              1:10       87.426
London-5yr              1:15       42.07
London-5yr              1:20       26.379
London-5yr              1:25       18.805
London-5yr              1:30       14.457
London-5yr              1:35       11.677
London-5yr              1:40       9.765
London-5yr              1:45       8.377
London-5yr              1:50       7.329
London-5yr              1:55       6.511
London-5yr              2:00       5.857
London-5yr              2:05       5.322
London-5yr              2:10       4.877
London-5yr              2:15       4.502
London-5yr              2:20       4.181
London-5yr              2:25       3.904
```

DEL19-103: Watson Farm Condominium Development
Proposed Conditions PCSWMM Input

```
London-5yr              2:30       3.662
London-5yr              2:35       3.449
London-5yr              2:40       3.26
London-5yr              2:45       3.091
London-5yr              2:50       2.94
London-5yr              2:55       2.803
London-5yr              3:00       0

[REPORT]
;;Reporting Options
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       DB_INFL          Surface
Link       2                Culvert
Link       1                IC

[MAP]
DIMENSIONS       486952.7494      4771911.25575    487285.2706      4772405.44725
UNITS            Meters

[COORDINATES]
;;Node           X-Coord          Y-Coord
;;-------------- ---------------- ----------------
CBMH18           487081.655       4772129.197
CBMH19           487129.713       4772148.531
CBMH20           487162.546       4772161.735
ST10             487185.592       4772170.52
ST2              487105.875       4771980.833
ST3              487090.734       4772024.689
ST4              487080.514       4772052.938
ST5              487070.253       4772080.83
ST6              487055.767       4772118.823
OF1              486967.864       4772143.827
OF2              487063.321       4771954.976
OF3              487067.189       4771947.063
DB_INFL          487083.157       4771970.161

[VERTICES]
;;Link           X-Coord          Y-Coord
;;-------------- ---------------- ----------------
2                487083.894       4771963.745
10               487073.154       4772132.911
10               487059.259       4772127.239
11               487050.845       4772109.612
11               487061.391       4772082.661
12               487076.023       4772047.328
12               487084.14        4772024.703
13               487086.915       4772018.756
13               487087.838       4772016.039
13               487097.93        4771986.135
14               487100.598       4771982.941
14               487083.394       4771974.302
17               487157.696       4772166.955
17               487129.574       4772156.19
18               487122.323       4772153.333
18               487083.215       4772137.075
20               487064.907       4772075.337
20               487073.548       4772052.927
9                487180.242       4772175.855
9                487165.097       4772169.86

[POLYGONS]
;;Subcatchment   X-Coord          Y-Coord
;;-------------- ---------------- ----------------
EXT1             487190.197       4772233.329
EXT1             487152.882       4772340.009
EXT1             487137.097       4772352.893
EXT1             487123.811       4772368.285
EXT1             487111.411       4772358.274
EXT1             487052.531       4772377.325
EXT1             487027.62        4772372.987
EXT1             487010.446       4772382.984
EXT1             486998.557       4772378.268
EXT1             487003.472       4772336.707
EXT1             487016.494       4772313.883
```

EXT1	487030.822	4772243.124
EXT1	487030.822	4772227.798
EXT1	487010.639	4772171.528
EXT1	487011.724	4772171.471
EXT1	487012.801	4772171.336
EXT1	487013.867	4772171.123
EXT1	487014.914	4772170.834
EXT1	487015.937	4772170.47
EXT1	487016.931	4772170.032
EXT1	487017.891	4772169.524
EXT1	487018.812	4772168.947
EXT1	487019.688	4772168.306
EXT1	487020.516	4772167.603
EXT1	487021.291	4772166.841
EXT1	487021.291	4772166.841
EXT1	487022.05	4772166.107
EXT1	487022.859	4772165.428
EXT1	487023.714	4772164.808
EXT1	487024.611	4772164.249
EXT1	487025.545	4772163.755
EXT1	487026.511	4772163.328
EXT1	487027.504	4772162.97
EXT1	487028.521	4772162.683
EXT1	487029.555	4772162.467
EXT1	487030.602	4772162.326
EXT1	487031.656	4772162.258
EXT1	487032.712	4772162.265
EXT1	487033.765	4772162.345
EXT1	487034.81	4772162.5
EXT1	487035.842	4772162.728
EXT1	487036.854	4772163.028
EXT1	487037.844	4772163.399
EXT1	487037.844	4772163.399
EXT1	487186.484	4772225.128
EXT1	487186.763	4772225.248
EXT1	487187.04	4772225.373
EXT1	487187.315	4772225.504
EXT1	487187.586	4772225.641
EXT1	487187.854	4772225.783
EXT1	487188.12	4772225.931
EXT1	487188.382	4772226.085
EXT1	487188.641	4772226.244
EXT1	487188.897	4772226.408
EXT1	487189.149	4772226.578
EXT1	487189.397	4772226.753
EXT1	487189.642	4772226.933
EXT1	487189.883	4772227.119
EXT1	487190.12	4772227.309
EXT1	487190.353	4772227.504
EXT1	487190.581	4772227.704
EXT1	487190.806	4772227.909
EXT1	487191.026	4772228.119
EXT1	487191.242	4772228.333
EXT1	487191.453	4772228.551
EXT1	487191.66	4772228.774
EXT1	487191.862	4772229.001
EXT1	487191.862	4772229.001
EXT1	487190.197	4772233.329
P1	487062.595	4772118.108
P1	487054.506	4772127.613
P1	487045.643	4772151.64
P1	487004.328	4772134.483
P1	487054.865	4771997.487
P1	487089.579	4772010.293
P1	487112.585	4771947.928
P1	487160.579	4771967.87
P1	487134.521	4772038.511
P1	487174.756	4772054.716
P1	487160.514	4772093.324
P1	487152.556	4772114.897
P1	487076.673	4772083.415
P1	487065.799	4772112.892
P1	487062.595	4772118.108
P2	487141.659	4772144.439
P2	487170.531	4772156.429
P2	487155.473	4772197.252
P2	487045.643	4772151.64
P2	487054.506	4772127.613
P2	487062.595	4772118.108
P2	487065.799	4772112.892

DEL19-103: Watson Farm Condominium Development
Proposed Conditions PCSWMM Input

P2	487076.673	4772083.415
P2	487152.556	4772114.897
P2	487141.659	4772144.439
P3	487199.671	4772217.232
P3	487201.43	4772216.272
P3	487235.246	4772124.435
P3	487230.721	4772122.42
P3	487160.514	4772093.324
P3	487152.556	4772114.897
P3	487141.659	4772144.439
P3	487170.531	4772156.429
P3	487155.473	4772197.252
P3	487196.788	4772214.41
P3	487199.671	4772217.232
P4	487054.865	4771997.487
P4	487089.579	4772010.293
P4	487112.585	4771947.928
P4	487078.39	4771933.719
P4	487054.865	4771997.487
P5	487160.579	4771967.87
P5	487134.521	4772038.511
P5	487174.756	4772054.716
P5	487160.514	4772093.324
P5	487230.721	4772122.42
P5	487235.246	4772124.435
P5	487270.156	4772029.803
P5	487265.598	4772027.872
P5	487256.766	4772007.838
P5	487160.579	4771967.87
ROW1	487038.526	4772148.685
ROW1	487038.017	4772150.065
ROW1	487037.897	4772150.356
ROW1	487037.758	4772150.639
ROW1	487037.599	4772150.911
ROW1	487037.422	4772151.171
ROW1	487037.226	4772151.419
ROW1	487037.014	4772151.652
ROW1	487036.786	4772151.869
ROW1	487036.543	4772152.07
ROW1	487036.287	4772152.254
ROW1	487036.019	4772152.419
ROW1	487035.74	4772152.565
ROW1	487035.451	4772152.691
ROW1	487035.154	4772152.797
ROW1	487034.851	4772152.881
ROW1	487034.542	4772152.945
ROW1	487034.229	4772152.986
ROW1	487033.915	4772153.005
ROW1	487033.6	4772153.003
ROW1	487033.286	4772152.978
ROW1	487032.974	4772152.932
ROW1	487032.666	4772152.863
ROW1	487032.364	4772152.774
ROW1	487032.069	4772152.663
ROW1	487032.069	4772152.663
ROW1	487027.236	4772150.656
ROW1	487026.961	4772150.538
ROW1	487026.689	4772150.416
ROW1	487026.42	4772150.288
ROW1	487026.153	4772150.155
ROW1	487025.889	4772150.016
ROW1	487025.627	4772149.872
ROW1	487025.369	4772149.723
ROW1	487025.114	4772149.569
ROW1	487024.861	4772149.41
ROW1	487024.612	4772149.246
ROW1	487024.366	4772149.077
ROW1	487024.124	4772148.903
ROW1	487023.885	4772148.724
ROW1	487023.65	4772148.541
ROW1	487023.418	4772148.353
ROW1	487023.191	4772148.16
ROW1	487022.967	4772147.963
ROW1	487022.747	4772147.762
ROW1	487022.531	4772147.556
ROW1	487022.319	4772147.346
ROW1	487022.111	4772147.132
ROW1	487021.908	4772146.913
ROW1	487021.908	4772146.913
ROW1	487021.207	4772146.132

```
ROW1             487020.454       4772145.401
ROW1             487019.651       4772144.725
ROW1             487018.803       4772144.107
ROW1             487017.913       4772143.549
ROW1             487016.987       4772143.056
ROW1             487016.029       4772142.628
ROW1             487015.043       4772142.268
ROW1             487014.034       4772141.978
ROW1             487013.007       4772141.759
ROW1             487011.968       4772141.613
ROW1             487010.921       4772141.539
ROW1             487009.871       4772141.539
ROW1             487008.824       4772141.613
ROW1             487007.785       4772141.759
ROW1             487006.758       4772141.978
ROW1             487005.749       4772142.268
ROW1             487004.763       4772142.628
ROW1             487003.805       4772143.056
ROW1             487002.879       4772143.55
ROW1             487001.99        4772144.108
ROW1             487001.141       4772144.726
ROW1             487000.339       4772145.402
ROW1             486999.585       4772146.133
ROW1             486998.884       4772146.914
ROW1             486998.24        4772147.743
ROW1             486997.655       4772148.615
ROW1             486997.133       4772149.525
ROW1             486996.675       4772150.47
ROW1             486996.285       4772151.444
ROW1             486995.964       4772152.443
ROW1             486995.714       4772153.463
ROW1             486995.535       4772154.497
ROW1             486995.429       4772155.541
ROW1             486995.397       4772156.591
ROW1             486995.438       4772157.639
ROW1             486995.552       4772158.683
ROW1             486995.739       4772159.716
ROW1             486995.997       4772160.733
ROW1             486996.327       4772161.73
ROW1             486996.725       4772162.701
ROW1             486997.19        4772163.642
ROW1             486997.719       4772164.548
ROW1             486998.311       4772165.415
ROW1             486998.962       4772166.238
ROW1             486999.669       4772167.014
ROW1             487000.428       4772167.739
ROW1             487001.237       4772168.408
ROW1             487002.09        4772169.02
ROW1             487002.983       4772169.57
ROW1             487003.914       4772170.057
ROW1             487004.875       4772170.477
ROW1             487005.864       4772170.829
ROW1             487006.875       4772171.111
ROW1             487007.904       4772171.322
ROW1             487008.944       4772171.46
ROW1             487009.992       4772171.525
ROW1             487011.041       4772171.516
ROW1             487012.088       4772171.435
ROW1             487013.126       4772171.28
ROW1             487014.151       4772171.053
ROW1             487015.157       4772170.755
ROW1             487016.14        4772170.387
ROW1             487017.095       4772169.951
ROW1             487018.017       4772169.45
ROW1             487018.902       4772168.885
ROW1             487019.746       4772168.26
ROW1             487020.543       4772167.578
ROW1             487021.291       4772166.841
ROW1             487021.291       4772166.841
ROW1             487022.05        4772166.107
ROW1             487022.859       4772165.428
ROW1             487023.714       4772164.808
ROW1             487024.611       4772164.249
ROW1             487025.545       4772163.755
ROW1             487026.511       4772163.328
ROW1             487027.504       4772162.97
ROW1             487028.521       4772162.683
ROW1             487029.555       4772162.467
ROW1             487030.602       4772162.326
ROW1             487031.656       4772162.258
```

DEL19-103: Watson Farm Condominium Development
Proposed Conditions PCSWMM Input

```
ROW1             487032.712       4772162.265
ROW1             487033.765       4772162.345
ROW1             487034.81        4772162.5
ROW1             487035.842       4772162.728
ROW1             487036.854       4772163.028
ROW1             487037.844       4772163.399
ROW1             487037.844       4772163.399
ROW1             487186.484       4772225.128
ROW1             487187.403       4772225.548
ROW1             487188.29        4772226.03
ROW1             487189.141       4772226.573
ROW1             487189.953       4772227.174
ROW1             487190.72        4772227.83
ROW1             487191.441       4772228.538
ROW1             487192.11        4772229.294
ROW1             487192.725       4772230.095
ROW1             487193.282       4772230.937
ROW1             487193.78        4772231.816
ROW1             487194.216       4772232.727
ROW1             487194.587       4772233.666
ROW1             487194.891       4772234.629
ROW1             487195.128       4772235.611
ROW1             487195.296       4772236.606
ROW1             487195.394       4772237.611
ROW1             487195.422       4772238.621
ROW1             487195.38        4772239.63
ROW1             487195.268       4772240.633
ROW1             487195.086       4772241.627
ROW1             487194.835       4772242.605
ROW1             487194.517       4772243.563
ROW1             487194.517       4772243.563
ROW1             487193.843       4772246.931
ROW1             487209.609       4772203.937
ROW1             487207.246       4772209.018
ROW1             487206.854       4772209.984
ROW1             487206.393       4772210.919
ROW1             487205.867       4772211.819
ROW1             487205.278       4772212.679
ROW1             487204.628       4772213.494
ROW1             487203.921       4772214.261
ROW1             487203.161       4772214.974
ROW1             487202.352       4772215.631
ROW1             487201.497       4772216.229
ROW1             487200.602       4772216.763
ROW1             487199.671       4772217.232
ROW1             487199.671       4772217.232
ROW1             487196.788       4772214.41
ROW1             487155.473       4772197.252
ROW1             487045.643       4772151.64
ROW1             487038.526       4772148.685
ROW2             487235.246       4772124.435
ROW2             487201.497       4772216.229
ROW2             487210.726       4772219.76
ROW2             487216.927       4772203.619
ROW2             487221.53        4772191.175
ROW2             487226.738       4772176.728
ROW2             487232.012       4772162.206
ROW2             487237.261       4772148.084
ROW2             487242.588       4772133.505
ROW2             487244.776       4772127.51
ROW2             487235.246       4772124.435

[SYMBOLS]
;;Gage           X-Coord          Y-Coord
;;-------------- ---------------- ----------------
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 8
Number of nodes ........... 13
Number of links ........... 20
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-25mm                 INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
------------------------------------------------------------------------------------------
EXT1                        2.73    182.00      5.00    1.0000 London               OF1
P1                          1.62    405.75     62.00    2.0000 London               ST3
P2                          0.77    220.00     62.00    2.0000 London               CBMH20
P3                          0.66    188.00     62.00    2.0000 London               ST10
P4                          0.25    124.50      0.00   20.0000 London               DB_INFL
P5                          1.24    311.00     62.00    2.0000 London               ST2
ROW1                        0.34    169.00     79.00    2.0000 London               OF1
ROW2                        0.06     24.00    100.00    0.2000 London               ST4


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
------------------------------------------------------------------------
CBMH18               JUNCTION       283.61      2.53       0.0
CBMH19               JUNCTION       283.84      2.31       0.0
CBMH20               JUNCTION       284.04      2.14       0.0
ST10                 JUNCTION       284.16      2.11       0.0
ST2                  JUNCTION       282.60      1.86       0.0
ST3                  JUNCTION       282.69      2.15       0.0
ST4                  JUNCTION       282.83      2.53       0.0
ST5                  JUNCTION       283.13      2.53       0.0
ST6                  JUNCTION       283.36      2.60       0.0
OF1                  OUTFALL          0.00      0.00       0.0
OF2                  OUTFALL        281.75      0.00       0.0
OF3                  OUTFALL        283.00      0.95       0.0
DB_INFL              STORAGE        281.75      2.35       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %Slope Roughness
-----------------------------------------------------------------------------------------------
15               CBMH20           CBMH19           CONDUIT           33.5    0.5075    0.0130
16               CBMH19           CBMH18           CONDUIT           40.7    0.4914    0.0130
19               ST5              ST4              CONDUIT           37.5    0.4000    0.0130
2                DB_INFL          OF3              CONDUIT           15.0    2.6676    0.0300
3                ST10             CBMH20           CONDUIT           18.3    0.4918    0.0130
4                CBMH18           ST6              CONDUIT           34.2    0.4971    0.0130
5                ST6              ST5              CONDUIT           30.7    0.4886    0.0130
6                ST4              ST3              CONDUIT           31.5    0.1905    0.0130
7                ST3              ST2              CONDUIT           36.7    0.1907    0.0130
8                ST2              DB_INFL          CONDUIT           15.4    0.3896    0.0130
10               CBMH18           ST6              WEIR
11               ST6              ST5              WEIR
```

DEL19-103: Watson Farm Condominium Development
25mm Design Storm Event – Proposed Conditions PCSWMM Output

```
12               ST4              ST3              WEIR
13               ST3              ST2              WEIR
14               ST2              DB_INFL          WEIR
17               CBMH20           CBMH19           WEIR
18               CBMH19           CBMH18           WEIR
20               ST5              ST4              WEIR
9                ST10             CBMH20           WEIR
1                DB_INFL          OF2              OUTLET


********************
Cross Section Summary
********************
                                          Full      Full      Hyd.      Max.   No. of      Full
Conduit              Shape                Depth      Area      Rad.     Width  Barrels      Flow
-------------------------------------------------------------------------------------------------
15                   CIRCULAR              0.30      0.07      0.07      0.30       1     68.89
16                   CIRCULAR              0.30      0.07      0.07      0.30       1     67.79
19                   CIRCULAR              0.45      0.16      0.11      0.45       1    180.33
2                    CIRCULAR              0.45      0.16      0.11      0.45       1    201.80
3                    CIRCULAR              0.30      0.07      0.07      0.30       1     67.82
4                    CIRCULAR              0.30      0.07      0.07      0.30       1     68.18
5                    CIRCULAR              0.45      0.16      0.11      0.45       1    199.30
6                    CIRCULAR              0.60      0.28      0.15      0.60       1    267.99
7                    CIRCULAR              0.68      0.36      0.17      0.68       1    367.14
8                    CIRCULAR              0.68      0.36      0.17      0.68       1    524.72


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/13/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 0.50 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 2
Head Tolerance ........... 0.001500 m


*************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.192        25.000
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.108        14.020
Surface Runoff ...........         0.074         9.637
Final Storage ............         0.010         1.355
Continuity Error (%) .....        -0.047


*************************       Volume       Volume
Flow Routing Continuity        hectare-m    10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.074         0.739
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

External Inflow	0.000	0.000
External Outflow	0.074	0.740
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.171	

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	0.50 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
EXT1	25.00	0.00	0.00	22.48	1.25	0.03	29.47	0.050
P1	25.00	0.00	0.00	9.00	14.60	0.24	142.63	0.584
P2	25.00	0.00	0.00	8.98	14.63	0.11	69.28	0.585
P3	25.00	0.00	0.00	8.98	14.63	0.10	59.20	0.585
P4	25.00	0.00	0.00	23.75	0.00	0.00	0.00	0.000
P5	25.00	0.00	0.00	9.00	14.60	0.18	109.33	0.584
ROW1	25.00	0.00	0.00	4.85	18.73	0.06	57.46	0.749
ROW2	25.00	0.00	0.00	0.00	24.26	0.01	11.15	0.971

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CBMH18	JUNCTION	0.02	0.44	284.05	0 01:27	0.44
CBMH19	JUNCTION	0.02	0.65	284.49	0 01:26	0.65
CBMH20	JUNCTION	0.02	0.85	284.89	0 01:25	0.84
ST10	JUNCTION	0.01	0.77	284.93	0 01:25	0.76
ST2	JUNCTION	0.02	0.39	282.99	0 01:25	0.39
ST3	JUNCTION	0.02	0.39	283.08	0 01:25	0.39
ST4	JUNCTION	0.02	0.28	283.11	0 01:25	0.28
ST5	JUNCTION	0.01	0.25	283.38	0 01:27	0.25
ST6	JUNCTION	0.01	0.23	283.59	0 01:27	0.23
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	281.75	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	283.00	0 00:00	0.00
DB_INFL	STORAGE	0.04	0.66	282.41	0 02:58	0.66

Node Inflow Summary

DEL19-103: Watson Farm Condominium Development
25mm Design Storm Event – Proposed Conditions PCSWMM Output

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CBMH18	JUNCTION	0.00	102.10	0 01:26	0	0.208	-0.027
CBMH19	JUNCTION	0.00	109.63	0 01:25	0	0.208	0.191
CBMH20	JUNCTION	69.28	121.15	0 01:25	0.113	0.209	0.211
ST10	JUNCTION	59.20	59.20	0 01:25	0.0962	0.0962	0.018
ST2	JUNCTION	109.33	338.03	0 01:25	0.182	0.641	-0.099
ST3	JUNCTION	142.63	234.99	0 01:25	0.237	0.46	0.116
ST4	JUNCTION	11.15	107.09	0 01:27	0.0146	0.223	-0.156
ST5	JUNCTION	0.00	99.50	0 01:27	0	0.208	0.004
ST6	JUNCTION	0.00	99.44	0 01:27	0	0.208	0.004
OF1	OUTFALL	86.93	86.93	0 01:25	0.0974	0.0974	0.000
OF2	OUTFALL	0.00	22.91	0 01:46	0	0.643	0.000
OF3	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
DB_INFL	STORAGE	0.00	337.92	0 01:25	0	0.642	-0.235

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
DB_INFL	0.026	1	0	0	0.398	17	0 02:58	22.91

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	6.59	5.70	86.93	0.097
OF2	11.20	22.15	22.91	0.643
OF3	0.00	0.00	0.00	0.000
System	5.93	27.85	108.97	0.740

Link Flow Summary

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
15	CONDUIT	109.63	0 01:25	1.55	1.59	1.00
16	CONDUIT	102.10	0 01:26	1.44	1.51	1.00
19	CONDUIT	99.52	0 01:27	1.23	0.55	0.51
2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
3	CONDUIT	52.29	0 01:25	0.81	0.77	1.00
4	CONDUIT	99.44	0 01:27	1.48	1.46	0.91
5	CONDUIT	99.50	0 01:27	1.28	0.50	0.49
6	CONDUIT	107.68	0 01:27	0.92	0.40	0.47

7	CONDUIT	231.58	0	01:25	1.19	0.63	0.55
8	CONDUIT	337.92	0	01:25	1.68	0.64	0.55
10	WEIR	0.00	0	00:00			0.00
11	WEIR	0.00	0	00:00			0.00
12	WEIR	0.00	0	00:00			0.00
13	WEIR	0.00	0	00:00			0.00
14	WEIR	0.00	0	00:00			0.00
17	WEIR	0.00	0	00:00			0.00
18	WEIR	0.00	0	00:00			0.00
20	WEIR	0.00	0	00:00			0.00
9	WEIR	0.00	0	00:00			0.00
1	DUMMY	22.91	0	01:46			

****
Flow Classification Summary
****

	Adjusted /Actual	Fraction of Time in Flow Class							
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
15	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
16	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
19	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.01	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
5	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
6	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
7	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
8	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
15	0.16	0.18	0.16	0.20	0.16
16	0.13	0.18	0.13	0.21	0.13
3	0.15	0.15	0.17	0.01	0.01
4	0.01	0.16	0.01	0.21	0.01

Analysis begun on: Wed Jun 07 15:31:36 2023
Analysis ended on: Wed Jun 07 15:31:48 2023
Total elapsed time: 00:00:12

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 8
Number of nodes ........... 13
Number of links ........... 20
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-2yr                  INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
EXT1                        2.73    182.00      5.00    1.0000 London               OF1
P1                          1.62    405.75     62.00    2.0000 London               ST3
P2                          0.77    220.00     62.00    2.0000 London               CBMH20
P3                          0.66    188.00     62.00    2.0000 London               ST10
P4                          0.25    124.50      0.00   20.0000 London               DB_INFL
P5                          1.24    311.00     62.00    2.0000 London               ST2
ROW1                        0.34    169.00     79.00    2.0000 London               OF1
ROW2                        0.06     24.00    100.00    0.2000 London               ST4


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
CBMH18               JUNCTION       283.61      2.53       0.0
CBMH19               JUNCTION       283.84      2.31       0.0
CBMH20               JUNCTION       284.04      2.14       0.0
ST10                 JUNCTION       284.16      2.11       0.0
ST2                  JUNCTION       282.60      1.86       0.0
ST3                  JUNCTION       282.69      2.15       0.0
ST4                  JUNCTION       282.83      2.53       0.0
ST5                  JUNCTION       283.13      2.53       0.0
ST6                  JUNCTION       283.36      2.60       0.0
OF1                  OUTFALL          0.00      0.00       0.0
OF2                  OUTFALL        281.75      0.00       0.0
OF3                  OUTFALL        283.00      0.95       0.0
DB_INFL              STORAGE        281.75      2.35       0.0


************
Link Summary
************
Name                 From Node           To Node             Type           Length    %Slope Roughness
-----------------------------------------------------------------------------------------------------
15                   CBMH20              CBMH19              CONDUIT          33.5    0.5075    0.0130
16                   CBMH19              CBMH18              CONDUIT          40.7    0.4914    0.0130
19                   ST5                 ST4                 CONDUIT          37.5    0.4000    0.0130
2                    DB_INFL             OF3                 CONDUIT          15.0    2.6676    0.0300
3                    ST10                CBMH20              CONDUIT          18.3    0.4918    0.0130
4                    CBMH18              ST6                 CONDUIT          34.2    0.4971    0.0130
5                    ST6                 ST5                 CONDUIT          30.7    0.4886    0.0130
6                    ST4                 ST3                 CONDUIT          31.5    0.1905    0.0130
7                    ST3                 ST2                 CONDUIT          36.7    0.1907    0.0130
8                    ST2                 DB_INFL             CONDUIT          15.4    0.3896    0.0130
10                   CBMH18              ST6                 WEIR
11                   ST6                 ST5                 WEIR
```

DEL19-103: Watson Farm Condominium Development
2-year Design Storm Event – Proposed Conditions PCSWMM Output

```
12                   ST4                 ST3                 WEIR
13                   ST3                 ST2                 WEIR
14                   ST2                 DB_INFL             WEIR
17                   CBMH20              CBMH19              WEIR
18                   CBMH19              CBMH18              WEIR
20                   ST5                 ST4                 WEIR
9                    ST10                CBMH20              WEIR
1                    DB_INFL             OF2                 OUTLET


********************
Cross Section Summary
********************
                                      Full      Full      Hyd.      Max.   No. of      Full
Conduit              Shape           Depth      Area      Rad.     Width  Barrels      Flow
-------------------------------------------------------------------------------------------
15                   CIRCULAR         0.30      0.07      0.07      0.30       1     68.89
16                   CIRCULAR         0.30      0.07      0.07      0.30       1     67.79
19                   CIRCULAR         0.45      0.16      0.11      0.45       1    180.33
2                    CIRCULAR         0.45      0.16      0.11      0.45       1    201.80
3                    CIRCULAR         0.30      0.07      0.07      0.30       1     67.82
4                    CIRCULAR         0.30      0.07      0.07      0.30       1     68.18
5                    CIRCULAR         0.45      0.16      0.11      0.45       1    199.30
6                    CIRCULAR         0.60      0.28      0.15      0.60       1    267.99
7                    CIRCULAR         0.68      0.36      0.17      0.68       1    367.14
8                    CIRCULAR         0.68      0.36      0.17      0.68       1    524.72


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/13/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 0.50 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 2
Head Tolerance ........... 0.001500 m


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.328        42.751
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.168        21.942
Surface Runoff ...........         0.149        19.477
Final Storage ............         0.010         1.351
Continuity Error (%) .....        -0.047


**************************       Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.149         1.494
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

External Inflow	0.000	0.000
External Outflow	0.150	1.496
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.127	

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	0.50 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
EXT1	42.75	0.00	0.00	36.19	5.29	0.14	48.22	0.124
P1	42.75	0.00	0.00	13.50	27.87	0.45	279.46	0.652
P2	42.75	0.00	0.00	13.46	27.91	0.21	136.80	0.653
P3	42.75	0.00	0.00	13.46	27.91	0.18	116.90	0.653
P4	42.75	0.00	0.00	36.76	4.73	0.01	3.45	0.111
P5	42.75	0.00	0.00	13.50	27.87	0.35	214.20	0.652
ROW1	42.75	0.00	0.00	7.28	34.06	0.12	94.22	0.797
ROW2	42.75	0.00	0.00	0.00	42.02	0.03	19.34	0.983

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CBMH18	JUNCTION	0.02	1.87	285.48	0 01:15	1.86
CBMH19	JUNCTION	0.02	2.18	286.02	0 01:15	2.18
CBMH20	JUNCTION	0.02	2.02	286.06	0 01:10	2.02
ST10	JUNCTION	0.02	1.97	286.13	0 01:10	1.97
ST2	JUNCTION	0.05	0.57	283.17	0 01:15	0.57
ST3	JUNCTION	0.04	0.61	283.30	0 01:15	0.61
ST4	JUNCTION	0.03	0.51	283.34	0 01:15	0.51
ST5	JUNCTION	0.02	0.43	283.56	0 01:15	0.43
ST6	JUNCTION	0.02	0.39	283.75	0 01:15	0.39
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	281.75	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	283.00	0 00:00	0.00
DB_INFL	STORAGE	0.17	1.36	283.11	0 03:03	1.36

Node Inflow Summary

DEL19-103: Watson Farm Condominium Development
2-year Design Storm Event – Proposed Conditions PCSWMM Output

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CBMH18	JUNCTION	0.00	249.50	0 01:10	0	0.397	-0.001
CBMH19	JUNCTION	0.00	252.59	0 01:10	0	0.398	0.134
CBMH20	JUNCTION	136.80	253.61	0 01:10	0.215	0.399	0.180
ST10	JUNCTION	116.90	116.90	0 01:10	0.184	0.184	0.010
ST2	JUNCTION	214.20	664.57	0 01:15	0.347	1.22	-0.097
ST3	JUNCTION	279.46	475.67	0 01:15	0.452	0.875	0.058
ST4	JUNCTION	19.34	229.71	0 01:16	0.0252	0.424	0.164
ST5	JUNCTION	0.00	217.22	0 01:15	0	0.397	-0.272
ST6	JUNCTION	0.00	217.58	0 01:15	0	0.397	0.023
OF1	OUTFALL	142.43	142.43	0 01:10	0.26	0.26	0.000
OF2	OUTFALL	0.00	22.91	0 01:13	0	1.24	0.000
OF3	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
DB_INFL	STORAGE	3.45	663.96	0 01:15	0.0118	1.23	-0.168

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
DB_INFL	0.112	5	0	0	0.997	43	0 03:03	22.91

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	7.50	13.35	142.43	0.260
OF2	21.16	22.54	22.91	1.237
OF3	0.00	0.00	0.00	0.000
System	9.55	35.89	164.84	1.496

Link Flow Summary

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
15	CONDUIT	169.04	0 01:08	2.39	2.45	1.00
16	CONDUIT	184.88	0 01:10	2.62	2.73	1.00
19	CONDUIT	218.37	0 01:16	1.56	1.21	0.85
2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
3	CONDUIT	83.51	0 01:08	1.18	1.23	1.00
4	CONDUIT	217.58	0 01:15	3.08	3.19	1.00
5	CONDUIT	217.22	0 01:15	1.62	1.09	0.80
6	CONDUIT	237.97	0 01:16	0.99	0.89	0.85

7	CONDUIT	473.99	0	01:15	1.48	1.29	0.85
8	CONDUIT	663.96	0	01:15	2.17	1.27	0.80
10	WEIR	0.00	0	00:00			0.00
11	WEIR	0.00	0	00:00			0.00
12	WEIR	0.00	0	00:00			0.00
13	WEIR	0.00	0	00:00			0.00
14	WEIR	0.00	0	00:00			0.00
17	WEIR	197.42	0	01:10			0.25
18	WEIR	112.10	0	01:15			0.17
20	WEIR	0.00	0	00:00			0.00
9	WEIR	55.40	0	01:10			0.11
1	DUMMY	22.91	0	01:13			

****
Flow Classification Summary
****

	Adjusted /Actual	Fraction of Time in Flow Class								
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
15	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
16	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
19	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.03	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.01	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
5	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
6	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.91	0.01	0.00
7	1.00	0.00	0.00	0.00	0.11	0.00	0.00	0.89	0.01	0.00
8	1.00	0.00	0.00	0.00	0.11	0.00	0.00	0.89	0.01	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
15	0.44	0.46	0.44	0.31	0.28
16	0.42	0.45	0.42	0.48	0.42
19	0.01	0.01	0.01	0.13	0.01
3	0.44	0.44	0.45	0.03	0.03
4	0.15	0.44	0.15	0.48	0.15
5	0.01	0.01	0.01	0.09	0.01
7	0.01	0.01	0.01	0.16	0.01
8	0.01	0.01	0.01	0.16	0.01

Analysis begun on: Wed Jun 07 15:38:22 2023
Analysis ended on: Wed Jun 07 15:38:34 2023
Total elapsed time: 00:00:12

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 8
Number of nodes ........... 13
Number of links ........... 20
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-5yr                  INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
EXT1                        2.73    182.00      5.00    1.0000 London               OF1
P1                          1.62    405.75     62.00    2.0000 London               ST3
P2                          0.77    220.00     62.00    2.0000 London               CBMH20
P3                          0.66    188.00     62.00    2.0000 London               ST10
P4                          0.25    124.50      0.00   20.0000 London               DB_INFL
P5                          1.24    311.00     62.00    2.0000 London               ST2
ROW1                        0.34    169.00     79.00    2.0000 London               OF1
ROW2                        0.06     24.00    100.00    0.2000 London               ST4


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
CBMH18               JUNCTION       283.61      2.53       0.0
CBMH19               JUNCTION       283.84      2.31       0.0
CBMH20               JUNCTION       284.04      2.14       0.0
ST10                 JUNCTION       284.16      2.11       0.0
ST2                  JUNCTION       282.60      1.86       0.0
ST3                  JUNCTION       282.69      2.15       0.0
ST4                  JUNCTION       282.83      2.53       0.0
ST5                  JUNCTION       283.13      2.53       0.0
ST6                  JUNCTION       283.36      2.60       0.0
OF1                  OUTFALL          0.00      0.00       0.0
OF2                  OUTFALL        281.75      0.00       0.0
OF3                  OUTFALL        283.00      0.95       0.0
DB_INFL              STORAGE        281.75      2.35       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %Slope Roughness
-----------------------------------------------------------------------------------------------
15               CBMH20           CBMH19           CONDUIT           33.5    0.5075    0.0130
16               CBMH19           CBMH18           CONDUIT           40.7    0.4914    0.0130
19               ST5              ST4              CONDUIT           37.5    0.4000    0.0130
2                DB_INFL          OF3              CONDUIT           15.0    2.6676    0.0300
3                ST10             CBMH20           CONDUIT           18.3    0.4918    0.0130
4                CBMH18           ST6              CONDUIT           34.2    0.4971    0.0130
5                ST6              ST5              CONDUIT           30.7    0.4886    0.0130
6                ST4              ST3              CONDUIT           31.5    0.1905    0.0130
7                ST3              ST2              CONDUIT           36.7    0.1907    0.0130
8                ST2              DB_INFL          CONDUIT           15.4    0.3896    0.0130
10               CBMH18           ST6              WEIR
11               ST6              ST5              WEIR
```

DEL19-103: Watson Farm Condominium Development
5-year Design Storm Event – Proposed Conditions PCSWMM Output

```
12               ST4              ST3              WEIR
13               ST3              ST2              WEIR
14               ST2              DB_INFL          WEIR
17               CBMH20           CBMH19           WEIR
18               CBMH19           CBMH18           WEIR
20               ST5              ST4              WEIR
9                ST10             CBMH20           WEIR
1                DB_INFL          OF2              OUTLET


********************
Cross Section Summary
********************
                                          Full      Full      Hyd.      Max.   No. of      Full
Conduit              Shape               Depth      Area      Rad.     Width  Barrels      Flow
-------------------------------------------------------------------------------------------------
15                   CIRCULAR             0.30      0.07      0.07      0.30       1     68.89
16                   CIRCULAR             0.30      0.07      0.07      0.30       1     67.79
19                   CIRCULAR             0.45      0.16      0.11      0.45       1    180.33
2                    CIRCULAR             0.45      0.16      0.11      0.45       1    201.80
3                    CIRCULAR             0.30      0.07      0.07      0.30       1     67.82
4                    CIRCULAR             0.30      0.07      0.07      0.30       1     68.18
5                    CIRCULAR             0.45      0.16      0.11      0.45       1    199.30
6                    CIRCULAR             0.60      0.28      0.15      0.60       1    267.99
7                    CIRCULAR             0.68      0.36      0.17      0.68       1    367.14
8                    CIRCULAR             0.68      0.36      0.17      0.68       1    524.72


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/13/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 0.50 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 2
Head Tolerance ........... 0.001500 m


*************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.348        45.373
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.176        22.947
Surface Runoff ...........         0.162        21.099
Final Storage ............         0.010         1.348
Continuity Error (%) .....        -0.050


*************************       Volume       Volume
Flow Routing Continuity        hectare-m    10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.162         1.619
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

External Inflow	0.000	0.000
External Outflow	0.162	1.620
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.113	

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	0.50 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
EXT1	45.37	0.00	0.00	37.92	6.19	0.17	52.18	0.137
P1	45.37	0.00	0.00	14.08	29.91	0.49	308.55	0.659
P2	45.37	0.00	0.00	14.05	29.95	0.23	151.05	0.660
P3	45.37	0.00	0.00	14.05	29.95	0.20	129.08	0.660
P4	45.37	0.00	0.00	38.29	5.83	0.01	4.63	0.129
P5	45.37	0.00	0.00	14.08	29.91	0.37	236.50	0.659
ROW1	45.37	0.00	0.00	7.60	36.37	0.12	101.98	0.802
ROW2	45.37	0.00	0.00	0.00	44.65	0.03	21.05	0.984

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CBMH18	JUNCTION	0.02	2.28	285.89	0 01:15	2.28
CBMH19	JUNCTION	0.02	2.19	286.03	0 01:15	2.19
CBMH20	JUNCTION	0.02	2.02	286.06	0 01:10	2.02
ST10	JUNCTION	0.02	1.97	286.13	0 01:10	1.97
ST2	JUNCTION	0.06	0.61	283.21	0 01:15	0.61
ST3	JUNCTION	0.05	0.66	283.35	0 01:15	0.66
ST4	JUNCTION	0.03	0.56	283.39	0 01:15	0.56
ST5	JUNCTION	0.02	0.50	283.63	0 01:15	0.50
ST6	JUNCTION	0.02	0.47	283.83	0 01:15	0.46
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	281.75	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	283.00	0 00:00	0.00
DB_INFL	STORAGE	0.19	1.44	283.19	0 03:04	1.44

Node Inflow Summary

DEL19-103: Watson Farm Condominium Development
5-year Design Storm Event – Proposed Conditions PCSWMM Output

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CBMH18	JUNCTION	0.00	279.11	0 01:10	0	0.427	0.081
CBMH19	JUNCTION	0.00	279.91	0 01:10	0	0.427	0.124
CBMH20	JUNCTION	151.05	280.08	0 01:10	0.231	0.428	0.144
ST10	JUNCTION	129.08	129.08	0 01:10	0.197	0.197	0.010
ST2	JUNCTION	236.50	725.67	0 01:15	0.372	1.31	-0.092
ST3	JUNCTION	308.55	519.68	0 01:15	0.486	0.939	0.033
ST4	JUNCTION	21.05	251.16	0 01:15	0.0268	0.454	0.229
ST5	JUNCTION	0.00	237.23	0 01:15	0	0.426	-0.295
ST6	JUNCTION	0.00	237.82	0 01:15	0	0.426	0.021
OF1	OUTFALL	154.17	154.17	0 01:10	0.292	0.292	0.000
OF2	OUTFALL	0.00	22.91	0 01:12	0	1.33	0.000
OF3	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
DB_INFL	STORAGE	4.63	725.23	0 01:15	0.0145	1.33	-0.166

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
DB_INFL	0.130	6	0	0	1.082	47	0 03:04	22.91

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	7.63	14.76	154.17	0.292
OF2	22.71	22.57	22.91	1.328
OF3	0.00	0.00	0.00	0.000
System	10.11	37.33	176.64	1.620

Link Flow Summary

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
15	CONDUIT	172.04	0 01:08	2.43	2.50	1.00
16	CONDUIT	186.80	0 01:09	2.64	2.76	1.00
19	CONDUIT	238.30	0 01:15	1.57	1.32	0.95
2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
3	CONDUIT	85.73	0 01:08	1.21	1.26	1.00
4	CONDUIT	237.82	0 01:15	3.36	3.49	1.00
5	CONDUIT	237.23	0 01:15	1.60	1.19	0.96
6	CONDUIT	259.17	0 01:16	1.00	0.97	0.93

7	CONDUIT	518.43	0	01:15	1.53	1.41	0.91
8	CONDUIT	725.10	0	01:15	2.26	1.38	0.90
10	WEIR	0.00	0	00:00			0.00
11	WEIR	0.00	0	00:00			0.00
12	WEIR	0.00	0	00:00			0.00
13	WEIR	0.00	0	00:00			0.00
14	WEIR	0.00	0	00:00			0.00
17	WEIR	239.60	0	01:10			0.28
18	WEIR	185.07	0	01:15			0.24
20	WEIR	0.00	0	00:00			0.00
9	WEIR	70.38	0	01:10			0.12
1	DUMMY	22.91	0	01:12			

****
Flow Classification Summary
****

	Adjusted /Actual	Fraction of Time in Flow Class							
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
15	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
16	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
19	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.94	0.05	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.01	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
5	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
6	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.90	0.01	0.00
7	1.00	0.00	0.00	0.00	0.13	0.00	0.00	0.87	0.01	0.00
8	1.00	0.00	0.00	0.00	0.13	0.00	0.00	0.87	0.01	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
15	0.46	0.47	0.46	0.30	0.27
16	0.44	0.47	0.44	0.47	0.41
19	0.01	0.08	0.01	0.16	0.01
3	0.45	0.45	0.47	0.03	0.03
4	0.18	0.46	0.18	0.50	0.18
5	0.01	0.02	0.01	0.12	0.01
7	0.01	0.01	0.01	0.19	0.01
8	0.01	0.01	0.01	0.19	0.01

Analysis begun on: Wed Jun 07 15:39:04 2023
Analysis ended on: Wed Jun 07 15:39:16 2023
Total elapsed time: 00:00:12

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 8
Number of nodes ........... 13
Number of links ........... 20
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-10yr                 INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
EXT1                        2.73    182.00      5.00    1.0000 London               OF1
P1                          1.62    405.75     62.00    2.0000 London               ST3
P2                          0.77    220.00     62.00    2.0000 London               CBMH20
P3                          0.66    188.00     62.00    2.0000 London               ST10
P4                          0.25    124.50      0.00   20.0000 London               DB_INFL
P5                          1.24    311.00     62.00    2.0000 London               ST2
ROW1                        0.34    169.00     79.00    2.0000 London               OF1
ROW2                        0.06     24.00    100.00    0.2000 London               ST4


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
CBMH18               JUNCTION       283.61      2.53       0.0
CBMH19               JUNCTION       283.84      2.31       0.0
CBMH20               JUNCTION       284.04      2.14       0.0
ST10                 JUNCTION       284.16      2.11       0.0
ST2                  JUNCTION       282.60      1.86       0.0
ST3                  JUNCTION       282.69      2.15       0.0
ST4                  JUNCTION       282.83      2.53       0.0
ST5                  JUNCTION       283.13      2.53       0.0
ST6                  JUNCTION       283.36      2.60       0.0
OF1                  OUTFALL          0.00      0.00       0.0
OF2                  OUTFALL        281.75      0.00       0.0
OF3                  OUTFALL        283.00      0.95       0.0
DB_INFL              STORAGE        281.75      2.35       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %Slope Roughness
-----------------------------------------------------------------------------------------------
15               CBMH20           CBMH19           CONDUIT           33.5    0.5075    0.0130
16               CBMH19           CBMH18           CONDUIT           40.7    0.4914    0.0130
19               ST5              ST4              CONDUIT           37.5    0.4000    0.0130
2                DB_INFL          OF3              CONDUIT           15.0    2.6676    0.0300
3                ST10             CBMH20           CONDUIT           18.3    0.4918    0.0130
4                CBMH18           ST6              CONDUIT           34.2    0.4971    0.0130
5                ST6              ST5              CONDUIT           30.7    0.4886    0.0130
6                ST4              ST3              CONDUIT           31.5    0.1905    0.0130
7                ST3              ST2              CONDUIT           36.7    0.1907    0.0130
8                ST2              DB_INFL          CONDUIT           15.4    0.3896    0.0130
10               CBMH18           ST6              WEIR
11               ST6              ST5              WEIR
```

DEL19-103: Watson Farm Condominium Development
10-year Design Storm Event – Proposed Conditions PCSWMM Output

```
12               ST4              ST3              WEIR
13               ST3              ST2              WEIR
14               ST2              DB_INFL          WEIR
17               CBMH20           CBMH19           WEIR
18               CBMH19           CBMH18           WEIR
20               ST5              ST4              WEIR
9                ST10             CBMH20           WEIR
1                DB_INFL          OF2              OUTLET


********************
Cross Section Summary
********************
                                          Full      Full      Hyd.      Max.   No. of      Full
Conduit              Shape                Depth      Area      Rad.     Width  Barrels      Flow
-------------------------------------------------------------------------------------------------
15                   CIRCULAR              0.30      0.07      0.07      0.30       1     68.89
16                   CIRCULAR              0.30      0.07      0.07      0.30       1     67.79
19                   CIRCULAR              0.45      0.16      0.11      0.45       1    180.33
2                    CIRCULAR              0.45      0.16      0.11      0.45       1    201.80
3                    CIRCULAR              0.30      0.07      0.07      0.30       1     67.82
4                    CIRCULAR              0.30      0.07      0.07      0.30       1     68.18
5                    CIRCULAR              0.45      0.16      0.11      0.45       1    199.30
6                    CIRCULAR              0.60      0.28      0.15      0.60       1    267.99
7                    CIRCULAR              0.68      0.36      0.17      0.68       1    367.14
8                    CIRCULAR              0.68      0.36      0.17      0.68       1    524.72


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/13/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 0.50 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 2
Head Tolerance ........... 0.001500 m


*************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.404        52.597
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.196        25.527
Surface Runoff ...........         0.198        25.746
Final Storage ............         0.010         1.353
Continuity Error (%) .....        -0.056


*************************       Volume       Volume
Flow Routing Continuity        hectare-m    10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.198         1.975
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

External Inflow	0.000	0.000
External Outflow	0.198	1.978
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.136	

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	0.50 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
EXT1	52.60	0.00	0.00	42.31	9.02	0.25	63.30	0.171
P1	52.60	0.00	0.00	15.60	35.62	0.58	387.95	0.677
P2	52.60	0.00	0.00	15.56	35.67	0.27	189.89	0.678
P3	52.60	0.00	0.00	15.56	35.67	0.23	162.27	0.678
P4	52.60	0.00	0.00	42.26	9.09	0.02	8.98	0.173
P5	52.60	0.00	0.00	15.60	35.62	0.44	297.36	0.677
ROW1	52.60	0.00	0.00	8.43	42.78	0.14	123.15	0.813
ROW2	52.60	0.00	0.00	0.00	51.88	0.03	25.55	0.986

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CBMH18	JUNCTION	0.02	2.39	286.00	0 01:10	2.39
CBMH19	JUNCTION	0.03	2.20	286.04	0 01:10	2.20
CBMH20	JUNCTION	0.03	2.03	286.07	0 01:10	2.03
ST10	JUNCTION	0.02	1.97	286.13	0 01:10	1.97
ST2	JUNCTION	0.09	0.80	283.40	0 03:05	0.80
ST3	JUNCTION	0.08	0.88	283.57	0 01:10	0.88
ST4	JUNCTION	0.06	0.84	283.67	0 01:11	0.84
ST5	JUNCTION	0.03	0.96	284.09	0 01:11	0.95
ST6	JUNCTION	0.02	1.08	284.44	0 01:11	1.07
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	281.75	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	283.00	0 00:00	0.00
DB_INFL	STORAGE	0.26	1.65	283.40	0 03:05	1.65

Node Inflow Summary

DEL19-103: Watson Farm Condominium Development
10-year Design Storm Event – Proposed Conditions PCSWMM Output

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CBMH18	JUNCTION	0.00	351.16	0 01:10	0	0.509	0.110
CBMH19	JUNCTION	0.00	351.82	0 01:10	0	0.509	0.061
CBMH20	JUNCTION	189.89	352.10	0 01:10	0.275	0.509	0.048
ST10	JUNCTION	162.27	162.27	0 01:10	0.235	0.235	0.006
ST2	JUNCTION	297.36	921.07	0 01:11	0.443	1.56	-0.080
ST3	JUNCTION	387.95	662.48	0 01:11	0.578	1.12	-0.005
ST4	JUNCTION	25.55	325.73	0 01:11	0.0311	0.54	0.137
ST5	JUNCTION	0.00	304.64	0 01:11	0	0.508	-0.207
ST6	JUNCTION	0.00	350.24	0 01:10	0	0.508	0.076
OF1	OUTFALL	186.45	186.45	0 01:10	0.391	0.391	0.000
OF2	OUTFALL	0.00	22.91	0 01:11	0	1.59	0.000
OF3	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
DB_INFL	STORAGE	8.98	921.19	0 01:11	0.0226	1.58	-0.157

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
DB_INFL	0.187	8	0	0	1.322	57	0 03:05	22.91

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	7.95	18.95	186.45	0.391
OF2	27.06	22.63	22.91	1.587
OF3	0.00	0.00	0.00	0.000
System	11.67	41.58	209.13	1.978

Link Flow Summary

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
15	CONDUIT	177.80	0 01:07	2.52	2.58	1.00
16	CONDUIT	190.93	0 01:08	2.70	2.82	1.00
19	CONDUIT	305.34	0 01:11	1.92	1.69	1.00
2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
3	CONDUIT	90.32	0 01:07	1.28	1.33	1.00
4	CONDUIT	243.06	0 01:09	3.44	3.56	1.00
5	CONDUIT	304.64	0 01:11	1.92	1.53	1.00
6	CONDUIT	328.83	0 01:11	1.16	1.23	1.00

7	CONDUIT	663.93	0	01:11	1.86	1.81	1.00
8	CONDUIT	921.16	0	01:11	2.64	1.76	1.00
10	WEIR	121.65	0	01:10			0.18
11	WEIR	0.00	0	00:00			0.00
12	WEIR	0.00	0	00:00			0.00
13	WEIR	0.00	0	00:00			0.00
14	WEIR	0.00	0	00:00			0.00
17	WEIR	319.36	0	01:10			0.36
18	WEIR	305.49	0	01:10			0.34
20	WEIR	0.00	0	00:00			0.00
9	WEIR	106.40	0	01:10			0.16
1	DUMMY	22.91	0	01:11			

****
Flow Classification Summary
****

	Adjusted /Actual	Fraction of Time in Flow Class							
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
15	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
16	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
19	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.89	0.03	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.02	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
5	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.94	0.05	0.00
6	1.00	0.00	0.00	0.00	0.15	0.00	0.00	0.85	0.01	0.00
7	1.00	0.00	0.00	0.00	0.17	0.00	0.00	0.83	0.01	0.00
8	1.00	0.00	0.00	0.00	0.17	0.00	0.00	0.83	0.01	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
15	0.51	0.52	0.51	0.33	0.27
16	0.49	0.52	0.49	0.43	0.36
19	0.12	0.15	0.12	0.21	0.12
3	0.50	0.50	0.51	0.02	0.02
4	0.23	0.51	0.23	0.57	0.23
5	0.13	0.14	0.13	0.19	0.13
6	0.12	0.12	0.95	0.12	0.11
7	1.08	1.11	2.71	0.24	0.09
8	3.00	3.11	4.06	0.24	0.01

Analysis begun on: Wed Jun 07 15:39:58 2023
Analysis ended on: Wed Jun 07 15:40:10 2023
Total elapsed time: 00:00:12

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 8
Number of nodes ........... 13
Number of links ........... 20
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-25yr                 INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
EXT1                        2.73    182.00      5.00    1.0000 London               OF1
P1                          1.62    405.75     62.00    2.0000 London               ST3
P2                          0.77    220.00     62.00    2.0000 London               CBMH20
P3                          0.66    188.00     62.00    2.0000 London               ST10
P4                          0.25    124.50      0.00   20.0000 London               DB_INFL
P5                          1.24    311.00     62.00    2.0000 London               ST2
ROW1                        0.34    169.00     79.00    2.0000 London               OF1
ROW2                        0.06     24.00    100.00    0.2000 London               ST4


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
CBMH18               JUNCTION       283.61      2.53       0.0
CBMH19               JUNCTION       283.84      2.31       0.0
CBMH20               JUNCTION       284.04      2.14       0.0
ST10                 JUNCTION       284.16      2.11       0.0
ST2                  JUNCTION       282.60      1.86       0.0
ST3                  JUNCTION       282.69      2.15       0.0
ST4                  JUNCTION       282.83      2.53       0.0
ST5                  JUNCTION       283.13      2.53       0.0
ST6                  JUNCTION       283.36      2.60       0.0
OF1                  OUTFALL          0.00      0.00       0.0
OF2                  OUTFALL        281.75      0.00       0.0
OF3                  OUTFALL        283.00      0.95       0.0
DB_INFL              STORAGE        281.75      2.35       0.0


************
Link Summary
************
Name                 From Node           To Node             Type           Length    %Slope Roughness
-------------------------------------------------------------------------------------------------------
15                   CBMH20              CBMH19              CONDUIT          33.5    0.5075    0.0130
16                   CBMH19              CBMH18              CONDUIT          40.7    0.4914    0.0130
19                   ST5                 ST4                 CONDUIT          37.5    0.4000    0.0130
2                    DB_INFL             OF3                 CONDUIT          15.0    2.6676    0.0300
3                    ST10                CBMH20              CONDUIT          18.3    0.4918    0.0130
4                    CBMH18              ST6                 CONDUIT          34.2    0.4971    0.0130
5                    ST6                 ST5                 CONDUIT          30.7    0.4886    0.0130
6                    ST4                 ST3                 CONDUIT          31.5    0.1905    0.0130
7                    ST3                 ST2                 CONDUIT          36.7    0.1907    0.0130
8                    ST2                 DB_INFL             CONDUIT          15.4    0.3896    0.0130
10                   CBMH18              ST6                 WEIR
11                   ST6                 ST5                 WEIR
```

DEL19-103: Watson Farm Condominium Development
25-year Design Storm Event – Proposed Conditions PCSWMM Output

```
12                   ST4                 ST3                 WEIR
13                   ST3                 ST2                 WEIR
14                   ST2                 DB_INFL             WEIR
17                   CBMH20              CBMH19              WEIR
18                   CBMH19              CBMH18              WEIR
20                   ST5                 ST4                 WEIR
9                    ST10                CBMH20              WEIR
1                    DB_INFL             OF2                 OUTLET


********************
Cross Section Summary
********************
                                          Full      Full      Hyd.      Max.   No. of      Full
Conduit              Shape                Depth      Area      Rad.     Width  Barrels      Flow
-------------------------------------------------------------------------------------------------
15                   CIRCULAR              0.30      0.07      0.07      0.30       1     68.89
16                   CIRCULAR              0.30      0.07      0.07      0.30       1     67.79
19                   CIRCULAR              0.45      0.16      0.11      0.45       1    180.33
2                    CIRCULAR              0.45      0.16      0.11      0.45       1    201.80
3                    CIRCULAR              0.30      0.07      0.07      0.30       1     67.82
4                    CIRCULAR              0.30      0.07      0.07      0.30       1     68.18
5                    CIRCULAR              0.45      0.16      0.11      0.45       1    199.30
6                    CIRCULAR              0.60      0.28      0.15      0.60       1    267.99
7                    CIRCULAR              0.68      0.36      0.17      0.68       1    367.14
8                    CIRCULAR              0.68      0.36      0.17      0.68       1    524.72


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/13/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 0.50 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 2
Head Tolerance ........... 0.001500 m


*************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.463        60.381
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.216        28.152
Surface Runoff ...........         0.237        30.926
Final Storage ............         0.010         1.346
Continuity Error (%) .....        -0.070


*************************       Volume       Volume
Flow Routing Continuity        hectare-m    10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.237         2.373
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

External Inflow	0.000	0.000
External Outflow	0.238	2.375
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.116	

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	0.50 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
EXT1	60.38	0.00	0.00	46.79	12.34	0.34	80.10	0.204
P1	60.38	0.00	0.00	17.15	41.88	0.68	497.73	0.694
P2	60.38	0.00	0.00	17.11	41.93	0.32	243.50	0.694
P3	60.38	0.00	0.00	17.11	41.93	0.28	208.08	0.694
P4	60.38	0.00	0.00	46.25	12.90	0.03	14.66	0.214
P5	60.38	0.00	0.00	17.15	41.88	0.52	381.50	0.694
ROW1	60.38	0.00	0.00	9.27	49.75	0.17	153.67	0.824
ROW2	60.38	0.00	0.00	0.00	59.68	0.04	31.73	0.988

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CBMH18	JUNCTION	0.02	2.41	286.02	0 01:10	2.41
CBMH19	JUNCTION	0.03	2.22	286.06	0 01:10	2.22
CBMH20	JUNCTION	0.03	2.05	286.09	0 01:10	2.05
ST10	JUNCTION	0.03	1.98	286.14	0 01:10	1.98
ST2	JUNCTION	0.14	1.01	283.61	0 03:06	1.01
ST3	JUNCTION	0.12	1.20	283.89	0 01:10	1.19
ST4	JUNCTION	0.09	1.22	284.05	0 01:10	1.21
ST5	JUNCTION	0.05	1.63	284.76	0 01:10	1.63
ST6	JUNCTION	0.03	1.98	285.34	0 01:10	1.98
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	281.75	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	283.00	0 00:00	0.00
DB_INFL	STORAGE	0.35	1.86	283.61	0 03:07	1.86

Node Inflow Summary

DEL19-103: Watson Farm Condominium Development
25-year Design Storm Event – Proposed Conditions PCSWMM Output

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CBMH18	JUNCTION	0.00	451.00	0 01:10	0	0.598	0.156
CBMH19	JUNCTION	0.00	451.27	0 01:10	0	0.599	0.048
CBMH20	JUNCTION	243.50	451.51	0 01:10	0.323	0.599	0.039
ST10	JUNCTION	208.08	208.08	0 01:10	0.276	0.276	0.009
ST2	JUNCTION	381.50	1207.65	0 01:10	0.521	1.83	-0.048
ST3	JUNCTION	497.73	858.58	0 01:10	0.68	1.31	-0.009
ST4	JUNCTION	31.73	422.56	0 01:11	0.0358	0.634	0.022
ST5	JUNCTION	0.00	401.87	0 01:10	0	0.597	-0.133
ST6	JUNCTION	0.00	450.50	0 01:10	0	0.597	0.061
OF1	OUTFALL	233.77	233.77	0 01:10	0.505	0.505	0.000
OF2	OUTFALL	0.00	22.91	0 01:10	0	1.87	0.000
OF3	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
DB_INFL	STORAGE	14.66	1210.44	0 01:10	0.0321	1.87	-0.151

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
DB_INFL	0.262	11	0	0	1.587	69	0 03:07	22.91

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	7.96	24.49	233.77	0.505
OF2	31.82	22.67	22.91	1.870
OF3	0.00	0.00	0.00	0.000
System	13.26	47.16	256.68	2.375

Link Flow Summary

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
15	CONDUIT	182.77	0 01:06	2.59	2.65	1.00
16	CONDUIT	194.77	0 01:07	2.76	2.87	1.00
19	CONDUIT	397.40	0 01:11	2.50	2.20	1.00
2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
3	CONDUIT	94.91	0 01:06	1.34	1.40	1.00
4	CONDUIT	242.25	0 01:08	3.43	3.55	1.00
5	CONDUIT	401.87	0 01:10	2.53	2.02	1.00
6	CONDUIT	433.62	0 01:11	1.53	1.62	1.00

7	CONDUIT	864.20	0	01:10	2.41	2.35	1.00
8	CONDUIT	1208.73	0	01:10	3.40	2.30	1.00
10	WEIR	292.83	0	01:10			0.32
11	WEIR	0.00	0	00:00			0.00
12	WEIR	0.00	0	00:00			0.00
13	WEIR	0.00	0	00:00			0.00
14	WEIR	0.00	0	00:00			0.00
17	WEIR	420.70	0	01:10			0.46
18	WEIR	420.25	0	01:10			0.44
20	WEIR	0.00	0	00:00			0.00
9	WEIR	156.03	0	01:10			0.21
1	DUMMY	22.91	0	01:10			

****
Flow Classification Summary
****

	Adjusted /Actual	Fraction of Time in Flow Class							
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
15	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
16	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
19	1.00	0.00	0.00	0.00	0.15	0.00	0.00	0.84	0.04	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.02	0.00
4	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.05	0.00
5	1.00	0.00	0.00	0.00	0.11	0.00	0.00	0.89	0.04	0.00
6	1.00	0.00	0.00	0.00	0.19	0.00	0.00	0.81	0.01	0.00
7	1.00	0.00	0.00	0.00	0.22	0.00	0.00	0.78	0.01	0.00
8	1.00	0.00	0.00	0.00	0.22	0.00	0.00	0.78	0.01	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
15	0.54	0.57	0.54	0.34	0.28
16	0.52	0.57	0.52	0.44	0.35
19	0.96	1.00	4.33	0.24	0.16
3	0.53	0.53	0.55	0.02	0.02
4	0.27	0.54	0.27	0.61	0.27
5	0.17	0.18	0.17	0.22	0.17
6	4.33	4.33	5.42	0.16	0.15
7	5.47	5.50	6.61	0.27	0.14
8	6.78	6.94	7.68	0.27	0.01

Analysis begun on: Wed Jun 07 15:40:44 2023
Analysis ended on: Wed Jun 07 15:40:55 2023
Total elapsed time: 00:00:11

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 8
Number of nodes ........... 13
Number of links ........... 20
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-50yr                 INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
EXT1                        2.73    182.00      5.00    1.0000 London               OF1
P1                          1.62    405.75     62.00    2.0000 London               ST3
P2                          0.77    220.00     62.00    2.0000 London               CBMH20
P3                          0.66    188.00     62.00    2.0000 London               ST10
P4                          0.25    124.50      0.00   20.0000 London               DB_INFL
P5                          1.24    311.00     62.00    2.0000 London               ST2
ROW1                        0.34    169.00     79.00    2.0000 London               OF1
ROW2                        0.06     24.00    100.00    0.2000 London               ST4


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
CBMH18               JUNCTION       283.61      2.53       0.0
CBMH19               JUNCTION       283.84      2.31       0.0
CBMH20               JUNCTION       284.04      2.14       0.0
ST10                 JUNCTION       284.16      2.11       0.0
ST2                  JUNCTION       282.60      1.86       0.0
ST3                  JUNCTION       282.69      2.15       0.0
ST4                  JUNCTION       282.83      2.53       0.0
ST5                  JUNCTION       283.13      2.53       0.0
ST6                  JUNCTION       283.36      2.60       0.0
OF1                  OUTFALL          0.00      0.00       0.0
OF2                  OUTFALL        281.75      0.00       0.0
OF3                  OUTFALL        283.00      0.95       0.0
DB_INFL              STORAGE        281.75      2.35       0.0


************
Link Summary
************
Name                 From Node           To Node             Type           Length    %Slope Roughness
-----------------------------------------------------------------------------------------------------
15                   CBMH20              CBMH19              CONDUIT          33.5    0.5075    0.0130
16                   CBMH19              CBMH18              CONDUIT          40.7    0.4914    0.0130
19                   ST5                 ST4                 CONDUIT          37.5    0.4000    0.0130
2                    DB_INFL             OF3                 CONDUIT          15.0    2.6676    0.0300
3                    ST10                CBMH20              CONDUIT          18.3    0.4918    0.0130
4                    CBMH18              ST6                 CONDUIT          34.2    0.4971    0.0130
5                    ST6                 ST5                 CONDUIT          30.7    0.4886    0.0130
6                    ST4                 ST3                 CONDUIT          31.5    0.1905    0.0130
7                    ST3                 ST2                 CONDUIT          36.7    0.1907    0.0130
8                    ST2                 DB_INFL             CONDUIT          15.4    0.3896    0.0130
10                   CBMH18              ST6                 WEIR
11                   ST6                 ST5                 WEIR
```

DEL19-103: Watson Farm Condominium Development
50-year Design Storm Event – Proposed Conditions PCSWMM Output

```
12                   ST4                 ST3                 WEIR
13                   ST3                 ST2                 WEIR
14                   ST2                 DB_INFL             WEIR
17                   CBMH20              CBMH19              WEIR
18                   CBMH19              CBMH18              WEIR
20                   ST5                 ST4                 WEIR
9                    ST10                CBMH20              WEIR
1                    DB_INFL             OF2                 OUTLET


********************
Cross Section Summary
********************
                                    Full      Full      Hyd.      Max.   No. of      Full
Conduit              Shape         Depth      Area      Rad.     Width  Barrels      Flow
-----------------------------------------------------------------------------------------
15                   CIRCULAR       0.30      0.07      0.07      0.30       1     68.89
16                   CIRCULAR       0.30      0.07      0.07      0.30       1     67.79
19                   CIRCULAR       0.45      0.16      0.11      0.45       1    180.33
2                    CIRCULAR       0.45      0.16      0.11      0.45       1    201.80
3                    CIRCULAR       0.30      0.07      0.07      0.30       1     67.82
4                    CIRCULAR       0.30      0.07      0.07      0.30       1     68.18
5                    CIRCULAR       0.45      0.16      0.11      0.45       1    199.30
6                    CIRCULAR       0.60      0.28      0.15      0.60       1    267.99
7                    CIRCULAR       0.68      0.36      0.17      0.68       1    367.14
8                    CIRCULAR       0.68      0.36      0.17      0.68       1    524.72


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/13/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 0.50 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 2
Head Tolerance ........... 0.001500 m


*************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.507        66.122
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.229        29.912
Surface Runoff ...........         0.268        34.905
Final Storage ............         0.010         1.357
Continuity Error (%) .....        -0.078


*************************       Volume       Volume
Flow Routing Continuity        hectare-m    10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.268         2.678
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

```
External Inflow .....          0.000          0.000
External Outflow .....         0.268          2.680
Flooding Loss .....            0.000          0.000
Evaporation Loss .....         0.000          0.000
Exfiltration Loss .....        0.000          0.000
Initial Stored Volume ....     0.000          0.000
Final Stored Volume .....      0.000          0.000
Continuity Error (%) .....     -0.087
```

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

```
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.50 sec
Maximum Time Step           :     0.50 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.00
```

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
EXT1	66.12	0.00	0.00	49.77	15.08	0.41	93.08	0.228
P1	66.12	0.00	0.00	18.20	46.59	0.76	579.29	0.705
P2	66.12	0.00	0.00	18.16	46.64	0.36	283.26	0.705
P3	66.12	0.00	0.00	18.16	46.64	0.31	242.06	0.705
P4	66.12	0.00	0.00	48.96	15.91	0.04	21.84	0.241
P5	66.12	0.00	0.00	18.20	46.59	0.58	444.02	0.705
ROW1	66.12	0.00	0.00	9.83	54.94	0.19	175.87	0.831
ROW2	66.12	0.00	0.00	0.00	65.43	0.04	36.16	0.990

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CBMH18	JUNCTION	0.03	2.42	286.03	0 01:10	2.42
CBMH19	JUNCTION	0.03	2.23	286.07	0 01:10	2.23
CBMH20	JUNCTION	0.03	2.06	286.10	0 01:10	2.06
ST10	JUNCTION	0.03	1.99	286.15	0 01:10	1.99
ST2	JUNCTION	0.18	1.16	283.76	0 03:06	1.16
ST3	JUNCTION	0.16	1.49	284.18	0 01:10	1.47
ST4	JUNCTION	0.13	1.57	284.40	0 01:10	1.55
ST5	JUNCTION	0.07	2.25	285.38	0 01:10	2.23
ST6	JUNCTION	0.04	2.47	285.83	0 01:10	2.46
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	281.75	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	283.00	0 00:00	0.00
DB_INFL	STORAGE	0.42	2.01	283.76	0 03:08	2.01

Node Inflow Summary

DEL19-103: Watson Farm Condominium Development
50-year Design Storm Event – Proposed Conditions PCSWMM Output

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CBMH18	JUNCTION	0.00	524.52	0 01:10	0	0.665	0.125
CBMH19	JUNCTION	0.00	524.90	0 01:10	0	0.666	0.109
CBMH20	JUNCTION	283.26	525.24	0 01:10	0.359	0.666	0.040
ST10	JUNCTION	242.06	242.06	0 01:10	0.307	0.307	0.007
ST2	JUNCTION	444.02	1399.00	0 01:10	0.58	2.04	-0.051
ST3	JUNCTION	579.29	1005.17	0 01:10	0.756	1.46	-0.014
ST4	JUNCTION	36.16	491.89	0 01:10	0.0393	0.703	-0.050
ST5	JUNCTION	0.00	522.25	0 01:10	0	0.663	-0.008
ST6	JUNCTION	0.00	523.99	0 01:10	0	0.664	0.108
OF1	OUTFALL	268.94	268.94	0 01:10	0.597	0.597	0.000
OF2	OUTFALL	0.00	22.91	0 01:09	0	2.08	0.000
OF3	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
DB_INFL	STORAGE	21.84	1405.87	0 01:10	0.0396	2.08	-0.150

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
DB_INFL	0.326	14	0	0	1.787	78	0 03:08	22.91

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	8.02	28.75	268.94	0.597
OF2	35.39	22.70	22.91	2.083
OF3	0.00	0.00	0.00	0.000
System	14.47	51.45	291.85	2.680

Link Flow Summary

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
15	CONDUIT	184.55	0 01:06	2.61	2.68	1.00
16	CONDUIT	196.37	0 01:07	2.78	2.90	1.00
19	CONDUIT	461.93	0 01:10	2.90	2.56	1.00
2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
3	CONDUIT	96.93	0 01:06	1.37	1.43	1.00
4	CONDUIT	241.63	0 01:08	3.42	3.54	1.00
5	CONDUIT	456.82	0 01:10	2.87	2.29	1.00
6	CONDUIT	508.20	0 01:11	1.80	1.90	1.00

7	CONDUIT	1008.40	0	01:10	2.82	2.75	1.00
8	CONDUIT	1398.71	0	01:10	3.91	2.67	1.00
10	WEIR	438.48	0	01:10			0.42
11	WEIR	114.65	0	01:10			0.17
12	WEIR	0.00	0	00:00			0.00
13	WEIR	0.00	0	00:00			0.00
14	WEIR	0.00	0	00:00			0.00
17	WEIR	494.70	0	01:10			0.54
18	WEIR	495.28	0	01:10			0.52
20	WEIR	0.00	0	00:00			0.00
9	WEIR	192.92	0	01:10			0.24
1	DUMMY	22.91	0	01:09			

****
Flow Classification Summary
****

	Adjusted /Actual	Fraction of Time in Flow Class							
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
15	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
16	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.03	0.00
19	1.00	0.00	0.00	0.00	0.19	0.00	0.00	0.81	0.04	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.02	0.00
4	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.91	0.05	0.00
5	1.00	0.00	0.00	0.00	0.15	0.00	0.00	0.85	0.04	0.00
6	1.00	0.00	0.00	0.00	0.23	0.00	0.00	0.77	0.01	0.00
7	1.00	0.00	0.00	0.00	0.26	0.00	0.00	0.74	0.01	0.00
8	1.00	0.00	0.00	0.00	0.25	0.00	0.00	0.75	0.01	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
15	0.59	0.61	0.59	0.35	0.30
16	0.55	0.61	0.55	0.44	0.35
19	4.46	4.50	7.22	0.25	0.19
3	0.57	0.57	0.59	0.02	0.02
4	0.29	0.58	0.69	0.65	0.29
5	0.19	0.21	2.74	0.24	0.19
6	7.21	7.22	8.20	0.19	0.18
7	8.26	8.29	9.31	0.28	0.17
8	9.50	9.63	10.37	0.28	0.05

Analysis begun on: Wed Jun 07 15:41:23 2023
Analysis ended on: Wed Jun 07 15:41:34 2023
Total elapsed time: 00:00:11

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 8
Number of nodes ........... 13
Number of links ........... 20
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------
London               London-100yr                INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------
EXT1                        2.73    182.00      5.00    1.0000 London               OF1
P1                          1.62    405.75     62.00    2.0000 London               ST3
P2                          0.77    220.00     62.00    2.0000 London               CBMH20
P3                          0.66    188.00     62.00    2.0000 London               ST10
P4                          0.25    124.50      0.00   20.0000 London               DB_INFL
P5                          1.24    311.00     62.00    2.0000 London               ST2
ROW1                        0.34    169.00     79.00    2.0000 London               OF1
ROW2                        0.06     24.00    100.00    0.2000 London               ST4


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
CBMH18               JUNCTION       283.61      2.53       0.0
CBMH19               JUNCTION       283.84      2.31       0.0
CBMH20               JUNCTION       284.04      2.14       0.0
ST10                 JUNCTION       284.16      2.11       0.0
ST2                  JUNCTION       282.60      1.86       0.0
ST3                  JUNCTION       282.69      2.15       0.0
ST4                  JUNCTION       282.83      2.53       0.0
ST5                  JUNCTION       283.13      2.53       0.0
ST6                  JUNCTION       283.36      2.60       0.0
OF1                  OUTFALL          0.00      0.00       0.0
OF2                  OUTFALL        281.75      0.00       0.0
OF3                  OUTFALL        283.00      0.95       0.0
DB_INFL              STORAGE        281.75      2.35       0.0


************
Link Summary
************
Name                 From Node           To Node             Type           Length    %Slope Roughness
-----------------------------------------------------------------------------------------------------
15                   CBMH20              CBMH19              CONDUIT          33.5    0.5075    0.0130
16                   CBMH19              CBMH18              CONDUIT          40.7    0.4914    0.0130
19                   ST5                 ST4                 CONDUIT          37.5    0.4000    0.0130
2                    DB_INFL             OF3                 CONDUIT          15.0    2.6676    0.0300
3                    ST10                CBMH20              CONDUIT          18.3    0.4918    0.0130
4                    CBMH18              ST6                 CONDUIT          34.2    0.4971    0.0130
5                    ST6                 ST5                 CONDUIT          30.7    0.4886    0.0130
6                    ST4                 ST3                 CONDUIT          31.5    0.1905    0.0130
7                    ST3                 ST2                 CONDUIT          36.7    0.1907    0.0130
8                    ST2                 DB_INFL             CONDUIT          15.4    0.3896    0.0130
10                   CBMH18              ST6                 WEIR
11                   ST6                 ST5                 WEIR
```

DEL19-103: Watson Farm Condominium Development
100-year Design Storm Event – Proposed Conditions PCSWMM Output

```
12                   ST4                 ST3                 WEIR
13                   ST3                 ST2                 WEIR
14                   ST2                 DB_INFL             WEIR
17                   CBMH20              CBMH19              WEIR
18                   CBMH19              CBMH18              WEIR
20                   ST5                 ST4                 WEIR
9                    ST10                CBMH20              WEIR
1                    DB_INFL             OF2                 OUTLET


********************
Cross Section Summary
********************
                                      Full      Full      Hyd.      Max.   No. of      Full
Conduit              Shape           Depth      Area      Rad.     Width  Barrels      Flow
---------------------------------------------------------------------------------------------
15                   CIRCULAR         0.30      0.07      0.07      0.30       1     68.89
16                   CIRCULAR         0.30      0.07      0.07      0.30       1     67.79
19                   CIRCULAR         0.45      0.16      0.11      0.45       1    180.33
2                    CIRCULAR         0.45      0.16      0.11      0.45       1    201.80
3                    CIRCULAR         0.30      0.07      0.07      0.30       1     67.82
4                    CIRCULAR         0.30      0.07      0.07      0.30       1     68.18
5                    CIRCULAR         0.45      0.16      0.11      0.45       1    199.30
6                    CIRCULAR         0.60      0.28      0.15      0.60       1    267.99
7                    CIRCULAR         0.68      0.36      0.17      0.68       1    367.14
8                    CIRCULAR         0.68      0.36      0.17      0.68       1    524.72


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/13/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 0.50 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 2
Head Tolerance ........... 0.001500 m


*************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.551        71.801
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.242        31.585
Surface Runoff ...........         0.299        38.925
Final Storage ............         0.010         1.354
Continuity Error (%) .....        -0.088


*************************       Volume       Volume
Flow Routing Continuity        hectare-m    10^6 ltr
*************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.299         2.986
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
```

```
External Inflow .....          0.000          0.000
External Outflow .....         0.299          2.987
Flooding Loss .....            0.000          0.000
Evaporation Loss .....         0.000          0.000
Exfiltration Loss .....        0.000          0.000
Initial Stored Volume ....     0.000          0.000
Final Stored Volume .....      0.000          0.000
Continuity Error (%) .....     -0.028
```

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

```
Minimum Time Step           :     0.50 sec
Average Time Step           :     0.50 sec
Maximum Time Step           :     0.50 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00
Percent Not Converging      :     0.00
```

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
EXT1	71.80	0.00	0.00	52.60	17.93	0.49	107.74	0.250
P1	71.80	0.00	0.00	19.20	51.29	0.83	667.24	0.714
P2	71.80	0.00	0.00	19.15	51.34	0.40	326.09	0.715
P3	71.80	0.00	0.00	19.15	51.34	0.34	278.66	0.715
P4	71.80	0.00	0.00	51.55	19.03	0.05	28.56	0.265
P5	71.80	0.00	0.00	19.20	51.29	0.64	511.43	0.714
ROW1	71.80	0.00	0.00	10.37	60.11	0.20	199.63	0.837
ROW2	71.80	0.00	0.00	0.00	71.13	0.04	40.83	0.991

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CBMH18	JUNCTION	0.04	2.43	286.04	0 01:10	2.43
CBMH19	JUNCTION	0.03	2.24	286.08	0 01:10	2.24
CBMH20	JUNCTION	0.03	2.07	286.11	0 01:10	2.07
ST10	JUNCTION	0.03	1.99	286.15	0 01:10	1.99
ST2	JUNCTION	0.23	1.29	283.89	0 03:09	1.29
ST3	JUNCTION	0.20	1.96	284.65	0 01:10	1.87
ST4	JUNCTION	0.17	2.13	284.96	0 01:10	2.02
ST5	JUNCTION	0.10	2.41	285.54	0 01:10	2.41
ST6	JUNCTION	0.06	2.49	285.85	0 01:10	2.49
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	281.75	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	283.00	0 00:00	0.00
DB_INFL	STORAGE	0.50	2.14	283.89	0 03:08	2.14

Node Inflow Summary

DEL19-103: Watson Farm Condominium Development
100-year Design Storm Event – Proposed Conditions PCSWMM Output

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CBMH18	JUNCTION	0.00	604.24	0 01:10	0	0.732	0.312
CBMH19	JUNCTION	0.00	604.36	0 01:10	0	0.733	0.139
CBMH20	JUNCTION	326.09	604.66	0 01:10	0.395	0.733	0.037
ST10	JUNCTION	278.66	278.66	0 01:10	0.338	0.338	0.007
ST2	JUNCTION	511.43	1696.98	0 01:10	0.638	2.24	-0.025
ST3	JUNCTION	667.24	1240.63	0 01:10	0.832	1.6	-0.020
ST4	JUNCTION	40.83	642.35	0 01:10	0.0427	0.772	-0.085
ST5	JUNCTION	0.00	603.99	0 01:10	0	0.729	-0.027
ST6	JUNCTION	0.00	604.23	0 01:10	0	0.73	0.082
OF1	OUTFALL	307.37	307.37	0 01:10	0.693	0.693	0.000
OF2	OUTFALL	0.00	22.91	0 01:08	0	2.29	0.000
OF3	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
DB_INFL	STORAGE	28.56	1716.13	0 01:10	0.0474	2.29	-0.138

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
DB_INFL	0.398	17	0	0	1.987	86	0 03:08	22.91

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	8.02	33.33	307.37	0.693
OF2	38.95	22.73	22.91	2.294
OF3	0.00	0.00	0.00	0.000
System	15.66	56.06	330.28	2.987

Link Flow Summary

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
15	CONDUIT	185.71	0 01:06	2.63	2.70	1.00
16	CONDUIT	197.33	0 01:06	2.79	2.91	1.00
19	CONDUIT	472.04	0 01:12	2.97	2.62	1.00
2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
3	CONDUIT	99.16	0 01:06	1.40	1.46	1.00
4	CONDUIT	241.03	0 01:07	3.41	3.54	1.00
5	CONDUIT	465.21	0 01:09	2.93	2.33	1.00
6	CONDUIT	609.34	0 01:10	2.16	2.27	1.00

7	CONDUIT	1229.11	0	01:10	3.43	3.35	1.00
8	CONDUIT	1702.80	0	01:10	4.76	3.25	1.00
10	WEIR	531.63	0	01:10			0.48
11	WEIR	313.54	0	01:10			0.34
12	WEIR	0.00	0	00:00			0.00
13	WEIR	0.00	0	00:00			0.00
14	WEIR	0.00	0	00:00			0.00
17	WEIR	574.16	0	01:10			0.61
18	WEIR	575.26	0	01:10			0.59
20	WEIR	210.83	0	01:10			0.26
9	WEIR	232.61	0	01:10			0.28
1	DUMMY	22.91	0	01:08			

****
Flow Classification Summary
****

	Adjusted /Actual	Fraction of Time in Flow Class							
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
15	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
16	1.00	0.00	0.00	0.00	0.09	0.00	0.00	0.91	0.07	0.00
19	1.00	0.00	0.00	0.00	0.23	0.00	0.00	0.77	0.06	0.00
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.02	0.00
4	1.00	0.00	0.00	0.00	0.13	0.00	0.00	0.87	0.05	0.00
5	1.00	0.00	0.00	0.00	0.18	0.00	0.00	0.81	0.05	0.00
6	1.00	0.00	0.00	0.00	0.26	0.00	0.00	0.74	0.01	0.00
7	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.01	0.00
8	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.02	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
15	0.62	0.64	0.62	0.37	0.31
16	0.58	0.64	0.58	0.45	0.36
19	7.52	7.52	9.93	0.27	0.28
3	0.60	0.60	0.63	0.02	0.01
4	0.30	0.61	4.25	0.67	0.30
5	2.59	2.59	5.92	0.25	0.25
6	9.93	9.93	10.85	0.19	0.19
7	10.92	10.92	11.96	0.30	0.28
8	12.15	12.25	13.01	0.29	0.17

Analysis begun on: Wed Jun 07 15:42:11 2023
Analysis ended on: Wed Jun 07 15:42:22 2023
Total elapsed time: 00:00:11

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL19-103 - Watson Farm Lands


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 8
Number of nodes ........... 13
Number of links ........... 20
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
London               London-250yr                INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------
EXT1                        2.73    182.00      5.00    1.0000 London               OF1
P1                          1.62    405.75     62.00    2.0000 London               ST3
P2                          0.77    220.00     62.00    2.0000 London               CBMH20
P3                          0.66    188.00     62.00    2.0000 London               ST10
P4                          0.25    124.50      0.00   20.0000 London               DB_INFL
P5                          1.24    311.00     62.00    2.0000 London               ST2
ROW1                        0.34    169.00     79.00    2.0000 London               OF1
ROW2                        0.06     24.00    100.00    0.2000 London               ST4


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
CBMH18               JUNCTION       283.61      2.53       0.0
CBMH19               JUNCTION       283.84      2.31       0.0
CBMH20               JUNCTION       284.04      2.14       0.0
ST10                 JUNCTION       284.16      2.11       0.0
ST2                  JUNCTION       282.60      1.86       0.0
ST3                  JUNCTION       282.69      2.15       0.0
ST4                  JUNCTION       282.83      2.53       0.0
ST5                  JUNCTION       283.13      2.53       0.0
ST6                  JUNCTION       283.36      2.60       0.0
OF1                  OUTFALL          0.00      0.00       0.0
OF2                  OUTFALL        281.75      0.00       0.0
OF3                  OUTFALL        283.00      0.95       0.0
DB_INFL              STORAGE        281.75      2.35       0.0


************
Link Summary
************
Name                 From Node           To Node             Type           Length    %Slope Roughness
-----------------------------------------------------------------------------------------------------
15                   CBMH20              CBMH19              CONDUIT          33.5    0.5075    0.0130
16                   CBMH19              CBMH18              CONDUIT          40.7    0.4914    0.0130
19                   ST5                 ST4                 CONDUIT          37.5    0.4000    0.0130
2                    DB_INFL             OF3                 CONDUIT          15.0    2.6676    0.0300
3                    ST10                CBMH20              CONDUIT          18.3    0.4918    0.0130
4                    CBMH18              ST6                 CONDUIT          34.2    0.4971    0.0130
5                    ST6                 ST5                 CONDUIT          30.7    0.4886    0.0130
6                    ST4                 ST3                 CONDUIT          31.5    0.1905    0.0130
7                    ST3                 ST2                 CONDUIT          36.7    0.1907    0.0130
8                    ST2                 DB_INFL             CONDUIT          15.4    0.3896    0.0130
10                   CBMH18              ST6                 WEIR
11                   ST6                 ST5                 WEIR
```

DEL19-103: Watson Farm Condominium Development
250-year Design Storm Event – Proposed Conditions PCSWMM Output

```
12                   ST4                 ST3                 WEIR
13                   ST3                 ST2                 WEIR
14                   ST2                 DB_INFL             WEIR
17                   CBMH20              CBMH19              WEIR
18                   CBMH19              CBMH18              WEIR
20                   ST5                 ST4                 WEIR
9                    ST10                CBMH20              WEIR
1                    DB_INFL             OF2                 OUTLET


********************
Cross Section Summary
********************
                                          Full      Full      Hyd.      Max.   No. of      Full
Conduit              Shape                Depth      Area      Rad.     Width  Barrels      Flow
-------------------------------------------------------------------------------------------------
15                   CIRCULAR              0.30      0.07      0.07      0.30       1     68.89
16                   CIRCULAR              0.30      0.07      0.07      0.30       1     67.79
19                   CIRCULAR              0.45      0.16      0.11      0.45       1    180.33
2                    CIRCULAR              0.45      0.16      0.11      0.45       1    201.80
3                    CIRCULAR              0.30      0.07      0.07      0.30       1     67.82
4                    CIRCULAR              0.30      0.07      0.07      0.30       1     68.18
5                    CIRCULAR              0.45      0.16      0.11      0.45       1    199.30
6                    CIRCULAR              0.60      0.28      0.15      0.60       1    267.99
7                    CIRCULAR              0.68      0.36      0.17      0.68       1    367.14
8                    CIRCULAR              0.68      0.36      0.17      0.68       1    524.72


*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/13/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 0.50 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 2
Head Tolerance ........... 0.001500 m


**************************       Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.664        86.611
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.269        35.038
Surface Runoff ...........         0.386        50.270
Final Storage ............         0.010         1.350
Continuity Error (%) .....        -0.054


**************************       Volume       Volume
Flow Routing Continuity        hectare-m    10^6 ltr
**************************     ---------    ---------
Dry Weather Inflow .......         0.000        0.000
Wet Weather Inflow .......         0.386        3.857
Groundwater Inflow .......         0.000        0.000
RDII Inflow ..............         0.000        0.000
```

External Inflow	0.000	0.000
External Outflow	0.386	3.856
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.013	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	0.50 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
EXT1	86.61	0.00	0.00	58.17	27.18	0.74	114.95	0.314
P1	86.61	0.00	0.00	21.38	63.88	1.04	702.00	0.738
P2	86.61	0.00	0.00	21.34	63.93	0.49	342.12	0.738
P3	86.61	0.00	0.00	21.34	63.93	0.42	292.36	0.738
P4	86.61	0.00	0.00	57.44	27.95	0.07	46.50	0.323
P5	86.61	0.00	0.00	21.38	63.88	0.79	538.07	0.738
ROW1	86.61	0.00	0.00	11.61	73.64	0.25	201.12	0.850
ROW2	86.61	0.00	0.00	0.00	85.92	0.05	40.88	0.992

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CBMH18	JUNCTION	0.06	2.43	286.04	0 01:10	2.43
CBMH19	JUNCTION	0.04	2.24	286.08	0 01:10	2.24
CBMH20	JUNCTION	0.03	2.07	286.11	0 01:10	2.07
ST10	JUNCTION	0.03	1.99	286.15	0 01:10	1.99
ST2	JUNCTION	0.27	1.49	284.09	0 02:18	1.49
ST3	JUNCTION	0.25	2.01	284.70	0 01:10	2.01
ST4	JUNCTION	0.21	2.26	285.09	0 01:10	2.26
ST5	JUNCTION	0.13	2.42	285.55	0 01:10	2.42
ST6	JUNCTION	0.09	2.49	285.85	0 01:10	2.49
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	281.75	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	283.00	0 00:00	0.00
DB_INFL	STORAGE	0.56	2.34	284.09	0 02:20	2.34

****
Node Inflow Summary
****

DEL19-103: Watson Farm Condominium Development
250-year Design Storm Event – Proposed Conditions PCSWMM Output

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CBMH18	JUNCTION	0.00	634.09	0 01:10	0	0.912	0.426
CBMH19	JUNCTION	0.00	634.19	0 01:10	0	0.912	0.032
CBMH20	JUNCTION	342.12	634.39	0 01:10	0.492	0.913	0.116
ST10	JUNCTION	292.36	292.36	0 01:10	0.421	0.421	0.005
ST2	JUNCTION	538.07	1899.66	0 01:10	0.795	2.79	-0.005
ST3	JUNCTION	702.00	1368.08	0 01:10	1.04	2	-0.014
ST4	JUNCTION	40.88	674.02	0 01:10	0.0516	0.959	-0.106
ST5	JUNCTION	0.00	634.01	0 01:10	0	0.907	-0.057
ST6	JUNCTION	0.00	634.09	0 01:10	0	0.908	0.068
OF1	OUTFALL	314.56	314.56	0 01:10	0.991	0.991	0.000
OF2	OUTFALL	0.00	22.91	0 01:07	0	2.45	0.000
OF3	OUTFALL	0.00	75.96	0 02:20	0	0.414	0.000
DB_INFL	STORAGE	46.50	1926.21	0 01:10	0.0696	2.86	-0.115

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
DB_INFL	0.464	20	0	0	2.287	99	0 02:20	98.87

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	9.13	41.87	314.56	0.991
OF2	41.58	22.74	22.91	2.451
OF3	4.77	33.47	75.96	0.414
System	18.49	98.09	337.47	3.856

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
15	CONDUIT	164.55	0 01:05	2.33	2.39	1.00
16	CONDUIT	190.23	0 01:06	2.69	2.81	1.00
19	CONDUIT	466.75	0 01:16	2.93	2.59	1.00
2	CONDUIT	75.96	0 02:20	1.18	0.38	0.42
3	CONDUIT	83.27	0 01:05	1.18	1.23	1.00
4	CONDUIT	242.74	0 01:06	3.43	3.56	1.00
5	CONDUIT	465.04	0 01:08	2.92	2.33	1.00
6	CONDUIT	677.14	0 01:10	2.39	2.53	1.00

7	CONDUIT	1235.81	0	01:11	3.45	3.37	1.00
8	CONDUIT	1902.16	0	01:10	5.32	3.63	1.00
10	WEIR	561.92	0	01:10			0.50
11	WEIR	349.58	0	01:10			0.36
12	WEIR	0.00	0	00:00			0.00
13	WEIR	211.26	0	01:10			0.26
14	WEIR	0.00	0	00:00			0.00
17	WEIR	603.89	0	01:10			0.63
18	WEIR	605.00	0	01:10			0.61
20	WEIR	311.85	0	01:10			0.34
9	WEIR	247.35	0	01:10			0.29
1	DUMMY	22.91	0	01:07			

****
Flow Classification Summary
****

	Adjusted /Actual	Fraction of Time in Flow Class							
Conduit	Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
15	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.94	0.04	0.00
16	1.00	0.00	0.00	0.00	0.12	0.00	0.00	0.88	0.05	0.00
19	1.00	0.00	0.00	0.00	0.25	0.00	0.00	0.74	0.07	0.00
2	1.00	0.95	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
3	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.02	0.00
4	1.00	0.00	0.00	0.00	0.16	0.00	0.00	0.84	0.05	0.00
5	1.00	0.00	0.00	0.00	0.21	0.00	0.00	0.79	0.05	0.00
6	1.00	0.00	0.00	0.00	0.29	0.00	0.00	0.71	0.01	0.00
7	1.00	0.00	0.00	0.00	0.32	0.00	0.00	0.68	0.01	0.00
8	1.00	0.00	0.00	0.00	0.32	0.00	0.00	0.68	0.02	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
15	1.02	1.03	1.33	0.42	0.37
16	1.48	1.51	3.22	0.54	0.48
19	9.45	9.45	11.86	0.36	0.36
3	0.91	0.91	0.99	0.02	0.02
4	3.66	3.74	6.74	0.86	0.74
5	5.48	5.48	8.11	0.34	0.33
6	11.86	11.86	12.77	0.26	0.26
7	12.84	12.85	13.88	0.39	0.37
8	14.15	14.18	15.01	0.38	0.33

Analysis begun on: Wed Jun 07 15:42:52 2023
Analysis ended on: Wed Jun 07 15:43:04 2023
Total elapsed time: 00:00:12

Appendix F: CDS Quality Control Unit Cut Sheets

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name: Watson Farm
Location: Thorndale ON
OGS #: 1

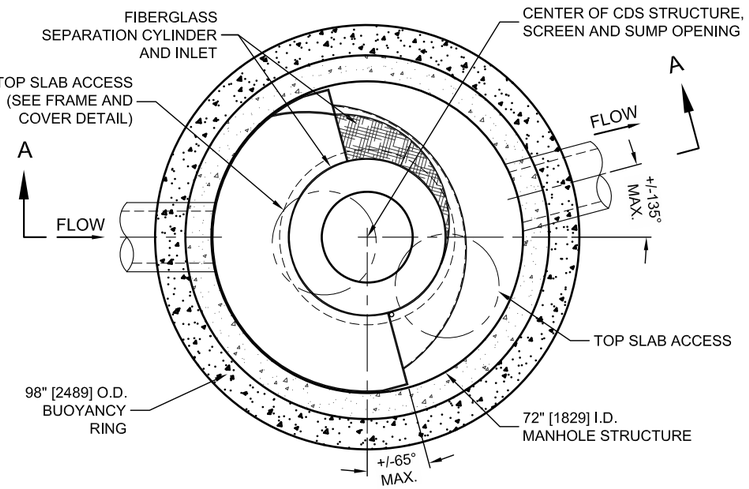
Engineer: **Development Engineering**
Contact: Kyle Zehr, EIT
Report Date: 6-Jun-23

Area	4.600	ha	**Rainfall Station #**	195	
Weighted C	0.62		**Particle Size Distribution**	FINE	
CDS Model	3035		**CDS Treatment Capacity**	108	l/s

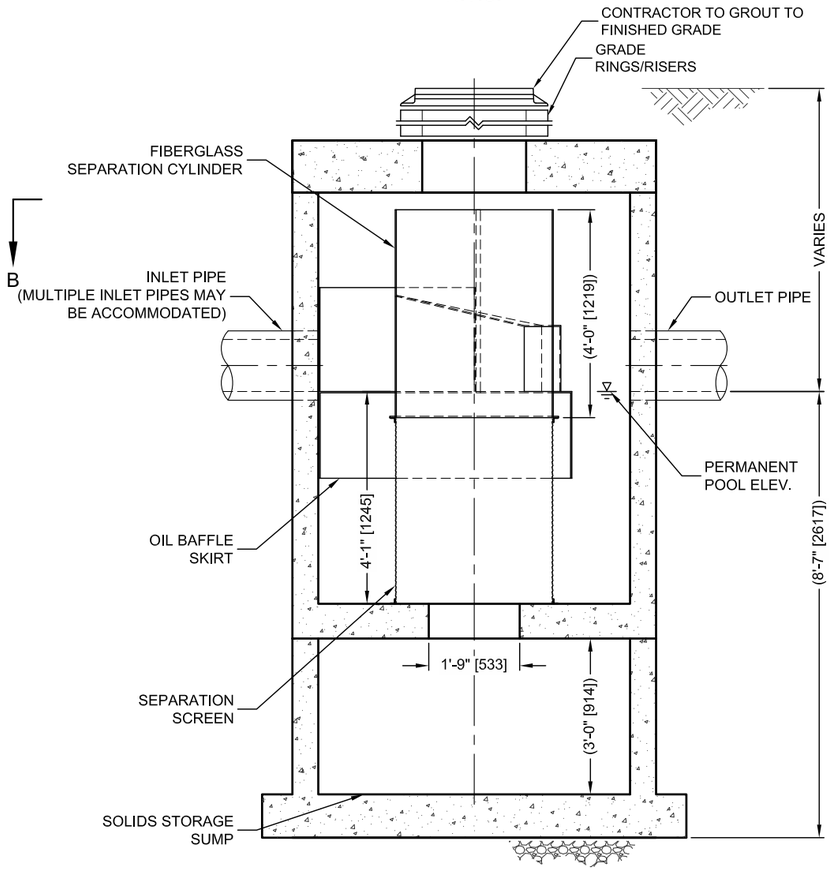
Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
1.0	10.3%	20.1%	7.9	7.9	7.3	96.8	9.9
1.5	9.7%	29.7%	11.8	11.8	11.0	95.7	9.2
2.0	8.9%	38.6%	15.7	15.7	14.6	94.7	8.4
2.5	7.7%	46.2%	19.7	19.7	18.3	93.6	7.2
3.0	6.5%	52.7%	23.6	23.6	21.9	92.6	6.0
3.5	4.2%	56.9%	27.5	27.5	25.6	91.5	3.9
4.0	4.7%	61.6%	31.5	31.5	29.2	90.5	4.2
4.5	3.9%	65.4%	35.4	35.4	32.9	89.4	3.4
5.0	3.4%	68.8%	39.3	39.3	36.5	88.4	3.0
6.0	4.7%	73.6%	47.2	47.2	43.8	86.3	4.1
7.0	4.6%	78.2%	55.1	55.1	51.2	84.2	3.9
8.0	3.5%	81.7%	62.9	62.9	58.5	82.1	2.9
9.0	2.3%	84.0%	70.8	70.8	65.8	80.0	1.8
10.0	2.6%	86.6%	78.6	78.6	73.1	77.9	2.0
15.0	6.7%	93.3%	118.0	107.6	100.0	64.0	4.3
20.0	2.7%	96.0%	157.3	107.6	100.0	48.0	1.3
25.0	1.7%	97.7%	196.6	107.6	100.0	38.4	0.7
30.0	1.3%	99.0%	235.9	107.6	100.0	32.0	0.4
35.0	0.6%	99.6%	275.3	107.6	100.0	27.4	0.2
40.0	0.3%	99.8%	314.6	107.6	100.0	24.0	0.1
45.0	0.0%	99.8%	353.9	107.6	100.0	21.3	0.0
50.0	0.2%	100.0%	393.2	107.6	100.0	19.2	0.0
							86.5

Removal Efficiency Adjustment[2] = 6.5%
Predicted Net Annual Load Removal Efficiency = 80.0%
Predicted Annual Rainfall Treated = 96.1%

1 - Based on 44 years of hourly rainfall data from Canadian Station 6144475, London ON
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.
3 - CDS Efficiency based on testing conducted at the University of Central Florida
4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications



PLAN VIEW B-B
N.T.S.

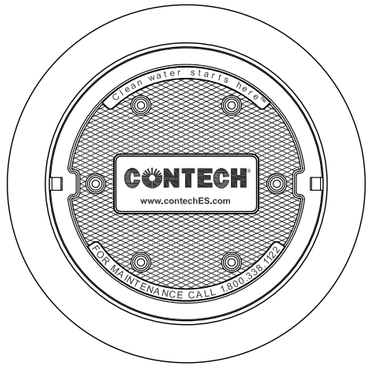


ELEVATION A-A
N.T.S.

CDS PMSU3035-6-C DESIGN NOTES

THE STANDARD CDS PMSU3035-6-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
CUSTOMIZABLE SUMP DEPTH AVAILABLE
ANTI-FLOTATION DESIGN AVAILABLE UPON REQUEST



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

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CDS PMSU3035-6-C
INLINE CDS
STANDARD DETAIL